CONCEPTUAL DETAILING FOR INTERIOR DESIGN

ISHIK UNIVERSITY/ENGINEERING FACULTY
INTERIOR DESIGN DEPARTMENT

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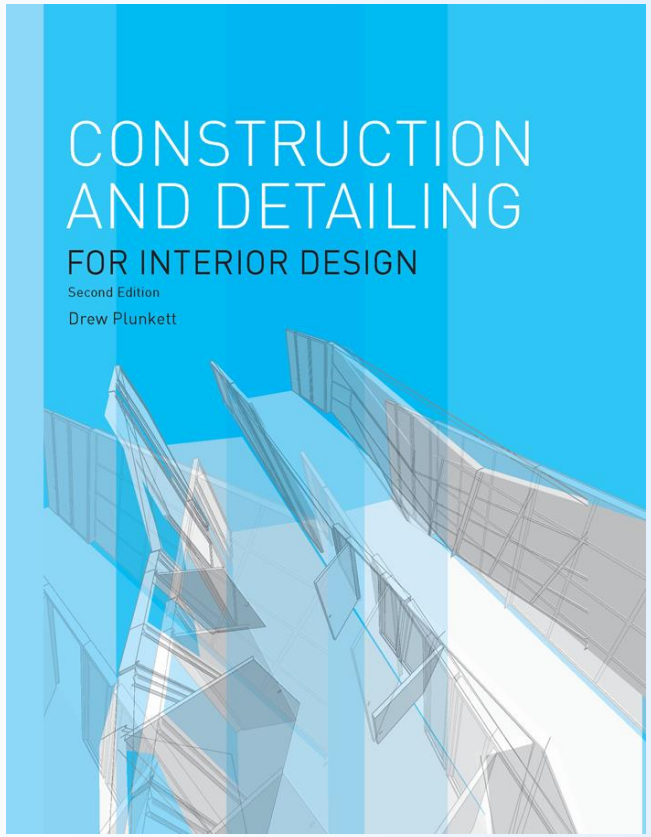
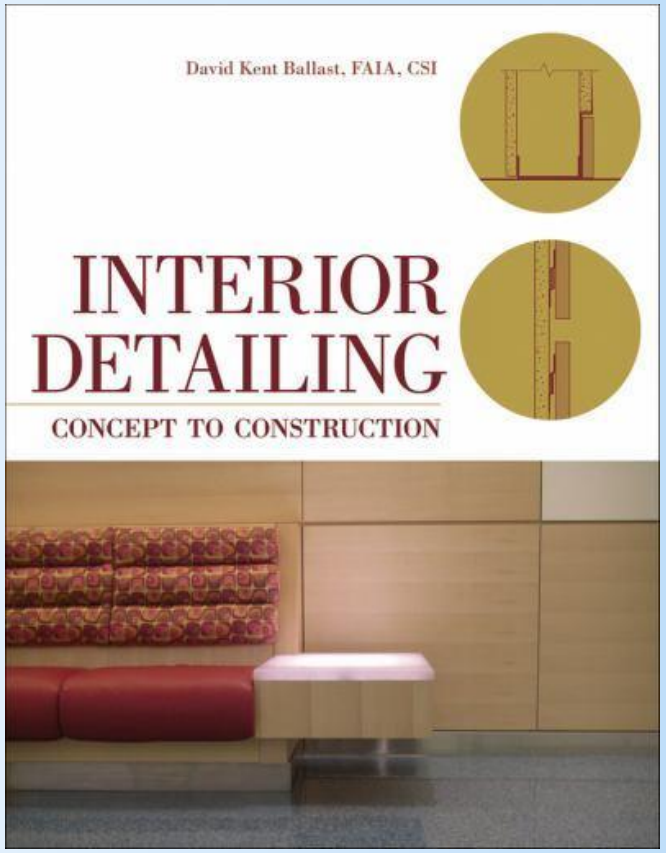
REFERENCE BOOKS



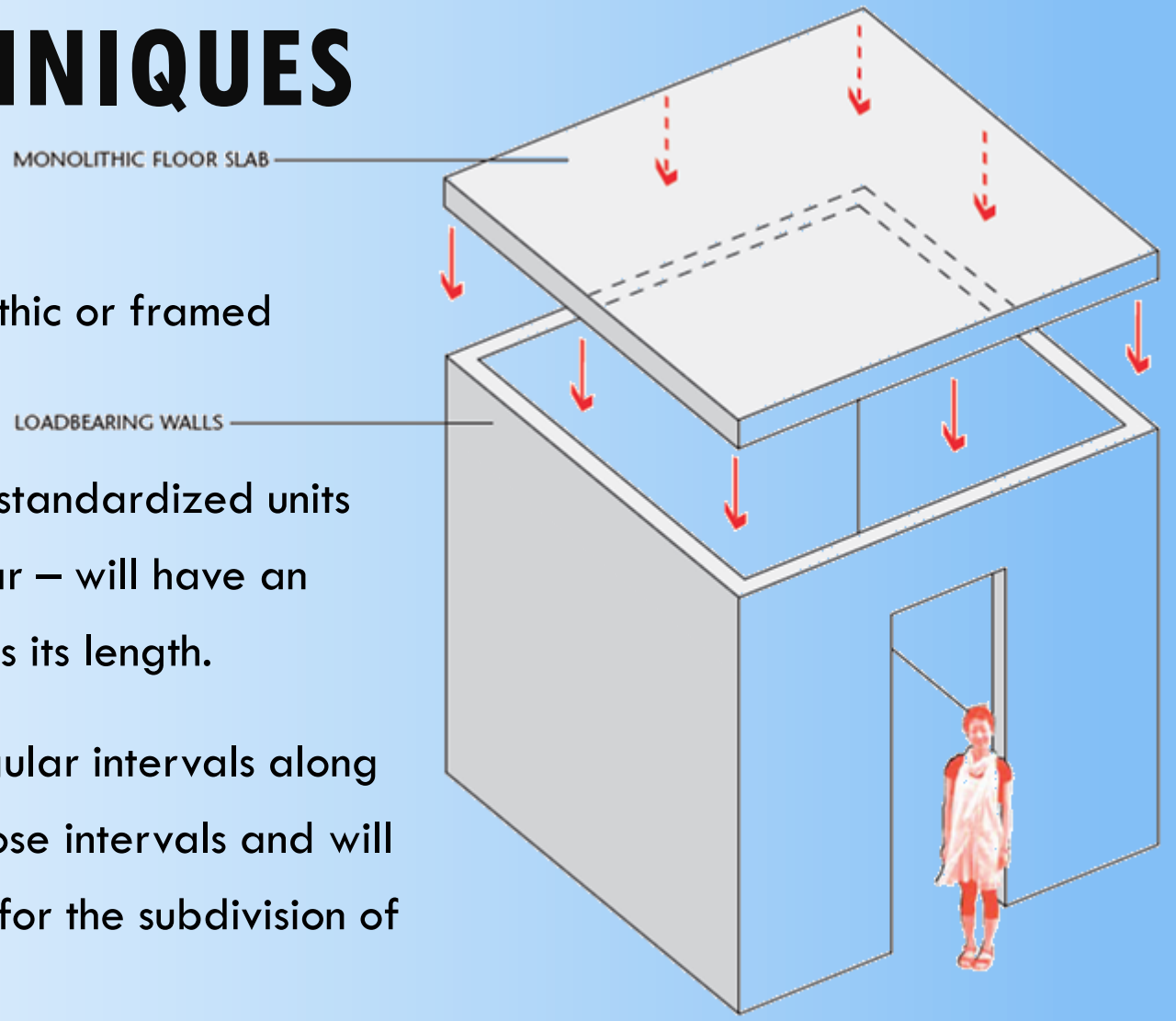


WALLS

walls may be loadbearing or non-loadbearing.

Loadbearing walls divide spaces, but are also responsible for supporting the construction above them. Nonloadbearing walls are responsible only for the subdivision of spaces.

CONSTRUCTION TECHNIQUES



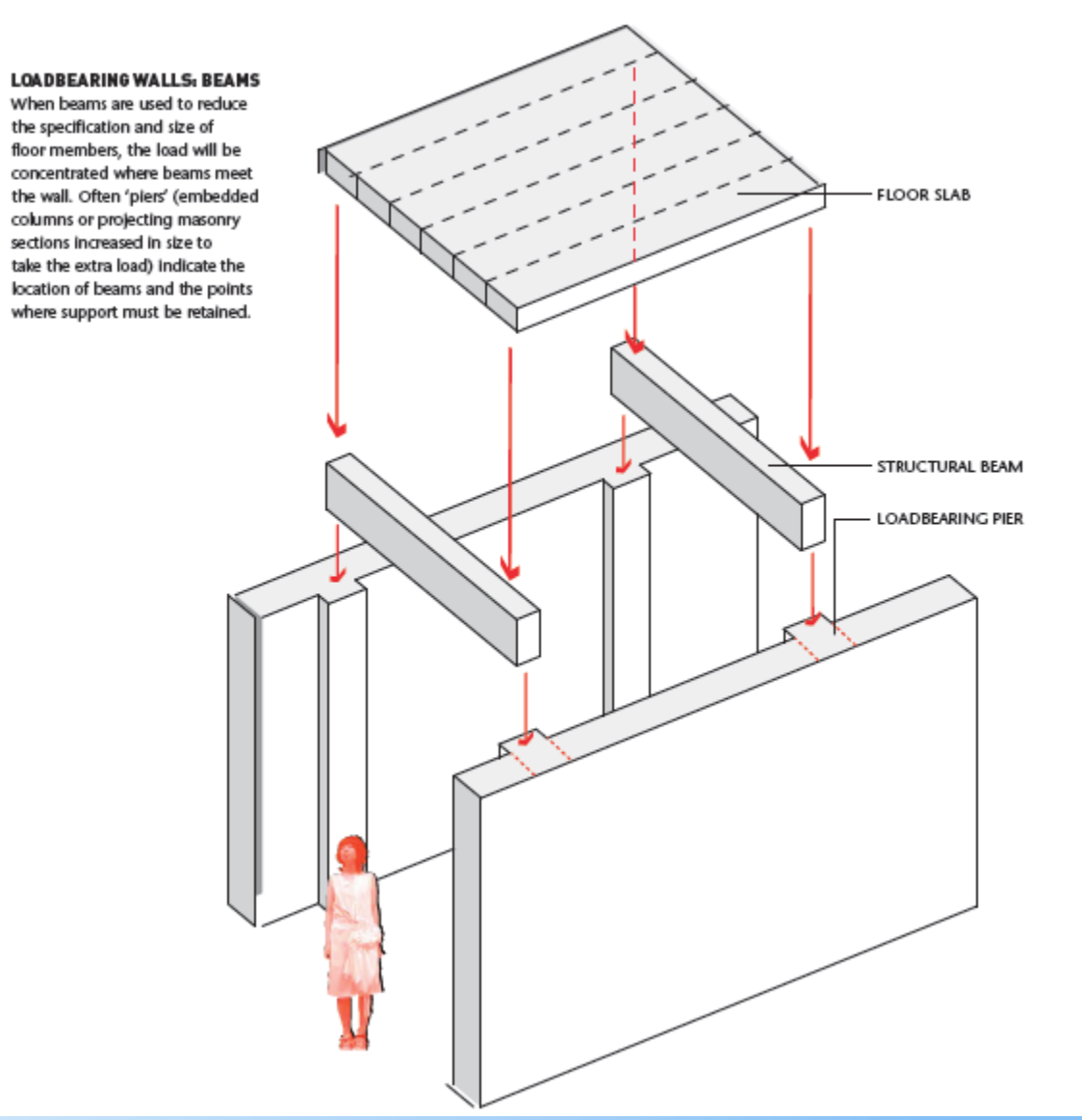
Both types of wall can use techniques of monolithic or framed construction.

- In the first case, the wall – probably made of standardized units such as brick, block or stone bonded with mortar – will have an equally distributed loadbearing capacity across its length.
- In the second, framing elements located at regular intervals along the length of a wall will focus the loading at those intervals and will allow the use of lighter, non-loadbearing walls for the subdivision of areas.

LOADBEARING WALLS

It is comparatively simple to identify a loadbearing wall.

If it aligns directly with a wall or walls on an upper floor then it is likely to be transferring their weight to the foundations.

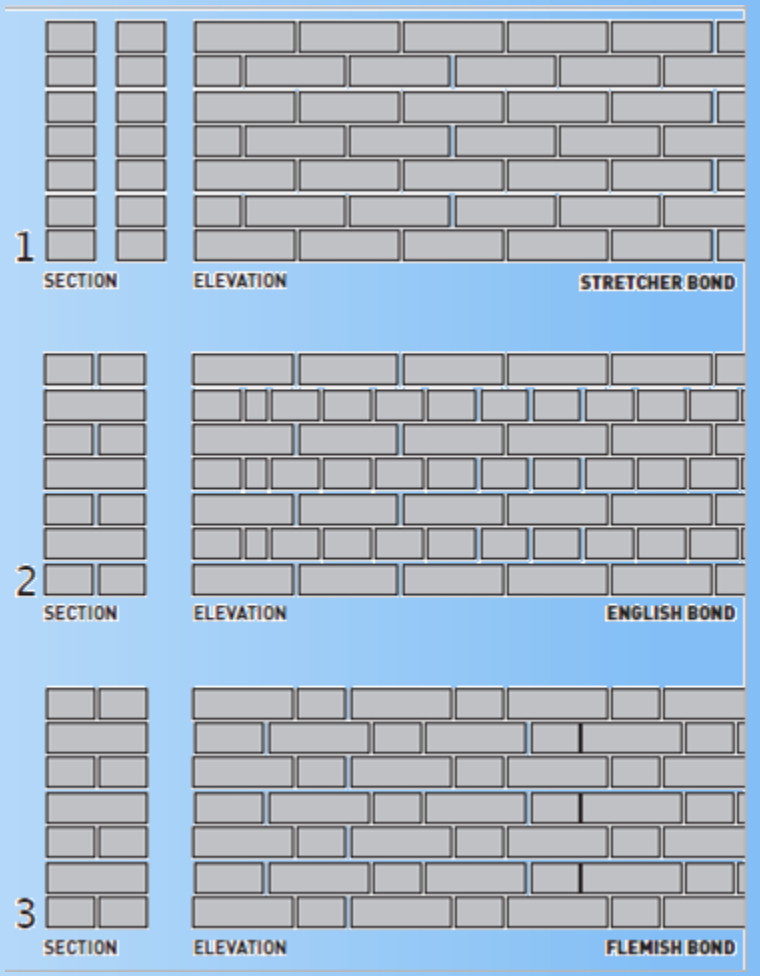


MASONRY

Bricks are probably the most common material used to construct loadbearing walls. They are made in standard sizes – the most common is nominally 215mm long, 102.5mm wide and 65mm high. The mortar joints that bind them are nominally 10mm, so that in calculating the dimensions of an area of brick wall, brick length plus joint (225mm) and height plus joint (75mm) become the basic modules.

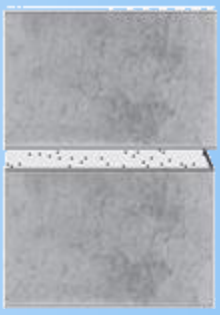
BONDS

Vertical mortar joints do not usually line through. This increases the structural cohesion of the wall. In the simplest 102.5mm-thick wall, bricks overlap by half their length, and in thicker walls, typically 215mm or 327.5mm wide, some bricks will be laid end-on to the face of the wall to increase lateral cohesion. A brick with its long side exposed is called a 'stretcher' and an exposed short side is a 'header'. The various brickwork patterns are known as the 'bond' and may be exploited for decorative effect. A horizontal line of brickwork is known as a 'course'.

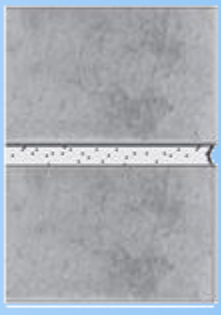


JOINTS

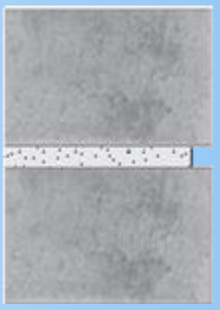
There are various different ways of finishing mortar joints. The most common internal, and external, method is to finish the mortar flush with the face of the brickwork. 'Weathered' and 'keyed' joints are used externally to shed rainwater from the face of the wall while creating a shadow that emphasizes the joint. If water collects on an exposed horizontal brick surface it facilitates penetration of the porous core, which will be fractured when the water freezes. A squared-off or 'recessed' joint, which would collect rainwater if used externally, may be used to emphasize the joint in new internal walls. It is essentially a decorative device.



WEATHERED MORTAR JOINT



KEYED MORTAR JOINT



RECESSED MORTAR JOINT

PLASTER

Often, bricks used for internal and external walls of a building shell will be concealed behind 10–13mm of plaster to provide a perfectly smooth surface for painting. Textured finishes are available, for application by both hand and machine.

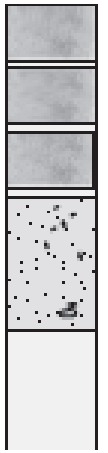
CREATING OPENINGS IN LOADBEARING WALLS

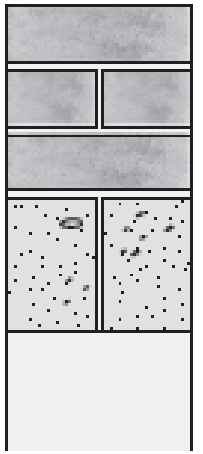
Door lintels

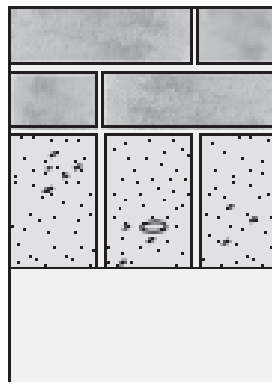
It is generally a simple matter to make door openings – they are unlikely to be wider than 900mm. Normal practice is to remove the section of brick- or blockwork and insert a precast reinforced-concrete lintel across the gap.

The lintel for a single door opening will probably be a single brick course deep and one brick high to make re-plastering of the area simple

Greater spans require deeper lintels, but it is convenient if these increase by the depth of a brick course to make their integration into existing brick courses simpler.

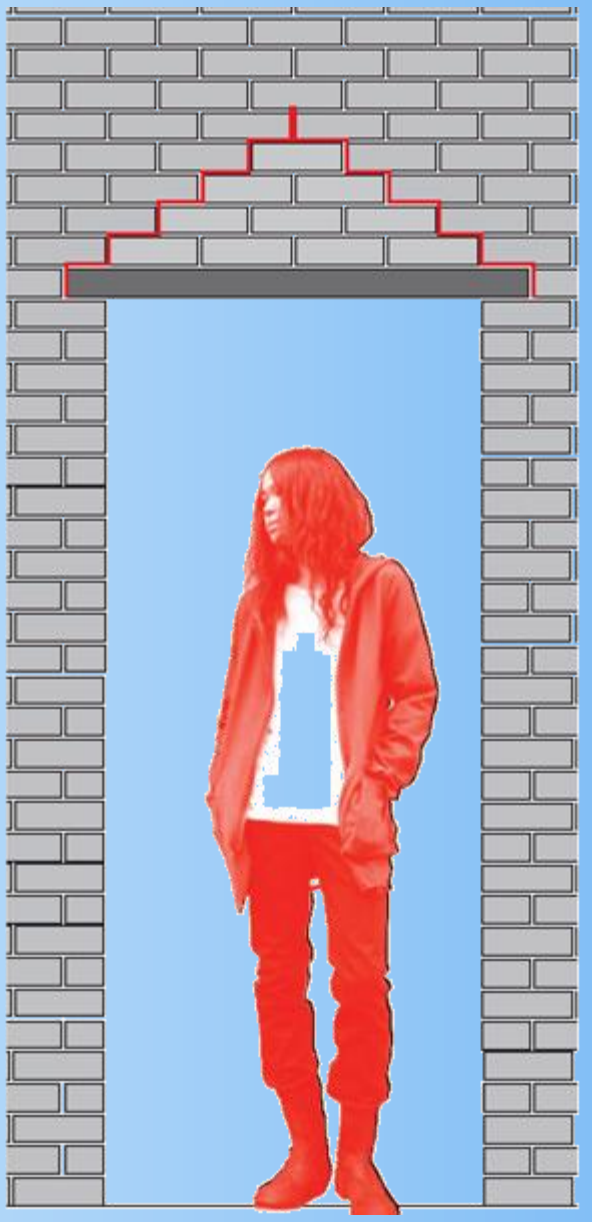

SINGLE LINTEL


DOUBLE LINTEL


TRIPLE LINTEL

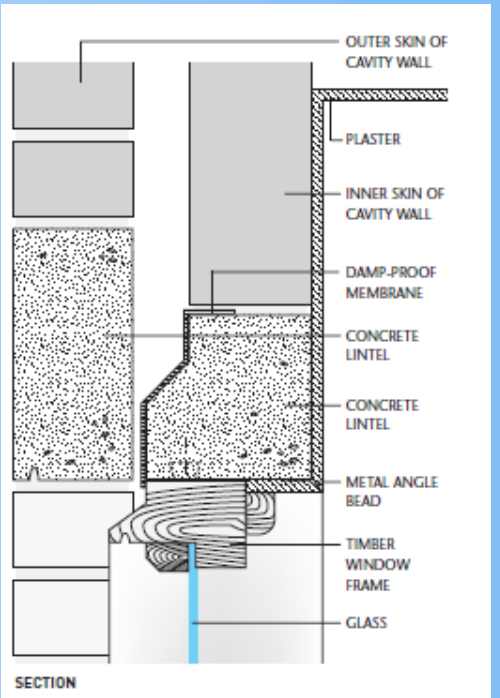
STEEL LINTELS

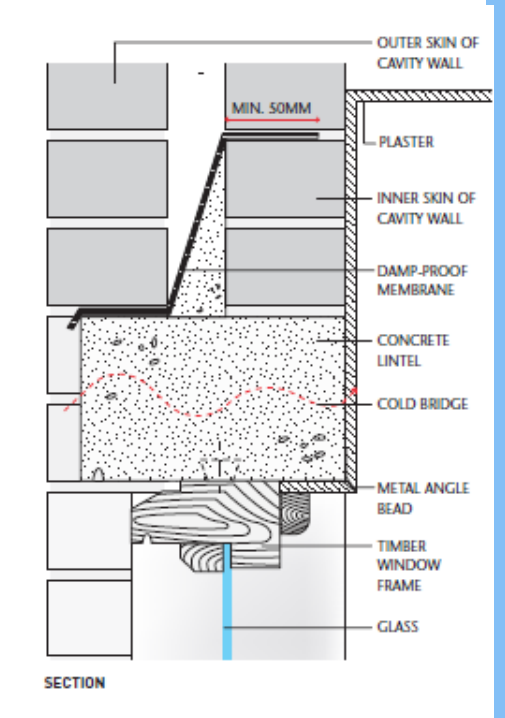
These offer an alternative to concrete, but their comparatively smooth and impervious surfaces do not provide as satisfactory a key for the mortar that will bond them to the brickwork. Steel lintels are more normally used within steel-framed construction, when they can be bolted to steel-supporting elements through pre-drilled holes in both components.



CAVITY WALLS

Traditional external masonry walls were solid. They could provide appropriate structural support, but offered less protection against the penetration of moisture, whether from rain or as 'rising damp' drawn by capillary action from the earth below and around the wall's base. The standard solution is now to build external walls as two skins, separated by a 'cavity' of about 50mm. Galvanized metal or plastic 'wall ties', built at regular horizontal and vertical intervals into corresponding horizontal courses, bind the skins into a monolithic structure, and twists at the midpoint of each tie shed water and prevent it from reaching the inner skin. Impervious insulation compounds, pumped into the cavity to improve thermal performance, will also help to prevent the passage of water to the inner skin, if intact. Fissures can act as conduits, carrying water to the inner skin.



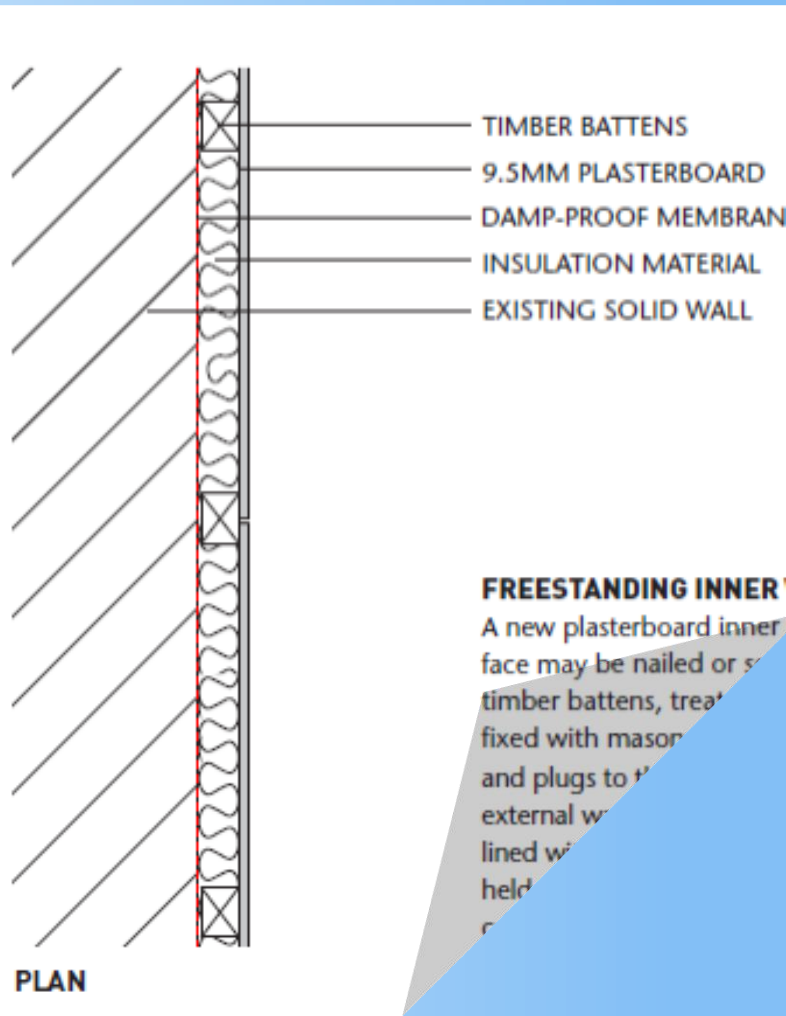


DAMP-PROOF MEMBRANES

The solution is to separate interior and external walls – in effect to form an inner skin and to treat the existing solid external wall as the outer skin.

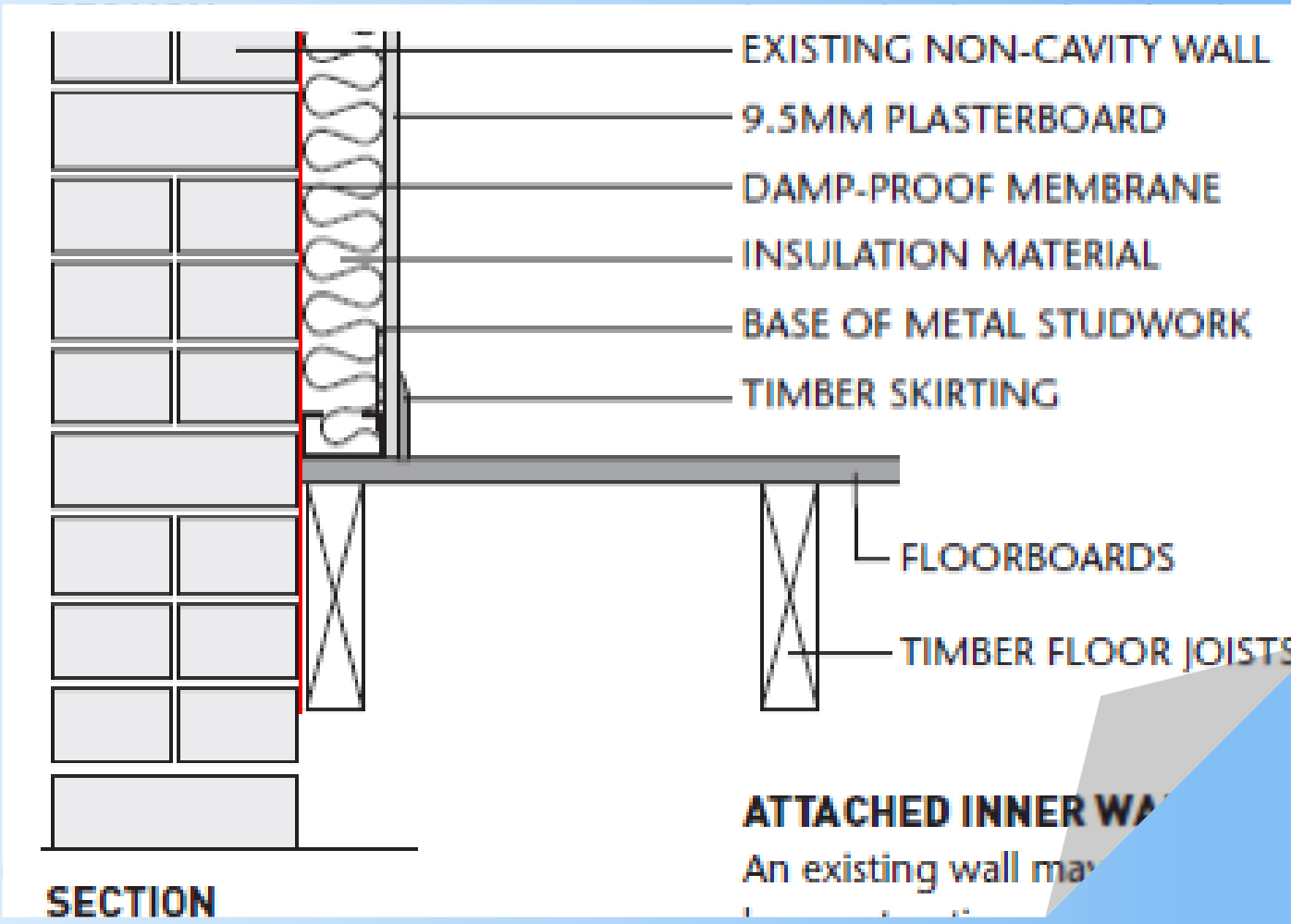
1- Attached inner walls

One option is to fix an impervious waterproof membrane to the inner face of the existing wall. This is usually a plastic sheet fixed in horizontal strips with generous overlaps and sealed joints. The sheet is held in position by timber battens nailed or screwed to the face of the existing wall



2- Freestanding inner walls

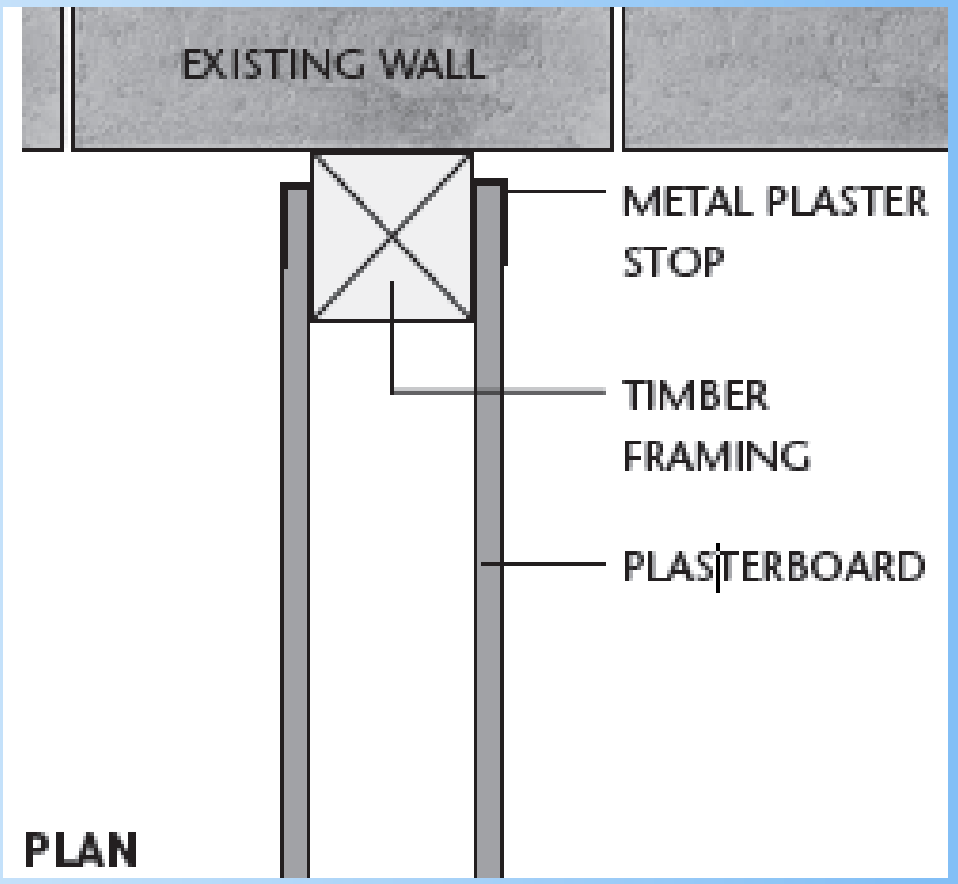
It is more effective to build a second, freestanding inner wall using a wooden or aluminium framing system clad with plasterboard on its inner face. The skeletal nature of the supporting framework leaves spaces that may be packed with fibreglass or polystyrene insulation. The reduction in floor area caused by the new wall may be critical.



NON-LOADBEARING WALLS

The practice of using framed construction to provide the basic structure for non-loadbearing walls is well established.

Traditionally, thin timber laths about 6mm thick, 50mm wide and 1200mm long were nailed to vertical timber posts, which were approximately 100 x 50mm and spaced at around 400mm centers, to provide the necessary structure.



BRICKS AND BLOCKS

Bricks or blocks, and certainly stone, are avoided in the construction of partitions because they are heavy, and this can be a particular problem with the subdivision of an upper floor, which will often be incapable of taking additional concentrated loading. The time taken for the wet sand-and-cement mortar used in masonry construction to dry also imposes delays that can be critical in the viability of some projects.

CONCRETE

A concrete wall will exacerbate all the problems of weight and construction time associated with masonry. It will be particularly heavy and should really only be used where this weight is useful – for example, as a means of reducing sound transference between areas.

Alternatives to concrete It is possible to use lightweight concrete, in which the larger aggregate (normally stone) is replaced by vermiculite, perlite or other less dense solids. The time-consuming problem of pouring wet concrete into temporary shuttering remains. Lightweight precast concrete panels may also be used but the dimensions of these are likely to be restricted by access to the site, making visible jointing of panels necessary.

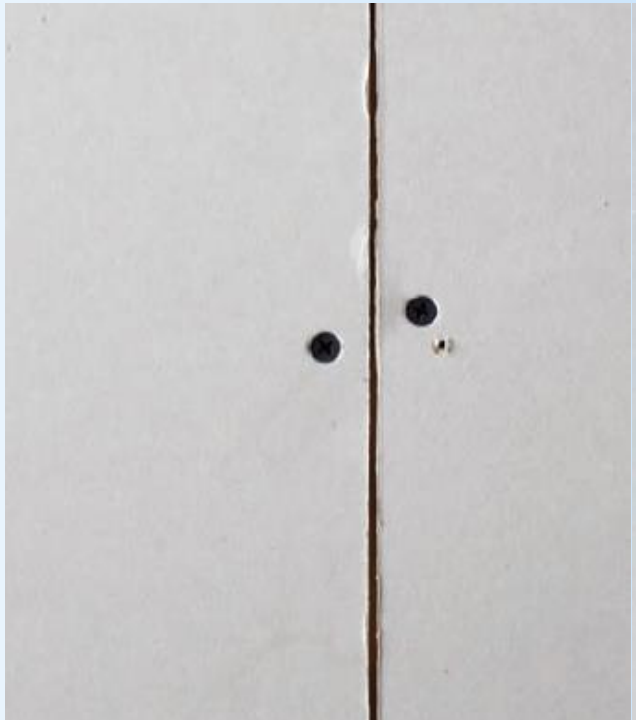
STUD PARTITION

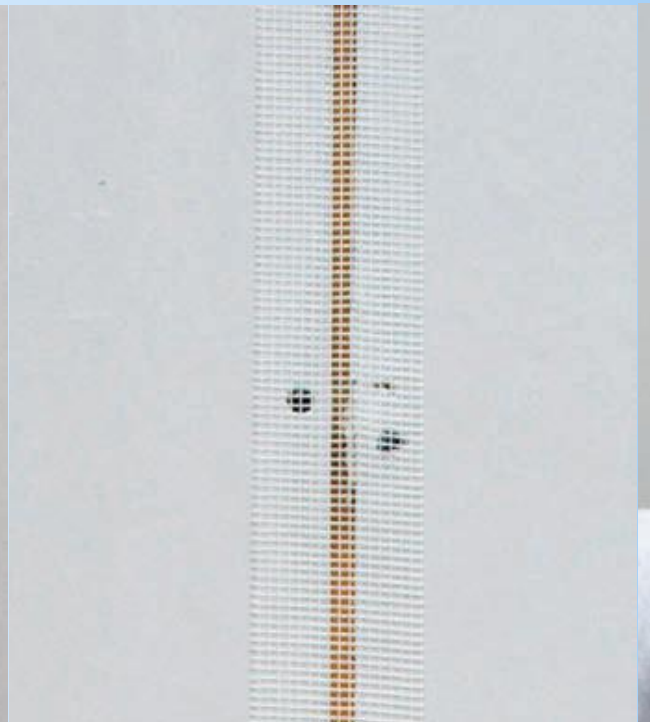
The stud partition offers a much quicker construction method than brickwork, block work, concrete or the traditional lath and plaster, with no lessening in quality of finish but with reduced acoustic performance.

PLASTERBOARD

Plasterboard sheets consist of a core of gypsum plaster between two skins of paper.

One side, the lighter colored, can be painted directly for a finished surface or used as a base for a plaster ‘skim’ coat; the darker side also provides an absorbent key for a skim coat of plaster.

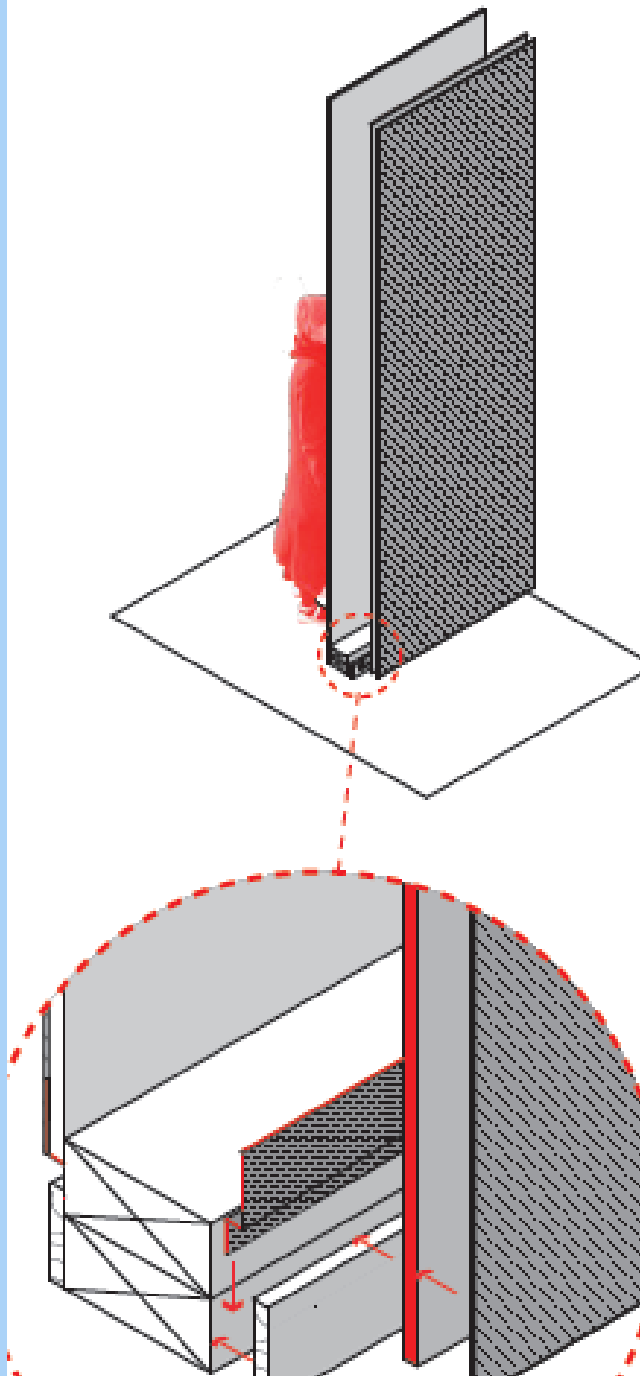




DRYWALL TECHNIQUE

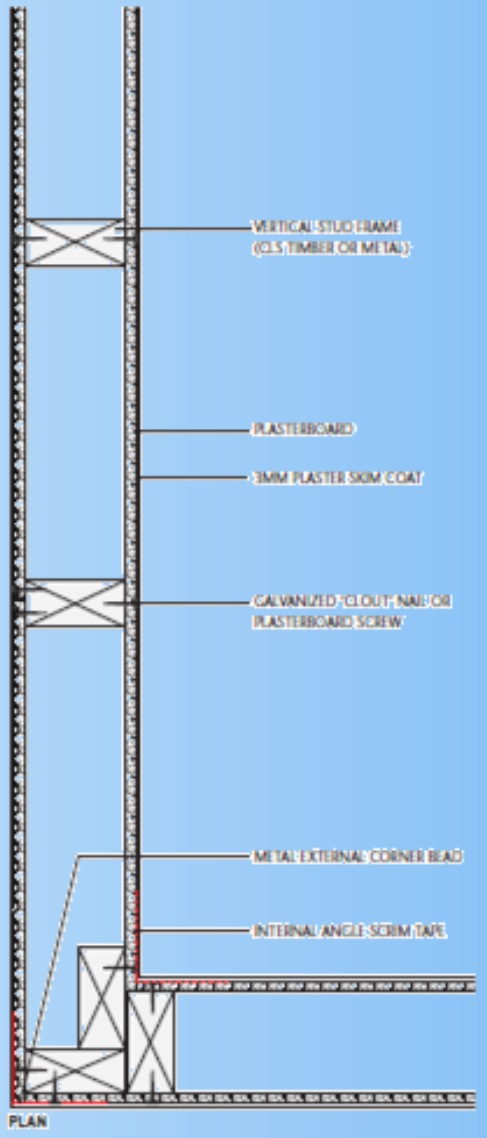
It is increasingly common to use the 'drywall' technique, eliminating a wet skim phase.

This was originally evolved to increase the mechanization of large-scale, repetitive construction, reducing building time and labour costs.

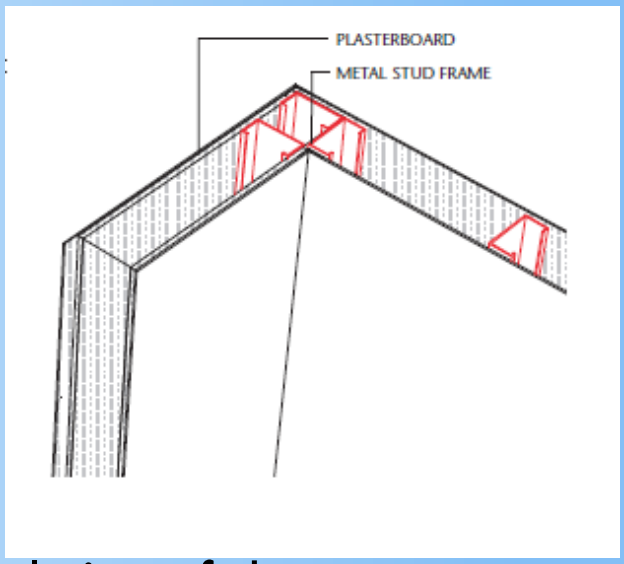


REINFORCEMENT OF JUNCTIONS IN STUD PARTITIONS

Every junction in a plasterboard-clad partition must have framing, timber or metal, behind it to align the faces of abutting sheets and to eliminate cracks caused by movement or shrinkage. Corners, however, require three vertical framing members that are themselves nailed or screwed together to ensure that they do not move unilaterally. They become a monolithic structural element to which the four plasterboard sheets meeting in the corner can be securely fixed.



METAL FRAMING FOR STUD PARTITIONS

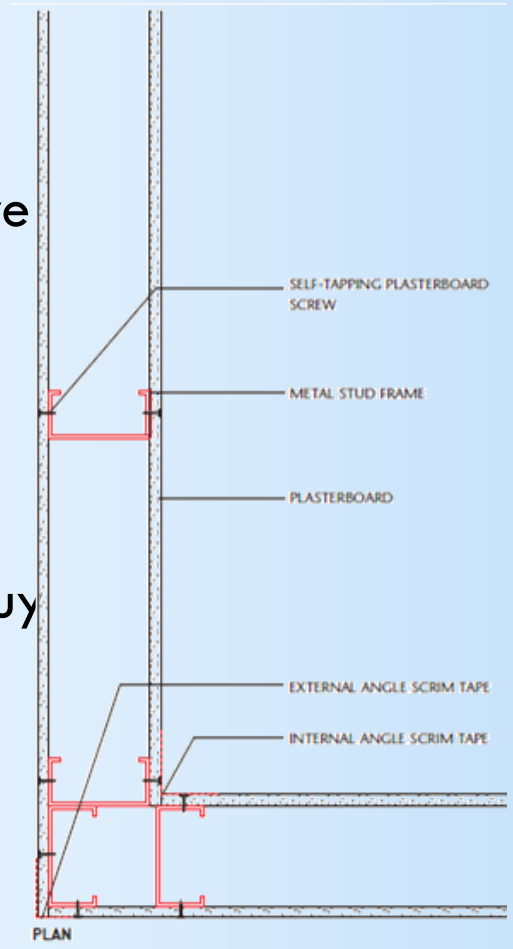


Advantages

Aluminium framing was primarily developed for use in large, repetitive projects.

It is much lighter than timber, and therefore easier to handle and transport

The material is more expensive to buy but quicker to erect by experienced labour, and is therefore likely to be cheaper for large jobs.



Disadvantages

The specialized evolution of the system makes variations from the standard more complex than with timber stud, and, unlike with timber stud, the folded hollow section does not offer the solid, flat surfaces for simple, robust, one-off conditions.

Designed primarily as a lightweight solution, metal studwork does not have the same loadbearing capacity as wood, and is therefore unsuitable for supporting storage units.

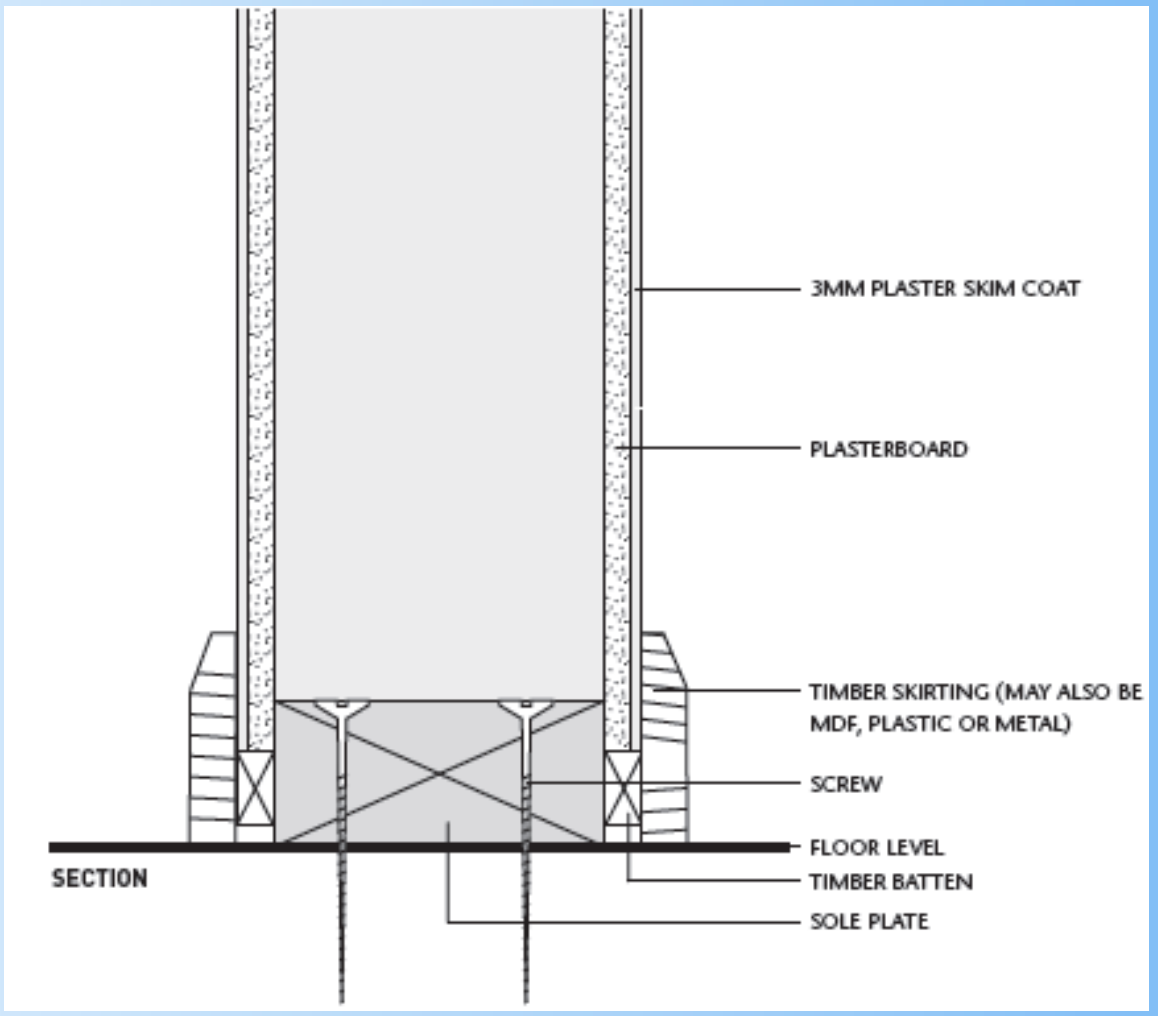
Metal can be recycled, but the recycling process is itself problematic.

SKIRTINGS

Skirtings evolved to cover the junction of floor and wall in traditional construction

MDF skirting

The traditional material for skirtings is timber, but this is often replaced by MDF (medium density fibreboard) sections, MDF versions are wholly stable and often come ready-primed for the paint finish that the material requires.



Plastic and metal skirting sections

Moulded plastic or pressed metal (usually aluminium) skirting sections are frequently used with proprietary partitioning systems and their hollow sections provide a useful zone for wiring circulation. They tend to come with a paint finish, aluminium sections (skirting heaters) incorporate hot-water circulation pipes and provide a space-saving alternative to radiators and a more energy-efficient alternative to underflo

INSTALLING SKIRTINGS

Skirtings are fixed after floor and wall finishes (other than paint and wallpaper) have been installed, and the abutting edges of these can be left comparatively rough. A gap between wall and floor allows movement without cracking.

Nails

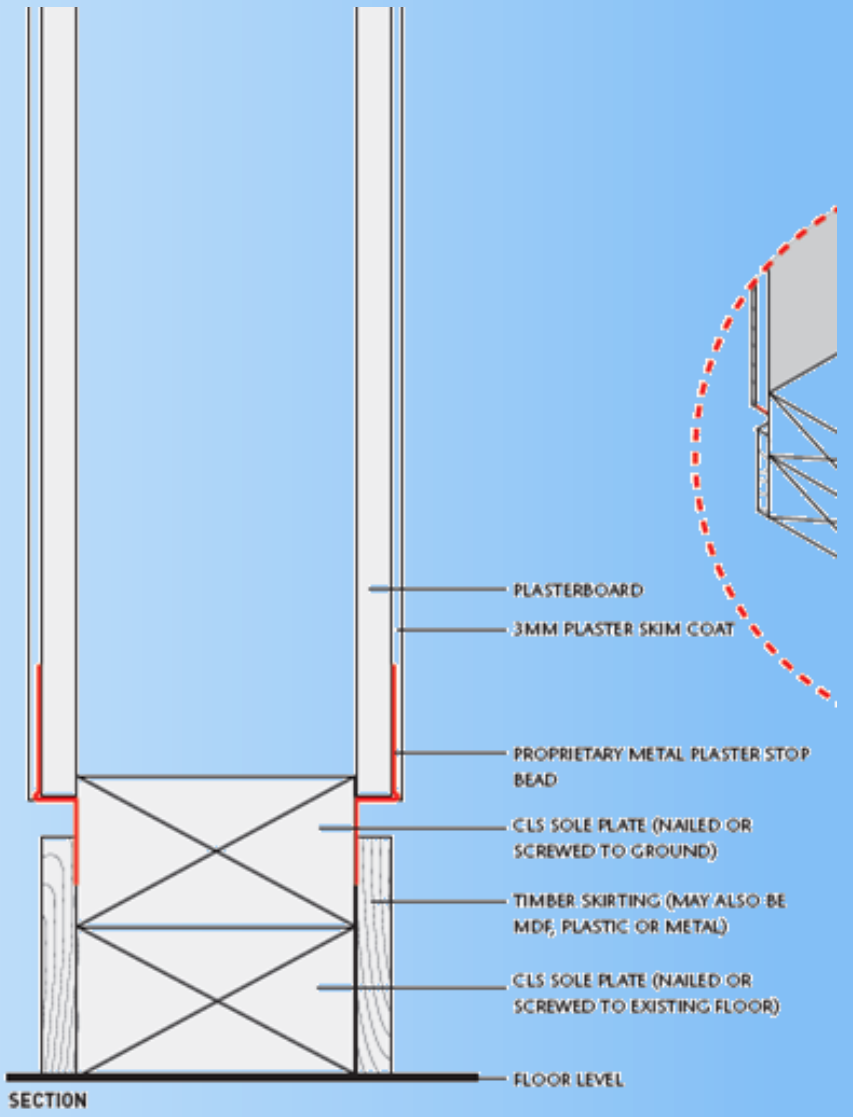
Screws

Adhesive

ALTERNATIVE SKIRTINGS

The narrow gap, which is best constructed using a proprietary metal plastering bead, can be difficult to clean and plaster at the base and, because it remains close to floor level, can be vulnerable to impact damage. The construction sequence also becomes more complicated since floor finishes need to be laid before the walls can be plastered.

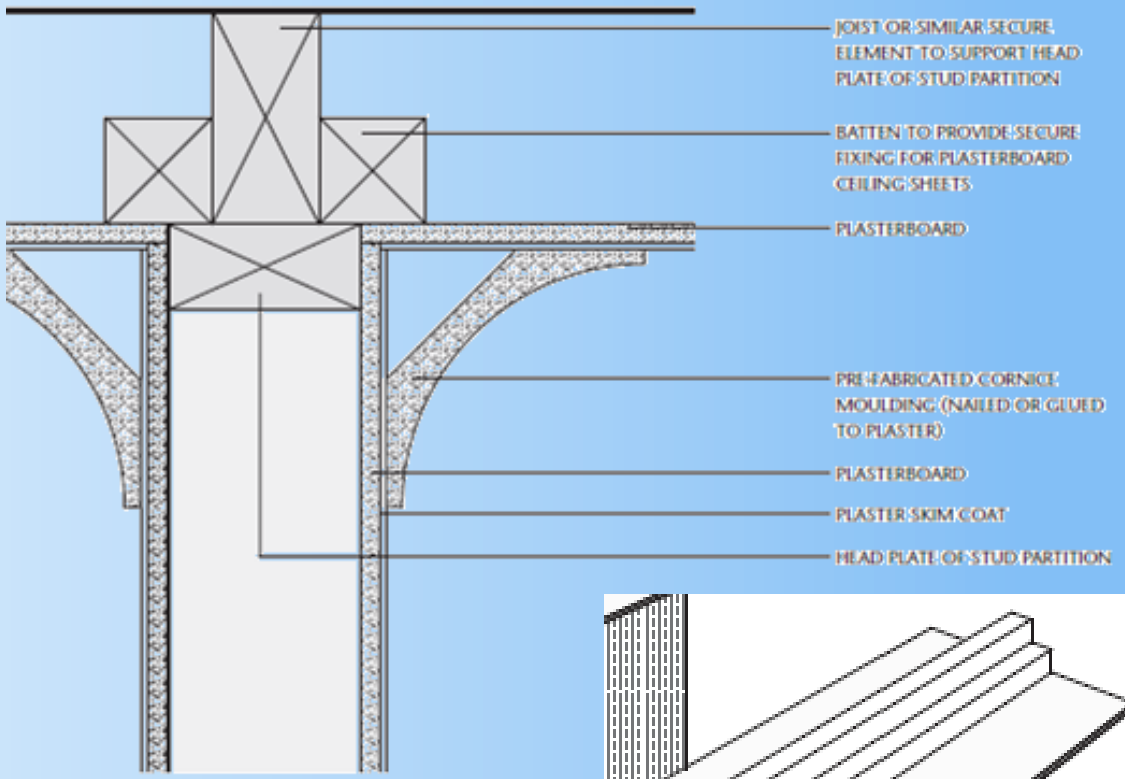
A more practical solution is to retain the gap but separate it from the floor with a simple timber skirting section, the face of which is flush with that of the plaster.

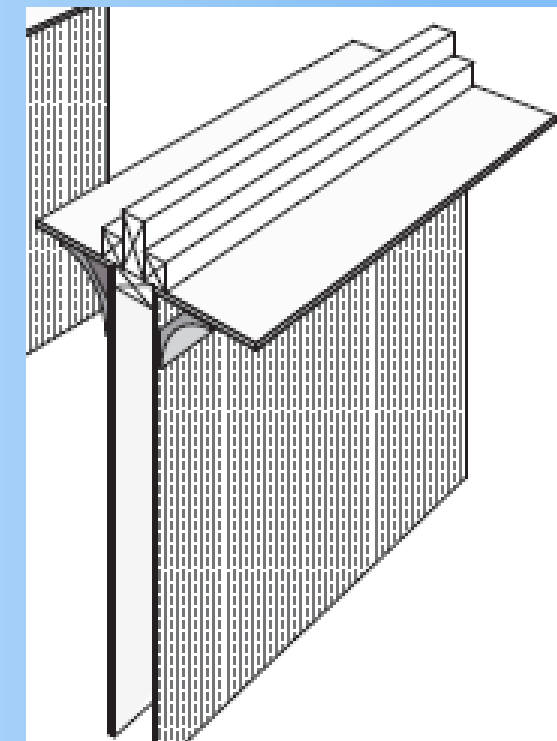


CORNICES

Cornices essentially serve the same purpose as skirtings. They mask the potentially unsightly junction of wall and ceiling.

Like skirtings, cornices were pre-fabricated, normally made of plaster and cast in moulds that could be used many times. They became a medium for elaborate decoration.



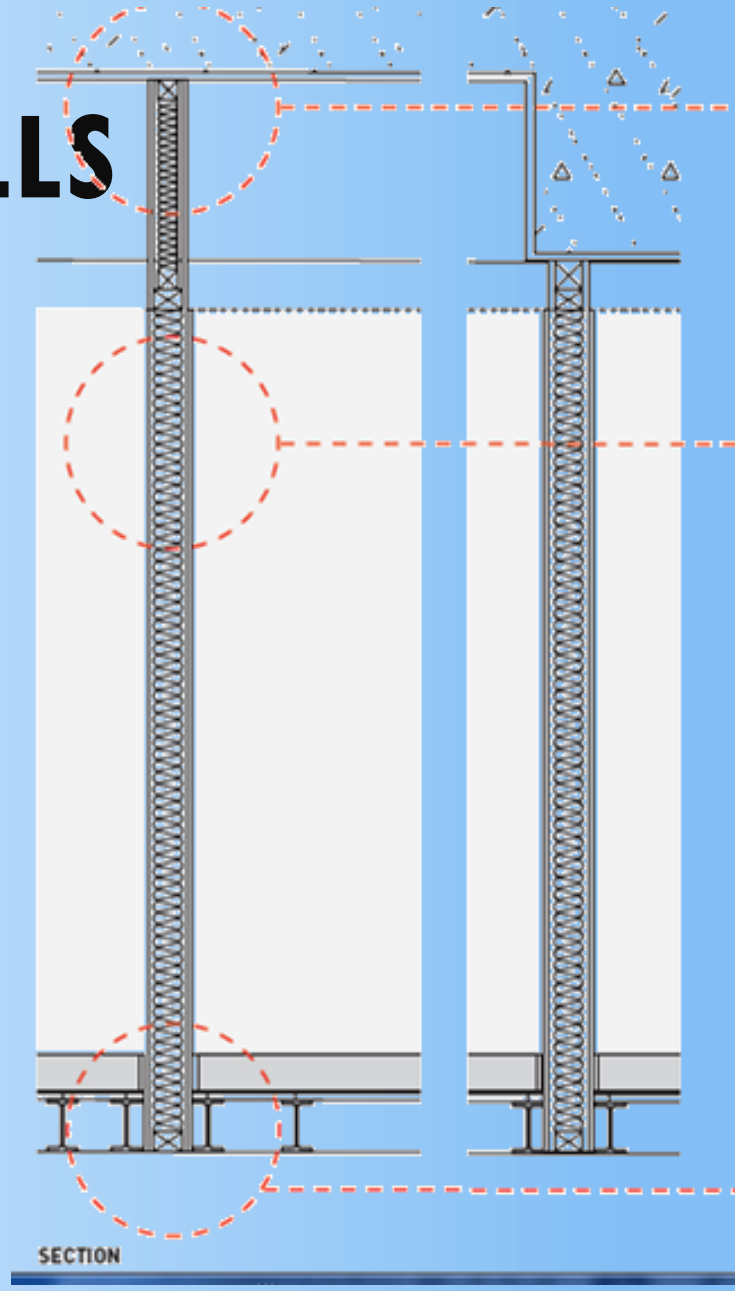


SOUNDPROOFING INTERNAL WALLS

Weight of materials and rigid construction are the most effective means of reducing the passage of sound. Concrete walls and floors, cast monolithically, Bricks

The 12mm finishing plaster needed adds more weight.

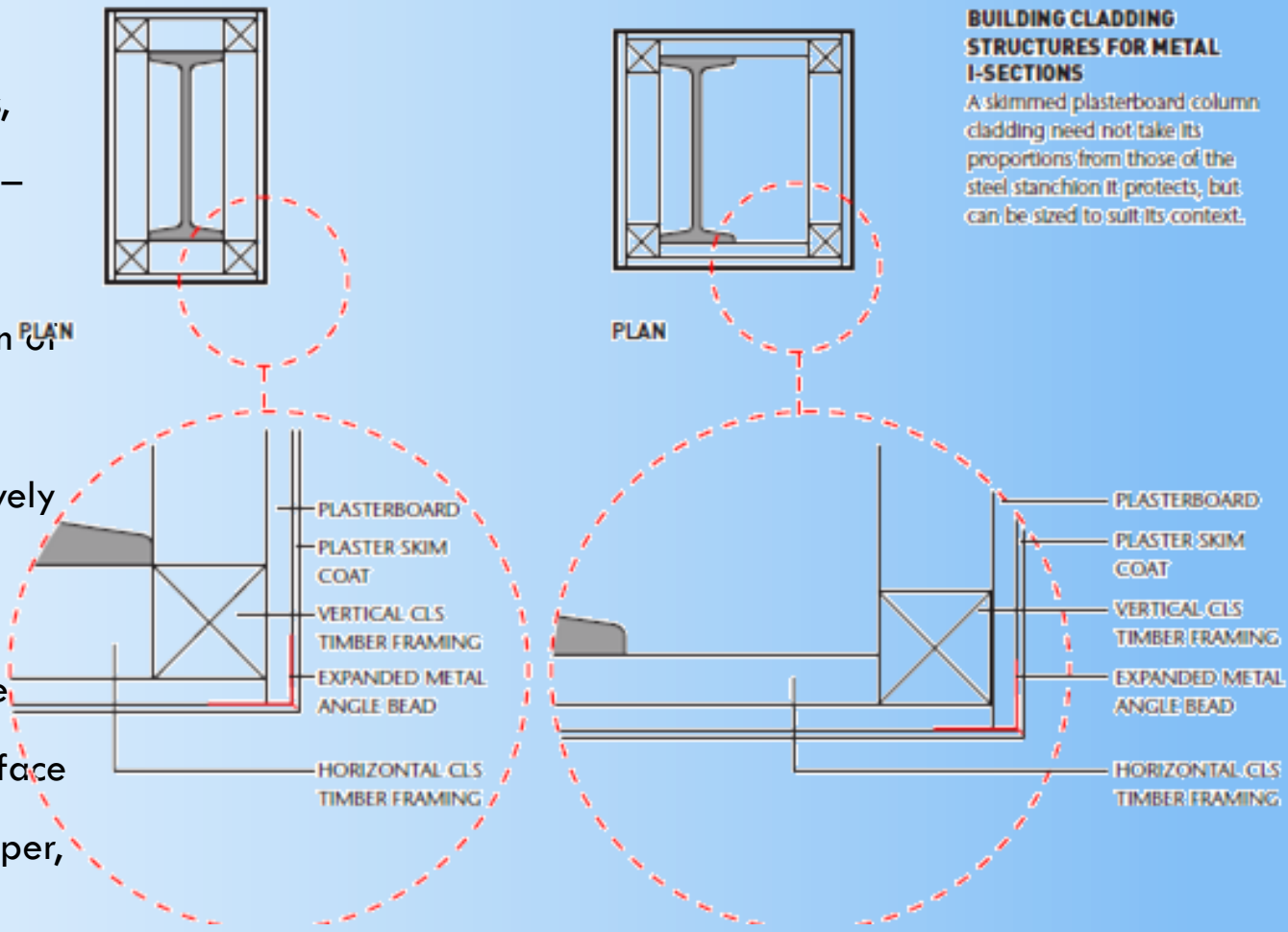
Specialist materials Hard surfaces and flat, parallel planes, which generate reverberation, exacerbate noise problems. Specialist plasterboard, identified by its blue paper face, soft absorbent finishes and angled surfaces, improve reduction. Transmission of airborne sound across the voids in stud partitions may be reduced if absorbent quilt material is inserted between framing.



FIREPROOFING WALLS

The basic requirements for fireproofing are, in many respects, similar to those for soundproofing. Noncombustible materials – concrete, brick and blockwork – obviously provide effective barriers. The materials and comparatively fragile construction of stud partitions present problems. Metal framing is non-combustible, but the thin section is liable to buckle comparatively quickly at high temperatures.

A skim coat improves the rating, as does – with more extreme requirements – the use of two sheets of plasterboard on the face of a partition. Some plasterboard sheets, faced with pink paper, offer improved fire ratings.



INSTALLING SERVICES

‘Services’ is a generic term for electrical, plumbing and air-conditioning provision

Order of installation

Installation is carried out in two phases:

First fix Installation of wiring, without power, and pipework, without water, gas or oil, is completed before finishes are applied. This is known as the ‘first fix’.

Second fix The installation and connection of switches, sockets, lights, sanitary and kitchen fittings is completed after the application of finishes and is the ‘second fix’.