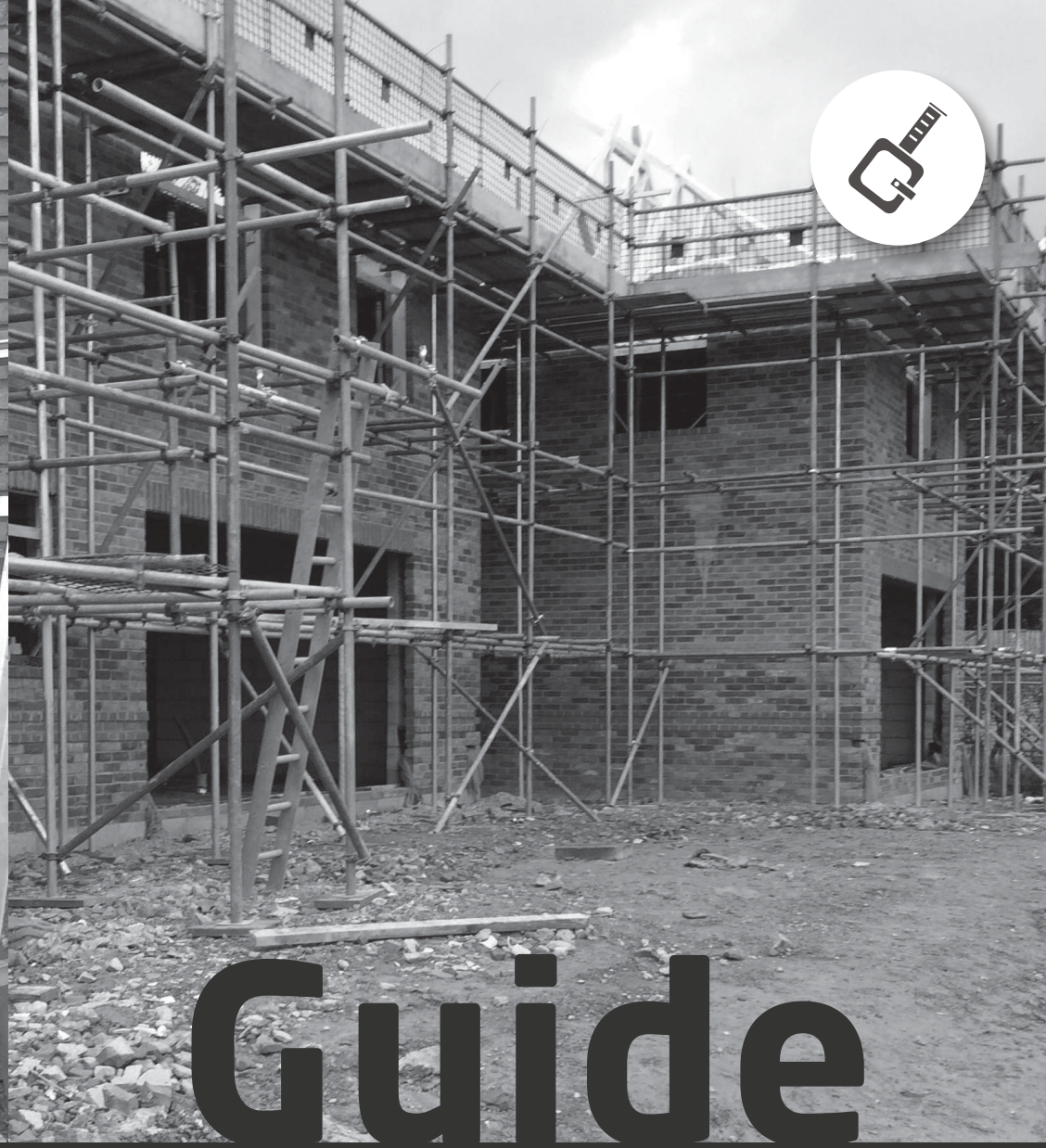

Guide

Surveying & Installation

FOLDING SLIDING DOORS

Brochure revision November 16

The Folding Sliding Door Company
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Contents

Introduction

BS 8213 - 4: 2007 Windows, Doors and Rooflights

Part 4: Code of Practice for the Survey and Installation of Windows and External Doorsets.

- As of March 2007, British Standard BS 8213-4: 2007 came into effect, the Code of Practice for the Survey and Installation of Windows and External Doorsets.
  In previous years the code of practice was issued by the BPF (British Plastics Federation) however, this has now become a more controlled and managed document under the British Standard flag.

- The document is used as a basis for obtaining a BSI kitemark for Surveying & Installation.

- The BS 8213 gives recommendations for the surveying and installation of NON LOADBEARING windows and doorsets of any material, which are installed vertically into the external face of a structure.

- The standard gives guidance on good practices necessary for successful surveying & installation of windows and doorsets into new build and replacement situations.

- The standard is mainly aimed at installation of frames into dwellings, however much of the document guidance can also be relevant to other types of installation.

- The document however does not cover curtain walling or load bearing windows and doorsets.

Issue: 2 (November 2016)

Terminology

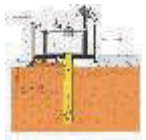
Backer Rod
A flexible polyethylene cord. Minimises the amount of sealant used reducing overall cost as well as allowing the user to obtain the optimum sealant shape, which prevents joint failure. Chemically and physically neutral, non-absorbent and will not rot. It can also be incorporated into side insulation and expansion joints preventing heat loss and provide acoustic properties.

Door Assembly / Door set
Complete assembly as installed, includes the door frame, the door sash together with the hardware

DPM (Damp Proof Membrane)
A layer or strip of impermeable material, placed within a wall, chimney or similar constructons to prevent the passage of moisture. The Dpc must be Least 150mm above ground.

End Grain Preserver
End Grain Protector preserves and protects vulnerable raw end grain from water penetration, insects, rot and decay. It is suitable for use on all types of softwood and hardwood timbers, and can be easily over-coated with Oils and Stains.

Finishing
Final covering and treatment of surfaces. E.g: Plaster, Render, Cladding etc



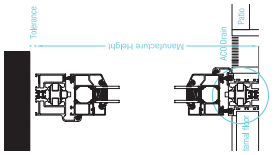
Fixing
Component that is used to secure separate parts of the doorset to each other, to secure an item of hardware to a door part or to secure the completed doorset into the structural opening.

Frame
Surround to a door leaf, window sash etc enabling it to be fixed into position, also referred to as an Outerframe.

Installation (Fixing) Packer
Packing piece used in gaps at fixing points to obtain rigid fixing and prevent distortion, usually made of plastic.

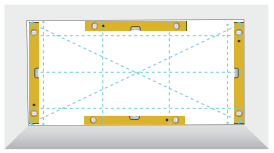
Installer
Company and / or individual carrying out the works of fitting the window / door.

Lintel
Beam which supports loads over a structural opening. Can be made of steel, reinforced concrete, timber etc or steel mesh fixed between brick courses.



Manufacturing Sizes
The overall dimensions for the door / window which result from making the approprite deductions from the structural opening size. Also known as Work Size.

Structural Opening
Aperture in a wall into which a window or doorset is to be installed.



Structural Opening Size
Size of the maximum rectangular shape which can be fitted within the structural opening.

Surveyor
Qualified or otherwise competent person who is capable of surveying for window and doorset installation, advising on suitable design, carrying out a risk assessment as necessary, and assessing the quality of the finished installation.

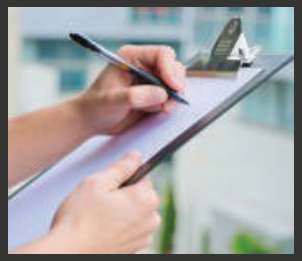
System Supplier
Original source of the design and / or supply of components used in the fabrication of a window or door.

Sealant
A compressible material used to seal around the perimeter of a window / door in the structural opening to prevent air and water penetration, commonly made of silicone, butyl tape, or polysulfide.

Replacement Doorsets

General, Surveyor

- Good surveying is the basis of ensuring a quality installation.
- Surveyors should be fully trained in window and doorset installation techniques and be aware of the manufacturers recommendations for the particular window / door system being used and maximum manufacturing sizes.
- In order to comply with the building regulations, it is advisable to make notes and photograph the window / door style which is being replaced along with sizes and of the opening lights and mullion / transom positions.
- The surveyor will be able to inform the purchaser / owner of any enhancements that could be made with respect to security issues and possible ventilation.
- Risk assessment must be carried out for window / doorset design.
- Risk assessment for the installation must also be carried out.
- Where load-bearing situations occur, the system suppliers recommendations must be followed.
- Check that replacement window / doorsets will not infringe any Local Authority planning controls i.e Conservation, Article 4 Direct.



Make Notes

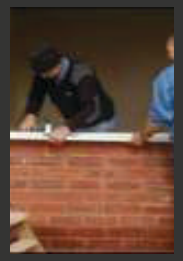
Take Photographs

Risk Assessment

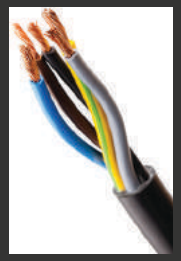
Replacement Doorsets

General, Surveyor

- Surveyor to check aperture for damage / defects and inform purchaser / owner accordingly.
- Check if aperture has any electrical wiring, telephone cables etc present or nearby.
- Check for presence of curtain rails.
  Important if the window / door is inward opening.
- Surveyor should determine the design wind load for the application and whether the window / door is suitable for the application.
- The surveyor should check that there is a lintel present above the window / door or alternatively look into providing support should it be required.
- Bow, Oriel and Dormer windows may in some cases require to be load bearing, and therefore reference to the system suppliers instructions must be made.
- For coupled window / doorsets, the surveyor must determine the method to be used taking into account wind and dead loads, aesthetics and coupling positions.
- Ensure BS8213-1 is complied with regarding window style to provide safety in use and cleaning (i.e Easyclean hinges).



Check Aperture for Defects



Check for Wires / Cables

Check for Curtain Rails

Wind Load Check

Check Lintel

Replacement Doorsets

General, Surveyor

- Surveyor is to confirm with purchaser / owner whether the window or doors are to be inward or outward opening and confirm the handing.

  Note: Outward opening window / doors into pedestrian areas must be taken into account.

- All surveys are taken as being viewed **INTERNALLY**
  Always check and confirm this is the case.

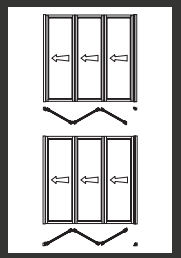
- Surveyor is to advise on restriction devices particularly on outward opening windows / doors to prevent damage caused by sudden wind gusts.

- Surveyor when dealing with doorsets should take into consideration the threshold types (Disability access), letterplate sizes and positioning, hardware specification and side panel specifications all clearly identified to the purchaser / owner.

- Where bricks are to be removed to install a product, the cavity closing method must be specified. It is recommended that you consult the local authority building control for advice and interpretation of local regulations.

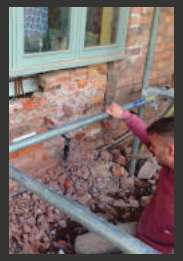
- The surveyor should specify or confirm the drainage method for the window / door frame and / or glazing.

- Glazing, including position, style, orientation, pattern / decoration, lead, georgian bar should be specified by the surveyor.

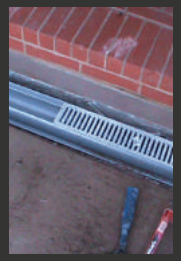


Inward or Outward Opening?

Additional Hardware?



Removing Brickwork?



Confirm Drainage Method

Glass Specification

Replacement Doorsets

Glazing, Building regulations

- The surveyor should indicate safety glass requirements and positions in accordance with the Building Regulation (Approved Document N) where appropriate.

Approved Document N - Part N1 - Glazing - Protection Against Impact

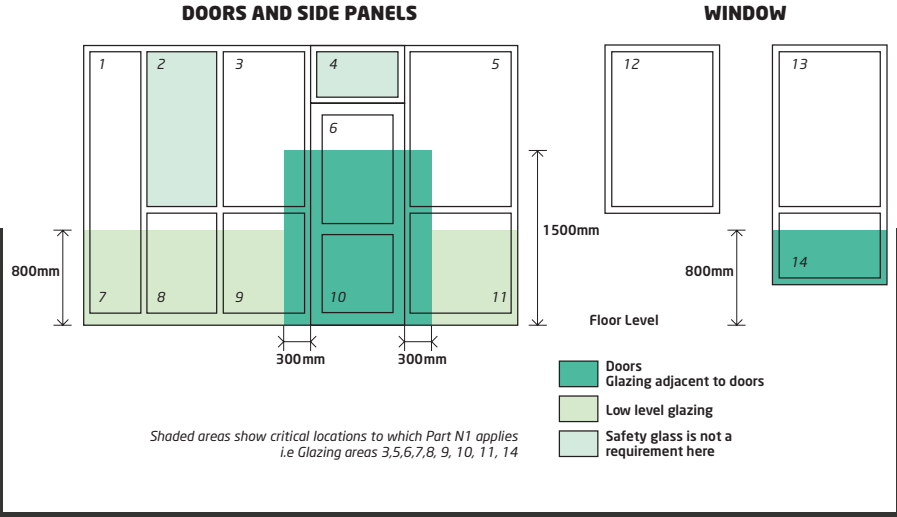
- Glazing with which people are likely to come into contact whilst moving in or about the building shall:

- If broken on impact, break in a way which is unlikely to cause injury, or

- Resist impact without breaking, or

- Be shielded or protected from impact.

Part N1 specifies the areas where safety glazing is required to be installed and is supported by by detailed British Standard documentation.



Critical Locations in Internal and External Walls - Part N1

Replacement Doorsets

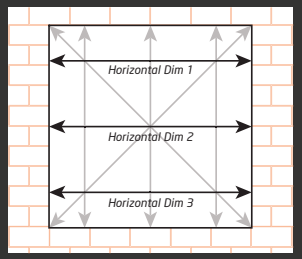
Measurement of an opening

- Three measurements of width and height should be taken across the opening, along with the squareness of the aperture by taking diagonal measurements. The smallest measurement of height and width will determine the manufacturing size.

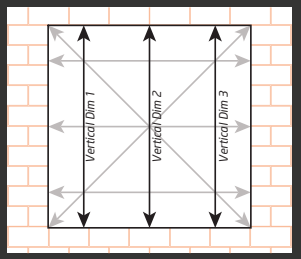
- The need for any sub-cill should be determined. The size of the sub-cill overhang should be such that it is an overhang of at least 25mm from the face of the brickwork to the inner edge of the cill overhang. The surveyor will determine the method of fixing, check requirements for cill horns and how any "making good" is to be carried out.

- The difference between internal and external reveal sizes should be determined and checks made to the operation of the opening light to ensure it is not impeded by plaster, render or tiles etc.

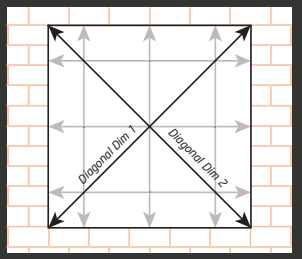
Measurement of Flat Windows & Doorsets



Step 1: Take 3no. Horizontal Dimensions



Step 2: Take 3no. Vertical Dimensions



Step 3: Take 2no. Diagonal Dimensions

Replacement Doorsets

Manufacturing Sizes

- Due to temperature fluctuations, PVCu windows and doors can expand and contract. This needs to be taken into account when calculating the finished frame size in relation to the aperture.

The table below highlights the recommended deductions for the width and height of a frame.

Recommended Deduction for Width and Height of Structural Opening

Material:	Up to 1.5m	1.5m to 3.0m	3.0m to 4.5m	4.5m +
GRP	5	10	15	15
PVC-U : White	10	10	15	20
PVC-U : Non White	15	15	22	28
Timber	10	10	10	15
Steel	8	10	12	15
Aluminium	10	10	15	20

All dimensions in millimetres (mm)

- These deductions are from the TOTAL width and height, and not "per side".

- The gap required for effective polyurethane foam fixing at the head is 10 - 15mm.

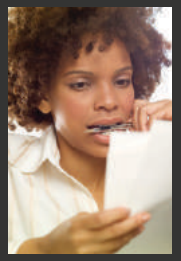
- NOTE: When the overall width or height exceeds 3.0m, intermediate expansion joints may be required.

- NOTE: BS7412 limits window sizes up to 3.0m only.

Removal of Existing

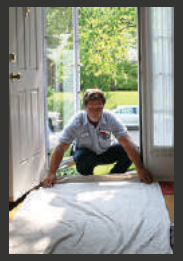
General Installer

- The installation team should ensure that all relevant documentation is available and clearly understood. i.e Drawings, Survey Sheets, Specialist Instructions etc
- Check and double check sizes, type and condition of all windows and doors against the survey sizes, type and against the actual aperture size, prior to any removal operations.
- Prior to commencement of work, the purchaser / owner must be given adequate notice to remove any furniture, fixings or fittings.
- The installer is responsible for both the external and internal protection of the property during installation work by the use of clean dust sheets. Avoid debris becoming embedded in soft garden areas.
- Care should be taken to avoid damage to floor coverings and to decorations.
- Plan to install and seal new doorsets on the same day as the existing windows / doorsets are removed, to maintain security and weathertightness of the dwelling.
- Remove existing windows /doorsets without damaging the building structure and its finishings.
- Electrical wiring and other specialist cables should be routed around and away from the window / door and not through the frame. If this is not possible then it must be agreed by the purchaser / owner and surveyor as to an alternative solution and if required a specialist service provider brought in to assist with the routing of the cables etc.

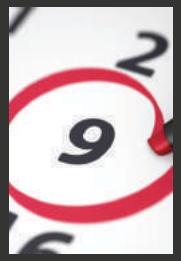


Check & Understand Documentation

Adequate Notice for Furniture Removal



Protect Furniture / Flooring



Remove & Re-Install Same Day

Not Sure About Wires / Cables, Ask for Assistance

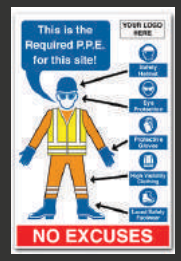
Site Safety

Window & Doorset removal & installation can be dangerous

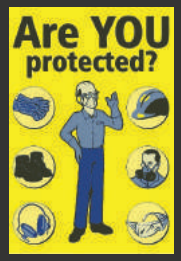
Health and Safety at Work Act 1974 / Control of Asbestos at Work Regulations 2002

- Train new operatives in the safe use of tools.
- Ensure operatives have and use correct PPE (Personal Protective Equipment)
- Full training and assessment records of operatives should be kept.
- Glass Handling: Wear eye protection, safety footwear, hand and wrist protection.
- All electrical power tools should: Work on 110 V mains power or
  * Be Battery operatered or
  * Work on 240V with residual current detector of 30 mA maximum rating.
- The use of a safe working platform to give safe access to the structural opening is essential.
- When operating a grinding disc, safety precautions as follows should be observed:
  * Heavy Gloves, face visors and helmets must be Worn.
  * Clear access provided.
  * Care should be taken that sparks can not ignite combustible materials i.e dust sheets.
  * All personnel should be kept at a safe distance.
- Store and dispose of old windows and doorsets and other debris safely and recycle where possible (Recovinyl).

Training

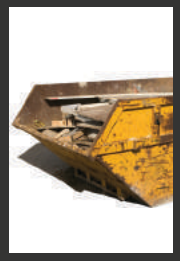


Personnel Protective Equipment



Think Safety!

Working Platforms



Storage and Disposal

Pre-Installation Survey

HOW TO MEASURE (viewed from inside)

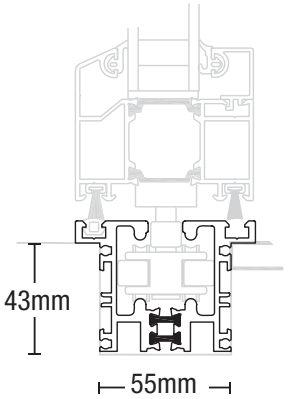
WE MANUFACTURE TO YOUR APPROVED DIMENSIONS, SO PLEASE CHECK!

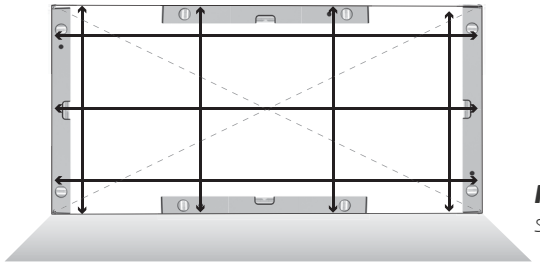
Frame Width

- Measurement from wall to wall of the opening minus tolerance (10-20mm)

Frame Height

- Measured from the underside of the top support to the underside of the bottom track minus tolerance (10-20mm)
- We recommend that you allow between 10mm to 20mm of tolerance between the opening structure and the door frame to allow easy installation
- When measuring it is advisable to use a spirit level to indicate the correct size of door you require
- Always include the bottom track in your measuring and remember to allow for your floor finishes, tiles, carpet etc

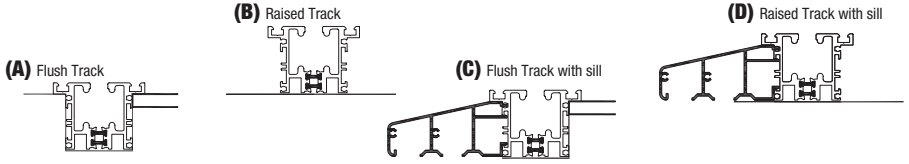




Note: *Flush Track, Please allow for the 43mm hidden track depth if choosing this option!*

Note: *Always use the smallest measurement*

Bottom Track Option



- Does the 'opening' require removal of any brickwork / cutting out / making good by builder? ..... Yes / No
  If yes, please state .....
- What is the agreed removal dimensions? (please sketch/list) ..... mm
- Does the 'opening' require additional brickwork /blockwork or structural steel? Yes / No
  If yes, please state .....
- What is the agreed additional dimensions? (please sketch/list) ..... mm
- What depth of screed is proposed? (please sketch/list) ..... mm
- What type of flooring is to be fitted? (Oak / laminates / tiles plus grout etc, (please sketch/list) .....
- What type of external decorative finish is proposed? Decking / Eco drain / Other .....

Details of the Structural Opening

A. **Structural opening:**

	Opening 1	Opening 2	Opening 3	Opening 4	Opening 5
Width (mm)					
Height (mm)					
Req. Configuration					
Req. Track Detail					
Req. Material					

B. **Details of the structural opening material that the doors will be fixed (Left side / Right side / Top & Bottom):**

	Opening 1	Opening 2	Opening 3	Opening 4	Opening 5
Head					
Left Side					
Right Side					
Base					

*(**T**) Timber (**B**) Brick (**S**) Steel (**C**) Concrete (**CB**) Concrete Block (**BB**) Breeze Block (**ML**) Metal Lintel (**CL**) Concrete Lintel (**CN**) Catnic*

C. **Manufacturing sizes of folding sliding doors (less fitting tolerances / inc. track):**

	Opening 1	Opening 2	Opening 3	Opening 4	Opening 5
Width (mm)					
Height (mm					

Site information & risk assessment

- Is the site New Build (covered by Building Control)? ..... Yes / No
- Does the install of replacement doors require FENSA certification? ..... Yes / No
- Are the doors to ground level? (if no, please list) ..... Yes / No
- Will scaffold / level platform be required to deliver / fit the doors? ..... Yes / No
- Will a mobile scaffold tower be made available? ..... Yes / No
- Can doors be fitted and fully operated uninstructed by scaffold or hoardings? . Yes / No
- Is site access clear and unobstructed (scaffolding / other trades preventing the installation from taking place) ..... Yes / No
- Do FSDC have access to on site skip facilities? ..... Yes / No
- Is the householder or main decision maker present? ..... Yes / No

Fixing

- Does the structural blockwork retain a plug & screw for fixing, check by drilling/testing? ..... Yes / No
- Has the lintel been identified and on the correct side of the cavity? ..... Yes / No
- Do the openings have a drip tray above the lintel? ..... Yes / No
- Is structural lintel / side blockwork in alignment to permit fixing through centre of door top track / jambs? ..... Yes / No
- Do the openings have DPM (Damp Proof Membrane) all round? ..... Yes / No
- Are trims required? If yes these will be chargeable please contact FSDC offices Yes / No
- If any of the above are not present has the customer been advised? ..... Yes / No

Render / Fair Faced Stone / Random Stone / Uneven Surfaces

- Does the uneven surface require dressing to allow the flush fitting of the jambs to the wall? ..... Yes / No
- If so is this allowed in the calculations for the manufactured doors? ..... N/A / Yes / No

Removal(s) of existing windows / doors

- Are existing doors / windows fitted within the opening? ..... Yes / No
- Will these require removal by FSDC? (rip out cost @ £180 per opening) ..... Yes / No
- Will the aperture require alterations to brick or blockwork? ..... Yes / No
- Please confirm that the opening is fully prepared on day of survey ..... Yes / No
  If NO, then please state agreed details and time scale to complete .....

Parking Restrictions

- Are there any parking/waiting or loading restrictions? ..... Yes / No
- Is the site accessible for delivery by a 18 tonne vehicle? ..... Yes / No
  (if no, please list further notes) .....
- Clear access for unloading/transfer? ..... Yes / No

PERMITS MUST BE PROVIDED TO THE ENGINEERS FOR THE DURATION ON THE INSTALLATION IF REQUIRED.

Installation

- Under normal circumstances your door installation will take place the following week after your delivery, unless otherwise agreed.

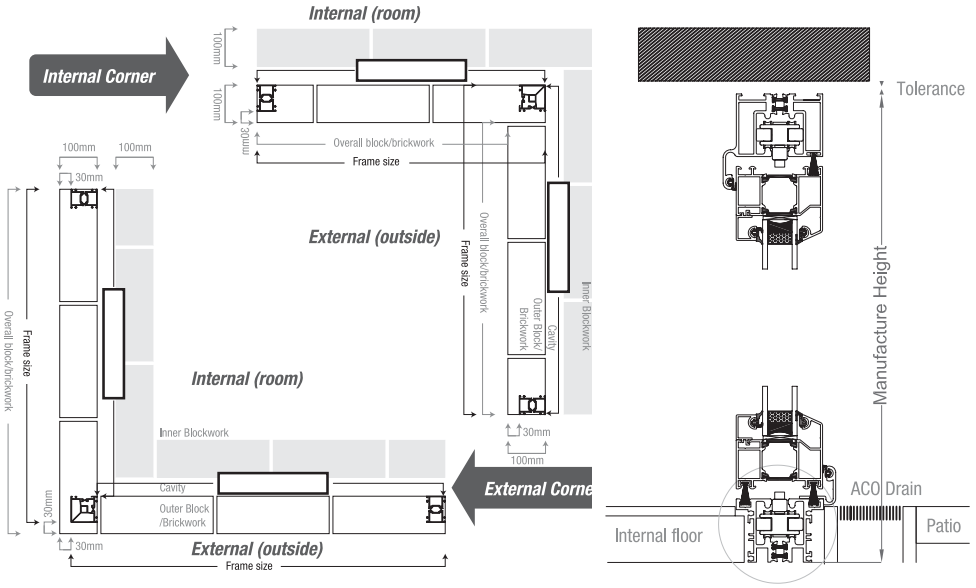
Corners

WE STRONGLY RECOMMEND A SITE SURVEY FROM FSDC

Have we agreed the position of the doors in the opening ..... Yes / No

Indicate the required position of the doors from the external and internal face of the brickwork

**** The frame is usually fixed on the outer brick/blockwork and recessed from the outer edge by 30mm, please remember to take into account frame position when measuring for a corner system.***



IMPORTANT NOTES

a: *This is NOT A STRUCTURAL SURVEY and will not highlight any structural defects in the property. If you have any concerns about structural problems associated with the opening you may wish to have a full structural survey carried out by your local planning office.*

b: *Please ensure that the above information is correct, if for any reason beyond our control prevents the installation from taking place you will be liable to pay a call out charge of £250+VAT. This will have to be paid in full before we can appoint a new installation date.*

c: *A folding sliding door must have a load bearing bottom track.*

d: *If the aperture(s) do not meet our requirements you will have 1 HOURS grace to rectify them. If this can not be achieved within 1 hour the installation will be aborted and a new date will be issued on receipt of the call out charge of £250+VAT.*

e: *If fitted into open cavities, FSDC require adequate structural turned block work protected from external brickwork by a DPC membrane at 100mm from top & bottom. . then at 300mm centres supplied by the customer / builder (not FSDC).*

f: *All blocks must be of high density (7 newtons), not Celcon / Thermalite or blocks of a similar density.*

g: *FSDC preferred fitting position for doors is 30mm from face of structure.*

h: *'Making good' of openings after installation of doors is the responsibility of the c ustomer & or builder (not FSDC).*

i: *A folding sliding door CANNOT BE HUNG from a light metal lintel (unless you have at least 2/3 courses of brickwork above).*

j: *A folding sliding door CANNOT BE FIXED to a cavity closer.*

k: *All blocks must be structural high density (7 newtons), not Celcon/Thermalite or blocks of a similar density.*

l: *Do not fix door tight to the lintel, tolerance must be allowed for any possible deflection.*

Checklist

Surveyors Checklist ..... Yes / No

Have risk assessment (s) been completed (See BS 8213-4: 2007)? .....

Is there any evidence of asbestos that may need to be removed or disturbed? .....

Is the condition of the aperture satisfactory and without evidence of damp / cracks? .....

Is the aperture square and even within 5mm height and width and 10mm diagonals? .....

Will any loads be carried by the building and not the window / doorset? .....

Has the size and method of fixing any sub-cill been determined? .....

Will the window / doorset function without being fouled by plasterwork etc? .....

Will any trickle ventilators fitted function without being fouled by plasterwork etc? .....

Will hinges functions without being fouled by plasterwork? .....

Are curtain tracks and nets clear of the proposed design? .....

Is the size and configuration within the manufacturers limits? .....

Will the products exposure category be suitable for the location? .....

Will the installation conform with the Building Regulations? .....

Is the method of drainage appropriate for the installation and product? .....

Has the purchaser confirmed position and handing of the opening lights? .....

Has any additional hardware been specified? .....

Is the access to the installation safe? .....

Has the fixing method of the window / doorset been determined? .....

Has the extent of "making good" been agreed with the purchaser? .....

Note: It can be of benefit to make a photographic record

Removal Techniques

Timber Windows / Doorsets

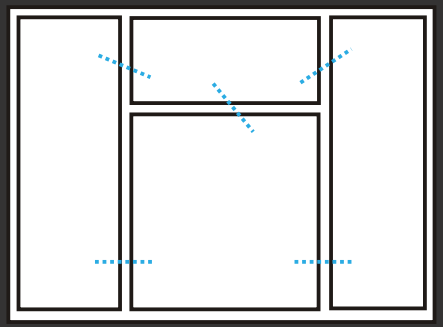
- Glazed fixed light: Preferred method is removal of putty, sprigs, beads or fixing nails and removal of glass intact. Alternatively, carefully break the glass so that the fragments are on the outside of the structure.

- It is good practice to run a sharp knife between the inside face of the frame and the plaster adjoining the frame, to minimize damage to the plaster when the window / doorset is removed.

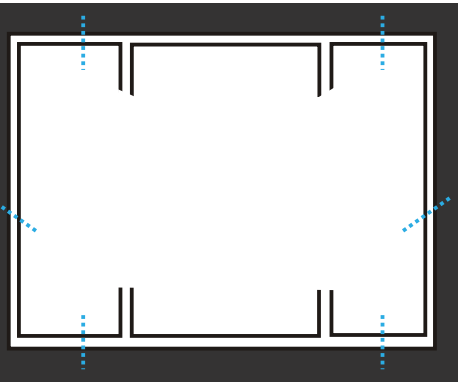
- Remove opening lights first, complete with the glass by levering the screws from the frames, or unscrew the hinges or by cutting through the hinges. This provides a larger working space and reduces the weight of the window.

- After removal of opening lights and fixed light glazing, any mullion / transoms which remain can be cut through in order to remove them.

Cutting Through Transom / Mullions



Cutting Through the Outer Frame



Removal Techniques

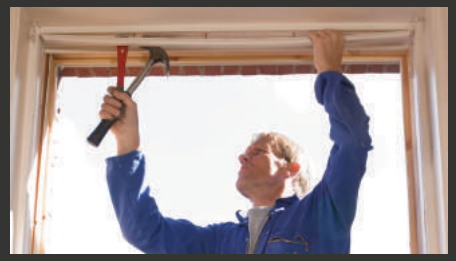
Windows & Doorsets

- Problems may arise with windows/ Doorsets under the roof eaves. There might be a brick course resting on the frame between the top of the existing frame and the soffit board. This is generally decorative and not load - bearing.

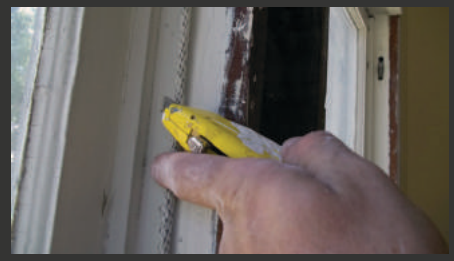
Box Sash Windows

- Most box-sash windows were installed before cavity walls existed and are built into the internal reveals of the solid brickwork. The sashes can be removed fully glazed as follows;

  **** Remove mitred bead from around frame.***
  **** Cut the sash cords to release and lower the weights.***
  **** Remove bottom sash, take off parting bead, remove top sash.***
  **** Cut outerframe from aperture leaving the horns in the structure.***
  **** Remove counterweight from sash box***



Remove mitred bead from around frame



Cut the sash cords to release and lower the weights

Removal Techniques

Metal Window & Doorsets

• Metal windows can be removed in one of the following ways;

If the window / doorset is fixed through the frame into timber sub-frames or direct into aperture;

** Remove all glazing from fixed lights, separate and remove all opening lights from frames.*

** Locate and remove screws holding frame in place.*

** Remove timber sub-frame*

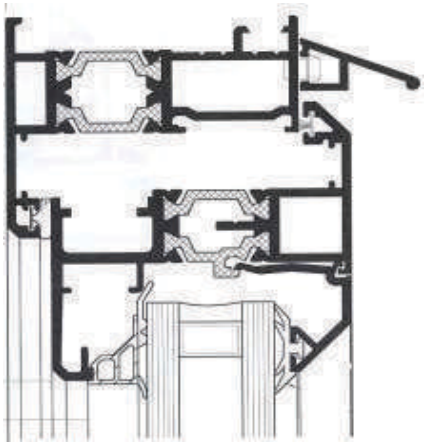
For metal windows / doorsets fixed directly into brickwork or concrete and held in place with lugs;

** Remove opening lights with angle grinder / hacksaw if unable to unscrew the fixings.*

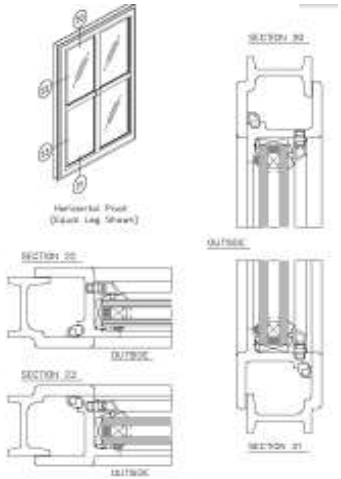
** Cut through the transoms / mullions and remove.*

** Remove the screws from the frame by drilling out the heads*

** Cut through each side of the frame with an angle grinder and lever away from the wall taking care not to damage the fabric of the aperture*



Typical Aluminium Window



Typical Steel Window

Removal Techniques

PVCu Window & Doorsets

• Remove the glazing beads and remove the glass

Use a sharp knife to free the glass where glazing tape has been used

Remove opening lights by unscrewing the fixings.

• Remove any trims in order to allow access and determine if fixing brackets / lugs are present.

** Through frame fixings - Unscrew to remove frame from aperture*

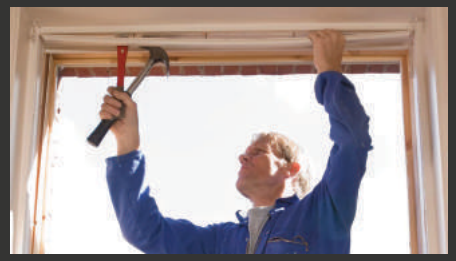
** Fixing Lug / brackets - Unscrew the fixings, or if not possible cut bracket with angle grinder*

** Special / Bespoke fixings may require instructions from the manufacturer*

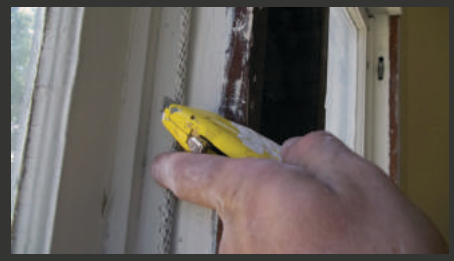
Sub Cills

Be aware of concealed D.P.M's (Damp proof membrane). Care must be taken when removing the sub cill as not to damage the plaster, render and brickwork.

If DPM is damaged upon frame removal, it must be repaired or replaced.



Remove mitred bead from around frame



Cut the sash cords to release and lower the weights

Installation

Window & Doorsets

- The window / doorset must be fixed into the structural opening or to an adjacent window / doorset in order to resist all likely imposed loads which may cause the frame to deflect. These loads might be due to:

  * ***Wind Loads***
  * ***Operating Loads***
  * ***Gravity (i.e Vertical Slider / Pivot / Casement)***
  * ***Accidental Impact***
  * ***Attempted Burglary***

- The fixing methods for the window / doorset can be affected by:

  * ***The wall construction i.e cavity or not, materials***
  * ***The nature and condition of any cavity***
  * ***The relative position of the frame and cavity***
  * ***The position of the plasterline and the need to minimize disturbance and damage to interior decorations***
  * ***The design of the reveal***

Installation

Fixing

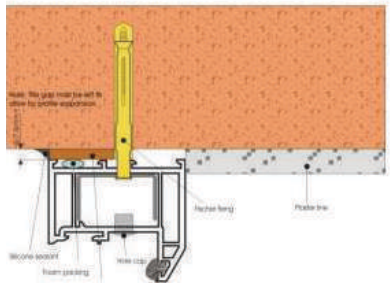
- Two methods of fixing window / doorset into opening or as combinations:

  * ***Through Frame Fixing***
  * ***Fixing Lugs***

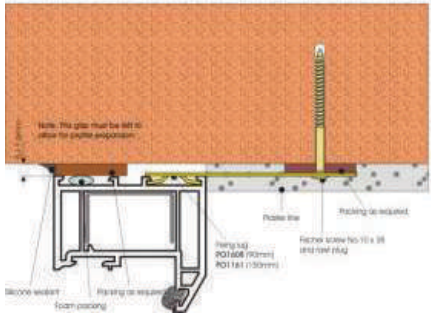
- Screw fixings should penetrate at least 25mm into timber, plugged holes in brick, block or masonry.

- Connections to steelwork should be made using the appropriate thread cutting screws or with pre-tapped holes and a machine screw, or self drilling screws.

Through Frame Fixing Detail



Fixing Lug Detail



Typical Frame Fixings

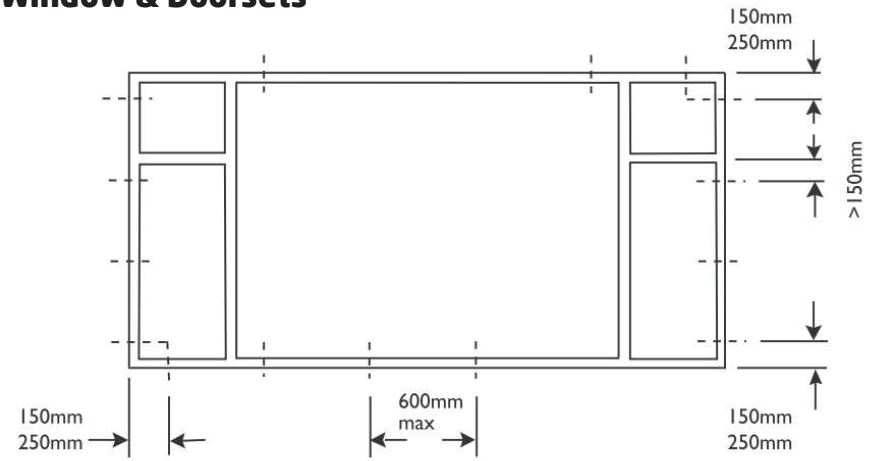
Typical Fischer Window Fixing

Self Drill Masonry Fixing (Tapcon)

Countersunk Concrete Screws

Installation

Fixing Distances and Positions for PVC-u Window & Doorsets



- All four sides of the window / doorset, where practicable, should be fixed in the opening.
- Concrete and steel lintels can make it difficult to achieve the correct fixing arrangement.
- Polyurethane foam is known to be beneficial to such when used in conjunction with the fixings if the correct fixing distances can not be achieved.
- DO NOT USE polyurethane expanding foam as the sole method of fixing.
- Corner fixings should be between 150mm and 250mm from the external corner.
- Fixings should be a minimum of 150mm from the centre line of a transom / mullion.
- Each jamb and cill should have a minimum of two fixings with intermediate fixin being positioned at no greater than 600mm centres.
- If the head is fixed with polyurethane foam, the following rules may be applied;
  - ***Frame width upto 1200mm - No fixings***
  - ***Frame width 1201mm to 2400mm- One central fixing***
  - ***Frame width 2401mm to 3600mm- two equally spaced fixings***

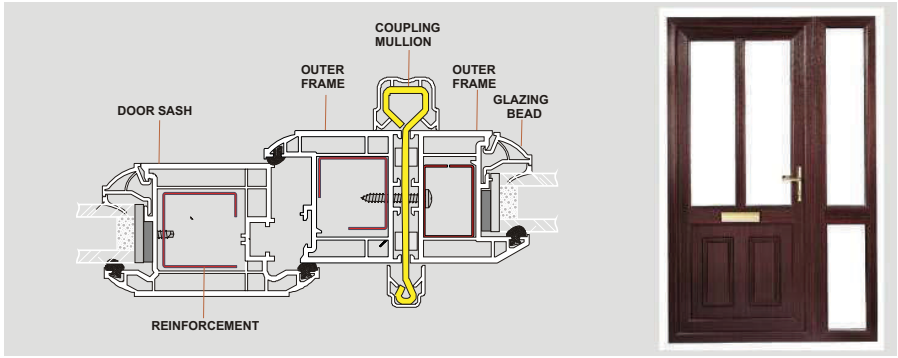
Installation

General: Installer

Fixing Lugs
- If used as an external lug, use either a "One Way" or security screw fixings.

Finishings
- Trims etc may be used to complete the interface of the frame and structure. DO NOT use the trims as a way of enhancing the weathertightness.

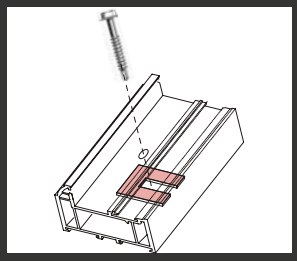
Coupled Assemblies
- Coupled assemblies are delivered to site as separate units and fixed in position in accordance with the system suppliers recommendations.



Installation Packers
- Used adjacent to fixing positions to prevent frame distortion. Must be made of a material which is resistant to compression, rot and corrosion.

Fixing Lugs

Installation Packers



Installation

Finishing Off & Making Good

- Drainage paths should be cleared of any debris.
- Internal reveals made good in accordance with the agreement between installer and purchaser.
- Remove protective tape from the window / doorset on completion of installation.

Sealing

- Perimeter joints should be sealed on both the inside and outside.

The sealant should:

**** Adhere to the frame surface***
**** Adhere to the structure***
**** Accommodate joint movement***
**** Withstand exposure to weather.***

- The British Adhesives & Sealants Association publish a guide to BS ISO 11600:2003 which is the Standard for classification and requirements for sealants. Also see BS 6093.

- Three key performance criteria are identified;
  **** Movement Capability***
  **** Modulus (i.e Low)***
  **** Elasticity (i.e High)***
- Other criteria for window sealant includes:
  **** flow, loss of volume & mass, adhesive strength etc***
- Specialist sealant companies may be required for some applications.

Final Inspection

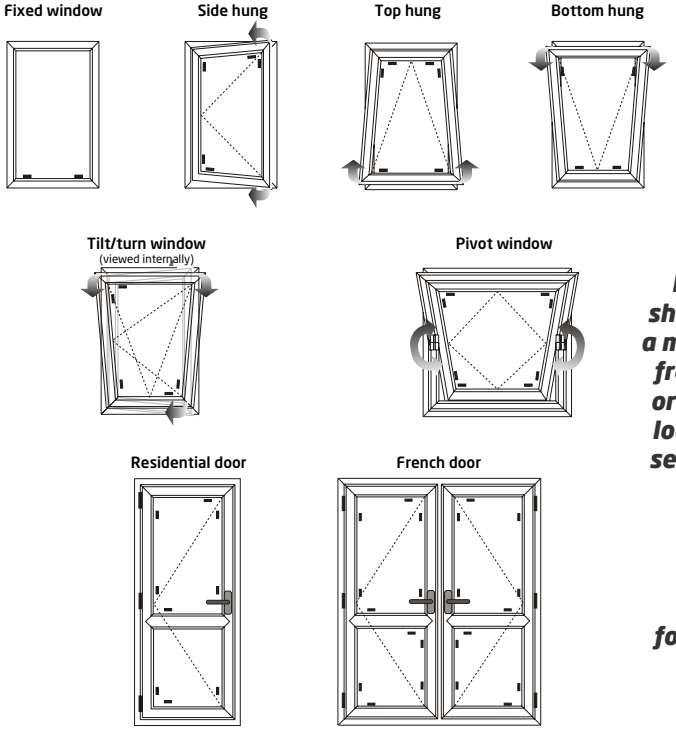
- Should be carried out preferably accompanied by the purchaser / owner, and ensure that the installation is in accordance with the surveyors / manufacturers instruction.
- Make the purchaser / owner aware of how to operate the door / window furniture.

Installation

Glazing

- All glazing should conform with the BS6262 and BS 8000-7 documentation.
- Support the glass units correctly in accordance with BS 6262 with glass support and packing blocks.
- Examine all glass units for damage prior to installation. Defective units should not be used. Insulated glass units incorporating safety glass should be installed with the safety glass on the appropriate side. (Note, the marking of the safety unit must remain visible after installation).
- Insulated units with Low emissivity coating should be installed in conjunction with the manufacturers instruction. Failure to do so may make the coating less effective.

Window/door packing configurations

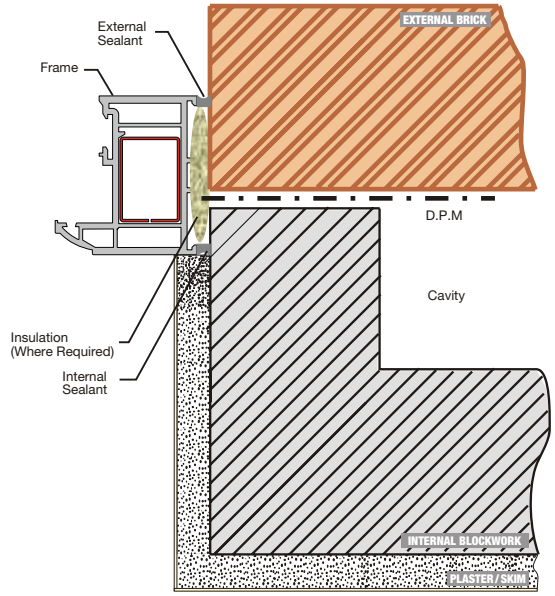


Note: All sashes should be packed at a maximum of 75mm from the corners in order that the dead load applied by the sealed units weight is distributed correctly.

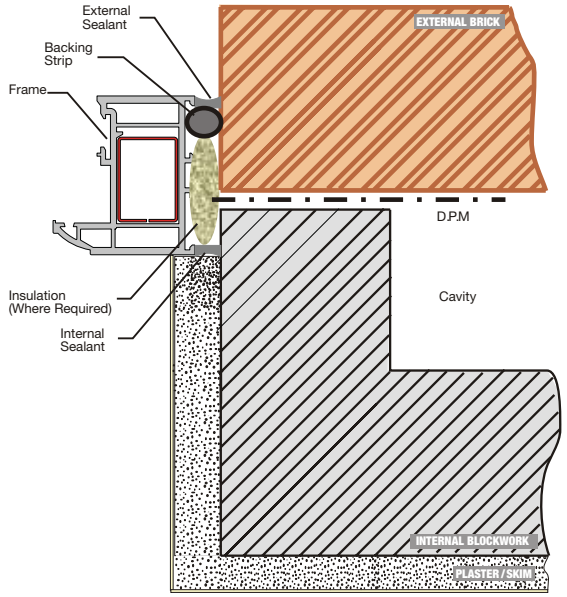
See BS 6262 for further window configurations and styles.

Frame Positions & Joint Construction

Flush Reveal with joint width less than 6.0mm, with frame bridging the D.P.M

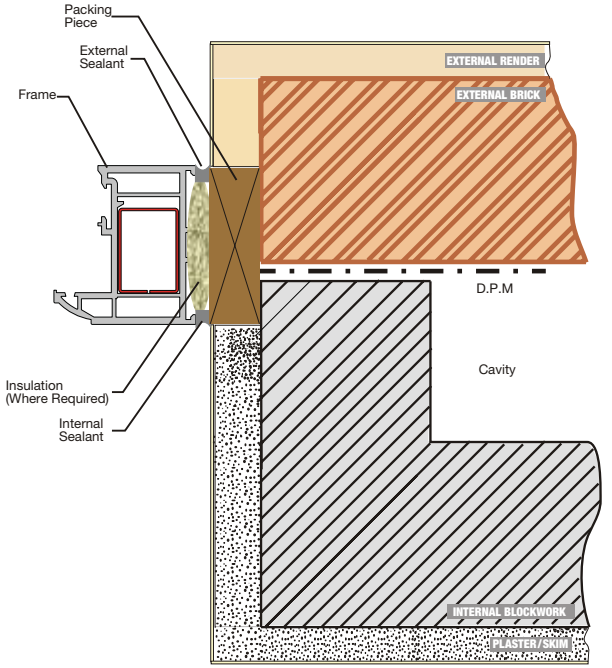


Flush Reveal with joint width from 6.0mm to 15.0mm, with frame bridging the D.P.M

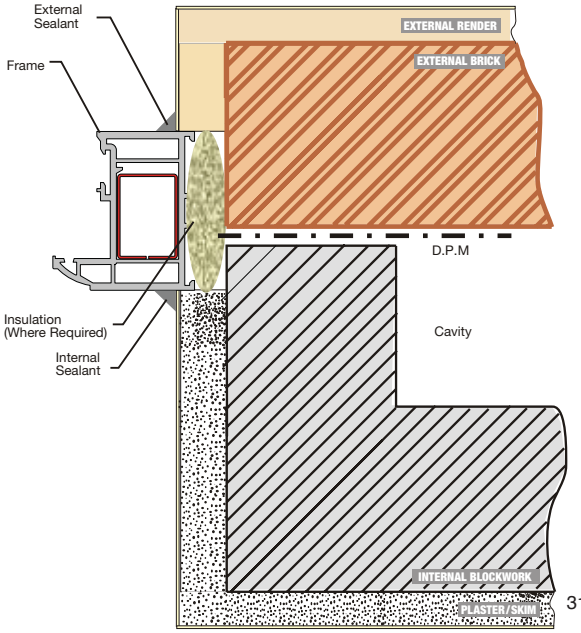


Frame Positions & Joint Construction

Flush Reveal with external render, for replacement frames

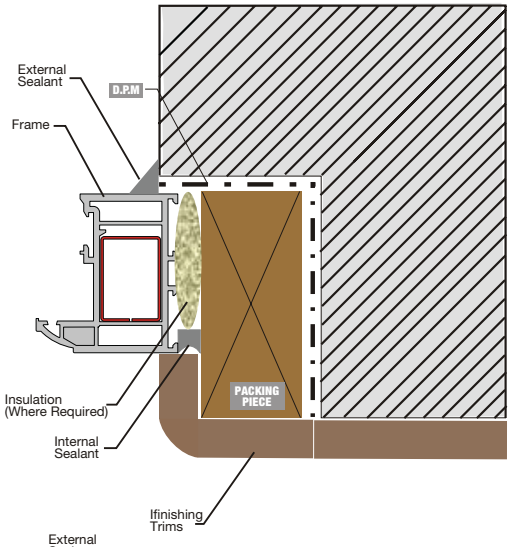


Flush Reveal with external render, for replacement frames shuffled into position

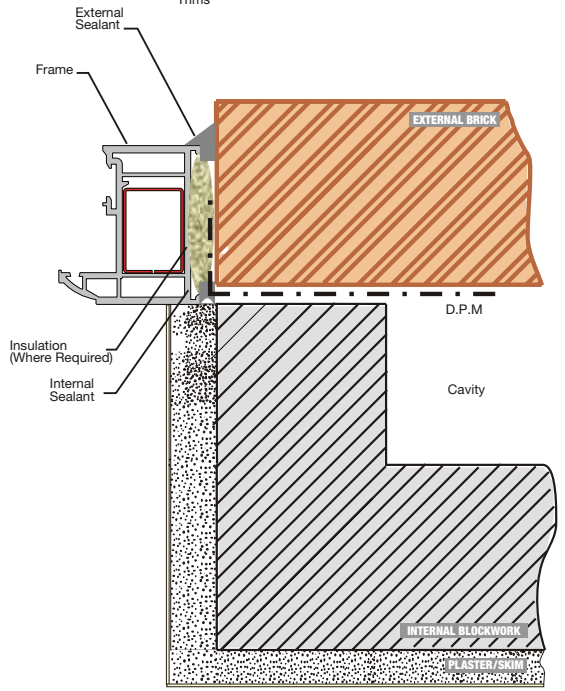


Frame Positions & Joint Construction

Box Sash replacement

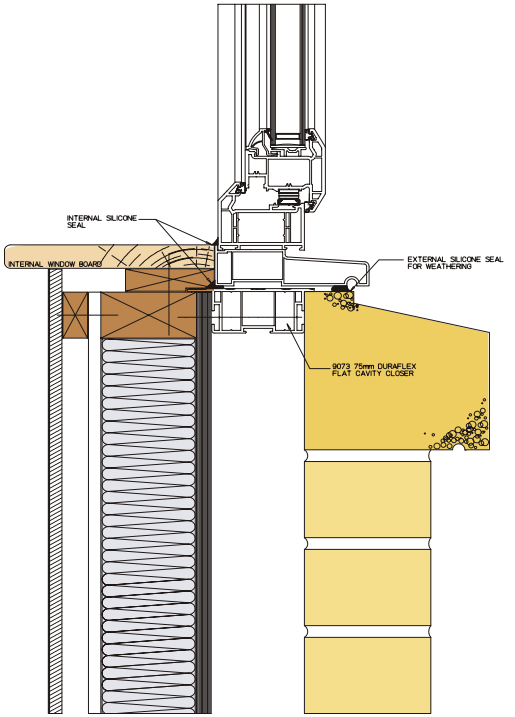


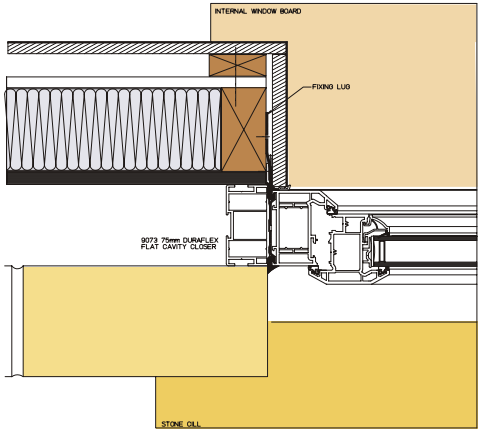
Frame forward of D.P.M



Frame Positions & Joint Construction

Typical new build construction





Checklist

Bi-Fold Door Installation Inspection Checklist

Frame

Have the top / bottom tracks been installed perfectly level in both length / width? ..... Yes / No

Has the top / bottom tracks been fixed 100mm from each end and then every 500mm? . Yes / No

Are the top / bottom tracks fitted rigidly with adequate fixings into a load bearing structural material? ..... Yes / No

Have the top / bottom tracks been installed onto or below a DPM (bottom) and cavity tray (top)? ..... Yes / No

Has the port for the track been positioned on the stacking side of the opening? ..... Yes / No

Are the jambs correctly positioned with the inside/outside of the track and perfectly level on both face and side ? ..... Yes / No

Are the jambs fitted rigidly with adequate fixings so that the hinge/closing side is 90 degrees to the track? ..... Yes / No

Have the jambs been fitted to a load bearing structural material using nonperishable packing? ..... Yes / No

Have the jambs been fitted rigidly onto an approriate DPM or cavity closer membrane? ... Yes / No

If an extension sill has been supplied, has it been adequately supported for standing? .... Yes / No

Panels & Glass

Have all panels been installed in their correct position with the glazing bead facing inside? . Yes / No

Are the top and bottom of the panels parallel with the tracks and approximately 8mm space between panel and track? ..... Yes / No

Are all seals around the panels correctly cut and placed to enable a full weather seal? .... Yes / No

Has the glass in the panels been packed correctly to provide equal positioning and lift for swinging or bi-fold panels? ..... Yes / No

Are the glazing beads positioned correctly and fitted to give adequate sealing pressure to the glass? ..... Yes / No

Are all glazing gaskets positioned correctly and fitted to give a water tight seal around the glass? ..... Yes / No

Hardware

Are all hinges fitted square to the panels with all six fixing screws tightly in place? ..... Yes / No

Are all hinge pin locking grub screws completely flush with hinges and locked in place? ... Yes / No

Are the rollers correctly installed with all locking grub screws tightened? ..... Yes / No

Have all handles and cylinder guards been installed correctly so that they are perpendicular to the panel? ..... Yes / No

Do all locks operate correctly, engaging into the tracks and keeps with little or no effort? Yes / No

Are sill end caps fitted (if required)? ..... Yes / No

The overall operation of the door is: *GOOD / FAIR / POOR / SMOOTH / DIFFICULT?* .....

Checklist

Final (Windows/Doors) Inspection Checklist

Visual Apperance

Is the frame installed plumb and square? ..... Yes / No

Are the beads fitted correctly and evenly? ..... Yes / No

Are exposed faces - including beads - free from damage? ..... Yes / No

Is the frame clean with all protective tape removed? ..... Yes / No

Has any damage to the aperture been correctly made good? ..... Yes / No

Have all trims internally / externally been fitted correctly? ..... Yes / No

Has all site debris been removed? ..... Yes / No

Glazing

Is all glazing as specified on the contract? ..... Yes / No

Are all sealed units free from scratches and damage? ..... Yes / No

Are obscure and coated glasses fitted correctly? ..... Yes / No

Are sealed unit spacer bars covered evenly by frame and beads? ..... Yes / No

Is the glazing held properly by the beads / gaskets etc? ..... Yes / No

Has safety glass been used where necessary? ..... Yes / No

Operation

Do all sashes open / close and lock as intended? ..... Yes / No

Are seals on the frames fitted correctly and without gaps? ..... Yes / No

Are cams free from binding against the strikers? ..... Yes / No

Is all operating gear lubricated as necessary? ..... Yes / No

Is all operating gear lubricated as necessary? ..... Yes / No

Is all hardware attached with correct number of fixings? ..... Yes / No

Sight Lines

Are all sight lines visually correct? ..... Yes / No

Are opening lights aligned correctly? ..... Yes / No

Are all decorative features e.g leading, correctly aligned? ..... Yes / No

Sealing

Are all joints smooth and correctly formed? ..... Yes / No

Is the sealant continuous around the perimeter of the frame? ..... Yes / No

Is the frame face free from excess sealant? ..... Yes / No

Drainage

Are all drainage channels correctly positioned and free from obstruction? ..... Yes / No

Technical Competence

Minimum requirements for Fenestration Surveying

KNOWLEDGE competence requirements: ***(Knowledge is evidenced via two online multiple choice knowledge tests, Installation and Surveying)***	***Areas covered:***
1. Understand the Building Regulations that have to be considered when carrying out Fenestrations Installation Surveys.	*In respect of:* (domestic replacements windows and doors) • Structure • Fire Safety • Resistance to moisture • Conservation of Fuel and Power • Heat producing appliances • Protection from falling • Access to building • Safety Glazing • Ventilation
2. Understand what type of installation /product is permitted and possible.	*In respect of:* • Customer requirements • Legislation • Guidelines and Codes of Practice
3. Know what information should be recorded.	*In respect of:* • Measurements • Tolerances recorded • Other information that may be required • Importance of accuracy
4. Know the types of additional products that may be required.	*In respect of:* • Trickle vents • Restriction devices • Fire resisting glass systems • Safety Glazing • Pet Flaps • Furniture
5. Know the problems that can occur when carrying out surveys and how to deal with them.	*In respect of:* • Existing structural conditions • Hidden detail • Obtaining measurements • Inaccurate information or communication • Hazardous materials including asbestos

Technical Competence

Minimum requirements for Fenestration Surveying

PRACTICAL competence requirements: (Practical competence is evidenced through a Professional Discussion with your Assessor based on recently completed Survey reports)	***Context:***
6. Be able to obtain, record and handle all necessary information to enable effective specifications to be completed.	Obtain and record all necessary information to ensure Specifications can be completed in line with Organisational requirements, *in respect of:* • Accuracy • Clarity • Different types of technical information • Format • Further use Give the customer all necessary information accurately and clearly. Ensure completed surveys are communicated to the appropriate individuals in line with Organisation requirements.

Technical Competence

Minimum requirements for Fenestration Installation

KNOWLEDGE competence requirements: *(Knowledge is evidenced via an online multiple choice knowledge test)*	*Areas covered:*
1. Understand the Building Regulations that have to be considered when carrying out Fenestrations Installation work.	*In respect of:* (domestic replacements windows and doors) • Structure • Fire Safety • Resistance to moisture • Conservation of Fuel and Power • Heat producing appliances • Protection from falling • Access to building • Safety Glazing • Ventilation
2. Understand safety glazing and Fire Resistant Glazing and know the requirements for glass markings.	*In respect of:* • Different types of safety glazing • When and where it must be used • Different information that must be clearly and indelibly present on safety glass • Situation where glass markings are missing or do not match job specification • Fire Resistant Glazing periods of fire resistance • When and where it must be used
3. Know the access equipment required for installation work and how to use it.	*In respect of:* • Different types • Use and suitability • Safety checks to make
4. Know how to use structural supports during removal of existing windows or doors.	*In respect of:* • Different types • Situations requiring use Evidence must be given that refers to load bearing bays and lintels
5. Know how to prepare frames, cills and apertures correctly during the installation process.	*In respect of:* • Cills • Add ons/frame extensions • Routing of cables through the aperture

Technical Competence

Minimum requirements for Fenestration Installation

KNOWLEDGE competence requirements: *(Knowledge is evidenced via an online multiple choice knowledge test)*	*Areas covered:*
6. Know how to and be able to prepare window and door units.	*In respect of:* • Different types of window units • Different types of door units
7. Know which sealing, bonding and weatherproofing materials should be used and be able to use them.	*In respect of:* • Internal use • External use
8. Know different methods of securing installation materials and fix installations securely.	*In relation to current Codes of Practice:* • Different types of structure • Using correct size, type and quantity of fixings
9. Know the importance of drainage holes and be able to ensure they are functioning.	*In respect of:* • Need to be clear and functioning
10. Know the type of information customers require on the work carried out.	*In relation to:* • Giving clear instructions relating to the operation of the window and door units • Guarantees • After care (maintenance and repair requests)
11. Know how to maintain and repair windows and doors.	*In respect of:* • Routine maintenance • Typical repair
12. Know the problems that can occur when carrying out Installation work and how to deal with them.	*In respect of:* • Incorrect specifications • Removal of windows and doors • Fixing • Glazing

Technical Competence

Minimum requirements for Fenestration Installation

PRACTICAL competence requirements: (Practical competence is evidenced through a Professional Discussion with your Assessor based on recently completed Survey reports)	***Context:***
13. Be able to adopt a safe system of work.	*In respect of legislation and official guidance relating to own responsibilities:* • Accident Prevention • Emergency procedures • Working at Height • Use of tools and equipment • Use of materials and substances • Movement of materials - Manual Handling - Mechanical Handling • Handling, storage and use of materials, components, consumables and substances • Hazardous materials including asbestos Carry out a visual risk assessment of the fenestration installation environment and ensure the work area is safe. Select and use safety equipment and Personal Protective Equipment required to carry out the task. *Establish safe working area:* • Temporary barriers • Protective sheeting • Warning signs
14. Be able to confirm installation requirements and suitability of materials and components.	*Check and confirm installation requirements and ensure sufficient type, quantity and quality of materials and components are available.*
15. Be able to remove window and door sets from the structure of the building.	*Remove components, materials and outer frames from the aperture causing minimum damage* • Sash/opening light • Outer frame • Door leaf/sash • Cladding • Glazing/Glass • Internal/External linings

Technical Competence

Minimum requirements for Fenestration Installation

PRACTICAL competence requirements: (Practical competence is evidenced through a Professional Discussion with your Assessor based on recently completed Survey reports)	***Context:***
16. Be able to ensure the damp proof membranes are effective during the aperture preparation process.	*In respect of:* • Vertical DPM • Horizontal DPC
17. Be able to handle, cut and assemble materials correctly.	Handle and cut the materials accurately to the required size and shape to fit the aperture in line with the job specifications.
18. Be able to check that the new or restructured apertures meet specification.	Check that the new or restructured apertures meet specification.
19. Be able to establish the correct position for the window and door units and ensure that the window and door units are correct for the installation.	Accurately carry out measurements to ensure that the window and door units are the correct size for the installation. Check that the supplied materials meet the specification including: • Appearance • Drainage • Locking mechanisms Establish the correct position for the window and door units.
20. Be able to handle and position window and door units correctly into apertures according to specification.	Position window and door units correctly into apertures according to specification. Ensure that window and door units are plumb, level and square ready for securing.
21. Be able to ensure that window and door units are plumb after being secured, and that they function correctly.	Accurately check window and door units to ensure that they are plumb after being secured. Check that window and door units function correctly
22. Be able to fit glass correctly and securely into apertures.	Fit glass into apertures correctly and securely to specification, using: • Packers/bridges • Alignment (toe and heel)
23. Be able to finish off the work to specification and carry out a final inspection.	Carry out a final inspection and finish off the work to specification.

Building Regulations

Approved Document A: Structure

Requirement A1, The building shall be constructed so that the combined dead, imposed and wind loads are sustained and transmitted by it to the ground: a) Safely; and b) Without causing such deflection or deformation of any part of the building, or such movement of the ground, as will impair the stability of any part of another building.

- With regard to windows and doors, Approved Document A applies to bay windows and other windows that are load bearing, e.g. where adequate means of support have not been used. When replacing windows and doors it is vital that the integrity of any existing structural support is not compromised. The supplier of the framing material may be able to offer technical advice.

- It is important to note that in situations where uncertainty exists, e.g. when using new materials or construction methods, the services of a structural engineer or other competent person should be employed.

Adequate means of support

- It is essential to maintain the integrity of the building.

- The necessity for an adequate means of support is dependent on the design of the structure. However, even if no such support is evident the Installation Company is responsible for assessing if one should be installed due to potential damage to the buildings structural integrity. If this additional work is required, the customer can be given the option to have it fitted by the Installation Company or independently.

  The Installation Company cannot avoid the issue on the grounds that because there is no means of support over the existing window there is no requirement to fit one over the new. It is strongly recommended that the need is thoroughly investigated before work commences.

A disclaimer issued by the customer is an unacceptable practice and is likely to incur a FENSA non-conformity.

- Every effort should be made at the time of survey to determine if an adequate means of support is either fitted or required. There will be instances where windows being renewed are replacements of the original load bearing timber frames but did not have the necessary means of support fitted.
  The construction material of the original windows should be established if possible as this may help in determining the requirement.

- If the surveyor cannot establish this either way, both the customer and installation team should be notified as to the possibility or should seek the advice of a structural engineer.

In the worst case the installation team may only recognise the need after the removal of the existing frame. It is entirely the installing company's responsibility to inform the customer immediately advising that an adequate means of support must be installed before the replacement window or door can be fitted.

- Clearly a situation to be avoided especially as this will incur additional time and cost to the customer not written into the original contract.

- It should be noted that if, after the completion of an installation and the issuing of the FENSA certificate, it can be established that an adequate means of support was not fitted where needed, a retrospective non-conformity will be levied against the installation company even if weeks, months or years have elapsed which will likely incur significant cost.

Removal of bay windows

- In order to maintain the structural integrity when replacing a bay window, it is essential that temporary supports such as adjustable steel props are used. It is important to ensure that the walls, floors or beams that may be affected by the window replacement are adequately supported prior to removing the windows. Care should be taken to protect internal ceiling / floor finishes at support points.

- After supporting the bay structure, the windows should be removed carefully, ensuring that the minimum of damage is caused to reveals, plaster, finishes and trims. It is recommended that structural mullions are removed one at a time, and that both the temporary supports and the pre-existing structure are closely monitored for any signs of settlement.

- If the condition of the aperture or the damp proof coarse (DPC) is not considered to be fit for purpose, or does not correspond with that described by the surveyor, the installer should refer back to the surveyor or the company for agreement to the proposed solution. Installation of the replacement window assembly should not start until any defects in the structure have been rectified.

- Care should be taken to ensure that no applied loads are carried by the individual segments of the window. Bearing plates should be used on bay poles when loads are transferred from or to masonry or timber.

- Care should be taken to ensure that the loads are transferred correctly from and to the structure of the building and the bay pole assembly. This is achieved either by having the bay pole pass through the sill, or by using a sill which is reinforced strongly enough to transfer the applied loads.

Building Regulations

Approved Document A: Structure

Note 1:
If a structural opening is to be made wider, Local Authority consent is required. This is outside the scope of FENSA registration and should be referred to Local Authority Building Control.

Note 2:
If the existing structural apertures are found to be unsound prior to the replacement of any windows and/or doors, work should be carried out before hand to ensure the stability of the building e.g. the soldier course above an existing window may require an adequate means of support.

Building Regulations

Approved Document B: Fire Safety

Requirement B1, The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times.

Provision for escape from the ground storey
Except for kitchens all habitable rooms in the ground storey should either:
a) open directly onto a hall leading to the entrance or other suitable exit; or
b) be provided with a window (or door) which complies with paragraph 2.8.

Provision for escape from upper floors not more than 4.5 metres above ground level
Except for kitchens, all habitable rooms in the upper storey(s) of a dwellin house served by only one stair should be provided with:
a) a window (or external door) which complies or
b) direct access to a protected stairway.

Emergency egress windows and external doors
Any window provided for emergency egress purposes and any external door provided for escape should comply with the following conditions:
a) The window should have an unobstructed openable area that is at least 0.33m^2 and at least 450mm high and 450mm wide (the route through the window may be at an angle rather than straight through). The bottom of the openable area should be no more than 1100mm above the floor.

Work on existing houses
Where windows are to be replaced (but not where they are to be repaired only, as repair work to windows does not fall within the definition of building work) the replacement work should comply with the requirements of Parts L and N of Schedule 1. In addition, the building should not have a lesser level of compliance, after the work has been completed, with other applicable parts of Schedule 1.

Particular care must be taken when replacing windows and doors within a timber framed building. In most cases there will be a fire break between the window frame and cavity within the timber structure. If there is no fire break present one must be in place before the replacement window or door is fitted. This fire break must be installed without exception in order to maintain the fire suppression properties as laid down in the Approved Document B3 (4).

Building Regulations

Approved Document C: Site preparation and resistance to contaminants and moisture

Requirement C2, The floors, walls and roofs of the building shall adequately protect the building and people who use the building from harmful effects caused by: a. Ground moisture, b. Precipitation, c. Interstitial and surface condensation, d. Spillage of water from or associated with sanitary fittings or fixed appliances.

Joint between doors and windows

- The joint between walls and door and window frames should:
  a) resist the penetration of precipitation to the inside of the building; and
  b) not be damaged by precipitation and not permit precipitation to reach any part of the building which would be damaged by it.

- Damp-proof courses should be provided to direct moisture to the outside:
  a) where downward flow of moisture would be interrupted at an obstruction e.g. at an adequate means of support;
  b) where sill elements, including joints, do not form a complete barrier to the transfer of precipitation, e.g. under openings, windows and doors;
  c) where reveals, including joints do not form a complete barrier to the transfer of rain and snow, e.g. at openings, windows and doors.

- In some cases the width of the cavity due to thermal insulation and the 50mm clearance for drainage may be such that the window frame is not wide enough to completely cover the cavity closer. The reveal may need to be lined with plasterboard, dry lining, a support system or a thermal backing board. Direct plastering of the reveal should only be used with a backing of expanded metal lathe or similar.

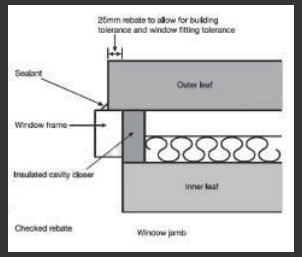


Diagram 1: Checked rebates

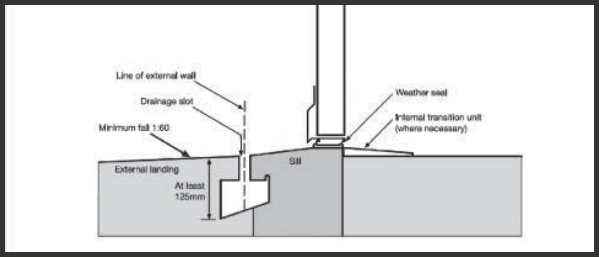


Diagram 2: Door Thresholds

- In areas of the country in driving rain exposure zone 4*, checked rebates should be used in all window and door reveals. The frame should be set back behind the outer leaf of masonry, which should overlap it as shown in (Diagram 1). Alternatively an insulated finned cavity closer may be used.

DOOR THRESHOLDS

- Where an accessible threshold is provided to allow unimpeded access, as specified in Part M, Access to and use of buildings, it will meet the requirements if:
  a) the external landing (Diagram 2) is laid to a fall between 1 in 40 and 1 in 60 in a single direction away from the doorway;
  b) the sill leading up to the door threshold has a maximum slope of 15 degrees.

Summary: Windows

- When existing windows are removed from a cavity wall, the vertical Damp Proof Coarse (DPC) or cavity closer should be inspected to ensure it is complete and un-damaged. Remedial works to ensure compliance should be completed prior to the installation of window.

- When existing windows are removed from a cavity wall, the horizontal cavity, DPC or cavity closer at the base of the window should be inspected to ensure moisture will not penetrate from the external skin of the wall to the inner skin of the wall. Remedial works to ensure compliance should be completed prior to the installation of window.

- When existing windows are removed from a wall built with a checked rebate, the vertical DPC or cavity closer should be inspected to ensure it is complete and un-damaged. Remedial works to ensure compliance should be completed prior to the installation of the window. Windows should be re-fitted with a check rebate to ensure compliance with Part C.

- Windows should be installed on a bed of sealant across the sill and beads of sealant applied vertically to the DPC or cavity closer and horizontally across the head of the window to form a seal between the rear of the window and the wall. Either insulation of suitable backing materials such as closed cell foam roll should be used in the gap between the window and wall to ensure the external sealant applied pressure to the frame and wall when applied.
  Suitable external sealant should be applied to cover and form a water resistant joint between the frame and wall.

- If the new window if fitted into a sub-frame, end sealing of the sill between the frame and sub-sill is essential to prevent water egress.

Summary: Doors

- When the existing door is removed, confirm the type of sill detail fitted, this will either be a conventional sill or an accessible threshold sill.

- If a conventional sill is fitted, the DPC and vertical DPC should be inspected for damage and if necessary repaired or replaced prior to the installation of the new door. Where a door with accessible threshold is removed, the original method of installation needs to be determined (e.g. directly onto a concrete sill with a DPC wrapped between the threshold and sill, on a timber sill fitted below finished floor level etc.) and the water tightness of the system confirmed.

  If a conventional sill is being installed, the door should be fitted in a similar way as described above for windows.

- If an accessible (low) threshold is being installed into an opening that originally had an accessible threshold fitted, the door should be installed in the same manner as the original door was fitted with a DPC between the bottom of the threshold and the stone or timber sill with a sealant between the threshold and DPC.

- If an accessible threshold is being installed where a conventional sill was originally fitted, some additional works may be necessary to correct the height of the sill below the door and to ensure surface water is directed away from the door to a suitable drainage channel or run-off.

- Details of accessible threshold designs can be obtained from The Stationary Office – Accessible thresholds for new housing or BRE guidance IP17/01.

- Doors should be sealed externally as described for windows above but care should be taken to ensure drainage holes in the external face of the threshold are not blocked.

Building Regulations

Approved Document F: Ventilation

Requirement F1, There shall be adequate means of ventilation provided for people in the building.

- There are two different types of ventilation that are required within a building.

1) Purge ventilation

- Purge ventilation is required to remove high levels of pollutants and water vapour. It may also improve thermal comfort and reduce overheating during the summer.

2) Background ventilation

- It is important that the dwelling can constantly breathe - good indoor air quality is important for health and also helps protect the fabric of the building from the harmful effects of condensation and mould etc. Background ventilation helps to achieve this.

Requirements for background ventilation

- Where the outgoing window provided background ventilation, the replacement window should also provide background ventilation. It is acceptable for alternative high level ventilation to be provided, e.g. high level air brick. Typically, background ventilation is positioned at least 1.7 metres above finished floor level to avoid discomfort due to draughts.

- Where trickle ventilators are used to provide background ventilation then the following performance is required:- habitable rooms 5000 mm2 equivalent area. Kitchens, bathrooms and other wet room areas require 2500 mm2 equivalent area.

- If trickle ventilators are fitted in the window that is being replaced, then a trickle ventilator should be fitted to the new window or an appropriately sized air brick fitted. (Two stage locking handles are not acceptable as an alternative to trickle ventilators.)

- If trickle ventilators are not fitted, but two-stage locking handles are fitted in the windows being removed, then either:
  a) trickle vents can be fitted as an alternative, or
  b) two-stage locking handles can be fitted or
  c) appropriate air-bricks can be fitted.

  If no ventilation is provided in the windows being removed then a number of options are available to the consumer. Consideration should be given to fitting of:
  a) trickle vents, or
  b) two-stage locking handles, or
  c) air bricks

- The key point is that the building work, once completed, should not have a worse level of compliance than before commencement of the work. Therefore the customer can, in these circumstances, opt not to fit ventilators.

- The provision of permanent ventilators for combustion appliances is a mandatory requirement as laid out in Approved Document J. Seek advice from a Gas Safe registered engineer to establish the level of required ventilation. See also Section J within this guidance.

Best Practice Notes

- When specifying replacement windows the current level of ventilation in each room should be assessed. If you consider that it is inadequate, advise the customer of the options available. Ensure that whichever method is chosen it meets the necessary level of compliance.

- Where the existing purge ventilation area is in excess of the requirements, although it is acceptable to reduce this to the minimum level requirement in the Approved Document, consideration should be given to retaining the existing level.

Building Regulations

Approved Document J: Combustion appliances and fuel storage systems

Air supply J1. Combustion appliances shall be so installed that there is an adequate supply of air to them for combustion, to prevent overheating and for the efficient working of any flue.

Discharge of products of combustion J2. Combustion appliances shall have adequate provision for the discharge of products of combustion to the outside air.

Note: J1 and J2 apply only to fixed combustion appliances (excluding incinerators)

Air supply for combustion appliances

- Combustion appliances require ventilation to supply them with air for combustion. Ventilation is also required to ensure the proper operation of flues or, in the case of flueless appliances, to ensure that the products of combustion are safely dispersed to the outside air. Installation of room-sealed appliances or those with a directly connected ducted external air supply will minimise ventilation energy losses from the room and the risk of cold draughts.

- Air vent sizes, which are dependent upon the type of fuel burned. The air supply provisions will usually need to be increased where a room contains more than one appliance (such as a kitchen containing an open-flued boiler and an open-flued cooker).

Permanently open ventilation of rooms

- Rooms or spaces intended to contain open-flued combustion appliances may need permanent ventilation to comply with Part J and adjustable ventilation to comply with Part F. Permanently open air vents for combustion appliances can be accepted in place of some or all of the adjustable background ventilation for health, dependent upon opening area and location. However adjustable vents installed to meet the requirements of Part F cannot be used as substitutes for the ventilation openings needed to comply with Part J unless they are fixed permanently open.

- Rooms or spaces intended to contain flueless appliances may need: permanent ventilation and purge ventilation (such as openable windows) to comply with Part J; and adjustable ventilation and rapid ventilation to comply with Part F. Permanent ventilation provisions to comply with Part J may be acceptable in place of adjustable ventilation provisions for Part F subject to the limitations described in Paragraph above. Openable elements installed for the rapid ventilation of rooms and other provisions made for the rapid ventilation of kitchens, in order to comply with Part F, may be acceptable in place of openable elements for the rapid ventilation of rooms or spaces containing flueless appliances.

Limitation on requirements

- The replacement window should not make the ventilation requirements any worse for any combustion appliance which is using permanently open vents installed through the window. If a replacement window installer is not sure if a window vent is being used to ventilate a gas appliance, a "Gas Safe" registered gas fitter should be consulted to provide advice.

- Particular care should be taken when installing replacement windows in rooms with a gas cooker, provision for a gas cooker or other flueless appliances such as water or space heaters.

- In the case of a gas cooker (or provision for a gas cooker), the size of permanently open ventilation is dependant on the volume of the room, if the room is below 5m3 free area of permanent ventilation is 10,000mm2, between 5m3 and 10m3, 5,000 mm2 (no permanent opening required if the room has a door that opens directly to outside) and over 10 m3, no permanently open vent needed.

- Instantaneous water heaters require the same permanently open ventilation but the volume limits are under 10m3, between 10m3 and 20m3 and over 20 m3 respectively.

- Space heaters installed in areas not classed as internal space, i.e.. a room which communicates with several other rooms or spaces, e.g. a hallway or landing, requires permanently open ventilation of 10,000 mm2 plus 5,500 mm2 per kW input (net) in excess of 2.7kW (net).

- Space heaters installed in an internal space, e.g. a lounge, requires permanently open ventilation of 10,000 mm2 plus 2,750mm2 per kW input (net) in excess of 5.4kW (net).

- If there is any doubt regarding the amount and provision of permanently open ventilation, the issue should be referred to a "Gas Safe" registered gas fitter to provide advice.

Outlets from flues

- Outlets from flues should be so situated externally as to allow the dispersal of products of combustion and, if a balanced flue, the intake of air. Further guidance on flues can be found by consulting the Fensa 'Guide of Compliance'.

- The flue outlet should not be nearer than 150mm (fanned draught) or 300mm (natural draught) to an opening into the building fabric formed for the purpose of accommodating a built-in element, such as a window frame.

Building Regulations

Approved Document K (2013 England): Protection from falling, collision and impact

Requirement K2. Protection from falling;
a) Any stairs, ramps, floors and balconies and any roof to which people have access, and;
b) any light well, basement area or similar sunken area connected to a building, shall be provided with barriers where it is necessary to protect people in or about the building from falling.

Requirement K4: Protection against impact with glazing
Glazing, with which people are likely to come into contact whilst moving in or about the building, shall:
a) if broken on impact, break in a way which is unlikely to cause injury or;
b) resist impact without breaking or;
c) be shielded or protected from impact.

Performance

In the Secretary of State's view, you can meet requirement K4 if you adopt, in critical locations, one of the following approaches.

- Measures to limit the risk of cutting and piercing injuries by the use of glazing that is reasonably safe, such that, if breakage did occur, any particles would be relatively harmless.

- Use of glazing sufficiently robust to ensure that the risk of breakage is low.

- Steps are taken to limit the risk of contact with the glazing.

- Impacts with glazing, particularly glazing in doors and door side panels, and at low level in walls and partitions, can result in cutting and piercing injuries.
  For doors and door side panels, the risk is greatest for glazing between floor and shoulder level when near to door handles and push plates, especially when normal building movement causes doors to stick.

- Hands, wrists and arms are particularly vulnerable. An initial impact at between waist and shoulder levels can be followed by a fall through the glazing, resulting in additional injury to the face and body.

- In walls and partitions, away from doors, the risks relate predominantly to glazing at low level. At that level, children are especially vulnerable.

See overleaf for diagram on glazing requirements.

Safe breakage

- Safe breakage is defined in BS EN 12600 section 4 and BS 6206 clause 5.3. In an impact test, a breakage is safe if it creates one of the following.

  a) A small clear opening only, with detached particles no larger than the specified maximum size.
  b) Disintegration, with small detached particles.
  c) Broken glazing in separate pieces that are not sharp or pointed.

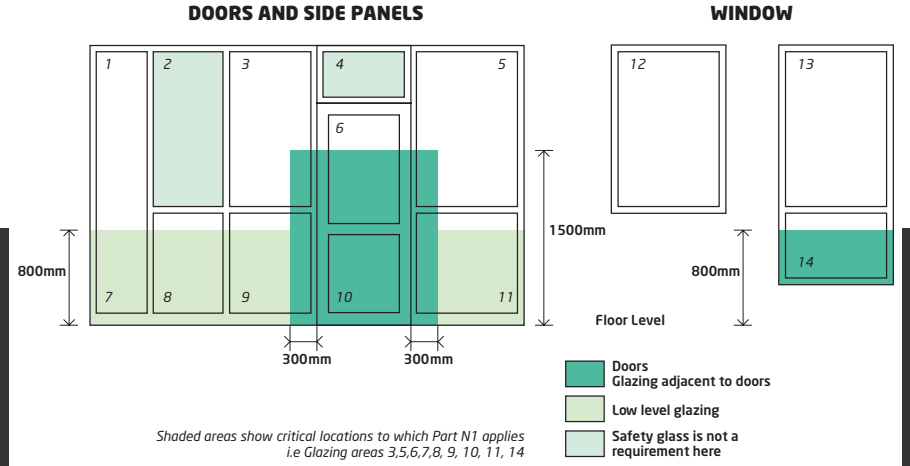
- A glazing material would be suitable for a critical location if it complies with one of the following.

  a) It satisfies the requirements of Class 3 of BS EN 12600 or Class C of BS 6206.
  b) It is installed in a door or in a door side panel and has a pane width exceeding 900mm and it satisfies the requirements of Class 2 of BS EN 12600 or Class B of BS 6206.

Note: *All glazing in buildings must comply with BS 6262-4 Glazing for Buildings –Part 4 – Code of Practice for Safety related to Human Impact - Clause 7 Marking for safety glazing.*

General

- Installed safety glass and safety plastics in critical locations is to be indelibly marked in such a position so that the marking is visible after installation.



Critical Locations in Internal and External Walls to which K4 requiirements applies.

Safety glass

- The installed safety glass should be clearly and indelibly marked with the following information:
  a) the name and trade mark of the manufacturer, merchant or installer
  b) the identifier of the product standard the safety glass conforms to; e.g. BE EN 12150; BS EN 14179; BS EN 14449;
  c) the classification according to BS EN 12600

- A non-compliance will be recorded during an inspection if the mark is not both completely visible and clearly legible following installation.

Best Practice Note

- The critical locations *illustrated previous page* for the positioning of safety glazing are minimum requirements. In certain circumstances and in consultation with the customer, it would be advantageous to supply and install safety glazing material in other situations which the surveyor considers hazardous following his risk assessment. Consideration should be given to the type of safety glazing material used. In certain environments the containment of broken safety glass is crucial.

Building Regulations

Approved Document K (Wales): Protection from falling, collision and impact

Requirement K2. Protection from falling, as England.

Approved document K2 states:
In the Secretary of State's view the requirements of K2 and K3 will be met if, in order to reduce the risk to the safety of people in and about the buildings:

a) pedestrian guarding is provided in dwellings which is capable of preventing people being injured by falling from a height of more than 600mm

- The Regulation applies to fixed glazing and opening lights less than 800mm above floor level, where the floor (or stairs or landing) adjacent to a window is more than 600mm above the outside ground level.

- It usually means that low-level opening lights should have restricted openers and all low-level glazing should be sufficiently robust to resist likely impact.

- Compliance can also be achieved by providing alternative guarding e.g. a guard rail or other fixed barrier, which should cover the zone 800mm above the floor.

- For replacement windows and doors the obligation is to make compliance no worse. A replacement window with a qualifying low-level opening light should be fitted with a restrictor if the outgoing window was fitted with one.
  If a new qualifying low-level opening light is introduced into a replacement window then this should be restricted.

- Any fixed glazing less than 800mm above floor level which acts as a barrier to prevent people falling out should be replaced with glazing which meets the impact resistance requirements of BS 6262-4 taking into account Approved Document K for containment.

Note: *This version of Approved Document K now only applies to Wales. Reference should be made to Approved Document K 2013 Edition for guidance in England.*

Best Practice Note
- Reference should also be made to Approved Document N Glazing
  - Safety in relation to impact for information on safety glazing materials.

Note: *Approved Document N (Wales) still refers to BS 6206 however, this standard has been withdrawn for glass. The Safe Breakage element has been replaced by EN 12600 and the Marking of Safety Glass by BS 6262-4: 2005*

Building Regulations

Approved Document L: Conservation of fuel and power

Requirement L1B; (1) Where a person intends to renovate a thermal element, such work shall be carried out as is necessary to ensure that the whole thermal element complies with the requirements of paragraph L1(a)(i) of schedule 1.
(2) Where a thermal element is replaced, the new thermal element shall comply with the requirements of paragraph L1(a)(i) of schedule 1.

Windows
- To comply with the 2010 edition of Approved Document L1B, replacement windows should comply with one of the following:

  a) Window Energy Rating minimum (WER) band C
  b) Whole window U-Value maximum 1.6 (W/m. K)
  c) Centre pane U-Value maximum 1.2 (W/m. K)
  (For exceptional circumstances only e.g. historic buildings or unique windows).

Doors
- All replacement doors should have a U-value not exceeding 1.8 (W/m2•K)

- *Table 1 Section 4 Document L1B*
  Currently for registration of replacement doors through the competent person's scheme, only doors and frames with greater than 50% glazing have to be registered.

Note: *These new regulations came into force October 1st 2010.*

Best Practice Note:
- When replacing windows within a block of flats, consideration should be given to ensure both the Local Authority and the buildings' landlord are informed of your customer's intention. This is particularly important if a design or material change is being proposed.

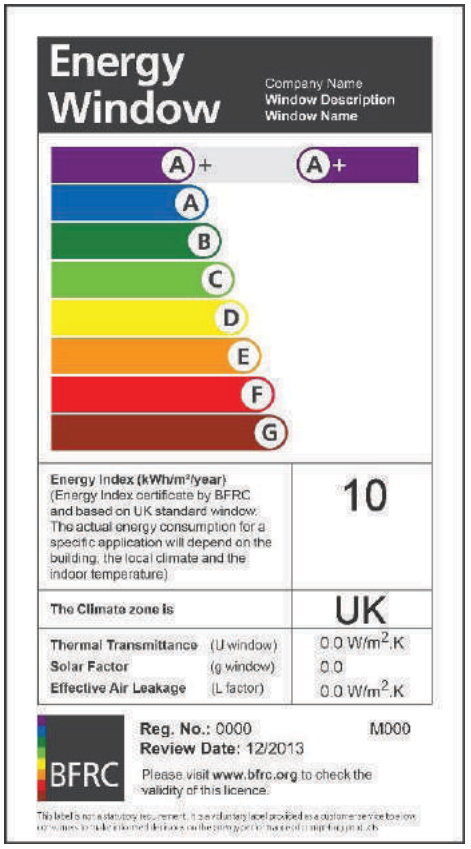
- When replacement combination frames are installed, the glazed area immediately adjacent to the door should be treated as separate windows and registered accordingly. This would include sidelights, top lights and flag windows.

- When installing a bow-bay conversion, it is important that the new window board is adequately insulated to ensure the requirements of Approved Document L are met. Failure to do so will result in non-compliance.

British Fenestration Rating Council (BFRC) Window Energy Rating Scheme

The BFRC Window Energy Rating scheme determines the energy rating of a window i.e. demonstrates how energy efficient a particular window is. The scheme takes into account the overall window and not just the insulating glass unit; it measures the window U-value, the solar gain and the air loss to produce an accurate performance figure which grades the window into one of eight bands A+ to G. The Window Energy Rating scheme is a recognised way of demonstrating compliance similar to that displayed on all new household 'white goods' such as refrigerators, freezers, washing machines, electric ovens etc. that can be found in many retail outlets.

The more efficient the product, the less energy or heat escapes from the property therefore saving the home-owner money and reducing environmental impact. Products that are 'A+' rated are the most efficient and those rated 'G' are the least efficient.



Building Regulations ask for a Window Energy Rating Band 'C' or better. This is one of a number of alternative methods to demonstrate compliance.

For additional information on how to gain a BFRC Window Energy Rating, or to see the various options for window installers and fabricators, go to the web site: www.bfrc.org.

Building Regulations

Approved Document M: Access to and use of buildings

Requirement M1; Reasonable provision shall be made for people to:
a) Gain access to; and
b) Use the building and its facilities.

In the 2013 update sections of Part M were incorporated into Part K (England). The requirement in Wales still uses the 2004 version, however, the following still applies in both England and Wales:

- The requirement of Part M is that you should not make the building less accessible than it was before the installation. The height of the sill for a door should not be made worse. In practice there is often a compromise between compliance (not make access worse) and performance (weatherproofing).

- When the outgoing door is compliant with new build requirements the replacement shall also be compliant.

- Where the door pre-dates the 2004 legal requirements, the installer should make compliance no worse, use best efforts to minimise the hazard and comply with the following:

  a) Protected doorways, and doors in areas of low weather exposure, should be fitted with a threshold sill which gives a height of no greater than 35mm.

  b) Doors in areas of high exposure, and therefore prone to water ingress, should be fitted with a threshold height of no greater than 50mm.

  c) In some situations, due to design considerations, it may not be possible to install a low threshold sill of the requirements as stated above. In these situations, a gap of up to 35 mm measured from the underside of the door leaf to the finished floor level would normally be considered acceptable.

  d) The principal entrance to a dwelling should ideally have a clear opening width of 775mm. When replacing the principal entrance door every practicable effort should be made to retain the maximum width. The clear opening width is taken from the edge of the frame on the latch side to the face of the door leaf when open at 90°.

e) All door installations should comply with the requirements of Approved Document C in relation to resistance to moisture. If the original principle entrance door was fitted after 2004, it should already be fully compliant with the Building Regulations. If being replaced, only this door needs to meet the requirement specified within Approved Document M. Although other door replacements within the property should not have a lesser level of compliance, they are not required to meet the requirements of Approved Document M.

Note: *Further guidance can be provided by the Stationery Office's publication. "Accessible thresholds in new housing: Guidance for house builders and designers". .*

Best Practice Note:

- When surveying or specifying a window or door for a dwelling, the surveyor should make note of the person, or persons occupying or using the dwelling. Special consideration should be given to occupants with disabilities. It is not possible to provide a universal solution, so the installation should be suited to the occupants' requirements. These requirements may include low height door thresholds, increased width door sets and suitable positioning and type of door furniture.

Building Regulations

Approved Document N: Glazing - Safety in relation to impact, opening and cleaning

Requirement N1; Glazing, with which people are likely to come into contact whilst moving in or about the building, shall:
a) If broken on impact, break in a way which is unlikely to cause injury or;
b) Resist impact without breaking;
c) Be shielded or protected from impact.

Critical Locations in Internal and External Walls - Part N1, are shown on page 9.

Safety in use

Where do safety-glazing materials need to be used?

Critical Safety Area Locations

- Part of a door, wall or other part of a building likely to be subject to accidental human impact.

- Those areas of internal and external walls, that are considered 'critical locations' in terms of safety are:

  a) Between the finished floor level and 1500mm above that level in doors, and side panels which are within 300mm of either edge of the door.
  b) Between the finished floor level and 800mm above that level in the case of windows not included in the point above.

Note 1: *In areas where the window is situated above a fixture e.g. bath/shower tray or window seat, the finished floor level is taken from the point on which is stood or sat upon and not the floor level where the item has been affixed.*

Note 2: *Similarly the drop on stairway is measured from the height of the highest tread within the span of the window. (See Figure 16)*

Note 3: *Finished floor level would be taken from the top of any floor furnishings that may or may not be in place at the time of the survey. In some cases the ground level outside may vary from inside the property. The smaller of the two dimensions should be used to determine if the window is in a critical location.*

It is important to note that any part of a glass area affected should meet the requirements in its entirety and not just in the relevant section.

Exception: Small Panes

- Small panes that have a smaller dimension not exceeding 250mm and an area not exceeding 0.5m2. Such glass should not be less than 6mm in thickness, except in the case of traditional leaded lights and copper lights, where 4mm can be used.

For further information regarding specifying glazing that will meet impact performance criteria, please refer to BS 6262 - 4: 2005 and/or Approved Document N of the Building Regulations.

Best Practice Note:

- The critical locations set out above for the positioning of safety glazing are minimum requirements. In certain circumstances and in consultation with the customer, it would be advantageous to supply and install safety glazing material in other situations which the surveyor considers hazardous following his risk assessment. Consideration should be given to the type of safety glazing material used. In certain environments the containment of broken safety glass is crucial.

  Although not necessarily a permanent fixture, bunk beds positioned under windows could also cause significant risk.

Marking of safety glass

- Safety glazing definition - according to BS 6262 - 4: 2005, Glazing for Buildings – Part 4: Code of practice for safety related to human impact.

- Installed safety glass in critical locations should be indelibly and legibly marked in such a position that the whole marking is visible after installation.

- The glass should be marked with the following:
  a) The name and trademark of the manufacturer, merchant or installer;
  b) The identifier of the product standard that the safety glass conforms to; e.g. BS EN 12150, BS EN 14449, etc.;
  c) The classification according to BS EN 12600.

- A non-compliance will be recorded during an inspection if the mark is not both completely visible and clearly legible following installation.

- The marking requirements of BS 6262-4 stated that the second and third characters of the classification are not required to be marked on the product. However, the full classification shall be stated within any Construction Products Directive performance declaration.

Note 1: *Approved Document N still refers to BS 6206 however, this standard has been withdrawn for glass. Reference should now be made to BS 6262-4 2005 which includes the European glass product Standards.*

Note 2: *This version of Approved Document N now only applies to Wales. Reference should be made to Approved Document K 2013 Edition for guidance in England.*

Building Regulations

Approved Document 7: Materials and workmanship

Materials and workmanship 7; Building work shall be carried out
(a) with adequate and proper materials which
(i) are appropriate for the circumstances in which they are used,
(ii) are adequately mixed or prepared, and
(iii) are applied, used or fixed so as adequately to perform the functions for which they are designed; and
(b) in a workmanlike manner.

Main changes in the 2013 edition

- This approved document supports regulation 7: Materials and workmanship. It takes effect on 1 July 2013 and is for use in England*. The 1999 edition will continue to apply to work started before 1 July 2013, or to work subject to a building notice, full plans application or initial notice submitted before 1 July 2013.

There is no change to Regulation 7.
The main amendments in this approved document are that:

- The document has been updated to reflect the full implementation of European Regulation 305/2011/EU-CPR covering construction products, referred to as the Construction Products Regulation, from 1 July 2013. This Regulation requires that products covered by a harmonised European product standard or conforming to a European Technical Assessment should normally have CE marking.

- Reference to the environmental impact of building work has been deleted.

- Guidance on resistance to moisture and substances in the subsoil has been deleted; this is now included in Approved Document C.

- Examples of materials susceptible to changes in their properties have been deleted. (In the case of intumescent coatings, durability testing is now an established element of testing of such products.)

- A new-style format has been used.

Notification of work

- Most building work and material changes of use must be notified to a building control body unless one of the following applies.
  a) It is work that will be self-certified by a registered competent person or certified by a registered third party.
  b) It is work exempted from the need to notify by regulation 12(6A) of, or Schedule 4 to, the Building Regulations.

Responsibility for compliance

- People who are responsible for building work (e.g. agent, designer, builder or installer) must ensure that the work complies with all applicable requirements of the Building Regulations. The building owner may also be responsible for ensuring that work complies with the Building Regulations. If building work does not comply with the Building Regulations, the building owner may be served with an enforcement notice.

Section 1: Materials

- Building work must meet the functional requirements of Schedule 1 to the Building Regulations. Approved documents refer to materials covered by harmonised European product standards, British Standards and other technical specifications. However, there is no obligation to adopt any particular solution contained in an approved document in order to meet functional requirements; the references are not exclusive and other materials may be suitable in the particular circumstances.

Section 2: Workmanship

- Ways of establishing the adequacy of workmanship

2.1 Examples of ways to establish the adequacy of workmanship are described in paragraphs 2.2 to 2.11.

CE marking

2.2 If a material has CE marking, workmanship may be specified in the relevant European Technical Assessment or harmonised product standard.

Standards

2.3 Methods of carrying out different types of work are also given in British Standards or other appropriate technical specifications.

Independent certification schemes

2.4 Some independent certification schemes specify how workmanship will deliver a declared level of performance. The person carrying out the work should show that the workmanship will provide the appropriate level of protection and performance.

2.5 Schemes, including competent person self-certification schemes that register installers of materials can provide a means of ensuring that work has been carried out by knowledgeable contractors to appropriate standards.

FENSA is instrumental in the setting up of the Minimum Technical Competence (MTC) scheme in an effort to raise the standards of workmanship to recognised levels. The issued registration cards will need to be made available for inspection upon request.

Part of this process is to encourage both surveyors and installation teams to work in accordance with established Codes of Practice such as:

- BS 8213-4: 2007 Windows, doors and rooflights.
- Code of practice for the survey and installation of windows and external doorsets.
- The Good Practice Guide for the Installation of Replacement Windows and Doors.

Poorly installed installations or incorrectly specified materials will be recognised following an inspection and may incur a non-conformity as a result.

Building Regulations

Approved Document Q: Security - Dwellings

Summary
This approved document gives guidance on how to comply with requirement Q1 of the Building Regulations.

It contains the following sections:
Section 1: Doors Section 2: Windows
Appendix A: Key terms
Appendix B: Bespoke timber secure door sets
Appendix C: Documents referred to
Appendix D: Standards referred to

Application
The guidance in this approved document applies to new dwellings only; this includes dwellings formed by a material change of use.

The 2015 Edition

- This approved document supports requirement Q1 of Schedule 1 to the Building Regulations 2010. It takes effect on 1 October 2015 for use in England*.
  It does not apply to work started before 1 October 2015, or work subject to a building notice, full plans application or initial notice submitted before that date provided the work is started on site before 1 October 2016.

Requirement Q1: Unauthorised access

Requirement	*Limits on application*
PART Q SECURITY **Unauthorised access** **Q1** Reasonable provision must be made to resist unauthorised access to— (a) any dwelling; and (b) any part of a building from which access can be gained to a flat within the building.	Requirement Q1 applies only in relation to new dwellings.

Performance

Requirement Q1 applies to easily accessible doors and windows that provide access in any of the following circumstances:

a) into a dwelling from outside
b) into parts of a building containing flats from outside
c) into a flat from the common parts of the building.

In the Secretary of State's view, doors and windows will meet requirement Q1 if they can resist physical attack by a casual or opportunist burglar by being both:

a) sufficiently robust
b) fitted with appropriate hardware.

Section 1: Doors

General

1.1 All easily accessible doorsets (including garage doorsets and communal entrance doorsets) that provide access into a dwelling or into a building containing a dwelling should be secure doorsets in accordance with paragraphs 1.2 to 1.4.

Note: *If a garage has no interconnecting doorset allowing access into the dwelling, garage doorsets need not be secure doorsets. Where access to the dwelling can be gained via an interconnecting doorset from the garage, then either the garage doorset (pedestrian and vehicular) or the interconnecting doorset should be a secure doorset.*

Design of secure doorsets

1.2 Secure doorsets should be either:

a) manufactured to a design that has been shown by test to meet the security requirements of British Standards publication PAS 24:2012, or
b) designed and manufactured in accordance with Appendix B.

Note: *Doorsets satisfying other standards that provide similar or better performance are also acceptable. These standards include:*

- STS201 Issue 5:2013
- LPS1175 Issue 7:2010 security rating 2
- STS202 Issue 3:2011 burglary rating 2
- LPS2081 Issue 1:2015 security rating B.

Further advice is available in Secured by Design's New Homes 2014.

1.3 Letter plates, where provided, should:

a) have a maximum aperture of 260mm x 40mm, and
b) be located and/or designed to hinder anyone attempting to remove keys with sticks and/or insert their hand, for example by incorporating a flap or other features to restrict access.

Note: *Letter plates meeting the requirements of the Door and Hardware Federation's (DHF) technical specification TS 008:2012 have been shown to protect against the attacks mentioned above.*

1.4 The main doors for entering a dwelling (usually the front door) should have a door viewer unless other means exist to see callers, such as clear glass within the door or a window next to the doorset. The same doorset should also have a door chain or door limiter.

Note: *In some situations a door chain or limiter is not appropriate, for example where a warden may need emergency access to residents in sheltered housing. Alternative caller-identification measures, such as electronic audio-visual door entry systems, can be used to identify visitors.*

Installation and fixing of secure doorsets

1.5 Frames should be mechanically fixed to the structure of the building in accordance with the manufacturer's installation instructions.

1.6 Lightweight framed walls should incorporate a resilient layer to reduce the risk of anyone breaking through the wall and accessing the locking system. The resilient layer should be timber sheathing at least 9mm thick, expanded metal or a similar resilient material. The resilient layer should be to the full height of the door and 600mm either side of the doorset.

Section 2: Windows General

General

2.1 Ground floor, basement and other easily accessible windows (including easily accessible rooflights) should be secure windows in accordance with paragraphs 2.2 and 2.3.

Design of secure windows

2.2 Windows should be made to a design that has been shown by test to meet the security requirements of British Standards publication PAS 24:2012.

Note: *Windows satisfying other standards that provide similar or better performance are also acceptable. These standards include:*

- STS204 Issue 3:2012
- LPS1175Issue 7:2010 security rating 1
- LPS2081Issue 1:2015 security rating A.

Further advice is available in Secured by Design's New Homes 2014.

Installation and fixing of secure windows

Frames should be mechanically fixed to the structure of the building in accordance with the manufacturer's installation instructions.

Appendix A: Key terms

Doorset
A complete door assembly, assembled on site or delivered as a completed assembly, consisting of the door frame, door leaf or leaves, essential hardware and any integral side panel or fanlight (but excluding coupled assemblies).

Window
Windows, rooflights, roof windows and similar.

Secure doorset
Either:
- a door set that is proven to resist physical attack by a casual or opportunist burglar, or
- a bespoke door set incorporating construction features that are proven to reduce crime.

Secure window
Either:
- a window that is proven to resist criminal attack, or
- a bespoke window incorporating construction features that are proven to reduce crime.

Easily accessible
Either:
- a window or doorway, any part of which is within 2m vertically of anaccessible level surface

such as the ground or basement level, or an access balcony, or
- a window within 2m vertically of a flat or sloping roof (with a pitch of less than 30°) that is within 3.5m of ground level.

Coupled assembly
A doorset and window that are supplied as separate self-contained frames and fixed together on site.

Proven
(In the context of secure doorsets and secure windows) – a product designed and constructed in accordance with a specification or design shown by test to be capable of meeting the required performance.

Further information on materials & workmanship is given in Approved Document 7.

Note 1: *Laboratories accredited by the United Kingdom Accreditation Service (UKAS) or an equivalent European national accreditation body should have the necessary expertise to conduct the relevant tests.*

Note 2: *Any test evidence used to confirm the security of a construction should be carefully checked to ensure that it demonstrates compliance that is adequate and that applies to the intended use. Evidence passed from one organisation to another can be-come unreliable if important details are lost. Small differences in construction can significantly affect the performance of a doorset or window.*

Note 3: *Schemes that certify compliance with PAS 24:2012 or other standards that offer similar or better performance may be acceptable for demonstrating compliance. A list of UKAS-accredited certification bodies is given on the UKAS website. Many recognised schemes are also listed in Secured by Design's New Homes 2014, Section 2.*

Appendix B: Bespoke timber secure doorsets

B.1 A timber doorset constructed in accordance with this appendix is considered a secure doorset for the purposes of requirement Q1.

Note: *The information in this appendix applies to doors of up to 1000mm wide and 2000mm high. Additional measures may be necessary for larger doorsets.*

Material
B.2 The doorset should be manufactured from solid or laminated timber with aminimum density of 600kg/m3.

Dimensions
B.3 Door rails, stiles and muntins should be at least 44mm thick.
After rebating, frame components should retain at least 32mm of timber.

B.4 Any panel within the doorset should be at least 15mm thick. The panel should be securely held in place. Beading should be mechanically fixed & glued in position.

B.5 The smaller dimension of each panel–which can be either the width or height of the panel – should be 230mm or less.

Locks, hinges and letter plates
B.6 The main doors for entering a dwelling (usually the front doorset) should be fitted with a multipoint locking system that meets the requirements of:

- PAS3621 (key locking on both sides), or
- PAS8621 (non-key locking on the internal face), or
- PAS10621 (non-key locking on the internal face, but with an externa locking override facility).

If it is not practical or desirable to install a multipoint locking system, a mortice lock that conforms with one of the following standards can be fitted instead, with a surface-mounted rim lock that conforms to the same standard:

- BS3621 (key locking both sides), or
- BS8621 (non-key locking on the internal face), or
- BS10621 (non-key locking on the internal face, but with an external locking override facility).

Between the locking points for the mortice lock and surface-mounted rim lock, the distance should be 400–600mm.

B.7 The non-primary doors for entering a dwelling (for example, back door or garage inter connecting doors) should be fitted with a multipoint locking system that meets the requirements of:

- PAS3621 (key locking on both sides), or
- PAS8621 (non-key locking on the internal face), or
- PAS10621 (non-key locking on the internal face, but with an external locking override facility).

If it is not practical or desirable to install a multipoint locking system, a mortice lock that conforms with one of the following standards can be fitted instead, with two morticed bolts.

- BS3621 (key locking both sides), or
- BS8621 (non-key locking on the internal face), or
- BS10621(non-key locking on the internal face, but with an external locking override facility).

The morticed bolts should have a minimum projection of 20mm, should be at least 100mm from the top and bottom corners of the door, and should avoid any door construction joints.

B.8 Hinges accessible from outside should incorporate hingebolts.

B.9 Letterplates,whereprovided,should:
a. have a maximum aperture of 260mm x 40mm, and
b. incorporate a flap or other features designed to hinder anyone attempting to remove keys with sticks and/or insert their hand.

Note: *Letter plates meeting the requirements of the Door and Hardware Federation's (DHF's) technical specification TS 008:2012 have been shown to protect against the attacks mentioned above.*

Door limitation and caller identification
B.10 The main doors for entering a dwelling (usually the front door) should have a door viewer unless other means exist to see callers, such as clear glass within the door or a window next to the doorset. The same doorset should also have a door chain or door limiter.

Note: *In some situations a door chain or limiter is not appropriate, for example where a warden may need emergency access to residents in sheltered housing. Alternative caller-identification measures such as electronic audio-visual door entry systems can be used to identify visitors.*

Glazing
B.11 Any glazing which, if broken, would permit someone to insert their hand and release the locking device on the inside of the door should be a minimum of class P1A in accordance with BS EN 356:2000. Double- or triple-glazed units need to incorporate only one pane of class-P1A glass.

Appendix C: Documents referred to

Secured by Design, New Homes 2014. ACPO, 2014.

Appendix D: Standards referred to

British Standards

BS EN 356
Glass in building. Security glazing. Testing and classification of resistance against manual attack [2000]

BS 3621
Thief resistant lock assembly. Key egress [2007+A2:2012]

BS 8621
Thief resistant lock assembly. Keyless egress [2007+A2:2012]

BS 10621
Thief resistant dual-mode lock assembly [2007+A2:2012]
Publicly available specifications

PAS 24
Enhanced security performance requirements for doorsets and windows in the UK. External doorsets and windows intended to offer a level of security suitable for dwellings and other buildings exposed to comparable risk [2012]

PAS 3621
Multipoint locking assemblies. Keyed egress. Performance requirements and test methods [2011]

PAS 8621
Multipoint locking assemblies. Keyless egress. Performance requirements and test methods [2011]

PAS 10621
Multipoint locking assemblies. Dual mode egress. Performance requirements and test methods [2011]

Loss Prevention Certification Board

LPS 2081: Issue 1
Requirements and testing procedures for the LPCB approval and listing of building components, strongpoints, security enclosures and free-standing barriers offering resistance to intruders attempting to use stealth to gain entry [2015]

LPS 1175: Issue 7
Requirements and testing procedures for the LPCB approval and listing of intruder resistant building components, strongpoints, security enclosures and free-standing barriers [2010]

Certisecure: Warrington Certification Limited

STS 201: Issue 5
Enhanced security requirements for doorsets to satisfy the requirements of PAS 24 [2013]

STS 202: Issue 3
Requirements for burglary resistance of construction products including hinged, pivoted, folding or sliding doorsets, windows, curtain walling, security grilles, garage doors and shutters [2011]

STS 204: Issue 3
Enhanced security performance for windows to satisfy the requirements of PAS 24 [2012]

Door and Hardware Federation

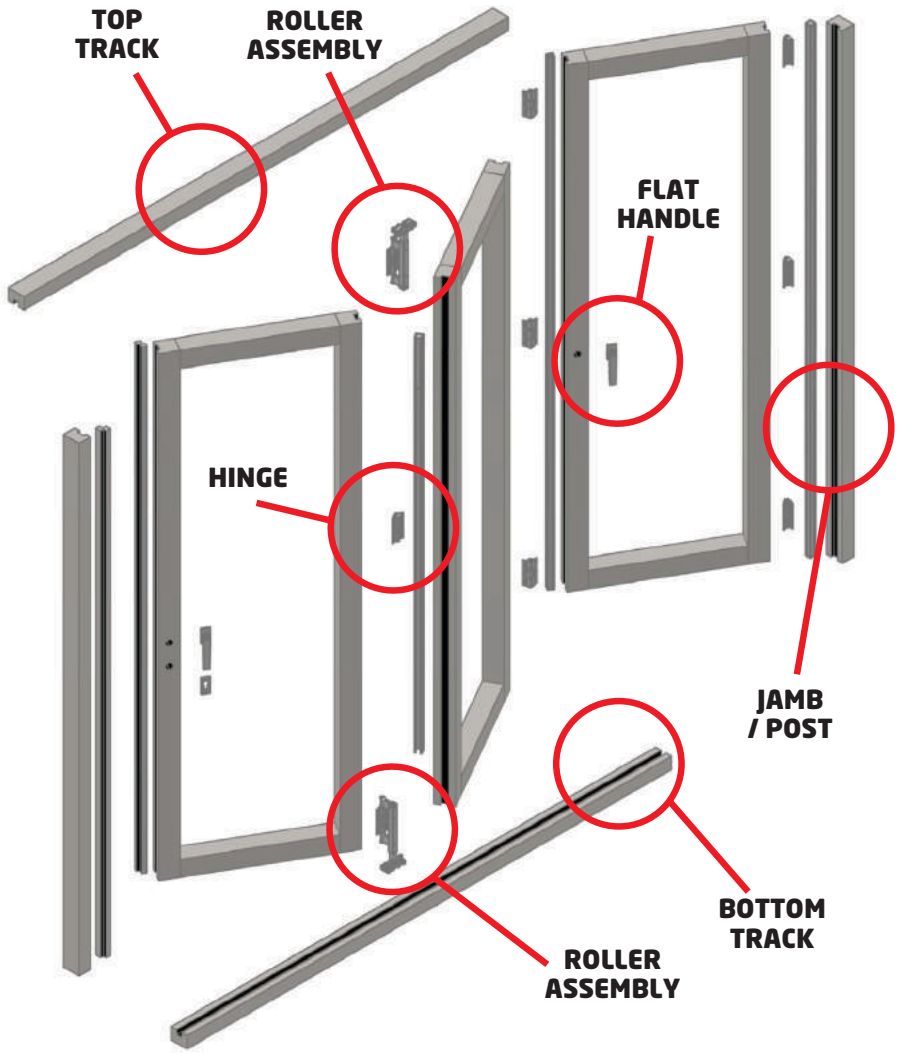
TS 008
Enhanced security and general requirements for letter plate assemblies and slide through boxes [2012].

Bibliography

- BS 7412: Plastic Windows made from unplasticized polyvinyl chloride (PVC-u) extruded hollow profiles.
- PAS 23 - 1: General performance requirements for door assemblies. BPF Code of practice for reinforcement (323 / 1)
- BS 7950: Specification for enhanced security performance of casement and tilt / turn windows
- PAS 24 - 1: Enhanced security performance requirements for door assemblies
- BS EN 12608: Unplasticized polyvinyl chloride (PVC-u) profiles for the fabrication of windows and doors
- BS 7722: Surface covered PVC-u profiles for windows and doors
- BS EN 1670: Building hardware. Corrosion Resistance.
- BS 8213: Windows, doors and rooflights. Design for safety in use and during cleaning of windows, including door height windows and rooflights
- British Adhesives & Sealants Association: Good Practice in sealant application
- BS 6093: Code of practice for design of joints and jointing in building construction
- Health and Safety at work Regulations
- Construction (Design Management) Regulations
- Construction (Health, Safety and Welfare) Regulations
- Health and Safety (Work at height) Regulations
- Manual handling operation s regulations
- Control of substances hazardous to health regulations (COSHH)
- Electricity at work regulations
- Provision and use of work equipment regulations
- Building Regulations (England and Wales)
- Building Regulations (Scotland)
- Building Regulations (Northern Ireland)
- Accessible thresholds in new housing: A guide to Part M if the building regulations approved document

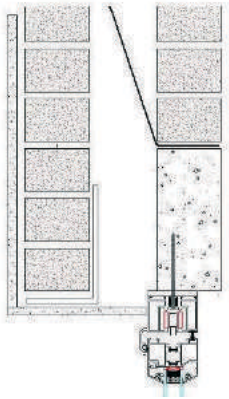
Typical components

Exploded view illustrating the typical components of a folding sliding door

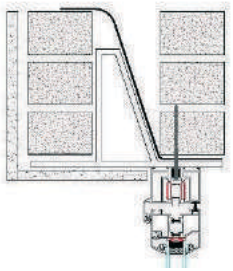


Top track fixing details

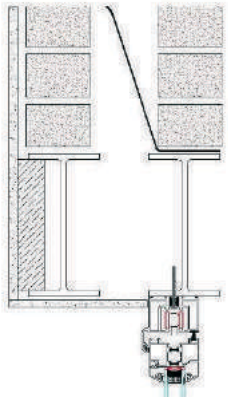
Recommended top track fixing details



Concrete or Timber Lintel



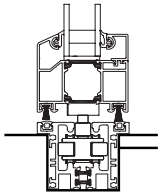
Catnic (with fixing screw fixed into the brick)



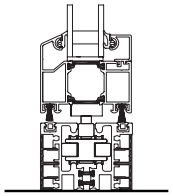
Re-enforced Steel Joist

Cill options

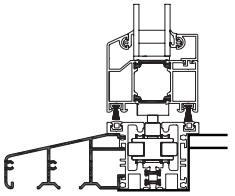
These cill options are example details and apply to all systems.
Our aluminium system has been used for the purpose of illustration.



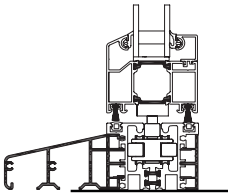
(1) Flush Track



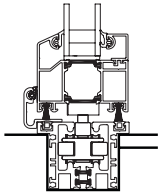
(2) Raised Track



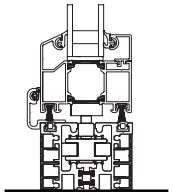
(3) Flush Track with sill



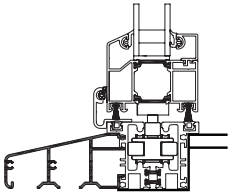
(4) Raised Track with sill



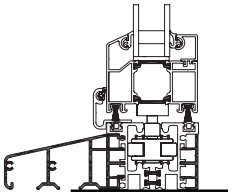
(5) Flush Track with rebate



(6) Raised Track with rebate



(7) Flush Track with sill with rebate



(8) Raised Track with sill with rebate