Association of Interior Specialists

BEST PRACTICE GUIDE

installation of partitioning

www.ais-interiors.org.uk
This guide to the installation of partitioning has been developed by the Association of Interior Specialists (AIS) to promote best practice in the installation of partitions.

Partitions are an integral part of many fit outs, offering fire, acoustic and structural performance, as well as making a major contribution to the overall appearance and quality of the finished space. There are a wide range of partitioning systems available, utilising a vast range of materials and construction techniques. These provide a huge scope for designers to create optimum solutions to meet clients specific requirements.

However, for the completed partitions to meet the legitimate expectations of the building owner, occupier, design professionals and construction team, the selection and installation process must be carefully considered and understood by all parties.

Partitions are a finishing trade and require installation by specialist contractors. The specialist contractor will provide the high levels of management, operative skills and resources essential to deliver a high quality product. Their considerable experience on similar projects will be of significant assistance to the construction team.

System manufacturers design and produce partitioning systems, which are then tested to meet the requirements for various environmental and performance levels. The provision of a whole range of design solutions is part of the responsibilities taken by manufacturers, who have a key role to play in partitioning design.

AIS has grown over the past 50 years to become the leading trade association for the interiors fit out sector of the construction industry, representing companies involved in the manufacture, supply and installation of all aspects of interior fit out and refurbishment. Its members can provide optimum solutions for the installation of interior elements.

This AIS Best Practice Guide for the Installation of Partitioning is not intended as a definitive technical manual, as the manufacturers’ recommendations must always be followed, but as a guide to the construction team as to best practice. AIS encourages all its members to follow the principles set out in this guide.
The extensive range of partitioning systems available, utilises a vast range of materials and construction techniques that provides huge scope for the architect, interior designer and facilities manager. A satisfactory partitioning installation must always fulfil three main requirements:

- **Performance – acoustic, fire rating, structural stability**
- **Appearance**
- **Demountable / relocatable**

These can only be achieved when the partitioning is installed under proper site conditions (see ‘AIS Site Guide for Partitioning), using the correct techniques, the right materials for the job, a high standard of workmanship and at all times adhering to health and safety regulations.

### 2.1 Scope

This best practice guide covers the installation of all types of partitioning systems up to a height of 3.6 metres.

Additional measures may be necessary to meet fire or acoustic performance requirements when ceiling voids extend over adjacent rooms. This may involve the installation of fire or sound attenuating barriers above the partitioning in the ceiling void or modification of the ceiling panels. The advice of the manufacturer of the partitioning system should be sought, together with reference to the AIS publication ‘A Guide to Office Acoustics’. In some cases the services of an acoustician or fire consultant may be required.
To enable the specialist contractor to submit a realistic tender it should be informed of the items given below. Tenders should normally be submitted on the basis that the work is to be carried out continuously. Should more than one visit be anticipated the tenderers should be informed accordingly.

Construction (Design and Management) Regulations 2007, designed to reduce the risk of harm to those that have to build, maintain and demolish structures, should always be observed.

www.hse.gov.uk/construction/cdm/faq/contractors.htm

3.1 Contract conditions

The form of contract, for example JCT, NEC, or bespoke form, should be stated and the relevant sections of those contracts completed (contract particulars / contract data), which will include the following particulars:

- Confirmation as to whether it is a lump sum or remeasureable contract
- Payments (ideally a list of due dates and final dates for payment)
- Retention (if applicable)
- Discounts (it is preferable to have contracts placed on a nett of discount basis)
- Insurances
- Liquidated damages
- Defects liability period (now called rectification period under JCT11)
- Programme (duration and likely commencement date, possibly also number of visits to site and any milestone dates)

- Ascertained of prices for variations
- Basis of day work charges (including actual rates for labour and percentage uplifts for plant and materials)
- Responsibility for design
- Requirements for bonds, warranties and parent company guarantees
- Waste management

3.1.1 Basis of measurement

The basis of measurement may take one of the following forms:

- Standard Method of Measurement 7th edition (SMM7)
- New Rules of Measurement (NRM)
- Quantities taken off drawings by the interior contractor and expressed as a lump sum (plan and spec) or an inclusive price per square or linear metre
- Site survey by specialist contractor
- Contractors Design Proposal (CDP)

3.1.2 Programme

In addition to the information given in 3.1, as much information as is available should be given to the tenderer regarding the main contractor’s building programme. If the main contractor has been appointed, ideally the partitioning tenderer should be given the dates of the work together with details of sequencing.

3.2 Main contractor (attendances)

Attendances together with services and facilities should be clearly defined before entering into final contract agreement. Both main contractor and specialist contractor should clarify in writing what they have allowed for. Good practice would be to agree a pre prepared schedule provided by either party on what each is providing so that the situation is clear. Items that should be covered would include responsibility for providing toilets, hutting, cabins, lock ups, skips, setting out and levels and datums, protection of the works, security.

3.2.1 Specialist scaffolding

When the provision of specialist scaffolding is the responsibility of the main contractor, it should be provided, erected and dismantled free of any charge and conform to current regulations and should be erected to the specialist contractor’s requirements within the agreed programme and in advance of the specialist contractor’s work. It should not be dismantled before satisfactory completion of the work.

If special scaffolding is the responsibility of the specialist contractor, it is assumed that the cost is included as a separate item in the tender. The main contractor should provide sufficient space for free movement of scaffolding and a suitable floor surface to properly support the scaffolding.

3.2.2 Unloading / distribution / hoists

Unloading the specialist contractor’s material and plant and distributing safely to the exact work locations should be defined as either being the responsibility of the main contractor or the specialist contractor. The former to be at the cost of the main contractor, and if the latter, the cost is deemed to be included in the specialist contractor’s tender.

If the specialist contractor’s operatives are offloading
material, they will assume that the groundworks are complete to allow easy ingress into the site.

### 3.2.3 On site storage
When storage of specialist contractor’s material, plant, etc is the responsibility of the main contractor, free use of a suitable secure, dry covered area of sufficient size for stacking on a flat base should be provided (see also 4.2). In the case of the specialist contractor being responsible for storage, the cost should be included in its tender.

### 3.2.4 Glass storage and handling
Once a full survey and assessment of site has been carried out, coordination with the project team with regard to site delivery, building access, lift or stairwell access and designated storage area for the glass is vital. Once delivered the glass needs to be inspected closely for any damage on glass edges or surface marks to the glass face.

Glass must be stored on its edge on raised support structures. The angle of inclination of the glass should be from 3 to 6 degrees from the vertical on static racks with sufficient lateral support to prevent any bowing. It should be in clean, dry, well ventilated conditions, out of direct sunlight and away from heat sources. Glass should not be stored in contact with any substance that is harder than itself ie concrete, stone or ferrous metals or against any existing or newly built (or possibly one side built) partitions. To minimise further risk of damage, all support structures should be clad with timber, felt or other suitable soft materials.

All materials and components should always be stored in accordance with manufacturer / supplier recommendations.

### 3.2.5 Temporary lighting and power
The responsibility for the provision of suitable lighting and suitable power supply should be stated. These must be in accordance with current safety regulations. Lighting levels should be designed to allow the installation of the partitioning to be completed to the level of quality expected, particularly relevant for any partitioning where the surface will receive a finish.

### 3.2.6 Working space
Sufficient space should be provided at floor level, free from traffic and interruption, for the specialist contractor to carry out the cutting of aluminium, steel and panels, cutting down of doors and preparation of wallcoverings as part of the normal process of the work. Consideration should be made to ensure that material can be moved around the site in a safe and efficient manner.

### 3.2.7 Waste management
The responsibility for clearing and removing waste material should be clearly defined pre-tender. During the partitioning installation process, there can generally be the following types of waste removal:

- The main contractor providing waste segregation skips / bins for items such as plasterboard, steel, aluminium, mineral wool, wood, and glass. The specialist contractor would place waste material in the relevant skip / bin. The main contractor then takes responsibility for removal from site to a local recycling centre.
- The specialist contractor is asked to take responsibility to remove segregated waste, as detailed above to the local recycling centre. To do this a ‘waste carrier licence’ is required. Without one a suitable authorised company will need to be appointed to collect the waste and transport to the local recycling centre.
- Recycling waste plasterboard back to the manufacturer for recycling in the manufacturing process, is an option providing there is reasonable volume. Consultation with the relevant manufacturer is advised.

More information about handling and managing plasterboard / gypsum being a controlled waste, can be found at [www.environment-agency.gov.uk/business/topics/waste/32148.aspx](http://www.environment-agency.gov.uk/business/topics/waste/32148.aspx)

### 3.3 Design requirements
Whilst in many cases the design and product selection is carried out by the specifier, to the clients requirements, design input is being increasingly sought from the main contractor, the specialist contractor and the manufacturer. So in the very early stages clarification of any design input required is needed by all parties and confirmed in writing.

#### 3.3.1 Drawings for tender enquiry
Layout drawings should be provided indicating the various areas covered by the enquiry, cross-referencing any changes in height and junctions between any different systems. A minimum scale 1:100 should be used, preferably 1:50 or better if possible.

The following information should be included:

- Detail drawings shall be provided to support design and installation
Recommendations for tendering and measurement

• Level of ceiling membrane above finished floor level
• Indication of any panels that require to be accessible
• Indication of any intrusions in the floor to ceiling height
• Abutment and head details
• Junction and corner details
• Vision panels requirements in doors
• Cable management
• Blinds – integral or free standing
• Glass type and thickness
• Gradient of floor

3.3.2 Specification
The specifier might wish to consider specifically how any mock ups or prototypes might be covered at this stage, to allow a more detailed final specification to be written.

A specification written in partnership with a manufacturer can ensure that key issues and details are considered in the design process, if however a performance specification is going to be produced then the specifier should ensure that evidence can be provided to satisfy them that areas of performance can be met. This is normally in the form of test evidence carried out by an independent test laboratory accredited by UCAS. Any test evidence should reflect the system and details proposed and where applicable sight of the test report and not just the certification should be made (although copies may not be left for confidential reasons).

Specifiers, building operators and facility managers should not accept any substitution of materials from the test report without assessments. In fire, acoustic or applied line load (ie crowd pressure on an escape route) assemblies, any alteration of materials may cause a failure. In line with the National Building Specification (NBS) K10 / K30, the design criteria should be given under the following headings (where applicable), together with outline details of layout:
• System manufacturer
• System type
• Location
• Layout
• System performance:
  • Fire resistance - BS 476-22(1987) or BS EN 1364-1(1999)
  • Spread of flame - BS 476-7(1997) or BS EN 13501-1(2002)
  • Structural - (duty rating BS 5234-2(1)
  • Strength - to BS 5232-2 grade
• Partition height:
  • Floor to ceiling (mm)
  • Deflection allowance (±mm)
• Panel type – module types
• Solid panels - finish / colour, joint treatment, cover trims
• Glazed panels - non fire rated and type, fire rated and type, glazing trim / colour, manifestation (to meet the requirements of AD M)
• Junctions
• Framework finish – colour
• Skirting - colour
• Incorporated features:
  • Door - type and size, finish, vision panel, ironmongery, overpanel
  • Blinds – type, finish
  • Accessories – switches

Note that doors can also be included within this specification if they are to perform as part of the partitioning especially in the case of fire rating. They should detail:
• Size including thickness, and clear opening size (to conform with AD M)
• Description, single / double, single action / double action / sliding
• Edge detail, square rebated, rounded
• Over panel if required
• Performance fire / sound / grade
• Size and position of vision panel (to conform with AD M)
• Finish, veneer, steel, aluminium glass
• Lippings, exposed / concealed long or all round
• Door frame, stops and architrave
• Ironmongery (schedule) and position on door leaf
• Accessories / door seals intumescent seals, drop down thresholds etc
• Environmental / sustainability requirements eg FSC, PEFC, SFI

It should be noted that ‘NBS Create’ will replace these standard clauses in due course.

3.4 Building owner inviting tender

When the owner of an existing building is inviting tenders the following information should be given in addition to specification and design details:
Recommendations for tendering and measurement

- Location of site and access
- New building, existing building or extension
- Availability of lifts (including size) and stairs in existing buildings and use of power and hoists (including size) for bringing materials and plant into the building
- Function of building
- Main contractor’s programme and building owner’s stipulation affecting the sequence and working hours of the works
- Limitations imposed by occupancy on construction work
- Payment terms.
Contract planning

Crucial to the success of a partitioning installation is the planning and coordination which precedes the work. The aim of this planning should be to establish:

- **Exactly What is to be done** [SPECIFICATION]
- **How it is to be done** [METHOD]
- **When it is to be done** [PROGRAMME]

These steps are inter-related and it is preferable not to discuss them separately. However, their identification will assist a methodical approach to contract planning.

All three items should have been clearly stated before tendering and indeed should have formed the basis of the tender. However, after entering into a contract it is necessary for the specialist contractor to confirm specification, method of working and programme.

The first action by the specialist contractor must be to establish the date by which materials must be ordered to meet programme requirements. This will set a limit to the time available for receipt of contract drawings, the production of specialist working drawings (if these are required) and checking and approval by the client. Where special sizes, sections, materials or finishes are involved this lead time can be considerable. It is often underestimated with serious consequences if contracts are delayed, leading to claims against the specialist contractor.

Next the detailed programme of work must be agreed with the main contractor. This will include start and completion dates for the subcontract work or specific phases of the work and will be closely related to the activity of other trades whose work can be expected to interact with the partitioning.

- A period of notice should be agreed for confirming or amending delivery dates.

  The specifier should issue contract drawings which clearly detail the specification required and all partitioning related services. These drawings should include and detail any interfaces with mechanical, electrical and related components that relate to the partitioning plane, to allow all services and penetrations to be considered. Drawings should be checked on receipt to ensure that the impact of these on fire or sound performance of the partitioning is fully understood.

  Any queries must be raised with the specifier or main contractor without delay and detailed drawings produced if required. Details which commonly require such attention include:

  - Fixing of the partition to a suspended ceiling - the need for pattresses behind the ceiling panels, lateral bracing to meet load requirements or acoustic treatment either on top of the partition or as a barrier fixed between the partition head and the soffit (see 6.1 Bracing and 7.7 Fire barriers)
  - Type of floor and any fixing restrictions that prevail
  - Type of abutting walls and any fixing restrictions that prevail.

  Where moveable walls are being installed there will be a need to construct suitable framing behind the suspended ceiling to carry the necessary weight and load requirements of the wall (see 6.8).

**4.1 Sequence of installation**

When the partitioning specification and integration with the building services are established the sequence of installation and the method of working should be considered. Generally, suspended ceilings are completed prior to the installation of partitioning, unless the partitions are to be installed to the underside of the structural soffit.

**4.2 Materials management**

For building construction to be efficient and economical the management of materials must be efficient from the point of specification to incorporation in the works. Orders must be placed with suppliers or manufacturers to allow ample time for manufacture or procurement. This is particularly important with special components or special sizes, when relatively long lead times are likely.

Building programmes are commonly disrupted for a variety of reasons eg bad weather, industrial disruption affecting delivery of major components, changes of policy by clients. It is important that suppliers are kept informed of possible delays in the building programme which may require delay in delivery to site. Materials delivered too early to a site are likely to be damaged. Inadequate notice of delay may invoke charges from suppliers particularly if products ordered are being bespoke manufactured for the project.

The specialist contractor must arrange with the main contractor for the satisfactory receipt and storage of his materials. All concerned must be made aware that
partitioning materials are generally fragile and require very careful handling and storage (see also 3.2.3).

To minimise handling, storage zones should be clearly identified adjacent to working areas, together with a time period for their use. Clear gangways and access to lifts and staircases should be available, with sufficient width to accommodate the safe handling of materials, and cleared of all obstacles to avoid tripping.

Consideration should be given to whether any floor protection is required and if so, who bears the cost. Likewise where appropriate, protection against damage to core / existing areas, normally the cost for this is covered by others.

4.3 Site conditions

It cannot be too strongly emphasised that partitioning is essentially a finishing trade and therefore the building should be in a proper condition with regard to cleanliness, humidity and temperature before partitioning can be installed. The building should be fully enclosed, all wet work completed and dried out.

The manufacturer’s recommended site conditions for the installation of their materials should be followed but generally conditions should be similar to those that will prevail when the building is occupied.

Partitioning work is normally carried out in one operation, albeit different products may require different operatives (ie doors, glazing, blinds, manifestations). If this is not possible, it will add to the cost of the installation.

Where mobile platforms are used, areas required for installation should be clean and clear of equipment and materials of other trades to provide an adequate and safe working space. The specialist contractor should leave these areas in a clean state after installation of the partition.

4.4 Programme

Realistic programming requires great care and depends on the professionalism and integrity of the various parties involved. In a building designed with a high concentration of services the various trades involved rely heavily on every member of the building team maintaining the correct rate of progress.

It is important that the partitioning contractor works in harmony with any associated trades such as suspended ceilings, drywall, electricians and lighting, to ensure that all elements are built with a minimum of disruption for all concerned.
5.1 Setting-out

It is essential that the setting-out points common to all trades are established early, and clearly indicated on the working drawings. It is also essential that all consultants, service contractors etc work to the same setting-out grid lines and datums and that these are established on site by the main contractor in each partitioning area.

Designers should note that tolerances in factory made partitioning sections are less than those usually accepted in building structures and it may therefore not be possible to maintain a strict alignment with modular elements such as structural columns or window mullions.

**Plan drawings**

It is usual to have a plan drawing showing the outline layout of the partition runs, door openings, junctions, solid and single or double glazed areas. Detail drawings will include all the dimensions.

**Elevation drawings**

Outline elevation drawings for individual partition runs are required to show the location of solid panels / boards, part height and full height doors and single or double glazing.

Setting-out the partition can be done by working from a given vertical or horizontal datum and then snapping a chalk line on the ceiling. With the use of a plumb line or laser, that line is transferred to the floor and walls. In some cases, tape may be used on the floor. The position of door openings should then be made on the floor and account should be taken of the manufacturers doorframe dimensions, to ensure that the correct opening is left prior to the fitting of the floor track.

It is recommended to measure the floor to ceiling height at one metre increments along the partition run and checked for level and true. Aperture width (horizontal) should also be checked at floor, mid and ceiling height and checked for level and true. Any surfaces that are not level should be noted.

From the drawings, also note any bulkheads or penetrations in the partition run and any effect they may have on the partition perimeter.

System thicknesses quoted throughout this document will exclude framing and skirting and are therefore face to face dimensions.

5.2 Partition tolerances

Where the partition is continuous and independent of the structure, the deviation from the agreed setting out positions should be within:

- The offset on plan from an agreed line or position, measured at the setting-out level at ceiling or floor ±3mm
- The offset from vertical, measured above or below the setting out position at ceiling or floor ±5mm

Refer to BS 5234-1(1992) and BS 8212(1995).
Partitioning system types and installation procedures

There are an extensive number of partition systems on the market, and this guide has broken them down into functional types. Whilst all systems have their own individual key performance and/or visual details, this section discusses systems in a general way and therefore is less specific in parts. Individual manufacturer’s product details should always be referenced for full understanding of system capabilities prior to making a complete system choice.

It is important at this stage to clearly establish the difference between ‘relocatable’ and ‘demountable’ partitions. A relocatable or reusable partition system can be removed and relocated without substantial repair (using a minimum of 80% of original components). It should be capable of reinstallation within a tolerance of ±10mm of the original installed height. Demountable partitions cannot be taken down without damaging or destroying some or all of the components.

All manufacturers provide recommended installation procedures for their systems and these should be considered before installation commences.

It is vitally important that operatives are trained in the system installation methods and that they have the necessary skills to carry out the contract. Fundamental good practices should include the following:

- Avoid cut lines / butt-joints coinciding on multisection tracks ie floor track and glazing beads
- When butt-jointing aluminium sections, the painted end of the extrusion should be cut off first to ensure a good joint is achieved
- Pre-drill and countersink all fixing holes to ensure that all countersunk fixing screws sit flush

- Fix tracks to all abutments with fixings at not less than 300mm centres
- To provide acoustic or fire integrity, ensure all abutment tracks are properly sealed to the structure with either the factory supplied (fitted) tapes, proprietary sealant, or both. There should be no visible air gaps between track and structure
- All work carried out should be done in accordance with the BS 8000 series. (Workmanship on building sites):
  - BS 8000-5 (1990) - Code of practice for carpentry, joinery and general fixings
  - BS 8000-7 (1990) - Code of practice for glazing
  - BS 8000-8 (1994) - Code of practice for plasterboard partitions and drylinings
  - BS 8000-12 (1989) - Code of practice for decorative wallcoverings and painting
  - BS 8212 (1995) - Code of practice for drylining and partitioning using gypsum plasterboard

6.1 Bracing

It can be acceptable to install non loadbearing mid-weight partitioning to the underside of a suspended ceiling, provided that the fixing is directly into the ceiling grid main tee / framework, and the performance of the partition is maintained in the ceiling void by installing fire and acoustic barriers where necessary, and the installation is strictly in accordance with the manufacturer’s instructions and test certification (see figure 1).

The partitioning stability is gained from the partition layout and should not add any loading to the ceiling. The ceiling grid main tee / framework which the top track of the partition is fixed to should be considered to provide location only.

It may be necessary when hanging workwall, credenzas or storage units from the partition face, to install additional hangers / pattresses / bracing above the partition. Also, where full height doors are installed, as the transient lateral loads caused by door slam can be transmitted via the doorframe to the head fixings. The weight of the doors will be transferred during the opening and shutting of the doors.
Bracing is especially required above full height frameless glass doors where they are held by a pivot pin. Where bracing is installed any need to accommodate deflection should be designed into the overall solution.

If there is any doubt, the manufacturers of the partition and the ceiling systems should be consulted.

### 6.2 Performance

Partitioning system manufacturers are required to undertake fire, acoustic and structural tests on their systems to include the elevations that they offer.

#### 6.2.1 Fire tests

Fire tests are carried out to BS EN 1364-1(1999) / BS 476 Pt 22(1987) and will test for integrity (against flames, smoke and hot gases) and insulation (thermal insulation). Some systems are capable of meeting the integrity requirement, but may not be able to meet the requirements of insulation. This can be quite acceptable in certain situations, but must be checked with the relevant authorities before installation. The use of a particular type of glass or door for fire resisting purposes must always be in conjunction with the framing and construction methods with which it has been tested. Care should be taken to ensure that any necessary steel glass or door liners are incorporated into the system to satisfy the fire test certification.

Any certificate relating to the partition will relate to the whole assembly, and as such, substitution of components may be detrimental to its overall performance and will invalidate the certification.

#### 6.2.2 Acoustic performance tests

Acoustic performance tests are carried out in laboratory conditions to BS EN ISO 10140-2(2010) / BS EN ISO 140-3 (1995) to determine the sound reduction index \( R \). From these results, the single figure weighted sound reduction index \( dB(R_w) \) is determined in accordance with BS EN ISO 717/1(1997), for both solid and glazed partitions.

However this test will only give an indication of the potential site performance as many other onsite factors will have an affect. In most buildings there will always be a degree of sound leakage through the structure (flanking transmission).

It is generally accepted that even with ideal site conditions, the minimum loss of performance to the tested data, will be between 3dB and 8dB \( R_w \). Where very high ratings are specified, the onsite loss may be even greater. If it is deemed necessary, after the partition has been completed, an independent acoustic test may be undertaken onsite to verify the actual performance of the constructed partition. Requirement for an onsite performance test should be stipulated at time of tender. In all cases, consultation with the manufacturer or an acoustic consultant is strongly advised, as is reference to the AIS Guide to Office Acoustics, available for free download at [www.acousticguide.org](http://www.acousticguide.org).

#### 6.2.3 Structural tests

Structural tests on partition walls have duty ratings which are levels of systems performances when tested in accordance with BS 5234-2(1992) - Specification for performance requirements for strength and robustness including methods of test.

The categories of duty are as follows:

- Light duty – domestic accommodation
- Medium duty – office accommodation
- Heavy duty – public circulation areas, industrial areas
- Severe duty – major circulation areas, heavy industrial areas

Typically most proprietary partition systems will fall into the 'medium duty' rating.

### 6.3 Screens

Free standing screens are used to form flexible work spaces for individuals or groups of people and can have the added benefit of providing acoustically absorbent surfaces which can be used to reduce reverberation time. The installation of screens is generally done at the same time as the office furniture. It is therefore essential that all services work and carpeting is completed prior to the screen installation.

There are five different types of screens available, all generally framed in aluminium:

1. **Desk mounted screens:** are fixed to the perimeter of desking and are available with straight or curved tops and are either fully upholstered, acrylic, laminate or steel mesh. Tool rails can also be incorporated. Bracketry involved in fixing to desking is often bespoke manufactured to suit the furniture requirements.
2. **Floor standing screens:** which offer huge flexibility, can be linked or non-linked, straight, or curved to heights of up to 2000mm and widths of up to 1800mm. Fabric panels with acrylic, wood or laminate are the popular styles.
3 Cable managed screens: come with floor standing and desk mounted features but incorporate an integral electrics facility which conforms to BS 6396. Sockets and monitor arms together with trays and tool bars are also featured.

4 Office pods: are considered to be the informal meeting room solution in offices and usually comprise acoustic panels, glass panels and either fixed or sliding doors. Seating can be manufactured to follow the pod lines to create a space utilising area. Some pods are designed to be sequentially built with a column and beam system, where the panels (any type) are clipped into position and can be easily removed or individually changed (see figure 2).

5 Stacking screens: are manufactured to allow flexibility in screen height. Generally screens are supplied to a height of 1100mm, but some systems have a stacking capability to take the screen to 1400mm (seating privacy) or 1800mm (standing privacy) as detailed in BS EN 1023.

6.3.1 Method of build
The installation of screens is generally done at the same time as the office furniture. It is therefore essential that all services work and carpeting is completed prior to the screen installation.

Floor standing screens will be linked together in a number of different methods at the panel ends ie slotted edges with linking splines with or without covering fascias, and will have levelling feet to give at least a 25mm adjustment to counter any differing floor level.

Desk mounted screens are fitted to the desk with brackets that provide configuration for desking type and layout in conjunction with the office furniture manufacturer, and in many cases are bespoke manufactured to suit the needs of the client, taking into account electrical wireways and screen accessories. The furniture itself should be in line and level before commencement of the screening.

6.4 Composite systems
The components of composite systems are designed to construct a generally demountable, lightweight, economical and easily erected office partitioning system. Modules can be solid or glazed. The overall thickness is 46mm with all extruded aluminium profiles available either in satin anodised or colour coated, generally to BS or RAL colour ranges.

The system is based on a nominal 1200mm module and standard components provide for junctions, corners, or changes of direction. A service post can accommodate wiring or control cables for interstitial blinds. Pre-fabricated door frames permit the inclusion of door openings within the system at virtually any position (see figure 3).

The extrusions accommodate standard 46mm honeycomb or flaxcore panels for solid elevations and UVPC or aluminium glazing profiles for glazed elevations.

Fire performance: the system does not offer any fire resistance.

Acoustic performance: through solid honeycomb panels an acoustic performance of circa 29dB($R_{w}$), single glazing 32-35dB($R_{w}$), double glazing 37-40dB($R_{w}$), depending on glass types and thicknesses.

6.4.1 Method of build - solid modules
Reversible head channel are fixed, shallow side up, to the ceiling using appropriate fixings at 600mm centres, with fixings at 150mm from each end. Acoustic foam can be inserted to the upper side if required, ensuring clearance for the fixing to prevent the foam from snagging.

The reversible head channel should be omitted at the position of any 90 or 135 degree corner posts to allow the posts to fit from floor to the underside of the ceiling. At the wall abutment an upright post is fixed at 600mm centres and checked for plumb.

Two floor pans are screw fixed to the floor on the partition line for the first module approx 250mm in from each of the upright posts for the module.
The first panel is cut to size and slid through both fixed parts of the floor shoes and into the first upright post. The panel is jacked up with a floorlifter and the floor pan is slid into position, before lowering the board onto the assembled shoes. The next upright post is put into position and fixed to the head and base with fixing brackets. The process is then repeated.

If the partition is being used for a wireway, holes will need to be punched or drilled at the foot of the upright post for cables, which can run under the floor pans.

**WALL ABUTMENT**
When a wall abutment is reached and an upright post cannot be used, a split (breakdown or abutment) post is used to fix the panel with a flat bar fixed to cover up the panel edge (see figure 4).

**LAMINATE SKIRTING**
Self-adhesive foam strip is applied to both edges of the back of the plastic, then lightly held in position and marked as to where the foam crosses the upright post. The skirting foam is cut to allow for the posts and then fixed in position. It is important that this type of skirting is installed in conditions that will reflect its temperature in use, as contraction / expansion can otherwise occur (see figure 5).

**ALUMINIUM SKIRTING**
In a similar way, upright post positions are marked on the skirting lip, then the gap is milled out and using skirting foam at the base fixed flush to the partition. In some
situations, if the lip is a suitable depth, it can be turned upside down and with a foam strip stuck to the unlipped edge, the skirting foam cut away for the upright post and then screw fixed to the partition.

DOOR FRAME

Door frames are generally supplied to site in a pack with pre-drilled and mitred stiles and head transom and are machined for lock keep and hinges. Door seals, hinges and sufficient fixings are included.

The frame is fitted between two plumbed upright posts, set out dimensions are often included in the door pack but the transom width also determines the necessary opening. Frame stiles are generally supplied oversize so they need to be cut to length to fit the door height. Care should be taken to allow for carpet thickness if required.

If the system calls for a solid or glazed panel above the door, this should be inserted prior to the fixing of the door head transom.

It is essential to use either switch posts or strong posts adjacent to full height doors and good practice on standard height doors to use switch posts with the added benefit of facility for a light switch.

Once the frame is fixed in position with mitres tight, the frame seal and lock keep are fitted. Hinges are fixed in the frame stile in accordance with manufacturers’ instructions. If lift-off hinges are to be used, ensure that the shorter pin is on the bottom hinge. Door / smoke seals are inserted.

Door frame in position, the door is usually fitted at the end of the installation to avoid damage.

6.4.2 Method of build - glazing modules

In the same way as for solid modules, the head channel is fitted, this time with the deep side uppermost, together with the acoustic foam and the first upright post.

FULL HEIGHT GLAZING

The next upright post is cut to size and positioned to suit the module width (pre-bracketed transoms can be used to accurately set out the upright posts) and fixed to the head and base with fixing brackets, ensuring that the post is plumb in both vertical planes. The installation continues in this manner, installing junction posts as required.

A 100mm high flaxboard or timber packer is located in the floor shoe outers (inners are not used) and the floor transom is fitted directly on top of the packer. If it is necessary to raise the transom for levelling purposes then additional packing should be provided underneath the packer.

PART MODULE GLAZING

The floor shoes are fixed and the panel cut to size and placed in position. The next upright post is cut to size and positioned at the edge of the panel, set out by the transom, and then fixed into position. The installation continues in this manner, installing junction posts as required.

Pre-bracketed transoms are then fixed across the tops of the panels and fixed to the upright posts ensuring that transoms in consecutive modules are level and in line. This method completes the fixing of half glazed elevations, for mid glazed the upper transom is installed at door head height with panel above. It is now possible to fit the glazing chair (single centre, single offset or double glazed).

The horizontal chairs are cut to fit the module, then the vertical sections. Glazing beads are then square cut, unless beads are chamfered, in which case a mitre cut should be made and fitted in place prior to glass of up to 7mm in thickness being fitted.

6.5 Stud and board systems

Stud and board systems form demountable, non-loadbearing, lightweight performance partitioning systems.

The overall system thickness is approximately 75mm, 100mm or 125mm, with the aluminium profiles available in satin anodised or colour coated, generally to BS or RAL colour ranges (see figure 6).

Systems are generally based on 1200mm modules and are constructed with a framework of 48 / 50 or 73 / 75mm galvanised studs, faced on both sides with one or two layers of 12.5mm plasterboard. The cavity formed can be used to incorporate insulation material to enhance the acoustic and fire performance of the partition.

Fire performance: can offer fire resistance of up to 30 minutes in most elevations and up to 60 minutes on 100mm double skin construction. Increased performance may be achieved by using thicker performance boards (refer to system manufacturer).

Acoustic performance: through solid elevations up to 52dB($R_w$) can be achieved, whilst glazed modules can achieve up to 42dB($R_w$).

Structural performance: solid elevations including doors, when using correct detailing from the manufacturer, can provide medium duty performance levels, and heavy duty can be
achieved on 100mm double skin construction.

Note: When any performance is required from a system, it must be installed in accordance with manufacturers’ instructions.

6.5.1 Method of build – solid modules

The aluminium head channel is cut as necessary and the galvanised steel track fixed using pop rivets inside the channel. If more than one length of head channel is being used an overlap of 200mm is recommended.

The assembly is fixed to the ceiling at 600mm centres and not less than 150mm from each end. Acoustic sealant and / or foam can be applied to the back of the channel before fixing if required.

The steel track is fixed to the floor with suitable fixings at 600mm centres and not less than 150mm from each end.

In cases where double boarding is required, the second board should be staggered jointed over the first board and appropriate length screws used to ensure a positive fixing through the two boards into the stud.

SQUARE EDGED PLASTERBOARD AND ALUMINIUM COVER TRIMS

When using square edged plasterboard and aluminium cover trims it should be noted that to achieve medium duty rating for all partitions in excess of 2.5 metres high, steel studs must be fully boxed.

Between the inside of the head track and the floor track is measured at the position of each vertical stud, and 10mm deducted (35mm for fully boxed stud configuration), before the studs are cut to length and clipped into position at 600mm centres. The board is then offered into position by lifting it up into the head channel and pushing the bottom in towards the stud framework.

The board is then fixed to the stud on its vertical edges and centre stud at 300mm centres with 25mm drywall screws, ensuring that board edges are plumb and are on stud centre lines. Joints in the plasterboard should be staggered one side to the other.

In situations where a double skin of plasterboard is required, the first board for the second layer is cut to size, ensuring that its edge will be adjacent to the centre of the first layer board.

Where acoustic performance is required, insulation material can be fitted between the studs behind the first board. It can be held in position by cutting 25mm wide tabs in the head track and pressing them back to trap the insulation.

When boarding is complete, the clamping strip is cut to size and fixed at 300mm centres over board joints. Screw heads in the plasterboard are filled and sanded and the decorative finish is applied to the plasterboard.

Finally, skirting is fitted and then cover trims are cut to size and clipped over the clamping strip.
SQUARE EDGED PLASTERBOARD WITH FLUSH OMEGA JOINT

This construction would generally use plasterboard that has been pre-decorated prior to installation. The dimensions given below allow for the back face of the omega section being 14mm. If the dimension was 16mm then studs would be at 608mm centres and the gap on stud would be 16mm.

Follow the board fixing procedure as detailed in ‘square edged plasterboard and aluminium cover trims’.

Boxed studs should be cut, plumbed and fixed at approximately 607mm centres (to allow for positioning of the omega section).

15mm diameter cones of silicone mastic are applied at approximately 500mm vertical centres to the stud which is at the centre of the first board.

The plasterboard is measured and cut to size and fitted, compressing the silicone mastic, bonding the board to the stud. The board should be checked to ensure it is plumb and aligned 7mm behind the stud centre line.

Adjoining boards should be fixed in the same way, creating a 14mm gap between the board edges. Two 75mm pieces of the omega trim are fixed with drywall screws, positioned at one third and two third height, to retain the boards in position until later in the installation process.

Acoustic material is installed.

This procedure continues with vertical board joints staggered between faces until the partition is fully boarded.

Skirting is cut and fixed, then omega trims measured, cut and fixed at 400mm centres and 150mm from each end removing 75mm pieces in the process. Once all omega trims are fitted, the PVC infill strips are cut and fitted to conceal fixing screws.

TAPERED EDGE PLASTERBOARD FOR FLUSH FILLED JOINTS

Follow the board fixing procedure as detailed in ‘square edged plasterboard and aluminium cover trims’.

Board joints are then taped and filled and screws at the board centre are filled and sanded smooth when set. Alternatively the partition face can be plaster skimmed.

Decoration is then applied to the plasterboard and skirting fitted.

SKIRTING

There are several types of skirting for use on stud and board systems. Generally they fall into the following four categories:

1. Clip-on skirting: involves the fixing of a backing clip to the board and track. Care should be taken to ensure that clips are either side of junction posts, door frames and skirting joints. The skirting is then held against the board above the skirting clips and slid downwards over the clips.

2. Secret-fix: is typically skirting with infill facility, which enables the skirting to be fixed directly to the stud and board and then screws hidden by the infill strip. Generally available in plastic and aluminium.

3. Laminate and aluminium skirting: as detailed at 6.4.1.

4. Timber: either face fixed or infill strip. Due to its thickness it will need to be chamfered into the aluminium door frame.

DOOR FRAMES

Aluminium door frames are generally supplied to site in a pack with pre-drilled and mitred stiles and head and machined for lock keep and hinges. Door seals, hinges and sufficient fixings are included.

Individual manufacturers will provide set out dimensions with the frame pack, so once the opening has been created the floor to ceiling height is measured then either two studs or a stud and a floor track (manufacturers’ methods vary) are cut and boxed either side of the appropriate timber infill.

The stud is checked for plumb, then fixed by snipping the sides of the head track and bending them inwards at either side of the stud. It is then fixed to the floor track at the base with wafer head screws.

The set out position for the stud transom will be in the set out instructions, but care should be taken to allow for the floor covering on the project. The transom is screw fixed into position.

Any surrounding solid panels are constructed together with glazed panels (see 6.5.4) including above the door requirements.

To ensure the lock box is in the correct position, the stud for the lock side of the door frame should be carefully marked and notched out.

Aluminium door heads are fixed, together with the inserted mitre cleats with the appropriate fixings, into the underside of the stud transom.

Frame stiles are cut to length and offered at an angle of approximately 30 degrees to the mitre cleat, which would be protruding down from the door head, and pushed upwards and into place. It is important to ensure that the mitre is tight before fixing the frame stile into the stud using screws provided. The process is repeated on the opposite frame stile.

The door frame seal and lock box can now be fitted and
hinges fitted in the frame stile in accordance with manufacturers’ instructions. If lift-off hinges are being used, ensure that the shorter pin is on the bottom hinge, before hanging the door.

6.5.2 Method of build - glazing modules
Head and floor sections are fixed as detailed in 6.5.1.

Check the elevation type to be constructed:

**Fire rated:** studs to be boxed for all elevation types, with a timber infill.

**Non fire rated:** part glazed - box to sufficient height to allow the transom to be fixed.

**Fully glazed:** fully box all studs.

Studs are fixed as detailed in 6.5.1, ensuring that any stud boxing for glass to glass mullions is in place.

If mid, half or top glazing is required, brackets are inserted into the stud transom ends, checking that it is the correct overall length to suit the glazing frame. This sets the position of the second stud. The height for the transom to be installed is set, the position marked on the first stud, and then transferred to the second stud with a suitable levelling device. A stud is cut to fit between the floor track and the transom for the centre of the module, the transom is then loosely fixed.

If a fully glazed or glazed to door head elevation is to be constructed, then three short pieces of stud, typically 95mm long, are cut to fit between the floor track and the base transom, one at each end and one in the centre (the return legs of the base transom will need to be flattened, at the point of, and to accept, the intermediate studs).

At this point manufacturers’ instructions for glazing frame assembly and for installation into the partition framework should be followed. The second stud is then pushed firmly against the glazing frame. For mid glazed or glazed to door head, a second transom is fixed directly on top of the glazing frame and an intermediate stud fitted.

This procedure is repeated along the partition run and with most systems, plasterboard or MDF fillets are fixed over the stud faces on vertical mullions and within the head track along the partition run.

Any plasterboard for solid panels above or below the glazing frames should be measured, cut and slid into position, fixed with drywall screws, installing, if required, any acoustic material in the process.

Galvanised clamping strip can then be fitted, panel faces decorated and finally the cover trim and skirting fitted.

Glazing chairs and beads are then fitted, along with any steel liners that the system requires for the necessary fire rating.

Note: Where the partition is fire rated, the specialist contractor should ascertain which partition face is the protected side, where any steel liners should be installed ie the corridor / escape route side. Fire glass must also be fitted on this side.

6.5.3 Fixtures and services
For medium weight fixtures of circa 9-20kg, a 100mm wide fixing channel should be fixed across the studs. For medium to heavyweight fixtures of circa 20-50kg, such as cupboards and shelving, a 150mm wide fixing channel needs to be used (see figure 7). For heavyweight fixtures of 50-100kg, such as wash basins, support plates, carrying 18mm plywood
should be used within the cavity, and installed between the studs and not on the face of the studs. Ply should not be used to substitute plasterboard, especially where fire or acoustic performance is required (see figure 8). When considering any fixtures to the partition wall, advice should be taken from the board manufacturer, in particular to the type of fixing to be used.

The installation of electrical services should always be carried out in accordance with the BS 7671 requirements for electrical installations, IEE Wiring Regulations. Installation is normally carried out after one side of the partition has been boarded. Studs will have cut outs or push outs to accommodate routing of electrical services. Grommets or isolating strip should be installed in the cut out to prevent abrasion of the cables which can pass horizontally through the cut / push outs. Should access for maintenance, upgrading or repair be required, a suitable, appropriately sized access panel can be installed.

Switch boxes and socket outlets can be supported by the fixing channel or if they are to be recessed, a floor / ceiling channel can be fixed between studs at the appropriate depth to allow the face of the socket to be flush with the partition face. Where plastic clip in sockets are being used in fire and sound rated systems, putty pads can be used, providing the performance substantiation is provided by the fire stopping manufacturer, and specialist acoustic back boxes can be installed to maintain sound insulation.

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 testing to be able to maintain the integrity of the construction. Care should be taken to ensure that all penetration edges are properly sealed with suitable fire stopping material or acoustic sealants.

6.5.4 Integration with glazing systems
Most partitioning systems will have single, double, full height, mid, half, top, framed and frameless glazing elevations as part of their system solutions. However, increasingly a range of aluminium extrusions together with plaster profiles are available to provide a wide choice of stud and board to glass junction details. Figures 9, 10 and 11 show just three solutions which are available to specifiers.
6.6 Frameless glass partitions

Frameless glass partitions comprise of 10mm to 15mm safety glass, installed between head and floor tracks. The edges of the glass are polished to accept a jointing method to provide a frameless glass partition. The glass can be installed in module sizes of up to 1500mm wide (subject to access into and around the site), or can be equalised along the partition run, although this can make relocation more difficult.

There are many ways to joint glass in a partition wall - the traditional vertical glazing joints most frequently used in commercial interiors are covered here. Horizontal jointing can also be achieved but best practice would recommend a proven proprietary dry joint with a maximum glass panel size of 900 x 3000mm wide (see figure 12).

In all jointing methods the principle lining up and levelling of glass panels is used in all processes – the glass is lifted and rested on two glazing packers (one at each end), the leading edge of the glass is checked for plumb, adding and removing 1mm packers as necessary. This will set the plumb line for the remaining glass run.

**Fire performance:** up to 30 minutes possible.

**Acoustic performance:** single glazed systems, up to 38dB($R_w$); double glazed with ghost post, up to 49dB($R_w$); double glazed without ghost post, up to 48dB($R_w$).

6.6.1 Method of build – silicone jointed

Glass is installed commencing at one wall abutment channel and continued towards the opposite end of the run, as detailed in 6.5.4.

The next panel is slid up to the first and for a 6mm silicone joint two 6mm glass packers (one at the top and one at the bottom) are used to space the two panels apart evenly. 1mm packers are added or removed from under the glass to achieve a plumb edge. The process continues for the remainder of the run.

The width of the completed joint can be affected by the edge tolerance of the glass. The 6mm joint width should be considered as nominal with 5 or 7mm also being acceptable.

For a 3mm joint, a 3mm packer can be used in a similar way.

When installing multiple glass panels, the last glass panel should be installed into the abutment track as deeply as possible, before the previous panel. This will give as much space as possible to apply the last glass to glass joint before pulling the last panel out to close the gap.

If there is a 90 degree corner in the run, then plumbing and levelling should commence in the corner, before working away towards the abutments. It is possible to create both a butt and mitre joint detail.

With the glass level, plumb and spaced, it is important to remove any deflection in the flatness of the glass. Two 5 or 6mm glazing packers should
be pilot drilled and fixed tight either side of the glass to tie two adjacent panels in the same plane. This can be done by using a drywall screw or if the gap is 3mm a wire tie, looped through the two holes.

With the glass packed rigid into the perimeter tracks a bead of silicone is applied between the two panels, tooling off from both sides to leave a smooth finish and feathering out above and below the toggle clamps. After allowing the silicone to cure for 24hrs, the toggle clamps are removed and the gaps made good (see figure 13).

Note that silicone jointing is a skilled process and should be carried out by specialist operatives.

6.6.2 Method of build - dry jointed

Dry jointing can be achieved in several ways, the most popular of which are aluminium, PVC and double glazed dry jointing.

ALUMINIUM

High bond tapes are applied to the vertical glass edges, and once the panels are level and straight the inner faces of the aluminium ‘H’ shaped dry joint should be thoroughly cleaned with an alcohol based glass cleaner. The tape is then peeled off and the aluminium dry joint is bonded to the glass, taking care to keep the face of the aluminium flush with the face of the glass all the way up. The next panel of glass with tape already applied is stood up, the tape peeled off and panel slid against the dry joint section. The process continues in the same way.

For the glass panel which forms a 3-way junction, the tape is peeled away and an edge protection strip is applied, then a high bond tape is applied to the flat surface of the section. Ensuring that the glazing of the main front run is installed with a dry joint centred on the offset run, the tape is peeled away and the offset panel carefully pushed against the front run dry joint, with firm pressure applied all the way down to ensure a complete bond.

PVC

These dry joints, also ‘H’ shaped, are fitted in a similar way to aluminium, but some manufacturers have high bond tape on the stalk of the section which is peeled off and fixed to the glass, others rely on a tight friction fit (see figure 14). There are also two part profiles available with a male / female central jointing usually with peel off adhesive tape on each edge (see figure 15). Softer circular PVC profiles with tape on either side are also available for a less visible joint. Some systems have a range of 3-way, 90 degree and 45 degree profiles fitted in a similar way and complete the visual appearance.
the glass edge, before pressing in place. The tape is then peeled away gradually. The adjoining piece of glass should then be cleaned before the outer bubble adhesive tape is removed and the glass pushed carefully onto the bubble ensuring that the glass leaves remain aligned (see figure 16). Gluing tubular soft pvc into grooved vertical edges of glass is achieved by using instant adhesive applied at the top edge of the joint. The tube, cut 20mm to 25mm shorter than the glass height, is then bonded in the same way at the bottom (see figure 17).

DOUBLE GLAZED DRY JOINTING
This can typically be achieved using the following methods:
- An ‘H’ profile dry joint section used on all joints on both faces of the partition
- A self-adhesive ‘bubble’ shaped pvc profile between all joints on both faces of the partition
- A dry joint section connected to an aluminium ‘ghost’ post which is fixed at the glass joint between the two glass panels (see figure 18)
- Silicone jointed glass panels, with an aluminium ‘ghost’ post fixed at the glass joints to provide a backing for the silicone joint (see figure 19)

6.7 Timber systems
Pre-lacquered timber or veneered MDF (V-MDF) partition systems can offer fire resistance, good acoustic performance, a wide range of veneers, and generally an option of double or offset glazing. As timber is a natural produce, it should be noted that there will be differences in shade and grain. It is understood that solid timber components are likely to be less similar than veneered components (see figure 20).

The systems available essentially fall into two proprietary types, V-MDF systems and timber only systems.

6.7.1 Method of build – veneered MDF systems
V-MDF systems are based on a framework of 50mm stud and track as described in 6.5.1, together with V-MDF or plain MDF sections to build the elevations required. The principles of the framework fixings are as 6.5.1.
Partitioning system types and installation procedures

**Fire performance:** 30 minutes is achievable in solid, glazed and door module elevations.
**Acoustic performance:** up to 46dB($R_{w}$) on solid elevations and 41dB($R_{w}$) on glazed and door module elevations.

**SOLID MODULE**
Solid module runs only would necessitate the fixing of floor track to the floor at 600mm centres. The head track either fixes to the underside of pre-fixed MDF packer in which case after boarding an V-MDF cover trim is fitted at ceiling level, or into an V-MDF head channel and then fixed to the soffit. Studs, boards and insulation, if required, are fixed in place. Boards should then either be taped and jointed prior to decoration, or decorated prior to fixing a V-MDF cover trim and any associated backing or infill strips.

For alternative solid and also glazed runs a MDF wireway ‘I’ shaped profile is fixed to the floor, and the stud is then fixed on top of the profile to form the base of the framework for the stud and board fixing.

**GLAZED MODULES**
Glazed modules are formed by fixing two part mullions between floor and head sections then planting glazing profiles onto the floor wireway and to the head packer. Glass is then fitted, along with any foam gaskets or intumescent mastic prior to a cover trim being fitted with backing and / or infill strips. Wall abutment detail consists of an MDF packer being fixed to the wall, onto which the glazing profile is fixed before the glass is held in place by an abutment or cover trim. To change from a solid module to fully glazed either create a mullion with an MDF glazed profile fixed to a 50mm stud or use a two part glazed mullion.

**DOOR FRAME MODULES**
Full height door frames are provided pre-mitred and will, at the head detail, either sit inside a head track with an MDF packer, or fix against an MDF packer with cover trims fitted either side at ceiling level. In solid elevations, boxed studs with timber infills will line both door frame stiles with cover trims fixed at the point of joint between the plasterboard and the door frame section. Glazed elevations are created in a similar way but with the door frame section being fitted to the back of the glazing profile.

Standard height frames in a solid elevation would also be framed with boxed stud and timber infill together with a stud transom horizontally fixed at door height level. Cover trims are used to mask joints. For glazed elevations the door frame would be fixed to the back of glazing profiles at stile and head detail and masked with cover trims.
SKIRTING
Skirting is fixed through to the wireway if being used, otherwise to the studs. Fixing will either be into a recess in the skirting which is subsequently covered with an infill strip, or the skirting is pushed onto backing clips which are levelled before being fixed back to the studs / wireway. Providing that the system is not being installed for its relocatable function, then rapid set glue could be used to fix the skirting.

6.7.2 Method of build - timber only systems
Timber only systems are generally made up of entirely hardwood sections utilising stud and track solid framework, or in some cases hardwood faced softwood.

Fire performance: up to 30 minutes for solid, glazed and door module elevations can be achieved constructing a 75mm system, 60 minutes on solid elevations can be achieved constructing a 100mm system.

Acoustic performance: up to 43dB($R_w$) on solid and 40dB($R_w$) on glazed and door module elevations can be achieved constructing a 75mm system. Systems of 100mm thickness can provide up to 52dB($R_w$) on solid elevations and 40dB($R_w$) on glazed elevations.

SOLID MODULES
Solid modules are typically framed in 50mm galvanised steel stud and track as in 6.5.1 or some systems utilise a 50mm timber stud framework fixed into a common head and base section. A 100mm system, which incorporates two layers of plasterboard on each side of the stud is an option for some systems. After fixing plasterboard and insulation a cover trim covers the panel, top and base joints.

GLAZED MODULES
Glazed modules are formed by fixing a glazing profile on top of the timber base and a glazing head track or by utilising a common head and base profile for taking the glass. The timber mullion is installed, in some cases by use of set-out brackets, glazing foam and intumescent seal. If glazing transoms are required, they are fixed either with a different set-out bracket or fixed with recommended screws through adjacent mullions (see figures 21 and 22).

DOOR FRAME MODULES
Door frame sections are pre-mitred and are designed to fit into the mullion, with a cover strip to cover the joints and also to fit into a transom for standard height doors or a head section for full height doors. This applies for both solid and glazed elevations.

SKIRTING
Fixing is made into a recess in the skirting, through to the studs if no timber base is being used, and through to the timber base if it is being used. The recess is then filled with an infill strip. True timber skirting can also offer bespoke skirting solutions, including chamfered, mitred or block details. On systems where the head and base section are the same profile, no skirting section will be required. Providing that the system is not being installed for its relocatable function, then rapid set glue could be used to fix the skirting.

6.7.3 Timber junctions
Timber junctions are provided by most manufacturers of timber systems, in many cases with the facility to introduce steel liners to provide fire resistance. Wireway solutions are also built in to some systems, along with the facility to install interstitial blinds.

For information on fire rating options, consult the system manufacturer.

Figure 21

Figure 22
6.8 Bi-Panel systems

Bi-Panel systems are made up of two single, factory produced panels, usually in 1200mm or 1500mm module widths, hooked onto an upright stud section. Some systems offer a varying stud thickness to provide an accessible service void. Panels can be manufactured from steel faced plasterboard, veneered, painted and laminated MDF panels, as well as glazed panels. The systems offer great flexibility with the ability to relocate, and opportunity to change module type as well as have different finishes on each side of a module. Both the head and floor track will become recessed profiles when the panels are fitted. No skirting sections are required with the systems (see figure 23).

Fire performance: 30 minutes is achievable in most module types and up to 60 minutes in solid module format.

Acoustic performance: up to 50dB($R_w$) in solid modules and 45dB($R_w$) in glazed modules can be achieved.

6.8.1 Method of build

Head and base tracks are plumbed and fixed into place at 600mm centres, being sure to use the manufacturers’ compression seals. The tracks will usually express a recessed ‘shadow gap’ detail and can also form part of a tolerance head detail. The manufacturer may provide head and base track with different end details to facilitate door and 90 degree junctions and / or pre-formed 135 degree and ‘Y’ junction sections. When abutting the junction sections to standard head and base track, the abutting head and base track should be cut not the pre-formed junctions.

Some systems incorporate a levelling platform with levelling feet which sits within the base track and is continuously levelled to provide a platform for the steel studs, others incorporate levelling feet into the base of the studs.

Steel studs are pushed into the head track and then rest on the levelling platform and provide hook-lugs to receive the panels and can provide racking slots to receive shelving for a working wall.

Some systems incorporate a levelling device in the base of the stud which negates the need for a levelling platform, and have studs with slots, rather than hook-lugs, incorporated which necessitates having a panelling system that has backing hooks (see inset figure 23a).

WALL ABUTMENT

The wall abutment can be a two-part adjustable steel channel assembly that is panel height and will provide a tolerance which allows the abutment to accept pre-sized and special width panels. The abutment wall channel is fixed to the wall, together with the appropriate foam.
compression seals and acoustic sealant. Once the levelling platform has been levelled, a steel stud is inserted into an abutment stud channel and locked together by engaging with the stud hook-lugs. This assembly is then inserted into the base track and slid into the head track. When vertical the assembly is slid over the abutment wall channel.

DOOR FRAMES
Door frames are factory prepared and painted and arrive on site ready to be hooked onto the studs either side of the door module. The studs should be carefully moved apart to allow the frame to be eased into position. The studs are then moved back into position to allow the door frame to be pulled down over the hook-lugs on the steel stud and into position. It is advisable to hang the door later to avoid any damage.

GLAZED PANELS
Glazed panels are delivered to site as sealed units, with a protective film on the back, manufactured to half the partition thickness, with locking strips built into the vertical edges. The panel is positioned on the floor in front of where it is about to be installed, then lifted into position and pushed back over the hook-lugs to meet the stud face and then pulled down over the hook-lugs into its final position. The same occurs on the other side but this time the protective film on the back of both panels should be removed.

Between all panel joints, a joint infill is cut to panel size and inserted in the gap. An acoustic seal is fitted in the horizontal gap between the panels and the head and base tracks.

6.9 Monobloc systems
Monobloc systems are manufactured and assembled in factory conditions to either specific or standard dimensions. Each panel will arrive on site with its pre-finished face which can be solid, glazed, glazed with integral blinds, or half glazed. This enables a fast installation time on site, flexibility of design, and simple relocation benefits (see figure 24).

Monobloc systems divide into three categories:
1. Monobloc: generally full height, very good fire and acoustic specification, bespoke design, possibilities to accommodate working wall, usually installed by the manufacturer.
2. Steel panel: which offers standard and bespoke products, single or double skin, full or partial height, predominantly steel or glazed modules, installed either by the manufacturer or the specialist contractor.
3. Cleanroom: which offers technical solutions for the medical / high tech environment, installed either by the manufacturer or the specialist contractor.

6.9.1 Method of build - monobloc systems
Monobloc systems are set out with a head and floor channel which are fixed to the ceiling and floor and plumbed level. Any acoustic foams or seals are also fitted along with any sections that will allow for wireways at either the head or base detail. Both the head and floor track will become recessed profiles when the panels are fitted no skirting sections are required with the systems.

Panels, which are factory manufactured in one piece, are then fitted by being lifted up into the head track, which has sufficient depth for the panel to then be dropped down onto the floor track. Seals at the head track are then inserted. Some systems have a single line junction without a cover strip, enabled by a system that clips the panels together. Other system types push panels together leaving a 6mm gap between panel faces to allow a vinyl or steel seal to be inserted. Solid vertical junctions can accommodate a concealed racking upright that facilitates the support of furniture items such as shelving, storage units and desking. The upright can be retrofitted and relocated if required.

Movement (service) panels can be provided with removable skins to allow installation and integration of electric switches and power sockets. Also small movement panels can be installed next to each door.

Doorsets also arrive to site pre manufactured with either a steel, timber or glass door, complete with floor mounted door seals.

Fire performance: of up to 60 minutes on solid and glazed elevations, 30 minutes on door modules. In certain circumstances 90 minutes can be achieved on solid elevations.

Acoustic performance: of up to 47dB($R_\text{w}$) on solid elevations, 45dB($R_\text{w}$) on double glazed elevations and 43dB($R_\text{w}$) on door modules can be achieved, but higher performance solutions can be provided as a bespoke manufacture.

6.9.2 Method of build - steel panel systems
Steel panel systems are available in double or single skin (including steel mesh), fire and non-fire resisting. Full or part height elevation and can be installed either by the manufacturer or the specialist contractor.
DOUBLE SKIN SYSTEMS
A full height partition of up to 3.6 metres high will necessitate a ceiling and floor track being installed and plumbed. The steel panels, which have a composite infill, are then placed in position, with a gap between each one. Within the gap, cleats are then fitted to lock the panels together, before closing the gap by clipping in a cover channel. Junction details are constructed in a similar way by cleating sections together. If a cut panel is required to abut the wall, then an abutment section should be fixed to the wall and the open end of the cut panel slid into the section, while the true panel end is cleated to the adjacent panel. If the system has to offer fire resistance then intumescent sealant should be used at wall, floor and ceiling abutments and mineral wool insulation inserted into all cavities.

Module elevations available are; full steel, steel / glass / steel, steel / glass, fully glazed with or without blinds, chair rail glazed, timber door in single module and double steel door. A mullion post is required to be fitted either side of any double doors. Modules can be provided in widths of 300mm – 1000mm at 100mm increments. Laminate skirting of 100mm height can be used at floor level but for fire resisting partitions a 100mm steel skirting must be used. A double lift height can be achieved by using a bespoke length mullion post at least every three metres and between partition panels a heavy duty top capping, but consultation with the system manufacturer is essential. For partial height partitions a mullion post, which is welded to a heavy duty base plate should be fixed every three metres along the partition run, with floor channels and panels installed in between. On the top of the partition a 100mm wide heavy duty capping section should be fitted to provide lateral stability (see figure 25).

Fire performance: of 60 minutes can be achieved in either a solid or solid / double glazed / solid elevation, 30 minutes can be achieved on solid / single glazed / solid or half glazed elevations. Single and double door modules can also achieve 60 minutes.

Acoustic performance: of up to 36dB($R_w$) can be achieved for solid elevations and 32dB($R_w$) for glazed elevations.

SINGLE SKIN SYSTEMS
Some require a floor track to be fixed to the floor and a ceiling track to the ceiling, or alternatively the panel is fixed directly to the floor. However, if the ceiling fixing detail is not considered to be strong enough, then mullion posts should be installed every three metres.

Panels are placed in the desired position with the holes in the panel edge lined up. Panels are then bolted together using M6 nuts and bolts. Glazed panels need to have the glass removed before the panel is fixed and re-fitted afterwards. A top channel is fitted to the ceiling on full height installations and a heavy duty capping on partial height partitions.

The door frame is fixed to the floor next to the adjacent panel or post, ensuring that it is square, then bolted to the
panel or post using M6 nuts and bolts. The overpanel is then bolted into position on top of the doorframe. Three way, 90 degree and circular post junctions can be formed by bolting the panels into the post. Module elevations available include steel; steel / mesh / steel; steel / mesh; full mesh; steel / mesh door; steel / glass / steel; steel / glass; steel / glass door. As for double skin, a mullion post must be fitted either side of any double doors (see figure 26).

Fire and acoustic performance: are not features of these systems which offer functional division of the industrial workspace.

6.9.3 Cleanroom systems

Cleanroom systems are designed and installed to meet the high standards set out in BS 5295 (1989) Part 2 and ISO 14644-1. Whilst the partition is often only a small part of the total cleanroom specification, these close control environments, specifically required in sectors such as healthcare, pharmaceutical and biotechnology, require systems that can meet the requirements of the standard ie air tightness. Systems, similar to those detailed in 6.9.2, which differ in detail from each manufacturer, will generally offer dust free, air sealing and flush glazing details together with coved skirting and ceiling details in a bid to minimise dust trappings.

6.10 Operable walls

Operable walls in general are installed by the manufacturer or their specific agent and are delivered to site in their finished state ready for final installation. In most cases, the manufacturer will have surveyed the site for manufacturing dimensions and provided weight loadings and deflection details for the structural engineer. However, unless the supplier has ‘professional indemnity insurance’ they cannot make comment regarding the suitability of the structural support. These details would include the individual panel weights and the maximum weight loading that the structure can be expected to take, particularly bearing in mind that panels can all be in one part of the tracking system at any one time. For ‘single point’ systems, the panels can be moved to any point along the length of the track, whereas for ‘double point’ systems the panels can only park in the designated parking bays.

This then allows a supporting framework to be designed, manufactured, and installed on site prior to the operable wall installation.

During the installation process an acoustic baffle will need to be installed above the partition to at least maintain the acoustic performance of the partition. This will typically be done using a single layer of 12.5mm plasterboard either side of a 50mm stud and 50mm insulation to provide up to 40dB(Rw), two layers of 12.5mm plasterboard on each side of a 50mm stud, infilled with 50mm insulation to provide up
Partitioning system types and installation procedures

6.10.1 Method of build - moveable walls

In many cases, moveable walls are required to be stacked out of sight necessitating the need for a panel parking area. The ceiling track therefore has to be fixed to the supporting framework and should be on the partition line together with the route method to the parking areas.

Panels need to be attached to track rollers which slide into the ceiling track. This is best done at the point of the escapement section (a short removable section of track at the end of the track system). To do this would generally require four people - two on either edge of the panel with any lifting apparatus ready in place, a third on a platform ready to offer the wheel carrier into the track, and a fourth on the opposite face steadying the panel. (Panel installation procedures and the safe working practice, must be clearly defined in the method statement site specific risk assessment.)

The panels are marked with numbers, beginning at the wall abutment, so that sequencing is straightforward for operatives to use following the system installation. Multiple partitions are also numbered in accordance with the layout plan.

Panels, as they are pushed together along the partition line, will either activate the ceiling and floor seals automatically, or by a manual handle. It is important that the sealing operation works correctly and that consideration is given to any possible floor live load deflection. If the deflections exceed the ability of the bottom seals of the operable wall to extend, all seal contact will be lost, creating a sound leak.

Passdoor panels (panels with a doorway inset) are supplied pre-assembled and note should be taken of the handing of the doors. Door leaves are supplied loose and care should be taken to ensure that they are equipped with full perimeter gasketing, including head seals. Panels are then pushed along the track to their respective positions.
6.10.2 Method of build - folding walls
Folding walls are generally of timber construction with aluminium flush fitting framing and are available in a variety of finishes including wood veneer, painted, melamine and high pressure laminates. Framed glass panels can be provided with single or double glazing, with options to have double glazed panels with interstitial blinds. Some single glazed panels are manufactured with powder coated aluminium framing.

All panels are continuously hinged on each side and are manufactured to either glide along a low profile floor track with a guide at ceiling level, or be top hung from a ceiling track. The lead panel is generally supplied as a pass door. The folding configuration can be tailored to meet client needs, allowing panels to be either stacked at one end or bi-parted to stack at each end. Panels can also be fitted to the track either at the centre of the panel base / head (centrefold) or at the end of each panel base / head (endfold).

**Fire performance:** of 30 and 60 minutes can be achieved but reference to the manufacturer must be made.

**Acoustic performance:** of up to 48dB($R_w$) can be achieved using solid panels and up to 32dB($R_w$) on glazed panels.

6.10.3 Vertically rising folding walls
Vertically rising folding walls are designed to be completely automatic and utilises flat, rigid panels that fold into the ceiling void. These systems are custom manufactured with a variety of panel finishes, including vinyl, fabric, metal, laminates, tapestry, murals and veneers. The complete storage of the system is in the ceiling void with return of the system to reach floor level being done automatically by remote control. Care needs to be taken in the early stages of structural work to ensure that the systems weight loadings, which on this system are static, are fully considered.

**Acoustic performance:** of up to 56dB($R_w$) can be achieved and systems can be installed to heights of up to 11 metres, with no limit on width. An exterior facing product is also available but can only be installed to a height of seven metres and a width maximum of four metres (see figure 30).

6.10.4 Folding screens
Folding screens are designed to provide speedy, efficient and cost effective room division. They are available in flame retardant and non-corrosive PVC coated fabrics or a choice of vinyl coverings. The system is top hung without floor rails and either single or bi-parting units.
Partitioning system types and installation procedures

**Fire performance:** flame retardant materials should conform to BS 6868.

**Acoustic performance:** of between 15 and 32dB(Rw) can be achieved with these systems.

### 6.11 Storagewall

Storagewall systems are designed to provide high volumes of storage capacity, by utilising the full floor to ceiling height. The storagewall can be positioned as a partitioning divide between offices, with doors facing both sides on adjoining bays or just the one side. Often the storagewall will be provided as part of a wider partitioning system design and can be integrated with the partitioning system specified with dedicated components such as head and base details. Alternatively they can be freestanding either back to back or single standing. Generally manufactured using MFC board, the systems are often installed by the manufacturer but can be installed by suitably trained operatives.

#### 6.11.1 Module options

Module options are generally widths of 1200mm, 1000mm and 800mm with door widths of 600mm, 500mm and 400mm to correspond. Single door width modules and larger widths to accommodate media units are also manufactured. The depth of each module comes in standard sizes of 600mm, 472mm (foolscap) and 412mm. There is a range of module elevations with full height doors, full height door with pelmet, doors with cupboard above, door and drawer, locker units, display with doors and drawers and split doors. Units are supplied with adjustable feet to overcome any unevenness in the floor.

#### 6.11.2 Finishes

Finishes are available in an extensive range of MFC finishes including wood grain and solid colours on to which full colour vinyl graphics can be applied to create a corporate theme. Natural wood veneers can also be supplied upon request. A wide range of high specification espagnolette locks and hinges complete the finishes.

#### 6.11.3 Internal components

Internal components are generally made of steel to give added strength, except pigeon holes, which are manufactured from MFC board, and installed 'tool free' allowing easy reconfiguration of the internals. The internals fit into a peg and hole system or a bespoke aluminium extrusion which usually has an adjustable pitch. Typical internals that are made available are plain shelves, combi shelves for filing and suspended lateral files beneath, deep and shallow drawers, roll out filing frames, horizontal coat rails, front to back coat rail with shelf above and pigeon holes.

#### 6.11.4 Load capacity

A load capacity of 40kg per internal / 240kg per module is the standard and whilst every installation will be loaded with differing volumes of materials, storagewall between offices can provide very good sound attenuation.

#### 6.11.5 Method of build – storagewall

Dividing panels will have a row of pre-drilled holes in both of its long sides, which are used to accept fixings and help with panel alignment. The first divider panel is secured with its fittings (height levelling feet, top clamp, panel clips, hinges and back panel brackets) before the left hand door is laid next to it and fixings for both are aligned.

Intermediate divider panels are built up in the same way as the first divider panel except that double hinges will be used and connector pins will be required. The build progresses until the last divider panel is fitted in a similar way to the first.

**ASSEMBLY STEPS (see figure 31).**

1. Ensure that the area the unit is to be installed in is clear. If the storage run is to be built against a wall or partition, begin building the run of storage against the wall.

Figure 31
2 Measure out from the wall at ceiling level and attach the top channel to the ceiling. The front edge of the channel should be flush with the front edge of the vertical divider panels.

3 Stand the first divider panel in position and clamp to the ceiling channel. Using the structural shelf as a guide, position the next divider panel at the correct distance and clamp to the ceiling channel.

4 For all 1000mm and above units, a central support leg must be fitted to the lower structural shelf.

5 Place the structural shelf onto the exposed connector pins at the bottom of each unit and then tighten the cams through the holes to make a rigid construction.

6 Using a safe working platform place a structural shelf onto the exposed connector pins at the top of each unit and tighten the cams in the same way.

7 Steps 3 to 6 are then repeated for all remaining divider panels, back panels and storage shelves.

8 Level the storage run by placing a spirit level across the bottom set of hinges in each section and adjusting the height levelling foot accordingly.

9 Fit the internal back panels by pushing into position on the brackets fitted to the divider panels. Secure using a roundhead screw. If the unit is freestanding, eight screws are fixed into the holes in the back panel, leaving the screws approximately 4mm from the surface of the panel. The back panel is put in position on the back of the unit and slid downwards onto the back panel brackets already installed on the divider panels. The back panel is then secured by tightening the screws from within the unit.

10 Taking each door in turn, line up the hinges with those already fitted in the carcass. Once all four are aligned, slide the hinge parts together and secure using the centre screw.

11 Fit the locking bolts to the top and bottom shelves. Open the doors and then close the locking door only. Looking inside the unit, fit the locking bolt mechanism to both shelves so that the cam on the top and bottom of the door locking bar is around the locking bolt pin. Secure with screw.

12 Fit the lock handle to each right hand door. Ensure that the lock handle is in the correct position before inserting the lock barrel. Looking into the handle, the flat side of the square recess should be towards the bottom of the door.

13 Clip on the bottom plinth and top scribe panel.

6.12 Working wall

Working wall is a concept in which the partition or screen combines with furniture to provide additional storage that can improve acoustics and offer relocatable opportunities. The integral panels can be factory finished in a wide range of furniture matching finishes including veneer, laminate, MFC, fabric, dry-wipe, glass or vinyl. Accessories to the systems include paper trays, coat and picture hooks, overhead storage cupboards, shelves and monitor arms. There are two distinct system types which would utilise some of the same components from the manufacturer, who may have a tie up with one or more furniture manufacturers.

6.12.1 Wall to wall

This system is a cladding solution, designed to be fitted to an existing drywall, proprietary partition or solid wall. The solution can be manufactured to any size and can be installed either from desk height (circa 800mm), or from floor to ceiling (see figure 32).

If the installation is in conjunction with a newly constructed back wall, then consideration should be given to...
Partitioning system types and installation procedures

fixing an interlayer of plywood behind the plasterboard of the drywall or partition wall to support the weight of the working wall. Otherwise, either fixing can be done to the wall picking up on the partition studs, or in some cases, fixing plywood strips to the studs at the points where the support rail needs to be installed. When fixing is being done into either concealed or exposed plywood then fixing centres will be at 300mm to 600mm centres, depending on weight loadings being applied.

Panelling methods do vary system to system, but in general there are two methods of construction:

1. **Slide-in panels**: where an aluminium rail is fixed to the floor, ceiling and wall abutments at maximum 600mm centres. An edge rebated panel is then slotted into the base rail, which can also be at floor or desk height, after which a slotted cross rail is then fitted on top of the panel and bracketed into the side rails. The next panel is then fitted into the cross rail and the wall is progressively built up to the ceiling level.

2. **Hook-on panels**: a framework of height adjustable slotted steel studs is built, with spacings and fixing centres appropriate for the weight loadings being imposed. If clerestory glazing or glazing to the sides of the workstation is required then the proprietary glazing sections must be used to complete the wall. Panels complete with tapered slots are then fitted onto the hook lugs on the studs.

### 6.12.2 Partition wall

A system which brings furniture and partitioning together and can often be integrated with the manufacturers glazing systems (see figure 33). Generally there are two methods of construction:

1. **Slide-in panels**: the main aluminium section, which is grooved on its two edges to take the decorative panels, is fitted to the ceiling and floor at 600mm centres. The section is then fitted as an upright post to create the desired framework. If clerestory glazing is required then the same section is fixed at the desired transom height. Panels are then slotted into each side of the section, leaving a cavity between panels, cross rails are then fitted on top of the panels and progressively built as described in 6.12.1. Glass is fitted between the top cross rail and the ceiling fixed section and retained by aluminium beads, however if only partial glazing above the workwall is required then an aluminium capping section is fitted on the top edge of the glass. If traditional glazing is required to come off the workwall section, then the glass is located in the central glazing pocket of the section and retained by aluminium beads.

2. **Hook-on panels**: a framework of height adjustable slotted steel studs is built, with spacings and fixing centres appropriate for the weight loadings being imposed. If clerestory glazing or glazing to the sides of the workstation is required then the proprietary glazing sections must be used to complete the wall. Panels complete with tapered slots are then fitted onto the hook lugs on the studs.

### 6.13 Washroom systems

Toilet cubicle systems, vanity units and internal plumbing systems have become an integral part of the interior fit out package and feature on partitioning packages. There is a wide choice of products available but all centre around similar components. Budget products are often available in packs and are available off the shelf, in standard colours and sizes.
There are three types of panels in use (plus frosted glass is available from certain manufacturers):

1. **Compact grade laminate (CGL):** generally 12-13mm, which is durable, strong and vandal resistant and is suitable for high usage areas in wet and high humidity conditions, ie shower areas, public areas, swimming pools and sports centres.

2. **High pressure laminate (HPL):** generally 19-21mm, which is durable and practical and is suitable for medium to heavy duty use.

3. **Melamine faced chipboard (MFC):** generally 17-19mm, which is suitable for light use environments.

Most panels are 1800-1900mm high and 1500-1800mm wide usually in one piece but on some ranges the panel is supplied in 2 x 900mm high panels with a jointing ‘H’ profile which fits between the panels. An extensive range of panel colours is available to provide good client choice but also to assist in complying with DDA regulations (BS 8300) which makes provision for visual contrast between:

- Ironmongery and door faces
- Some door faces and door edges - where doors are self closing
- Door faces and pilasters
- Handrails and walls
- Floors and walls

Components tend to be nylon, satin anodised or powder coated aluminium, which can be provided with customised logos on the locking mechanisms, together with stainless steel or nickel plated brass for aggressive environments. The product ranges will also include door hooks, toilet roll holders and door rubber buffers.

The positions for the three brackets / channel on the pilaster (fascia) are marked, fixed in place and then the pilaster is fixed to the end of the partition.

The support leg is attached to the partition, either under the pilaster or towards the door end of the partition panel (depending on manufacturers instructions) and adjust to the correct height. The partition should be checked for alignment and then the leg fixed to the floor.

A head rail is then placed in position over the tops of the pilasters, bridging the door gap, then fixed permanently.

Door hinges are fixed to the pilaster and door, ensuring that the door is hung plumb. The indicator bolt is then attached to the door, the lock engaged and the pilaster marked at the point that the keep is to be positioned.

The indicator bolt is then unlocked and the keep attached using the fixings provided.

When fixing a cubicle into a corner, the pilaster is fixed to the side wall using three brackets or a channel (see figure 34).

### 6.13.1 Method of build – toilet cubicles

The position of the partitions is measured and marked off on the back wall. The position of the three brackets or channel (whichever the system uses) are marked and then fixed to the wall with suitable fixings.

The partition panel is slid into the brackets / channel to the required level, whilst being supported from the underside of the panel to the floor. Once level, the panel is fixed into the brackets / channel to the partition using the through-nuts provided.

### 6.13.2 Integrated plumbing systems

To complement cubicle systems, wall integrated plumbing systems are designed to cloak existing cisterns and pipework with panelling that matches the cubicle panelling.

A steel floor track is fixed to the floor, centred on the soil pipe inlet. The slotted steel framework, with the cistern already fixed, is then located into the floor track, adjusted for height, plum and level and securely fixed to the ceiling and wall channels. Decorative frame spacer panels, skirting wall and ceiling scribe panels are then installed.

The back panelling comes in three pieces - the bottom
6.13.3 Vanity units

Vanity units are supplied in two formats:

1 **Off the shelf vanity packs**: supplied with a laminated top, together with an upstand piece, one side panel, one front panel and a 500x500mm insertion piece for access behind the panel, an extra end panel is required if the vanity unit is freestanding. The top and front panels are trimmed to the exact size required and basin holes are cut out to suit. The units are assembled on site and provide a fast, low cost solution.

2 **Purpose made units**: generally fitted to a 50x38mm softwood framework, constructed to the correct height and depth. Typically units will be manufactured to create a basin height of 850mm with a 75mm upstand. Tops are constructed from 18mm moisture resistant MDF, faced with 0.9mm high pressure laminate and production balancing material to reverse. Tops typically incorporate front downstand and rear upstand with a postformed front edge to a 12mm radius. Secret lift-off access panels are fitted below the basin to individual size requirements.
Partitioning system ancillaries

Incorporated into most partitioning systems are important components that add to the aesthetic, function and performance of the system. In this section we discuss the key product types that influence the look and performance of partitioning systems in general.

7.1 Glass

Regulations covering the use of glass in partitions are comprehensive and specifically detail the performance requirements in relation to fire, impact and visibility in both partitions and doors. The glass type and finish specified should therefore be capable of complying with the regulations in all respects. See also the AIS Site Guide for Glazed Partitions.

7.1.1 Glass types

BS EN 572 covers glass types used in the interiors sector:

Toughened glass: is float glass that is heat treated (tempered) and is used as safety glass. When broken it shatters into small pieces and any edgework drilling or surface decoration, ie etching or sandblasting, must be carried out prior to the toughening process, as the glass cannot be reworked after treatment. Tends to be used for frameless partitioning and glass doors but can be vulnerable on its edges.

Laminated glass: is two or more sheets of float glass that are bonded together using a special interlayer and is used as safety glass. If broken, the pieces are retained by the interlayer and if properly supported will remain within the partition without shattering. Cut-outs, notches and mitred edges should be carried out under workshop conditions, however, unlike toughened glass, laminated glass can be reworked if necessary.

Wired glass: is also a product available in the market, but it is not considered best practice in terms of office partitioning.

Switchable LCD privacy glass/film: normally has a diffused white appearance which acts as a screen, but can be made transparent simply by passing an electric current through it. The liquid crystal film is sandwiched by two layers of conductive film, which is then laminated between two pieces of glass. Available in 10mm, 12mm, and 14mm thicknesses, the system is operated by electrical switch or remote control via a transformer and should be installed in accordance with BS 7671 - IEE Wiring Regulations 17th edition.

When choosing types of glass at the specification stage, consideration should be given to the thickness of the glass and the height of the partition in which it is to be installed. Glass will deflect if it is not thick enough or the module centres are too wide apart. This is particularly relevant in silicon glazed / dry jointed partitions and where toughened glass doors are required. For specific guidance, manufacturers or specialist advice should be sought. Best practice in all partitioning situations would be to use safety glass to BS EN 12600 and BS 6262 at all times. Kite marks and/or logos should be located consistently in the same place on each plane, ideally in the bottom left or right hand corner, facing outwards from the partition face to make any inspection easier.

7.2 Manifestations

Glass films are applied within partitions for a number of reasons:

- Document N – manifestation is necessary in critical locations where people may not be aware of the presence of glazing and may collide with it. The more recent Document M now takes preference over Document N and provides guidance on the type, position and finish of manifestation.
- Document M – access to and use of buildings, which includes information on both doors and partitions (see 7.2.1).
- Privacy – privacy within meeting rooms and offices can be achieved without loss of light or change of partition design, by using all over or mid height cover.
- Identity – company logos, themes or room names can be included within film design to provide identity within the office environment.
- Blast film – designed to be used on toughened glass to eliminate glass shards being scattered following an explosion.

7.2.1 Partitions

Approved Document M details the design considerations to allow people to access and use buildings. People using the space should be in no doubt as to the location of glass doors especially when they are within a glazed partition, and there should be clear delineation between the elements. The choice of style of manifestation for the door and the glazed partition can help to differentiate between them.
Glass doors and partitions will satisfy the requirements providing:

- They are clearly defined with manifestation on the glass at two levels taken from the floor, 850mm to 1000mm and 1400mm to 1600mm, contrasting visually with the background seen through the glass (both inside and outside) in all lighting conditions (see drawing below). Note: any manifestation or all over cover to doors should take into account the requirements for minimum zones of visibility (see figures 36 and 37).
- Manifestation takes the form of a logo or sign at least 150mm high (repeated if on a glazed partition), or a decorative feature such as broken lines or continuous bands at least 50mm high (see figure 38).

Note: where there appears to be a conflict between the guidance in Part M and Part N - Part M takes precedence.

7.2.2 Manifestation application method

Installation of manifestations should be carried out at the end of the project, when the site is clean and dust free. Glass should be cleaned thoroughly prior to application, taking care not to scratch the glass.

Glass is marked with a level line on the opposite side of the glass with a spirit level, chalk line or laser level, to ensure that the manifestation is straight and level once applied.

Clean water and application solution are then used to apply the manifestation to the glass, taking care not to wet any carpeting. The manifestation should not overlap silicone joints or edges of glass.

Once the graphics are dry and finished, any water marks should be cleaned off. Graphics should not then be cleaned again for 30 days.

Visual inspection of graphics should be carried out from the side that the manifestation has been applied, from a distance of two metres.

Figure 36

Figure 37

Figure 38
7.3 Blinds

Venetian blinds are a popular component used with glazed partitioning. They are mainly used between the glass panels in double glazed elevations, but are also used with offset glazing where space permits. Blinds are supplied in 15mm or 25mm widths and are available either plain or perforated aluminium in a wide range of colours. When choosing a blind, the size of the toprail in relation to the double or offset glazed opening should be considered to ensure that the blind has space to be fitted and be operable.

The blind length can be made to order so that when the blind is fitted and opened, there is no bunching at the bottom. Hold down clips are available to hold the bottom of the blind in place to avoid any twist movement. In double glazed elevations it is not possible to operate the rise and fall mechanism on the blind, but the opening or closing of blinds can be remotely controlled, or the popular method is by way of a control knob which is fixed to the adjacent partition mullion. A cable fixed to the blind is fed through the partitioning framework to the control knob.

On monobloc systems the blind will be installed in the manufacturing process and arrive to site enclosed in the glazed unit.

7.4 Doors

Doors are an integral part of a partition system and are the one element that users interact with daily. It is important that doors are coordinated with the partition manufacturer, especially where sound and fire performance is required. Many partition manufacturers also manufacture doors, so are able to supply doors in structural openings as part of a coordinated interior.

Doors that are used in the interiors sector include veneer, laminate, continuous pressure laminate, paint grade, steel or glass (as described in 7.4.4). A range of standard widths are available, however, manufacturers will produce bespoke sizes on request. Conventional door height sizes are produced as standard as are some full partition height doors but doors with an overpanel are generally made to order. Care should be taken when ordering doors with particular handing. Figure 36 explains the descriptive methods to be used.

It is important that gaps between the door and the door frame are consistent. Best practice would be for a 3mm gap at the top and sides of the door and 3 to 5mm at the bottom of the door depending on the type and thickness of the floorcovering and the underlying level of the floor. BS 1245 offers guidance on the installation of doors.

Timber doors generally tend to be 35mm or 44mm thick for cellular hollow core doors and 44mm and 54mm for solid core doors.

Ideally, all doors should be delivered to site immediately prior to their installation and any packaging material left on the door for as long as possible to avoid any site damage. Timber doors should be handled and stored as detailed in BS Code of Practice CP151 (Wooden doors clause 501 - storage and protection).

Timber door manufacturers and fabricators, as part of their environmental policy, should operate a chain of custody procedure on the timber used in their operation. This involves a commitment to purchase all timber and wood based products from sources that are committed to supply material which originates from sources which offer either FSC or PEFC chain of custody or complies with the FSC standard for non FSC certified controlled wood. Clear specification as to whether FSC / PEFC material made doors are required on each project should be made and users need to vet their suppliers to ensure that they conform to the chain of custody standards.

Glazed vision panels of varying shapes and types can be included in the door specification. This includes matching...
hardwood beads, flush hardwood beads, stainless steel or painted steel. Options of product to meet 30(FD30) and 60(FD60) minute fire resistance are available factory made and whilst some vision panels can be cut and created on site, best practice for FD30 or FD60 doors is for the vision panels to be manufactured off site using the specified intumescent material and the correct quality timber and appropriate glass.

Approved Document Part M of the Building Regulations 2004 (Access to and use of buildings) and BS 8300 (2009) (Design of buildings and their approaches to meet the needs of disabled people) set out the positioning of vision panels and clear opening widths to meet these requirements (see figures 36, 37, 38 and table 1).

### 7.4.1 Veneered doors

Veneered doors are produced with a solid or hollow core, faced with a natural wood veneer and are generally not sold as matched sets as variations in grain features and/or colour shading can be expected. If matching veneers are required then it should be made absolutely clear from the outset of the partitioning contract.

Natural wood veneers should not be exposed to direct sunlight as fading may occur. Storage should be flat and supported off the ground by a minimum of three bearers and in a dry ventilated area, with conditions as close as possible to those expected in final use.

Most doors are supplied with 6mm thick concealed edge lippings to long edges only. Material used for the lippings should compliment the veneer facing but may not always be the same timber species as the face veneer. Similarly, if
standard width doors need to be cut down to a smaller width, an exposed lipping can be applied and used to the hinge side, leaving the opposite side with its standard concealed lipping.

Veneered doors are supplied to site either fully finished, with generally three coats of lacquer on the door faces and edges, so if the door is cut down at its edges on site, rescaling needs to be undertaken. However some doors may only be lacquered on the door faces, in which case lacquering of edges needs to be undertaken. It is important that contractors ascertain from their door supplier the finish of the door prior to contract commencement.

7.4.2 Laminate doors
Laminate doors are available in two types, CPL (continuous pressure laminate) and HPL (high pressure laminate).

1 CPL doors: have an approximate 0.5mm laminate face finish, in a range of veneer types, and provide a durable easy to clean product which has consistent colour and uniformity of grain. Not only are they an economical solution, but are unaffected by sunlight, eliminating fading or shading.

2 HPL doors: are generally bespoke made, providing a specific laminate of approximate 1.5mm thickness, typically from the Formica / Polyrey range, to both faces of solid core doors.

7.4.3 Paint grade doors
Paint grade doors have a solid or hollow core, generally with a plywood, MDF or low grade hardwood veneered face. It is advisable to coat the doors with a primer immediately after receipt on site, with further coats applied as soon as possible afterwards.

7.4.4 Glass doors
Single glazed doors are generally of either 10mm or 12mm toughened glass, and can be achieved in a variety of ways typically which will be with an aluminium or timber frame or frameless within frameless glazed systems. Frameless doors can be installed on either a floor spring (in the case of a raised access a coffer box needs to be installed) floor or free swing floor pivot or using a variety of glass door hinges. Installation can be carried out under a fixed glazing head or a deflection head. In each case a concealed fitted bar will support the top pivot pin. Back to back pull handles or latch lock lever handles can be used although long pull handles are strongly recommended for full height doors. As glass doors will always be manufactured square, any plumb deviation in the floor to ceiling dimension should be addressed prior to the installation of the frameless glass door. Also the gap between the frameless glass door and the adjacent glass panel, frame or ceiling should be consistent and parallel.

Double glazed doors can be either framed in aluminium or virtually frameless with generally 6 or 8mm glass skins being structurally bonded to a hidden aluminium perimeter frame. The leaves can be fitted on offset pivots and can be mounted on either a floor spring with pull handles or latch and lever handles on a free swing pivot.

Sliding glass doors can be incorporated into many glazed partition systems and are available in three popular types:

1 Sliding doors are made up of a 10mm or 12mm toughened glass leaf acting on carriages within a robust head track with a guide fitted to the floor. Doors up to 3000mm in height can be installed this way whilst still satisfying the opening apertures required within Part M. Locking can be achieved by the use of locking pull handles or integral locks on certain seal enhancing doors.

2 Using a similar robust head track that positions the carriages in a central position, allows a 12mm glass leaf to slide into the cavity of the adjoining double glazed system. The cavity is sealed to optimise acoustic performance and to reduce the ingress of dust.

3 Sliding doors that hang off a tubular track which is fixed to the surrounding glass above the door opening. The hanging mechanism is a roller, designed to fit snugly over the tubular track, and is fixed to the glass door leaf. A stop end is fitted on the tube and at floor level a guide and stop end is fitted to correspond. Some systems can
Partitioning system ancillaries

offer an acoustic brush seal for fitting to the edge of the door leaf (see figure 39).

Fixing mechanisms to glass is a very specialist operation and should always be undertaken by the manufacturer or suitably trained operatives, using the correct tools.

7.4.5 Steel doors
Steel doors are available from the manufacturer either plain or with vision panels and or mesh panels.

7.4.6 Door furniture / ironmongery
BS 8300 and Approved Document M include a number of ‘preferred dimensions and fixing heights’ for door furniture.

HINGES
Fixing height: doors with three hinges should have one centred 250mm up from the bottom of the door, one centred 250mm down from the top of the door and the third centred 450mm down from the top (see figure 40).

LEVER HANDLES AND LOCKS
Fixing height: lever handle to be between 900mm and 1000mm above the finished floor level, 1000mm is preferred.
Dimensions: not less than 19mm diameter if round section. Not less than 45mm clearance from the rear of the handle to face of door. Not less than 54mm backset from the leading edge of the door. Not less than 72mm centres from the lever handle to key turn.

INDICATOR BOLTS AND TURNS
Fixing height: between 900mm and 1000mm above the finished floor level.
Dimensions: the operating bar of the inside turn should be not less than 45mm long.

SIGNS AND SYMBOLS
Fixing height: 1800mm above the finished floor level except on wheelchair accessible facilities where 1500mm would be more suitable.
Dimensions: symbols should not be less than 70mm high. Kicking plates should not be less than 150mm in height.

7.4.7 Door closers
Door closers are used in buildings to self close doors mainly for reasons of security, privacy, acoustics, fire resistance, energy conservation and hygiene. There are essentially three types of closers used; overhead closers, frame concealed closers and floor springs. Closers come in two distinct types, uncontrolled and controlled.

Overhead closers are generally fixed to the top of the door, or inside the top of the door (concealed closer) providing the door is a minimum of 45mm thick. Occasionally the closer is fixed to the frame. An arm assembly carries the power of the closer to either the door or frame, depending on where the closer is fitted. The arm is usually jointed, but for some closer types, it is straight and one end slides in a channel. There are numerous types of the popular overhead closer – rack and pinion, asymmetrical rack and pinion, cam action, cam and roller, latch action, delayed action and backcheck which cannot be flung open violently. Close working with manufacturers and ironmongers to provide exactly what the client requires is absolutely vital.

Frame concealed closers are designed to fit into the door from the hinge side. They are attached to a bracket on the frame by rod linkages.

Floor springs are designed to be housed in a rectangular box which is embedded in the floor with only the top floor plate being visible, in the form of a box which contains the mechanism. Floor springs are attached to the door by accessories called ‘bottom straps’ and ‘top centres’. The spindle on the floor spring is positioned vertically below the pivot pin of the top centre.

Uncontrolled closers are the most simply operated door closers and will have little speed control, although some will have a form of hydraulic damping. Usually these are not adjustable and can easily be overridden by hand or variation in air pressure. Helical spring and chain link are typical examples.

Controlled closers usually incorporate a hydraulic system, where oil flows through a valve that can be adjusted to control the closing speed of the door. BS EN 1154 is the standard across Europe for controlled door closing devices.
of fire performance as detailed in UK Building Regulations*, the minimum of which is Class 3 when tested to BS 476 part 7. Many wallcoverings will perform at higher levels up to Class 0 when tested to BS 476 parts 6 & 7, and this will be needed in many areas of a building. Please refer to manufacturers when choosing wallcoverings that require fire resisting properties.

Wallcoverings are broadly split into the following types:

1. **Paper backed wallcovering**: offer all the benefits of colour and design but are manufactured for low traffic areas where high durability is not a requirement. Available in widths up to 1300mm, it is ideal for use with the traditional 1200mm partition module width.

2. **Fabric backed wallcoverings**: provide exceptional wear and tear performance, making them suitable for high traffic areas such as corridors and stairwells. This range is available in up to 1300mm widths and uses either a cotton scrim or non-woven backer to give added strength, and is suitable for heavier weight and deep embossed products.

3. **Write on and wipe off wallcovering**: which can be used in a whole wallcovering or either horizontal or vertically hung to allow for optimum writing/projection area as required. Also available with magnetic properties these wallcoverings help create very functional offices and training rooms.

4. **Protective and decorative performance wallcovering**: developed for high traffic areas in hospitals, care homes, schools, hotels and other installations where durability, cleanliness and hygiene are the key requirements. The product also has antifungal and antibacterial properties together with a dirt repellent coating.

5. **Digital printed wallcoverings**: provide clients with an opportunity to deliver very high impact visual messages. Finished print design, tailored to meet specific needs can be accommodated on most wallcovering types.

6. **Flexible vinyl film**: designed to be applied to hard, non-porous surfaces, acts like a laminate providing a highly durable, hard wearing and easily maintained decorative surface.

7. **Luxury wallcoverings**: manufactured using textiles, natural woven grasspapers, metal leaf, glass beads and luxurious fabrics provide an excellent choice for the discerning client.

8. **Environmental wallcoverings**: that can contain up to 30% recycled waste materials, provide a sustainable choice option.

*The fire rating system is set to change in July 2013, with the advent of the Construction Products Regulations. The UK Building Regulations will transfer to a new system where fire performance is measured using European test methods. The new levels required, Classes B, C, or D, are to be published in the Building Regulations to cross reference to the appropriate current Classes 0, 1, & 3.

### 7.5.1 Application method

#### PREPARING WALLS

- **Uncoated absorbent surfaces**: such as plaster, plasterboard, timber sheet material such as MDF or chipboard require one coat of primer, diluted as appropriate with water and allowed to dry fully.
- **Coated absorbent surfaces**: matt emulsion should be sanded down to provide a key and then coated with one coat of manufacturers recommended primer and allow to fully dry. Multiple coats of emulsion may impair the
surface porosity and affect adhesion. A meths test should be carried out to determine the type and number of surface coatings. If in doubt, contact the wallcovering manufacturer. If oil based paint forms part of the previously painted system, apply one coat of a proprietary brand oil based alkali resisting primer. Allow 48 hours to fully dry following the relevant COSH regulations then treat the surface as non absorbent.

• **Uncoated and coated non absorbent surfaces:** metal, laminate surfaces glass fibre, oil based paints, plasterboard coatings (drywall sealers, topcoat etc) – rub down the surface to provide a key. Metal surfaces should be primed as appropriate to the type of metal. If necessary contact the paint supplier for advice on metal primers.

**PRIMERS AND ADHESIVES**
Manufacturers always recommend the use of a primer or sizing agent as part of the preparation process and adhesive system as it aids adhesion and gives slip and manoeuvrability to the hanging process. Wallcovering adhesives are available in light, standard (medium), heavy, and strippable adhesive. All are water based, high solids, low moisture content, blend of starch, PVA and fillers, which allows the dry stripping of fabric backed vinyls from absorbent plasterboards, drylining or partitions, without causing undue damage to the face of the plasterboard substrate.

**HANGING WALLCOVERING**
Best practice measures to be followed when hanging wallcoverings include:

• All wallcoverings should be handled with care, to avoid damaging pre-trimmed edges, especially materials that are designed to be butt jointed. Never store the rolls on their ends.
• When hanging the first drop, a plumb line or spirit level should be used to ensure that it is plumb and straight.
• Appropriate adhesive should be applied to the wall by roller. A paintbrush should be used to cut in at skirting and ceiling levels and for intricate corners/light switches etc.
• Plain wallcoverings will often require reverse hanging, this is where drops are hung in alternate direction ie roll up, roll down. This is to avoid possible contrast in shade variation across the roll.
• A plastic spatula, pure bristle smoothing brush or a felt roller should be used to smooth out any air bubbles and to form a good bond with the adhesive.
• Checks for shading should be carried out throughout installation and a minimum gap of 15 minutes left before trimming at the top and bottom of the drop with a steel or plastic straight edge.
• Only full width material should be used. Cutting narrow widths above doors and window frames should be avoided.
• Contract width wallcoverings have a salvage running along the edge of the material, which is removed by overlapping and trimming. Pins should be placed at the top, middle and bottom of the first drop, 50mm in from the right hand edge. The left hand edge of drop two simply slides to the edges of the three pins on the first drop. This ensures that the drops are parallel to each other and that a 50mm overlap is achieved. Then trim straight through the centre of the overlap with a sharp knife and a straight edge.

Internal corners are best cut with a sharp knife and a spatula allowing a return of 2mm around the corner (this is often the depth of the spatula).
• A seam roller should be used to dress the joints, but care should be taken not to overwork the joints. On vinyls a soft foam roller should be used, for textiles a hard seam roller in conjunction with a clean piece of waste material placed face to face on the wallcovering.

**7.6 Deflection head details**

Deflection head details are designed to accommodate movement in the structural slab when live loads are applied during the occupation of a building. This is expressed as a + or – figure in mm.

Typically this figure would be ±25mm, but can be between ±15mm and ±40mm. The structural engineer will calculate that the structural component may move up or down by 25mm during the loading out or unloading of the floor. In practice, this figure will refer to the maximum designed deflection, and that will be at the centre of the unsupported component.

Some suspended ceilings are suspended by wire which will absorb some of the movement and may possibly negate the need for a deflection head detail.

When installing frameless glazed systems, the deflection head will alter the appearance of the head detail and may preclude the use of full height frameless doors.

Deflection head details have been introduced for many partitioning systems, and this issue is an important consideration on any new build or refurbishment contract.
Always check with manufacturers as to what individual systems can achieve.

At present the most widely used systems with a lot of deflection head detailing are glazing and drywall.

**7.6.1 Glazing system**
To construct a deflection head detail involves the use of two sections at the head of the partition. The upper one fixed to the soffit in the normal way, and a lower section, housing the top of the glass, which either slides inside or outside the upper section depending on the system design. The sections are designed to allow sufficient space for the lower section to move upwards or downwards to the designed deflection level, securing the glass at all times (see figures 41 and 42).

Appropriate steps need to be taken when installing at abutments to ensure that the upper section can deflect through the abutment if necessary. Notching of the upper and lower sections will be required at three way junctions to allow the sections and glass to pass through. The lower deflection head section will need to be joined at all junctions, using an appropriate splice plate.

Some manufacturers offer a factory produced notching facility which saves on site time, others need to train their nominated contractors to undertake this really important task correctly. This facility is offered by manufacturers for both single and double glazed systems (see figure 43).

**7.6.2 Stud and board drywall systems**
Plasterboard manufacturers offer a range of deflection head solutions that can provide ±25mm movement and 15mm to 50mm downward movement together with fire resistance of 60 to 120 minutes.

In principle the systems use a 50mm fixing strap between two layers of plasterboard into which the uppermost fixing should be made, being careful to ensure that it does not fix into the system head track.
7.7 Fire barriers

Fire barriers can be used to maintain the line of compartmentation but must be a proprietary and certified fire barrier equal to or greater than the performance of the partition, i.e. 30/30 or 60/60.

It is important that fire barriers are installed in strict accordance with the manufacturer’s installation instructions, including the stitching / fastening together of blanket joints and use of secure fixings to the soffit and head of the partition.

Any penetrations should be made good with proprietary fire stopping systems to ensure the fire resistance performance of the cavity barrier is maintained.

See ‘ASFP Red Book – Fire stopping: Linear joint seals, penetration seals and small cavity barriers, third edition’ for detailed descriptions and methodology. This can be downloaded from www.asfp.org.uk.
Contracting support administration

8.1 Sustainability

All construction projects over a certain value will have a sustainability / carbon footprint agenda which will have to be embraced by all specialist contractors to share in the process.

As a best practice principle, all specialist contractors should have an ongoing carbon footprint reduction program, which can then become applicable on all projects.

This will include the disposal of all materials from the strip out, and offcuts from the installation. Fortunately the main components used in partitioning systems are aluminium, steel, glass, plasterboard and gypsum fibre boards, all of which have a recycling process to avoid landfill.

Aluminium, steel and toughened glass can be recycled many times over at end of life. Aluminium is particularly good as it requires comparatively low temperatures to turn into a raw product that can be recycled numerous times without degradation.

Gypsum fibre board and plasterboard manufacturers have schemes for recycling off cuts back into the manufacturing process, and recycling used plasterboards.

Materials may be selected, ideally from manufacturers with BES 6001 accreditation, to comply with systems that are designed to measure the environmental impact of the fit out such as BREEAM, LEED or Ska (see page 50).

An online learning detailing methods of designing out plasterboard waste is shortly to be published to cover this subject in more detail. Visit [www.wrap.org.uk](http://www.wrap.org.uk).

Other considerations to limit any environmental impact would be to design out waste prior to the project commencement. Typically this could involve actions such as:

- Steel or timber stud lengths manufactured to exact sizes avoiding any site off-cuts
- Plasterboard being produced to bespoke length to cut down on any offcuts (certain volumes would be required by the manufacturers to achieve this)
- Using standard partitioning components and module sizes, to avoid any extra site waste or any special manufacturing
- Stringent site management to limit any site damage
- Using a one stop shop supplier to limit the carbon footprint on delivery vehicles

8.2 Operation and maintenance (O&M) manuals

It is good practice, when work has been completed, to obtain signatures from the main contractor on a completion handover certificate, to avoid later disputes on any damage to the partitioning caused subsequently by others.

If required by the terms of engagement, the specialist contractor must provide, either in paper form or more commonly on computer files, information relevant to the installation that has been carried out.

This typically includes:

- Name of the manufacturer of the proprietary systems and / or components
- Type of partition and / or other systems, construction and finish, including working drawings, source for obtaining replacements and any other relevant information
- ‘As built’ drawings if required
- Manufacturers’ product information, including source of replacement material, and advice on maintenance, repair and disposal of materials for recycling at end of life
- Acoustic and fire test performance details
- Details of any special elements to the project
- Details of special characteristics, eg security glazing
- Details of access panels, type and catalogue numbers of appropriate keys
- In the case of moveable walls, clear instructions on how to unlock panels and guide them into the hold area. On larger projects a panel numbering system to ease the process of sliding the panels both in and out
- Relevant COSHH data

MAINTENANCE

- Advice on cleaning, including details of surface finishes, types and availability, and special polishes, detergents or cleaning agents that may be required
- Advice on removal and replacement of trims and skirtings
- Guidance on measures required to maintain fire integrity, particularly as they relate to seals and spread of flame of finishing materials
- Recommendations for attaching fixtures and fittings with details of any special requirements
- Advice on dismantling and re-assembling relocatable partitions and where appropriate, how to reseal the partitions at joints, perimeter junctions, abutments and surface penetrations to maintain integrity of performance

The O&M manual is left with the main contractor who in turn makes it available to the client.
8.3 Health and safety

To conform to the Health & Safety at Work Act 1974 the specialist contractor and main contractor must provide a method statement and risk assessment of the work that has to be undertaken on each project. All members of the construction team have a duty of care to their site colleagues. Working to agreed programmes and to formalised method statements can contribute to site safety. Identifying hazards and assessing potential risks should cover the working environment, the work to be done, the tools and equipment to be used and the materials to be installed.

Guidance can be sought from the ‘AIS Health & Safety Handbook’ and also the ‘AIS Site Guide for Partitions’, which has particular reference to working at height.
BREEAM
BREEAM is an environmental assessment method and rating system for buildings. Launched in 1990, it sets the standard for best practice in sustainable building design, construction and operation and has become one of the most comprehensive and widely recognised measures of a building's environmental performance.

A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. They include aspects related to energy and water use, the internal environment (health and wellbeing), pollution, transport, materials, waste, ecology and management processes.

LEED
Leadership in Energy and Environmental Design (LEED) is a third party certification program for buildings. It is a nationally accepted organisation for design, operation and construction of high performance green buildings. This ensures the buildings are environmentally compatible, provide a healthy work environment and are profitable.

LEED New Construction buildings are awarded points for sustainability for things like energy efficient lighting, low flow plumbing fixtures and collection of water. Recycled construction materials and energy efficient appliances also impact the point rating system.

Ska
Lead and owned by the Royal Institution of Chartered Surveyors (RICS) the Ska Rating is an assessment method, benchmark and standard for non-domestic fit outs. It helps landlords and tenants assess fit out projects against a set of sustainability good practice criteria.

Ska Offices is used on fit out projects large and small, both refurbishment and new build, and it scores environmental good practice irrespective of the base building. The offices scheme consists of 104 individual good practice measures covering Energy and CO₂ Emissions, Waste, Water, Materials, Pollution, Wellbeing and Transport.

Ska Rating for Retail is suitable for fit-out projects of any size in existing or new buildings and for one-off projects or multi-store roll out programmes including:

- Food retail
- Non-food retail
- Retail banks
- Restaurants.

This guidance is freely available along with an online assessment tool, which can be used informally or for formal certification using an RICS Ska Rating Accredited Assessor. Assessments can be carried out at three stages: design, handover and occupancy.

AIS is a Ska development partner.

References

www.breeam.org

www.leed.net

www.rics.org/ska
Acknowledgments

AIS would like to extend its thanks to those AIS members and other professionals and specialists who gave generously of their valuable time and expertise to make this publication possible.

About AIS

The Association of Interior Specialists (AIS) has grown over the past 50 years to become the leading trade association for the interiors fit out sector of the construction industry. AIS represents companies involved in the manufacture, supply and installation of all aspects of interior fit outs and refurbishment.

AIS members operate in retail and commercial offices, the public sector, banks and building societies, hotels and leisure, airports, hospitals, and so on. Most work nationally and an increasing number operate in Europe and beyond.

Quality and integrity lie at the heart of AIS’s philosophy - each member is expected to act with the utmost integrity, and to exercise the highest standards of business practice and workmanship. At the same time, the Association seeks to continually raise, maintain and ensure the perpetuation of standards in order to remain a source of quality membership.

AIS membership is not automatic and applicants are subject to strict vetting procedures on application, as well as ongoing vetting. In the case of contractors, this includes inspection of recent contracts to assess workmanship standards.

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First edition published January 2013
ISBN 978-0-9565341-4-9
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Published by Association of Interior Specialists

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While every care has been taken to ensure the accuracy of the details presented in this document, we regret that AIS cannot be held responsible for any errors or omissions contained herein.
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ISBN 978-0-9565341-4-9