Promat

PASSIVE FIRE PROTECTION SYSTEMS
Application & Technical Manual:
Cavity & Smoke Barriers, Parapet & Spandrel Walls

For Promat Asia Pacific Organisation • February 2014

PASSIVE FIRE PROTECTION SYSTEMS Application & Technical Manual: Cavity & Smoke Barriers, Parapet & Spandrel Walls – Contents

PROMINA® 60 fire resistant smoke barriers at the Carrefour warehouse in Klang, Malaysia.

The purpose of a cavity and smoke barriers is to prevent the spread of smoke and flame from penetrating and/or moving within a concealed space in a fire compartment. Documents supporting the regulations provide guidance on where such barriers should be located within hidden voids in a building and they usually give examples of deemed-to-satisfy barriers for voids in or above stud walls or partitions.

If a barrier in a concealed space coincides with a compartment wall or floor it will normally be required to provide the same fire performance as the wall or floor. If the barrier is located between such compartment walls or floors however, the barrier is defined as a “cavity barrier” and will normally only be required to provide 30 minute integrity and 15 minute insulation (depending on local building regulations).

A large cavity barrier is defined as a barrier across a void in which a square with 1000mm sides can be accommodated. A small cavity barrier is one in which such a square cannot be accommodated. A large cavity barrier is required to provide 30 minute integrity and 15 minute insulation while a small cavity barrier need only provide 30 minute integrity.

Cavity barrier definitions are also dependent on the requirements of local building regulations.

A parapet is a low standing wall above a roof, on top of either an external wall or a fire separating wall. A parapet wall is supposed to prevent fire venting through the roof on one property and crossing over the separating wall down into any adjacent property.

A spandrel panel is used generally as part of curtain walling systems. The spandrel panel generally protects vertically up from the top of a floor slab, or down from the underside of a floor slab.

Spandrel panels are supposed to deflect fire and prevent spread of flames via the ends of floor slabs.

A spandrel wall is designed to form a separator at any part of a window or an opening in an external wall above another opening in the storey below. The vertical construction projects no further than 450mm outside the lower opening.

Any structural element to which the spandrel wall system is affixed must have a minimum equivalent fire resistance.

Regulatory documents also provide guidance where cavity and smoke barriers are applicable in open and large areas like atrium where the requirement to limit the smoke and flame movement is required.

Clockwise from above
Fire resistant spandrel walls and cavity closers between floor slabs and curtain walls at Kim Chuan Depot at Paya Lebar in Singapore, Samsung Tower in Church Street, Singapore and a tobacco plant in Tsingtao, China.

Opposite page
PROMINA®-HD smoke screens at the departure hall of Terminal 3, Changi International Airport, Singapore.

Fire Resistant Test Standards

Cavity Barriers

Cavity barriers should normally be tested* or assessed in accordance with BS 476: Part 22: 1987 and be required to satisfy the failure criteria of integrity and insulation for 30 minutes and 15 minutes respectively when exposed to fire from either side (for exceptions, please see above and local building regulations guidance documents or, if relevant, insurance codes).

It should be noted that in some instances, integrity and insulation criteria not only reflect performance requirements but are in fact considerably higher than those outlined above. For example, if the cavity barrier is situated above or on top of a -/120/120 compartment wall, then this cavity barrier would be required to provide similar fire resistance to the wall below, i.e. -/120/120.

Smoke Barriers

In fire situations, smoke generally kills more people faster than exposure to heat, flames or structural collapse. Most modern buildings today have an engineered smoke control system which frequently involves the use of smoke reservoirs by means of constructing smoke channelling screens and curtains. Smoke reservoirs are used to prevent the lateral spread of smoke and to create a reservoir in which to collect smoke for removal.

Smoke curtains and screens must meet the requirements of BS 7346: Part 3: 1990, which requires the screen to withstand a fire temperature of 600°C (± 20°C) for a minimum of 30 minutes. Promat solutions offer a permanent, easy to install, maintenance free and cost efficient method to meet and exceed the requirements of the above standard.

Parapet & Spandrel Walls

Parapet and spandrel walls should normally be approved in accordance with the criteria of BS 476: Part 22: 1987, which is required to satisfy a minimum fire resistance of 60/60/60 (for exceptions see above and local building regulations guidance documents or, if relevant, insurance codes).

It should be noted that, in some instances, the integrity and insulation criteria for the performance requirements could be considerably higher than mentioned above. For example, if the spandrel wall is situated above a -/120/120 fire resistant wall, then this spandrel wall would be required to provide a similar fire resistance to the wall below.

General Design Consideration

❶ Size of Barrier & Location

As previously noted, there may be occasions when the required performance of the barrier will differ from the general requirement of 30 minutes integrity and 15 minutes insulation. This is certainly the case if a cavity or smoke barrier is located above a compartment wall for example.

❷ Differential Movement

Cavity and smoke barriers are often located between two buildings elements that may move at different rates in normal conditions and/or in the event of a fire, e.g. a floor and a suspended ceiling. The design of the barrier must therefore allow for such movement while still maintaining the required levels of fire performance.

❸ Service Penetrations

To maintain fire and, where applicable, acoustic performance of the barrier system, perimeter gaps must be filled with a suitable caulking material. PROMASEAL®-A Acrylic Sealant or other tested* fire and acoustically rated material of equivalent or better performance must be used.

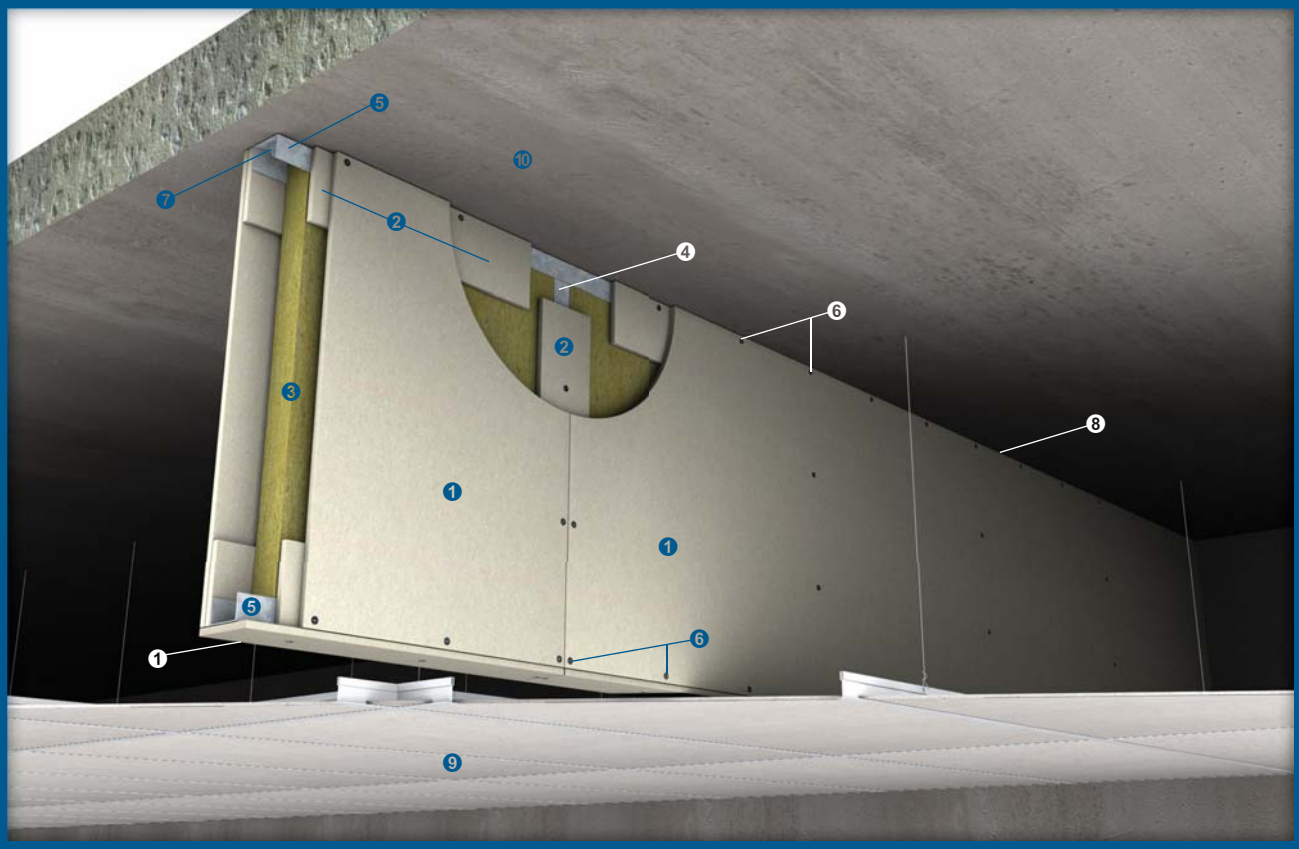
Care needs to be taken in detailing a suitable fire stopping system around any penetration of the barrier by services. Allowance should be made for movement of the services in both ambient and in fire conditions to ensure loads are not applied to the cavity barrier.

Please see separate documents for details of the PROMASEAL® and PROMASTOP® fire stopping range from Promat.

❹ Adjoining Structure

It is essential that the surrounding building elements, e.g. roof, floor or walls, do not collapse in the event of a fire. A cavity barrier in a roof space, for instance, will require that the roof truss to which it is secured is also protected to prevent collapse when exposed to fire for at least 30 minutes, or the regulatory performance requirement, whichever is the longer period of time.

* “Tested” is defined as the use of an alternative sealant which has been shown to provide adequate performance by being subject to a certified, standard fire test in conjunction with the relevant Promat system.



Up to -/60/60 fire resistance in accordance with the requirements of BS 476: Part 22: 1987

1. PROMINA® 60 board 9mm thick at each side and bottom
2. PROMINA® 60 cover fillet 100mmn x 9mm thick
3. For minimum -/30/30 fire resistance: No mineral wool is required
   For minimum -/60/60 fire resistance: Mineral wool 50mm thick x 40kg/m³
4. Vertical galvanised steel channel 50mm x 35mm x 0.6mm thick at nominal 610mm centres
5. Top and bottom galvanised steel channels each of 50mm x 25mm x 0.6mm thick
6. 35mm long self-tapping screws at maximum 200mm centres
7. 30mm long M6 anchor bolts at maximum 600mm centres
8. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
9. Existing suspended ceiling construction
10. Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the cavity barrier system

NOTE: Care should be taken that the framing sections (4 and 5) AND the length and centres of anchor bolts (7) are suitable for supporting the proposed height and weight of this cavity barrier system under fire conditions

Up to -/60/60 fire resistance in accordance with the requirements of BS 476: Part 22: 1987

1. PROMINA® 60 board 9mm thick at each side and top, constructed in strict accordance with manufacturer's recommendations
2. PROMINA® 60 cover fillet 100mmn x 9mm thick
3. For minimum -/30/30 fire resistance: No mineral wool is required
   For minimum -/60/60 fire resistance: Mineral wool 50mm thick x 40kg/m³
4. Vertical galvanised steel channel 50mm x 35mm x 0.6mm thick at nominal 610mm centres
5. Top and bottom galvanised steel channels each of 50mm x 25mm x 0.6mm thick
6. 35mm long self-tapping screws at maximum 200mm centres
7. 30mm long M6 anchor bolts at maximum 600mm centres
8. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
9. Mild steel L-bracket at 1220mm centres to brace support upstand to the cavity barrier system
10. Masonry or concrete supporting construction, e.g. raised access floor system or platform, with fire resistance equal to or higher than that of the cavity barrier system

NOTE: This cavity barrier system is NOT suitable for use where there may be any differential movement between the elements of construction in a vertical plane

The following is a standard Architectural Specification for a cavity barrier system constructed using PROMINA® 60. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

30 or 60 minutes fire resistance, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the cavity barrier system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMINA® 60 matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

The steel framework consists of top and bottom horizontal steel channels, and vertical studs 50mm x 35mm x 0.6mm thick, at nominal 610mm centres. The top and bottom horizontal channels are of minimum size 50mm x 25mm x 0.6mm thick for barrier depths/heights up to 3000mm.

For barriers within ceiling voids, the top channel is fastened to the concrete soffit with M6 steel anchors 30mm in length, at maximum 600mm centres. The vertical studs are fastened to the top channel with two steel pop-rivets or two steel self-tapping screws on both sides of each stud. The bottom horizontal channel is fastened to the bottom of each stud with one steel pop-rivet or one steel self-tapping screw on both sides of each stud.

For barriers within floor voids, the bottom channel is fastened to the concrete floor with M6 steel anchors 30mm in length, at maximum 600mm centres. The vertical studs are fastened to the bottom channel with two steel pop-rivets or two steel self-tapping screws on both sides of each stud. The top horizontal channel is fastened to the bottom of each stud with one steel pop-rivet or one steel self-tapping screw on both sides of each stud.

Care should be taken that the framing sections (vertical, top and bottom horizontal steel channels) and the length and centres of M6 steel anchors are suitable for supporting the proposed height and weight of the barrier system under fire conditions.

For -/60/60 minute fire resistant system, mineral wool of 50mm thick x 40kg/m³ nominal density is used within the cavity of the barrier system.

Cover strips made of 100mm wide x 9mm thick PROMINA® 60 board are fixed to each face, i.e. the top, bottom & vertical channels.

PROMINA® 60 boards are fixed to both sides of the framework using 35mm self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge. Vertical board joints must coincide with the steel framework and should be staggered between the two faces of the barrier. Horizontal board joints are backed with PROMINA® 60 cover strips 100mm wide x 9mm thick.

For barriers within floor voids, mild steel L-brackets are fixed to the floor at 1220mm centres to brace and support the upstand cavity barrier.

This barrier system is not suitable for use where there may be any differential movement between the elements of construction is a vertical plane.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

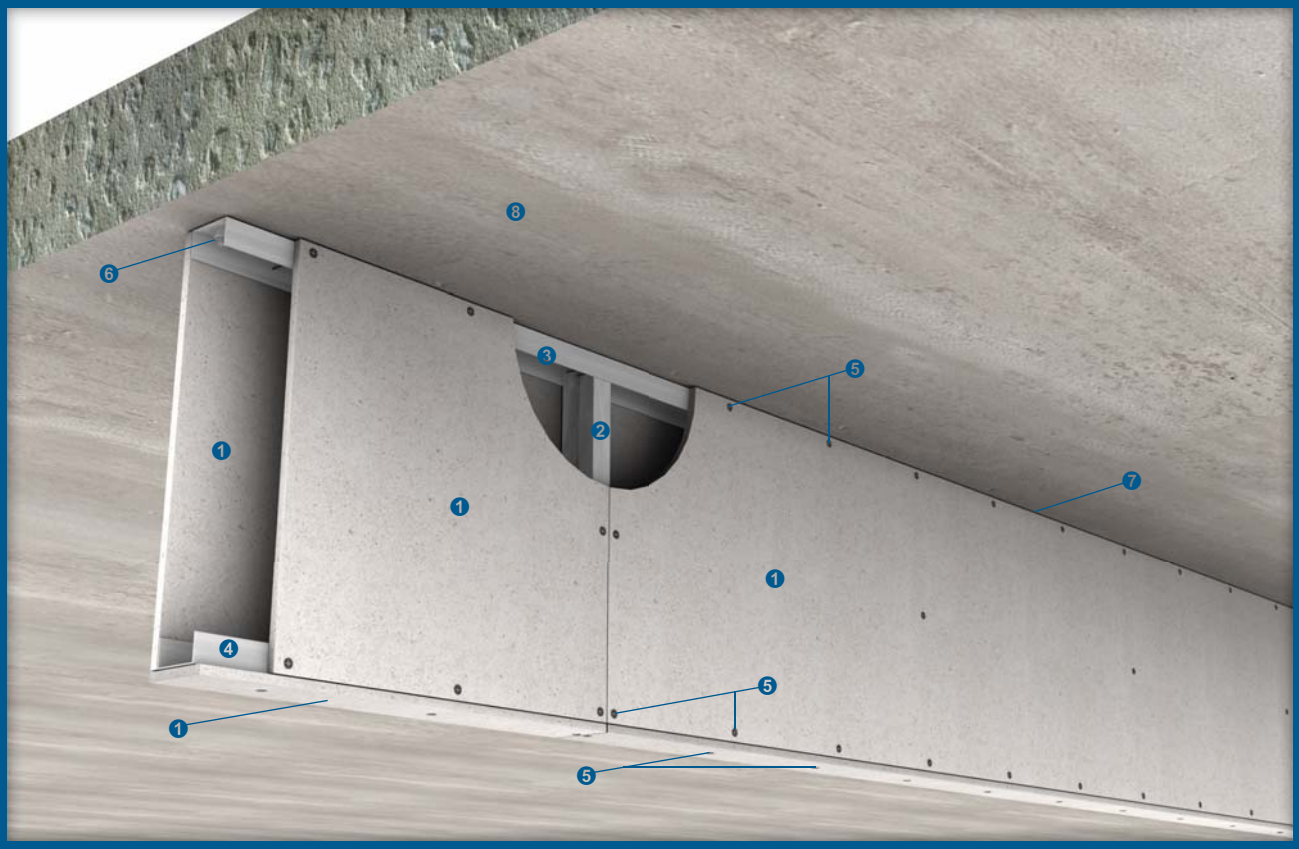
Butt Jointing

Plain butt joints between machined edges of boards.[1]
Joints filled in preparation for painting.[2]
Joints filled and taped in preparation for decoration.[3]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[4] in accordance with manufacturer's recommendations.

NOTE:
- [1], [2], [3], [4] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/60/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

1. PROMATECT®-H board 9mm thick at each side and bottom
2. Vertical galvanised steel channel 50mm x 38mm x 0.6mm thick at nominal 610mm centres
3. For barrier height ≤ 1000mm: Top galvanised steel channel 50mm x 38mm x 0.9mm thick
   For barrier height ≤ 2440mm: Top galvanised steel channel 50mm x 38mm x 1.2mm thick
4. Bottom galvanised steel channel minimum 50mm x 38mm x 0.6mm thick
5. 25mm long self-tapping screws at maximum 200mm centres
6. 30mm long M6 anchor bolts at maximum 600mm centres
7. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
8. Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the smoke barrier system

NOTE: Care should be taken that the framing sections (❷, ❸ and ❹) AND the length and centres of anchor bolts (❻) are suitable for supporting the proposed height and weight of this smoke barrier system under fire conditions

The following is a standard Architectural Specification for a smoke barrier system constructed using PROMATECT®-H. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

60 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the smoke barrier system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMATECT®-H matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

The steel framework consists of top and bottom horizontal steel channels, and vertical studs, 50mm x 38mm x 0.6mm thick, at nominal 610mm centres. The top horizontal channel is of minimum size 50mm x 38mm and at least 0.9mm thick for barrier depths up to 1000mm and 1.2mm thick for barrier depths up to 2440mm. The top channel is fastened to the concrete soffit with M6 steel anchors 30mm in length, at maximum 600mm centres. The vertical studs are fastened to the top channel with two steel pop-rivets or two steel self-tapping screws on both sides of each stud. The bottom horizontal channel with similar dimensions to the vertical studs is fastened to the bottom of each stud with one steel pop-rivet or one steel self-tapping screw on both sides of each stud.

Care should be taken that the framing sections (vertical, top and bottom horizontal steel channels) and the length and centres of M6 steel anchors are suitable for supporting the proposed height and weight of the barrier system under fire conditions.

PROMATECT®-H boards are fixed to both sides of the framework with 25mm long self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge. Vertical board joints must coincide with the steel framework and must be staggered between the two faces of the barrier. There are no horizontal board joints.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

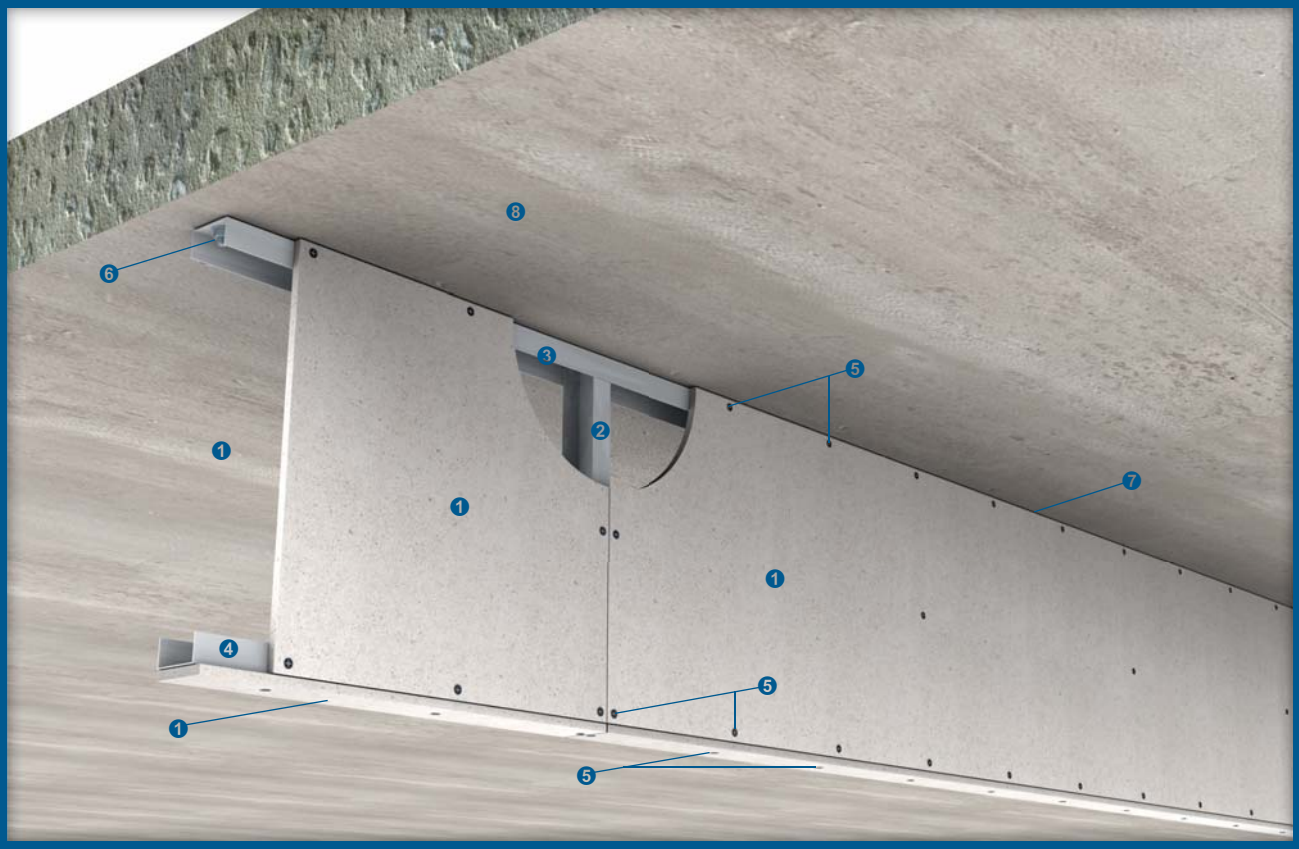
Butt Jointing

Plain butt joints between machined edges of boards.[(1)]
Joints filled in preparation for painting.[(2)]
Joints filled and taped in preparation for decoration.[(3)]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[(4)] in accordance with manufacturer's recommendations.

NOTE:
- [(1), (2), (3), (4)] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/120/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

❶ PROMATECT®-H board 9mm thick at each side and bottom

❷ Vertical galvanised steel channel minimum 50mm x 50mm at nominal 610mm centres, thickness in accordance with table below

❸ Top galvanised steel channel minimum 50mm x 50mm, thickness in accordance with table below, fixed to ❷ using minimum two pieces of ❺ on both sides of the flange

❹ Galvanised steel channel minimum 50mm x 50mm x 0.6mm thick at every horizontal joints, fixed to ❷ using minimum one piece of ❺ on both sides of the flange

❺ 25mm long self-tapping screws at maximum 200mm centres horizontally and at maximum 300mm centres vertically, types in accordance with table below

❻ Anchor bolts at nominal 500mm centres, types in accordance with table below

❼ All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance

❽ Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the smoke barrier system

Barrier height	≤ 2440mm	≤ 3660mm	≤ 4000mm
Galvanised steel channel thickness of ❷ and ❸	1.2mm	1.6mm	1.6mm
Screw type of ❺	M4	M5	M5
Anchor bolt type of ❻	M6	M8	M8

The following is a standard Architectural Specification for a fixed smoke curtain system constructed using PROMATECT®-H. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

120 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the fixed smoke curtain system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMATECT®-H matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

The top steel channel, minimum of 50mm x 50mm x 1.2mm is fastened to the concrete floor soffit with minimum M6 steel anchor bolts at 500mm centres. Steel C-section vertical studs, minimum 50mm x 50mm x 1.2mm are hung from the top channel at 610mm centres. Each stud is fastened to the top channel with four minimum M4 steel pop-rivets or self-tapping screws, two each side. The bottom steel horizontal channel, the same size as the top channel but minimum 0.6mm thick, is fastened to the bottom of each stud with two minimum M4 steel pop-rivets or self-tapping screws, one on each side.

9mm PROMATECT®-H boards are fixed to one side of the framework with 25mm long self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge.

Vertical board joints must coincide with the steel framework. Horizontal board joints are backed with PROMATECT®-H board strips, 50mm wide x 9mm OR steel channel, the same size as the vertical studs.

As the height of the barrier increases, the minimum requirements for the fixings and steel thickness are shown in the table on page 9.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

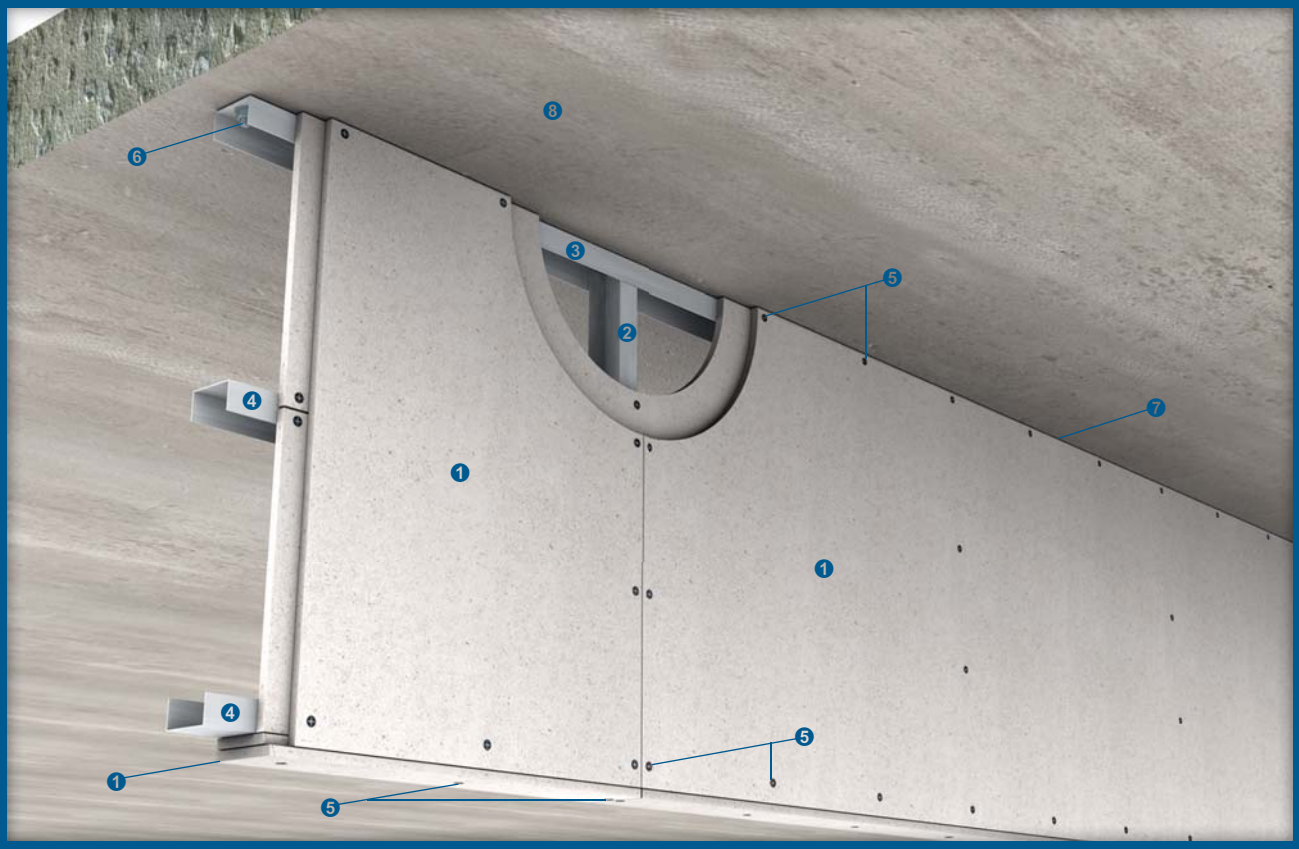
Butt Jointing

Plain butt joints between machined edges of boards.[1]
Joints filled in preparation for painting.[2]
Joints filled and taped in preparation for decoration.[3]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[4] in accordance with manufacturer's recommendations.

NOTE:
- [1], [2], [3], [4] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/240/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

❶ PROMATECT®-H board, 2 layers x 9mm thick at each side and bottom

❷ Vertical galvanised steel channel minimum 50mm x 50mm at nominal 610mm centres, thickness in accordance with table below

❸ Top galvanised steel channel minimum 50mm x 50mm, thickness in accordance with table below, fixed to ❷ using minimum two pieces of ❺ on both sides of the flange

❹ Galvanised steel channel minimum 50mm x 50mm x 1.2mm thick at every horizontal joints, fixed to ❷ using minimum one piece of ❺ on both sides of the flange

❺ 25mm long (on first layer board) and 35mm long (on second layer board) self-tapping screws at maximum 200mm centres horizontally and at maximum 300mm centres vertically, types in accordance with table below

❻ Anchor bolts, types and fixing centres in accordance with table below

❼ All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance

❽ Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the smoke barrier system

Barrier height	≤ 2440mm	≤ 3660mm	≤ 4000mm
Galvanised steel channel thickness of ❷ and ❸	2.5mm	3.0mm	3.3mm
Screw type of ❺	M6	M8	M8
Anchor bolt type of ❻	M8	M10	M10
Nominal fixing centres of ❻	500mm	400mm	400mm

The following is a standard Architectural Specification for a fixed smoke curtain system constructed using PROMATECT®-H. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

240 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the fixed smoke curtain system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

Two layers of 9mm thick PROMATECT®-H matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

The top steel channel, minimum of 50mm x 50mm x 2.5mm is fastened to the concrete floor soffit with minimum M6 steel anchor bolts at 500mm centres. Steel C-section vertical studs, minimum 50mm x 50mm x 2.5mm are hung from the top channel at 610mm centres. Each stud is fastened to the top channel with four minimum M4 steel pop-rivets or self-tapping screws, two each side. The bottom steel horizontal channel, the same size as the top channel but minimum 1.2mm thick, is fastened to the bottom of each stud with two minimum M4 steel pop-rivets or self-tapping screws, one on each side.

Two layers of 9mm PROMATECT®-H boards are fixed to one side of the framework with 25mm long (on first layer board) and 35mm long (on second layer board) self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge.

Vertical board joints must coincide with the studs and be staggered between layers. Horizontal board joints must be staggered by at least 300mm between layers. Horizontal joints in the outer layer boards are fastened to the inner layer with steel 35mm long self-tapping screws at 200mm centres.

As the height of the barrier increases, the minimum requirements for the fixings and steel thickness are shown in the table on page 11.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

Butt Jointing

Plain butt joints between machined edges of boards.[1]
Joints filled in preparation for painting.[2]
Joints filled and taped in preparation for decoration.[3]

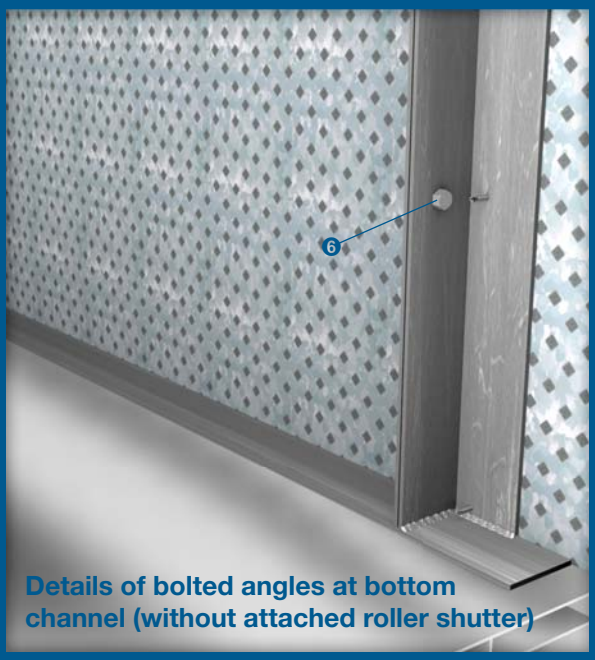
Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[4] in accordance with manufacturer's recommendations.

NOTE:
- [1], [2], [3], [4] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.

Minimum -/240/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

1. PROMATECT®-S board 6mm thick, installed in strict accordance with manufacturer's recommendations
2. Double vertical galvanised steel angles 50mm x 50mm x 3mm thick, bolted or welded back to back to form a T-section at 2500mm centres for barrier height ≤ 1200mm or at 1200mm centres for barrier height ≥ 1200mm but ≤ 2500mm
3. Top and bottom galvanised steel angles each of 50mm x 50mm x 3mm thick
4. 35mm x 5.5mm thick self-tapping Teks screws at maximum 200mm centres
5. 40mm long M12 anchor bolts at maximum 500mm centres
6. Minimum M8 anchor bolts connecting ❷ at maximum 400mm centres
7. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
8. Existing fire resistant roller shutter, independently fixed to substrate in accordance with manufacturer's instructions
9. Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the smoke and fire barrier system



Details of bolted angles at bottom channel (without attached roller shutter)

The following is a standard Architectural Specification for a smoke and fire barrier system constructed using PROMATECT®-S. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

240 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the smoke and fire barrier system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

6mm thick PROMATECT®-S cement/steel composite boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2500mm x 1200mm x 6mm.

Fixing

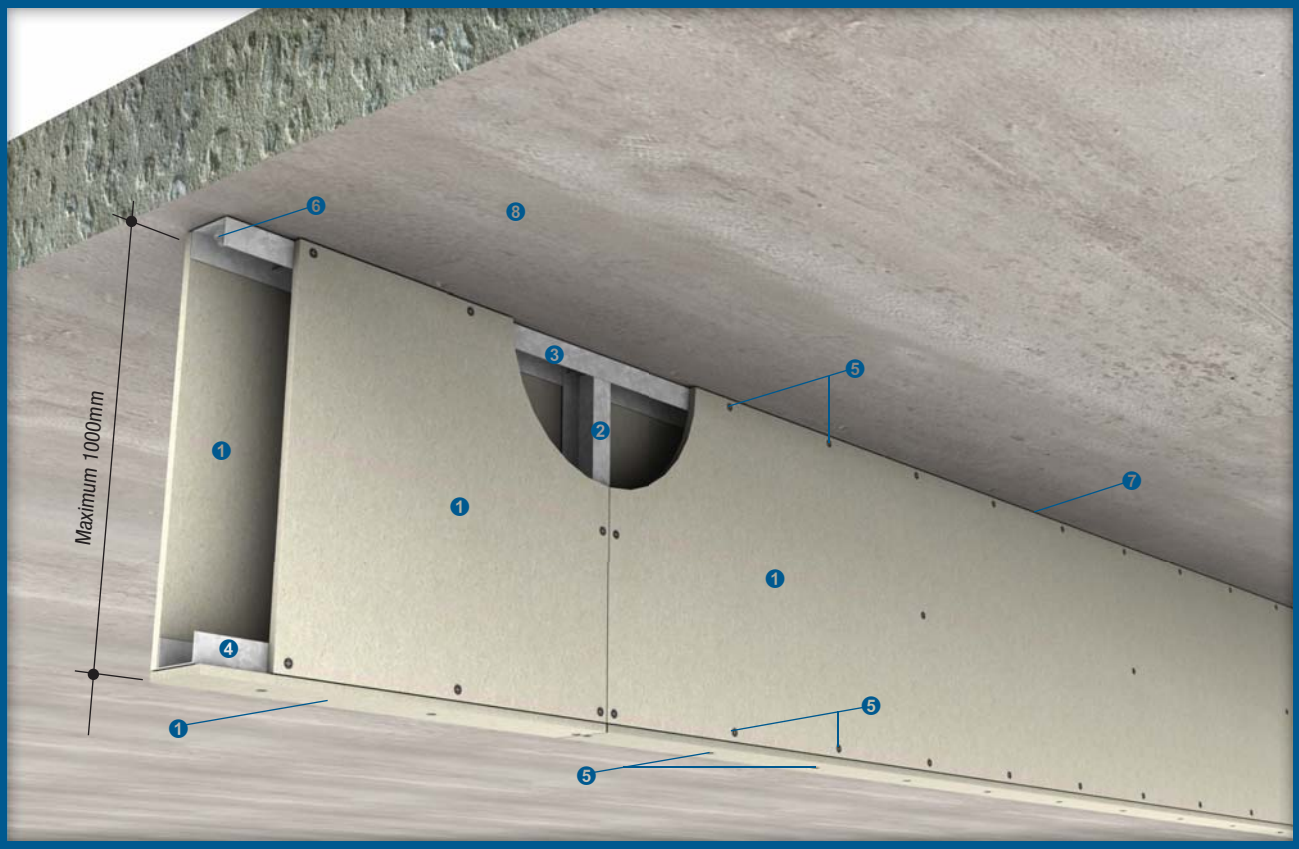
The steel framework consists of hot or cold rolled steel angles, 50mm x 50mm x 3mm thick, forming a perimeter to which the vertical angles or tees are welded. The perimeter framework is fixed to the concrete substrate with M12 all steel expanding anchors 40mm in length, at maximum 500mm centres. If the barrier is used above a fire resistant roller shutter, the perimeter framework is fixed to the enclosure with either M5.5 self-drilling Teks screws at maximum 200mm centres or M8 bolts at maximum 300mm centres. Vertical framing made from hot or cold rolled steel angles, 50mm x 50mm x 3mm thick, bolted at nominal 400mm centres using M8 bolts or welded back to back to form a T-section, and welded to the perimeter framework at 2500mm centres for heights not exceeding 1200mm, or at 1200mm centres for heights greater than 1200mm but not exceeding 2500mm.

PROMATECT®-S boards are fixed to one side of the framework using M5.5 fine thread steel Teks screws at maximum 200mm centres. Board joints must coincide with the steel framework.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

NOTE: All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/120/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

❶ PROMINA® 60 board 9mm thick to each side and to bottom

❷ Vertical galvanised steel channel minimum 50mm x 36mm x 0.6mm thick at nominal 610mm centres

❸ Top galvanised steel channel minimum 50mm x 36mm x 0.9mm thick fixed to ❷ using minimum two pieces of ❺ on both sides of the flange

❹ Bottom galvanised steel channel minimum 50mm x 36mm x 0.9mm thick fixed to ❷ using minimum one piece of ❺ on both sides of the flange

❺ Minimum 25mm long M4 self-tapping screws at maximum 200mm centres

❻ Minimum 30mm long M6 anchor bolts at nominal 600mm centres

❼ All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance

❽ Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the smoke barrier system

NOTE: Care should be taken that the framing sections (❷, ❸ and ❹) AND the length and centres of anchor bolts (❻) are suitable for supporting the proposed height and weight of this smoke barrier system under fire conditions

The following is a standard Architectural Specification for a smoke barrier system constructed using PROMINA® 60. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

120 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the smoke barrier system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMINA® 60 matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

The steel framework consists of top and bottom horizontal steel channels, and vertical studs, 50mm x 36mm x 0.6mm thick at nominal 610mm centres. The top horizontal channel is of minimum size 50mm x 36mm and at least 0.9mm thick for barrier depths up to 1m and 1.6mm thick for barrier depths up to 2.44m. The top channel is fastened to the concrete soffit with M6 steel anchors 30mm in length, at 600mm maximum centres. The vertical studs are fastened to the top channel with two steel pop-rivets or two steel self-tapping screws on both sides of each stud. The bottom horizontal channel similar dimensions to the vertical studs is fastened to the bottom of each stud with one steel pop-rivet or one steel self-tapping screw on both sides of each stud.

Care should be taken that the framing sections (vertical, top and bottom horizontal steel channels) and the length and centres of M6 steel anchors are suitable for supporting the proposed height and weight of the barrier system under fire conditions.

PROMINA® 60 boards are fixed to both sides of the framework with 25mm self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge. Vertical board joints must coincide with the steel framework and be staggered between the two faces of the barrier. There are no horizontal board joints.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

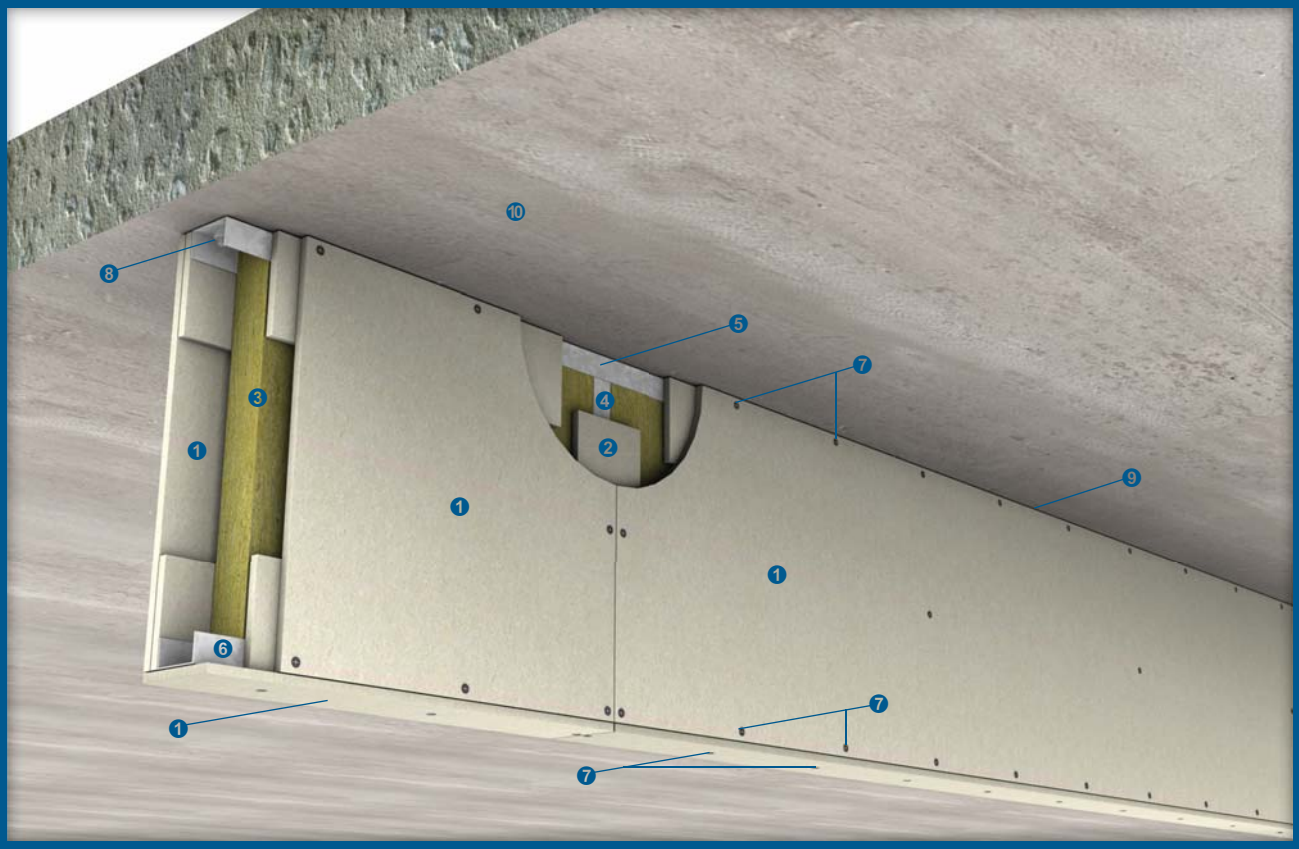
Butt Jointing

Plain butt joints between machined edges of boards.[(1)]
Joints filled in preparation for painting.[(2)]
Joints filled and taped in preparation for decoration.[(3)]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[(4)] in accordance with manufacturer's recommendations.

NOTE:
- [(1), (2), (3), (4)] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/120/120 fire resistance in accordance with the requirements of BS 476: Part 22: 1987

❶ PROMINA® 60 board 9mm thick to each side and to bottom

❷ PROMINA® 60 cover fillet 100mm x 9mm thick to be fixed to each face of the framing prior to the installation of the main boards

❸ Mineral wool 50mm thick x 100kg/m³ to be filled in the cavity

❹ Vertical galvanised steel channel minimum 50mm x 50mm at nominal 610mm centres, thickness in accordance with table below

❺ Top galvanised steel channel minimum 50mm x 50mm, thickness in accordance with the table below, fixed to ❹ using minimum two pieces of ❼ on both sides of the flange

❻ Bottom galvanised steel channel minimum 50mm x 50mm, thickness in accordance with table below, fixed to ❹ using minimum one piece of ❼ on both sides of the flange

❼ Minimum 25mm long self-tapping screws at maximum 200mm centres, types in accordance with table below

❽ Minimum 30mm long M10 anchor bolts at nominal 500mm centres

❾ All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance

❿ Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the smoke barrier system

Barrier height	≤ 2000mm	≤ 3000mm	≤ 4000mm
Galvanised steel channel thickness of ❹, ❺ and ❻	1.2mm	2mm	2.5mm
Screw type of ❼	M4	M5	M5

NOTE: Care should be taken that the framing sections (❹, ❺ and ❻) AND the length and centres of anchor bolts (❽) are suitable for supporting the proposed height and weight of this smoke barrier system under fire conditions

The following is a standard Architectural Specification for a smoke barrier system constructed using PROMINA® 60. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

120 minutes fire resistance, integrity and insulation in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the smoke barrier system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMINA® 60 matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions should be 2440mm x 1220mm x 9mm.

Fixing

The steel framework consists of top and bottom horizontal steel channels, and vertical studs, 50mm x 38mm x 0.6mm thick at nominal 610mm centres. The top horizontal channel is of minimum size 50mm x 38mm and at least 0.9mm thick for barrier depths up to 1m and 1.6mm thick for barrier depths up to 2.44m. The top channel is fastened to the concrete soffit with M6 steel anchors 30mm in length, at 600mm maximum centres. The vertical studs are fastened to the top channel with two steel pop-rivets or two steel self-tapping screws on both sides of each stud. The bottom horizontal channel similar dimensions to the vertical studs is fastened to the bottom of each stud with one steel pop-rivet or one steel self-tapping screw on both sides of each stud.

Care should be taken that the framing sections (vertical, top and bottom horizontal steel channels) and the length and centres of M6 steel anchors are suitable for supporting the proposed height and weight of the barrier system under fire conditions.

PROMINA® 60 boards are fixed to both sides of the framework with 25mm self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge. Vertical board joints must coincide with the steel framework and be staggered between the two faces of the barrier. There are no horizontal board joints.

Mineral wool of 50mm x 100kg/m^3 is fitted within the cavity of the barrier. The mineral wool must fill the studs and channels.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

Butt Jointing

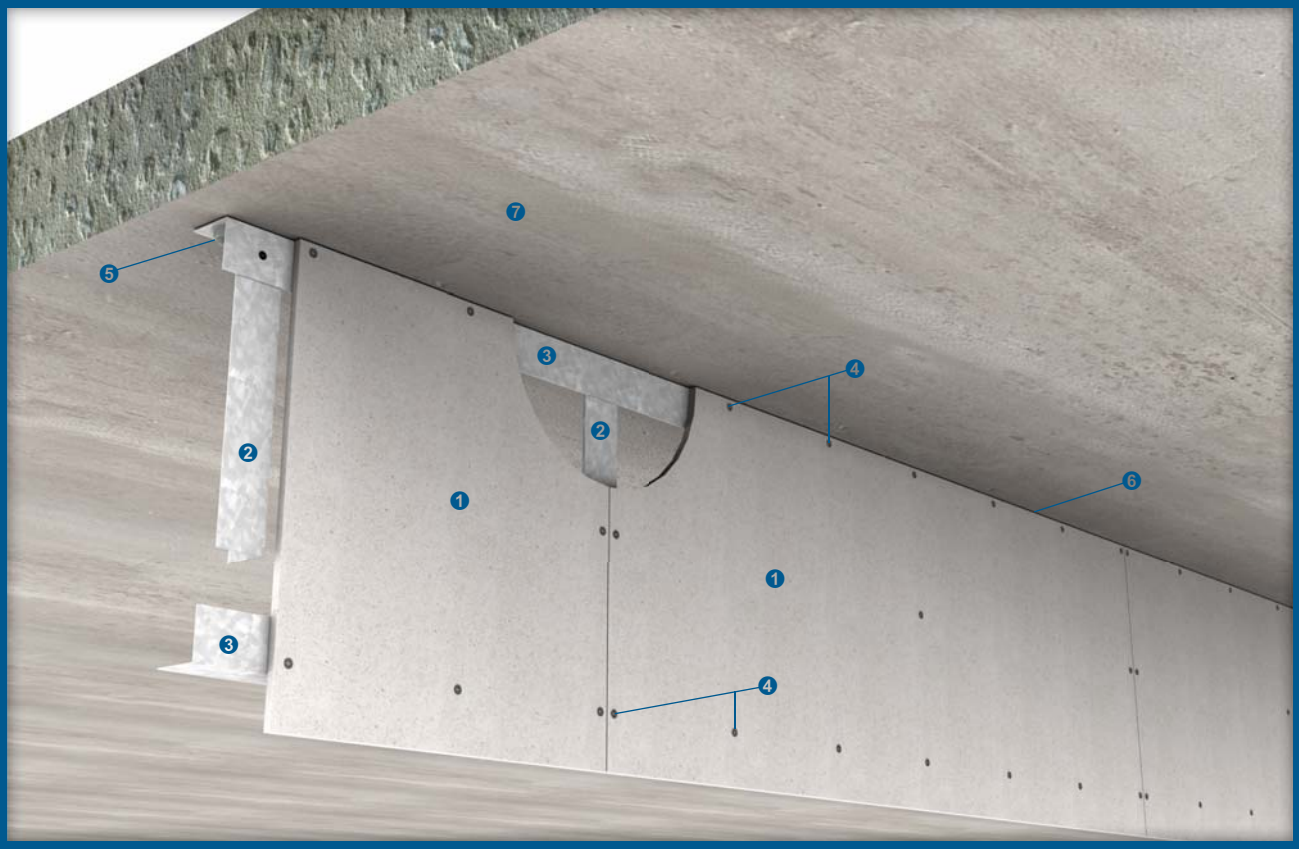
Plain butt joints between machined edges of boards.[1]
Joints filled in preparation for painting.[2]
Joints filled and taped in preparation for decoration.[3]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[4] in accordance with manufacturer's recommendations.

NOTE:

- [1], [2], [3], [4] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/30/- fire resistance in accordance with the requirements of BS 7346: Part 3 Clause 4.1: 1990

1. PROMINA®-HD board 9mm thick
2. Vertical galvanised steel angles 100mm x 50mm x 1mm thick at 610mm centres
3. Horizontal galvanised steel angles 150mm x 50mm x 1mm thick
4. 25mm long self-tapping drywall screws at maximum 300mm centres
5. 30mm long M8 anchor bolts at maximum 600mm centres
6. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
7. Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the fixed smoke curtain system

The following is a standard Architectural Specification for a fixed smoke curtain system constructed using PROMINA®-HD. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

30 minutes fire resistance, integrity only, in accordance with the criteria of BS 7346: Part 3 Clause 4.1: 1990.

Supporting Structure

Care should be taken that any structural element to which the fixed smoke curtain system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMINA®-HD matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

The steel framework consists of top and bottom horizontal steel angles 150mm x 50mm x 1mm thick, and vertical framing made of steel angles 100mm x 50mm x 1mm thick at 610mm centres. The top angle is fastened to the concrete soffit with M8 steel anchors 30mm in length, at maximum 600mm centres. The vertical studs are fastened to the top angle using two steel pop-rivets or two steel self-tapping screws on each vertical framing member. The bottom horizontal angle is fastened to the bottom of each stud with one steel pop-rivet or one steel self-tapping screw on each framing member.

PROMINA®-HD boards are fixed to one side of the framework using 25mm self-tapping screws at maximum 300mm centres, a minimum of 12mm from the board edge. All board joints must coincide with the steel framing.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 7346: Part 3 Clause 4.1: 1990.

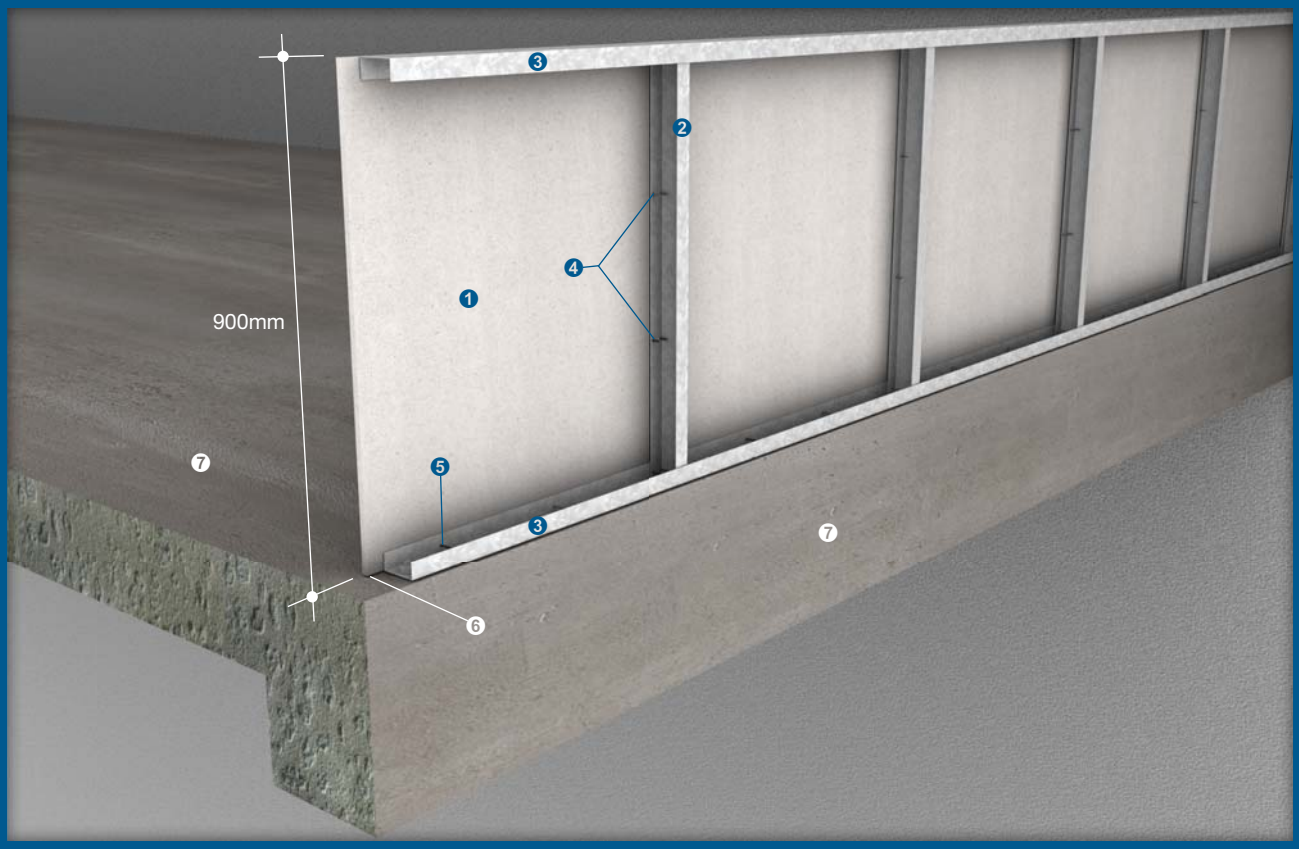
Butt Jointing

Plain butt joints between machined edges of boards.[1]
Joints filled in preparation for painting.[2]
Joints filled and taped in preparation for decoration.[3]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[4] in accordance with manufacturer's recommendations.

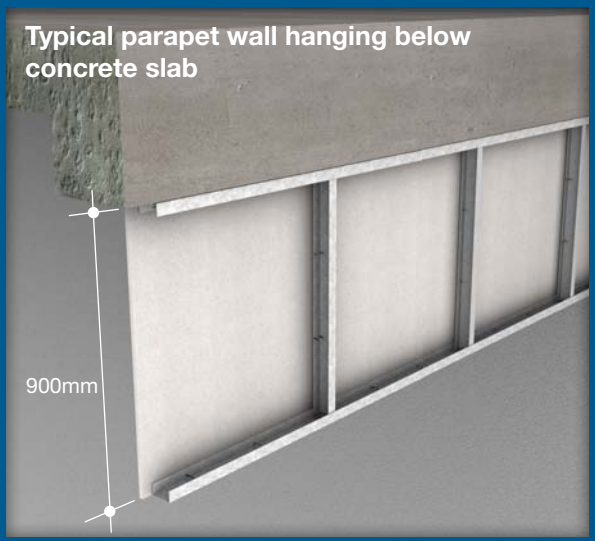
NOTE:
- [1], [2], [3], [4] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/120/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

1. PROMATECT®-H board 9mm thick
2. Vertical galvanised steel channels 25mm x 50mm x 0.6mm thick at maximum 610mm centres
3. Horizontal galvanised steel channels 25mm x 50mm x 0.6mm thick
4. 35mm long self-tapping screws at maximum 200mm centres
5. 30mm long M6 anchor bolts at maximum 500mm centres
6. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
7. Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the parapet wall system

Typical parapet wall hanging below concrete slab



The following is a standard Architectural Specification for a parapet wall system (upstand/downstand) constructed using PROMATECT®-H. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

120 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the parapet wall system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMATECT®-H matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

Framework system made of a perimeter of galvanised steel channel, 25mm x 50mm x 0.6mm thick, to be fastened to the floor/slab with M6 steel anchors 30mm in length at maximum 500mm centres. Vertical channels, 25mm x 50mm x 0.6mm thick, are positioned at maximum 610mm centres and are fastened to the perimeter channel, on both faces using steel self-tapping screws or steel pop-rivets.

PROMATECT®-H boards are fixed to one side of the framework using 35mm long self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge. Board joints must coincide with the steel framework.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

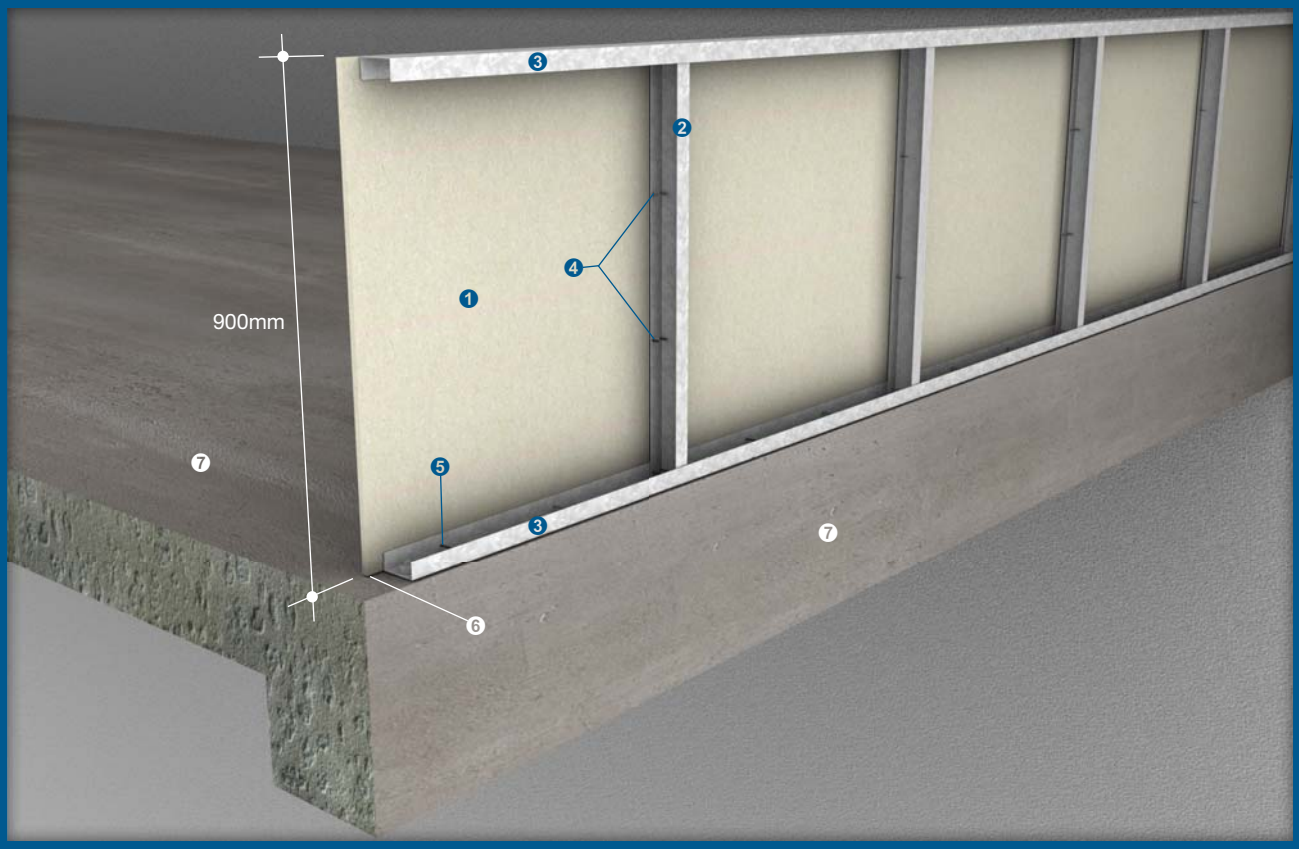
Butt Jointing

Plain butt joints between machined edges of boards.[1]
Joints filled in preparation for painting.[2]
Joints filled and taped in preparation for decoration.[3]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[4] in accordance with manufacturer's recommendations.

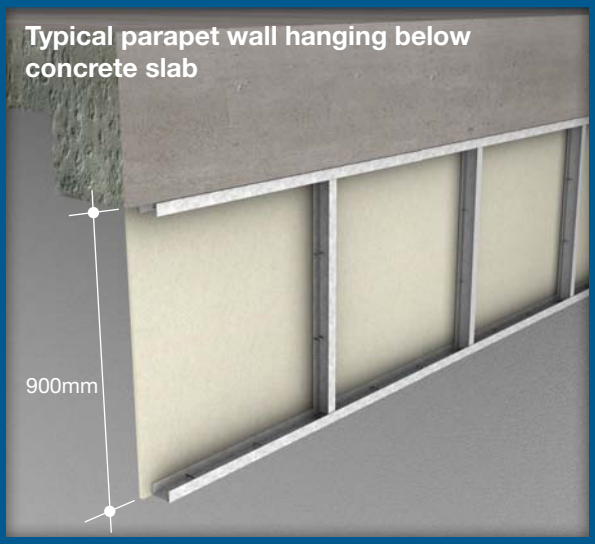
NOTE:
- [1], [2], [3], [4] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/120/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

1. PROMINA® 60 board 9mm thick
2. Vertical galvanised steel channels 38mm x 48mm x 33mm x 0.5mm thick at 610mm centres
3. Horizontal galvanised steel channels 25mm x 50mm x 0.5mm thick
4. 25mm long self-tapping screws at maximum 200mm centres
5. M6 anchor bolts at nominal 600mm centres
6. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
7. Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the parapet wall system

Typical parapet wall hanging below concrete slab



The following is a standard Architectural Specification for a parapet wall system (upstand/downstand) constructed using PROMINA® 60. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

120 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the parapet wall system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMINA® 60 matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

For the downstand parapet wall, the top horizontal steel channels, 25mm x 50mm x 0.5mm thick is fastened to the floor slab with M6 steel anchor bolts at nominal 600mm centres. Vertical steel studs channel, 35mm x 48mm x 33m x 0.5mm, are positioned at 610mm centres and are fastened to the top channel, through both flanges, with minimum 25mm long self-tapping screws or M4 steel pop-rivets. The bottom steel channel, of the same size as the top horizontal channel, is similarly fastened to the bottom of the vertical C-studs.

PROMINA® 60 boards are fixed to one side of the framework with 25mm self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge. Vertical board joints must coincide with the steel framework. There are no horizontal board joints.

The construction of the upstand parapet wall is the same as the downstand parapet wall except that the bottom steel channel is fastened to the top face of the floor slab.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

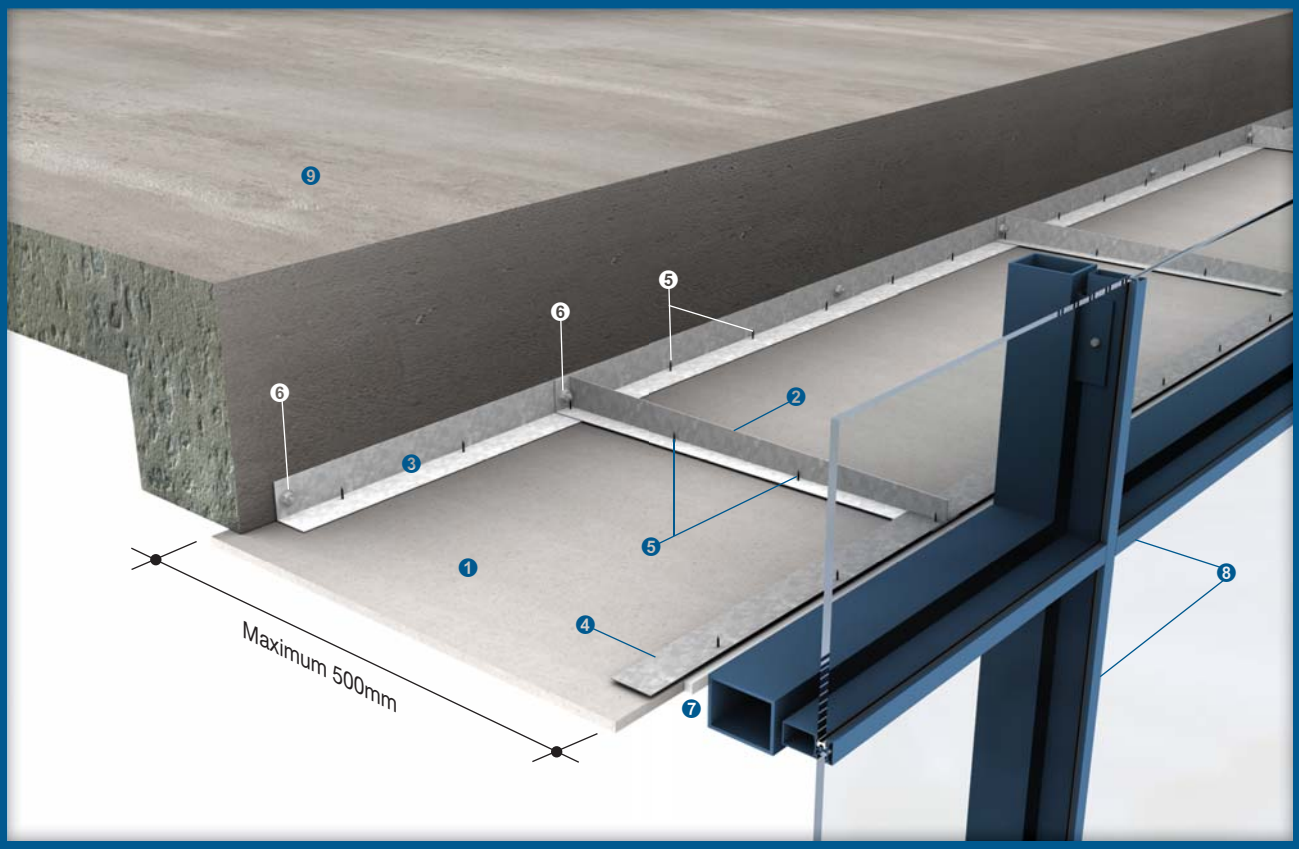
Butt Jointing

Plain butt joints between machined edges of boards.[1]
Joints filled in preparation for painting.[2]
Joints filled and taped in preparation for decoration.[3]

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling[4] in accordance with manufacturer's recommendations.

NOTE:
- [1], [2], [3], [4] delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/120/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987

1. PROMATECT®-H board 9mm thick
2. Mild steel cantilever brackets 50mm wide x 1mm thick at maximum 1220mm centres to coincide with butt joints between boards
3. Galvanised steel angle 50mm x 50mm x 1mm thick
4. Additional galvanised steel angle or flat bar minimum 1mm thick fixed to the framing of 8 (only required where the gap width of the spandrel wall system is greater than 300mm)
5. 25mm long self-tapping screws at maximum 200mm centres
6. 30mm long M8 anchor bolts at maximum 400mm centres
7. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
8. Existing curtain wall panel system
9. Structure element to which the spandrel wall system is affixed, with a minimum equivalent fire resistance

NOTE: This spandrel wall system is NOT a loadbearing construction. The contractor should be liable for displaying warning notices accordingly

The following is a standard Architectural Specification for a spandrel wall system constructed using PROMATECT®-H. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

120 minutes fire resistance, integrity only, in accordance with the criteria of BS 476: Part 22: 1987.

Supporting Structure

Care should be taken that any structural element to which the spandrel wall system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Boards

9mm thick PROMATECT®-H matrix engineered mineral boards as manufactured by Promat International (Asia Pacific) Ltd. All joints to be coincident with steel framing. Standard board dimensions 2440mm x 1220mm x 9mm.

Fixing

Mild steel cantilever brackets, having a table at least 50mm wide and formed from steel at least 1mm thick, are fixed to an angle and positioned at maximum 1220mm centres. The angle, 50mm x 50mm x 1mm thick, is fastened to the edge of the floor using M8 steel anchors 30mm in length, at no more than 400mm centres. Where the gap width is greater than 300mm, the cantilever brackets should be supported by an additional angle or flat bar formed from steel at least 1mm thick.

PROMATECT®-H boards are fixed to one side of the framework with 25mm self-tapping screws at maximum 200mm centres, a minimum of 12mm from the board edge. Board joints must coincide with the steel framework.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987.

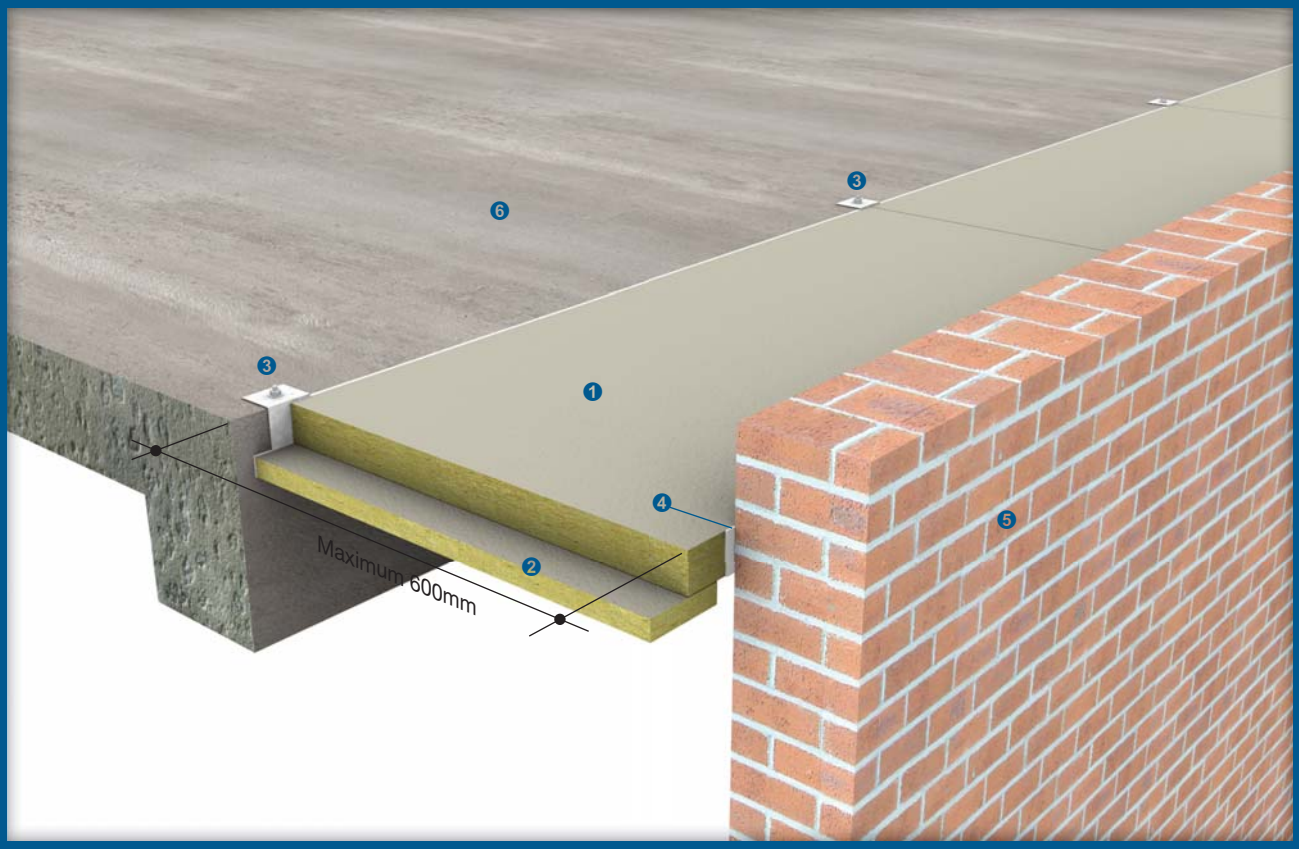
Butt Jointing

Plain butt joints between machined edges of boards.(1)
Joints filled in preparation for painting.(2)
Joints filled and taped in preparation for decoration.(3)

Follow-on Trades

Surface of boards to be prepared for painting/plastering/tiling(4) in accordance with manufacturer's recommendations.

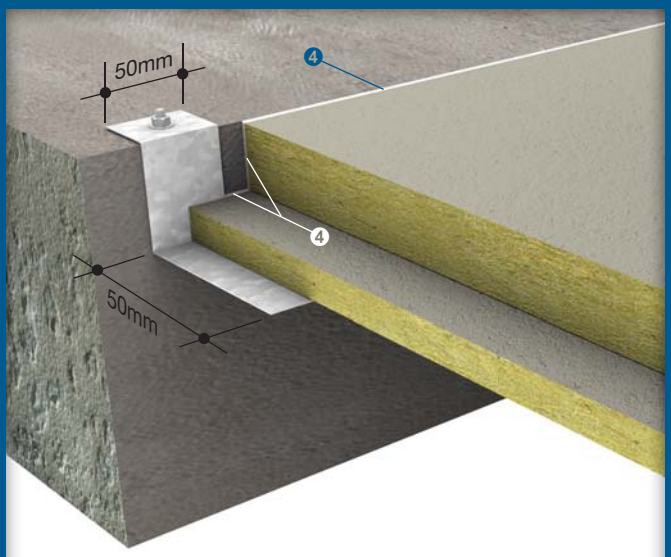
NOTE:
- (1), (2), (3), (4) delete as appropriate.
- All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant.



Minimum -/120/- fire resistance in accordance with the requirements of BS 476: Part 22: 1987 and BS 7346: Part 3 Clause 4.1: 1990

1. PROMASEAL® Bulkhead* 50mm thick x 120kg/m³, constructed in strict accordance with manufacturer's recommendations
2. PROMASEAL® Bulkhead strip* 100mm wide x 25mm thick x 120kg/m³ at each joint, fix using spiral wound spring screws or similar at 150mm centres*
3. Steel brackets 50mm x 50mm x 1mm thick fixed with 30mm long M6 anchor bolts at 1200mm centres
4. All perimeter gaps caulked with PROMASEAL®-A Acrylic Sealant to achieve the required fire resistance performance
5. Masonry or concrete wall only, not applicable for any curtain wall system
6. Masonry or concrete supporting construction, with fire resistance equal to or higher than that of the smoke barrier system

*Coat all surfaces with PROMASEAL® Bulkhead Sealer after installation



Fixing details of supporting steel brackets

NOTE: This smoke barrier system is NOT a loadbearing construction. The contractor should be liable for displaying warning notices accordingly

The following is a standard Architectural Specification for a smoke barrier system constructed using PROMASEAL® Bulkhead. The designer must determine the suitability of the design for the proposed application and regulatory requirements before undertaking or constructing any works relating to the specification and where in doubt should obtain the advice of a suitably qualified engineer. All installations must be certified by the contractor as appropriate.

Fire Attack From Either Side

120 minutes fire resistance, integrity and partial insulation in accordance with the criteria of BS 476: Part 22: 1987 and BS 7346: Part 3 Clause 4: 1990.

Supporting Structure

Care should be taken that any structural element to which the smoke barrier system is affixed, e.g. a beam, floor or wall, has a minimum equivalent fire resistance.

Lining Materials

1200mm x 600mm x 50mm thick PROMASEAL® Bulkhead supplied in pre-coated battens, together with 5kg containers of PROMASEAL® Bulkhead Sealer as manufactured by Promat International (Asia Pacific) Ltd.

Fixing

Steel brackets made of 50mm wide x 1mm thick steel flat are positioned at maximum 1200mm centres and fixed to the concrete substrate, using one M6 steel anchor bolt minimum 30mm in length per bracket. 100mm wide x 25mm thick of PROMASEAL® Bulkhead strips are positioned to cover all batten to batten joints, fixed using two beads of PROMASEAL®-A Acrylic Sealant and minimum 90mm long spiral spring screws at maximum 150mm centres. 50mm x 120kg/m³ density mineral wool pre-coated on both faces with a thin film of minimum 2mm thick PROMASEAL® Bulkhead Sealer is friction fitted into the opening. A bead of PROMASEAL®-A Acrylic Sealant is applied between the edges of the battens and the floor slab to seal and take up any irregularities between the surfaces.

Tests & Standards

The complete system along with the material and framing is approved to meet the requirements of BS 476: Part 22: 1987 and BS 7346: Part 3 Clause 4: 1990.

Promat

For latest information of the Promat Asia Pacific organisation, please refer to www.promat-ap.com.

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