6.2 Laminated Vertical Shaft

The laminated vertical shaft system consists of fire rated plasterboard laminated together to form enclosures for building services. They are designed to provide fire and acoustic isolation for electrical, plumbing and air-handling services. They are not suitable to operate as an air supply duct while exposed to an external fire or contain products of combustion, ie: smoke exhaust.

The laminated vertical shaft systems are constructed from three layers of either 13mm or 16mm **fire**shield and metal angle framing.

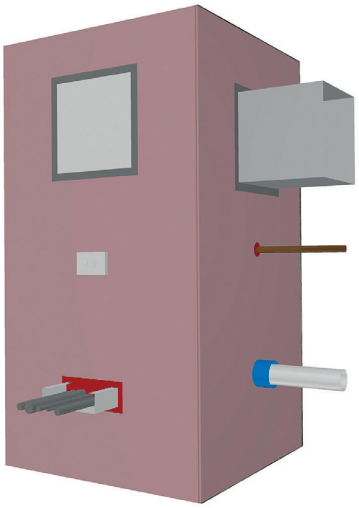
Laminated vertical shaft systems are suitable for use with fire rated penetrations including access panels, fire dampers, pipes and cables.

Laminated vertical shafts can form one up to four sides of a fire rated enclosure. They can be easily joined to other plasterboard, masonry or concrete walls with an equivalent or higher fire rating.

Laminated vertical shaft systems are non-load bearing and must not support roof, ceiling or floor loads.

For acoustic upgrades, refer to Section 6.1.

LVS1 - LVS2



- 50 x 50mm x 0.7mm BMT Steel Backing Angle framing
- 3 layers of 13mm or 16mm **fire**shield laminated together

fireshield can be substituted with **multi**shield
Laminated Riser Duct can be 1, 2, 3 or 4 sided

FRL Fire Report FAR1660	System	Plasterboard Lining	Plasterboard Thickness (mm)	Sound Insulation Rw (Rw + Ctr)	
- / 90 /90 rated from both sides	LVS1	3 layers of 13mm **fire**shield	39	37 (34)	Report Day Design 3094-33
- / 120 /120 rated from both sides	LVS2	3 layers of 16mm **fire**shield	48	38 (35)	

General Requirements

	Fire Rated
Only joint the face layer. As a minimum to achieve the FRL, only use paper tape and two coats of 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.	✓

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

Framing

Combined Fire and Structural Limited Wall Heights

Maximum Duct Width (m)	Maximum Duct Height (m)
3.5	2.4
3.18	2.7
3.0	3.0
2.4	3.6
2.16	4.2
1.8	4.8
1.2	5.4

1. Dimensions apply to both LVS1 and LVS2
2. Serviceability Limit State load 0.35 kPa.

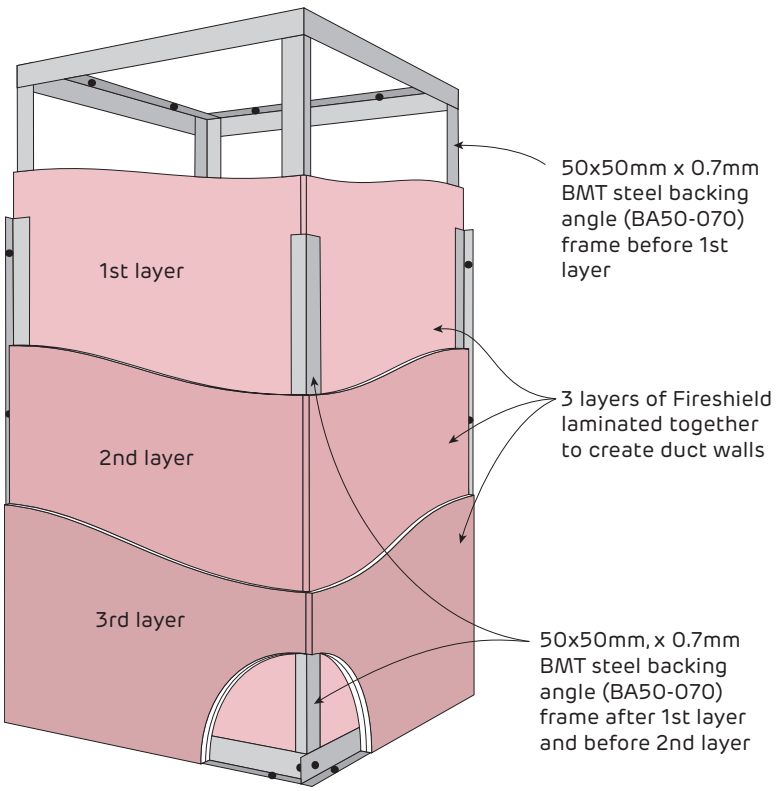


FIGURE 1 Framing and Plasterboard Layout

Plasterboard Layout

Vertical Layout	Fire Rated
Stagger butt joints by 600mm minimum on adjoining sheets and between layers.	✓
First layer butt joints must be backed by 50x50mm x 0.7mm BMT steel backing angle	✓
Stagger recessed edges by 300mm minimum between layers.	✓

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 are used in the field for 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
13mm	6g x 25mm screw	6g x 41mm screw *	7g x 57mm screw *
16mm	6g x 32mm screw	6g x 45mm screw *	8g x 65mm screw *

For steel ≤ 0.75mm BMT, use fine thread needle point screws.
For steel ≥ 0.75mm BMT, use fine thread drill point screws.
*10g x 38mm Laminating screws may be used as detailed in installation diagrams.

FIGURE 2 Fire Rated Laminated Vertical Duct - 1st Layer - Vertical

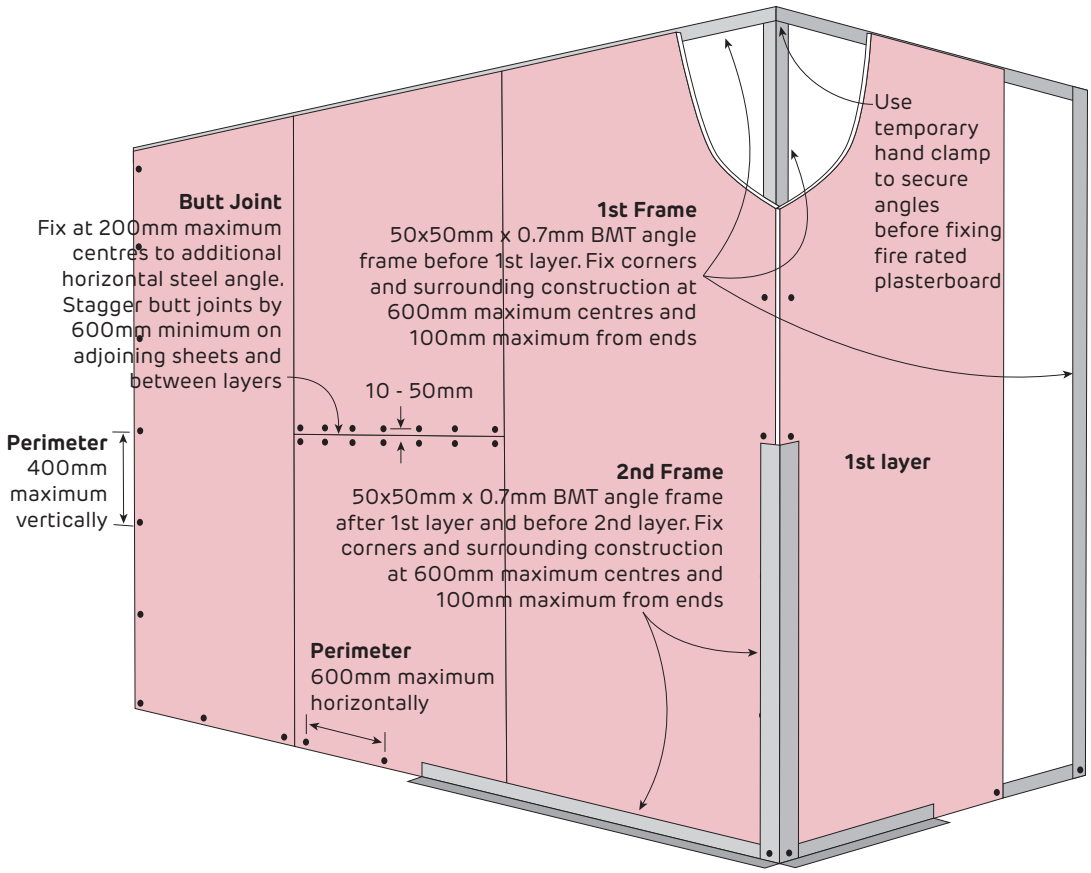
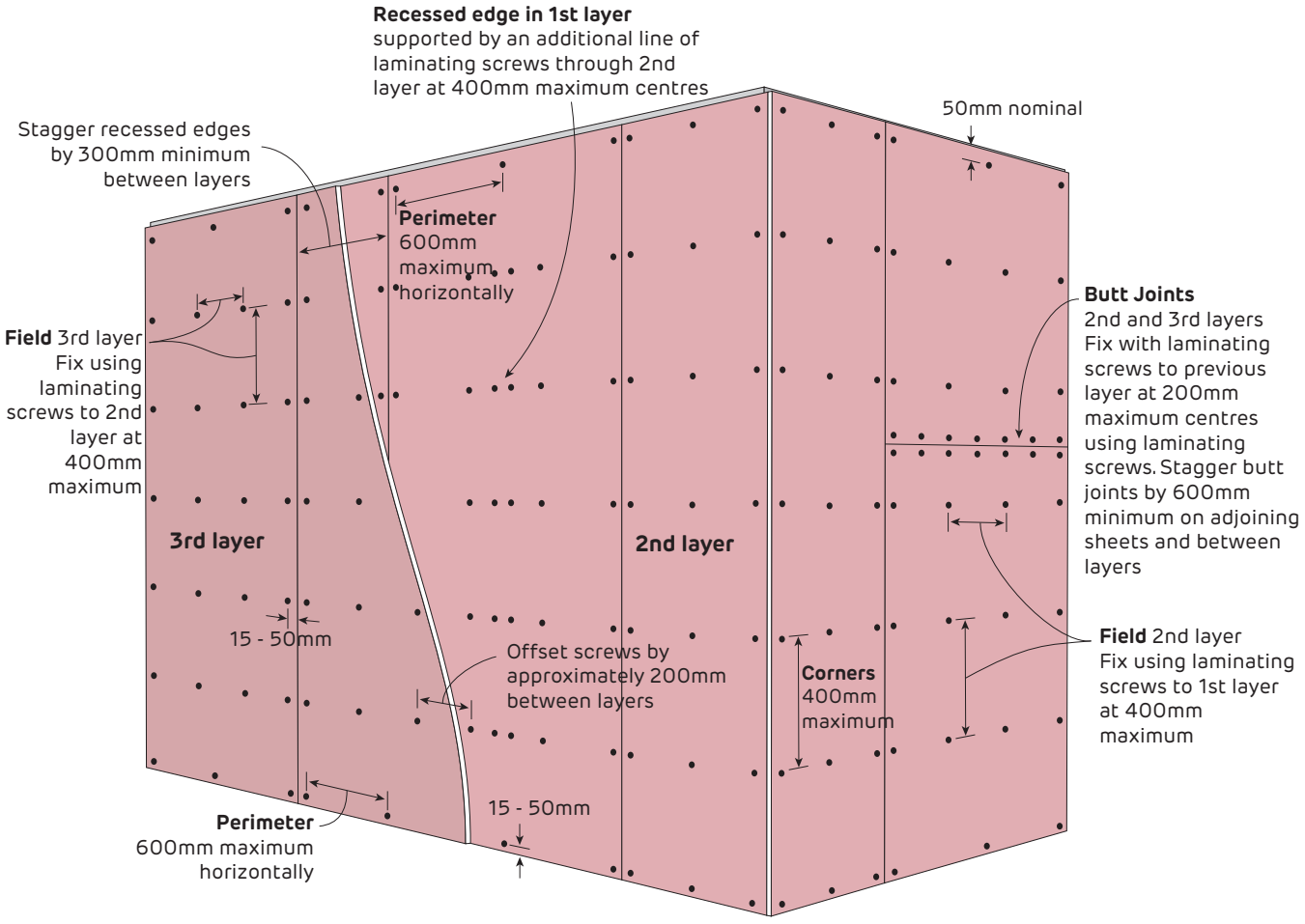


FIGURE 3 Fire Rated Laminated Vertical Duct - 2nd and 3rd Layers - Vertical + Vertical



Jointing Only joint the face layer. As a minimum to achieve the FRL, only use paper tape and two coats of Mastabase or Mastalongset.

Fire Rated

Details for the Fire Rated Laminated Riser Duct

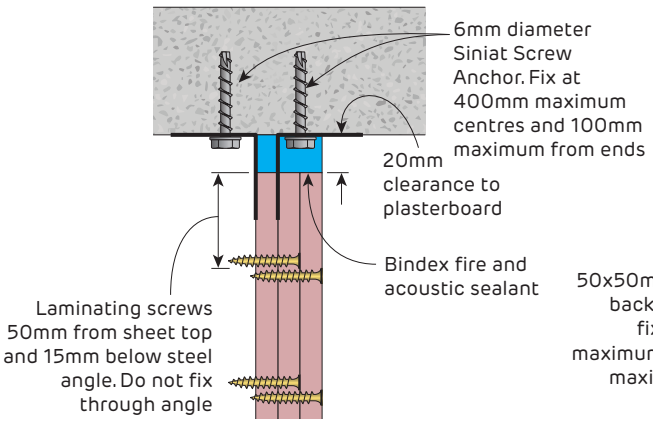


FIGURE 4 Laminated Duct Deflection Head to Slab
Elevation

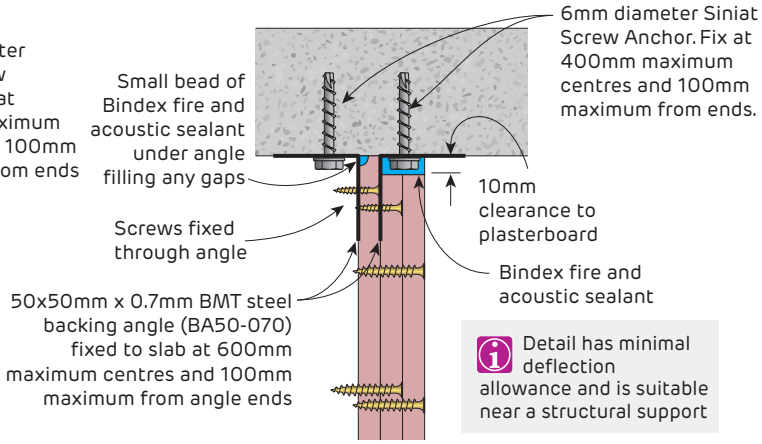


FIGURE 5 Laminated Duct Head to Slab near Structural Support
Elevation

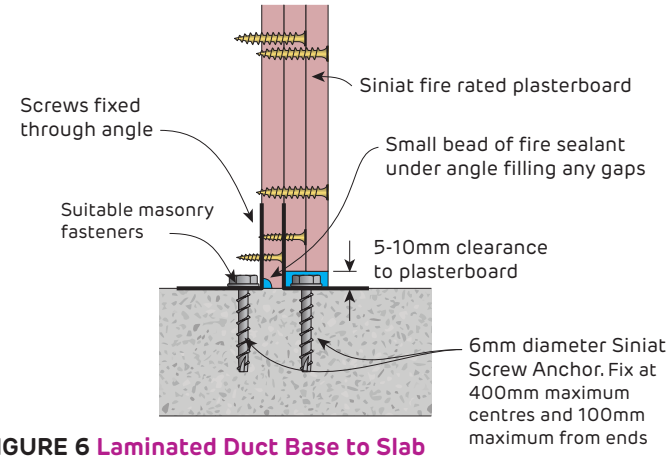


FIGURE 6 Laminated Duct Base to Slab
Elevation

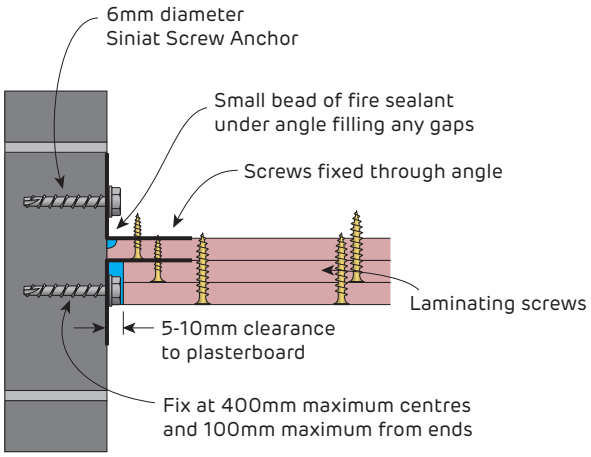


FIGURE 7 Laminated Duct to Masonry Wall
Plan view

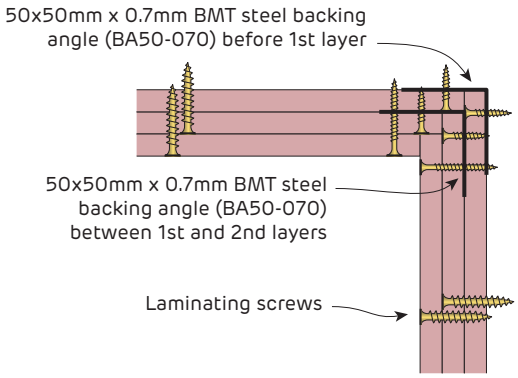


FIGURE 8 Laminated Duct Internal Corner
Plan view

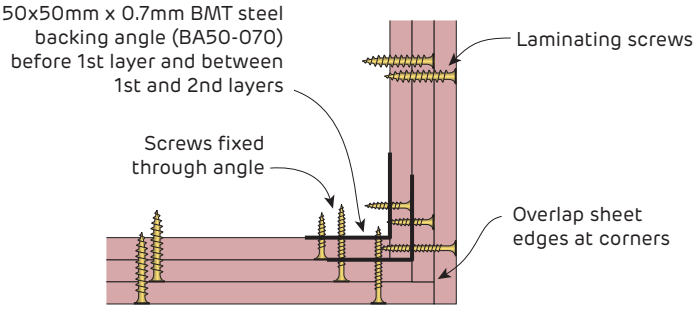


FIGURE 9 Laminated Duct External Corner
Plan view

Fire Rated

Details for the Fire Rated Laminated Riser Duct

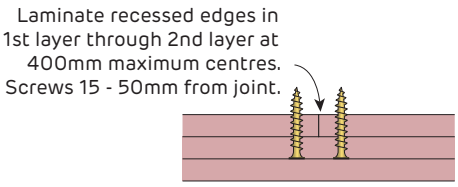


FIGURE 10 Laminated Duct Recessed Edge in 1st Layer
Plan view

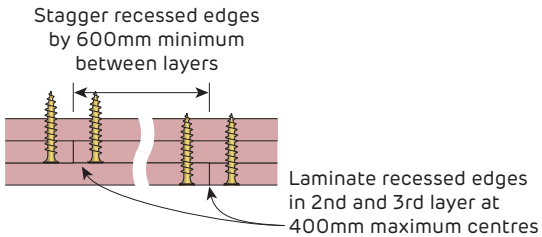


FIGURE 11 Laminated Duct Recessed Edge in 2nd and 3rd Layer
Plan view

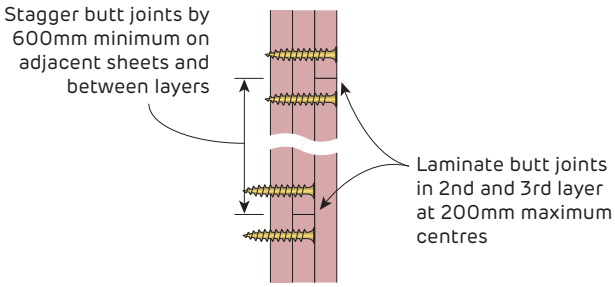


FIGURE 12 Laminated Duct Butt Joint in 2nd and 3rd Layer

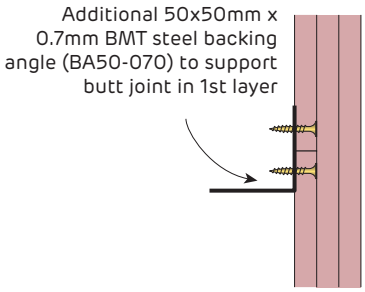


FIGURE 13 Laminated Duct Butt Joint in 1st Layer

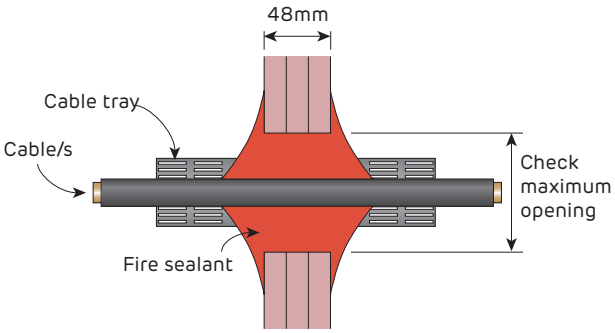


FIGURE 14 Typical Cable Tray Penetration
Up to 2 hours FRL
Example Only

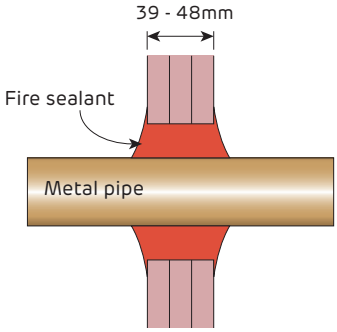


FIGURE 15 Typical Metal Pipe Penetration
Up to 2 hours FRL
Example Only

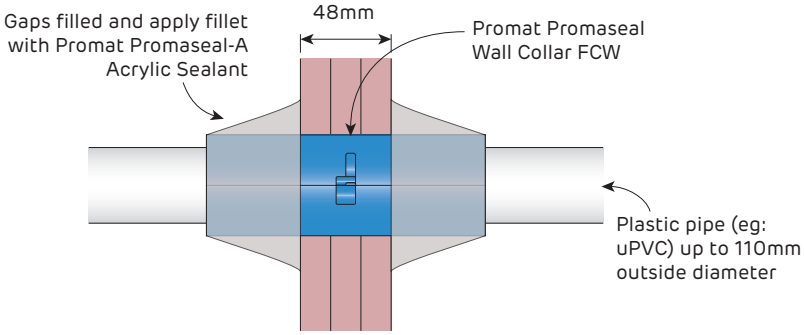


FIGURE 16 Fire Collar for Plastic Pipes
Promat Promaseal Wall Collar - Up to FRL -/120/90
Section