

Introduction:

This section provides for general guidance for the users of Strebord® for the manufacture of bespoke doorsets. The section includes recommendations with regard to the reference points generally used within the industry for the determinations of dimensions.

Experience suggests that the coordination of doorsets with floor levels can be particularly difficult when considering regulations relating to threshold gaps and the possibility that the actual thickness of floor finishes may not be known at the time of manufacture of the doorsets. This section suggests one method (general method) for accommodating variations in floor levels by way of limited site adjustments. Where the precise alignment of doorset components between adjacent doorsets in a building is a factor for consideration, this section also suggests a method (precision method) that can provide for this.

NOTE: For the purpose of this section, the term 'Hard Floor Finish' is used, this may also be referred to as the structural floor level and relates to the floor level before the application of floor finishes. The hard floor levels may include concrete, chipboard or floor boards etc.

For some performance applications e.g. fire performance, there are limits to the maximum approved doorset size and to the minimum size of frame section that can be used, otherwise Architects and Designers are provided with generous scope for the use of Strebord® based doorsets to meet their design requirements.

Standard doorsets are manufactured to designs determined by the manufacturer and produced without knowledge or consideration of the particular location in which they might be used. These are usually supplied through builders merchants with the majority of doorsets in this sector being used in the domestic housing market.

Bespoke doorsets are generally purpose made to suit a particular location in a particular building and are generally 'sold' in advance of manufacture and supplied in accordance with the terms of a particular contract. Sizes and aesthetic appearances are generally determined by an Architect or Designer will must also specify performance requirements to the satisfaction of the Regulations applicable to the building.

Standard doorsets should comply with the dimensional requirements of BS4787 Part 1.

Whereas BS4787 Part 1 might be a useful standard for the manufacture of standard doors, it has its limitations for bespoke applications. In particular:

- Architrave is not described in BS4787 Part 1 and there are no considerations with regard to the installation of the doorsets into the building.

- Doorsets with flush over panels are not considered.
- Double action doorsets are not considered.

The purpose and intended use of the building will have an influence on design requirements and the manufacturers of bespoke doorsets are accustomed to working closely with designers and contractors to provide for coordinated products to meet the requirements of a particular project.

Generally the important requirements are:

- The doorsets should reasonably satisfy the aesthetic requirements of the Designer.
- The doorsets should provide for the performance requirements for each location to the satisfaction of the Regulations and specifications applicable to the particular building.
- The doorsets should fit the particular opening in the particular building into which they are to be installed.

To satisfy these requirements there needs to be a high level of coordination between the doorset manufacturer and other parties involved with the installation.

- Openings in walls and partitions need to be properly prepared to suit the required doorset design and dimensions.
- Floor finishes and floor levels need to be determined to ensure that the doors clear the floor during the swing of the door and that the under door clearances satisfy the standards and regulations applicable to any related performance.

• The installation of the doorset needs to be carried out by competent installers, particularly where 'performance' doorsets are required.

NOTE 1: The primary performance requirement for any doorset is to provide for a means for 'traffic' to pass from one side of a wall to the other. The term 'performance doorset' in this section relates to secondary performances that may be attributed to the same location e.g. fire, smoke, sound attenuation, security etc.

NOTE 2: If a doorset does not work satisfactorily in its primary role then it is unlikely that any secondary performance requirement will be achieved.

This section provides for a description of BS4787 Pt.1 requirements for general information. The remainder of this section provides for recommendations for the application of the general principles of BS4787 Pt.1 to the manufacture of bespoke doorsets in a manner that accommodates the above considerations.

BS4787 Pt.1:

BS4787 Pt.1 describes standard dimensions for internal doorsets used in the United Kingdom.

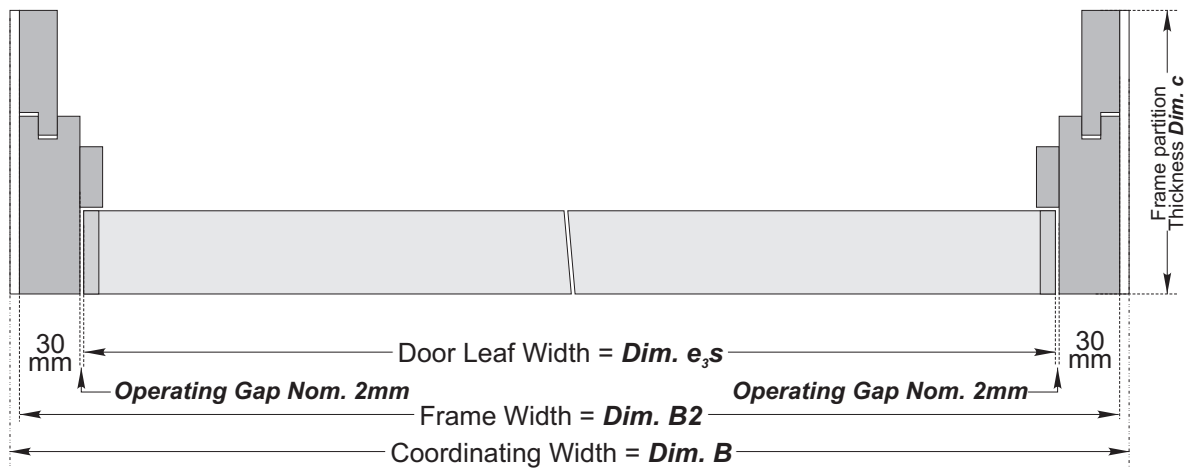
This standard is based upon a 30mm frame section which is not suitable for some performance doorset applications e.g. some fire rated doorsets where the minimum approved frame section is 32mm.

BS4787 Pt.1 does not consider double action doorsets or doorsets with flush over panels and does not consider coordination with other trades for the installation of the doorset into a building.

NOTE: It is common practice to use standard imperial sized door (e.g. 6ft. 6in. x 2ft. 6in.) for the domestic dwellings market.

BS 4787 Pt.1 Single Leaf Doorsets - Internal Doorsets:

Fig. 8.1

**BS4787 Pt.1: Standard provisions:**

BS4787 Part 1 refers to the following width dimensions:

For single leaf doorsets BS4787 Pt.1 provides for the following coordinating widths:

- 600mm
- 700mm
- 800mm
- 900mm
- 1000mm

Work size widths (Frame widths) for single leaf doorsets:

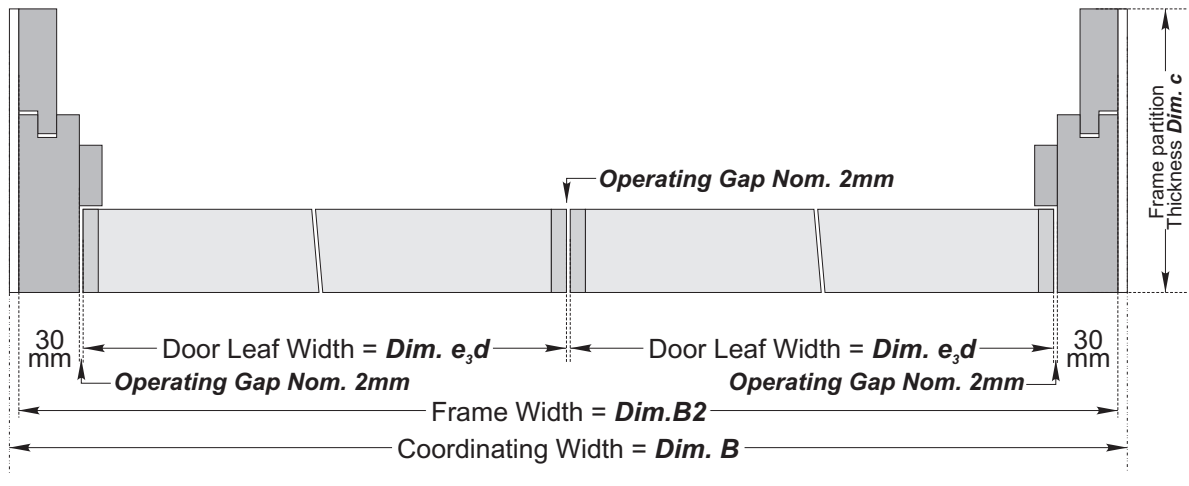
- 590mm
- 690mm
- 790mm
- 890mm
- 990mm

Manufactured frame and door leaf widths based upon these coordinating dimensions are:

- Door Leaf = 526mm
- Door Leaf = 626mm
- Door Leaf = 726mm
- Door Leaf = 826mm
- Door leaf = 926mm

BS 4787 Pt.1 Double Leaf Doorsets (Pairs) - Internal Doorsets:

Fig. 8.2



BS4787 Pt.1: Standard provisions:

BS4787 Part 1 refers to the following width dimensions:

For double leaf doorsets (pairs) BS4787 Pt.1 provides for the following coordinating widths:

- 800mm
- 900mm
- 1000mm
- 1200mm
- 1500mm
- 1800mm
- 2100mm

Work size widths (Frame widths) for single leaf doorsets:

- 790mm
- 890mm
- 990mm
- 1190mm
- 1490mm
- 1790mm
- 2090mm

Manufactured frame and door leaf widths based upon these coordinating dimensions are:

- Door Leaves = 2x362mm
- Door Leaves = 2x412mm
- Door Leaves = 2x462mm
- Door Leaves = 2x562mm
- Door Leaves = 2x712mm
- Door Leaves = 2x862mm
- Door Leaves = 2x1012mm

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BS4787 Pt.1:

BS4787 Pt.1 describes standard dimensions for internal doorsets used in the United Kingdom.

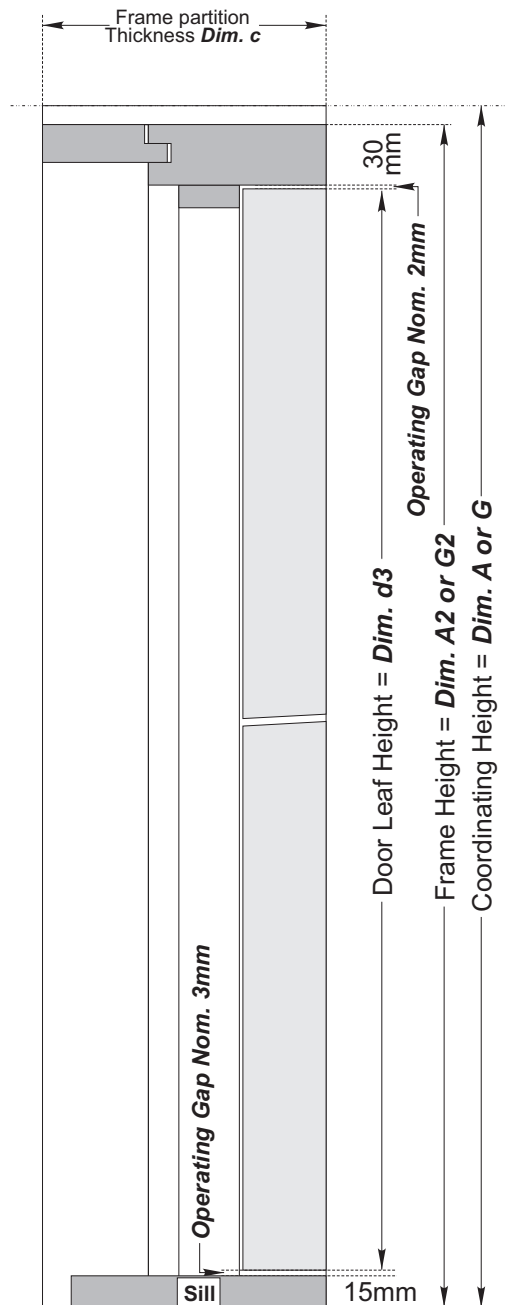
This standard is based upon a 30mm frame section which is not suitable for some performance doorset applications e.g. some fire rated doorsets where the minimum approved frame section is 32mm.

BS4787 Pt.1 does not consider double action doorsets or doorsets with flush over panels and does not consider coordination with other trades for the installation of the doorset into a building.

BS4787 Pt.1 only describes doorsets with a sill at the threshold. However, the sill could be removed to allow for floor finishes up to 15mm thickness.

BS4787 Pt.1. Doorset Height - Internal Doorsets:

Fig. 8.3



BS4787 Pt.1- Standard provisions.

For door height doorsets BS4787 Pt.1 provides for a coordinating height of 2100mm for door height doorsets.

For storey height (or ceiling height) doorsets BS4787 Pt. 1 advises options as follows:

2300mm
2350mm
2400mm
2700mm
3000mm

'Work size and door height dimensions are described in BS4787 Pt.1 as follows:

Frame = 2090mm	Door Leaf = 2040mm
Frame = 2285mm	Door Leaf = 2040mm
Frame = 2335mm	Door Leaf = 2040mm
Frame = 2385mm	Door Leaf = 2040mm
Frame = 2685mm	Door Leaf = 2040mm
Frame = 2985mm	Door Leaf = 2040mm

NOTE 1: To provide for these dimensions, the frame head sections must be 30mm with the sill dimension being 15mm.

NOTE 2: By reference to BS4787 Pt.1, it is anticipated that the frame will be fitted with a transom rail to suit the 'standard' 2040mm door leaf height for all storey height doorsets.

Doorset Coordination - Bespoke Projects:

For bespoke projects, the doorset designs and the coordination of the doorsets will be determined by the Designer with due regard to the performance requirements for particular locations in a building with reference to relevant standards and regulations. Considerations should include for the following:

- The nature of the structure into which the doorset is to be fitted including provisions for installation fixings.
- The dimensions of the opening in the wall or partition to receive the doorset.
- The required sizes of the door leaves (**NOTE: maybe subject to performance limitations**).
- The extent to which there is a requirement to align doorset elements between adjacent doorsets in the same building.

NOTE: Doorset elements can include door leaf height levels, glazing aperture levels, hardware positions etc.

- The work to be carried out by the builder in preparation to receive the doorsets.
- Floor finishes and levels.

The following advice provides for guidance for Designers and describes recommended conventions to be applied in the absence of specific design instructions to address the particular issues discussed in this section.

The conventions are based upon guidance to be found by reference to BS4787-1 : 1980 Incorporating Amendment Nos. 1, 2 & 3 'Internal and External wood doorsets, door leaves and frames - Part 1: Specification for dimensional requirements' and BS6750 : 1986 'Modular coordination in building'. However, the conventions are applied in a manner that provides for bespoke doorsets of any size (**subject to performance limitations**) that may be required by the Designer.

Use of doorset designs that use separate architrave provide for greater flexibility and are less demanding with regard to the necessity for pre manufacture planning. Frame designs using integral architrave or 'nibs' or which use 'shadow gaps' around the installed frame require more careful planning in advance of manufacture.

BS4787 Pt. 1 and other standards referred to above identifies the use of a coordinating dimensions. The relevant standards will show the coordinating dimensions to relate to positions

in space between the doorset and the surrounding structure. The method described in this section refers to the 'Prepared Opening'. This is the opening size in the wall or structure to be prepared by the builder to receive doorsets of the desired dimensions and provides for a clear separation between the builders work and the work to be done by the doorset installation contractor.

Frame sectional dimensions have evolved based upon economic use of raw material sizes for timber. Frame jambs and heads using planted doorstops were traditionally moulded from ex. 1¹/₂in. material while frames with moulded doorstops use ex 2in. raw material. This has resulted in maximum finished frame sections of 32mm and 45mm respectively after allowing for trimming and finishing of the timber. Frames of different finished sections may be used (**subject to performance limitations**). A minimum 32mm finished frame section is an essential requirements for some performance doorset designs. Where the frame section dimension is greater than 32mm the door leaf sizes may be reduced to provide for coordination with the building. Where the frame section dimension is less than 32mm it is recommended that the door leaf sizes remain the same but with increased packing between the frame and the surrounding structure.

When installed, it is recommended that the doorset designs should provide for a minimum of 5mm cover of the surrounding structure by the architrave.

NOTE: The term 'Architrave' in this sense can apply to a separate architrave section or an integral architrave (nib).

The determination of precise finished floor levels in advance of manufacture of the doorsets creates a major difficulty in determining doorset component height requirements. The general method suggested in this section provides for a minimum clearance of 20mm from the bottom of the door to the bottom of the frame jamb (**when used without sills**). This allows for the frame jambs to rest upon the hard floor (floor level before the application of floor finishes) permitting the use of floor finishes up to 17mm thickness to leave the 3mm under door operating tolerance required (where threshold seals are not used) by reference to BS4787 Pt.1 and BS5588 - 11 (DD9999) (**for smoke containment doorsets without threshold seals**).

Doorset Coordination - Bespoke Projects contd.

Where the applied floor finishes are less than 17mm, the frame jambs can be reduced on site to provide for a minimum 3mm clearance over the actual floor finish within the installation tolerances provided for by use of a 44mm section architrave.

NOTE: A 44mm section architrave allows for the economic use of timber allowing for the use of ex. 2in (50mm) raw material with minimal wastage. Increased architrave dimensions provide for increased installation tolerances.

Where soft floor finishes (e.g. carpet) are greater than 17mm it may be necessary to trim the bottom edge of the door leaves to provide for the under door operating clearance.

NOTE: Where soft floor finishes are used, it is recommended that jambs extend down to the hard floor finish. Where hard floor finishes (e.g. ceramic tiles) are used, the frame jambs can be reduced with the doorset fitted after laying the tiles.

The general method described above has the advantage of permitting the manufacture of doorsets in advance of final decisions with regard to applied floor finish dimensions. Whereas this method is satisfactory for use with doorset using separate architrave of suitable dimensions for the purpose of accommodating tolerances, there can be some misalignment of doorset components between adjacent doorsets following on site adjustments to suit actual floor finish thicknesses.

Designers may prefer to use doorset systems with integral architrave. Alternatively, doorset designs using shadow features (without architrave) may be desired. A requirement to align doorset elements between adjacent doorset may also be an important design consideration. Where these considerations apply a more precise method for coordination is recommended.

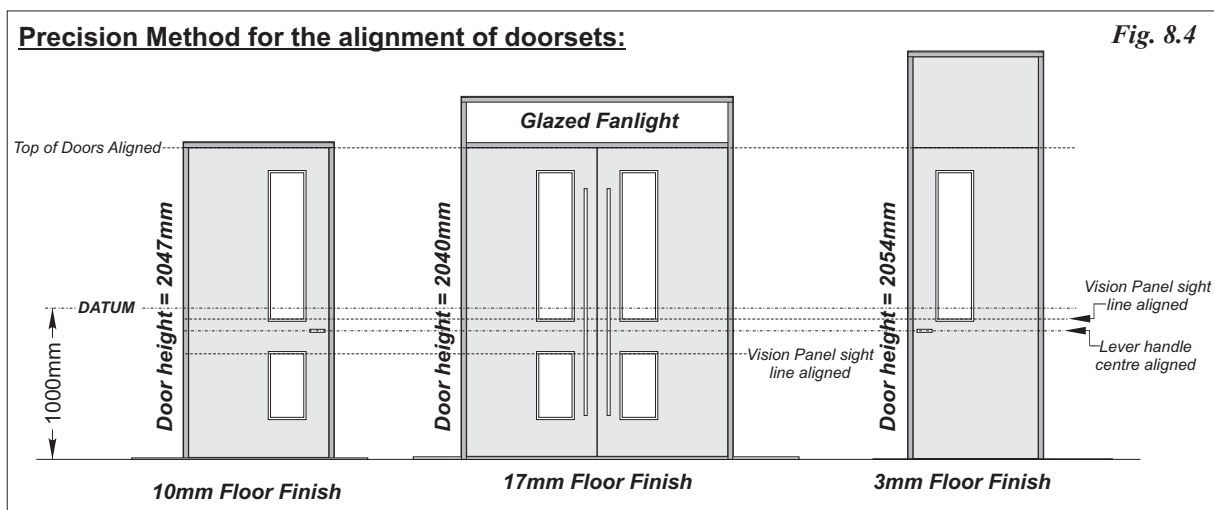
The suggested 'Precision Method' is based upon the use of a building DATUM which is used as a reference by all affected trades.

The DATUM can be shown in project drawings and physically marked in the building for use as a reference by all affected trades including:

- Builder: Construction of Prepared Openings to receive doorsets.
- Doorset manufacturer.
- Doorset Installation Contractor.
- Flooring Contractor.
- Electrical Fittings Contractor. (*for the alignment of wall mounted switches etc.*)
- Other trades required to fit visible products in a coordinated manner.

The DATUM can be set at any height determined by the Designer but for convenience a height of 1000mm above a nominal (hard floor) floor level is recommended. All affected trades can then work independently to suit the DATUM reference.

NOTE: To satisfy the requirements of Building Regulations - (England & Wales) - Approved Document 'M' and BS8300, glazed aperture location dimensions should relate to the sight line of the glass i.e. the clear glass area after beading.

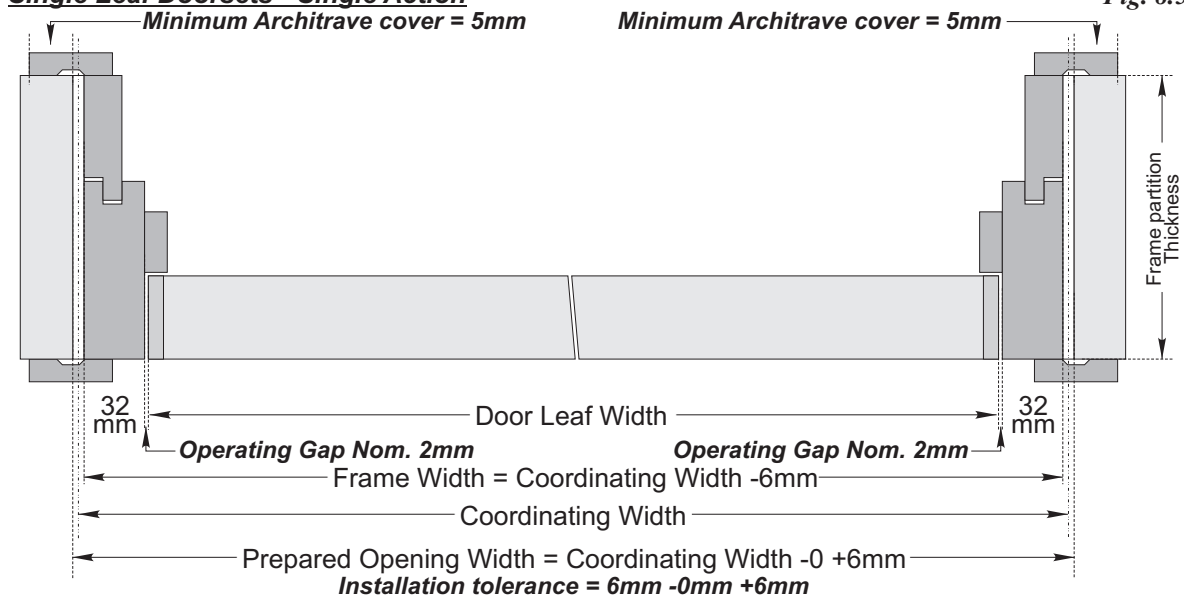


Non Precision - Doorset Coordination Doorset Widths - Single Action Doorsets:

- Generally the cover provided by the architrave allows for generous installation tolerances.
- The architrave, when fitted should provide for a minimum 5mm cover over the surrounding structure.
- The prepared opening width in the structure (or the frame width) should be calculated to provide for a minimum 6mm installation gap in width (min. 3mm at each jamb).
- Prepared openings must carefully formed and must be plumb and square to receive doorsets.

Single Leaf Doorsets - Single Action

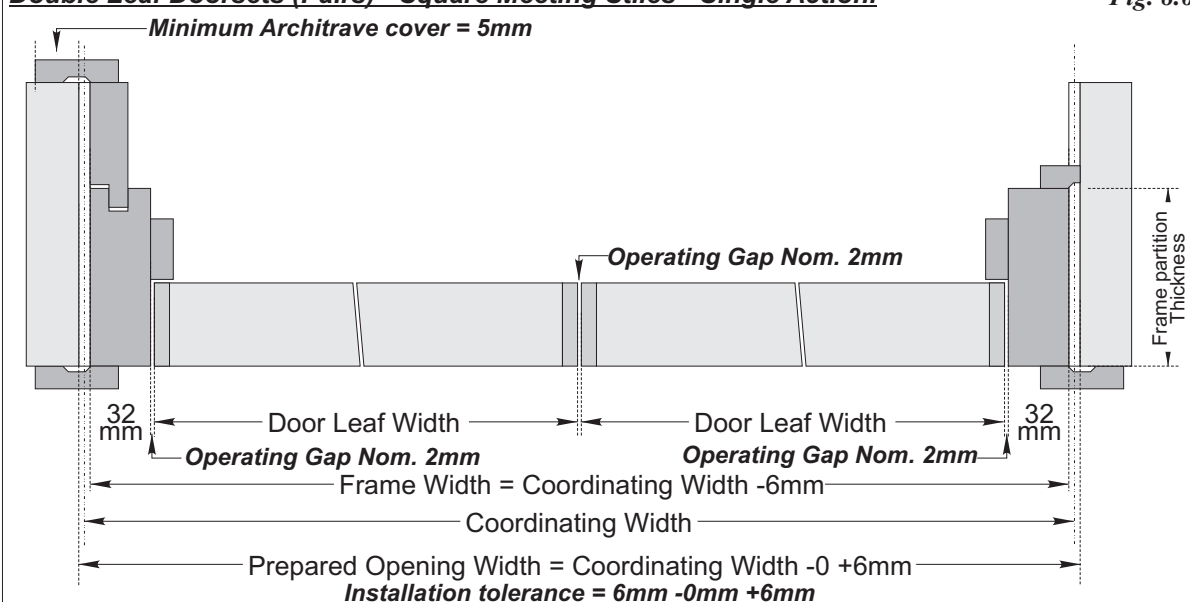
Fig. 8.5



NOTE: The installation tolerance can be increased for frame designs using separate architrave subject to a minimum architrave cover of 5mm over the surrounding structure

Double Leaf Doorsets (Pairs) - Square Meeting Stiles - Single Action.

Fig. 8.6

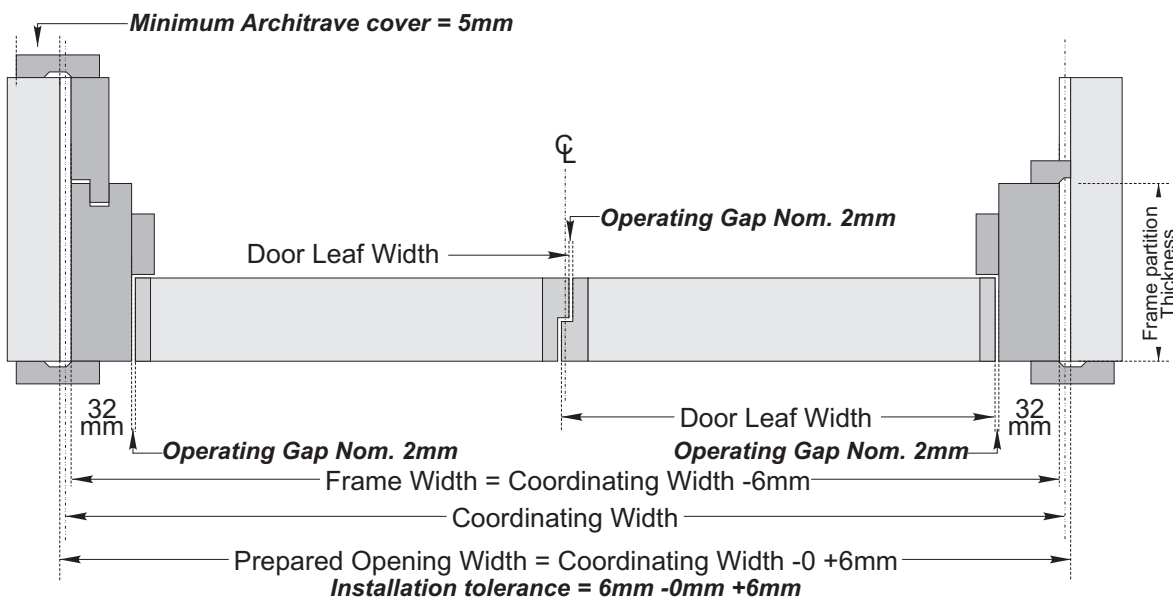


NOTE 1: The installation tolerance can be increased for frame designs using separate architrave subject to a minimum architrave cover of 5mm over the surrounding structure.

NOTE 2: Where door leaves of unequal width are required the door leaf width for the large door should be specified together with the frame width. The handing of the large leaf should also be specified. See 'Method of Handing'.

Double Leaf Doorsets (Pairs) - Rebated Meeting Stiles - Single Action.

Fig. 8.7



NOTE 1: The installation tolerance can be increased for frame designs using separate architrave subject to a minimum architrave cover of 5mm over the surrounding structure.

NOTE 2: Unless otherwise specified requirements for rebated meeting stiles will be satisfied by providing for 12mm rebated meeting stiles achieved by increasing each door leaf width by 6mm. This will essentially mean that the meeting stile gap will be off centre width of the pair on both faces of the doors.

NOTE 3: Where required the operating gap can be positioned to show centre width of the pair of doors to one of the door faces. In this event the Designer should specify the door leaf widths necessary to provide for the desired aesthetic effect. In any event the handing for the first opening door leaf should be specified. See 'Method of Handing'

Non Precision Doorset Coordination Doorset Heights - Door Height Doorsets - Single Action

Coordinating doorsets in height is more difficult due to the number of trades involved. The general method described in this detail is suitable for use with doorsets using separate architrave to cover the junction between the frame and the surrounding structure.

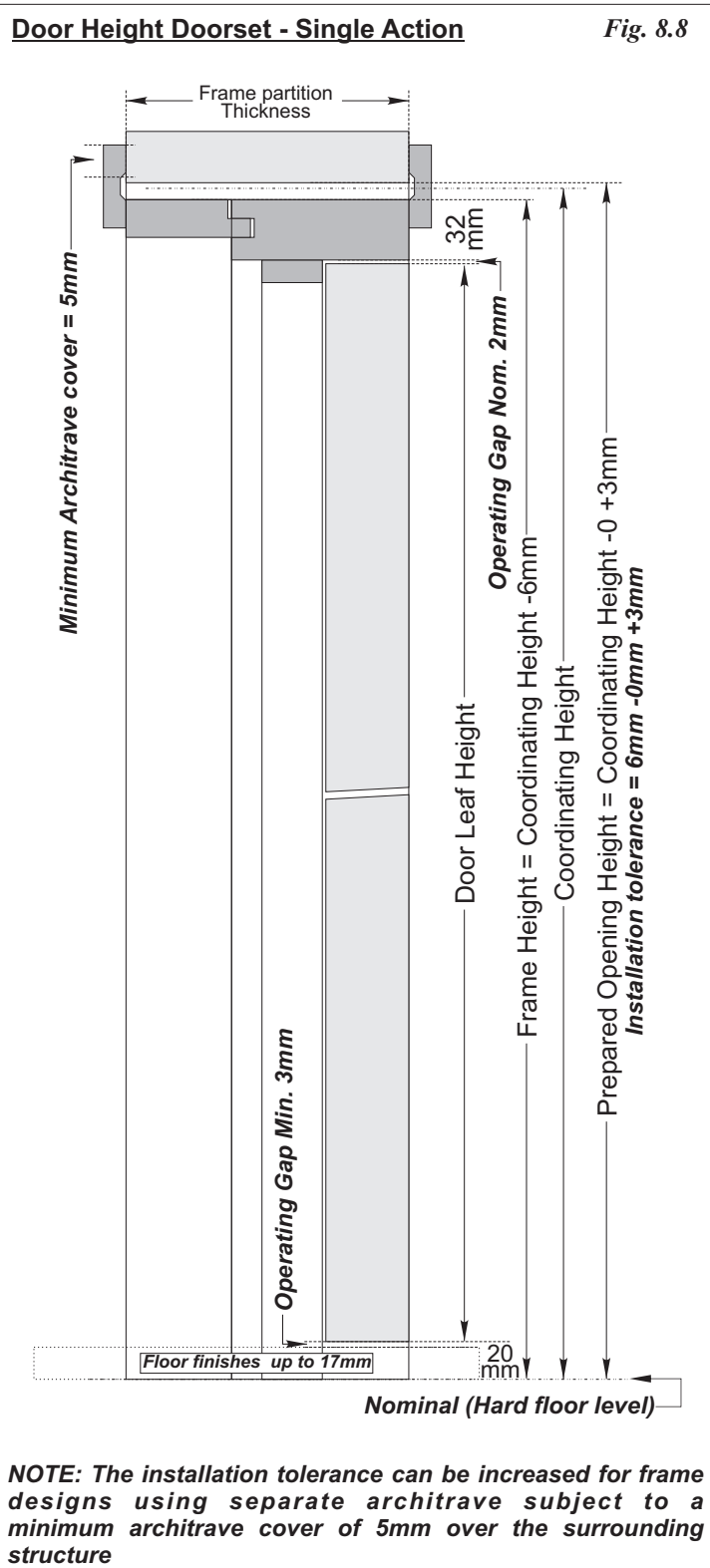
This method provides for the site adjustment of frames to suit actual floor finishes for each site location. The frame jambs are sized to provide for the site reduction of frames by up to 17mm while providing for a Nom. 3mm clearance between the bottom of the door and the top of the floor finish to the satisfaction of BS4787 and BS5588-11 (DD9999) (without additional threshold sealing) for smoke sealed doorsets.

Where under door gaps in excess of 3mm are acceptable or required, this should be clearly defined in the design details for the particular project.

For some performances e.g., smoke sealing, fire performance and sound attenuating performances, the installation contractor should provide for packing between the frame and the surrounding structure. This might require the addition of softwood grounds to be applied to the top of the frame head or the underside of the structure. **NOTE: See BS8214 for Fire Rated doorsets.**

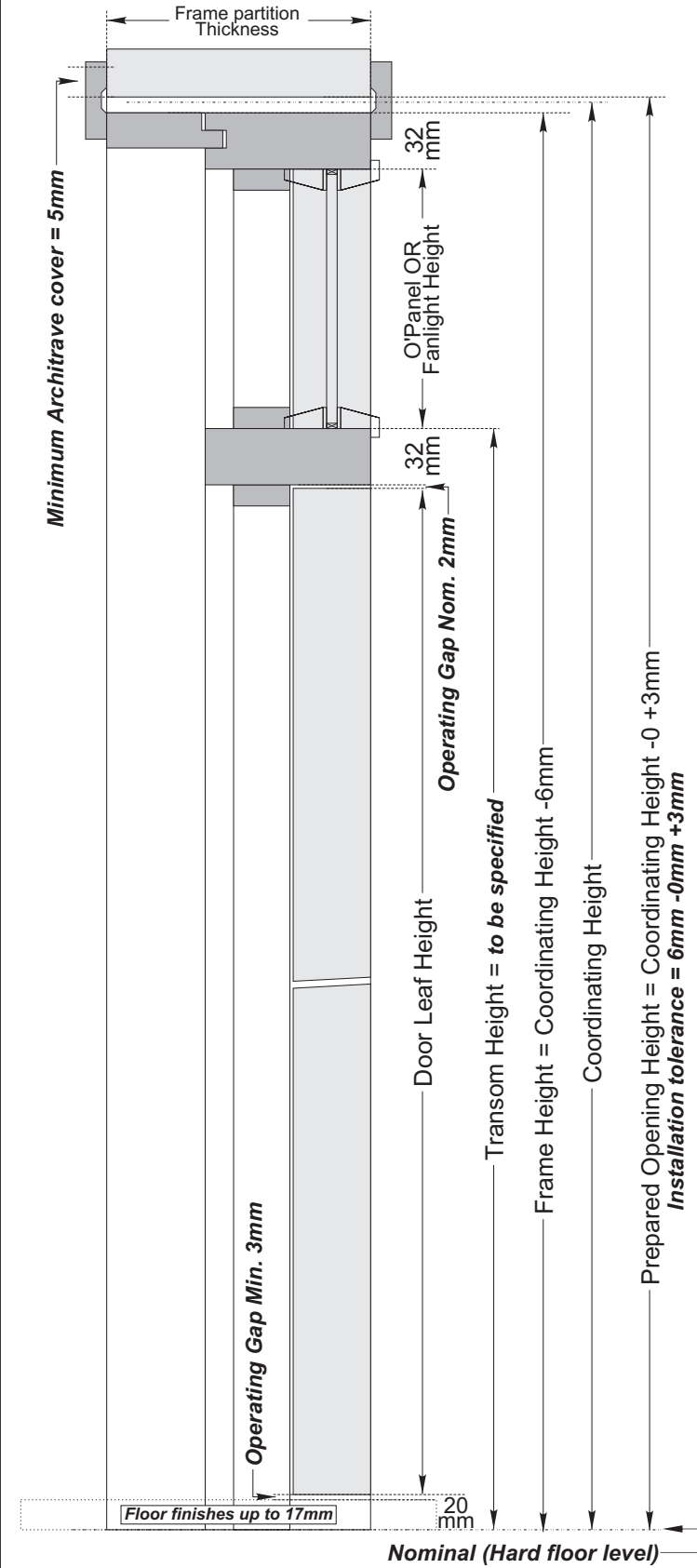
The method of adjustments and dimensional advice described in this section will provide for the minimum 5mm cover over the surrounding structure when used with a nom. 44mm architrave. Designers may vary these details but with a possible requirement that increased size architrave may be required.

As frames may be reduced on site to suit actual location requirements, particularly floor finishes, this method does not provide for the alignment of doorsets or doorset elements (e.g. glazed apertures, hardware) between adjacent doorsets where different floor finishes may be used.



**Storey Height Doorset - Single Action
- Transomed Over panel OR Glazed Fanlight**

Fig. 8.9



Storey Height Doorsets - Single Action - with Transomed Over panel OR Fanlight

For storey height doorsets with transom rails the frame height is calculated in the same manner as for door height doorsets.

Additional instructions are required for the purpose of locating the transom rail height.

Where transomed storey height doorsets are used with door height doorsets on the same project, the transom rail height will generally be set to align with the frame head position for door height doorsets in the absence of any other instructions.

NOTE: The Fanlight beading profile shown in this detail is indicative only to illustrate location. The beading profile and location may be varied to suit performance requirements.

Coordination

**Storey Height Doorsets - Single Action
- with Flush Over panel - Single leaf
doorsets.**

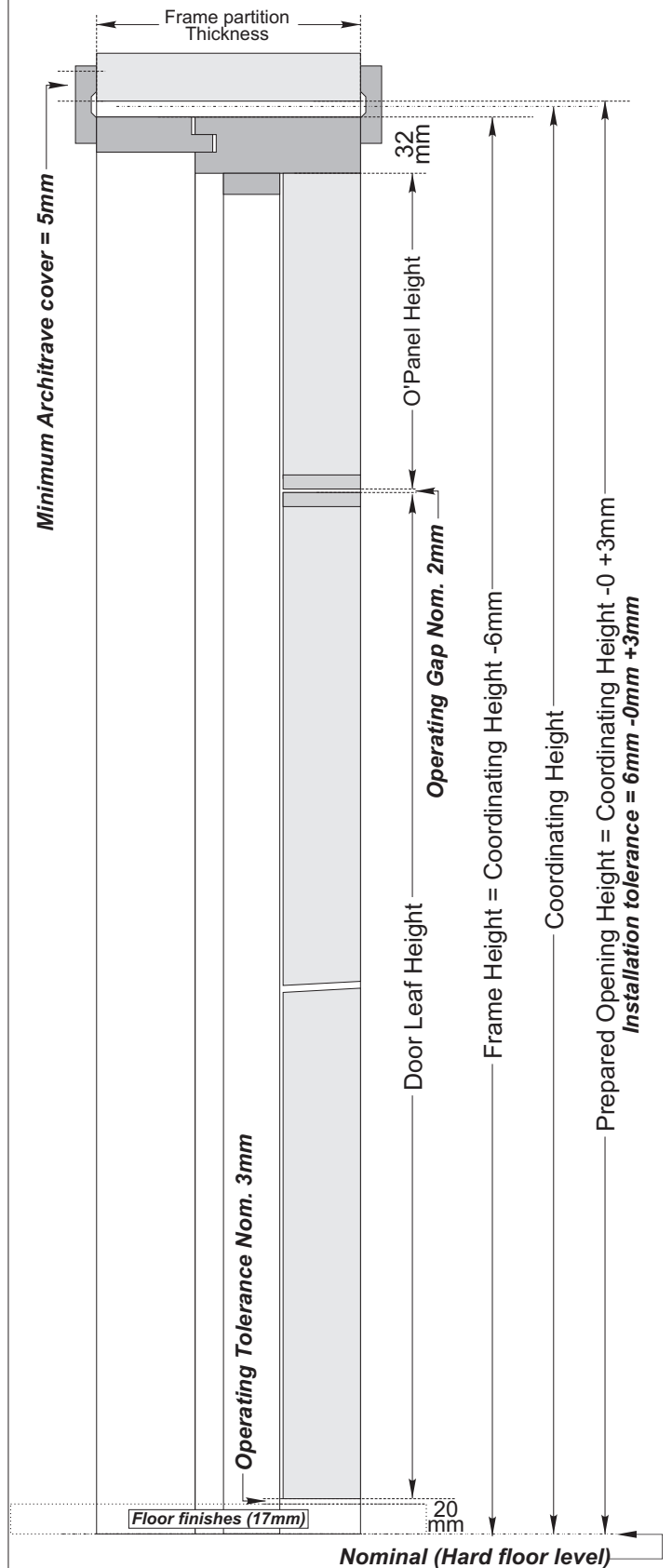
For storey height doorsets with flush over panels the door leaf height will be sized to suit door height doorsets that are specified for the same project.

Alternatively, the door leaf height should be specified by the Designer on a project basis.

NOTE: Unless otherwise specified (and detailed) the overpanel widths will be to the full clear opening width of the frame i.e. door leaf width plus operating gap dimensions. Similarly, the overpanel will fit tight against the frame head unless otherwise specified (and detailed).

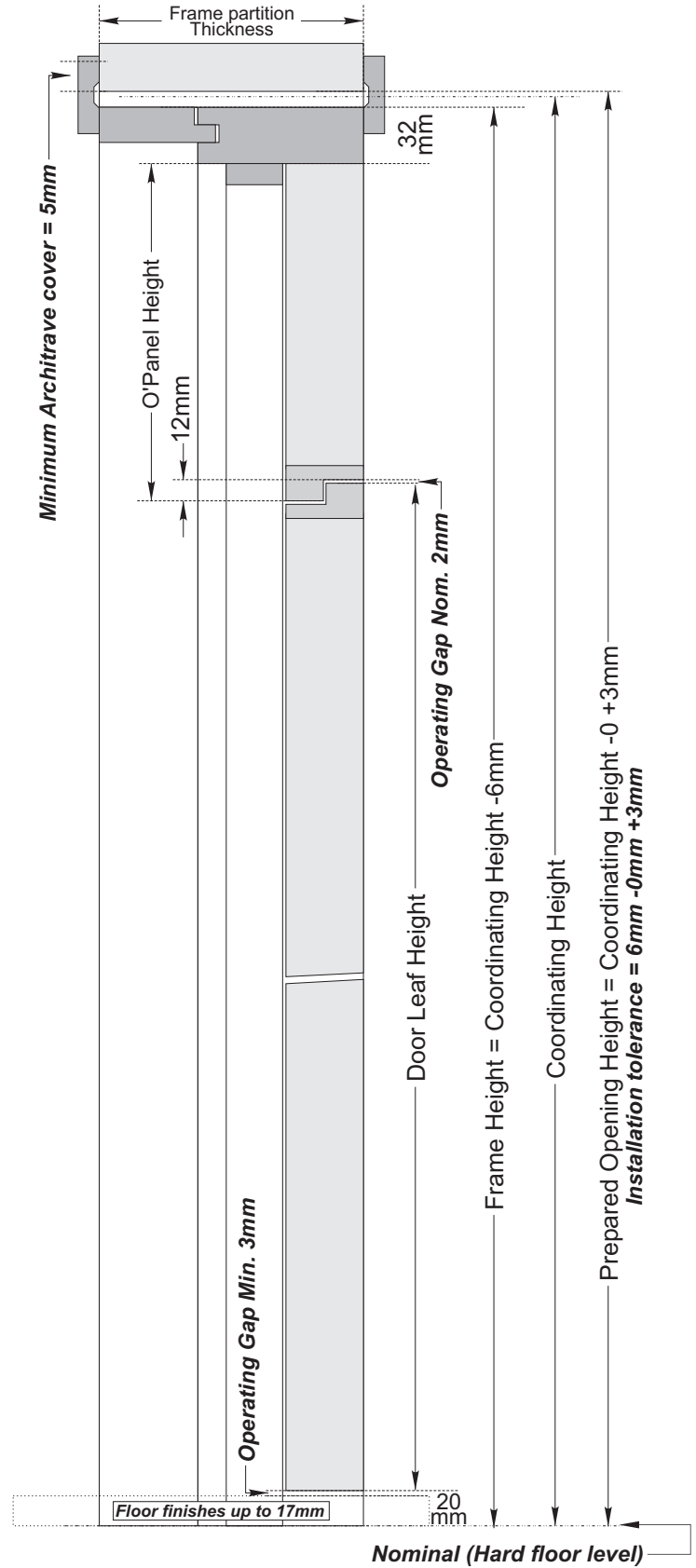
**Storey Height Doorset - Single Action
- Single Leaf - Flush Over panel**

Fig. 8.10



**Storey Height Doorset - Single Action
- Double Leaf (Pairs) - Flush Over panel**

Fig. 8.11



Storey Height Doorsets - Single Action - with Flush Over panels - Double Door Doorsets (Pairs).

For pairs of doors, a doorstop is required at the head of the door to prevent the doors from swinging through. Unless otherwise specified, this is generally achieved by rebating the door leaves to the over panel using a 12mm rebate.

Unless otherwise specified, the door leaf is sized such that the overall height of the door is the same as the door height for single leaf doorsets for the same project. The overpanel is sized to suit the remaining space between the top of the door and the underside of the frame head plus the 12mm rebate depth. i.e. both the door leaf and the over panel are dimensioned to show overall heights.

NOTE: To provide for some performance requirements and / or to suit some hardware fittings, the rebates at the top of the door and bottom of the overpanel may be off set in the thickness of the door.

NOTE: Unless otherwise specified (and detailed) the overpanel widths will be to the full clear opening width of the frame i.e. door leaf width plus operating gap dimensions. Similarly, the overpanel will fit tight against the frame head unless otherwise specified (and detailed).

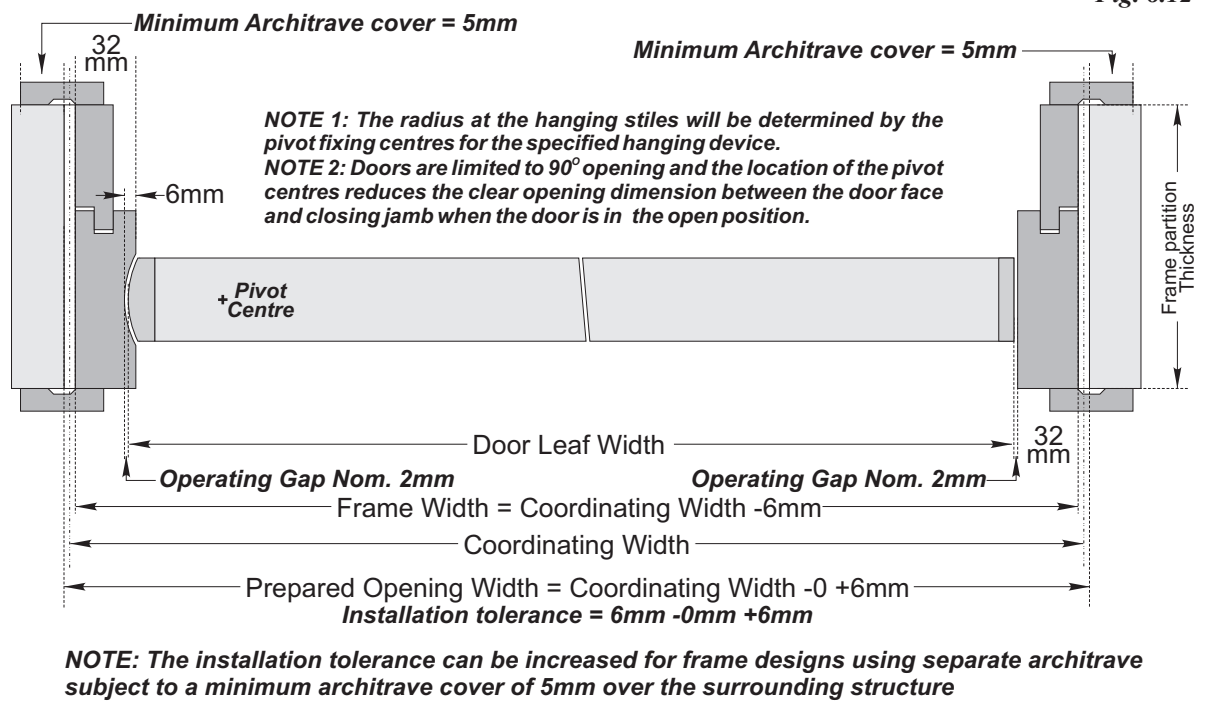
Non Precision - Doorset Coordination Doorset Widths - Double Action Doorsets:

- Generally the cover provided by the architrave allows for generous installation tolerances.
- The architrave, when fitted should provide for a minimum 5mm cover over the surrounding structure.
- The prepared opening width in the structure (or the frame width) should be calculated to provide for a minimum 6mm installation gap in width (min. 3mm at each jamb).
- Prepared openings must carefully formed and must be plumb and square to receive doorsets.

NOTE: Larger frame lining sections are required for some fire door applications - See fire test / assessment data.

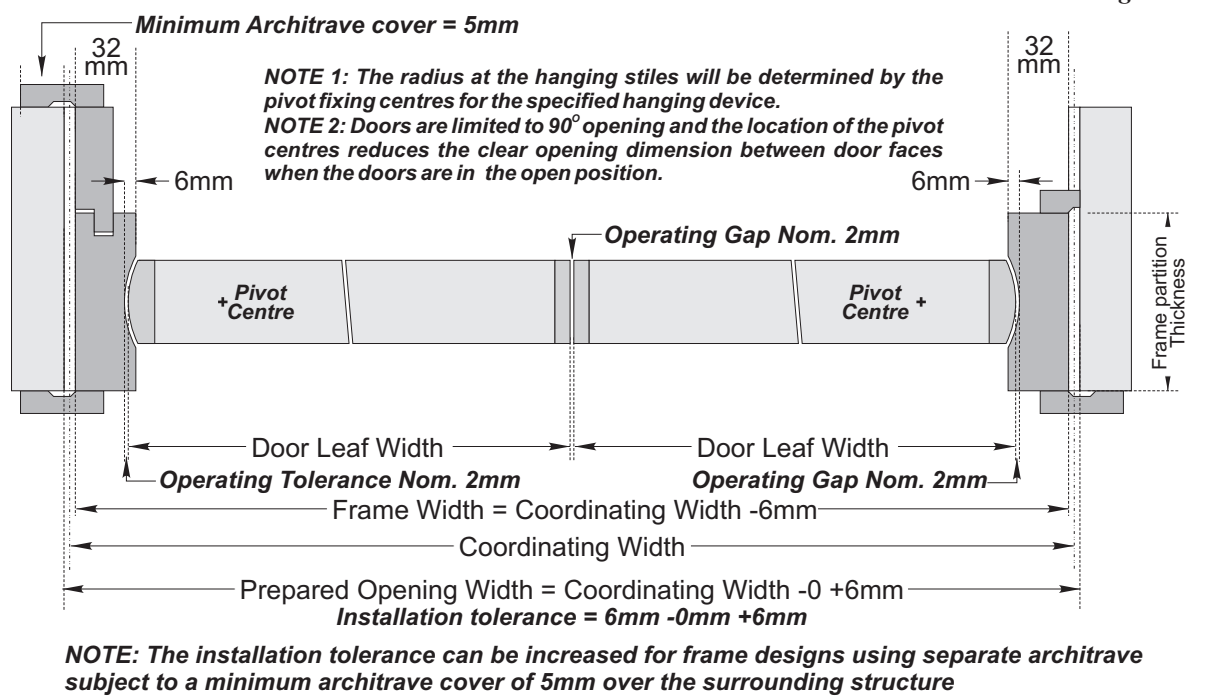
Single Leaf Doorsets

Fig. 8.12



Double Leaf Doorsets (Pairs)

Fig. 8.13

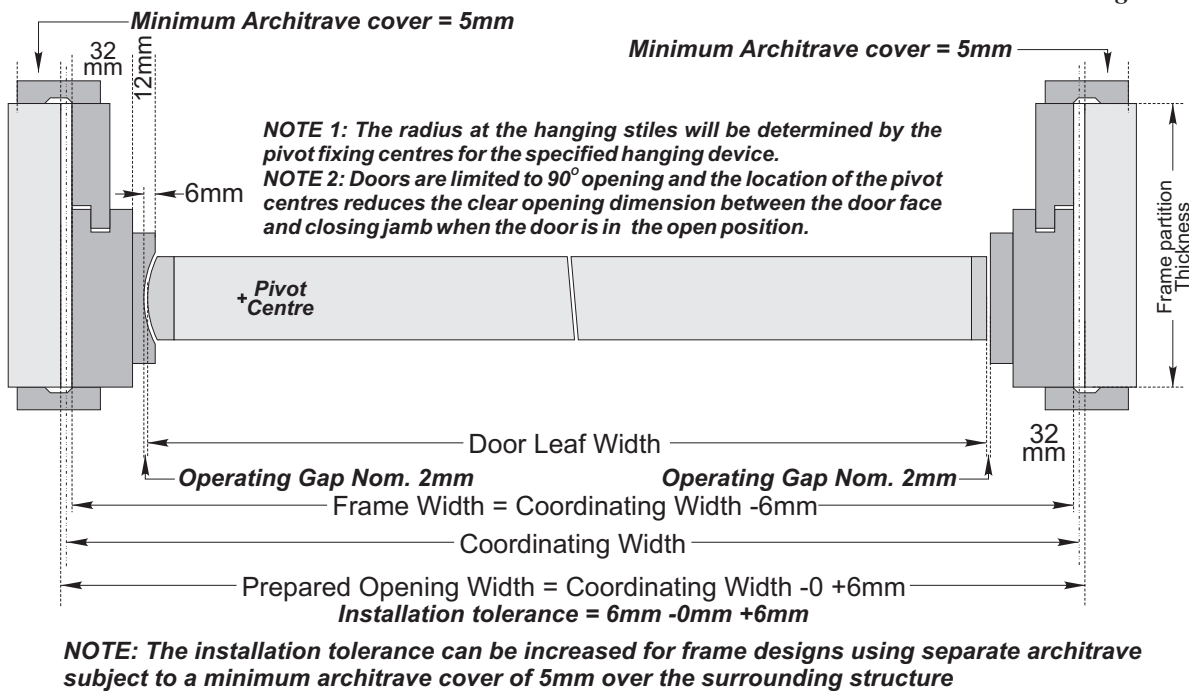


Non Precision Doorset Coordination Doorset Widths - Double Action Doorsets - Option 2:

For some frame designs, or where required by the Designer, saddles are used to cover the joint between split frame components. This will result in reduced door leaf widths for any given frame or coordinating width dimension.

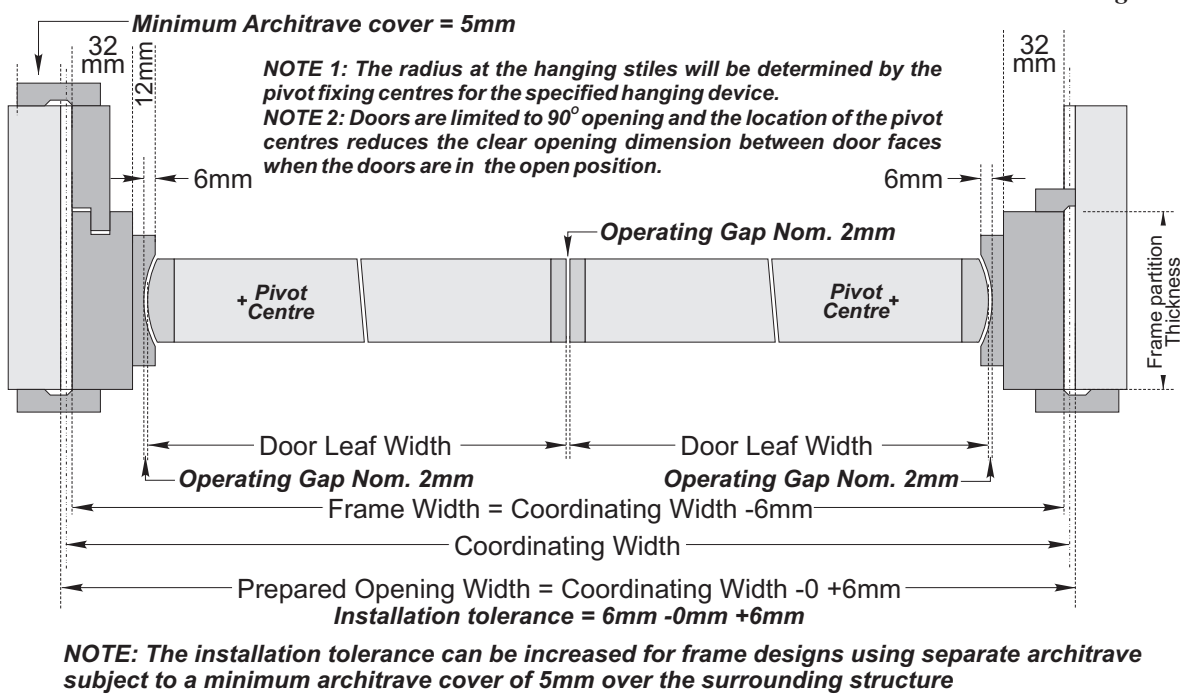
Single Leaf Doorsets

Fig. 8.14



Double Leaf Doorsets (Pairs)

Fig. 8.15



**Non Precision Doorset Coordination
Doorset Heights - Door Height
Doorsets - Double Action:**

This detail shows a typical arrangement for double action doors hung on floor mounted closers. Reference should be made to the particular closer details and fittings with the closer details to take precedence in the event of any conflict with the following advice.

To provide for the housing of the top pivot fixings it is recommended that the frame nose dimension is increased from 32mm to 45mm with a corresponding reduction in the door leaf height.

NOTE: It is possible to use a 32mm head section. However, in this event the top pivot fixing may extend into the prepared opening space at the head of the frame. This is not recommended for doorsets in locations required to provide for fire rated or acoustic performances.

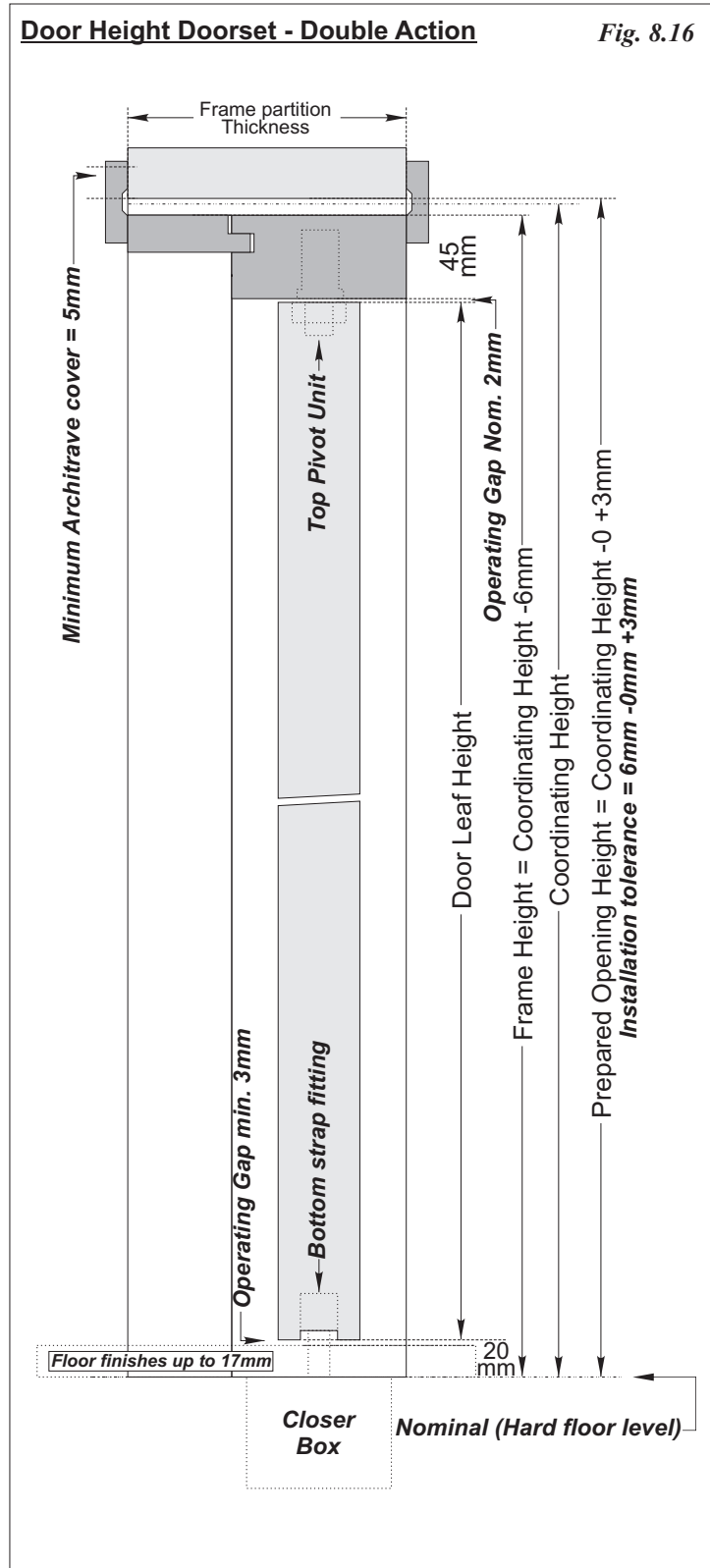
The particular closer details will give recommendations with regard to the clearance to be allowed from the top of the floor finish and the bottom of the double action strap fitting. With some closer designs the strap fittings can be recessed into the bottom edge of the door to provide for an under door gap between the bottom of the door and the top of the floor finish of not exceeding 3mm to the satisfaction of BS4787 and BS5588-11 (DD9999) (for smoke sealed doorsets without additional threshold sealing). In this case the dimension from the top of the floor finish to the underside of the strap fitting is generally in the region of 8mm and it may be necessary to notch the heel of the door to aid installation.

The floor mounted closer manufacturer will usually offer a range of spindle lengths to suit variations in floor finishes such that the floor mounted closer box can be installed relative to the 'hard floor' level (before the application of floor finishes).

As with single action doorsets, frame jambs can be reduced by up to 17mm on site to suit actual floor finishes.

Door Height Doorset - Double Action

Fig. 8.16

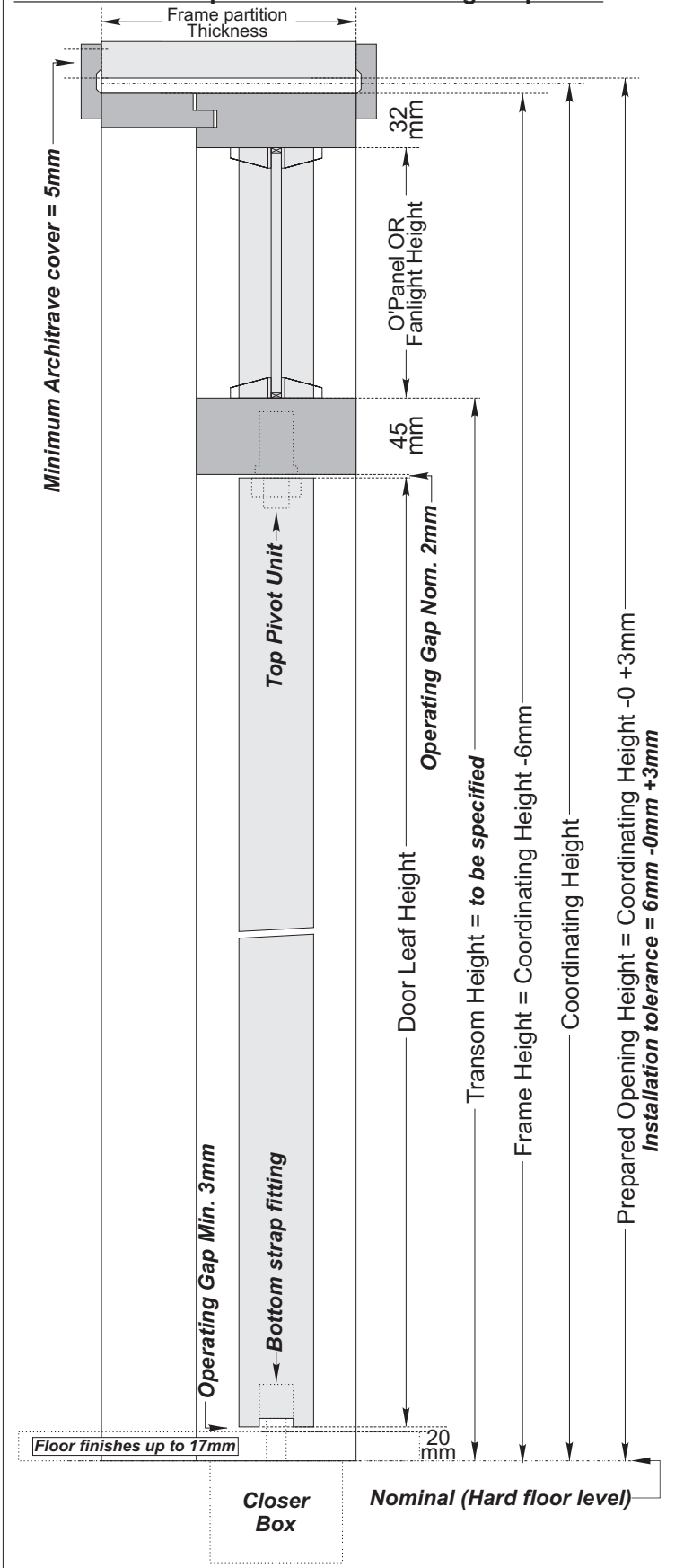


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Storey Height Doorset - Double Action - Transomed Over panel OR Glazed Fanlight Option 1

Fig. 8.17



Storey Height Doorsets - Double Action - with Transomed Over panel OR Fanlight Option 1

For double action storey height doorsets with transom rails the frame height is calculated in the same manner as for door height doorsets.

Additional instructions are required for the purpose of locating the transom rail height.

It is recommended that the transom rail dimension is increased from 32mm to 45mm, with a corresponding reduction in the door leaf height to provide for the housing of the top pivot fixings

NOTE: Unless otherwise specified (and detailed) the over panel widths will be to the full clear opening width of the frame i.e. door leaf width plus operating gap dimensions. Similarly, the over panel will fit tight against the frame head and transom unless otherwise specified (and detailed). The scallop in the frame will be stopped at the top of the door leaf to the underside of the transom. Where saddles are used the saddle will stop at the underside of the transom rail.

NOTE: Unless otherwise specified, the transom rail will be located at a position to align with the head of other door height double action doorsets for the same project.

NOTE: The Fanlight beading profile shown in this detail is indicative only to illustrate location. The beading profile and location may be varied to suit performance requirements.

Coordination

Storey Height Doorsets - Double Action - with Flush Over panel - Single leaf doorsets.

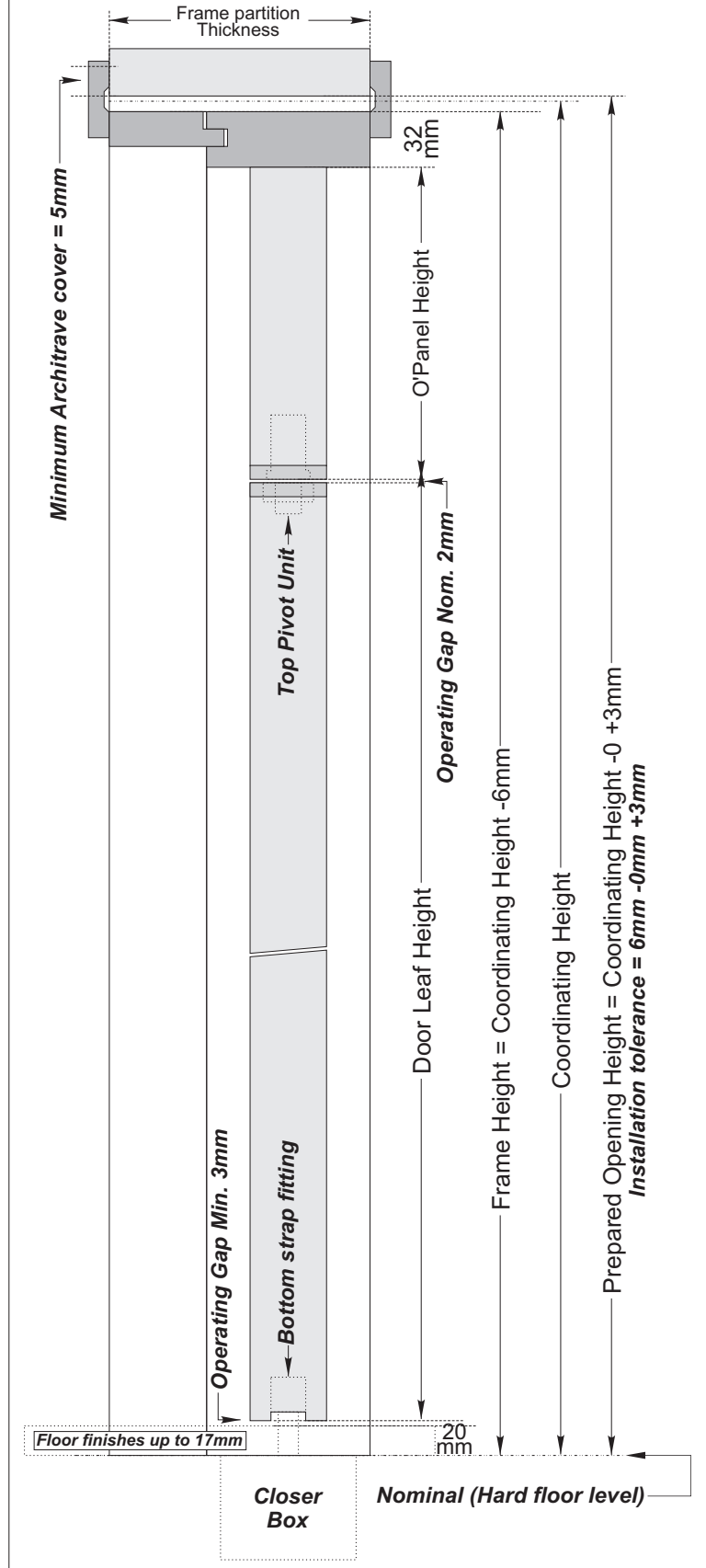
For storey height doorsets with flush over panels the door leaf height will be sized to suit door height doorsets that are specified for the same project.

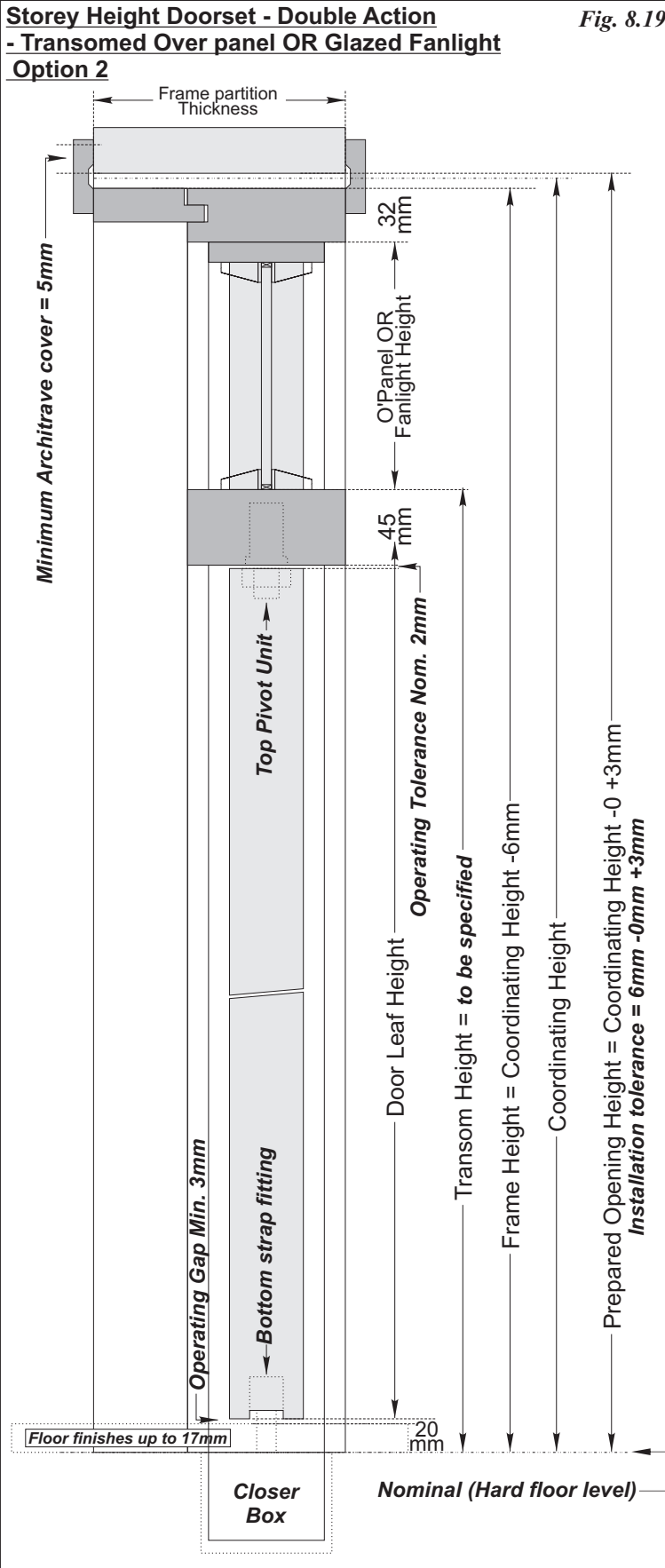
Alternatively, the door leaf height should be specified by the Designer on a project basis.

NOTE: Unless otherwise specified (and detailed) the over panel widths will be to the full clear opening width of the frame i.e. door leaf width plus operating tolerance dimensions. Similarly, the over panel will fit tight against the frame head unless otherwise specified (and detailed). The scallop in the frame will be stopped at the door leaf height to the underside of the over panel. This detail is not recommended for use with frame designs using saddles.

Storey Height Doorset - Double Action - Flush Over panel

Fig. 8.18





Storey Height Doorsets - Double Action - with Transomed Over panel OR Fanlight. Option 2

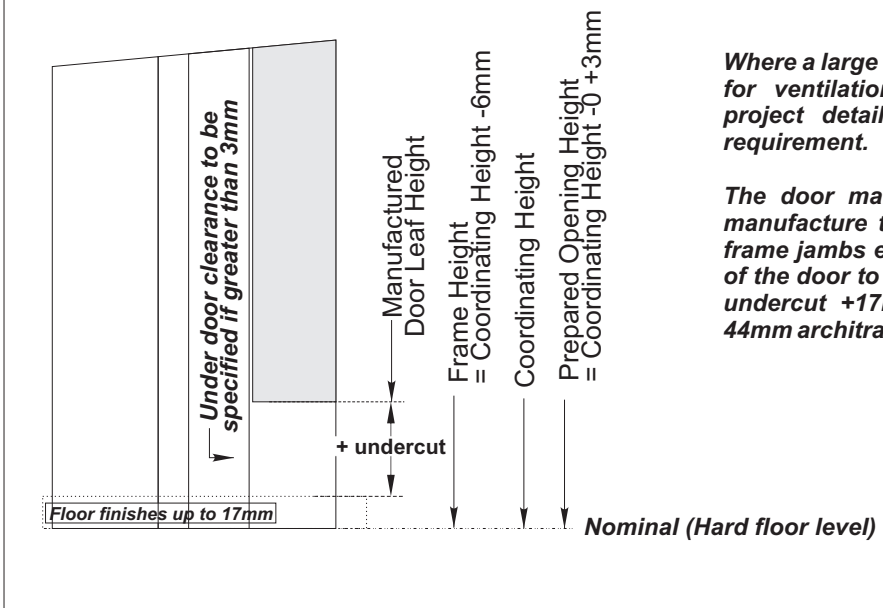
For frame designs using saddles, the saddles are applied to the jambs and head with saddles to butt to both sides of the transom rail. Square faced (not scalloped) saddles will be used at the over panel / glazed fanlight position.

NOTE: Unless otherwise specified, the transom rail will be located at a position to align with the head of other door height double action doorsets for the same project.

NOTE: The Fanlight beading profile shown in this detail is indicative only to illustrate location. The beading profile and location may be varied to suit performance requirements.

Site Adjustments - Under Door Clearances:

Fig. 8.20



Where a large undercut is required e.g. for ventilation, the specifications / project details should identify this requirement.

The door manufacturer should then manufacture the doors such that the frame jambs extend below the bottom of the door to the size of the specified undercut +17mm when used with a 44mm architrave.

Increased Door Undercut:

The general coordination method provides for frames to be manufactured such that the bottom of the frame jamb extends 20mm below the bottom of the door leaf for location where a 3mm under door gap (above finished floor level) is required to satisfy BS4787 and BS5588-11 (DD9999) (for smoke sealed doors without additional threshold seals).

The 'Hard Floor' level described in these details is the floor level before the application of floor finishes. Floor finishing materials can be many and varied including carpet with or without underlay, ceramic tiles, vinyl tiles etc. Where the floor finishing materials are less than 17mm this method provides for frame jambs to be reduced on site to suit.

For ceramic tiled areas the tiles can be laid before the doorset is installed. In other cases e.g. for carpeted areas the frames are generally fitted to suit the hard floor finish before the flooring is laid.

Where the 17mm floor finish allowance provided for by these details is insufficient OR, where an increased under door clearance over the

finished floor level is required (e.g. for ventilation), door leaves may be reduced in height on site where minor adjustments are required. Alternatively, door leaves can be manufactured to a reduced height to suit the under door clearance requirements specified in project documents with a corresponding increase in the 20mm dimension from the bottom of the door to the bottom of the frame jambs allowed for the purpose of manufacture.

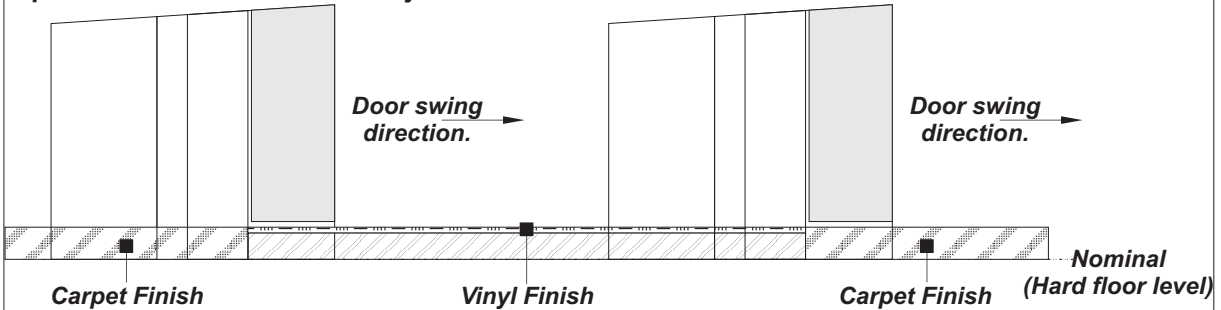
Where these considerations apply, it is recommended that the Designer should ensure that the project details identify the requirement. The doorset manufacturer should then add the door undercut dimension to the 'standard' dimension allowed from the bottom of the door to the bottom of the frame jamb.

Example: If a 50mm undercut is required to provide for (say) ventilation. This is 47mm greater than the 3mm allowance normally provided for. The door leaf height would be reduced by 47mm and the dimension from the bottom of the door to the bottom of the frame jambs would be increased from 20mm to 67mm to provide for the same degree of site adjustment. To define this requirement project details should advise: Door undercut = +50mm.

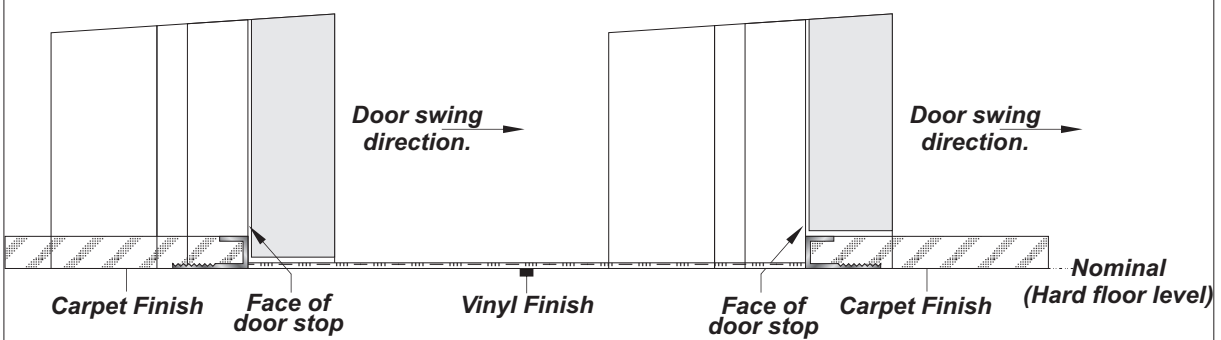
Change of Finished Floor levels:

Fig. 8.21

Option 1 - Hard Floor Levels adjusted to suit floor finishes:



Option 2 - Variable height floor levels to suit floor finishes:



Change of Floor Finish:

In many cases the levels for the hard floor will be varied such that the finished floor levels when the flooring is laid will be a constant throughout the building. (*Option 1*).

In other cases the finished floor levels will vary with the possibility that there will be a change of floor finish at the doorset positions. (*Option 2*).

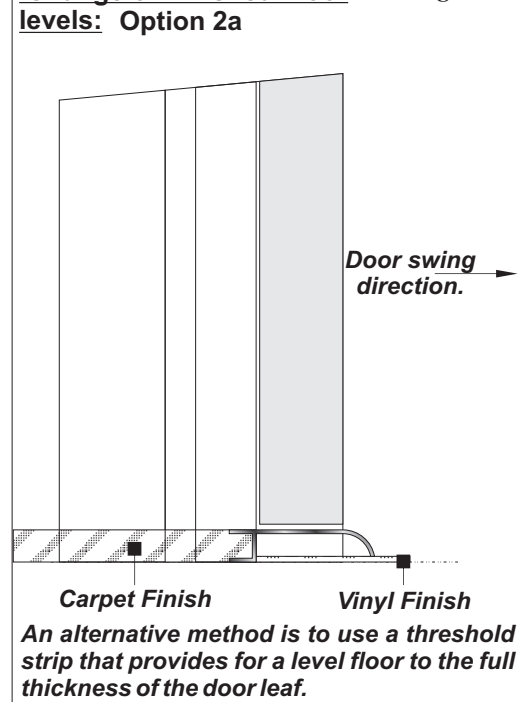
For single action doors it is recommended that the change of floor levels should be planned to align with the face of the doorstop. Alternatively threshold strips may be used. (*Option 2a*). In both cases the floor level should be a constant within the thickness of the door.

Using the general method suggested in this section, the frame jambs will be adjusted on site to provide for a finished floor level up to 17mm above the hard floor level (*using a 44mm architrave*).

For double action doors it is recommended that the change of floor level should be planned such that the higher floor level extends through the whole thickness of the door. This will ensure that the doors will clear the floor during the whole of the swing.

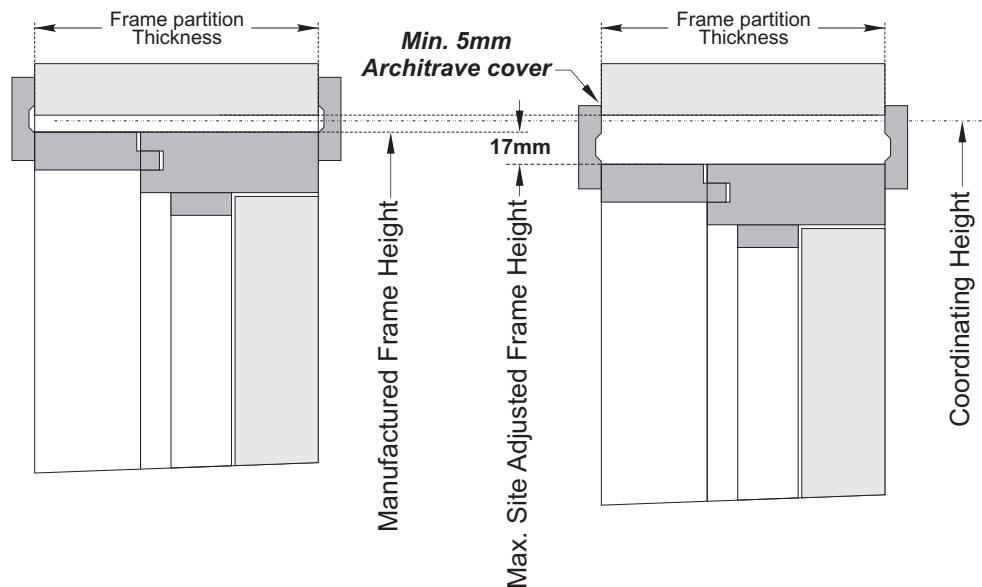
Change of Finished Floor levels: Option 2a

Fig. 8.22



Frame Height Adjustment to suit Finished Floor levels - (44mm Architrave):

Fig. 8.23



Frame Height Adjustment:

The general method suggested in this section provides for the frame jambs to extend 20mm below the bottom of the door leaf (plus additional undercut where specified).

This provision will allow for the use of floor finishes up to 17mm thickness when used with a 44mm architrave. The frame jamb dimensions can be further extended with increased scope for adjustment where an architrave section greater than 44mm is used.

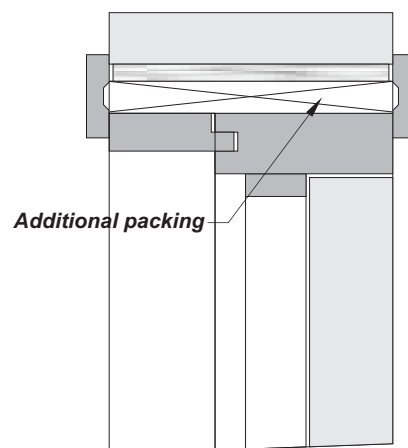
If a floor finish is not used, or where the floor finish is less than 17mm, the frame jambs can be reduced on site to provide for the desired under door clearance over the actual floor finish where the maximum reduction to the frame jambs does not exceed 17mm.

Where the maximum 17mm site reduction is carried out, this will provide for a Nom. 3mm under door clearance above the hard floor level.

Where performance doorsets (e.g. fire rated and sound attenuating doorsets) are adjusted in this manner, additional packing is required at the head of the doorset.

Reduced Height - Performance Doorsets

Fig. 8.24



For some performance doorsets e.g. fire rated and sound attenuating doorsets, additional packing is required at the head of the doorset where the doorset height is reduced to suit floor conditions.

Reference should be made to BS8214 to test / assessment data relating to the particular performance to determine requirements of this nature.

Doorset Coordination - Operational Considerations - Door Growth Formula:

Fig. 8.25

When a door operates it will swing around the axis of the hanging device. The actual operating gap required for the door leaf to clear the frame (or adjacent door if a pair) will vary according to the following formula:

$$\left[\sqrt{(a-b)^2 + (c-d)^2} \right] + a - b$$

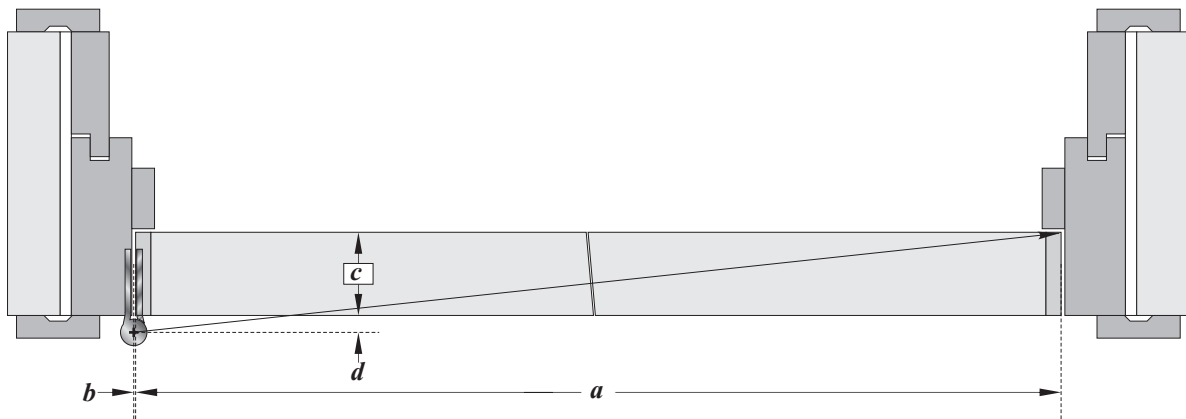
a = Door leaf width.

b = Dimension from the hanging stile to the pivot centre of the hanging device.

c = Door leaf thickness.

d = Dimension from the opening face of the door to the pivot centre of the hanging device.

NOTE: Dimensions *b* & *d* can be a negative figure for double action doorsets.



Adjusting for Door Growth:

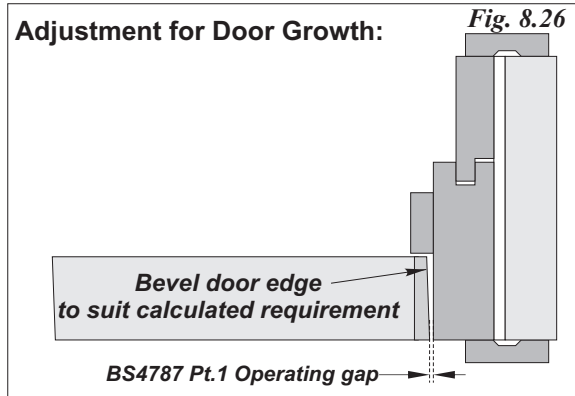
For wide and thin doors it is likely that 'door growth' will not create problems as the growth takes place within the operating gaps provided for by reference to BS4787 Pt.1.

Door Growth can become a problem where thick / narrow doors are used. e.g. a 600mm wide x 54mm thick door hung on single action pivots with a 32mm projection to the pivot centre will require an operating gap of 6 ~ 7mm between the door edge and the closing jamb for the door to clear the frame.

The operating gaps described by reference to BS4787 Pt.1 should always be measured from the opening face of the door excepting at the threshold where the measurement applies at any point within the thickness of the door.

Adjustments to accommodate 'door growth' should be made to suit the particular location and by bevelling the closing stile of the door.

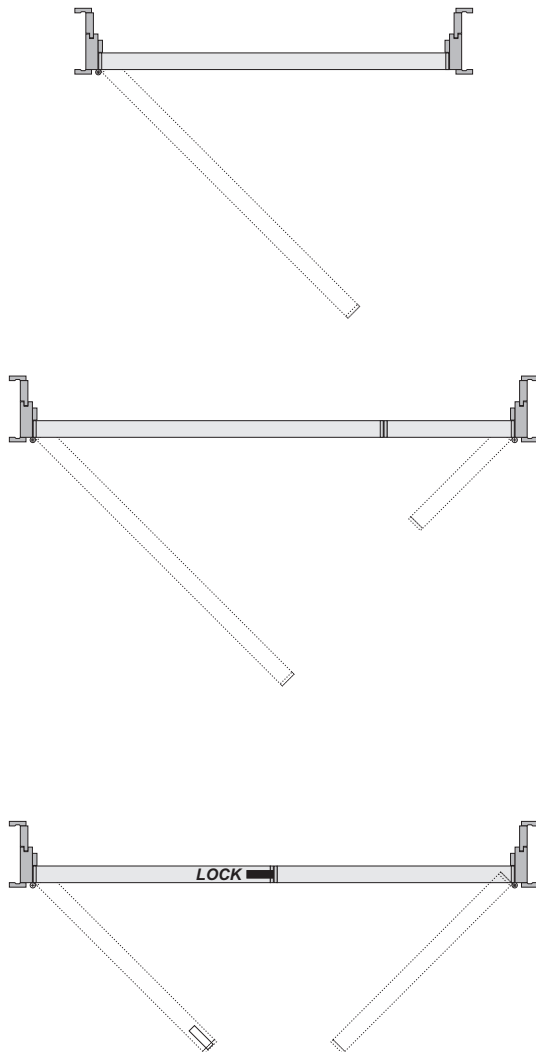
Some door manufacturers offer a 'factory bevel' service as an optional extra. This service usually provides for a fixed 2 ~ 3° bevel that will suit most circumstances.



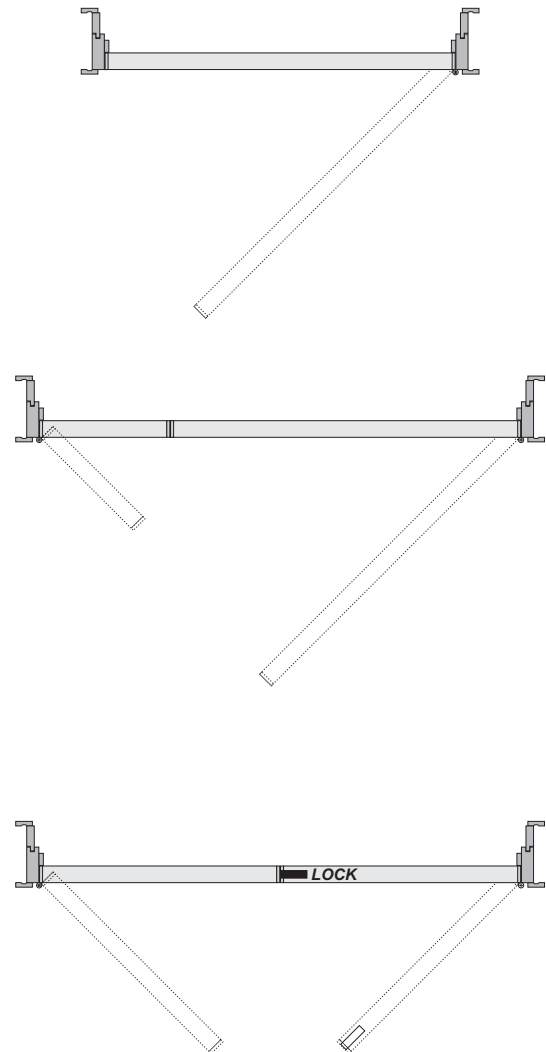
Method of Handing:

Fig. 8.27

LH (Left Hand) Doorsets:



RH (Right Hand) Doorsets:



Method of Handing:

The recommended Method of Handing is culled from BS EN 12519 : 2004 which is extended to include unequal pairs.

When facing the opening face of the door, if the knuckle of the hanging device is to the left then this is a LH (Left hand) door. If the knuckle is on the right then this is a RH (Right hand) door.

For unequal pairs the doors are handed in the same manner, relative to the wider door leaf.

For equal pairs, the doors are handed in the same manner but related to the 'active' leaf, i.e. first operating leaf. This will generally only apply to rebated pairs but may also apply to doors fitted with a latch or lock with the handing defined to describe which leaf is to be fitted with this hardware.

Locating Apertures:

Whereas variations in door undercut might be relatively common, it is unusual to require an air space between the top of the door and the head of the frame. Where this is a requirement, precise details should be provided by the Designer.

As variations in undercut usually apply to the bottom edge of the door, most manufacturers will locate apertures in height relative to the top edge of the door leaf.

Information required by the manufacturer to locate apertures is shown in these details.

For the 'general method' described in this section measurements are taken relative to the top edge of the door in height and the closing stile in width with two essential dimensions in each plane required:

- 1/ A reference dimension = $R1$ & $R2$ in this detail.
- 2/ An aperture dimension = $d1$ & $d2$ in this detail.

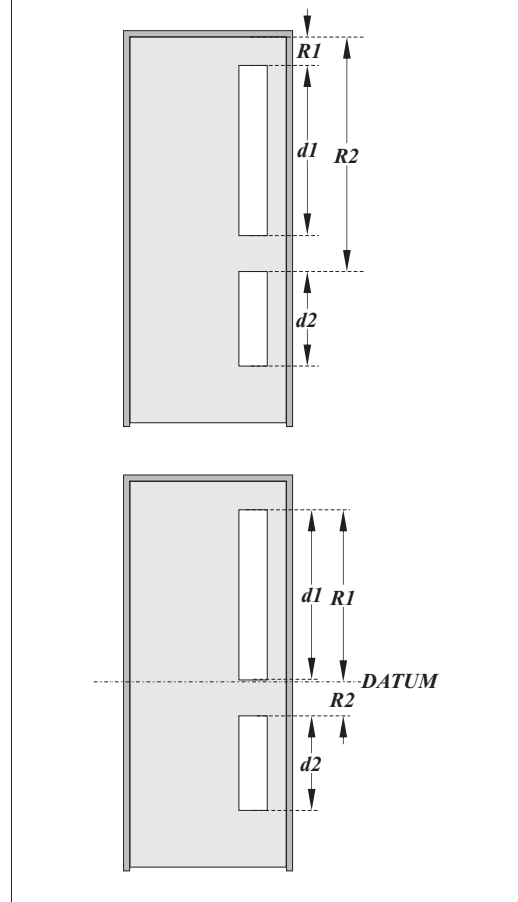
For the 'precision method' all components are located relative to a **DATUM**. The principle however remains the same in that a reference dimension and size dimension is required for each aperture.

Primarily as a consequence of the influence of Building Regulation - (England & Wales) - Approved Document 'M' and the related BS8300, the dimensions related to glazed apertures will be assumed to refer to the clear glass dimensions (the vision area after beading), unless otherwise specified. The door manufacturer should then cut the aperture in the door leaf to suit the beading dimension that may vary according to performance. (See Glass & Glazing - Section 6)

For apertures other than glazed apertures (e.g. to receive grilles), the apertures will be cut to suit specified dimensions.

Locating Apertures:

Fig. 8.28



NOTE 1: For rebated pairs of doors, the reference dimension to locate the aperture will generally be taken from the widest edge of the door unless otherwise specified in project details.

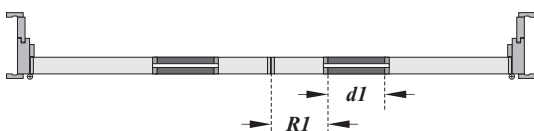
NOTE 2: Reference should be made to test / assessment data relating to the particular performance when locating apertures in fire rated doorsets.

Locating Glazed Apertures in Width:

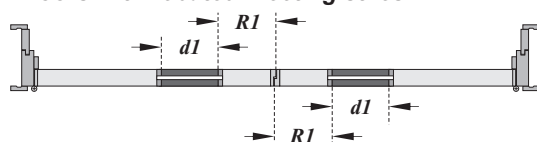
Fig. 8.29

Determine the reference dimensions $R1$ relative to the closing stile of the door leaf.

Square edged doors:



Doors with rebated meeting stiles:



Locating Hinges:

Whereas variations in door undercut might be quite common, it is unusual to require an air space between the top of the door and the head of the frame. Where this is a requirement, precise details should be provided by the Designer.

As variations in undercut usually apply to the bottom edge of the door, most manufacturers will locate hinges relative to the top edge of the door leaf.

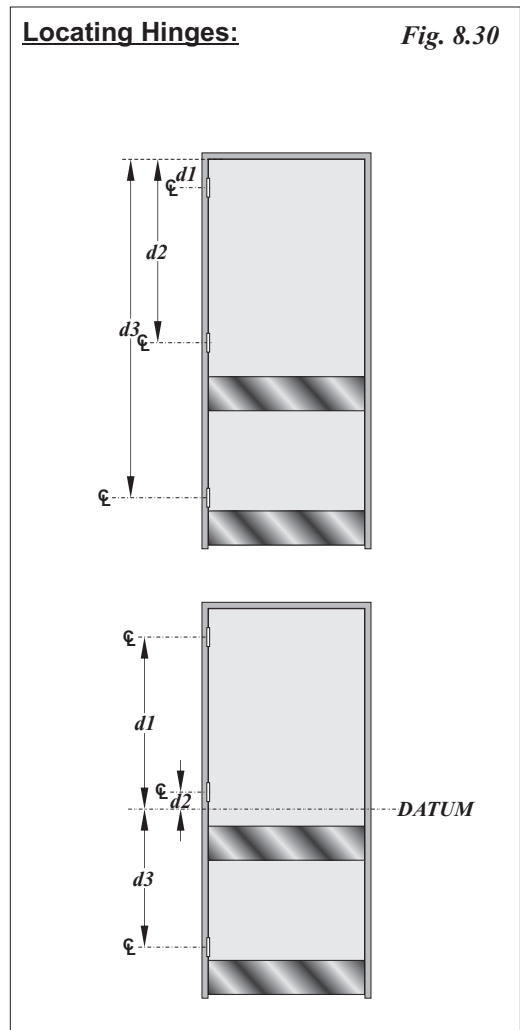
For the 'general method' described in this section measurements are taken relative to the top edge of the door.

For the 'precision method' described elsewhere in this manual all components, including hinges are located relative to a **DATUM**.

Requirements and restrictions relating to the location of hinges (i.e. dimensions *d1*, *d2* & *d3* in these details) may be found by reference to the hinge manufacturers technical data. Otherwise hinges may be located to suit Designers instructions.

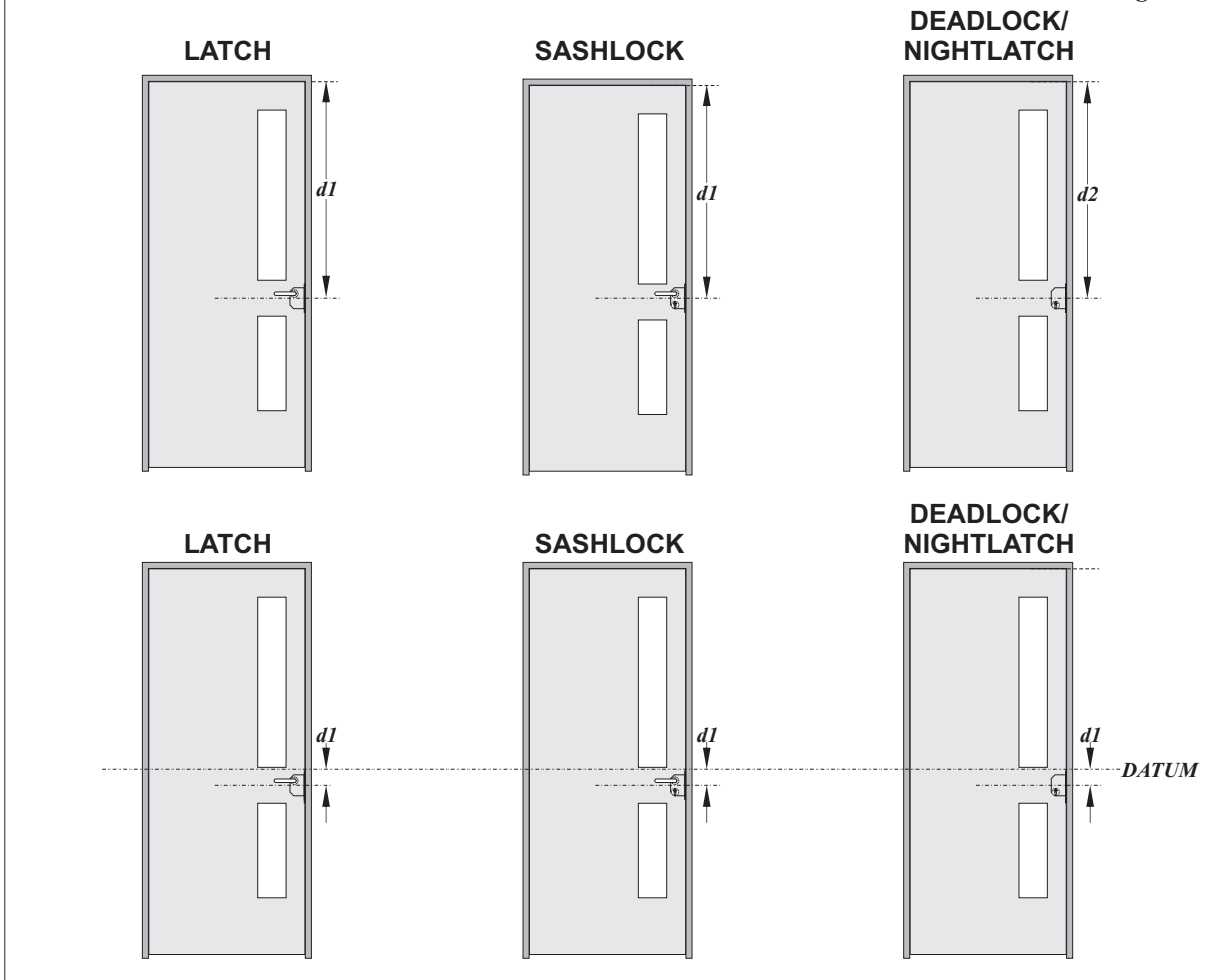
For fire rated doors reference should be made to the fire test / assessment data relating to the particular performance which may place restrictions with regard to the hinge type and location.

Consideration should be given to the location of other hardware when locating hinges, in particular conflict with metal protection (kick & buffer plates) should be avoided.



Locating Locks / Latches:

Fig. 8.31



Locating Locks / Latches:

There are numerous designs of latches and locks, some of these use the same size case for different functions, for other designs the cases may vary according to function.

For most bespoke projects, Architects and Designers are mainly concerned with the visible elements i.e. lever handles and cylinders / escutcheons.

For the 'general method' described in this document it is recommended that securing hardware is located relative to the top edge of the door for the same reasons as stated for apertures and hinges. For the 'precision method' these items should be located relative to the project DATUM.

Depending upon the design of the securing hardware, the locks / latches can be located in a manner that relates to the visual elements, alternatively, and particularly where common case dimensions for each function are used, securing hardware of this type can be located to centre the mortise. (As illustrated).

NOTE 1: Care should be taken to avoid conflicts between the location of securing hardware and glazed apertures.

NOTE 2: For some fire door applications it is necessary to use intumescent gaskets, generally under the lock / latch forend and under strike plates. It is the responsibility of the person fitting hardware to ensure that intumescent gaskets complying with test / assessment data relating to the door leaf construction and / or the particular hardware product are fitted in accordance with the fire test / assessment data.

Frame Designs:

The information provided in this section is advisory only and provides for general guidance in respect of matters to be considered. This section also suggests options for further consideration by Designers and Manufacturers. There may be other ways for meeting the requirements of a particular project.

The following details indicate typical frame designs where either the general method or the precision method may be used. Further details illustrate other typical frame designs where the general method may not be suitable.

The choice of frame design is likely to be influenced to a large extent by the nature of the structure into which the doorsets are to be fitted and the suitability of that structure to accommodate the building tolerances necessary to suit the desired frame design.

