Introduction

Penetrations in fire rated construction can allow spread of fire and smoke from one fire-cell to another if they are not correctly tested, specified or installed. Penetrations can compromise the FRR and in turn the health and safety of building occupants.

GENERIC DETAILS FOR ONE-SIDED PENETRATIONS

The following pages give generic details for the installation of one-sided penetrations and show general principles of forming simple penetrations through the linings of a GIB® Fire Rated System.

Many of the details shown rely on plasterboard baffles to retain the system's FRR. The penetration solutions shown are suitable for an FRR up to 120/120/120 unless otherwise noted.

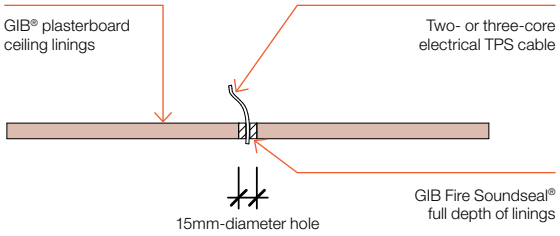
PROPRIETARY PENETRATION SEALS

More elegant proprietary penetration seals exist such as metal switch boxes with intumescent pads. Similarly, through penetrations such as for metal or plastic pipes, cable trays, ducts, etc. are not shown in this literature and rely on proprietary products and penetration seals.

— The continuity and effectiveness of fire separations must be maintained around penetrations. Where a difference exists between the FRR of the penetration seal or closure and the FRR of the GIB® Fire Rated System, the lower FRR determines the performance of the element.
— For proprietary systems, contact the relevant penetration seal supplier.

SINGLE-CABLE PENETRATION FOR SURFACE-MOUNTED ELECTRICAL FIXTURES

SECTION VIEW



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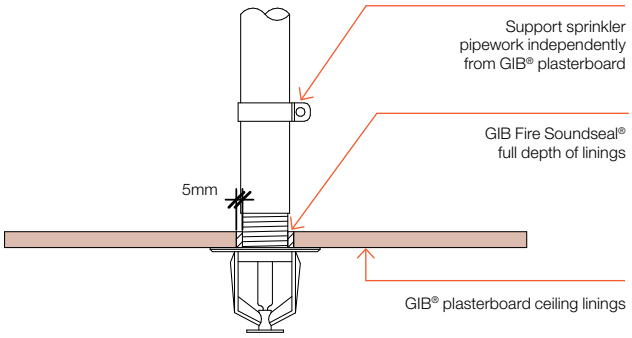

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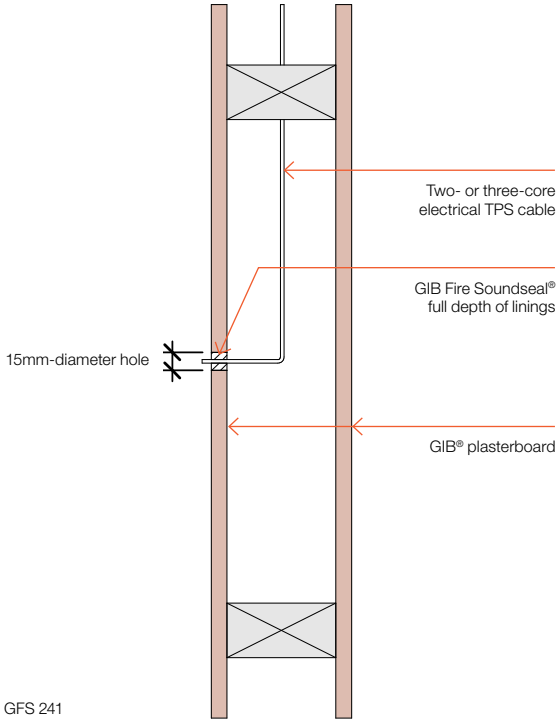
PLAN VIEW



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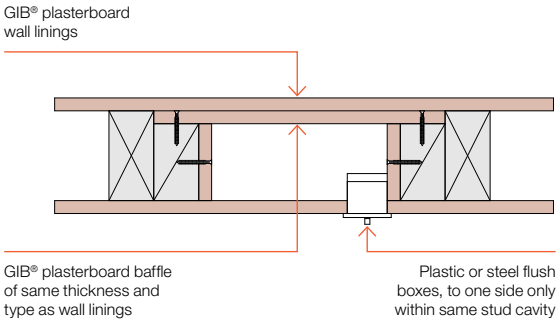
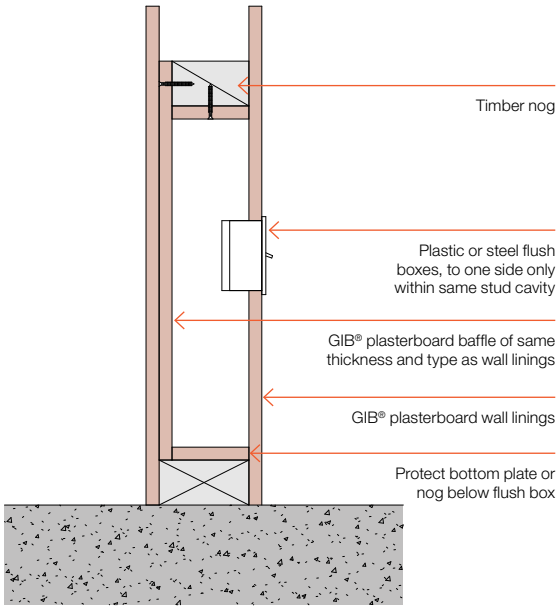
FLUSH BOXES IN TIMBER STUD WALLS

PLAN VIEW



SECTION VIEW



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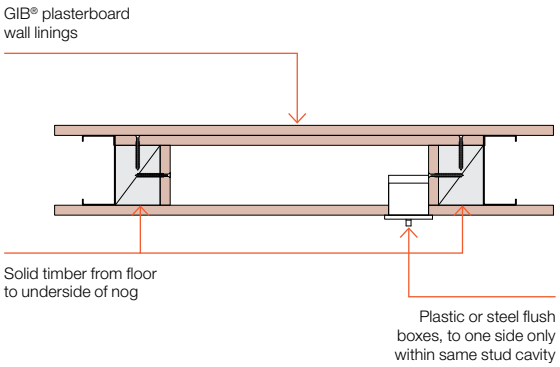
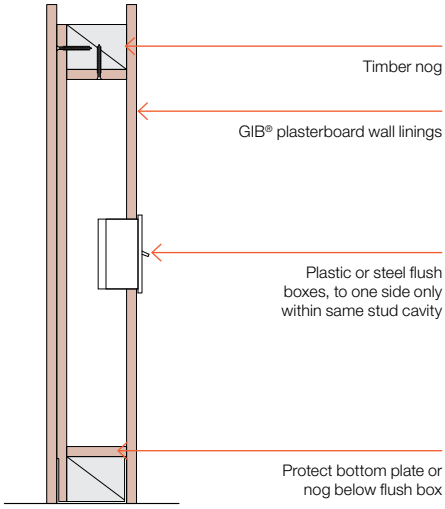
FLUSH BOXES IN METAL STUD WALLS

PLAN VIEW



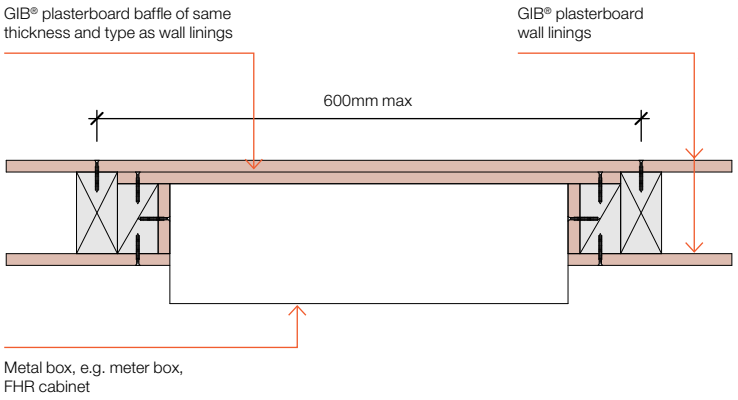
SECTION VIEW



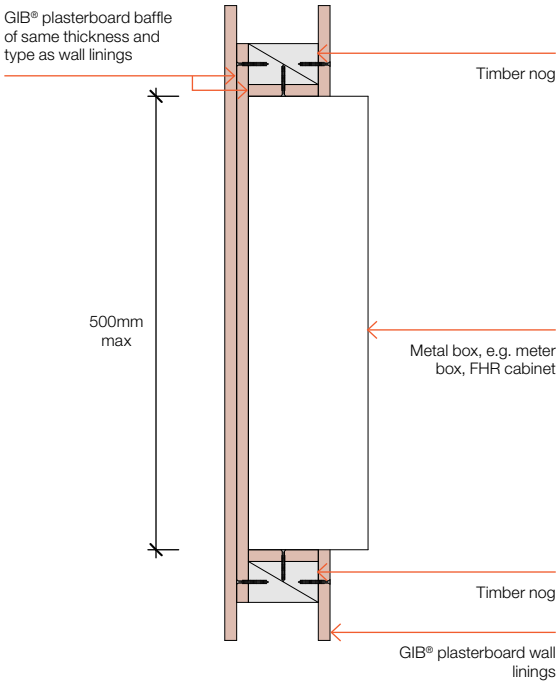
GFS 261

LARGER RECESSES IN TIMBER STUD WALLS

PLAN VIEW



SECTION VIEW



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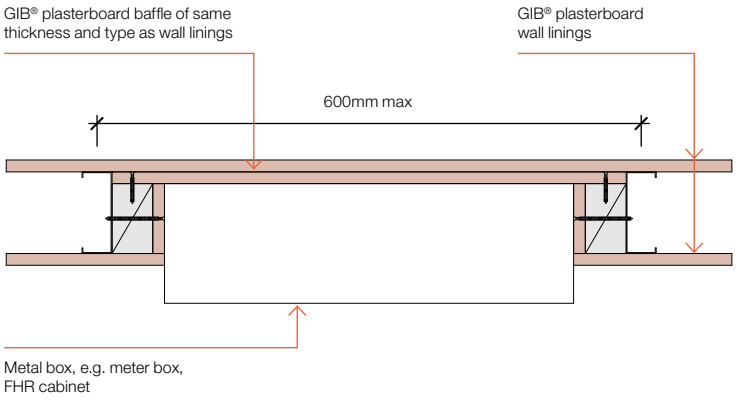
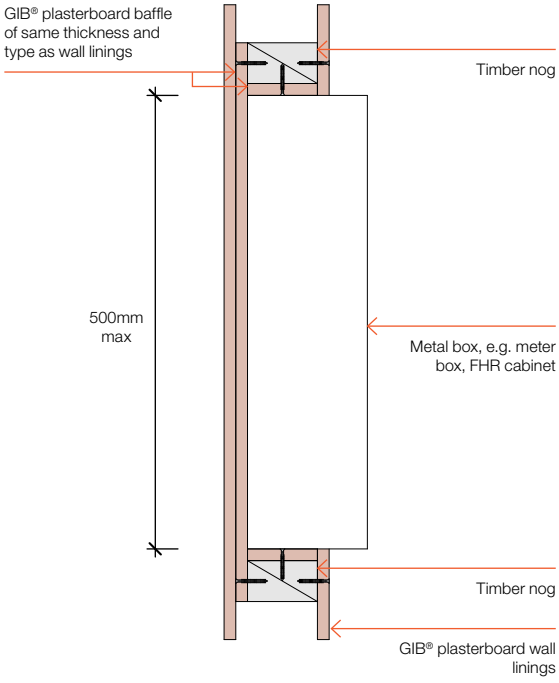
LARGER RECESSES IN METAL STUD WALLS

PLAN VIEW



SECTION VIEW



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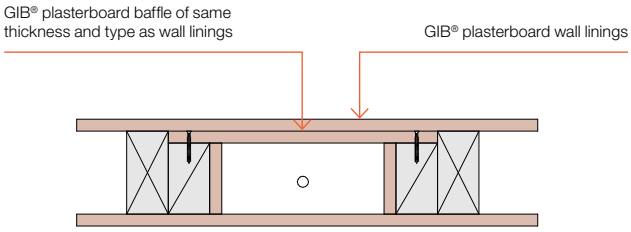
METAL PIPE IN TIMBER STUD WALL

PLAN VIEW



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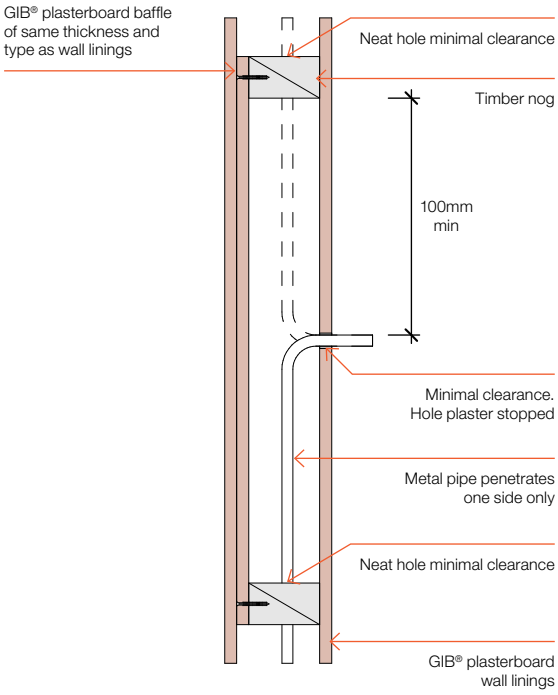
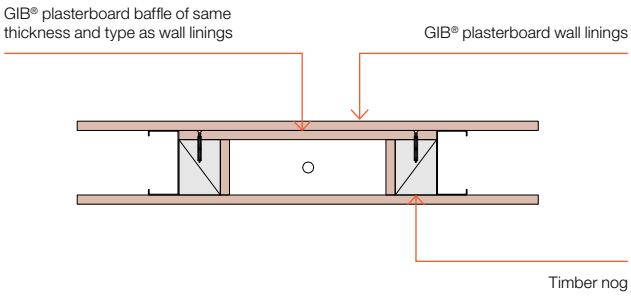
SECTION VIEW



Note: This detail applies to metal pipe only.

METAL PIPE IN METAL STUD WALL

PLAN VIEW



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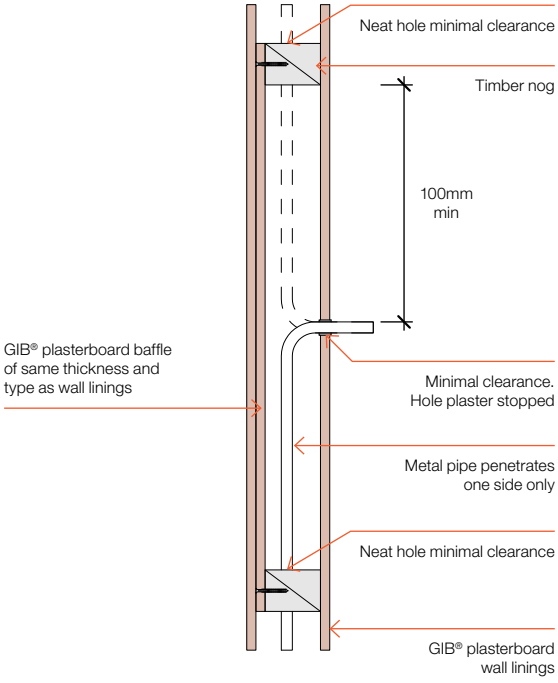
SECTION VIEW

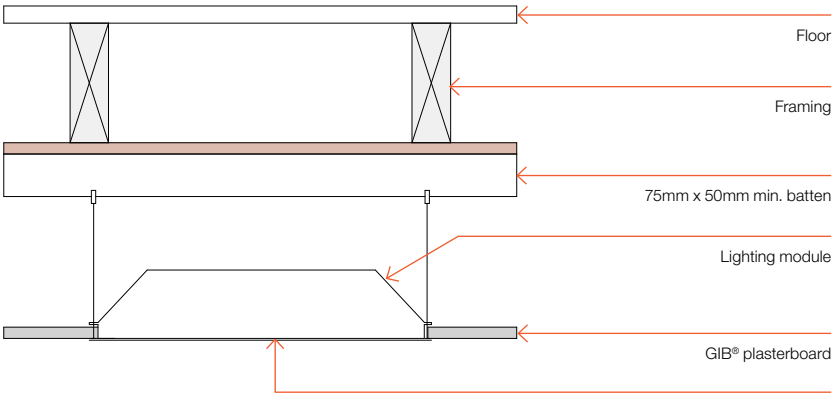


Note: This detail applies to metal pipe only.

SUSPENDED CEILING (SECTION VIEW)

GIB® Fire Rated System Types
GBFC, GBCJ or GBUC

Any suspended ceiling system with ties to fixed battens. Recessed light fittings may be installed conventionally including troffer pack modules (shown), recessed downlights or other light fittings as required

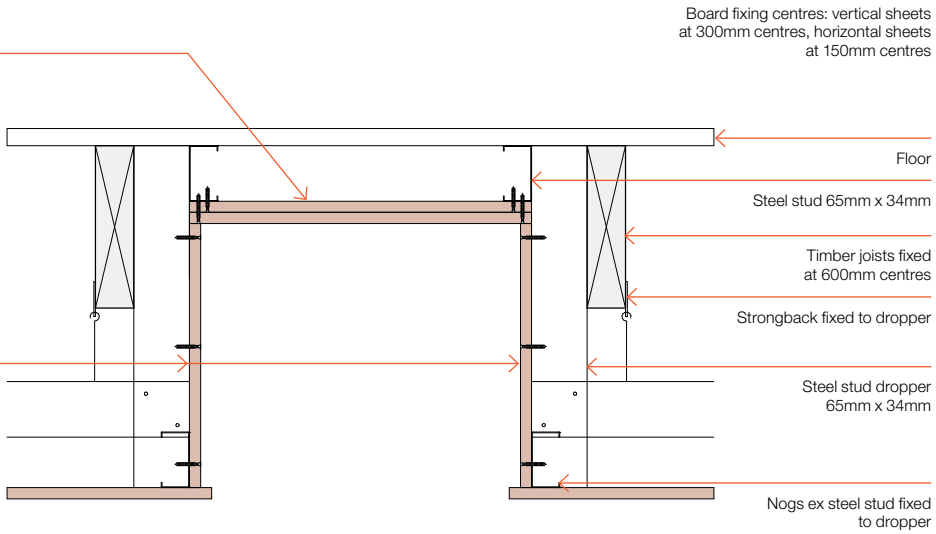


GFS 280

SPRING OR CLIP FIXED LIGHT FITTING (SECTION VIEW)

Floor/ceiling systems require one extra layer of GIB® plasterboard of same type and thickness as the ceiling lining. Universal systems are lined as per ceiling

GIB® plasterboard as per ceiling linings

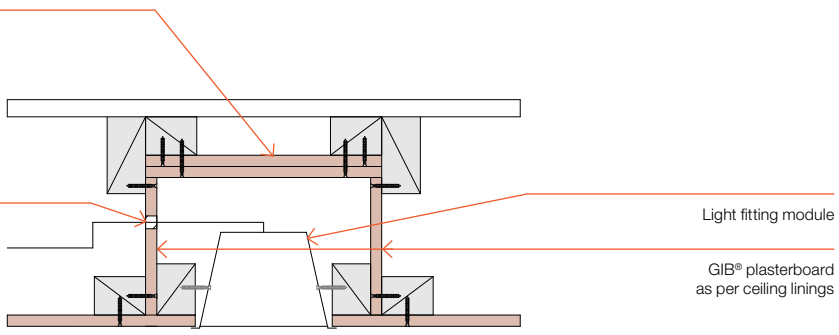


GFS 281

FRAME FIXED LIGHT FITTING (SECTION VIEW)

Floor/ceiling systems require one extra layer of GIB® plasterboard of same type and thickness as the ceiling lining. Universal systems are lined as per ceiling

Cable penetration fire stopped (see detail GFS 241, page 97)



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DESIGN STRATEGY

Resolve and specify fire rated service penetrations in the design office rather than on-site. Combine services as much as possible in ‘services highways’ or shafts which can themselves be fire rated, eliminating the need for many different and individual penetrations.

ENSURE FITNESS FOR PURPOSE

Fire test results for penetration seals, such as plastic pipe collars that have been tested in concrete, cannot be simply transferred to other types of construction such as framed construction lined with gypsum plasterboard.

Sometimes suppliers of penetration seals rely on overseas or local tests carried out on gypsum plasterboard assemblies with significantly greater fire resistance than what is claimed for the penetration seal. A penetration seal must be suitable for the construction type it is installed in. Check test reports and manufacturer’s information carefully.

SUPPORT PENETRATION SEALS

To erase doubt, ensure penetration seals are supported by framing around the aperture and not directly by gypsum plasterboard linings. Installation of additional framing members may be required.

Alternatively, an additional strip of plasterboard can be installed over the existing lining and supported by adjacent framing members. This option is suitable for penetration seals such as cable bundles, small metal pipes and plastic pipe collars.

When multiple services penetrate a fire rated wall above ceiling level, it is best practice to install a continuous strip of GIB® plasterboard at that location over the wall linings as illustrated below, providing local strengthening.

Penetration patches are not required when penetration seals are installed in one way universal (UW and UC) systems.

Heavy penetrating items such as cable trays and ducts must have separate supports, such as hangers to the floor above.