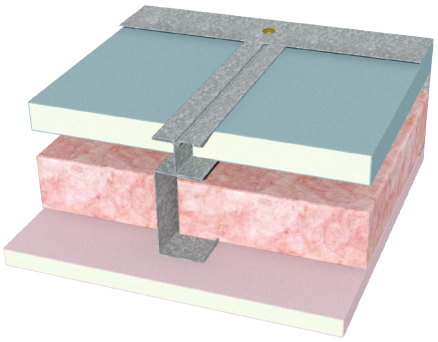
5.4 Shaft Wall Ceiling

Shaft Wall Ceiling is constructed in a similar way to a standard Shaft Wall and uses the same components. It is constructed using steel CH-studs as the ceiling joists.

Shaft Wall Ceiling systems are ideal for building a ceiling when access is only possible from below and a fire rating is required from above, or from above and below.

SHC1



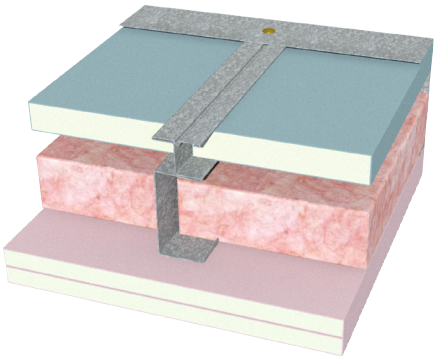
- [Above] 25mm **shaft**liner encased in Shaft Wall CH-studs
- [Below] 1 layer of 16mm **fire**shield

Deflection limited to Span/ 360 or 10mm maximum
fireshield can be substituted with **multi**shield

Fire Resistance Level
60/60/60
rated from above only
Report FC14332

CH-stud Size (mm)		Span (mm)		Thickness (mm)	Sound Insulation Rw (Rw + Ctr) for joists at 600mm centres and thinnest BMT		
Depth	BMT	Ws 0.35 kPa Joist Spacing (mm) 300	600		No insulation	Pink® Partition 50mm 11 kg/m³ R1.2	Report
64	0.55	2330	1850	80	39 (32)	46 (39)	Day Design 3094-17
	0.9	2730	2170				
102	0.55	3400	1960	118	42 (33)	48 (41)	
	0.9	3880	3160				

SHC2



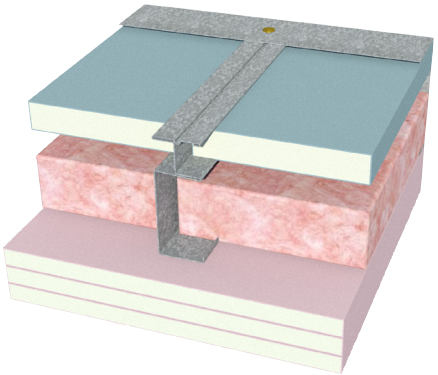
- [Above] 25mm **shaft**liner encased in Shaft Wall CH-studs
- [Below] 2 layers of 16mm **fire**shield

Deflection limited to Span/ 360 or 10mm maximum
fireshield can be substituted with **multi**shield

Fire Resistance Level
60/60/60
rated from above and below
Report FC14332

CH-stud Size (mm)		Span (mm)		Thickness (mm)	Sound Insulation Rw (Rw + Ctr) for joists at 600mm centres and thinnest BMT		
Depth	BMT	Ws 0.35 kPa Joist Spacing (mm) 300	600		No insulation	Pink® Partition 50mm 11 kg/m³ R1.2	Report
64	0.55	2740	1650	96	44 (36)	50 (42)	Day Design 3094-17
	0.9	3000	2570				
102	0.55	3290	1650	134	46 (37)	52 (46)	
	0.9	3920	3090				

SHC3



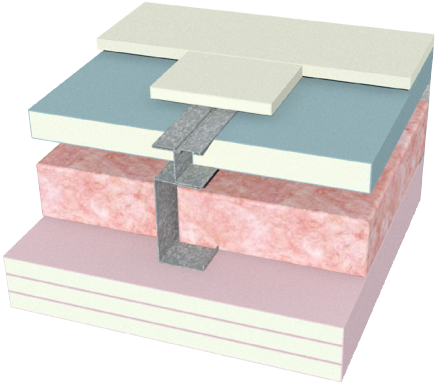
- [Above] 25mm **shaft**liner encased in Shaft Wall CH-studs
- [Below] 3 layers of 16mm **fire**shield

Deflection limited to Span/ 360 or 10mm maximum
fireshield can be substituted with **multi**shield

Fire Resistance Level
90/90/90
rated from above and below
Report FC14332

CH-stud Size (mm)		Span (mm)		Thickness (mm)	Sound Insulation Rw (Rw + Ctr) for joists at 600mm centres and thinnest BMT		
Depth	BMT	Ws 0.35 kPa Joist Spacing (mm) 300	600		No insulation	Pink® Partition 50mm 11 kg/m³ R1.2	Report
64	0.55	2600	1420	112	46 (37)	53 (45)	Day Design 3094-17
	0.9	2850	2440				
102	0.55	2840	1420	150	49 (40)	55 (49)	
	0.9	3790	2660				

SHC4



- [Above] 100mm wide strips of minimum 10mm plasterboard over exposed metal framing, adhered with any plaster cornice or back-blocking cement
- 25mm **shaft**liner encased in Shaft Wall CH-studs
- [Below] 3 layers of 16mm **fire**shield

Deflection limited to Span/ 360 or 10mm maximum
fireshield can be substituted with **multi**shield

Fire Resistance Level
120/120/120
rated from above and below
Report FC14332

CH-stud Size (mm)		Span (mm)		Thickness (mm)	Sound Insulation Rw (Rw + Ctr) for joists at 600mm centres and thinnest BMT		
Depth	BMT	Ws 0.35 kPa Joist Spacing (mm) 300	600		No insulation	Pink® Partition 50mm 11 kg/m³ R1.2	Report
64	0.55	2600	1420	122	46 (37)	53 (45)	Day Design 3094-17
	0.9	2850	2440				
102	0.55	2840	1420	160	49 (40)	55 (49)	
	0.9	3790	2660				

General Requirements

	Fire Rated
Install control joints in plasterboard ceilings: › At 12m maximum intervals › At all control joints in the structure › At any change in the substrate › At the junction of a larger room and passageway.	✓
Shaft Wall Ceilings are non-trafficable. Do not walk on plasterboard ceilings!	✓
Limit dead loads on plasterboard ceilings to 2 kg/m^2.	✓
Only joint the face layer. As a minimum, use paper tape with either masta**base** or masta**longset**.	✓
Use approved fire rated penetration details. Fire penetrations may require fire collars or other devices to maintain fire performance.	✓
Use **bindex** fire and acoustic sealant on all gaps and around perimeter. Vermiculite plaster is not permitted.	✓
Attach ceiling fixtures to framing members only. Ensure the framing is designed to carry any additional load.	✓

Framing

	Fire Rated
CH-studs as per framing table or structural design. Space CH-studs at 600mm (full **shaft**liner) or 300mm centres (**shaft**liner cut in half lengthways)	✓
Twist CH-studs into perimeter Shaft Wall J-tracks and Shaft Wall Deflection Head J-tracks.	✓
For Shaft Wall components and installation sequence, refer to Section 3.6 Shaft Wall.	✓

Table 1 Maximum Perimeter Track Anchor Spacing

Stud Spacing (mm)	Maximum Anchor Spacing (mm)
600	600
300	450

1. Additional anchors 100mm maximum from track ends.
2. 102mm studs require 2 anchors across width.

Anchor Demand From System Tables

1. Maximum anchor shear and tension demand = 1.13 kN
2. Anchors at maximum 1.5 x stud spacing up to 600mm maximum, and 100mm maximum from ends.
3. 102mm tracks where minimum 2 anchors across width.

Siniat Internal Wind Load Calculator

Refer to Section 2.3 for assistance determining the relevant internal wind pressures for a specific project. Or use the Siniat Internal Wind Load Calculator by clicking on the link or by using your phone's camera on the QR code.

Plasterboard Layout

Fireshield Layout	Fire Rated
Install **fire**shield perpendicular to the framing members.	✓
Stagger face layer butt joints by 600mm minimum on adjoining sheets and between layers.	✓
First layer butt joints must be backed by a CH-stud joist.	✓
Stagger recessed edges by 300mm minimum between layers.	✓
Shaftliner Layout	
If the ceiling width exceeds the length of **shaft**liner, position the **shaft**liner butt joints within the first and last third of the ceiling. [Refer to Section 3.6]	✓
Stagger **shaft**liner butt joints for adjacent panels and reinforce with horizontal CH-stud cut to fit between the ceiling CH-studs. [Refer to Section 3.6]	✓

Minimise butt joints by using long sheets.

Plasterboard Fixing

	Fire Rated
Use the 'Screw Only Method'. Stud adhesive is not permitted.	✓
For the installation of **fire**shield to CH-studs joists, refer to Section 5.1.	✓
Drive screws to just below the sheet surface, taking care not to break the paper linerboard. For over-driven screws, install another screw 20mm away. Leave or remove the over-driven screw and patch.	✓
Laminating screws can be used to fix butt joints in the second and third layer.	✓

Screw Type and Minimum Size for the Installation of Plasterboard to Steel

Plasterboard Thickness	1st Layer	2nd Layer	3rd Layer
16mm **fire**shield	6g x 30mm screw	6g x 45mm screw *	8g x 65mm screw *
25mm **shaft**liner	6g x 45mm screw #	-	-

1. For steel ≤ 0.75mm BMT, use fine thread needle point screws.
2. For steel ≥ 0.75mm BMT, use fine thread drill point screws.
3. *10g x 38mm Laminating screws may be used as detailed in installation diagrams.
4. # For securing Shaftliner to J-track when the J-track is used as an end stud.

Fire Rated
Details for Shaft Wall Ceilings

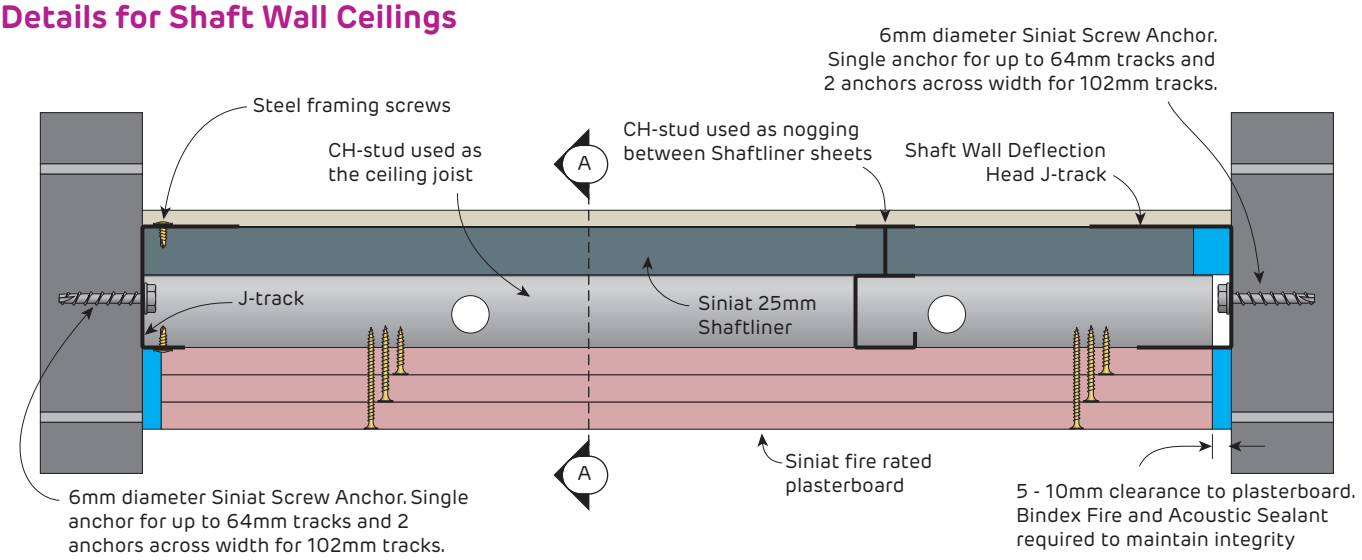
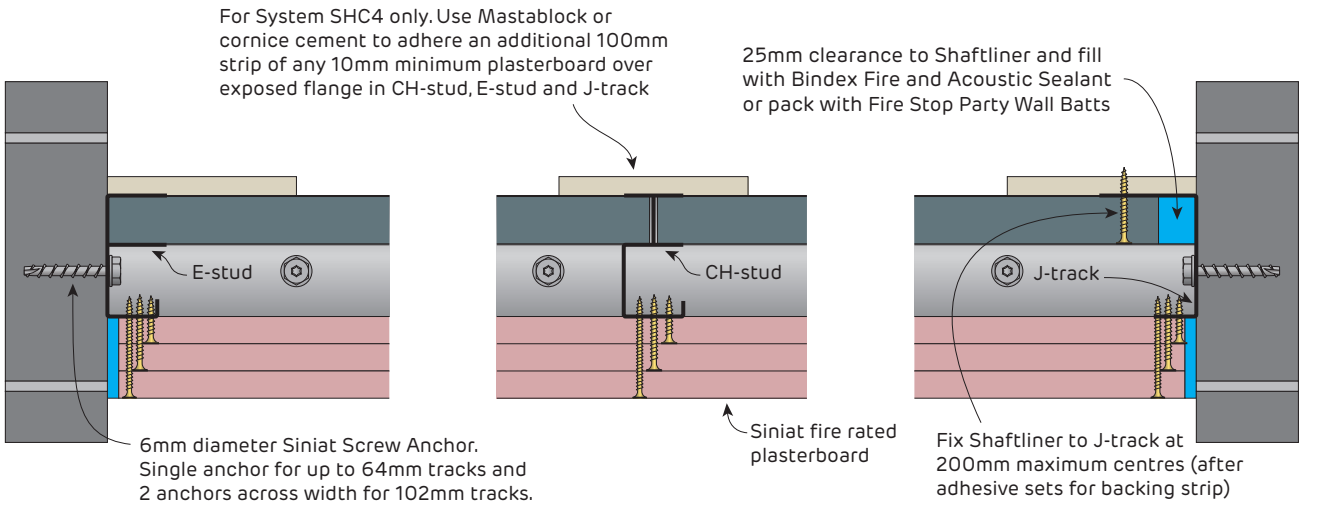


FIGURE 1 Shaft Wall Ceiling to Masonry Wall
Section



SECTION A-A Ceiling Start
E-stud
Section

SECTION A-A Ceiling Middle
CH-stud
Section

SECTION A-A Ceiling End
J-track
Section

Fill any gaps with Bindex Fire and Acoustic Sealant to maintain integrity

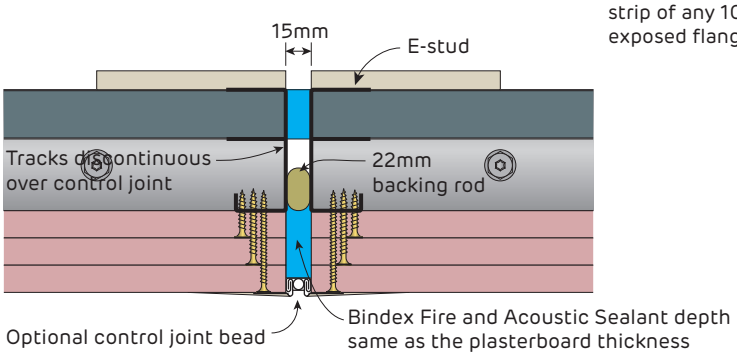


FIGURE 2 Shaft Wall Ceiling Control Joint
Section

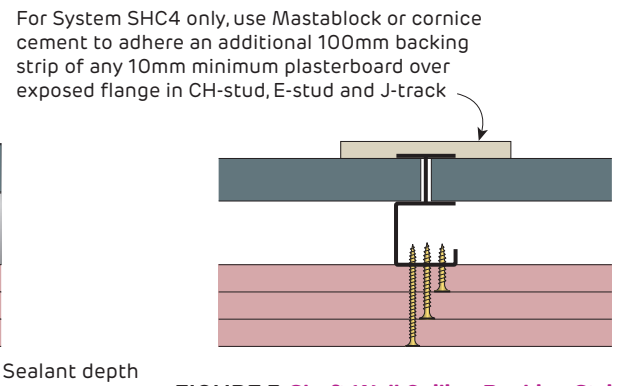


FIGURE 3 Shaft Wall Ceiling Backing Strips
System SHC4 only
Section

Fire Rated
Shaft Wall Ceiling and Supporting Load Bearing Wall

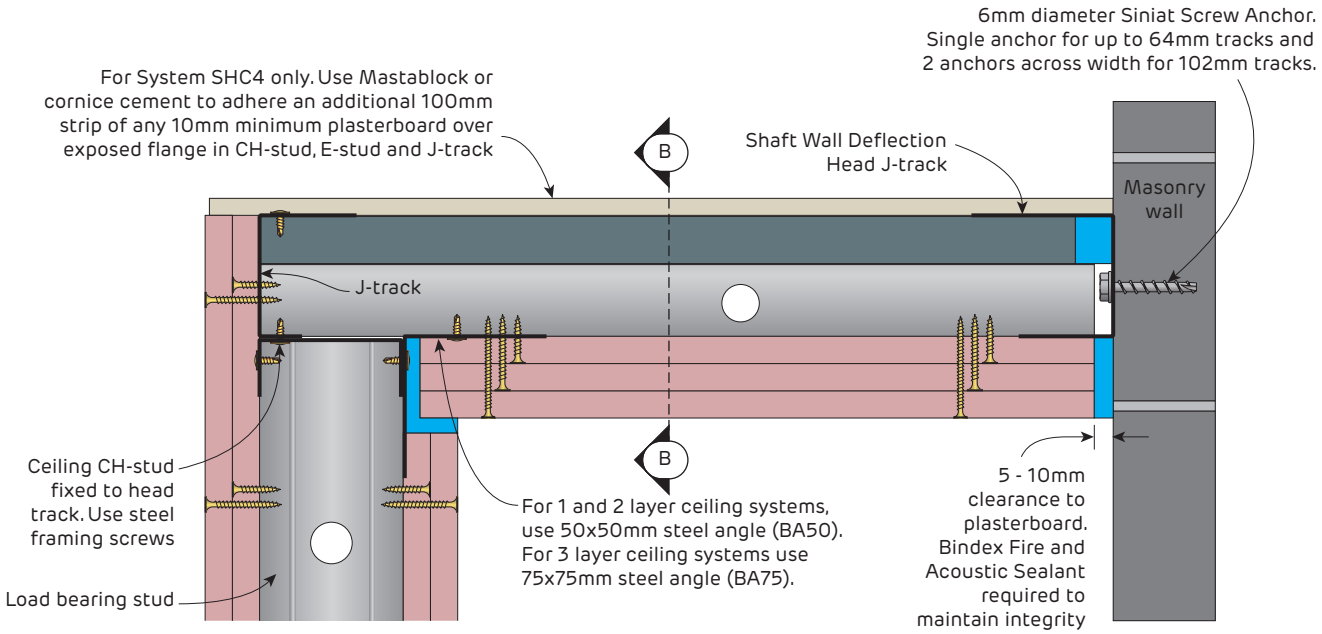
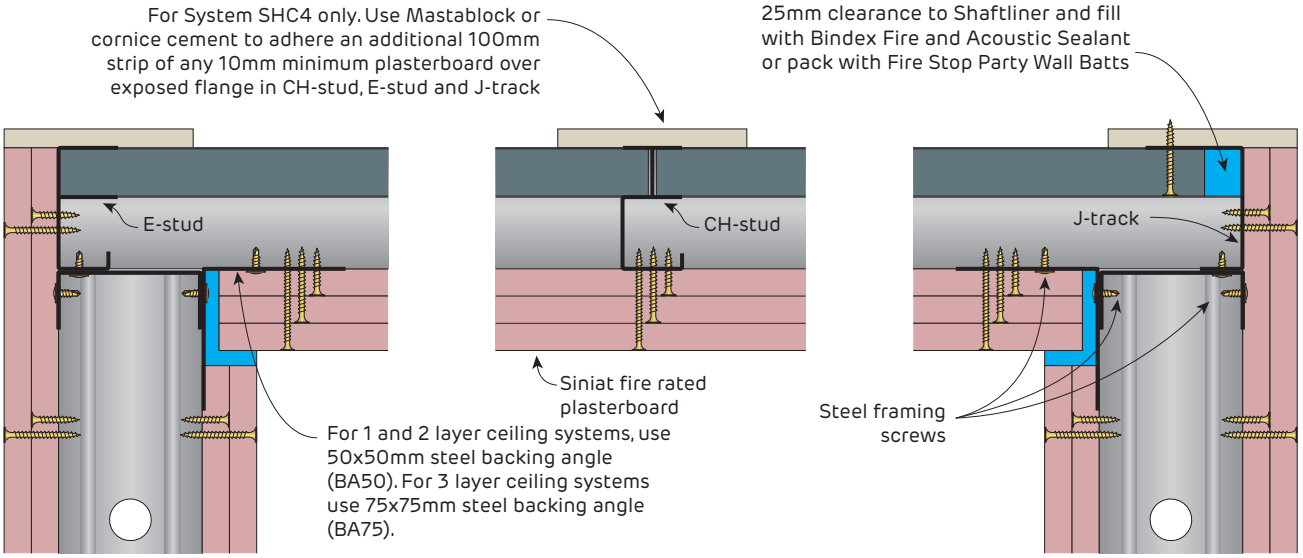


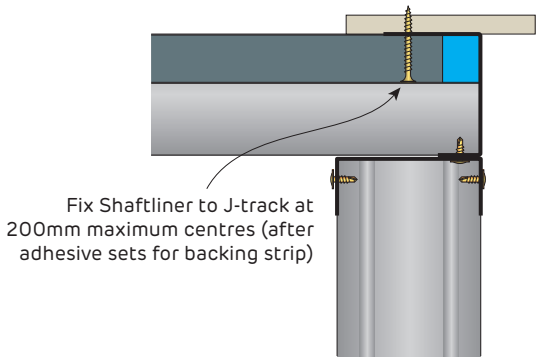
FIGURE 4 Shaft Wall Ceiling to Steel Stud Wall
SSW317 and SHC4
Section



SECTION B-B Ceiling Start
E-stud
Section

SECTION B-B Ceiling Middle
CH-stud
Section

SECTION B-B Ceiling End
J-track
Section



SECTION B-B Construction of Ceiling End
J-track
Section

Fire Rated
Shaft Wall Ceiling using Structural Beams

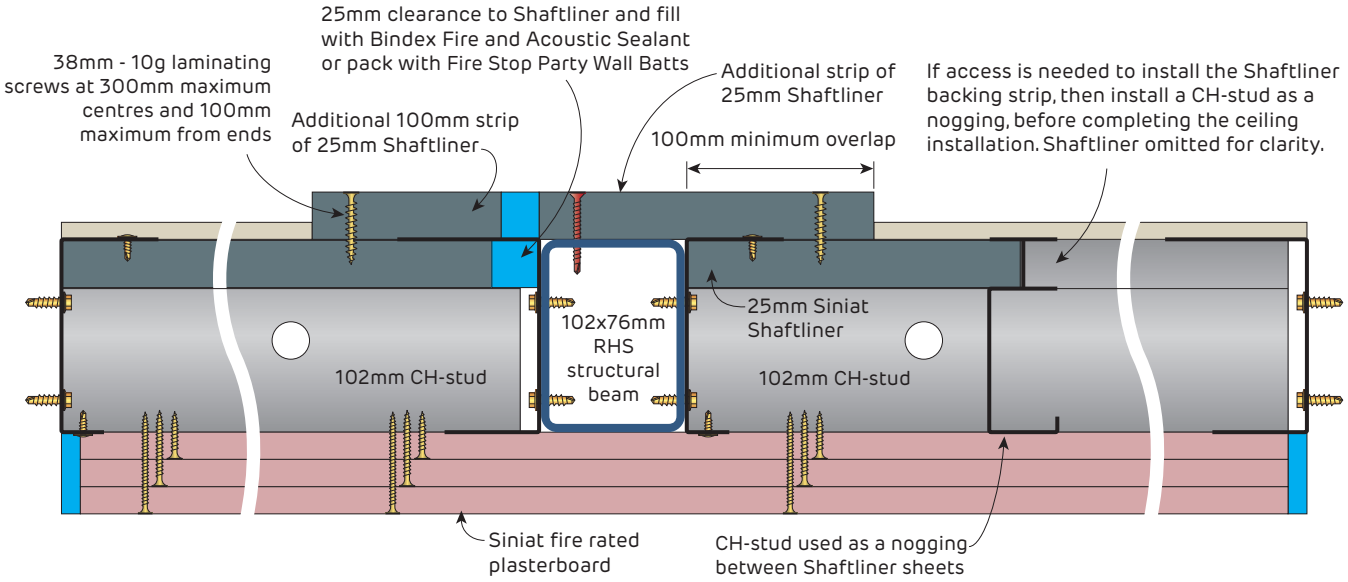
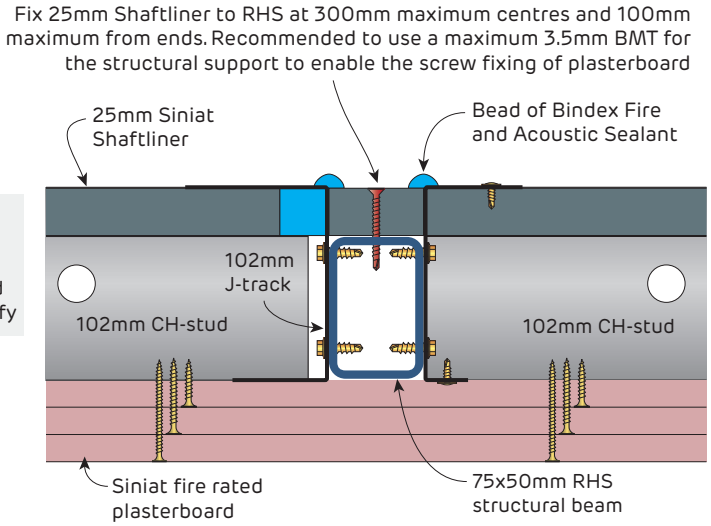


FIGURE 5 Shaft Wall Ceiling with RHS Structural Beam
Used to increase the span of 102mm CH-stud Shaft Wall Ceilings
Section



Additional 100mm strip of any 10mm minimum plasterboard over exposed flange in CH-stud, E-stud and J-track is not shown for clarify

FIGURE 6 Alternative Detail with RHS Structural Beam
Used to increase the span of 102mm CH-stud Shaft Wall Ceilings
Section

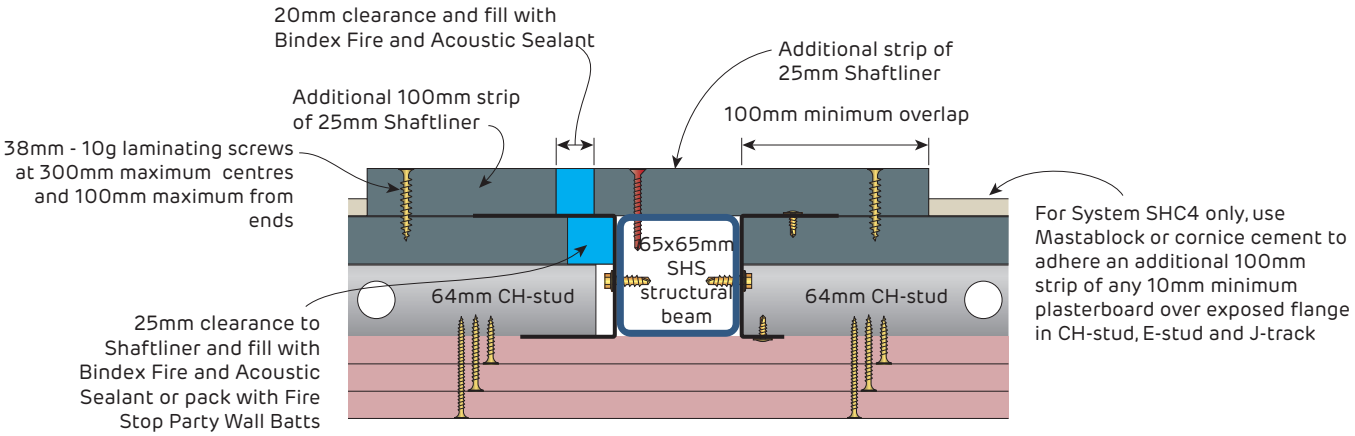


FIGURE 7 Shaft Wall Ceiling with SHS Structural Beam
Used to increase the span of 64mm CH-stud Shaft Wall Ceilings
Section

Fire Rated
Shaft Wall Ceiling using Structural Beams

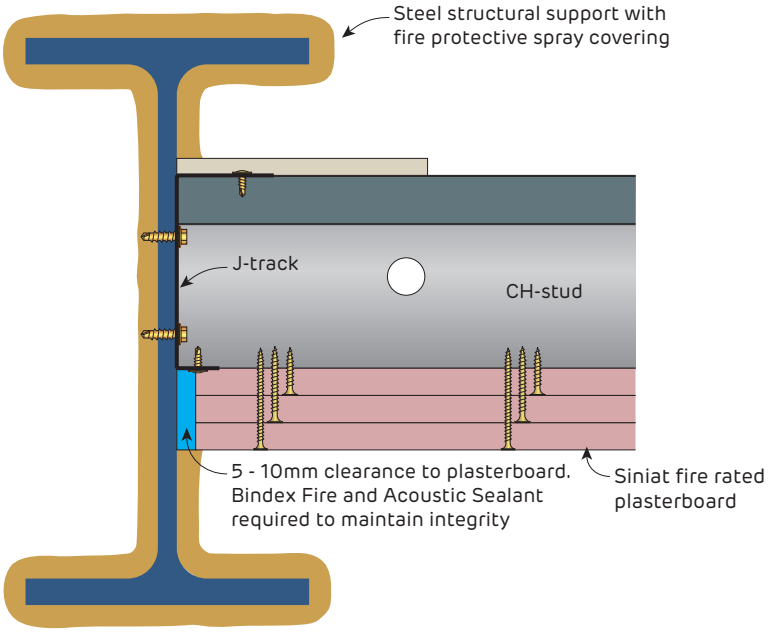


FIGURE 8 Shaft Wall Ceiling to Structural Beam
Section

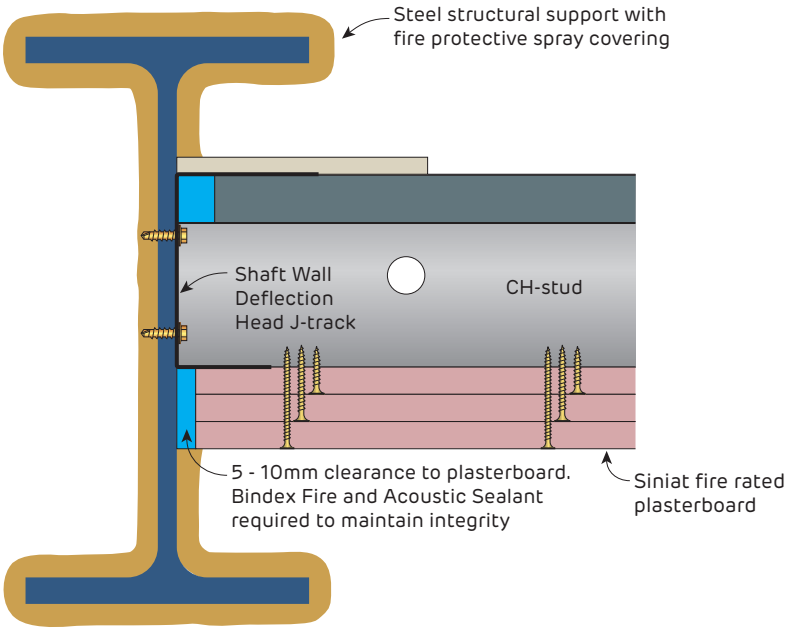


FIGURE 9 Shaft Wall Ceiling to Structural Beam
Section

Fire Rated

Details for Shaft Wall Bulkhead - Fire Rated from Both Directions

Using Wall Systems SHW312 or SHW317 with Ceiling Systems SHC3 or SHC4

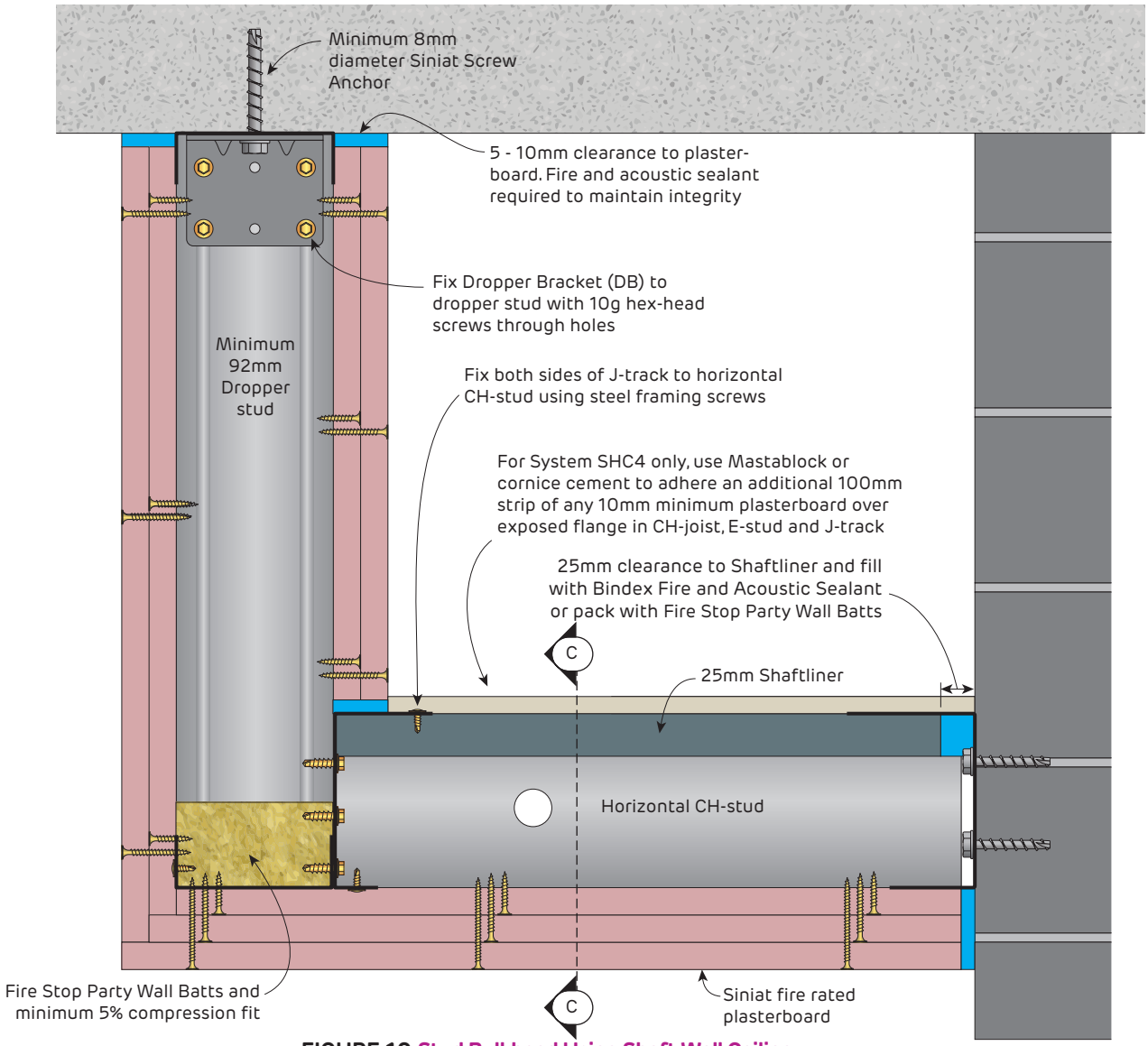
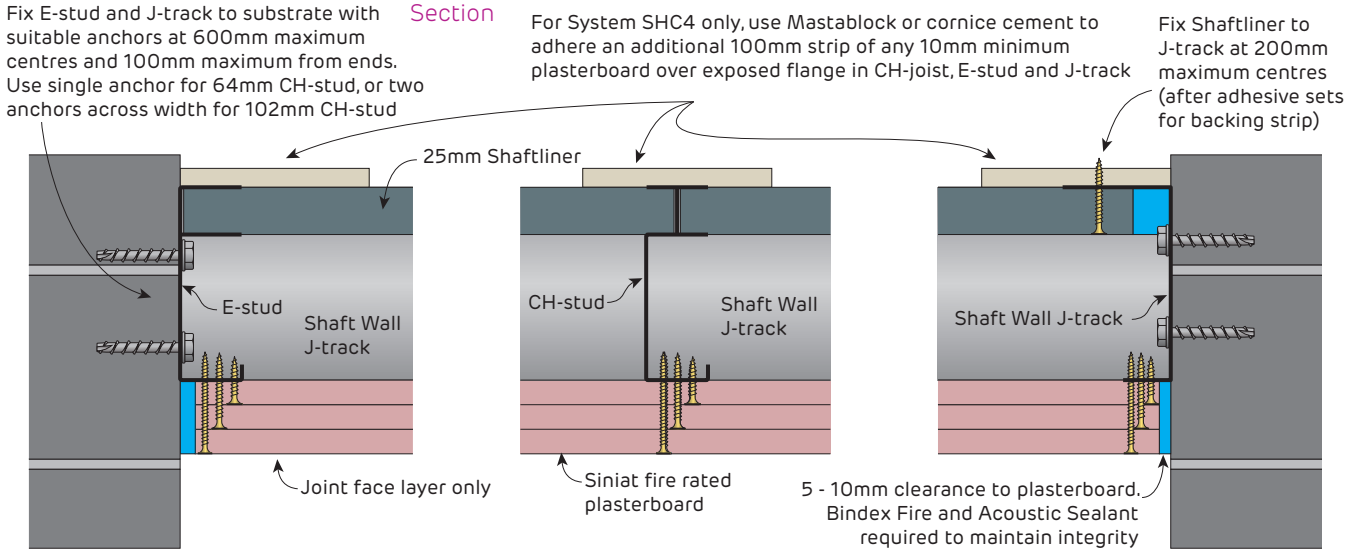


FIGURE 10 Stud Bulkhead Using Shaft Wall Ceiling
Fire rated from both directions (Built from outside only)
Section



SECTION C-C Ceiling Start
Horizontal E-stud fixed to substrate
Section

SECTION C-C Ceiling Middle
Section

SECTION C-C Ceiling End
Horizontal J-track fixed to substrate
Section

Fire Rated
Shaft Wall Ceiling and Bulkhead using Structural Beams

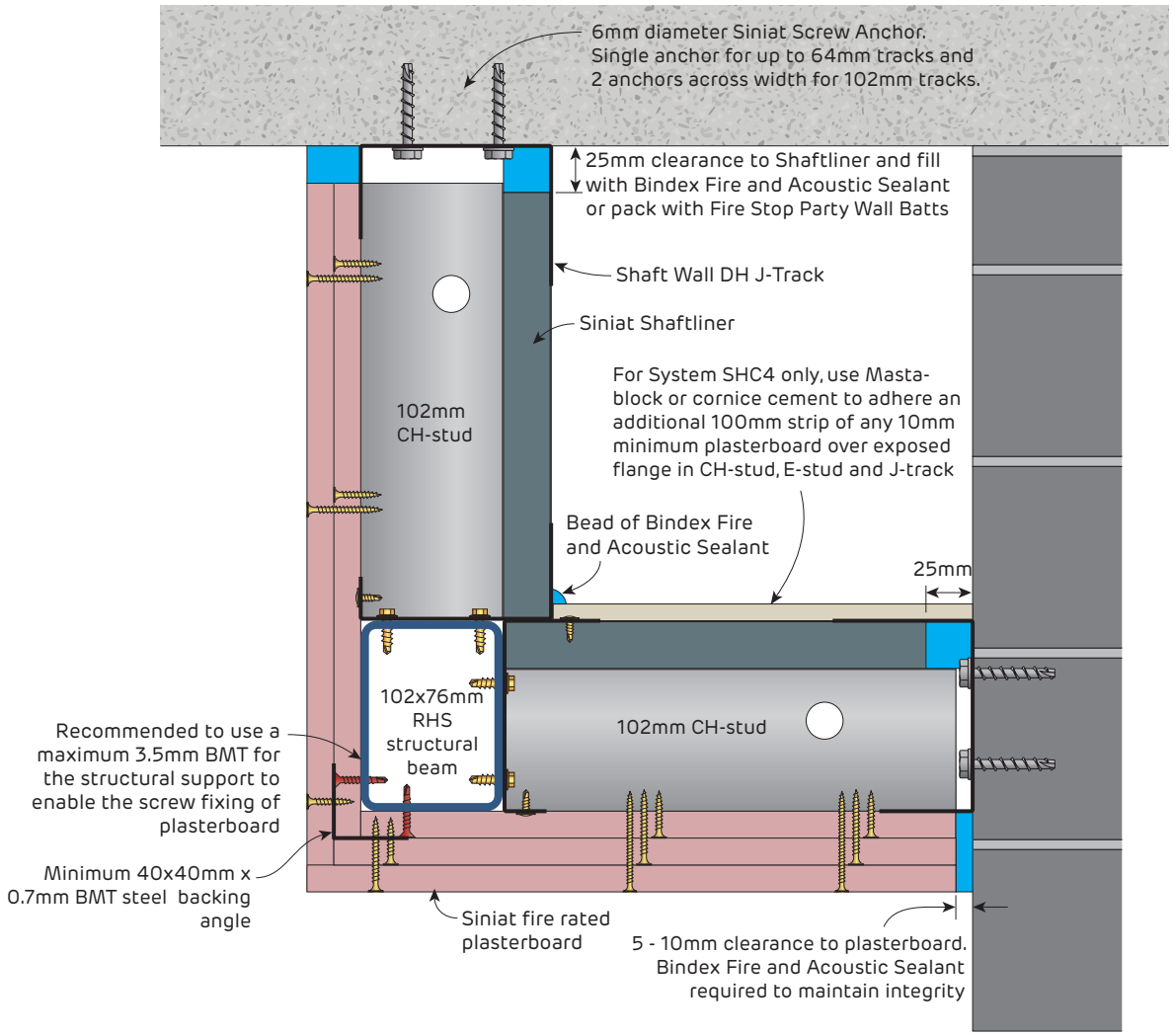


FIGURE 11 Shaft Wall Ceiling and Bulkhead with RHS Structural Beam
SHW2 and SHC4
Section

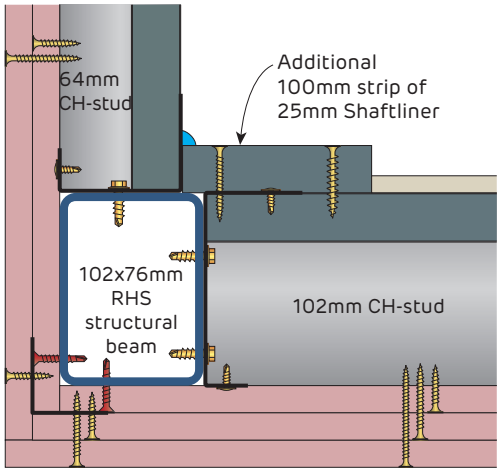


FIGURE 12 Alternative detail using RHS Beam with 64 and 102mm CH-Studs
SHW2 and SHC4
Section

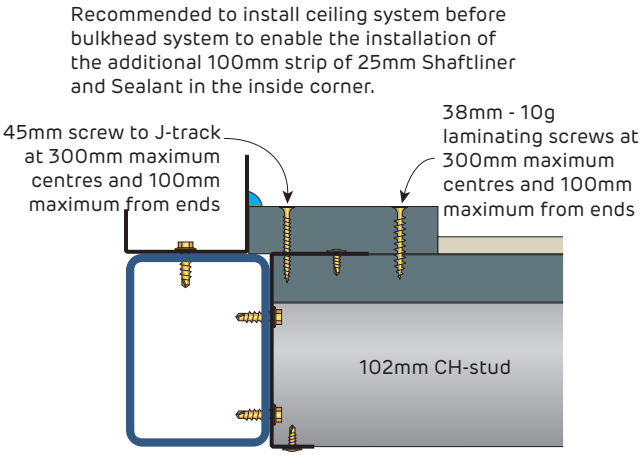


FIGURE 13 Construction of Shaft Wall Ceiling and Bulkhead
Section

Fire Rated
Shaft Wall Ceiling and Bulkhead using Structural Beams

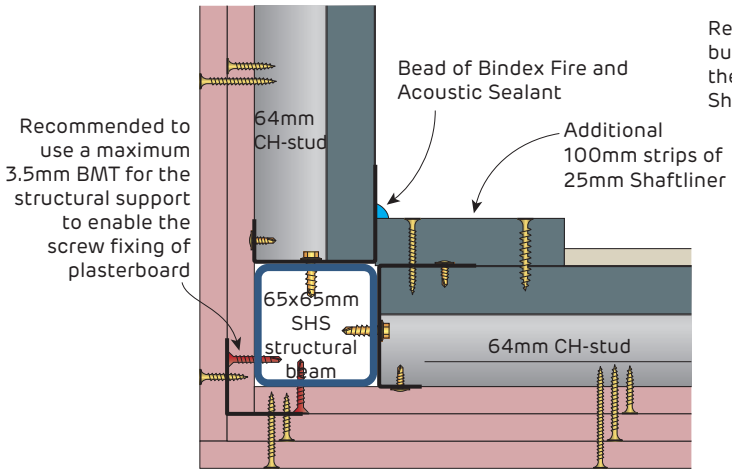


FIGURE 14 Detail using SHS Beam with 64mm CH-Studs
SHW2 and SHC4
Section

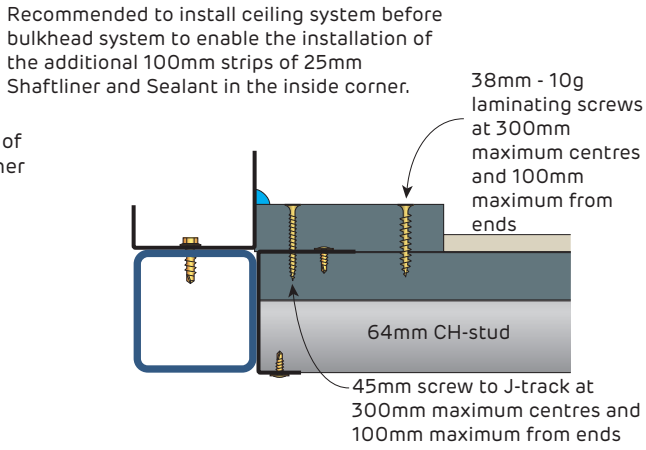


FIGURE 15 Construction of Shaft Wall Ceiling and Bulkhead
Section

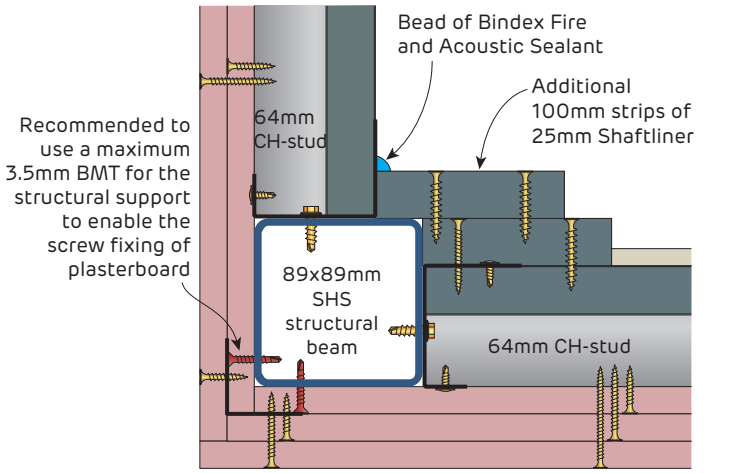


FIGURE 16 Alternative Detail using SHS Beam with 64mm CH-Studs
SHW2 and SHC4
Section

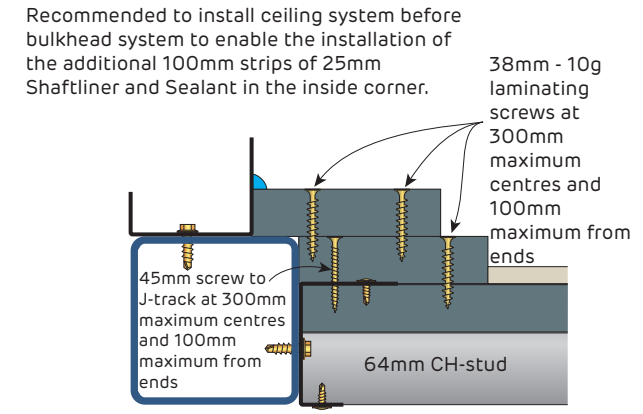


FIGURE 17 Construction of Shaft Wall Ceiling and Bulkhead
Section

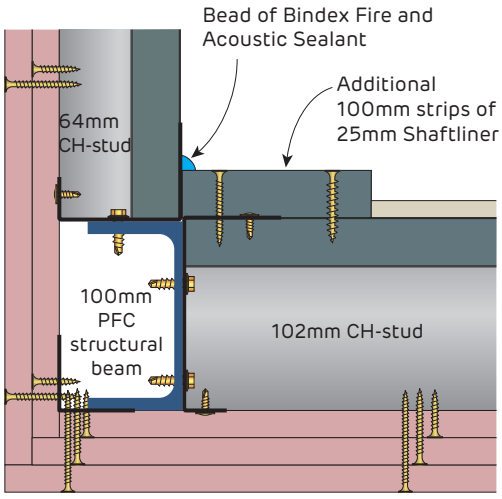


FIGURE 18 Detail using PFC Beam with 64 and 102mm CH-Studs
SHW2 and SHC4
Section

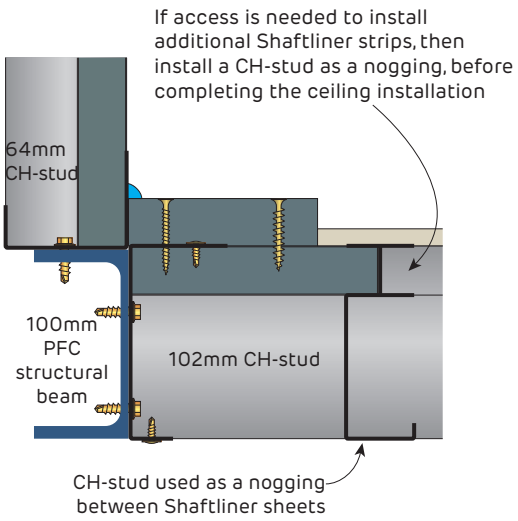


FIGURE 19 Construction of Shaft Wall Ceiling and Bulkhead
Section

Fire Rated
Shaft Wall Bulkhead using Structural Columns

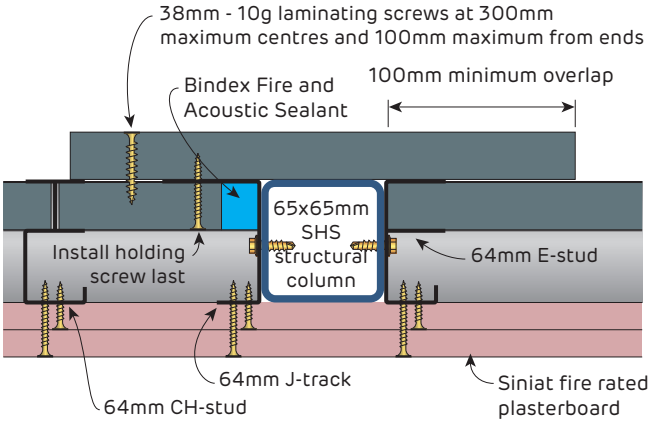


FIGURE 20 Shaft Wall Bulkhead using SHS Column with 64mm CH-Studs
SHW2
Plan

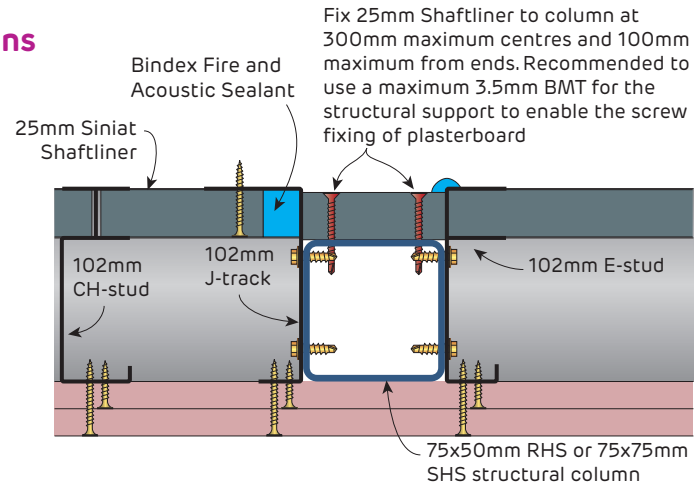


FIGURE 21 Shaft Wall Bulkhead using SHS Column with 102mm CH-Studs
SHW2
Plan

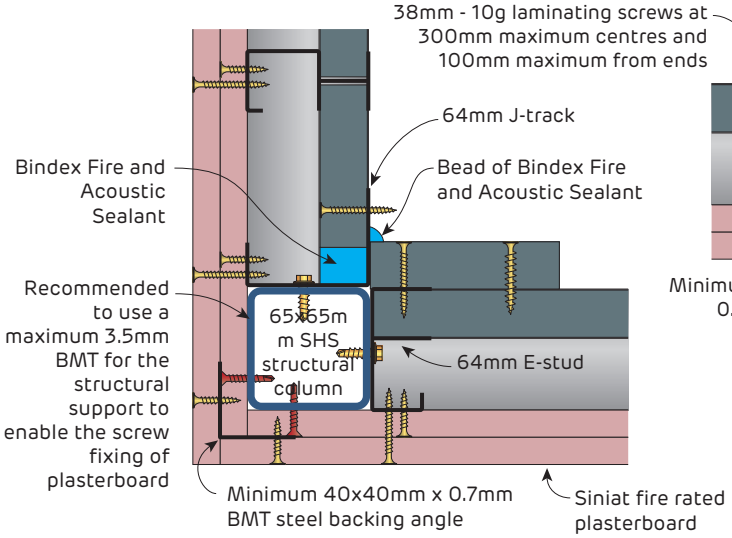


FIGURE 22 Shaft Wall Bulkhead External Corner using SHS Column with 64mm CH-Studs
SHW2
Plan

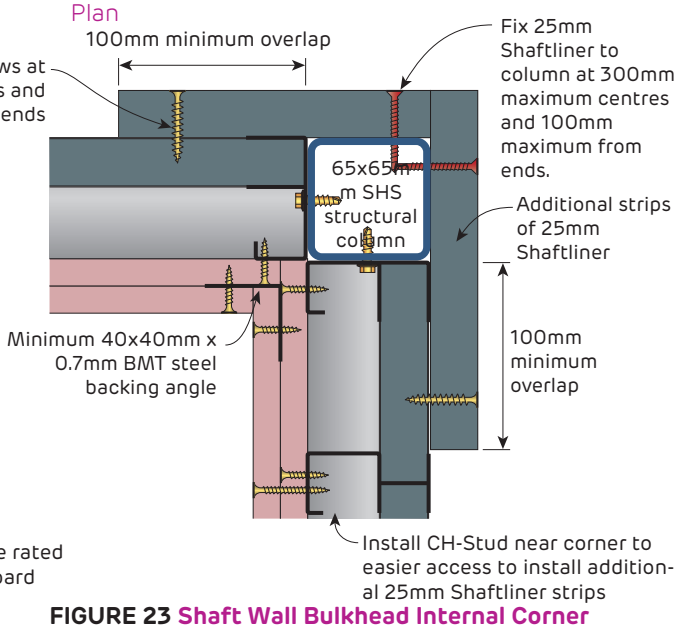


FIGURE 23 Shaft Wall Bulkhead Internal Corner using SHS Column with 64mm CH-Studs
SHW2
Plan

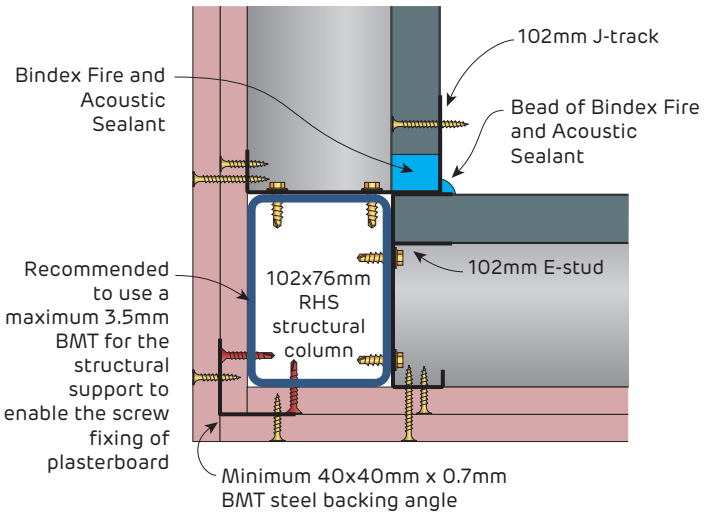


FIGURE 24 Shaft Wall Bulkhead External Corner using RHS Column with 102mm CH-Studs
SHW2
Plan

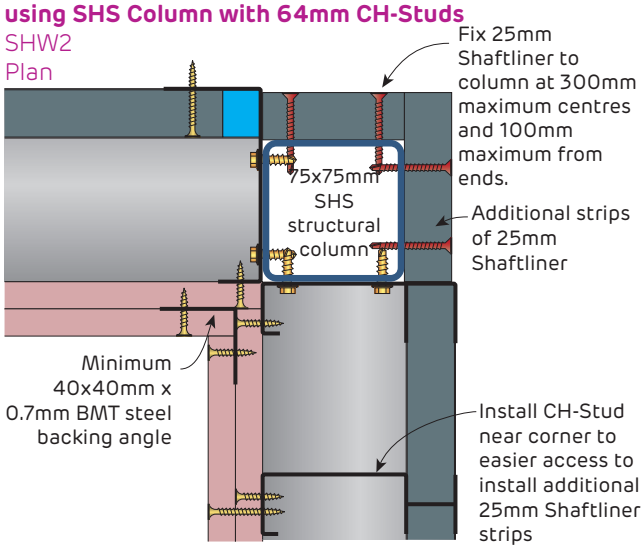


FIGURE 25 Shaft Wall Bulkhead Internal Corner using SHS Column with 102mm CH-Studs
SHW2
Plan

Fire Rated

Shaft Wall Ceilings and Bulkhead using Structural Columns and Beams

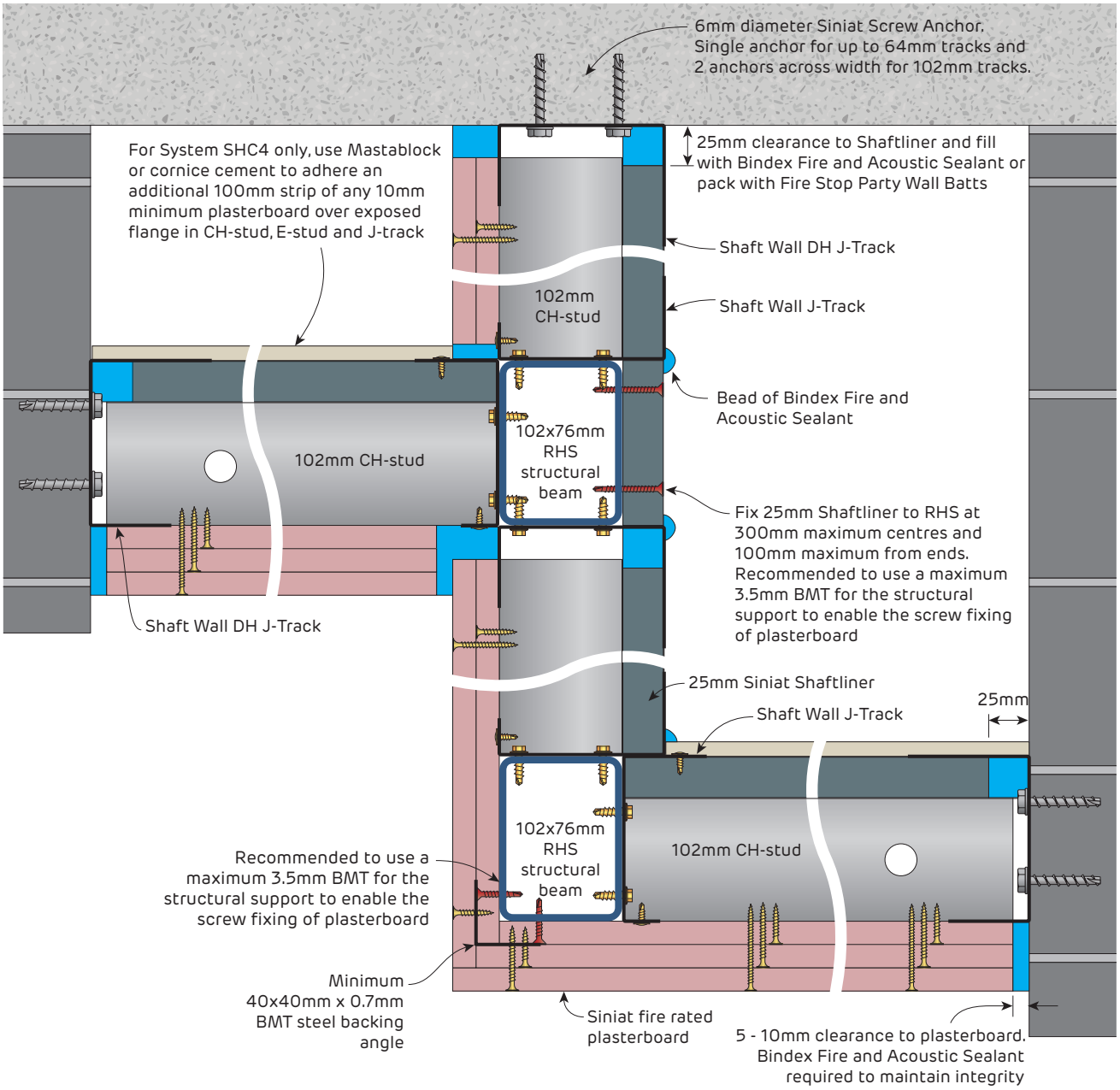


FIGURE 26 Shaft Wall Ceilings and Bulkhead using RHS Structural Columns and Beams
SHW2 and SHC4
Section

Fire Rated
Shaft Wall Ceiling and Bulkhead using Structural Beams

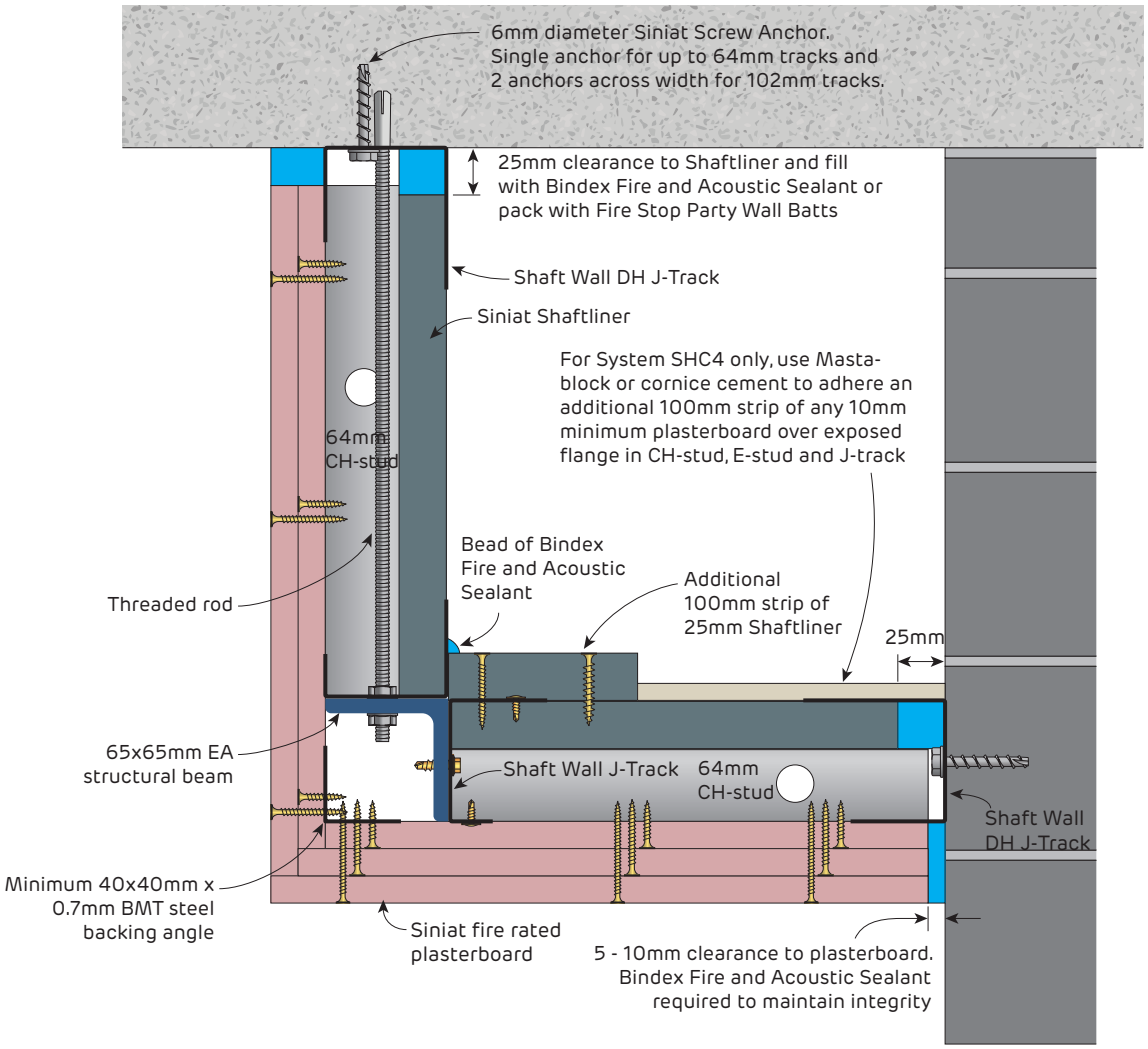


FIGURE 27 Shaft Wall Ceiling and Bulkhead with EA Structural Beam
SHW2 and SHC4
Section

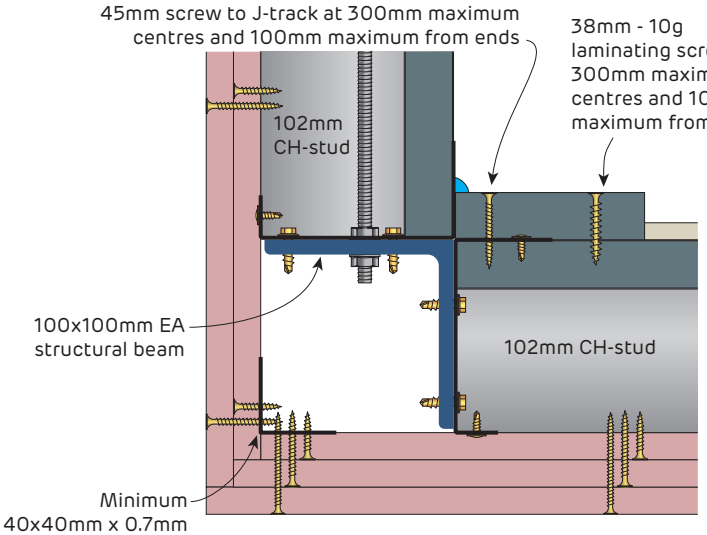


FIGURE 28 Detail using EA Beam with 102mm CH-Studs
SHW2 and SHWC4
Section

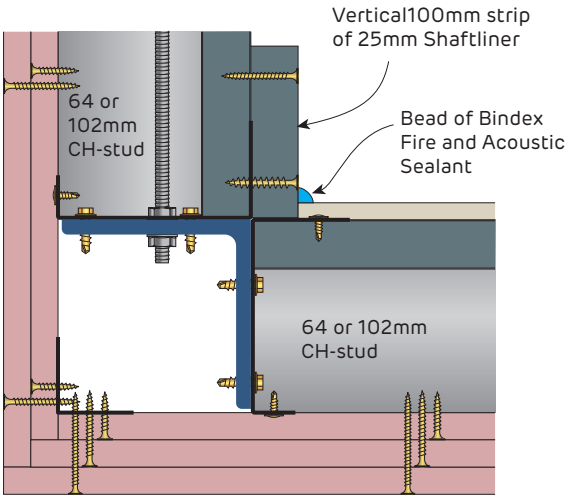


FIGURE 29 Alternative Detail using EA Beam with 64mm or 102mm CH-Studs
SHW2 and SHC4
Section