



THE SASH
WINDOW
WORKSHOP

SLIDING SASH WINDOWS - TECHNICAL GUIDE



HISTORY OF THE SASH WINDOW

The development of the sash window is sometimes credited, without conclusive evidence, to the inventor, architect and philosopher Robert Hooke (1635-1703). Some of the oldest surviving examples of sash windows are thought to be those in Ham House which were installed 1670s. They can also be found in Chatsworth and the Banqueting House in Whitehall, designed by Inigo Jones in 1685.

The popularity of the sliding sash window grew during the late 18th and 19th Centuries, as the design not only allowed great flexibility in size and pattern but also provided excellent ventilation because the opening of the window can be finely adjusted down to a narrow gap at the top or the bottom (or both) with little danger of rain blowing into the room. Opening both the top and bottom of a sash window by equal amounts allows warm air at the top of the room to escape thus drawing relatively cool air from outside into the room from outside.

The main reason why so many original sash windows still survive in period properties is because of the stability of the design. The sash, being hung from each of its top corners, rather than from the side as with a hinged window, is less likely to distort under its own weight and less distortion means longer life. The wooden structure of the sash can be built with thin sections, giving more light and a more delicate appearance, harmonising with the classical style and so becoming the principal feature of the graceful and elegant buildings of the Georgian period.

Early sash windows were generally small with multiple panes, the classic arrangements being six or eight panes in each of the top and bottom sashes. However, as glass technology improved and pane size increased, there was less of a need to divide up the window using timber glazing bars and by the early 20th century sash windows could be made with single very large panes.

In order for the windows to slide smoothly, the weight of the glazed panel is finely balanced by a heavy cast iron counter-weight concealed within the window frame (box). The sash weight is connected to the window by a sash cord or chain that runs over a pulley at the top of the frame. Early sash windows often had fixed top sashes with lower sashes hung on weights over wooden pulleys. As technology improved, metal pulley wheels and heavier weights came available, allowing for bigger heavier windows to be made and both sashes to be moveable.

Nowadays many sash windows are balanced on spring (spiral) balances, which remove the need for a hollow frame with weights and cords. However these tensioned springs have limitations and tend not to be so durable. A tensioned, lubricated spring balance will probably have a service life of 10 – 15 years whereas the correctly built traditional sash window with weights can continue to function for decades.

There are variations on the standard vertical sliding sash window including the Yorkshire Sash, which slides horizontally, and the Venetian sash where the frames are divided by mullions into three or more openings and the centre pair of sashes is hung and the outer ones fixed with the cords for hanging the centre pair taken through the top of the mullions into the box frame on the side.



THE SASH WINDOW WORKSHOP – SASH WINDOWS

Our sash windows have been designed to meet the discerning needs of the owners of period properties and for those who want windows with charm and warmth and an authentic feel. They are also made to be the best windows available.

We try very hard to replicate as closely as possible the proportions and designs of historic sash windows, whilst incorporating the latest manufacturing techniques. The materials we use enable us to produce windows to the highest specifications, thereby giving the best possible performance, combining minimum maintenance with maximum lifespan. We are frequently early adopters of new technology, materials and methods.

We would not for example expect to make our windows in any timber with a classification less than “durable” as we do not believe this appropriate for the British climate. We expect our windows to have a minimum service life of 60 years if properly maintained.

We control all the processes in the manufacture and installation of our windows in house.

We comply to the following:

- European Manufacturing Standard EN 14351
- European Glazing Standard EN 1279
- Our new products are UKCA marked
- FSC certification for 98% of the timber that we use

We make the following types of sash window:

TYPE	APPLICATION
Traditional weight hung sash windows	For windows designed to go into brick reveals or those properties with exposed traditional boxes*
Spiral hung sash windows	For windows designed to go into flush openings*
Traditional or Spiral bay windows	Multiple aspect bay windows, Venetian style windows
Specialist sash windows	Bowed windows / arched windows and windows of different shapes or patterns in either traditional or spiral configuration

* See technical drawings of traditional or flush reveal

Most of our windows are made to standard details, which incorporate a large degree of design flexibility for our clients, however if specialist, or even unique, detail is required then this presents no issue for us.

Our aim is to produce the very best windows for our clients, meeting the highest aesthetic and technical standards.

Installation

Sash windows are available on a supply only basis or, for properties in London and Southern England, can be installed by The Sash Window Workshop’s experienced installation staff.

SPECIFICATIONS FOR SASH WINDOWS

Timber Specifications

TRADITIONAL HUNG BOX SASH WINDOW	
Box frame up to 2000mm in height or width	Accoya / Tricoya
Box frame over 2000mm in height or width	Accoya
Cill section	Accoya
Sashes	Accoya
Glazing Beads and bonded glazing bars	Accoya
Parting bead	Accoya
Internal staff bead / liners / architrave	Tulipwood

SPIRAL HUNG SASH WINDOW	
Frame	Accoya
Cill section	Accoya
Sashes	Accoya
Glazing Beads and bonded glazing bars	Accoya
Parting bead	Accoya
Internal staff bead / liners / architrave	Tulipwood

	HERITAGE BSW SINGLE GLAZED WINDOW - NON DOC L	HERITAGE BSW DOUBLE GLAZED WINDOW - NON DOC L	CLASSIC BSW/ SSW WINDOW - DOC L	CONTEMPORARY BSW/SSW WINDOW - DOC L
MINIMUM FRAME DEPTH	127mm	127mm	158mm	158mm
MINIMUM CILL HEIGHT	67mm	67mm	67mm	67mm
CILL EXTENTIONS	Variable and will increase Cill Height	Variable and will increase Cill Height	Variable and will increase Cill Height	Variable and will increase Cill Height
SPIRAL FRAME	35mm	35mm	35mm	35mm
BOX FRAME PULLEY STILE AND HEAD	20mm Accoya	20mm Accoya	20mm Accoya / 18mm Tricoya (as specified)	20mm Accoya / 18mm Tricoya (as specified)

	HERITAGE BSW SINGLE GLAZED WINDOW - NON DOC L	HERITAGE BSW DOUBLE GLAZED WINDOW - NON DOC L	CLASSIC BSW/ SSW WINDOW - DOC L	CONTEMPORARY BSW/SSW WINDOW - DOC L
BOX FRAME LININGS	15 x 97mm Accoya / Tricoya	15 x 97mm Accoya / Tricoya	15 x 97mm Accoya / Tricoya	15 x 97mm Accoya / Tricoya
SASH THICKNESS	36mm*	36mm*	52mm	52mm
STILE/TOP RAIL	55mm*	55mm*	55mm	55mm
MEETING RAIL	36mm*	36mm*	40mm	40mm
BOTTOM RAIL	80mm (internal)*	80mm (internal)*	95mm (internal)*	95mm (internal)
STAFF BEAD	Standard Staff / Special (POA)	Standard Staff / Special (POA)	Standard Staff	Standard Staff
PAS 24 OPTION	No	No	Yes	Yes
16mm BAR WIDTH	✓		✓	
20mm BAR WIDTH	✓		✓	
24mm BAR WIDTH	✓	✓	✓	✓
30mm BAR WIDTH	✓	✓	✓	
35mm BAR WIDTH	✓	✓	✓	
SASH PROFILE	Ovolo / Lambs Tongue**	Ovolo / Lambs Tongue**	Ovolo / Lambs Tongue**	Ovolo
GLAZING CAVITY	Argon	Argon	14mm Argon	16mm Argon
GLAZING MAXIMUM UNIT THICKNESS	4/6/6.8mm (Heritage)	8.8mm	4/14/8.8mm	4/16/8.8
INTEGRAL SPACER	Individual panes	Individual panes	Back to Back Spacer / With Gas Gaps	Solid Proprietary Bars
SPACER COLOUR	White/Black	White/Black	White/Grey/Black	White/Black
STAFF BEAD	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48

	HERITAGE BSW SINGLE GLAZED WINDOW - NON DOC L	HERITAGE BSW DOUBLE GLAZED WINDOW - NON DOC L	CLASSIC BSW/ SSW WINDOW - DOC L	CONTEMPORARY BSW/SSW WINDOW - DOC L
HEAD BEAD	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48
BOTTOM RAIL	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48
MID RAIL	2- Aquamac 48	2- Aquamac 48	2- Aquamac 48	2- Aquamac 48
TOP RAIL TOP SASH	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48	1 - Aquamac 48
STILES	2 - Aquamac 48	2 - Aquamac 48	2 - Aquamac 48	2 - Aquamac 48
VENTILATOR	Concealed in frame head. As required.	Concealed in frame head. As required.	Concealed in frame head. As required.	Recessed or Surfaced Mounted. As required.

**Various dimensions available.*

*** Special sash profiles available on request.*

Window horn details

	STANDARD	OPTIONS AT AN EXTRA COST
Top sash	No horn, 90mm Victorian horn or 70mm short Victorian	Bespoke horn detailing. Not available for contemporary BSW / SSW window.
Bottom sash	No horn, 90mm Victorian horn or 70mm short Victorian	Bespoke horn detailing. Not available for contemporary BSW / SSW window.

Paint finish

STANDARD	OPTIONS AT AN EXTRA COST
3 coats of factory applied Sigma white semi gloss paint, 2 x prime base coats, 1 x top coat	Bespoke paint finish. No high gloss options provided.

We do not offer primed only or unpainted windows.

Ironmongery

WINDOW TYPE	IRONMONGERY	HUNG WITH
Traditional sash window	4 x pulley wheels 1 x fitch catch, 2 x sash lifts, 1 x rola lock set	4 x steel or lead weights, white prestretched cord
Spiral sash window	1 x fitch catch, 2 x sash lifts, 1 x rola lock set	4 x white pre-tensioned balances

A full range of sash window ironmongery is available at extra cost.

TSWW SASH WINDOW PERFORMANCE

Thermal efficiency

All of our double glazed windows are designed to meet Document L requirements and optimise aesthetic with thermal efficiency; we use the very best materials available to achieve this.

Our windows can also meet the highest Window Energy Ratings, if that is what is required.

The following independent Buildcheck U-Value calculation documents are available on our website:

<https://www.sashwindow.com/energy-ratings/>

TSWW Classic Window Energy Ratings / U Values to meet DOC L - June 2023 Requirements

	Inner Pane	4mm Planitherm Total +					4mm Pilkington S1				
	Cavity	14mm Cavity / Argon					14mm Cavity / Argon				
	Outer Pane	4mm Low Iron					4mm Low Iron				
	Integral Bars	Super Spacer					Super Spacer				
	Sash Thickness	48mm sash and greater					48mm sash and greater				
	Frame	Test Reference	Energy Rating	U Value Rating	G Value	BFRC Cert No.	Test Reference	Energy Rating	U Value Rating	G Value	BFRC Cert No.
Accoya Spiral	152mm Frame	CU22076 -2/2	A +2	1.5	0.48	6188	CU22076 -2/1	D -22	1.4	0.34	6187
Accoya BSW	152mm Frame	CU22076 -8/2	A + 1	1.5	0.48	6193	CU22076 -8/3	D - 25	1.4	0.34	6192
Hybrid BSW	150mm Frame	CU22076 -3/2	B -3	1.6	0.48	6189	N/A	N/A	N/A	N/A	N/A
		DEFAULT OPTION - ON ALL TEMPLATES					PILKINGTON S1 AS STD				

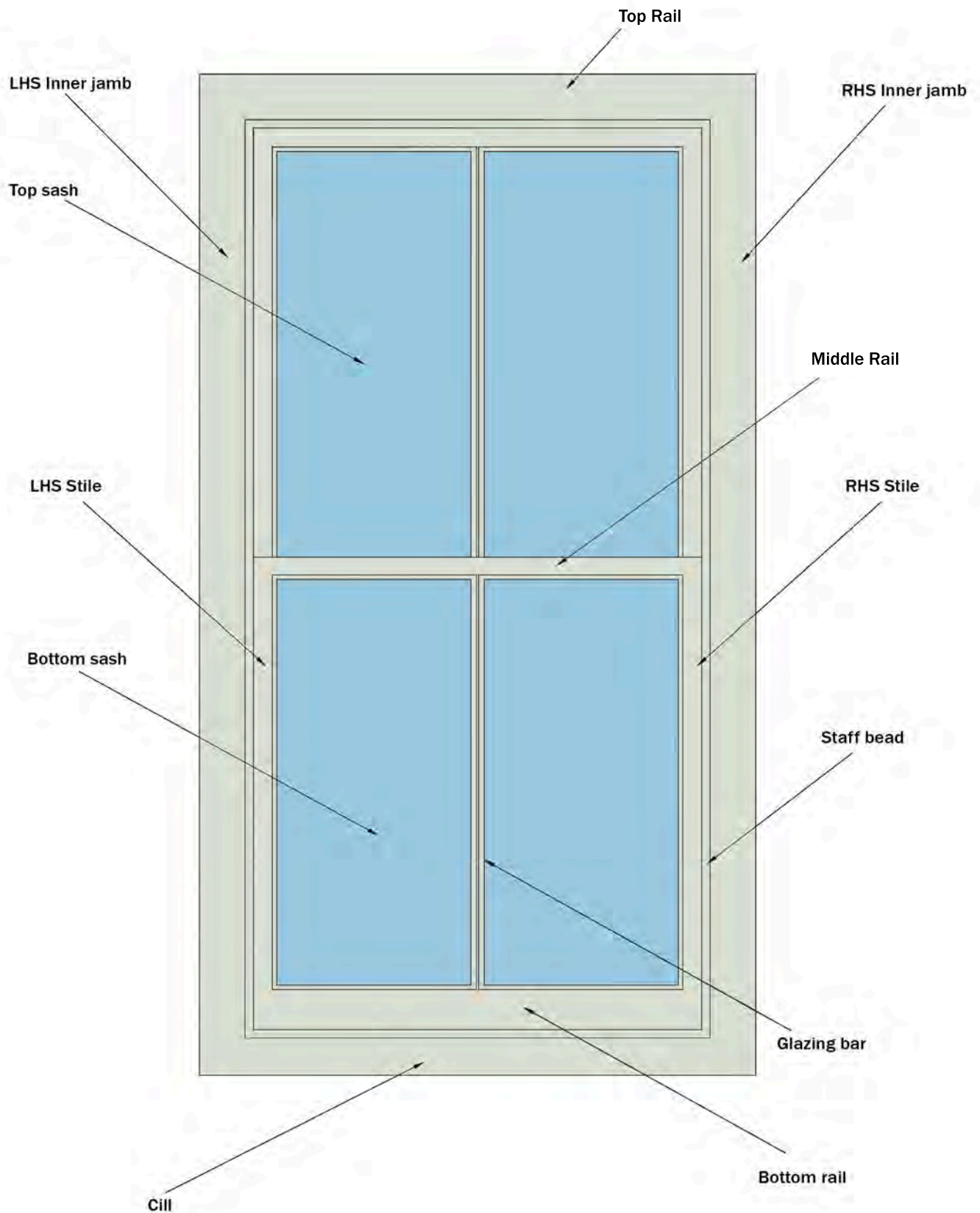
TSWW Contemporary Window Energy Ratings / U Values to meet DOC L - June 2023 Requirements

	Inner Pane	4mm Planitherm Total +					4mm Pilkington S1				
	Cavity	16mm Cavity / Argon					16mm Cavity / Argon				
	Outer Pane	4mm Low Iron					4mm Low Iron				
	Integral Bars	Truplas SDL					Truplas SDL				
	Frame	Test Reference	Energy Rating	U Value Rating	G Value	BFRC Cert No.	Test Reference	Energy Rating	U Value Rating	G Value	BFRC Cert No.
Accoya BSW & SSW Sliding Sash - 52mm Thick	160mm Frame	3-001-14	A + 2	1.4	0.46	6212	3 -001-13	C -20	1.3	0.34	6211
		DEFAULT OPTION - ON ALL TEMPLATES					PILKINGTON S1 AS STD				

TRADITIONAL SASH WINDOW - PARTS OF THE WINDOW INTERNAL VIEW



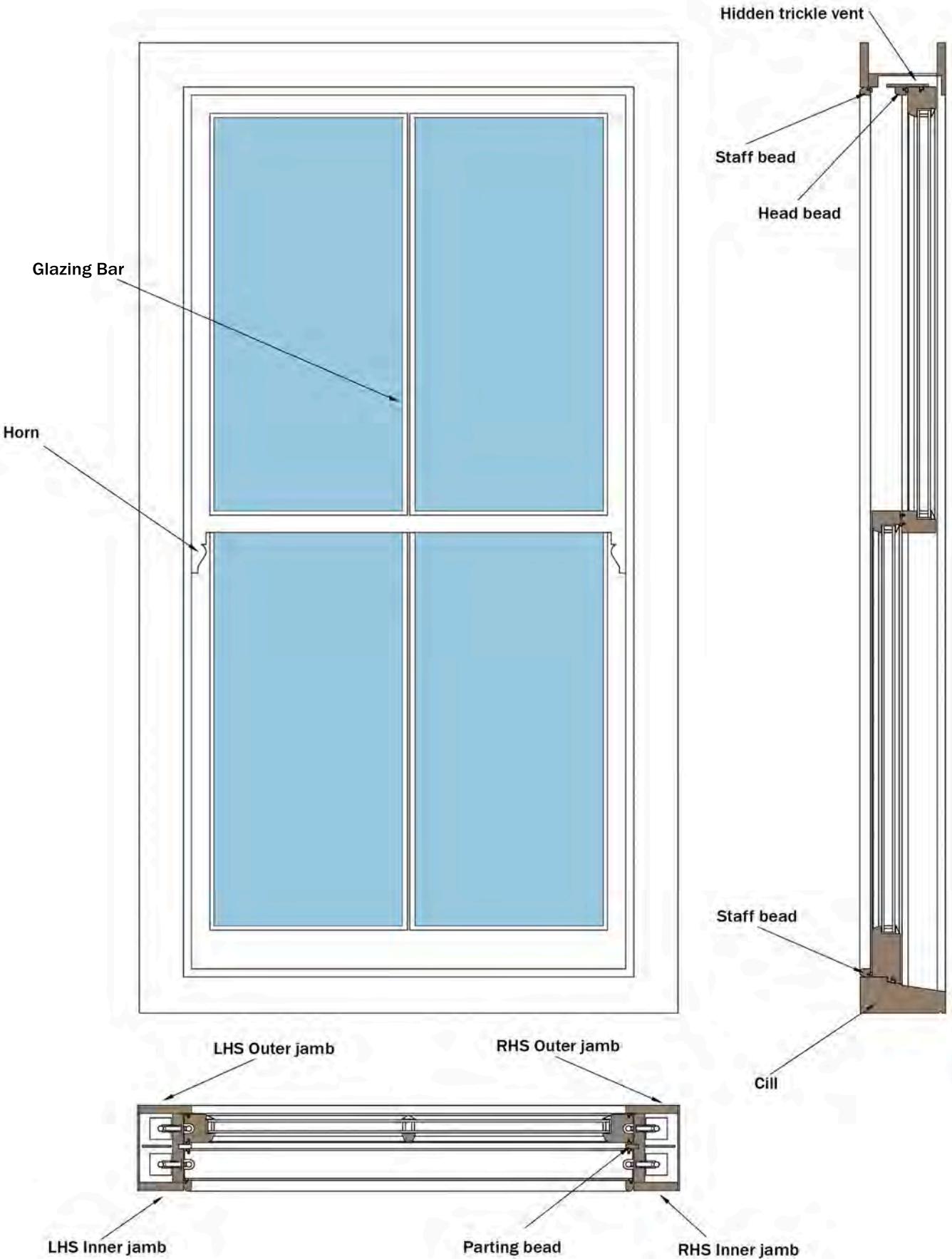
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TRADITIONAL SASH WINDOW - PARTS OF THE WINDOW
EXTERNAL VIEW



THE SASH
WINDOW
WORKSHOP



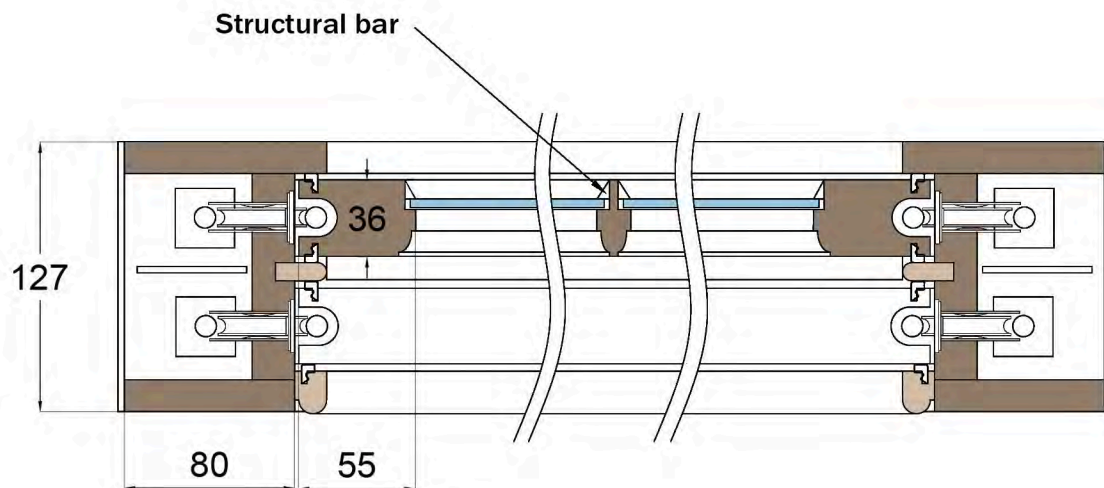
HERITAGE SINGLE GLAZED SASH WINDOW NON DOC L

Single glazed with structural bars

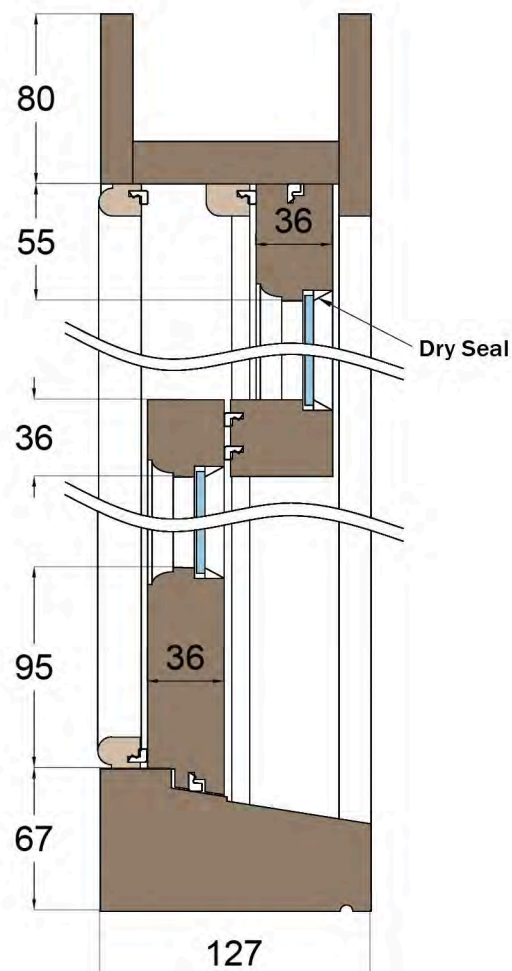


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SECTION THROUGH FRAME JAMB & SASH STILES



SECTION THROUGH FRAME HEAD, CILL AND MEETING RAIL



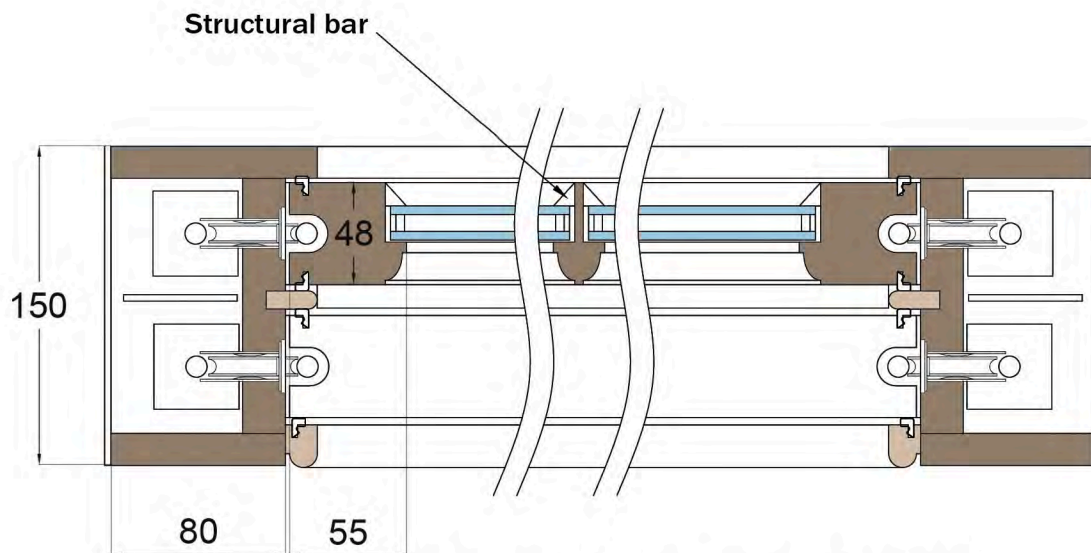
HERITAGE SASH WINDOW NON DOC L

Double glazed with structural bars

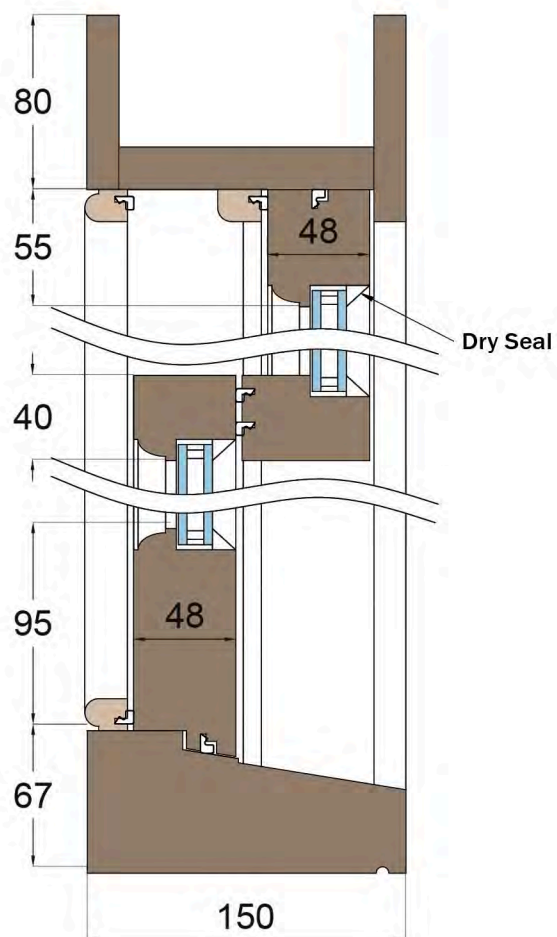


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SECTION THROUGH FRAME JAMB & SASH STILES



SECTION THROUGH FRAME HEAD, CILL AND MEETING RAIL

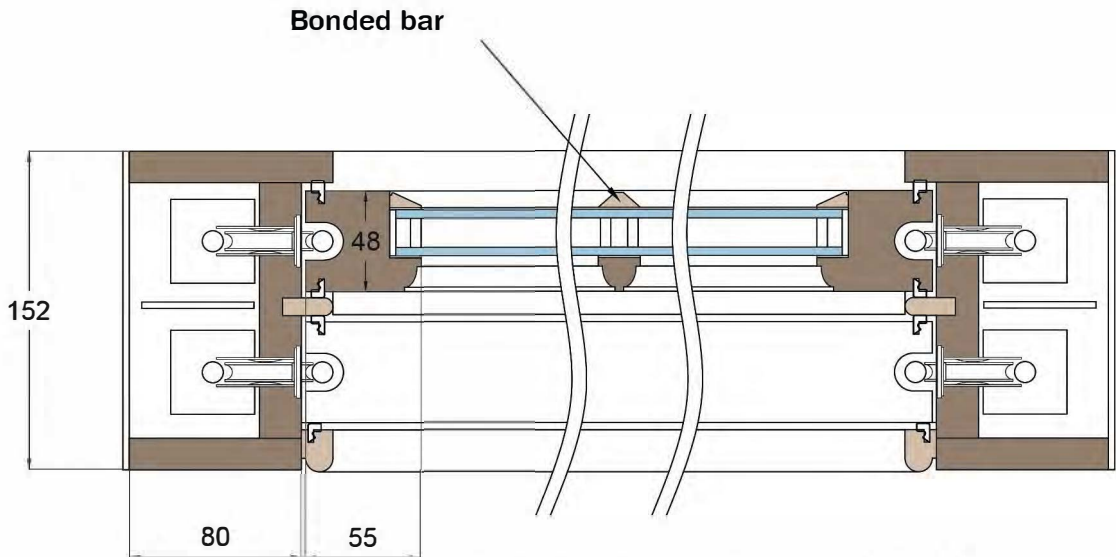


CLASSIC SASH WINDOW DOC L

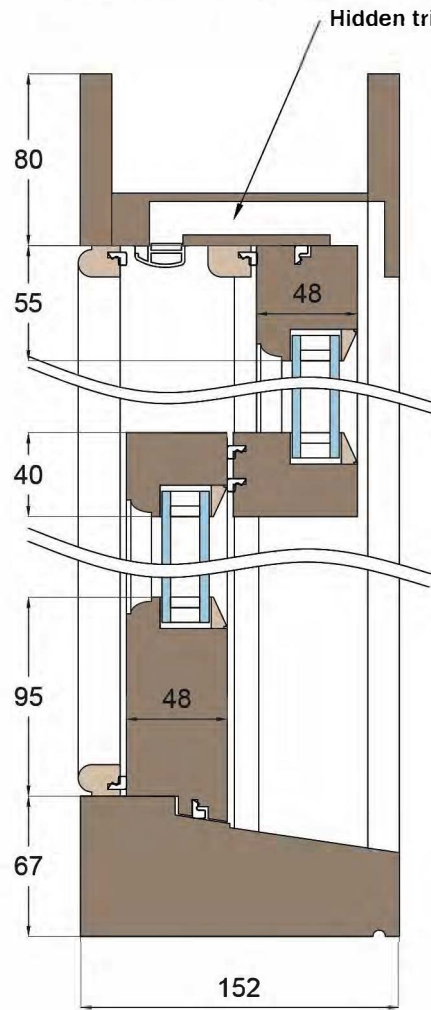
Double glazed with bonded bars



SECTION THROUGH FRAME JAMB & SASH STILES



SECTION THROUGH FRAME HEAD, CILL AND MEETING RAIL



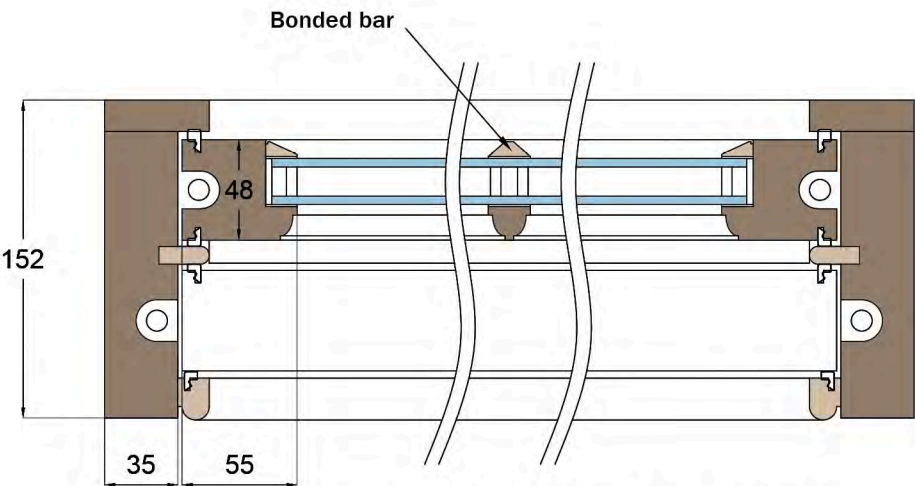
SPIRAL SASH WINDOW DOC L

Double glazed with bonded bars

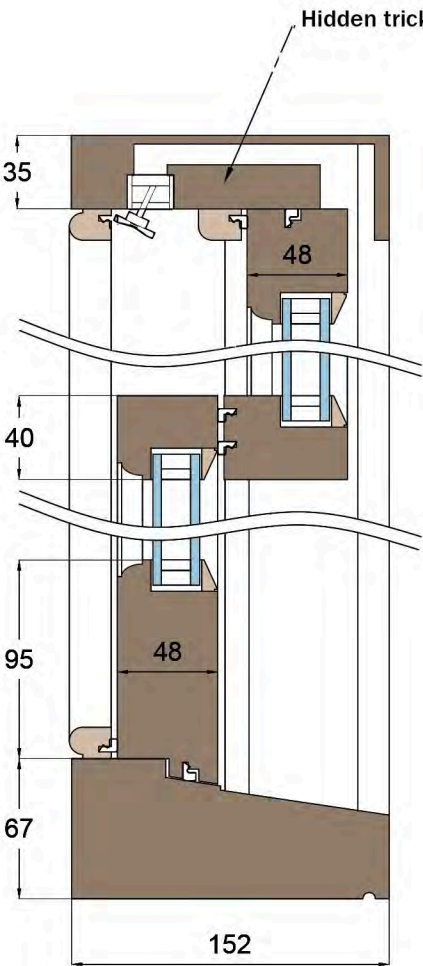


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SECTION THROUGH FRAME JAMB & SASH STILES



SECTION THROUGH FRAME HEAD, CILL AND MEETING RAIL

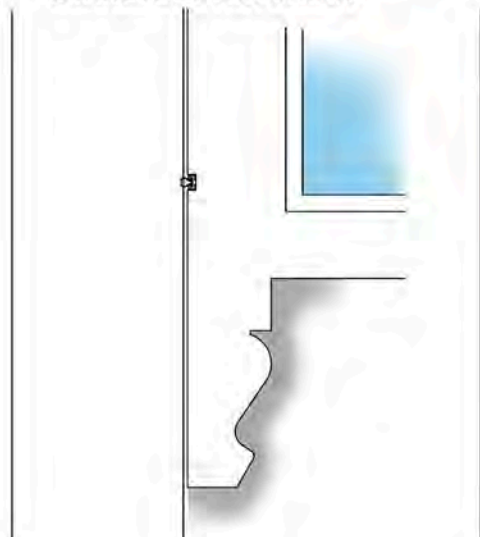


TYPICAL HORN OPTION FOR HERITAGE & CLASSIC BOX SASH WINDOW RANGE

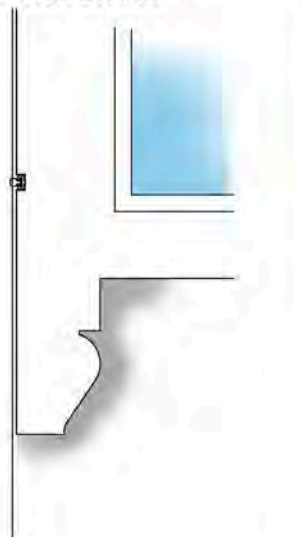


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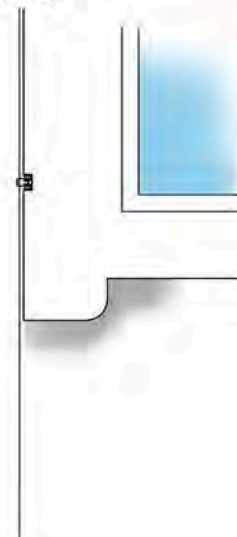
STANDARD VICTORIAN



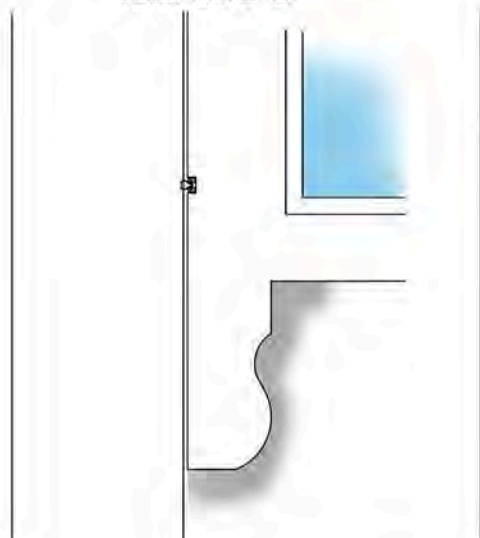
SHORT VICTORIAN



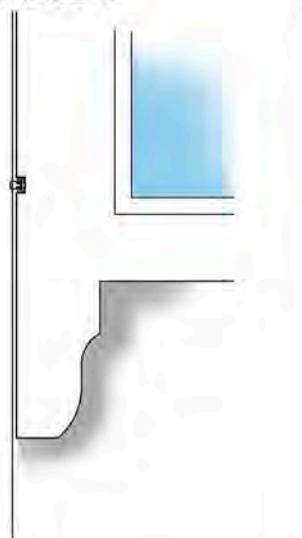
STUBB



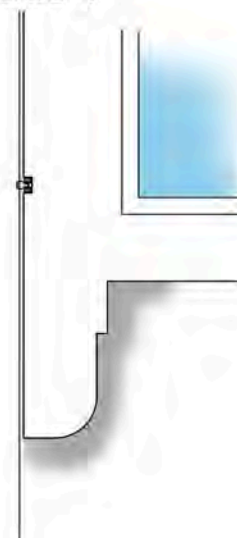
TEMPLATE 2



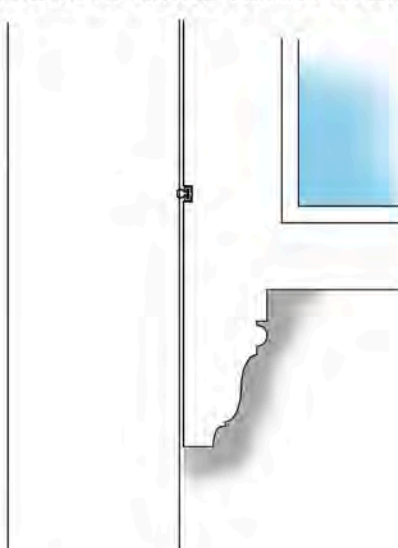
TEMPLATE 3



TEMPLATE 4



BESPOKE - CAN BE MADE TO ANY DESIGN



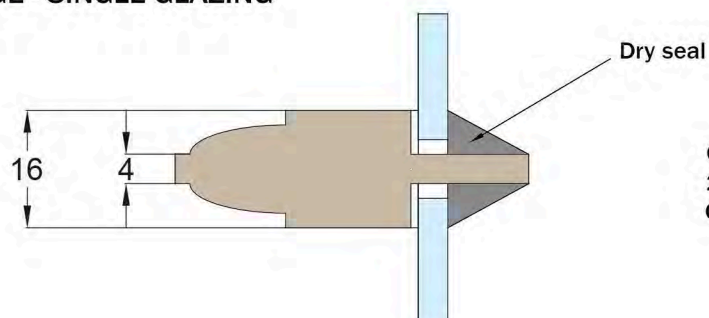
TYPICAL GLAZING BAR DETAILS

As per Box sash Windows



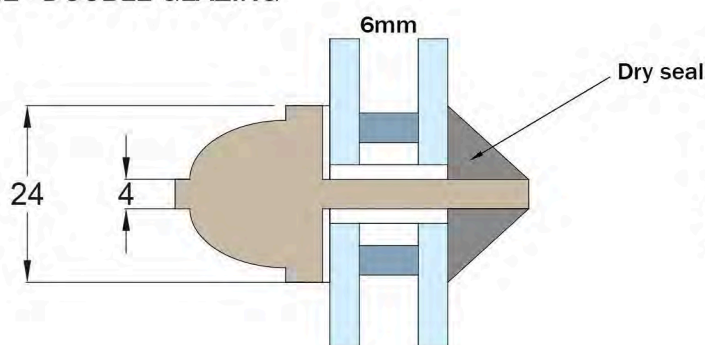
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HERITAGE - SINGLE GLAZING



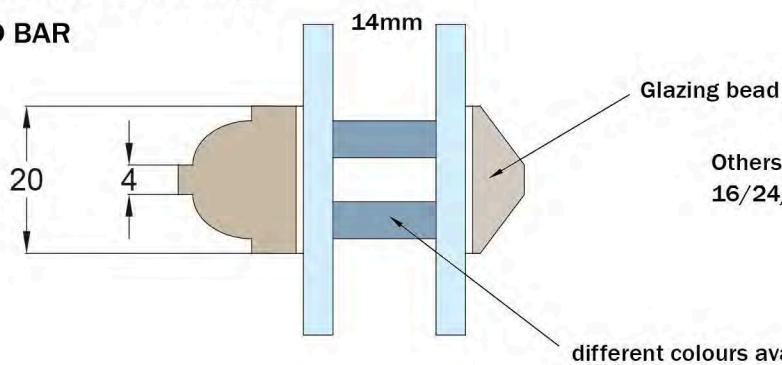
Others options:
20/24/30/35 Ovolo or lambs tongue
Glass up to 8.8mm thick

HERITAGE - DOUBLE GLAZING



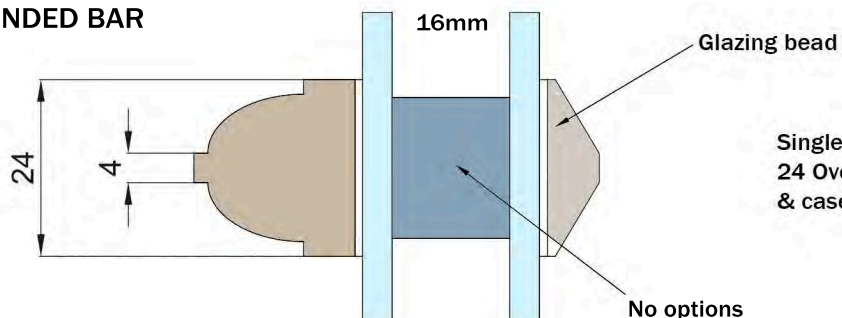
Others options:
4/8mm spacer
Black, Grey or White
30/35 Ovolo or lambs tongue

CLASSIC - DOUBLE GLAZING BONDED BAR



Others options:
16/24/30/35 Ovolo or lambs tongue

CONTEMPORARY - DOUBLE GLAZING BONDED BAR



Single option:
24 Ovolo contemporary range of sashes
& casements

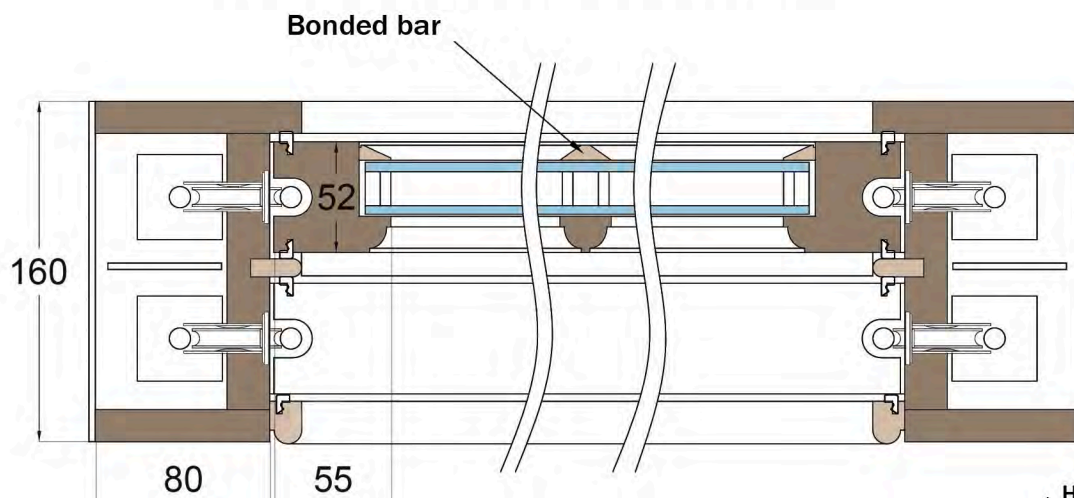
CONTEMPORARY SASH WINDOW DOC L

Double glazed with bonded bars

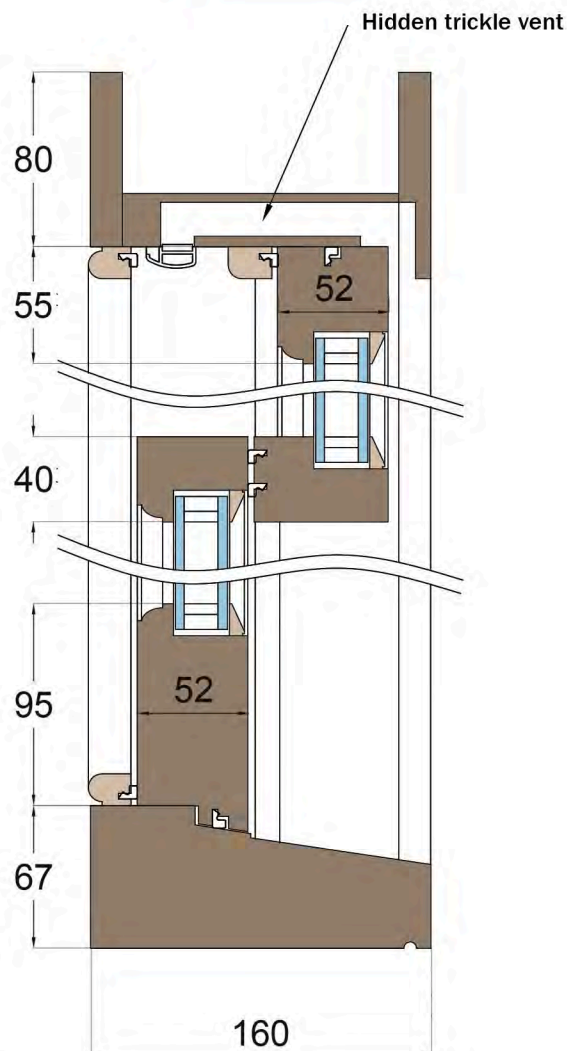


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SECTION THROUGH FRAME JAMB & SASH STILES

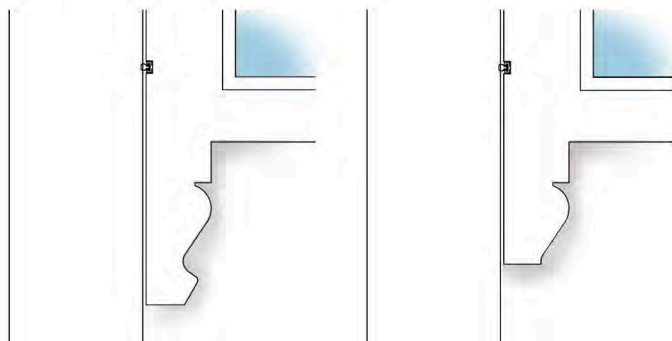


SECTION THROUGH FRAME HEAD, CILL AND MEETING RAIL

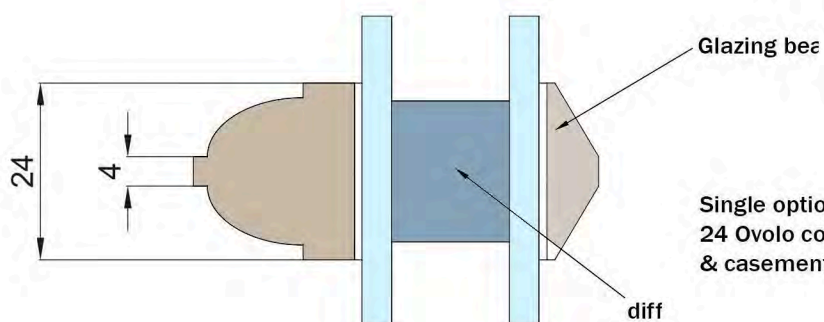


DETAIL OF HORN

STANDARD VICTORIAN & SHORT VICTORIAN



CONTEMPORARY - DOUBLE GLAZING
BONDED BAR



Single option:
24 Ovolo contemporary range of sashes
& casements

All spacer bars warm edge
Glass units gas filled with argon

ADDITIONAL DOCUMENTS

The following documents are available from the technical documents page on our website:

<https://www.sashwindow.com/technical-guides/>

- TSWW Supply and Install Warranty
- TSWW Supply Only Guarantee
- TSWW Window and Door Maintenance Guidelines
- Insurance backed guarantees and deposit protection