

Technical performance and principles of system design

Service installations

Service installations

Services within partitions and lining cavities

The installation of electrical services must always be carried out strictly in accordance with the National Rules for Electrical Installations, Fourth Edition ET101:2008 (RoI) and *BS 7671 Requirements for electrical installations. IET Wiring Regulations (NI)*.

Services can be incorporated within all our partition and lining systems. As shown in figure 21 and figure 22, Gypframe studs either have cut-outs or push-outs to accommodate routing of electrical services and other small services. Grommets or isolating strips should be installed in the cut-out to prevent abrasion of the cables.

Gypframe channels do not generally have cut-outs and so, if required, they need to be cut on-site, paying attention to Health & Safety guidance. Grommets or isolating strips should be installed in these cut-outs to prevent abrasion of the cables. However, Gypframe GWR3 Floor & Ceiling Channel has half-round cut-outs at regular centres. Refer to figure 23. These cut-outs are designed to prevent abrasion of electrical cables where they pass through the metal framework, therefore grommets are not required.

When installing electrical services within a partition, this 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 24 and figure 25.

Where heating pipes, particularly micro-bore systems, 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.

If a lining system, such as **Drilyner**, does not have sufficient depth to accommodate the service then the background should be 'chased out' to the appropriate depth considering maximum allowable tolerances. Pipes or conduits should be fixed in position before work commences.

Please see National Housing Building Council (NHBC) Standards 8.1 and Building Research Establishment (BRE) Thermal Insulation: avoiding risks (BR262)'.
Thermal insulation covering or around cables has the effect of reducing the current carrying capacity and so the cable may need to be de-rated and increased in size.

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► Refer to National Rules for Electrical Installations, Fourth Edition ET101:2008, BS 7671 and SR 54: Code of Practice: Methodology for the energy efficient retrofit of existing dwellings.

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.

Hot and cold water pipes should be installed strictly in accordance with manufacturers instruction.

In the case of gas service pipes behind drylined walls, *BS 6891* states that the pipe should be encased in building material, which could take the form of Gyproc plaster. Alternatively, apply a continuous band of Gyproc Plasterboard Compound or timber battens either side of the pipe to receive a plasterboard lining.

Service penetrations and fixing into drywall systems

Switch boxes and socket outlets can be supported on brackets formed from Gypframe 99FC50 Fixing Channel or cut and bent channels fixed horizontally between the studs. Alternatively, services can be fixed 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 26.

In fire-rated walls, the fire-stopping design is dependent on the period of fire resistance. Where acoustic performance is not a specific requirement, refer to figure 27 and figure 28.

Fixing electrical socket boxes into our partitions and walls can affect the technical performance e.g. fire, acoustic, air leakage, but careful detailing can minimise this. Robust Details offer specific guidance on the installation of socket boxes in separating walls, particularly with regard to the avoidance of back-to-back services. Refer to figure 29.

There are a number of putty pad products available on the market from a range of manufacturers and whilst we have no objection to the use of putty pads (by others) within drylining systems, all performance substantiation has to be provided by the fire-stopping manufacturer as is the case for any fire-stopping material. Refer to figure 30, for example.

The Robust Details pattern book also offers *the* alternative of a 'sacrificial' lining in front of a separating wall to create a zone for service installation. These service zones remove the need for service penetration of the actual Robust Detail separating wall construction, which in turn removes the

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risk of a loss in acoustic performance as a result of service penetrations. Refer to figure 31.

This method is increasingly migrating to projects where Pre-Completion Testing is being used, as best practice. However, it can lead to a downgrading of the $D_{nT,W} + C_{tr}$ performance of the base wall due to the introduction of additional cavities within the overall construction. Robust Detail walls are designed to exceed the building regulations so the slight potential downgrade in performance caused by the 'sacrificial' lining would not lead to system failure.

Where Pre-Completion Testing is required however, depending on the system specified, there may not be this level of 'safety margin', particularly at lower frequencies. Therefore, where additional 'sacrificial' service installation zone linings have been specified in non-Robust Details systems the most appropriate solution to ensure no reduction in the acoustic performance of the base partition is a 70mm cavity with 50mm Isover Acoustic Roll and a single layer 15mm Gyproc SoundBloc board lining installed on one or both sides of the base partition construction. Refer to figure 32, for example.

The plasterboard should always be neatly cut and Gyproc Sealant should be applied where optimum acoustic performance is required.

In wall linings and ceilings, access for services may be required for routine maintenance, inspection, upgrading or repair. This can be achieved by installing Gyproc Proflex Access Panels. Services should be routed through the lowest acoustic performing wall where possible. 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 for fire spread. It is important to use only those services and their installations that have been shown by a 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 are 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 and the drylining specification.

There is a wide variety of fixing devices suitable for securing fixtures and fittings to our systems. Generally, the choice of individual fixing devices will depend on the type of system and the loading requirements. This section gives recommendations on the selection of generic devices and proprietary fixings. Tables 11, 12 and 13 give example fixing

devices and typical applications in drywall systems to meet the specific load criteria for 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.

The guidance given is primarily concerned with fixtures at the time of installation. For subsequent installation, especially for heavier fixtures, the identification of studs and noggings within the lining / partition system will be required in order to attach the fixtures at these points.

Duct / damper penetration through drywall systems

Fire and smoke resisting dampers can be installed in our 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 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.


Figure 33, figure 34 and figure 35 show a method of preparing openings for installing dampers up to a maximum weight of 57kg within our 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.

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Table 11 – 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 up to 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 and GypWall systems ¹ GypLyner iwL	A	B or C	D, E or I	G, H or I	K
Timber stud	A	B or C	K or D	K	K
Drilyner	A	B	F	L	L
GypLyner wall lining	A	B or C	D or E	K	K

Reference	Detail	Description	Typical SWL ² (typical failure load)
A		5mm 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	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 Gypframe metal stud / Gypframe 99 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 0.9mm Gypframe metal stud	30kg (120kg)
H		No.12 self-tapping screws fixed through Gyproc plasterboard into minimum 0.9mm Gypframe metal stud	50kg (200kg)
I		Steel expanding metal cavity fixing, e.g. M4 x 40, through Gyproc plasterboard into 0.9mm Gypframe metal stud (board thicknesses up to 12.5mm)	40kg (160kg)
		Steel expanding metal cavity fixing, e.g. M4 x 65, through Gyproc plasterboard into 0.9mm Gypframe metal stud (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 Gypframe 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 Gypframe 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.

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.






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

The information within table 11 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 11 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 12 – Example fixing devices and typical safe working loads on partitions incorporating Rigidur (GypWall EXTREME)








Reference	Detail	Description	Typical SWL ¹ (typical failure load)
B		Steel picture hook and masonry nail into 12.5mm Rigidur	17kg (68kg)
		Steel picture hook and masonry nail into 15mm Rigidur	18kg (72kg)
F		Fischer PD nylon plug and screw into 12.5mm or 15mm Rigidur	20kg (140kg)
A		No. 10 woodscrew into 12.5mm or 15mm Rigidur	15kg (60kg)
I		Fischer HM8 x 55 steel cavity fixing into 15mm Rigidur	49kg (196kg)
M		Fischer KD6 steel cavity fixing into 12.5mm Rigidur	58kg (232kg)
		Fischer KD6 steel cavity fixing into 15mm Rigidur	74kg (296kg)

¹ Safe Working Load (SWL) – a safety factor of 4 (steel fixings) and 7 (plastic fixings) has been used.

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.

The information within table 12 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 12 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.

Table 13 – Example fixing devices and typical safe working loads on partitions incorporating Habito (GypWall SUPERIOR)

Reference	Detail	Description	Typical SWL ¹ (typical failure load)
A		5mm Woodscrew into 12.5mm Gyproc Habito	15kg (60kg)
A		5mm Woodscrew into 2 x 12.5mm Gyproc Habito	34kg (136kg)
N		Steel expanding cavity fixing - M5/12 Cavity Anchor into 12.5mm Gyproc Habito	37kg (148kg)
O		Steel expanding cavity fixing - M5/25 Cavity Anchor into 12.5mm Gyproc Habito	47kg (188kg)
O		Steel expanding cavity fixing - M5/25 Cavity Anchor into 2 x 12.5mm Gyproc Habito	81kg (324kg)
P		M4 Spring Toggle into 12.5mm Gyproc Habito	42kg (168kg)
P		M4 Spring Toggle into 2 x 12.5mm Gyproc Habito	53kg (212kg)

¹ Safe Working Load (SWL) – a safety factor of 4 (steel fixings) has been used.

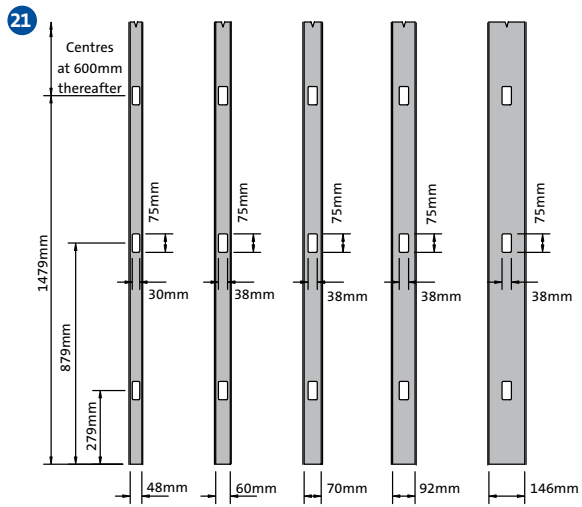
For technical assistance on above fixings please contact the fixings manufacturer. The suitability of the fixing must be confirmed by the building designer / fixing manufacturer.

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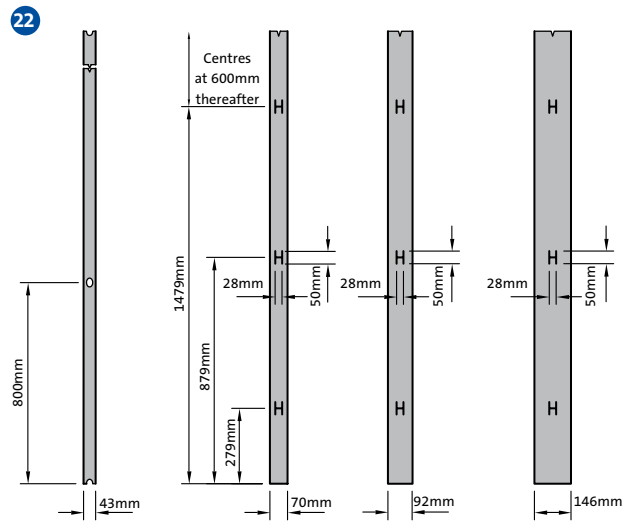
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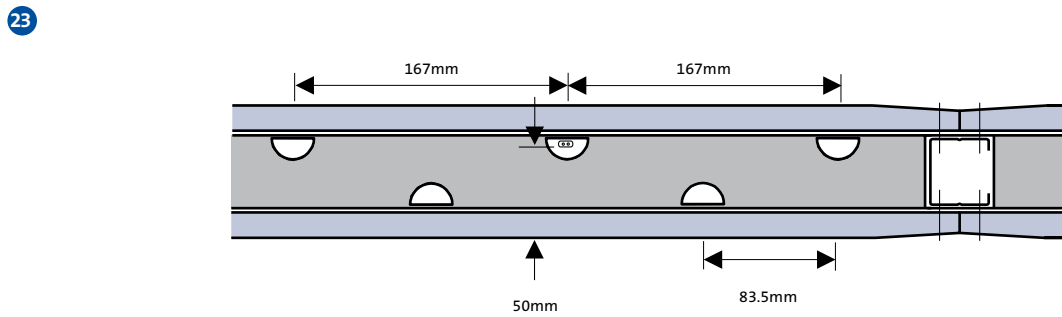
Figures



Gyframe studs service cut-out details – Gyframe 'C' and Gyframe 'I' Studs



Gyframe studs service push-out details – Gyframe AcouStuds



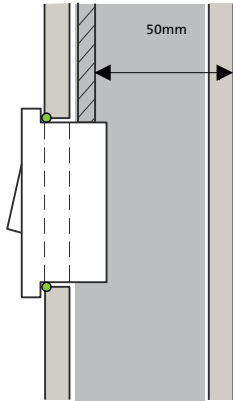
Cross-nogging cut-outs

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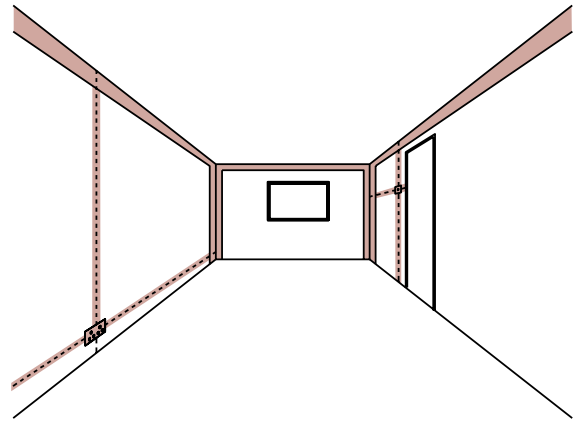
Figures

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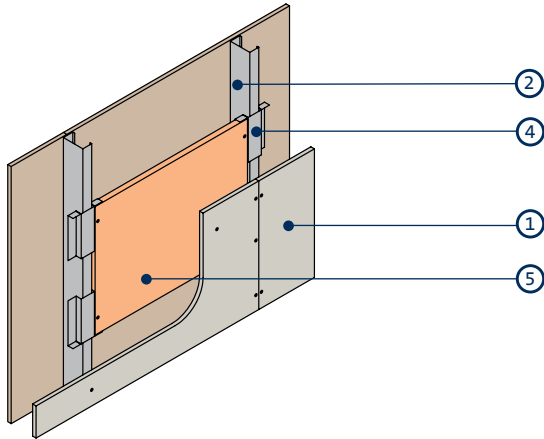
Minimum distance of cabling

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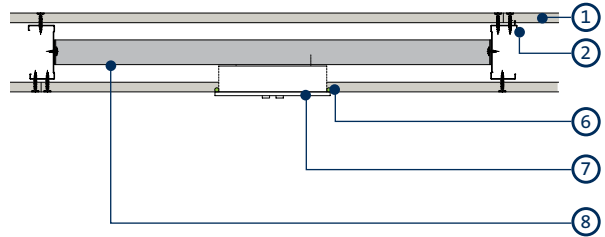
Standard zones of cabling

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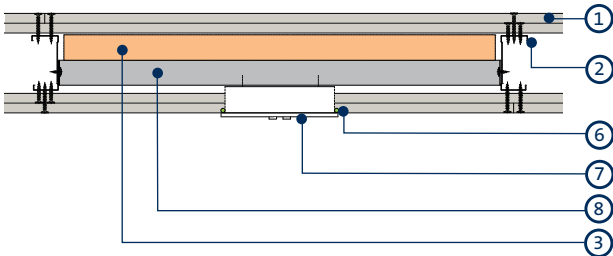
General arrangement of service support plates showing studs at 600mm centres

27



Socket box installation – up to 60 minutes fire resistance

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Socket box installation – up to 120 minutes fire resistance

- 1 Gyproc plasterboard or Gyproc specialist board
- 2 Gypframe 'C' Stud
- 3 Stone mineral wool (minimum 80kg/m³) backing to socket box
- 4 Gypframe Service Support Plate
- 5 18mm plywood

- 6 Gyproc Sealant at switch box perimeter for improved acoustics
- 7 Electrical socket with metal back box fitted tight into plasterboard
- 8 Gypframe Folded Edge Standard Floor & Ceiling Channel receiving fixing of socket box – channel legs tabbed, bent and fixed to metal studs with Gyproc Wafer Head Drywall Screws

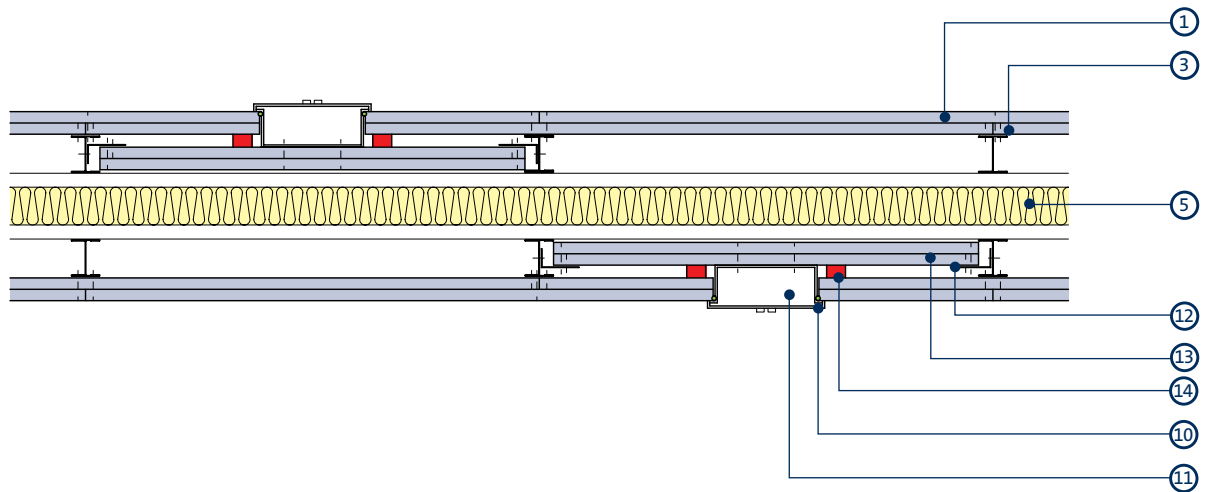
NB If Gypframe Service Support Plates are being installed and not immediately boarded, secure plates with a Gyproc Wafer Head Drywall Screw or Gyproc Wafer Head Jack-Point Screw.

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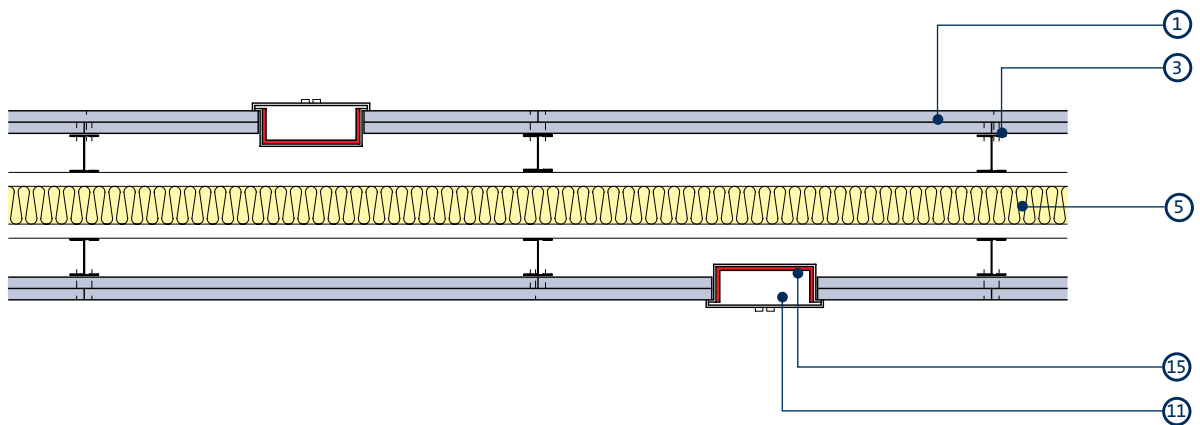
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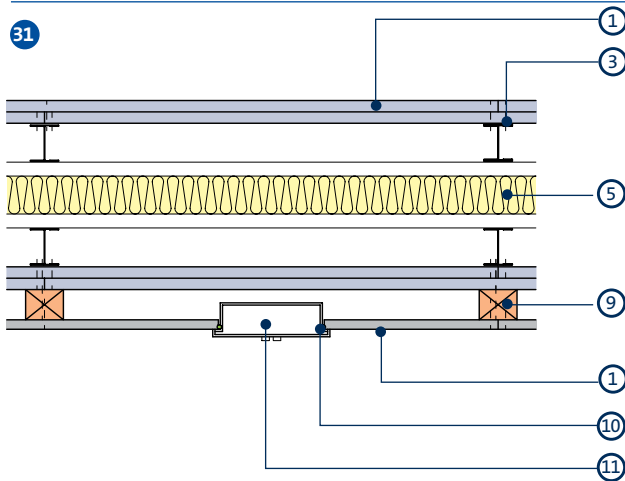
Electrical socket box with plasterboard baffle in GypWall QUIET IWL

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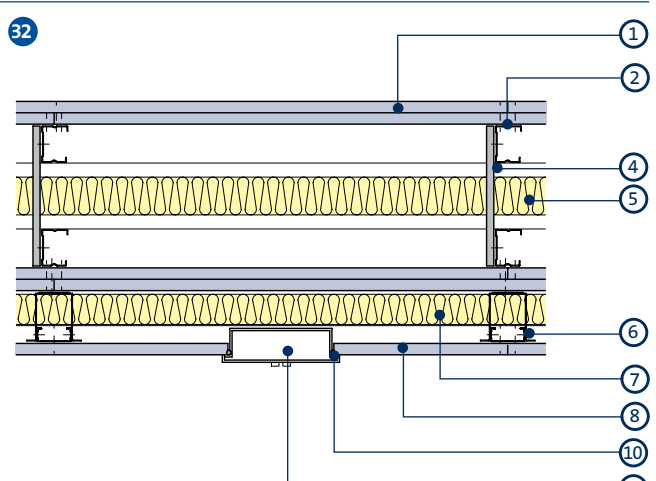
Electrical socket box with putty pad in GypWall QUIET IWL

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Robust Details sacrificial lining where a slight performance downgrade is not detrimental to the system

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Electrical socket box in sacrificial lining to GypWall QUIET

1 Gyproc plasterboard

2 Gypframe 'C' Stud

3 Gypframe 'T' Stud

4 Gypframe 99 FC 50 Fixing Channel

5 Isover acoustic insulation

6 GypLyner with minimum 70mm cavity

7 50mm Isover Acoustic Roll

8 15mm Gyproc SoundBloc

9 Timber batten

10 Gyproc Sealant

11 Electrical socket box

12 Gypframe GA4 Steel Angle

13 150mm high Gyproc plasterboard baffle to match partition lining

14 Fire-resistant seal where required

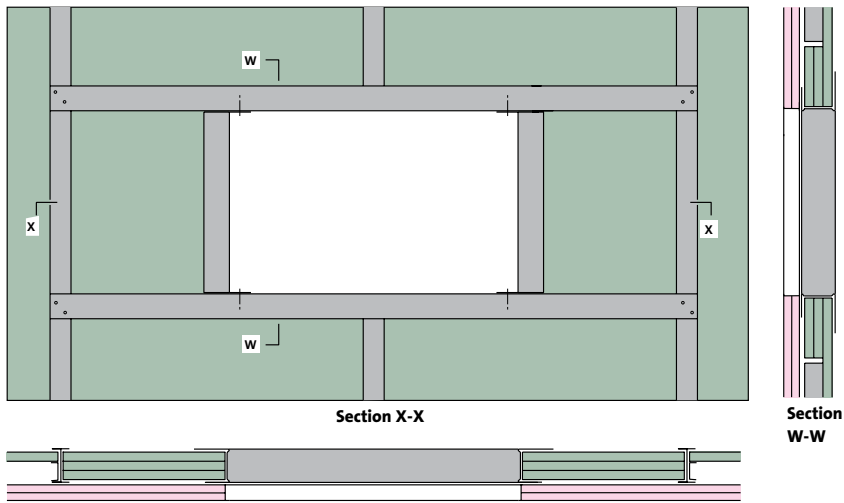
15 Putty pad (by others) in accordance with manufacturer's instructions

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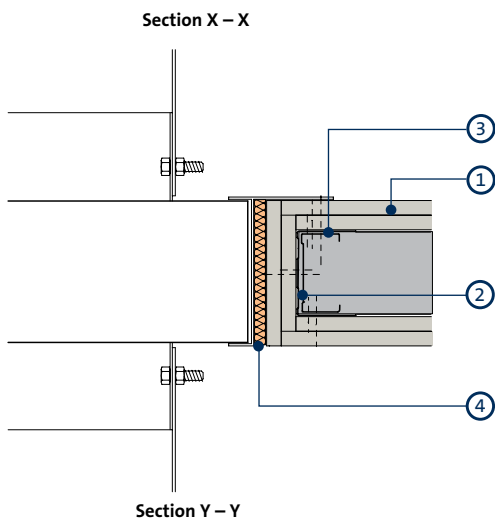
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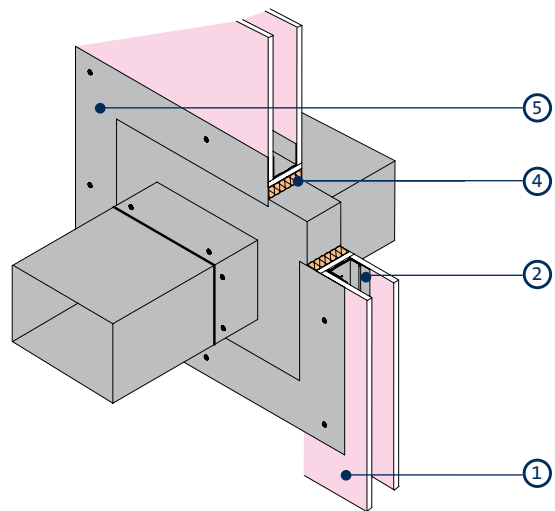
Opening bridging studs for duct / damper penetration within ShaftWall

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Typical opening for service penetrations in fire-rated partitions

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Fire rated construction in which the damper is supported by the partition (isometric view)

- 1 Gyproc plasterboard or Glasroc F 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 damper should not exceed 1400 x 1200mm