MULTIPLEX

CONSTRUCTION HANDBOOK – FIRE RESISTANCE

Version 01

Print Copy

Disclaimer

This is a print version whereas the structure of the construction handbook may have been adapted for ease of reference.

The handbook app should take precedence in case of any ambiguity.

Multiplex Constructions Pty Limited

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CONTENTS

1. Fire Resistance

1.1 General

Fire Resistance Level

What is Fire Resistance Level (FRL)?

Fire Resistance Level (FRL) is defined in the Building Code of Australia (BCA).

It is a grading period in minutes that a structure, or part, will withstand a fire event as determined from a full scale fire test to AS1530.4 “Methods for fire tests on building materials, components and structures – fire-resistance tests of elements of building construction”.

It is expressed as three criteria:

Structural adequacy - the ability of a structure to maintain its stability and loadbearing capacity.

Integrity - the ability of a structure to resist the passage of flames and hot gases.

Insulation - the ability of a structure to maintain a temperature below specified limits on the surface not exposed to fire.

A wall with a FRL of 90/90/90 means that the wall must maintain structural adequacy for 90 minutes, integrity for 90 minutes and insulation for 90 minutes.

FRL values for lightweight wall systems are generally presented as integrity and insulation values only (-/XX/XX), in accordance with AS1530.4-2005.

Whenever an element of a building does not require a FRL, the non-required FRL is expressed as a “-“; not a “0” or by leaving the space blank. An example of this is a structural element such a steel column. It may only require structural adequacy. This then will be expressed as “120/-/-“.

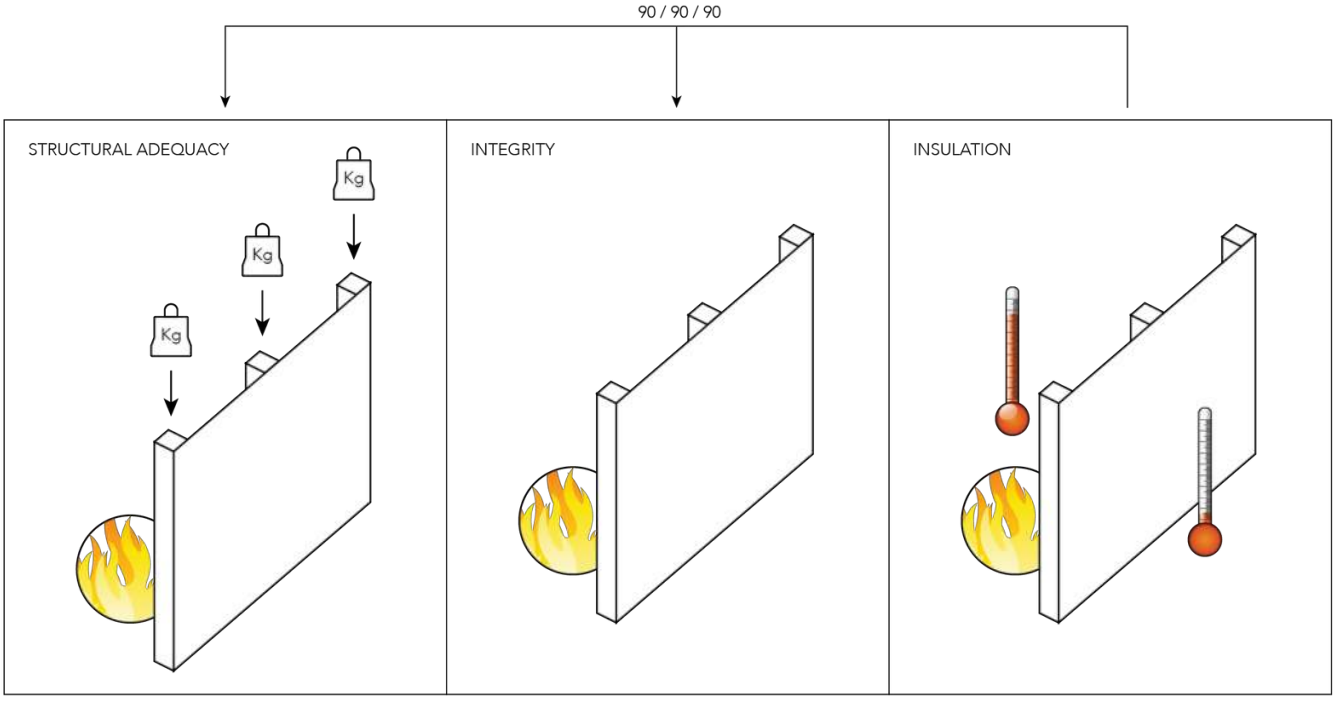


Figure 1: Fire Resistance Level

Compartmentation

What is Compartmentation?

- Fire compartmentation is a crucial element of ‘passive fire protection’ and is achieved by dividing the premises into ‘fire compartments’ through the use of:
- Fire doors
- Floors and walls of fire-resisting construction
- Cavity barriers within roof voids
- Fire stopping to services that penetrate through these dividing elements.

Fire Resistant compartmentation (which ensures FRL of an agreed and uniform value) is applied to:

- Walls
- Ceilings
- Structure (that may have a greater FRL)
- Doors
- Service risers

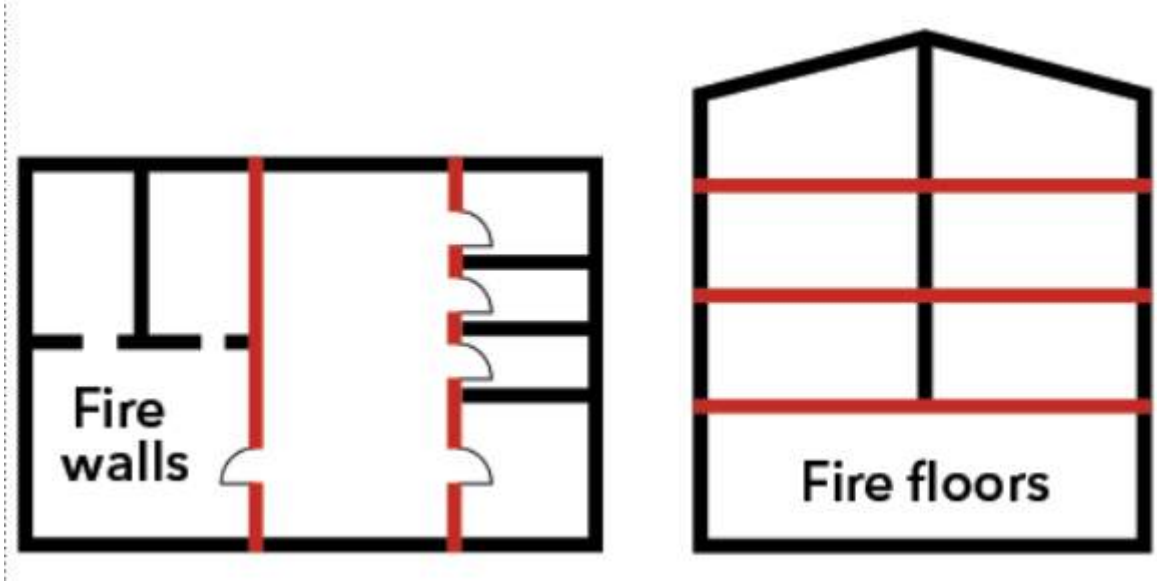


Figure 2: Simple diagram representing compartmentation by walls and by floors

What is adopted?

- Life fire safety for the occupants of the building
- Prevents the spread of fire, smoke and toxic gases
- Subdivides buildings into manageable areas of risk
- Provides adequate means of escape enabling time for the occupants to evacuate the premises safely.

Who is responsible to develop?

- Compartmentation plans are required to be developed by the fire engineer and architect.

How is it constructed?

The responsible MPX team member in each instance must:

- Ascertain the Fire Resistance Level (FRL), read manufacturer's installation instructions and evidence of suitability
- Understand wall material type (i.e. Plasterboard, Hebel, Speedpanel, shaft wall, blockwork.)
- Confirm service material against the approved sample and review coordinated service penetration elevations
- Coordinate service penetrations
- Ensure installation of the fire stopping system is in accordance with the manufacturer's installation instructions and evidence of suitability

Australian Standards requires each service to have a minimum separation of 50mm

Identical with the tested prototype.

Process

- Management of the passive fire process must be in accordance with "Passive Fire Safety Systems" flow chart.

Document and Forms

Passive Fire Safety Systems Flow Chart

Schedule of High Risk Prototypes, Samples and Test Reports

Multiplex Guide to Passive Fire

1.2 Plasterboard Walls

Key considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Element Material FRL (i.e. wall, floor, ceiling)
- Service Material FRL (i.e. penetrating a compartment, FRL)
- Fire/smoke stopping system (as per MPX schedule)

1.2.1 Framing

Design

- Steel stud manufacturer to produce design and workshop drawings including seismic detailing.
- Expected long term creep deflection with Structural Engineer must be confirmed.

Steel Stud Framing

- Wall studs must be selected based on the manufacturer's/designers workshop drawings which are based on wall height and number of lining boards.
- Base metal thickness (BMT) and stud centres must be in accordance with workshop drawing.
- Ensure framing centres and noggings are installed as detailed in the workshop drawings.
- Where vertical building movement is expected, a suitable gap must be specified, and in this case, deflection head track must be used. Studs are to be cut 20 mm short of the slab soffit.

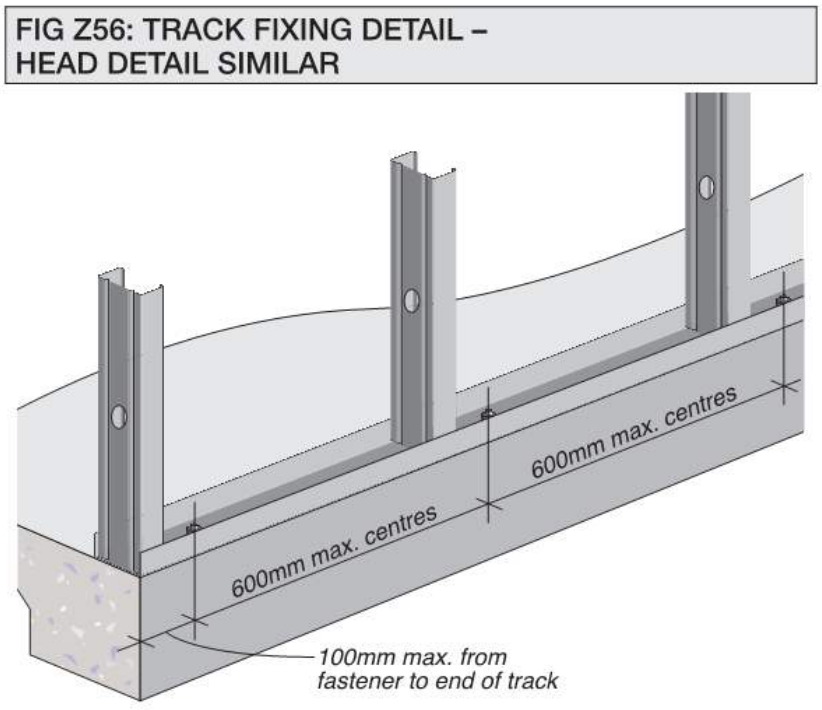


Figure 1: Track Fixing Detail, CSR Red Book GYP500

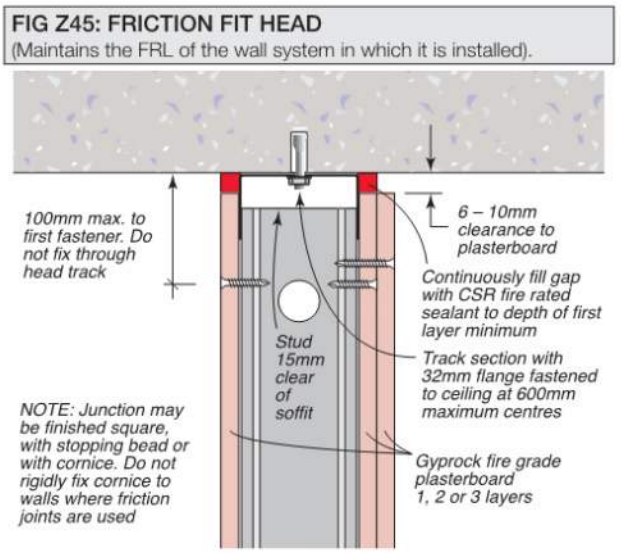
Wall Head/Base Details

Plasterboard head tracks installed on concrete soffits must have:

- Head track section fastened to the soffit at maximum 600mm centres but may be less depending on project requirements and first fixing no greater than 100mm from the end of the track.
- Minimum 15-20mm clearance between the concrete soffit and studs for deflection.

Plasterboard base tracks installed on concrete soffits must have:

- Metal track fixings at 600mm centres with 150mm track, using 2 fixings approx 20mm in from each side of track
- Track section fastened to slab at maximum 600mm centres and first fixing no greater than 100mm from the end of the track (refer Figure below).



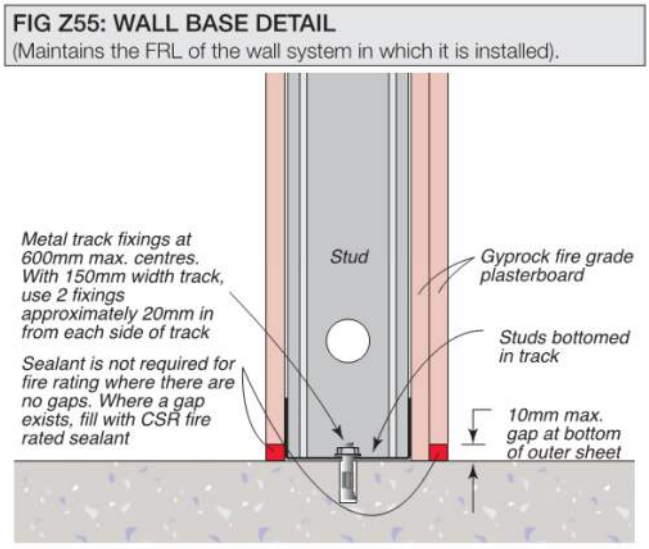


Figure 2: Friction Fit Head, CSR Red Book GYP500 Figure 3: Wall Base Detail, CSR Red Book

1.2.2 Sheeting

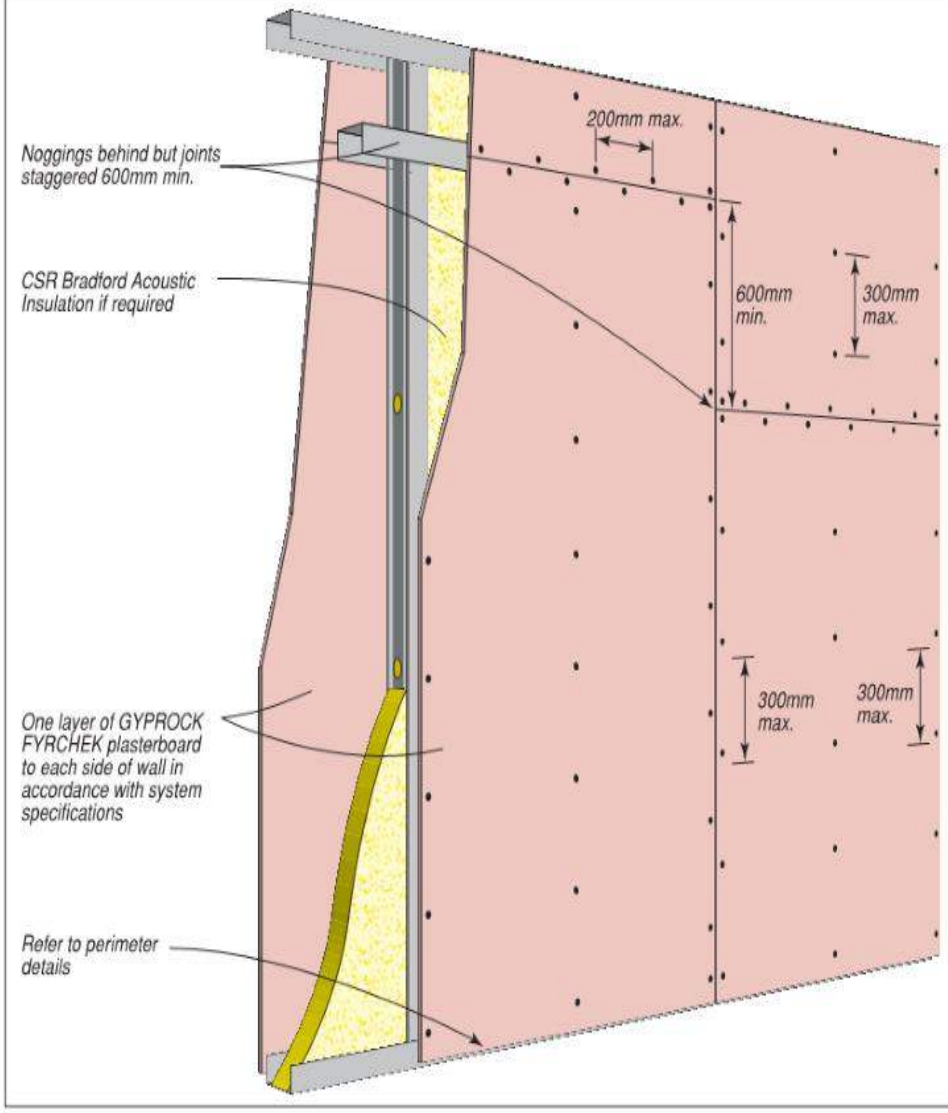
- Plasterboard and fixings must be as per approved samples.
- Sheets must be screw fixed to framing using zinc plated bugle head screws.
- Refer to the manufacturers specific requirements for screw placement and frequency noting that:
    - First layer sheets are screwed at a greater spacing than following layers.
    - Outer layers are screwed at 200 mm centres at:
        - Butt joints and
        - 300 mm in the body of the sheets.
- Firewalls must be smoke sealed.
- Fixings must be installed in accordance with the manufacturer's details (refer to the table and figures below of the CSR screws for fixing plasterboard).

Table 1: Example of CSR Screws for fixing plasterboard to steel (Note: other manufacturer details may be different)

Plasterboard Thickness	1st Layer	2nd Layer	3rd layer
10mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 40mm DP Screw	n/a
13mm Plasterboard	Type S #6-18 x 25mm DP Screw	Type S #6-18 x 40mm DP Screw	Type S#8-15 x 65mm NP and #10x40mm Laminating Screw
16mm Plasterboard	Type S #6-18 x 30mm DP Screw	Type S #6-18 x 45mm DP Screw	Type S#8-15 x 65mm NP and #10x40mm Laminating Screw

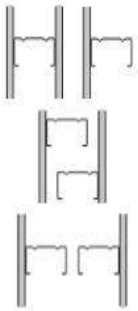
Type S#8-15 x 65mm NP and #10x40mm Laminating Screw

FIG 45: INSTALLATION DETAIL - SINGLE LAYER FIRE RATED - VERTICAL SHEETING



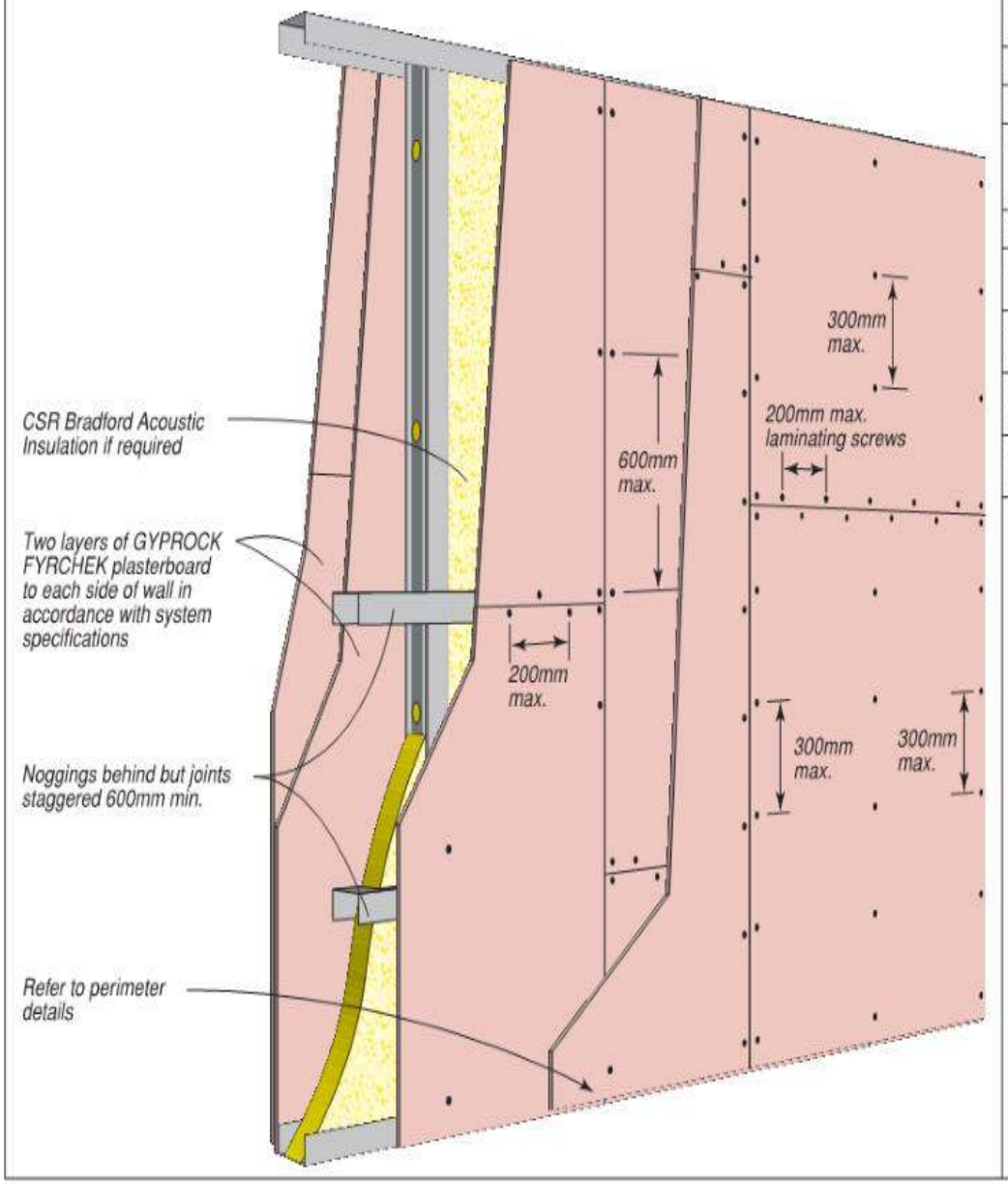
Fixing Specifications	
Screws	*Refer to Table 2 & 3*
Location	**Fixing & Spacing**
Field	*Screws at 300mm max. centres*
Recessed Edges	*Screws at 300mm max. centres*
Butt Joints	*Screws at 200mm max. centres*
Corners & Openings	*Screws at 300mm max. centres*

SUITABLE FOR:



Noggings may not be permitted in staggered stud systems

FIG 47: INSTALLATION DETAIL - TWO LAYER FIRE RATED - VERTICAL SHEETING



Fixing Specifications	
Screws	*Refer to Table 2 & 3*
1st Layer	**Fixing & Spacing**
Recessed Edges & Field	*Screws at 600mm max. centres*
2nd Layer	**Fixing & Spacing**
Field	*Screws at 300mm max. centres*
Recessed Edges	*Screws at 300mm max. centres*
Butt Joints	*Screws at 200mm max. centres*
Corners & Openings	*Screws at 300mm max. centres*

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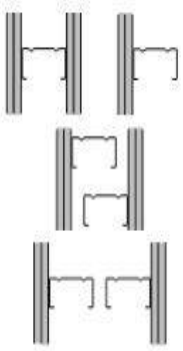

Noggings may not be permitted in staggered stud systems

Corners and Intersections

Internal corners must:

- Be set with paper tape and cement
- Installed as Figures below

External corners must:

- Be set with an angle bead and cement
- Installed as Figures below

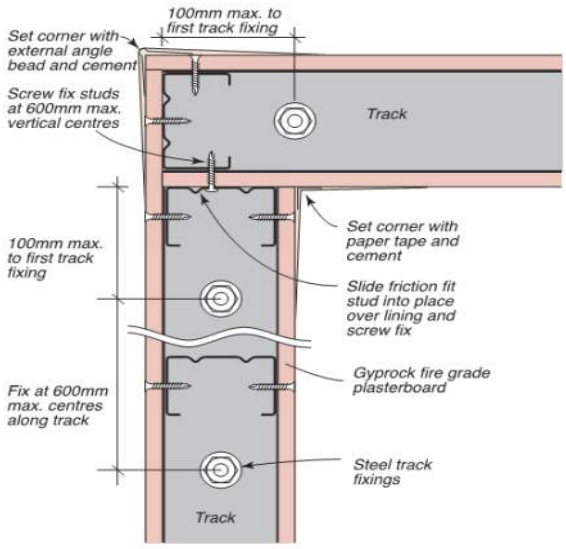

Figure 7 Corner Detail CSR Red Book

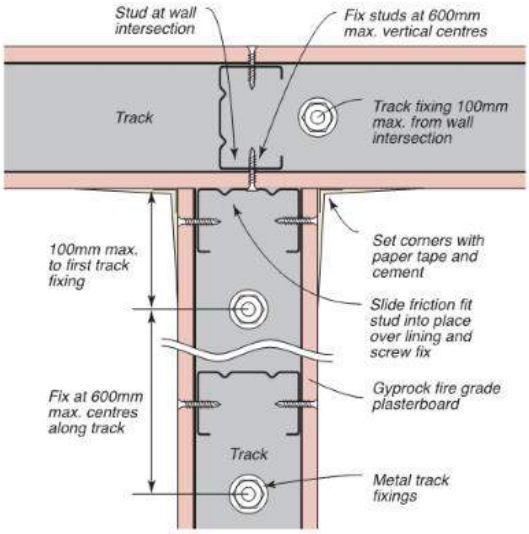

Figure 8 Intersecting Detail Corner Detail CSR Red Book

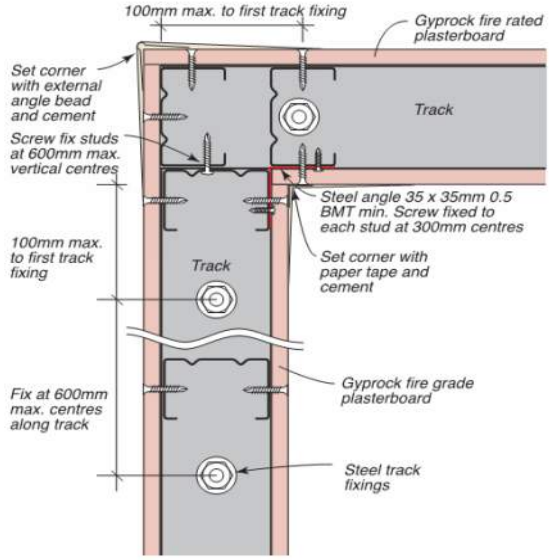

Figure 9 Corner Detail CSR Red Book

Sheet Joints

- Joints in the outer layer of all systems must be set with paper tape and 2 coats of the base coat as a minimum or as specified by manufacturer.
- Butt joints must be:
    - Backed by either a stud or noggin in all first layers.
    - Staggered by 600mm minimum in adjacent sheets and on opposite sides of the wall.
    - Fixed at 200mm maximum centres.
- Recess joints must be offset on opposite sides of the wall by one stud.

1.2.3 Control Joints

What are control joints?

Control joints are a discontinuity in the sheeting and framing to allow movement in the building structure.

Why are control joints used?

- To control the deformation and damage to internal linings and partitions that may be caused by movement and stresses created by fluctuations in temperature and humidity.
- To allow for structural movement through the frame and lining.
- To relieve stresses of expansion and contraction of internal plasterboard ceilings and walls:
    - When over 12m in length or width, and
    - Wherever the ceiling or wall abuts structure or other wall types.

Before installation of a control joint:

- Top and bottom tracks cannot be continuous and must mirror the gaps in the studs.
- Studs must be 15mm – 20mm apart, orientated back to back.
- Sheeting must also allow a 15mm – 20mm gap.
- A 22mm diameter backing rod is inserted into the gap to ensure correct geometry of the sealant (i.e. 1:1 or 1:2 ratio to ensure the elasticity of sealant is maintained).

Install control joints:

- When the ceiling and wall expanses are more than 12m in length.
- Where changes in structural support systems occur, i.e. abutments to columns, masonry, CSR Hebel, Speed Panel, concrete walls etc.
- Apply fire rated sealant to the:
    - The first layer only to maintain elasticity.
    - The outer layer at the base of walls only.

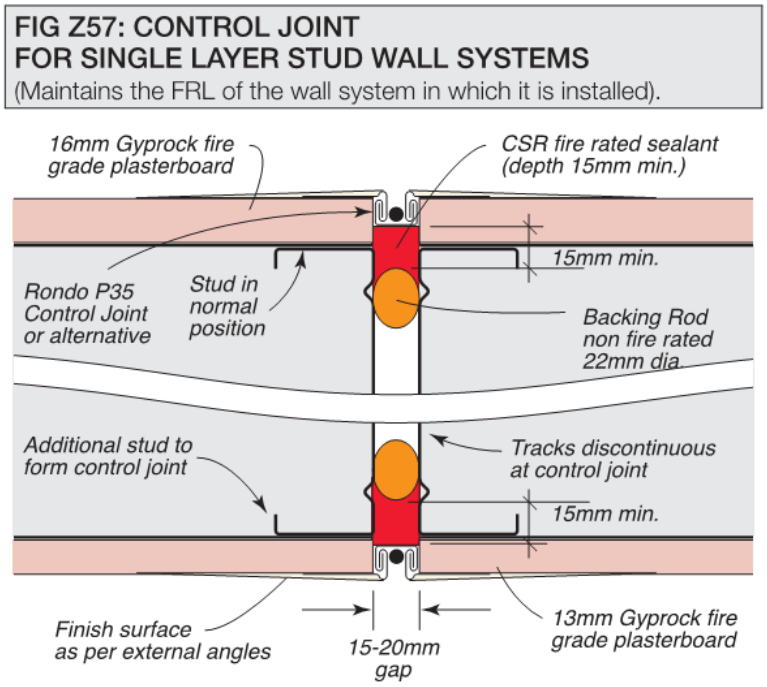

Figure 10: Control joint for single layer stud wall systems, CSR Red Book

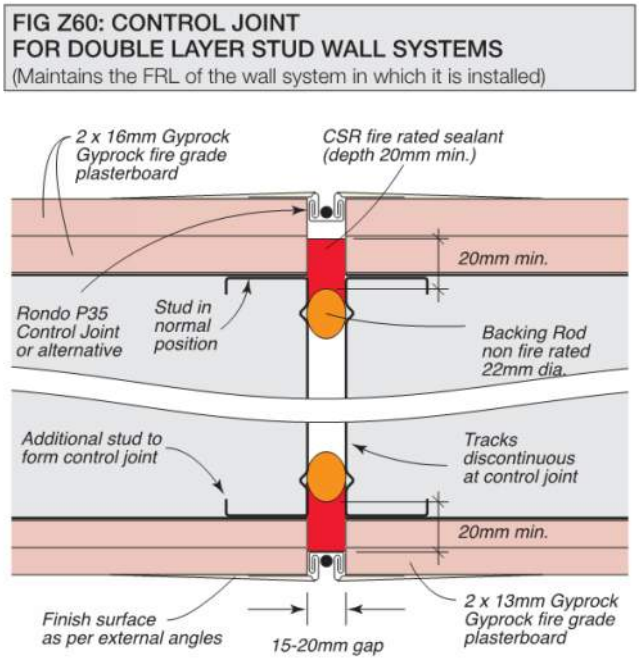

Figure 11: Control joint for double layer stud wall systems, CSR Red Book

1.2.4 Penetrations

General

Penetrations must be:

- As per evidence of suitability
- Note: A minimum of 95mm separation from the edge of penetrations for CSR sheeting (refer figure).

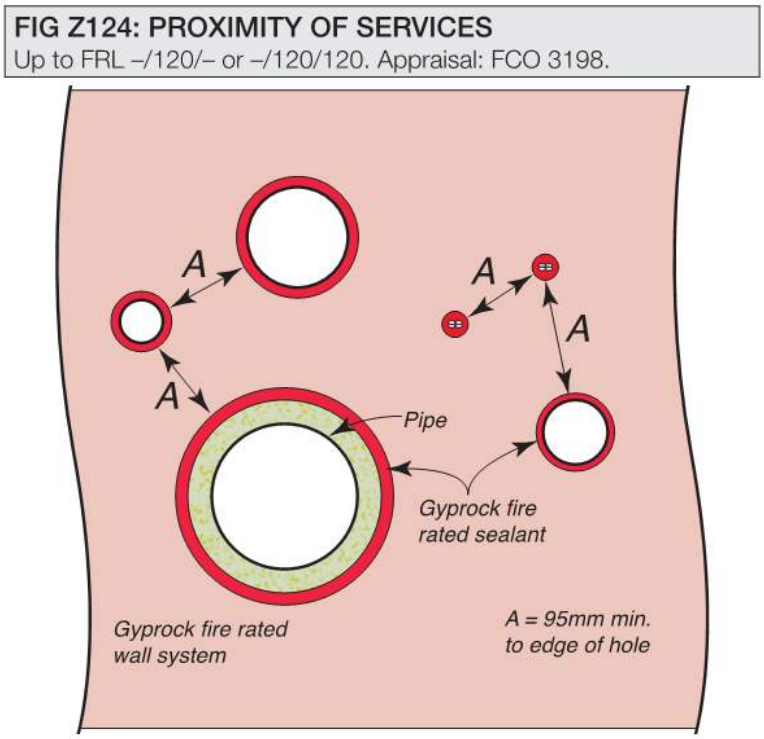

Figure 12: Proximity of Services (CSR Red Book)

Hydraulic Pipe

Combustible i.e. PVC

Combustible pipework must be:

- Installed in accordance with the evidence of suitability which should:
  - Be installed with a retrofit collar or through collar as per evidence of suitability (Note: Through collars should not be used for wall greater than 128mm)
  - Be sealed in accordance with the diagram below or as as per evidence of suitability.
  - Have a min of 50mm from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
  - Have a min of 200mm separation from the edge of any other formed penetration or as specified.

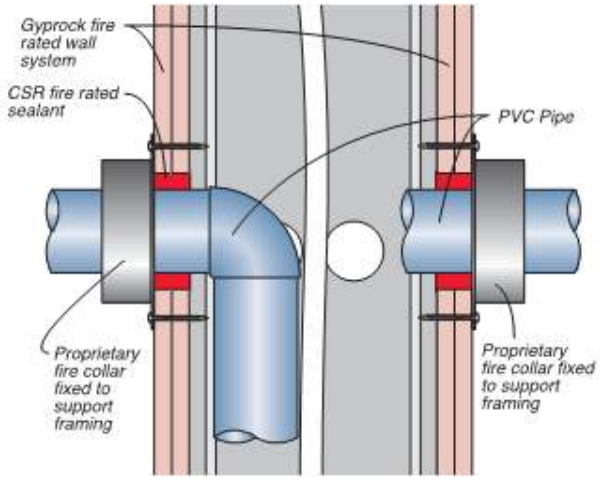

Figure 13: Retrofit collar, CSR Red Book

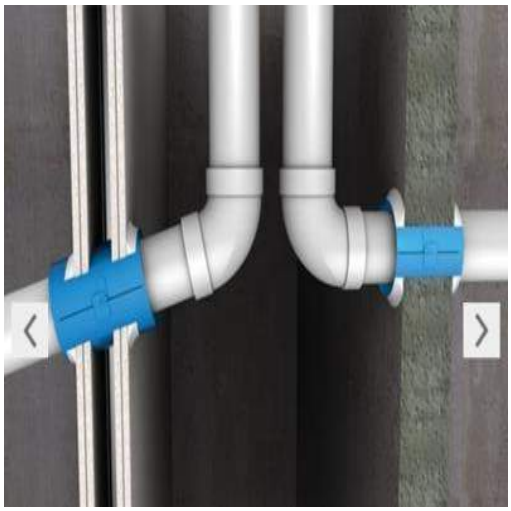

Figure 14: Through collar

Combustible i.e. Copper, Brass & Ferrous Metal

Non-combustible must be:

- Installed in accordance with the evidence of suitability which should:
  - Be wrapped.with insulation from the surface of the wall to maintain insulation criteria
  - Be wrapped with insulation through the wall for chilled or hot water pipe to maintain insulation criteria.
  - Unless wrapped, be no closer than 100mm to any other service penetration (refer Figures below)
  - Be sealed in accordance with the diagrams below
  - Have a min of 50mm separation from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
  - Have a min of 200mm separation from the edge of any other formed penetration or as specified.

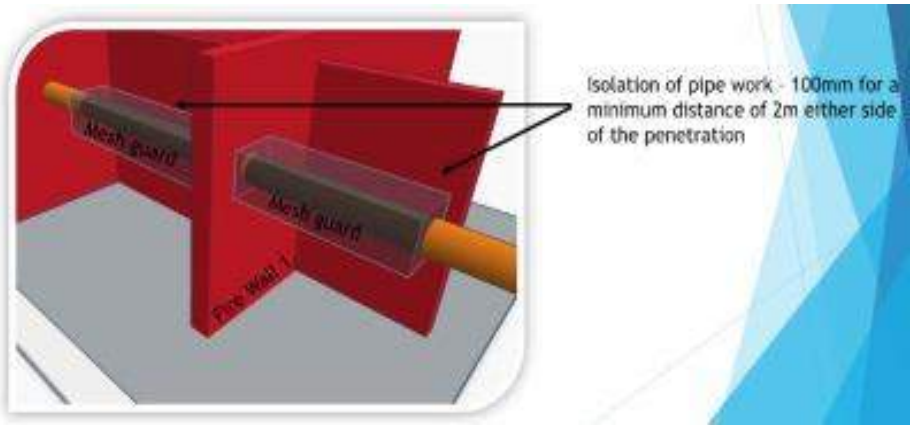

Figure 15 Combustible Pipe with clearance mesh though Fire Rate Walls

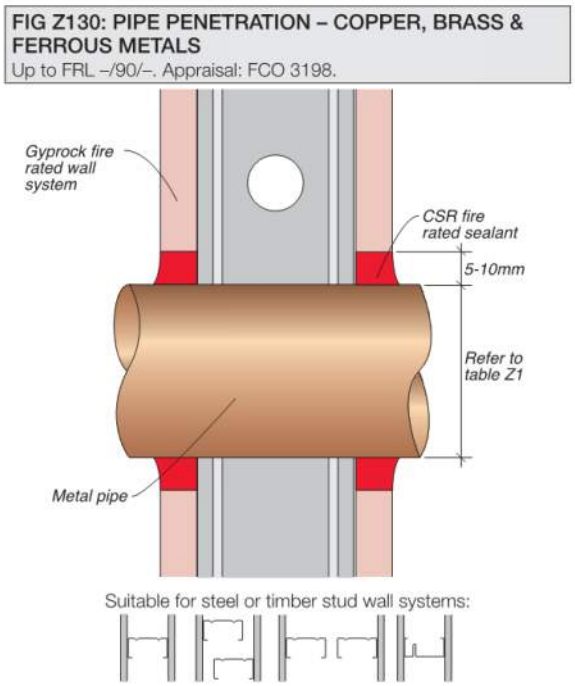

Figure 16: Single layer - sealing of pipe (CSR Red Book)

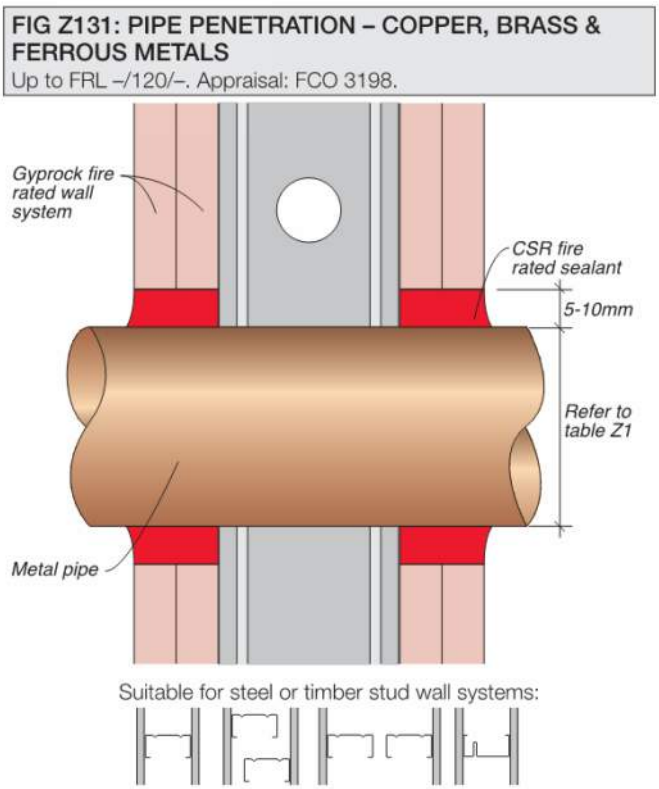

Figure 17: Double layer (CSR Red Book)

Cable Penetrations

Single Cable

Single cables must be:

- Installed in accordance with the evidence of suitability which should:
  - Have a min of 50mm separation from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
  - Have a min of 200mm separation from the edge of any other formed penetration or as specified.
  - Be sealed.

Figure 18: Single cable though Plasterboard

Bundled Cables

Bundled Cables must be:

- Installed in accordance with the evidence of suitability which should:
    - Have a min of 50mm separation from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation from the edge of any other formed penetration or as specified. (
    - Be sealed.
    - Be installed with the the maximum size of bundled cables considered
    - Be fixed with steel fasteners (surface mounted collars only)

Cable Trays

Cable trays <300mm x 100mm (IBS Rods and inert sealants) must be:

- Installed in accordance with the evidence of suitability which should:
    - Have hangers installed 150mm maximum from either side of the wall
    - Be filled with IBS rods or pillows as per diagrams below
    - Be sealed in accordance with the diagrams below
    - Be wrapped either side to maintain insulation criteria
    - Have a min of 50mm separation from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation from the edge of any other formed penetration or as specified.

Figure 19 Cable Tray through Plasterboard

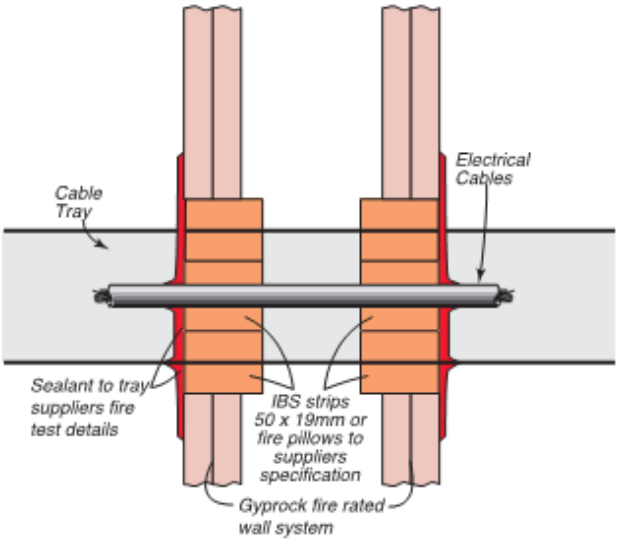

Figure 20 Cable Tray through Plasterboard - CSR Redbook

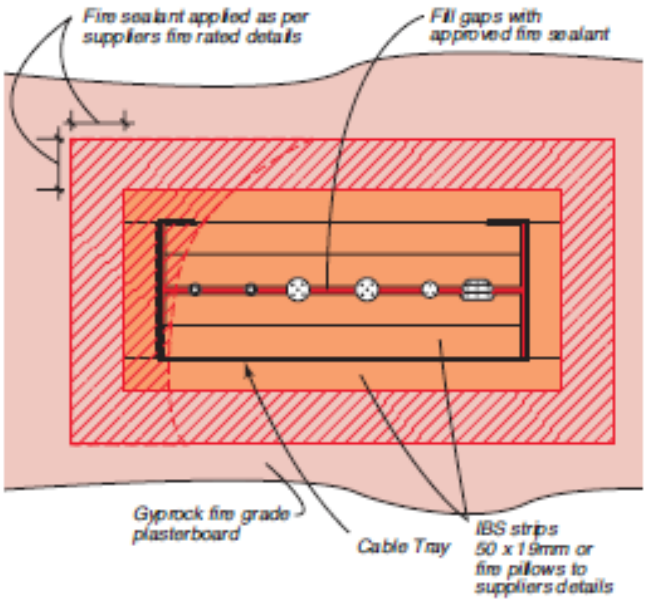

Figure 21 Cable Tray through Plasterboard - CSR Redbook

Cable trays >300mm x 100mm must be:

- Installed in accordance with the evidence of suitability which should:
    - Have boxed studs and trimmers
    - Be lined
    - Have hangers installed 150mm maximum from either side of the wall
    - Be filled with pillows or equivalent
    - Be sealed
    - Be wrapped either side to maintain insulation criteria
    - Have a min of 50mm separation from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation from the edge of any other formed penetration or as specified.

Figure 22: Framed and lined opening, MPX Training Mock-up

Conduits

- Conduits must be:
- Installed in accordance with the evidence of suitability which should:
    - Have either a intumescent sealant or fire collar fixed with steel fasteners
    - Be smoke sealed internally when passing through 2 compartments or more
    - Have a min of 50mm separation from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation from the edge of any other formed penetration or as specified.
- Note: size limitations may apply to some fire stopping systems:
- Promat Conduit Collar = Max. 32mm conduit.
- Trafalgar Fyrechoke Collars = Max. 40 mm conduit.

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- Promat Conduit Collar = Max. 32mm conduit.
- Trafalgar Fyrechoke Collars = Max. 40 mm conduit.

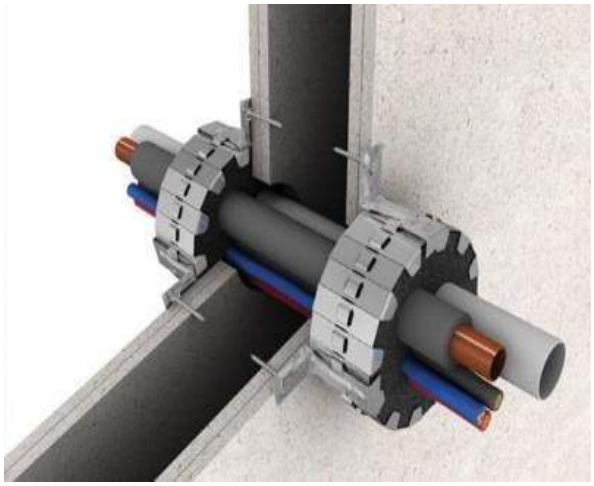


Figure 23: Promaseal Conduit Collars (Promat Australia)

Fire Dampers

Fire dampers must be:

- Installed in accordance with the evidence of suitability which should:
  - Have boxed studs and trimmers.
  - Be lined.
  - Have hangers 150mm maximum from either side of the wall must be installed.
  - Have a min of 50mm separation from the edge of any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
  - Have a min of 200mm separation from the edge of any other formed penetration or as specified.
  - Be installed as per section Fire Dampers and figure below.

Doors

Door frames must:

- Framed with a box stud
- Be securely fixed at 400 centers
- Filled top and sides in accordance with the evidence of suitability
- Installed as per Section Fire Resistance Doorsets

Multi-Services

Multi-services through one penetration utilising the BOSS Fire® Transit Box must:

- Be installed in accordance with the manufacturer's installation details.

Figure 25 BOSS Fire® Transit Box

1.3 Plasterboard Riser Shafts

Key considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Element Material FRL (i.e. wall, floor, ceiling)
- Service Material FRL (i.e. penetrating a compartment, FRL)
- Fire/smoke stopping system (as per MPX schedule)

What are plasterboard riser shaft systems?

Plasterboard risers systems (I.e. CSR Shaft wall, Boral Shaft liner, Knauf Shaftwall) are non-loadbearing fire resistance wall assemblies designed to encase lift shafts, stairwells and service risers in low and high rise construction.

Why use plasterboard riser shaft systems?

Plasterboard risers systems can be constructed from one side unlike many other fire rated wall systems that require access to both sides and is cost-effective.

Figure 26: A Typical Shaftwall During Construction (CSR Shaft Systems - lift, stairwell and services shaft design and installation guide)

1.3.1 Framing and Sheeting

Framing and sheeting must be:

- Installed as per the sequence recommended by the manufacturer. Refer example.
- Constructed with correct framing components. Refer Figure

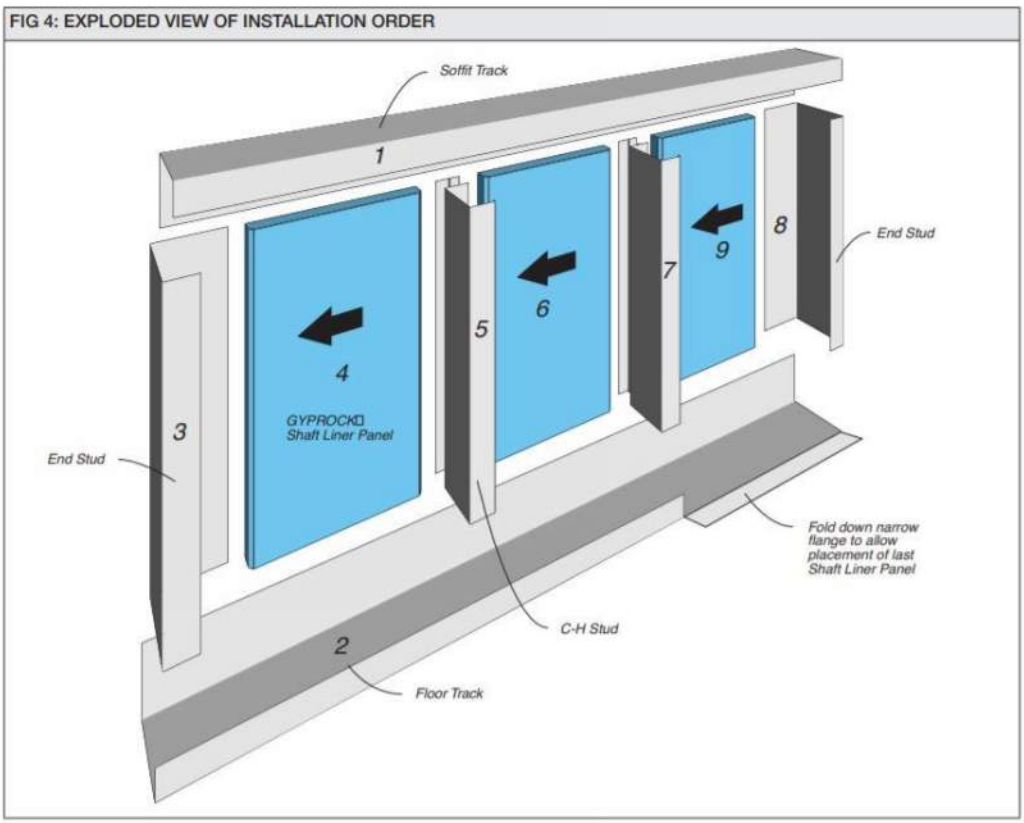


Figure 25 : Exploded view of installation order, CSR Shaft Systems

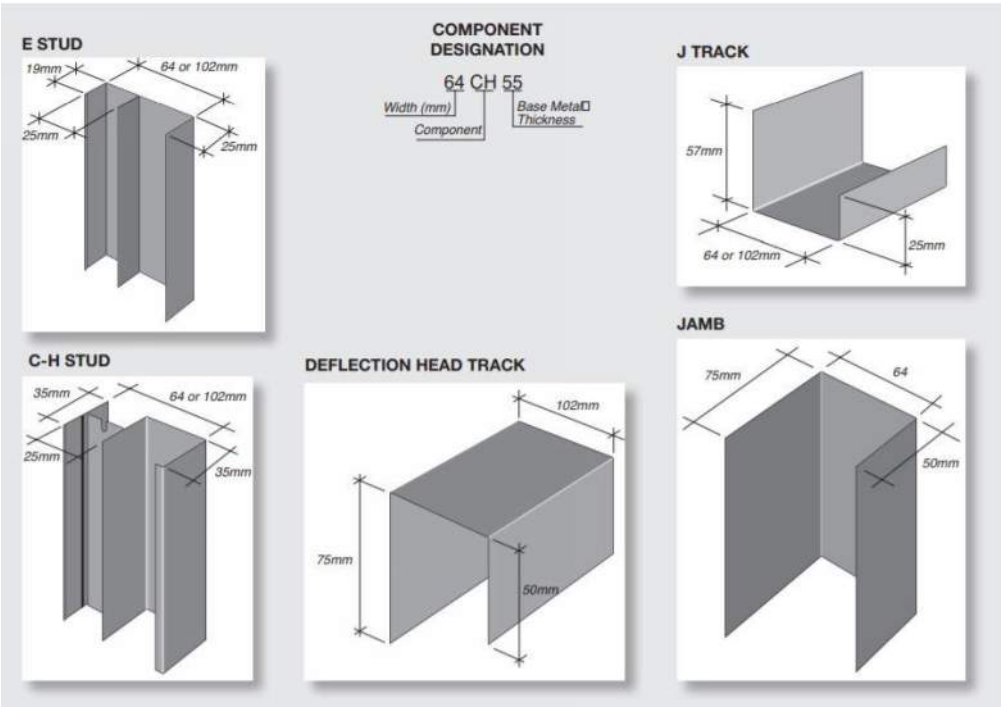


Figure 3: Framing Components, CSR Shaft Systems

Framing

- Cut both the floor and soffit J tracks 20mm shorter than the actual length of the wall.

- Cut the narrow flange off both ends of the floor and soffit J tracks for a distance of 60mm maximum. Refer to Figure
- Accurately align the floor and soffit tracks according to the wall layout. Position the tracks with the narrow flange facing the storey side.
- Secure the floor and soffit tracks with fasteners at 100mm maximum from ends and at 600mm maximum centres.
- Cut the end stud 20mm shorter than the wall height. Position the stud with the 25mm face to the storey side.
- Fix the end stud to the wall with fasteners at 100mm maximum from the ends and at 600mm maximum centres.
- With steel frame construction, tracks and studs should be attached to steel columns and beams before the structural members are independently fire rated.
- C-H studs should be cut 13mm shorter than the wall height to allow a gap at the top of the studs.

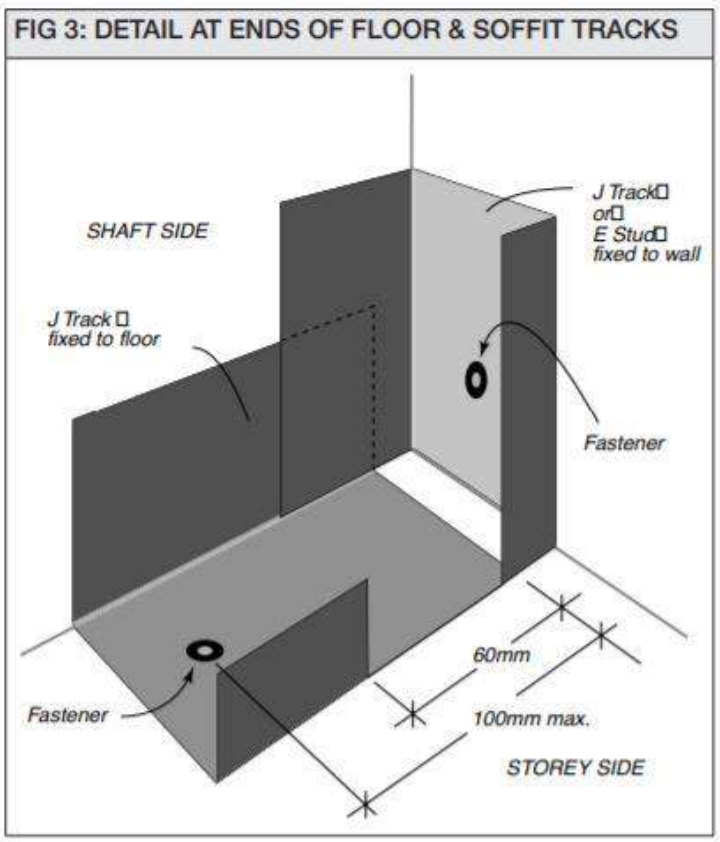


Figure 4: Detail at ends of floor and soffit tracks, CSR Shaft Systems

Sheeting - Double Layer

Riser shaft walls must be:

- Fixed in accordance with the manufacturer's details (see example of CSR Shaftwall installation specifications).

Sheeting - Single Layer

Fix single layer systems as per the details for the second layer of double layer systems.

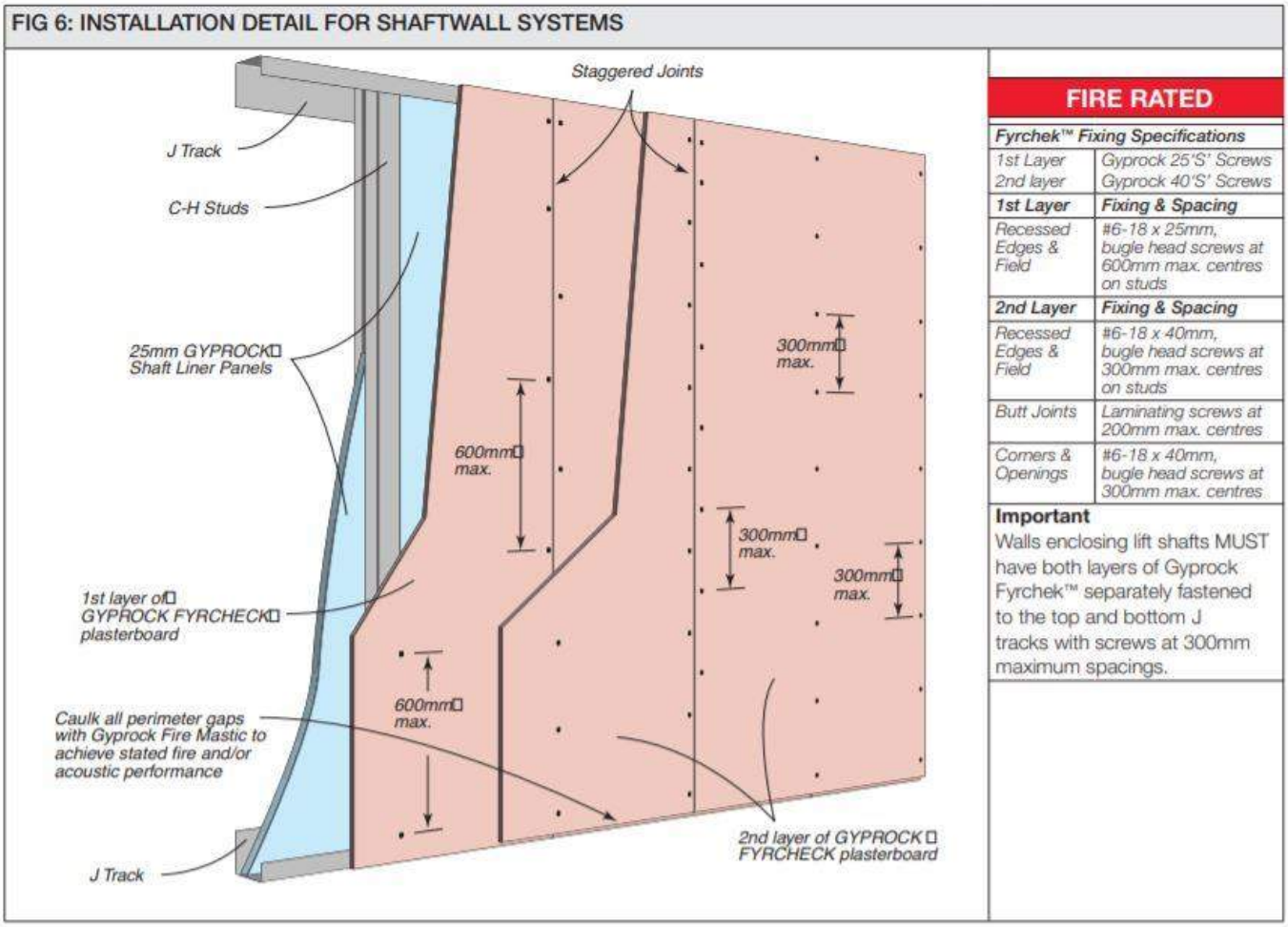


Figure 5: Installation Detail for Shaftwall Systems, CSR Red Book

Head Details

Riser shaft head details must:

- Have J tracks fixed to soffit and 600mm max centres.
- Have studs 15-20mm clear of soffit.
- Be fixed in accordance with the manufacturer's details (see example of CSR Shaftwall installation specifications).

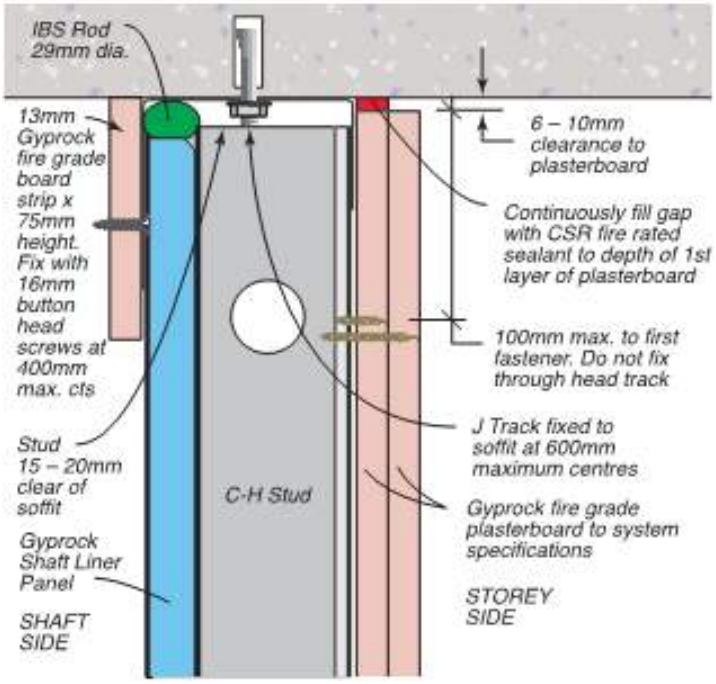


Figure 6: Head detail, CSR Redbook

Base Details

Riser shaft base details must be:

- Fixed in accordance with the manufacturer's details (see example of CSR Shaftwall installation specifications).

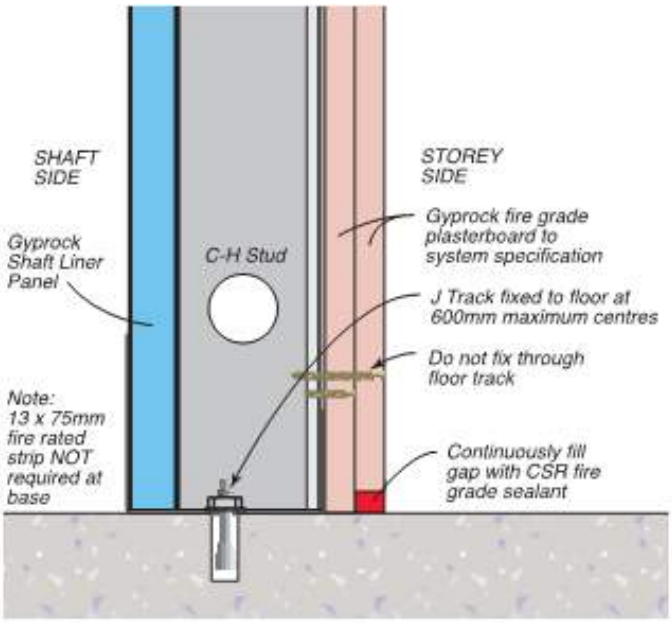


Figure 7: Base detail, CSR Redbook

Wall Junctions

Junctions with Masonry Walls

Riser shaft walls junctions with masonry must be:

- Fixed in accordance with the manufacturer's details (see example of CSR Shaftwall installation options).

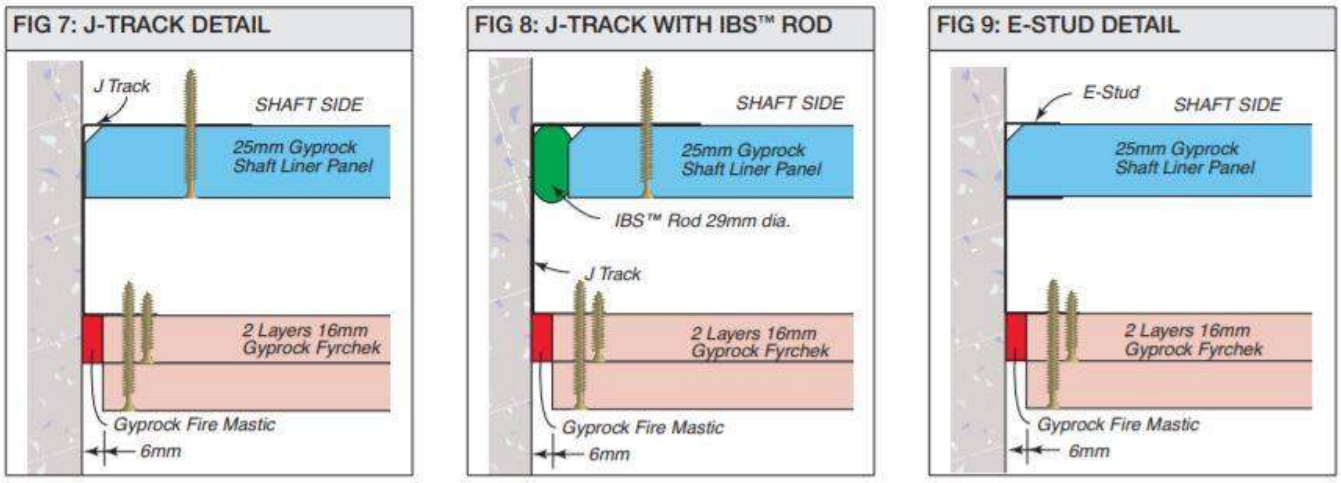


Figure 8: Wall Junction Details, CSR Redbook

Inside and Outside Corner Details

Riser shaft walls inside and outside corners details must be:

- Fixed in accordance with the manufacturer's details (see example of CSR Shaftwall installation options).

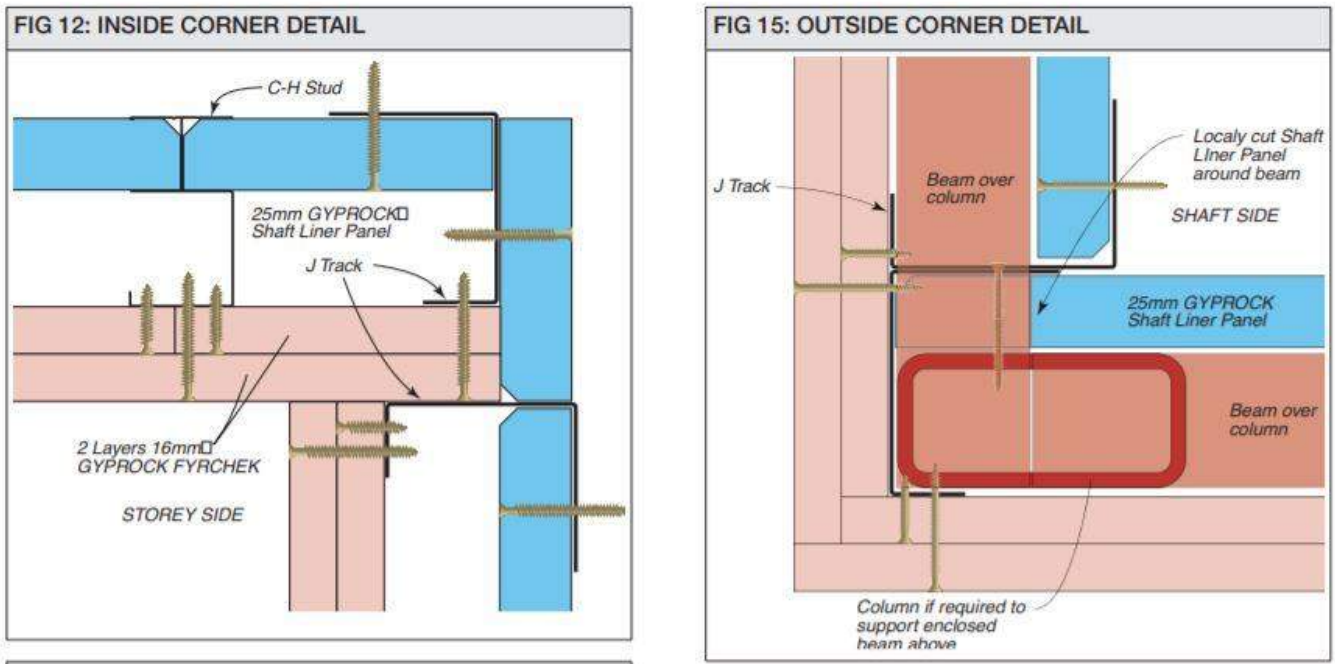
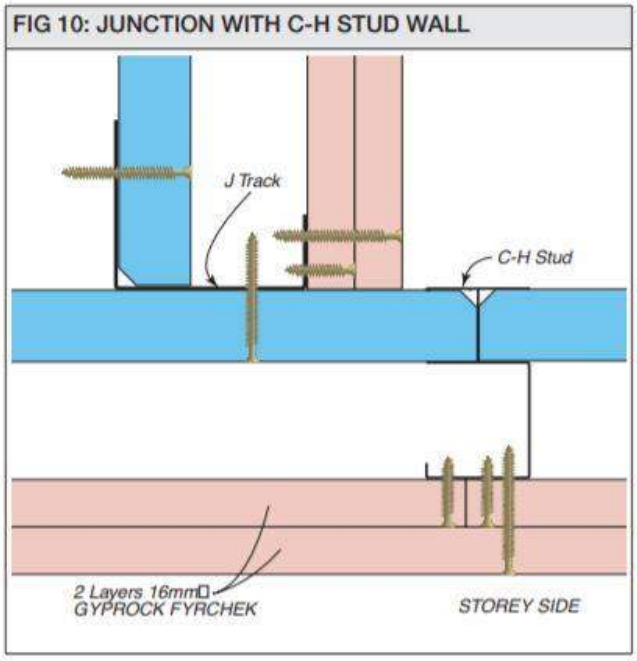


Figure 9: Corner Details, CSR Redbook

Junctions with Stud Walls

Riser shaft walls injunctions with stud walls must be:

- Fixed in accordance with the manufacturer's details (see example of CSR Shaftwall installation options).



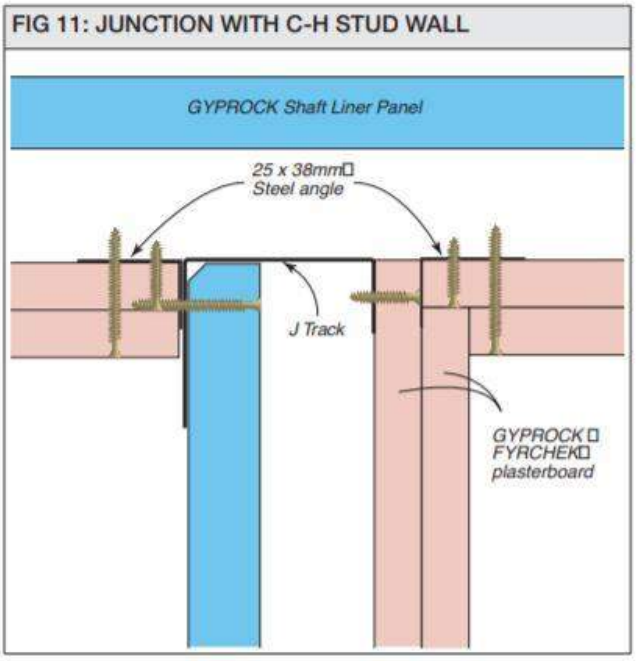


Figure 10: Junction with Stud Wall Details, CSR Redbook

1.3.2 Penetrations

General

- Shaft liner systems are not generally suitable for large penetrations.
    - Note: Only the Lorient LV44 Fire Damper has been tested with the CSR Shaftwall system (Refer Figure)
- Small penetrations can be done but must be strictly in accordance with the the evidence of suitability.

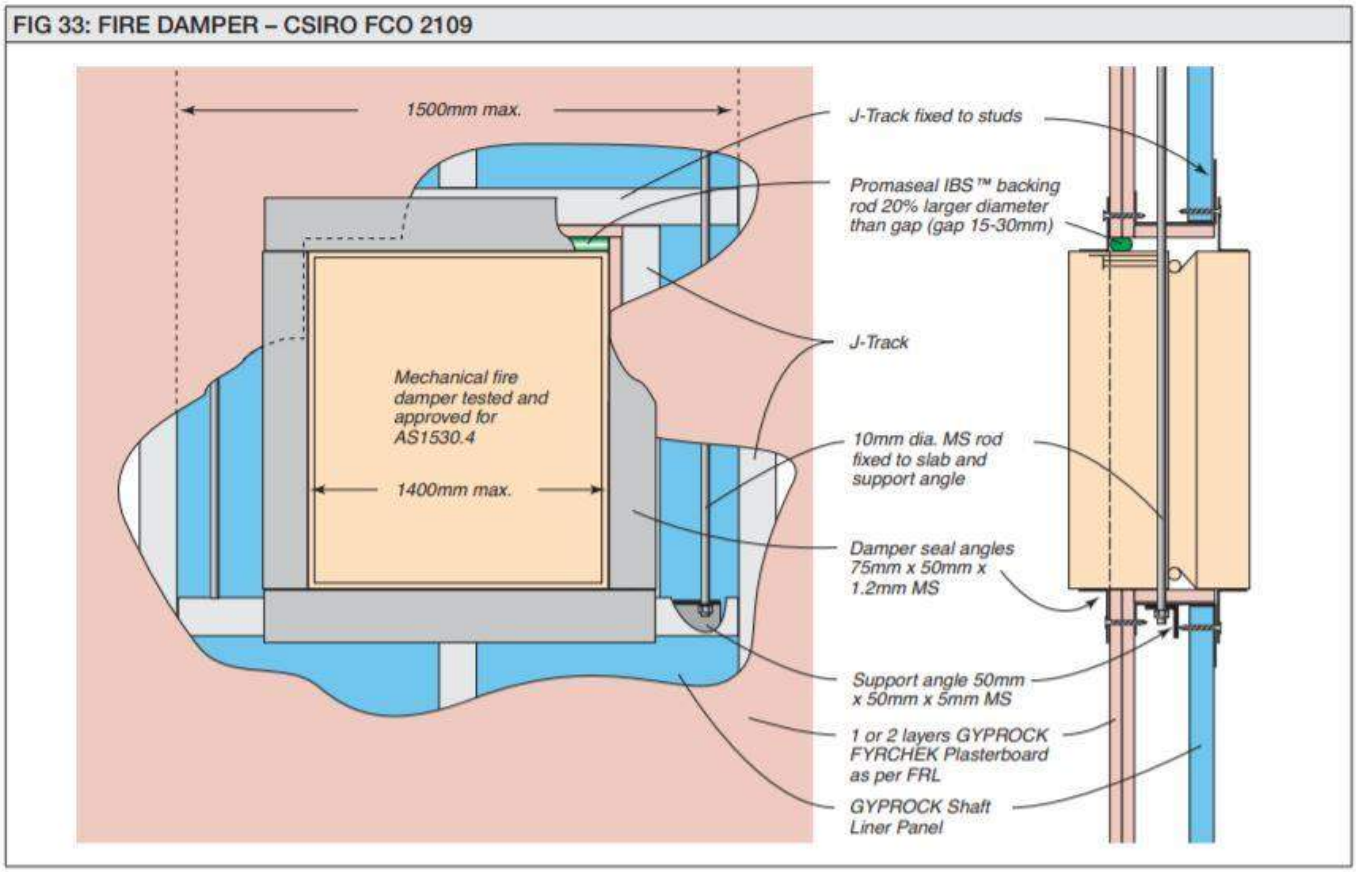


Figure 11: Fire Damper - CSIRO FCO 2109, CSR Redbook

1.4 Hebel Walls

Key considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Element Material FRL (i.e. wall, floor, ceiling)
- Service Material FRL (i.e. penetrating a compartment, FRL)
- Fire/smoke stopping system (as per MPX schedule)

What is the Hebel?

Hebel is autoclaved aerated concrete (ACC), manufactured from sand, lime and cement to which a gas-forming agent is added. The liberated gas expands the mixture, forming extremely small, finely dispersed air pockets, resulting in lightweight aerated concrete.

Hebel wall systems contain steel reinforcement with an anti-corrosion protection layer for added strength and durability.

Figure 1: Standard Panel (Hebel Panels Showing Reinforcement, CSR brochures)

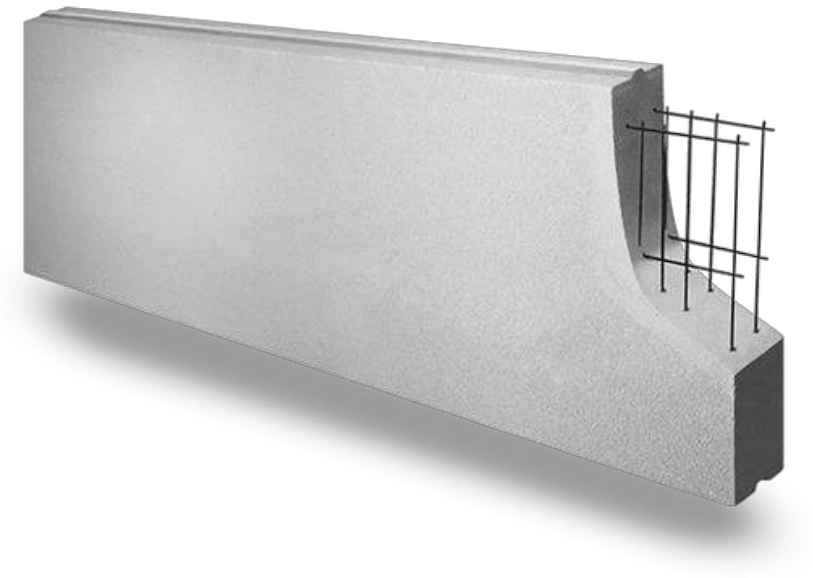


Figure 2: Panel with Caged Mesh (Hebel Panels Showing Reinforcement, CSR brochures)

Why use Hebel?

Hebel provides:

- Lighter loads on the structure compared to traditional masonry products.
- Reduced structural sizes and speed of installation with subsequent cost savings compared to traditional masonry construction.
- Thermal resistance performance and effective sound transmission barriers between external and internal environments of the buildings.
- Fire rating properties with fire resistance levels (FRL).

Note: Hebel is best situated to be installed between intertenancy walls where they are not penetrated by services.

1.4.1 Framing

General

Hebel walls must:

- Be installed as per Hebel's Installation Guide, which includes the requirements as noted in the Figure.
- Have screws with a minimum 50mm from edges or ends of Hebel panels.
- Have screws embedded 10 to 15mm below the surface.
- Use Hebel Adhesive or Hebel Patch Compound to cover the screw.

Head and Base Angles

- Fix slotted angles and base angles at 600mm maximum centres and maximum 100mm from ends to the concrete support structure must be installed.
- A minimum of 10mm and a maximum 20mm gap at the head of the panel must be maintained.

Head track angle must be:

- 75mm x 50mm with 1.2mm BMT (<3.3m in height)
- 2x75mm x 50mm with 1.2mm BMT (>3.3m in height)

Base angle must be:

- 50mm x 50mm with a 0.8mm BMT (<3.3m in height)
- 75mm x 50mm with a 1.2mm BMT (>3.3m in height)

1.4.2 Panels

FRL and Heights

- Refer to the table below a guide to the FRL that may be achieved for the nominated wall heights.
- Panels over 3300 mm must be made with caged mesh.

Table 1: Hebel Power Panel tongue & groove 75mm standard and made-to-length sizes, CSR Hebel: High Rise Apartments Student Accommodation Hotels Commercial Design & Installation Guide, HELIT117 Aug 16

	PROFILE	REINFORCEMENT	FIRE RATING LEVEL	LENGTH MM	WIDTH MM
Standard sizes (stock)	Tongue & groove	Single mesh	-/90/90	2700	600
				2800	600
				2850	600
				2900	600
				3000	600
				3300	600
		Caged mesh	-/120/120	3600	600
				4200	600
Made-to-length sizes (5mm increments)	Tongue & groove	Single mesh	-/90/90	up to 3300	600
		Caged mesh	-/120/120	up to 4800	300 - 600

Vertical Junction Details

Panel Abutting Concrete

Panel abutting to concrete must:

- Have a 10mm -20mm gap when abutting other materials (i.e. concrete columns).
- Installed as per Figure.

Panel Junctions

Panel junctions must:

- Have 14-10 x 150mm hex head type 17 screws at maximum 900mm centres (min 3 per panel).
- Have adhesive applied between panels.
- Installed as per Figures.

Joints

Joints must:

- Have adhesive applied between panels.

1.4.3 Control Joints

Control joints must be:

- Located at 6m centres.
- Have a slotted head and base track discontinuous at the control joint.

1.4.4 Penetrations

Panels (Structural Adequacy)

- Never more than one-third of a panel's width can be cut, N.B. maximum 200mm for a 600mm panel.
- Large openings must have:
    - Lintel panels over large openings >600 mm wide (refer to Door Details for stitching screw details).
    - Horizontal panels used below the opening.
- Cut ends of reinforcement must be painted with Hebel corrosion protection paint.

Cable Penetrations

Single Cable

Single cables must be:

- Installed in accordance with the evidence of suitability which should:
    - Be installed in accordance with the manufacturers' installation details.
    - Have a separation between any other penetration.
    - Be sealed.

Bundled Cables

Bundled cables must be:

- Installed in accordance with the evidence of suitability which should:
    - Have a separation between any other penetrations.
    - Be sealed.
    - Installed with the the maximum size of bundled cables considered.
    - Be fixed with steel fasteners (surface mounted collars only).

Cables on Trays

Cable trays must be:

- Installed in accordance with the evidence of suitability which should:
    - Have hangers installed 150mm maximum from either side of the wall.
    - Be wrapped either side to maintain insulation criteria.

Conduits

- Conduits must be:
- Installed in accordance with the evidence of suitability which should:
    - Have either an intumescent sealant or fire collar fixed with steel fasteners.
    - Smoke sealed internally when passing through 2 compartments or more.
    - Have a separation between any other penetrations.
- Note: size limitations may apply to some fire stopping systems:
- Promat Conduit Collar = Max. 32mm conduit.
- Trafalgar Fyrechoke Collars = Max. 40 mm conduit

Hydraulic Pipework

Combustible i.e. PVC

Combustible pipework must be:

- Installed in accordance with the evidence of suitability which should:
    - Be installed with a retrofit collar or through collar (in wall-type) as per evidence of suitability.
    - Have a 10-15mm annular gap.
    - Be sealed in accordance with the Figures or as as per evidence of suitability.
    - Have a separation between any other penetrations.

Hydraulic Pipework

Non-Combustible i.e. Copper

Non-combustible pipework must be:

- Installed in accordance with the evidence of suitability which should:
    - Be wrapped with insulation from the surface of the wall to maintain FRL insulation criteria.
    - Be wrapped with insulation though the wall for chilled or hot water pipe to maintain insulation criteria.
    - Be sealed in accordance with the Figures.
    - Have a separation between any other penetrations.

Fire Dampers

Fire dampers must be:

- Installed in accordance with the evidence of suitability which should:
    - Have hangers 150mm maximum from either side of the wall must be installed.
    - Have a separation between any other penetration
    - Installed as per section Fire Dampers

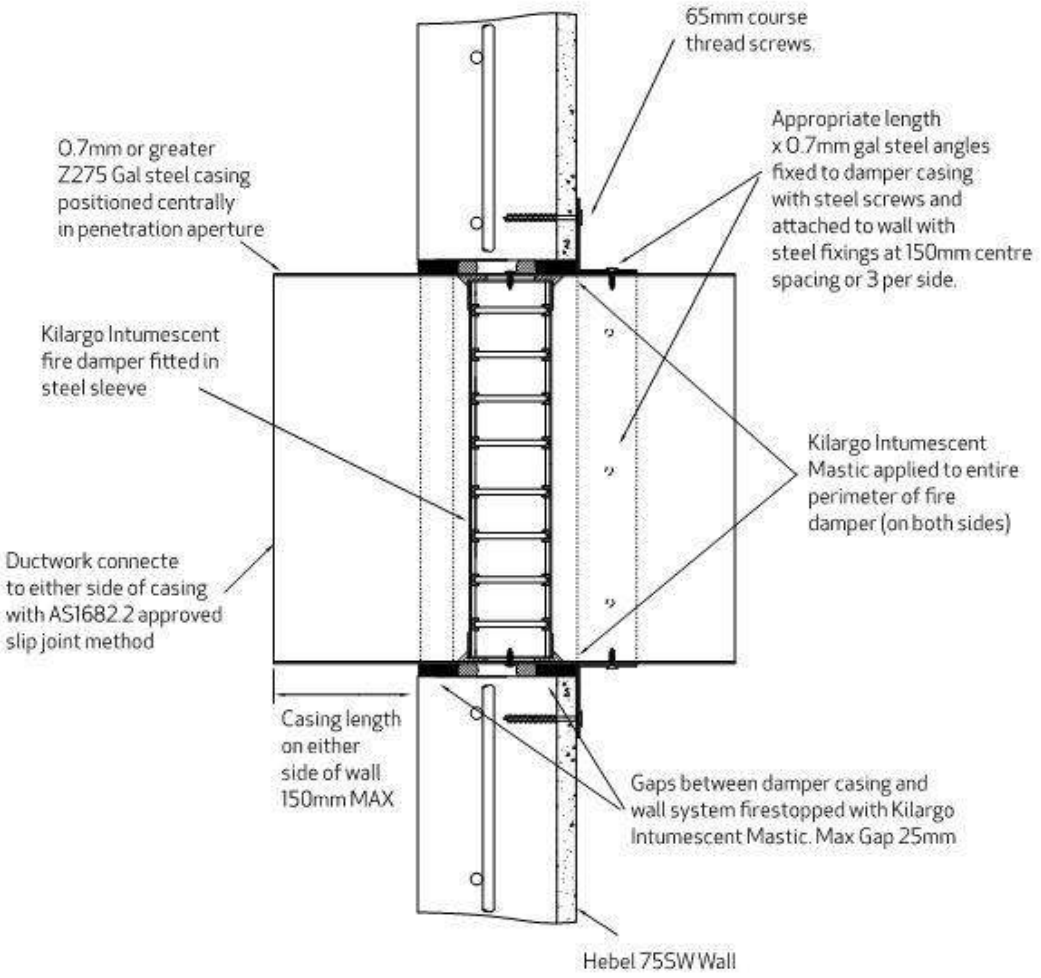


Figure 3: An Example of Fire Damper System (Source: Kilargo)

Doors

Door Nib Detail

- Door nibs must never be smaller than 150 mm.

Door Opening

- Openings must have a lintel over with a max depth of 700mm and max span of 1200mm
- Door frames must be:
    - Securely fixed using Type 17 screws at a 300 to 450 mm centres, or as otherwise tested.
    - Filled top and sides with cementitious grout.
- Cut ends of reinforcement must be painted with Hebel corrosion protection paint.

1.5 Speed Panel Walls

Key Considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Element Material FRL (i.e. wall, floor, ceiling)
- Service Material FRL (i.e. penetrating a compartment, FRL)
- Fire/smoke stopping system (as per MPX schedule)

What is the Speed Panel wall system?

Speed Panel is a fire and acoustic rated wall system. Each panel is made from a light gauge steel shell that is filled with a lightweight aerated concrete core. The roll-formed steel outer shell is made by two separate halves that are stitched together.

Why use Speed Panel?

- Lighter loads on the structure compared to traditional masonry products.
- Reduced structural sizes together with speed of installation that results in cost savings compared to traditional masonry construction.
- Thermal resistance performance and effective sound transmission barriers between external and internal environments of the buildings
- Fire rating properties with fire resistance levels (FRL).
- One sided construction.

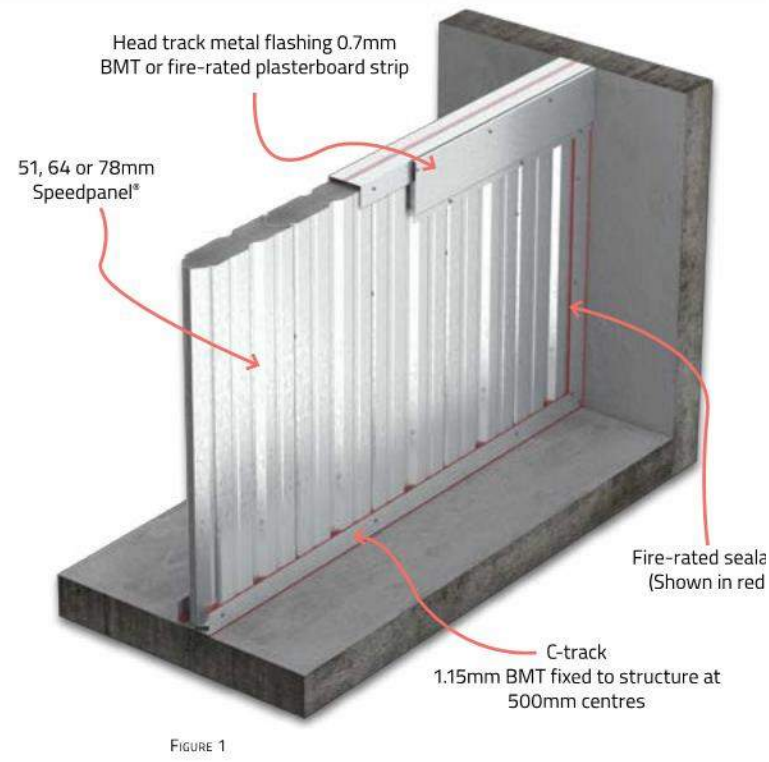


Figure 1: Speed Panel Installation

1.5.1 Framing

Head, Base and Side Track

Tracks must be:

- Installed in accordance with Speedpanel installation guide and details. Refer to Speedpanel:
  - Head details
  - Base details
  - End Details
- Fixed with M6.5 x 50mm Mushroom Head Spikes into the structure at 500mm centres (or approved sample).
- Applied with a continuous approved fire rated sealant in-between track and structure for the entire perimeter (Refer figure).

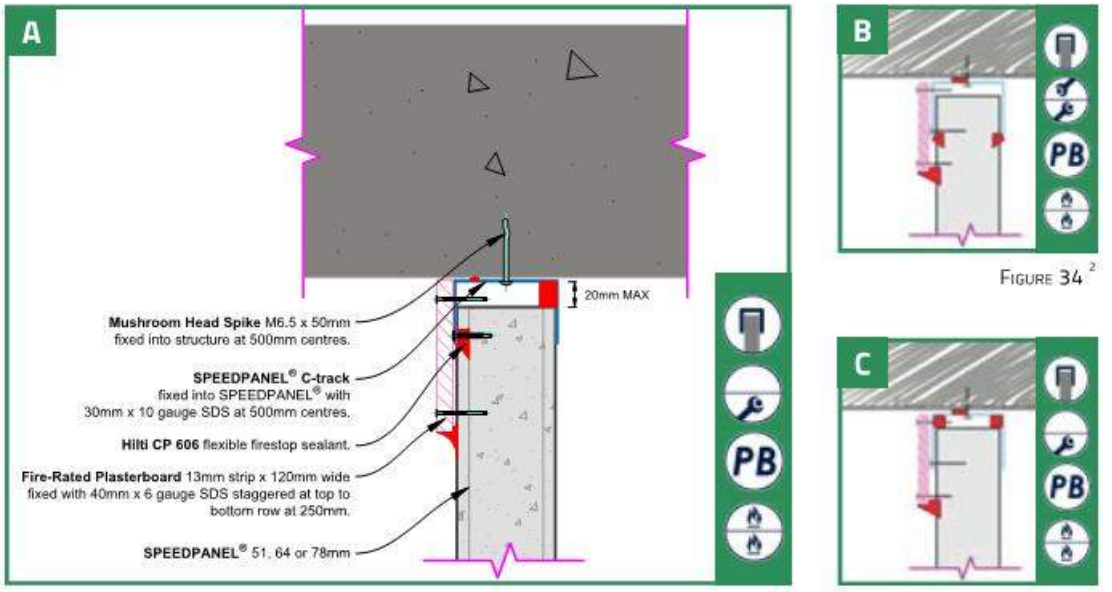


Figure 2: Showing head and base tracks

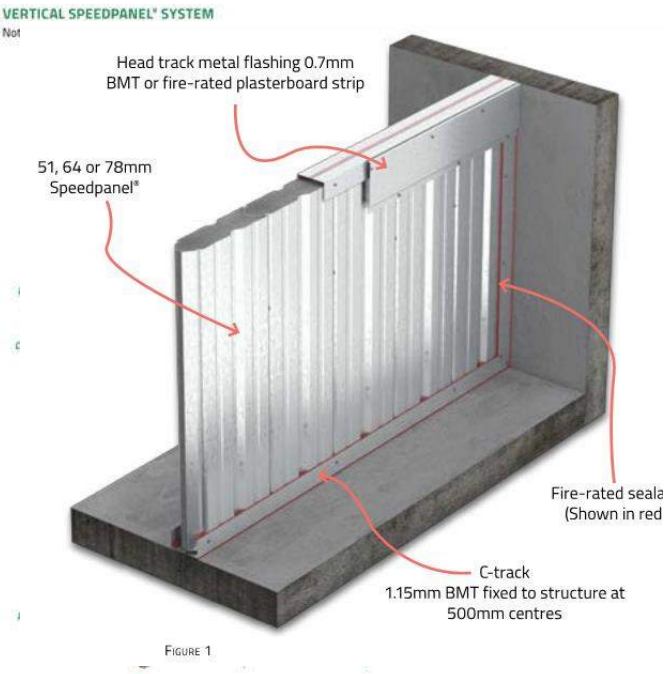


Figure 3: Vertical speedpanel system

1.5.2 Panels

FRL and Heights

Refer to the table below a guide to the FRL that may be achieved for the nominated wall heights.

SPEEDPANEL® WALL SYSTEM							
Panel profile	51		64		78		
Fire rating	-/60/60		-/90/90		-/120/120		
Direction of fire rating	Both Ways		Both Ways		Both Ways		
Panel orientation	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	
						All other applications	Scissor Stair application only
Max. span between structural connections	5.0m	3.0m	5.0m	3.0m	6.0m	4.5m	5.0m
Max. wall length (Single span)	Unlimited	3.0m	Unlimited	3.0m	Unlimited	4.5m	5.0m
Max. wall height (Single span)	5.0m	5.0m	5.0m	5.0m	6.0m	Unlimited	Unlimited
Max. wall length (Multiple structural connections)*	N/A	Unlimited	N/A	Unlimited	N/A	Unlimited	N/A
Max. wall height (Multiple structural connections)**	14.0m	N/A	14.0m	N/A	14.0m	N/A	N/A

Figure 5: FRL Table for Speedpanel Wall System

Horizontal Installation

Fix panels:

- Vertically at 250mm centres at the perimeter.
- Horizontally at 500mm centres at the perimeter.
- At every Panel joint, vertically at 250mm.
- Horizontally at 1000mm centres.

Each panel must interlock before fixing to ensure fire rating and acoustic properties are maintained.

HORIZONTAL SPEEDPANEL® SYSTEM

Note that the head protection (flashing or fire-rated plasterboard) is not shown for clarity purposes.

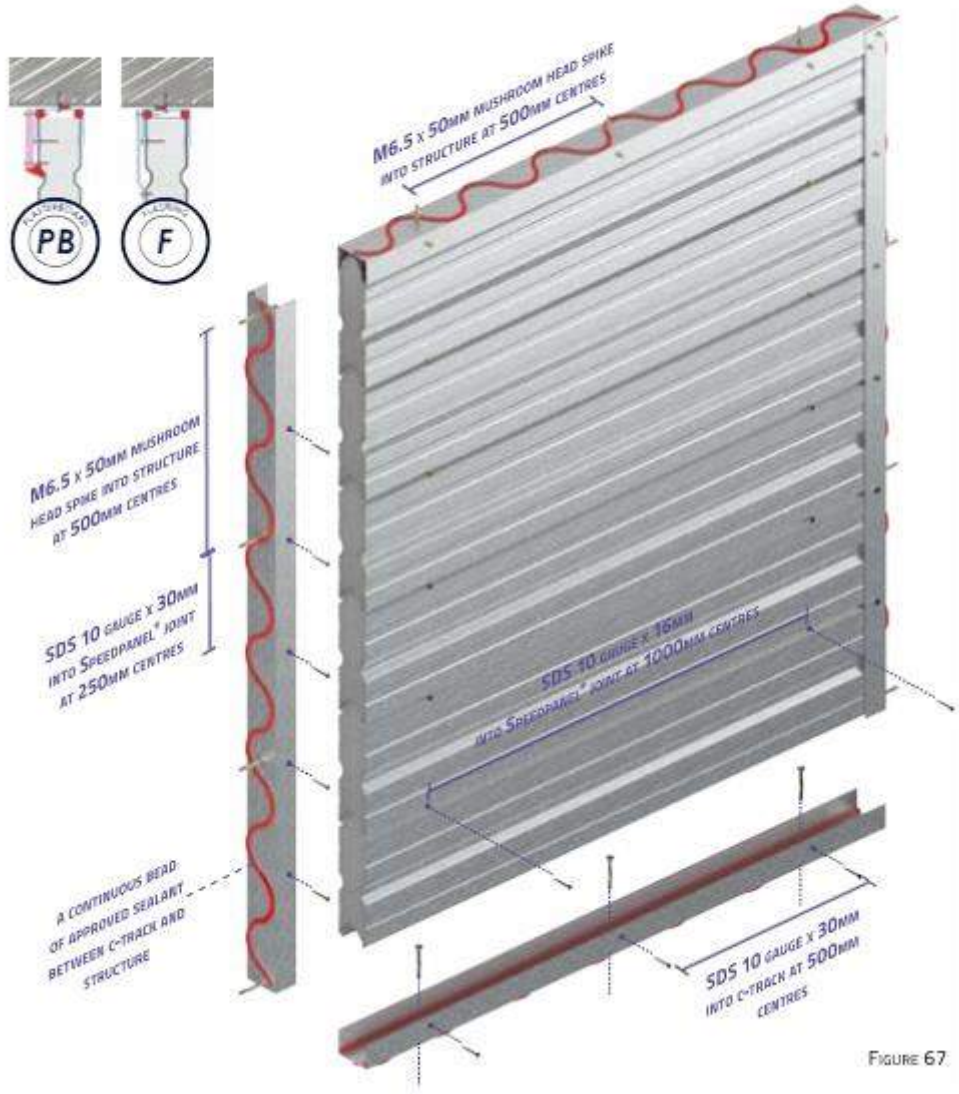


Figure 6: Horizontal Speedpanel System

Horizontal Corners and Intersections

Horizontal corners and intersections must be:

- At intersecting panels at 900mm centres
- At intersecting corners with 10D x 16mm SDS
- Installed in accordance with the Figure
- Installed in accordance with Corner and Intersection Details

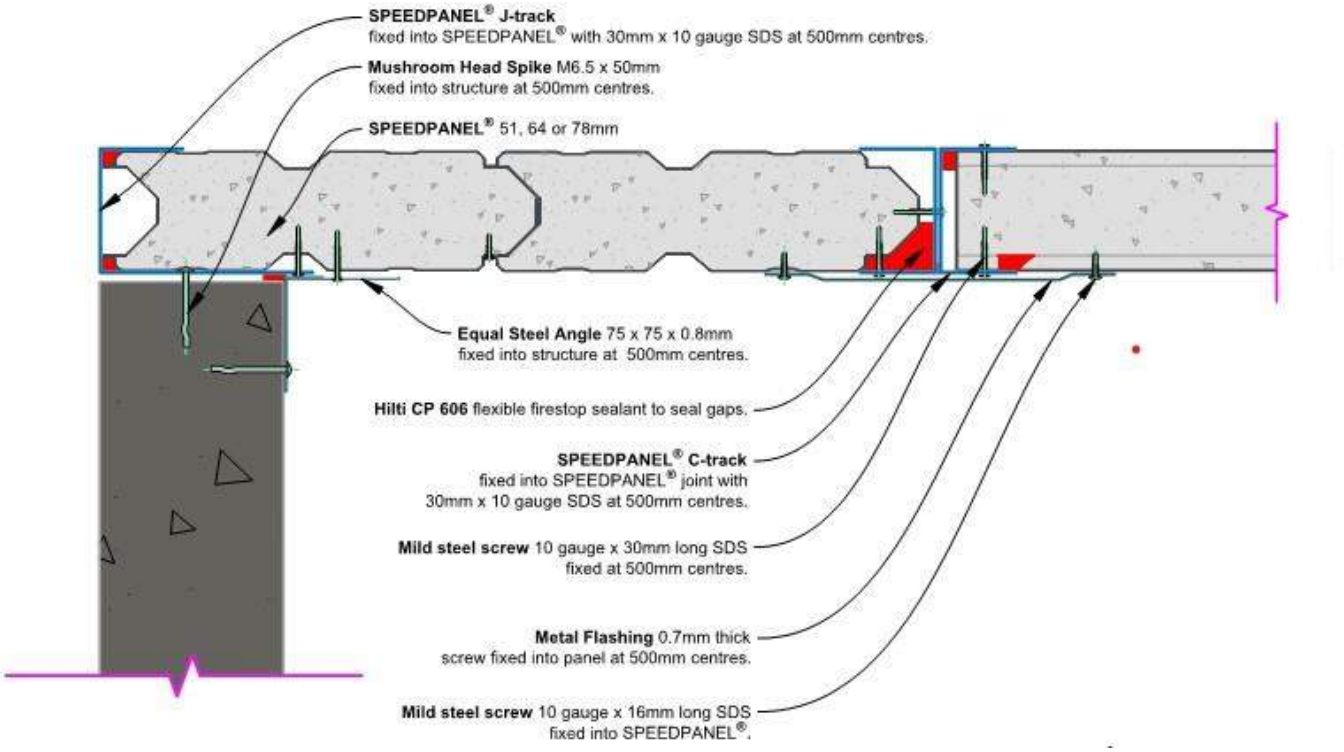


Figure 7: SpeedPanel Corner and Intersection

Vertical Installation

Panels (up to 5m in height) must be fixed:

- Horizontally and vertically at 500mm centres at the perimeters.
- Vertically at 1000mm centres in the body of the panels.
- At every panel joint, horizontally at 250mm

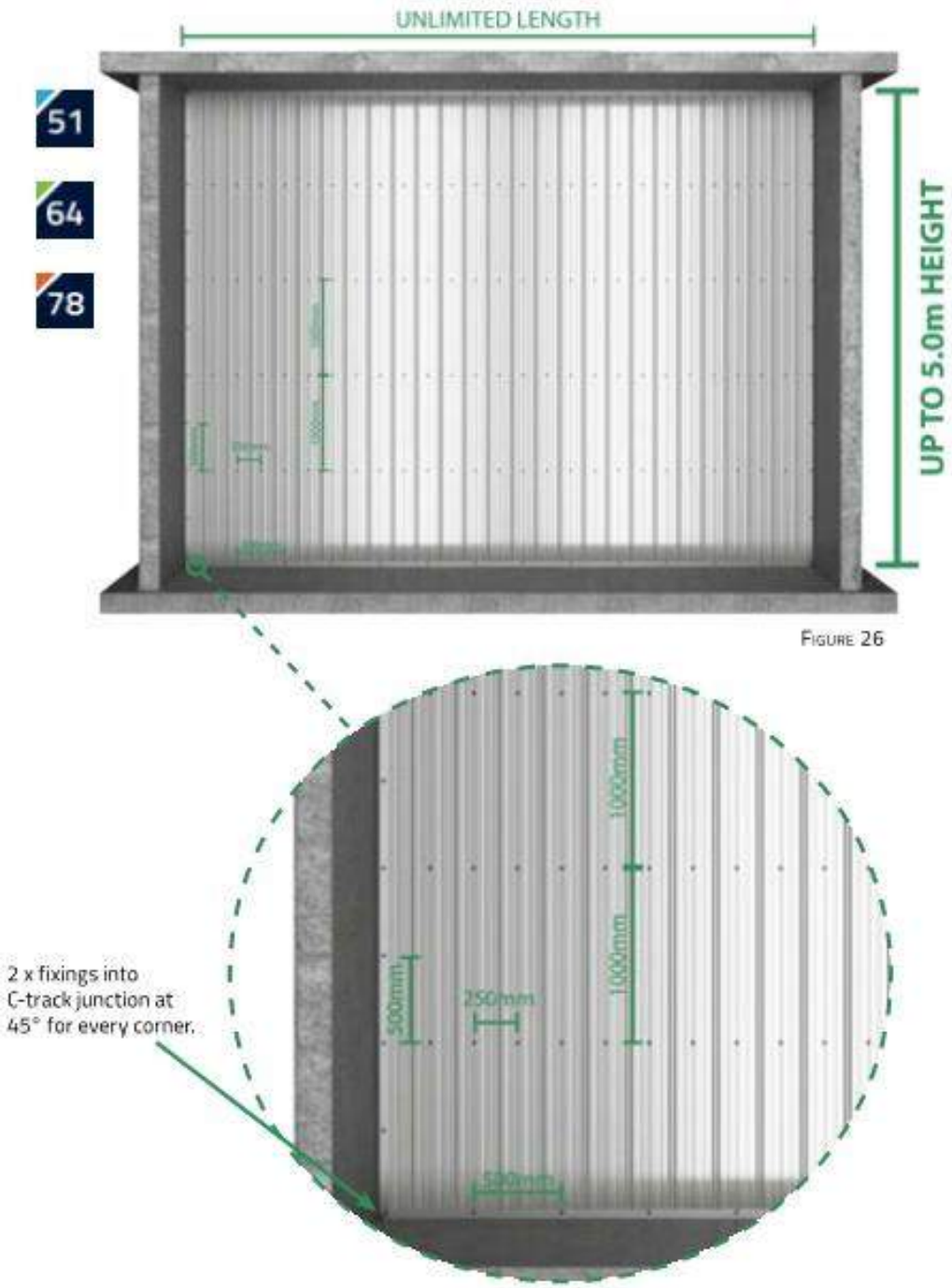


Figure 8: SpeedPanel Vertical Installation

Vertical Corners and Intersections

Vertical corners and intersections must be:

- At intersecting panels at 900mm centres
- At intersecting corners with 10D x 16mm SDS
- Installed in accordance with the Figure
- Installed in accordance with Corner and Intersection Details

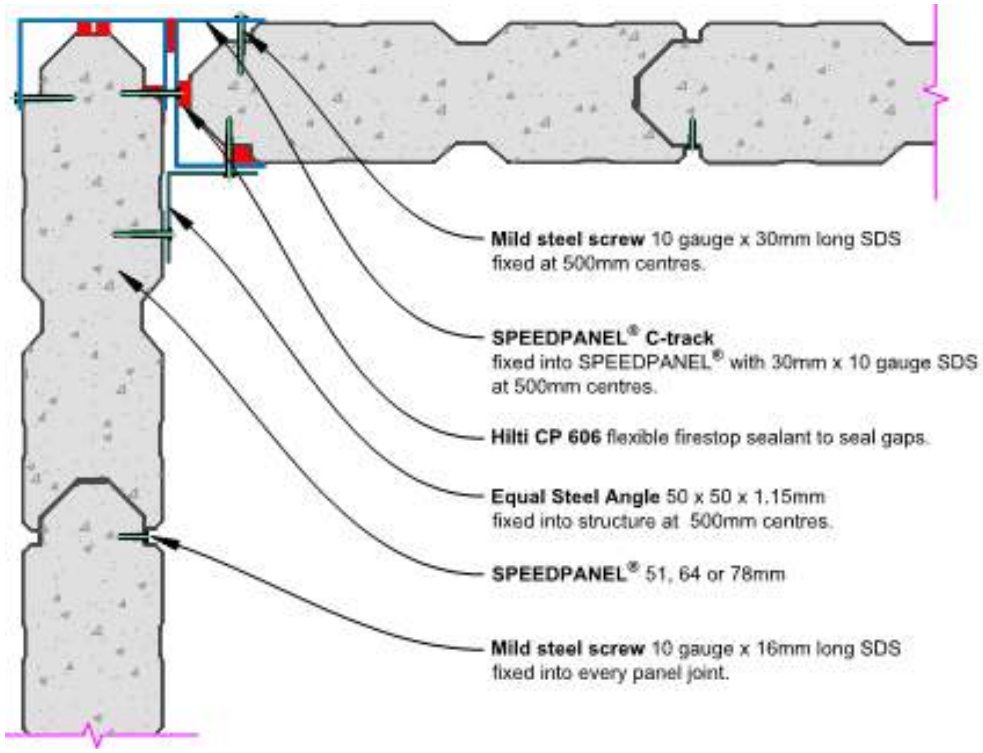


Figure 9: Vertical wall, 90-degree corner detail

Vertical Wall Connection

Vertical wall connection must be:

- Installed in accordance with the figure.

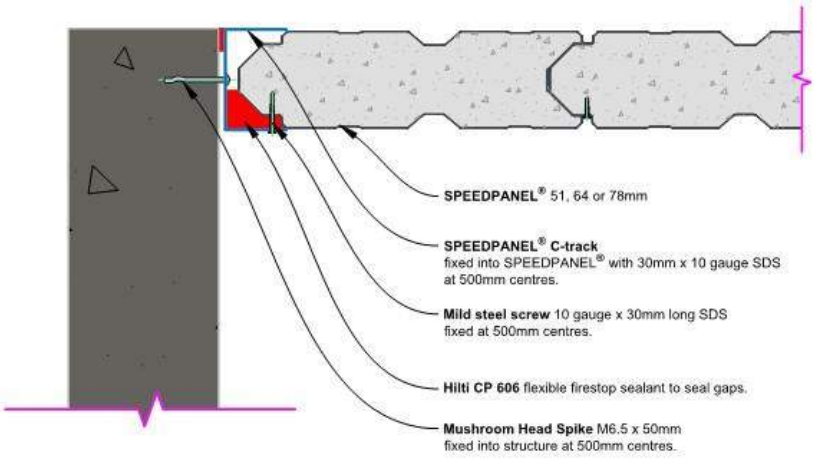


Figure 10 SpeedPanel Vertical Wall Connection

1.5.3 Penetrations

Vertical System Penetrations

Structural Adequacy

Vertical systems can have rectangular or square penetrations up to 4m2. Refer to Table and Figure.

Where multiple small services run through a wall, these can be considered to be grouped into a rectangle with a total area not exceeding 4m2. Refer to the Table above and Figure.

51mm Panel	64mm Panel	78mm Panel	Max. area A x B	Bmax (mm)	Ymax (mm)	Head detail
3000	-	-	4m²	2000	35-1000	Fig. 33-41 & Fig. 64-66
-	5000	-	4m²	2200		
-	-	5000	4m²	2400		
5000	-	-	4m²	2400	>1000	Fig. 42-44
-	5000	-				
-	-	6000				

Figure 11 SpeedPanel Horizontal System Penetrations

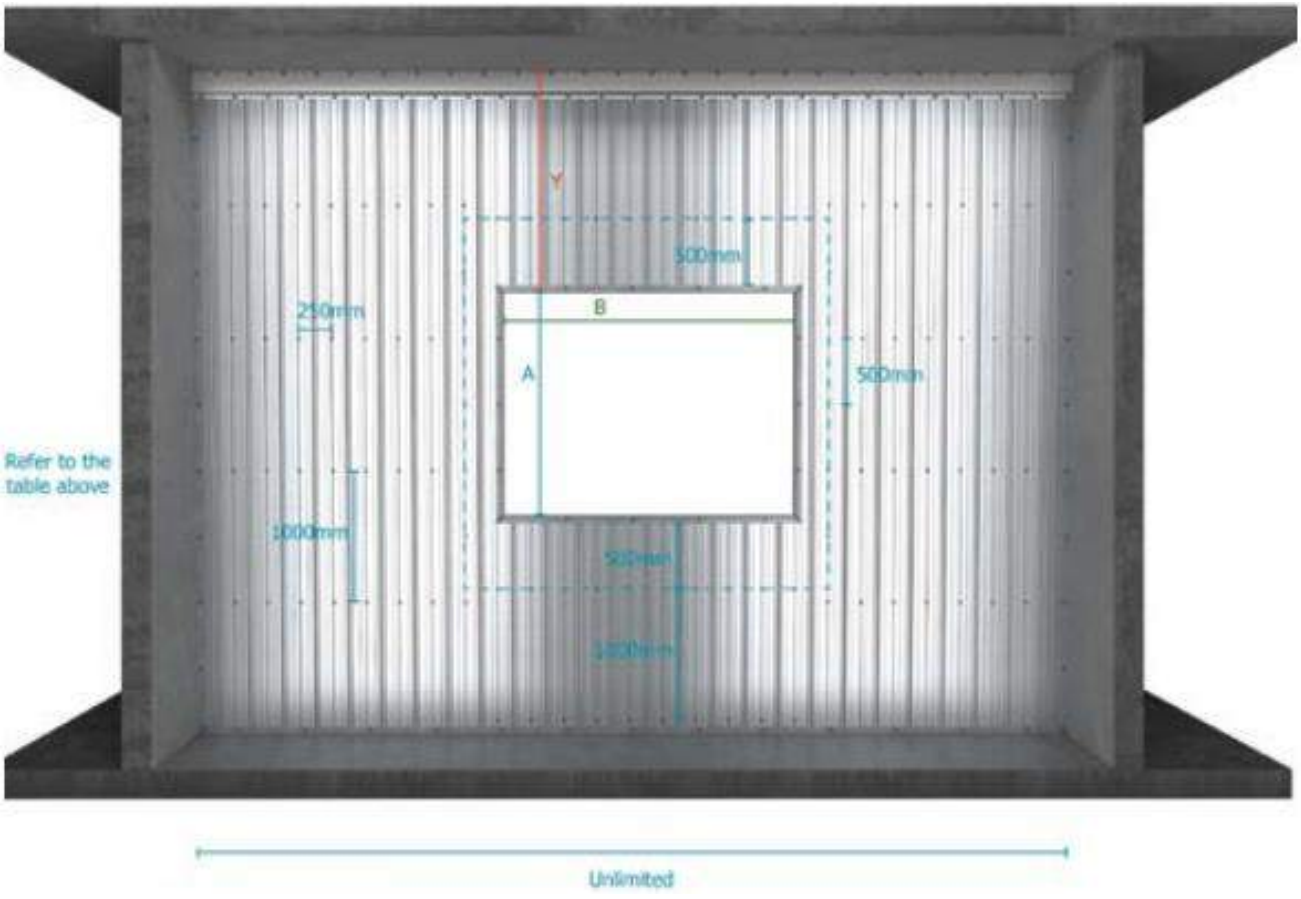


Figure 12 SpeedPanel Horizontal System Penetrations

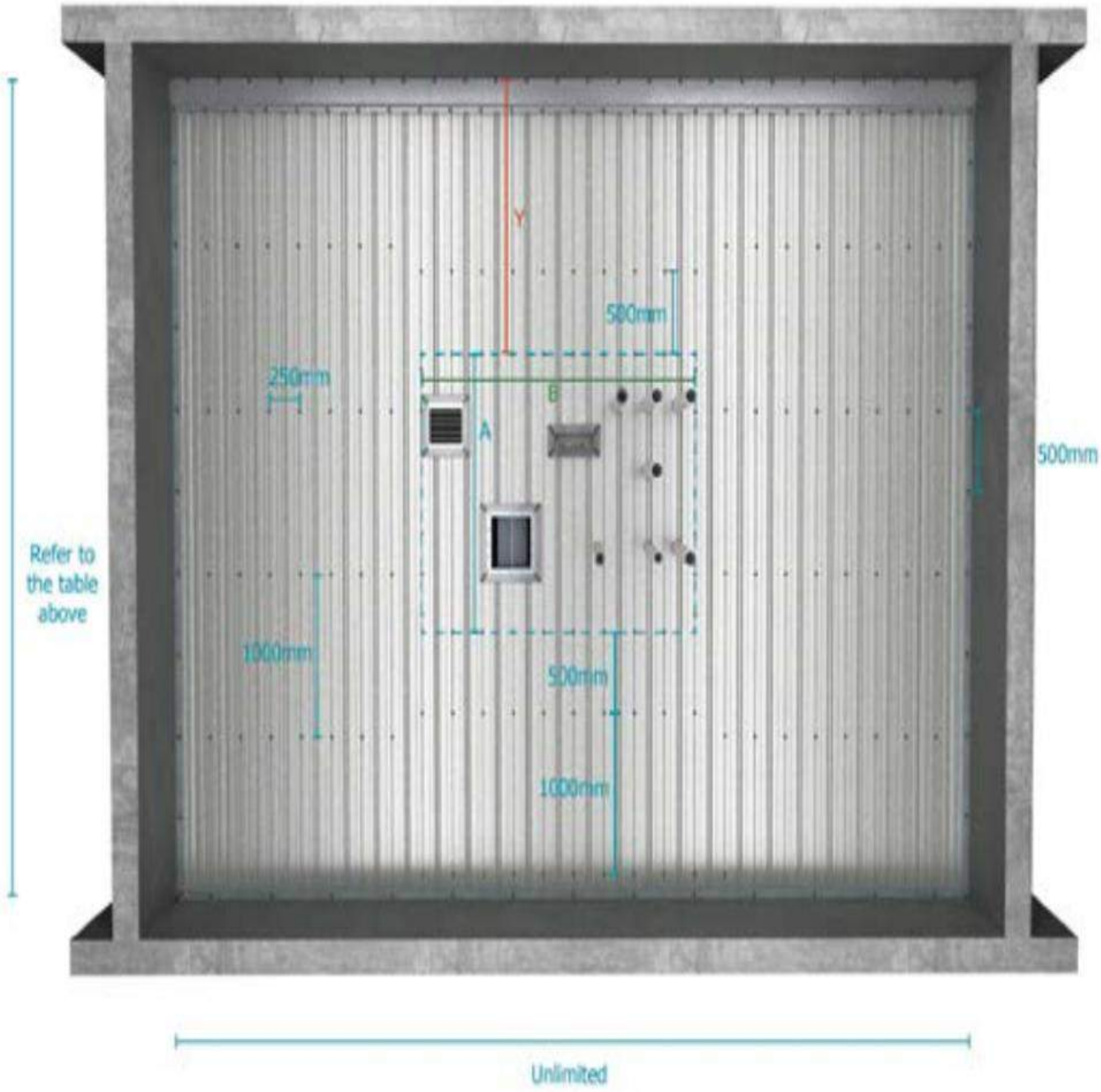


Figure 13 SpeedPanel Horizontal System Penetrations

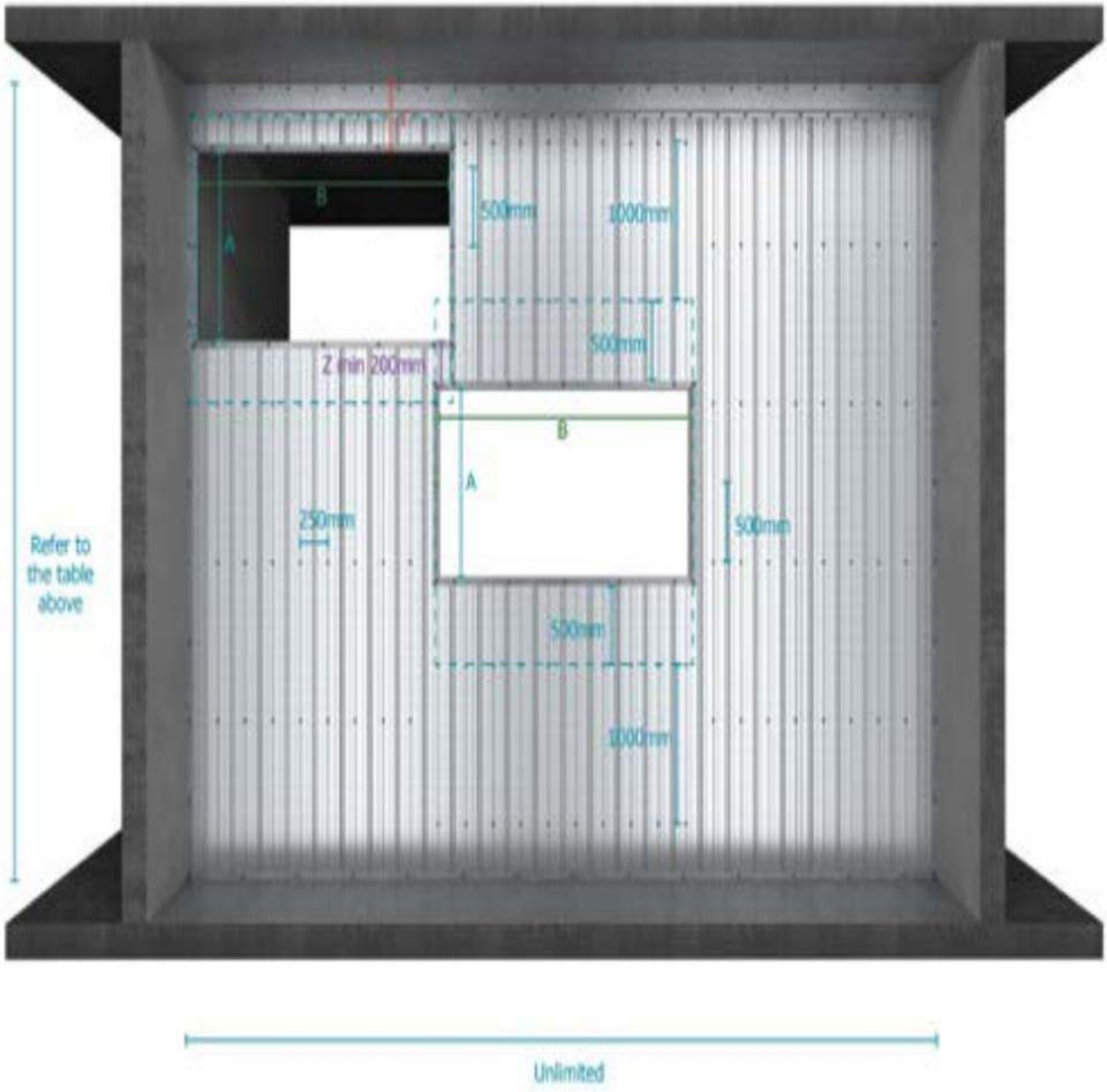


Figure 14 SpeedPanel Horizontal System Penetrations

Corner Fixing

- “C” track is to be notched out as shown 55mm into each end of the C-track.
- Use 10 gauge self-drilling screws and fix into the corners at 45° as shown.

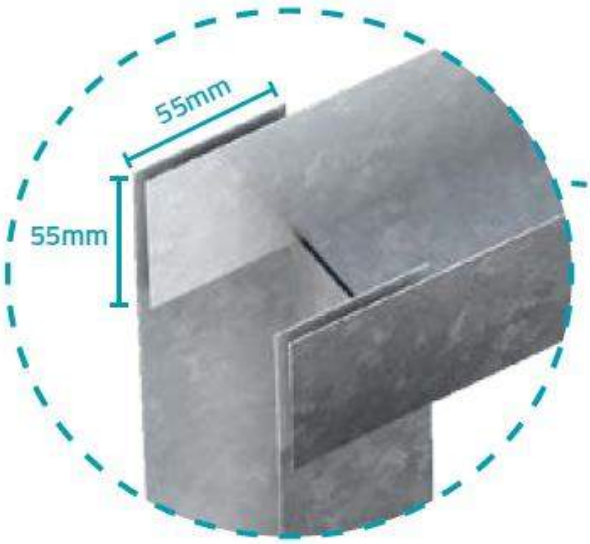


Figure 15: SpeedPanel Corner Fixing

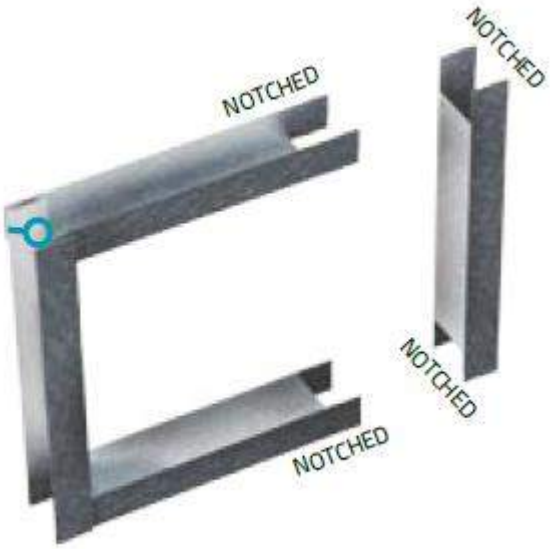


Figure 16: SpeedPanel Corner Fixing

Figure 17 SpeedPanel Corner Fixing

Cable Penetrations

Single Cable

Single cables must be:

- Installed in accordance with the evidence of suitability which should:
    - Have a min of 50mm separation between any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation between any other formed penetrations or as specified.
    - Be sealed.

Bundled Cables

Bundled cables must be:

- Installed in accordance with the evidence of suitability which should:
    - Have a min of 50mm separation between any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation between any other formed penetrations or as specified.
    - Be sealed
    - Consider the maximum size of bundled cables.
    - Be fixed with steel fasteners (surface mounted collars only).
    - Be fixed with fire grade plasterboard sheets (where required).

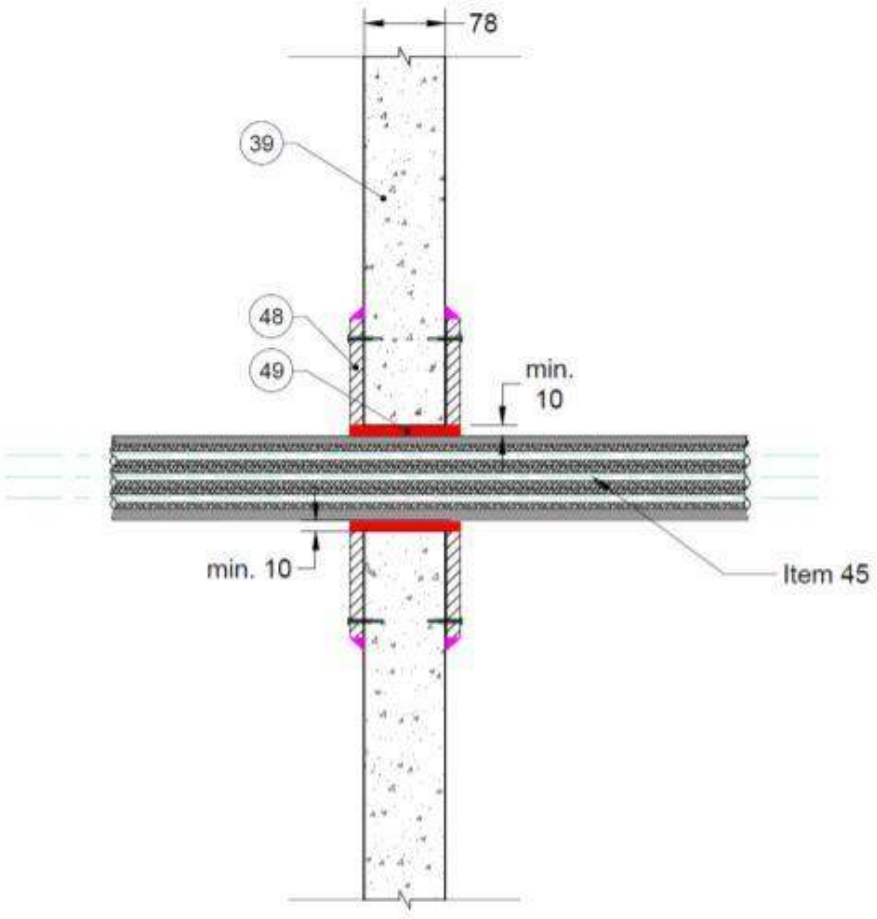


Figure 18 Example of Bundle Cables through SpeedPanel

Cables on Trays

Cable trays must be:

- Installed in accordance with the evidence of suitability which should:
    - Have hangers installed 150mm maximum from either side of the wall.
    - Have wrapping 600mm either side of the cable tray to maintain insulation criteria or 2mm steel cylindrical mesh.
    - Have a min of 50mm separation between any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation between any other formed penetrations or as specified.
    - Have the installation fire grade plasterboard sheets (where required).
    - Have a minimum 10mm clearance between cable tray and aperture surface.

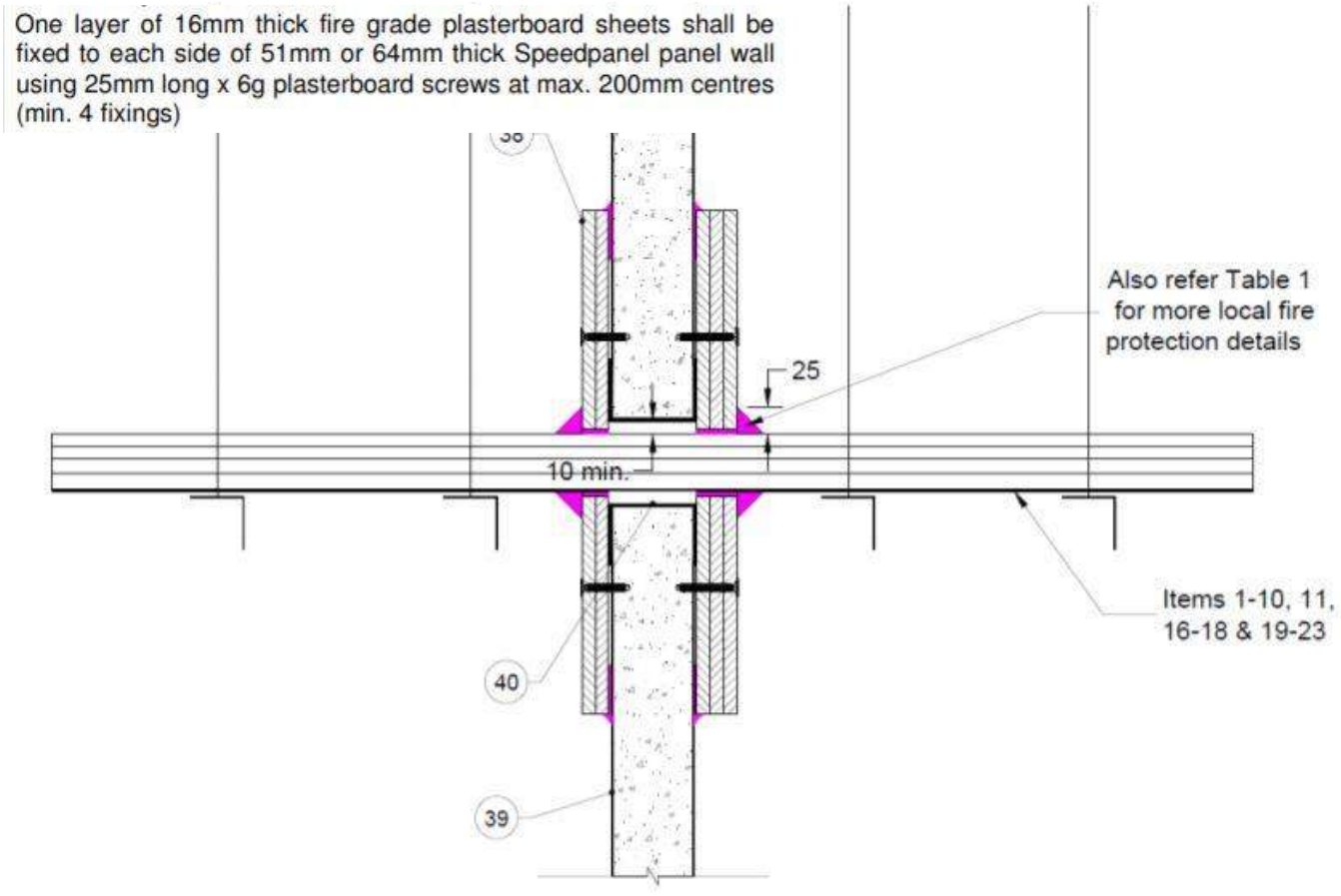


Figure 8 – Cable Penetrations in Speedpanel Wall Option 2 without Mesh (Sectional View)

Figure 19 Example of Cable Tray through SpeedPanel

Conduits

- Conduits must be:
- Installed in accordance with the evidence of suitability which should:
    - Have either a intumescent sealant or fire collar fixed with steel fasteners
    - Be smoke sealed internally when passing through 2 compartments or more
    - Have a min of 50mm separation between any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation between any other formed penetrations or as specified.

Note: size limitations may apply to some fire stopping systems:

- Promat Conduit Collar = Max. 32mm conduit.
- Trafalgar Fyrechoke Collars = Max. 40 mm conduit

Figure 20: Promat Conduit Collar

Hydraulic Pipework

Combustible ie. PVC

Combustible pipework must be:

- Installed in accordance with the evidence of suitability which should:
    - Be installed with a retrofit collar or through collar (in wall-type) as per evidence of suitability (Refer Figure for an example)
    - Have a 10-15mm annular gap
    - Be sealed
    - Have a min of 50mm separation between any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
    - Have a min of 200mm separation between any other formed penetrations or as specified.

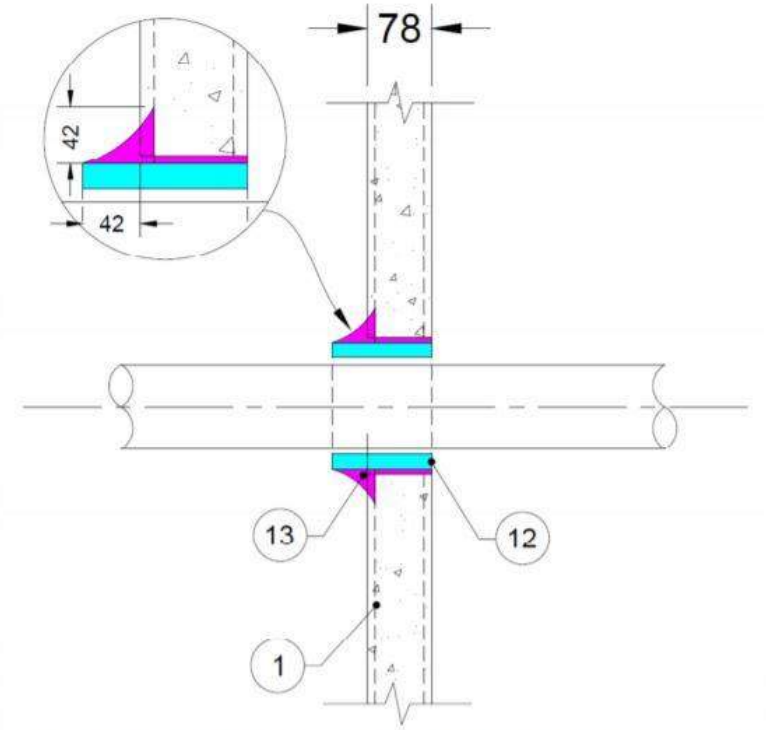


Figure 14 – uPVC Pipes with PROMASEAL® FCW Collars – Collar fitted flush to Wall Surface

Non-Combustible ie. Copper

Non-combustible pipework must be:

- Installed in accordance with the evidence of suitability which should:
  - Have a minimum 100mm clearance around the pipe from any combustible material for a length of 2m vertically (refer Figure) or
  - Be wrapped with insulation from the surface of the floor to maintain FRL insulation criteria.
  - Be sealed
  - Have a min of 50mm separation between any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.

- Have a min of 200mm separation between any other formed penetrations or as specified.

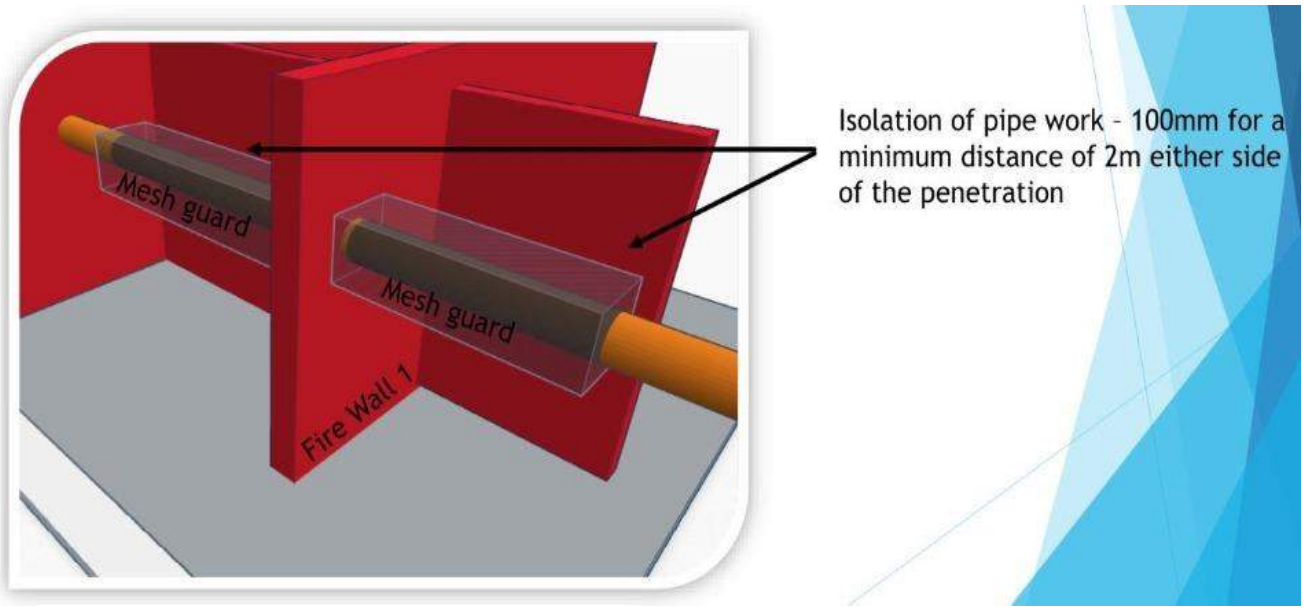


Figure 21 Example of Non-Combustible Pipework through SpeedPanel

Fire Dampers

Fire dampers must be:

- Installed in accordance with the evidence of suitability which should:
  - Have hangers installed 150mm maximum from either side of the wall.
  - Have a min of 50mm separation between any other drilled penetration (ie. single, bundled cable or insulated penetration) or as specified.
  - Have a min of 200mm separation between any other formed penetrations or as specified.

- Installed as per section Fire Dampers.\

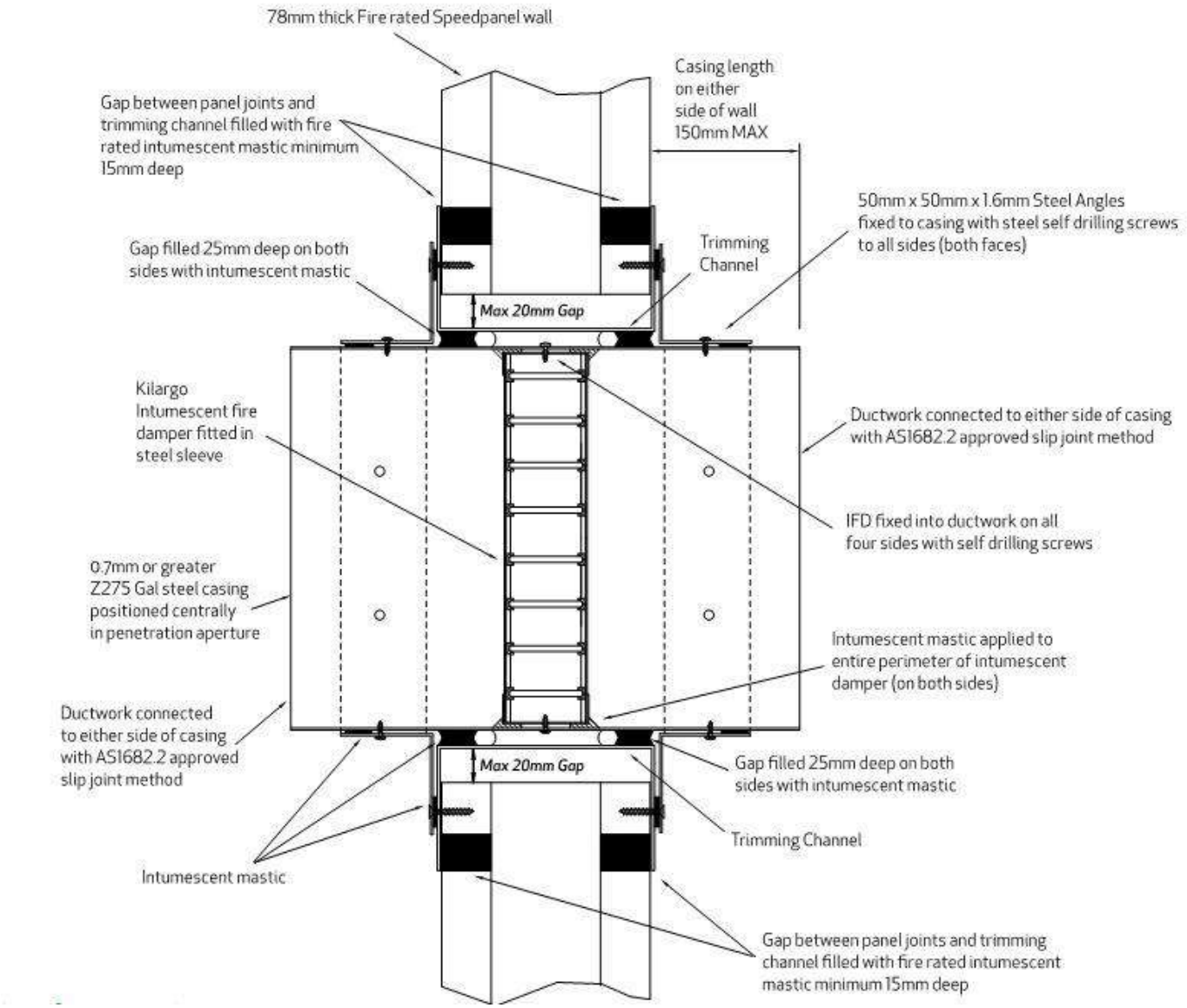


Figure 22: Example of a Kilagro Fire Damper in a Speedpanel Wall

Where fire dampers are being installed within 170mm of the soffit, Vicuclad or Promatec filling must be installed in accordance with the evidence of suitability. Refer example in Figure.

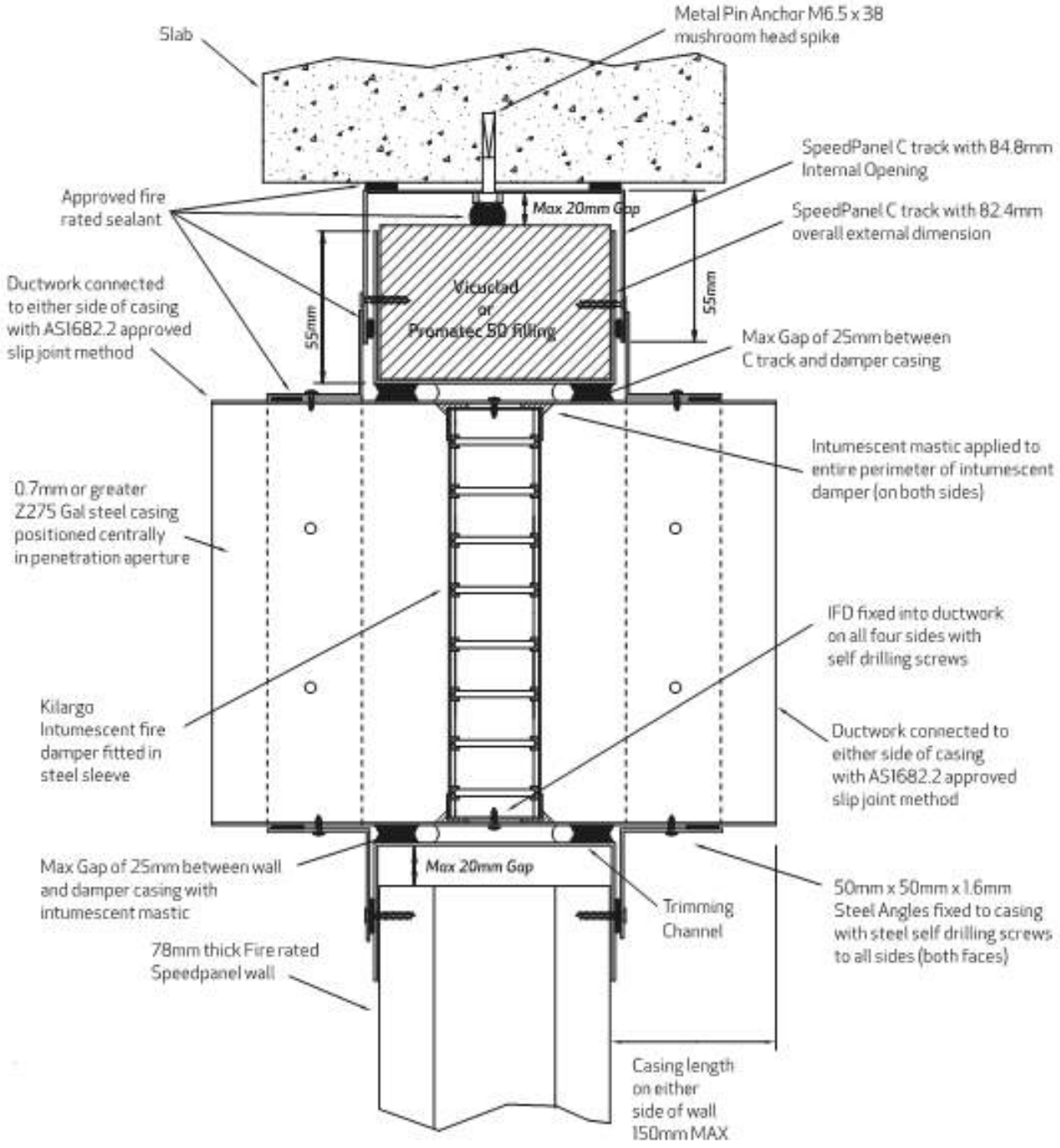


Figure 23 Example of a Kilagro Fire Damper in a Speedpanel Wall

Multi-Services

TBA Firefly Intubate

Multi-services through one penetration utilising the TBA Firefly Intubat must:

- Be installed in accordance with the manufacturers' installation details up to 1150mm x 1150mm. Refer to manufacturers for installation details.

Transit Box

Multi-services through one penetration utilising the BOSS Fire® Transit Box must:

- Be installed in accordance with the manufacturers' installation details.

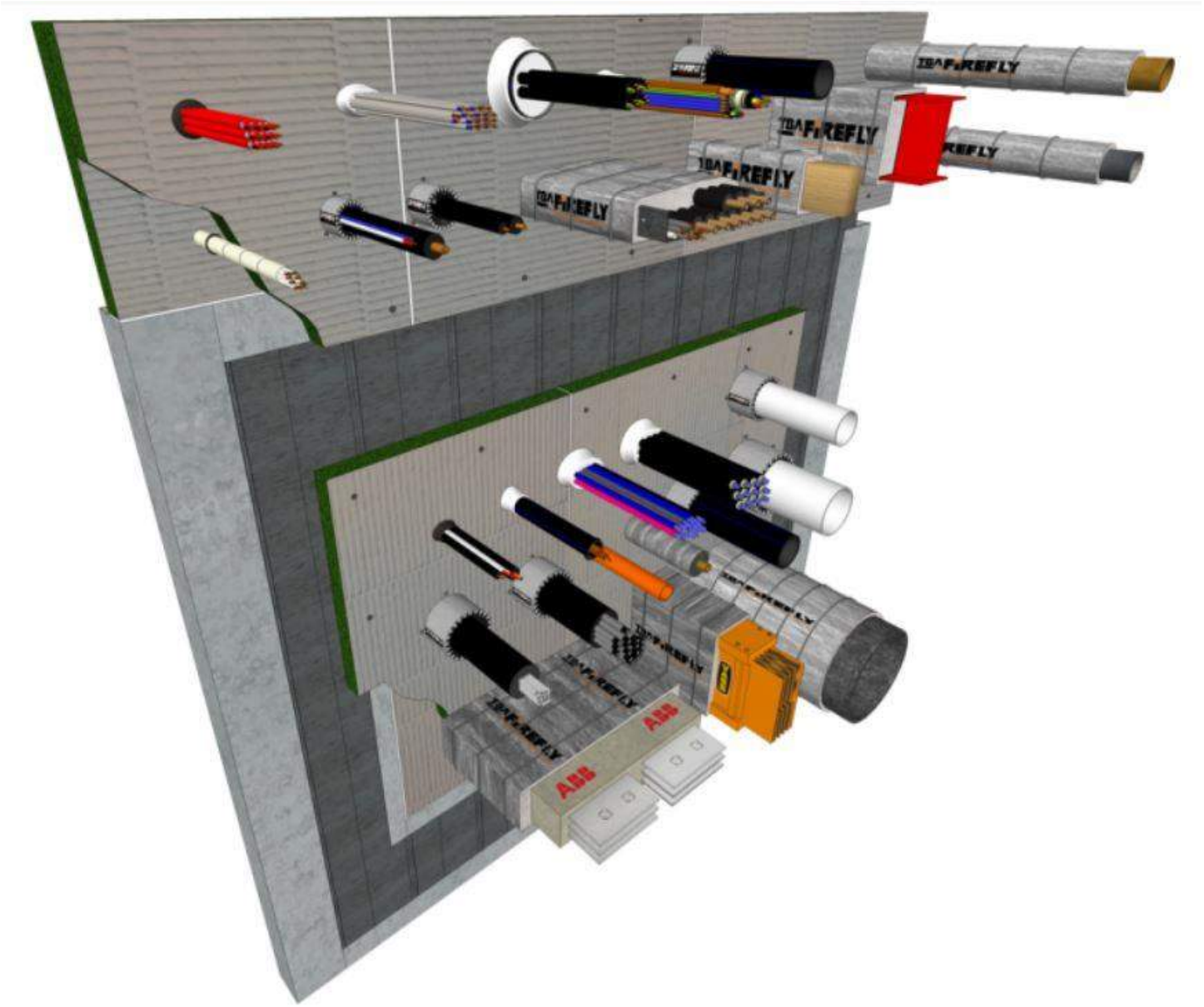


Figure 24: TBA Firefly Intubatt through Speedpanel

1.6 Speed Panel Risers

Key Considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Element Material FRL (i.e. wall, floor, ceiling)
- Service Material FRL (i.e. penetrating a compartment, FRL)
- Fire/smoke stopping system (as per MPX schedule)

1.6.1 Framing and Panels

Speedpanel shafts should be installed in accordance with the Speedpanel Shaft Wall Details

Horizontal Installation

Horizontal Speedpanel (at unlimited heights) must:

- Have a with a maximum span of 4.5m
- Supported both sides.

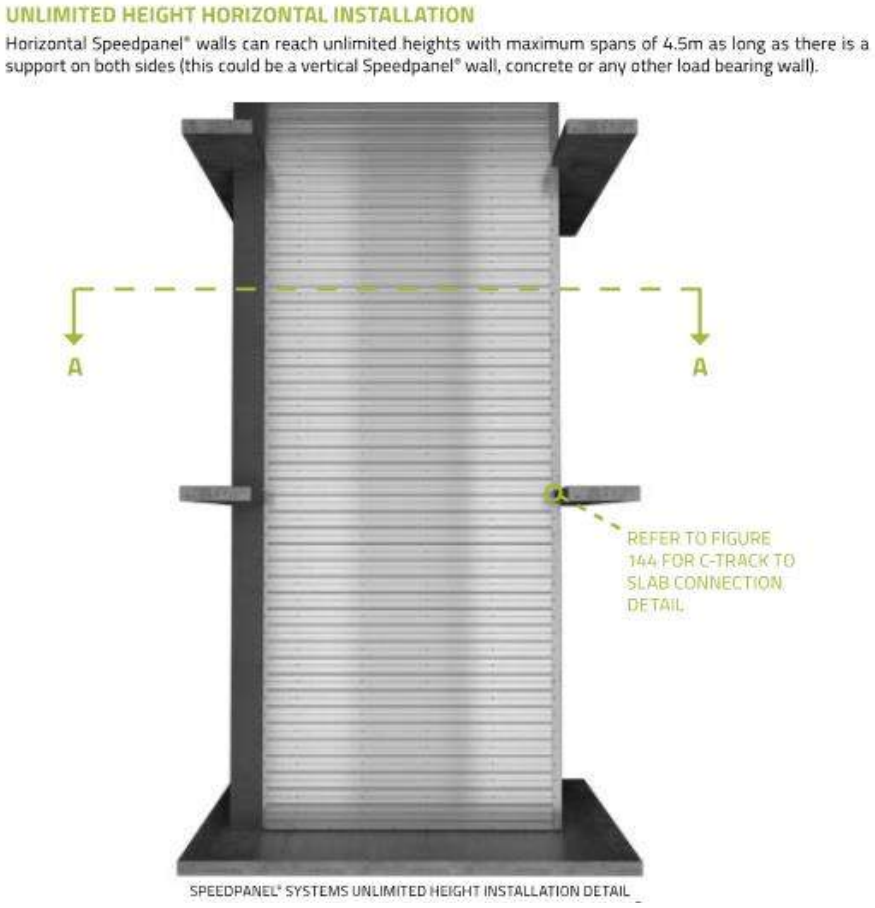


Figure 1: Horizontal Installation Detail

T-Intersections

Panel to Structure

Horizontal Speedpanel (panel to structure) must have:

- 10G x 35mm SDS screws fixings on both sides of the sides of the side C-tracks at 250mm centres into every panel joint on both sides Refer Figure.
- M6.5 x 50mm mushroom head spike into structure at 500mm centres into every panel joint. (Under 5.0m in height).
- M6.5 x 50mm mushroom head spike into structure at 250mm centres into every panel joint. (Over 5.0m in height).
- Sealant applied as per Figure.

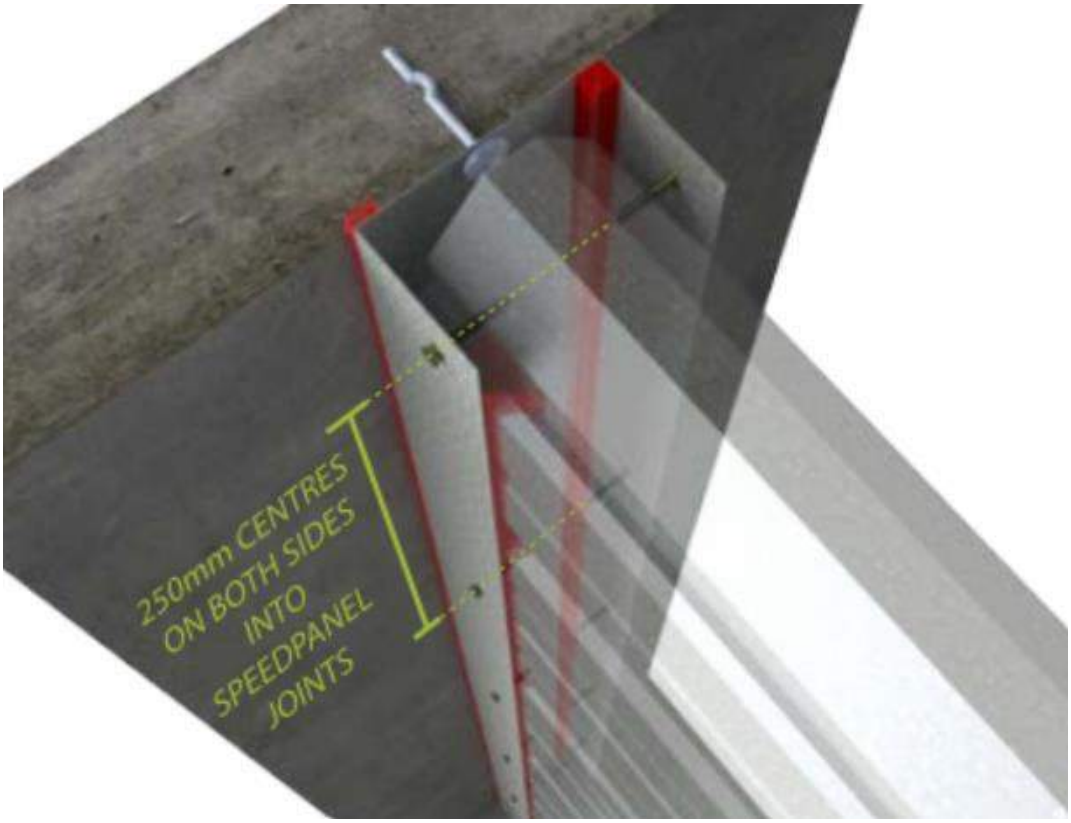


Figure 2 Speedpanel T-Intersection Detail

Panel to Panel (C-Track)

Horizontal Speedpanel (C-Track) must have:

- Have 35mm SDS screws at 250mm centres into every panel joint at both sides.
- Sealant applied as per Figure.

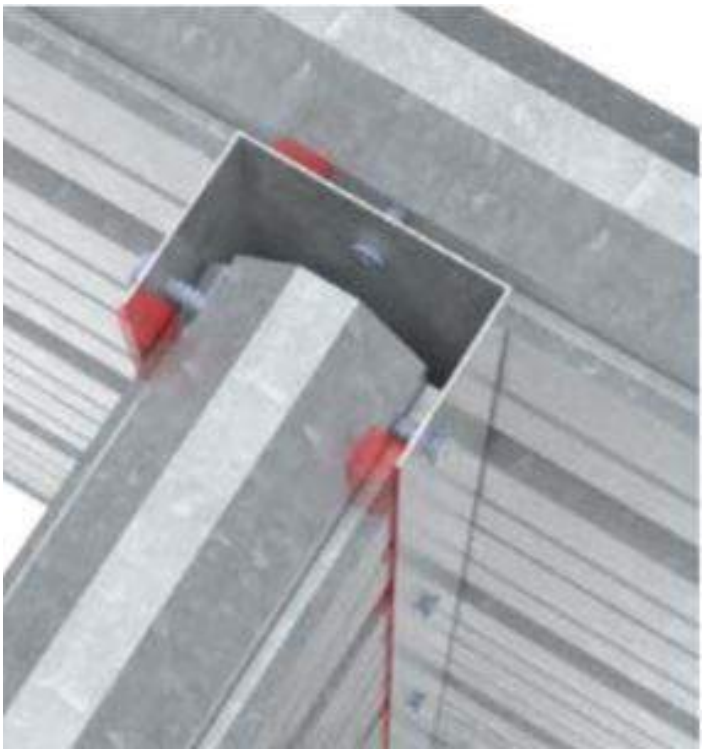


Figure 3 Speedpanel C-Track

Panel to Panel (Angle)

Horizontal Speedpanel (angle) must have:

- 50 x 50 x 1.2mm angle and 35mm SDS screws at 250mm centres into every panel joint at both sides.
- Sealant applied as per Figure.

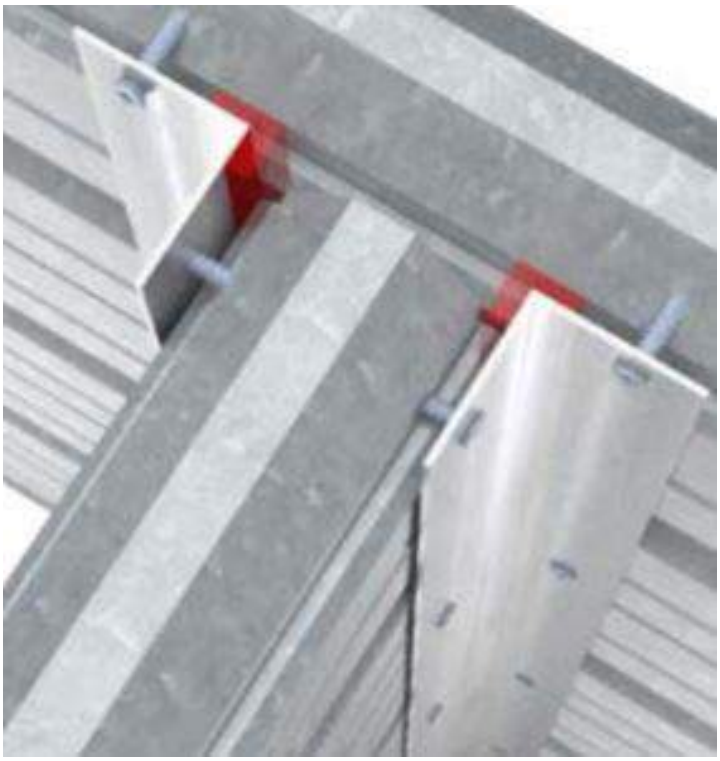


Figure 4 Speedpanel Angle Detail

Panel to Panel (Alternative)

Horizontal Speedpanel (alternative) must have:

- SDS 14 Gauge 20tpi x 115mm and 50 x 3mm steel washer at every 250mm centres.
- Sealant applied as per Figure.

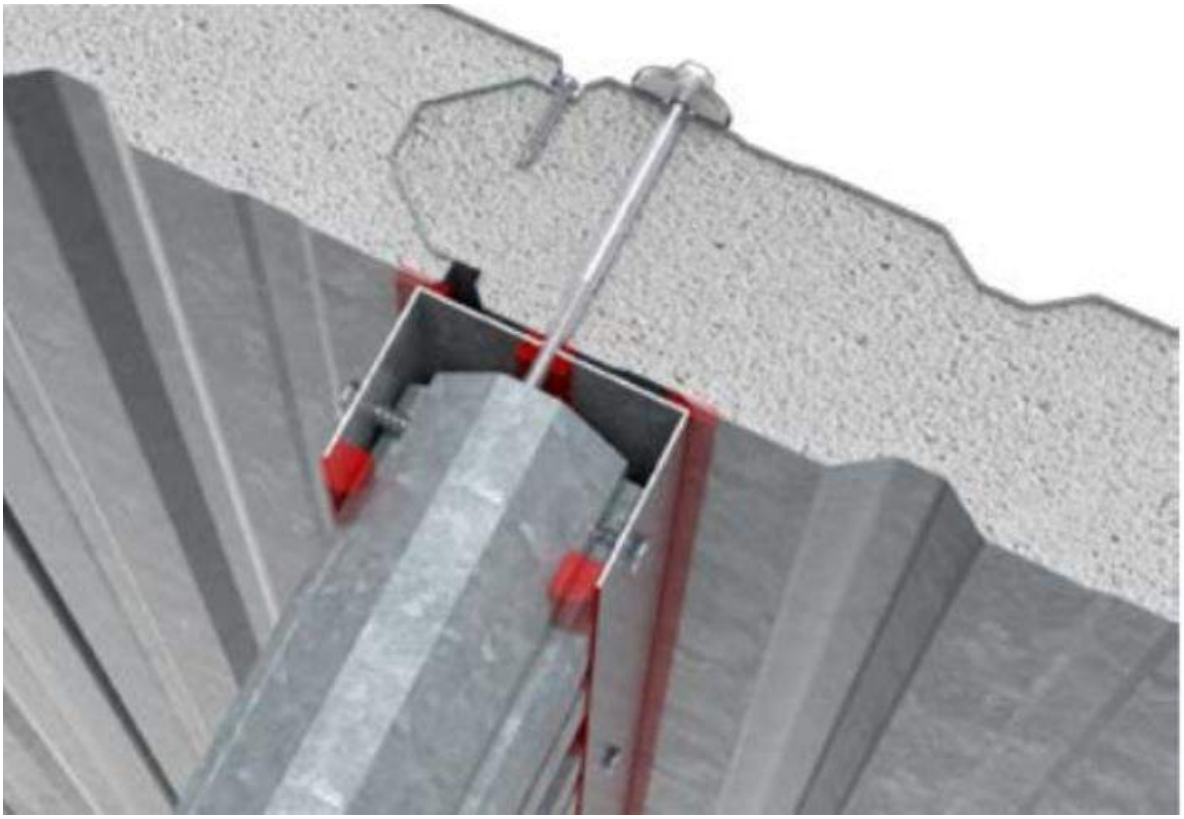


Figure 5: Speedpanel Intersection Detail

Corners

Horizontal Panel to Vertical Panel

Corner Horizontal Panel to Vertical Panel Detail must:

- Have C-tracks secured at 250mm centres with 10 gauge x 16mm long SDS screws.
- Have mild steel angle 50mm x 50mm x 1.2mm BMT secured at 250mm centres.

- Have an approved Fire rated sealant applied between each panel.

The C-tracks are to be secured together at 250mm centres through both sides and the skin of the next panel with a pair of 10 gauge x 16mm long SDS screws. On the inside of the junction a mild steel angle nominally 50mm x 50mm x 1.2mm thick will be secured at 250mm centres to each panel.

The approved fire-rated sealant must be applied between panels, under the angle section and between the end of the panels and C-tracks, as well as between C-tracks, as shown below.

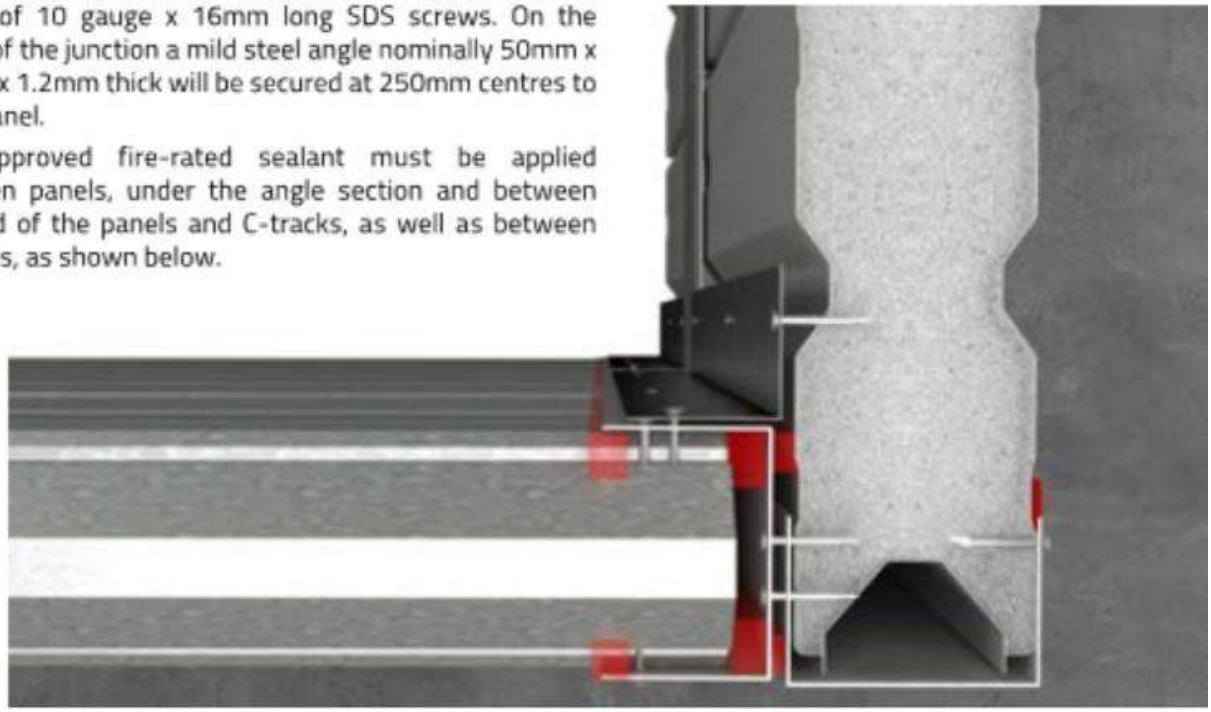


Figure 6 Speedpanel Corner Detail

Pressurised Shafts

Speedpanel walls that need to be pressurised must:

- Have a bead of sealant applied around the wall perimeter on the inside and outside of the C-tracks.
- Have the sealant along each Speedpanel joint.

Figure 7 SpeedPanel Pressurised Shaft

1.6.2 Penetrations:

Refer to speed panel walls

1.7 Concrete Masonry

Key Considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Element Material FRL (i.e. wall, floor, ceiling)
- Service Material FRL (i.e. penetrating a compartment, FRL)
- Fire/smoke stopping system (as per MPX schedule)

1.7.1 Blocks and Joints

Blocks

- Blocks must be:
    - As per the approved samples.
        - 2 hour rated block - 30mm wall thickness
        - 4 hour rated block - 60mm wall thickness
    - Installed in accordance with section Concrete Masonry (Blockwork)

Figure 1: Standard Concrete Blocks

Control Joints

- Fire rated sealant and backing rod must be applied at head of walls and at all control joints.
- Control joints must be installed as per Architectural and Structural Engineer's drawings.

1.7.2 Penetrations

Blockwork (Structural Adequacy)

- Circular penetrations must be cored or drilled to ensure consistent annular gap is maintained for fire sealant application.
- Penetrations greater than 400mm must have a lintel/bond beam with drawings signed off by the Structural Engineer.
- Service penetrations must be coordinated with wall structural support systems such as wall stiffeners.

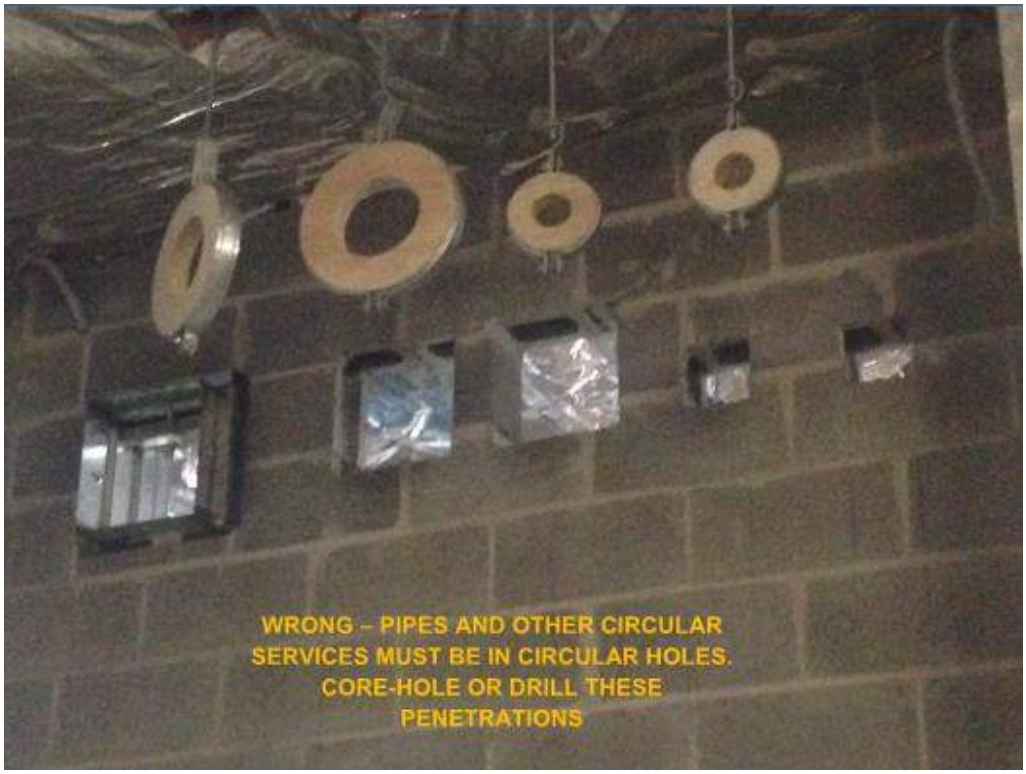


Figure 2: How not to prepare a concrete block wall for penetrations

Cable Penetrations

Single Cable

Single cables must be:

- Installed in accordance in accordance with the evidence of suitability which should:
  - Have a 50mm separation between any other penetration
  - Be sealed
  - Have a uniform annular gap (Note max and min gap)

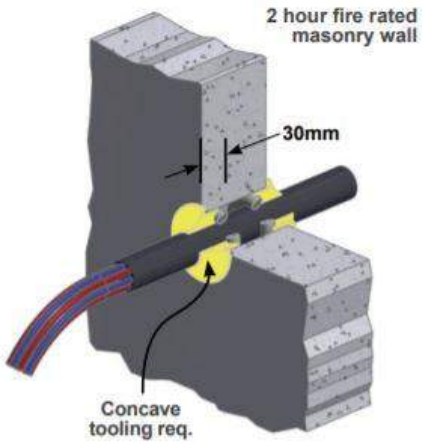


Figure 3 Example of a Single Cable through a Masonry Wall

Bundled Cables

Bundled cables must be:

- Installed in accordance with the evidence of suitability which should:
    - Have a 50mm separation between any other penetration
    - Be sealed
    - Installed with the the maximum size of bundled cables considered
    - Be fixed with steel fasteners (surface mounted collars only).

Cables on Trays

Cable trays must be:

- Installed in accordance with the evidence of suitability which should:
    - Have hangers installed 150mm maximum from either side of the wall.
    - Be wrapped either side to maintain insulation criteria.

Figure 4 Example of Cable Tray through a Masonry Wall

Conduits

- Conduits must be:
- Installed in accordance with the evidence of suitability which should:
    - Have either a intumescent sealant or fire collar fixed with steel fasteners
    - Smoke sealed internally when passing through 2 compartments or more
    - Have a separation between any other penetrations.
- Note: size limitations may apply to some fire stopping systems:
- Promat Conduit Collar = Max. 32mm conduit.
- Trafalgar Fyrechoke Collars = Max. 40 mm conduit

Figure 5 Example of a conduit installed through a masonry wall

Hydraulic Pipework

Combustible ie. PVC

Combustible pipework must be:

- Installed in accordance with the evidence of suitability which should:
    - Be installed with a retrofit collar or through collar (in wall-type) as per evidence of suitability with steel fixings / anchors.
    - Have a 10-15mm annular gap
    - Be sealed
    - Have a separation between any other penetrations.

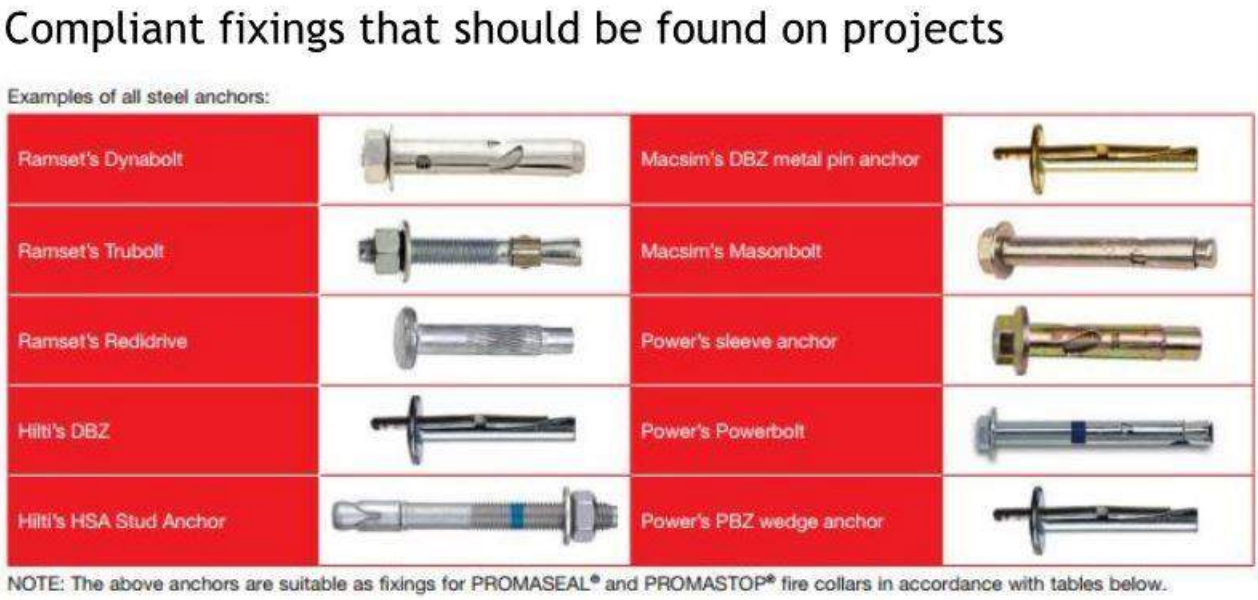


Figure 6: Example of all steel anchors

Non-Combustible i.e. Copper

Non-combustible pipework must be:

- Installed in accordance with the evidence of suitability which should:
    - Be wrapped with insulation from the surface of the wall to maintain FRL insulation criteria.
    - Have a minimum 100mm clearance around the pipe from any combustible material for a length of 2m vertically (refer Figure).
    - Be wrapped with insulation though the wall for chilled or hot water pipe to maintain insulation criteria.
    - Be sealed
    - Have a separation between any other penetrations.

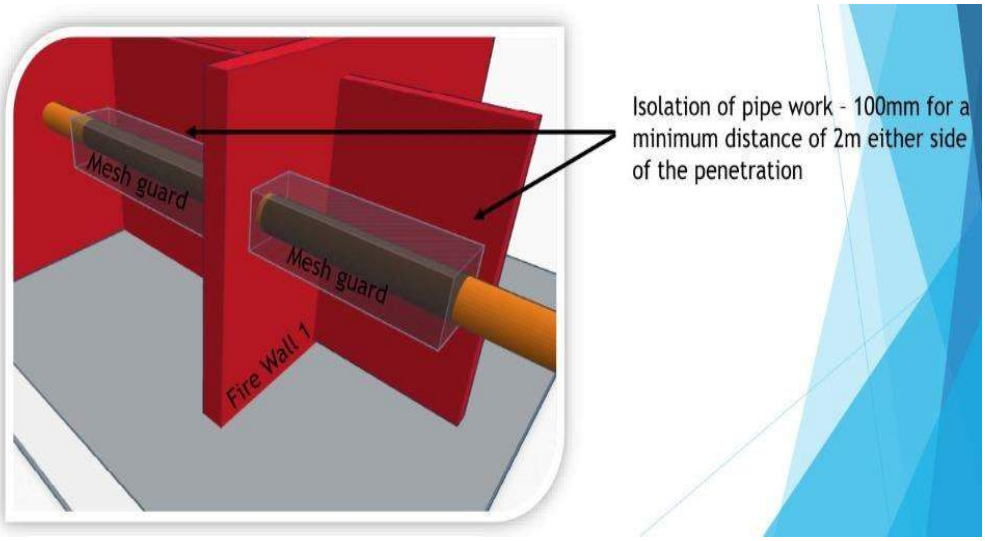


Figure 7 Example of non-combustible pipe through a masonry wall

Fire Dampers

Fire dampers must be:

- Installed in accordance with the evidence of suitability which should:
  - Have hangers 150mm maximum from either side of the wall must be installed.
  - Have a separation between any other penetrations.
  - Installed as per section Fire Dampers.

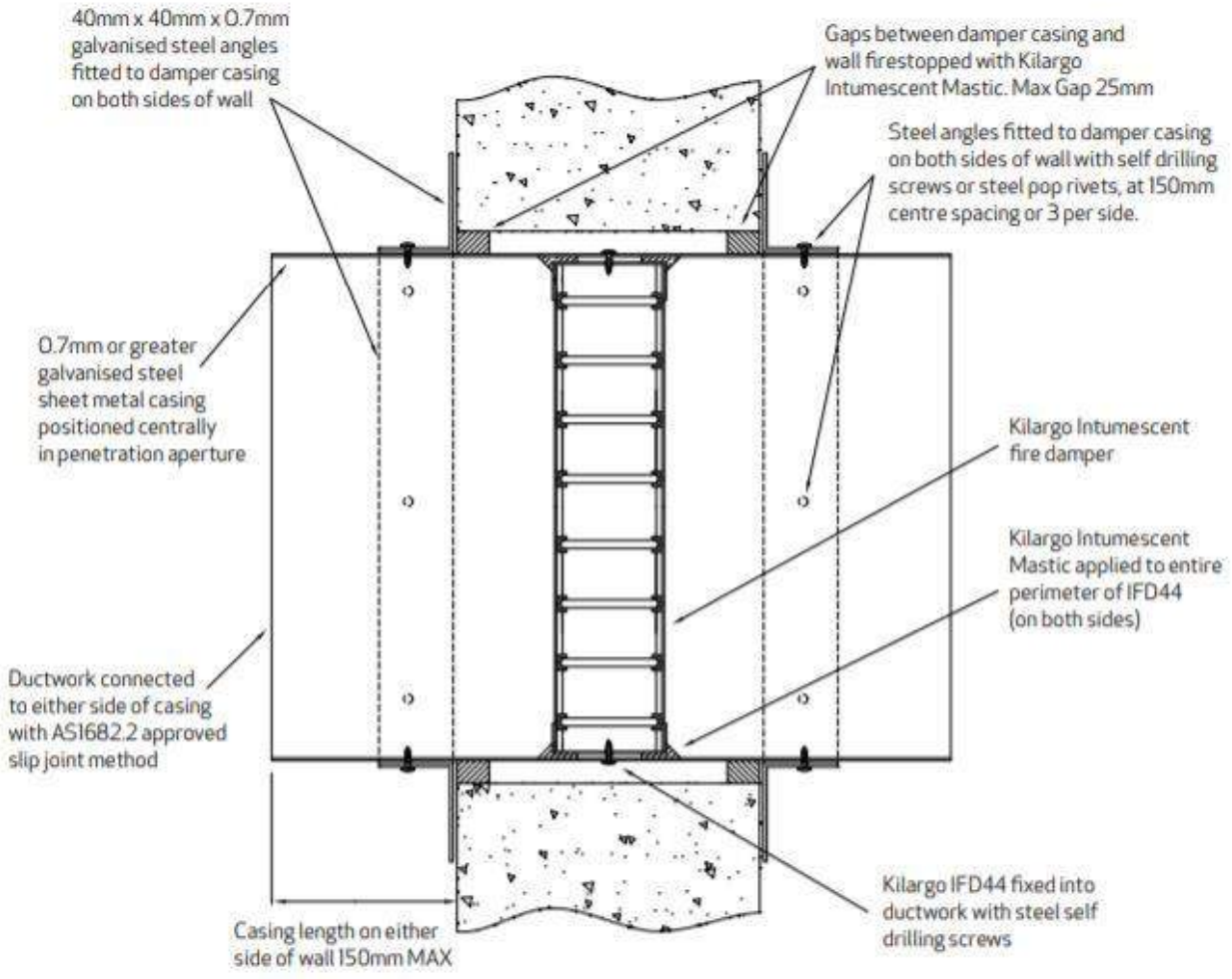


Figure 8 - Example of a Fire Damper installation (Source: Kilargo)

1.8 Concrete Floors

Key Considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Element Material FRL (i.e. wall, floor, ceiling)
- Service Material FRL (i.e. penetrating a compartment, FRL)
- Fire/smoke stopping system (as per MPX schedule)

1.8.1 Penetrations

What is a fire collar?

A fire collar is a type of fire-resistant fitting that maintains the integrity and fire insulation rating of a building element which has been penetrated by building services.

Cast in collars that are placed in position before concrete is poured/applied:

- on the underside of masonry slabs, finishing flush with the slab.
- either side of masonry or plasterboard walls

Retrofit collars that clip around existing pipes and are installed:

- on the underside of masonry slabs
- on either side of walls

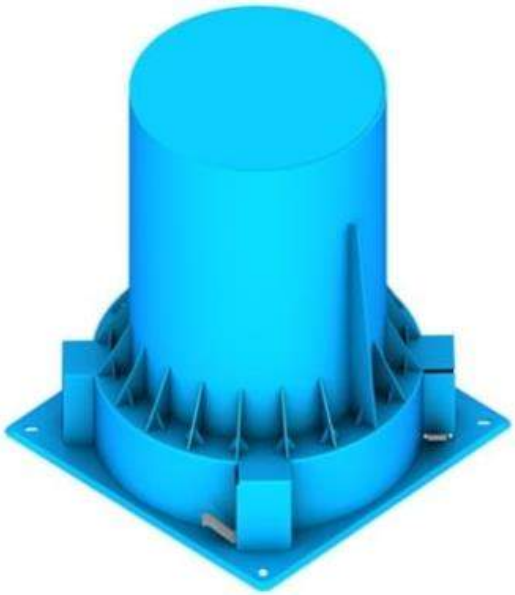


Figure 1: Cast in floor collar

Insert slab retro fit

Figure 2: Retro-fit floor waste collar

What is the difference between a floor collar and a stack collar?

Floor collars are required to close in a shorter duration than stack collars and thus generally have springs or other mechanisms to assist in faster closing time.

Figure 3: Floor Waste Fire Collar

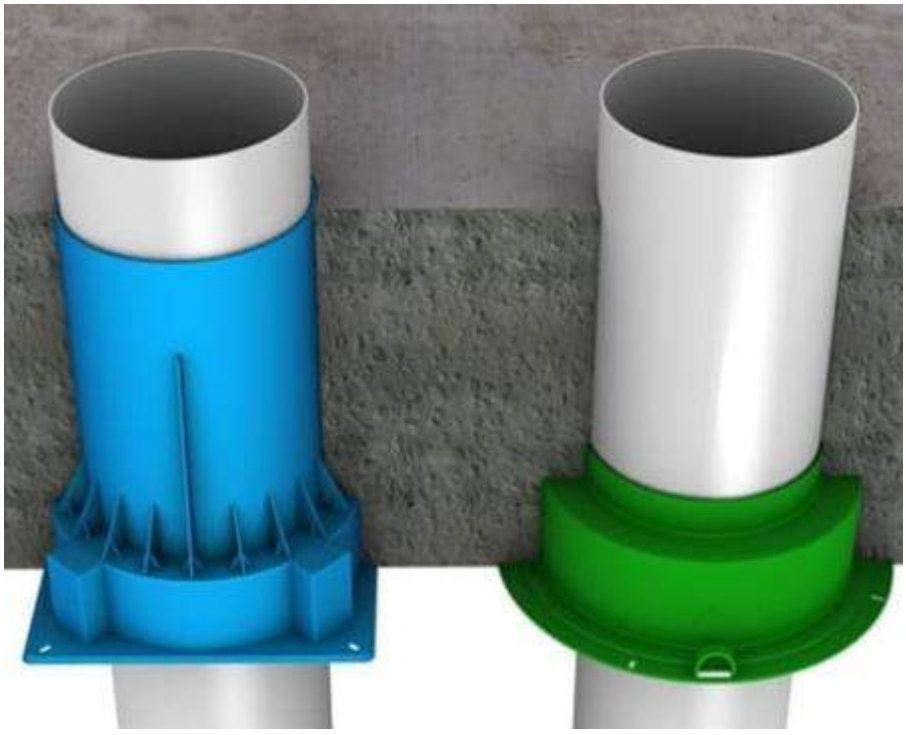


Figure 4: Stack Collar

Why is a fire collar required?

Fire collars are required when fire walls or floors are penetrated by cables, ducts, pipework etc. In this situation, the fire rating of the wall or floor can be reduced by the penetration as it can provide a path that allows the fire to spread beyond the compartmentation that has been designed to contain it.

Fire collars contain an intumescent material that expands and seals against flames, smoke and hot gases when plastic piping melts, thereby ensuring fire resistant integrity for the required period.

Hydraulic Pipework

Combustible, i.e. PVC

Combustible pipework must be:

- Installed in accordance with the evidence of suitability
- Installed with a collar

Collars must:

- Be as per the approved sample.
- Siliconed under the formwork.
- Have a min of separation from the edge of any other penetration as per structural engineers details
- Ensure that the insulating material does not compromise the ability of the collar to operate.
- Ensure that the concrete slurry does not leach into the collar.
- Ensure the hole for the penetration is cut correctly to allow the mechanism to function where metal formwork systems have been used,
- Be installed with steel fixings / anchors

Figure 5 Example of a fire collar

Figure 6: Example of steel anchors

Non-Combustible ie Copper

- Non-combustible pipework must be:
- Installed in accordance with the evidence of suitability which should:
    - Be wrapped with insulation from the surface of the floor to maintain FRL insulation criteria or
    - Have a minimum 100mm clearance around the pipe from any combustible material for a length of 2m vertically (refer Figure).
    - Be wrapped with insulation though the floor for chilled or hot water pipe to maintain insulation criteria.
    - Be sealed
    - Have a min of separation from the edge of any other penetration as per structural engineer's details.

Cable Trays

- Cable trays must be:
- Installed in accordance with the evidence of suitability which should:
    - Be filled with pillows, batts or equivalent
    - Be sealed
    - Be wrapped for a length of 2 metres from the top of the slab to maintain insulation criteria
    - Have a min of separation from the edge of any other penetration as per structural engineer's details.

Conduits

Conduits must be:

- Installed in accordance with the evidence of suitability which should:
    - Have either an intumescent sealant or fire collar fixed with steel fasteners.
    - Be smoke sealed internally when passing through 2 compartments or more.
    - Have a min of separation from the edge of any other penetration as per structural engineer's details.

Note: size limitations may apply to some fire stopping systems:

- Promat Conduit Collar = Max. 32mm conduit.
- Trafalgar Fyrechoke Collars = Max. 40 mm conduit.

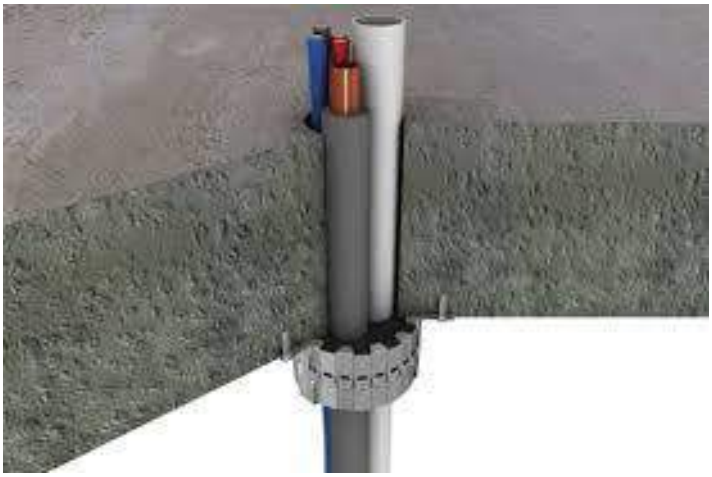


Figure 7 Example of a conduit through a masonry floor

Fire Dampers

Fire dampers must be:

- Installed in accordance with the evidence of suitability which should:
  - Have a min of separation from the edge of any other penetration as per structural engineer's details.
  - Be wrapped for a length of 2 metres from the top of the slab to maintain insulation criteria.
  - Be installed as per section Fire Dampers.

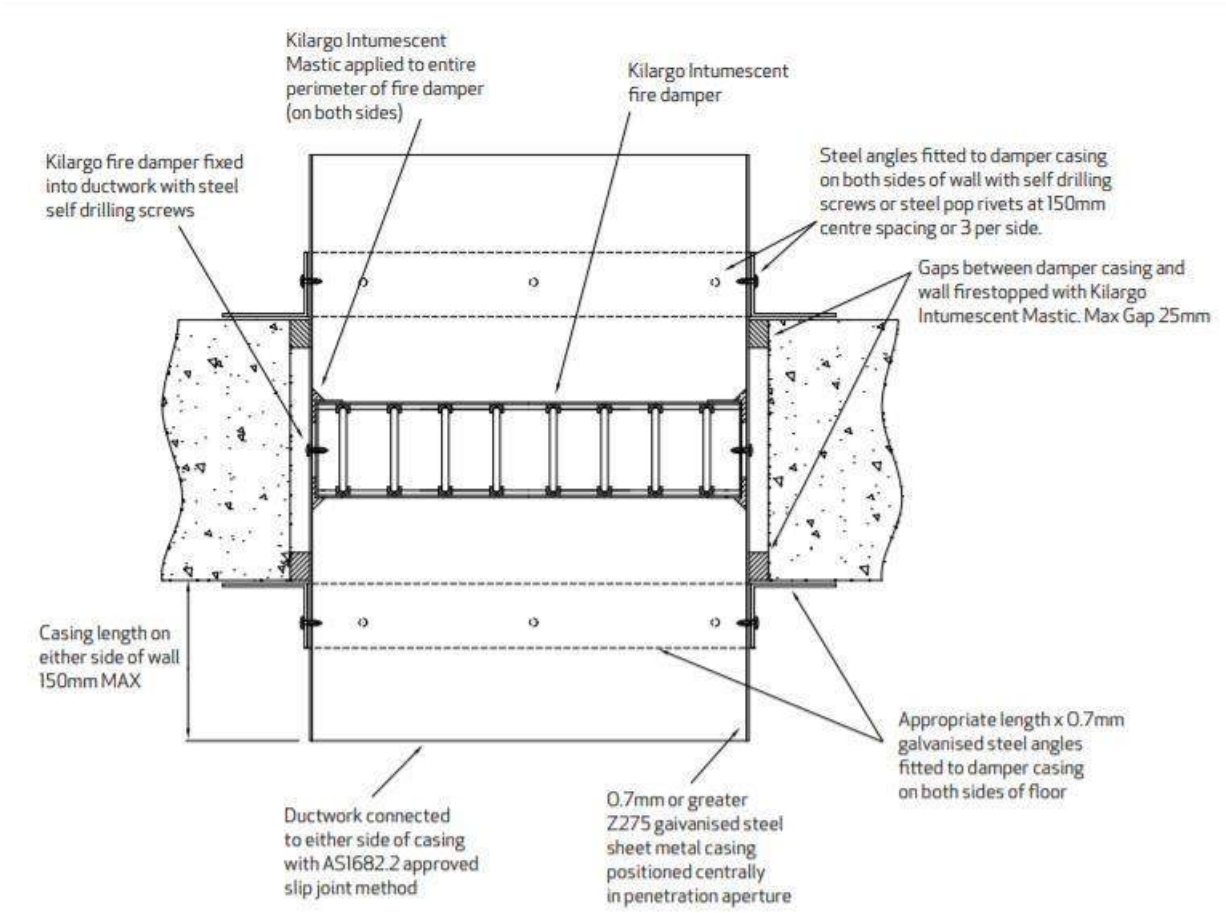


Figure 8 Example of a Kilargo damper through a concrete floor

Multi-Services

Multi-services through one penetration utilising products such as the BOSS Fire® Transit Box must:

- Be installed in accordance with the manufacturers' installation details.

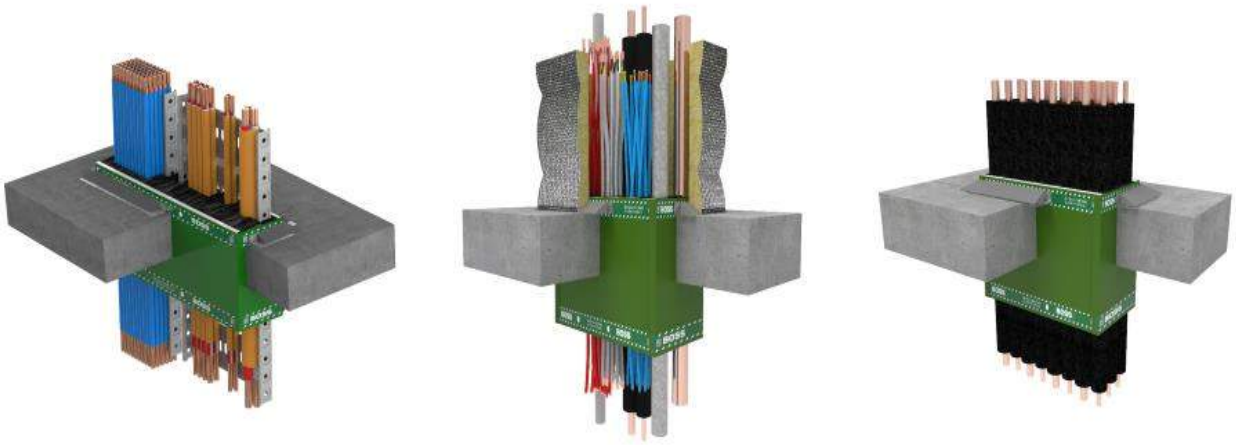


Figure 9: BOSS Fire® Transit Box:

1.9 Fire Resistant Door Sets

Key Considerations

- Compartmentation Plans - Fire & Smoke
- Fire Resistance Level (FRL)
- Interface between framing and wall (i.e. plasterboard, masonry)
- Filling of frames (insulation)

What are fire resistant door sets?

Fire resistant door sets are a complete assembly consisting of:

- A steel or timber frame, and
- Door leaf/s, and
- Hardware,

That have all been tested together to AS1530.4 and achieved a FRL.

Fire resistant door sets:

- May be sliding or side hung.
- Must be designed and manufactured to AS1905.1 for side hung doors and AS1905.2 for sliding doors.
- Are generally made with a core of fire resistant material which incorporates steel plates at the fixing points of the hinges, timber edges strips, a door closer and latch. It is then sheeted both sides with facing sheets made of reconstituted timber and/or other materials.

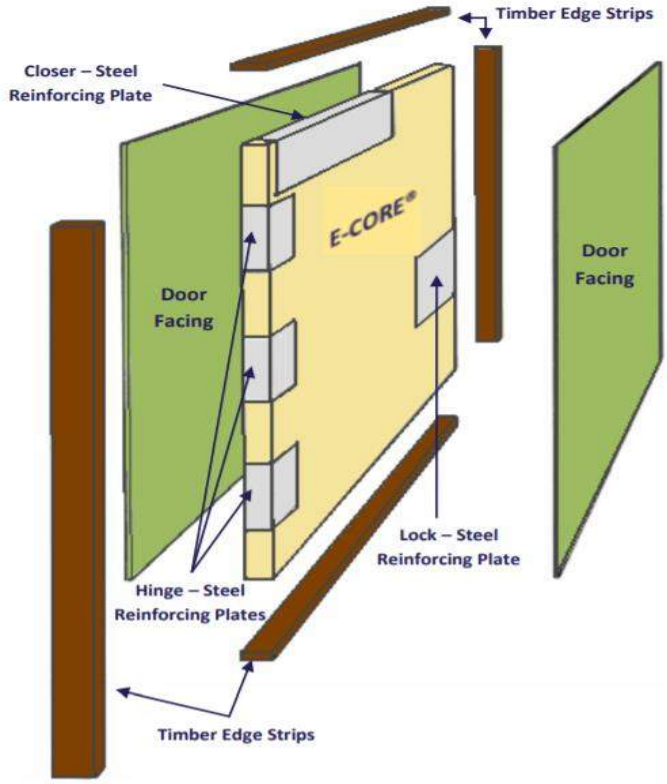


Figure 1: Exploded View of a Fire Resistant Door Leaf, E-Core Fire Door Handbook

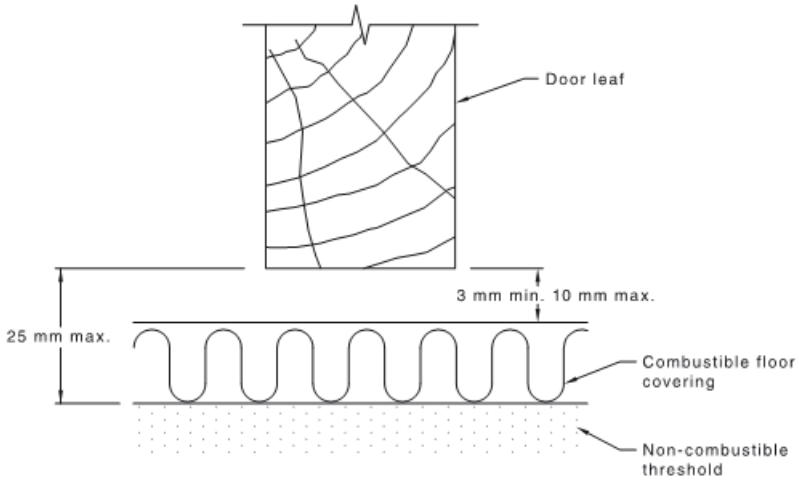
Why is a fire resistant door set required?

- Fire resistant door sets form part of the building's passive fire protection system and is used to protect the openings in fire resistant walls.
- It is a critical as part of building fire protection system designed to reduce the spread of fire and smoke between separate compartments of a structure and to enable safe egress from a building or structure.

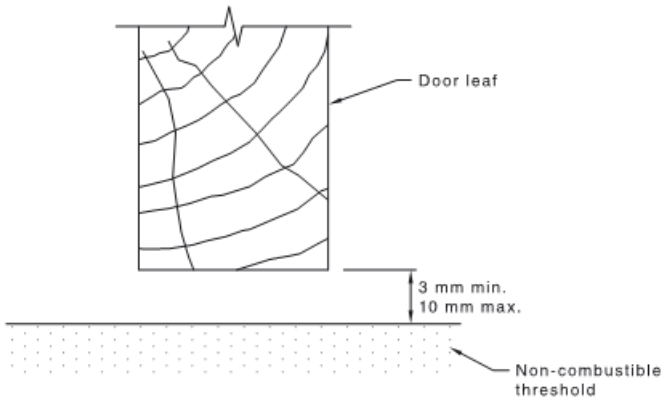
1.9.1 Installation

- Door sets used must be installed as per approved sample and supplied test report/evidence of suitability.
- Door leaf clearances must be as per Clause 5.5 of AS1905.1, i.e. a maximum 10mm gap at the bottom of the door leaf to the Finished Surface Level (FSL) and a maximum of 25 mm gap on the bottom of the door to the non-combustible sill, i.e. a concrete slab, unless the door set has been tested otherwise.

AS 1905.1:2015 26



(a) With a combustible floor covering



(b) Without a combustible floor covering

FIGURE 5.5.1 CLEARANCES TO FLOOR

Figure 2: Fig 5.5.1 from AS 1905.1

- Sides and top must have gaps of an average of 3mm.
- Fill door frames as per tested specimen
- Frames must:
    - When grouted, have no hollow sounds when tapped
    - In plasterboard walls, filled with plasterboard strips or grouted, but not a combination of the two.
- Fixings of the steel doorframes must generally be not greater than 300 to 400mm centres into the supporting structure. Refer to the manufacturer's literature to confirm fixing requirements.
- Completed installations must be tagged strictly in accordance with AS1905 with metal tags a minimum size of 50 x 25 mm and nailed or riveted in place and include the following information:
    - Number of the performance standard
    - FRL
    - Name of the manufacturer
    - Name of the applicant (or sponsor)
    - Name of the certifier/surveyor
    - Year of manufacture
    - Serial number (or door set number)
- Lettering must be done by etching, embossing or stamping
- Tags must be installed at 1500 mm above floor level:
    - To the door frame near the door leaf tag,
    - On side hung doors, fixed to the hinge stile,
    - On two leaf door sets, fixed to both leafs on the hinge stile,
    - On sliding door sets, fixed to the trailing edge.

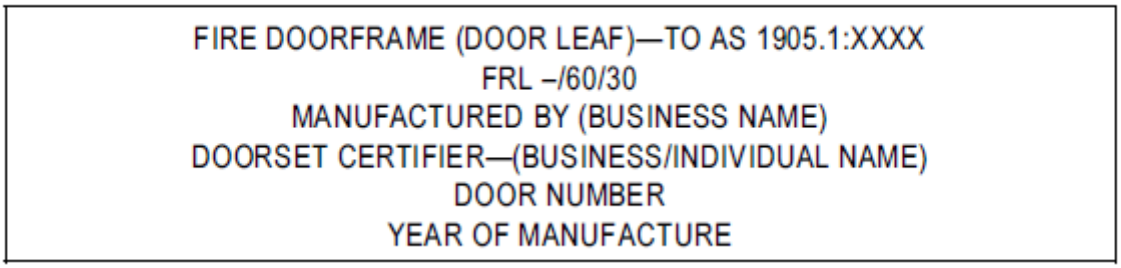


Figure 3: Doorframe and door leaf tag