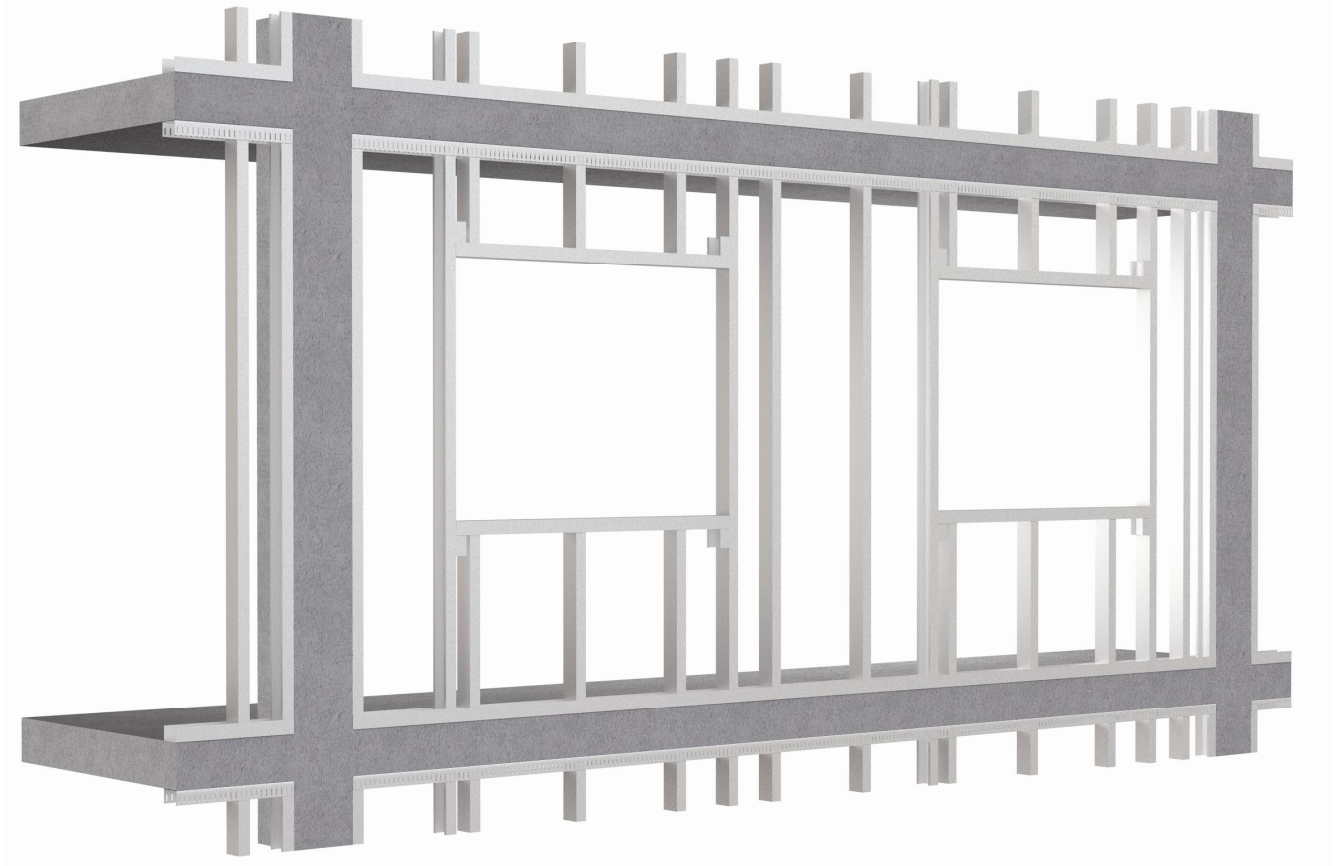
Metsec plc
Lightweight Structural Systems
SFS Division
Broadwell Road, Oldbury
West Midlands B69 4HF
T. +44 (0) 121 601 6000
F. +44 (0) 121 601 6021
E. sfs@metsec.com

Metsec SFS Installation Manual

Infill Walling

September 2009



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voestalpine
ONE STEP AHEAD.

Introduction

Metsec PLC manufacturers a comprehensive range of cold rolled steel profiles for both the construction and manufacturing industry.

The company was established in 1932 and is now a wholly owned subsidiary of the Austrian steel manufacturer, VOEST ALPINE STAHL AG.

Metsec Framing division was formed in 1984 and forms one of eight divisions within Metsec. The other divisions are Purlins, Hepsec, Lattice Beams, Metstrut, CRF, Manipulation (MPM) and Windows.

Metsec Framing division has two main products, SFS and Metframe. The SFS product is split further into four distinct product groups: Infill External Walling, Continuous External Walling, High Bay Walling and Load Bearing Structures. This installation guide deals only with the SFS walling systems. For guides for Load Bearing Structures and Metframe please contact Metsec.

The key objectives of this guide are to provide:

- General details showing the typical fixing requirements which can be used by installers on site along with project specific designs and drawings to install the SFS product.
- Information for installers to assist with the preparation of specifications, method statements and risk assessments.
- A site reference guide for contractors.

Throughout this manual Metsec Framing will be referred to as Metsec.

All text & drawings contained in this document show typical details. Reference should be made to project specific drawings & calculations for confirmation of section sizes / connection details.

Whilst every effort has been taken to ensure this manual contains full & accurate information Metsec cannot accept any liability for errors or omissions. The contents constitute advice, given in good faith.

Where details show overall construction this does not imply agreement by Metsec or the installer to provide all elements shown.

Metsec reserves the right to change details and specifications at any time, without prior notice.

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Product Description - SFS

SFS is a fast-track solution to construct external walling, high bay separating walls and load bearing elements in lightweight cold-rolled galvanized steel sections.

SFS has been extensively used in construction projects covering residential flats, apartments, nursing homes and sheltered accommodation, commercial developments, public buildings and industrial properties. It is also ideally suited to refurbishment projects, particularly involving sub-division of buildings, conversions or roof extensions.

SFS projects are usually designed in house by Metsec's team of engineers and typical details and calculations are provided to aid construction.

Sections are typically supplied to site as individual components and fully assembled in-situ. This is an advantage where site access/craneage is restricted. Components can be supplied in final required lengths or standard lengths cut to suit on site. By cutting to length on site construction tolerances in structures being worked alongside can be fully accommodated.

Generally SFS sections are fixed together using self-drilling / self-tapping (Tek) screws.

SFS External Infill Walling requires support at the slab edge between a hot-rolled steel or concrete frame structures. This allows insulation and external finishes to be installed continuously outside the main structural frame. The system is suitable for both low and high-rise constructions.

SFS External Continuous Walling is fitted outside the line of the structural frame using support and/or restraint cleats at each floor level with connections designed to allow slab deflection. It is particularly suited to situations where cladding materials are sensitive to differential movement of the mainframe.

Both the above systems achieve early weather protection of the building allowing other internal fitting trades to work inside the structure and removing external cladding from the critical path.

SFS external walling will provide lateral support to most cladding materials including masonry, profiled metal sheets, proprietary panels and insulated render systems.

SFS High Bay Walling is a single-span separating wall typically used within existing buildings such as warehouses and industrial units. Its lightweight construction and uniformly distributed loading minimizes disruption to the existing structure.

SFS Load Bearing Structures are used to provide individual elements or a complete stand-alone structure. Roofs, floors and internal walls are lightweight, quick to install and flexible in detail and performance characteristics.

SFS structures are particularly suited to developments where access is limited or lightweight loadings are required eg/extensions supported by existing structures.

SFS Load Bearing Structures are not covered in this guide.

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Components - SFS

The following tables show the Metsec Framing standard section ranges for SFS.

These consist of the section profiles listed below;

'C sections': Used as studs in walls and joists in roofs or floors.

'Channels': Used as tracks on top and bottom of walls and ends of roof and floor joists.

'Angles': Used for various arrangements to provide additional or temporary support.

'Straps': A range of straps is available to use as bracing members when screw fixed to the face of walls or roofs.

Examples of section references are:

100M12 = Lipped 'C section' of 100mm depth, 1.2mm material thickness.
'M' reference denotes SFS section.

104M12 = Non-lipped 'channel' section of 104mm depth, 1.2mm material thickness.

Where necessary the Metsec SFS range of sections can be used in conjunction with other ranges produced in the Metsec Framing Division.

'C sections' and 'channels' are formed from pre-hot dipped galvanized steel G275 coating, minimum yield strength = 280N/mm^2.

All other components shown in our details but not listed in our range are not supplied by Metsec.

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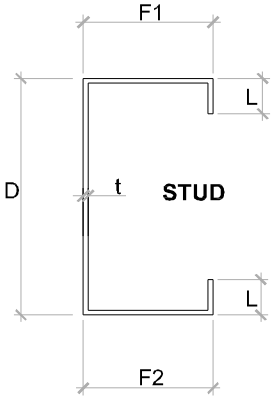
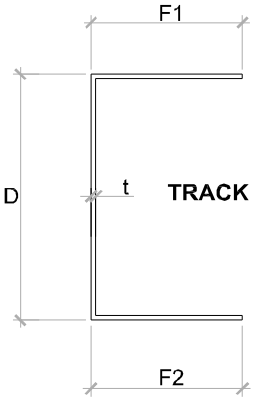
Metsec Framing Section Range - SFS

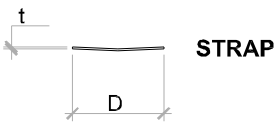
Section Reference	Area cm^2	Weight kg/m	D mm	F1 mm	F2 mm	L mm	t mm	Service Slot
70M15	2.31	1.83	70	35	35	10	1.5	72x32
100M12	2.75	2.14	100	53	53	14	1.2	72x32
100M15	3.45	2.67	100	54	54	14	1.5	72x32
100M20	4.60	3.56	100	55	55	14	2.0	72x32
100M23*	6.04	4.67	100	71	71	15	2.3	72x32
100M29*	7.67	5.83	100	72	72	16	2.9	72x32
100M30*	10.56	8.26	100	110	110	22	3.0	72x32
150M12	3.37	2.64	150	55	55	13	1.2	72x32
150M15	4.23	3.37	150	56	56	13	1.5	72x32
150M20	5.64	4.47	150	57	57	13	2.0	72x32
150M30*	8.76	6.83	150	62	62	15	3.0	72x32
200M12	3.97	3.13	200	55	55	13	1.2	72x32
200M15	5.28	4.18	200	65	65	14	1.5	72x32
200M20	7.08	5.56	200	67	67	14	2.0	72x32
200M30*	10.56	8.26	200	68	68	14	3.0	72x32
250M16	6.55	5.11	250	68	68	15	1.6	72x32
250M20	8.16	6.38	250	68	68	15	2.0	72x32
300M20	8.80	6.97	300	59	59	15	2.0	72x32
300M29	12.83	10.1	300	62	62	15	2.9	72x32
74M12	1.82	1.47	74	40	40	0	1.2	None
74M20	4.00	3.26	74	65	65	0	2.0	None
104M12	2.71	2.14	104	62	62	0	1.2	None
104M15	3.38	2.67	104	62	62	0	1.5	None
104M20#	4.52	3.56	104	63	63	0	2.0	None
108M30*	6.78	5.35	108	62	62	0	3.0	None
154M12	3.33	2.64	154	63	63	0	1.2	None
154M20#	5.64	4.47	154	66	66	0	2.0	None
158M30*	8.70	6.83	158	69	69	0	3.0	None
204M12	3.93	3.13	204	63	63	0	1.2	None
204M20#	6.96	5.56	204	74	74	0	2.0	None
208M30*	10.38	8.26	208	72	72	0	3.0	None
254M12	3.93	3.13	254	38	38	0	1.2	None
254M20	8.00	6.38	254	79	79	0	2.0	None
304M16	6.41	5.11	304	53	53	0	1.6	None
304M20	8.72	6.97	304	68	68	0	2.0	None
306M29	12.65	10.1	306	68	68	0	2.9	None
38VB09	0.34	0.27	38	0	0	0	0.9	None
100VB12	1.20	0.94	100	0	0	0	1.2	None
45x45x2.0	1.76	1.38	0	45	45	0	2.0	None
100x100x2.0	3.96	3.11	0	100	100	0	2.0	None

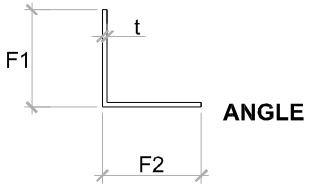
* - Non-Standard section sizes. Availability and lead in times may vary from typical periods.
# - Section is available with deflection head slots with an 'S' reference i.e. 104M20S.
When provided the service slot is on the centre of the web.

All other components shown in our details but not listed in our range are not supplied by Metsec.









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SFS Walling Systems – Site Installation

To be read in conjunction with all details in sections 1 to 5 and also project specific calculations and drawings.

Please note that any details shown in project specific calculations/drawings take precedent over general details within this installation guide.

The details in this guide are split into sections which follow a sequence similar to how the systems should be constructed on site.

GENERAL SITE PROCEEDURE GUIDANCE NOTES

It is the installer's responsibility to produce a cutting list and order Metsec materials. This should be co-ordinated to suit the desired construction programme.

The installer should conduct a site survey to establish the as built dimensions of the 'main frame' to enable material to be ordered in the most economic manner, alternatively material can be cut to suit on site. Splices in sections are not permitted except where specifically designed by Metsec.

The following points are guidelines that the installer should carefully consider before producing his site-specific method statement:

- SFS Sections are delivered to site in bundles on an articulated lorry unless requested otherwise.
- When lifting bundles and hot-rolled steel using a crane a tail line must be used with an operative on the ground to control lift.
- Where materials are put into temporary storage on site it must be in designated areas with suitable protection to prevent damage.
- Any materials that are damaged upon arrival on site or during construction must be reported and replaced.
- Leading edge protection must be in place throughout roof/floor works and adequate barriers provided around stairwells and voids. Alternatively a fall arrest system of air bags or netting may be suitable.
- Where components need to be cut on site they should be cut with a chopsaw with TCT blade and not an abrasive disk. Care should be taken to cut the components square where they are used in right-angled connections, or as required for an angular fit against abutting members.
- Fixing of components shall be with self-tapping screws. Screw type and size shall be as typical details attached / project specific design. Screw details are included in Section A. All screw fixings must be installed perpendicular to the surface unless advised otherwise.
- No holes are to be cut or formed in SFS steelwork without prior reference to Metsec.
- 72mm deep x 32mm wide service slots can be provided 600mm from each end of studs or joists when requested.
- All drylining, insulation and boarding must be installed in accordance with the project specification and manufacturers recommendations.
- Drylining specification to be in accordance with the contract requirements for fire protection, thermal and acoustic performance. Wall make-up is to be agreed with the Architect.

Reference should be made to the project specific Metsec drawings and Metsec Design Plan and Assessment.

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INFILL EXTERNAL WALLING

Refer to project specific design / drawings for all component section sizes.

Material should be stacked adjacent the area it is to be utilized following storage/loading restrictions applied by the Main Contractor.

It is important that the supporting structure is correctly set out to receive base and head tracks.

Base Tracks should be installed as per the **SF100 series** details. Where the base track overhangs the structure then the overhang solutions can be used when designed by Metsec.

Head Tracks should be installed as per the **SF200 series** details. Where the head track overhangs the structure then the overhang solutions can be used when designed by Metsec.

Studs can be installed as per the **SF300 series** of details. Studs shall be plumbed, aligned and securely attached/located within the base and head tracks. In all infill applications a deflection head detail should be used at the top of the stud. Metsec recommend the use of the slotted head track wherever possible.

Openings can be framed as per the **SF400 series** of details. Where compound sections are shown for lintels, cills & jamb studs these sections should be full length and not spliced.

Resistance to bending and rotation about the minor axis shall be provided by blocking and strapping as shown on the project specific drawings and detail **SF361**.

General details with an overview of more complicated situations such as Curved Walls, Soffits, Parapets, Downstands, Upstands, and Clashes with Structural Bracing can be requested from Metsec.

Details for the fixing of finishes can be found in the **SF800 series** of details and in all cases the installation of these components should be done with to the manufacturers' recommendations.

CONTINUOUS EXTERNAL WALLING

Refer to project specific design / drawings for all component section sizes.

Material should be stacked adjacent the area it is to be utilized following storage/loading restrictions applied by the Main Contractor.

Base Tracks should be installed as per the **SF100 series** details. Where the base track overhangs the structure then the overhang solutions can be used when designed by Metsec. The base detail will occur at the base of the SFS wall and normally every two or three storey's up the building. Metsec will liaise with the design team as to the locations of this support but the support details and transfer of loads to the main structure are the responsibility of the design team and project engineer.

Studs can be installed as per the **SF300 series** of details. Studs shall be plumbed, aligned and securely attached/located within the base track and restrained back to the main structure at floor level and details **SF255, SF256** at the top of the wall. Restraint details shown in this guide are for illustration only and project specific details will always be provided for this type of application. A selection of standard cleat sizes can be found in Section B.

Openings can be framed as per the **SF400 series** of details. Where compound sections are shown for lintels, cills & jamb studs these sections should be full length and not spliced.

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Resistance to bending and rotation about the minor axis shall be provided by blocking and strapping as shown on the drawings and detail **SF361**.

General details with an overview of more complicated situations such as Curved Walls, Soffits, Parapets, Downstands, Upstands, and Clashes with Structural Bracing can be requested from Metsec.

Details for the fixing of finishes can be found in the **SF800 series** of details and in all cases the installation of these components should be done with to the manufacturers' recommendations.

HIGH BAY WALLING

Refer to project specific design / drawings for all component section sizes.

Material should be stacked adjacent the area it is to be utilized following storage/loading restrictions applied by the Main Contractor.

Base Tracks should be installed as per the **SF100 series** details. Where the base track overhangs the structure then the overhang solutions can be used when designed by Metsec.

Head Tracks should be installed as per the **SF200 series** details if possible or by project specific design when used within existing buildings. Where the head track overhangs the structure then the overhang solutions can be used when designed by Metsec. High bay walling often requires a deflection head of greater than 15mm and where this is required Metsec should be contacted to provide an appropriate detail.

Studs can be installed as per the **SF300 series** of details. Studs shall be plumbed, aligned and securely attached/located within the base and head tracks. In all infill applications a deflection head detail should be used at the top of the stud. Metsec recommend the use of the slotted head track wherever possible.

Openings can be framed as per the **SF400 series** of details. Where compound sections are shown for lintels, cills & jamb studs these sections should be full length and not spliced.

Resistance to bending and rotation about the minor axis shall be provided by blocking and strapping as shown on the drawings and detail **SF361**.

Details for the fixing of finishes can be found in the **SF800 series** of details and in all cases the installation of these components should be done with to the manufacturers' recommendations.

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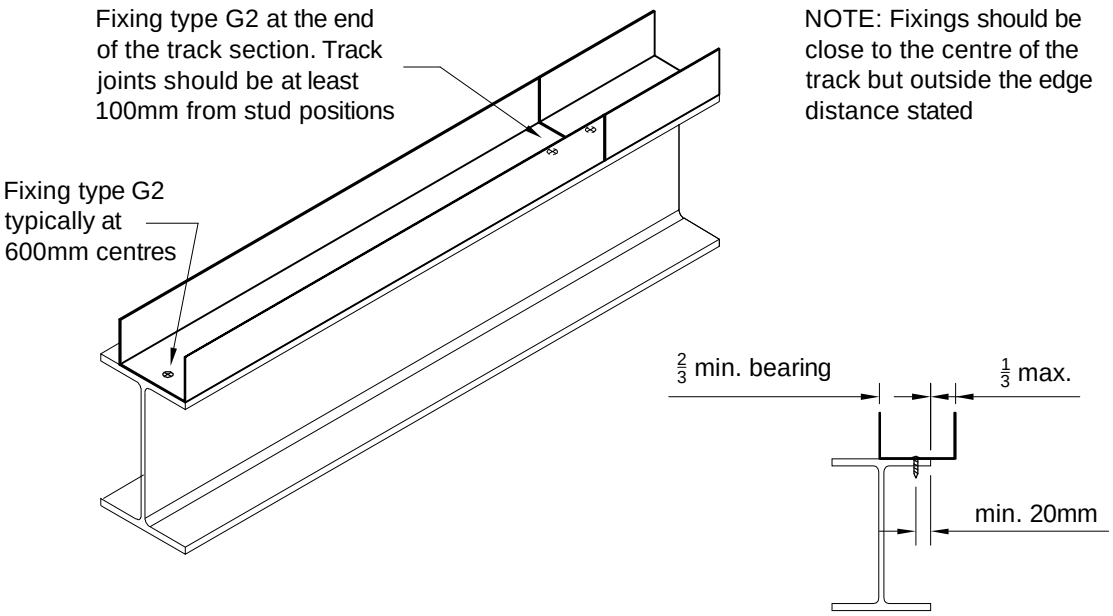

DETAIL SF111

Base Track: Fixing to Steel

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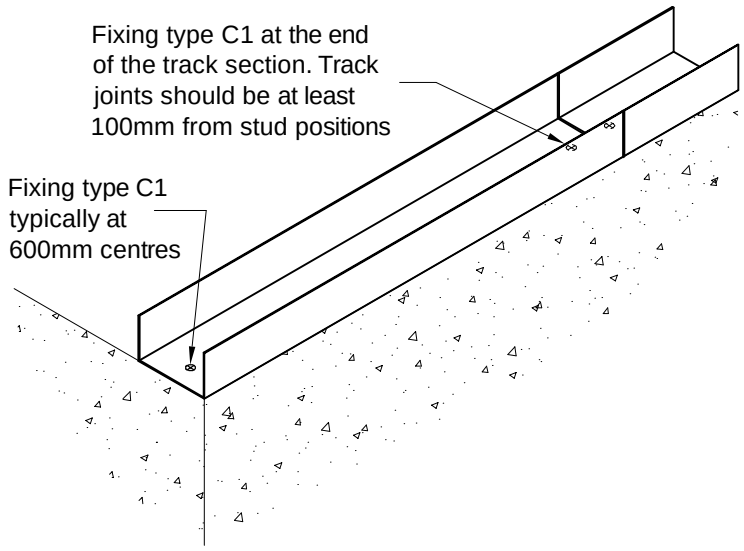
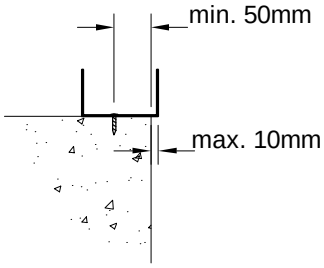
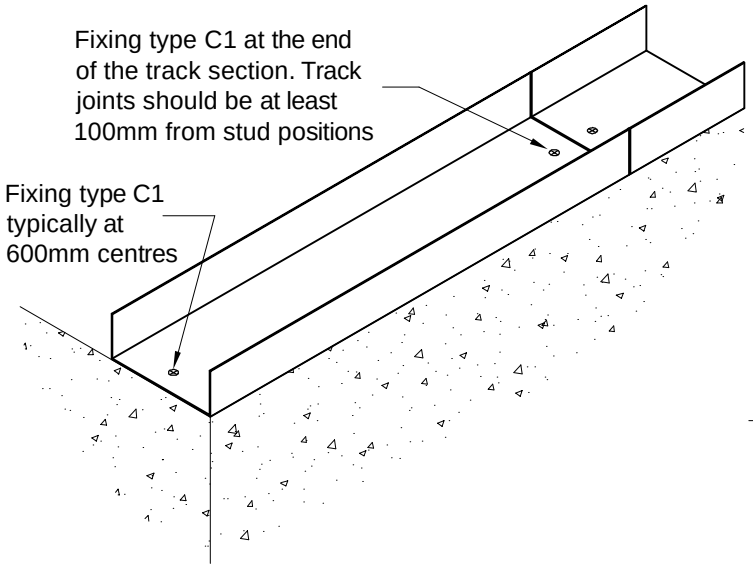


NOTE: Fixings should be close to the centre of the track but outside the edge distance stated

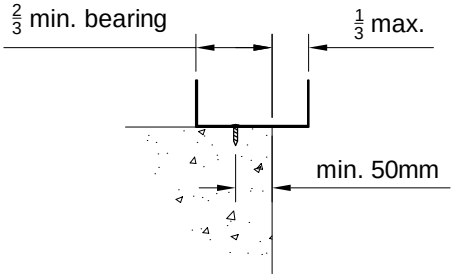


DETAIL SF121

Base Track: Fixing to Concrete - 104mm Wide Track



NOTE: Fixings should be close to the centre of the track but outside the edge distance stated



DETAIL SF122

Base Track: Fixing to Concrete - Track Width 154mm or Greater

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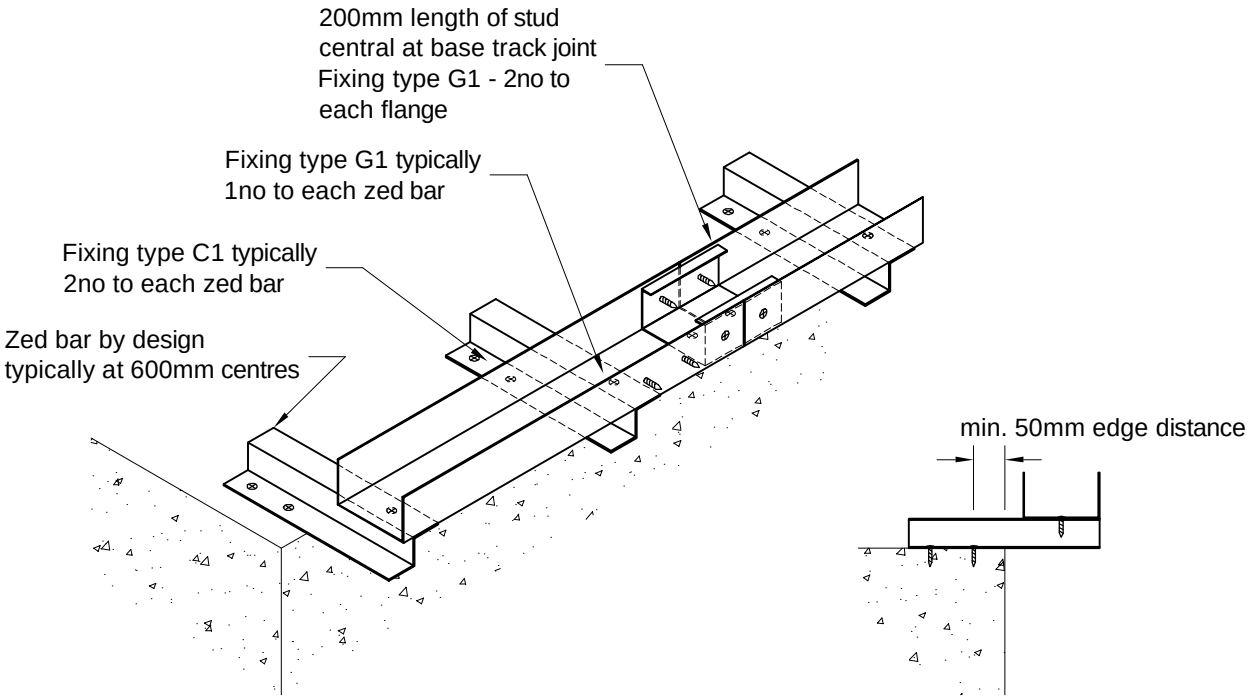
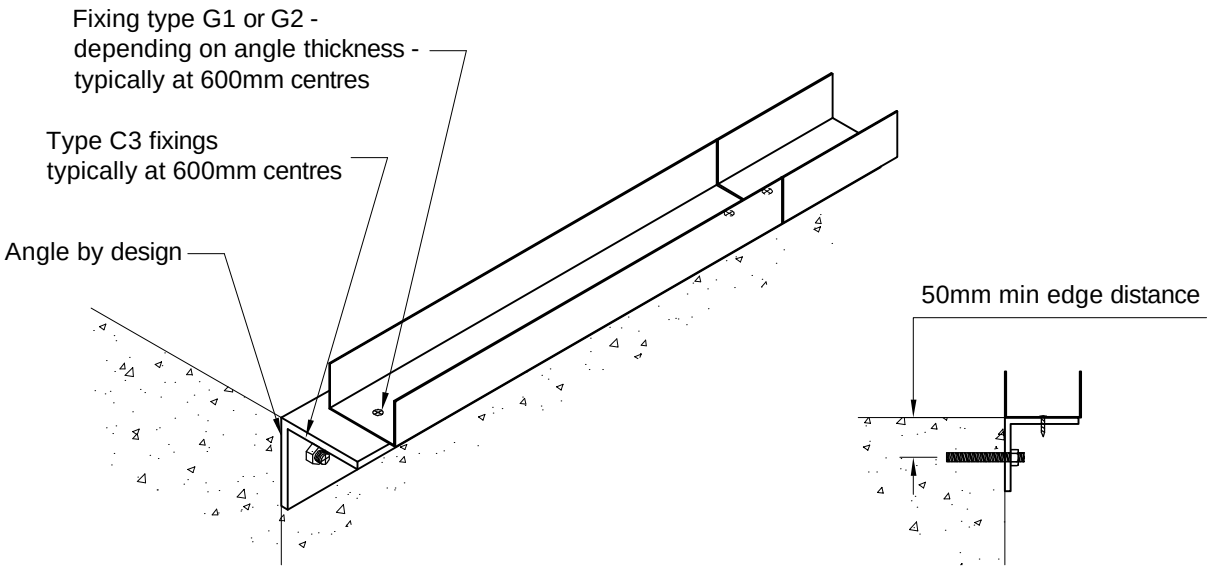


DETAIL SF163

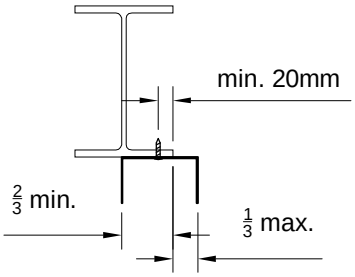
Base Track to Concrete: Overhang Solutions - Zed Bars



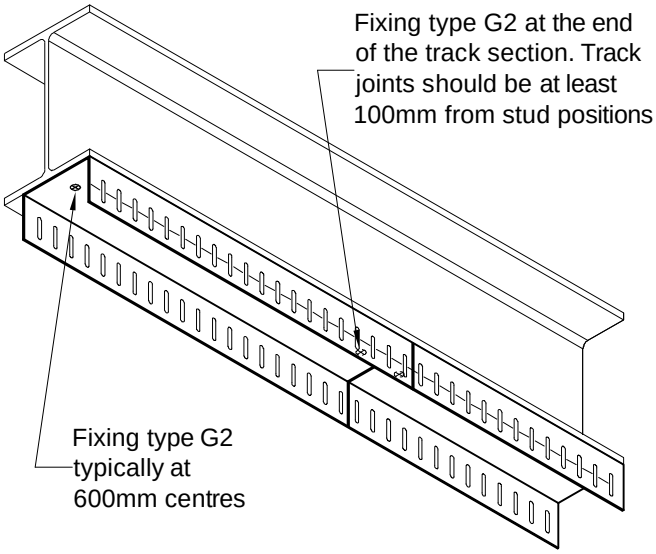
DETAIL SF164

Base Track to Concrete: Overhang Solutions - Support Angle

Tel: 0121 601 6000 Fax: 0121 601 6126



NOTE: Fixings should be close to the centre of the track but outside the edge distance stated



DETAIL SF211

Slotted Head Track: Fixing to Steel

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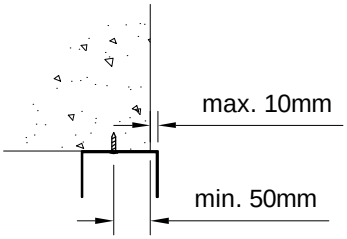
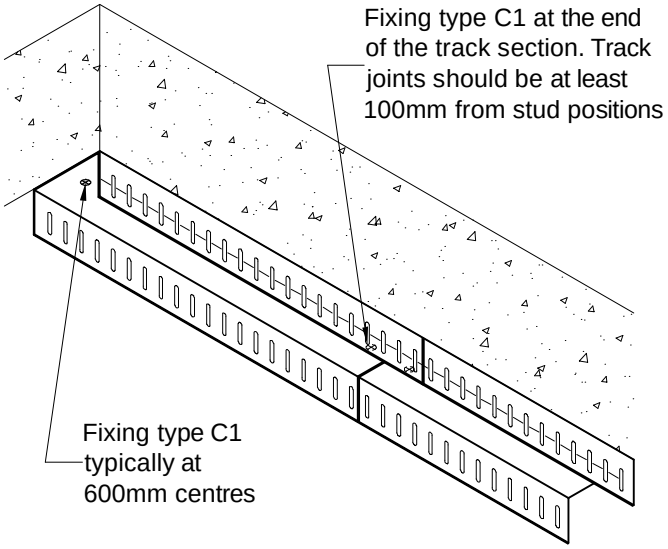
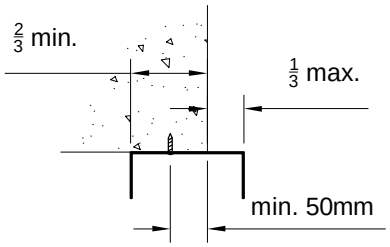


NOTE: Fixings should be close to the centre of the track but outside the edge distance stated

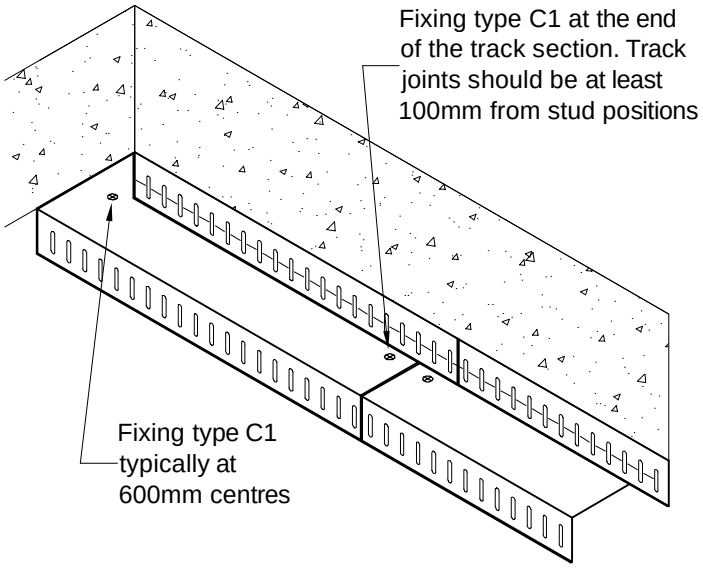


DETAIL SF221

Slotted Head Track: Fixing to Concrete - 104mm Wide Track



NOTE: Fixings should be close to the centre of the track but outside the edge distance stated



DETAIL SF222

Slotted Head Track: Fixing to Concrete - for Track Width 154mm or Greater

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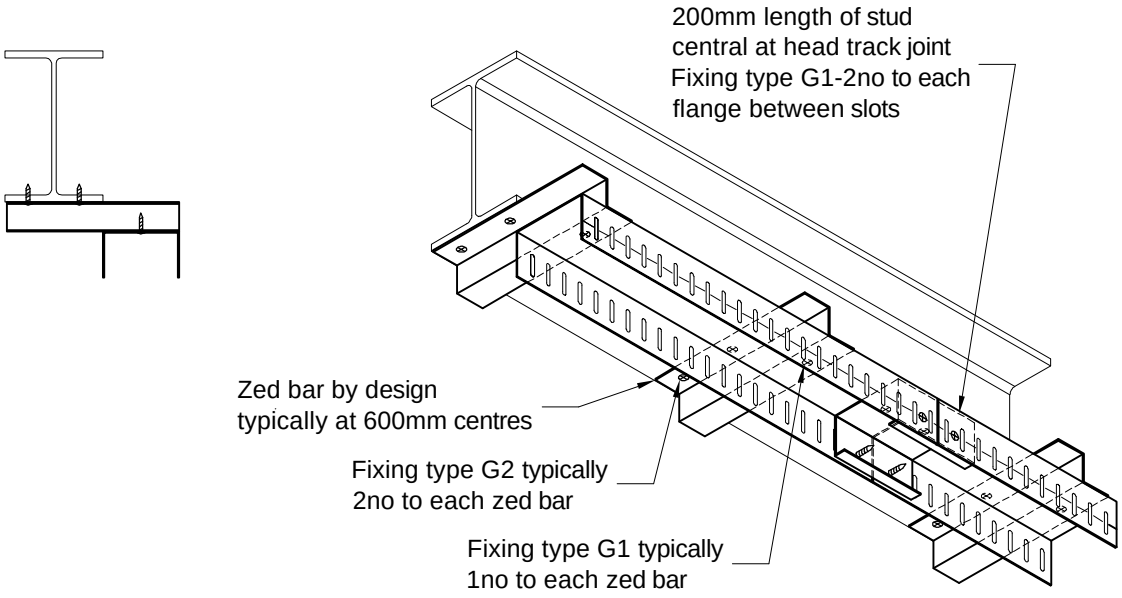

DETAIL SF253

Slotted Head Track to Steel: Overhang Solutions - Zed Bars

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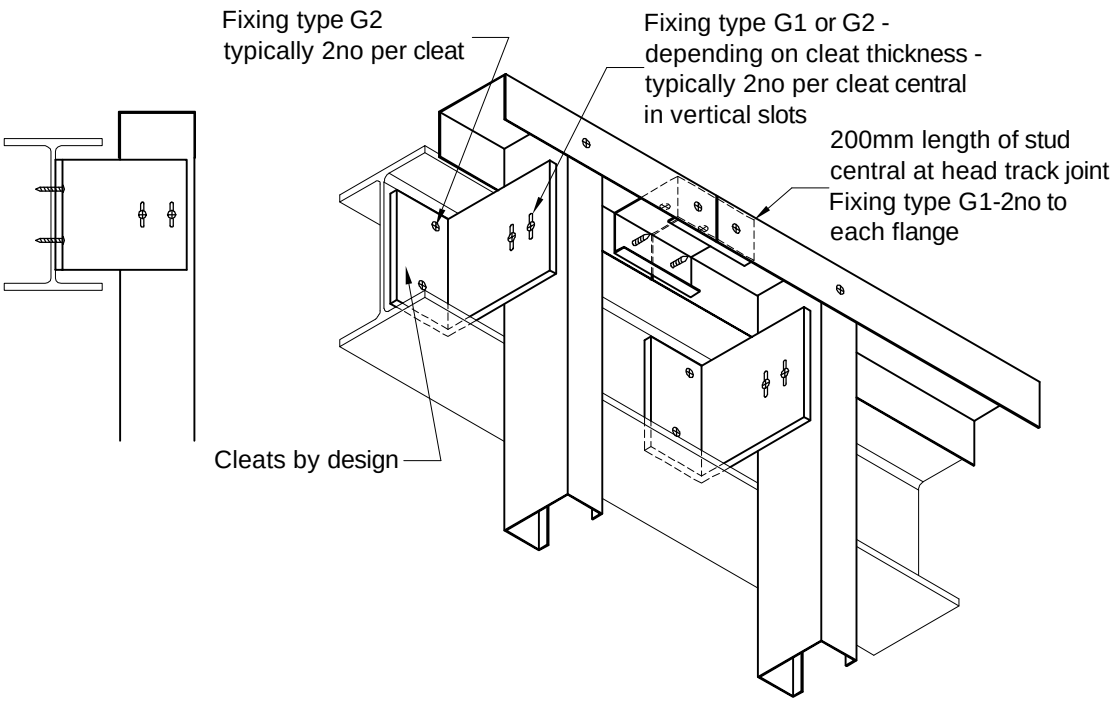
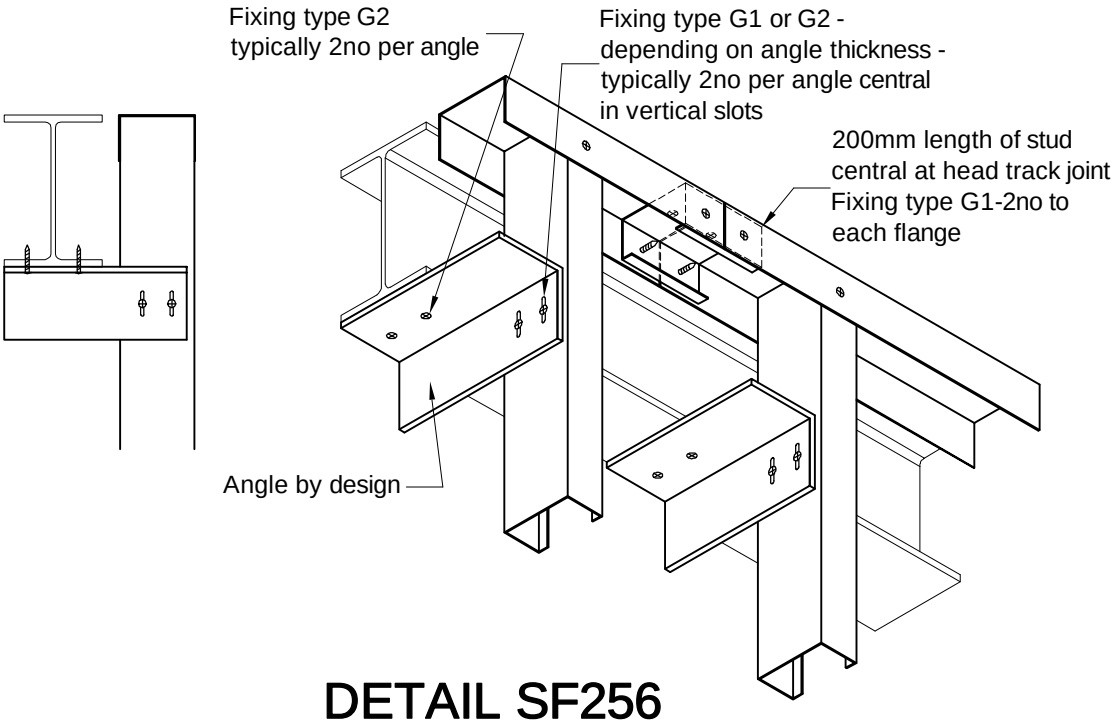


DETAIL SF255

Plain Head Track to Steel: Overhang Solutions - Deflection Cleats



DETAIL SF256

Plain Head Track to Steel: Overhang Solutions - Slotted Angle Cleats

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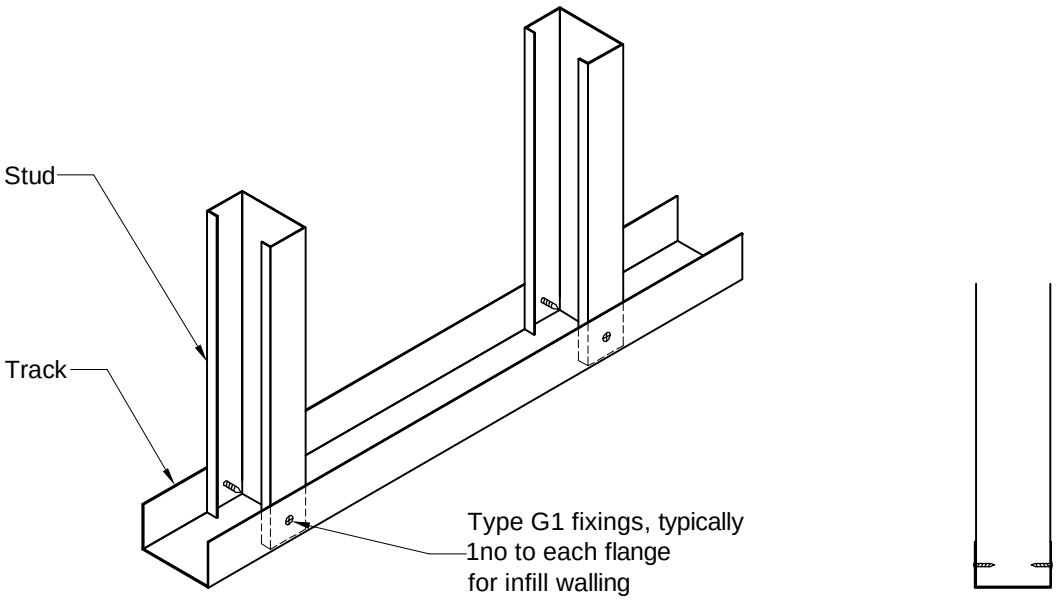
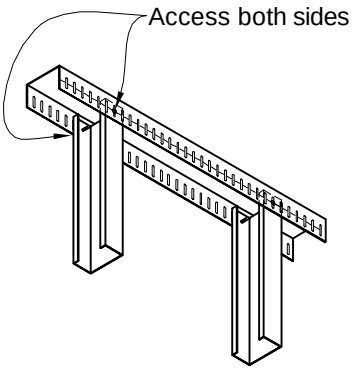
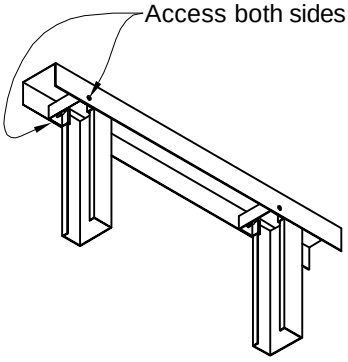


DETAIL SF310

Infill Walling Stud to Base Track Connection



SF330
Slotted Head Track
Access required to both sides



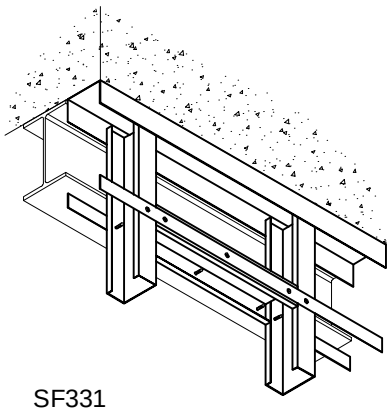
SF333
Deflection Brackets
Access required to both sides

Note - Designed head details are not interchangeable

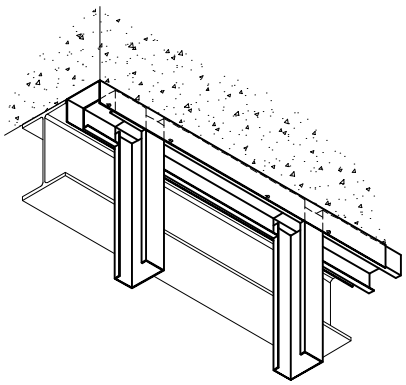
DETAIL SF322

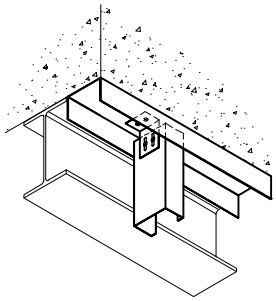
Correct Use of Deflection Heads: Access Both Sides

Tel: 0121 601 6000 Fax: 0121 601 6126



SF331
Blocking & Strapping
Blocking can be lowered to
below beam to allow access



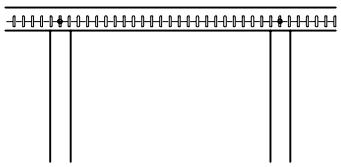


SF334
High Load Cleat
No side access necessary

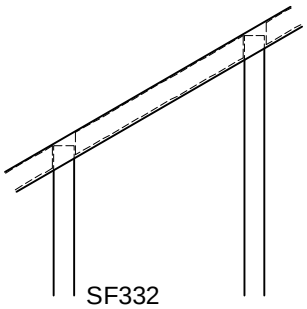
Note - Designed head details are not interchangeable

DETAIL SF323

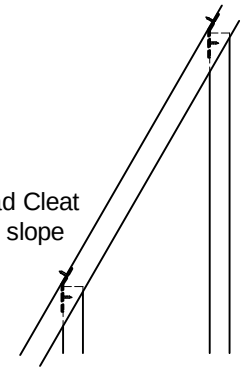
Correct Use of Deflection Heads: Access One or No Sides



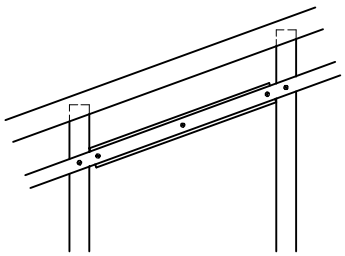
SF330
Slotted Head Track
0° to 6° slope



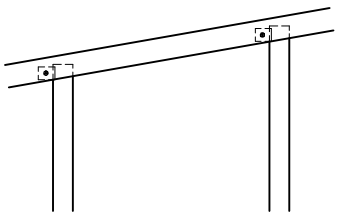
SF332
Noggins
0° to 30° slope



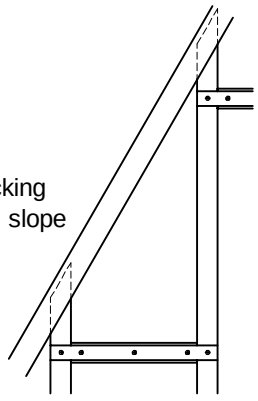
SF334
High Load Cleat
0° to 60° slope



SF331
Blocking & Strapping
0° to 20° slope



SF333
Deflection Brackets
0° to 10° slope

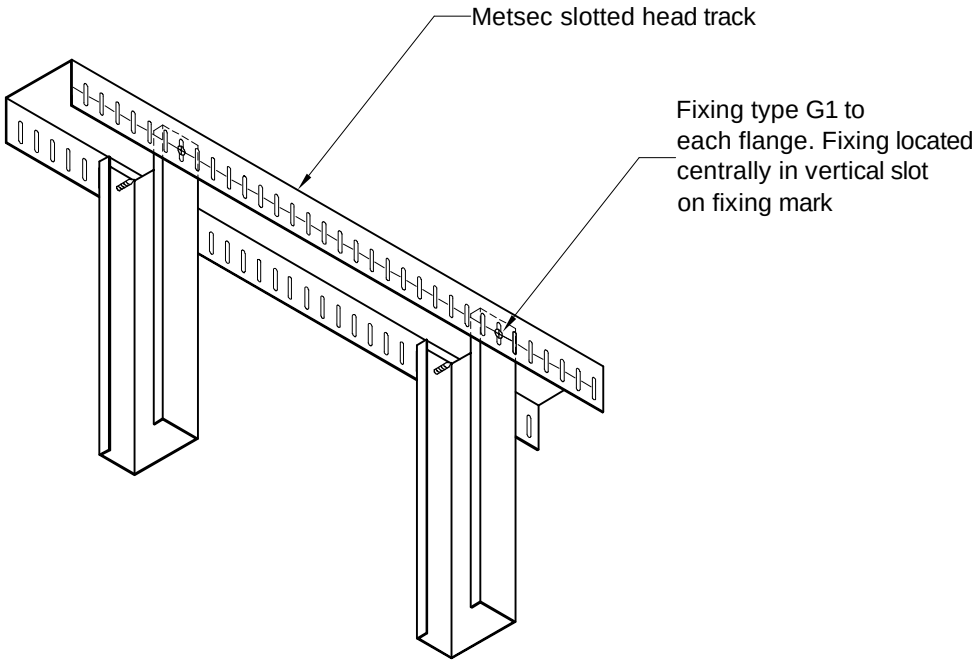


SF335
Solid Blocking
20° to 60° slope

DETAIL SF324

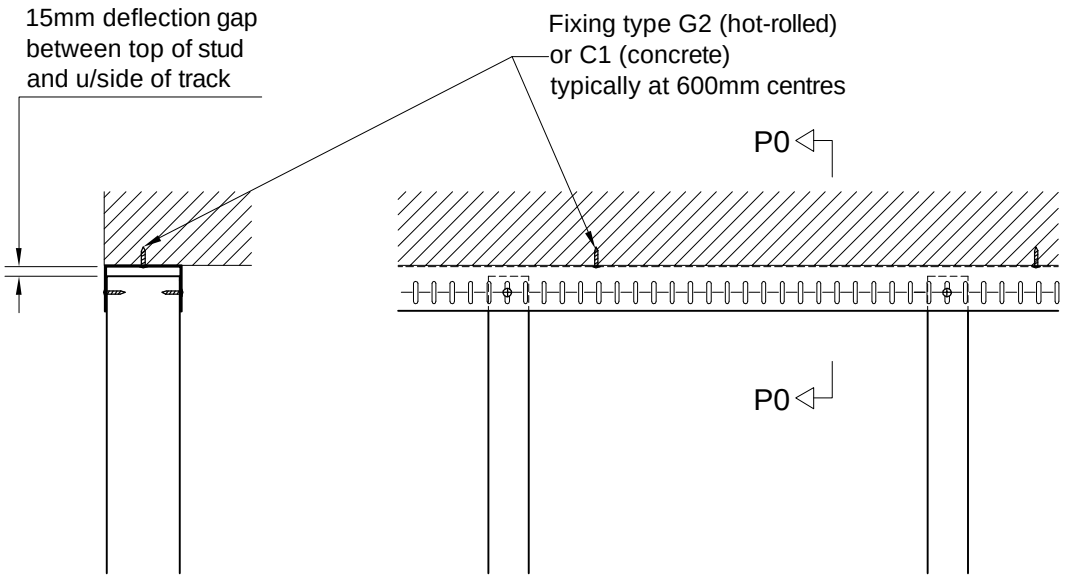
Correct Use of Deflection Heads: Angled Heads

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF330-a

Isometric View: Deflection Head - Slotted Track

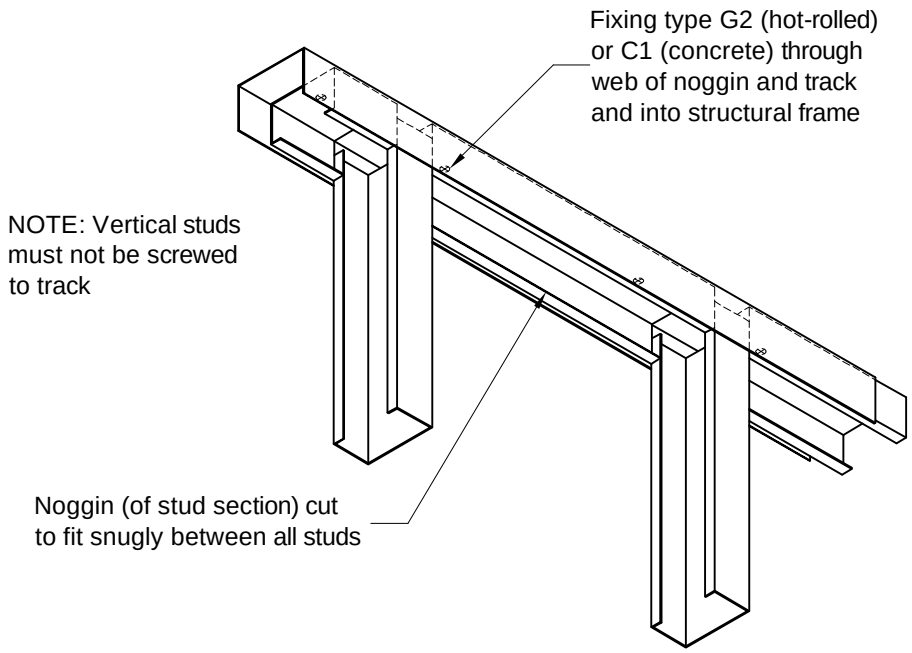


P0-P0 Elevation

DETAIL SF330-b

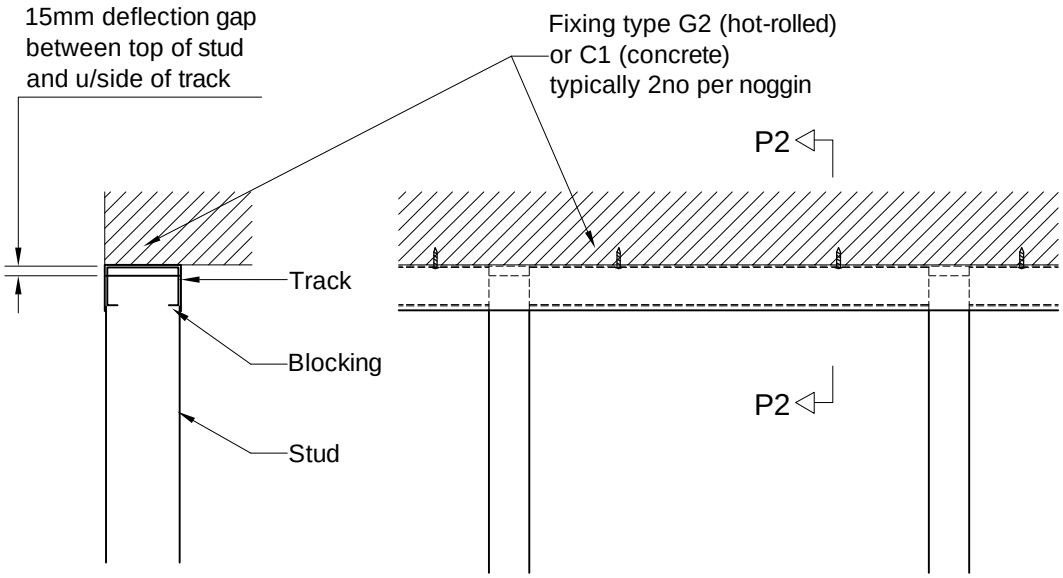
Elevation View: Deflection Head - Slotted Track

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF332-a

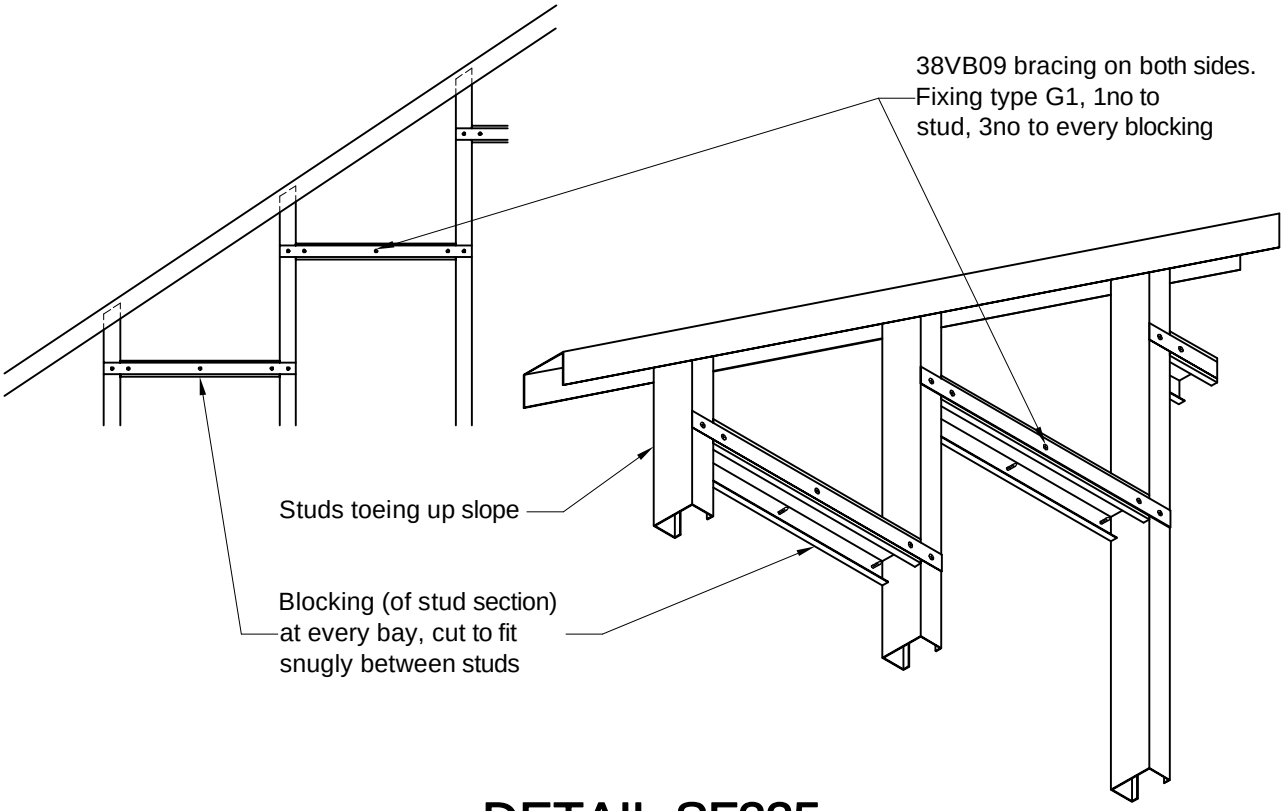
Isometric View - Deflection Head - Noggins



DETAIL SF332-b

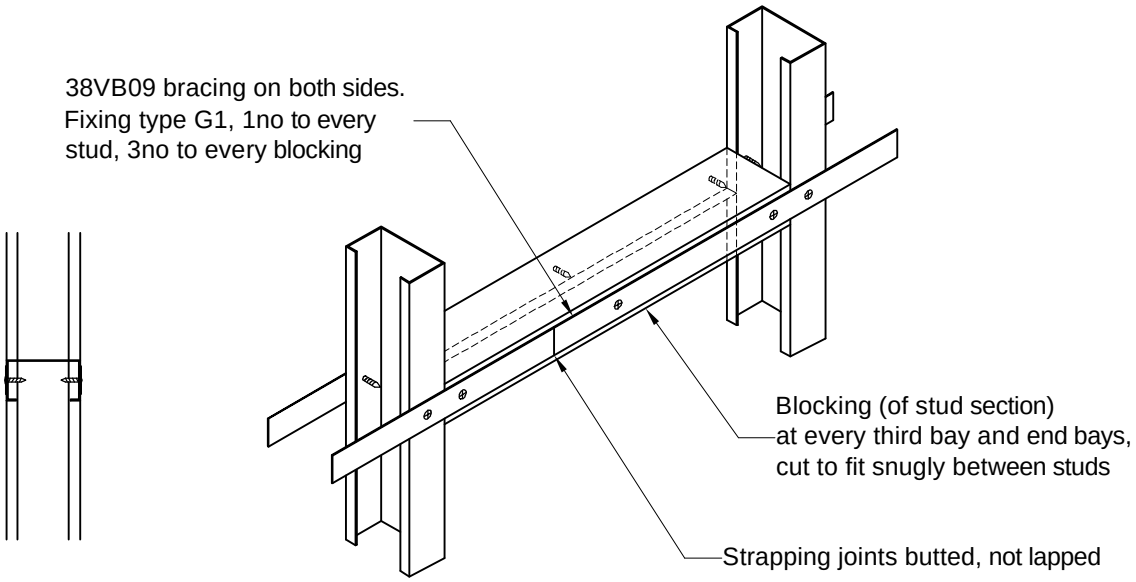
Elevation View - Deflection Head - Noggins

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF335

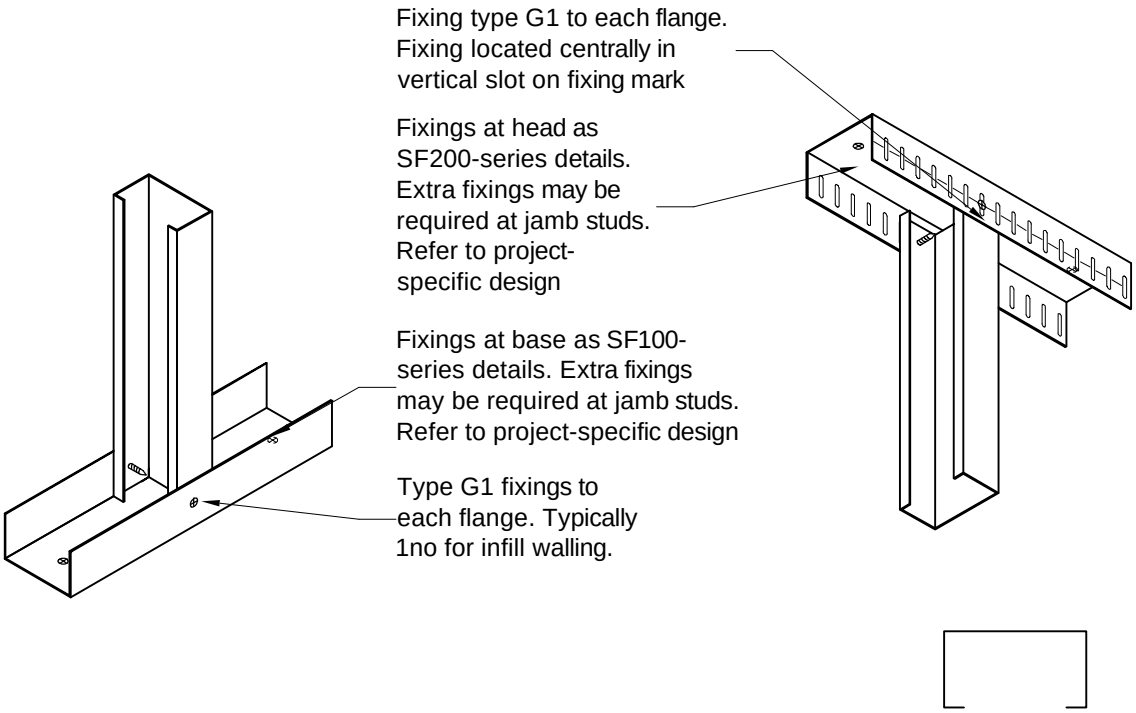
Deflection Head - Solid Blocking with Sloping Head Track



DETAIL SF361

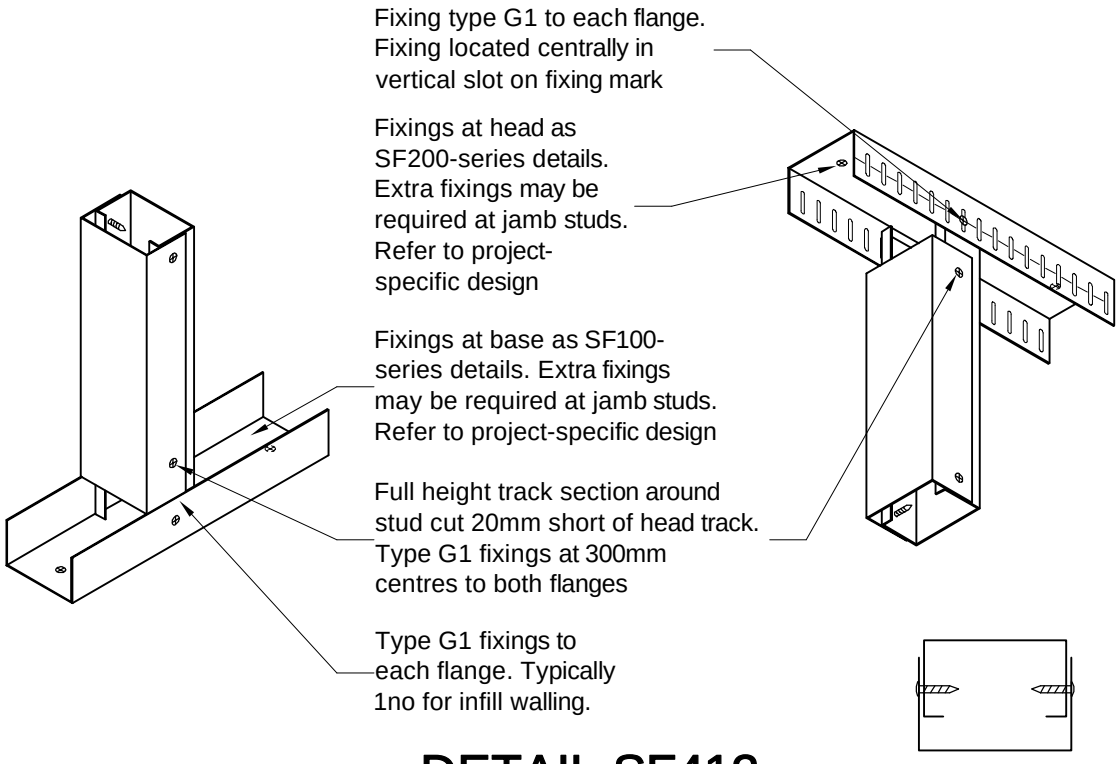
Torsional Restraint - Blocking

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF411

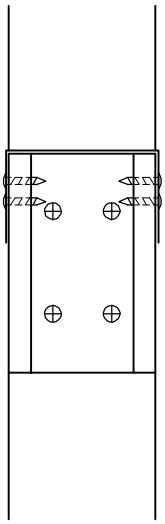
Single Jamb Stud - Slotted Head Track

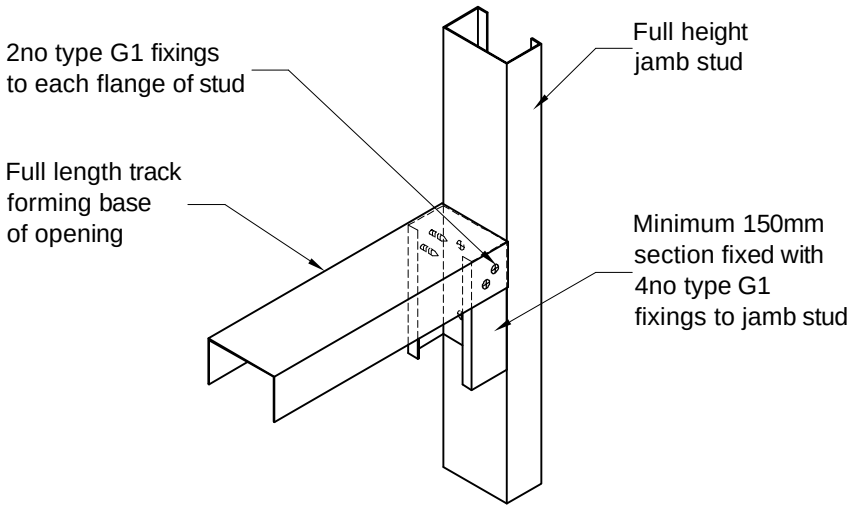


DETAIL SF412

Compound Jamb - Two-Member Section - Slotted Head Track

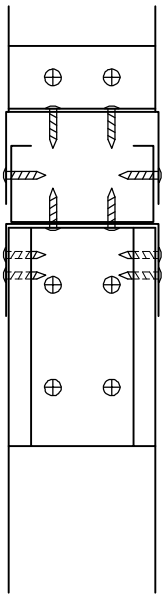
Tel: 0121 601 6000 Fax: 0121 601 6126

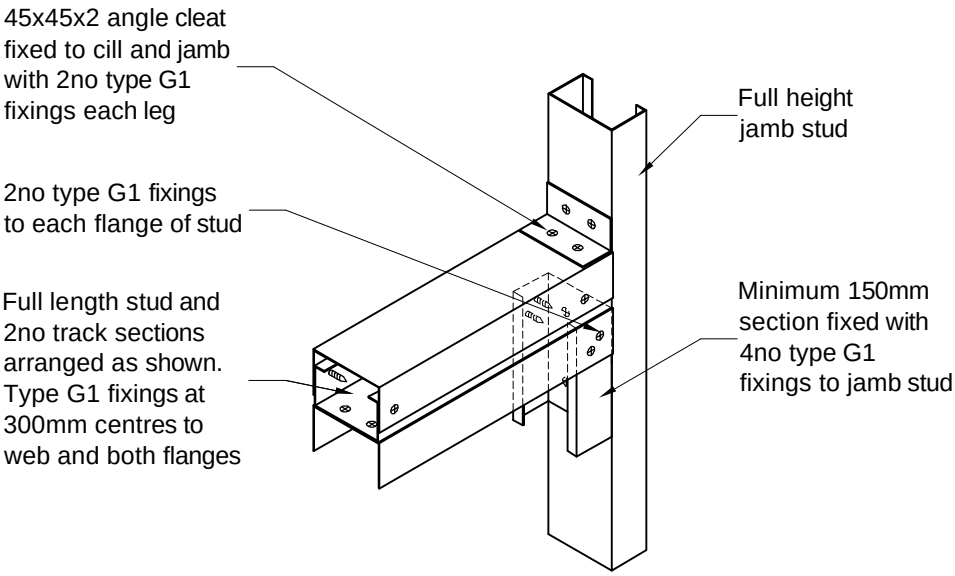




DETAIL SF420

Single Cill

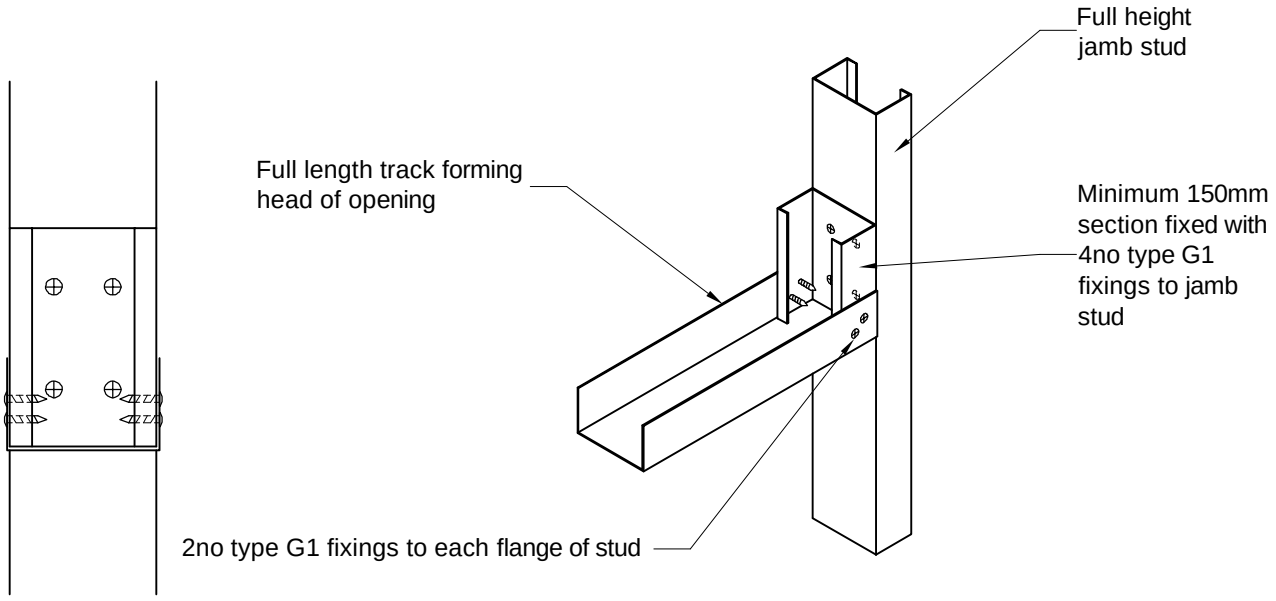




DETAIL SF421

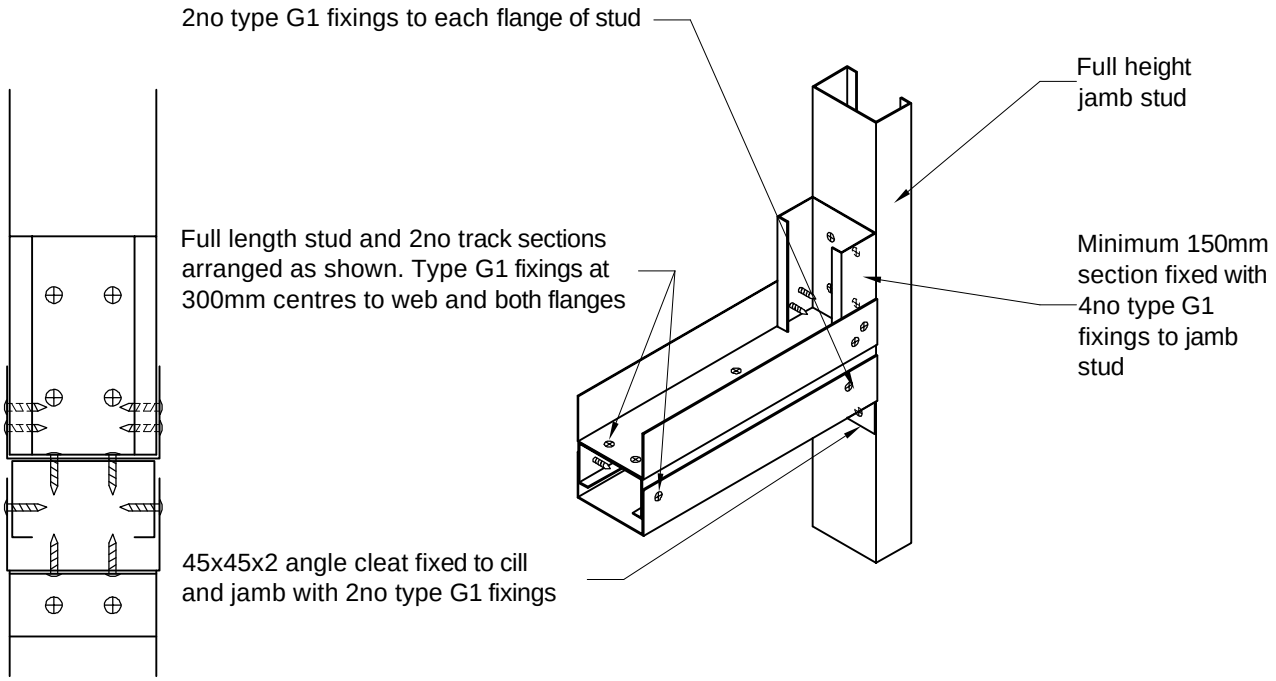
Compound Cill

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF430

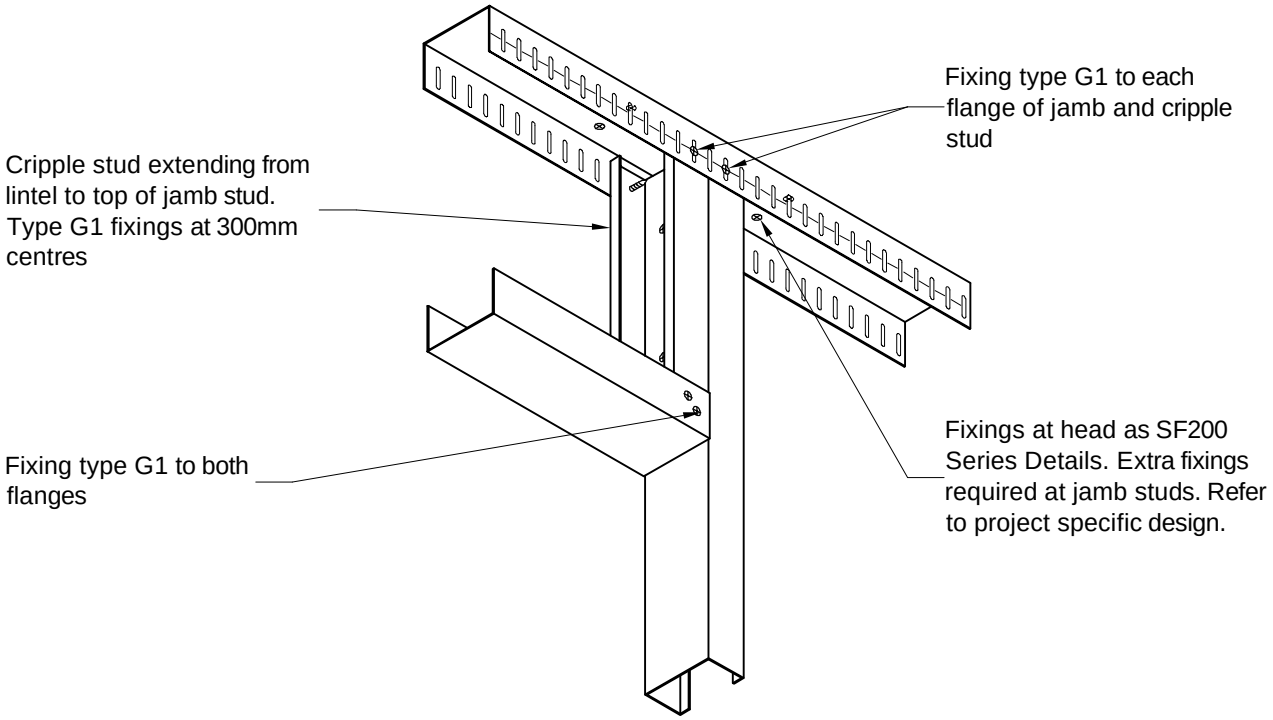
Single Lintel to Single Jamb Stud



DETAIL SF431

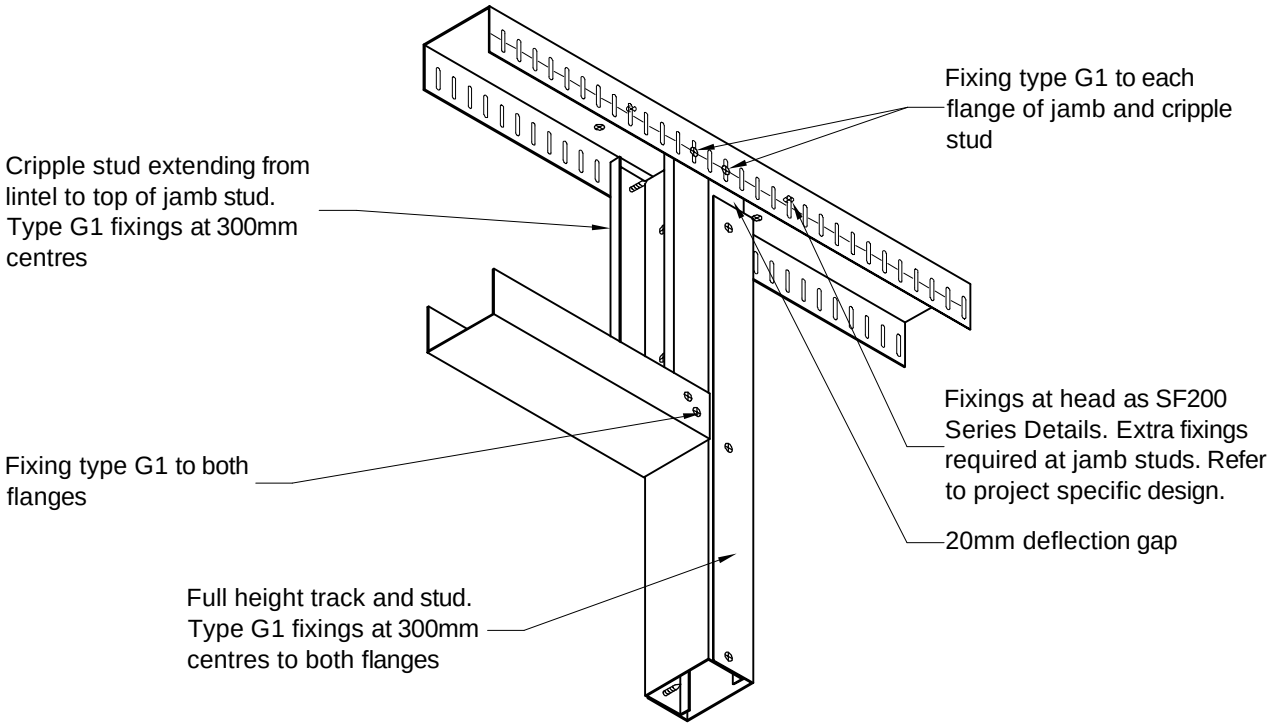
Three-Member Compound Lintel to Single Jamb Stud

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF441

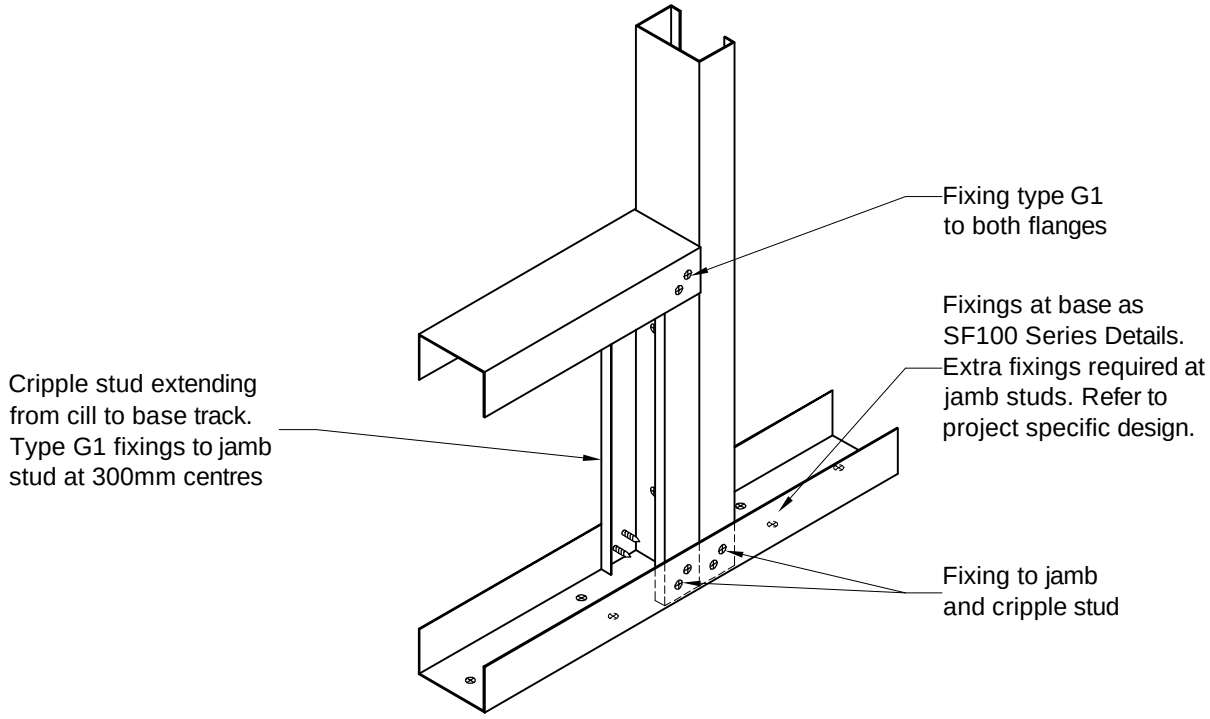
High Load Single Jamb - Slotted Head Track



DETAIL SF442

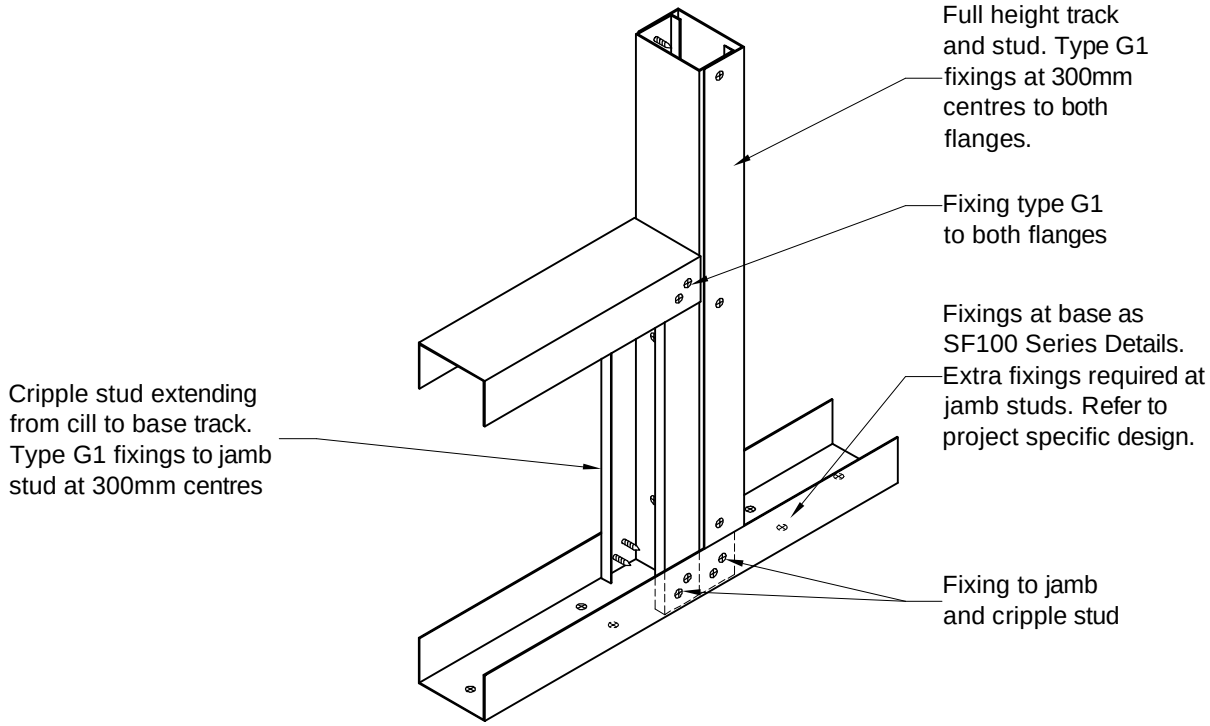
High Load Two-Member Compound Jamb - Slotted Head Track

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF445

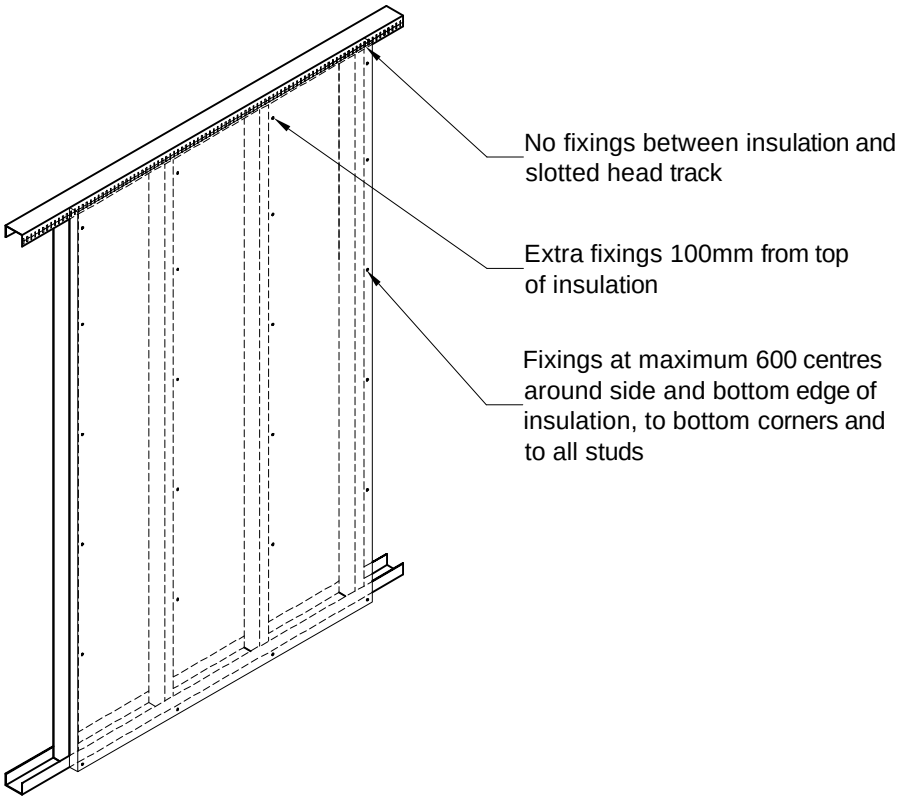
High Load Base Detail - Single Jamb



DETAIL SF445-2

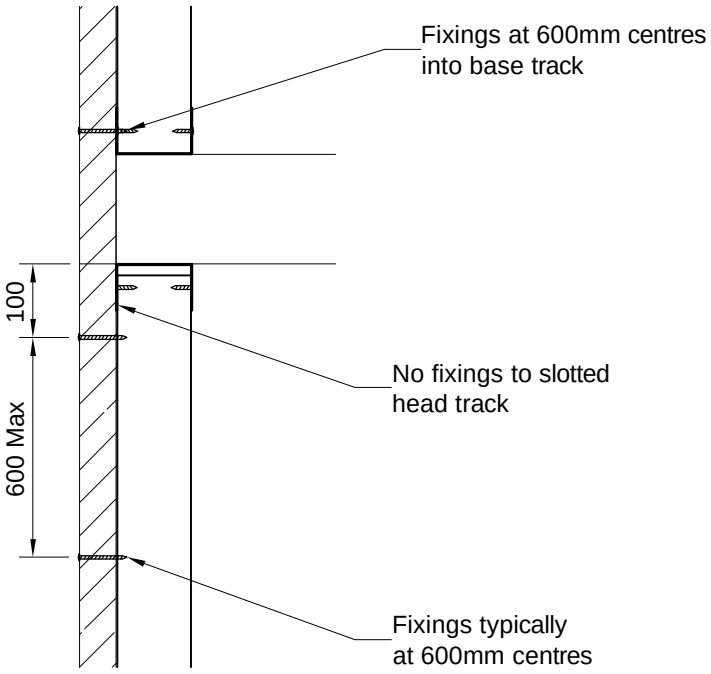
High Load Base Detail - Two-Member Compound Jamb

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF811

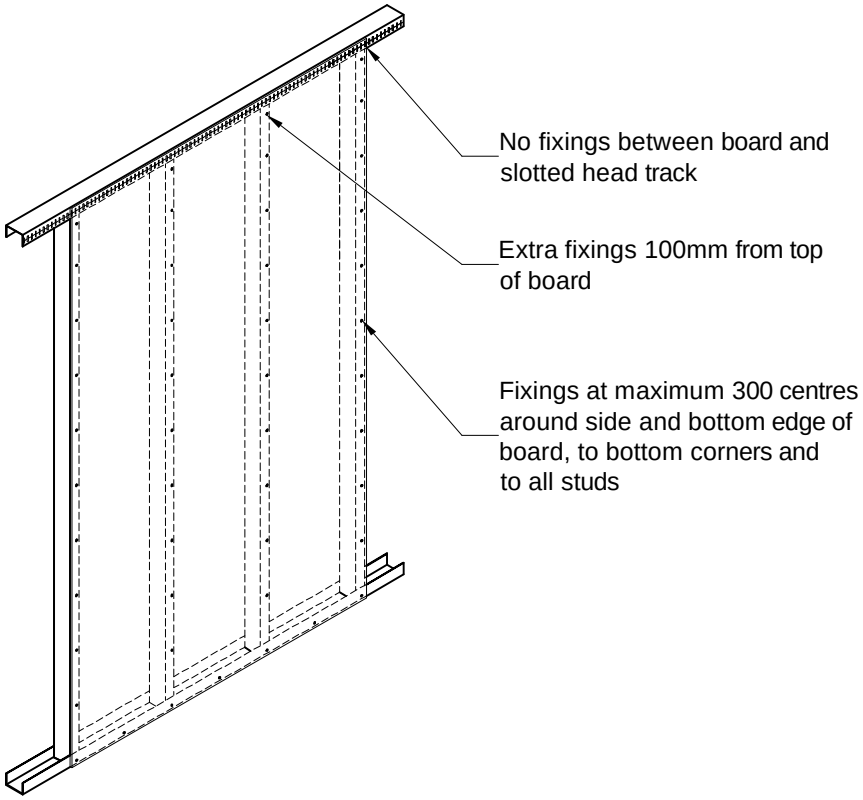
Fixing Rigid Insulation to Infill



DETAIL SF812

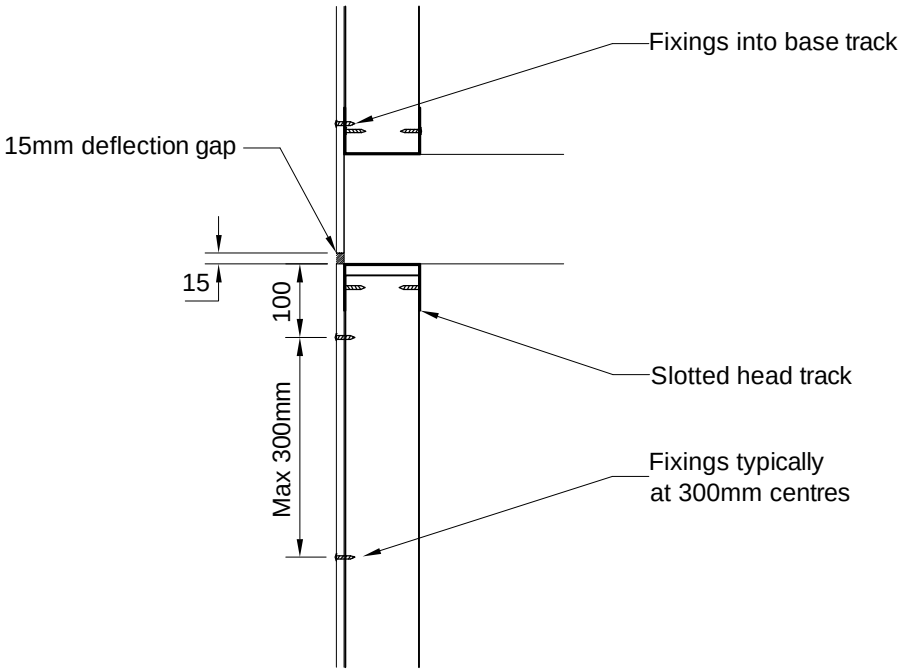
Deflection Head Fixing Detail - Insulation

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF813

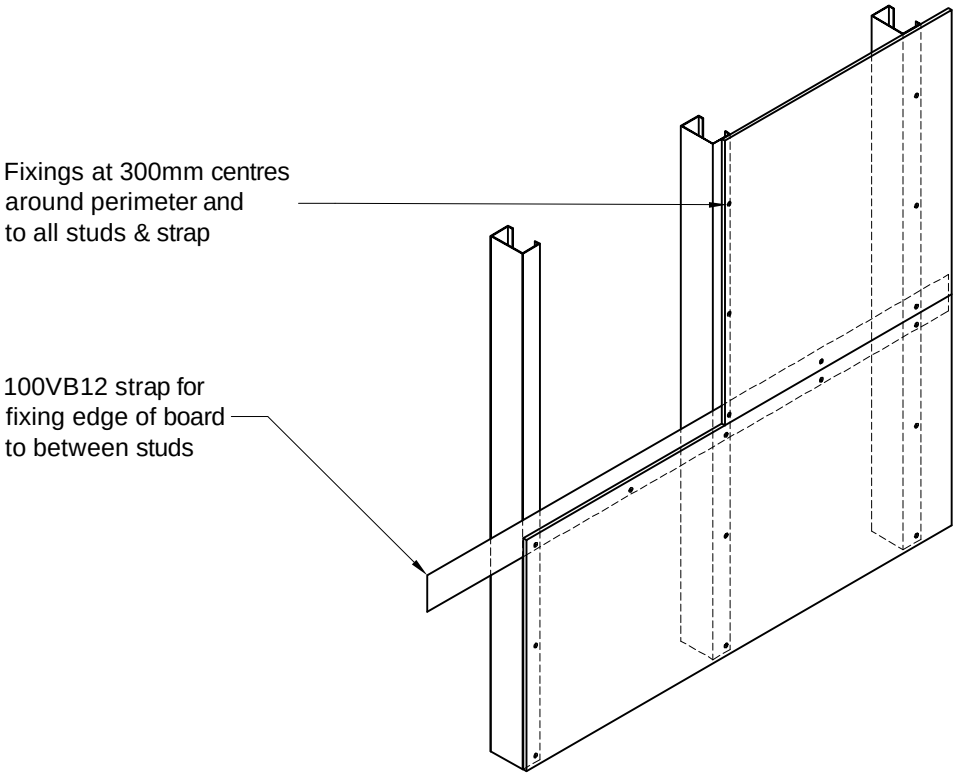
Fixing Boarding - (CPB, OSB, PLY) to Infill



DETAIL SF814

Deflection Head Fixing Detail - Boarding

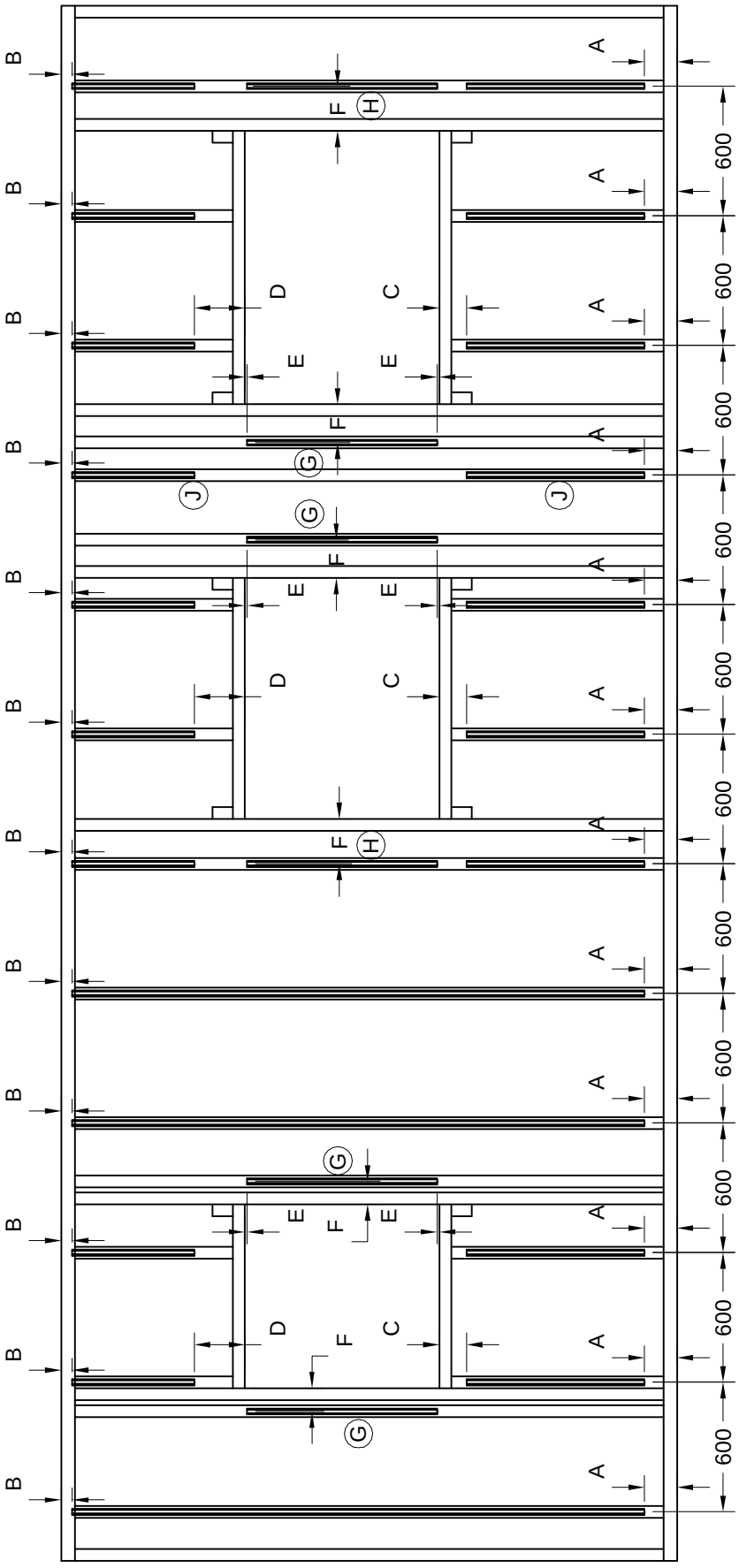
Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF815

Horizontal Board Joint

Tel: 0121 601 6000 Fax: 0121 601 6126



A = 150mm, u/s basetrack to bottom of brick tie channel (btc).
B = 50mm, top of btc to top of panel.
C = 125mm, Metsec cill to top of btc below.
D = 235mm, Metsec lintel to bottom of btc over.
E = 10mm, Metsec cill/lintel to btc adjacent window.
F = 70-215mm, brickwork reveal to btc - see detail SF823.

Ⓖ = Additional btc required where btc's at 600mm centres do not satisfy dimension F.
Ⓗ = Detail where btc's at 600mm centres satisfy dimension F.
Ⓙ = Where btc's between windows are at less than 600mm centres any btc's falling between do not need to be full height.

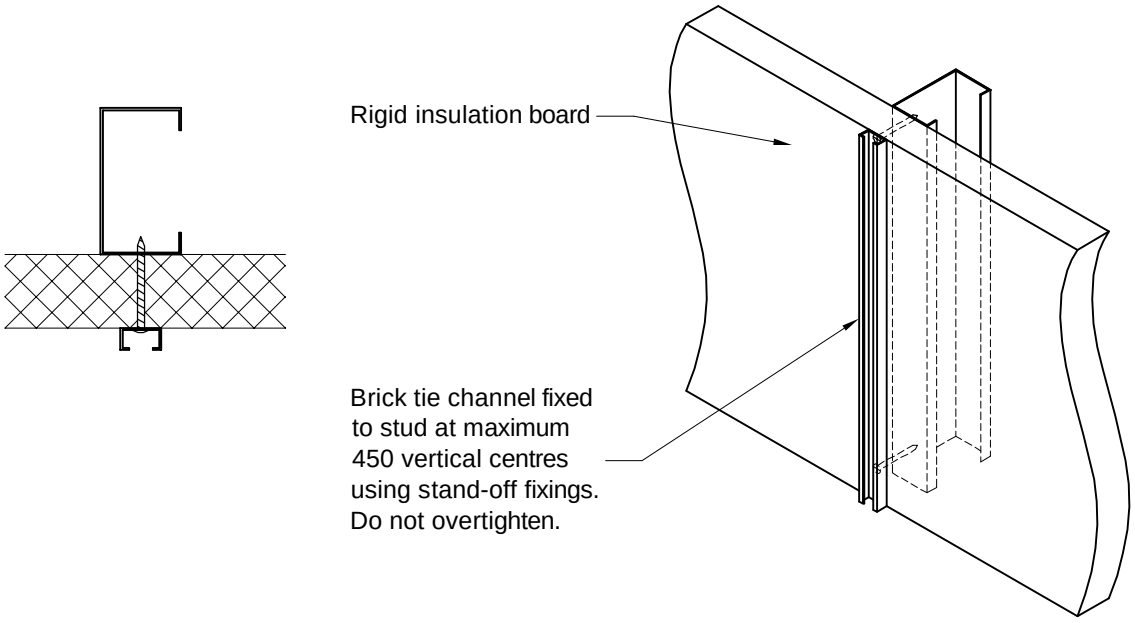
Notes:
1. All btc dimensions are to centreline of channel
2. These rules must be read in conjunction with architect's project-specific opening setout/drawings.
3. Btc's fixed to studs with stand-off screws at 450mm vertical centres. Minimum 2no screws per panel.
4. Brick ties to be built into brickwork at 450mm vertical centres.

DETAIL SF821

Typical Arrangement of Brick Tie Channels

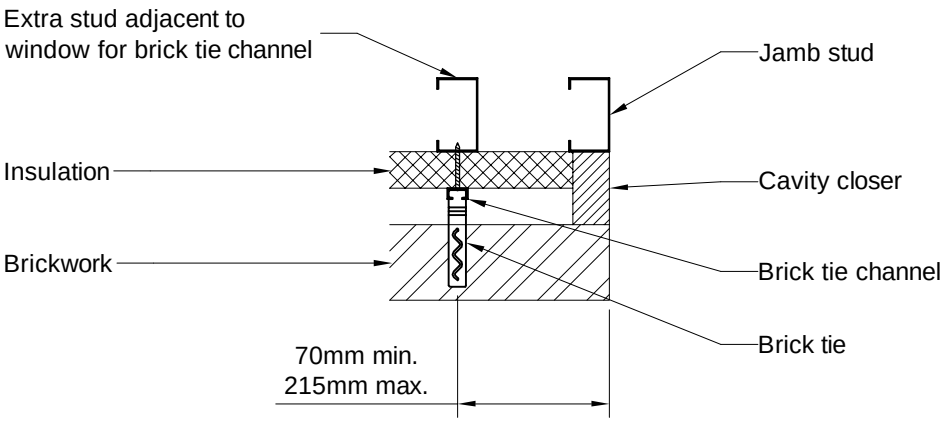
Tel: 0121 601 6000 Fax: 0121 601 6126

voestalpine
ONE STEP AHEAD.



DETAIL SF822

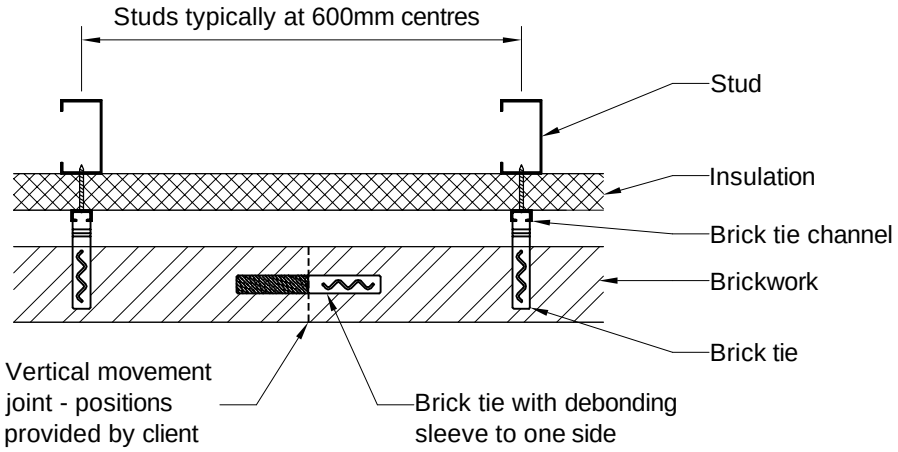
Fixing Brick Tie Channels



DETAIL SF823

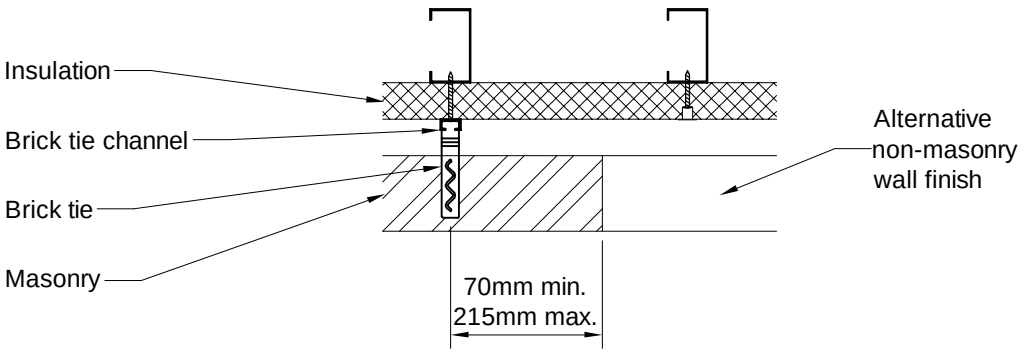
Brick Tie Detail Adjacent to Opening

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF824

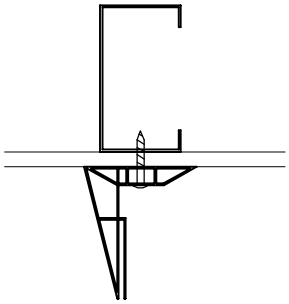
Brick Tie Detail Adjacent Movement Joint

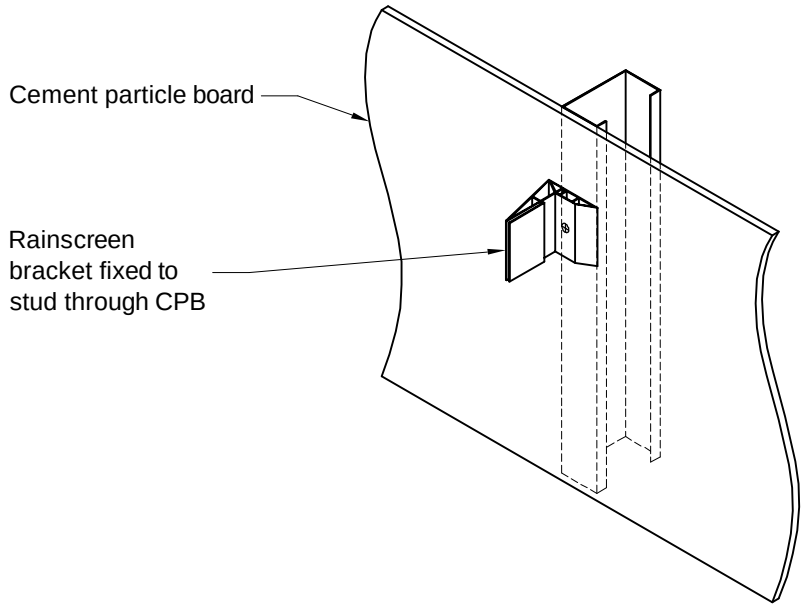


DETAIL SF825

Stud / Brick Tie Arrangement at End of Masonry-Finished Area

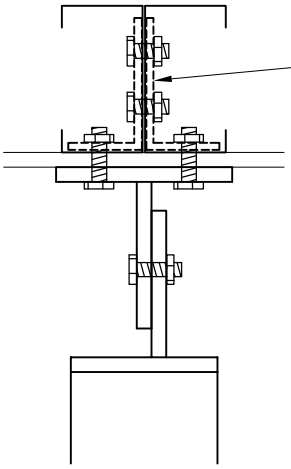
Tel: 0121 601 6000 Fax: 0121 601 6126

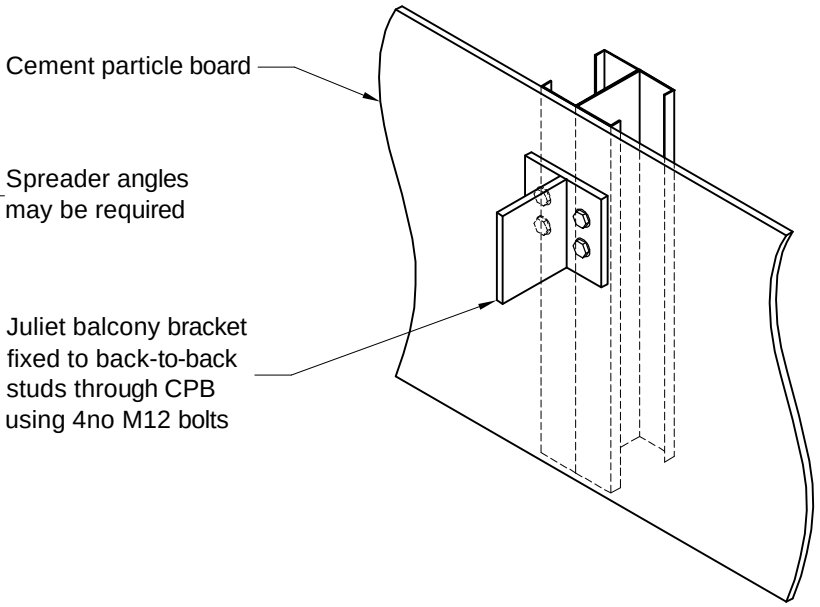




DETAIL SF831

Typical Rainscreen Brackets

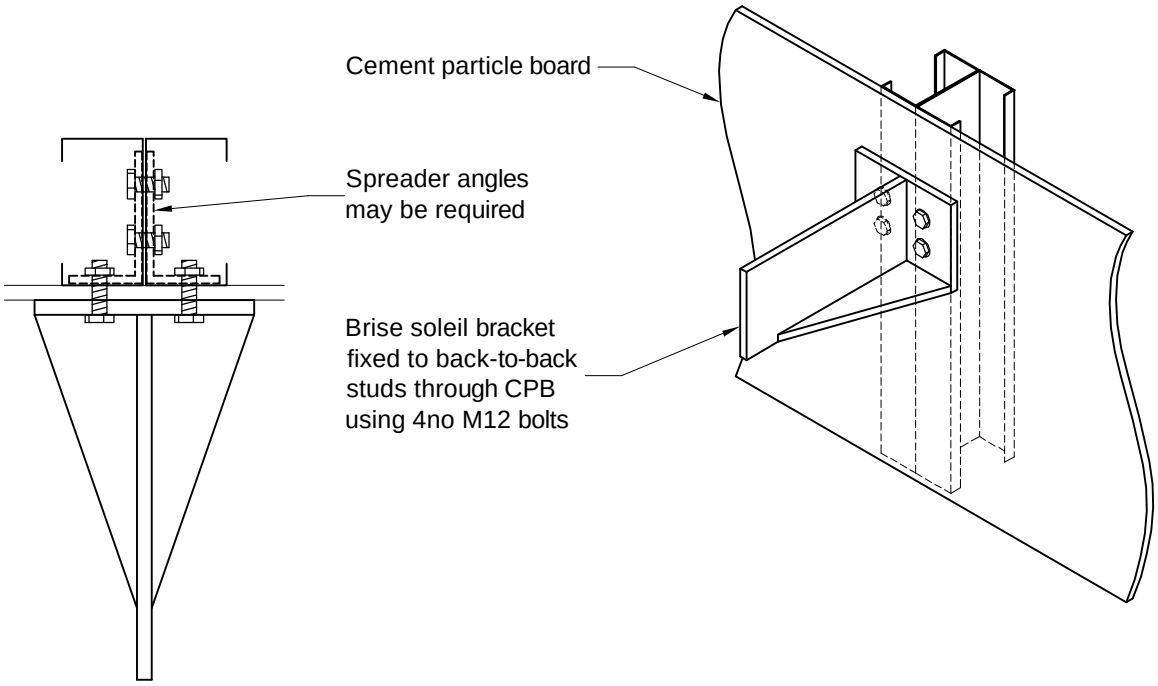




DETAIL SF832

Typical Juliet Balcony Brackets

Tel: 0121 601 6000 Fax: 0121 601 6126



DETAIL SF833

Typical Brise Soleil Brackets

Tel: 0121 601 6000 Fax: 0121 601 6126

Section A - Metsec Framing Fixing Application Guide

Notes on the Fixing Guide:

- Only the fixings specified below or similar recommended should be used with Metsec Framing.
- For similar recommended fixings please contact Metsec.
- Fixing codes have been supplied by the fixing manufacturer and in the event of any fixing not performing as required the fixings manufacturer should be contacted before Metsec.
- Fixings given below are a guide to the range of fixings often used with Metsec Framing. Project specific fixings may be used in addition to those given below and these will be shown on the Metsec project specific details.
- Unless specified or noted all Pan Head, Low Profile or Countersunk screws have a P2 Phillips recess and all Hex Head Screws have a AF 8mm head.

Fixing manufacturers contact details:

Hilti (Gt. Britain) Limited
1 Trafford Wharf Road
Trafford Park
Manchester
M17 1BY

Freephone: 0800 886 100
Freefax: 0800 886 200

www.hilti.co.uk

ITW Construction Products
Customer Services
R8 Blair Court
100 Borron Street
Port Dundas Business Park
Glasgow
G4 9XG

Main Telephone: 0141 342 1660
Main Facsimile: 0141 332 7489

Freephone Orderline: 0800 833381
Free Fax Orderline: 0800 521077

Technical Helpline
Freephone: 0800 7314924

www.itwcp.co.uk

EJOT U.K Limited
Hurricane Close
Sherburn Enterprise Park
Sherburn-in-Elmet
GB-Leeds
LS25 6PB

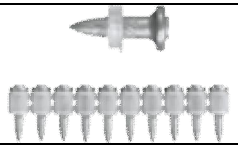
Tel: 01977 68 70 40
Fax: 01977 68 70 41

www.ejot.co.uk

Pictures shown have been provided courtesy of Hilti (Gt. Britain) Limited and represent their range of fixings only.

Tel: 0121 601 6000 Fax: 0121 601 6126

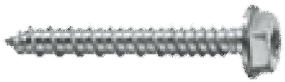
Table 1 - General Framing Fixings

	Application	Description	Picture	Hilti Product Code	Spit Product Code	Ejot Product Code
G1	General framing screw fixing studs/joist/runners and bracing sections. 1.2-1.5mm to 1.2-1.5mm steel.	5.5mm Diameter Pan Head Screw		S-MD01ZW 5.5x19	CFC26 (1)	JT2-NH3-5.5x19
	General framing screw fixing studs/joist/runners and bracing sections. 1.5-3.0mm to 1.5-3.0mm max steel. (2)	5.5mm Diameter Low Profile Head Screw		S-MD03ZW 5.5x25	CFC26 (1)	LSCF 5.5x25 (P3 Recess)
		5.5mm Diameter Hex Head Screw		S-MD03Z 5.5x25 (2)	TC25	LS 5.5x25
G2	General framing screw fixing studs/joist/runners and bracing sections. 1.2-3.0mm max to 3.0-12.5mm max steel.	5.5mm Diameter Low Profile Head Screw		S-MD05ZW 5.5x40	CFL32	HSCF 5.5x38 (P3 Recess)
		5.5mm Diameter Hex Head Screw		S-MD05Z 5.5x40	TL38	HS 5.5x38
	Shot Fired fixing studs/joist/runners and bracing sections. 3.0mm max to 6.0 - 12.5mm max steel. (3)	Powder Actuated Nail Fixing to Hot Rolled Steel		X-U 16 P8 or X-U 16 MX (3,4)	SC9 or SBR9(4)	None

Notes:

1. The CFC26 has an ITW exclusive Philips Square Drive (2PSD)
2. If the material build-up is over 5.5mm then the Hilti fixing required will be S-MD03Z 6.3x25.
3. Please see approved **Data Sheet** and **Installer Guide** for this application available from Metsec / Hilti. The Hilti X-U nail has no maximum base steel thickness.
4. The use of Powder Actuated Nail Fixings must be approved by Metsec for each individual project due to the large range in fixing load capacities.

Table 2 - Fixings to Concrete

	Application	Description	Picture	Hilti Product Code	Spit Product Code	Ejot Product Code
C1	Fixing 1.2-3.0mm Steel to Concrete	Concrete Screw Anchor Hex Head		HUS-H 7.5x35 (1)	4H32 (1)	4H 6.3x32 (1)
		Powder Actuated Nail Fixing into Predrilled Hole using Hilti DX-Kwik Method (2)		X-DNH 37-P8 (2)	None	None
C2	Fixing 3.0-15.0mm Steel to Concrete	Concrete Screw Anchor Hex Head		HUS-H 7.5x45 (1)	4H45 (1)	4H 6.3x45 (1)
C3	Fixing 1.2-15.0mm Steel to Concrete (3)	Large Diameter Concrete Screw Anchor Hex Head		Range of HUS-H 10.5x55 to HUS-H 16.5x160	Range of LDT M10x45 to LDT M20x159	Range of LDT M10x45 to LDT M20x159
		Stud Anchors		Range of HST M8/10 to HST M24/60	Range of HDP 06/10 to HDP 20/50	None
		Chemical / Adhesive Anchors		Range of HVU M8 to HVU M24 with HAS Rod	Range of Maxima M8 to Maxima M24 with studs	None

Notes:

1. Screw anchors listed are the shortest that can be used in the range. Longer fixing may be specified by Metsec Design.
2. Please see approved **Data Sheet and Installer Guide** for this application available from Metsec / Hilti. Powder Actuated Nail Fixings have a minimum edge distance of 80mm to the edge of the concrete. The use of Powder Actuated Nail Fixings must be approved by Metsec for each individual project due to the large range in fixing load capacities.
3. Large anchors are designed on a project by project basis and the different makes cannot be substituted for each other. All head types vary.

Table 3 - Fixing Insulation to Steel

Application [1]	Description	Picture	Hilti Product Code [2]	Spit Product Code [2]	Ejot Product Code
Fixing 50mm Insulation to 1.2mm Steel	Large Washer with Stainless Countersunk Head Screw		None	None	IT/S 5/60 Washer with TKE 4.8x70
Fixing 50mm Insulation to 1.2-3.0mm Steel	Large Washer with Stainless Hex Head Screw		S-MD03S 5.5x80	TC75	SBV 90 Washer with JT3-3-5.5x70
Fixing 50mm Insulation to 3.0-6.0mm Steel	Large Washer with Stainless Hex Head Screw		S-MD05S 5.5x82	Contact Spit	SBV 90 Washer with JT3-6-5.5x70

Notes:

1. Application shown is for fixing 50mm insulation. For other insulation thicknesses please consult the fixing manufacturers' product range and select the appropriate length of fixing.
2. Hilti and ITW products do not contain the large washers however the fixings shown will work with the SBV 90 washer from Ejot.

Table 4- Fixing Brick Tie Channels to Steel

Application [1]	Description	Picture	Hilti Product Code	Spit Product Code	Ejot Product Code
Fixing BTC via 50mm Insulation to 1.2-3.0mm Steel	5.5mm Diameter Stainless Hex Head Screw with EPDM sealing washer.		S-CD63S 5.5x85	SCOTS Fixing	JT3-D-3-5.5x82 S16
Fixing BTC via 50mm Insulation to 3.0-6.0mm Steel	5.5mm Diameter Stainless Hex Head Screw with EPDM sealing washer.		S-CD63S 5.5x85	SCOTS Fixing	JT3-D-6H-5.5x87 S16

Notes:

1. Application shown is for fixing 50mm insulation. For other insulation thicknesses please consult the fixing manufacturers' product range and select the appropriate length of fixing.

Table 5 - Fixing Sheathing Boards and Timber to Steel

These types of fixings are suitable for the following types of sheathing boards:
Cement Particle Board, Cement Fibre Board, PLY Board, Oriented Strand Board, Chipboard and Timber.

Application [1]	Description	Picture	Hilti Product Code	Spit Product Code [2]	Ejot Product Code [2]
Fixing to 1.2-3.0mm Steel. Board thickness 6.0mm to 19mm	4.8mm Diameter Wafer/CSK Ribbed Head Wing Tipped Screw		S-WD12Z 4.8x38	TFC36 or RKC 41	WDLS 4.8x38
Fixing to 1.2-3.0mm Steel. Board thickness 13mm to 29mm	5.5mm Diameter Wafer/CSK Ribbed Head Wing Tipped Screw		S-WD12Z 5.5x50	TFC50 or RKC 41	WDLS 5.5x50
Fixing to 1.2-3.0mm Steel. Board thickness 25mm to 60mm	5.5mm Diameter Wafer/CSK Ribbed Head Wing Tipped Screw		S-WD12Z 5.5x85	TFC80	WDLS 5.5x85
Fixing to 1.2-3.0mm Steel. Board thickness 65mm to 100mm	5.5mm Diameter Wafer/CSK Ribbed Head Wing Tipped Screw		S-WD12Z 5.5x100 [3]	TFC120	WDLS 5.5x127
Fixing to 3.0-6.0mm Steel. Board thickness 10.0mm to 24mm	5.5mm Diameter Wafer/CSK Ribbed Head Wing Tipped Screw		S-WD15Z 5.5x65	TFL65	WDHS 5.5x65

Notes:

1. Applications shown are for regularly selected boarding/timber thicknesses. For other thicknesses please consult the fixing manufacturers' product range and select the appropriate length of fixing.
2. P3 Phillips recess drive bit required in 5.5 diameter screws in the Ejot and ITW product range.
3. Up to 82mm only

Table 6 - Fixing Plasterboard to Steel

Application [1]	Description	Picture	Hilti Product Code	Spit Product Code[2]	Ejot Product Code[2]
Fixing to 1.2mm Steel. Single board up to 15mm thick.	3.5mm Diameter Bugle/Wafer/CSK Ribbed Head Screw		S-DD01B 3.5x25	TFC36 or RKC 41	WDLS 4.8x38
Fixing to 1.2mm Steel. Double boards up to 30mm combined thickness.	3.5mm Diameter Bugle/Wafer/CSK Ribbed Head Screw		S-DD01B 3.5x45	TFC80 or RKC 41	WDLS 5.5x85
Fixing to 1.2-2.0mm Steel. Single board up to 15mm thick.	3.5mm Diameter Bugle/Wafer/CSK Ribbed Head Screw		S-DD01B 3.5x25	TFC36 or RKC 41	WDLS 4.8x38
Fixing to 1.2-2.0mm Steel. Double boards up to 30mm combined thickness.	3.5mm Diameter Bugle/Wafer/CSK Ribbed Head Screw		S-DD01B 3.5x45	TFC80	WDLS 5.5x85
Fixing to 2.0-6.0mm Steel. Single board up to 15mm thick.	4.8mm Diameter Wafer/CSK Ribbed Head Wing Tipped Screw		S-WD12Z 4.8x38	TFC36	WDLS 4.8x38
Fixing to 2.0-6.0mm Steel. Double boards up to 30mm combined thickness.	5.5mm Diameter Wafer/CSK Ribbed Head Wing Tipped Screw		S-WD12Z 5.5x85	TFC80	WDLS 5.5x85

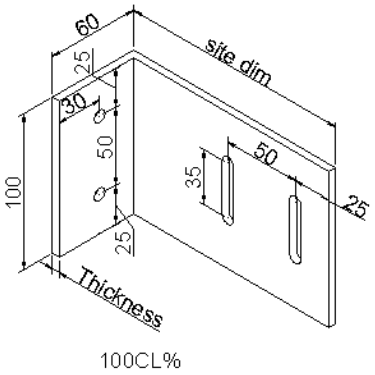
Notes:

1. Applications shown are for regularly selected boarding thicknesses. For other thicknesses please consult the fixing manufacturers' product range and select the appropriate length of fixing.
2. ITW & Ejot require wing tipped screws of 4.8 & 5.5 diameters for lower thicknesses of steel as no plasterboard screws available.

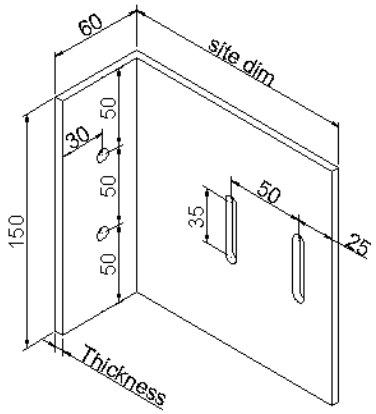
Section B1 - Standard Deflection Cleats

Notes:

1. The cleat strength is S275
2. Concrete strength minimum C30. Care to be taken to follow the fixing guidelines.
3. The cleat reference is in the form of ###CL%, where ### is the cleat depth which isn't linked to the stud size and % is the thickness.
4. The reference S is for slotted holes to the stud.
5. The structures depth should always be the same as or greater than the cleat depth.
6. In the case of fixing to concrete the minimum concrete depth is 150mm, even for 100mm cleats.
7. Cleats should be fixed central to the supporting structure.
8. For Fixing Types see Metsec Fixing Application Guide (Section A).



100CL%



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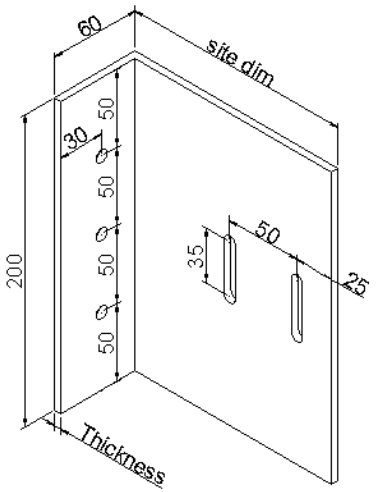

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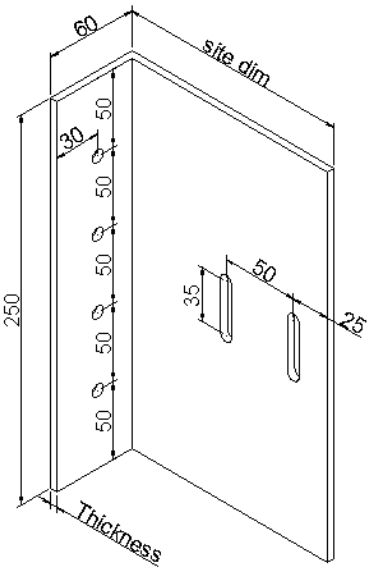

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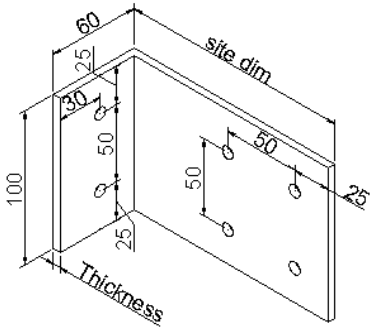
Section B2 – Standard Dead Load Cleats

Notes:

1. The cleat strength is S275
2. Concrete strength minimum C30. Care to be taken to follow the fixing guidelines.
3. The cleat reference is in the form of ###CL%, where ### is the cleat depth which isn't linked to the stud size and % is the thickness.
4. The structures depth should always be the same as or greater than the cleat depth.
5. In the case of fixing to concrete the minimum concrete depth is 150mm, even for 100mm cleats.
6. Cleats should be fixed central to the supporting structure.
7. For Fixing Types see Metsec Fixing Application Guide (Section A).
8. Fixings listed assume maximum tensile & shear loads and an edge distance to concrete of 50mm.
9. For maximum dead loads for different offsets values can be interpolated between 100mm & 200mm
10. To check the cleat for combined wind and dead loads use the following equation.

$$\frac{Dead\ Load\ on\ Cleat}{Max\ Dead\ Load\ Capacity} + \frac{Wind\ Load\ on\ Cleat}{Max\ Wind\ Load\ Capacity} \leq 1$$



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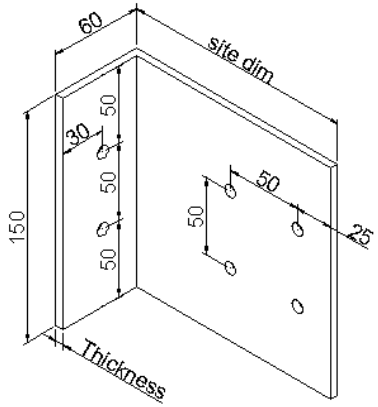

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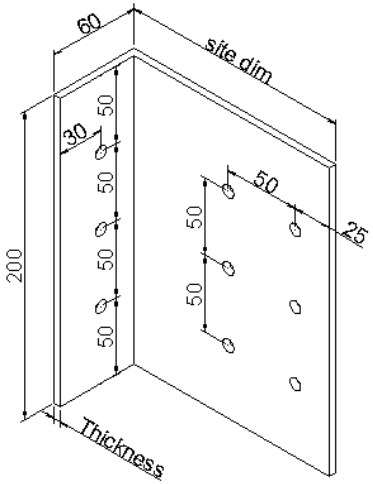

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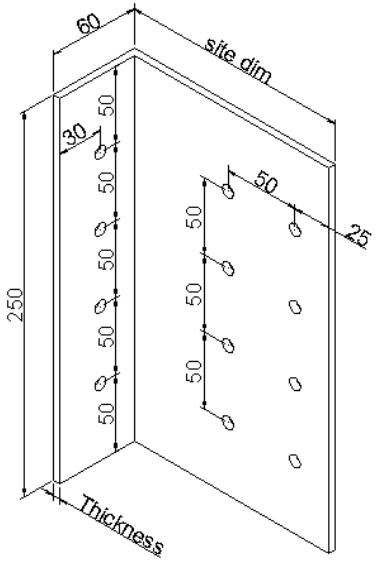

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Lightweight Structural Systems

SFS Division
Fast-Track Steel Building Systems
Tel: +44(0) 121 601 6000
Fax: +44(0) 121 601 6021
sfs@metsec.com

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Pre-panelised Framing System
Tel: +44(0) 121 601 6000
Fax: +44(0) 121 601 6021
metframe@metsec.com

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Fax: +44(0) 121 601 6177
metstrut@metsec.com

Hepsec Division
Dry Linings, Partitioning and Ceiling Support Systems
Tel: +44(0) 2476 585600
Fax: +44(0) 2476 585649
hep@metsec.com

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Metsec plc
Broadwell Road, Oldbury, West Midlands, B69 4HF
Tel: 44+ (0) 121 601 6000
Fax: 44+ (0) 121 601 6109
email: framing@metsec.com
www.metsec.com

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