BRITISH STANDARD

BS 5234-1: 1992

Partitions (including matching linings) —

Part 1: Code of practice for design and installation

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the General Building Codes Technical Committee (B/209) to Subcommittee B/209/5, upon which the following bodies were represented:

Aluminium Federation
Association of Building Component Manufacturers
Autoclaved Aerated Concrete Products Association
British Board of Agrément
British Precast Concrete Federation Ltd.
Building Employers' Confederation
Cold Rolled Sections Association
Department of Health
Department of the Environment (Building Research Establishment)
Department of the Environment (Property Services Agency)
Federation of Plastering and Drywall Contractors
Flat Glass Manufacturers' Association
Glass and Glazing Federation
Gypsum Products Development Association
Institution of Structural Engineers
Local Authority Organizations
Loss Prevention Council
Partitions Industry Association
Royal Institute of British Architects
Timber Research and Development Association

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Contents

Foreword

This British Standard has been prepared under the direction of the General Building Codes Technical Committee and supersedes BS 5234:1975 which is withdrawn. This edition of BS 5234 is being issued in two Parts. BS 5234-1 deals with design and siteworks, and BS 5234-2 specifies performance requirements for strength and robustness, including methods of test.

A partition is now defined as "non-loadbearing" and accordingly this adjective no longer appears in the title. Definitions of different types of partition are now given.

The recommendations given are applicable to all partitions including masonry partitions, but the standard makes no reference to specific materials and methods used in their construction. Masonry should be designed in accordance with the recommendations given in BS 5628-1, BS 5628-2 and BS 5628-3. Information on other forms of partition construction is given in BS 5268-6 and BS 8212.

Partitions have now been given grades. These relate to the level of activity in adjacent spaces and the degree of care the partition is likely to receive. Grades are defined by the strength and robustness of a sample partition when tested by the methods described in BS 5234-2. A summary of performance criteria for grades of partitions is given in Annex B.

Assessed capability. Users of this British Standard are advised to consider the desirability of quality system assessment and registration against the appropriate Part of BS 5750 by a third party certification body.

Enquiries as to the availability of third party certification schemes are forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 30, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1.1 Scope

This Part of BS 5234 gives recommendations for the design and installation of partitions. Types of partition are defined and the functions and properties of partitions to be considered are given. Recommendations for ensuring that the design is realized on site and maintained after completion are given.

Partitions are graded by their categories of duty, assessed against performance criteria when sample partitions are tested for strength and robustness by the methods given in BS 5234-2:1992. The performance requirements are for partitions complete with their surface finishes where these are part of the partition specification.

Performance requirements specific to special purpose partitions are not included. Examples of excluded properties are:

structural stability of screens;

thermal insulation to cold store partitions;

sound absorption of partitions to large auditoria;

bullet-resistance of glazed high security partitions (see BS 5051-1);

X-ray resistance of partitions (see HTM 56[1)]) [1];

all properties of patent glazing partitions (see BS 5516).

1.2 References

1.2.1 Normative references

This Part of BS 5234 incorporates, by reference, provisions from specific editions of other publications. These normative references are cited at the appropriate points in the text and the publications are listed on page 30. Subsequent amendments to, or revisions of, any of these publications apply to this Part of BS 5234 only when incorporated in it by updating or revision.

1.2.2 Informative references

This Part of BS 5234 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this Part of BS 5234 the definitions given in BS 6100 apply. Terms which are particularly relevant are reproduced together with others not in BS 6100. Illustrations of some terms, with additional information, are shown in Figure 1, Figure 2 and Figure 3.

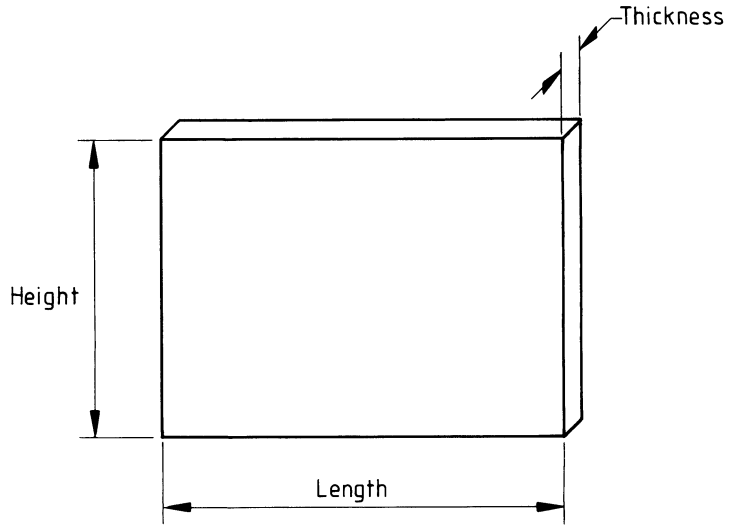
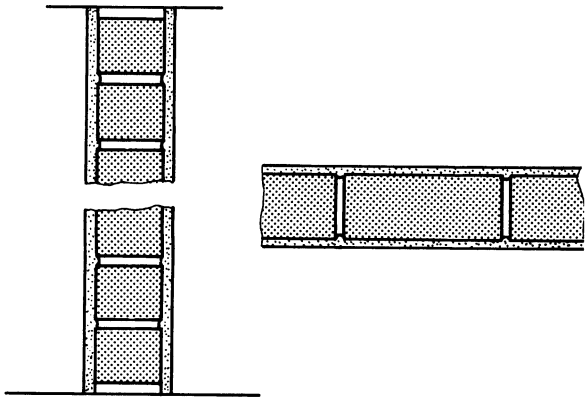


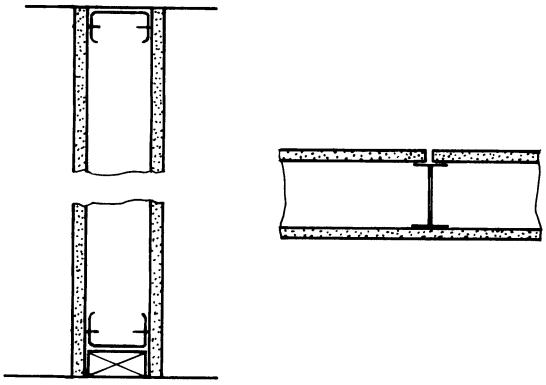
Figure 1 — Dimensional terms for partitions

[1)] Health Technical Memorandum 56, Partitions. Obtained from: HMSO, 49 High Halborn, London WC1.



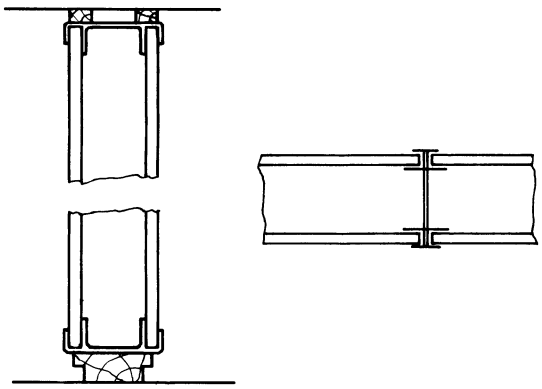
Partitions of brickwork, blockwork and concrete panels, complete with any specified surface finishes.

a) Masonry



Partitions of sheet material supported by and concealing studs and other ancillary members (noggings, floor sole plates, etc.). Stud materials include timber and steel. Sheet materials include plasterboard, chipboard, plywood, fibreboard and steel. Finishes include taped and filled joints between sheets, single coat plaster and paint.

b) Stud and sheet

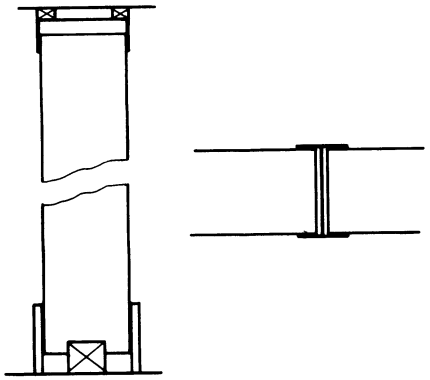


Partitions of sheet material supported by a framework and with expressed joints. The framework may provide cover to the sheet edge joints and the sections necessary to form door and glazing openings. Frame materials include extruded aluminium, timber and steel. Sheet materials include plasterboard, chipboard, plywood, fibreboard and steel. Finishes can be either site or factory applied. Joint designs vary from simple butt joints to recessed joints with integral accessory supports.

c) Frame and sheet

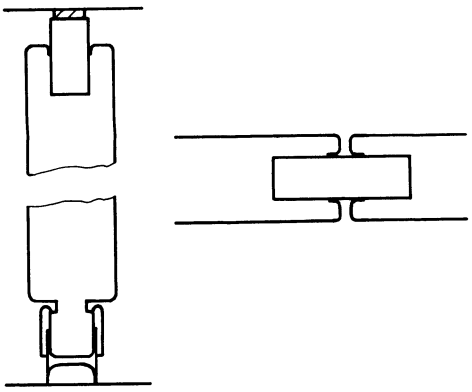
NOTE Diagrams are indicative only.

Figure 2 — Types of partition construction



d) Frame and panel

Partitions of composite panels supported by an exposed framework. Typically the panel edges are concealed by the framework. Therefore the panels may be cut to fit on site where necessary. The framework sections form door and glazing openings. Frame materials include extruded aluminium, steel and timber. Panels are usually proprietary products and include prefabricated gypsum wallboard panels, steel facings, wood wool slabs and particle boards.

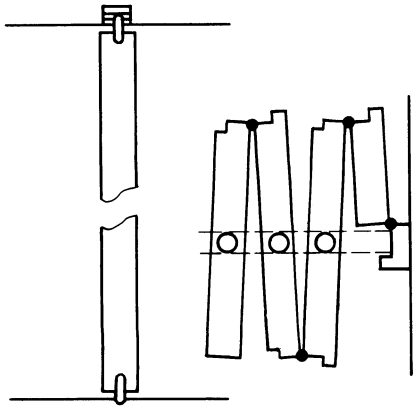


e) Panel

Partitions of prefabricated panels butted together in floor and head tracks without supporting framework. The range of panels includes glazed panels and doorsets. Generally relocatable with the loss only of such items as some perimeter fixings and sealing materials. The simplest are sandwich panels fixed together with a tongue and groove joint. Proprietary panel materials include sheet steel facings with lightweight cores. In relocatable systems, channels can normally be fixed to ceilings and on floor finishes with limited damage.

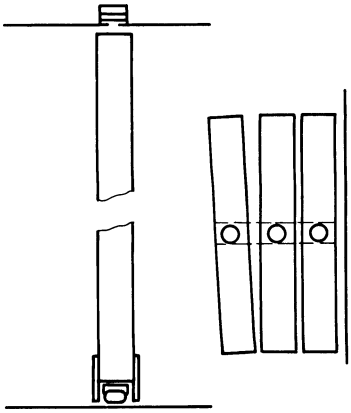
NOTE Diagrams are indicative only.

Figure 2 — Types of partition construction *(concluded)*



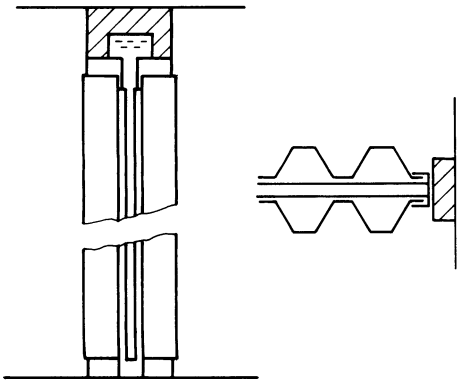
Solid panels are hinged together and run on rollers on top and/or bottom tracks. They range from lightweight non-acoustic timber to acoustically sealed systems. Track and storage configurations vary and adjacent storage space is necessary for flush stacking of panels.

a) Sliding folding partition



Independent panels are track-supported for ease of movement and lock into position with expanding seals. Panels may be top hung or floor supported, or both. Electrically operated versions are available. There is a variety of stacking configurations. Recessed storage is necessary for flush stacking of panels.

b) Tracked monoblock panel partition (single panel, centre supported)



Variable length partitions with a concealed pantograph or similar supporting mechanism and flexible or hinged panel outer facings. They are usually top hung and incorporate top and bottom 'sweep strips' to enhance their acoustic performance.

c) Tracked flexible (concertina partition)

NOTE 1 These partitions are supported and guided by ceiling and/or floor track mechanisms and can be moved by the building occupants. They should not be used where fire resistance is required.

NOTE 2 Diagrams are indicative only.

Figure 3 — Tracked, movable partitions

1.3.1
partition

internal dividing non-loadbearing vertical construction

NOTE It is incorrect to assume that there is no subjection to incidental loads, particularly lateral loads.

1.3.2
lining

dry covering to any internal building surface

1.3.3
matching lining

independent vertical lining that is similar in construction and appearance to adjacent partition(s)

1.3.4
hollow partition

partition that has usable voids throughout most of its area

1.3.5
solid partition

partition that has no usable void throughout most of its area

1.3.6
glazed partition

partition that includes transparent or translucent glass or plastics in its construction

NOTE It may be fully or partially glazed.

1.3.7
solid area partition

partition without glazing

1.3.8
monobloc panel

prefabricated partition unit, capable of being removed without affecting adjacent units

1.3.9
screen

partition that may not extend fully from floor to ceiling, sometimes self-supporting, that provides a degree of protection or privacy

1.3.10
framed partition

partition consisting of a continuously supported plane frame with facings or infillings

1.3.11
stud and sheet partition

framed partition in which the studs and other ancillary members are concealed by the facings

1.3.12
frame and sheet partition

framed partition in which the framework is exposed

1.3.13
frame and panel partition

framed partition in which the panels are supported by an exposed framework

1.3.14
panel partition

partition of rigid panels without supporting framework

1.3.15
relocatable partition

partition capable of removal and reassembly elsewhere without substantial repair other than replacement of ancillary seals and fixings

NOTE The term "demountable partition" is deprecated.

1.3.16
movable partition

partition of separate sections, that is capable of rearrangement by the occupants of a building

1.3.17
sliding and folding partition

partition of hinged leaves that can be folded away by moving them horizontally on a fixed track

1.3.18
tracked monobloc panel partition

movable monobloc panels supported and guided by track mechanism

1.3.19
tracked flexible partition

partition of variable length with flexible or hinged panel facings, supported by track mechanism

1.3.20
floating head fixing

head fixing which allows a specified amount of movement in the structure to occur without it imposing any direct loading onto the partition

1.3.21
platform floor

floor that comprises loadbearing fixed or removable panels, adjustable pedestal supports and necessary accessories, to provide an underfloor space for the housing and distribution of services

NOTE The terms "raised access floor", "modular floor", "palette floor" are deprecated.

1.4 Exchange of information

The exchange of information should be comprehensive to ensure that proper quotations can be provided and that adequate provision is made for site operations to proceed correctly. The following checklist is included for guidance and includes items that should, if appropriate, be considered:

a) contract arrangements, e.g. attendances, storage, protection, handling, removal of waste, supply of utilities, indicative lighting, setting out, programming and dates and sample requirements;

b) site, conditions and access;

c) drawings and specifications showing the extent of the work and materials of construction;

d) lengths, heights, thicknesses, centres of studs or joints (if applicable) and mass;

e) permitted tolerances and deviations;

f) deflections of surrounding structures;

g) fire resistance, surface spread of flame, closing of cavities, fire stopping;

h) sound insulation and/or sound absorption;

i) thermal insulation and water vapour control;

j) strength and wind loading;

k) tests and performance required;

l) method of fixing to structure and other elements and fixings for fittings;

m) provision for services;

n) humidity, moisture and temperature range during construction and in service;

o) biological attack;

p) finishes, integral or applied;

q) doors and glazing, integral or allowance for;

r) detail and trim;

s) special requirements, e.g. security screens, radiation resistance;

t) maintenance.

1.5 Time schedule

The time schedule should show the date of commencement, the sequence of work, the rate of erection and the date of completion. It should provide for the completion of the works of preceding trades prior to commencement on site of the partition contractor.

NOTE The erection of partitions, apart from masonry partitions, is often one of the last operations before a building is occupied, and unless carefully controlled, previous trades can intrude into the programme time allotted for partitioning. In order to meet a handing over date, it is advised that pressure should not be applied to the partition erector to start work before the building is ready and weather-tight unless the partition is designed for unprotected conditions. Hasty construction can waste much of the effort that has been put into a partition's design and development to achieve the designed performance.

The time schedule should be carefully planned to avoid the risk of serious damage to the partition by subsequent work and to avoid last-minute alterations in the sequence of operations. If permanent decoration is delayed, the surfaces should be given an appropriate protective treatment.

The programme should be arranged to ensure that prefinished partitions are installed as late as possible and adequate provision made for protection.

Allowance should be made in the time schedule for decorators' preparatory work which may become necessary if finished surfaces are likely to be subjected to adverse atmospheric conditions or damage by other trades, this being particularly relevant when surfaces are unfinished for a protracted period of time.

The time schedule should allow for the necessary curing or drying out times of:

a) screeds and other wet construction in the vicinity of dry partitioning prior to its erection;

NOTE It is advised that drying be continued until any water vapour generated is unlikely to cause moisture movement problems, such as warping of panels and jamming of door leaves.

b) masonry partitions prior to the application of finishes;

c) wet surface finishes, e.g. plaster, prior to decoration;

d) any "wet" joint system used prior to decoration;

e) decorative finishes on all types of partitioning.

NOTE Allowing adequate drying times is particularly important during the winter as the drying and hardening of many materials depend upon atmospheric conditions.

Where services are to be installed within partitions, time should be allowed in the schedule for their installation, testing and acceptance.

Section 2. Design

2.1 Function

The function of partitions is the horizontal subdivision of internal space within a building in conjunction with other elements of construction. This is to provide separation, a degree of privacy, and protection for the building's occupants and to support some of its contents. These and other attributes of a partition often conflict with one another. Table 1 gives primary functions of a partition that should be considered and reference should also be made to the checklist given in Annex A.

Table 1 — Primary functions and properties of a partition

Function or property	Points to be considered
Separation	Partition layout, fixed, relocatable or movable
Access	Location and types of doors and hardware, hatches, etc., movable partition
Strength and stiffness	Ability to support fixtures, e.g. cupboards, basins, services, etc. Resistance to impacts from objects, door slamming and occupants Strength of the fixings to the supporting structure Resistance to wind pressure
Fire protection	Regulations for fire resistance, surface spread of flame and smoke control
Acoustics	Sound insulation in conjunction with other elements Sound absorption
Visibility, privacy and lighting	Arrangement and type of glazing. Borrowed light
Hygrothermal separation	Thermal resistance Reduced air movement through joints, access panels, etc. Water vapour control Within partitions or surface mounted
Distribution of services	Selection of materials. Frequency and ease of maintenance/repair
Durability	Colour and texture
Appearance	

It should be noted also that the partition system may need to be modified to provide linings to the internal face of the external wall, or to form the linings of service ducts and enclosures for structural members.

2.2 Compatibility with adjoining elements

2.2.1 General

The building designer should discuss and provide details of boundary conditions to the partition supplier to ensure compatibility.

In order that the required performance of the system may be realized in practice, the adjoining structures and junctions should have at least equivalent fire protective and sound insulation performance. Equally the installation of a partition should not reduce the fire protection and sound insulation of existing structures.

2.2.2 Floors and beams

The floor should be capable of taking the dead and imposed loads of the partition system without undue deflection.

Where the deflection requirements of the floor are considered unusual or excessive, the partition supplier should be advised to ensure that the partition system can accommodate such movements (see **2.4.2**).

The fixing of services and other surface connections, e.g. suspended ceilings, should be designed to take into account the movement of the floor.

On platform floors, partitions should be located at the positions and within the maximum loading recommended by the supplier of the floor system; otherwise, additional supports may be required.

When a partition that is to provide sound insulation is to be erected on a platform floor, consideration should be given to the sound insulation characteristics of the platform floor; if lower than those of the partition, it may be necessary to install a sound insulating barrier in the floor void.

2.2.3 Walls and columns

Adjoining wall structures should be able to provide adequate support and bracing for the partition, afford adequate provision for fixings and permit suitable freedom in their location. The designer should anticipate any difficulties and provide solutions which may include predetermined fixing points. Alternatively, the partition supplier should be asked to provide suitable methods of fixing.

2.2.4 Soffits and other structural ceilings

Structural soffits of floors or roofs should be used to provide anchorage, or where necessary additional support at the head of the partition should be used to provide the required stability.

2.2.5 Suspended ceilings

It should be noted that the fixing of partitions to the underside of a suspended ceiling may require special provisions in the ceiling construction, or predetermined fixing supports placed above the suspended ceiling. Care should be taken to ensure that the head fixing does not impair the stability performance of the partition or ceiling (see also **2.4.3**).

Care should be exercised by the specifier of any partition, whether fixed or relocatable, which is attached to a suspended ceiling, to ensure that it does not adversely affect any aspect of the fire protection performance of that ceiling.

NOTE Exposed grid ceilings, which may rely on local deformation of the main suspension members to allow for local expansion, are particularly vulnerable in this respect.

Care should be exercised particularly in the case of relocatable partitions, which may be fixed or refixed at any position relative to the ceiling construction after general construction has been completed.

Where relocatable partitions are used, consideration should be given to a means of protecting the surface of the ceiling from being marked by seals, etc., otherwise the ceiling may be irretrievably disfigured or damaged.

Cavity barriers placed above fire-resistant partitions should be adequately fire-stopped.

When the purpose of an installed partition is to provide sound insulation, consideration should be given to the sound insulation characteristics of the ceiling. Where the sound insulation properties of the ceiling are lower than those of the partition, a barrier should, if necessary, be introduced in the void to maintain the required sound insulation.

2.2.6 Storey height door assemblies

Door assemblies should meet the appropriate performance requirement for the partition. Performance levels for doors are given in DD 171:1987.

2.2.7 Integral components

The inclusion of components in the partition, such as door assemblies, glazed areas, access hatches and access and service terminals, should not detract from the overall performance of the partition. The designer should consider supplementary tests where doubt exists, e.g. partitions which provide glazed areas often require alterations to the basic partition structure, such as the trimming of studs. Under such circumstances, a partition may be significantly weakened to reduce the performance levels previously achieved for the solid area specimen when tested for grade conformity. Selected tests may be used to substantiate performance conformity which may be applied to a specimen glazed partition sample. Tests such as stiffness and soft body impacts can be applied to the solid areas around the glazed openings, as can door slam and crowd pressure tests when appropriate.

2.3 Dimensions and setting out

2.3.1 Dimensions

A partition, by its nature, takes its height and length from the structure, which may be new or existing, into which it is built. Heights generally range between 2 300 mm and 3 600 mm but for practical purposes no upper limit exists.

NOTE It is suggested that manufacturers should state the maximum height limit of their partition systems.

The minimum heights of solid areas of partition required to provide visual privacy (based on 95 percentile male) are:

seated 1 400 mm;

standing 1 800 min.

Where modular coordination is required, the requirements of BS 6750:1986 should be followed. Partitions designed to accommodate standard doorsets should follow the coordinated dimensions given in BS 4787-1:1980.

2.3.2 Setting out

For setting out purposes, the designer should designate as an “accurate partition face” all partition faces whose positions are critical to his design and along which setting out lines are to be run.

NOTE Only one face of a partition may be designated an “accurate partition face” unless the two faces of the partition are structurally separate.

For line and plumb measurement purposes, the designer should indicate which parts of the partition face are to be included in the face plane. Probable exclusions include:

a) applied cover trim in panel construction;

b) glazing in glazed screens;

c) applied architraves and skirtings;

d) recessed mortar joints in fair-faced brick and blockwork.

Recommendations for the setting out of partitions are given in **3.5**.

Permissible deviations and tolerances for partitions are given in **3.6** and **3.7**.

Where a partition or one partition face is a matching lining, the designer should determine tolerances for each part of the construction which, when taken together, will be acceptable to him. The capacity of the matching lining to correct inaccuracies in the supporting structure should be considered.

2.4 Structural

2.4.1 Loading imposed by the partition

Partition loadings are distributed through the perimeter connections to the adjacent supporting structures. The specifier should ensure that no partition is erected which might result in loading greater than that allowed for in the design of the adjacent supporting structure (including for example, platform floors).

Where applicable, the partition manufacturer should provide information on the assembled weight of the partition.

Building structures designed in accordance with BS 6399-1:1984 should meet the following recommendations.

"When partitions are indicated on the plans their weight should be included in the dead load acting as concentrated loads in their actual positions. When the partitions are not determined on the plans, an additional imposed load on beams and floors (where these are capable of effective lateral distribution of the load) may be taken as a uniformally distributed load per square metre of not less than one-third of the weight per metre run of the finished partitions. For floors of offices the uniformally distributed load should not be less than 1.0 kN/m^2."

If these recommendations have been followed, no further calculation for floor loading should be necessary, provided that

$H \times M$ does not exceed 306,

where

H is the height of finished partition (in m);

M is the mass per square metre of finished partition (in kg/m^2).

This means that a partition of not more than 63 kg/m^2 may be installed in heights of up to 4.8 m without further calculation.

This calculation should not be used for platform floors, which may have lower loading capabilities. Reference should be made to the manufacturer or supplier of these floors.

2.4.2 Loads imposed by adjacent structure

Partitions should be designed to accommodate anticipated horizontal and vertical movement in the building, e.g. structural and hygrothermal movement.

Where a partition continues across the line of a structural movement joint consideration should be given to accommodating any movement at that point.

NOTE This may be achieved by providing a vertical movement joint capable of accommodating the same range of movement as the movement joint in the structure. Compatibility of jointing details should be considered.

NOTE Jointing details of the structure will not necessarily be suitable for the partition.

2.4.3 Structural support and functional areas

Structural support for a partition may be from structural floor to structural soffit, from structural floor to a suspended ceiling, from a platform floor to structural soffit or from a platform floor to a suspended ceiling. Where partitions are built on platform floors and/or depend on suspended ceilings for their stability, the strength of these elements should be checked.

The functional areas of a partition (see Table 1) may be less than its structural performance areas, for example, where there are suspended ceilings and/or platform floors. Consideration should be given to the effect this may have on such functions as fire resistance and sound insulation.

Figure 4 shows possible combination of structural support and extent of functional areas.

2.4.4 Wind loads and air pressure

Partitions and their fixings should be capable of resisting, with adequate safety factor and stiffness, differential pressures caused by air movement around and through the building.

The resistance to pressure differences, calculated from CP 3:Chapter V-2:1972 and BRE Digest 346:1990-8[2)] [2], for any partition structure, can be obtained by test.

[2)] Obtainable from HMSO, 49 High Holborn, London WC1 for personal callers or by post from HMSO, PO Box 276, London SW8 5DT.

For partitions not exceeding 4.2 m in height in areas where the design wind speeds do not exceed 48 m/s, the resistance to wind load may be deemed to be adequately met if the partition satisfies the crowd pressure requirements of 0.75 kN m given in **5.7** of BS 5234-2:1992.

For partitions over 4.2 m in height and/or where the wind speed is greater than 48 m/s, see Annex C.

2.4.5 Strength, robustness and grades by categories of duty

The frequency and intensity of the loads on a partition vary and it is convenient to grade them by the level of activity in adjacent spaces and the degree of care likely to be exercised by people in the area (see Table 2).

Partitions should be sufficiently robust to withstand, to varying degrees, the following conditions and may be assessed by testing a specimen partition by the methods described in BS 5234-2:1992.

a) Bending caused by people leaning on the partition or by a person standing on a ladder leaning against it (see stiffness test).

b) Impact caused by people falling against the partition (see soft body impact tests).

c) Impact caused by trolleys, wheelchairs and equipment (see hard body impact tests).

d) Door slamming caused by wind or people closing a door energetically (see door slam test).

The requirements and test methods given in BS 5234-2:1992 can be used in combination or individually to criteria set by the designer. Only requirements applicable need be tested and then only to the level of performance required.

However, for a partition to conform to a particular grade it is required to meet all the performance requirements for that grade. A summary of the attributes tested and the performance levels required for each grade is given in Annex B of this Part.

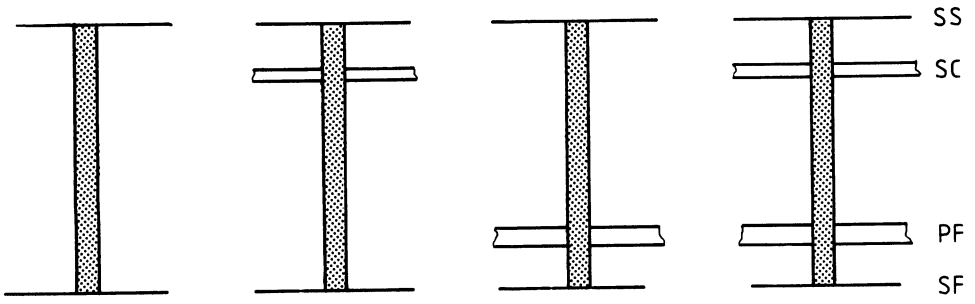
NOTE 1 These requirements and grades of partitions for strength and robustness are not intended to be applied to screens, movable partitions or tracked partitions.

NOTE 2 The methods of test given in BS 5234-2:1992 include impact tests on a right-angle junction and may be used to test the strength and robustness of other junctions, particularly where the materials and/or method of constructing the partition differ from those used in straight lengths of the partition.

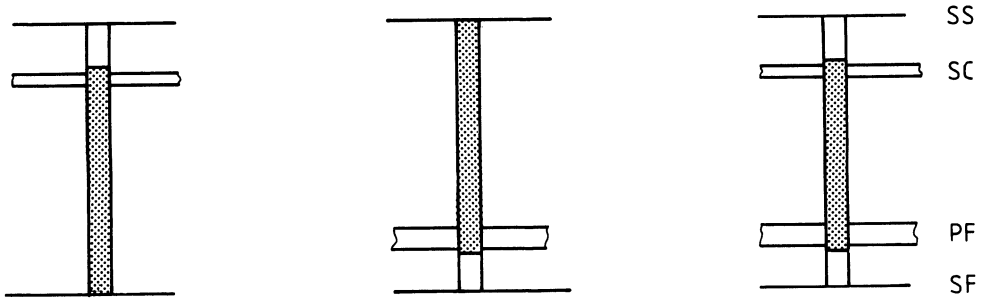
The designer should consider the performance required for each location and ensure, by reference to test reports, that the partition meets the performance specified and for the design height. Account should also be taken of the methods of fixing to adjoining structures.

Table 2 — Partition grades by categories of duty

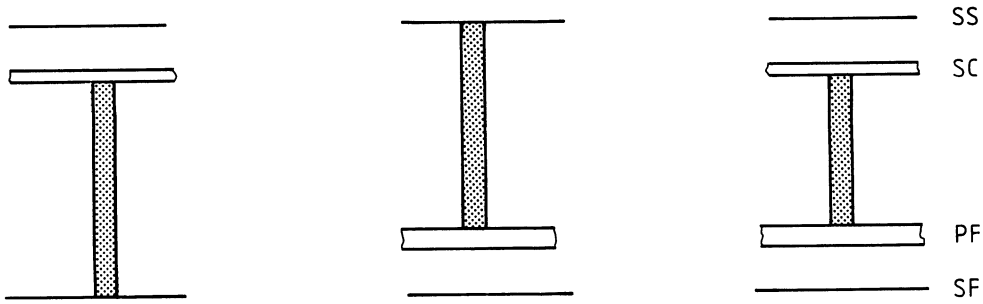
Grade	Category of duty	Examples
Light duty (LD)	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occurring or of misuse	Domestic accommodation
Medium duty (MD)	Adjacent space moderately used, primarily by persons with some incentive to exercise care. Some chance of accident occurring and of misuse	Office accommodation
Heavy duty (HD)	Adjacent space frequently used by the public and others with little incentive to exercise care. Chances of accident occurring and of misuse	Public circulation areas Industrial areas
Severe duty (SD)	Adjacent space intensively used by the public and others with little incentive to exercise care. Prone to vandalism and abnormally rough use	Major circulation areas Heavy industrial areas



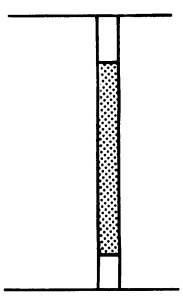
a) Structural and functional performances extend from structural floor to structural soffit (suspended ceilings and platform floors abut partition)



b) Structural performance extends from structural floor to structural soffit. Functional performance extends from just above suspended ceiling or just below platform floor.



c) Structural and functional performances do not penetrate suspended ceiling or platform floor.



Key

Structural support

Functional area

SS structural soffit
SC suspended ceiling
PF platform floor
SF structural floor

d) Structural performance extends as a), b) or c). Functional performance extends only part of this height.

Figure 4 — Structural support and extent of functional areas

2.4.6 Crowd pressure

Where a partition is liable to be subjected to the pressure of crowds, consideration should be given to a sample partition being tested as given in BS 5234-2:1992. See Annex B of this Part of this standard.

The designer should ensure, by reference to the test report, that the partition meets the performance specified and for the design height. The method of fixing the partition to the adjoining structures should also be considered.

2.4.7 Fixtures and fittings

The designer should verify that the partition in its finally selected form will be capable of carrying the fittings and their loading.

Consideration should be given to the effect of superimposed loads upon partitions required to support fixtures and fittings.

NOTE Examples of typical fittings include hand rails, bath rails for the elderly and infirm, cupboards, shelving, fire extinguishing equipment from small cylinders to large water hose reels, ceramic tiling unsupported by the floor, coat hooks/rails, meter boards, sanitary fittings and plumbing and mechanical services.

The partition system selected should be able to withstand the proposed loadings without modification or should be capable of being modified and strengthened locally. Framed and stud partitions can be strengthened by increasing the number and/or size of the studs or framing members. Metal studs can be strengthened by increasing the thickness of metal or by boxing and bracing, or by additional studs provided this does not detract from other performance requirements. Where additional strength is required it should be possible to modify the partition by inserting supplementary support members in predetermined positions.

Whenever there is a requirement for a partition to support additional loads, to establish its suitability it is recommended that a representative sample partition is tested by the methods given in BS 5234-2:1992. These are optional tests and may be used to establish the suitability of a partition to support additional loads such as the following:

a) loadings from lightweight fittings, e.g. coat hooks, small fire extinguishers, towel holders, etc., supported on single anchorages (see lightweight anchorage tests);

b) loading from heavyweight fittings, for example, lavatory basins, wall cupboards and similar fittings (see heavyweight anchorage tests).

A summary of these tests and typical loading requirements are given in Annex B of this Part.

For masonry partitions designed in accordance with BS 5628-3:1985 consideration should be given to the restraint conditions of partitions where these may be subjected to imposed loadings transmitted through fixtures and fittings. The performance of masonry partitions should not be impaired by fixings, chases and holes to accommodate surface fittings.

2.5 Fire protection

2.5.1 General

Consideration should be given to the fire protection properties of the partition, including its components and materials, to satisfy current building legislation.

Properties may include:

a) fire resistance;

b) reaction to fire properties, i.e.:

1) non-combustibility;

2) materials of limited combustibility;

3) surface spread of flame classification;

4) fire propagation indices;

c) cavity barrier requirements;

d) fire stopping requirements.

For partitions that are to form escape routes, compartment walls or protected shafts, the designer should consult all relevant Parts of BS 5588 on the provision of escape routes in buildings and their fire protection. If glazing is to be incorporated in the partitions, PD 6512-3:1987 should also be consulted.

2.5.2 Fire resistance

2.5.2.1 *General*

Where fire resistance is required, the partition should have been tested in accordance with BS 476-20:1987 and BS 476-22:1987 and have met the relevant performance requirement.

The partition tested should be a representative sample of the partition system both in materials used and the method of assembly. For partitions that incorporate doors and/or glazing, the fire resistance of the complete assembly should be tested or assessed.

NOTE 1 A door that satisfies a fire resistance requirement in a masonry partition may not provide the same fire resistance when fitted in a partition made of other materials.

NOTE 2 Where relocatable partitions are used and subsequently moved it is essential that statutory requirements for means of escape and fire resistance are not contravened.

2.5.2.2 *Glazed partitions*

Where a partition or fire rated glazed door is designed and constructed having less than 50 % of the surface area consisting of glazing, it should be tested as a partition or a doorset in accordance with clause **5** or **8** respectively of BS 476-22:1987. Where this area of glazing is exceeded, the element should be tested in accordance with clause **10** of BS 476-22:1987.

Glass has limited ability to provide fire protection. Fire-resistant glazing components should conform to the relevant Part of BS 5588, which has removed restrictions on the size of individual panes of glass, subject to satisfactory and proven test results for the proposed installation.

2.5.3 Non-combustibility

This property applies to materials tested in accordance with BS 476-4:1970. A pass in this test eliminates the need for further evaluations to any of the tests given in **2.5.4** and **2.5.5**.

2.5.4 Surface spread of flame

Statutory requirements restrict the rate at which flames may spread across walls depending on purpose group, room size and use. Internal surfaces of partition cavities are not controlled but the surface spread of flame characteristics of the material could determine the position of cavity barriers.

The materials should be tested in accordance with BS 476-7:1987. Where building legislation requires class 0 surfaces they should achieve Class 1 of BS 476-7:1987 and in addition, when tested to BS 476-6:1989, have fire propagation indices not exceeding $I = 12$ and $i_1 = 6$.

2.5.5 Heat emission

The heat emission properties of a material used in a partition may be required to be determined where the material is required to be designated "a material of limited combustibility". The material should be tested in accordance with BS 476-11:1982.

2.5.6 Cavity barriers and closures

Cavity barriers and cavity barrier closures may be required to be installed in and around cavities to resist the unseen spread of smoke and flames. Hollow partitions should incorporate cavity barriers within their construction at specified intervals, depending upon the performance classification of the boundary material. Cavity closures should be provided at the perimeters of a cavity.

Where the partition is required to provide fire resistance any voids above or below the partition, e.g. ceiling plenum or platform floor void, should be subdivided with cavity barriers in the plane of the partition. Similarly, where fire-resisting partitions abut cavity wall structures, other than those constructed in non-combustible materials, cavity barriers should be installed in the adjoining cavity to complete the integrity of the system.

Where partitions have continuous frames from structural floor to structural soffit, these may act as cavity barriers providing that they conform with the provisions of the regulations.

In situations where the partition or its frame does not extend beyond the finished floor or finished ceiling, cavity barriers should be installed and supported independently, i.e. to the structural floor, structural soffit and walls (see Figure 4).

NOTE Where there is a fire-resisting non-demountable ceiling which extends throughout the fire-protected compartment and where its properties meet the requirements of building control, relaxation may be given for the omission of cavity barriers.

Suitable cavity barrier materials and fixings are given in supporting documents to building regulations. Alternatively a structure may be tested in accordance with BS 476-22:1987.

2.5.7 Fire stopping

Fire stopping may be required to seal any imperfection of fit between fire-resisting partitions and other elements such as adjoining structure or cavity barriers, and to seal around any services which may penetrate the partition. To maintain an effective seal an adequate allowance should be made for any differential movement.

The materials should be non-combustible or designated materials of limited combustibility or should exhibit other special properties, such as intumescence.

2.5.8 Smoke control

Where there is a requirement for fire resistance, the partition should be imperforate and sealed against the passage of smoke at ambient temperatures at all boundaries, junctions, service and structural penetrations making adequate allowance for all differential movement. Further guidance can be found in BS 5588.

2.6 Acoustics

2.6.1 Sound insulation

The designer and user should consider the sound insulation of partitions in conjunction with the purpose and detailed design of the building. Advice on sound insulation in and of buildings is given in BS 8233:1987. Specific sound insulation requirements for dwellings are given in National Building Regulations. Where partitions contain glazed areas, doors, etc., both users and designers should realize that the sound insulation potential of the partition as a whole is considerably reduced unless the glazing or door acoustically matches the rest of the partition.

Multiple elements in the partition construction will have differing effects, but the net performance of the partition will largely be determined by the area having the least resistance to the transmission of sound. If good sound insulation is important, doorframes and thresholds should be provided with effective seals and glass panels should have thicker single glazing, double glazing, double windows with a wide air space and airtight seals, or acoustic laminated glasses, or a combination of these. Advice on sound insulating glazing should be sought from specialist manufacturers or acoustic consultants.

To obtain a sound insulation performance near to the potential of a partition in practice, all joints, particularly those between panels, at the perimeters and around service penetrations have to be airtight. The sealing material should be inserted through the full depth of a joint to give an efficient seal. Movable partitions including sliding and folding tracked panel and tracked flexible partitions are most difficult to seal. Flexible seals should be specified around pipes which are subject to movements.

The methods of measuring airborne sound insulation are given in BS 2750-3:1980 for laboratory tests and in BS 2750-4:1980 for field measurements. Results obtained in a laboratory will not include sound transmitted through the flanking construction and it is unlikely that laboratory results can be reproduced on site.

Measurements are made using 16 one-third octave band centre frequencies which can be expressed as a single number: the weighted sound of reduction index R_w for laboratory measurements, and weighted standardized level difference (Dn T_w) for field measurements, by the procedure given in BS 5821-1:1984. The R_w values are based on the following assumptions:

a) laboratory test results with no indirect sound transmission through flanking constructions;

b) the noise is speech and domestic office noises except for the 60 category which includes music;

c) the partition has no direct air paths and does not include areas of lower sound insulation such as a door or glazed area;

d) there is only low background noise in the rooms.

Care should be taken to ensure that, in practice, flanking transmission does not severely limit the expected performance, especially laboratory measurements which indicate a high performance standard in excess of 55 R_w.

In applications where high sound insulation is required and where other onerous conditions may apply, such as machinery noise, the lower frequency performance of the partition, as well as the need to minimize flanking paths, should be taken into account. In these circumstances the advice of an acoustic consultant is recommended.

The designer should have desirable levels of performance in mind when selecting a partition for a particular condition and environment in the building. Reference should be made to the results of laboratory and field tests that are readily available from partitioning manufacturers and in BS 8233:1987.

Suggested minimum sound insulation performance levels for privacy in some occupational conditions are given in Annex D.

2.6.2 Sound absorption of surface material

Sound-absorbent materials are used for acoustic correction of rooms and for general noise reduction by reducing the reverberation time and reverberant sound pressure level, in enclosures with sound reflective surfaces or high overall noise levels.

In general, sound absorption is applied in the form of treatment to floors, ceilings, wall and partition surfaces or by the use of acoustic screens in large open-plan offices. A heavy screen with sound absorbing surface treatment may be used as a space divider and can give about 5 dB of attenuation between closely located work stations. Where sound absorption is used to improve noise reduction in a room from a noise source outside, the improvement is limited to about 3 dB for every doubling of the total sound absorption within the room. It is unlikely that sound absorption treatment to the surface of a partition will produce a worthwhile improvement in sound insulation. Further information is given in BS 8233.

The acoustic efficiency of a sound absorbent is given by the sound absorption coefficient. Tests to determine the sound absorption coefficient of a material should be conducted in accordance with BS 3638:1987.

2.7 Visibility, privacy and lighting (glazing)

Glazed partitions should be used for borrowed light, visual contact and observation. They can also provide decoration and, if required, incorporate enhanced sound and thermal insulation.

Glass and plastics glazing sheet material of a suitable type, thickness and size should be selected to provide an appropriate degree of safety, taking into account the intended use. Types of glass are classified in BS 952-1:1978.

Consideration should be given to the safety aspects and choice of glazing, in accordance with the recommendations of **4.7** of BS 6262:1982 and whether further measures and precautions are required for particularly vulnerable areas.

"Safety glass" and "safety plastics" conforming to the requirements of BS 6206:1981 have "no breakage" or "breaks safely" characteristics and are classified A, B or C according to their impact test behaviour. They may be single panes of glass or plastics or individual panes of double glazing.

2.8 Hygrothermal performance (moisture/vapour resistance)

2.8.1 General

When in use, partitions with their structural members and finishes should be capable of withstanding specified temperatures and humidity conditions and contact with water. There should be no detrimental reactions from contact between adjacent parts of the partition system or between the partition system and its fixings or adjoining materials. The partition system should withstand hygrothermal changes within the specified limits described in Table 3 without delamination or other form of deterioration.

2.8.2 Normal conditions of use

Surfaces which are expected to encounter moisture from splashes around sinks, etc. should be protected by tiling or other suitable materials to form splash backs.

2.8.3 Humid conditions of use

Surfaces exposed intermittently to high levels of humidity, such as in bathrooms and shower rooms, should be adequately protected from humidity and moisture. The treatment should preferably extend to the ceiling height to provide a complete protective membrane. Abutting surfaces should be adequately sealed to prevent moisture penetration to concealed areas.

2.8.4 Wet conditions

Partitions should be specifically designed for use in those areas where there is a requirement for direct contact with water, either in the operation of the area or the need to wash the surface of the partition and/or the adjacent floor. Ideally, continuous surfaces of moisture-resistant material should be selected, ensuring that the perimeter joints can be sealed to provide an impervious structure.

Any skirting should be sealed to the partitions and the floor and at all other junctions.

NOTE Partitions subject to treatments such as high temperature steam cleaning are not covered by this code.

2.8.5 Water vapour control

Where there is a temperature gradient from one side of the partition to the other and where high humidity conditions prevail, a vapour control treatment should, if necessary, be incorporated or applied to the warm side of the partition.

NOTE It has been recognized that a water vapour transmission resistance of at least 15 MN s/g is acceptable. Recommendations for vapour control are given in BS 5250.

2.9 Health and resistance to biological attack

The surface of the partition should not contain material which by direct contact with the skin would be detrimental to the health, comfort or safety of users. The partition should not contain material likely to emit vapour, or material which is known to give off appreciably toxic products during combustion.

No constituent material should promote the growth of fungi, microorganisms or insects, or give off dust after the partition is erected and the finishes applied.

2.10 Thermal

2.10.1 Thermal transmittance

Thermal transmittance is not normally an important property of a partition. However, there are situations where values should be specified. Examples include:

a) linings to external walls;

b) partitions between different occupancies;

c) partitions between heated and unheated areas, e.g. adjacent to unheated corridors.

In all situations where there are large temperature variations on opposite faces consideration should be given to the possibility of metal framing members acting as a thermal bridge, thus increasing the risk of pattern staining and condensation.

Table 3 — Hygrothermal conditions

Conditions	Relative humidity	Temperature	Examples
Normal	Up to 65 %	10 °C to 25 °C	
Humid	Up to 100 %	10 °C to 25 °C	Bathrooms, showers
Wet (periodic contact with water)	100 %	10 °C to 30 °C	Laundries, communal showers, industrial processes, swimming pools

Where services are run within or through a partition, their installation should not be allowed to lower the thermal insulation required of the partition.

2.10.2 Thermal mass

It should be noted that thermal mass affects the rate of heating and cooling of the structure at the beginning and end of heating periods, the plant margin for intermittent operation of the heating system and the usefulness of internal and solar gains.

2.11 Services

Where services are run within or through a partition, their installation should not lower the performance of the partition below the level required.

NOTE Piped services within relocatable partitions are likely to restrict their relocatability.

The services designer should consult the partition manufacturer regarding the effects of the inclusions of services of a run within or through the partition. The risk of condensation on cold water pipes and conduits should be considered.

Services within or passing through a fire-resisting partition should be kept to a minimum and be fire stopped to the required rating.

NOTE Attention is also drawn to statutory requirements in respect of size and specification and to the current edition of the IEE regulations for Electrical Installations [3][3)] regarding electrical installation work.

Pipework and services generally should be tested and accepted before the partition is finally boarded up. Access should be provided for maintenance and repair. If, for any reason, it is not possible to provide access to services, pipes should be installed in unjointed lengths. Particular care is required with gas installations.

Pipes and conduits should generally be held securely in position by fixing within the cavity. The provision of fixings and chases for services in masonry partitions should conform to BS 5628-3:1985.

2.12 Finishes

2.12.1 General

Finishes may be used to enhance or change the basic characteristics of the partition. They may also be used to upgrade the surface where the integral finish may have to be improved to meet the designer's or user's requirements. Care should be taken to maintain the minimum standard of finish where this is required to meet functional or statutory requirements.

The choice of a suitable decorative finish will be influenced by a number of factors such as appearance, lighting, wearing qualities, acoustic efficiency, fire hazard and maintenance. More specific guidance on the selection and durability of the decorative finish is given in **2.12.2** to **2.12.13** and Annex E.

2.12.2 Components and their assembly

Consideration should be given to the possible variations in material characteristics and their need for jointing, plastering or other preparatory treatment to achieve a satisfactory surface. It is important to ensure that such treatments and components are fully compatible in use. The surface or the substrate may be jointless or have featured joints.

2.12.3 Moisture resistance

Adequate resistance should be provided to the action of water and solutions containing detergents, disinfectants and other liquids likely to be encountered in use in buildings.

2.12.4 Water vapour resistance

Where a finishing system incorporates water-vapour-resisting properties, care should be taken to ensure that these are not damaged by subsequent treatment.

2.12.5 Cleaning

Partitions may be subjected to cleaning routines of varying severity and frequency ranging from light washing to rigorous scrubbing of the surface. (See also **3.8**.)

NOTE Partitions that would require steam or water spraying/hosing treatments are not covered in this standard.

[3)] Available from the Institution of Electrical Engineers, Savoy Place, London WC1.

Consideration should be given to the ability of the surface to withstand the removal of wallpaper without damage. BS 6150:1982 provides advice on the preparation of surfaces to receive decoration.

2.12.6 Maintenance

Abrasions and minor impacts are inevitable and should be capable of being made good. The ease or difficulty of repairing materials in situ and matching the colour and texture should be considered.

Finishes such as paper and emulsion paint are easily damaged by adhesive materials used to fix illustrations and notices.

2.12.7 Sound correction

Surface finishes may be used in conjunction with suitable materials and furnishings to correct the reverberation time in rooms, offices and halls or in order to reduce the general noise level.

Consideration should be given to possible adverse effect of subsequent redecoration, e.g. where acoustic panels are incorporated.

2.12.8 Colours

Colours of predecorated components should be selected from the BS 4800 or other generally recognized colour range.

2.12.9 Surface appearance

Gloss finishes with a sheen can accentuate even minor surface imperfections, particularly with high intensity shallow angle lighting. Under such conditions some visual imperfections are to be expected. Matt finishes are likely to retain a more acceptable appearance. Colour selection may also be used to minimize this problem. Textured or flecked finishes have been found to be satisfactory in use and appearance.

Surface defects, scratches, undulations, texture and grain may be apparent if the surface is subjected to rigorous inspection under strong artificial lighting, or a close visual inspection is made in natural lighting.

2.12.10 Jointless finishes

Plastics sheet can be fixed with a variety of adhesives and the joints can be sealed or welded making it suitable for use in wet areas. Arrises and internal angles should be radiused to allow for the thickness of the material.

Proprietary spray-applied jointless finishes are available to provide easily cleaned, hygienic, water-resistant surfaces suitable for areas where rigorous wet cleaning methods are used for cleaning (e.g. hospital operating theatres).

2.12.11 Ceramic tiling

Where a partition is required to support large areas of wall tiling, suitable precautions should be taken to ensure that the partition is stable and rigid. Stability requirements may include the need for vertical and horizontal movement joints. Further advice is given in BS 5385-1.

2.12.12 Compatibility of finish with the environment

The designer should ensure that the chosen finish is suitable for the environmental conditions expected within the space.

2.12.13 Applied trims

Consideration should be given to the compatibility in appearance and function of trims, and to ensure that those in vulnerable positions have an enhanced resistance to damage.

2.13 Protection against mechanical damage

2.13.1 General

In high risk areas, consideration should be given to avoiding narrow corridors, tortuous circulation routes and inadequate size of door openings, which are some of the causes of damage by mobile equipment to partitions.

Consideration should be given to providing additional protection to surfaces where high wear or damage is anticipated. Such protection may then be replaced, when necessary, as part of the maintenance procedure. Examples include:

a) protection at skirting level to withstand the method of cleaning envisaged;

b) protection at exposed arrises, particularly in areas where mobile equipment is in use;

c) protection at chair-rest level, in waiting and other areas where movable chairs are likely to be placed around the walls;

d) protection along corridors used by mobile equipment, e.g. wheelchairs and trollies.

The protection required may take the form of protective finishes, buffer rails and corner guards.

Consideration should be given to the long-term availability of factory produced finishes where additional or replacement components might be required and that further protection may be required after the building has been occupied when it is known more precisely where and at what levels other damage may occur.

Protection to doorsets, their ironmongery and internal glazing should be considered in conjunction with that proposed for partitions.

2.13.2 Vandalism

Attention should be given to minimizing the effects of vandalism on partitions in public areas, by the choice of a suitable partition, the correct grade of partition (see Table 2) and the choice of glazing.

Consideration should also be given to the protective finishes in relation to cleaning and damage.

2.14 Durability

2.14.1 General

Requirements for durability vary from building to building and from one partition to another. Requirements may be related to intended use, to finance and to periods for maintenance, repair or replacement. The building owner should define the required service life of the building in the initial brief, and if different, the required service for specific partitions. The required service life of partitions should be given in years.

Where the building owner has not specified the conditions that will apply to the building or its parts the designer should record, for the client, what conditions have been assumed.

A requirement for durability may also be given when a partitioning system is ordered from a manufacturer either by a designer or by those responsible for maintenance. Again this should be given as a required service life in years and related to partition grade and building life.

2.14.2 Predictions of durability

A designer should have information on durability in order to meet the building owner's requirements and to develop a rational policy for the durability of the whole construction. Information should be obtained from various sources including:

a) experience in the use of traditional materials embodied in British Standard codes of practice, textbooks and trade association publications;

b) predictions of the service life of partition systems provided by their manufacturers. Where possible such predictions should include details of the method of assessment, the variability of test results, the assumed conditions of use, and maintenance requirements.

Further information on durability is given in BS 7543.

2.15 Maintenance and repairability

Partitions should be capable of being repaired in a way which will not adversely affect their functional performance.

Where the speed of repair is a major factor, consideration should be given to the use of a relocatable system. Additional components may then be held for repair purposes. For the selection of finishes see **2.12**.

On completion of partitioning a record of its construction should be prepared and passed to the building owner (see section 4).

Section 3. Site works

3.1 General

All relevant information given in **1.4** and **1.5** should be checked.

Consideration should be given to the site conditions (e.g. temperature and humidity conditions within the building) prior to the delivery or erection of partitions and components. Many partition systems should not be delivered or erected until all of those parts of the building have been weather sealed and appropriate temperature and humidity conditions which have been agreed are maintained. Whilst wet construction may require less onerous conditions, the same criteria as for dry construction should apply to their finishes.

Sufficient areas in proper sequence should be available to enable the partitioning work to commence and continue as part of the programme. The facility for the supply of water and electricity services in the works area should be established.

Working areas should be clean and free from obstructions and completed floors should be protected to provide safe working conditions.

3.2 Preparatory steps prior to commencing site work

Before starting to erect any partitions the following should be checked:

a) arrangements for access, distribution and storage, giving consideration to the suitability of the protection of materials;

b) site dimensions, including the alignment of structural openings, and any allowance for the deflection of floors and soffits;

c) the location of movement joints;

d) that previously installed services are satisfactory for the installation of the partition;

e) compatibility with previously installed fixtures and finishes, including the suitability of partition fixings to adjacent structure and of structural supports for heavy fixtures.

3.3 Lighting

The level and quality of lighting should be agreed and this should be provided from the commencement of the work, to facilitate the production of the required standard of finish in any area. It is essential that the intensity and angle of this lighting should be similar to that under which the final inspection will be made (see Annex E).

Consideration should be given to both the final designed natural and artificial lighting conditions.

3.4 Storage and handling

Materials should be stored and handled in accordance with relevant codes of practice and manufacturers' instructions.

Storage should be such that materials are in position where they are least likely to be damaged and as close as possible to the area of operation. The storage area should be secure.

The time that materials are stored on site prior to use should be kept to a minimum to reduce the risk of damage.

Extra care should be taken in storing and handling prefinished components to ensure that all protective materials and measures are complete and in position.

3.5 Setting out

All setting out should be from agreed reference points, maintained throughout the period of the work.

Partitions not dependent for their location on the adjacent structure should be set out to minimize the amount of sitework (e.g. cutting and scribing). The use of a setting-out grid is recommended. It may be more convenient to divide large layouts into smaller areas, each with its own setting-out grid. Partition runs between different areas may then have to be set back to avoid any misalignment. This should be agreed with the designer. Possible solutions are shown in Figure 5.

The alignment of partitions with columns and wall returns requires consideration. If the columns or wall returns are in line and plumb, then one side of the partition may be set out on the same line. If not, the partitions should be set back or positioned to avoid columns completely, this being the preferred method of accommodating building tolerances.

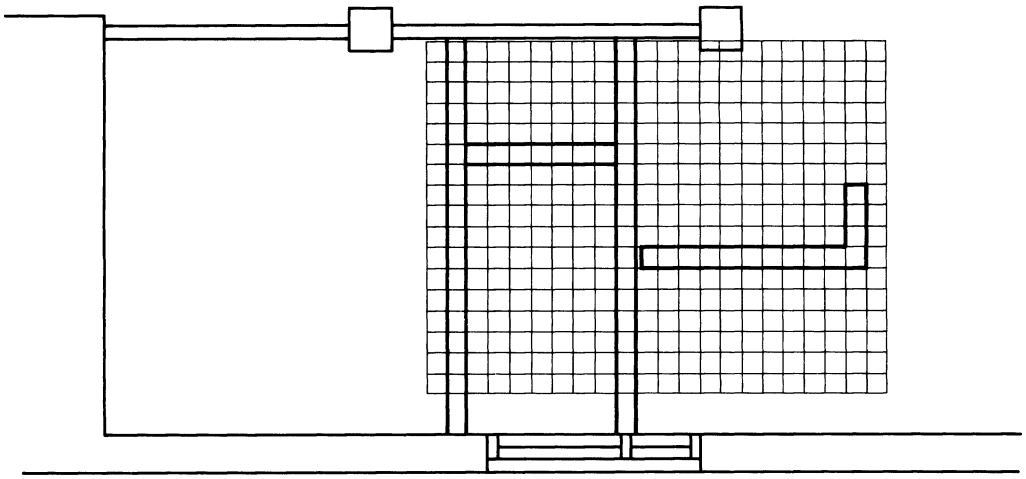
3.6 Construction of the partition

3.6.1 Supervision

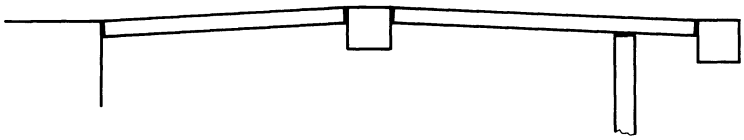
The supervision system should establish, document and maintain records for an agreed period of time for the following:

a) an inspection system capable of producing objective evidence that the materials used and the construction method conform to the specified performance level; the supervisor should ensure that the essential inspection requirements are satisfied throughout all phases of the work;

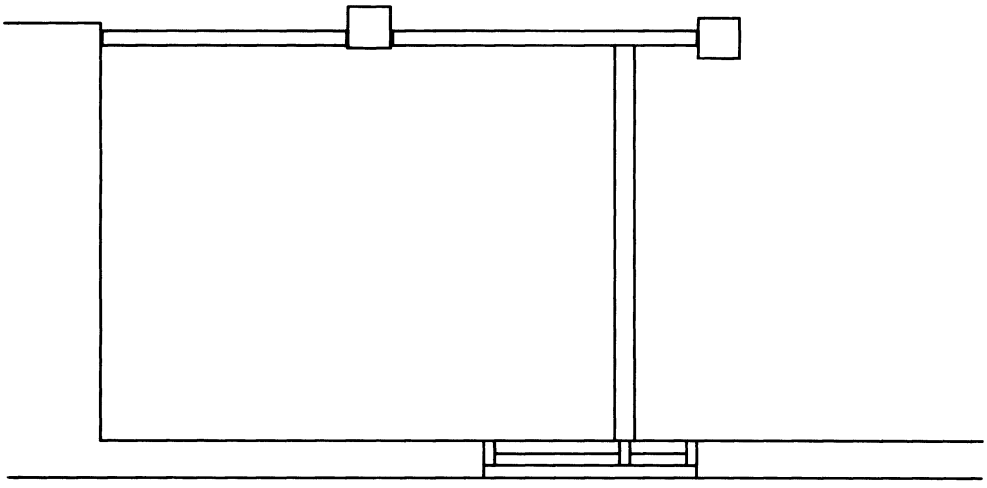
b) records of all inspections and tests of all service installations incorporated in the partition, including copies of all tests certificates and clearances to proceed;



a) Setting out to grid lines



b) Partition aligned with faces of columns and wall return



c) Partition set back from column faces and wall return

Figure 5 — Setting out

c) a system to check conformity of materials with the specification;

d) a procedure for controlling material that does not conform to the specified requirements; these procedures should include provision for their identification, segregation and disposal or return of unfit material and components;

e) a routine to agree and obtain a method of approval to ensure perimeter fixings, fire stopping and other sealing is completed prior to handover, conforming with the partition specified, so that the partition meets the tested criteria applicable;

f) a programme for the completion of the installation works and completion of the partition;

g) a system to record all remedial, variation work, modifications and handover certification.

3.6.2 Standard of workmanship and quality of materials

Prior to work commencing, a sample of each type of partition should be erected in a sample room or area and the standard of materials and workmanship approved before work proceeds. Where practicable the sample partitioned should form part of the permanent works.

Proprietary partitions should be erected in accordance with the manufacturer's instructions and should, where appropriate, conform to the tested construction in accordance with the test reports for the sponsors systems for test carried out in accordance with BS 5234-2:1992.

Any alteration or cutting of the partition by service installers should not be allowed to impair the structural stability and performance levels of the partitions. The method of sealing around services should be agreed with the partition contractor.

The provision of fixings and chases for services within masonry partitions should be in accordance with BS 5628-3:1985.

Where framed and stud partitions are to be erected on a prepared floor, whether screeded or monolithic, all floors in the area should be complete. If the floor is not thoroughly dried out, a damp-proof course, the full length and thickness of the partition, should be installed under the base member of the frame.

Where framed partitions are erected on screed depth haunchings, timber plates, etc. before the floor screeds are laid, care should be taken to avoid damage and the ingress of moisture during both the laying and drying of the screed.

All partitions which penetrate the ceiling zone should be erected before the ceiling is installed. Where facings or infillings do not extend to the structural soffit, provision should be made for the insertion of any cavity barriers, fire-stopping and acoustic barriers.

Coordination with the installation and testing of services is essential.

Framed partitions which contain services should be erected in two stages:

a) erect partition frame and clad one side with boards;

b) after the service installation has been tested and accepted, clad the remaining side of the partition and prepare and finish as soon as possible.

Where framed partitions are required to support heavy fittings:

a) ensure framing members are sufficiently strong and correctly positioned;

b) erect partition in two stages as above and add strengthening members prior to completing the facings or infillings.

Floor finishes laid after the erection of the partitions should be coordinated with other finishing trades and particularly with the fixing of skirtings, doorsets, junctions between flexible floor finishes and skirtings, door frames and architraves.

3.6.3 Setting out: deviations

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

a) the offset on plan from an agreed line or position, measured at the setting out level at ceiling or floor ± 3 mm

b) the offset from vertical, measured above or below the setting out position at ceiling or floor ± 5 mm

3.6.4 Services

Pipes and conduits should be held securely in position by suitable fixings. Care should be taken to avoid situations likely to damage any services, e.g. cables and pipes should not be passed through gaps provided to allow fordeflection in the adjacent structure, such as over framing at ceiling level. Service holes through thin metal are invariably sharp edged and any cables not in conduit passing through these holes should have protection against insulation damage. Care should also be taken to prevent partition fixings perforating or damaging services.

Services should not be inserted into relocatable partitions unless specified and the partition has been designed to accommodate the particular services.

All concealed services should conform to their relevant code of practice and be tested and accepted before the partition is completed. In the case of framed and stud partitions erected in two stages, the services should be tested prior to the final lining being installed. Access should be provided for maintenance and repair.

3.6.5 Cavity barriers

Cavity barriers should be installed in accordance with the designer's and/or manufacturer's specification which should include evidence that the cavity barrier meets the required performance. The programme should allow for installation and checking of cavity barriers before the partition is completed.

3.6.6 Fire stopping

Joints between fire-resistant partitions, cavity barriers and other elements of structure which serve as a barrier to the passage of fire should be fire stopped using suitable materials. Equally, all openings for service penetrations through partitions and cavity barriers should be fire stopped in order to meet the requirements of national building legislation.

3.6.7 Seals, other than fire stopping

Where gaps in and around partitions are required to be closed, they should be effectively sealed in accordance with the designer's instructions. Care should be taken to ensure the correct materials as specified are used. On completion, check the sealing of all joints, perimeter junctions and services apertures is made.

3.6.8 Partition fixings

The fixings of the partition to adjacent construction should be equivalent or superior to those used in the tests to satisfy the performance requirements given in BS 5234-2:1992 or by the appropriate code of practice. These fixings should be compatible with the materials of the adjacent structure to be joined.

3.6.9 Provision of supports for fittings

Where additional members are required to support heavyweight fittings the recommendations given in **8.6** should be followed. The location of additional members should be identified for following trades.

3.7 Accuracy of finished partition and openings

3.7.1 Finished surfaces

The deviations of a finished surface of a partition or lining from a straight line connecting end points of the partition should be within a band of 10 mm as shown in Figure 6.

NOTE 1 Finished surface refers to the finished plane of the partition; it excludes projections or recesses such as expressed joints, skirtings, architraves, raked joints, etc.
NOTE 2 Some fair-faced masonry partitions may not be able to conform to these tolerances.

The horizontal deviation band measurements should be taken at approximately 600 mm above the finished floor level and should be accompanied by measurements of the partitions or linings vertically at the measuring points which should also be within a 10 mm deviation band (see Figure 6, notes 1 and 2).

The method of measurement should be by laser or optical instruments. In small buildings, e.g. housing, a simplified method of measurement may be used.

3.7.2 Prepared openings and stop ends

The deviations in the sizes of prepared openings should not exceed:

Horizontal: $^{+\ 10}_{\ \ 0}$ mm

Vertical: $^{+\ 5}_{\ \ 0}$ mm

The deviation in the thickness between partition faces should not exceed ± 5 mm.

3.7.3 Local undulations

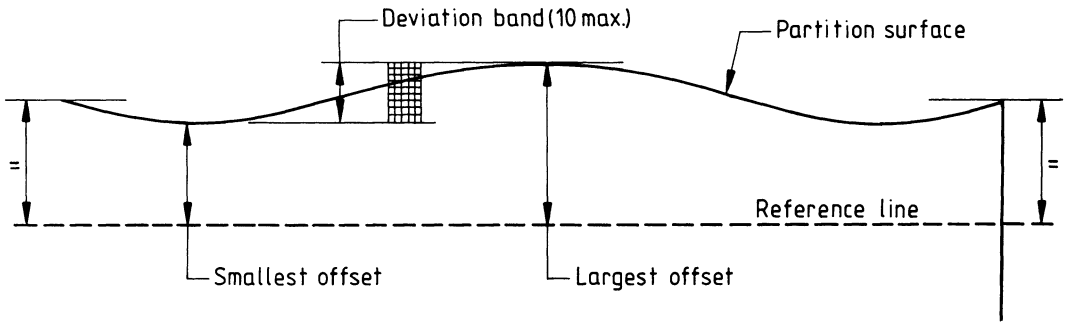
The gap between the finished surface and a 2 m straight edge resting points of contact on the surface should not exceed 5 mm.

NOTE The codes of practice for the installation of particular materials may require a more stringent tolerance.

3.8 Protection during construction

The protective measures required by the designer and/or manufacturer should be strictly followed. Any temporary protection should be retained as long as it is required.

Consideration should be given as to any additional protective measures required to protect finishes prior to handover.



Dimension shown is in millimetres.

NOTE 1 Deviation is the zone between two vertical parallel planes within which all the points of the surface under consideration lie.

The horizontal deviation band for a finished surface should be taken to be that deviation band parallel to a line joining the two end points of the partition surface.

In the vertical direction the deviation band is always vertical rather than parallel to the line joining the top and bottom of the surface.

NOTE 2 These tolerances do not include residual deflections resulting from, for example, heavy fittings.

Figure 6 — Deviation band for finished surface

Section 4. Handover

4.1 Maintenance manual

A manual should be provided in a robust form, with printed recommendations for the maintenance and repair of the partition surface or applied finish. The manual should be handed to the building owner at practical completion of a contract together with any special accessories equipment and access panel keys.

The manual should include the following information:

partition type, construction and finish;

identification of manufacturer of any proprietary system;

sound category;

fire rating;

any special requirements to maintain "Fire integrity", seals, finishes controlling spreads of flames;

special characteristics (e.g. security glazing);

surface finish including types and availability, also any special polishes, detergents and cleaners;

compatibility of finishes;

recommendations for fixing or fittings, with detail of any special requirements;

instructions on removal and replacement of trims and skirtings;

copies of relevant test data;

access panel details;

type and catalogue numbers of keys to any access panels;

method of dismantling and re-assembling relocatable partitions;

copy of manufacturer's working details, instructions and test certificate numbers, working drawings and any relevant information on the partition installed;

where to buy replacements;

instructions on cleaning maintenance and repair;

procedures for maintenance which, if done, will maintain the partition up to the original contracted levels of performance;

information, where appropriate, on how to reseal the partition at joints, perimeter junctions and service pipes.

NOTE Further advice about keeping building records for maintenance purposes is given in BS 8210.

Annex A (informative)
Design checklist

This list is not exhaustive but is intended to provide the main factors for consideration in selecting partitions suitable for their purpose.

A.1 Preliminary considerations of building

Type and use.

Construction.

New type of construction, dimensional constraints.

Existing construction materials; limitations of its form and structural capacity.

Structural capacity of building to support partitions; design loading on floors.

Design life and future requirements.

Environmental conditions: temperature, humidity.

Site: location, conditions, access to and within building.

Project budget.

Statutory requirements.

Dates: design and construction periods, completion dates for partitions.

Maintenance: user's normal arrangements.

A.2 Principal considerations for partitions

Structural.

NOTE By definition partitions are non-loadbearing (see **1.3**).

Lateral loads: wind, fittings and crowd pressure.

Type: static, relocatable or movable.

Grade: category of duty to be met.

Appearance: quality, finishes, glazing, trim and accessories.

Functional performance

Fire protection

Thermal insulation

Moisture resistance

Water vapour resistance

Sound insulation

Vision and borrowed light

Services: loadings from fitting

: access for

Durability: effect of solar or environmental heating

: contamination from dirt, fumes chemicals, humidity

Access: door openings, access panels, hatches

Cleaning

Maintenance

A.3 Selection of the partition

For each area decide the type and principal requirements as listed in **A.2**.

Availability

Check that manufacturers/suppliers are able to meet programme dates

Check that products/components will be available for repairs and alterations

Initial choice

Proprietary system or purpose design system

Verify that chosen partition will meet performance requirements, by testing if necessary

A.4 Final considerations

Agree partition layout

Check compatibility with other components

Check ability to accommodate tolerance and deflections

Resolve details, e.g. at junctions, door and glazing openings

For fire and/or sound insulation partitions ensure performance is maintained above suspended ceilings and below platform floors, also within ducts, cill-line heating, etc.

Schedule finishes and colour schemes

Agree service runs

Locate all services and fittings requiring additional support

Agree and schedule all fittings and accessories

Agree installation procedures including storage and handling requirements.

Annex B (normative)
Strength and robustness performance

B.1 Grades of partition

Partitions are graded in terms of categories of duty as given in **2.4**.

To conform to a particular grade, a representative sample partition should have been tested by the test methods given in BS 5234-2:1992. A summary of the principal minimum levels of acceptance for each grade is given in Table 4.

For a partition to be designated as having a particular grade all the test levels listed for that grade in Table 4 have to be satisfied.

Table 4 — Partition grades: summary of requirements and principle test performance levels

Requirement and test method[a]	Units	Grade (see Table 3)				Principle criteria
		LD	MD	HD	SD	
Stiffness (A)	mm	25	20	15	10	Maximum deflection
	mm	5	3	2	1	Maximum residual deformation
Small hard body impact:						
surface damage (B)	N m	3	3	6	10	Judgement of indent
perforation (D)	N m	—[b]	5	15	30	No perforation of facing
Large soft body impact:						
damage (C)	N m	20	20	40	100	2 mm maximum deformation
structural damage (E)	N m	60	60	120	120	No collapse or dislocation
Door slam (F)	No.	20	20	100	100	No damage and 1 mm maximum displacement

[a] Test methods are shown by letters in brackets which refer to annexes in BS 5234-2:1992.
[b] No requirements for this grade.

Table 5 — Summary of tests for crowd pressure, lightweight anchorages and heavyweight anchorages

Attribute and test method[a]	Recommended performance levels	Principle criteria
Crowd pressure (G)	0.75 kN/m, 1.5 kN/m or 3.0 kN/m	No collapse or dangerous damage
Lightweight anchorages:		
pull-out (H)	100 N minimum	Shim retained
pull-down (J)	250 N minimum	Shim retained and 2 mm maximum displacement
Heavyweight anchorages:		
wash basin (K)	500 N minimum	5 mm maximum deflection
	1 000 N to 1 500 N range	20 mm maximum deflection
wall cupboard (L)	2 000 N to 4 000 N range	5 mm maximum deflection

[a] Test methods are shown by letters in brackets which refer to annexes in BS 5234-2:1992.

B.2 Crowd pressure

The crowd pressure test is an additional test suitable for HD and SD grade partitions. The recommended performance levels are given in Table 5.

B.3 Anchorages for fixtures and fittings

Where there is a requirement to support additional loads from fixtures and fittings a representative sample partition should be tested. Recommended test methods for particular forms of loading are given in BS 5234-2:1992 for this purpose. A summary of these tests together with recommended levels of performance are given in Table 5.

Annex C (normative) Wind loads and air pressures

C.1 General

When a building is divided into rooms the internal pressure differences between them generate loads on the dividing walls or partitions. These can be large enough to cause failure, damage to finishes, or at least to cause difficulty in opening internal door. The largest internal pressure differences are caused when the internal wall forms a barrier to the flow of air from the windward face to the leeward or side faces. The partitions and their fixings should be capable of withstanding these differential pressures.

C.2 Dependent parameters

The pressure on an internal partition is dependent upon the external pressures and the relative porosity of the internal partitions to the external walls. The porosity will be dependent upon whether any doors or windows in the wall or internal partition are open or shut. The internal pressure in a single or multi-room building can be calculated theoretically using quasi-steady flow balance equations.

C.3 External and internal wind pressures

The external wind pressures should be determined from CP3:Chapter V-2:1972. The pressure difference between the various faces has to be resisted by the external walls and any internal partitions.

For internal pressures reference should be made to BRE Digest 346-8:1990.

C.4 General rules for determining ratio of load on internal partitions

In a multi-room building the internal wall with the least porosity will be the most heavily loaded. In general if the porosity of this partition is zero, or is small compared to that of the external wall, then all the load will be taken on the partition. When the partition and external walls, or adjoining partitions, have equal porosity then the load is equally shared. If the internal wall porosity is at least twice that of the external wall, or adjoining partition, then it only carries 10 % of the load.

C.5 Design cases

Two design cases should normally be considered:

a) all external windows and doors and all internal doors closed;

b) all internal doors closed and any combination of external windows and doors open.

Case a) should be considered at the ultimate limit state.

Assuming that doors and windows will not deliberately be left open in strong winds (when it should be considered at the ultimate limit state) case b) can be considered at the serviceability limit state. Further, the different combinations for case b) can be reduced by considering only leeward windows being open.

It may be necessary to consider the effect of a windward window being open (e.g. to simulate the effect of it having been broken by flying debris), when case b) should be considered as an accidental situation.

Annex D (informative) Suggested minimum sound insulation values of partitions

Suggested minimum sound insulation performance levels for privacy in some occupational conditions are given in Table 6. The values given are based on laboratory measurements.

Table 6 — Suggested minimum sound insulation values of partitions

Location	Weighted sound reduction index R_W dB
Habitable rooms in dwellings	30
Quiet rooms in dwellings	44
Enclosing bathrooms in dwellings	38
General offices	38
Private offices	44
Executive offices	50
Hotel rooms	55
Music practice rooms	60
Cinemas	60

NOTE Where there is a great deal of background noise a lower R_W may be acceptable.

Annex E (informative) Lighting for partitioning

Certain operations in building, including the erection and finishing of partitions, are visually more exacting than others because the work is concerned with surface finishes. A higher general level of illumination is required for these operations and this can readily be obtained from additional local light sources supplementary to those providing general working light. Each supplementary lamp should be of not less than 100 W rating for a filament lamp.

However, the problem of lighting for the critical finishing operations in building interiors cannot always be solved merely by providing a higher level of illumination. The nature of some of these operations is such that the direction of the light incident upon the work surface is of considerable importance. A particular direction of the light (e.g. a "glancing" angle of incidence) may make the quality of the work in hand much more apparent than a higher illumination obtained by a more normal incidence of light. This factor is of particular importance when it is intended that the permanent installation will incorporate side-lighting techniques, such as semi-recessed trough lighting in ceilings, cornice lighting or wall lighting from close-wall fittings.

Trials of lighting at glancing incidence have been made for the plastering trades, using an experimental additional lighting unit embodying a 1 200 mm 40 W fluorescent lamp housed in a suitable reflector and mounted on a telescopic tripod. The unit was made so that the reflector could be easily adjusted to illuminate either horizontal or vertical surfaces during plastering, with the fitting close to and parallel with the surface being worked. Ideally the work should be carried out under the same lighting conditions that will ultimately be obtained from the permanent installation. By using these units, however it has been shown that effect of the permanent side-light can be simulated to a considerable degree. Furthermore, the relatively large area and length of the tubular lamps eliminate much of the troublesome shadows that can occur with the more compact filament of tungsten lamps.

Another advantage of tubular fluorescent lamps is that they are resistant to breakage from water splashes; a saving which serves to offset the higher initials cost of the units. Trials have shown that the tubular lamps often outlive their expected life and although they are relatively expensive they have introduced a new conception of temporary lighting. It should be noted that this particular form of lighting does not generally cause such sever glare because the lamps are of comparatively low brightness even though their luminous efficiency is about three times that of filament lamps.

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List of references (see 1.2)

Normative references

BSI standards publications

BRITISH STANDARDS INSTITUTION, London

BS 476, *Fire tests of building materials and structures.*

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BS 476-6:1989, *Method of test for fire propagation for products.*

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BS 476-20:1987, *Method for determination of the fire resistance of elements of construction (general principles).*

BS 476-22:1987, *Methods for determination of the fire resistance of non-loadbearing elements of construction.*

BS 952, *Glass for glazing.*

BS 952-1:1978, *Classification.*

BS 2750, *Measurement of sound insulation in buildings and of building elements.*

BS 2750-3:1980, *Laboratory measurements of airborne sound insulation of building elements.*

BS 2750-4:1980, *Field measurements of airborne sound insulation between rooms.*

BS 3638:1987, *Method for measurement of sound absorption in a reverberation room.*

BS 4787, *Internal and external wood doorsets, door leaves and frames.*

BS 4787-1:1980, *Specification for dimensional requirements.*

BS 4800:1989, *Schedule of paint colours for building purposes.*

BS 5234, *Partitions (including matching linings).*

BS 5234-2, *Specification for performance requirements for strength and robustness including methods of test.*

BS 5588, *Fire precautions in the design and construction of buildings.*

BS 5588-1, *Residential buildings.*

BS 5588-1.1:1990, *Code of practice for single-family dwelling houses.*

BS 5588-2:1985, *Code of practice for shops.*

BS 5588-3:1983, *Code of practice for office buildings.*

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BS 5588-5:1986, *Code of practice for firefighting stairways and lifts.*

BS 5628, *Code of practice for use of masonry.*

BS 5628-1:1978, *Structural use of unreinforced masonry.*

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BS 6206:1981, *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings.*

BS 6262:1982, *Code of practice for glazing for buildings.*

BS 6399, *Loading for buildings.*

BS 6399-1:1984, *Code of practice for dead and imposed loads.*

BS 6750:1986, *Specification for modular coordination in building.*

BS 8233:1987, *Code of practice for sound insulation and noise reduction for buildings.*

DD 171:1987, *Guide to specifying performance requirements for hinged or pivoted doors (including test methods).*

CP 3, *Code of basic data for the design of buildings.*

CP 3:Chapter V-2:1972, *Wind loads.*

PD 6512, *Use of elements of structural fire protection with particular reference to the recommendations given in BS 5588 "Fire precautions in the design and construction of buildings".*

PD 6512-3:1987, *Guide to the fire performance of glass.*

Informative references

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BRITISH STANDARDS INSTITUTION, London

BS 5051, *Specification for security glazing.*

BS 5051-1:1988, *Bullet-resistant glazing for interior use.*

BS 5250:1989, *Code of practice for the control of condensation in dwellings.*

BS 5268, *Structural use of timber.*

BS 5268-6, *Code of practice for timber frame walls.*

BS 5268-6.1:1988, *Dwellings not exceeding three storeys.*

BS 5385, *Wall and floor tiling.*

BS 5385-1:1990, *Code of practice for the design and installation of internal ceramic wall tiling and mosaics in normal conditions.*

BS 5516:1977, *Code of practice for patent glazing.*

BS 5750, *Quality systems*[4)].

BS 7543:1992, *Guide to durability of buildings and building elements, products and components.*

BS 8210:1986, *Guide to building maintenance management.*

BS 8212:1988, *Code of practice dry lining and partitioning using gypsum plasterboard.*

Other references

[1] Health Technical Memorandum 56, Partitions. Available form HMSO, 49 High Holborn, London WC1.

[2] BRE Digest 346:1990, *The assessment of wind loads Part 8 Internal pressures.*

[3] IEE Regulations for Electrical Installations. Available from IEE, Savoy Place, London WC1.

[4)] Referred to in the foreword only.

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