

Technical performance and principles of system design

Service installations

Service installations guidance

Services within partitions and lining cavities

Services can be incorporated in all Gyproc lining systems, partitions and ceilings.

Gypframe stud framing has the benefit of 'H' shaped cut-outs, 70 x 27mm at the centres shown in **Figure 22 - Gypframe studs service cut-out details**. These service cut-outs are used to accommodate routing of electrical and other services within the partition cavity. Grommets or isolating strip can be installed in the push-out to provide additional prevention against abrasion of the cables if required. Switch boxes and socket outlets can be supported on brackets formed from Gypframe 103 FC 50 or 153 FC 90. Fixing Channels or cut and bent channels fixed horizontally between the studs.

Gypframe head and base channels do not generally have cut-outs, these need to be cut on site, paying attention to Health and safety guidance. Grommets or isolating strip should be installed in these cut-outs to prevent abrasion of the cables.

If a blockwork wall lining system, such as **GypLyner UNIVERSAL**, does not have sufficient depth to accommodate the service then the background should be 'chased out' to the appropriate depth. Pipes or conduits should be fixed in position before dry lining work commences. To maintain an airtight construction, the perimeter of any penetration through the lining should be sealed as necessary at the time the services are being installed.

When installing electrical services within a partition, it might result in the concealed cable being less than 50mm from the surface of the partition, particularly if the partition is less than 100mm thick. Whilst it may be apparent that electrical services are contained within a partition cavity due to the appearance of electrical sockets / switches on the partition surface, this might not be obvious from the reverse side. Therefore, before carrying out work, e.g. drilling into the surface, the reverse side of the partition must always be checked to determine the location of any concealed cables. It is good practice to maintain a clear zone. Where the location of electrical outlets cannot be determined from the reverse side, then the cable must either be mechanically protected or run at least 50mm from the surface of the wall or partition on the reverse side. Refer to figure 25 and 26.

Where water pipes are to be located within the GypWall system, it is recommended that only one pipe is passed through each aperture in the metal framework. If this cannot be accommodated for whatever reason, it may be necessary to incorporate proprietary pipe restraining clips, or other means of keeping the pipes apart, to prevent vibration noise.

To maintain an airtight construction, the perimeter of any penetration through the lining should be sealed as necessary at the time the services are being installed

Service penetrations and fixing into drywall systems

Fixing electrical socket boxes into Gyproc partitions and walls can impair both fire and acoustic performance, but with careful detailing this can be minimised. The relevant sections in this book offer specific guidance for the installation of socket boxes in separating walls, however designers should note that in particular the avoidance of back-to-back services is recommended. The plasterboard should always be neatly cut and Gyproc Sealant should be applied where optimum acoustic performance is required.

In fire-rated walls, the fire-stopping design is dependant on the period of fire resistance. Some typical details are shown in **Figure 27 - Socket box installation - up to 60 minutes fire resistance**, **Figure 28 - Socket box installation - up to 120 minutes fire resistance**, **Figure 29 - Socket box installation - up to 120 minutes fire resistance for twin frame partitions** and **Figure 30 - Socket box installation - up to 120 minutes fire resistance for GypWall QUIET SF**.

There are a number of fire-stopping products including putty pads, available on the market from a range of manufacturers. Whilst Gyproc has no objection to the use of putty pads for example within drylining systems, all performance substantiation has to be provided by the fire-stopping manufacturer as is the case for any fire-stopping material.

Penetrations of fire resistant constructions for services need careful consideration to ensure that the integrity of the element is not impaired, and also that the services themselves do not act as the mechanism of fire spread. It is important to use only those services and their installations that have been shown by fire test to be able to maintain the integrity of the construction. By designing service zones through which all services pass, the number of individual service penetrations can be minimised. Service zones can be sealed after installation of the services using a tested and substantiated fire-stopping system.

In most situations, the services will be installed by contractors other than the drylining contractor. It is important, therefore, that all relevant contractors should be advised as to where and how their service penetrations should be made and maintained. The necessity to independently support services will depend on their size and weight. Contact the Gyproc Technical Team for further guidance.

For fixing medium to heavy fixtures directly off the drywall system Gyproc Habito boards should be used as the face layer of the drywall. Due to the reinforced core of Gyproc Habito board it allows a safe working load of 30kg to be directly fixed to it by using a simple No. 10 woodscrew. In order to ensure the same working load from all the fixings, 15mm spacing is required between the fixings. Table 10 provides example fixings and typical safe working loads on partitions incorporating Gyproc Habito board.

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It is important to ensure that the drylining system specified is capable of supporting the loads, particularly if installing multiple fixtures. Furthermore, it may be necessary to incorporate several fixings per fixture to ensure the weight is distributed across the drylining system rather than a point load, particularly for medium to heavy fixtures.

When using any other Gyproc plasterboard, there are wide variety of fixing devices suitable for securing fixtures and fittings to typical Gyproc systems. Generally, the choice of individual fixing devices will depend on the type of system and the loading requirements. **Table 9** gives example fixing devices and usual applications in typical drywall systems to meet the specific load criteria.

For fixing services into a typical drywall except Gyproc Habito board, install services to the face of the partition, using a Gypframe Service Support Plate, which carries 18mm plywood within the cavity of the partition as shown in **Figure 20 - General arrangement of service support plates showing studs at 600mm centres**. An alternative to this would be to install a metal or timber support framework within the cavity of the partition as shown in **Figure 19 - Folding support rail fixture** and **Figure 20 - General arrangement of service support plates showing studs at 600mm centres, or Figure 21 - Gypframe 103 FC 50 or 153 FC 90 Fixing Channels**

Duct / damper penetration through drywall systems

Fire and smoke resisting dampers can be installed in to Gyproc's systems. Dampers prevent fire and smoke from passing from one fire compartment to another through heating, ventilation and air conditioning systems. 'An Industry Guide to the Design for the Installation of Fire and Smoke Resisting Dampers' is available from the Association of Specialist Fire Protection (ASFP) or as a download from www.asfp.org.uk. This document refers the designer to the principles of construction, and in particular to tested constructions, or to constructions assessed for performance in fire by a suitably qualified person.

Figures, 31 - Opening bridging studs for duct / damper penetration, 32 - Opening for service penetrations in fire-rated partitions and 33 - Fire tested construction in which the damper is supported by the partition show a method of preparing openings for installing dampers up to a maximum weight of 57kg within Gyproc systems. As the performance of the complete assembly will depend on a number of elements, the actual details of the opening need to be determined in conjunction with the fire-stopping and damper manufacturers.

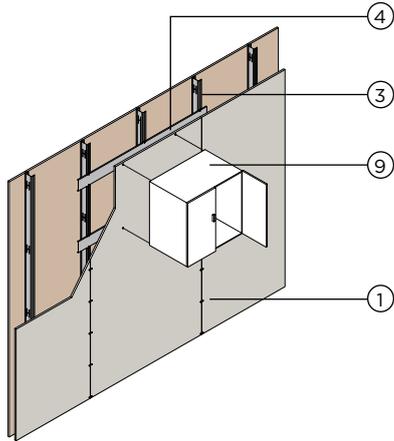
Useful reference documents covering international legislation and guidance

In the UK the installation of electrical services is carried out in accordance with the requirements of BS 7671: 2018, requirements for electrical installations, IEE Wiring Regulations. This was introduced in conjunction with the Institution of Engineering and Technology (IET), and is used for all books related to wiring regulations.

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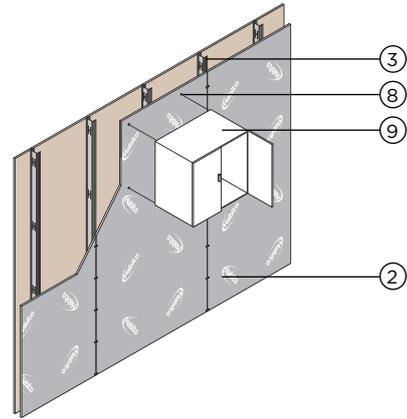
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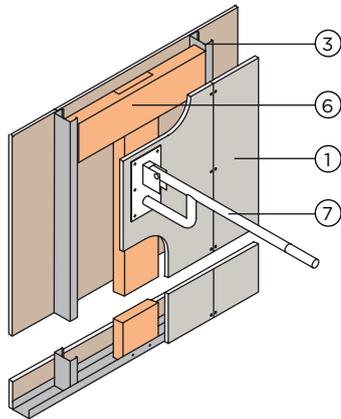
Wall cupboard fixture detail using Gyproframe Fixing Channel

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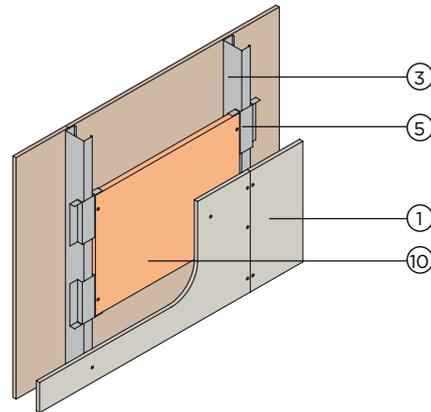
Wall cupboard fixture detail using Gyproc Habito

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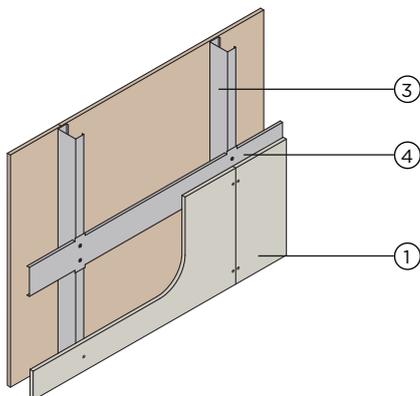
Folding support rail fixture detail

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General arrangement of service support plates showing studs at 600mm centres

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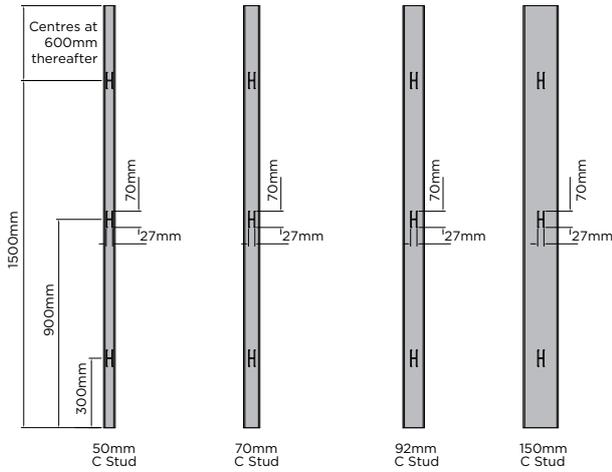
Gyproframe 103 FC 50 Fixing Channel

- | | |
|--|--|
| 1. Gyproc plasterboard or Glasroc specialist board | 6. 150 x 50mm timber suitably fixed to studs and channel |
| 2. Gyproc Habito plasterboard | 7. Folding support rail |
| 3. Gyproframe 'C' Stud | 8. No. 10 woodscrew, directly fixed to board only |
| 4. Gyproframe 103 FC 50 Fixing Channel fixed to studs with Gyproc Waferhead Screws | 9. Wall cupboard |
| 5. Gyproframe Service Support Plate | 10. 18mm plywood |

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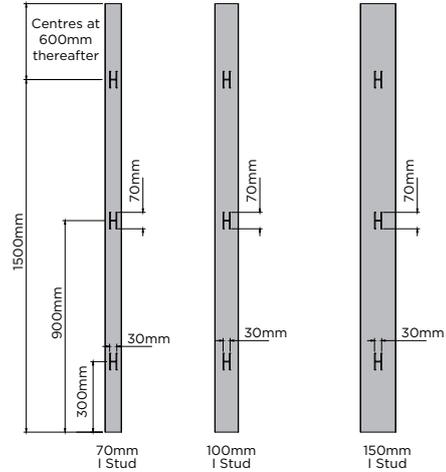
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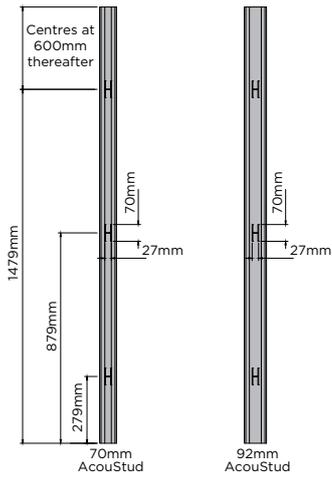
Gypframe studs service cut-out details - Gypframe 'C' Studs

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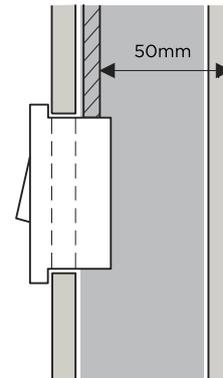
Gypframe studs service cut-out details - Gypframe 'I' Studs

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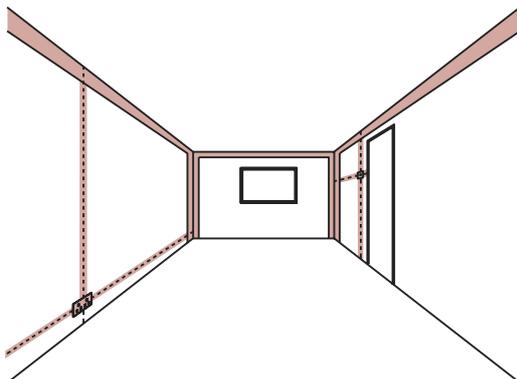
Gypframe studs service cut-out details - Gypframe 'AS' AcouStuds

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Minimum distance of cabling

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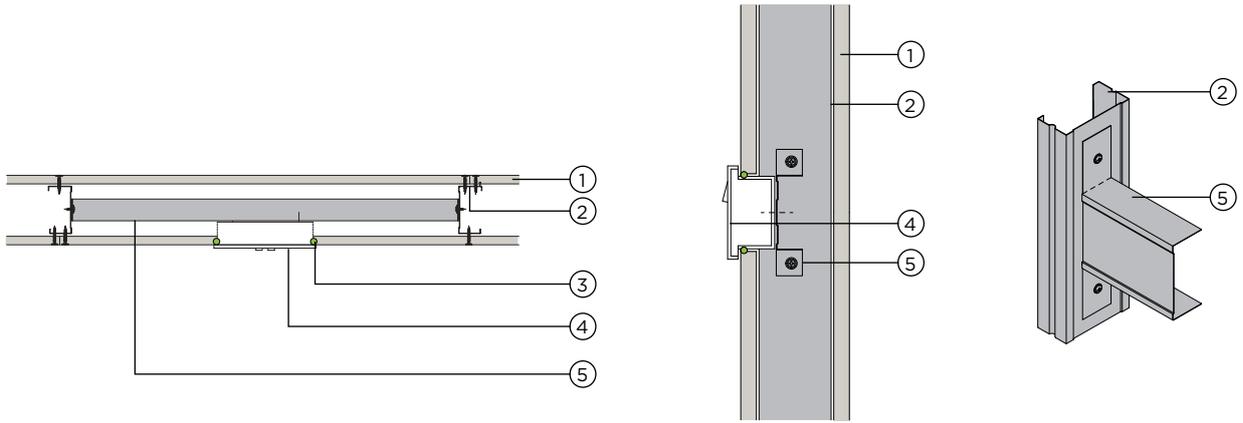


Standard zones of cabling

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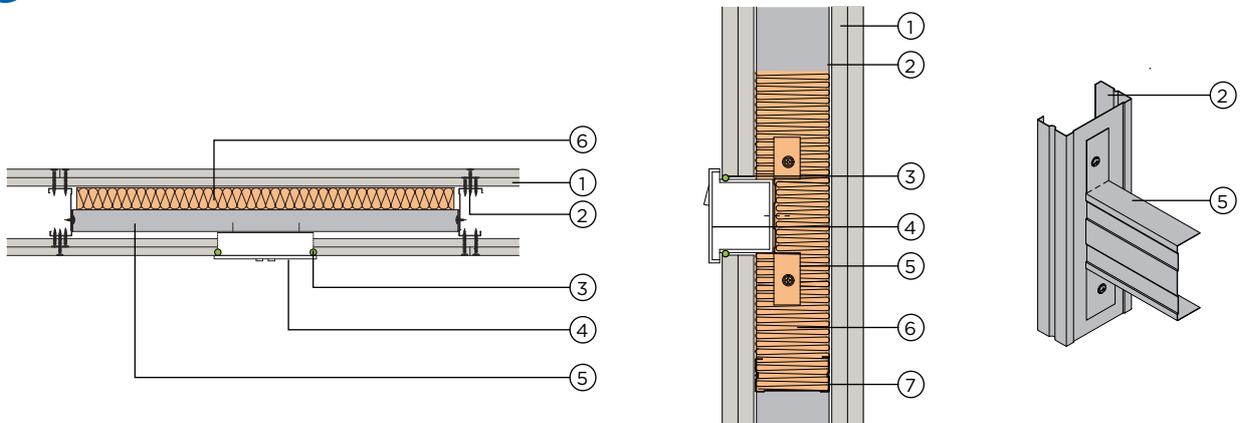
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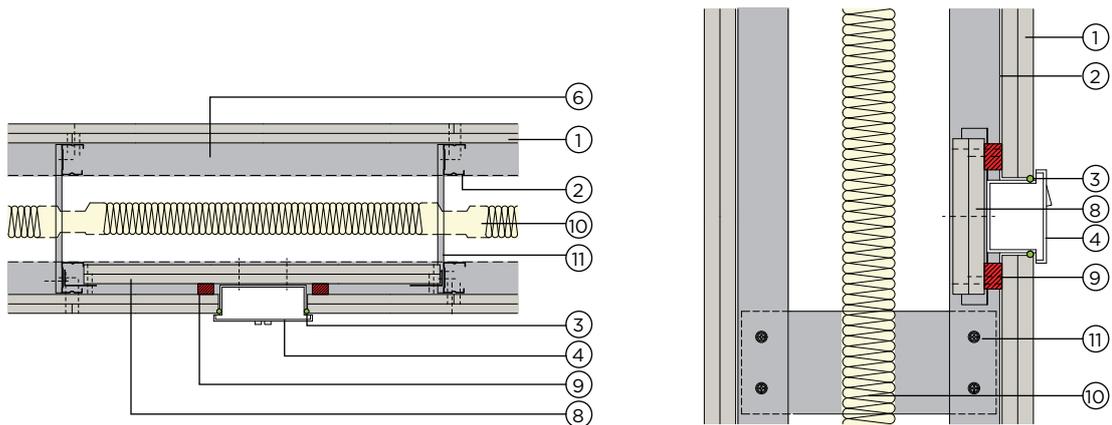
Socket box installation detail - up to 60 minutes fire resistance

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Socket box installation detail - up to 120 minutes fire resistance

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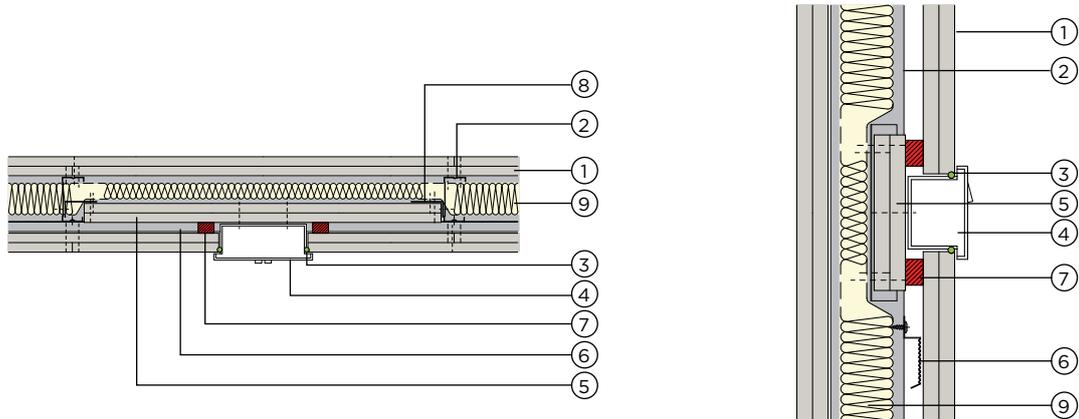
Twin frame - Socket box installation detail - up to 120 minutes fire resistance

1. Gyproc plasterboard
2. Gyproframe 'C' Stud
3. Gyproc Sealant at switch box perimeter for improved acoustics
4. Electrical socket with metal back box fitted tight into plasterboard
5. Gyproframe Standard Floor & Ceiling Channel receiving fixing of socket box - channel legs tabbed, bent and fixed to metal studs with Gyproc Waferhead Screws
6. Stone mineral wool (minimum 80 kg/m³) backing to socket box
7. Gyproframe 'C' Stud Noggings with ends notched around stud and fixed with Gyproc Waferhead Screws to help retain stone mineral wool (by KIMMCO ISOVER)
8. Two layers of Gyproc plasterboard (same board type as partition lining) forming normal 150mm high baffle fixed to Gyproframe GA4 Steel Angle with Gyproc Drywall Screws. Gyproframe 103 FC 50 or similar / plywood may also be used (in addition to the plasterboard pattress) to provide additional support for the socket box if required
9. Suitable fire resistant seal where required
10. ISOVER Eco APR
11. Gyproframe 103 FC 50 Fixing Channel

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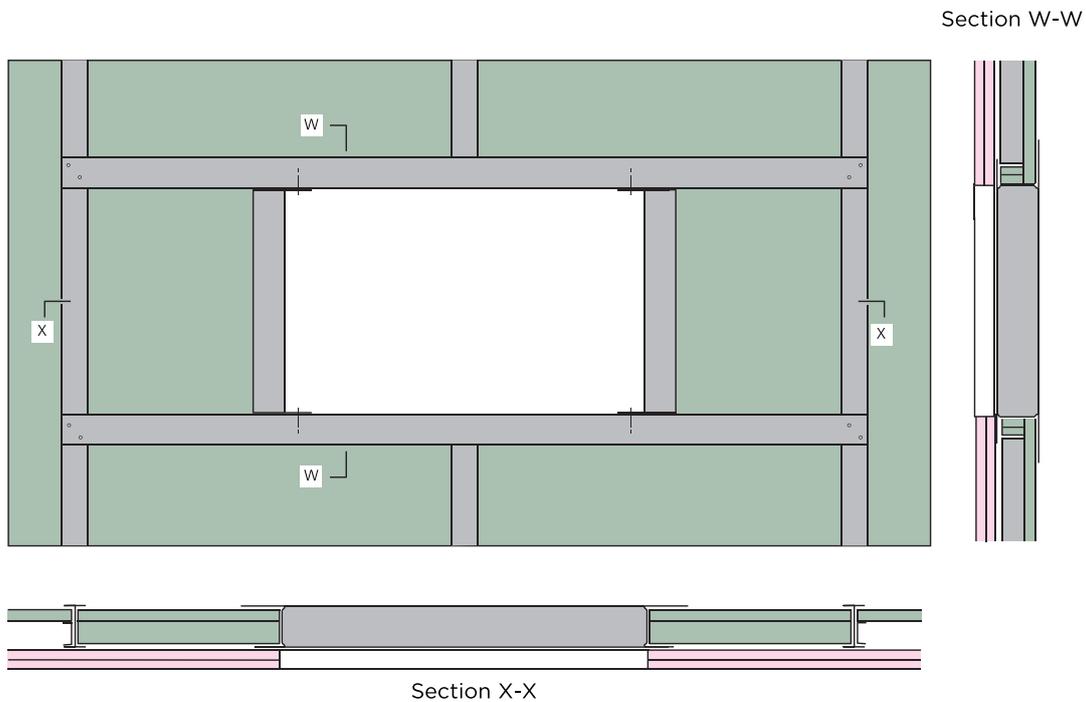
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GypWall QUIET SF - Socket box installation detail - up to 120 minutes fire resistance

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Opening bridging studs for duct / damper penetration within ShaftWall

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Gyproc plasterboard 2. Gypframe 'C' Stud 3. Gyproc Sealant at switch box perimeter for improved acoustics 4. Electrical socket with metal back box fitted tight into plasterboard 5. Two layers of Gyproc plasterboard (same board type as partition lining) forming normal 150mm high baffle fixed to Gypframe GA4 Steel Angle with Gyproc Drywall screws. Gypframe 103 FC 50 or similar / plywood may also be used (in addition to the plasterboard pattress) to provide additional support for the socket box if required | <ol style="list-style-type: none"> 6. Horizontal Gypframe RB1 Resilient Bars 7. Suitable fire resistant seal where required 8. 150mm length of Gypframe GA4 Steel Angle fixed to the studs with two Gyproc Waferhead Screws 9. ISOVER Eco APR |
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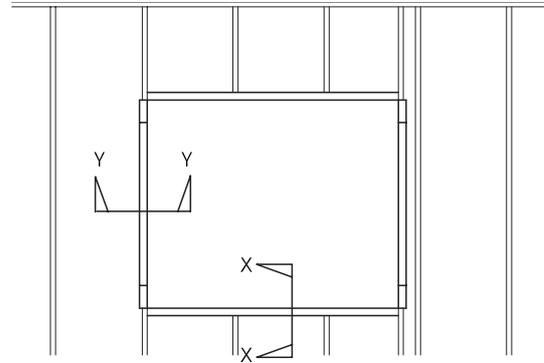
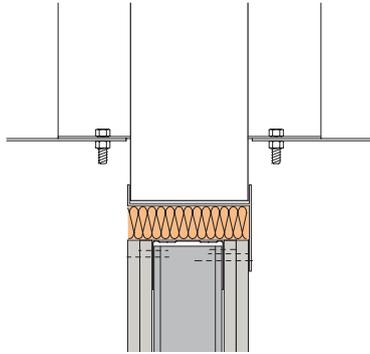
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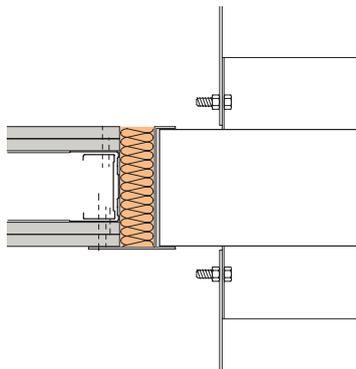
Typical opening for service penetrations in fire-rated partitions

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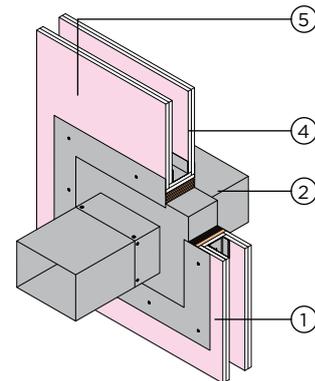
Section X-X



Section Y-Y



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1. Gyproc plasterboard or Glasroc specialist board
2. Gypframe 'C' Stud
3. Gypframe Floor & Ceiling Channel
4. Penetration seal as tested by damper manufacturer or proprietary alternative, confirmed as compatible by system designer / specifier (plasterboard lining around opening may not be required)
5. Damper (by others). Weight of damper should not exceed 57kg. Size of damper should not exceed 1400 x 1200mm

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Table 9 - Example fixing devices and typical safe working loads on partitions and wall linings

System	Lightweight fixtures up to 3kg (e.g. socket)	Lightweight to medium fixtures 4 - 8kg (e.g. small mirror)	Medium weight fixtures 9 - 20kg (e.g. shelf)	Medium to heavy fixtures 21 - 50kg (e.g. cupboard)	Heavy fixtures 51 - 100kg (e.g. basin)
ShaftWall					
GypWall systems ¹	A	B or C	D or I	G, H or I	K or H
GypLyner ^{1WL}					
Drilyner	A	B	F	L	L
GypLyner UNIVERSAL wall lining	A	B or C	D or E	J, K or L	K or L
Reference	Detail	Description	Typical SWL ² (typical failure load)		
A		No. 10 woodscrew into Gyproc plasterboard	3kg (12kg)		
B		Steel picture hook and masonry nail into Gyproc plasterboard	4kg (16kg)		
C		Metal self-drive into single layer Gyproc plasterboard	6kg (24kg)		
		Metal self-drive into double layer Gyproc plasterboard into timber nogging	8kg (32kg)		
D		Steel expanding cavity fixing, e.g. M5 x 40, into Gyproc plasterboard (board thicknesses up to 12.5mm)	12kg (48kg)		
		Steel expanding cavity fixing, e.g. M5 x 65, into plasterboard (board thicknesses from 15mm to 28mm)	18kg (72kg)		
E		Gyproc Drywall Screw fixed through Gyproc plasterboard into 0.5mm Gyproframe metal stud / Gyproframe 103 FC 50 Fixing Channel	19kg (76kg)		
F		Heavy duty plastic plug fixed through Gyproc plasterboard into masonry with 55mm minimum penetration	20kg (140kg)		
G		Gyproc Jack-Point Screws fixed through Gyproc plasterboard into minimum 0.8mm Gyproframe metal stud / Gyproframe 103 FC 90 Fixing Channel	30kg (120kg)		
H		No. 12 self-tapping screws fixed through Gyproc plasterboard into minimum 0.9mm Gyproframe metal stud / Gyproframe 103 FC 90 Fixing Channel	50kg (200kg)		
I		Steel expanding metal cavity fixing, e.g. M4 x 40, through Gyproc plasterboard into 0.9mm Gyproframe metal stud / Gyproframe 103 FC 90 Fixing Channel (board thicknesses up to 12.5mm)	40kg (160kg)		
		Steel expanding metal cavity fixing, e.g. M4 x 65, through Gyproc plasterboard into 0.9mm Gyproframe metal stud / Gyproframe 103 FC 90 Fixing Channel (board thicknesses from 15mm to 28mm)	50kg (200kg)		
		Steel expanding metal cavity fixing, e.g. M5 x 65, fixing through Gyproc plasterboard into plywood supported by Gyproframe Service Support Plate	50kg (200kg)		
J		8mm steel frame fixing fixed through Gyproc plasterboard into masonry with minimum 55mm penetration	60kg (240kg)		
K		No.12 self-tapping screw fixed through Gyproc plasterboard into timber sub-frame	120kg (480kg)		
L		M8 steel bolt / anchor fixed through Gyproc plasterboard into masonry with minimum 55mm penetration	130kg (520kg)		

¹ For GypWall QUIET SF, ensure that the fixings do not bridge the Gyproframe RB1 Resilient Bars, otherwise the acoustic performance will be compromised.

² Safe Working Load (SWL) - a safety factor of 4 (steel fixings) and 7 (plastic fixings) has been used.

NB For technical assistance on above fixings please contact the fixings manufacturer. The suitability of the fixing must be confirmed by the relevant controlling authority.

NB Reference can also be made to the Construction Fixing Association (CFA) guidance note 'Fixing For Plasterboard', which can be accessed at fixingscfa.co.uk

NB The information within table 9 does not take into consideration any additional forces that may be applied whether it be accidental, abusive or otherwise. The example fixing devices, typical safe working loads and typical failure loads given in table 9 relate to the installation of single fixtures. It is important to ensure that the drylining system specified is capable of supporting the loads, particularly if installing multiple fixtures. Furthermore, it may be necessary to incorporate several fixings per fixture to ensure the weight is distributed across the drylining system rather than a point load, particularly for medium to heavy fixtures.

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Table 10 - Example fixing devices and typical safe working loads on Gyproc partitions, lining and ceiling systems incorporating Habito

Fixing Type			Habito Layers	Typical SWL ¹ (typical failure load)
Detail	Description	Size		
	Woodscrew	No. 10 (5mm)	1 x 12.5mm	30kg (60kg) ²
			2 x 12.5mm	80kg (160kg) ²
	Steel expanding cavity fixing	M5 x 37	1 x 12.5mm	55kg (110kg)
		M5 x 65	2 x 12.5mm	60kg (120kg)
		M6 x 37	1 x 12.5mm	65kg (130kg)
		M6 x 65	1 x 12.5mm	65kg (130kg)

¹Safe Working Load (SWL) - a safety factor of 2 has been used.

²A standard 5mm, single thread, No. 10 Woodscrew should be used. Other types of woodscrews can affect the safe working load.

NB The distance between screws used to support fixtures, as shown in this table, should be a minimum of 15mm apart. Fixings closer than this have poorer performance due to a breakdown of the plasterboard core.

NB Fixing screws can be taken out and then screwed back into the same hole without a decrease in pull out performance. This is because when first screwed in a thread is formed within the gypsum core. Re-inserting the screw uses the same thread and provides the same level of screw pull out performance up to a maximum of three times.

NB For GypWall QUIET SF, ensure that fixings do not bridge the Gypframe RB1 Resilient Bars, otherwise the acoustic performance will be compromised.

NB For technical assistance on above fixings please contact the fixings manufacturer. The suitability of the fixing must be confirmed by the building designer / fixing manufacturer.

NB The information within table 10 does not take into consideration any additional forces that may be applied, whether it be accidental, abusive or otherwise. The example fixing devices, typical safe working loads and typical failure loads given in table 10 relate to the installation of single fixtures. It is important to ensure that the drylining system specified is capable of supporting the loads, particularly if installing multiple fixtures. Furthermore, it may be necessary to incorporate several fixings per fixture to ensure the weight is distributed across the drylining system rather than a point load, particularly for medium to heavy fixtures.