3.7 Shaft Wall

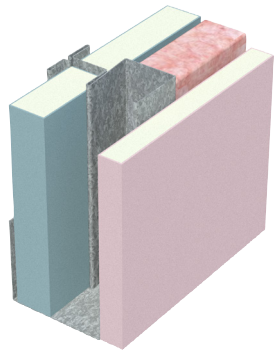
Shaft Wall systems are fire rated non-load bearing walls commonly used for shafts and service ducts. The Shaft Wall system is not suitable to operate as an air supply duct while exposed to an external fire or to contain products of combustion, ie: smoke exhaust. Shaft Wall systems have been tested to *AS 1530.4 Part 4: Fire-resistance tests for elements of construction*, but not Part 9 (Air Ducts).

Shaft Wall systems are ideal when constructing a wall where access is only possible from one side. This side is referred to as the storey side.

Shaft Wall has advantages compared with masonry construction:

- 75% lighter
- Thinner – typically less than 100mm wide using 64mm CH-Studs
- No wet trades required
- Faster installation – no scaffolding is required inside the shaft.

SHW1



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

fireshield can be substituted with **multi**shield or **tru**rock

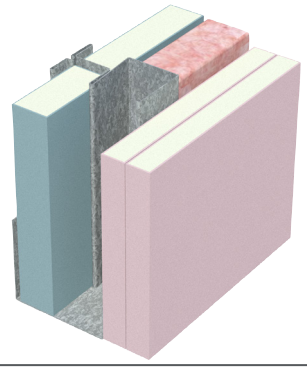
Fire Resistance Level

-/60/60
rated from both sides

Report FAR2863

CH-stud Size (mm)		Maximum Height (m)		Wall Width (mm)	Sound Insulation Rw (Rw + Ctr) for studs at 600mm centres and thinnest BMT		
Depth	BMT	Ws 0.25 kPa Stud Spacing (mm) 600	Ws 0.35 kPa Stud Spacing (mm) 600		No insulation	Pink® Partition 50mm 11 kg/m³ R1.2	Report
64	0.55	2.95	2.64	80	39 (32)	46 (39)	Day Design 3094-18
	0.9	3.46	3.09				
102	0.55	3.73	2.66	118	42 (33)	48 (41)	
	0.9	4.98	4.19				

SHW2



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

fireshield can be substituted with **multi**shield or **tru**rock

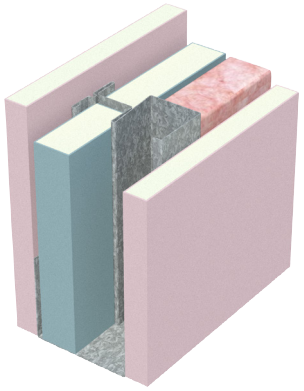
Fire Resistance Level

-/120/120
rated from both sides

Report FAR2863

CH-stud Size (mm)		Maximum Height (m)		Wall Width (mm)	Sound Insulation Rw (Rw + Ctr) for studs at 600mm centres and thinnest BMT		
Depth	BMT	Ws 0.25 kPa Stud Spacing (mm) 600	Ws 0.35 kPa Stud Spacing (mm) 600		No insulation	Pink® Partition 50mm 11 kg/m³ R1.2	Report
64	0.55	3.73	2.66	96	44 (36)	50 (42)	Day Design 3094-18
	0.9	4.38	3.89				
102	0.55	3.73	2.66	134	46 (37)	52 (46)	
	0.9	5.54	4.19				

SHW3



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

fireshield can be substituted with **multi**shield or **tru**rock

Fire Resistance Level

-/120/120
rated from both sides

Report FAR2863

CH-stud Size (mm)		Maximum Height (m)		Wall Width (mm)	Sound Insulation Rw (Rw + Ctr) for studs at 600mm centres and thinnest BMT		
Depth	BMT	Ws 0.25 kPa Stud Spacing (mm) 600	Ws 0.35 kPa Stud Spacing (mm) 600		No insulation	Pink® Partition 50mm 11 kg/m³ R1.2	Report
64	0.55	3.73	2.66	96	44 (35)	50 (42)	Day Design 3094-18
	0.9	4.38	3.89				
102	0.55	3.73	2.66	134	46 (36)	52 (45)	
	0.9	5.54	4.19				

Components

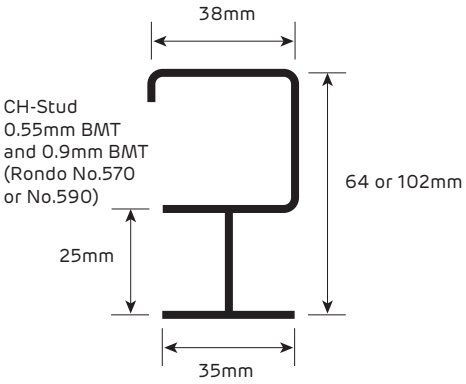


FIGURE 1 Shaft Wall CH-Stud
Section

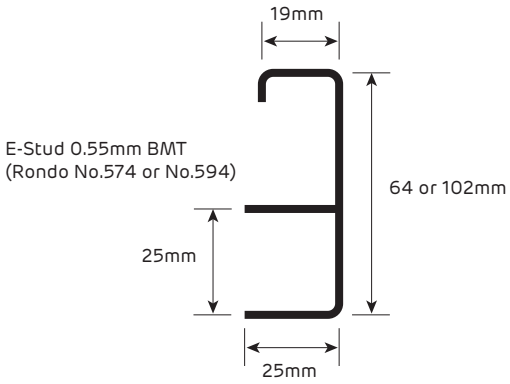


FIGURE 2 Shaft Wall E-Stud
Section

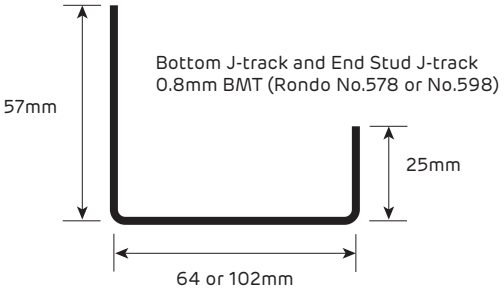


FIGURE 3 Shaft Wall J-Track
Section

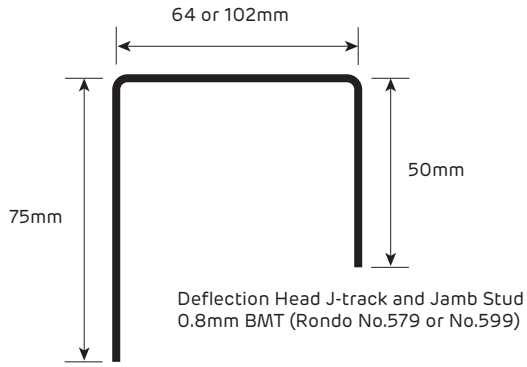


FIGURE 4 Shaft Wall Deflection Head J-Track
Section

General Requirements

	Fire Rated
Install control joints in plasterboard walls: > At 12m maximum intervals > At all control joints in the structure > At any change in the substrate	✓
Only joint the face layer. As a minimum, use paper tape with any Siniat jointing compound applied in one or two coats to the thickness of two coats. Alternatively, use **bindex** fire and acoustic sealant according to the Product Data Sheet.	✓
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.	✓
Attach all fixtures to studs or purpose installed noggings/blocking. Wall anchors must not be fixed only to the plasterboard of fire rated walls.	✓

For acceptable modifications or variations to fire rated systems, refer to Section 2.3 Fire Resistance

Framing

	Fire Rated
CH-studs as per framing table or structural design. Space CH-studs at 600mm (full **shaft**liner).	✓
Twist CH-studs into base tracks and push studs down completely.	✓

Table 1 Maximum Head and Base Track Anchor Spacing

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

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

Table 2 Concrete Anchor Table

Wall Height (m)	Anchor
0 - 6.92	SA6x45

1. Concrete 20 MPa minimum. No edge / spacing effects.
2. Anchors at maximum 1.5 x stud spacing up to 600mm maximum, and also 100mm maximum from track ends.
3. 102mm CH-studs require 2 anchors across width.

Plumbing and electrical services must not protrude beyond the face of the studs.

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.

Installation Sequence

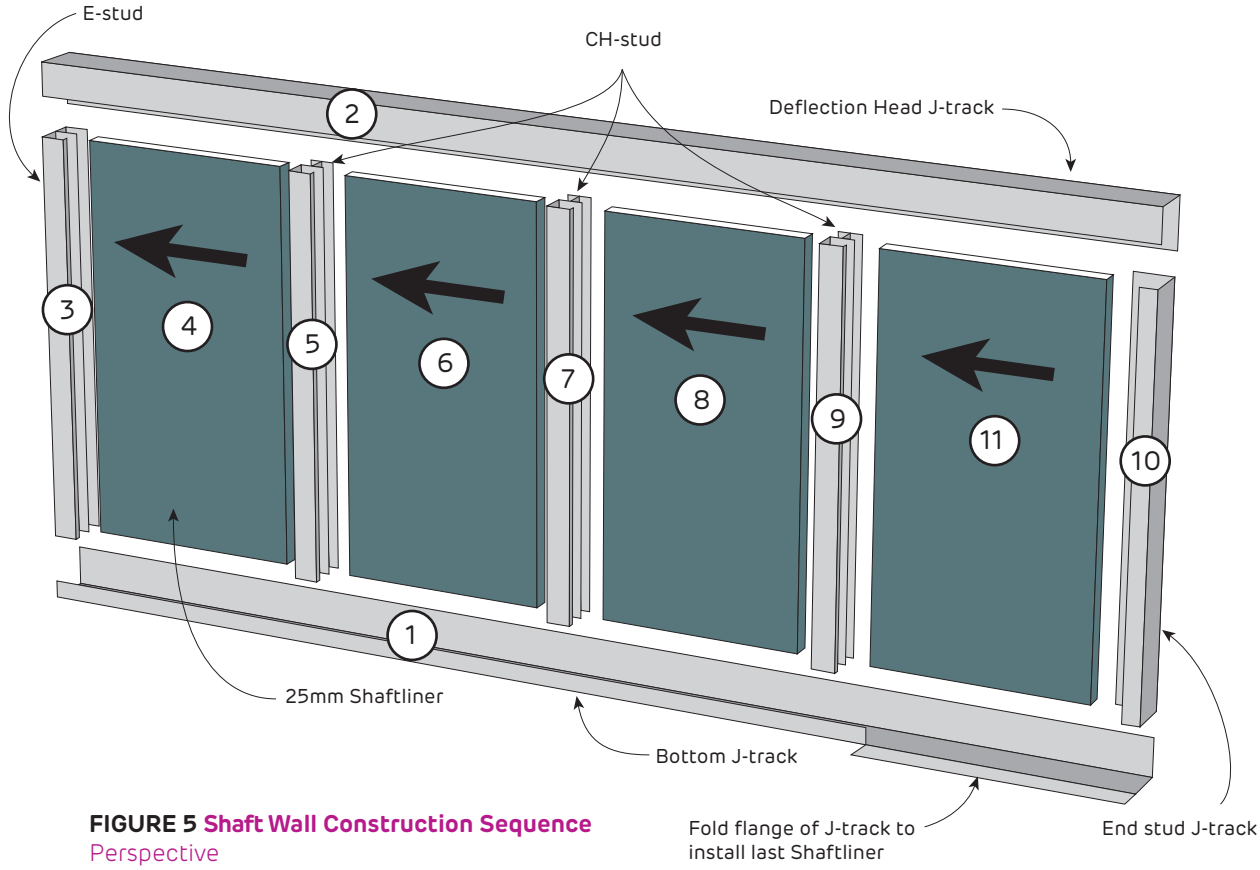


FIGURE 5 Shaft Wall Construction Sequence
Perspective

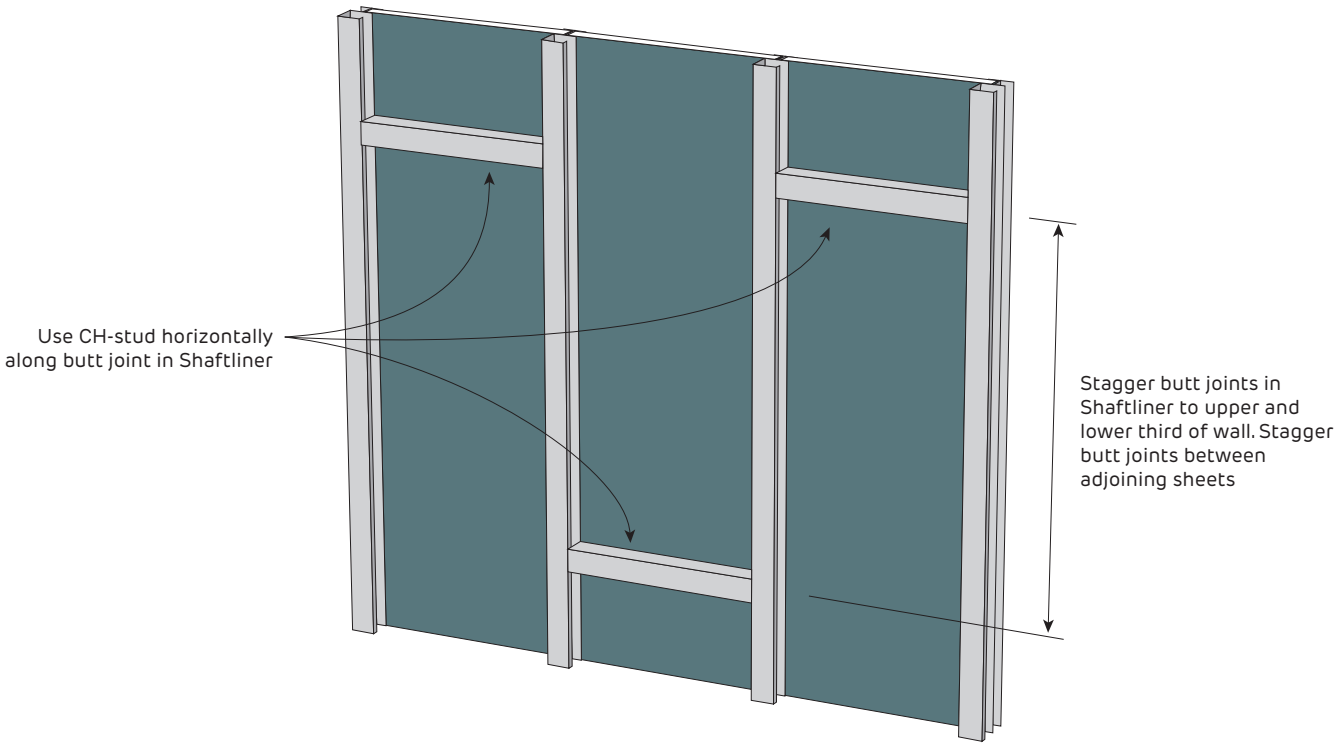


FIGURE 6 Shaftliner Butt Joint Layout
Perspective

Plasterboard Layout

	Fire Rated
Vertical joints must be 200mm minimum from the edge of any opening such as windows and doorways to minimise cracking at the joints.	✓
Fireshield Horizontal Layout	
Stagger butt joints by 300mm minimum on adjoining sheets and between layers.	✓
First layer butt joints must be backed by a CH-stud. Refer to installation diagrams.	✓
Stagger recessed edges by 300mm minimum between layers.	✓
Fireshield Vertical Layout	
Stagger butt joints by 300mm minimum on adjoining sheets and between layers.	✓
First layer butt joints must be backed by a nogging.	✓
Stagger recessed edges by 300mm minimum between layers.	✓
Shaftliner Layout	
If the wall height exceeds the length of **shaft**liner, position the **shaft**liner butt joints within the upper and lower third of the wall. [Refer to Figure 6]	✓
Stagger **shaft**liner butt joints for adjacent panels and reinforce with horizontal CH-stud cut to fit between the vertical studs. [Refer to Figure 6]	✓

> Install Fireshield horizontally when practical to reduce the effect of glancing light.

> Minimise butt joints by using long sheets.

Plasterboard Fixing

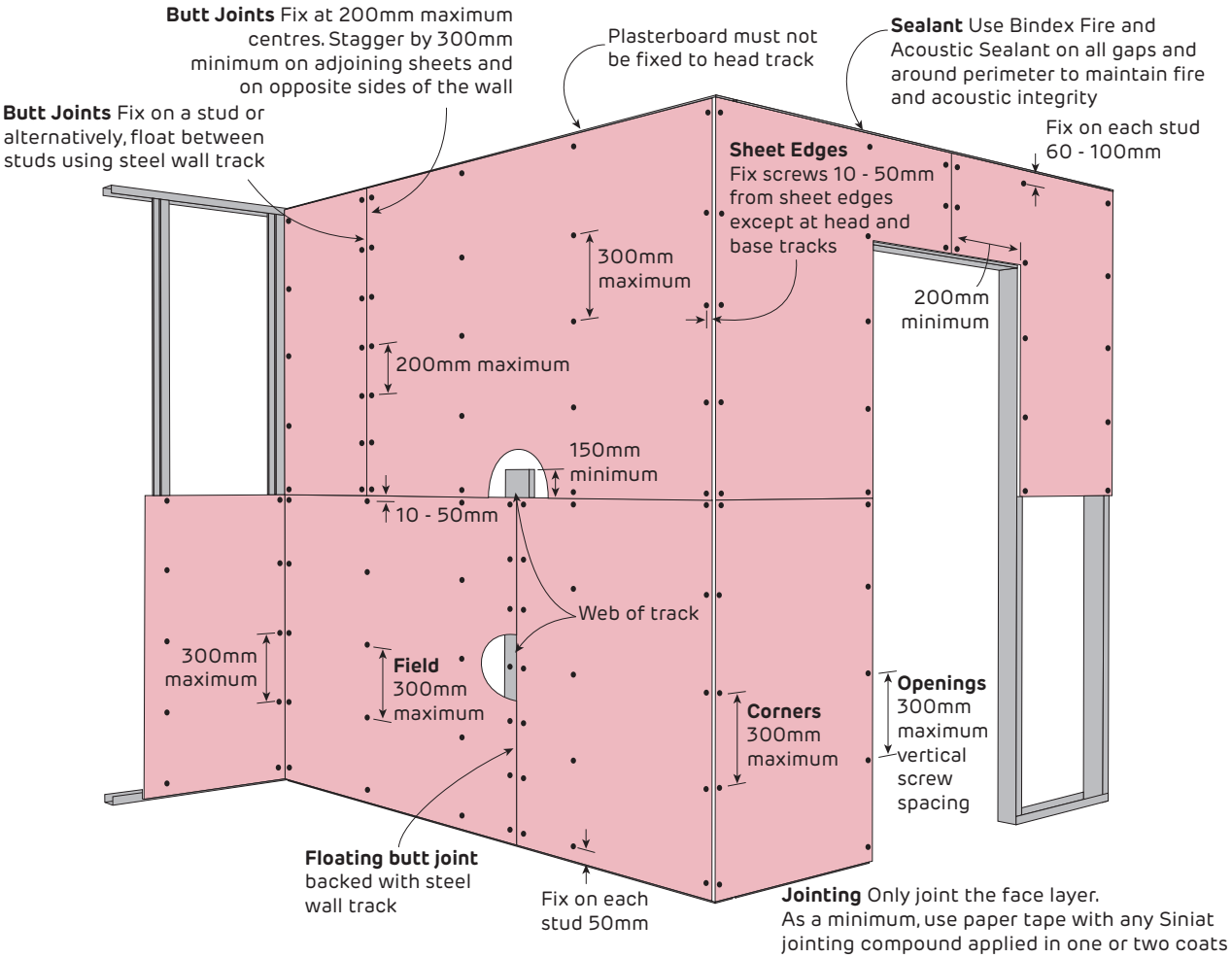
	Fire Rated
Use the 'Screw Only Method' in tiled or fire rated areas. Stud adhesive is not permitted.	✓
Drive screws to just below the sheet surface, taking care not to break the paper linerboard. For over-driven screws, install another screw 20mm away. Leave or remove the over-driven screw and patch.	✓
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 32mm 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.

FIGURE 7 Shaft Wall Fire Rated 1 Layer - Horizontal
Screw Only Method



Fixing Pattern Table

Sheet Width	Fixing Pattern
600mm	S S S (3)
900mm	S S S S (4)
1200mm	S S S S S (5)
1350mm	S S S S S S (6)
1400mm	S S S S S S (6)

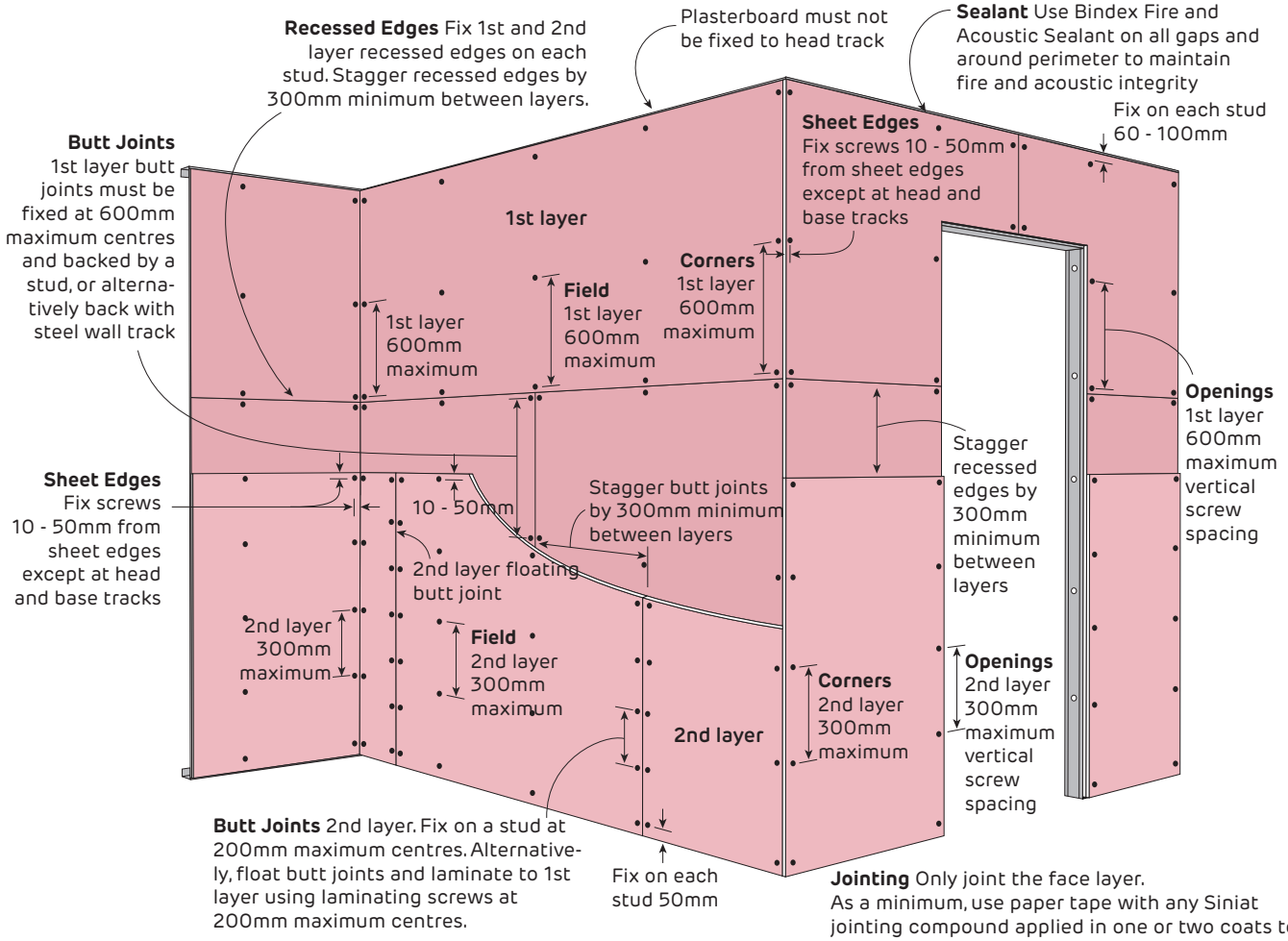
S = Screw

Maximum Ultimate Limit State Wind Load Table (kPa)

Plasterboard Thickness	Maximum Wall Stud Spacing			
	600mm	450mm	400mm	300mm
13mm	0.85	1.15	1.30	1.70
16mm	0.85	1.15	1.30	1.70

1. Calculations do not include the framing which must be independently designed to suit the desired loads.
2. If higher internal wind pressures are expected, please contact Siniat for specific design.

FIGURE 8 Shaft Wall Fire Rated 2 Layers - Horizontal + Horizontal
Screw Only Method



Fixing Pattern Table

Sheet Width	Fixing Pattern
600mm	S S S (3)
900mm	S S S S (4)
1200mm	S S S S S (5)
1350mm	S S S S S S (6)
1400mm	S S S S S S (6)

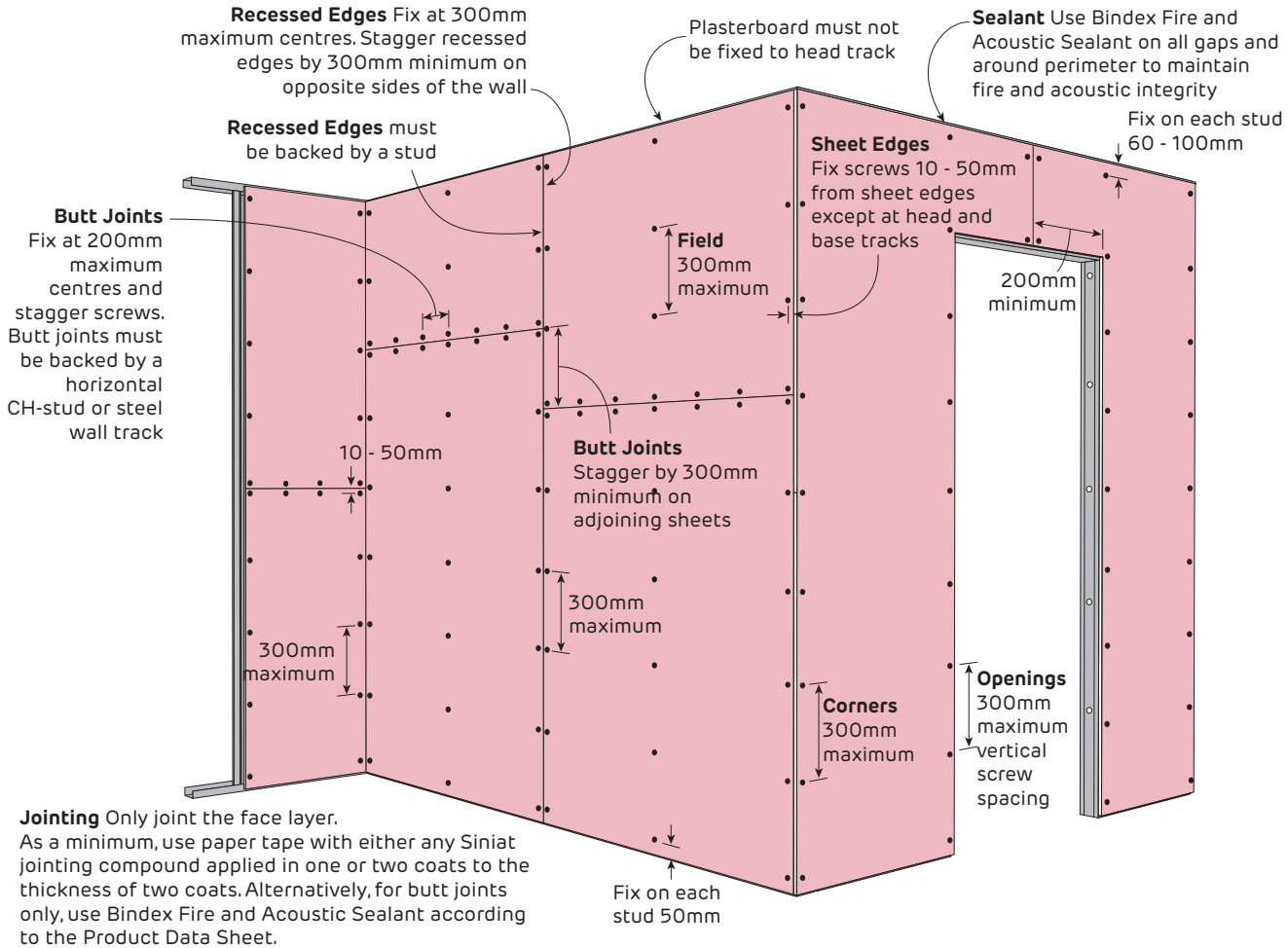
S = Screw

Maximum Ultimate Limit State Wind Load Table (kPa)

Plasterboard Thickness	Maximum Wall Stud Spacing			
	600mm	450mm	400mm	300mm
13mm	0.85	1.15	1.30	1.70
16mm	0.85	1.15	1.30	1.70

1. Calculations do not include the framing which must be independently designed to suit the desired loads.
2. If higher internal wind pressures are expected, please contact Siniat for specific design.

FIGURE 9 Shaft Wall Fire Rated 1 Layer - Vertical
Screw Only Method

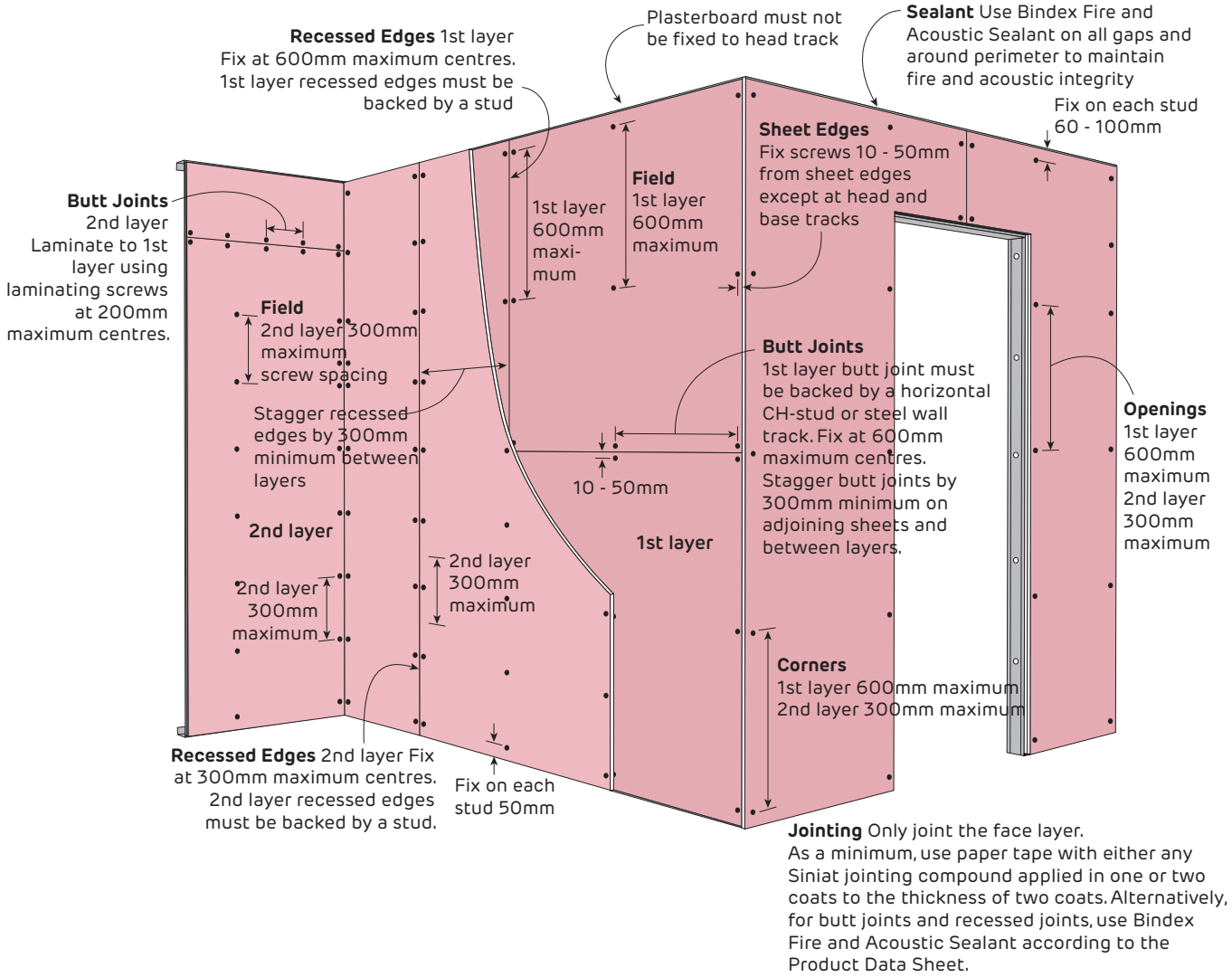


Maximum Ultimate Limit State Wind Load Table (kPa)

Plasterboard Thickness	Maximum Wall Stud Spacing			
	600mm	450mm	400mm	300mm
13mm	0.85	1.15	1.30	1.70
16mm	0.85	1.15	1.30	1.70

1. Calculations do not include the framing which must be independently designed to suit the desired loads.
2. If higher internal wind pressures are expected, please contact Siniat for specific design.

FIGURE 10 Shaft Wall Fire Rated 2 Layers - Vertical + Vertical
Screw Only Method



Jointing Only joint the face layer. As a minimum, use paper tape with either any Siniat jointing compound applied in one or two coats to the thickness of two coats. Alternatively, for butt joints and recessed joints, use Bindex Fire and Acoustic Sealant according to the Product Data Sheet.

Maximum Ultimate Limit State Wind Load Table (kPa)

Plasterboard Thickness	Maximum Wall Stud Spacing			
	600mm	450mm	400mm	300mm
13mm	0.85	1.15	1.30	1.70
16mm	0.85	1.15	1.30	1.70

1. Calculations do not include the framing which must be independently designed to suit the desired loads.
2. If higher internal wind pressures are expected, please contact Siniat for specific design.

Fire Rated
Shaft Wall Head and Base Details

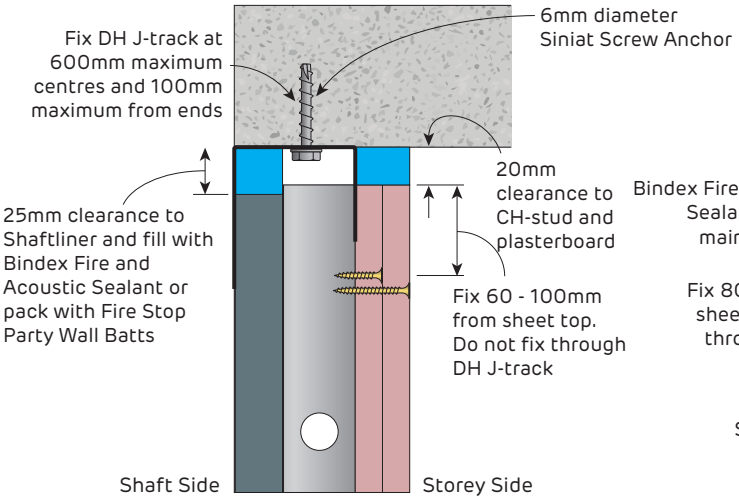


FIGURE 11 Shaft Wall Deflection Head
Max 20mm deflection allowance
System SHW2 - Section

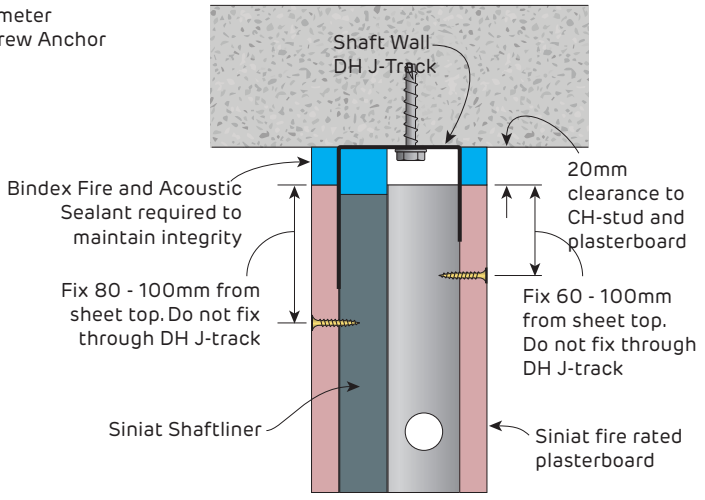


FIGURE 12 Shaft Wall Deflection Head
Max 20mm deflection allowance
System SHW1 and SHW3 - Section

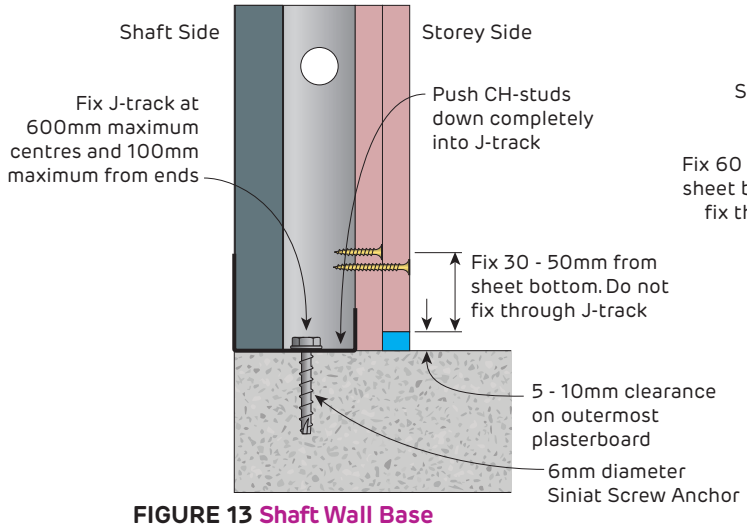


FIGURE 13 Shaft Wall Base
System SHW2
Section

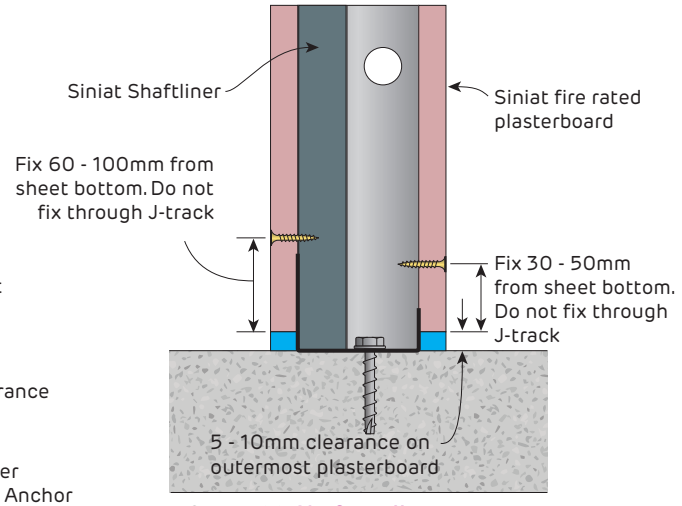


FIGURE 14 Shaft Wall Base
System SHW1 and SHW3
Section

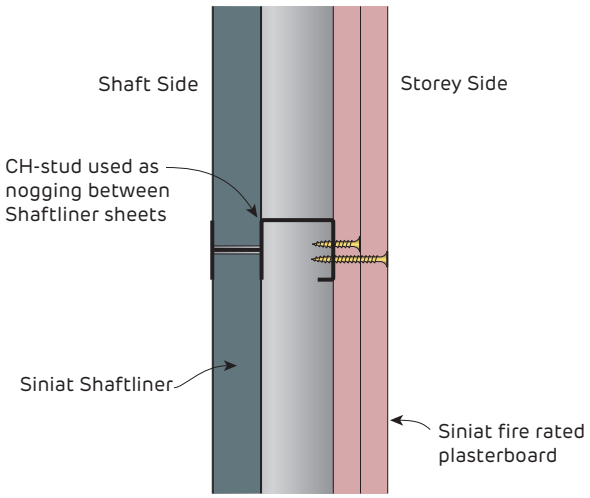


FIGURE 15 Butt Joint in Shaftliner
Section

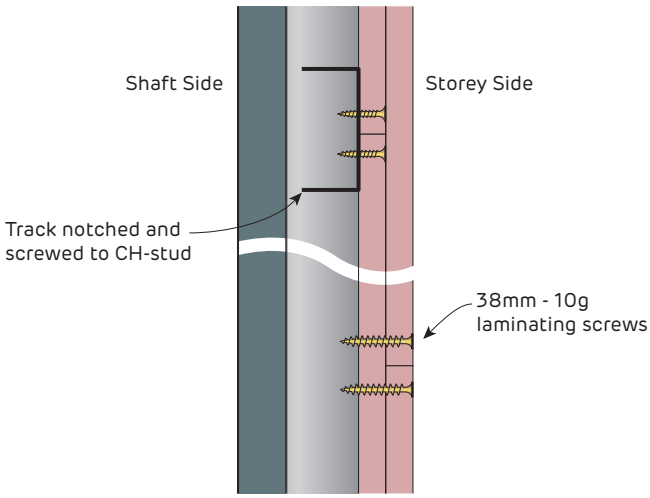


FIGURE 16 Butt Joint in Fire Rated Plasterboard
Section

Fire Rated
Shaft Wall Details

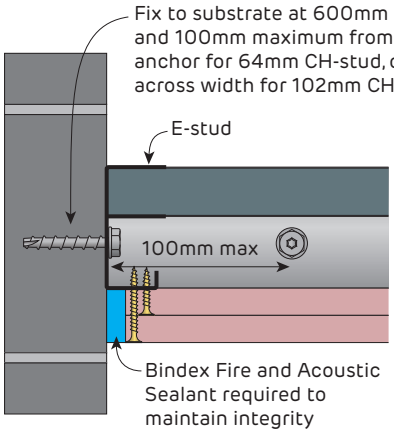


FIGURE 17 Shaft Wall Start
E-stud
Plan

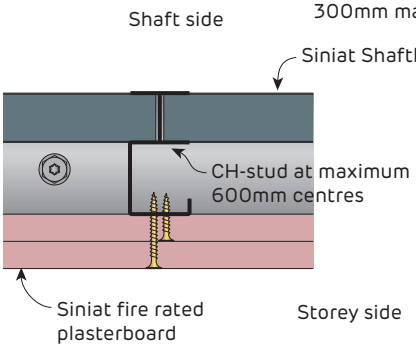


FIGURE 18 Shaft Wall Middle
CH-stud
Plan

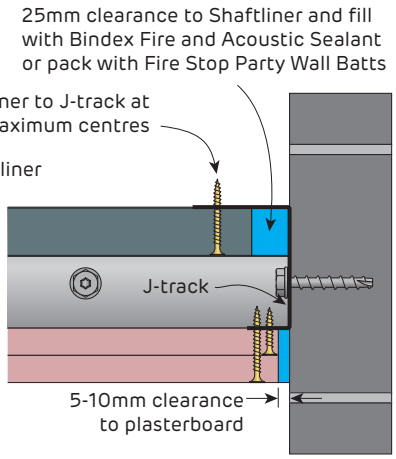


FIGURE 19 Shaft Wall End
J-track
Plan

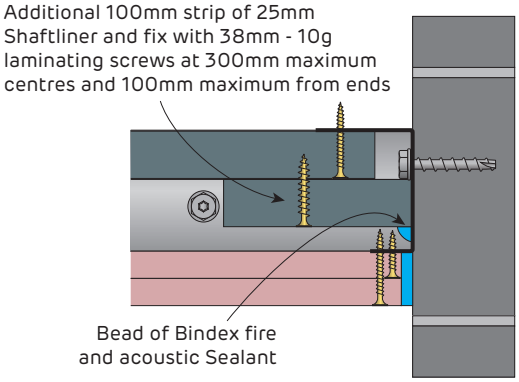


FIGURE 20 Alternative Shaft Wall End
J-track
Plan

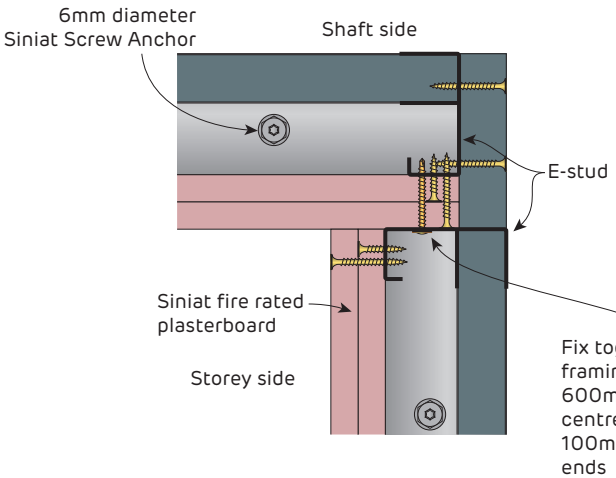


FIGURE 21 Shaft Wall Internal Corner
Plan

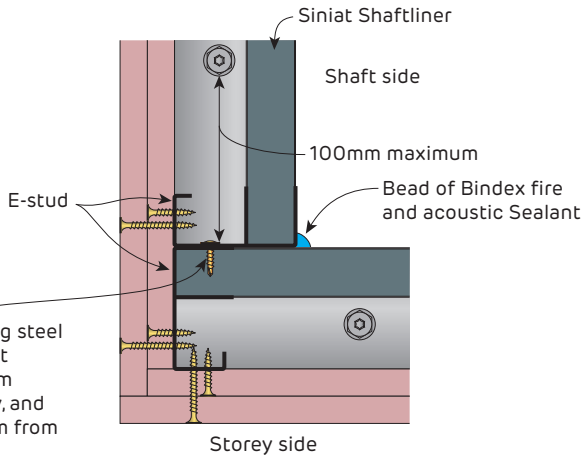


FIGURE 22 Shaft Wall External Corner
Plan

Fire Rated
Shaft Wall Details

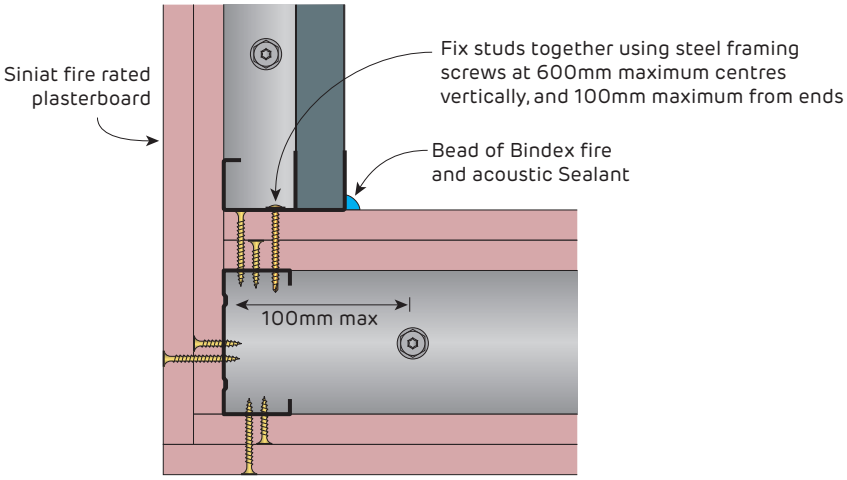


FIGURE 23 Shaft Wall to Internal Partition Corner
Plan

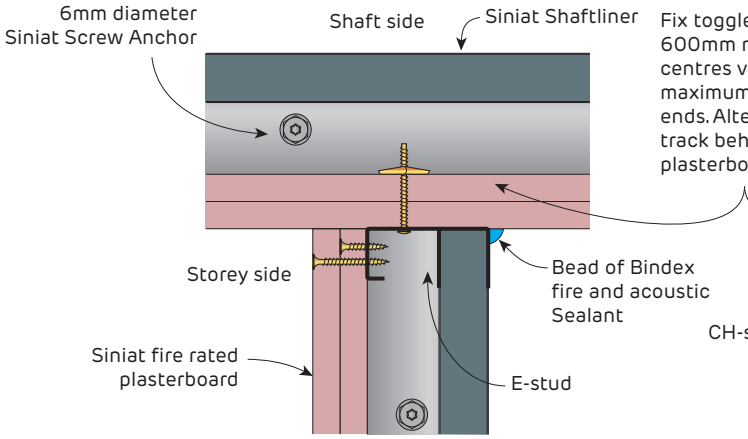


FIGURE 24 Shaft Wall Intersecting Wall
Plan

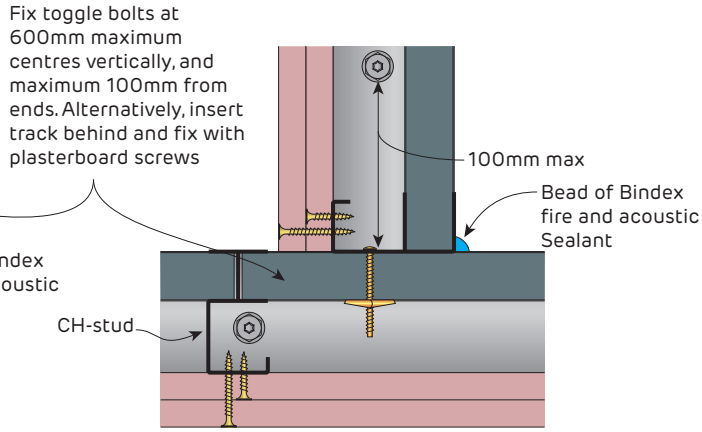


FIGURE 25 Shaft Wall Intersecting Wall
Plan

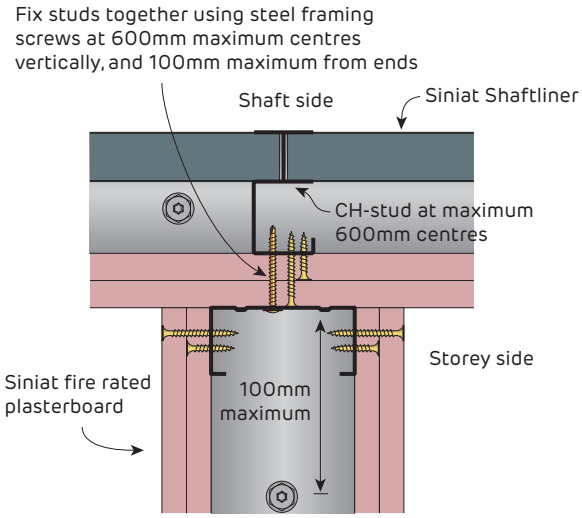


FIGURE 26 Shaft Wall to Partition Intersecting Wall
Plan

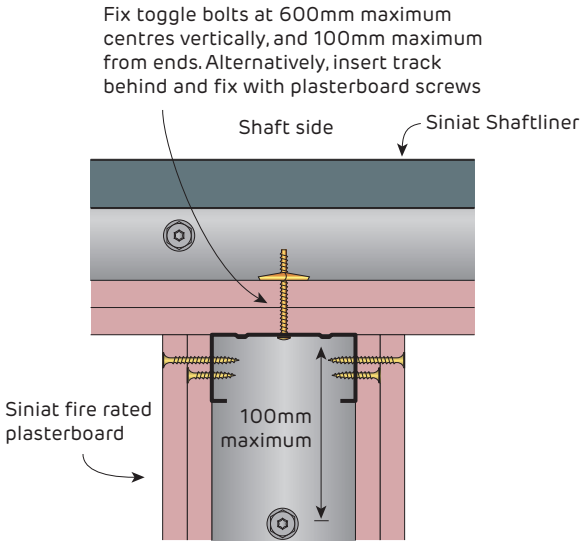


FIGURE 27 Shaft Wall to Partition Intersecting Wall
Plan

Fire Rated
Shaft Wall Details

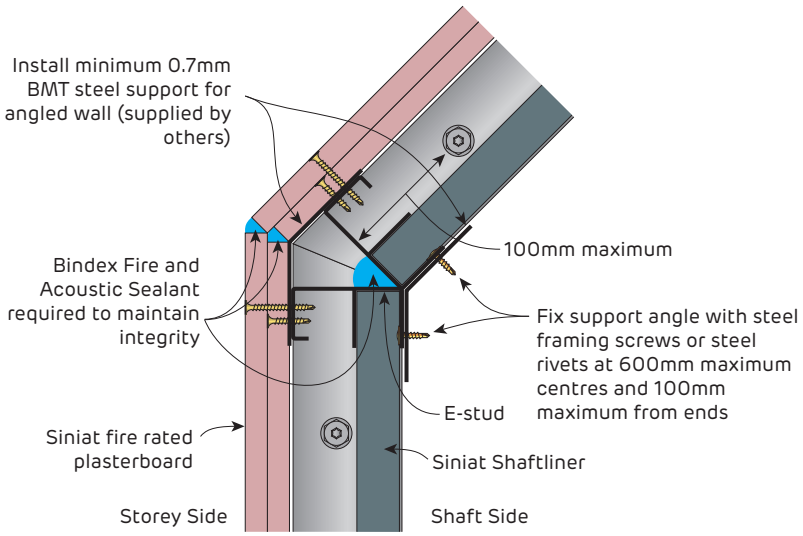


FIGURE 28 Shaft Wall Obtuse Angle
Plan

Fire Rated
Shaft Wall Details for Access Panel and Fire Damper

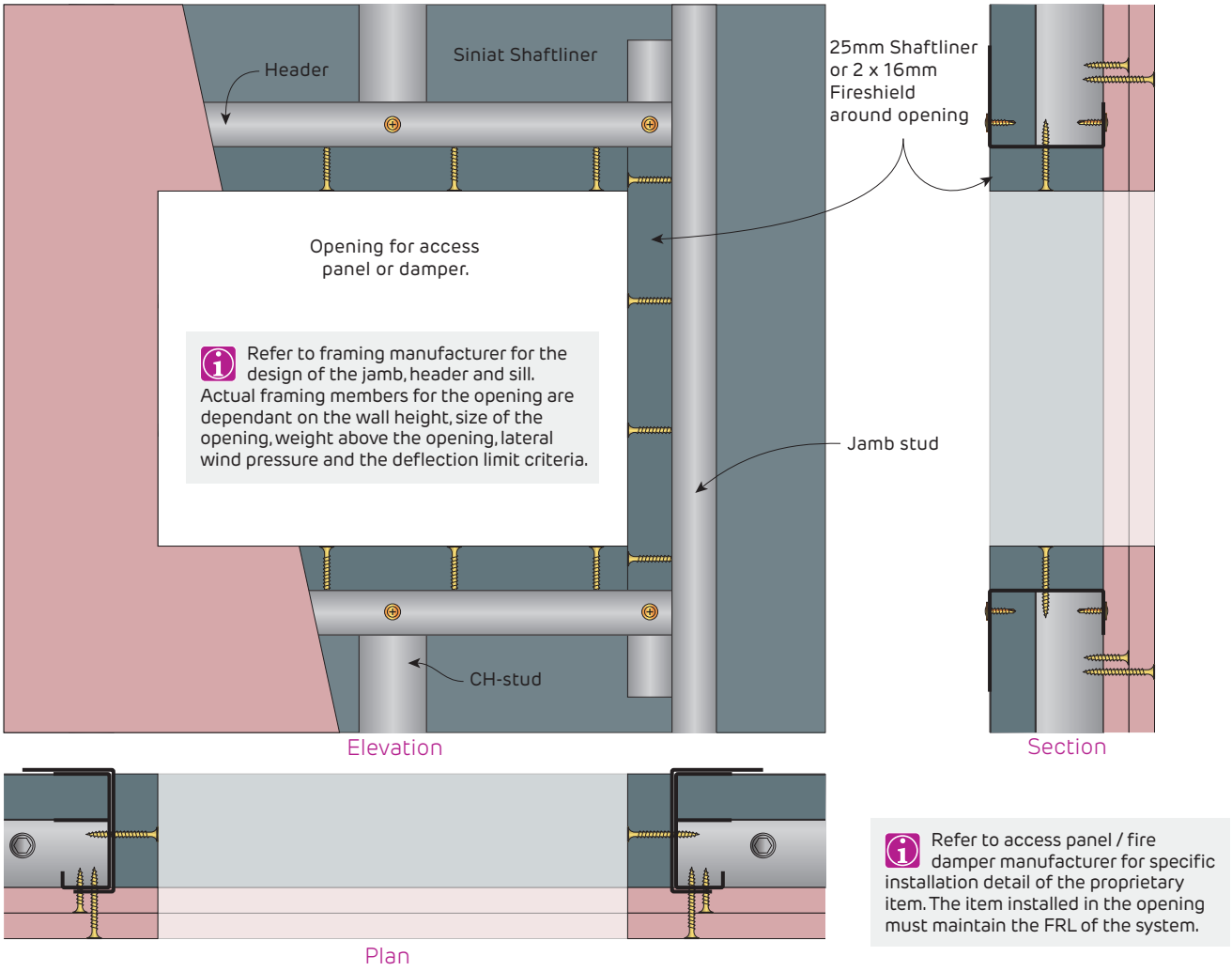


FIGURE 29 Typical Opening Detail For Fire Damper or Access Panel
Fire rated from both directions but built from one side only

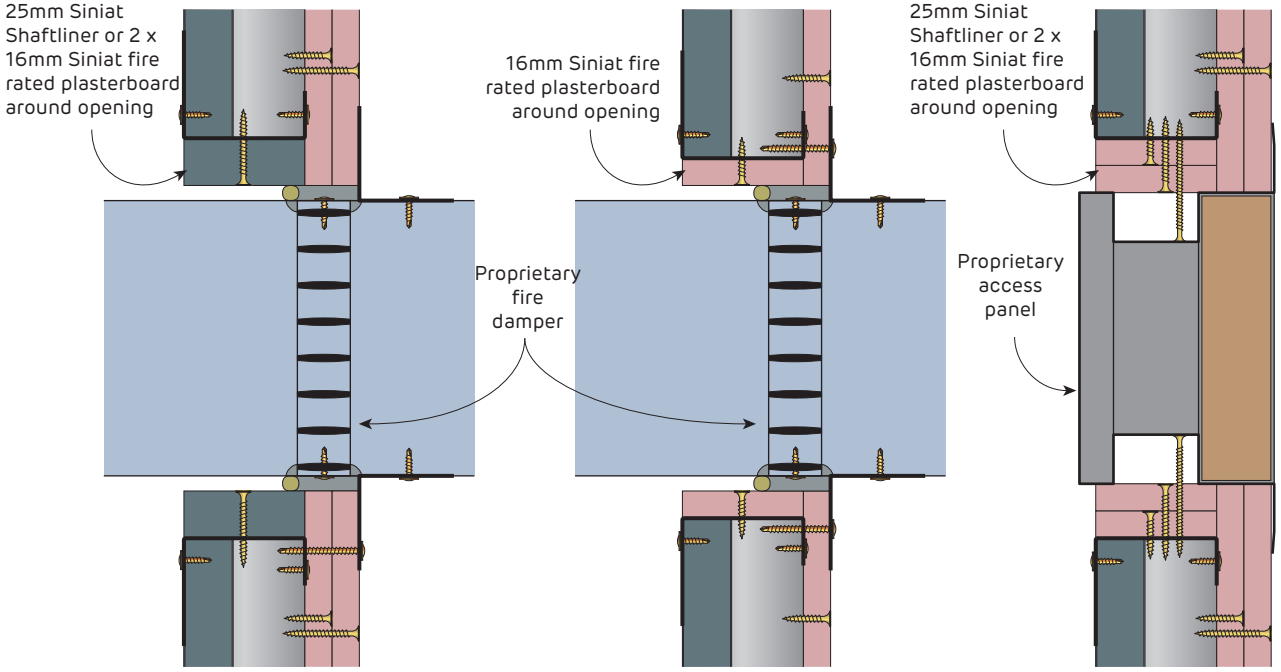


FIGURE 30 Fire Damper Example Detail
Section

FIGURE 31 Fire Damper Example Detail
Section

FIGURE 32 Access Panel Example Detail
Section