A BOWATER BUILDING PRODUCTS COMPANY

VERTICAL SLIDING WINDOW

(Version 4.0)

Fabrication Manual

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Amendment List – System 10 Vertical Slider Technical Manual

Date of last amendment – 13/10/2011 – This is a live document
Amendments are issued as required by the Technical Department

Page No.	Chapter	Last issue date	New Issue date.	Details of Change
9.1.01	9	09/2004	11/2009	Page re-dated
9.1.02	9	09/2004	11/2009	Page re-dated
9.1.03	9	09/2004	11/2009	Nearest RAL equivalent note changed
9.1.04	9	09/2004	11/2009	Page re-dated
9.1.05	9	09/2004	11/2009	Not ref BS EN 14351 dangerous substances added
9.1.06	9	09/2004	11/2009	Page re-dated
9.2.01	9	09/2004	10/2009	Page revised to show coupling nut and not P01070
9.2.02	9	09/2004	10/2009	Changed to show further details for coupling nut
9.2.03	9	09/2004	10/2009	This pags was moved from 9.2.02
9.2.04	9	09/2004	10/2009	This page was moved from 9.2.03
9.3.03	9	09/2004	09/2006	Woolpile details for P10139 interlock added
9.4.01	9	09/2004	09/2006	P10139 interlock added
9.4.02	9	09/2004	09/2006	M00189 cam catch packer removed
9.4.03	9	09/2004	10/2009	P10177 trim added
9.5.03	9	09/2004	09/2006	Emergency egress sizes revised (due to incl P10139)
9.6.05	9	09/2004	09/2006	P10139 interlock added
9.6.06	9	09/2004	09/2006	P10139 interlock added
9.6.11	9	09/2014	11/2011	Page subject changed to show Caldwell heavy duty restrictor
9.6.12	9	N/a	11/2011	This page was previously 9.6.11
9.7.04	9	09/2004	09/2006	Spec revised to show deductions using P10139
9.7.05	9	09/2004	09/2006	Spec revised to show deductions using P10139
9.7.08	9	09/2004	09/2006	Spec revised to show deductions using P10139
9.7.09	9	09/2004	09/2006	Spec revised to show deductions using P10139
9.8.01	9	09/2004	09/2006	P10139 interlock added

9.0 VERTICAL SLIDING WINDOWS

9.1 – General Recommendations

Page	Issue	Context
9.1.01	11/2009	General information – Profile storage, frame drainage and profile ventilation, welding of PVC-U profiles, sealed unit thickness
9.1.02	11/2009	General information – Welding of frames, sealed unit thickness
9.1.03	11/2009	General information – PVC-U material specification
9.1.04	11/2009	General information – PVC-U cleaning recommendations
9.1.05	11/2009	General information – PVC-U profiles, health and safety information
9.1.06	11/2009	General information – EPDM gaskets, health and safety information

9.2 – Coupling Options

Page	Issue	Context
9.2.01	10/2009	Recommended distances for positioning coupling nut H01704
9.2.02	10/2009	Preparation for P10177 trim and continuous sill when using coupling nut H01704
9.2.03	10/2009	Recommended distances for positioning coupling nut H01704 when using A00316
9.2.04	10/2009	Recommended distances for screw fixing using aluminium coupling A00316

9.3 – Manufacturing details

Page	Issue	Context
9.3.01	09/2004	Frame, glass and thermal insulation – Physics of heat transfer
9.3.02	09/2004	Frame, glass and thermal insulation – indicative values for PVC-U Vertical sliders
9.3.03	09/2006	Woolpile fitting details
9.3.04	09/2004	Authentic georgian bar layouts
9.3.05	09/2004	Georgian bar end milling and fitting details

9.4 –Vertical slider profiles and components

Page	Issue	Context
9.4.01	09/2006	Vertical sliding window profile chart
9.4.02	09/2006	Vertical slider window parts list
9.4.03	10/2009	Vertical slider coupling components
9.4.04	09/2004	Vertical sliding window profile – James Harcourt

9.5 - Vertical sldier maximum and minimum sizes

Page	Issue	Context
9.5.01	09/2004	Recommended maximum sizes based on 24mm glazing and steel reinforced sashes
9.5.02	09/2004	Recommended maximum sizes based on 24mm glazing and steel reinforced sashes – Arched/ Curved
9.5.03	09/2006	Vertical sliding windows to suit building regulations Part B – Fire safety

9.6 – Manufacturing details

Page	Issue	Context
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9.6.02	09/2004	Reinforcing guidelines and fixing details
9.6.03	09/2004	Sill mechanical joint and spring balance detail
9.6.04	09/2004	Mechanical joint and cutting details for P10125 deep base rail
9.6.05	09/2006	Manufacturing details relating to tilt latches
9.6.06	09/2006	Manufacturing details P10124 covers & M00077 horns
9.6.07	09/2004	Mechanical joint details for P10118 Sash with horn feature
9.6.08	09/2004	Mechanical joint details for P10118 Sash with horn feature
9.6.09	09/2004	Handle and M00182 sash block fitting details
9.6.10	09/2004	Fitting details for tilt restrictors
9.6.11	11/2011	Fitting details for the Caldwell heavy duty bar restrictor
9.6.12	11/2011	Manufacturing details for dummy/fixed sashes

9.7 – Profile combinations

Page	Issue	Context
9.7.01	09/2004	Specification Small sash, large sash at base – Equal split
9.7.02	09/2004	Specification Small sash and Large sash – Equal split
9.7.03	09/2004	Specification Small sash and Large sash with deep bottom rail – Equal split
9.7.04	09/2006	Specification Large sash only – Equal split
9.7.05	09/2006	Specification Large sash deep bottom rail
9.7.06	09/2004	Specification Small and large sash – 2/3,1/3 or 2/5 3/5 split
9.7.07	09/2004	Specification Small and large sash with deep base rail – 2/3,1/3 or 2/5 3/5 split
9.7.08	09/2006	Specification Large sash only – 2/3,1/3 or 2/5,3/5 split
9.7.09	09/2006	Specification Large sash with deep base rail – 2/3,1/3 or 2/5 3/5 split

9.8 – Locking devices

Page	Issue	Context
9.8.01	09/2006	Cam catch details

9.9 – Miscellaneous

Page	Issue	Context
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9.9.02	09/2004	Details for Brookvent SM2000 & SM4000 Ventilators
9.9.03	09/2004	Details for Brookvent SM2000 & SM4000 Ventilators
9.9.04	09/2004	Details for Brookvent PD Glazed –in Ventilator – Controllable ventilation
9.9.05	09/2004	Ventilation details for Caldwell UK124 two stage keep

9.10 – Survey and installation Miscellaneous

Page	Issue	Context
9.10.01	09/2004	Survey and installation guidelines – Introduction, Surveyors role, Preliminary checks
9.10.02	09/2004	Survey guidelines – Building regulations, Approved document B, Approved document E, Approved document F
9.10.03	09/2004	Survey guidelines approved document L, approved document N
9.10.04	09/2004	Method of establishing existing frame height and new frame width
9.10.05	09/2004	Method of measuring arched or semi-arched vertical, vertical sliding sashes
9.10.06	06/2011	External sill projection
9.10.07	09/2004	Vertical slider fitting

1.1 GENERAL INFORMATION

These general recommendations are intended to cover areas that can affect the product quality and the long-term performance of the manufactured PVC-U frames.

STORAGE OF PVC-U PROFILES

Wherever possible profile should be stored indoors at the optimum working temperature of 17 to 23° C with packaging vented to prevent condensation. However, indoor storage is not always practicable and where profile is stored outside measures to protect against rain, moisture, dirt ingress and direct sunlight should be taken.

All profiles should be stored flat, preferable in purpose made storage racks, with intermediate supports spaced between 1000 to 1200 mm. The profile stack height should not exceed 1 metre and in order to avoid scratching, the profiles should be lifted lengthways from the stack.

WOODGRAIN PROFILES

Woodgrain profiles are high, value added products, it is therefore essential to store the profiles indoors, wherever possible. The same indoor storage conditions as for white PVC-U profiles will apply.

FRAME DRAINAGE, PRESSURE EQUALISATION AND PROFILE VENTILATION

The reasons for the frame drainage system are to avoid water ingress to room side and to prevent damage to the edge sealant of the double glazed sealed units. The number of drain slots and their position within the frame depends on the frame style and the frame size as outlined in the various manual chapters. The function of the drainage system is based on equalling the atmospheric pressure at the entry and the exit of the provided drain slots to achieve rapid removal of water through the hollow profile chambers (open container principle). This is achieved by drilling 5-mm holes in the outer frame, sash and transom mullion, preferably in an unobtrusive position at the head of frame members.

The drain slot position must be staggered to avoid any possible water blow back. Face drained frames require extra care to ensure that correct slot size and slot position is maintained for the cover fitting purpose and appearance reasons. The use of drain slot covers should be considered especially in high rise or exposed locations due to the fact that the cover will funnel the wind locally which can result in water blow back. If drain slot covers are a stringent requirement then the double slotted round covers should be used to create a suction effect in the drainage system ‘Venturi principle’.

WOODGRAIN FRAMES

Profile chamber ventilation for woodgrain frames is an essential factor to avoid heat pressure build-up in the welded and subsequently closed profile chambers. The ventilation holes, diameter 5-mm, should be drilled either through vertical and horizontal frame members to allow the air to circulate. This applies to frame chambers including sills, which are not part of the drainage system.

NOTE: Frame drainage through the reinforced chamber shall ‘NOT’ be undertaken!

WELDING OF PVC-U PROFILES

The fusion welding process is the most important activity in the manufacture of PVC-U frames. Regular inspection of the welded corners and ma chine checks are recommended to ensure that a consistent good weld quality can be achieved and maintained by: -

- Positioning the welding machine in draught-free area of the factory
- Ensuring that the minimum manufacturing temperature of 17°C can be maintained
- Verifying the optimum welding parameters by sample corner weld testing
- Accurate mitre and square cutting to achieve the correct 'burn off'
- Cleaning and changing the Teflon covers on a regular basis
- Checking the welding plate temperature on the active area on a daily basis
- Observing the weld sprue quality i.e. colour, gloss, uniformity and contamination
- Introducing regular cyclic calibration of all welding plates and temperature controllers
- Maintaining/checking the welding machines/welding parameters on a regular basis
- Considering, regular corner weld testing to BS EN 514: 2002 or BS 7412: 2002

Indicative theoretical setting values for welding machines

Welding temperature (measured at the plate)	240ºC - 250ºC
Welding (fusion) pressure	2.0 - 3.0 bar
Clamping pressure	5.0 - 6.0 bar
Fusion time	30 - 45 secs
Cooling time	35 - 40 secs

RECOMMENDED SEALED UNIT THICKNESS TOLERANCE

In view of manufacturing efficiencies, standardisation of components and maintaining consistency in t erms of frame performance and security; it is advisable that all manufactured and/or purchased sealed units shall be within the recommended tolerance band of nominal thickness minus 0.5 mm, i.e. overall unit thickness 24.0 - 0.5 mm or 28.0 - 0.5 mm. This t olerance requirement must be aimed for to avoid costly errors, expensive rectification and glass breakage on site.

The European standard thickness tolerance along the periphery of the sealed unit, in accordance with EN 1279-1, can range from ± 1.0 mm to ± 1.5 mm de pending on glass type in use and will always be applied unless otherwise stated and/or agreed.

The benefits of 'TIGHTER' sealed unit tolerances are:

- Predetermination of the required gasket thickness or glazing tape thickness
- Standardisation of glazing gaskets throughout the product range
- Utilisation of pre-gasketed main frame profiles and glazing beads

PVC-U MATERIAL SPECIFICATION

WHS Halo profiles are manufactured from an Acrylic high impact modified, unplasticised Polyvinyl Chloride compound (PVC-U), formulated to suit the Central European climate.

Material properties	Test method	Value
Co-efficient of linear expansion (white and coloured PVC-U profiles)		0.7mm/10°C/ metre length
Fire resistance	BS 476 Part 7 1971	Class 1
Flame spread index	ASTM E162	10 (constant)
Limiting Oxygen index	ASTM S2893	~ 45 %
Thermal conductivity at 23 °C	DIN 52 612	0.15 W/m²K
Creep strength after 1000 hours	DIN 53 444	15 MPa
Shear modulus G at 23°C	DIN 53 445	1000 MPa
Density	DIN 53 479	1.45 kg/m³
Water absorption after 24 hours	DIN 53 495	< 0.1 %
Flexural modulus of elasticity	EN ISO 178	>2200 MPa
Charpy impact strength	EN ISO 179-2	>10 kJ/m²
Vicat softening point	EN ISO 306	>75ºC
Tensile impact strength at (23±2) ºC	EN ISO 8256	>600 kJ/m²
Resistance to impact by falling mass at -10ºC	EN 477	pass
Behaviour after heat ageing at 150ºC	EN 478	pass
Heat reversion (main profiles, external beads)	EN 479	<2 %
Heat reversion (auxiliary profiles)	EN 479	<3 %
Impact strength after artificial ageing	EN 513	>40%
Resistance to weathering	EN 513	M <5 GJ/m²
Colour fastness (after exposure)	EN 513	DE*<5,Db*<3
Weldability test	EN 514	>25 MPa
Hardness, Shore table D	ISO 868	79

WHITE PROFILE COLOUR REFERENCE FOR INFILL PANELS AND FINISHING TRIMS

Recommendation: RAL 9016 or NCS 0401-G65Y is the **'CLOSEST'** match of WHS Halo's profile colour.

RAL colour code	NCS colour code	Delta E value	Delta L value (RAL L value)	Delta A value (RAL A value)	Delta B value (RAL B value)
RAL 9010	0502-Y14R	1.23	0.4 (94.00)	0.45 (-0.49)	-1.07 (3.97)
RAL 9016	0401-G65Y	1.87	1.4 (93.00)	0.68 (-0.72)	+1.03 (1.87)

Note: RAL 9010 or NCS 0502-Y14R is an alternative colour match option.

PVC-U FRAME CLEANING AFTER INSTALLATION

Dirty marks on PVC-U frames can be easily removed using the cleaning agents as outlined below. For the application of polishing and cleaning agents, only unbleached cellulose cloth should be used, cloth containing synthetic fibres should be avoided. Any spots remaining after cleaning may require sand and polishing.
Under no circumstances may solvent containing agents be used.
Mortar, cement etc. should never be scraped off with sharp tools.

Cleaning chart **Dirt or marks**	Scrape off and rub dry	Wipe off with dry cloth	Wash off with water	Wash off with water and non abrasive cleaning agent	Use chemical cleaner or polishing agent
Aluminium marks				■	
Bitumen					■
Pencil				■	
Emulsion paint	■				
Felt tip pen				■	
Organic grease				■	
Inorganic grease				■	
Plaster, cement			■		
Rubber				■	
Heating oil					■
Wood stain			■		
Wood impregnator					■
Lime, mortar			■		
Putty, glue					■
Linseed - oil putty	■				
Ball pen			■		
Cellulose paint	■				
Oil crayon				■	
Oil paint					■
Rust					■
Soot				■	
Salammoniac			■		
Slate chalk					■
Blackboard chalk		■			
Wax, candle wax					■
Wax crayon					■
Water glass		■			

NOTES: PVC-U frames should be cleaned at periodic intervals to maintain their original appearance. The frequency depends upon the geographical location and or the ambient atmosphere but as a general rule the frames should be cleaned whenever the glass is cleaned. The best method of cleaning is to use a clean cloth and a solution of detergent, diluted to the normal concentration for washing-up. If the surface is excessively dirty, it should be cleaned as above. If any unsightly stains remain, then a mild household non-scouring cream should be applied to remove the stains. Abrasive materials should not be used for any cleaning purpose because of scratching of the surface. Especially avoid the use of steel wool pads, as these might cause permanent stains.

PVC-U PROFILES, HEALTH AND SAFETY INFORMATION

BS EN 14351 : DANGEROUS SUBSTANCES

PVC-U WINDOWS DO NOT RELEASE ANY DANGEROUS SUBSTANCES

Control of substances hazardous to health and safety

Product description	PVC-U profiles
Form of product	Extruded hollow and/or solid profile sections
Nature of material	Unplasticised Polyvinylchloride compound based on PVC resin, Acrylic high impact modifier, Lead stabiliser, Calcium organic, Titanium dioxide colour pigments and organic filler
Material hazard	None
Process conditions which may cause hazard : PVC-U frame sand and polishing and fusion welding of corner and T - joints	
Hazard control	N/A
Hazard exposure	Fumes and dust
Hazard component	Fumes = Hydrogen chloride, dust = Polyvinylchloride
Exposure limits 1	Fumes = 5 ppm (10 minutes T.W.A. reference period)
Exposure limits 2	Dust = 5mg/m³ (8 hours T.W.A. reference period)
Exposure limits 3	N/A
First aid	N/A
Inhalation	Fumes = Move to fresh air
Skin contact	Dust = Wash affected skin thoroughly with soap and water
Eye contact	N/A
Recommended personal protective equipment Dust = Facemask should be worn when sand and polishing.	
Storage recommendation PVC-U profiles should be stored away from moisture, heat appliances and direct sunlight. Note: Approximate PVC-U softening point is 80°C.	
Personnel hygiene N/A	
Thermal composition PVC-U profiles are heat stabilised for correct processing up to 240°C. Thermal loading in excess of this, with respect of time and temperature can cause decomposition of the profiles resulting in a liberation of HCL (Hydrogen Chloride).	
Protection against fire and explosion PVC-U profiles are self-extinguishing, but can continue to burn as long as a flame is applied, i.e. PVC-U profiles can burn with other combustible materials. HCL is formed when the product is burned. There is no explosion hazard.	
Disposal PVC-U profiles and manufactured frames can be recycled or incinerated with household refuse in accordance with local regulations.	
Ability to recycle All PVC-U products can be 100 % recycled and re-processed.	

All information given in this data sheet is to the best of our knowledge. Because of the nature of the product, the user assumes all risks, if any, with respect to it. These data shall describe our products referring to questions of health and safety including environmental consideration.

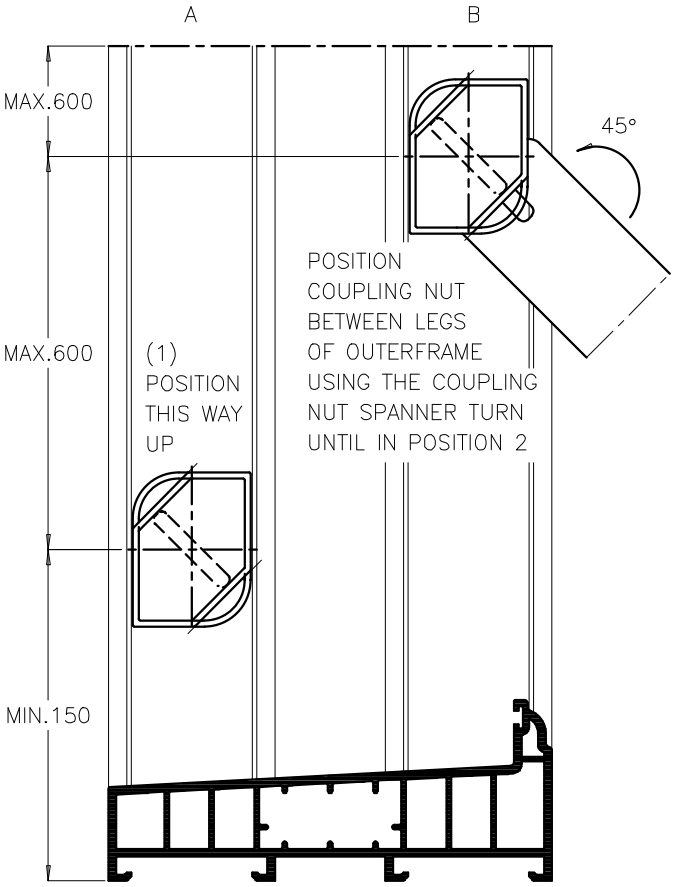
EPDM GASKETS, HEALTH AND SAFETY INFORMATION

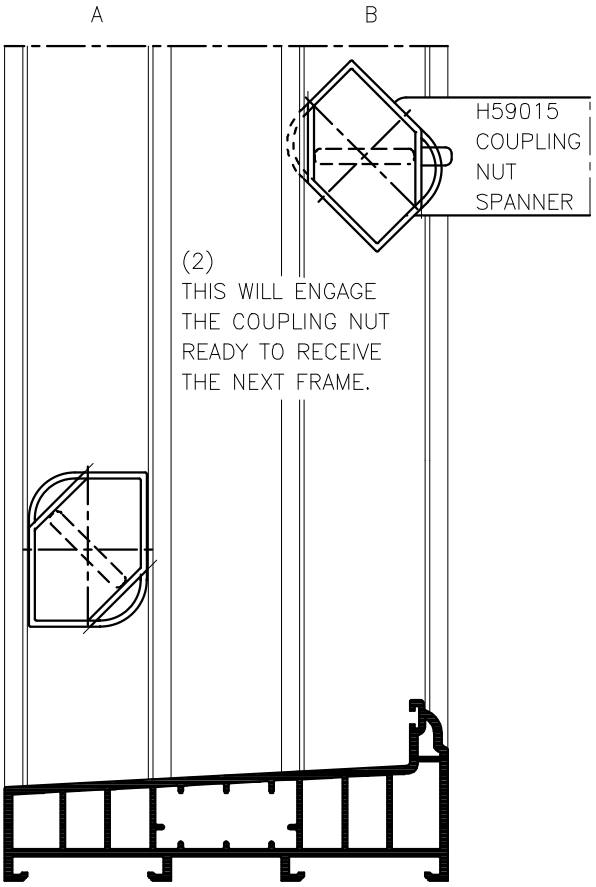
Control of substances hazardous to health and safety

Product description	EPDM gaskets i.e. weather seals and glazing gaskets
Form of product	Extruded gasket profile coils
Nature of material	EPDM (Ethylen Propylene Diene Monomer) Synthetic vulcanised rubber
Material hazard	None
Process conditions which may cause hazard : Transmitting surface agents i.e. Silicone, from the hands when fitting the gaskets into the PVC-U profile sections.	
Hazard control	n/a
Hazard exposure	Skin and eye contact
Hazard component	n/a
Exposure limits 1	n/a
Exposure limits 2	n/a
Exposure limits 3	n/a
First aid	n/a
Inhalation	n/a
Skin contact	Wash affected skin thoroughly with soap and water
Eye contact	Flush eyes thoroughly with cold water
Recommended personal protective equipment Barrier creme and gloves may be used as an added protection.	
Storage recommendation Vulcanised rubber section should be stored away from heat sources and flames.	
Personnel hygiene Those handling vulcanised rubber sections should practise a good standard of personal hygiene. Frequent washing with soap and water is recommended.	
Thermal composition n/a	
Protection against fire and explosion Vulcanised rubber sections will bu rn fiercely with other combustible materials and will emit dense smoke and toxic fumes. There is no explosion hazard.	
Disposal Disposal of vulcanised rubber section must be ca rried out in compliance with the requirements of the “Control of Pollution Act 1974” by means of incineration.	
Ability to recycle **EPDM gaskets CAN NOT be recycled or re-processed.**	

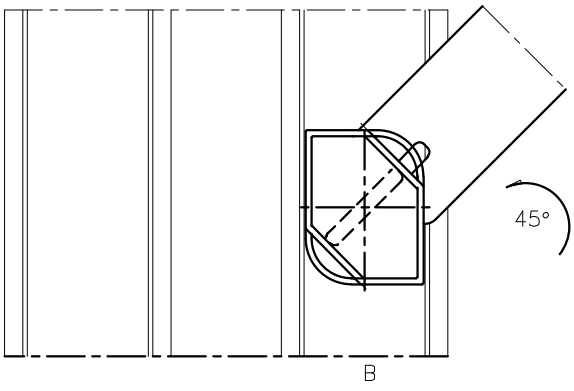
All information given in this data sheet is to the best of ou r knowledge. Because of the nature of the product, the user assumes all risks, if any, with respect to it. These data shall describe our products referring to questions of health and safety including environmental consideration.

RECOMMENDED DISTANCES FOR POSITIONING COUPLING NUT H01704
THIS PAGE IS TO BE READ IN CONJUNCTION WITH PAGE 9.2.02



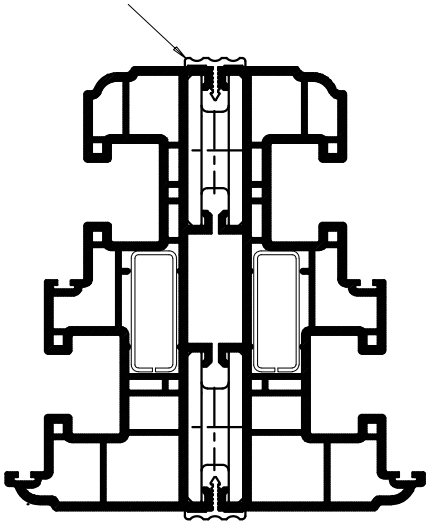


SPACE COUPLING NUTS A MINIMUM
OF 150mm FROM THE BOTTOM OF THE
FRAME, STARTING IN GROOVE 'A'.
THE NEXT NUT WILL BE POSITIONED IN GROOVE 'B'
AND AT NO MORE THAN 600mm CTRS, AS SHOWN.
THEN USE GROOVE 'A' AGAIN AND SO ON.



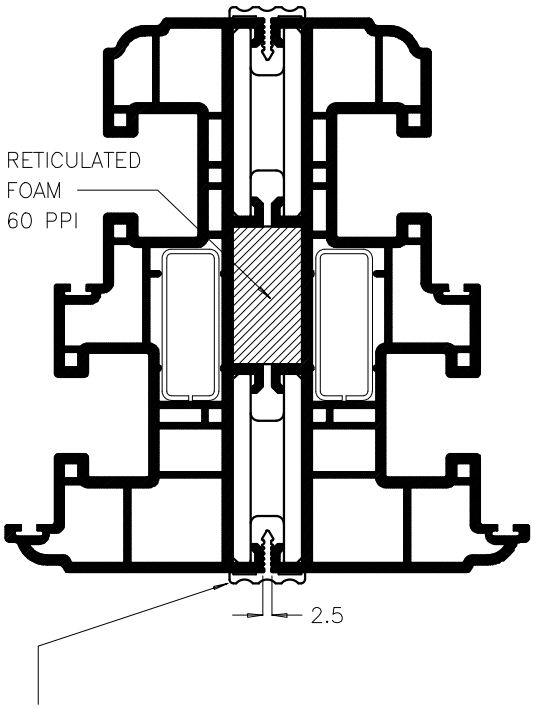
WHEN THE SECOND FRAME IS
POSITIONED USE THE SPANNER
TO TURN EACH NUT FURTHER
UNTIL IN POSITION (3)

P10177
COUPLING NUT TRIM



FOR JOINT FINISHING DETAILS,
SEE PAGE 9.2.02

PREPARATION FOR P10177 TRIM AND CONTINUOUS SILL WHEN USING COUPLING NUT H01704



JOINT GAP BETWEEN OUTERFRAMES IS COVERED USING COUPLING NUT COVER P10177.

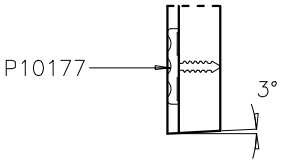
IN WHITE, P10177 IS ADHERED TO OUTERFRAMES USING THE DOUBLE SIDED TAPE, ALREADY FITTED TO THE UNDERSIDE.

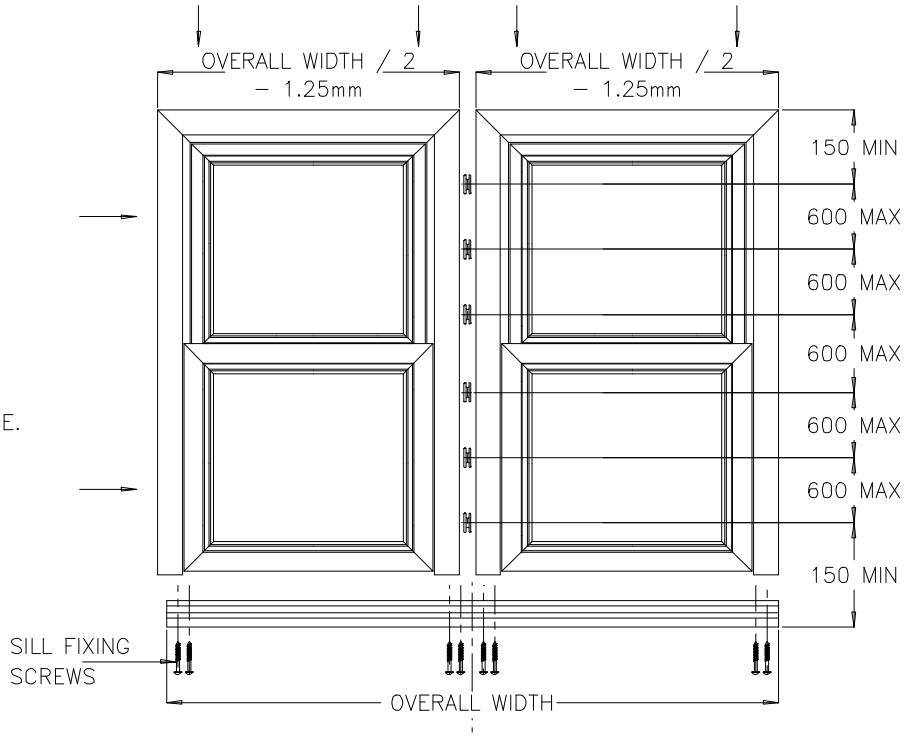
IN WOODGRAIN, P10177 IS ADHERED TO THE OUTERFRAMES USING SILICONE.

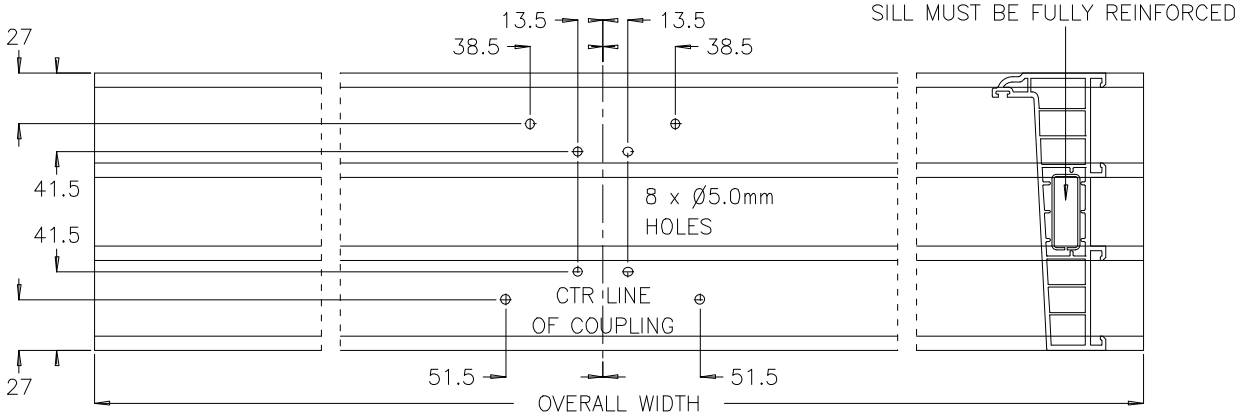
COUPLED FRAMES SHOULD BE PUT ONTO A SINGLE, CONTINUOUS SILL. H01704 COUPLING NUT SHOULD BE USED TO ALIGN THE FRAMES. THE OUTERFRAMES MUST BE MANUFACTURED TO THE CORRECT WIDTH, BEARING IN MIND THAT THE H01704 ADDS 2.5mm ONTO ANY COUPLED JOINT.

PREPARATION FOR P10177:
INSIDE :– THE P10177 SHOULD BE STRAIGHT CUT BOTH ENDS TO A LENGTH OF OVERALL FRAME HEIGHT – 60mm.

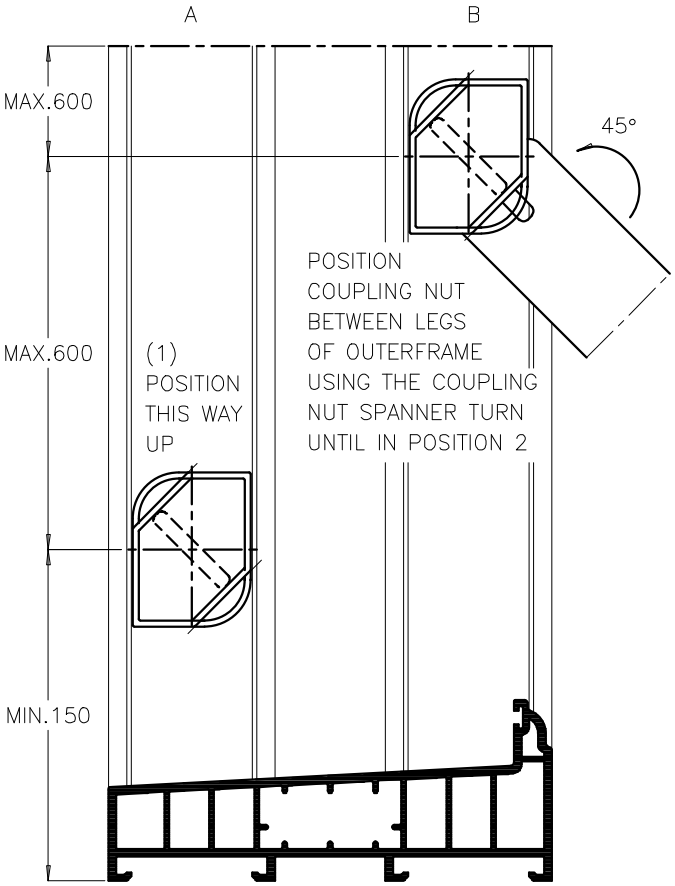
OUTSIDE :– THE P10177 SHOULD BE STRAIGHT CUT ONE END, 3° THE OTHER (see below), TO A LENGTH OF OVERALL FRAME HEIGHT – 31mm.

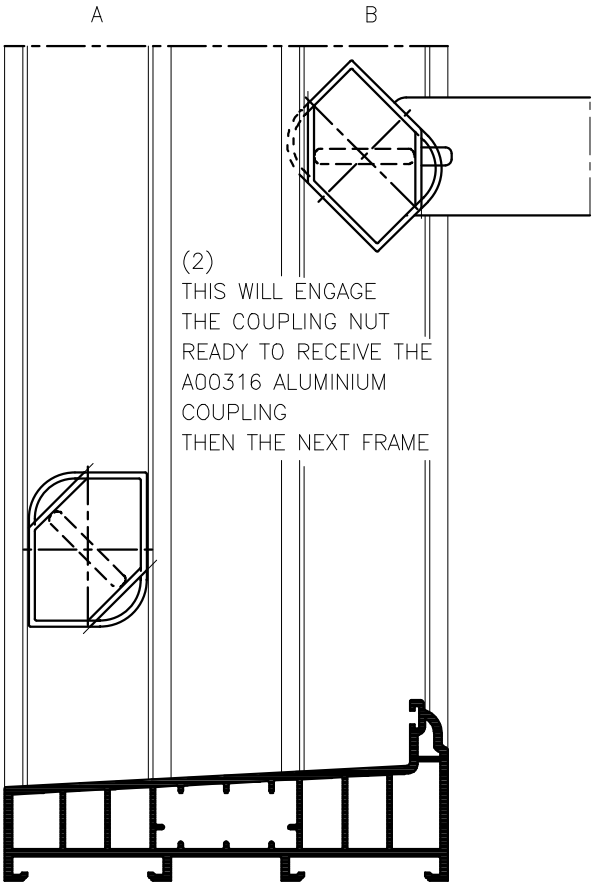






RECOMMENDED DISTANCES FOR POSITIONING COUPLING NUT H01704
WHEN USING COUPLING A00316





SPACE COUPLING NUTS A MINIMUM
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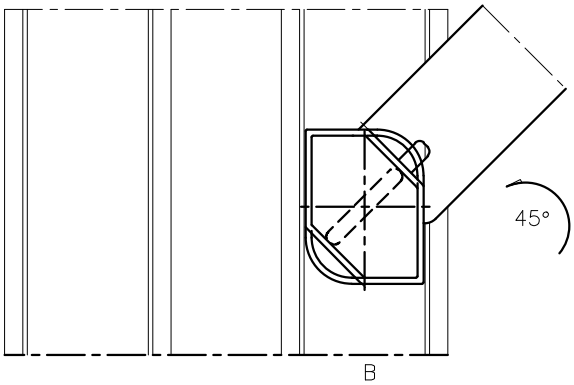
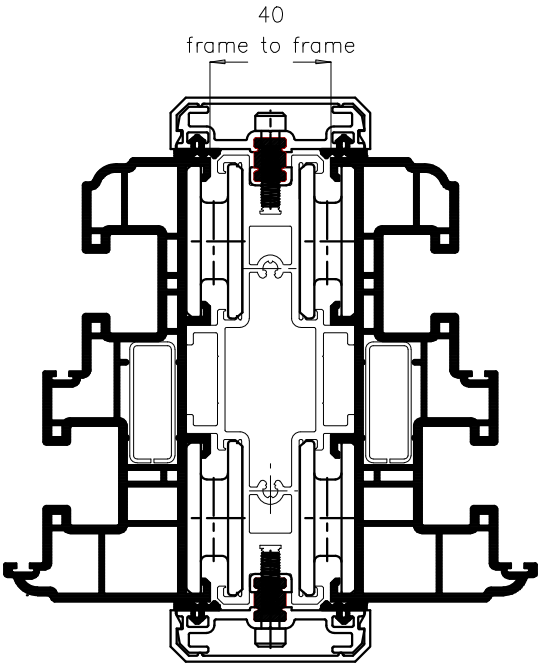
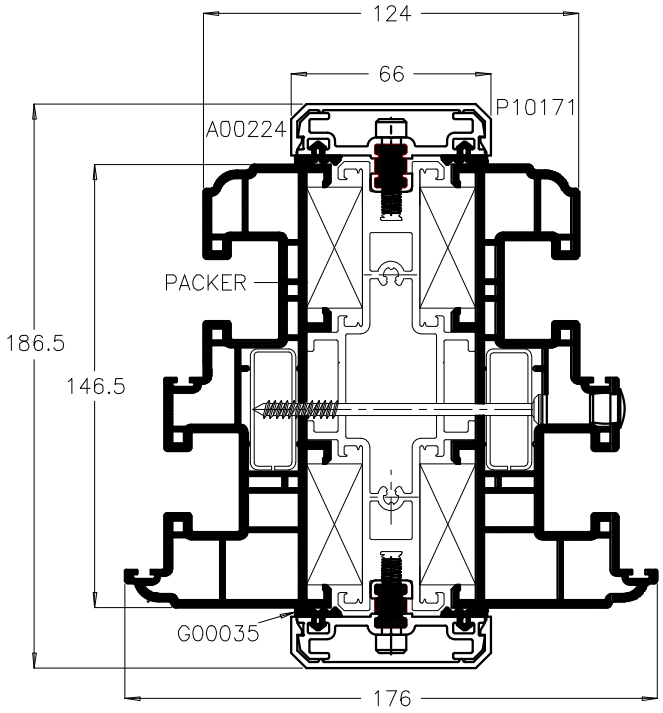




WHEN THE SECOND FRAME IS
POSITIONED USE THE SPANNER
TO TURN EACH NUT FURTHER
UNTIL IN POSITION (3)

WHEN THE COUPLING NUTS HAVE BEEN TIGHTENED,
FINISH THE GAP USING A00224 COVER PLATE
AND P10171 COVER PROFILE WITH G00035 GASKET TO SEAL

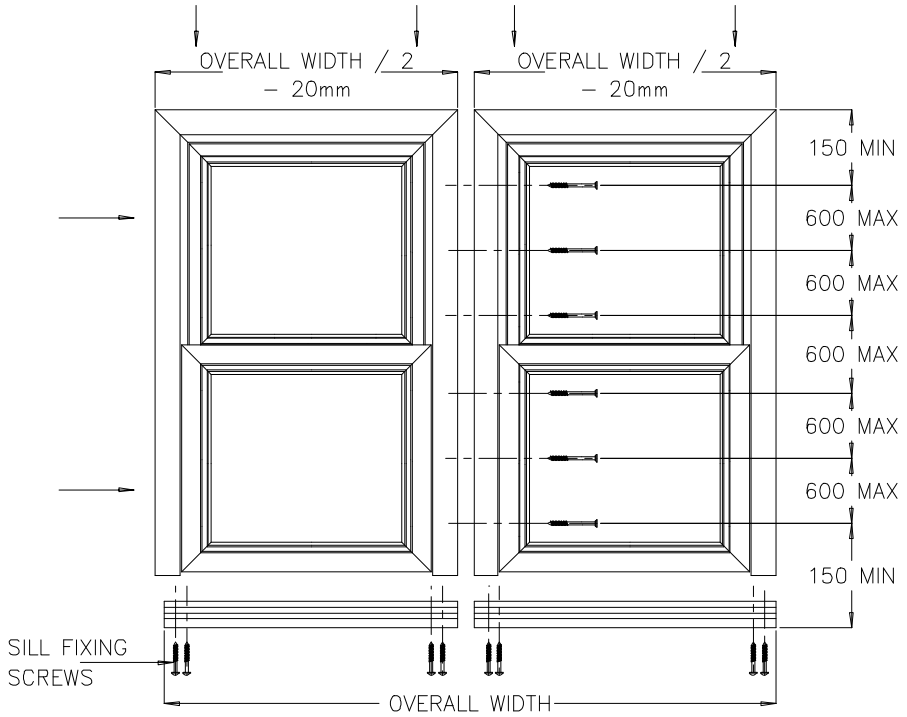
RECOMMENDED DISTANCES FOR SCREW FIXING USING ALUMINIUM COUPLING A00316



PRE DRILLING FOR SCREW FIXINGS :
DRILL Ø4mm HOLE THROUGH ONE OUTERFRAME AND INTO THE OTHER, AS SHOWN, OPEN THIS HOLE OUT TO Ø10mm THROUGH THE TWO WALLS OF PROFILE AS SHOWN.

USE A Ø4.8 x 95mm SCREW TO COUPLE THE TWO FRAMES TO THE A00316, A PACKER MUST BE USED TO SPACE THE OUTERFRAME FROM THE COUPLING AS SHOWN

CAP THE HOLE USING PLASTIC PLUG M00179
TO FINISH THE GAP USE A00224 COVER PLATE AND P10171 COVER PROFILE WITH G00035 GASKET TO SEAL



9.3 FRAME, GLASS AND THERMAL INSULATION

PHYSICS OF HEAT TRANSFERS

Heat is exchanged through a surface, or heat is lost, in any of 3 different ways:

- **Conduction** involving the transfer of heat energy between adjacent parts arising from temperature differences.
- **Radiation** involving the transmission of energy from the warm side in all directions to the colder side requiring no medium to convey that energy.
- **Convection** involving the movements of gas molecules from the warm side towards the colder side aiming to establish a consistent temperature within the provided air gap.

U-VALUE

- **U-value** or thermal transmittance, is a measure of the rate of heat loss through a building material in W/m²K The lower the U-value, the better the insulation!
- **U-value** or thermal transmittance of windows, doors and shutter can be calculated in accordance with BS EN ISO 10077-1:2000 Calculation of thermal transmittance - Part 1:Simplified method

$$U = \frac{A_g U_g + A_f U_f + l_g \psi_g}{A_g + A_f}$$

SI unit	Description	Obtaining data for calculation
U in W/m²K	Total U-value of frame, glass and spacer bar	Result as per formula
Ag in m²	Area of glass	Fabrication computer system
Ug in W/m²K	Thermal transmittance of glazing	Supplier info from calculation or test
Af in m²	Area of frame	Fabrication computer system
Uf in W/m²K	Thermal transmittance of frame	Supplier info from calculation or test
Lg in m	Perimeter of glazing or length around the glass	Fabrication computer system
Ψg in W/Mk	Linear thermal transmittance at the edge of glass	Supplier info from calculation or test

Note: Values for Uf (thermal transmittance of frame) have been evaluated by numerical calculation method in accordance with pr EN ISO 10077-2 or have been obtained from hot box testing in accordance with EN ISO 12412-Part1 and EN ISO 12412 - Part2.

SEALED UNIT RECOMMENDATION

- **Thermal efficient sealed units** are based on low emissivity glass (low E glass). Low E glass types have an ultra thin coating of ranging from 0.02 to 0.10 mm (soft coat) and from 0.15 to 0.20 mm (hard coat). The coating reflects the long wavelength energy, generated from heat appliances and lightening back into the building whilst permitting the transmission of short wavelength solar energy from outside.
- **Sealed units with a centre pane U-value of 1.2 W/m²K** are an alternative way to comply with Part L in England and Wales for replacement frames whereby frame size, frame style and frame materials are not being measured. Centre pane sealed units can be obtained from Interpane Glass (UK) Ltd (trade description: Iplus C), from commercial Pilkington sealed unit manufacturers (trade description: Optifloat ® Clear / Argon / Optitherm ® SN) and/or from commercial Saint-Gobain sealed unit manufacturers (trade description: SGG Planitherm ® Futur N).

9.3 FRAME, GLASS AND THERMAL INSULATION

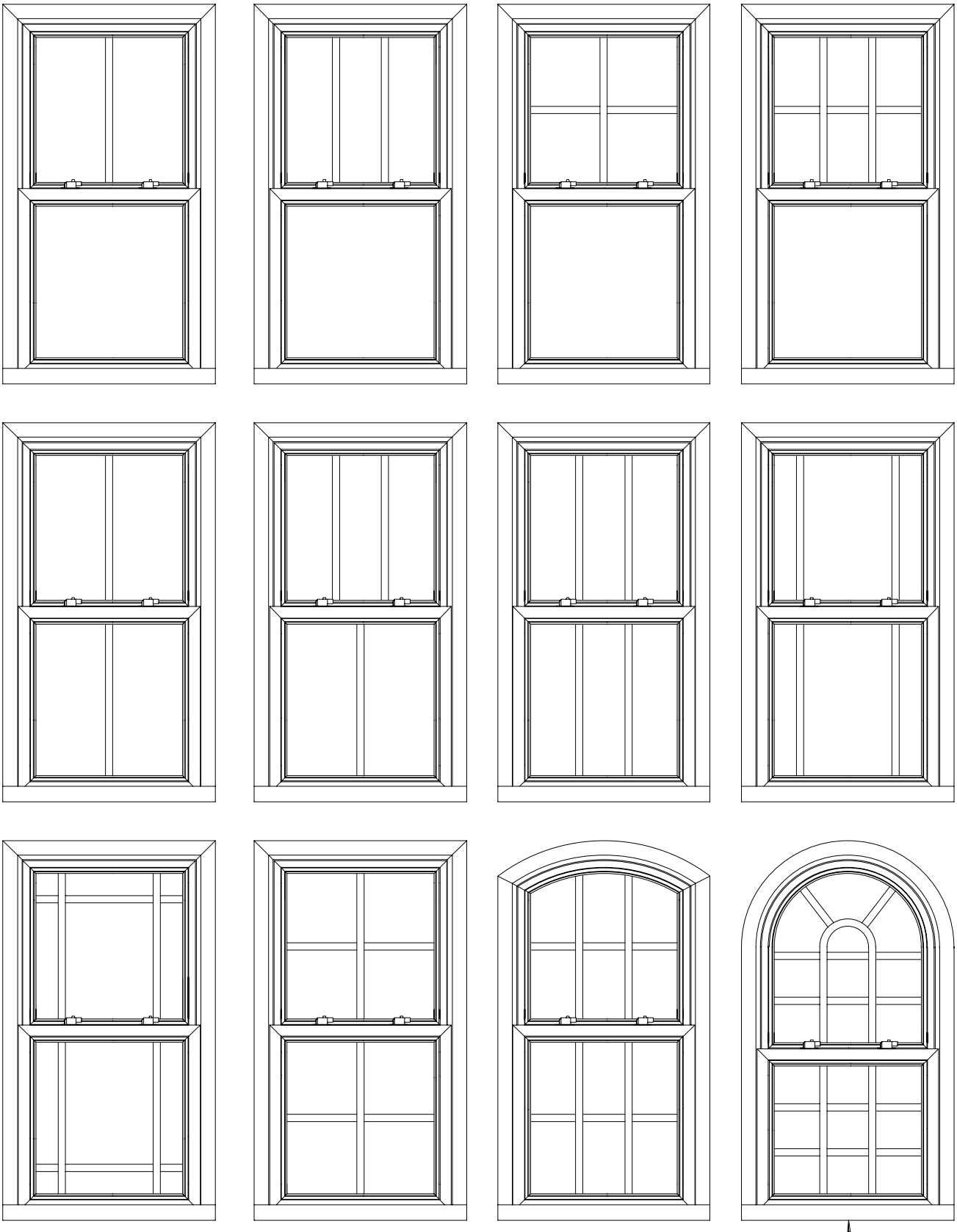
INDICATIVE U-VALUES FOR PVC-U VERTICAL SLIDERS

Glass type	Gas type	Spacer bar	PSI-value W/mK	Ug glass W/m²K	Uw window W/m²K
K-glass (hard coat)	Air	Aluminium	0.067	1.7	**2.0**
K-glass (hard coat)	Air	TIS spacer	0.048	1.7	**1.9**
K-glass (hard coat)	Air	Swisspacer	0.043	1.7	**1.9**
K-glass (hard coat)	Air	Swisspacer v	0.033	1.7	**1.8**
K-glass (hard coat)	Argon	Aluminium	0.067	1.6	**1.9**
K-glass (hard coat)	Argon	TIS spacer	0.048	1.6	**1.8**
K-glass (hard coat)	Argon	Swisspacer	0.043	1.6	**1.8**
K-glass (hard coat)	Argon	Swisspacer v	0.033	1.6	**1.8**
Planitherm (soft coat)	Air	Aluminium	0.067	1.5	**1.8**
Planitherm (soft coat)	Air	TIS spacer	0.048	1.5	**1.8**
Planitherm (soft coat)	Air	Swisspacer	0.043	1.5	**1.7**
Planitherm (soft coat)	Air	Swisspacer v	0.033	1.5	**1.7**
Optitherm SN (soft coat)	Air	Aluminium	0.067	1.4	**1.8**
Optitherm SN (soft coat)	Air	TIS spacer	0.048	1.4	**1.7**
Optitherm SN (soft coat)	Air	Swisspacer	0.043	1.4	**1.7**
Optitherm SN (soft coat)	Air	Swisspacer v	0.033	1.4	**1.6**
Planitherm (soft coat)	Argon	Aluminium	0.067	1.3	**1.7**
Planitherm (soft coat)	Argon	TIS spacer	0.048	1.3	**1.6**
Planitherm (soft coat)	Argon	Swisspacer	0.043	1.3	**1.6**
Planitherm (soft coat)	Argon	Swisspacer v	0.033	1.3	**1.6**
Optitherm SN (soft coat)	Argon	Aluminium	0.067	1.2	**1.6**
Optitherm SN (soft coat)	Argon	TIS spacer	0.048	1.2	**1.6**
Optitherm SN (soft coat)	Argon	Swisspacer	0.043	1.2	**1.5**
Optitherm SN (soft coat)	Argon	Swisspacer v	0.033	1.2	**1.5**
Optitherm S2 (soft coat)	Argon	Aluminium	0.067	1.1	**1.6**
Optitherm S2 (soft coat)	Argon	TIS spacer	0.048	1.1	**1.5**
Optitherm S2 (soft coat)	Argon	Swisspacer	0.043	1.1	**1.5**
Optitherm S2 (soft coat)	Argon	Swisspacer v	0.033	1.1	**1.4**
Iplus C (soft coat)	Krypton	Aluminium	0.067	1.0	**1.5**
Iplus C (soft coat)	Krypton	TIS spacer	0.048	1.0	**1.4**
Iplus C (soft coat)	Krypton	Swisspacer	0.043	1.0	**1.4**
Iplus C (soft coat)	Krypton	Swisspacer v	0.033	1.0	**1.4**

NOTES:

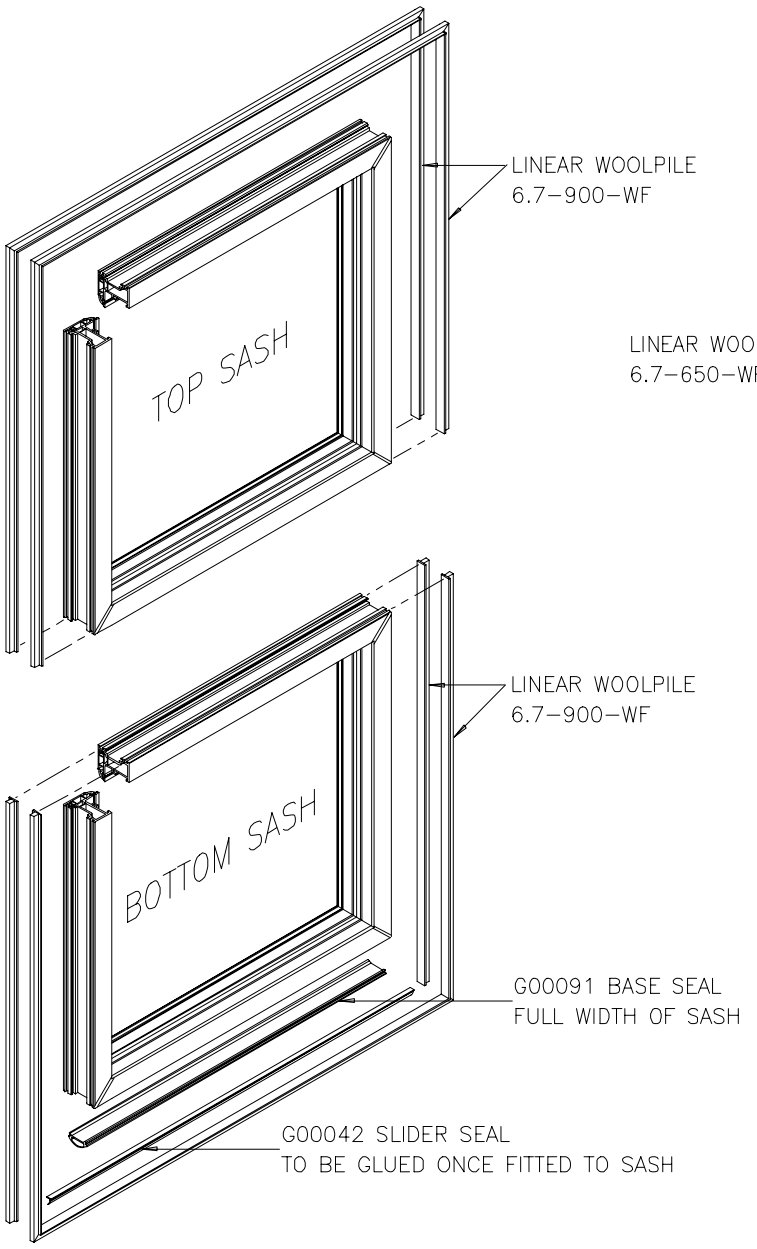
- Uw - window U-value (EN frame style and size of 1230 mm x 1480 mm - 33% frame + 67% glass)
- Ug - glazing U-value - thermal transmittance of glazing
- PSI values - linear thermal transmittance at the edge of glass
- K glass, Optitherm ® SN, Optitherm ® S2, TIS (warm edge technology) are **Pilkington products**
- Planitherm, Swisspacer and Swisspacer V (warm edge technology) are **Saint-Gobain products**
- Iplus C is an **Interpane Glass (UK) Ltd product**

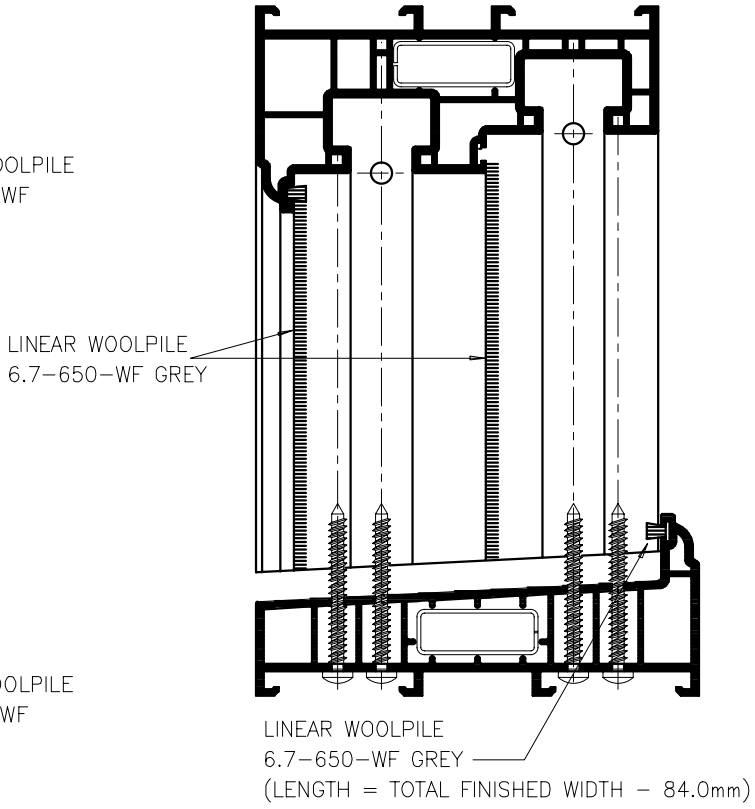
AUTHENTIC GEORGIAN BAR LAYOUTS



THIS GEORGIAN BAR LAYOUT IS ONLY AVAILABLE AS BARS INSIDE THE SEALED UNIT.
IT IS NOT AVAILABLE WITH 'STICK ON' AUTHENTIC GEORGIAN BAR.
PLEASE BE AWARE THAT THIS LAYOUT IS NOT AVAILABLE ON NARROW UNIT WIDTHS.
ITS SUITABILITY MUST BE CHECKED WITH THE GLASS UNIT SUPPLIERS.

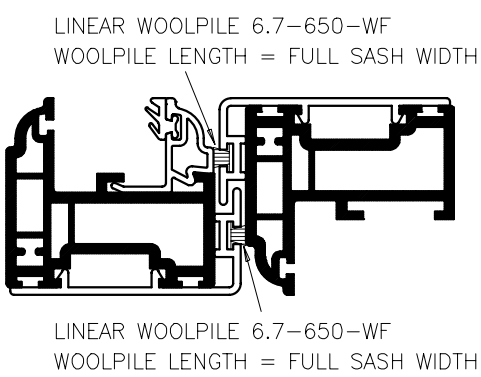
WOOLPILE FITTING DETAILS



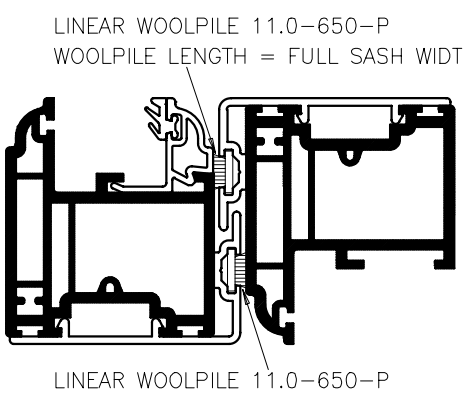


NOTE
WOOLPILES TO BE GLUED ONCE
FITTED INTO THE SASHES.

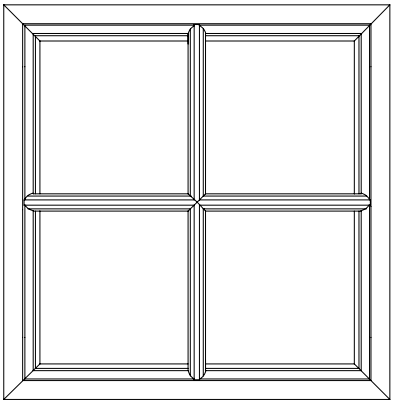
P10119 INTERLOCK – WOOLPILE DETAILS



P10139 INTERLOCK – WOOLPILE DETAILS



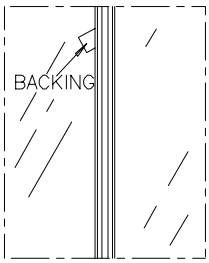
GEORGIAN BAR END MILLING AND FITTING DETAILS



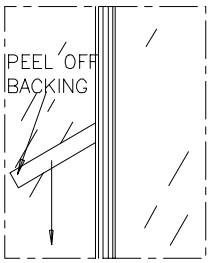
1) THE GEORGIAN BAR MUST BE CUT TO LENGTH AND THE ENDS PROFILE MILLED.
2) CLEAN THE GEORGIAN BAR TO REMOVE ANY GREASE PRIOR TO APPLYING THE DOUBLE SIDED TAPE.
3) CLEAN THE GLASS TO REMOVE ANY DIRT OR GREASE PRIOR TO FITTING THE GEORGIAN BAR.
4) CUT AND APPLY THE DOUBLE SIDED TAPE (TECHNIBOND DOUBLE SIDED TAPE 1 x 16.5) TO THE GEORGIAN BAR.
5) POSITION THE GEORGIAN BAR CORRECTLY ON THE GLASS.
6) PEEL THE BACKING FROM THE TAPE AND APPLY PRESSURE TO THE GEORGIAN BAR AS YOU GO ALONG. DO NOT REMOVE THE BACKING ALL AT ONCE AND THEN TRY TO POSITION THE GEORGIAN BAR ON THE GLASS BECAUSE ONCE THE TAPE COMES INTO CONTACT WITH THE GLASS IT PROVES VERY DIFFICULT TO REMOVE AND RE–POSITION IF NOT CORRECT.

PLEASE NOTE ! ENSURE THAT THE SASH MEMBERS ARE NOT BOWED PRIOR TO APPLICATION OF THE GEORGIAN BAR.

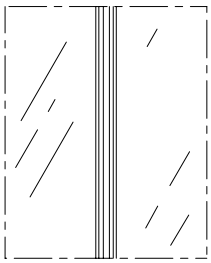
RECOMMENDED CLEANING AGENT – ISOPROPANOL (3M VHB SURFACE CLEANER)



1. CORRECTLY POSITION GEORGIAN BAR ON GLASS. PEEL BACK A SMALL LENGTH OF BACKING FROM ONE END OF THE GEORGIAN BAR AND FOLD OVER.

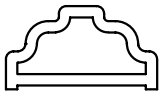


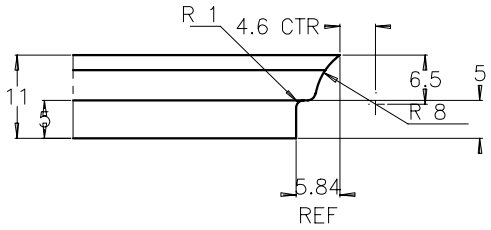
2. START TO PEEL OFF THE BACKING TAPE WHILST THE GEORGIAN BAR IS ON THE GLASS. APPLY HARD PRESSURE ONTO THE GEORGIAN BAR AS YOU REMOVE THE BACKING.



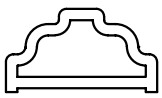
3. ONCE THE BACKING IS COMPLETELY REMOVED APPLY HARD PRESSURE ALL ALONG THE GEORGIAN BAR TO ENSURE GOOD ADHESION TO THE GLASS UNIT.

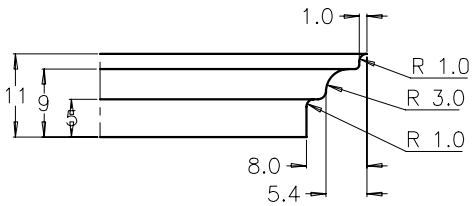
END MILLING DETAIL FOR P10122 GEORGIAN BAR FITTING UP TO P10118 OR P10123 SASH AND FITTING UP TO P10121 BEAD.





END MILLING DETAIL FOR P10122 GEORGIAN BAR FITTING UP TO P10122 GEORGIAN BAR.

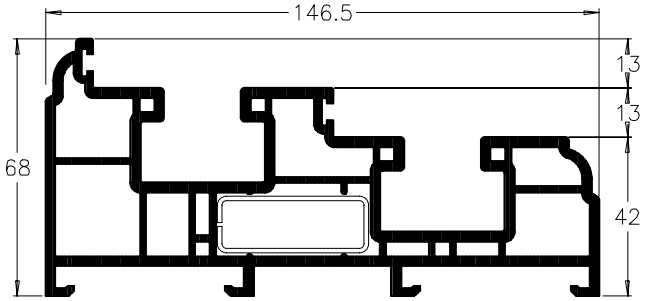




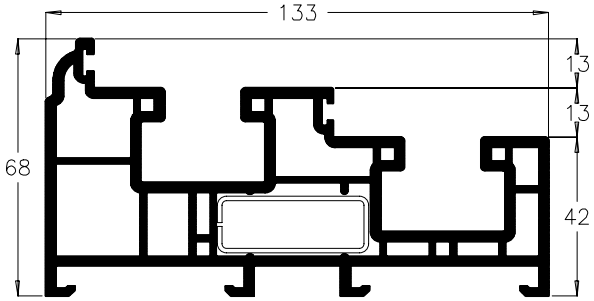
PLEASE NOTE.
END MILLING CUTTERS TO SUIT VARIOUS MILLING MACHINES CAN BE ORDERED THROUGH WHS HALO TECHNICAL SERVICES DEPARTMENT.

PLEASE NOTE ! SASHES MUST NOT BE OPENED OR CLOSED BY USING THE GEORGIAN BAR TO ACT AS A 'HANDLE'

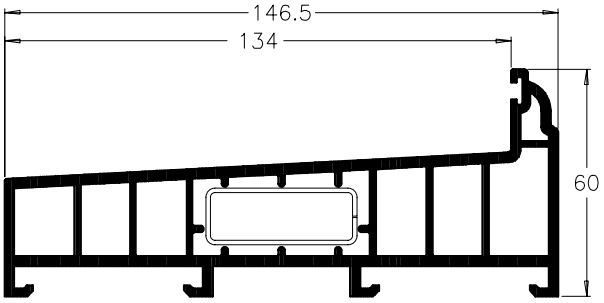
VERTICAL SLIDING WINDOW PROFILE CHART



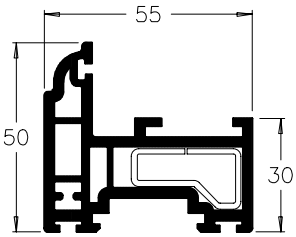
P10153 OUTERFRAME
S00016



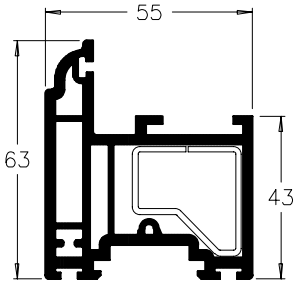
P10173 OUTERFRAME
S00016



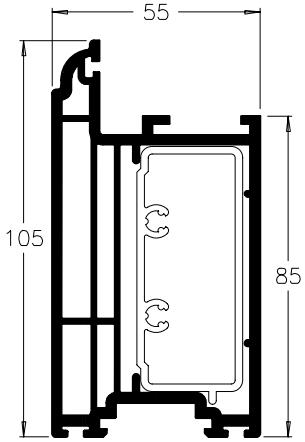
P10155 Sill
S00016



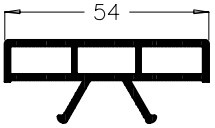
P10118 SMALL SASH
S00120



P10123 LARGE SASH
S00121

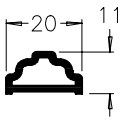


P10125 DEEP BOTTOM RAIL
A00318

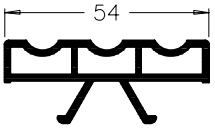


P10190 COVER

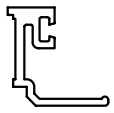
P10121.64
24mm GLAZING BEAD



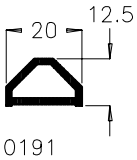
P10122
GEORGIAN GLAZING BAR



P10124 COVER

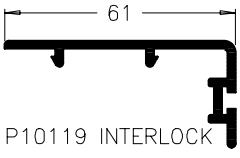


A00163
ALUMINIUM VENT BEAD

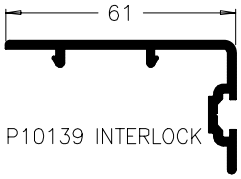


P10191
GEORGIAN GLAZING BAR

GEORGIAN BAR TAPE:
WHITE – H00615.01,
BLACK – H00615.80
1mm x 16.5mm x 50M ROLL
TECHNIBOND DOUBLE SIDED TAPE

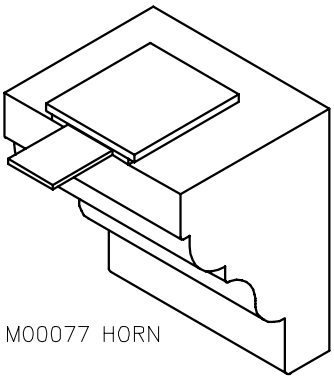


P10119 INTERLOCK

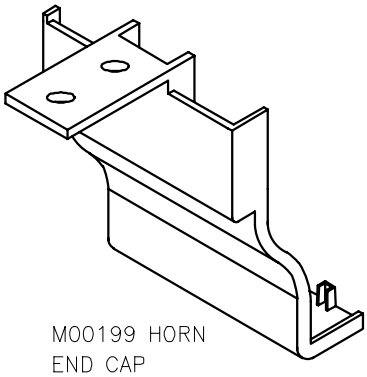


P10139 INTERLOCK

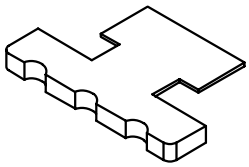
VERTICAL SLIDING WINDOW PARTS LIST



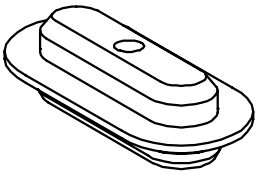
M00077 HORN



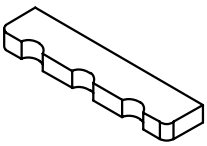
M00199 HORN
END CAP



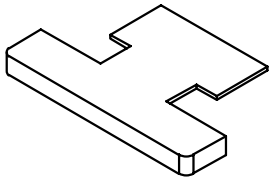
M00079 COVER ENDCAPS
FOR P10124



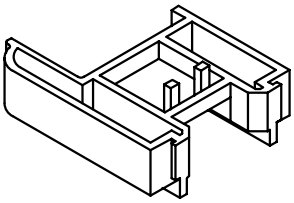
M00182 SASH BLOCK



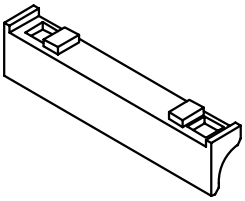
M00078 COVER ENDCAPS
FOR P10124



M00192 COVER ENDCAPS
FOR P10124



M00122 VERTICAL SLIDER ENDCAP
FOR MECHANICAL JOINT FIXING



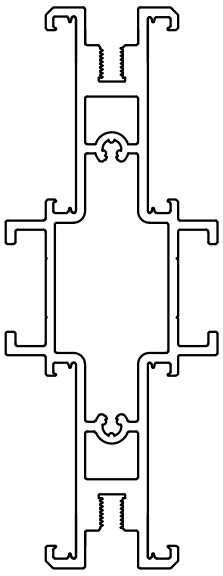
M00091 KEEP PACKER
FOR USE WITH CALDWELL
KEEPS ONLY.

G00066 GLAZING GASKET

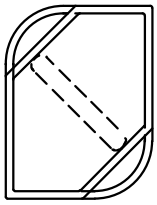
G00042 SLIDER SEAL

G00091 BASE SEAL

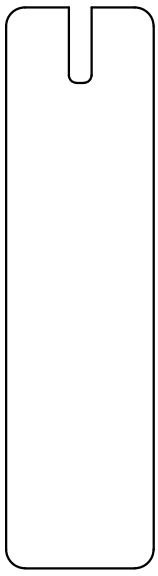
VERTICAL SLIDER COUPLING COMPONENTS



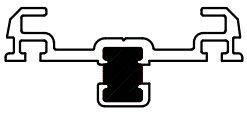
A00316 COUPLING



H01704 COUPLING NUT

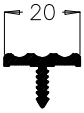


H59015
COUPLING NUT SPANNER

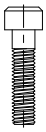


A00224 COVER PLATE

P10171 COVER

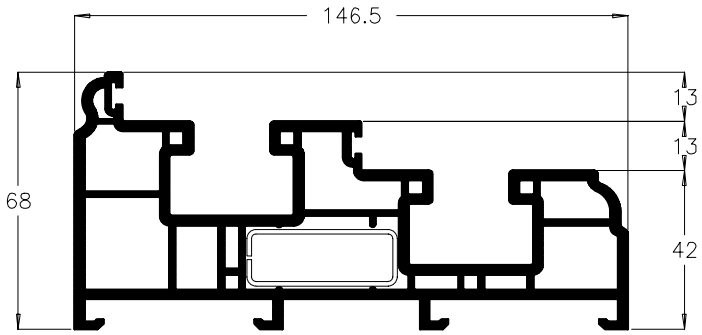


P10177
COUPLING NUT TRIM

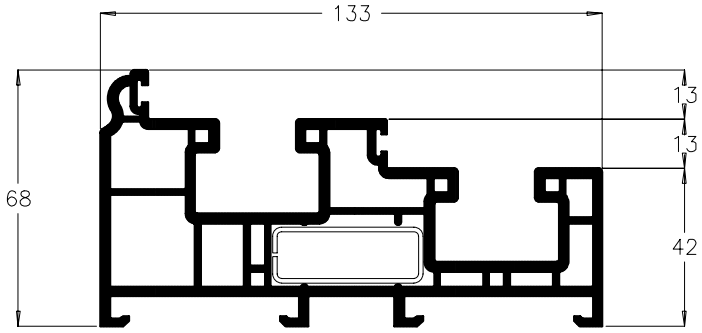


H01512
M6 x 25mm S/TEEL
CAP SCREW

G00035 PRESSURE GASKET



P10154 OUTERFRAME
S00016

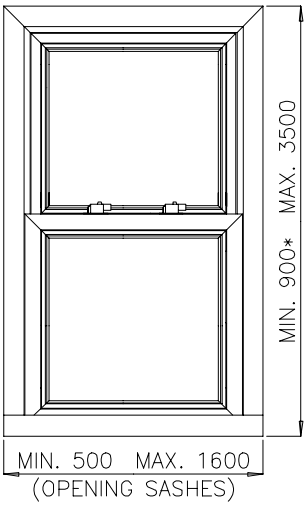


P10174 OUTERFRAME
S00016

THESE OUTERFRAMES ARE EXCLUSIVE TO THE JAMES HARCOURT FABRICATORS.

ALL DETAILS FOR FABRICATION OF FRAMES USING THESE PROFILES IS IDENTICAL TO THE MANUAL PAGES SHOWING P10153 & P10173 OUTERFRAMES.

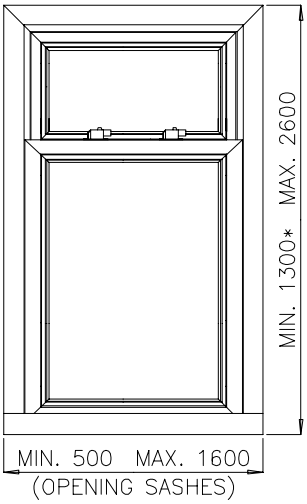
RECOMMENDED MAXIMUM SIZES BASED ON 24mm (4.16.4) GLAZING AND STEEL REINFORCED SASHES.
NOTE! MAXIMUM SASH WEIGHT MUST NOT EXCEED 40Kg (80lb)



EQUAL SASH SPLIT VERTICAL SLIDER
BOTTOM SASH PROFILE = P10123 OR P10123 & P10125 DEEP BASE RAIL COMBINATION
FOR TOP SASH PROFILE & OUTERFRAME SIZES SEE TABLE BELOW

OUTERFRAME WIDTH		500–900	1000	1100	1200	1300	1400	1500	1600
MAXIMUM OUTERFRAME HEIGHT. (NON TILTING SASHES)	TOP SASH P10118	3500	3500	3300	2700	2100	1600	1300	1100
	TOP SASH P10123	3500	3500	3200	2900	2700	2500	2300	2100
MAXIMUM OUTERFRAME HEIGHT. (TILTING SASHES)	TOP SASH P10118	3500	3100	2800	2500	2100	1600	1300	1100
	TOP SASH P10123	3500	3100	2800	2500	2400	2200	2100	1900

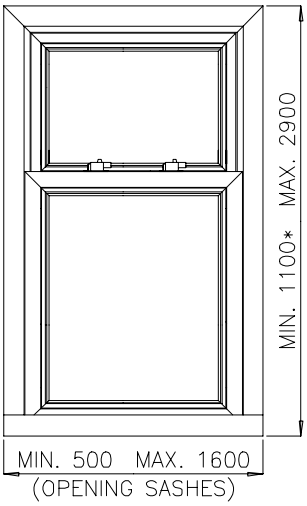
* MINIMUM OUTERFRAME HEIGHT FOR TILT FACILITY = 1000mm
FOR FRAMES WITH FIXED / NON SLIDING SASHES THE ADVISED MINIMUM OUTERFRAME WIDTH = 350mm



1/3, 2/3 SASH SPLIT VERTICAL SLIDER
BOTTOM SASH PROFILE = P10123 OR P10123 & P10125 DEEP BASE RAIL COMBINATION
FOR TOP SASH PROFILE & OUTERFRAME SIZES SEE TABLE BELOW

OUTERFRAME WIDTH		500–900	1000	1100	1200	1300	1400	1500	1600
MAXIMUM OUTERFRAME HEIGHT. (NON TILTING SASHES)	TOP SASH P10118	2600	2600	2350	2150	2000	1850	1700	1550
	TOP SASH P10123	2600	2600	2350	2150	2000	1850	1700	1550
MAXIMUM OUTERFRAME HEIGHT. (TILTING SASHES)	TOP SASH P10118	2600	2400	2100	1900	1800	1650	1550	N/A
	TOP SASH P10123	2600	2400	2100	1900	1800	1650	1550	N/A

* MINIMUM OUTERFRAME HEIGHT FOR TILT FACILITY = 1500mm
FOR FRAMES WITH FIXED / NON SLIDING SASHES THE ADVISED MINIMUM OUTERFRAME WIDTH = 350mm



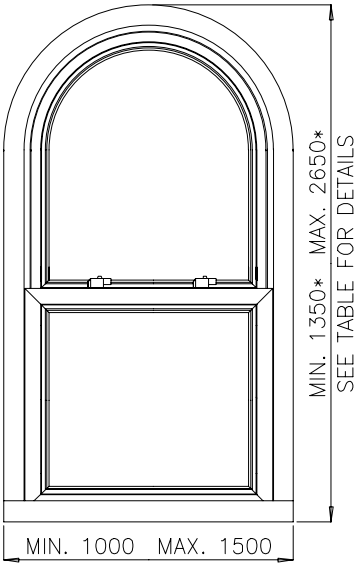
2/5, 3/5 SASH SPLIT VERTICAL SLIDER
BOTTOM SASH PROFILE = P10123 OR P10123 & P10125 DEEP BASE RAIL COMBINATION
FOR TOP SASH PROFILE & OUTERFRAME SIZES SEE TABLE BELOW

OUTERFRAME WIDTH		500–900	1000	1100	1200	1300	1400	1500	1600
MAXIMUM OUTERFRAME HEIGHT. (NON TILTING SASHES)	TOP SASH P10118	2900	2900	2650	2400	2200	2050	1800	1500
	TOP SASH P10123	2900	2900	2650	2400	2200	2050	1900	1700
MAXIMUM OUTERFRAME HEIGHT. (TILTING SASHES)	TOP SASH P10118	2900	2650	2400	2150	2000	1850	1700	1500
	TOP SASH P10123	2900	2650	2400	2150	2000	1850	1700	1600

* MINIMUM OUTERFRAME HEIGHT FOR TILT FACILITY = 1300mm
FOR FRAMES WITH FIXED / NON SLIDING SASHES THE ADVISED MINIMUM OUTERFRAME WIDTH = 350mm

RECOMMENDED MAX. & MIN. SIZES BASED ON 24mm (4.16.4) GLAZING AND STEEL REINFORCED SASHES.

NOTE! MAXIMUM SASH WEIGHT MUST NOT EXCEED 40Kg (80lb)



FULL ARCHED HEAD VERTICAL SLIDER – EQUAL SPLIT
BOTTOM SASH = P10123 OR P10123 & P10125 DEEP BASE RAIL COMBINATION.
FOR TOP SASH PROFILE & OUTERFRAME SIZES SEE TABLE BELOW.

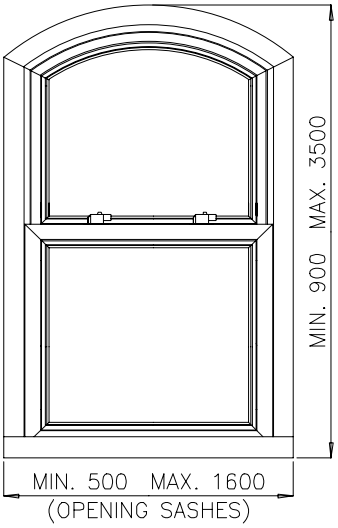
ON ARCHED HEAD WINDOWS THE TOP SASH MUST BE FIXED.

OUTERFRAME WIDTH		1000	1100	1200	1300	1400	1500
MAXIMUM OUTERFRAME HEIGHT.	TOP SASH P10118	2650	2625	2575	2100	N/A	N/A
	TOP SASH P10123	2650	2625	2575	2550	2500	2300

OUTERFRAME WIDTH		1000	1100	1200	1300	1400	1500
MINIMUM OUTERFRAME HEIGHT.	TOP SASH P10118	1350	1450	1550	1650	N/A	N/A
	TOP SASH P10123	1350	1450	1550	1650	1750	1850

* MAXIMUM & MINIMUM OVERALL FRAME HEIGHTS MUST BE READ IN CONJUNCTION WITH THE ABOVE TABLE.

PLEASE NOTE. THE MINIMUM OUTERFRAME HEIGHTS ARE CALCULATED TO GIVE APPROX. 150mm OF SASH TRAVEL UP TO THE SPLIT LINE OF THE RADIUS. (FULL ARCHED HEAD)



SEMI ARCHED HEAD VERTICAL SLIDER – EQUAL SPLIT
BOTTOM SASH = P10123 OR P10123 & P10125 DEEP BASE RAIL COMBINATION.
FOR TOP SASH PROFILE & OUTERFRAME SIZES SEE TABLE BELOW.

ON SEMI ARCHED HEAD WINDOWS THE TOP SASH MUST BE FIXED.

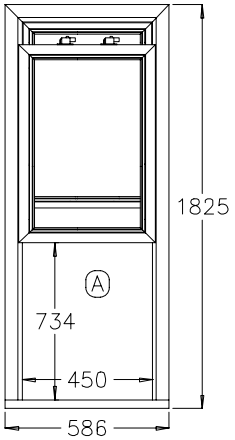
OUTERFRAME WIDTH		500–900	1000	1100	1200	1300	1400	1500	1600
MAXIMUM OUTERFRAME HEIGHT. (NON TILTING SASHES)	TOP SASH P10118	3500	3500	3300	2700	2100	1600	1300	1100
	TOP SASH P10123	3500	3500	3200	2900	2700	2500	2300	2100
MAXIMUM OUTERFRAME HEIGHT. (TILTING SASHES)	TOP SASH P10118	3500	3100	2800	2500	2100	1600	1300	1100
	TOP SASH P10123	3500	3100	2800	2500	2400	2200	2100	1900

FOR FRAMES WITH FIXED / NON SLIDING SASHES THE ADVISED MINIMUM OUTERFRAME WIDTH = 350mm

PLEASE NOTE !
WE CAN NOT MANUFACTURE OR SUPPLY CURVED FRAMES.
I.E. WHERE A FULLY CURVED FRAME SITS ON A CURVED SILL.

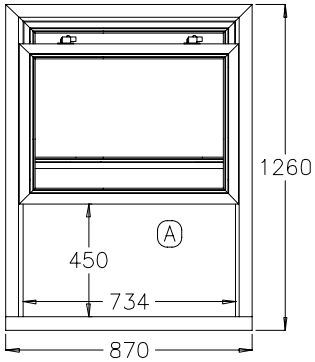
VERTICAL SLIDING WINDOWS
TO SUIT BUILDING REGULATIONS PART B – FIRE SAFETY

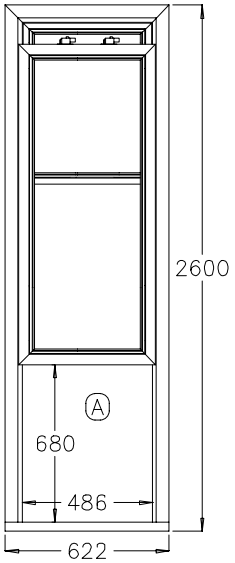
A WINDOW FOR EMERGENCY EGRESS SHOULD HAVE AN UNOBSTRUCTED OPENABLE AREA THAT IS AT LEAST 0.33M², AND AT LEAST 450mm IN WIDTH OR AT LEAST 450mm IN HEIGHT.



EQUAL SASH SPLIT WINDOWS

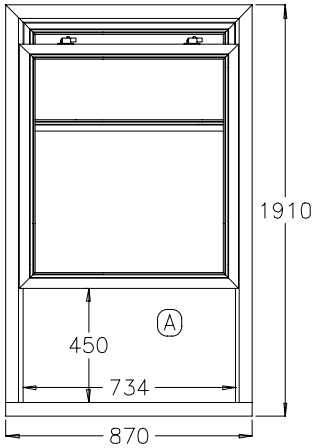
AREA 'A' = 0.33 M2

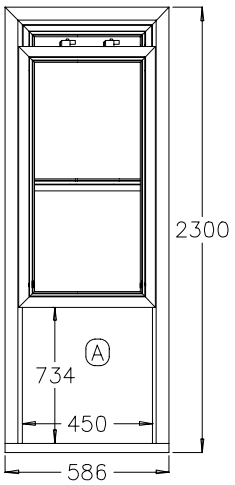




1/3, 2/3 SASH SPLIT WINDOWS

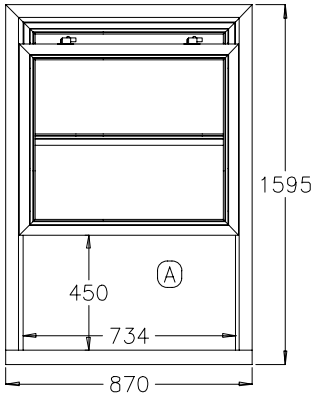
AREA 'A' = 0.33 M2





2/5, 3/5 SASH SPLIT WINDOWS

AREA 'A' = 0.33 M2

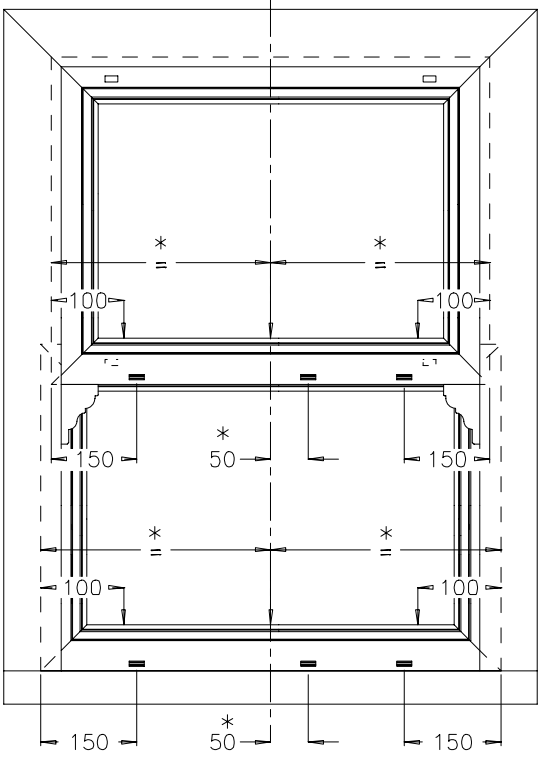


CAM CATCHES FITTED TO FIRE ESCAPE WINDOWS MUST BE NON KEY LOCKING

DRAINAGE ROUTING AND PRESSURE EQUALISATION DETAILS

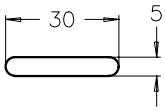
FOR OUTERFRAMES OVER 600mm WIDTH
TWO DRAINAGE ENTRY SLOTS 100mm FROM THE MITRE.
TWO DRAINAGE EXIT SLOTS 150mm FROM THE MITRE.

FOR OUTERFRAMES UNDER 600mm WIDE
(DIMENSIONS MARKED ∗)
ONE DRAINAGE ENTRY CENTRE OF SASH.
ONE DRAINAGE EXIT 50mm FROM CENTRE LINE.

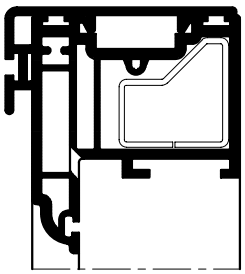


DRAINAGE ENTRY
CONCEALED DRAINAGE SLOT
PRESSURE EQUALISATION
NOTE : ALL DIMENSIONS ARE APPROXIMATE

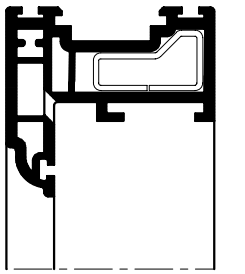
THE PRESSURE EQUALISATION HOLES SHOWN HERE WILL ASSIST IN EQUALISING THE ATMOSPHERIC PRESSURE AT THE ENTRY AND EXIT DRAINAGE SLOTS.
COMBINING THESE HOLES WITH THE DRAINAGE SLOTS SHOWN ALLOWS THE WATER TO DRAIN AWAY MORE EFFICIENTLY.
DRILL HOLES IN EACH SASH APPROX. 150mm FROM EACH INTERNAL TOP CORNER. THESE HOLES ARE 5mm DIAMETER.



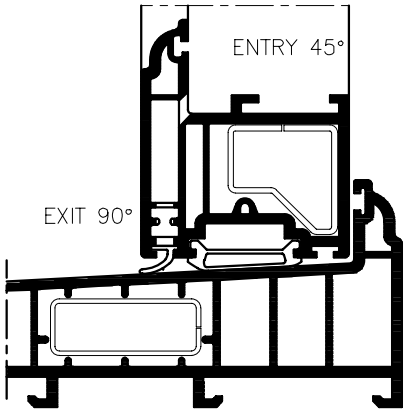
ALL ENTRY AND EXIT DRAINAGE SLOTS SHOULD BE ROUTED AS SHOWN HERE.

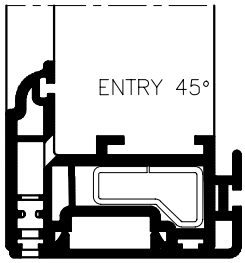


BOTTOM SASH DRAINAGE & PRESSURE EQUALISATION



TOP SASH DRAINAGE & PRESSURE EQUALISATION

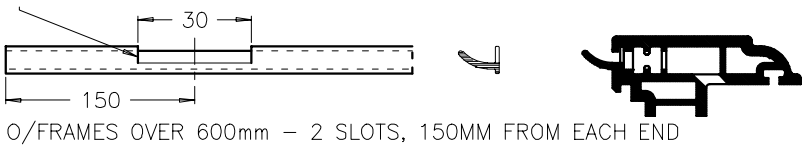




EXIT 90°

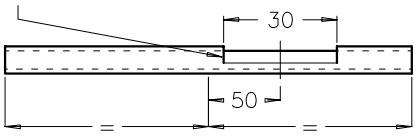
DRAINAGE THROUGH G00042 SLIDER SEAL

G00042 CUT LOCALLY



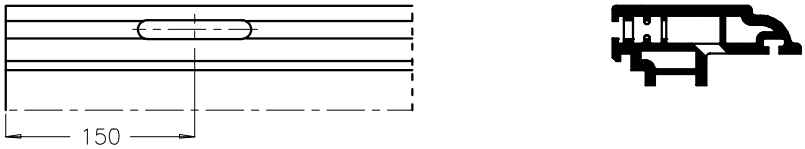
O/FRAMES OVER 600mm – 2 SLOTS, 150MM FROM EACH END

G00042 CUT LOCALLY

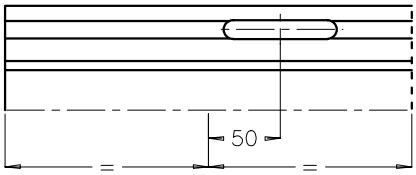


O/FRAMES UNDER 600mm – 1 SLOT

DRAINAGE THROUGH BOTTOM SASH

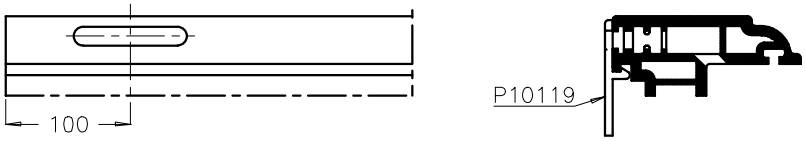


O/FRAMES OVER 600mm – 2 SLOTS, 150MM FROM EACH END

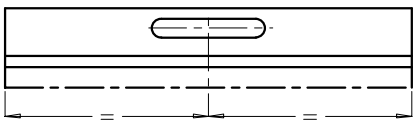


O/FRAMES UNDER 600mm – 1 SLOT

DRAINAGE THROUGH TOP SASH INTERLOCK



O/FRAMES OVER 600mm – 2 SLOTS, 150MM FROM EACH END



O/FRAMES UNDER 600mm – 1 SLOT

REINFORCEMENT GUIDELINES

THE REINFORCEMENT GUIDELINES ARE BASED ON GALVANISED STEEL SECTIONS FOR STRENGTH PURPOSE AND TO IMPROVE THE THERMAL EFFICIENCY OF THE FRAMES. THE CONTINUATION OF THE REINFORCEMENT SECTION IN LENGTH IS ESSENTIAL TO PROVIDE THE REQUIRED STRENGTH IN ALL BASE RAILS, SASHES AND OUTERFRAMES FORMING A COUPLING JOINT.

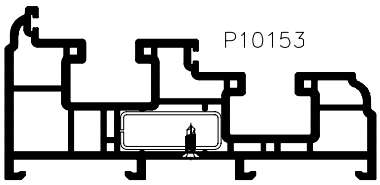
REINFORCEMENT RECOMMENDATIONS

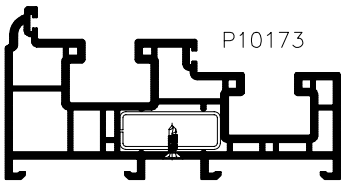
VERTICAL SLIDERS

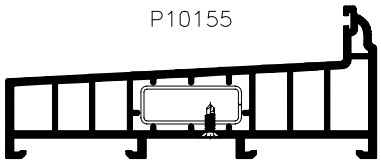
OUTERFRAMES – REINFORCE WHEN EXCEEDING 1500mm
SILLS – REINFORCE WHEN EXCEEDING 1000mm
SMALL SASH – FULLY REINFORCED
LARGE SASH – FULLY REINFORCED JAMBS AND BASE MEMBERS
LARGE SASH – REINFORCE HEAD MEMBERS WHEN EXCEEDING 1000mm
DEEP BASE RAIL – FULLY REINFORCED

FIXED VERTICAL SLIDERS

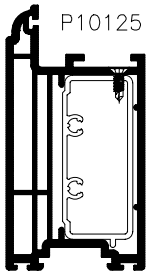
OUTERFRAMES – REINFORCE WHEN EXCEEDING 1500mm
SILLS – REINFORCE WHEN EXCEEDING 1000mm
SMALL SASH – REINFORCE SASH BASE MEMBERS EXCEEDING 400mm
LARGE SASH – REINFORCE SASH BASE MEMBERS EXCEEDING 400mm
DEEP BASE RAIL – DEEP BASE REINFORCED LOCALLY FOR ASSEMBLY PURPOSE

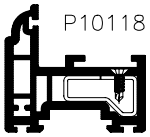


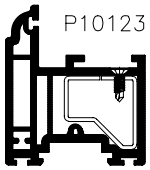




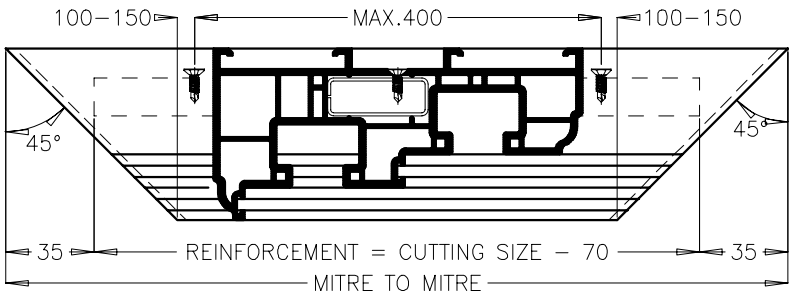
SILL REINFORCEMENT LENGTH =
SILL LENGTH – 10mm



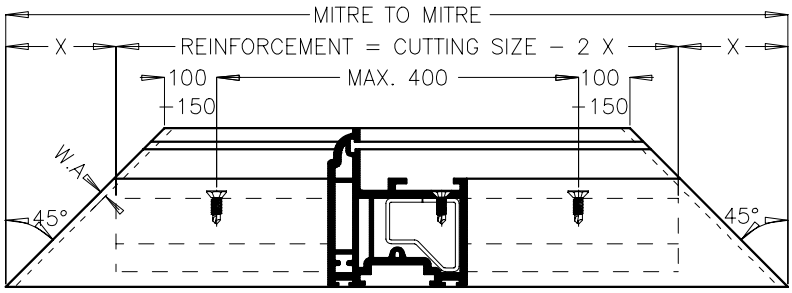




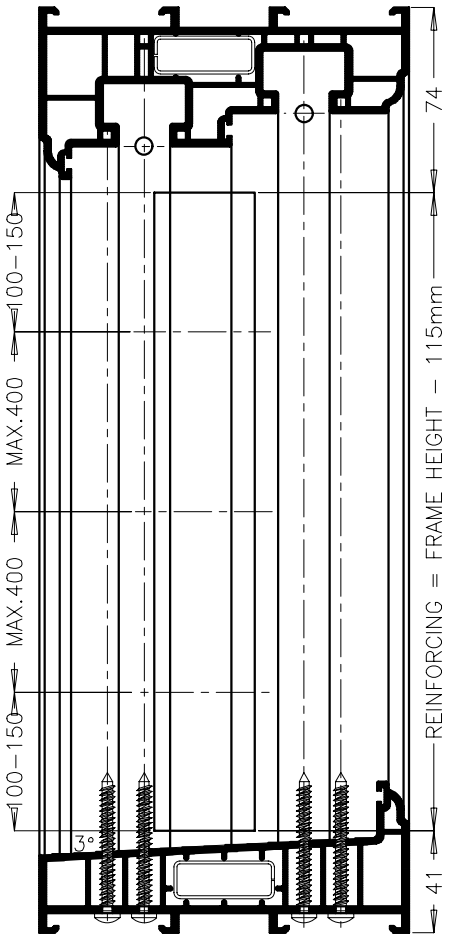
P10153 & P10173 OUTERFRAMES



P10118 & P10123 SASHES



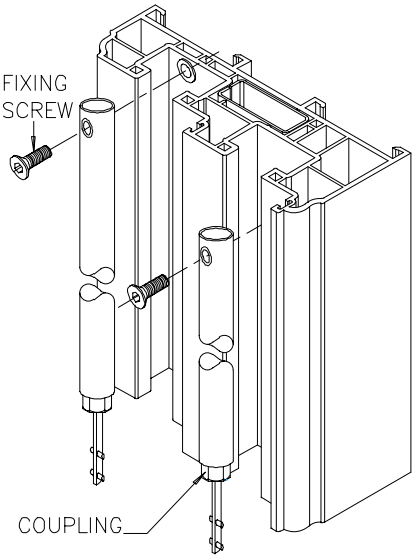
P10118 X = 31mm, P10123 X = 44mm



JAMB REINFORCEMENT CUTTING
AND SCREW FIXING POSITIONS

SILL MECHANICAL JOINT AND SPRING BALANCE DETAILS

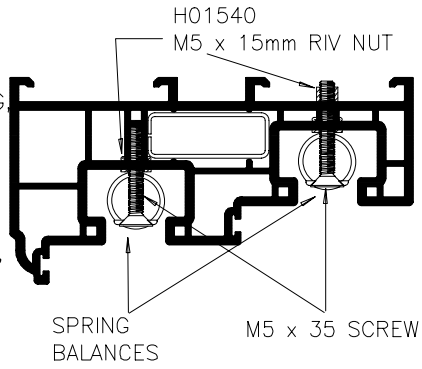
DETAIL OF OUTERFRAME AT HEAD



ADJUSTMENT OF SPRING BALANCES –

TORSO SPRING BALANCES CAN NOT BE ADJUSTED. IF THE BALANCE IS TOO WEAK, AND THE SASH DROPS, OR IS TOO STRONG AND GIVES TOO MUCH RESISTANCE WHEN OPERATING THE SASH, THE BALANCES WILL HAVE TO BE REPLACED.

ULTRALIFT BALANCES CAN BE ADJUSTED +/– 1K/g. TO ADD OR RELEASE TENSION, FIRSTLY THE SPRING MUST BE PULLED DOWN SO IT IS VISIBLE OUT OF THE TUBE. TO ADD TENSION ROTATE ONE TURN CLOCKWISE. TO RELEASE TENSION ROTATE ONE TURN ANTI CLOCKWISE.

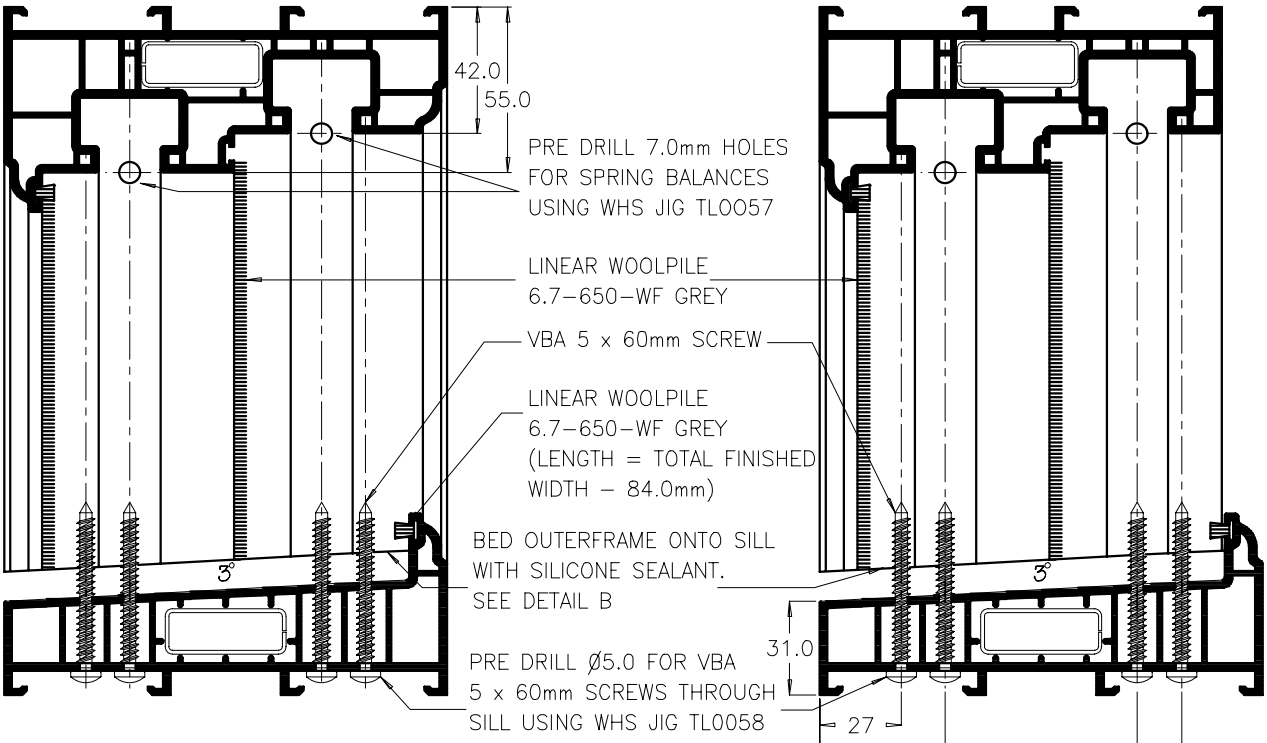


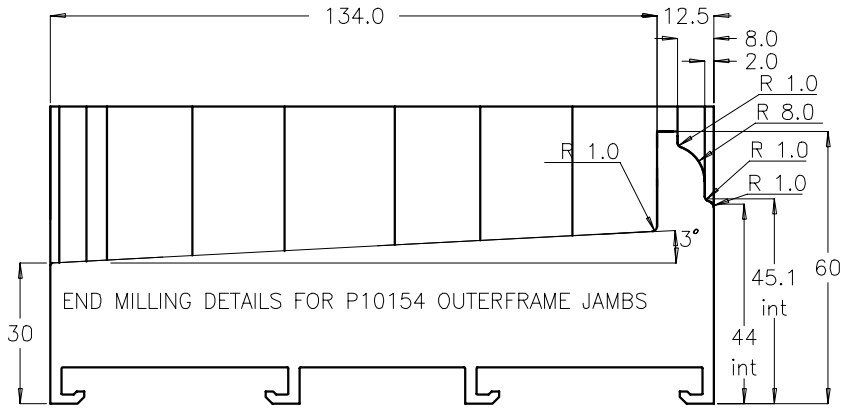
THE BALANCE MUST NOT BE ADJUSTED MORE THAN ONE TURN IN EITHER DIRECTION OR IT WILL BE DAMAGED AND THEREFORE REQUIRE REPLACING.

BALANCE IDENTIFICATION –

TORSO BALANCES HAVE A SQUARE / RECTANGULAR COUPLING.
ULTRALIFT BALANCES HAVE A HEXAGONAL COUPLING.

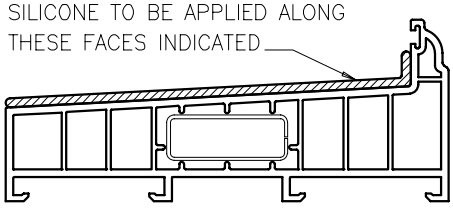
DETAIL SHOWING HOLE POSITIONS FOR SPRING BALANCES, SILL MECHANICAL JOINT DETAIL & WEATHERFIN FITTING DETAILS.



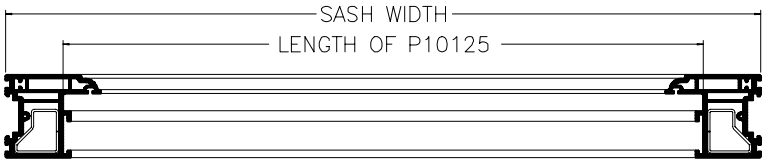


DETAIL B

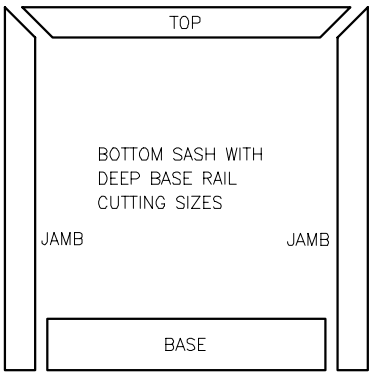
SILICONE TO BE APPLIED ALONG THESE FACES INDICATED



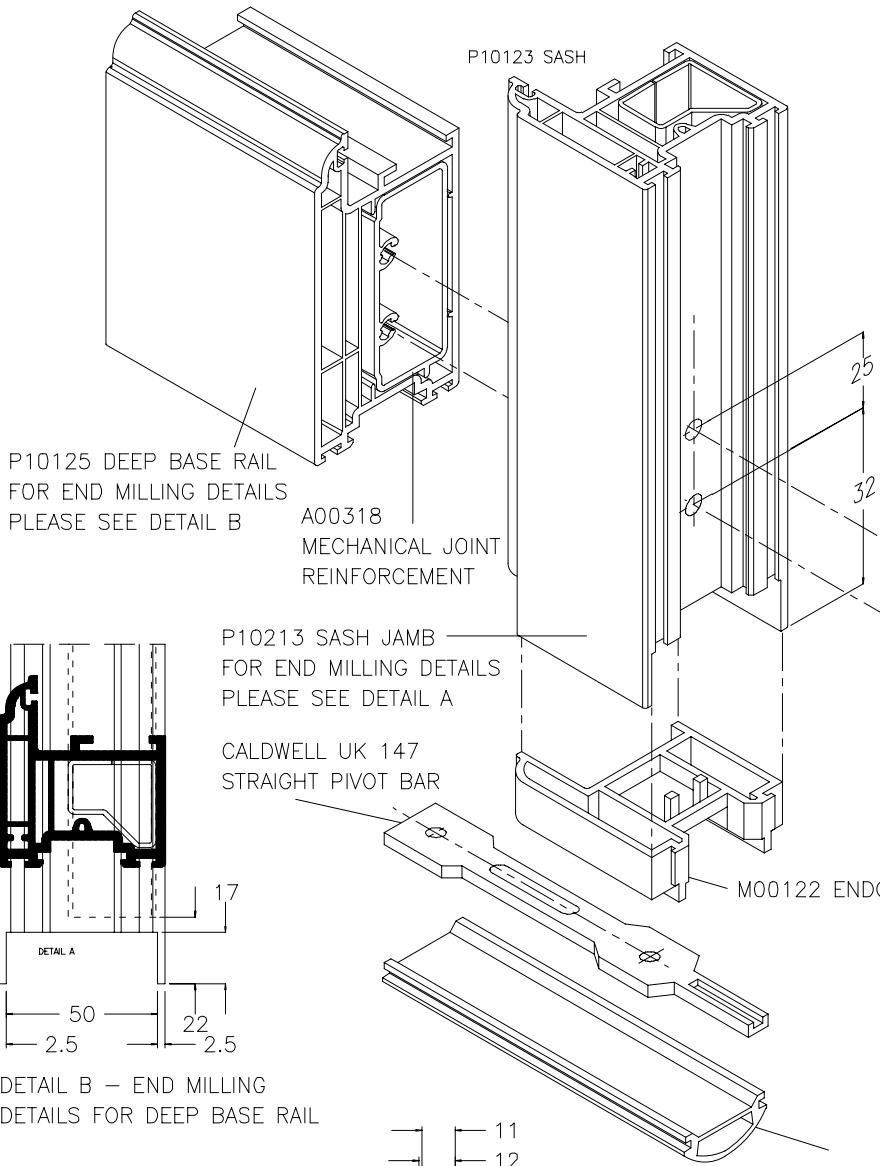
MECHANICAL JOINT AND CUTTING DETAILS FOR P10125 DEEP BASE RAIL

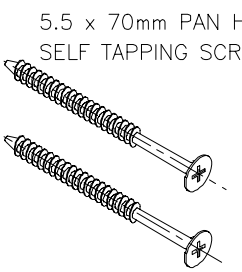


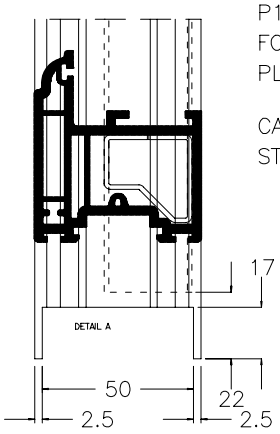
LENGTH OF P10125 = SASH WIDTH – 76mm
LENGTH OF S00122 = LENGTH OF P10125 – 30mm
LENGTH OF S00121 = LENGTH OF P10123 – 66mm



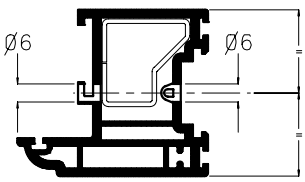
TOP = SASH WIDTH, MITRE CUT & W.A ON BOTH ENDS.
JAMBS = SASH HEIGHT, MITRE CUT & W.A ON ONE END, STRAIGHT CUT ON THE OTHER. (LEFT & RIGHT HAND REQ'D)
BASE = SASH WIDTH – 76mm, STRAIGHT CUT BOTH ENDS PRIOR TO END MILLING.



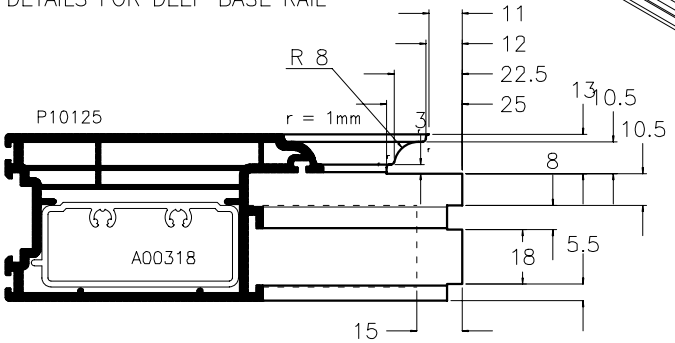




DETAIL B – END MILLING DETAILS FOR DEEP BASE RAIL



DRILL Ø6mm HOLES THROUGH SASH, TO ACCOMMODATE 5.5 x 70mm PAN HEAD SELF TAPPING SCREW.

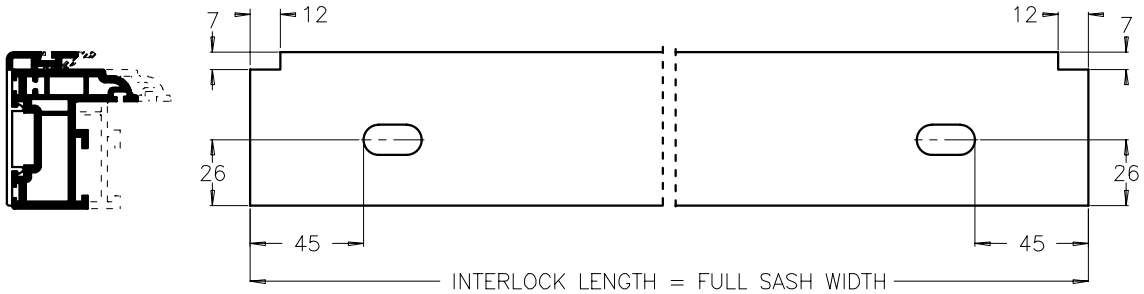


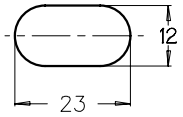
G00091 BASE SEAL
LENGTH = SASH WIDTH

PLEASE NOTE:
MATING FACES SHOULD BE SEALED USING A GOOD QUALITY SEALANT. ANY EXCESS SHOULD BE WIPED AWAY FROM THE VISIBLE SURFACES ONCE THE JOINT HAS BEEN FULLY TIGHTENED.
END MILLING CUTTER SETS ARE AVAILABLE THROUGH WHS/HALO TECHNICAL SERVICES DEPT.

MANUFACTURING DETAILS RELATING TO TILT LATCHES

CUT OUT DETAILS FOR THE INTERLOCK ON BOTTOM SASH

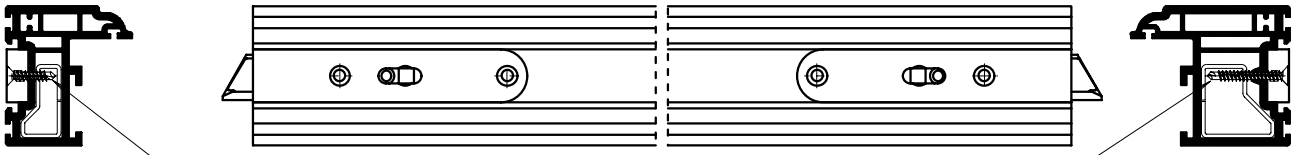




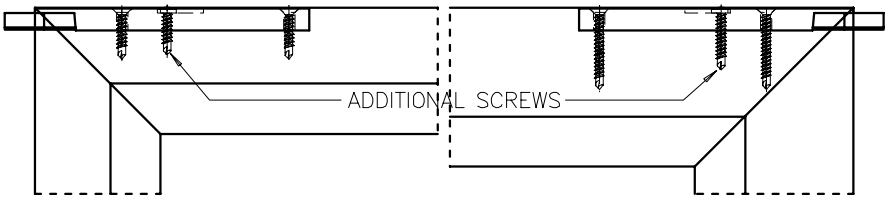
SLOT DETAIL
SCALE 2:1

THESE SLOTS ARE NOT REQUIRED IF THE SASHES ARE TO BE NON TILTING

UK 472 TILT LATCH. 2 FITTED PER SASH
SCREW FIXING DETAILS FOR TILTING & NON TILTING SASHES



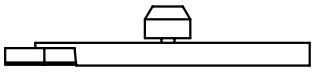
ADDITIONAL SCREW FIXING REQUIREMENTS FOR TILT LATCHES FOR NON TILTING SASHES



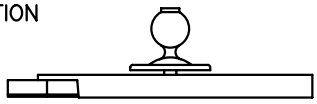
SCREW FIX TILT LATCHES, AS SHOWN ABOVE. FOR USE ON NON TILTING SASHES ADDITIONAL SCREWS ARE REQUIRED. THE OPERATING KNOB SHOULD NOT BE FITTED, AND A SCREW PUT IN ITS PLACE. THESE SCREWS SHOULD BE:–

FOR P10118 SASH – 3.9 x 19mm PAN HEAD, DRILL POINT SCREW.
FOR P10123 SASH – 3.9 x 25mm PAN HEAD, DRILL POINT SCREW.

TILT LATCH OPERATING KNOB SELECTION

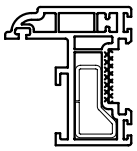


FOR TOP SASH.
FIT CHAMFERED KNOB (UK 482)



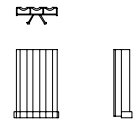
FOR BOTTOM SASH.
FIT DECORATIVE KNOB (UK 493)

IMPORTANT MANUFACTURING DETAIL



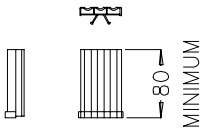
IT IS IMPORTANT TO ENSURE THAT THE SASH CORNERS ARE ADEQUATELY CLEANED IN AREAS MARKED xxxx TO ENSURE CORRECT OPERATION OF THE TILT LATCH, ONCE SCREW FIXED TO SASH.

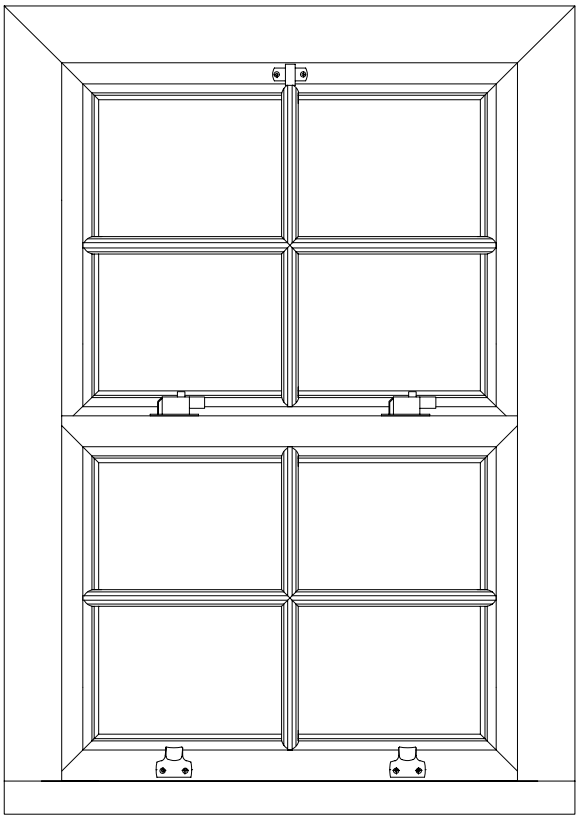
MANUFACTURING DETAILS – P10119 & P10139 INTERLOCKS, P10124 COVERS & M00077 HORNS



P10124 COVER AT HEAD CAPPED WITH M00078 END CAP

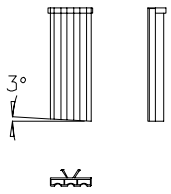
COVER TO BE STRAIGHT CUT



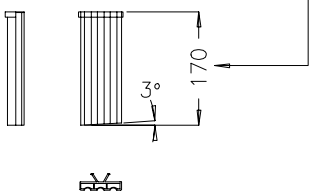


NOTE!
WHEN USED ON UNEQUAL SPLIT WINDOWS AS END STOPS AT THE BASE, THE P10124 COVER MUST BE CUT TO LENGTH TO SUIT THE TOP SASH.
THIS IS TO AVOID DAMAGE TO THE SPRING BALANCES.
THE SASH MUST REACH THE STOP BEFORE MAXIMUM BALANCE TRAVEL IS ACHIEVED.

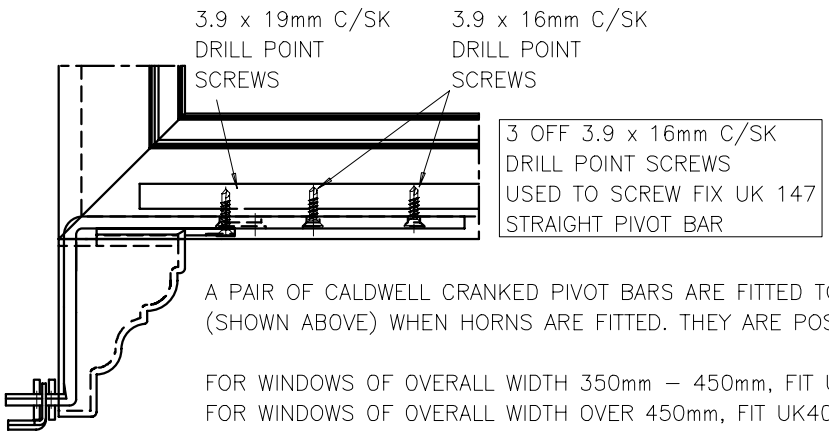
P10124 COVER AT BASE CAPPED WITH M00079 END CAP



WHERE NO HORNS ARE TO BE FITTED TO THE TOP SASH, THE LENGTH OF THE END STOP AT THE BASE MUST BE INCREASED TO 270mm.

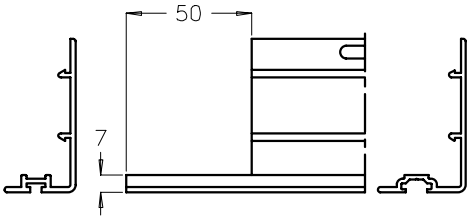


MANUFACTURING DETAILS RELATED TO HORN FITTING



3 OFF 3.9 x 16mm C/SK DRILL POINT SCREWS USED TO SCREW FIX UK 147 STRAIGHT PIVOT BAR

INTERLOCK CUT OUT FOR HORNS



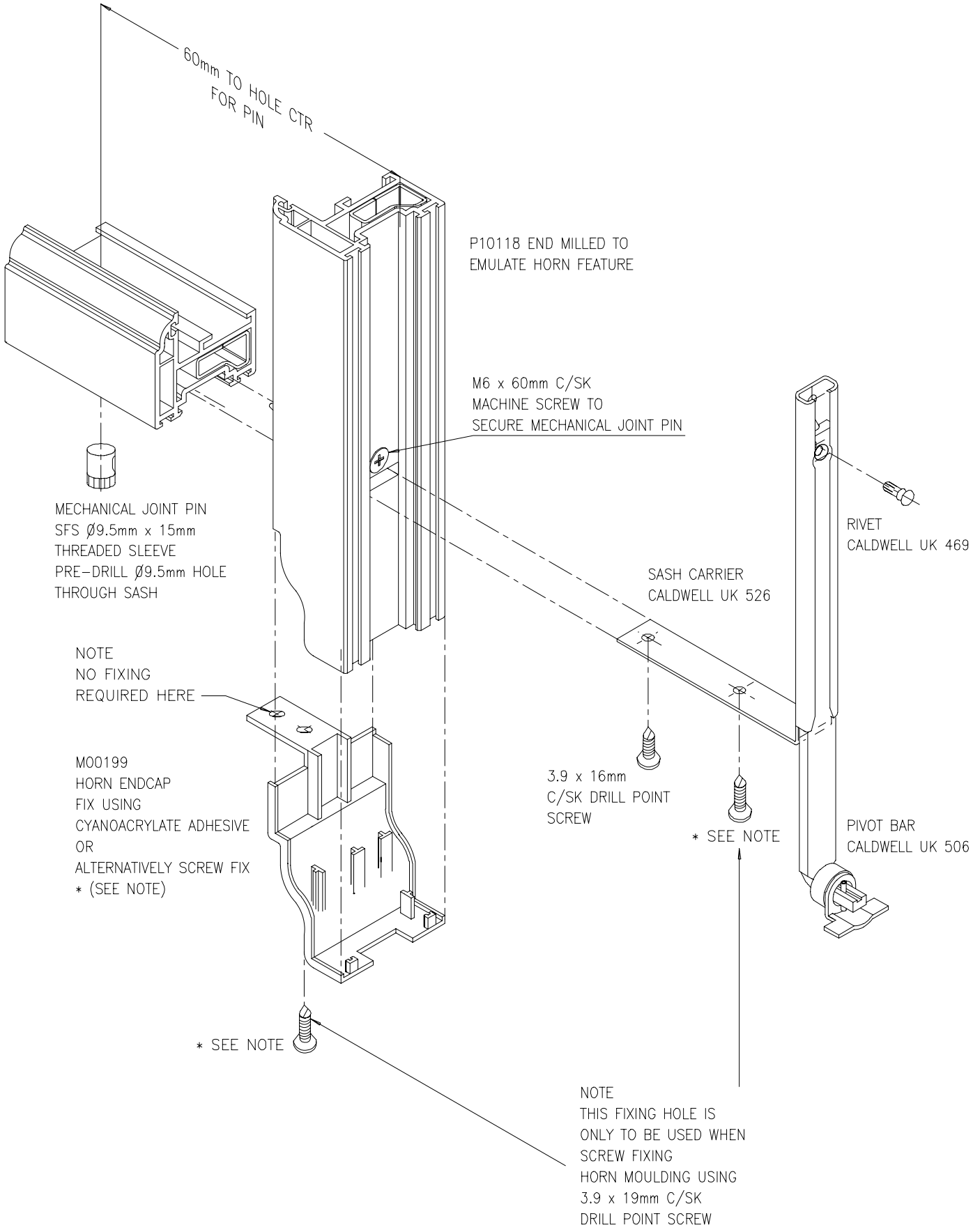
A PAIR OF CALDWELL CRANKED PIVOT BARS ARE FITTED TO THE UPPER (OUTER) SASH (SHOWN ABOVE) WHEN HORNS ARE FITTED. THEY ARE POSITIONED USING WHS JIG TL0082.

FOR WINDOWS OF OVERALL WIDTH 350mm – 450mm, FIT UK487 CALDWELL CRANKED PIVOT BAR
FOR WINDOWS OF OVERALL WIDTH OVER 450mm, FIT UK404 CALDWELL CRANKED PIVOT BAR.

UK147 CALDWELL STRAIGHT PIVOT BARS ARE FITTED TO THE LOWER (INNER) SASH.

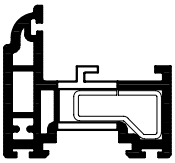
PLEASE NOTE !
WHEN HORNS ARE NOT FITTED TO THE TOP SASH, THE STRAIGHT PIVOT BAR UK147 IS TO BE FITTED TO BOTH TOP AND BOTTOM SASHES. THESE STRAIGHT PIVOT BARS ARE POSITIONED USING WHS JIG TL0082.
EACH STRAIGHT PIVOT BAR MUST BE FITTED WITH A CALDWELL SHACKLE PART No. UK216.

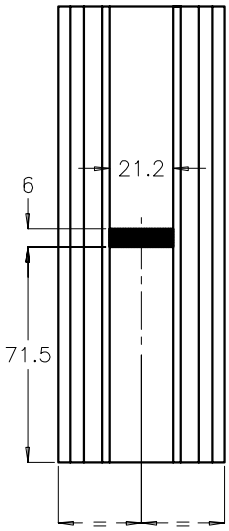
MECHANICAL JOINT DETAILS
FOR P10118 SASH WITH HORN FEATURE

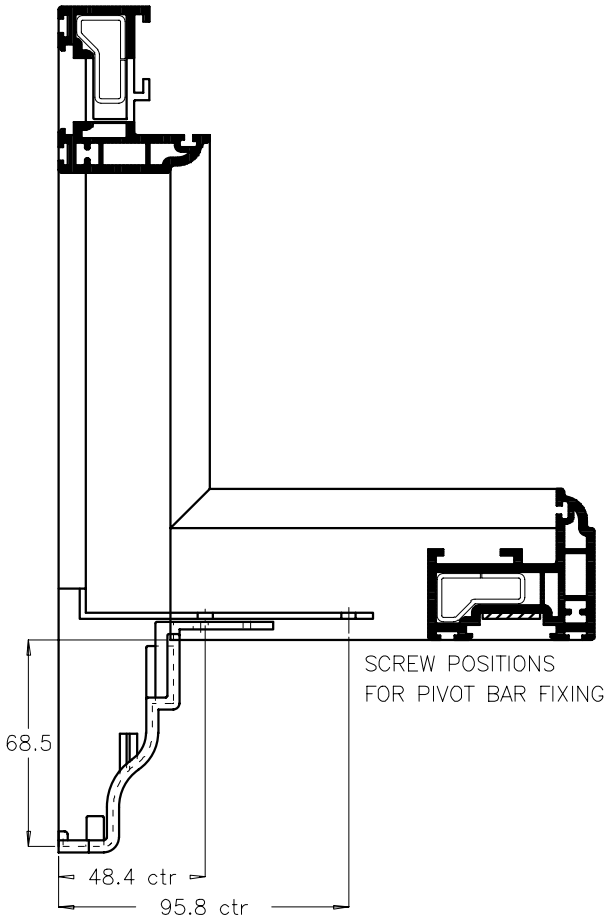


MECHANICAL JOINT DETAILS
FOR P10118 SASH WITH HORN FEATURE

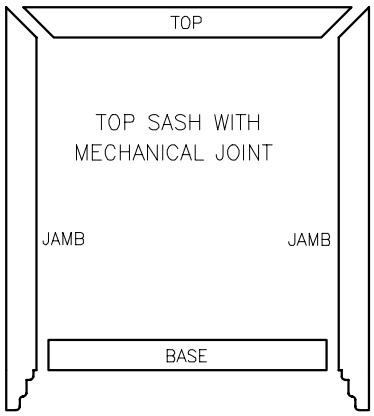
ROUT SLOT
TO ALLOW FOR
PIVOT BAR UK 506
FITTING



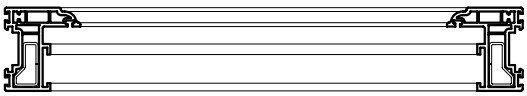




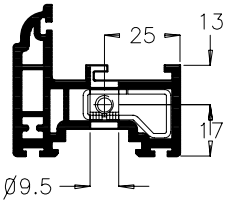
SCREW POSITIONS
FOR PIVOT BAR FIXING



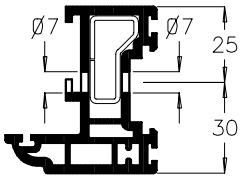
TOP = SASH WIDTH, MITRE CUT
& W.A ON BOTH ENDS.
JAMBS = SASH HEIGHT + 68.5mm,
ENDMILLED AT BOTTOM END
& W.A ON THE OTHER
BASE = SASH WIDTH – 50mm,
STRAIGHT CUT BOTH ENDS
PRIOR TO END MILLING.



LENGTH OF P10118 = SASH WIDTH 50mm
LENGTH OF S00120 = LENGTH OF P10118 – 30mm

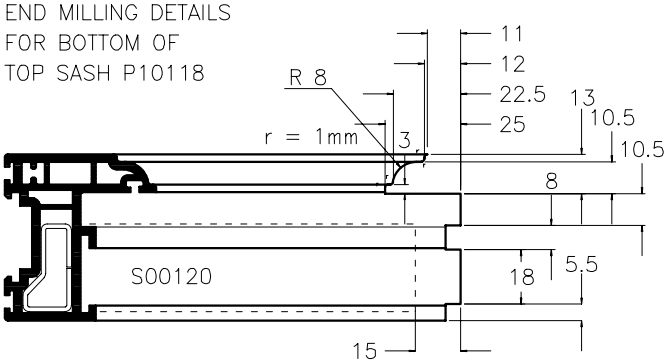


DRILL Ø9.5m HOLE
THROUGH SASH,
TO ACCOMMODATE
MECHANICAL JOINT PIN



DRILL Ø7mm HOLES
THROUGH SASH, TO
ACCOMMODATE 6 x 60mm
C/SK MACHINE SCREW.
FOR FIXING THE
MECHANICAL JOINT PIN

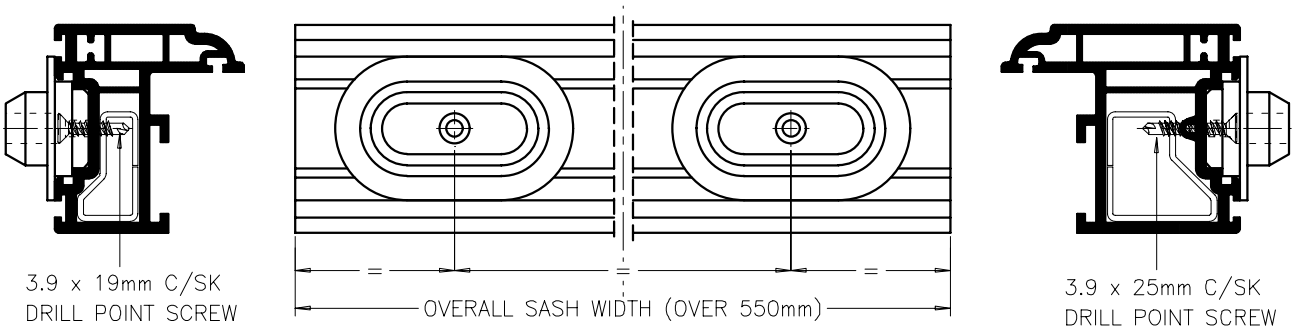
END MILLING DETAILS
FOR BOTTOM OF
TOP SASH P10118



PLEASE NOTE:
MATING FACES SHOULD BE SEALED USING A GOOD QUALITY SEALANT. ANY EXCESS SHOULD BE WIPED AWAY FROM THE VISIBLE SURFACES ONCE THE JOINT HAS BEEN FULLY TIGHTENED.
END MILLING CUTTER SETS ARE AVAILABLE THROUGH WHS/HALO TECHNICAL SERVICES DEPT.

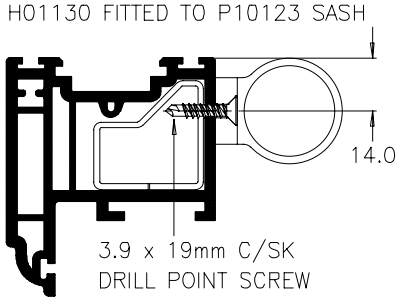
HANDLE AND M00182 SASH BLOCK FITTNG DETAILS

M00182 SASH BLOCK
O/FRAME WIDTH 350mm – 549mm 1 SASH BLOCK FITTED CTR OF SASH.
O/FRAME WIDTH 550mm UPWARDS 2 SASH BLOCKS FITTED EQUALLY SPACED ON SASH, AS SHOWN BELOW.

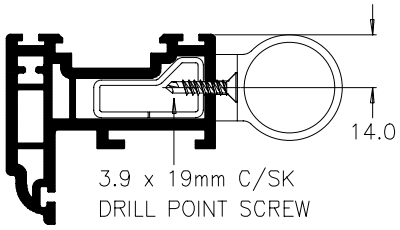


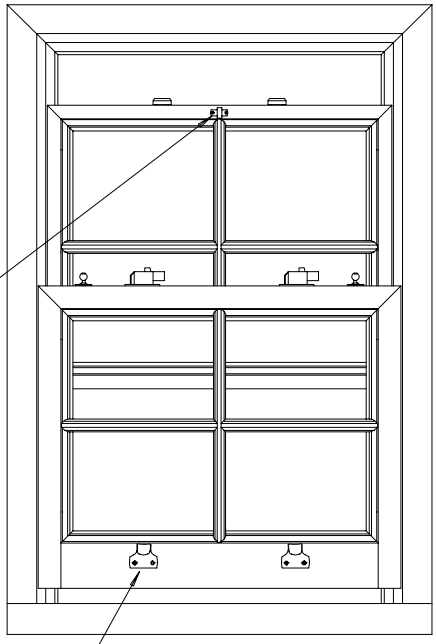
TOP SASH

H01130 FITTED TO P10123 SASH



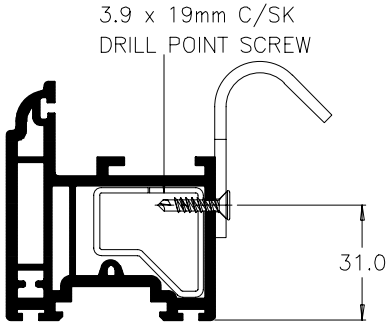
H01130 FITTED TO P10118 SASH



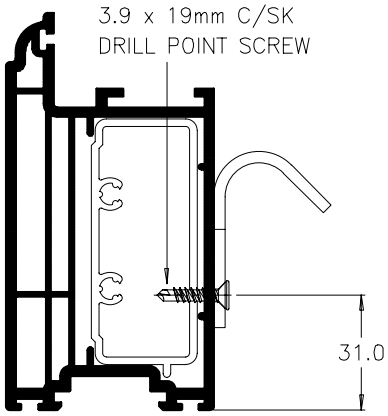


BOTTOM SASH

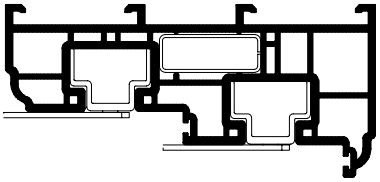
H01132 FITTED TO P10123 SASH

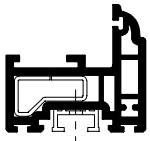


H01132 FITTED TO P10125 BASE RAIL



FITTING DETAILS FOR TILT RESTRICTORS



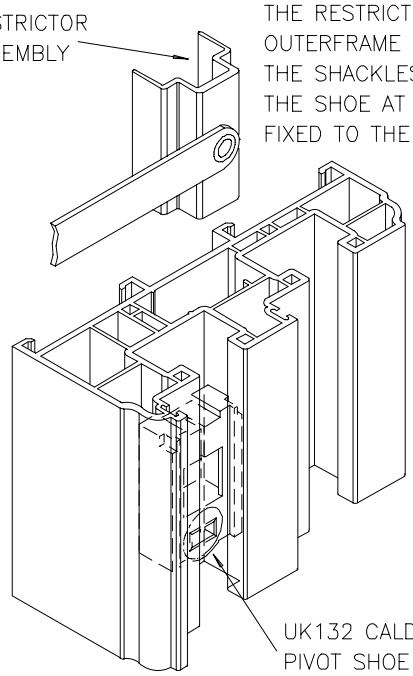


CALDWELL
UK241 PACKER

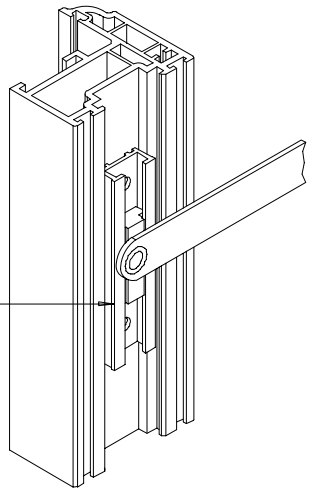
3.9 x 19mm (P10118)
3.9 x 25mm (P10123)
PAN HEAD
DRILL POINT SCREW

RESTRICTOR
ASSEMBLY

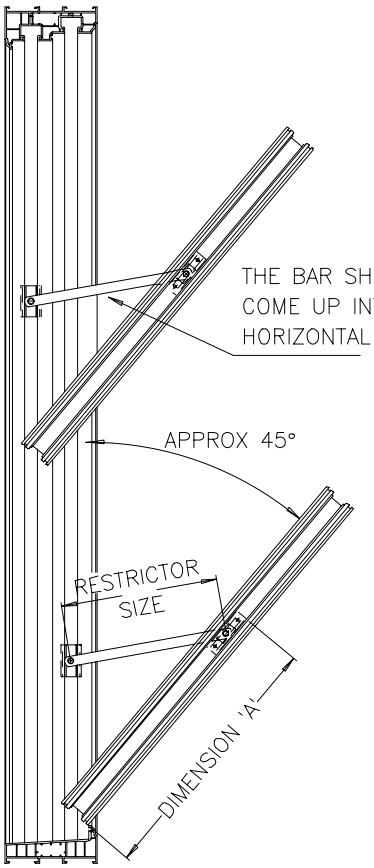
THE RESTRICTOR ASSEMBLIES ARE FITTED INTO THE OUTERFRAME CHANNEL ABOVE THE PIVOT SHOE. THE SHACKLES & PIVOT BARS MUST BE FITTED ONTO THE SHOE AT THIS STAGE PRIOR TO THE SILL BEING FIXED TO THE OUTERFRAME.



UK132 CALDWELL
PIVOT SHOE



THE SASH PLATE IS POSITIONED
USING WHS JIG TL0072

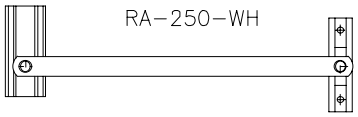


THE BAR SHOULD NOT
COME UP INTO THE
HORIZONTAL POSITION.

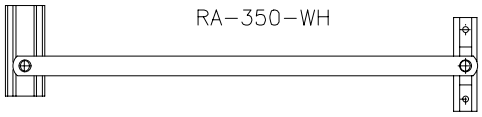
APPROX 45°

RESTRICTOR
SIZE

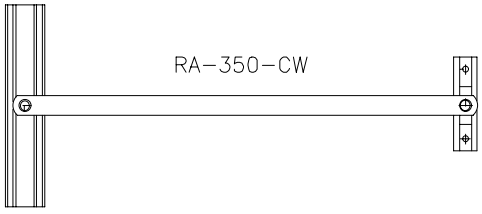
DIMENSION 'A'



RA–250–WH



RA–350–WH

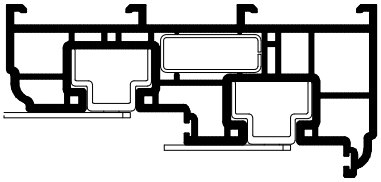


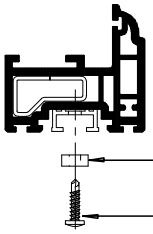
RA–350–CW

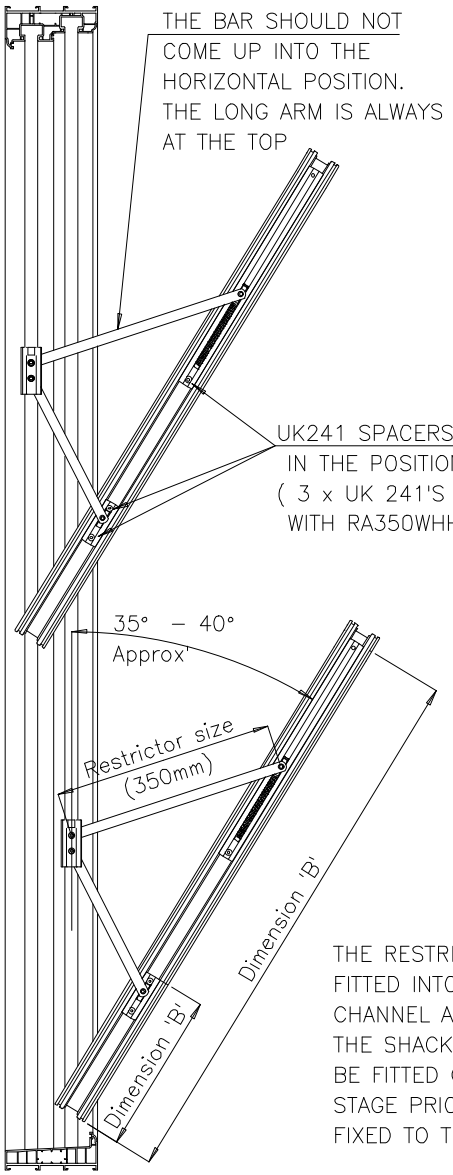
DIM 'A'	SASH HEIGHT	MAX. SASH WEIGHT	RESTRICTOR SIZE & CALDWELL PART No.
400mm	450mm TO 650mm	30 k/g	RA–250–WH
550mm	650mm TO 1100mm	30 k/g	RA–350–WH
570mm	650mm ONWARDS*	36.5 k/g	RA–350–CW

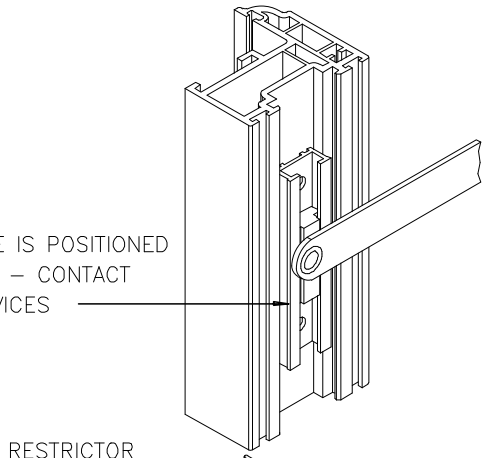
* PLEASE NOTE.
ALL SASHES OVER 1100mm IN HEIGHT TO USE RA–350–CW.
ALL SASHES OVER 650mm IN HEIGHT AND OVER 30 k/g TO USE RA–350–CW

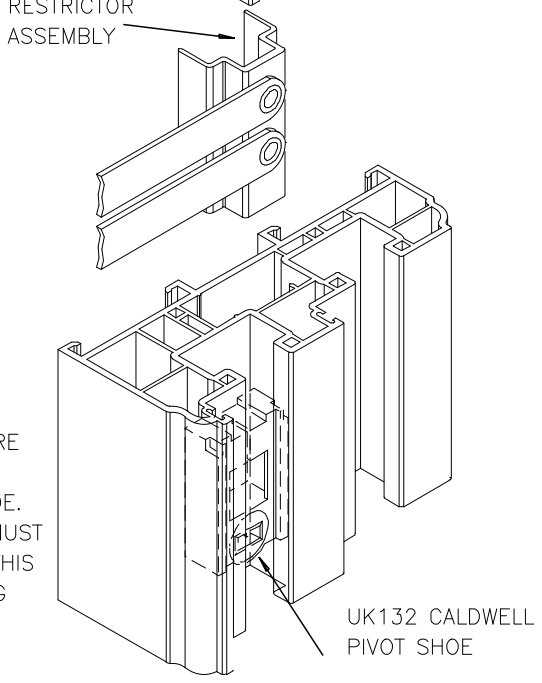
FITTING DETAILS FOR THE CALDWELL
HEAVY DUTY BAR RESTRICTORS









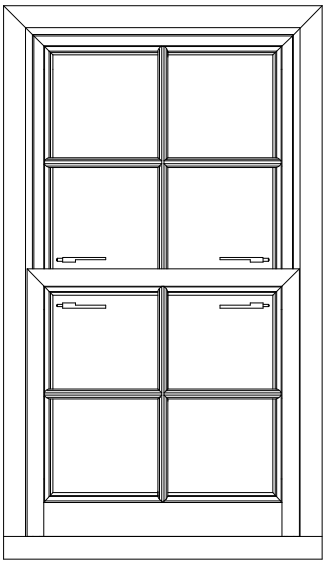


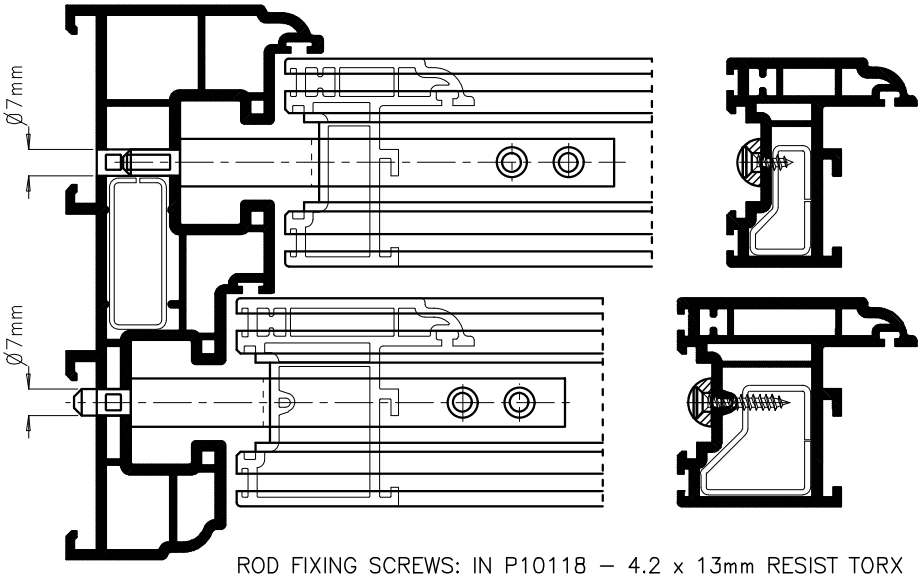
THE RESTRICTOR ASSEMBLIES ARE FITTED INTO THE OUTERFRAME CHANNEL ABOVE THE PIVOT SHOE. THE SHACKLES & PIVOT BARS MUST BE FITTED ONTO THE SHOE AT THIS STAGE PRIOR TO THE SILL BEING FIXED TO THE OUTERFRAME.

DIM 'A'	DIM 'B'	MIN.SASH HEIGHT	MAX.SASH HEIGHT	MAXIMUM SASH WEIGHT	CALDWELL PART No.
		(Including horn if applicable)			
875mm	255mm	900mm*	1550mm*	40 k/g	RA350WHHD

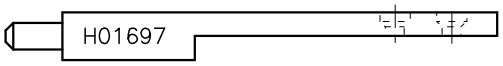
PLEASE NOTE; THE MAXIMUM/ MINIMUM SASHES SIZES DO NOT APPLY TO ALL WINDOW SIZES. THE SIZES SHOWN ON THE PAGE 'RECOMMENDED MAXIMUM SIZES' MUST NOT BE EXCEEDED

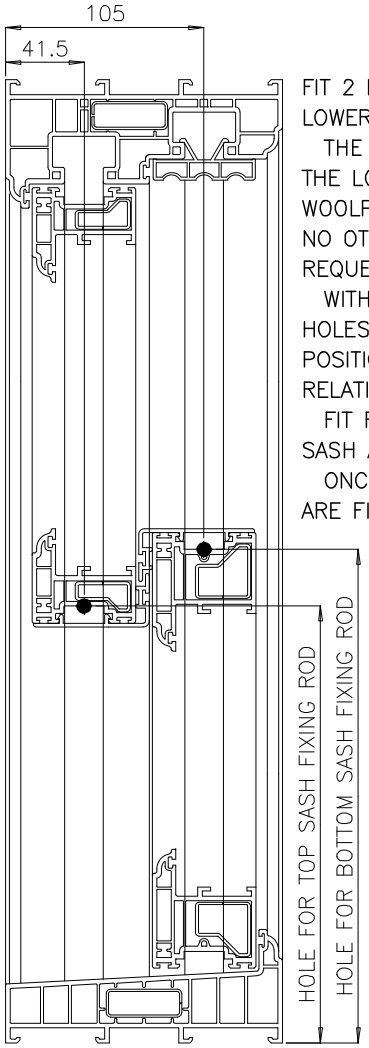
MANUFACTURING DETAILS FOR DUMMY / FIXED SASHES
USING H01697 SASH FIXING ROD.





ROD FIXING SCREWS: IN P10118 – 4.2 x 13mm RESIST TORX
IN P10123 – 4.2 x 25mm RESIST TORX
TAMPER PROOF SCREWS. PRE DRILL Ø3.0mm





FIT 2 H01697 RODS PER FIXED SASH. 2 ON THE TOP OF THE LOWER SASH, 2 ON THE BOTTOM OF THE UPPER SASH.

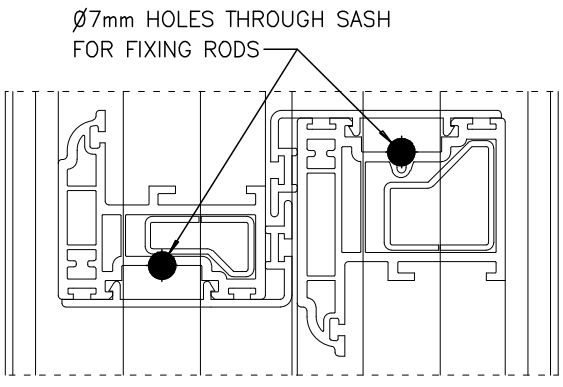
THE UPPER SASH IS FITTED WITH M00182 MOULDINGS AND THE LOWER SASH WITH G00042 & G00091 GASKETS, WOOLPILES ARE FITTED TO SASHES & O/FRAME AS STANDARD. NO OTHER HARDWARE IS REQUIRED, UNLESS REQUESTED BY THE CUSTOMER. (CAM CATCHES E.T.C).

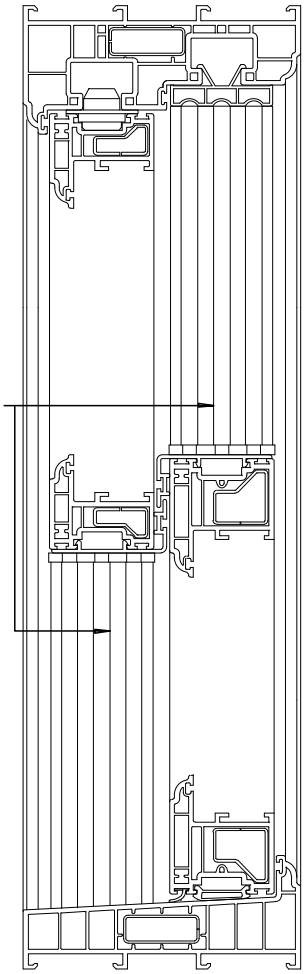
WITH SASHES IN CORRECT POSITION IN O/FRAME, Ø7mm HOLES (4off) MUST BE DRILLED THROUGH O/FRAME. HOLE POSITIONS ARE CENTRAL TO BALANCE CHANNEL, AND IN RELATION TO SASH FACES AS INDICATED LEFT & BELOW.

FIT RODS INTO HOLES THROUGH O/FRAME, POSITION ONTO SASH AND PRE DRILL Ø3mm HOLES. SCREW FIX ROD TO SASH.

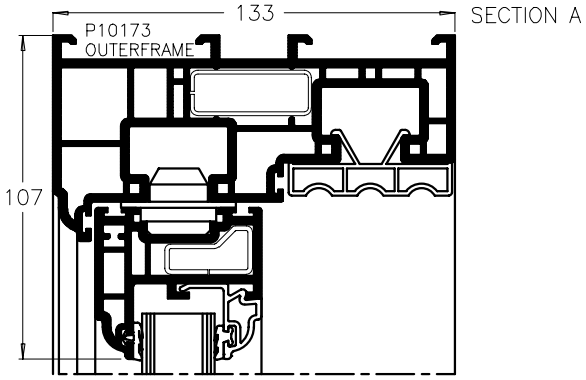
ONCE RODS FITTED, P10124 COVER & M00078 END CAPS ARE FITTED TO FILL CHANNELS ABOVE & BELOW BOTH SASHES.

SASH ROD POSITIONING DRILL JIG – J10033–99

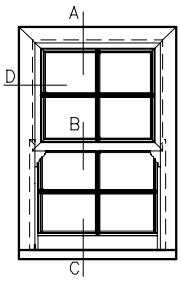




VERTICAL SLIDING WINDOW SMALL SASH, LARGE SASH AT BASE
EQUAL SPLIT



SECTION A

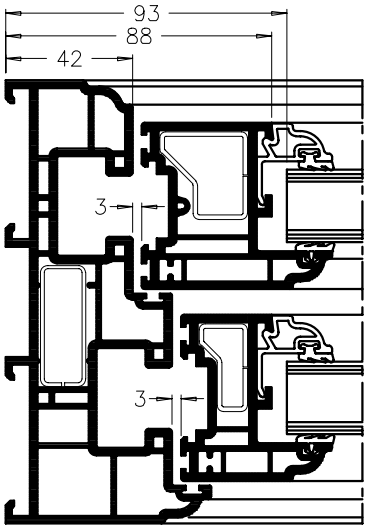


TO CALCULATE FINISHED SASH HEIGHTS.
TOP & BOTTOM SASH HEIGHT =

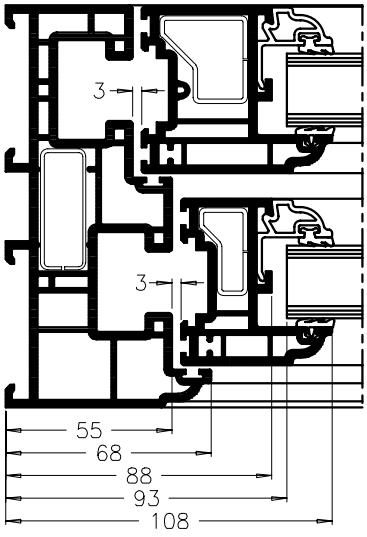
$$\frac{\text{OVERALL FRAME HEIGHT} - 97\text{mm}}{2} + 24\text{mm}$$

TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm

BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm

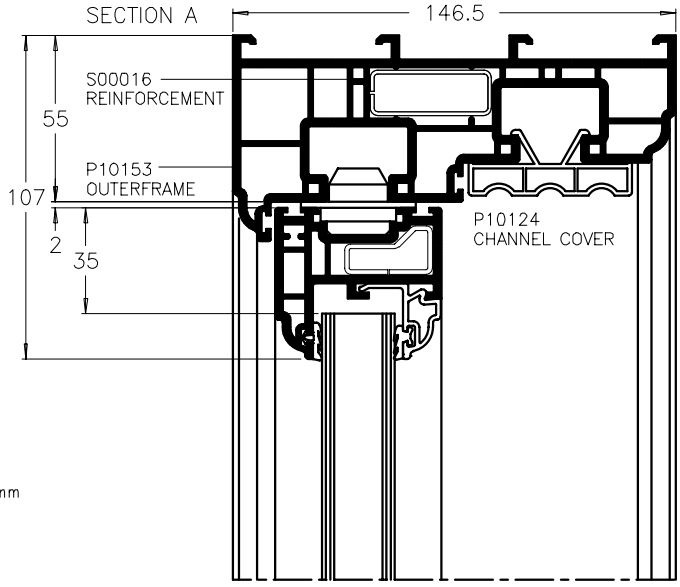


SECTION D
P10153
OUTERFRAME

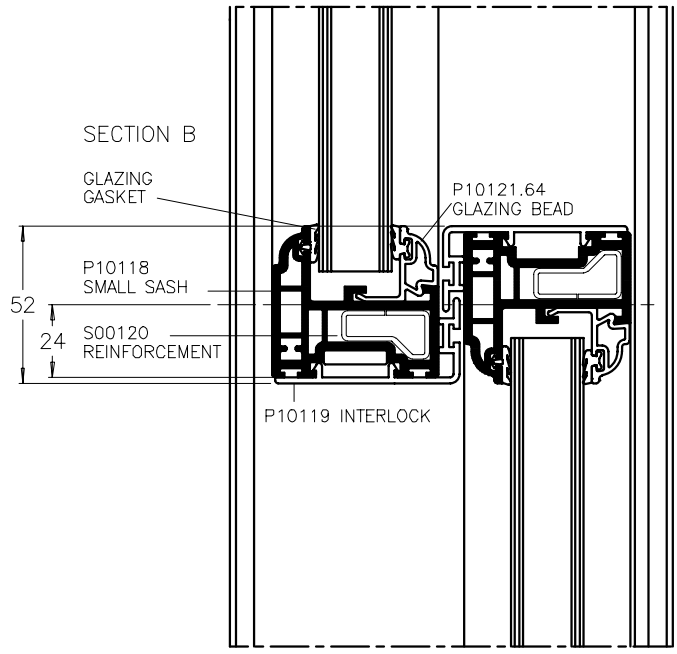


SECTION D
P10173
OUTERFRAME

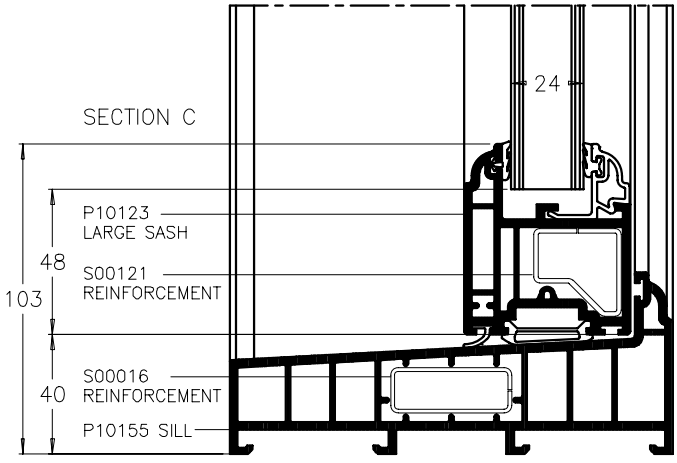
SECTION A



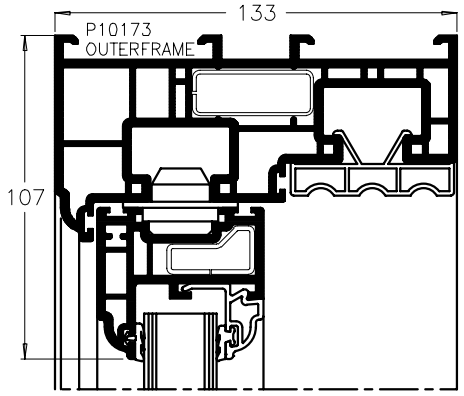
SECTION B



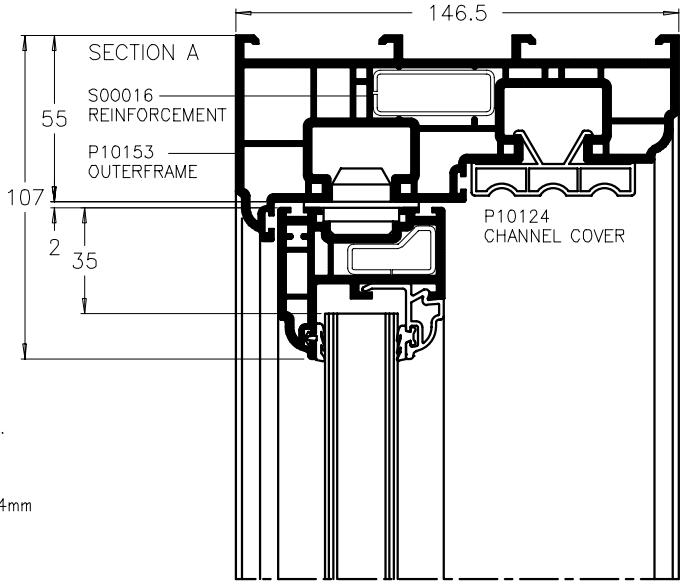
SECTION C

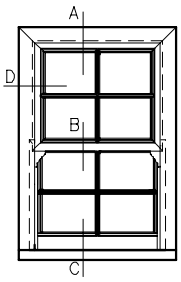


VERTICAL SLIDING WINDOW SMALL AND LARGE SASH
EQUAL SPLIT



SECTION A



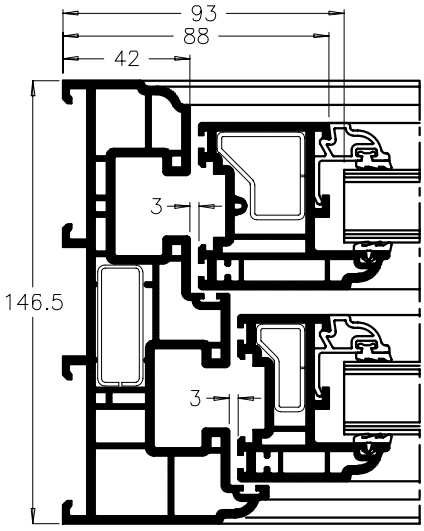


TO CALCULATE FINISHED SASH HEIGHTS.
TOP & BOTTOM SASH HEIGHT =

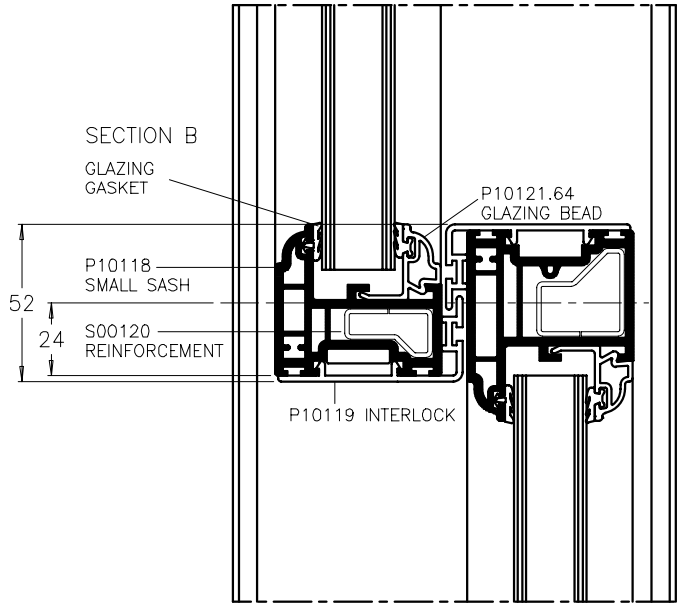
$$\frac{\text{OVERALL FRAME HEIGHT} - 97\text{mm}}{2} + 24\text{mm}$$

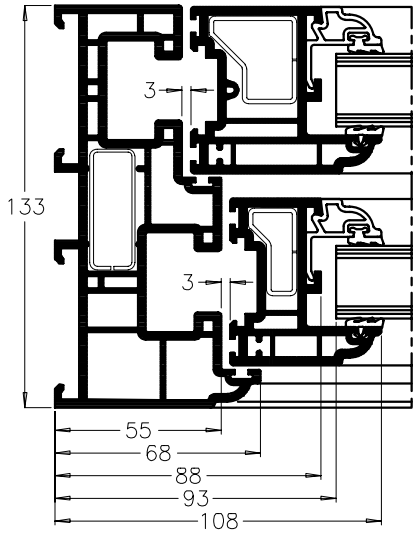
TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm

BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm

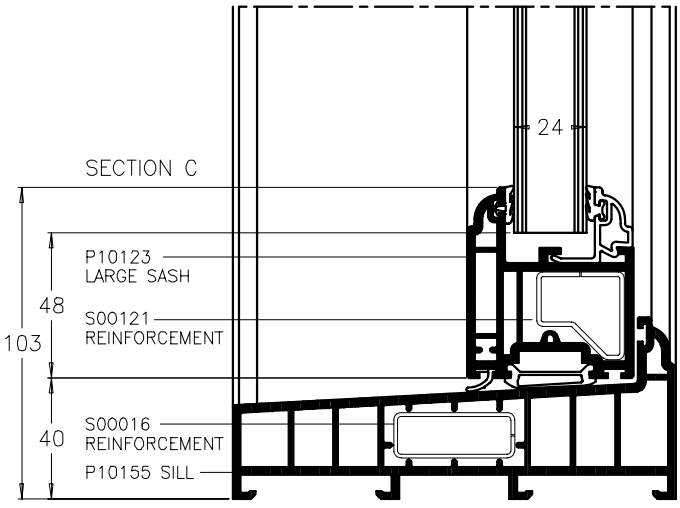


SECTION D
P10153
OUTERFRAME

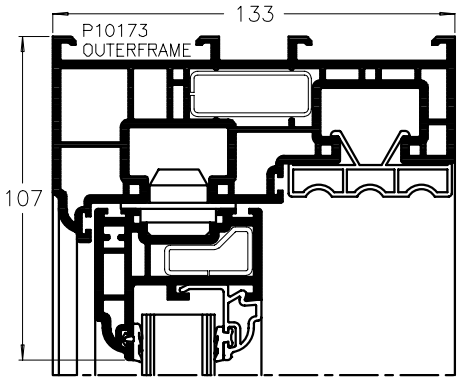




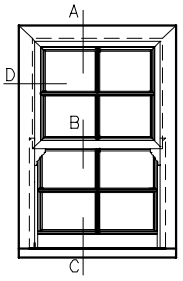
SECTION D
P10173
OUTERFRAME



VERTICAL SLIDING WINDOW
SMALL SASH AND LARGE SASH WITH DEEP BOTTOM RAIL
EQUAL SPLIT



SECTION A

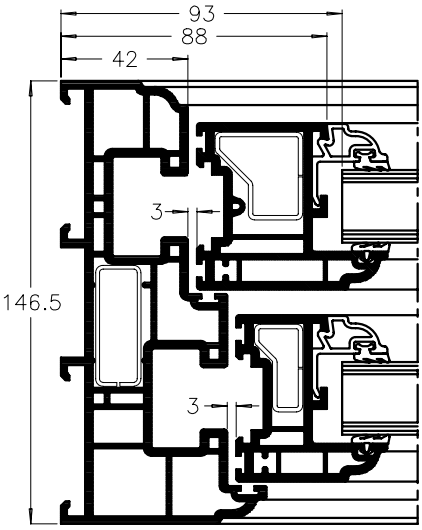


TO CALCULATE FINISHED SASH HEIGHTS.
TOP & BOTTOM SASH HEIGHT =

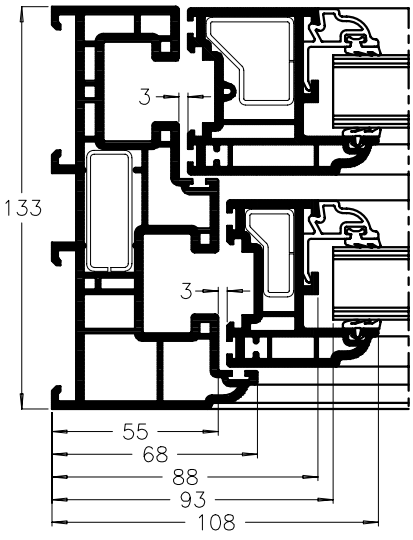
$$\frac{\text{OVERALL FRAME HEIGHT} - 97\text{mm}}{2} + 24\text{mm}$$

TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm

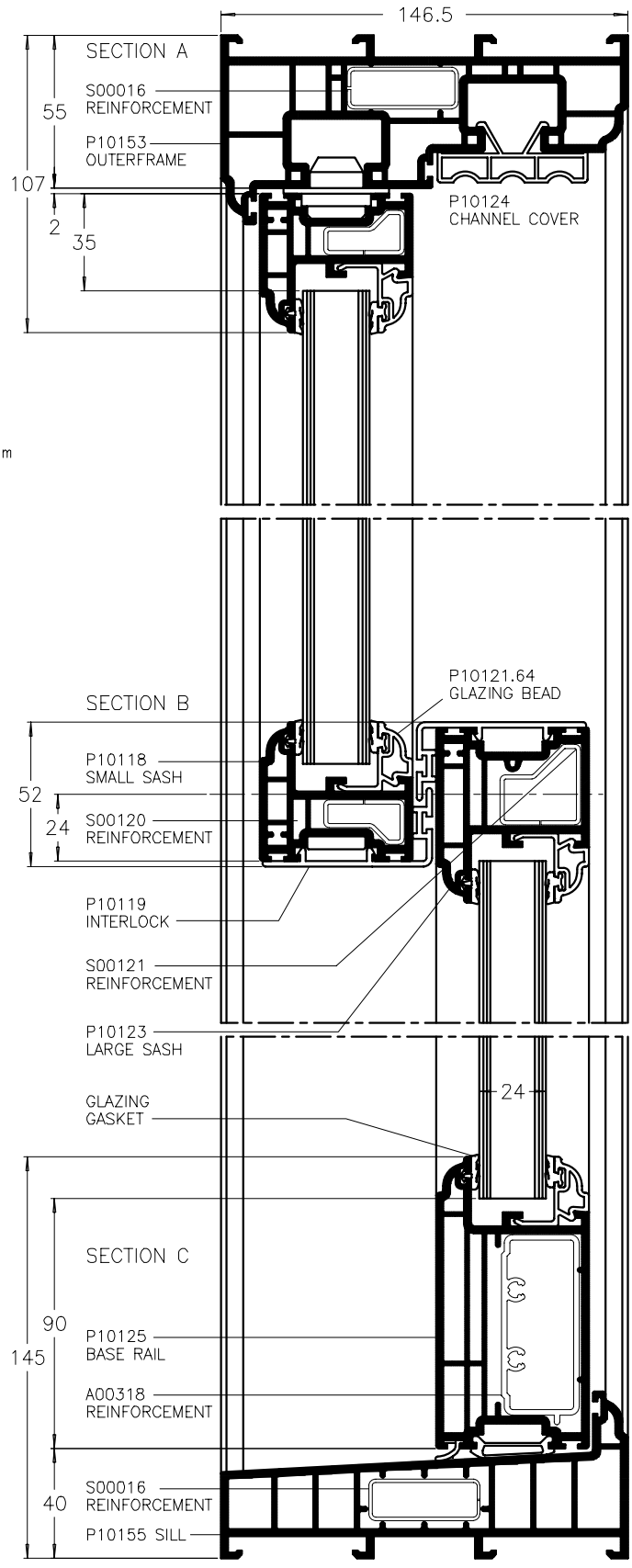
BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm



SECTION D
P10153
OUTERFRAME

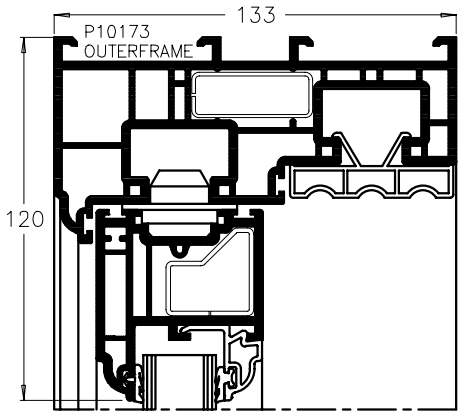


SECTION D
P10173
OUTERFRAME

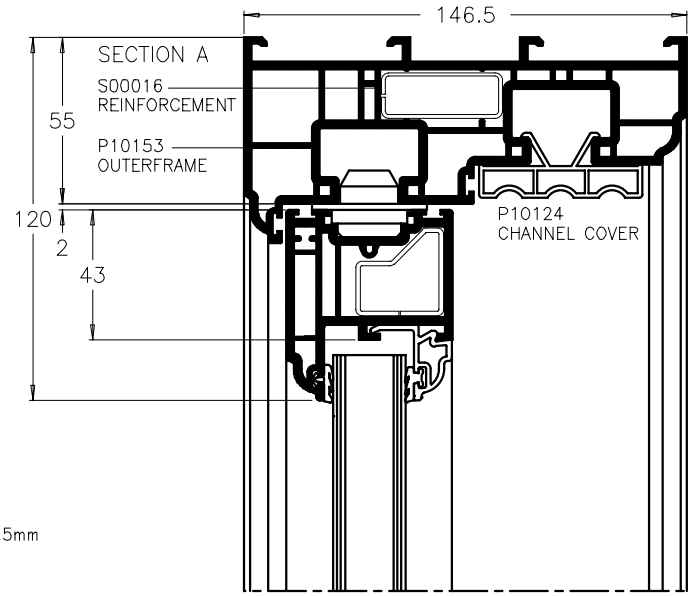


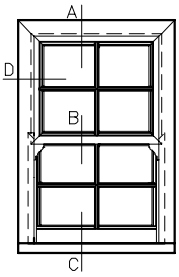
VERTICAL SLIDING WINDOW LARGE SASH ONLY

EQUAL SPLIT



SECTION A



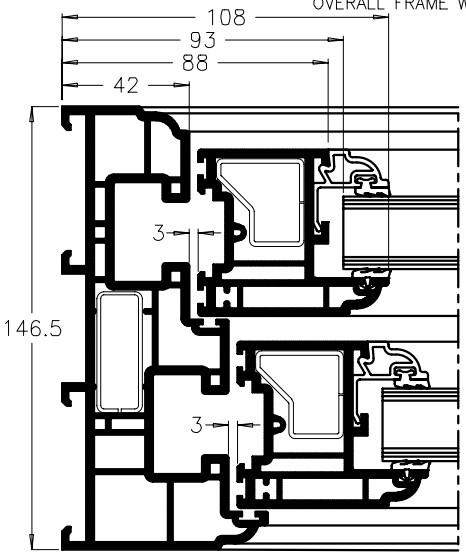


TO CALCULATE FINISHED SASH HEIGHTS.
TOP & BOTTOM SASH HEIGHT =

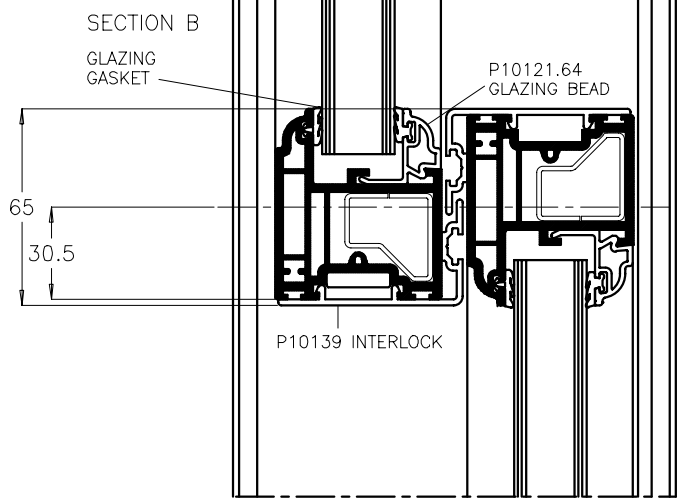
$$\frac{\text{OVERALL FRAME HEIGHT} - 97\text{mm}}{2} + 30.5\text{mm}$$

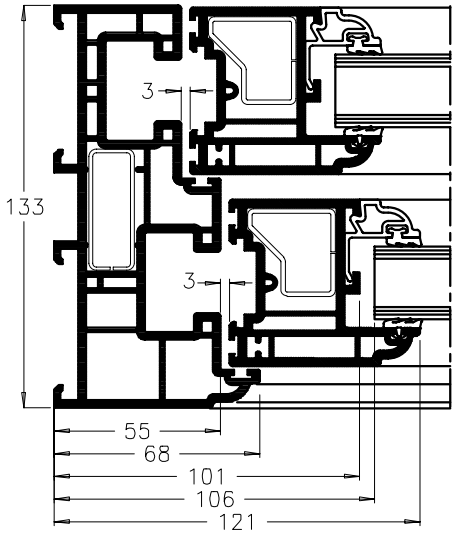
TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm

BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm

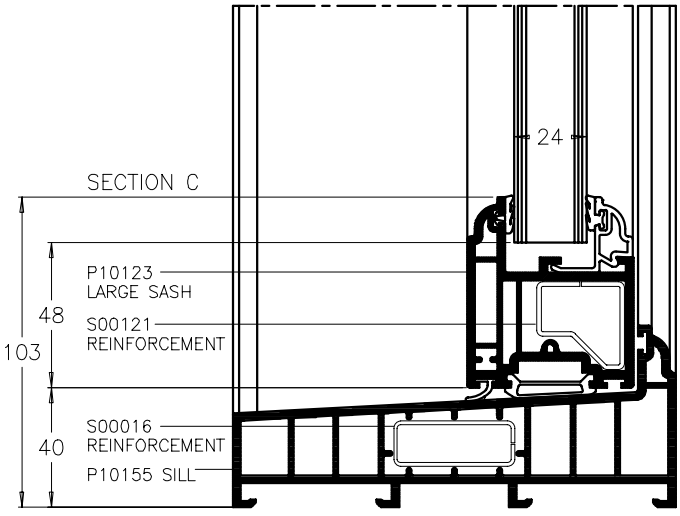


SECTION D
P10153
OUTERFRAME

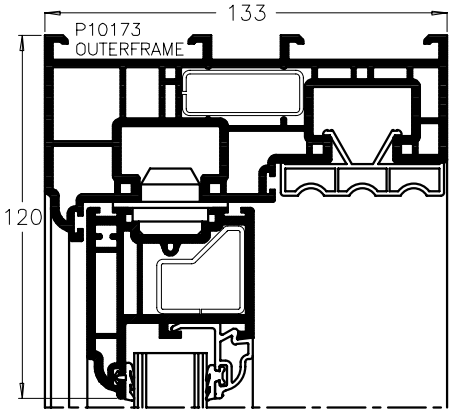




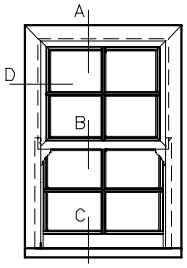
SECTION D
P10173
OUTERFRAME



VERTICAL SLIDING WINDOW LARGE SASH WITH DEEP BOTTOM RAIL
EQUAL SPLIT



SECTION A

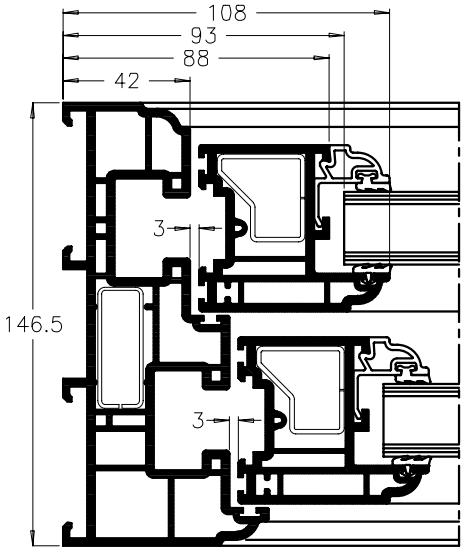


TO CALCULATE FINISHED SASH HEIGHTS.
TOP & BOTTOM SASH HEIGHT =

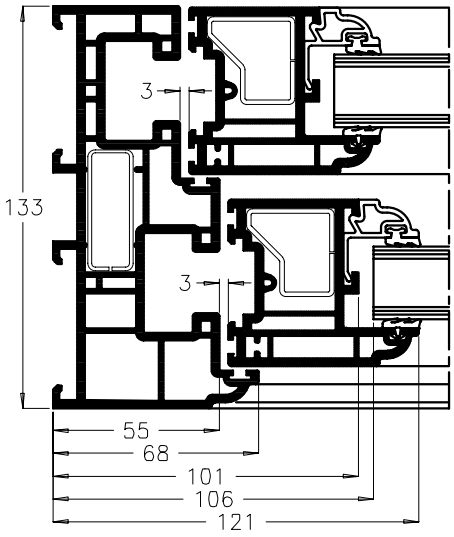
$$\frac{\text{OVERALL FRAME HEIGHT} - 97\text{mm}}{2} + 30.5\text{mm}$$

TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm

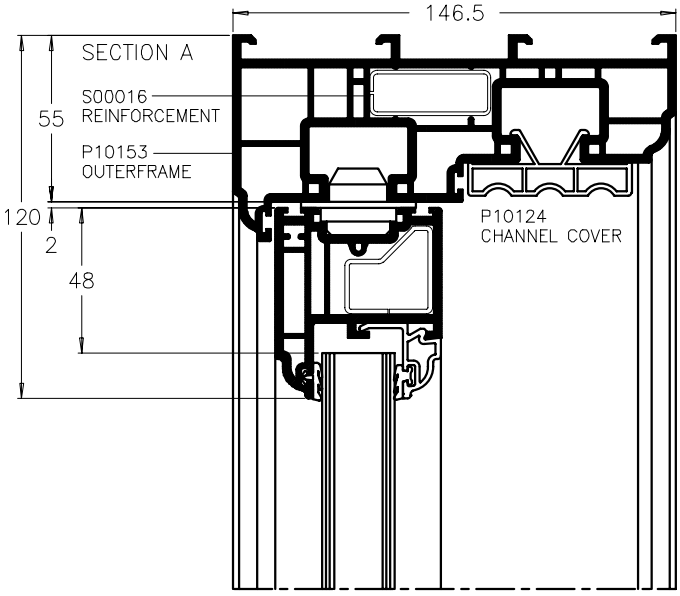
BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm

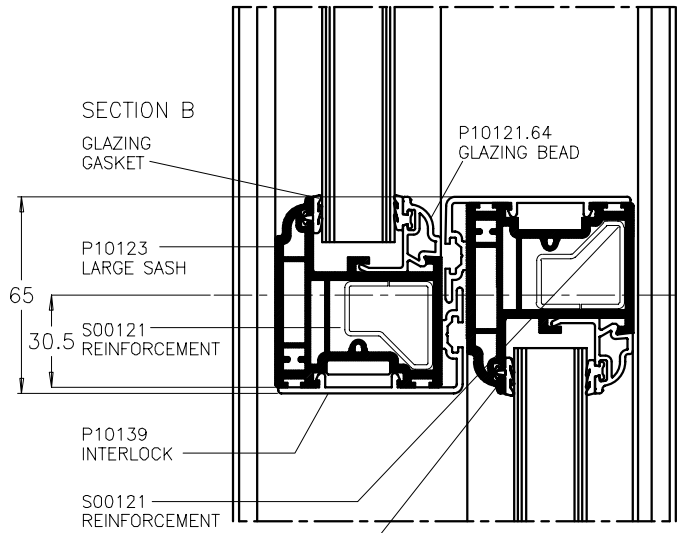


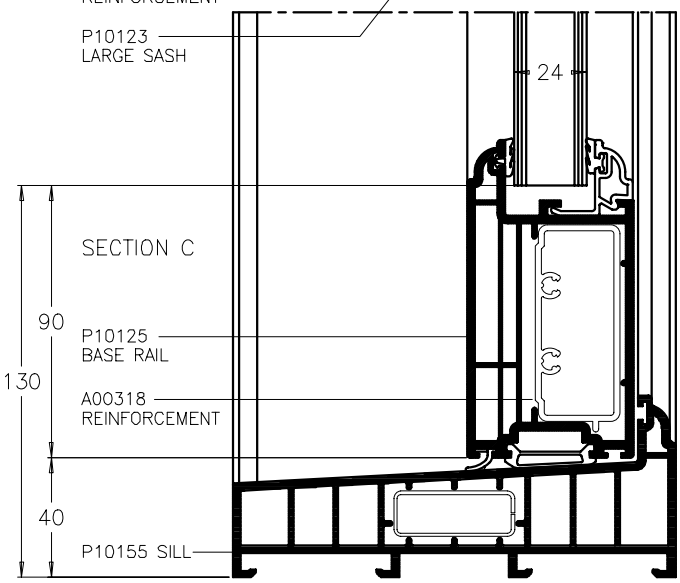
SECTION D
P10153
OUTERFRAME



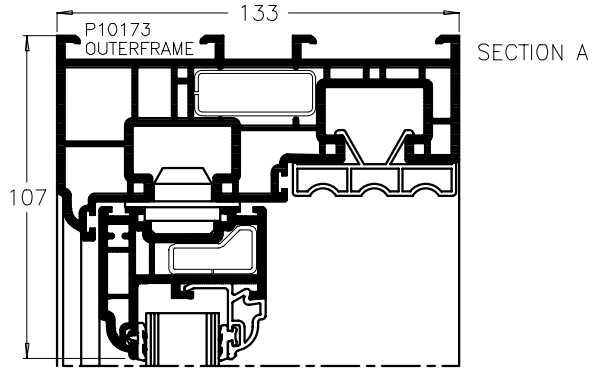
SECTION D
P10173
OUTERFRAME

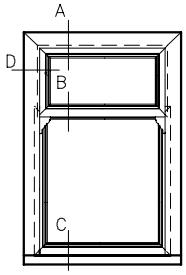






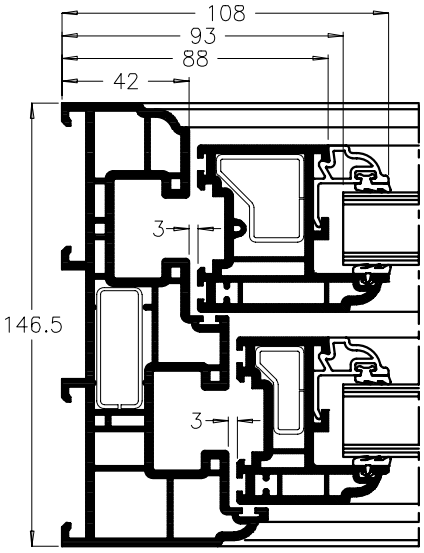
VERTICAL SLIDING WINDOW SMALL AND LARGE SASH
2/3, 1/3 OR 2/5, 3/5 SPLIT



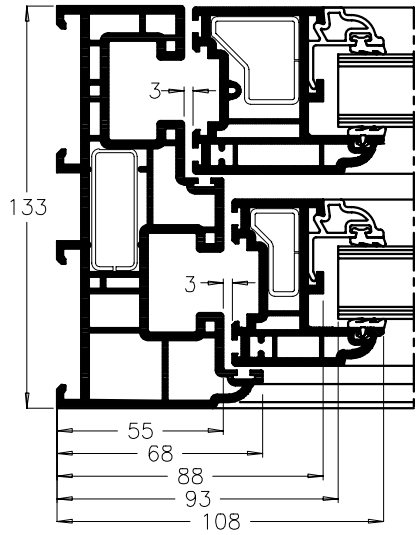


TO CALCULATE FINISHED SASH HEIGHTS.
TOP SASH HEIGHT =
1/3 OVERALL FRAME HEIGHT – 33mm
OR 2/5 OVERALL FRAME HEIGHT – 33mm
BOTTOM SASH HEIGHT =
2/3 OVERALL FRAME HEIGHT – 16mm
OR 3/5 OVERALL FRAME HEIGHT – 16mm

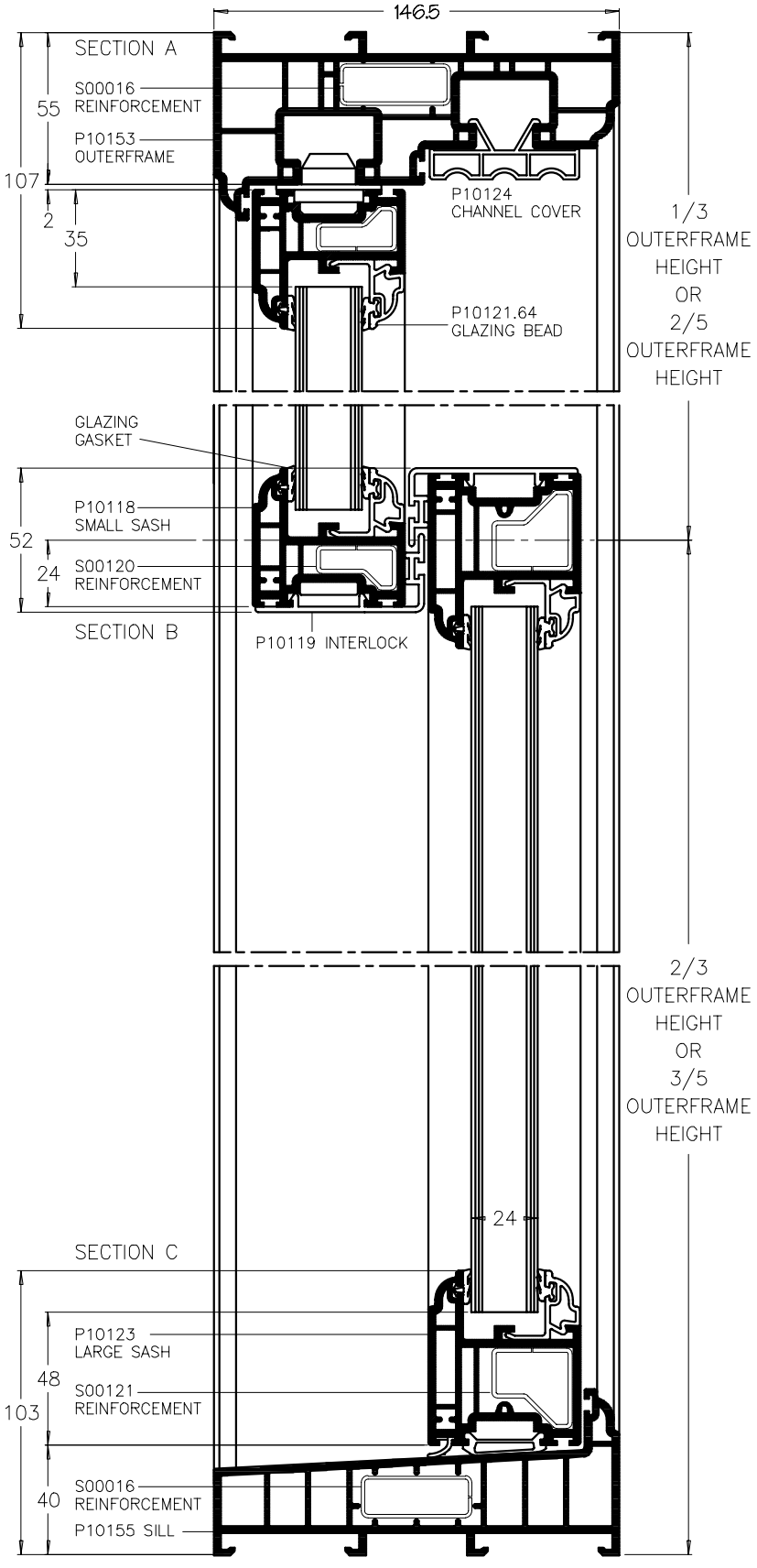
TO CALCULATE FINISHED SASH WIDTHS
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm
BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm



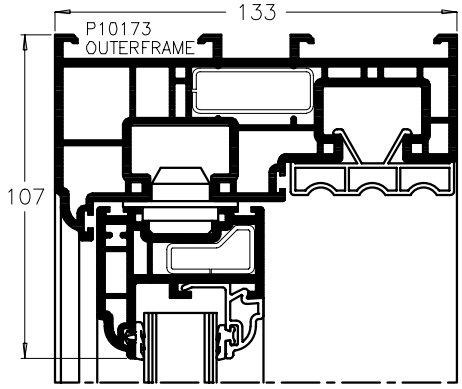
SECTION D
P10153
OUTERFRAME

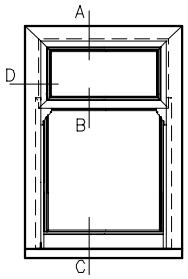


SECTION D
P10173
OUTERFRAME



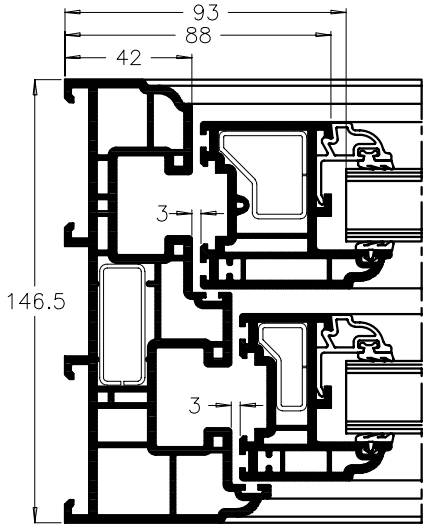
VERTICAL SLIDING WINDOW WITH SMALL AND LARGE SASH WITH DEEP BASE RAIL 2/3, 1/3 OR 2/5, 3/5 SPLIT



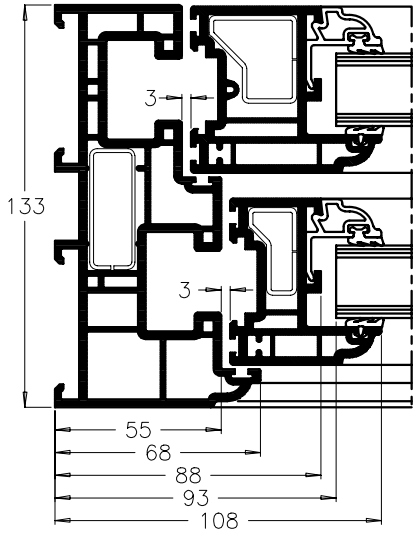


TO CALCULATE FINISHED SASH HEIGHTS.
TOP SASH HEIGHT =
1/3 OVERALL FRAME HEIGHT – 33mm
OR 2/5 OVERALL FRAME HEIGHT –33mm
BOTTOM SASH HEIGHT =
2/3 OVERALL FRAME HEIGHT – 16mm
OR 3/5 OVERALL FRAME HEIGHT –16mm

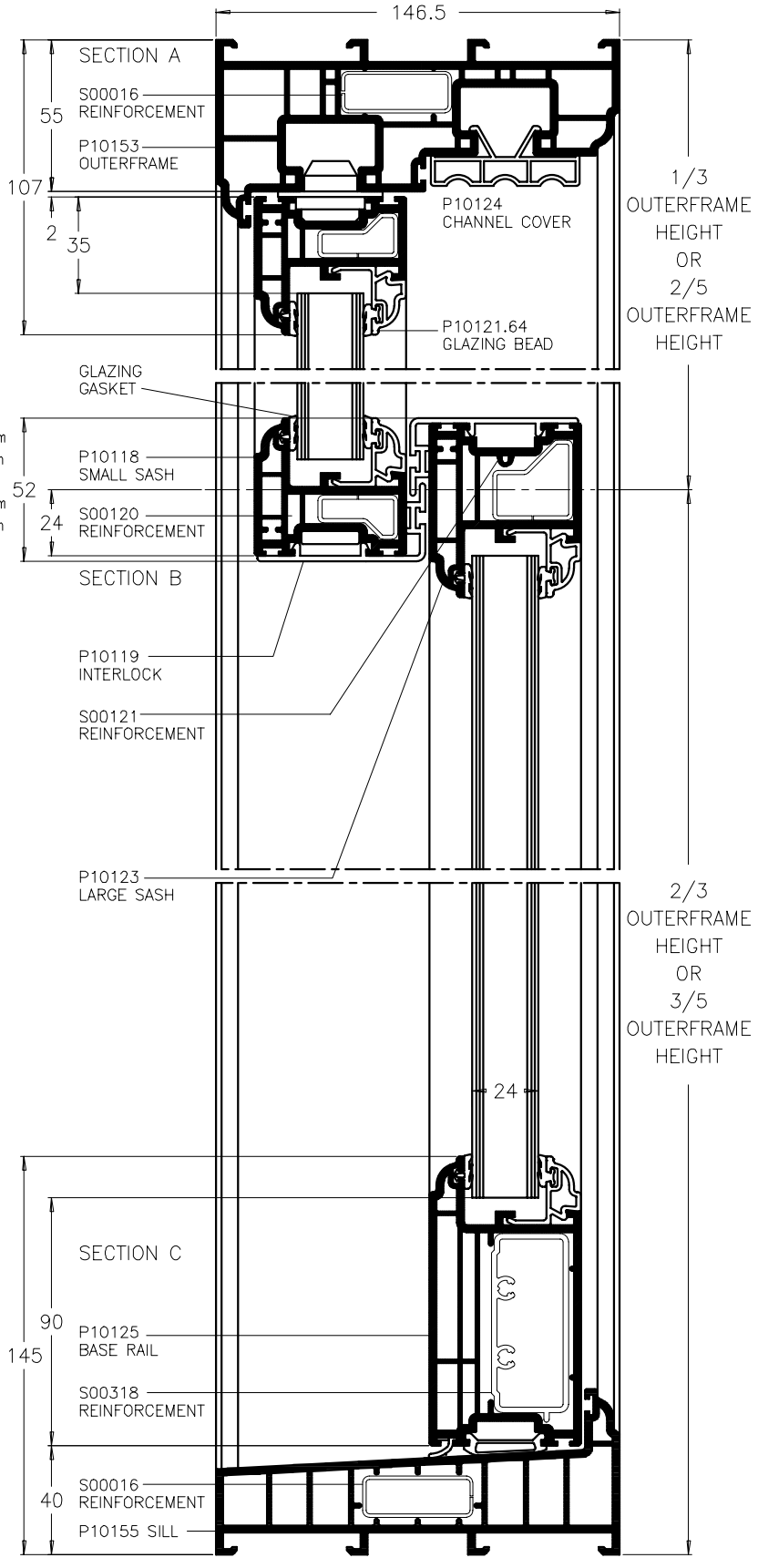
TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm
BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm



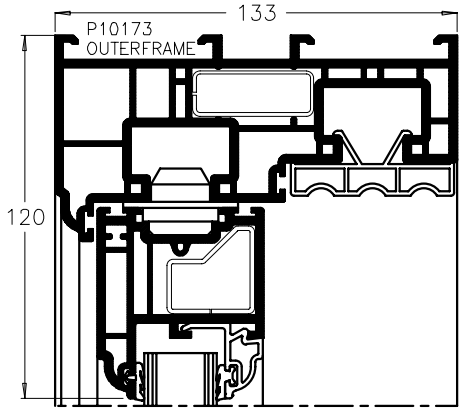
SECTION D
P10153
OUTERFRAME



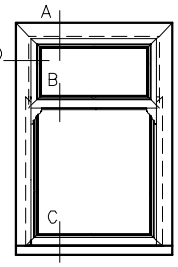
SECTION D
P10173
OUTERFRAME



VERTICAL SLIDING WINDOW LARGE SASH ONLY
2/3, 1/3 OR 2/5, 3/5 SPLIT

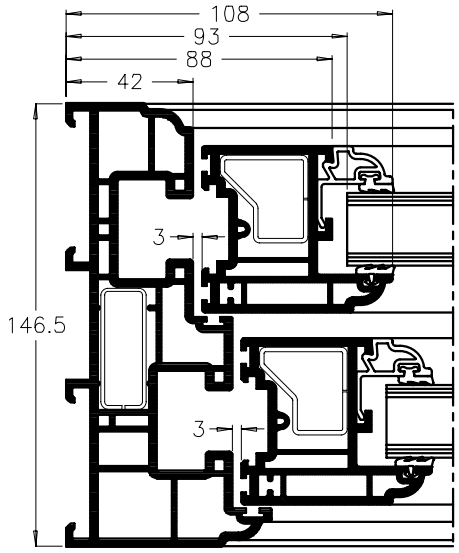


SECTION A

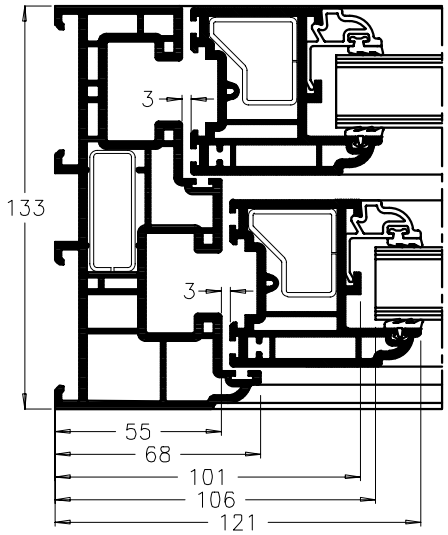


TO CALCULATE FINISHED SASH HEIGHTS.
TOP SASH HEIGHT =
1/3 OVERALL FRAME HEIGHT – 26.5mm
OR 2/5 OVERALL FRAME HEIGHT – 26.5mm
BOTTOM SASH HEIGHT =
2/3 OVERALL FRAME HEIGHT – 9.5mm
OR 3/5 OVERALL FRAME HEIGHT – 9.5mm

TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm
BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm

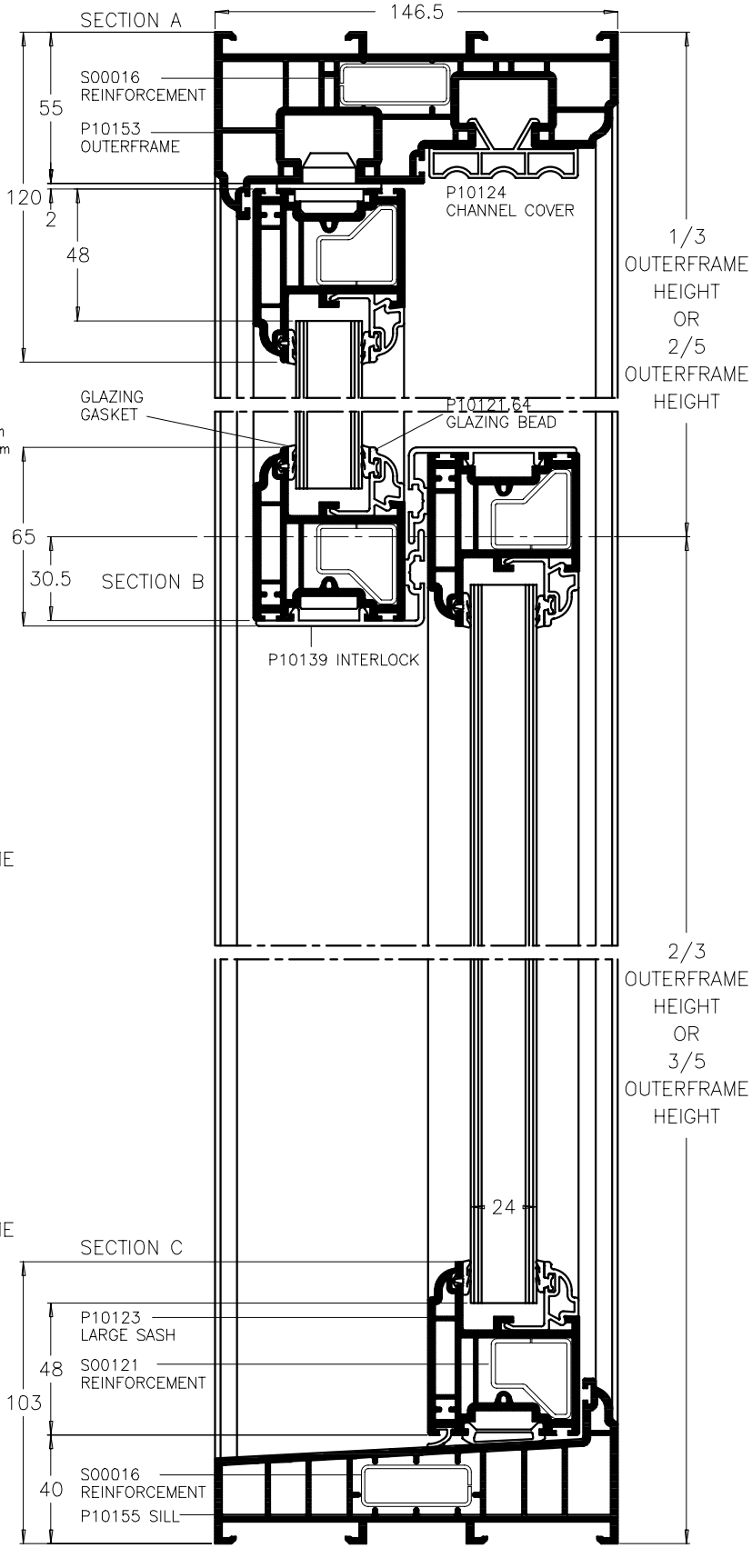


SECTION D
P10153
OUTERFRAME

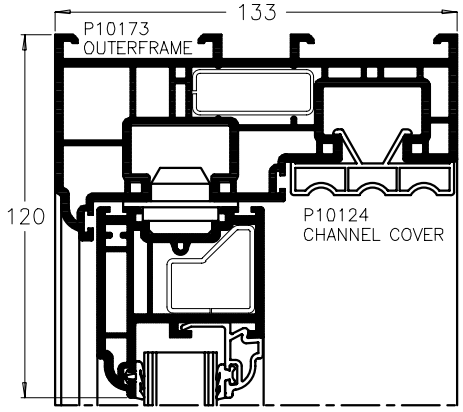


SECTION D
P10173
OUTERFRAME

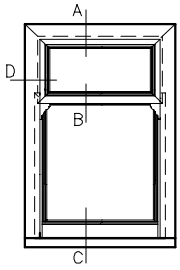
SECTION A



VERTICAL SLIDING WINDOW LARGE SASH WITH DEEP BASE RAIL
2/3, 1/3 OR 2/5, 3/5 SPLIT



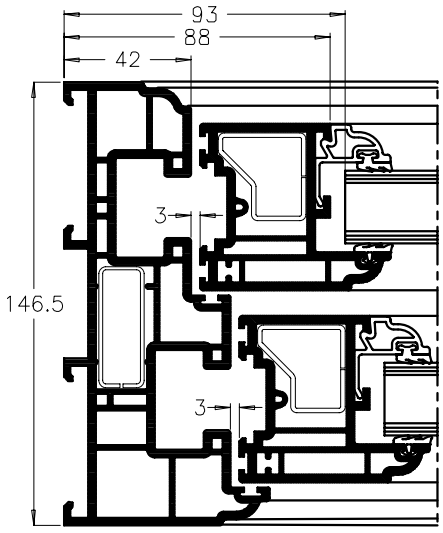
SECTION A



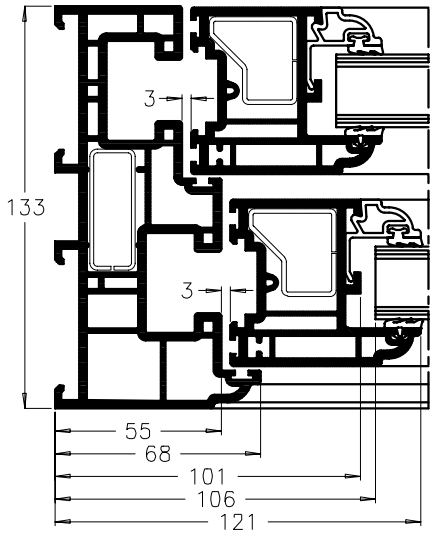
TO CALCULATE FINISHED SASH HEIGHTS.
TOP SASH HEIGHT =
1/3 OVERALL FRAME HEIGHT – 26.5mm
OR 2/5 OVERALL FRAME HEIGHT – 26.5mm
BOTTOM SASH HEIGHT =
2/3 OVERALL FRAME HEIGHT – 9.5mm
OR 3/5 OVERALL FRAME HEIGHT – 9.5mm

TO CALCULATE FINISHED SASH WIDTHS.
TOP SASH WIDTH =
OVERALL FRAME WIDTH – 116mm

BOTTOM SASH WIDTH =
OVERALL FRAME WIDTH – 90mm

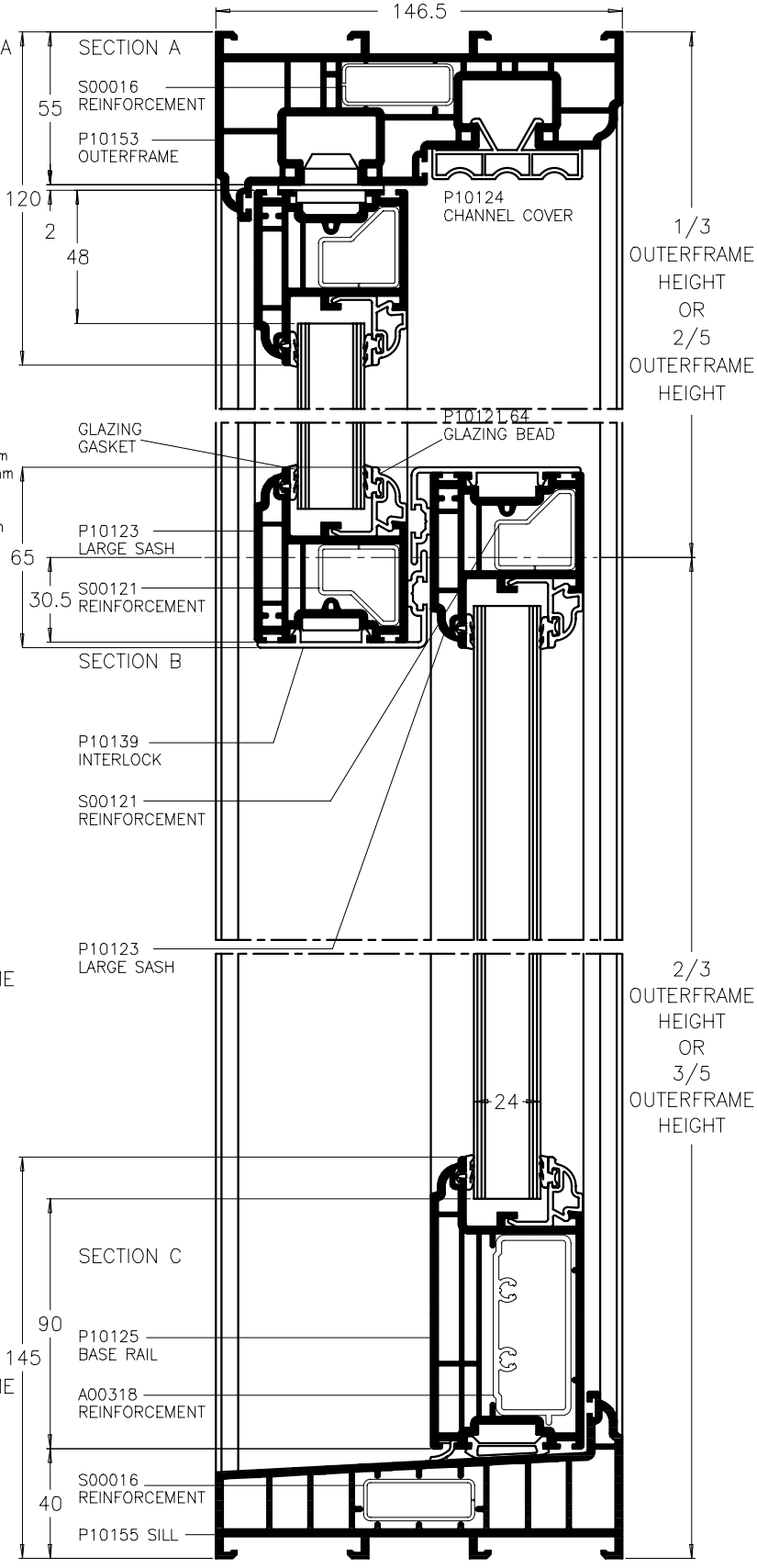


SECTION D
P10153
OUTERFRAME

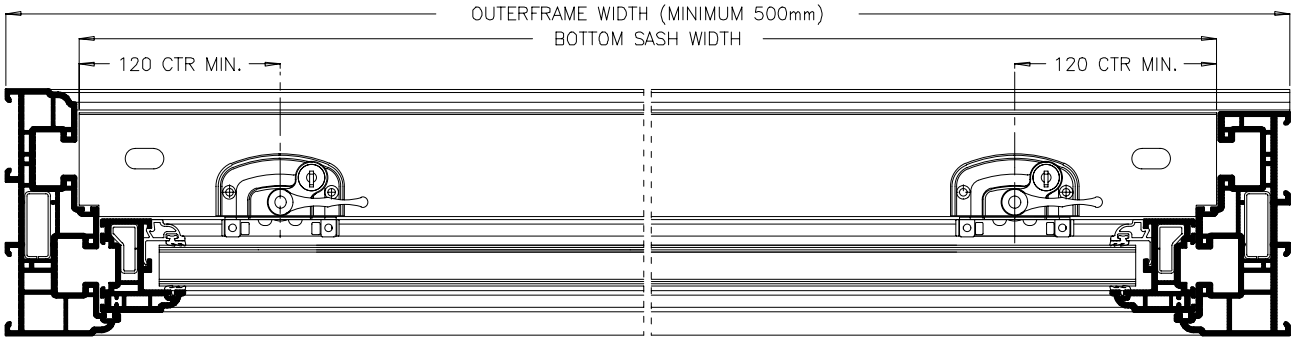


SECTION D
P10173
OUTERFRAME

SECTION A

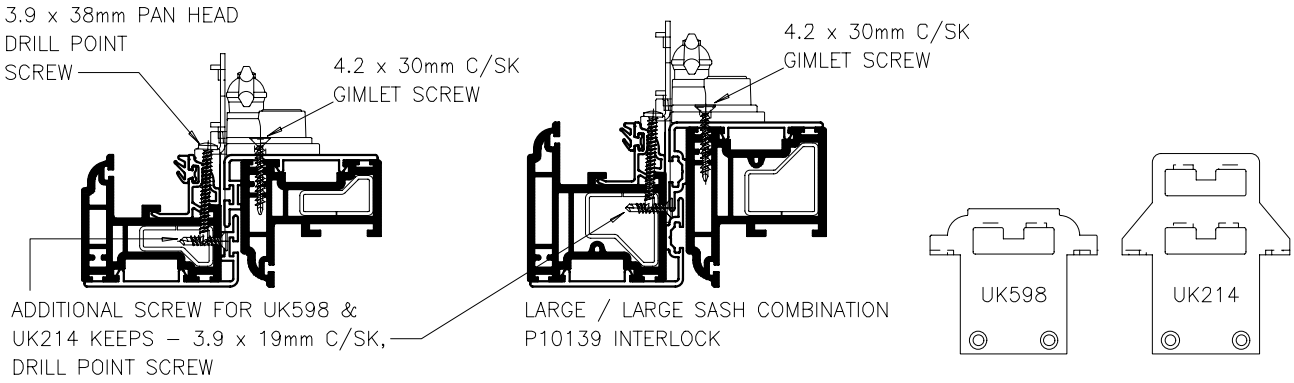


CAM CATCH DETAILS

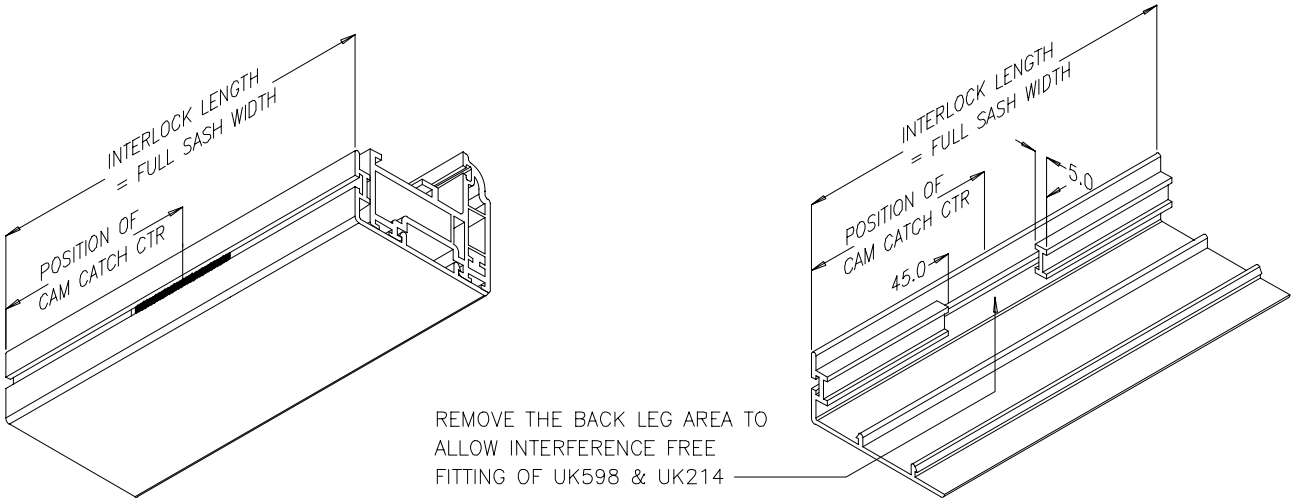


2 CAM CATCHES TO BE FITTED NO CLOSER TO THE EDGE OF THE SASH THAN 120mm (CTR), AS SHOWN.
CAM CATCHES FITTED TO FIRE ESCAPE WINDOWS MUST BE NON KEY LOCKING.

CALDWELL CAM CATCH OPTIONS – GOLD AND CHROME.
LOCKING CAM CATCH – PE 520. NON LOCKING CAM CATCH – PE 521.
CAM CATCH KEEPS – UK598 & UK214

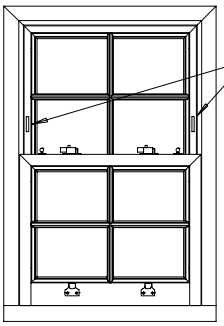


ADDITIONAL PREPARATION FOR TOP SASH INTERLOCK
WHEN USING UK598 & UK214 KEEPS.
THIS APPLIES TO INTERLOCK SECTIONS P10119 & P10139 (P10119 SHOWN)



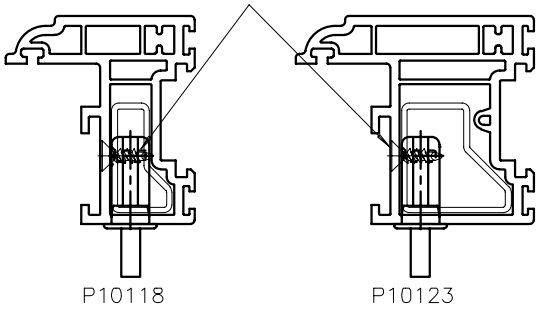
TRAVEL RESTRICTORS, 100mm RESTRICTED OPENING – BOTTOM SASH

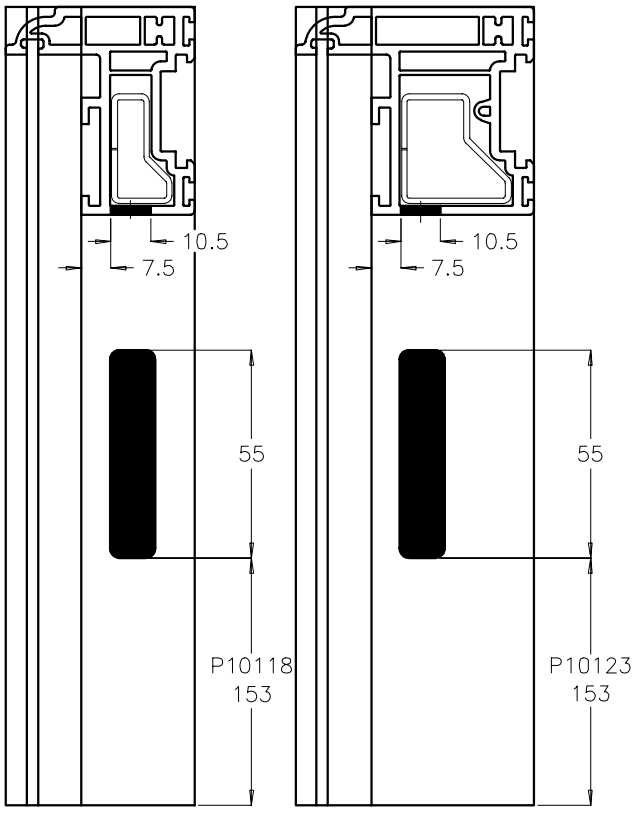
RESTRICTOR TYPE
CALDWELL PE401 – KEY OPERATED TRAVEL RESTRICTOR
CALDWELL PE443 – NON LOCKING TRAVEL RESTRICTOR

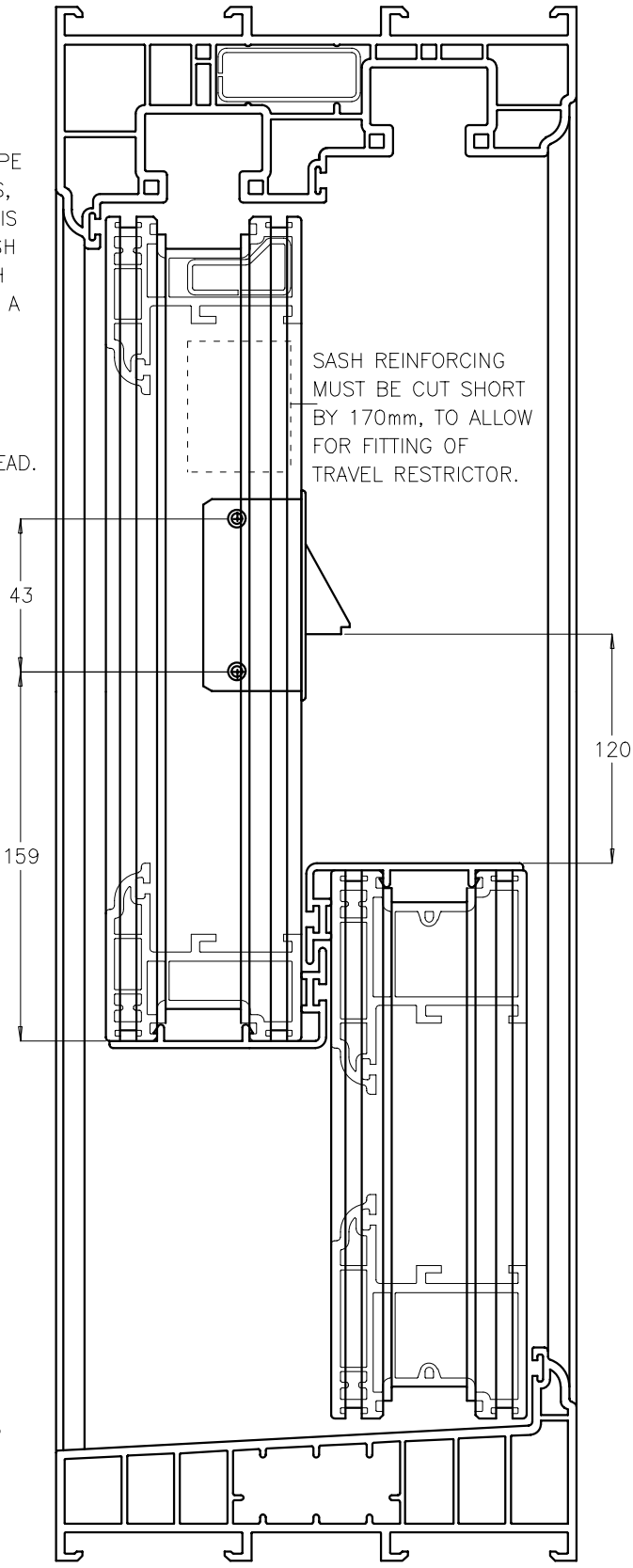


PLEASE NOTE!
IT IS RECOMMENDED THAT THIS TYPE OF RESTRICTOR IS FITTED IN PAIRS, UNLESS OTHERWISE SPECIFIED. THIS IS TO PREVENT ANY POSSIBLE SASH DISTORTION THAT MAY OCCUR WITH THE SASH BEING OPENED AGAINST A RESTICTOR ONLY ON ONE SIDE.

3.9 x 13mm C/SK DRILL POINT SCREW. HEAD OF SCREW MUST BE DEEP ENOUGH TO AVOID INTERFERENCE WITH BEAD.

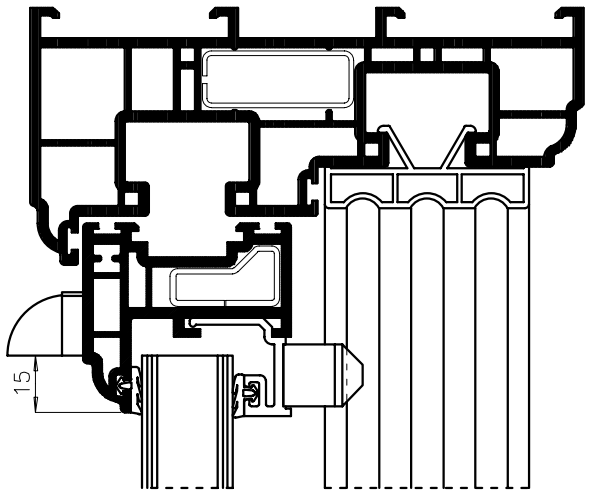




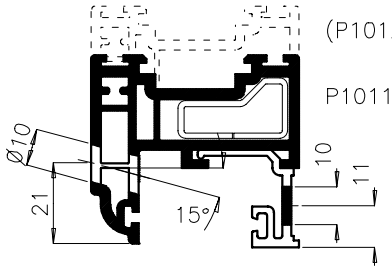


THE KEY OPERATED RESTRICTOR CAN BE LOCKED IN BOTH THE OPEN AND CLOSED POSITION. THE CLOSED POSITION ALLOWS THE SASH(ES) TO BE OPENED FULLY. IF RESTRICTORS ARE TO BE FITTED TO A FIRE ESCAPE WINDOW, CONSULTATION SHOULD BE SOUGHT WITH YOUR LOCAL BUILDING CONTROL OFFICER.

DETAILS FOR BROOKVENT SM2000 & SM4000 VENTILATORS

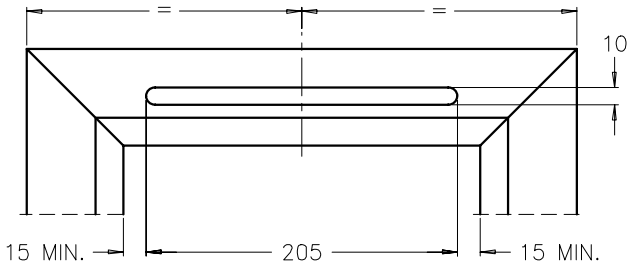


FIXING SCREWS :–
FOR FIXING OPERATING VENTILATOR TO ALUMINIUM VENT BEAD USE 3.9 x 13mm PAN HEAD DRILL POINT SCREWS.
FOR FIXING EXTERIOR HOOD TO PROFILE USE 4.2 x 13mm C/SK GIMLET POINT SCREWS.
THIS VENTILATOR CAN ONLY BE FITTED TO THE HEAD OF THE TOP SASH.



A00163 ALUMINIUM VENT BEAD

PROFILE AND VENT BEAD ROUTING DETAIL FOR BROOKVENT SM 2000 VENTILATOR

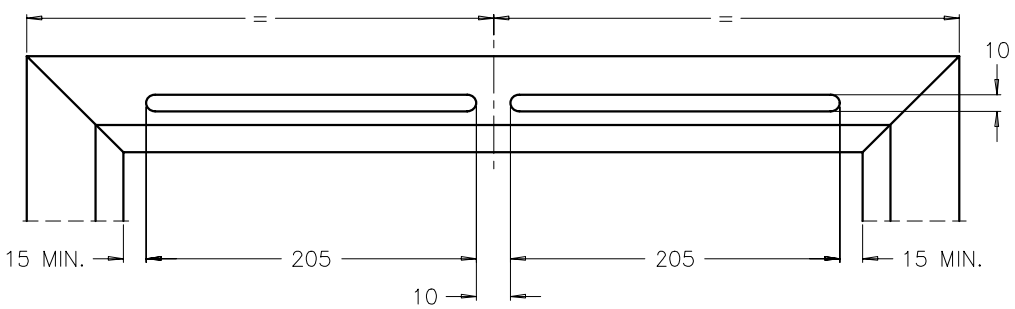


MIN O/FRAME WIDTH TO ACHIEVE 2000mm2

P10118 SASH – 425mm O/F
P10123 SASH – 451mm O/F

PLEASE NOTE FRAMES UNDER 500mm IN WIDTH ARE TO BE FIXED (NON – SLIDING)

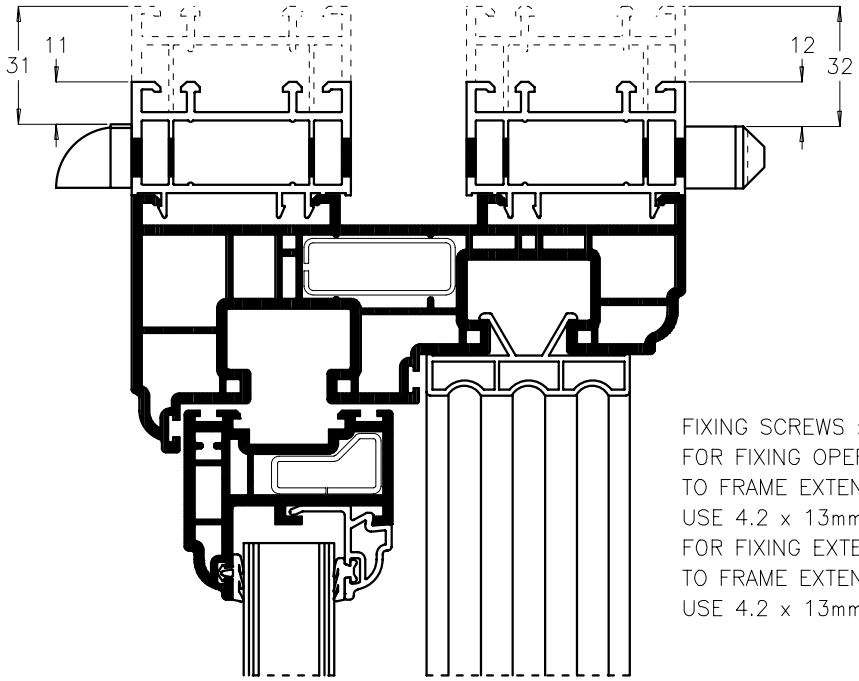
PROFILE AND VENT BEAD ROUTING DETAIL FOR BROOKVENT SM 4000 VENTILATOR



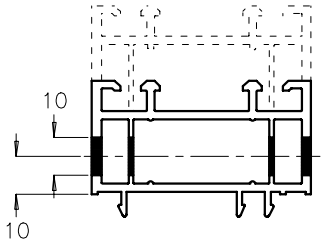
MIN O/FRAME WIDTH TO ACHIEVE 4000mm2

P10118 SASH – 640mm O/F
P10123 SASH – 666mm O/F

DETAILS FOR BROOKVENT SM2000 & SM4000 VENTILATORS



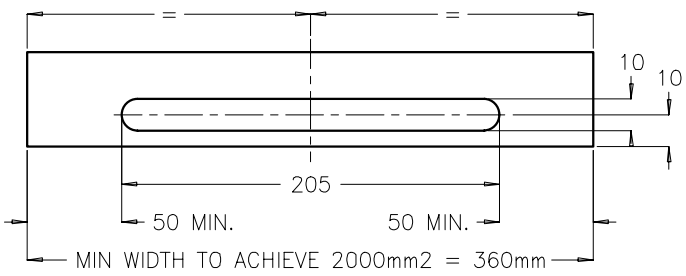
FIXING SCREWS :–
FOR FIXING OPERATING VENTILATOR
TO FRAME EXTENSION
USE 4.2 x 13mm PAN HEAD GIMLET POINT SCREWS.
FOR FIXING EXTERIOR HOOD
TO FRAME EXTENSION
USE 4.2 x 13mm C/SK GIMLET POINT SCREWS.



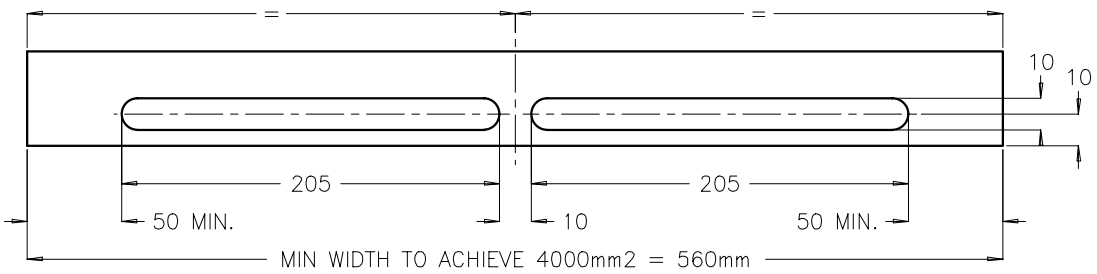
(P58092 50mm FRAME EXTENSION)

P58091 30mm FRAME EXTENSION

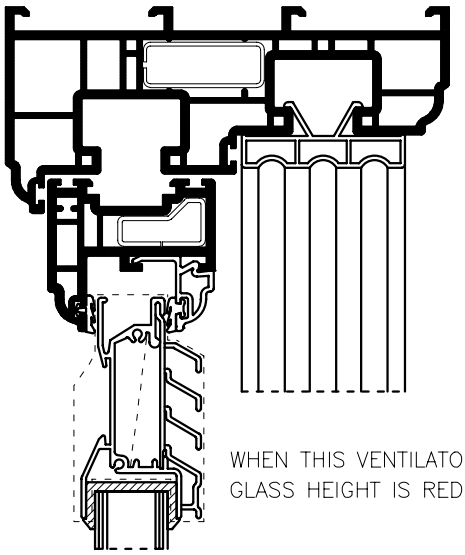
ROUTING DETAILS FOR BROOKVENT SM 2000 VENTILATOR



ROUTING DETAILS FOR BROOKVENT SM 4000 VENTILATOR



DETAILS FOR BROOK PD GLAZED–IN VENTILATOR – CONTROLLABLE VENTILATION



THIS VENTILATOR GIVES A CONTROLLABLE FREE AIR SPACE
OF 9000mm2 PER LINEAR METRE OF ALUMINIUM VENT SECTION
E.G GLASS WIDTH – 54mm (see drg below)
THIS VENTILATOR CAN BE FITTED TO THE HEAD
OF EITHER THE TOP OR BOTTOM SASH

WHEN THIS VENTILATOR IS TO BE FITTED THE
GLASS HEIGHT IS REDUCED BY 69mm

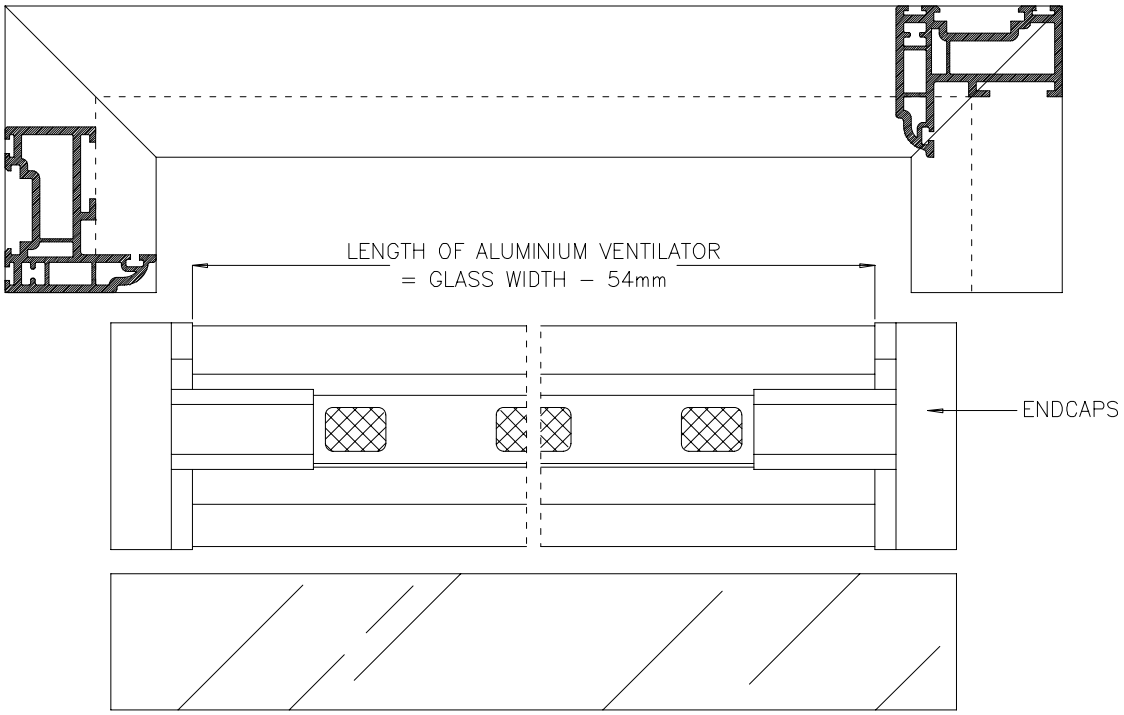


TABLE SHOWING FREE AIR SPACE FOR VENTILATION THROUGH BROOK PD GLAZED–IN VENTILATOR

OUTERFRAME WIDTH (mm)		350*	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
TOP SASH P10118	SASH WIDTH (mm)	234	384	484	584	684	784	884	984	1084	1184	1284	1384	1484
	VENT LENGTH (mm)	110	260	360	460	560	660	760	860	960	1060	1160	1260	1360
	AIR SPACE (mm2)	**990**	**2340**	**3240**	**4140**	**5040**	**5940**	**6840**	**7740**	**8640**	**9540**	**10440**	**11340**	**12240**
TOP SASH P10123	SASH WIDTH (mm)	234	384	484	584	684	784	884	984	1084	1184	1284	1384	1484
	VENT LENGTH (mm)	84	234	334	434	534	634	734	834	934	1034	1134	1234	1334
	AIR SPACE (mm2)	**756**	**2106**	**3006**	**3906**	**4806**	**5706**	**6606**	**7506**	**8406**	**9306**	**10206**	**11106**	**12006**
BOTTOM SASH P10123	SASH WIDTH (mm)	260	410	510	610	710	810	910	1010	1110	1210	1310	1410	1510
	VENT LENGTH (mm)	110	260	360	460	560	660	760	860	960	1060	1160	1260	1360
	AIR SPACE (mm2)	**990**	**2340**	**3240**	**4140**	**5040**	**5940**	**6840**	**7740**	**8640**	**9540**	**10440**	**11340**	**12240**

* OUTERFRAME WIDTHS OF LESS THAN 500mm WILL HAVE FIXED / NON SLIDING SASHES

VENTILATION USING CALDWELL UK214 TWO STAGE KEEP

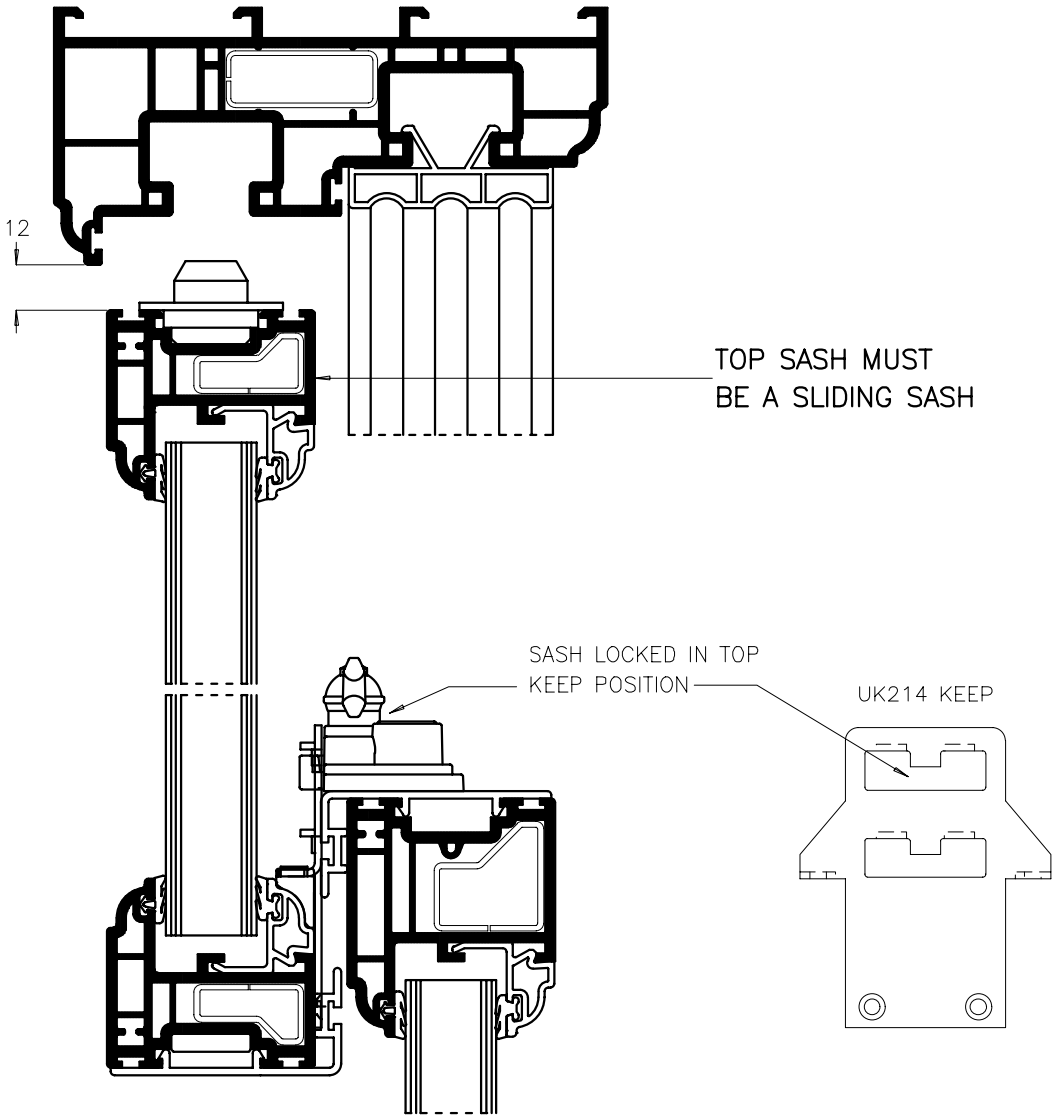


TABLE SHOWING FREE AIR SPACE FOR VENTILATION USING CALDWELL UK214 TWO STAGE KEEP

OUTERFRAME WIDTH (mm)	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
CLEAR OPENING WIDTH (mm)	364	464	564	664	764	864	964	1064	1164	1264	1364	1464
AIR SPACE (mm2)	**4368**	**5568**	**6768**	**7968**	**9168**	**10368**	**11568**	**12768**	**13968**	**15168**	**16368**	**17568**

PLEASE NOTE. ANY FRAME LEFT IN THIS VENTILATION POSITION MUST BE REGARDED AS AN 'OPEN WINDOW', AND THEREFORE UNSECURE.

9.10 SURVEY AND INSTALLATION GUIDELINES

INTRODUCTION

Survey guidelines have been based on manufacturing and installation knowledge of PVC-U windows and door-sets and the British Plastics Federation 'Code of Practices'. Due to the variety of installation conditions and building details found in the UK, it is not possible to cover all applications. The recommendations in this document shall be regarded as a guide to good building practices to ensure satisfactory installation of PVC-U windows and door-sets.

SURVEYORS ROLE

Define the sales promise and the customer's requirement into product fit for the purpose and application. To provide concise information to allow the manufacturing and installation process to be undertaken efficiently.

- To recommend and agree with the customer any design alterations.
- To obtain from the customer confirmation of any details where the customer can exercise choice.
- To verify contractual issues with the customer.
- To ensure product designs will conform to statutory requirements
- Prepare a schedule of all consumable material.

PRELIMINARY CHECKS

The Surveyor is responsible for ensuring the customer's property is structurally sound for the installation to be successfully undertaken.

Preliminary checks: -

- Establish the suitability of the structural opening
- Presence of structural supports,
- Condition of DPC
- Cracks, Damp

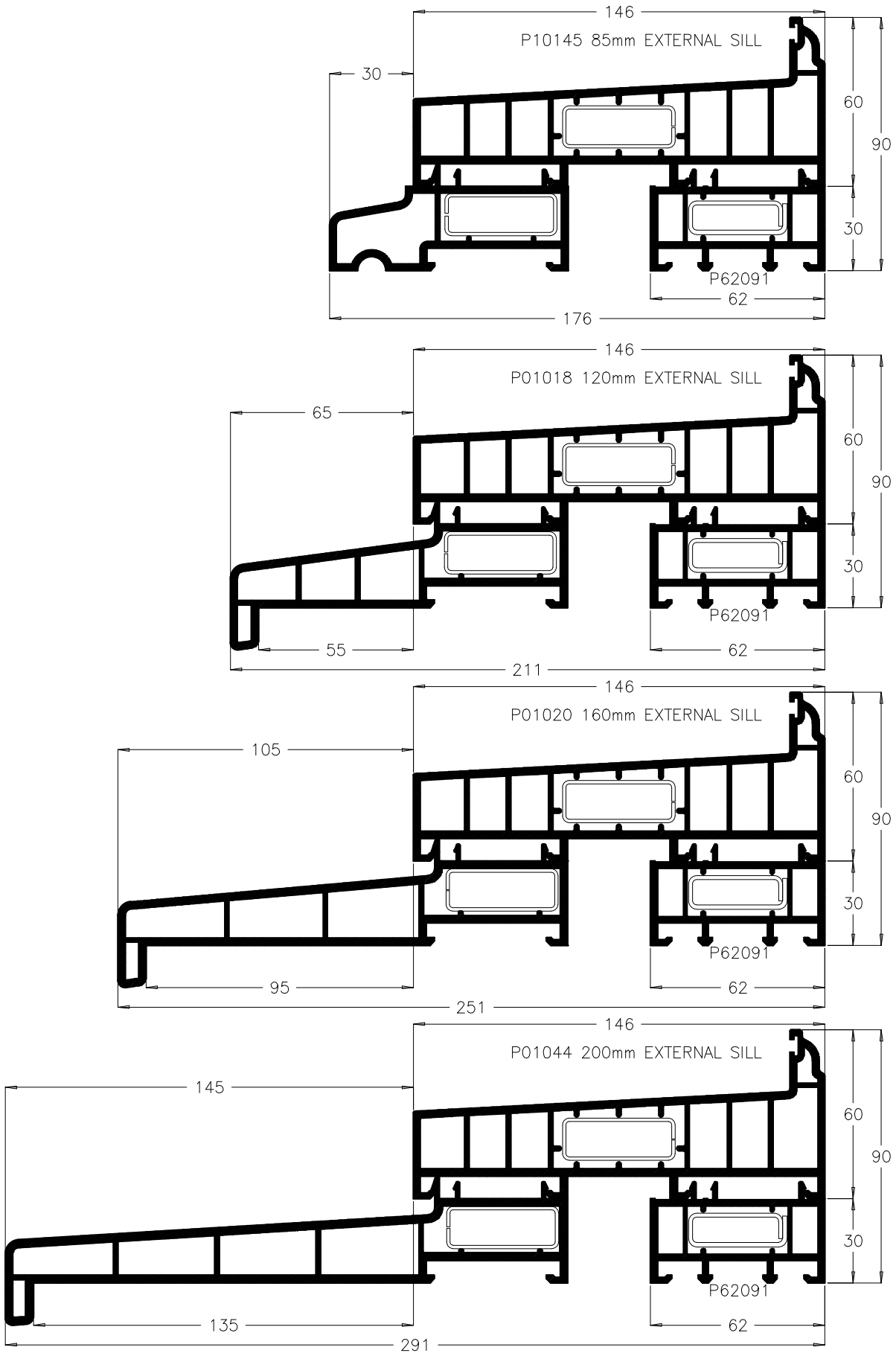
Establish and record any damage to existing fitments and fitting, including: -

- Ceramic tiles, Sanitary ware
- Roof or cladding material
- Work tops
- Fitted units
- Record the presence of any obstruction and agree an appropriate course of action with the customer: -
- Satellite dishes
- Telephone wires
- Ariel's or satellite dishes

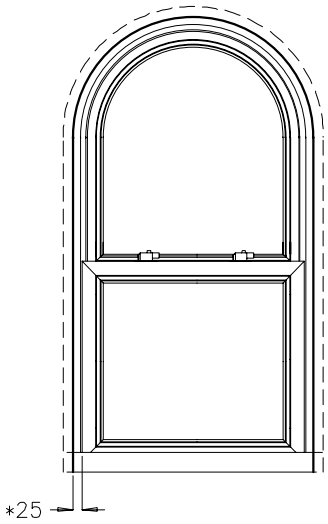
Undertake a risk assessment of the proposed installation: -

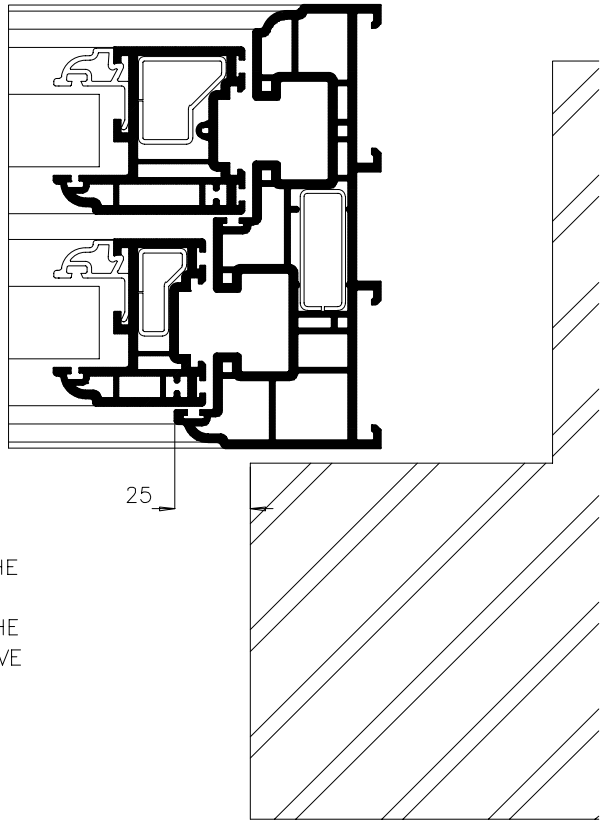
- Access equipment
- Asbestos
- Customer and property protection
- Consider the building detail and recommend appropriate installation instructions.

EXTERNAL SILL PROJECTION DETAILS



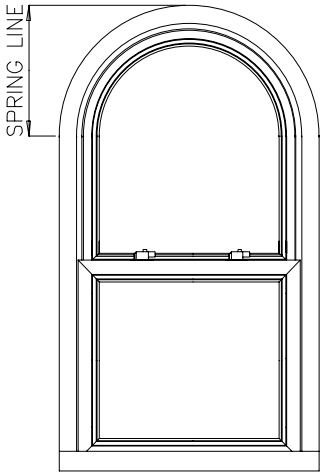
METHOD OF MEASURING ARCHED OR SEMI–ARCHED
VERTICAL SLIDING SASHES
MAXIMUM AND MINIMUM SIZES BASED ON 24mm (4/16/4) GLAZING
AND STEEL REINFORCED SASHES – NOTE MAXIMUM SASH WEIGHT MUST NOT EXCEED 40Kg (80lb)
PLEASE NOTE THAT THE TOP SASH ON THESE STYLES IS NON SLIDING



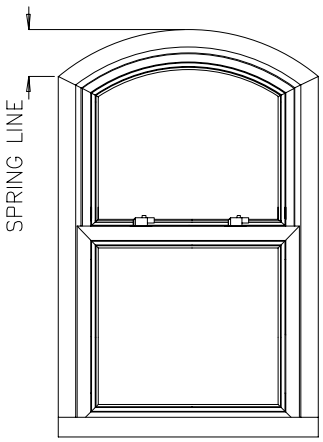


* PLEASE NOTE
THE MARGIN OF FRAME BEHIND THE BRICKWORK MUST BE MAINTAINED AT THE HEAD AND ALL AROUND THE JAMBS AS SHOWN HERE AND ABOVE

FULL ARCHED HEAD

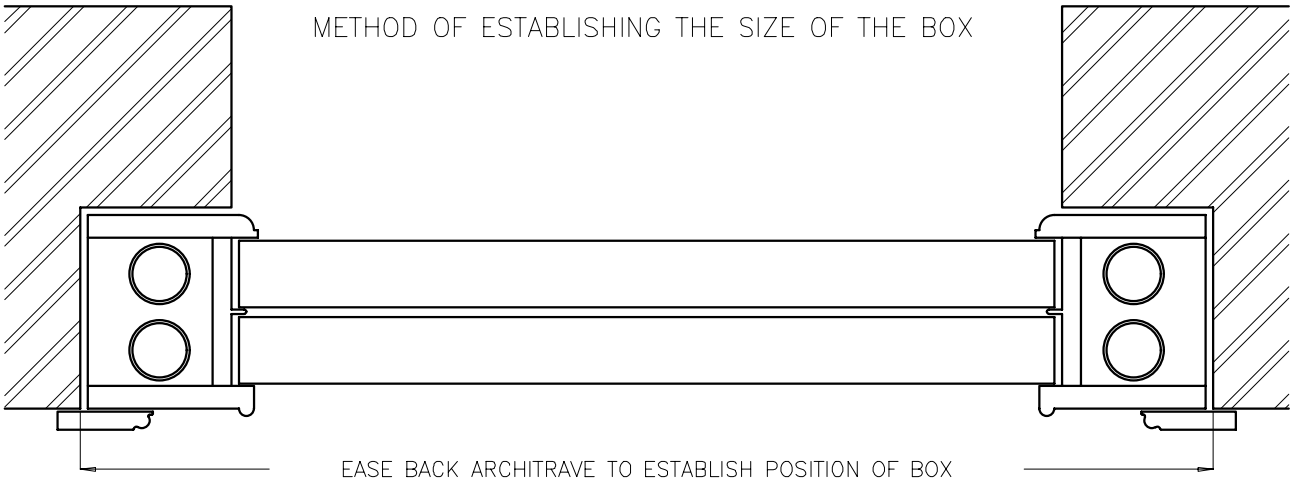


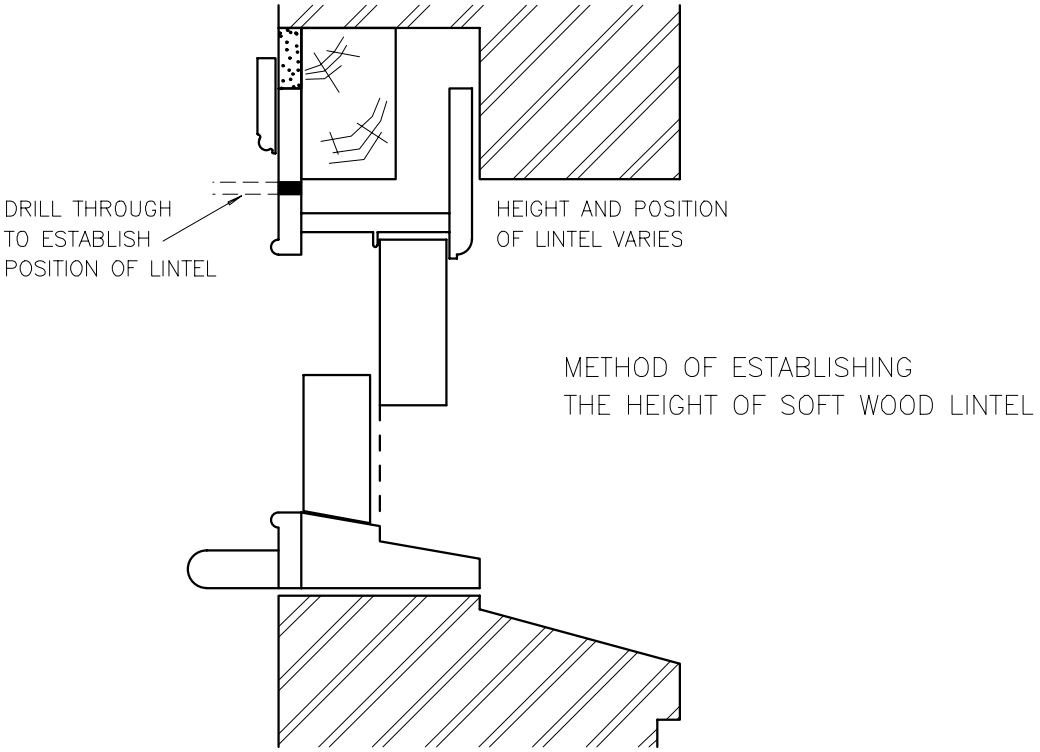
SEMI–ARCHED HEAD

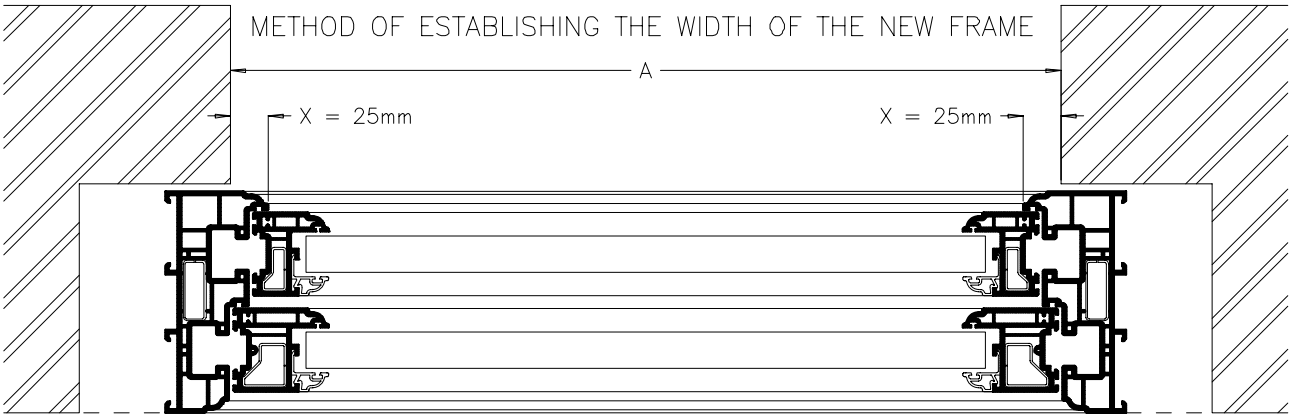


FOR SIZES FOR THESE WINDOW STYLES PLEASE REFER TO
THE VERTICAL SLIDER TECHNICAL MANUAL CHAPTER PAGE 9.5.02

METHOD OF ESTABLISHING EXISTING FRAME HEIGHT AND WIDTH AND NEW FRAME WIDTH







VERTICAL SLIDER OUTERFRAME WIDTH = A + 86mm OR A – (25+25) + (68+68) = WIDTH

NOTE: CHECK POCKET SIZE TO CONFIRM WIDTH OF FRAME

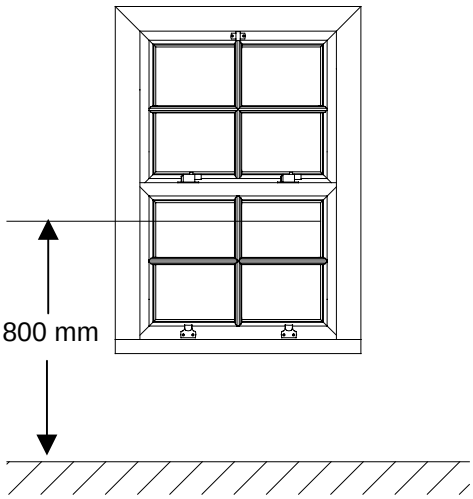
APPROVED DOCUMENT L (Scotland J): CONSERVATION OF FUEL & POWER

Changes to the Government Building Regulations (Part L in England and Wales and Parts A&J in Scotland) aim to improve the thermal efficiency of buildings, and set out mandatory requirements for any replacement windows and doors in new structures.

The new standards are based on the thermal performance of the whole window (glass and frame). To meet the Building Regulations, every window fitted in domestic and commercial building will need to use low E-glass (low emissivity glass).

APPROVED DOCUMENT N: GLAZING - MATERIALS AND PEROTECTION

Glazing used in the vicinity of the floor and in or near door sets will usually require safety glazing, toughened or laminated, complying with the requirements of BS 6206.



Critical locations

- Critical locations as described in the building regulations Document N are as follows
- Between finish floor level and 800mm above that level in internal and external walls and partitions
- Between finish floor level and 1500mm above that level in a door or in a side panel close to either edge of the door.
- Critical Locations are further extended in BS 6262 glazing for building to cover bathing areas:
- Any glazing located adjacent to a bath or shower area shall constitute a potential danger due to the possibility of a person slipping on a wet surface.

BUILDING REGULATIONS

It is good practice to ensure that replacement windows are manufactured and installed in compliance with the current Building Regulations. The most relevant to windows and door sets are listed below.

NOTE: It may not be possible to comply with the latest Building Regulations due to restrictions within the existing building envelope. But special care should be taken to ensure that the design of the replacement frame (s) does not worsen the situation.

APPROVED DOCUMENT B (Scotland E): FIRE SAFETY

If a window is intended as part of an escape route in case of fire, it needs to provide a minimum unobstructed opening of: -

- Minimum of 450mm high
- Minimum of 450mm wide
- Open able area of 0.33sq metres
- Bottom of the open able area not higher than 1100mm above the floor
- With non lockable cam catches
- Without opening restrictors – consultation should be sought with the local Building control officer

APPROVED DOCUMENT E (Scotland H): RESISTANCE TO THE PASSGAE OF SOUND

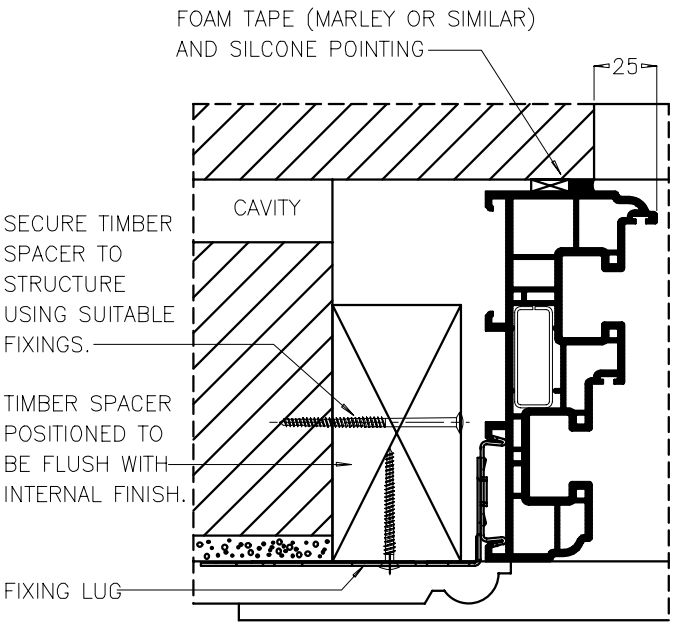
Good sealing between the window and door set and the building fabric is critical to the achievement of the desired acoustic insulation. The presence of the smallest gap can impair the effectiveness of the best acoustic window or door set.

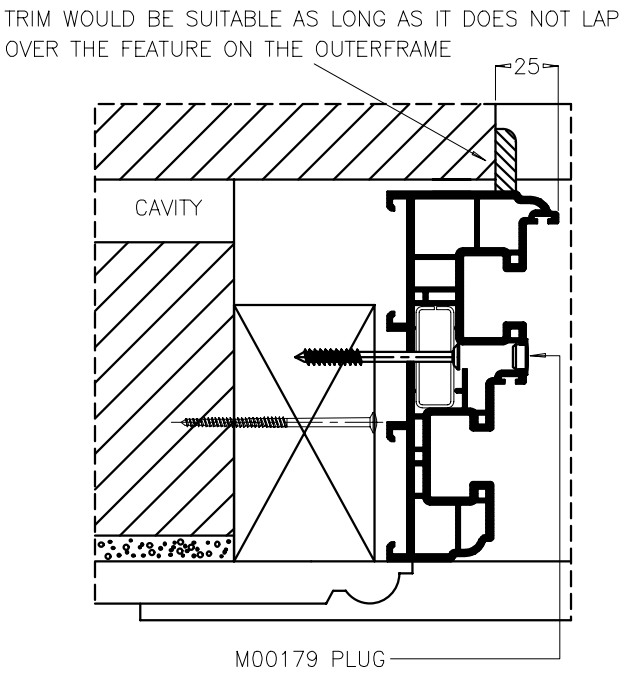
APPROVED DOCUMENT F (Scotland K): VENTILATION

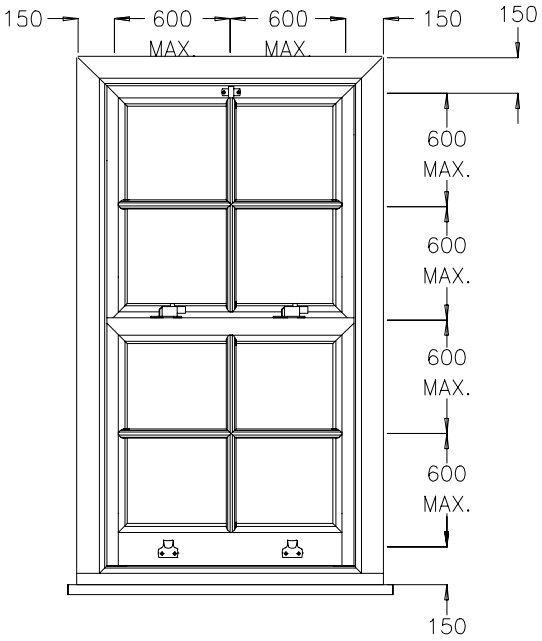
Building regulations require the provision of background ventilation A trickle ventilator built into or added to the window usually provides this. The required area of ventilation depends on the size of the room and its intended use, see table for general guidelines. **Note:** The presence of an open flue gas-burning appliance may require special provision of ventilation. Commercially available 'Gas Board ventilators' fitted to the frames will contradict other requirements of the Building Regulations i.e. Conservation of Fuel & Power and Resistance to the passage of Sound. It is therefore necessary to seek expert advice.

Room	**Rapid Ventilation**	**Background Ventilation**	**Extract ventilation Fan rates or PSV**
Habitable room	1/20th of floor area	8000sqmm	
Kitchen	Opening window No minimum size	4000sqmm	30 litres/second adjacent to a hob or 60 litres/second elsewhere or PSV
Utility room	Opening window No minimum size	4000sqmm	30 litres/second or PSV
Bathroom	Opening window No minimum size	4000sqmm	15 litres/second or PSV
Sanitary accommodation	1/20th of floor area or mechanical extract at 6 litres/second	4000sqmm	

VERTICAL SLIDER FITTING







POSITIONS FOR FIXINGS

FOAM FIXING SHOULD ONLY BE USED AS AN 'ASSIST' OR AS A VOID FILLER. IT MUST NOT BE USED AS AN ALTERNATIVE TO MECHANICAL FIXINGS. AFTER APPLICATION IT MUST BE CHECKED THAT THERE HAS BEEN NO FRAME DISTORTION, IE THAT THE GAPS BETWEEN THE SASH AND OUTERFRAME ARE UNIFORM.

WHEN FITTING THE FRAME IT IS TO BE ENSURED THAT THE SILL IS FITTED FLAT AND THAT IT IS NOT SUBJECT TO ANY DISTORTION OR BOWING. THE SILL MUST BE BEDDED FLAT SO AS TO ENSURE THERE IS NO AIR PENETRATION AT THE BASE.