

THE SASH  
WINDOW  
WORKSHOP

## SLIDING SASH WINDOWS - TECHNICAL GUIDE





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## 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.





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## 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 CE marked
- FSC certification for 95% of the timber that we use

We make the following types of Sash Window:

TYPE	APPLICATION
<b>Traditional weight hung sash windows</b>	For windows designed to go into brick reveals or those properties with exposed traditional boxes*
<b>Spiral hung sash windows</b>	For windows designed to go into flush openings*
<b>Traditional or Spiral bay windows</b>	Multiple aspect bay windows, Venetian style windows
<b>Specialist sash windows</b>	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.



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## SPECIFICATIONS FOR SASH WINDOWS

### Timber Specifications

TRADITIONAL HUNG BOX SASH WINDOW	
<b>Box frame up to 2200mm in height or width</b>	Tricoya
<b>Box frame over 2200mm in height or width</b>	Accoya
<b>Cill section</b>	Durable hardwood
<b>Sashes</b>	Accoya
<b>Glazing Beads and bonded glazing bars</b>	Accoya
<b>Parting bead</b>	Accoya
<b>Internal staff bead</b>	European Redwood

SPIRAL HUNG SASH WINDOW	
<b>Frame</b>	Accoya / Tricoya
<b>Cill section</b>	Durable hardwood
<b>Sashes</b>	Accoya
<b>Glazing Beads and bonded glazing bars</b>	Accoya
<b>Parting bead</b>	Accoya
<b>Internal staff bead</b>	European Redwood

### Window horn details

	STANDARD	OPTIONS AT EXTRA COST
<b>Top sash</b>	No horn or 90mm Victorian horn or 70mm short Victorian	Bespoke horn detailing
<b>Bottom sash</b>	No horn or 90mm Victorian horn or 70mm short Victorian	Bespoke horn detailing

### Paint finish

STANDARD	OPTIONS AT EXTRA COST
3 coats of factory applied Sigma white semi gloss paint, 2 x primer base coats, 1 x top coat	Bespoke paint finish

\*No gloss application provided

### Weathersealing

Full weatherstripping integrated into the sashes frames and beading.



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## Glazing bar detail

Either heritage individually glazed panes or applied bars. The following glazing bar options are available at no extra charge:

BAR WIDTH	Ovolo Bonded	Ovolo Heritage	Lambs Tongue Bonded	Lambs Tongue Heritage
16mm	✓			
20mm	✓		✓	
24mm	✓	✓	✓	✓
30mm	✓		✓	

## Standard Glazing Specifications

	STANDARD DOCUMENT L WINDOW	HERITAGE DOUBLE GLAZED INDIVIDUAL PANES
Internal glass	4mm Planitherm Total +	4mm Planitherm Total +
Airspace	10mm	4mm
Gas	Argon**	Argon**
External glass	4mm low iron	4mm low iron
U value	Refer to energy ratings on Page 6	1.4
Max glass thickness	23mm	16mm
Spacer colour	white*	white*
Glazing Tape	white*	white internally
External finish	Single pane with bonded bar, intermediate bars as necessary	Individually glazed panes faced with Dry seal

\* Black glazing tape available on request \*\* Krypton Gas available for windows at extra charge

Toughened glass is supplied as required by law and a wide range of other glass types including acoustic laminates are available on request.

## Standard Ironmongery

WINDOW TYPE	IRONMONGERY**	STANDARD FINISHES	HUNG WITH
Traditional sash window	4 x pulley wheels 1 x fitch catch, 2 x sash lifts, 1 x rola lock set	Brass, satin chrome or brushed chrome	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	Brass, satin chrome or brushed chrome	4 x white pre - tensioned balances

\*\* A full range of sash window ironmongery and finishes available at extra cost

## Installation

Sash windows are available supply only or supply and fit by TSWW installation staff.



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## 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 from the Commercial section of our website:

[www.sashwindow.com/commercial/u-values](http://www.sashwindow.com/commercial/u-values)

- Accoya A Rated U14332-7 BFRC Report.pdf
- Accoya A Rated U14332-8 BFRC Report.pdf
- Accoya C Rated RU14332-2 BFRC Report.pdf
- Accoya Hybrid C Rated U14332-1 BFRC Report.pdf
- Box Sash (Q Lon) June 2010 W10176-2 BFRC Report.pdf

### **Noise reduction**

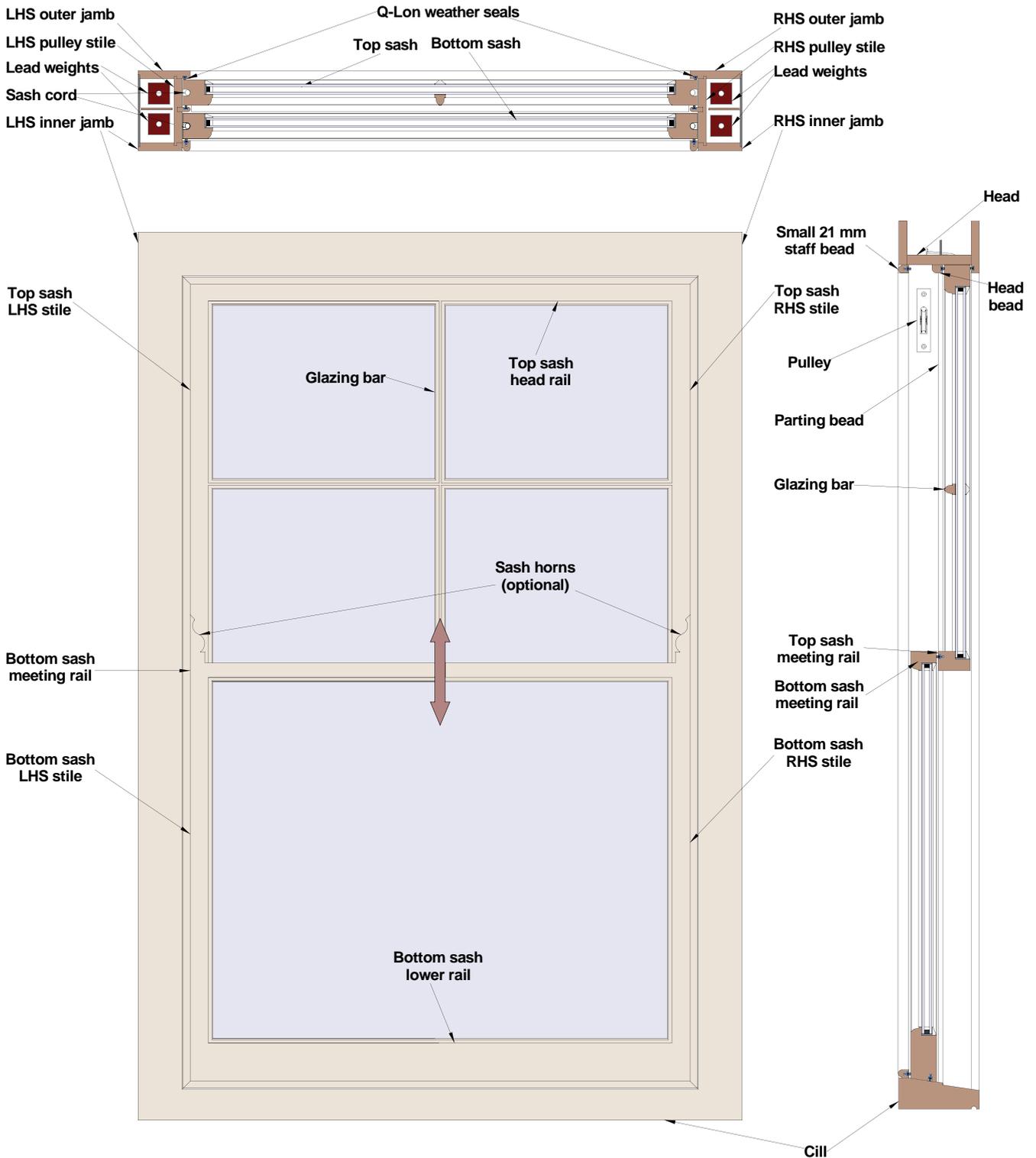
We are frequently asked by our clients to produce noise reducing solutions in windows. If this is required, please consult the glass page on our website.



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# TRADITIONAL BOX SASH WINDOW - INTERNAL VIEW

Double glazed with bonded bars

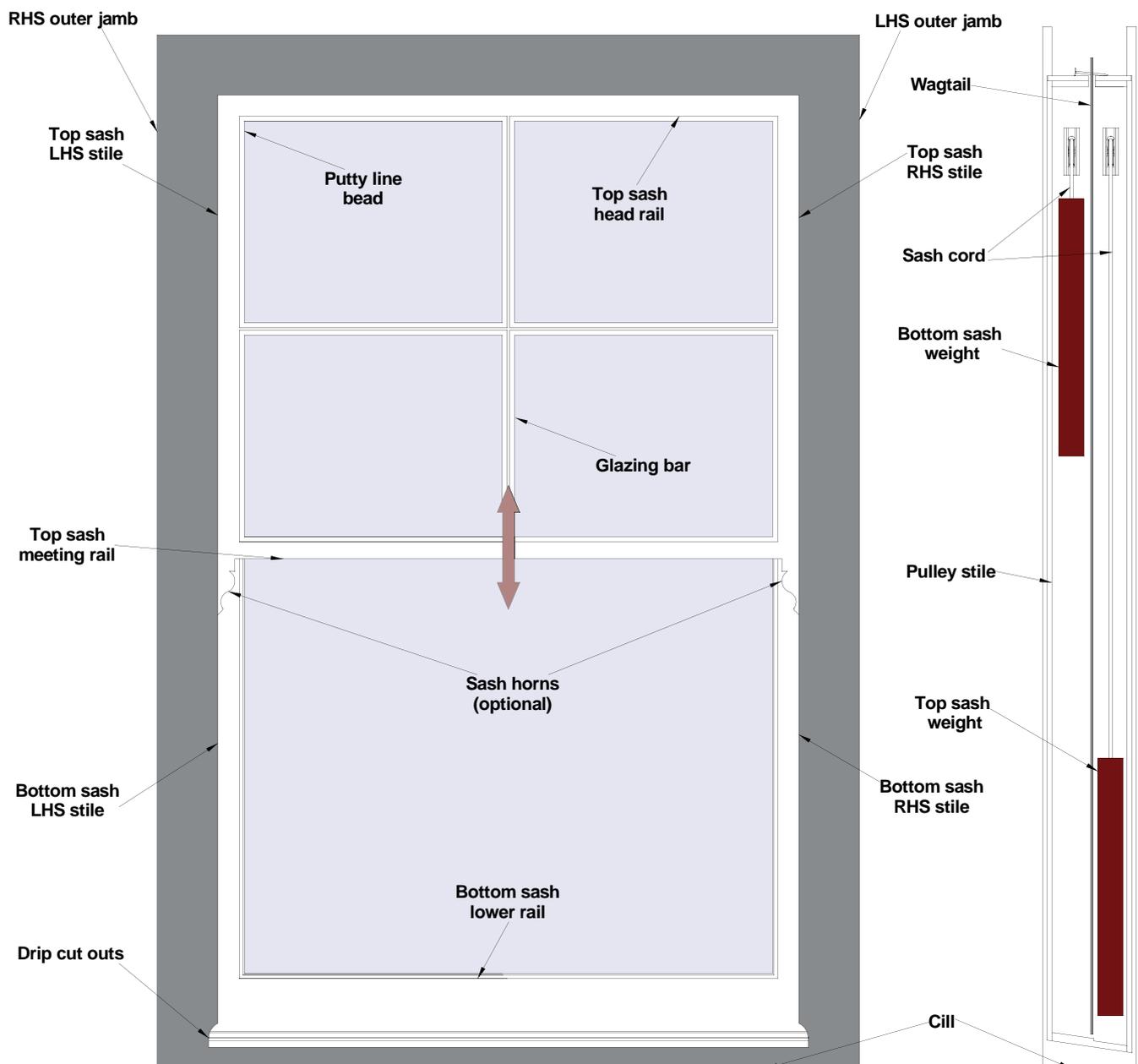




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# TRADITIONAL BOX SASH WINDOW - EXTERNAL VIEW

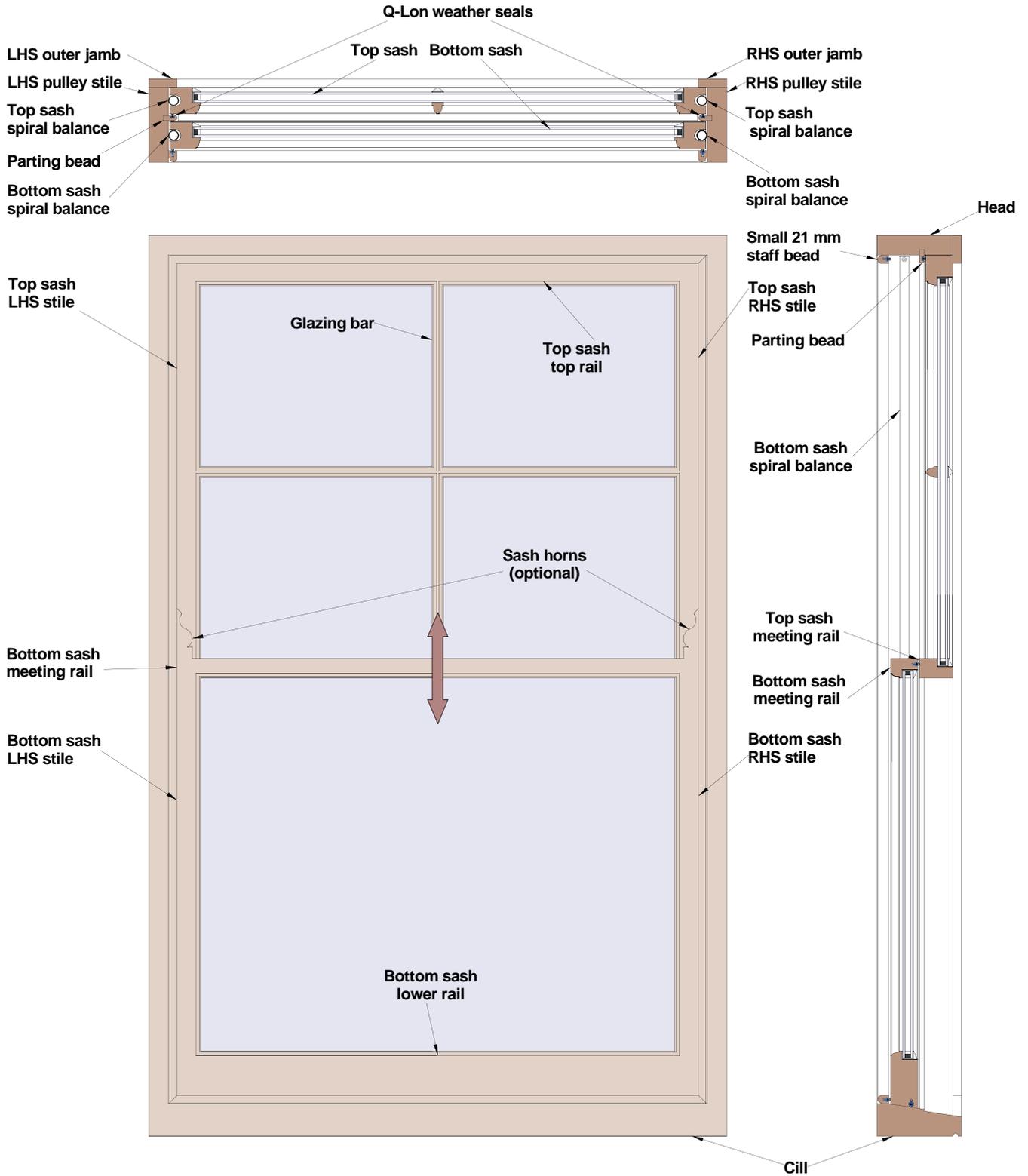
Double glazed with bonded bars

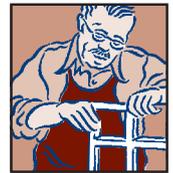




# SPIRAL HUNG BOX SASH WINDOWS - INTERNAL VIEW

## Double glazed with bonded bars

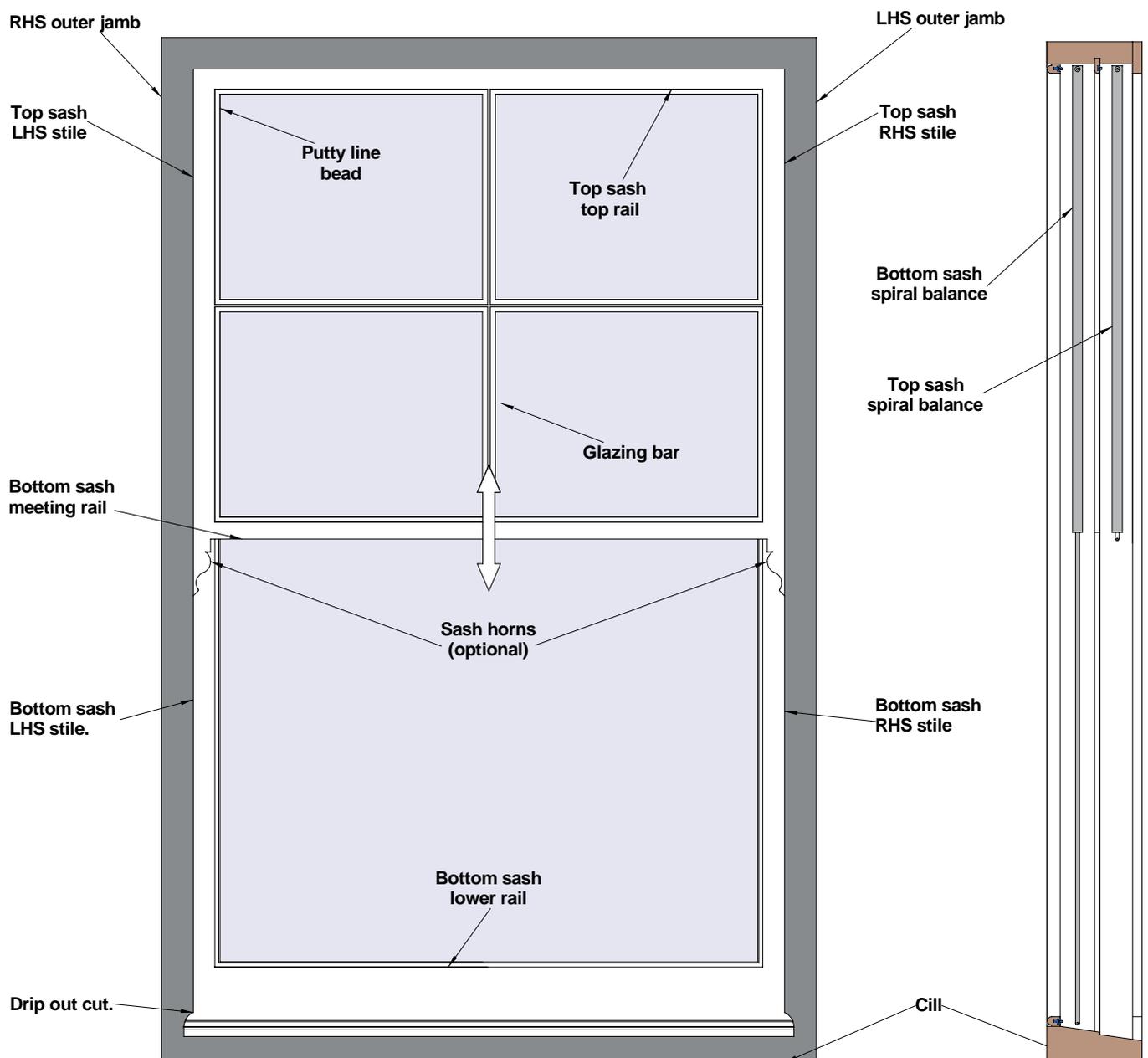




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## SPIRAL HUNG BOX SASH WINDOWS - EXTERNAL VIEW

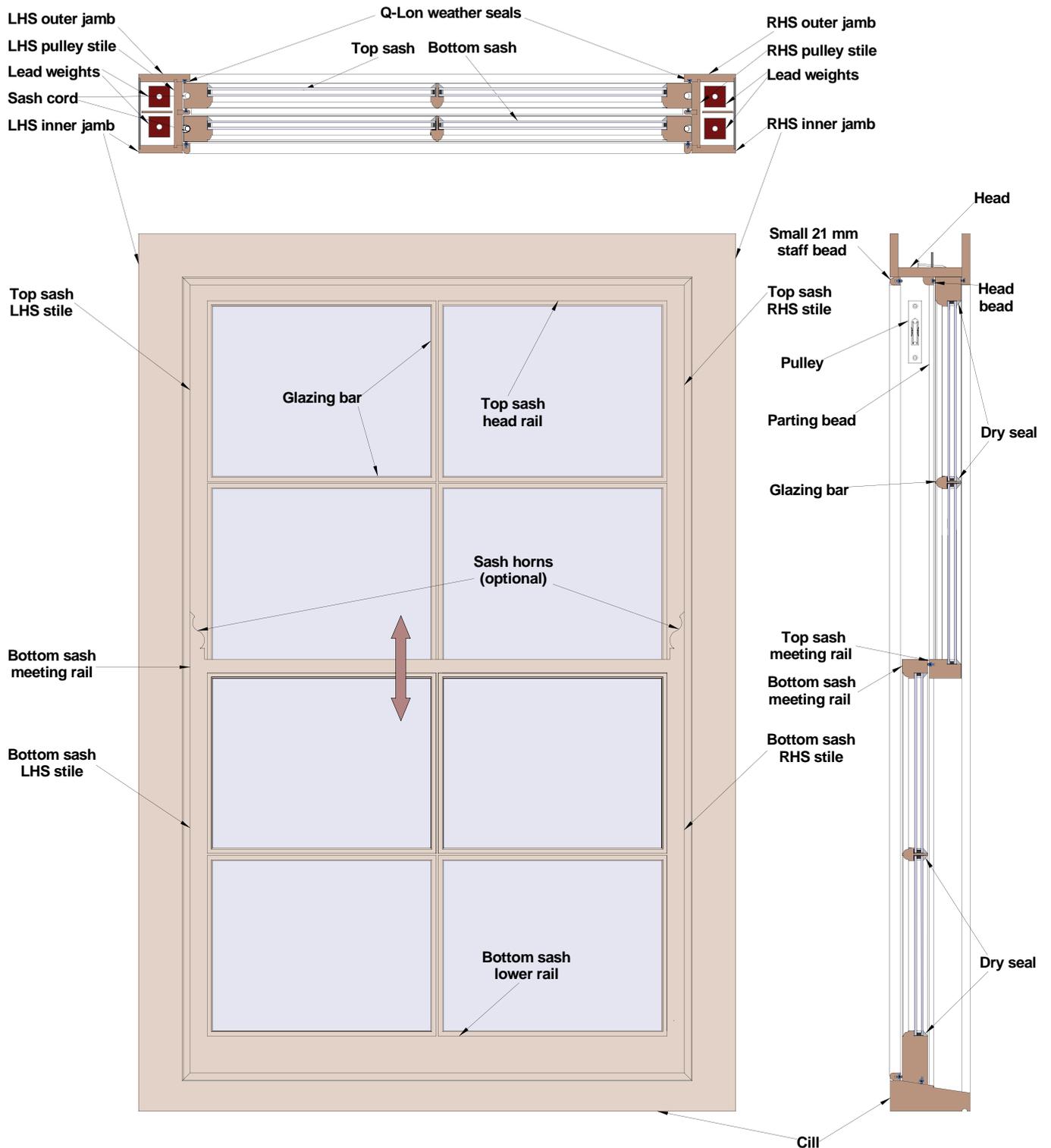
Double glazed with bonded bars





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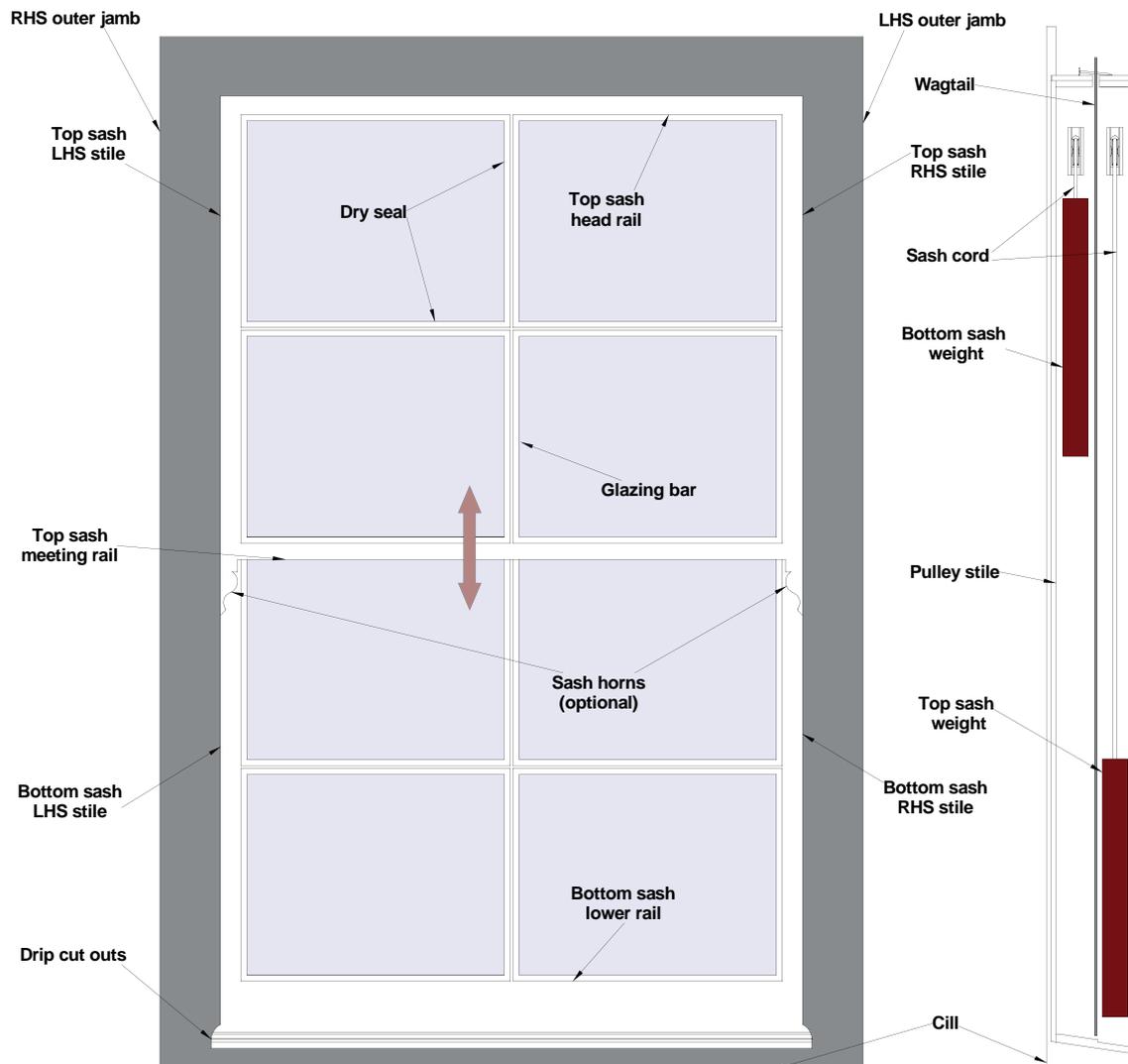
# TRADITIONAL BOX SASH WINDOW INDIVIDUALLY GLAZED WITH HERITAGE DOUBLE GLAZED UNITS - INTERNAL VIEW





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# TRADITIONAL BOX SASH WINDOW INDIVIDUALLY GLAZED WITH HERITAGE DOUBLE GLAZED UNITS - EXTERNAL VIEW



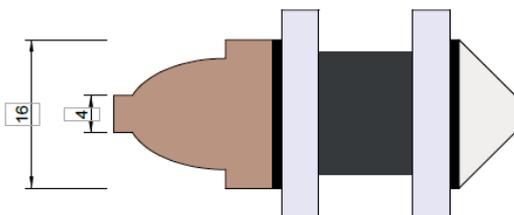


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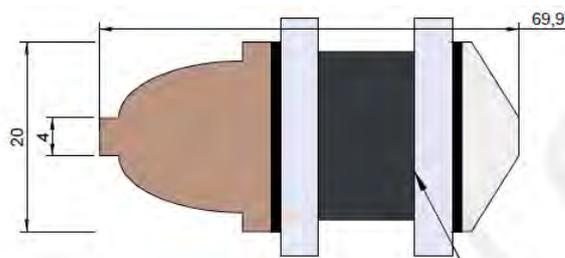
## GLAZING BARS

### Glazing bar details to sashes - Cross Section

16 Ovolo 4x10 - 4 Low E : 10mm : 4 Low Iron



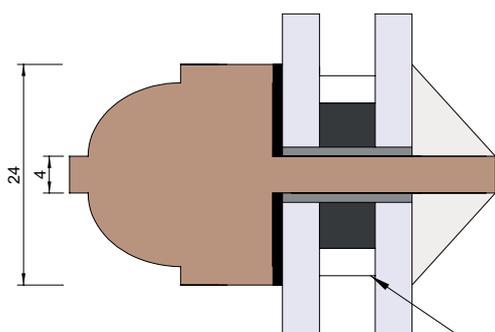
20 Ovolo 6x13 - 4 Low E : 10mm : 4 Low Iron



Other options:  
- 24/30mm Ovolo or Lambs Tongue

Available colours : Charcoal or White

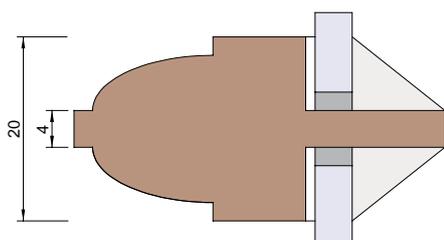
24 Heritage Ovolo 8x10 - 4 Low E : 6mm : 4 Low Iron



Other options:  
- 4/8mm spacer

Available colours : Black or White

20 Single glaze Ovolo 6x13 - 4mm Low Iron



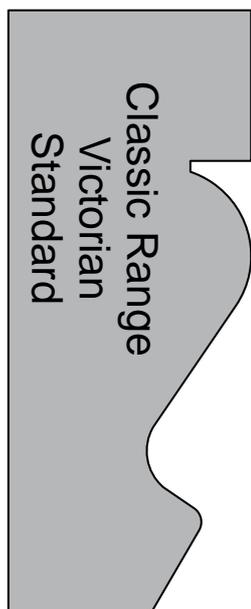
Other options:  
- 16/24 mm Ovolo or Lambs Tongue



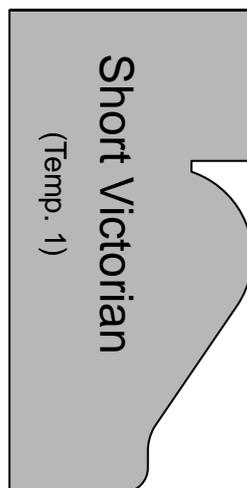
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## STANDARD HORN DETAILS

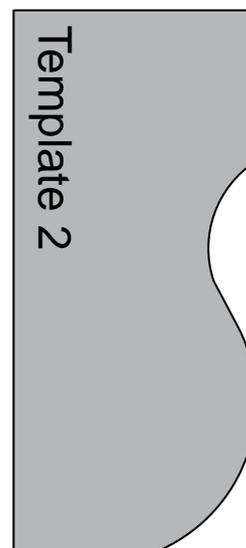
**Standard Detail**



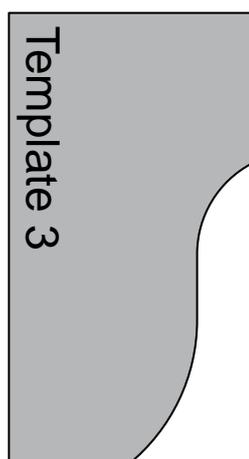
**Standard Detail**



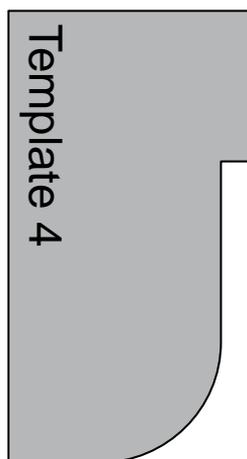
**Optional extra**



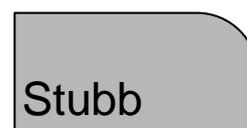
**Optional extra**



**Optional extra**



**Optional extra**

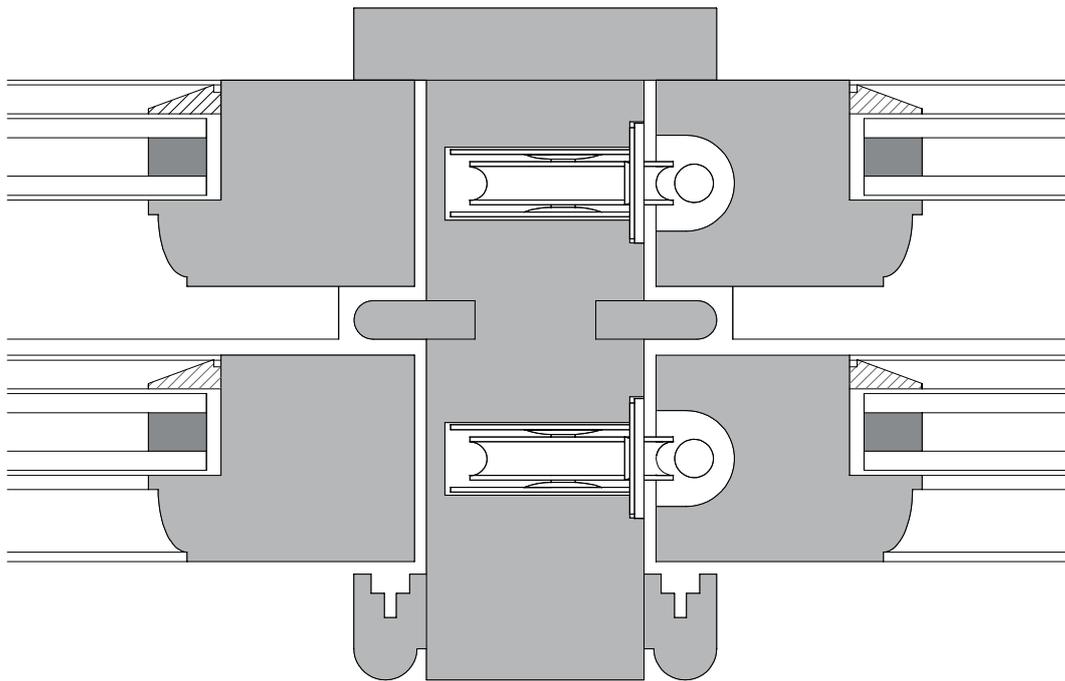
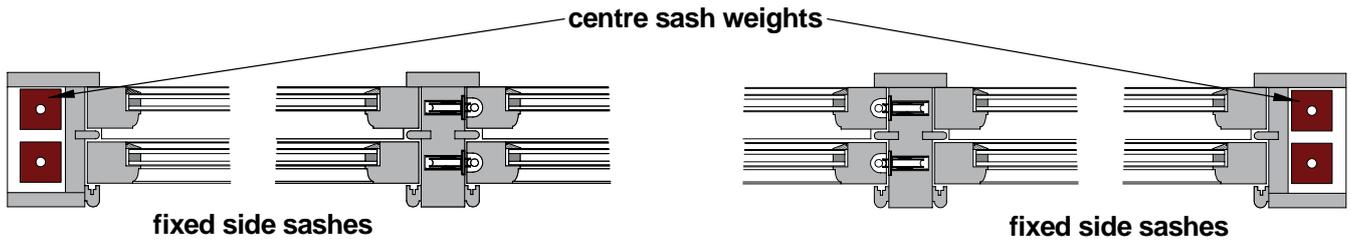




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## CROSS SECTION - VENETIAN BOX SASH WINDOW

### Left Hand Mullion Plan View

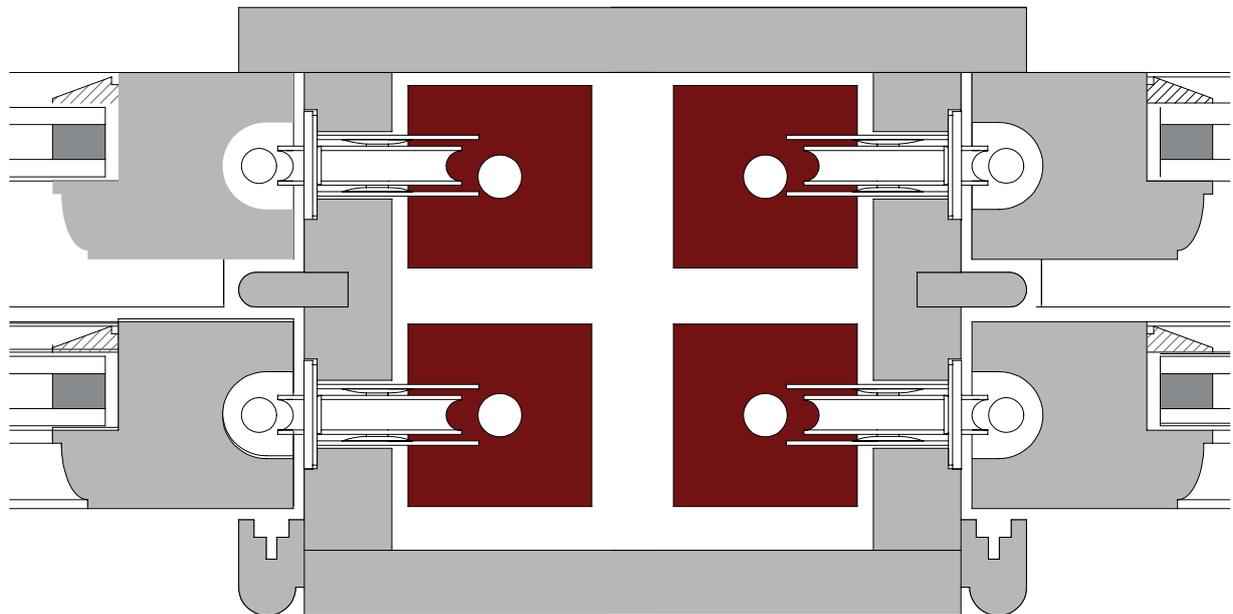
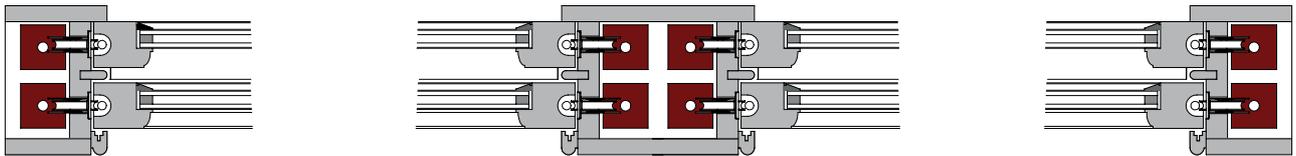




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## CROSS SECTION DOUBLE BOX SASH WINDOW

### Mullion Plan View





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## ADDITIONAL DOCUMENTS

The following documents are available from the Commercial section of our website:

[www.sashwindow.com/commercial](http://www.sashwindow.com/commercial)

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