



BS 5234 : 1975

UDC 69.022.5

Code of practice

Internal non-loadbearing partitioning

British Standards Institution

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This code of practice represents a standard of good practice and therefore takes the form of recommendations. Compliance with it does not confer immunity from relevant statutory and legal requirements.

Foreword

For the purposes of PD 6432 'Dimensional co-ordination in building. Arrangement of building components and assemblies within functional groups', Part 1 'Functional groups 1, 2, 3 and 4', the partitions to which this code of practice refers fall within functional group 3 and as grade A components with first priority dimensional co-ordination is essential.

Following the new philosophy for building standardization and guidance on the performance approach to documentation issued by the Building Performance Investigation Panel BCP/-/2, the code sets out basic guidance data for designer, specifier, manufacturer and erector.

As a statement within the intended 'package' of performance documentation on this subject, the code is not complete in that it has not been possible at this stage to introduce references to its interdependent statements in the form of standards of agreed acceptance levels, methods of assessment and test methods. Until such time as a programme leading to the publication of these standards is completed, thus enabling the subject to be described fully in performance terms, reference should be made to current publications on performance tests which are listed in 5.2.

Guide to the code of practice

The following parts of this code will be of interest to the:

	Page	Designer/Specifier	Manufacturer	Erector
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Internal non-loadbearing partitioning

Section one. General

1. Scope

1.1 Field of application. This British Standard code of practice lists the properties that non-loadbearing partitions may require, and recommends good practice to be followed during design, manufacture, erection and maintenance.

1.2 Types excluded. The code does not deal with:

- (a) mobile partitions which are unrestrained at the head, such as office 'acoustic' screens
- (b) highly specialized partitions, such as glazed security screens, X-ray barriers, partitions to cold stores and partitions for large auditoria.

1.3 Relocatable partitions. The frequently used term 'dismountable' can be misleading: most partitions are in this category but not all can be reassembled. The term 'relocatable' is to be preferred and is used in this code to denote those partitions which are capable of re-use without substantial repair.

2. References

The titles of the British Standards referred to in this standard are listed on the inside back cover.

3. Materials

Materials for the partitions include the following:

- aerated concrete slab
- asbestos cement sheet
- asbestos insulation board
- blockboard
- compressed straw building slab
- cork board
- expanded plastics
- fibre insulating board
- fibrous concrete
- flax building slab
- glass
- glass wool
- gypsum plasterboard
- hardboard
- laminboard
- metal
- mineral wool
- particle board
- premixed lightweight gypsum plaster
- plastics laminate
- plastics sheet
- plywood
- timber
- wood wool slab.

Section two. Performance

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4. Requirements

4.1 Dimensions

4.1.1 Co-ordination. Following the recommendations of BS 4011, BS 4330 and PD 6444, co-ordinating sizes should be as follows.

4.1.1.1 Heights

(1) *All building types other than local authority housing.* Partition heights should be based on floor-to-ceiling heights which should be in multiples of 300 mm up to 6600 mm, and multiples of 600 mm for heights above this. The most commonly used heights are 2400 mm, 2700 mm and 3000 mm.

(2) *Local authority housing.* For such housing, partition heights should be based on floor-to-ceiling dimensions of 2300 mm, 2350 mm and 2400 mm.

It should be noted that the height of 2350 mm is currently a statutory requirement of the Department of the Environment and does not comply with BS 4011 which requires that all dimensions over 300 mm shall be in multiples of 100 mm.

4.1.1.2 Length. Preferably in increments of 300 mm. The increment should relate to the thickness of the partition however, if site cutting is to be reduced to a minimum; consequently, 100 mm increments may be desirable for some 100 mm thick partitions.

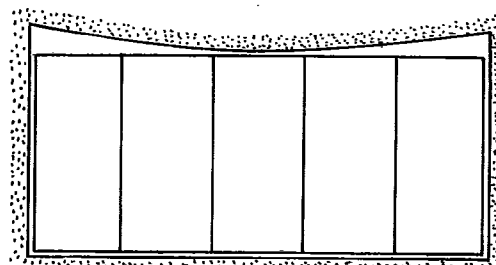
4.1.2 Tolerances. The effects of inaccuracy in the building should be anticipated.

4.1.2.1 Inherent inaccuracy. This arises from the nature of materials used in the building, e.g. deflection of floors and ceilings under load, and changes in dimension due to thermal or moisture variations.

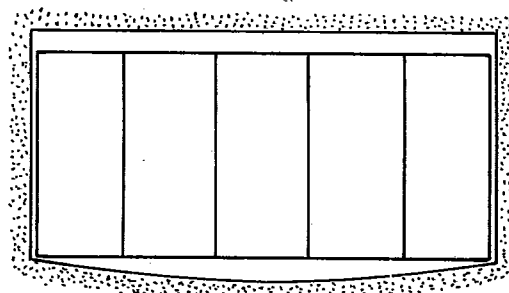
The resultant movement may be comparatively large and not take place until long after construction has been completed.

DC 12* prepared by the Interdepartmental Sub-Committee for Component Co-ordination illustrates how deflection, especially with live loads, can produce a critical situation where long spans and thin structural members are used. The sketches show

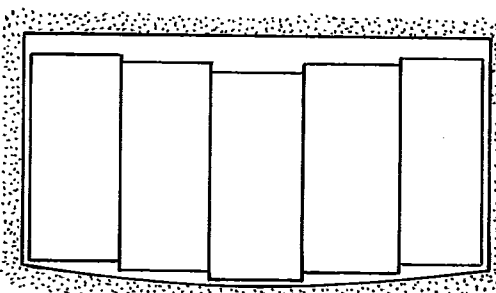
(a) what happens when the floor above deflects downwards;



(b) what happens when the floor below deflects downwards but the partitions do not drop with the floor;



(c) the tendency for partitions to move down with the floor.



The relevant British Standards and codes of practice dealing with structural frames, e.g. BS 449, CP 112 and CP 114, give guidance on limiting the deflection of the structure to e.g. 1/360th span and 1/300th span. This gives an indication of the deflection that may have to be encountered by partitions.

4.1.2.2 Induced inaccuracy. This is caused by the work done in connection with the partition itself, e.g. inaccurate manufacture of components, faulty setting out and inaccuracies in erection.

* 'Designing with Components: an appreciation of the problems of fit that arise and techniques that may be used in solving them.'

4.1.3 Permissible deviations. Both inherent and induced deviations are likely to occur during construction and the building designer should endeavour to cater for them. They will vary according to the type of construction, e.g. a greater standard of accuracy is possible for vertical spaces using a lightweight steel structure and suspended ceiling than the equivalent spaces between two in situ concrete floor slabs.

PD 6440 gives some recommendations; it should be realized, however, that such tolerances may not be achieved in practice.

A partition should be designed to accommodate these deviations and maintain all functional requirements especially sound reduction, fire resistance and appearance. Any trim should be large enough to deal with the joints arising from the combined tolerances of the structure and partition.

4.2. Strength and stability

4.2.1 Handling. The materials or components used for the partition should be capable of being handled and should resist damage or permanent deformation.

4.2.2 Loads. Partitions should be able to withstand impact and other loads. Details are given in clause 5.

4.2.3 Wind forces. It should not be overlooked that a partition may have to resist distributed loads created by pressure differences between the spaces each side. For guidance on wind pressures generated inside a building, reference should be made to appendix E of CP 3: Chapter V: Part 2: 1972.

4.3 Fire protection. Terms associated with fire and used in this code are defined in BS 4422: Parts 1 and 2.

4.3.1 Regulations. Mandatory requirements are laid down in the appropriate Building Regulations and Acts.

These are minimum requirements dealing with the fire resistance of the partition and the rate at which flame spreads over its surface. In view of the complexity of the Regulations relating to fire some notes are included here for the convenience of users of the code. They should not be regarded as a precise interpretation of the Regulations.

4.3.2 Fire resistance. Current Building Regulations, with the objective of stopping the spread of fire, adopt the principle of dividing buildings into compartments. The elements of structure used to separate compartments are floors and walls. Access between compartments is permitted only through other elements of structure enclosing protected shafts such as stairways, or through self-closing fire resisting doors or shutters. The fire resistance required depends on the size and type of compartment or building.

Depending on their situation and function, non-loadbearing partitions may be required to have fire resistance, such as for the protection of escape routes.

Partitions required to have up to $\frac{1}{2}$ hour fire resistance may be constructed of any material provided they achieve the required performance in the fire resistance test described in BS 476: Part 8. Except for certain one-hour partitions in residential occupancy, all other partitions requiring a resistance of one hour or more must be constructed of non-combustible material.

4.3.3 Surface spread of flame. Depending upon their situation, the surface finishes of partitions are generally required to be classified according to the extent and rate of flame spread across their surfaces. The method of testing is described in BS 476: Part 7.

Particular attention should be paid to flame spread requirements, especially where there are mentally or physically handicapped people and where low partitions are used for screening and similar purposes.

4.3.4 Fire propagation. The surface spread of flame test mentioned above broadly classifies materials on their behaviour in a fire situation but does not measure all the properties relevant for placing lining materials in their correct order of hazard. The fire propagation test described in BS 476: Part 6 measures the amount and rate of heat release evolved by a specimen whilst it is being subjected to heat, and therefore at present it is used for testing materials in critical situations.

4.3.5 Non-combustibility test. This test, described in BS 476: Part 4, determines whether a material is non-combustible or combustible. There is no intermediate grade, nor is there a way of treating combustible materials to make them non-combustible.

4.3.6 Ignitability test. This test, described in BS 476: Part 5, identifies ignitable rigid or semi-rigid materials. Materials designated 'X' by the test method should not be used in any situation where there is the possible risk of fire even from the smallest heat source.

4.3.7 Glazing. Glass has limited ability to provide a fire protection. CP 153: Part 4 deals with the fire hazards associated with glazed areas in buildings and defines glazing designs which can be expected to offer significant fire resistance.

A patented method of construction is now available where the permitted glass pane size for both $\frac{1}{2}$ hour and 1 hour fire resistance is 1.14 m^2 . This method is based on timber frames and fire check channels of asbestos sheet material; the latter has an intumescent coating which, when exposed to a fire, produces a foam which seals gaps and edges.

4.3.8 Fire Precautions Act, 1971. This act, providing for the issue of a fire certificate after requirements for means of escape and other fire precautions have been met, is applicable to premises which involve members of the public being present in any number. The Act and its Guides should be consulted for a detailed list of applications.

4.3.9 Insurance. Fire protection should be considered from the insurance aspect. Some insurance companies take the Rules of the Fire Offices Committee for Standards of Construction as a guide. These have fire standards relating to construction, Standard I representing the highest and Standard V the lowest.

4.4 Thermal insulation and water resistance

4.4.1 Temperature and moisture changes. A partition may be subject to great climate differentials, e.g. where one face is to an unheated passage open to the outside and the other is to a room with good heating. Partitions may also distort due to a change in moisture content from that on manufacture. In these conditions a partition should have a high level of resistance to distortion, and be capable of accommodating movement.

Any bow in the partition should not exceed $1/500$ of the height or 5 mm, whichever is the greater.

4.4.2 Thermal insulation. This is of importance for partitions in such positions as boiler rooms and entrance lobbies. A partition separating a habitable room from an unheated one should have a thermal transmittance coefficient not greater than the external walls.

In all situations where there are large temperature variations on opposite faces, metal framing members should not be allowed to create thermal bridges and thus increase the risk of condensation and pattern staining.

4.4.3 Water vapour resistance. Where there is a temperature gradient from one side of the partition to the other, and where high humidity conditions prevail, it may be necessary to incorporate or apply a vapour barrier treatment to the partition. Although there is no standard for a vapour barrier in the UK it has been recognized that a water vapour resistance of at least 15 meganewton seconds per gram is acceptable. A vapour barrier treatment should always be positioned on the warm side of the structure. Because of the difficulty in maintaining the integrity of the barrier due to perforations at light switches, sockets, etc., a vapour *check* may be considered adequate depending on the severity of the conditions.

4.4.4 Thermal capacity. The materials chosen for the surface of the partition can greatly affect the comfort of the occupants, for instance, when the heating is intermittent (as in an office building with little or no power over the weekend). Materials with a low thermal capacity are quicker to respond but provide greater thermal storage.

4.4.5 Water at floor level. Where the use of water for washing the floor is envisaged, the joint between the partition and the floor should prevent water penetrating to the adjoining space. Any part of the partition sensitive to water by way of its lower edge should be protected against a depth of water of at least 75 mm.

4.4.6 Surface temperature. The performance of the partition should not be affected when it is subject to local heating caused by the sun or by radiators and similar heating appliances.

4.5 Acoustic properties

4.5.1 Transmission of sound. A lack of sound insulation tends to be the cause of more dissatisfaction with a partition than any other factor. Frequently both building owner and specifier expect an unrealistic performance, particularly from the types of partition covered by this code of practice.

Partitions can be designed to give good sound reduction but this is frequently impaired by direct and flanking air paths, and by indifferent workmanship.

The essential principles of sound insulation as they relate to partitions are given in appendix A and further information is to be found in such publications as:

CP 3: Chapter III

Department of the Environment publication 'Sound Insulation in Buildings' by Humphreys and Melliish.

BRE Digest No. 143 'Sound Insulation: basic principles'.

4.5.2 Recommended levels of insulation. CP 3: Chapter III recommends levels of insulation for various building types and rooms.

There are no mandatory requirements for the sound insulation of partitions (except for separating walls in dwellings).

4.5.3 Planning against noise. The building designer should consider the sound insulation of partitions in conjunction with the detailed design of the building: see clause 6.

4.6 Durability

4.6.1 Damage during use. Abrasion and minor impacts are inevitable and partitioning should be capable of being made good after a time. The ease or difficulty of repairing materials in situ and matching the colour and texture should be considered.

4.6.2 Toilet partitions. Surfaces should be hygienic and easily cleaned, and should resist disfigurement.

4.6.3 Pin boards. Finishes such as paper and emulsion paint are quickly damaged by the removal of adhesive tape used to fix calendars and notices. The partition should incorporate or be able to support pin boards where required (subject to their meeting fire precaution and means of escape requirements when considered as wall linings).

4.6.4 Extra protection. When necessary, the partition should be capable of receiving and supporting extra protection against chemical or radioactive materials, and in other instances the fixing of rails and external angles to prevent damage from trolleys and similar movable objects.

4.6.5 Atmospheric conditions. Depending on the life required, the performance of the partition (and its fire-resistant properties) should not deteriorate due to the relatively high humidity of the ambient atmosphere. When such conditions can be anticipated materials should receive suitable treatment.

4.6.6 Decorations. If wallpaper is proposed, consideration should be given to the ability of the surface to withstand removal of the paper without damage.

4.7 Fixtures and services

4.7.1 The carrying of fixtures. Manufacturers should make clear which fixing devices can be used in their partitions, particularly where special devices have been developed, and this information should be supplied in durable printed form to the building user.

Some partitions require a backplate to be fixed inside them to carry loads from basins, etc. The building user should also be informed about the need for such backplates, and how to arrange for their introduction should there be a requirement for additional loads in the future.

4.7.2 Provision for services. Partitions should allow service outlets to be positioned freely over as large an area of the partition as possible, and at least at intervals of 300 mm vertically and 200 mm horizontally.

Provision should be made for pipes to pass through the top and bottom of the partition into the floor and ceiling zones.

Manufacturers should state the maximum dimensions of any routes available for services. When considering these dimensions the designer should allow for any crossing over of pipes, lagging, valves, etc.

The introduction of services into the core of a partition may affect its repositioning, sound insulation, fire resistance and stability, and may also delay erection. The partition should be designed so that its erection does not depend too much upon tradesmen fixing services.

A partition composed of panels on stud framing accommodates services well. Such a partition has the advantage that the framework of studs can be erected and left for the services to be installed, the panels being fixed later. Similarly the two sides of the partition may be supported by two independent rows of studs to leave a completely unobstructed service distribution zone.

In solid partitions services such as telephone and electrical wiring are often buried in chases cut in the partition material. The depth of these chases should be kept to a minimum when the stability and sound insulation of the partition are important. Outlet boxes in particular should not be placed back to back.

Wiring in combustible partitions may need to be specially insulated against fire.

4.7.3 Service ducts. The partition should allow the construction of integral ducts having the same surface materials as the remainder of the partition.

4.7.4 Service access panels. Access panels, which may be required for the full height of the partition, should be designed for easy opening. Hinged panels (which are lockable if necessary) are better than screw-fixed panels. Edge seals are essential for good sound insulation.

4.7.5 Maintenance of sound and fire standards. Where specified sound insulation and fire resistance standards have to be maintained, all gaps round pipes passing through the partition face need to be well sealed, such as with an acoustical and fire resistant caulk. Hot water pipes should be passed through a close-fitting sleeve to allow for movement.

4.8 Maintenance and hygiene

4.8.1 Design. The design of the partition should be such that dirt-holding crevices, particularly at skirting level, are avoided.

4.8.2 Constituents. The partition and its finishes should not be made from toxic materials and should not give off obnoxious smells, nor should they give off harmful vapours or particles in the factory or on site.

4.8.3 Vermin. Where there is a high risk of vermin infestation, careful consideration should be given to the nature of the materials used and the form of construction, e.g. it may be desirable to avoid hollow partitions.

4.8.4 Maintenance.

- (1) Materials should be capable of being cleaned or otherwise maintained without surfaces or colour being noticeably affected.
- (2) Partitions should be resistant to marking and discolouration from pencils, ink, adhesive tape and the like, and resistant to staining above radiators and similar heating appliances.
- (3) Where a material's resistance to dirt is liable to be affected by static electricity, the material should be suitably treated.
- (4) The normal cleaning of the premises and the use of the usual volatile disinfectant and insecticide products, should not cause any deterioration of the partition.
- (5) Any cleaning or maintenance of partition surfaces should not destroy the surface spread of flame or other fire performance requirements.
- (6) The skirting, and any finish applied to it, should be able to withstand wet floor cleaning where necessary.

4.8.5 Instructions. The manufacturer should provide printed instructions about cleaning and redecoration of the partition, including the availability of special detergents and polishes. Warnings about the use of abrasives, and other harmful materials should be included if necessary. These instructions should be in a durable form for retention by the building owner and boldly marked that they are to be kept for reference.

5. Testing

5.1 Tests. Partitions may require testing for the following.

- (1) **Strength and robustness**
 - (a) Instability.
 - (b) Resistance to hard body impact.
 - (c) Resistance to soft body impact.

- (d) Resistance to pressure.
- (e) Resistance to point loading.
- (f) Resistance to eccentric loading.
- (g) Resistance to fixing pull out.
- (h) Resistance to marring of finish.

(2) Environmental insulation. Resistance to:

- (a) air leakage;
- (b) sound transmission;
- (c) heat transmission;
- (d) condensation;
- (e) water penetration;
- (f) fire penetration;
- (g) smoke penetration.

(3) Serviceability

- (a) Spread of flame.
- (b) Dimensional stability.
- (c) Resistance to distortion caused by climate differential.

5.2 References to tests. Tests to assess the performance of a partition will form the subject of a separate BSI publication. Meanwhile reference may be made to the following publications.

MINISTRY OF PUBLIC BUILDING AND WORKS. Partitions performance specification. 1970.

DEPARTMENT OF EDUCATION AND SCIENCE. Common performance standards for building components. 1970.

INTERDEPARTMENTAL SUB-COMMITTEE FOR COMPONENT CO-ORDINATION. Performance requirements for partitions. Technical Note No. 3. 1970.

DEPARTMENT OF HEALTH AND SOCIAL SECURITY. Partitions including glazed screens performance specification. 1972.

Fire

Combustibility	BS 476 : Part 4
Ignitability	BS 476 : Part 5
Fire propagation	BS 476 : Part 6
Surface spread of flame	BS 476 : Part 7
Fire resistance	BS 476 : Part 8

Sound

Airborne and impact sound transmission	BS 2750
Sound absorption coefficients	BS 3638

Finishes

Resistance to marking by liquids	BS 3962 : Part 4
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6. Application to a building

6.1 Locating the partition

6.1.1 Alignment with columns and walls. The positioning of partitions in relation to columns needs careful consideration. It will be seen that the alternatives shown in figure 1 affect such things as the freedom to position fixtures and furniture, ease of cleaning, the laying of floor finishes and the construction of skirtings.

If columns are in line and plumb, one side of the partition may be aligned with a column face. If columns are not in line and plumb, the partition may have to be set back or positioned to avoid the columns completely.

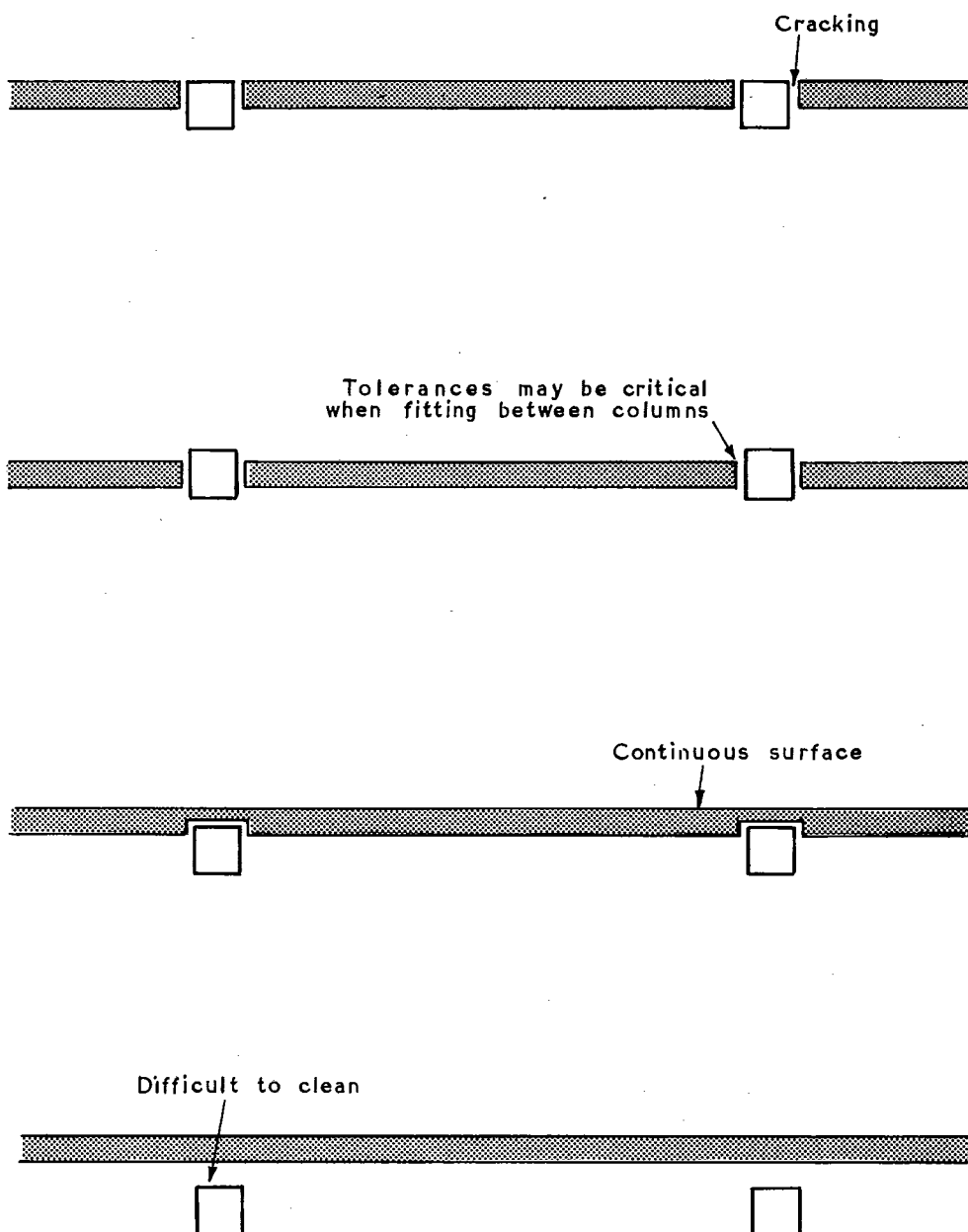


Figure 1. Plans showing positioning of partition in relation to columns

6.1.2 Junction with walls (see figure 2). Similarly, it may be preferable not to align a partition with a wall return, to avoid showing discrepancies and to obtain a firmer fixing away from the corner. This might leave an awkward junction which could harbour dirt.

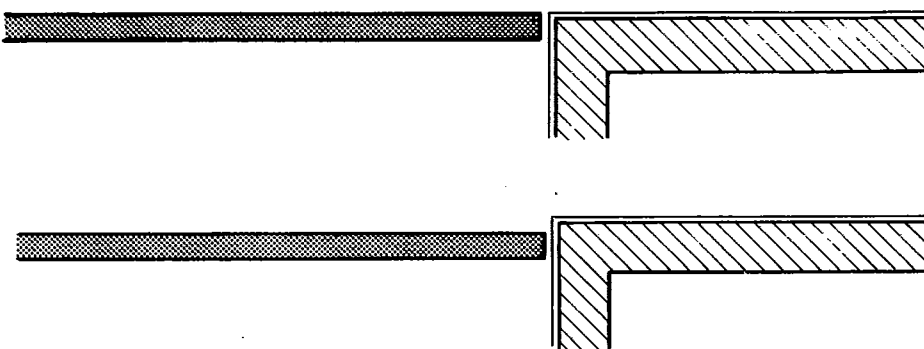


Figure 2: Plans showing relationship of partition to wall return