UK Structural Design Guide

Version: 7.0
March 2004

world class conservatory systems

SDG003 FP 0304 1000

Buy direct or from your nearest Ultraframe fabricator/distributor:

Ultraframe (UK) Ltd
Salthill Road,
Clitheroe,
Lancashire. BB7 1PE

Fabricator First Team tel : 08704 141006
Installer First Team tel : 08704 141002

www.ultraframe.com

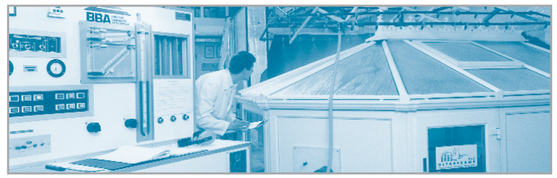
ULTRAFRAME is Europe's leader in the design and manufacture of conservatory roofing systems. It's products are fitted every day by discerning conservatory installation companies – from small, local building and joinery businesses through to the many nationally known home improvement companies. One thing links them all together – they are "safe in the knowledge".

authority/accreditation

No direct British or International standard exists currently for conservatory roofing systems. Ultraframe has, therefore, sought it's own accreditations that will prove fitness for purpose. Ultraframe is the only conservatory roofing company to have both:-

- BS EN ISO 9001/9002 for design, manufacture and supply
- BBA certification (96/3261) for it's white Victorian and Ultralite 500 roofing systems. The BBA states that Ultraframe roofs will have a "*life expectancy of at least 25 years*"

BBA BRITISH BOARD OF AGRÉMENT CERTIFICATE No. 96/3261 states "*25 year roof life expectancy*"



additional accreditation

CON. ASSOC

The Conservatory Association is a specialist division of the Glass and Glazing Federation. Ultraframe is fully committed to the concept of one body representing the industry, writing technical standards and promoting consumer awareness. Ultraframe is actively involved at every level in the Conservatory Association.

ISO

In June 1994 Ultraframe was the first company to achieve ISO 9001 & 9002 for the design, manufacture and supply of conservatory roofing systems. To this day it remains the only conservatory roofing company with this accreditation.

GGF

Ultraframe is a member of the Glass and Glazing Federation (GGF) and is actively involved in the Technical Working Party Committees helping to set standards of excellence for the future and ensuring that current requirements are adhered to.

PATENTS

Ultraframe has always been the design leader in conservatory roofing systems. Continuous investment ensures that it will remain as Europe's leading manufacturer of innovative products, and the achievement of over 300 UK, European and Worldwide Patents is evidence of this.

WFRC

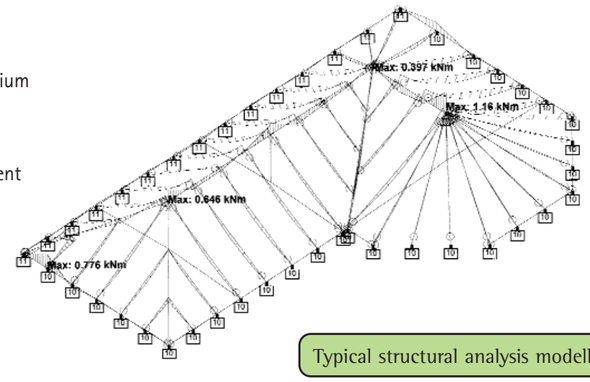
In addition to authoritative testing by the government backed approvals body, the BBA, Ultraframe uses many other independent testing agencies such as Warrington Fire Research Centre, Leyland Test Centre and Bradford University.

scope of the UK structural design guide

This document is principally designed for use with the BBA certified Victorian Roofing System, usually of floor plans up to 30m².
For larger structures the Ultraspan Mini-Portal, an "off the shelf" system is available for up to 7.5m clear spans, whilst a full bespoke aluminium portal system for 7-12m clear spans is available. Over this size and the company will employ steel portal structures.
This guide should be used in conjunction with Ultraframe's Survey, Fabrication and Installation guides (see page 3).
For advice on any aspect of conservatory design, please contact the Technical Support Team on **0870 414 1008**

specifications and standards

BS 8118	structural use of aluminium
BS 6399 pt.1&3	loadings for buildings
CP3 chapter V pt2	wind loadings
BS 5516	vertical and sloping patent glazing
BS 6262	glazing for buildings

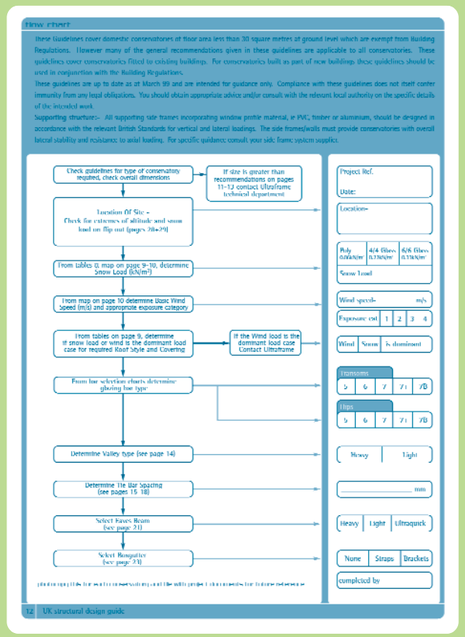


Typical structural analysis modelling

contents

Introduction

how to use this guide



It is important to read this guide thoroughly before design work begins.

Either photocopy the full size flow chart on page 4 or use the "tear out" sheets in the pad provided with the pack. Carry the flow chart sheet with you throughout the guide, making important notes along the way.

Date, reference and sign the completed form and keep it in your project file.

ultraframe support material

fabrication guide

A wide range of technical documentation is available to support fabricators/installers of Ultraframe systems. This includes exhaustive fabrication manuals, detailed on-site installation guides, a comprehensive guide for surveyors and wide ranging information in the independently authored BBA certificates - these certificates are an excellent source of information on ventilation, condensation, durability etc. and are ideal for satisfying Building Control Officers


installation guides


ultramate

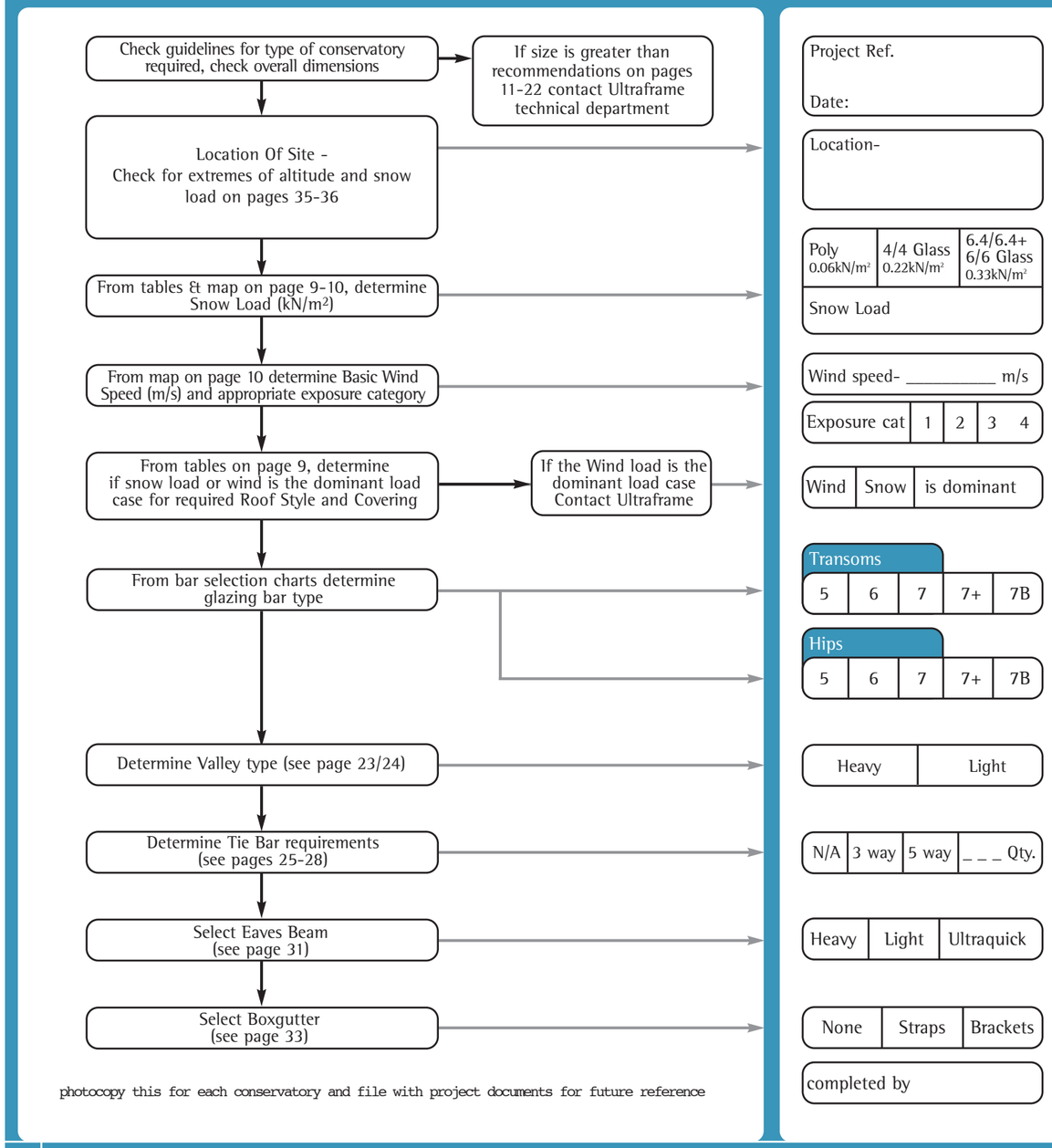
A wide range of training courses are on offer including one on "structural design criteria"

flow chart

These Guidelines cover domestic conservatories of floor area less than 30 square metres at ground level which are exempt from Building Regulations. However many of the general recommendations given in these guidelines are applicable to all conservatories. These guidelines cover conservatories fitted to existing buildings. For conservatories built as part of new buildings these guidelines should be used in conjunction with the Building Regulations.

These guidelines are up to date as at June 99 and are intended for guidance only. Compliance with these guidelines does not itself confer immunity from any legal obligations. You should obtain appropriate advice and/or consult with the relevant local authority on the specific details of the intended work.

Supporting structure:- All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for vertical and lateral loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. For specific guidance consult your side frame system supplier.



photocopy this for each conservatory and file with project documents for future reference

Ultraframe's roofing systems

a solution to your structural conservatory roofing needs at all levels

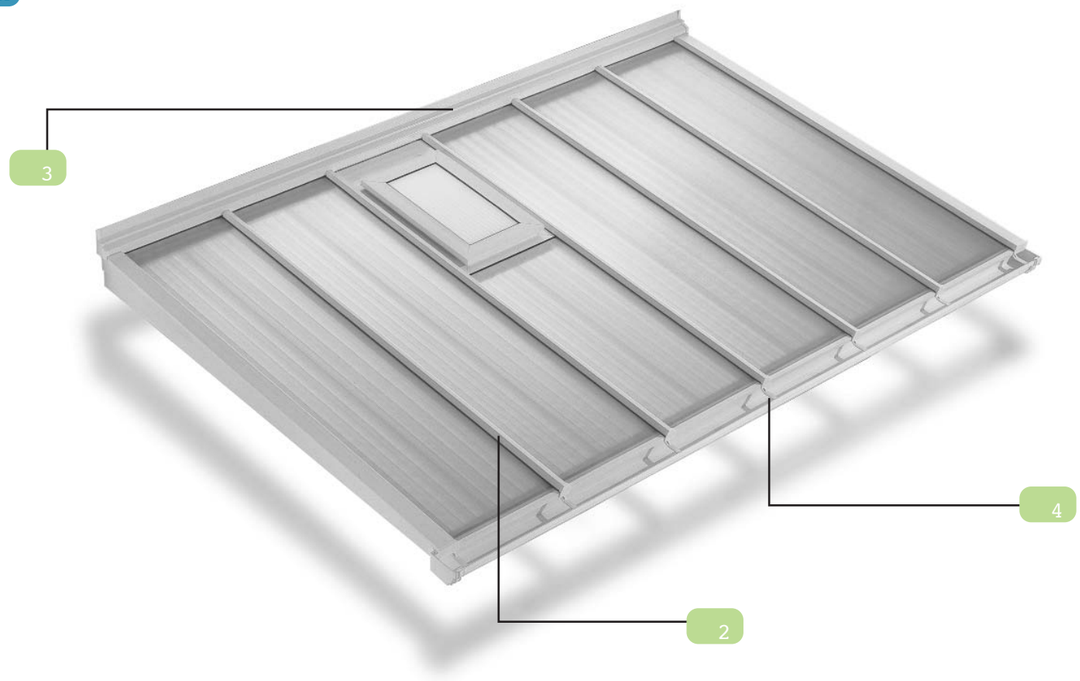
BBA BRITISH BOARD OF AGRÉMENT CERTIFICATE No. 96/3261

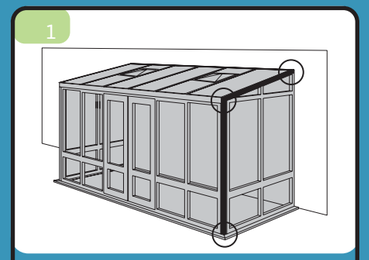
states "25 year roof life expectancy"

Ultraframe can supply a conservatory roof to satisfy the most unusual requests and retain structural integrity due to our unique design skills and fifteen years experience in the industry. The principles of these roofs and the critical details are outlined according to Ultraframe's product range.

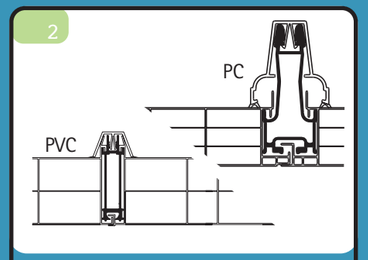
All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for vertical and lateral loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. For specific guidance consult your side frame system supplier.

A Ultralite 500 PVC & Ultralite 500 PC

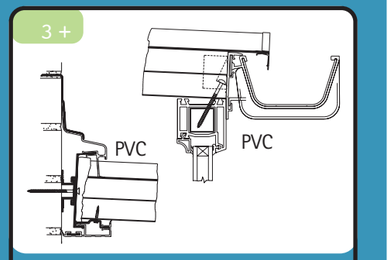




1 structure diagram



2 glazing bar details



3 + wall channel/fascia detail

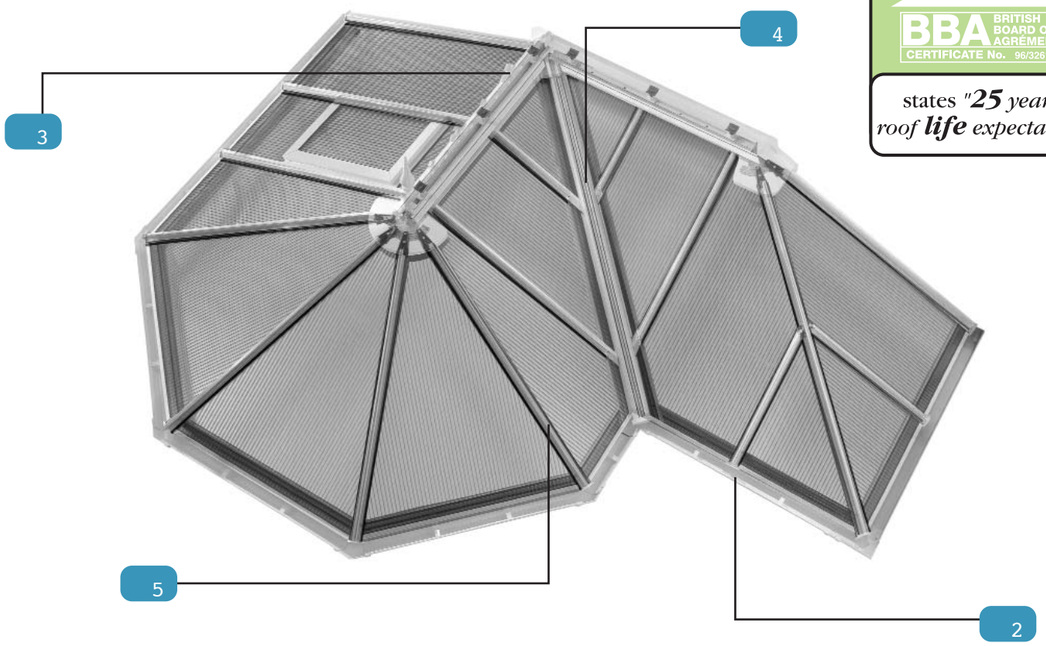
Ultraframe's roofing systems

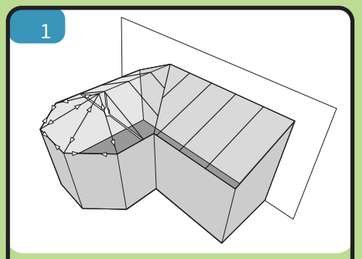
a solution to your structural conservatory roofing needs at all levels

B Classic Victorian System

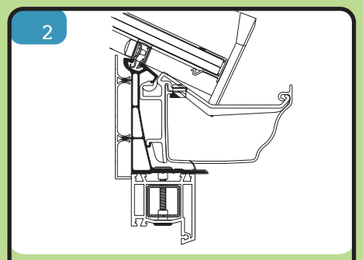
BBA BRITISH BOARD OF AGRÉMENT CERTIFICATE No. 96/3261

states "25 year roof life expectancy"

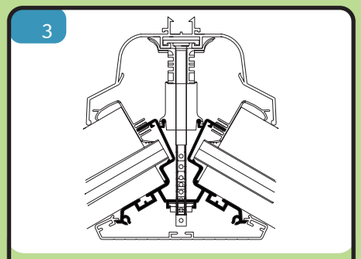




1 structure diagram

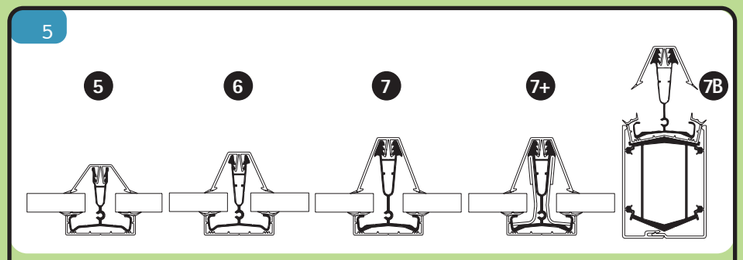


2 multi eaves beam



3 ridge

4 valley



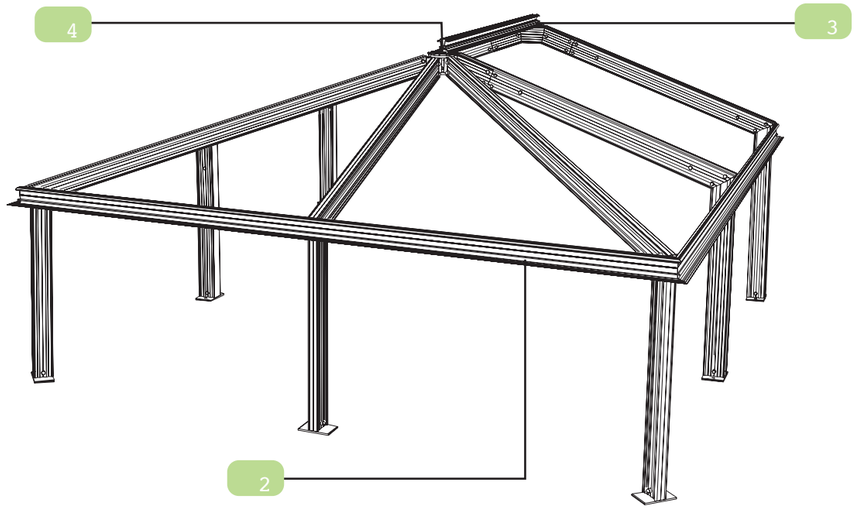
5 glazing bars

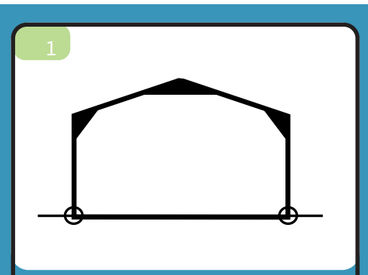
Ultraframe's roofing systems

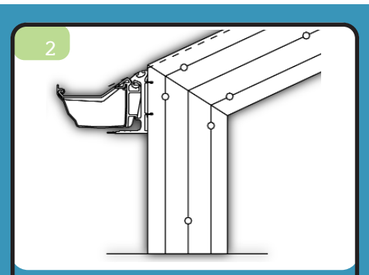
a solution to your structural conservatory roofing needs at all levels

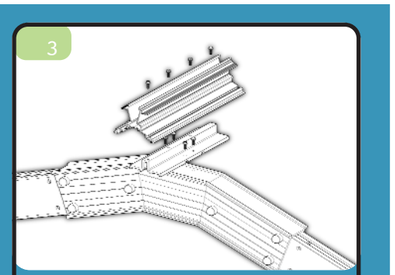
C Ultraspan mini-portal

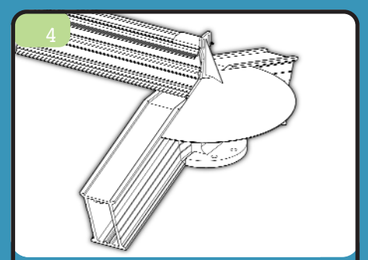
- cost effective, ideal for large domestic and commercial applications where customers want to maximise space and minimise costs
- available for 20° and 25° pitches
- standard designs available pre-fabricated

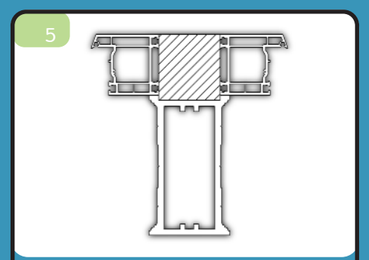


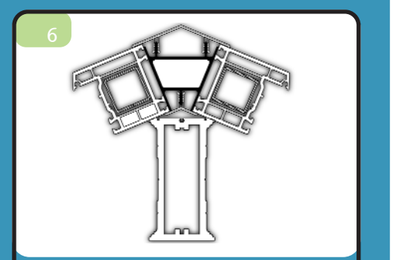

1 structure diagram


2 eaves detail


3 ridge adaptor plate


4 ridge end


5 window frame to portal

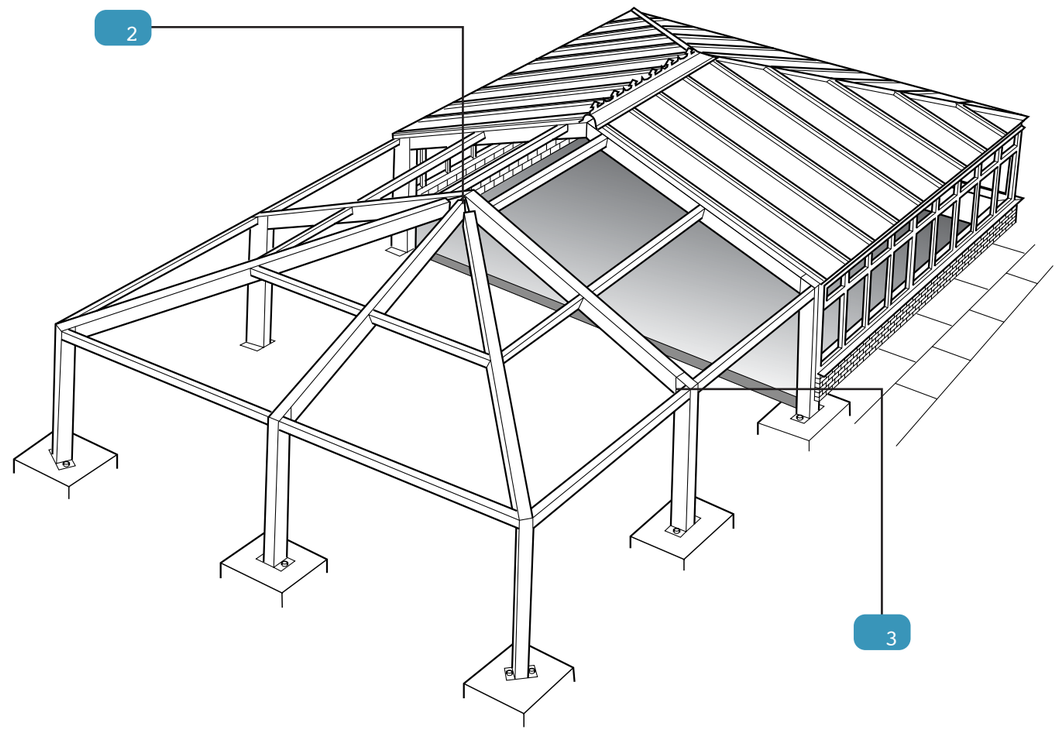

6 window frame to portal

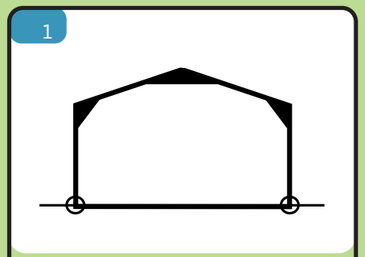
Ultraframe's roofing systems

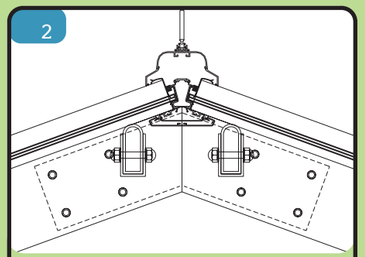
a solution to your structural conservatory roofing needs at all levels

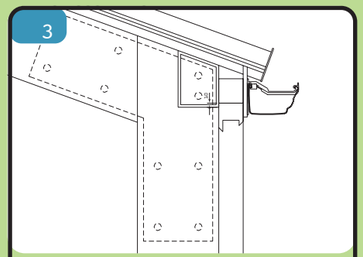
D aluminium portal frame conservatories

- High strength/low weight aluminium portal frame system
- From 7 to 12m spans
- Totally bespoke designs




1 structure diagram


2 portal apex detail


3 Eaves detail

roof loadings 1

loading types

dead loading

Dead loading is the self weight of the glazing bars and glazing material itself. These are:

Polycarbonate	6kg/m² (0.06kN/m²)
4/4mm double glazed units	22kg/m² (0.22kN/m²)
6/6mm (+6.4/6.4) double glazed units	33kg/m² (0.33kN/m²)
Ultralite 500 PVC	6kg/m² (0.06kN/m²)
Ultralite 500 PC	6kg/m² (0.06kN/m²)

snow loading (imposed)

The requirement for snow loading applied to roofs is given within BS 6399 Part 3 and, as a general rule, most of the UK can be divided into two basic snow loading areas - 0.6kN/m² (60kg/m²) and 0.8kN/m² (80kg/m²) and over. These areas are well defined on the map opposite (minimum requirement of 0.6kN/m²).

wind loading

The wind loading applied to conservatory roofs is generally a suction or negative force. The tendency is to lift the roofs up from their supports. The load is dependant on the geographical position within the UK, site exposure, site topography and roof shape. The four site wind exposure categories are defined below.

The basic wind speeds below assume that the conservatory is not located near the summit of a hill, crest of a cliff, escarpments or ridges. If this is not the case then advice must be sought from Ultraframe technical department.

Any conservatories above 3m to eaves, contact Ultraframe technical support team for advice.

wind exposure categories

1 Areas of open and nearly level country with no shelter, ie. flat coastal fringes, estuaries, air fields and moorland.

2 Flat undulating country with obstructions such as hedges or walls, around fields, scattered wind breaks, trees and occasional buildings. Most farms and country estates fall into this category

3 Surfaces with numerous large obstructions. Examples are wooded parkland and forest areas, towns and their suburbs, and the outskirts of large cities. General level of roof tops in the area will be about 10m

4 City locations where the general roof height is about 25m. In very large towns where buildings are dense and also quite tall.

SNOW IS GENERALLY THE WORST CASE LOADING CONDITION ON CONSERVATORY ROOFS.

summary of basic wind speeds for when wind uplift will become the dominant loadcase over snow load

Compared with 0.6kN/m² snow loading

Victorian styles

	Poly	4/4 glass	6/6+6.4/6.4
Exp cat 1	40m/s	48m/s	50m/s
Exp cat 2	47m/s	56m/s	
Exp cat 3	52m/s	SNOW DOMINANT CONTINUE THROUGH GUIDE	
Exp cat 4			

Lean-to styles

	Poly	4/4 glass	6/6+6.4/6.4
Exp cat 1	37m/s	43m/s	48m/s
Exp cat 2	42m/s	50m/s	55m/s
Exp cat 3	47m/s	56m/s	SNOW DOMINANT CONTINUE THROUGH GUIDE
Exp cat 4	54m/s		

Compared with 0.8kN/m² snow loading

Victorian styles

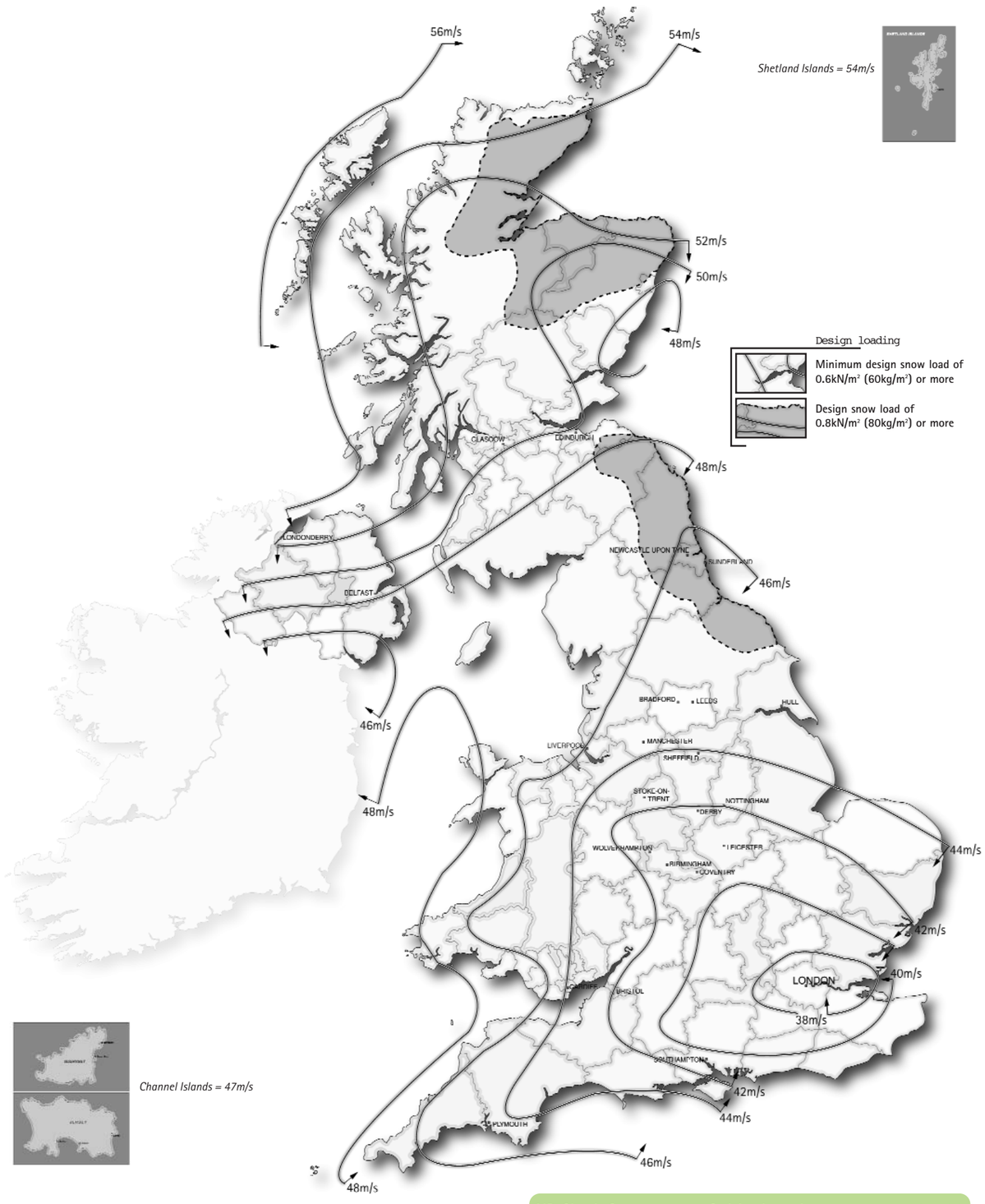
	Poly	4/4 glass	6/6+6.4/6.4
Exp cat 1	45m/s	53m/s	
Exp cat 2	53m/s		
Exp cat 3	SNOW DOMINANT CONTINUE THROUGH GUIDE		
Exp cat 4			

Lean-to styles

	Poly	4/4 glass	6/6+6.4/6.4
Exp cat 1	41m/s	47m/s	51m/s
Exp cat 2	47m/s	55m/s	
Exp cat 3	53m/s	SNOW DOMINANT CONTINUE THROUGH GUIDE	
Exp cat 4			

roof loadings 2

Combination map of the UK showing wind speeds and snow loads [see pages 35-36 for more detail]



NB Check for extremes of altitude and snow on pages 35+36

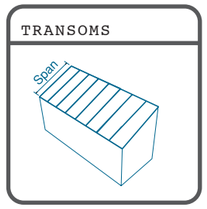
glazing bar span chart

Polycarbonate 0.6kN/m² snow load

Supporting structure:- All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for vertical and lateral loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. For specific guidance consult your side frame system supplier.

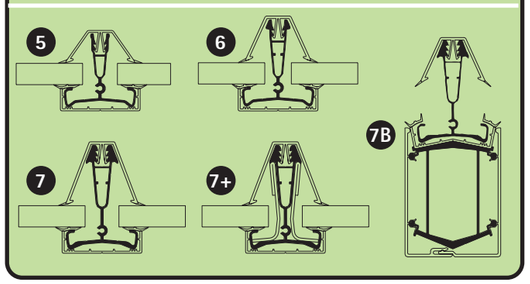
Lean - to's 5°-30° roof pitch

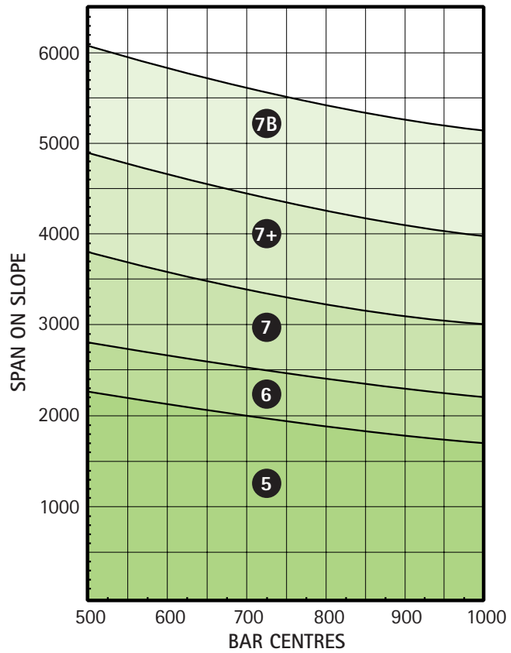
TRANSOMS



Consult Ultraframe for advice on spans over 5.5m

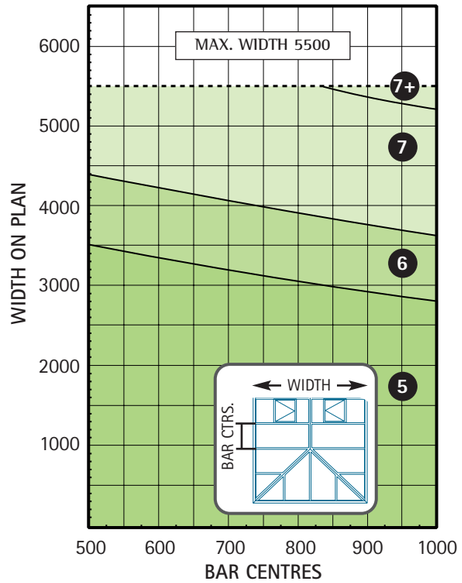
Glazing bar selection



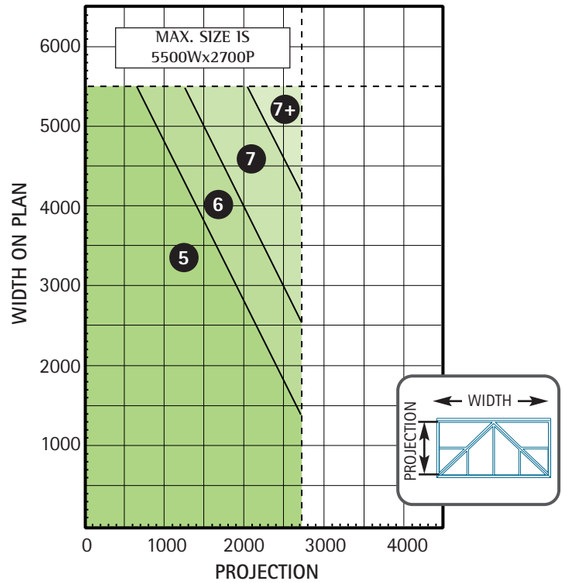


Georgian roofs + woks 15°-19.9° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions

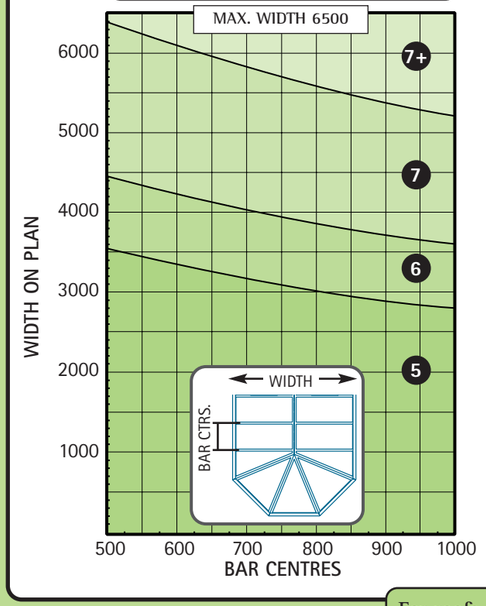


HIP SELECTION CHART
Use also for wok roofs and roofs without tie bars

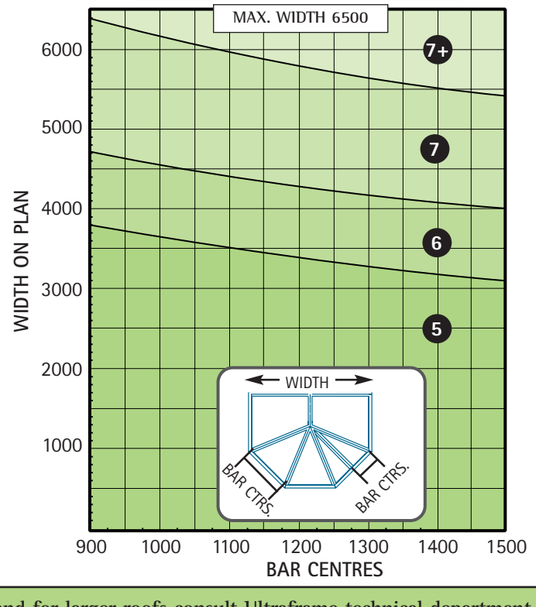


Victorian roofs + Woks 15°-35° roof pitch

TRANSOM SELECTION CHART
For roofs with Tie Bars



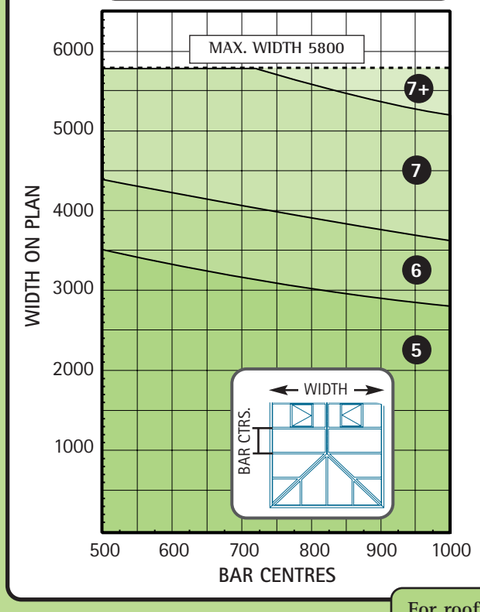
HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



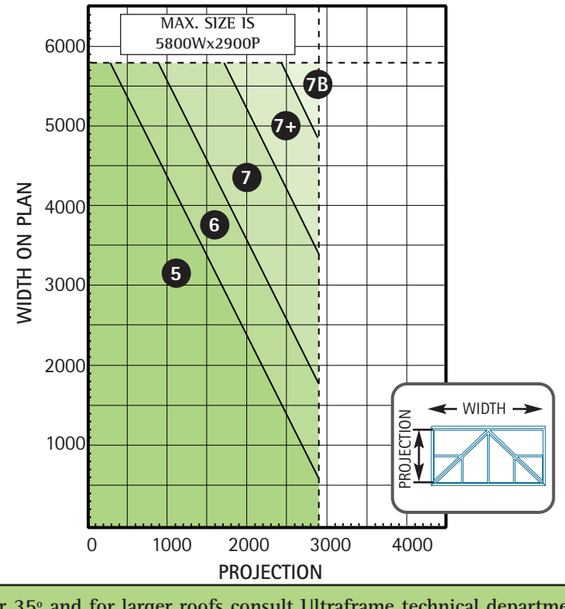
For roofs over 35° and for larger roofs consult Ultraframe technical department

Georgian roofs + woks 20°-35° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions



HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



For roofs over 35° and for larger roofs consult Ultraframe technical department

glazing bar span chart

Polycarbonate 0.8kN/m² snow load

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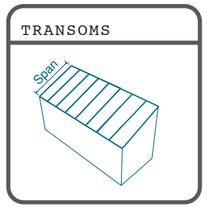
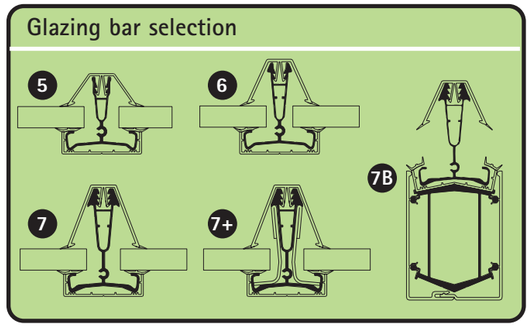
Lean - to's 5°-30° roof pitch

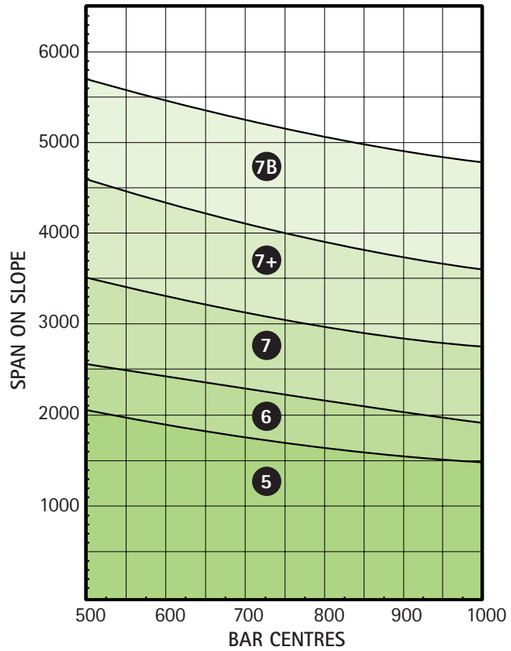
TRANSOMS



Consult Ultraframe for advice on spans over 5.5m

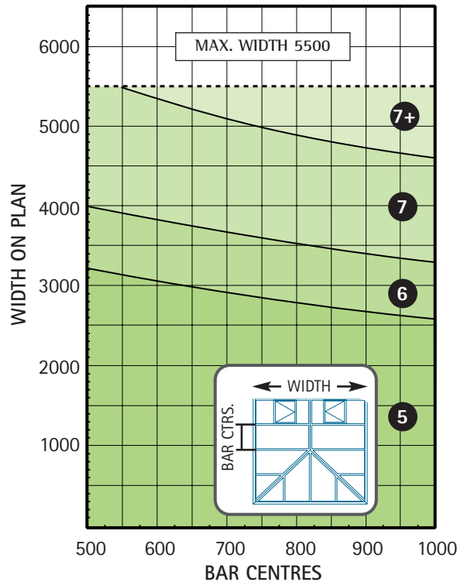
Glazing bar selection



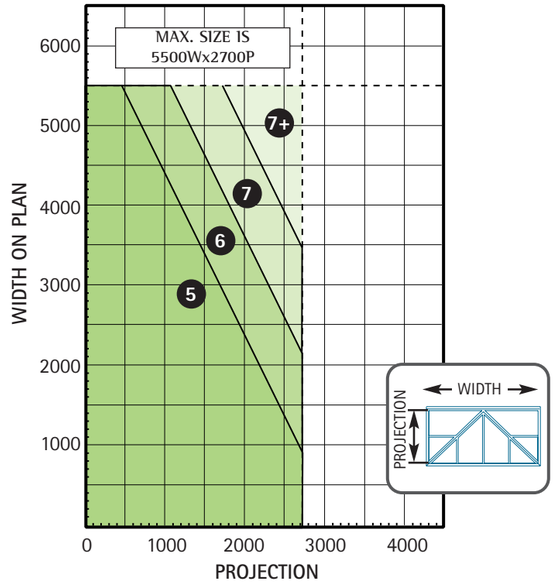


Georgian roofs + woks 15°-19.9° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions

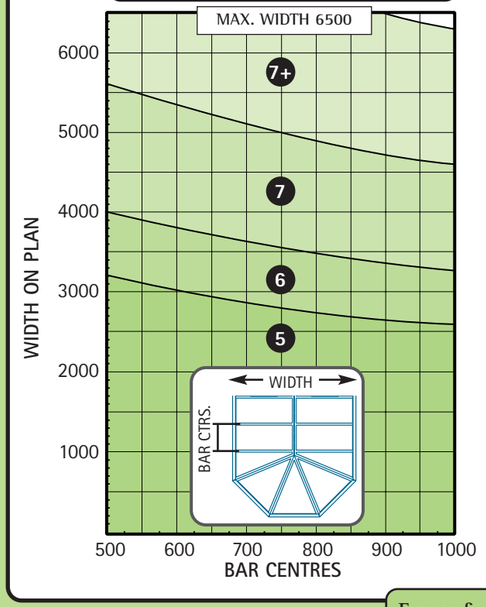


HIP SELECTION CHART
Use also for wok roofs and roofs without tie bars

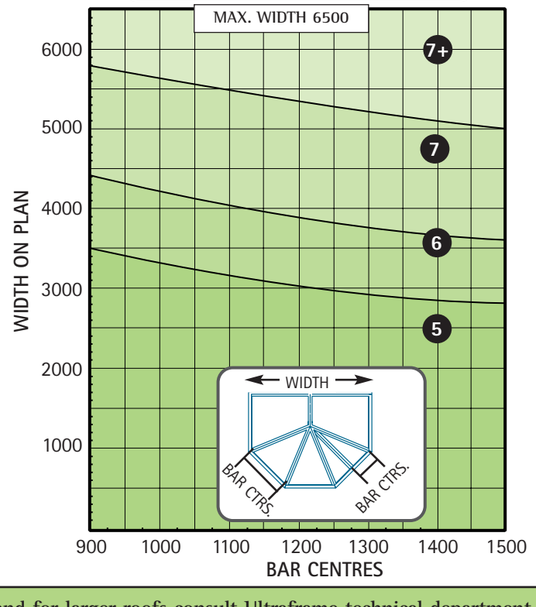


Victorian roofs + Woks 15°-35° roof pitch

TRANSOM SELECTION CHART
For roofs with Tie Bars



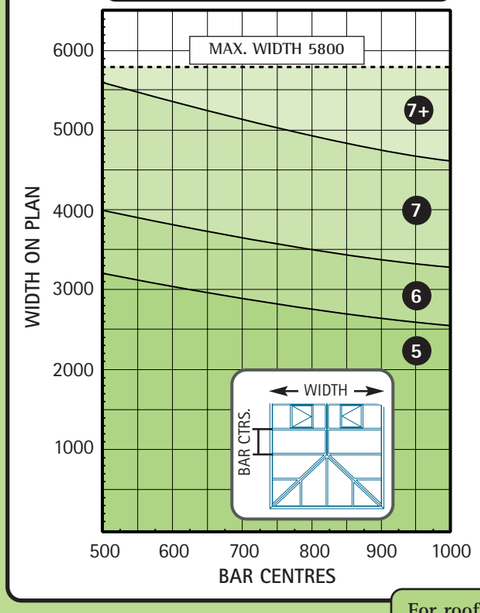
HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



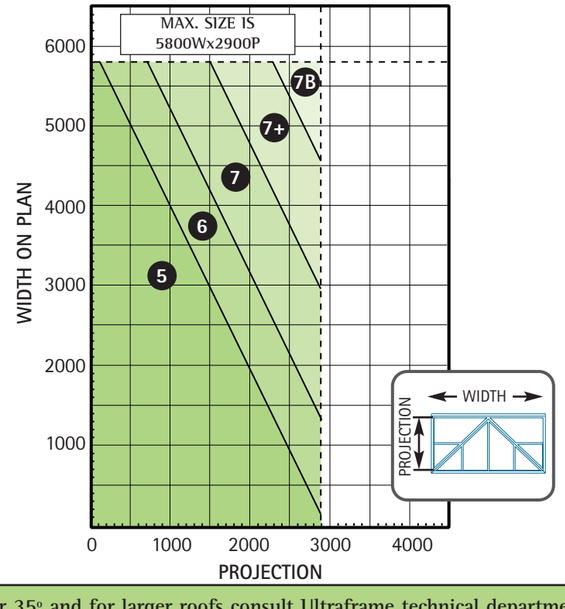
For roofs over 35° and for larger roofs consult Ultraframe technical department

Georgian roofs + woks 20°-35° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions



HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



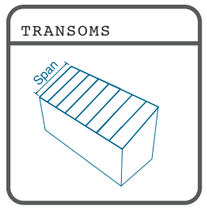
For roofs over 35° and for larger roofs consult Ultraframe technical department

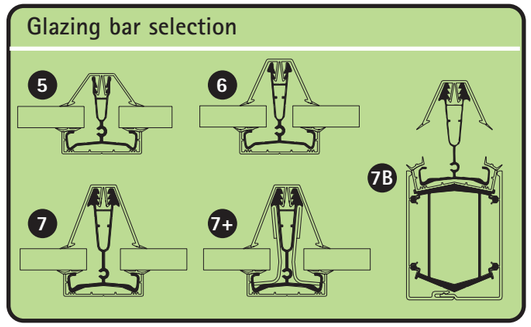
glazing bar span chart

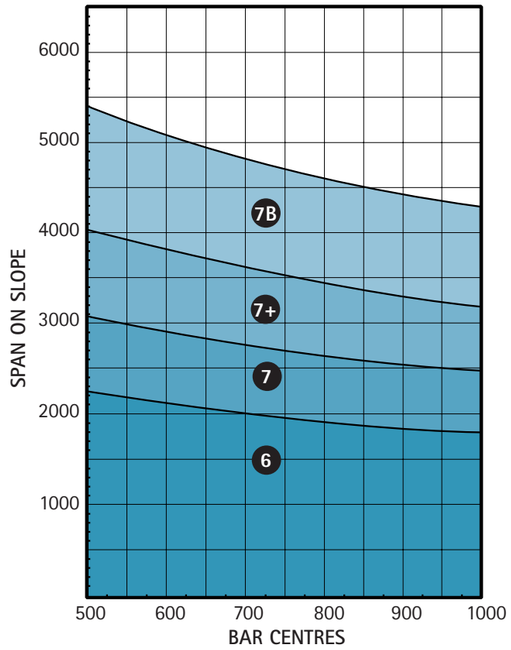
4/4 Glass 0.6kN/m² snow load

Supporting structure:- All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for vertical and lateral loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. For specific guidance consult your side frame system supplier.

Lean - to's 5°-30° roof pitch

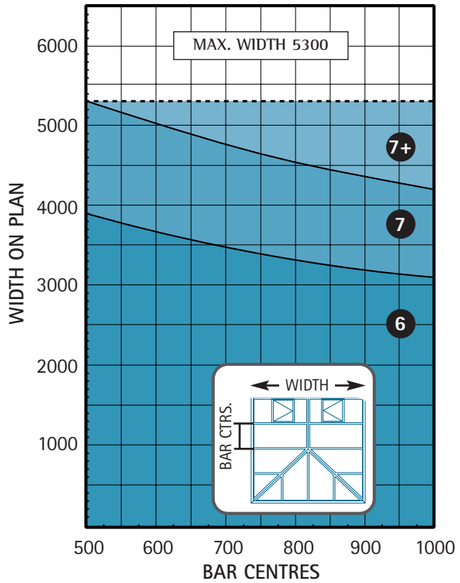




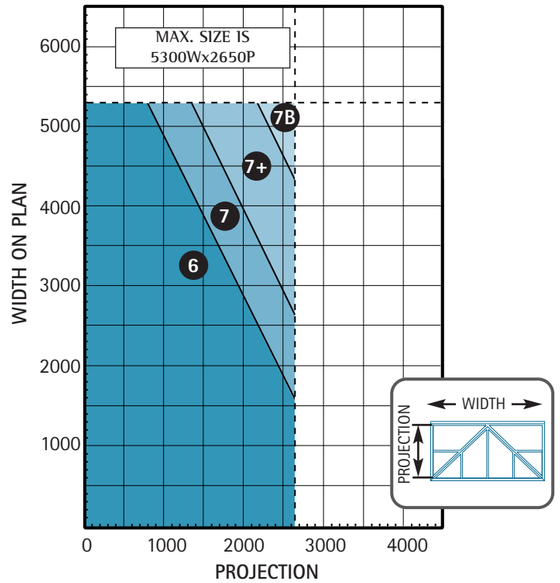


Georgian roofs + woks 15°-19.9° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions

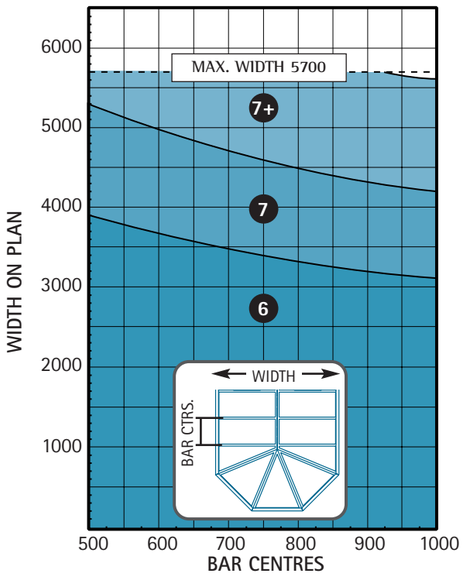


HIP SELECTION CHART
Use also for wok roofs and roofs without tie bars

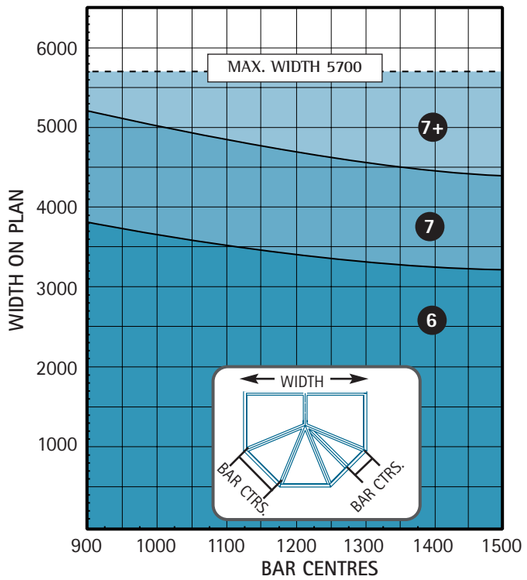


Victorian roofs + Woks 15°-35° roof pitch

TRANSOM SELECTION CHART
For roofs with Tie Bars



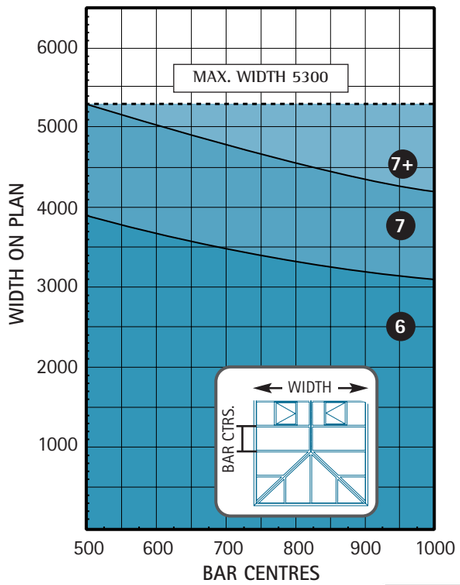
HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



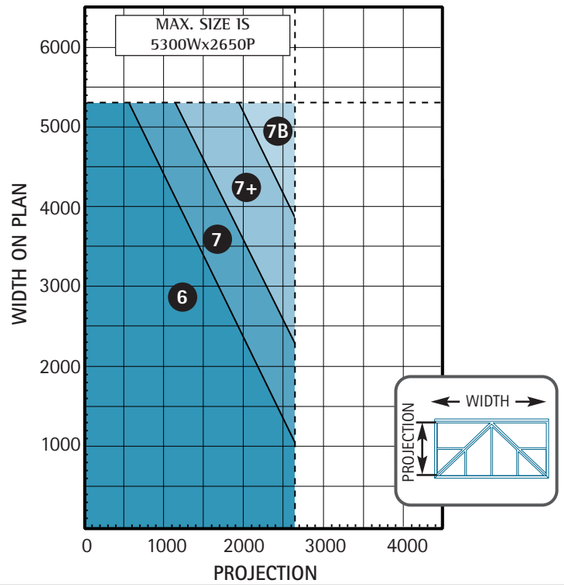
For roofs over 35° and for larger roofs consult Ultraframe technical department

Georgian roofs + woks 20°-35° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions



HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



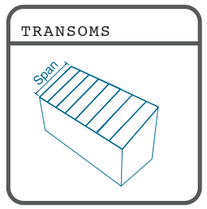
For roofs over 35° and for larger roofs consult Ultraframe technical department

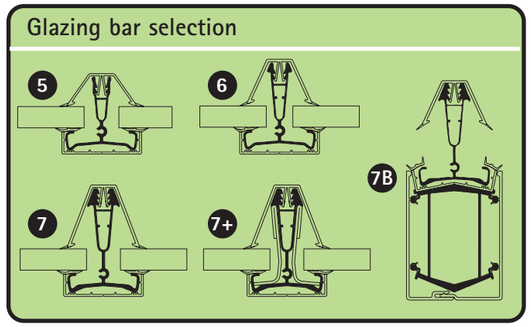
glazing bar span chart

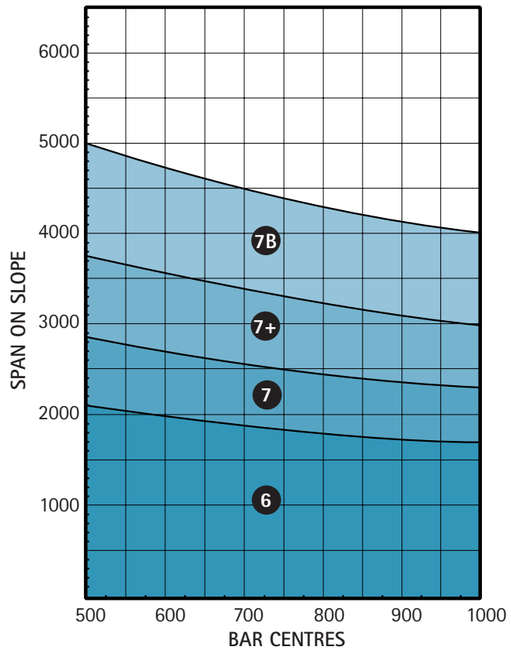
4/4 Glass 0.8kN/m² snow load

Supporting structure:- All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for vertical and lateral loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. For specific guidance consult your side frame system supplier.

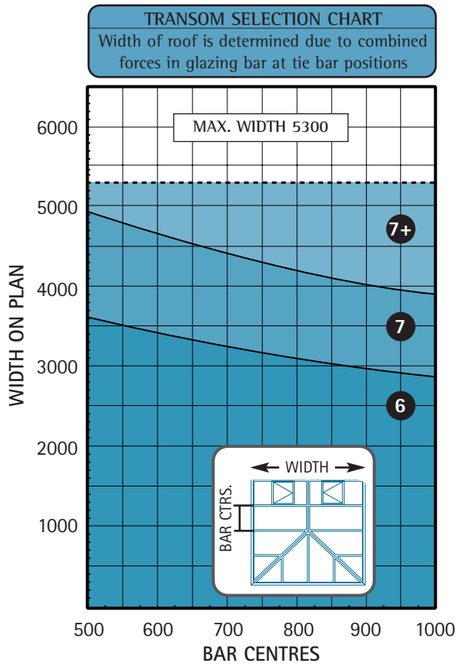
Lean - to's 5°-30° roof pitch

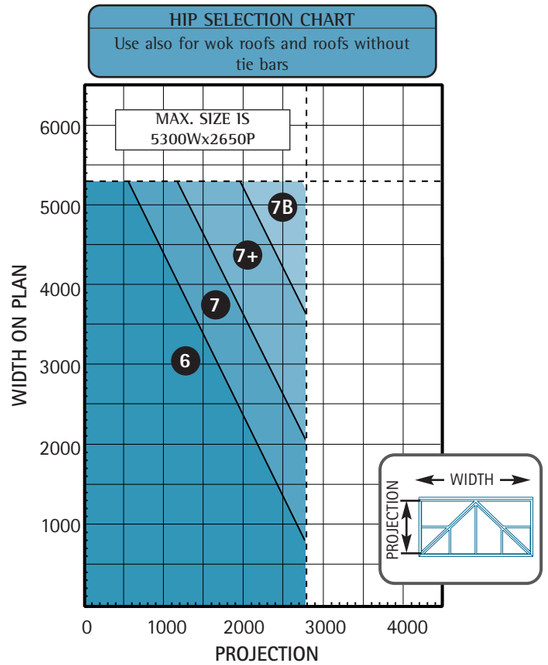




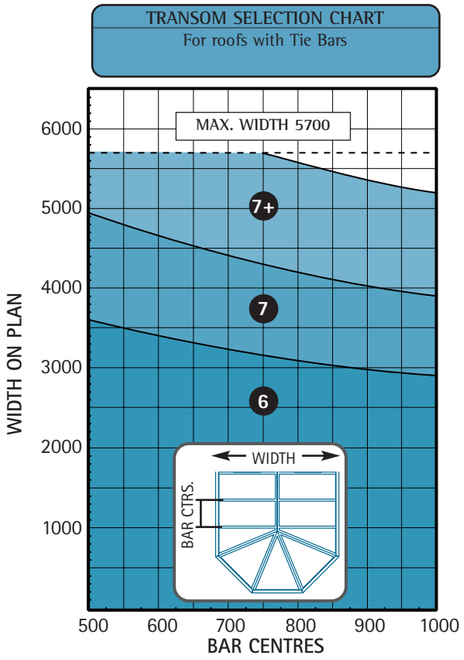


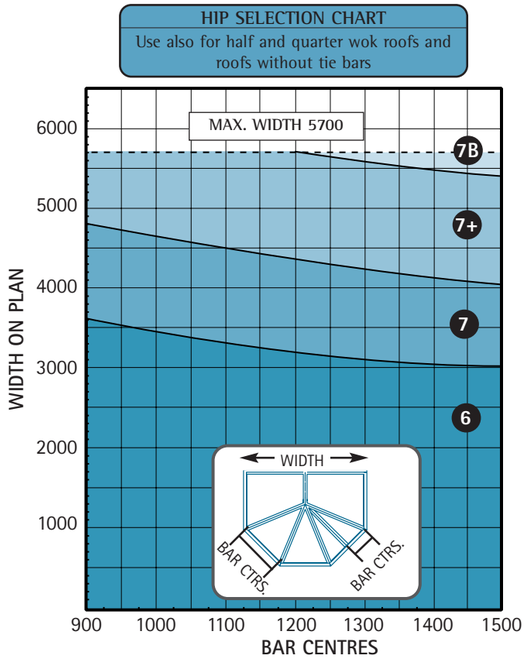
Georgian roofs + woks 15°-19.9° roof pitch





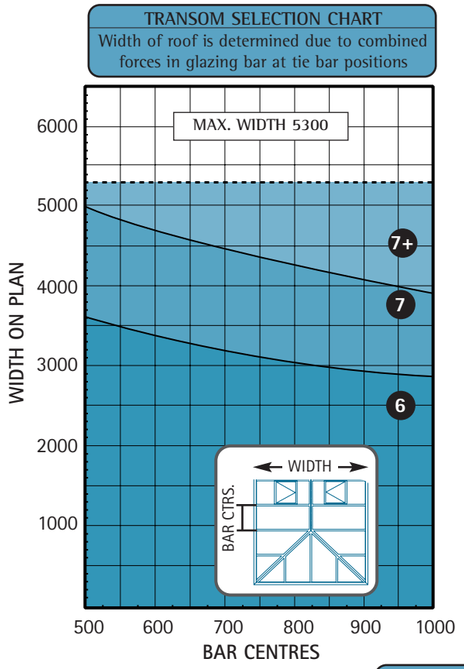
Victorian roofs + Woks 15°-35° roof pitch

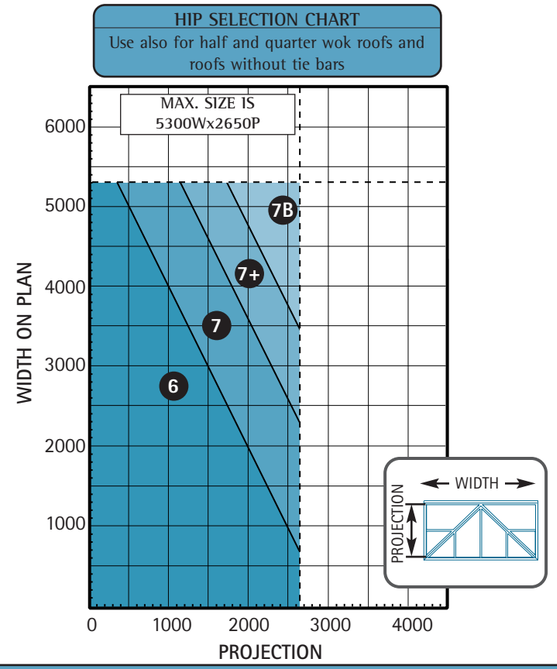




For roofs over 35° and for larger roofs consult Ultraframe technical department

Georgian roofs + woks 20°-35° roof pitch





For roofs over 35° and for larger roofs consult Ultraframe technical department

glazing bar span chart

6/6+6.4/6.4 Glass 0.6kN/m² snow load

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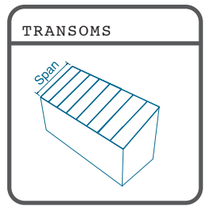
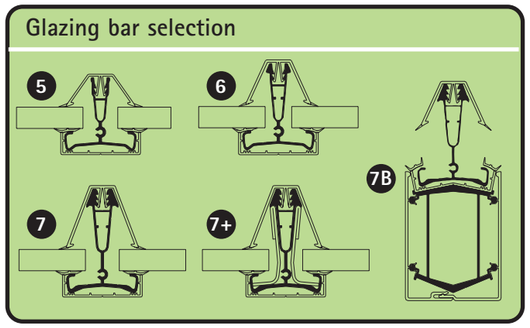
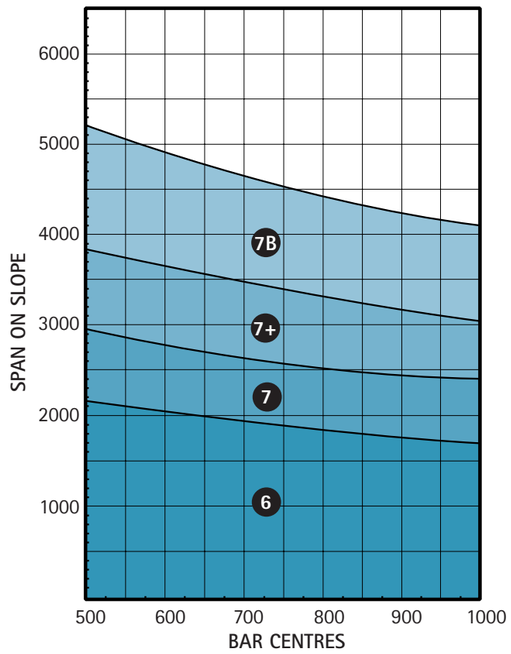
Lean - to's 5°-30° roof pitch

TRANSOMS



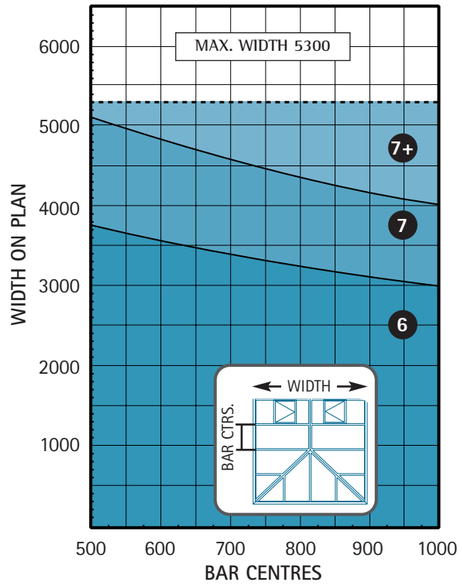
Glazing bar selection



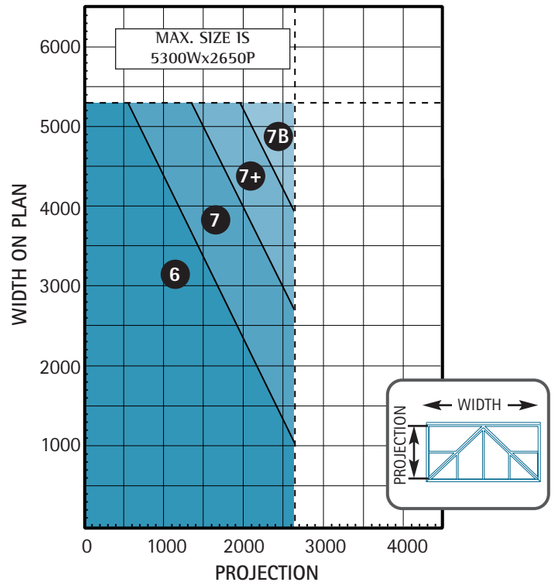


Georgian roofs + woks 15°-19.9° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions

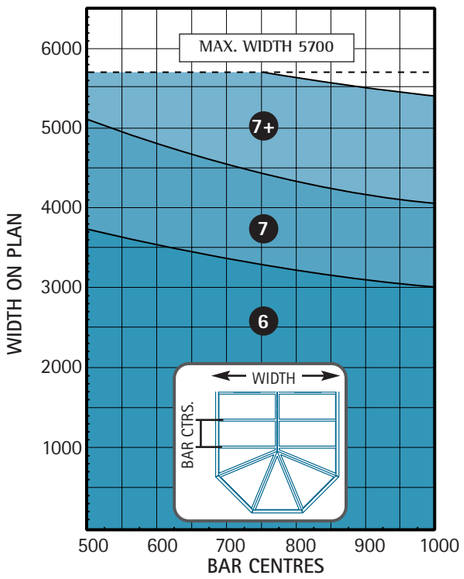


HIP SELECTION CHART
Use also for wok roofs and roofs without tie bars

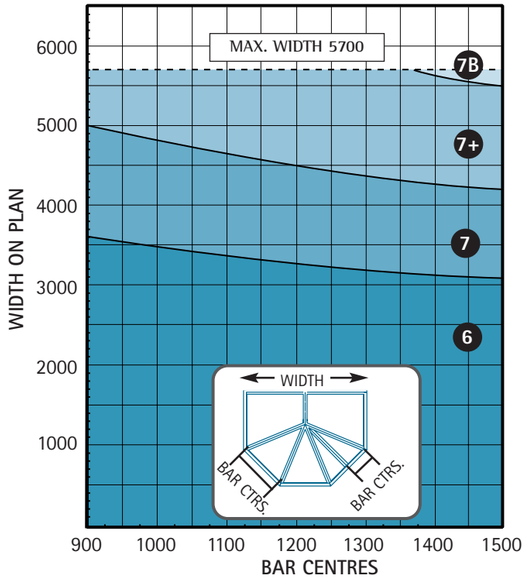


Victorian roofs + Woks 15°-35° roof pitch

TRANSOM SELECTION CHART
For roofs with Tie Bars



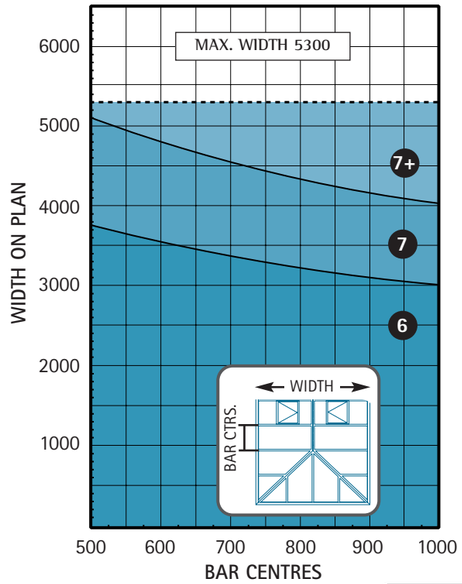
HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



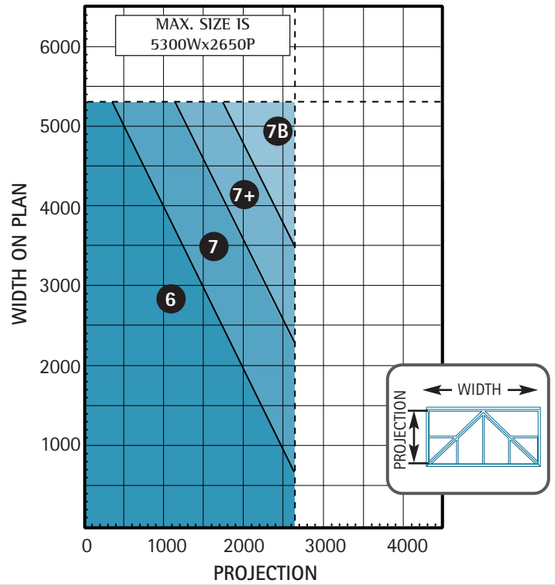
For roofs over 35° and for larger roofs consult Ultraframe technical department

Georgian roofs + woks 20°-35° roof pitch

TRANSOM SELECTION CHART
Width of roof is determined due to combined forces in glazing bar at tie bar positions



HIP SELECTION CHART
Use also for half and quarter wok roofs and roofs without tie bars



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glazing bar span chart

6/6+6.4/6.4 Glass 0.8kN/m² snow load

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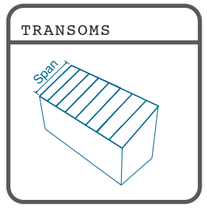
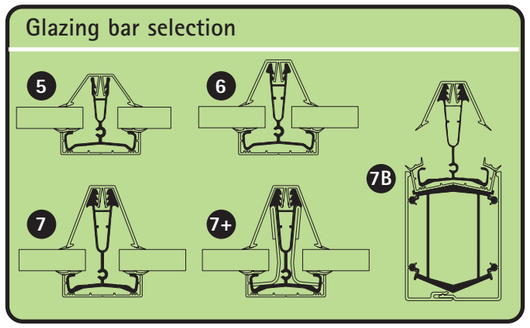
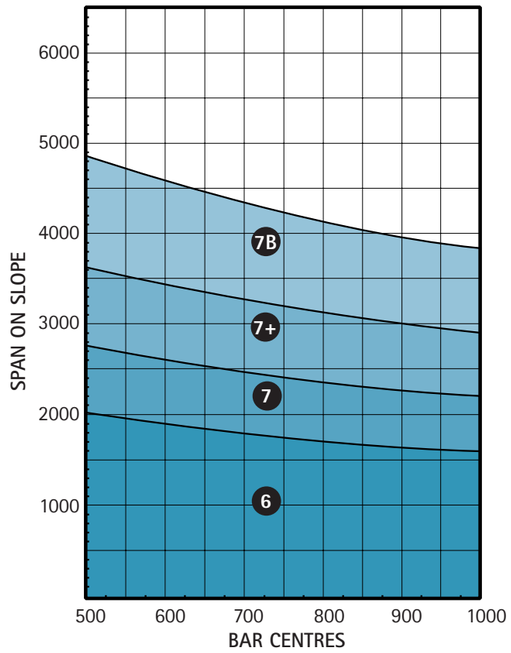
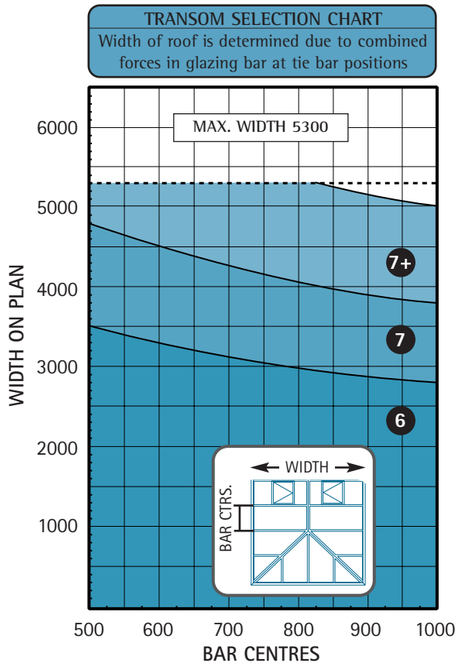
Lean - to's 5°-30° roof pitch

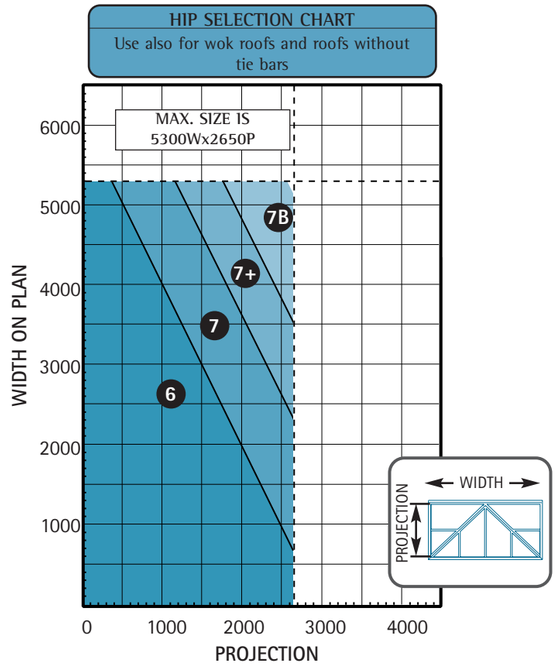




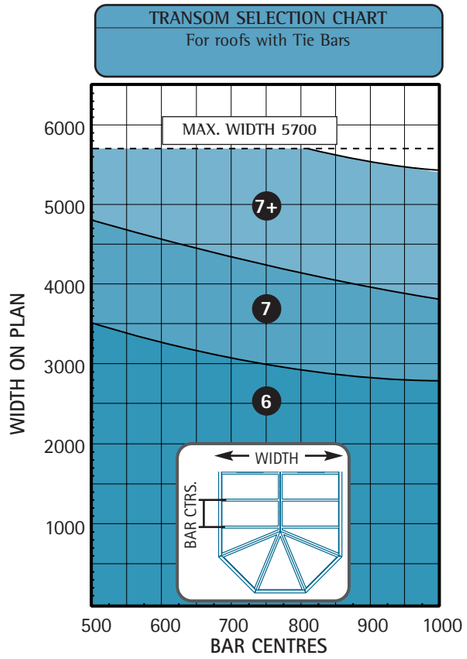


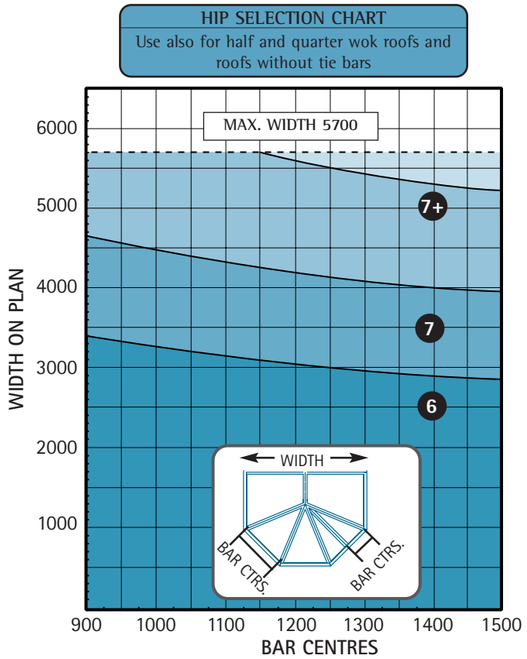
Georgian roofs + woks 15°-19.9° roof pitch





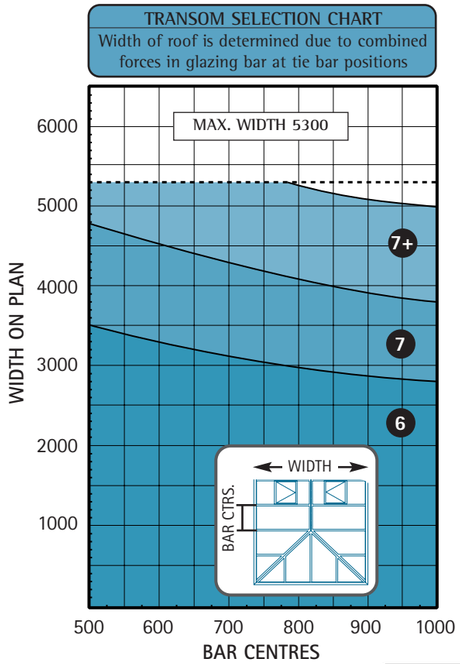
Victorian roofs + Woks 15°-35° roof pitch

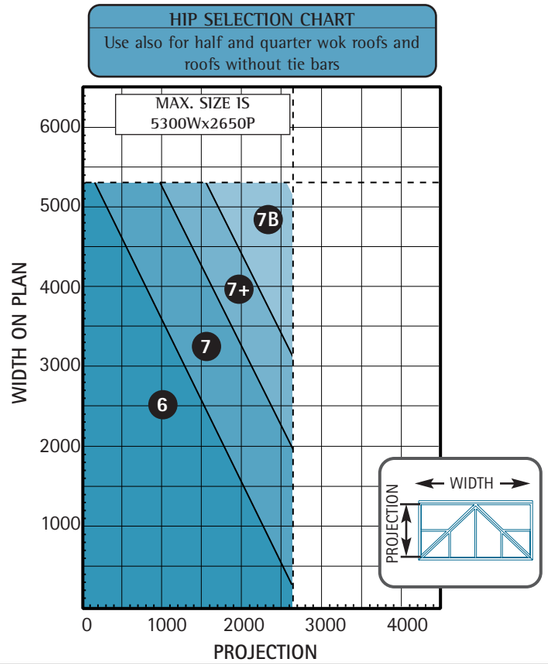




For roofs over 35° and for larger roofs consult Ultraframe technical department

Georgian roofs + woks 20°-35° roof pitch

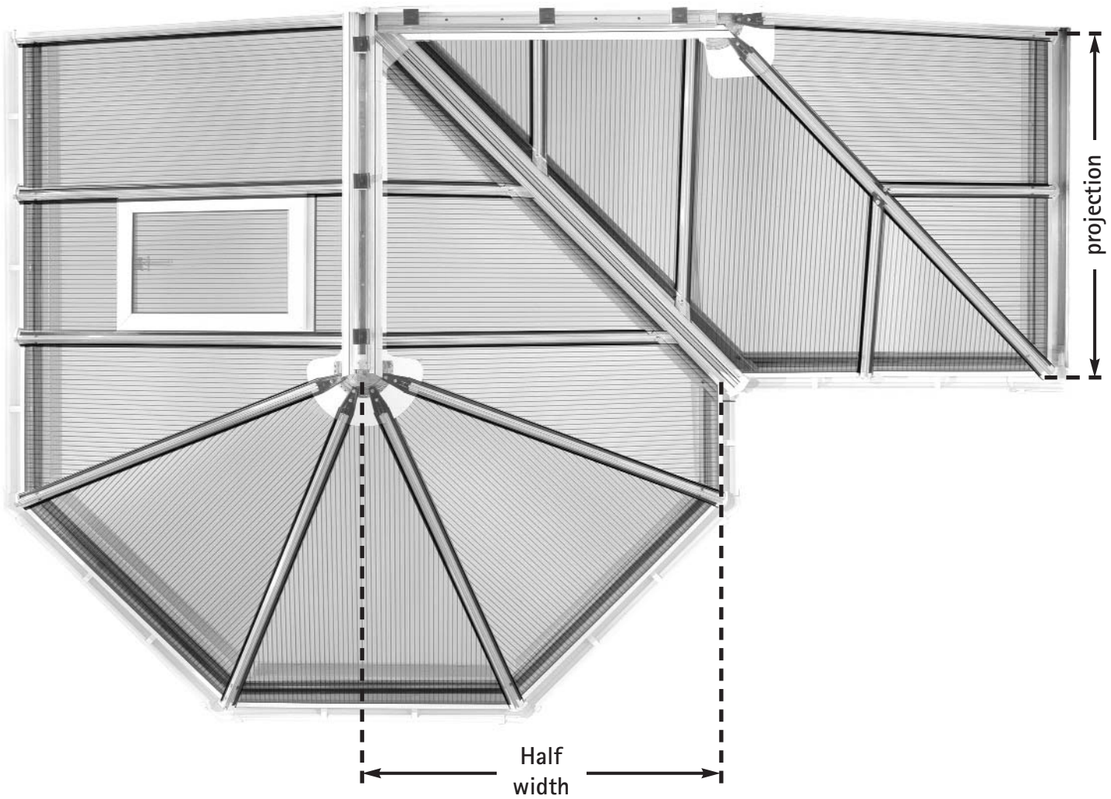




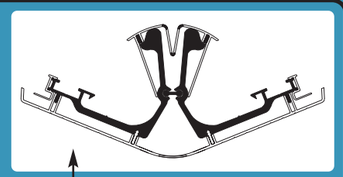
For roofs over 35° and for larger roofs consult Ultraframe technical department

valley selection guide

from width and projection determine valley specification

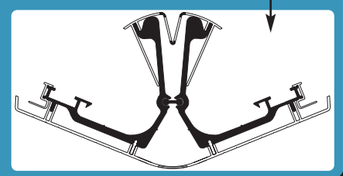


Valley Type	Glazing Bars
Light	6 Series
Heavy	7 & 7+ Series



Valley selection

Light Heavy

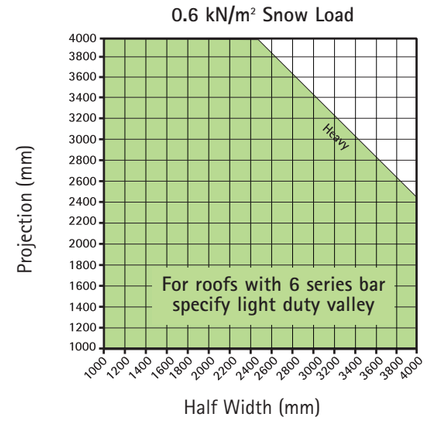


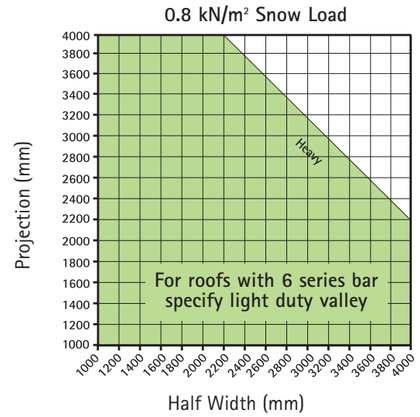
Charts based on 600-900 bar centres

valley selection guide

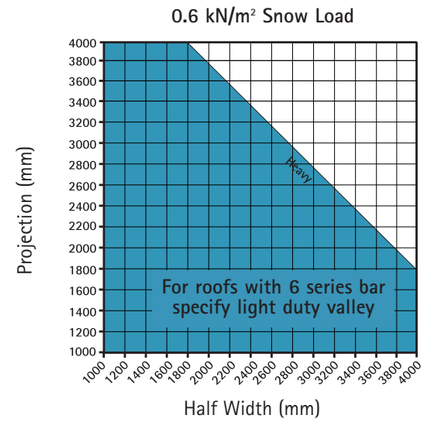
from width and projection determine valley specification

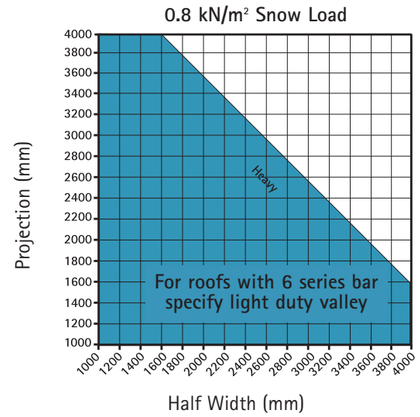
Polycarbonate



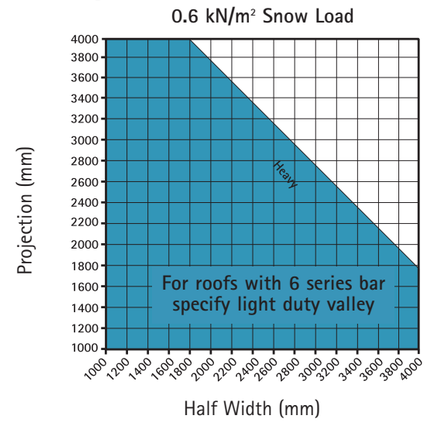


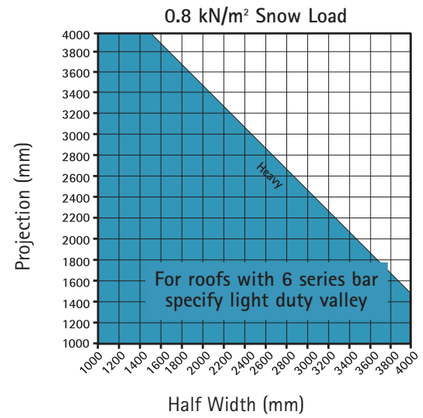
4/4mm glass





6/6+6.4/6.4mm glass





Diagrams are for guidance only. For specific rules refer to figures quoted

Tie bar rules apply to Vic 3 and 5 bay and Georgian roofs. These are based on 0.6kN/m² and 0.8kN/m² snow load and polycarbonate.

Roofs at 15°–19.9º pitch

RIDGE LENGTH	CONSERVATORY WIDTH: Up to 3000mm		3001mm to 4000mm		4001mm to 5000mm		5001mm to 6200mm (5500 georgian)	
0 - 1000mm		Ridge length without Tie Bars. ❶ Max 1000		Ridge length without Tie Bars. ❶ Max 1000		Ridge length without Tie Bars. ❶ Max 500		Ridge length without Tie Bars. ❶ Max 500 (0 for Georgians)
1001mm - 1500mm		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000
1501mm - 2000mm		Tie Bar centres for longer ridges ❸ Max 2400		Tie Bar centres for longer ridges ❸ Max 2400		Tie Bar centres for longer ridges ❸ Max 1900		Tie Bar centres. ❸ Max 1900
2001mm - 3000mm								
3001mm - 4000mm								

Roofs at 20°–35° pitch

for roofs outside this matrix and the guidelines on pages 29–30 contact Ultraframe technical dept.

RIDGE LENGTH	CONSERVATORY WIDTH: Up to 3000mm		3001mm to 4000mm		4001mm to 5000mm		5001mm to 6500mm (5800 georgian)	
0 - 1000mm		Ridge length without Tie Bars. ❶ Max 2500		Ridge length without Tie Bars. ❶ Max 2000		Ridge length without Tie Bars. ❶ Max 1500		Ridge length without Tie Bars. ❶ Max 1000
1001mm - 1500mm		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000
1501mm - 2000mm		Tie Bar centres for longer ridges ❸ Max 3000		Tie Bar centres for longer ridges ❸ Max 3000		Tie Bar centres for longer ridges ❸ Max 2400		Tie Bar centres. ❸ Max 2400
2001mm - 3000mm								
3001mm - 4000mm								

❶ Ridge length without Tie Bars

❷ Distance from the Finial

❸ Tie Bar centres

5 way tie bar rules

Georgian roofs greater than 5m Width
Victorian roofs greater than 5.75m overall width
or a front facet greater than 3.75m

Tie bar requirements –

Double ended ridges/hipped back conservatory roofs.
See page 33 for box gutter support guide.

Tie bars (see table right)

Conservatory span

Conserv. Span	Ridge length	Tie Bar Required
less than 3.5m	less than 1m	None
less than 3.5m	greater than 1m + less than 2.5m	1 central tie bar
greater than 3.5m	less than 1.5m	1 central tie bar
greater than 3.5m	greater than 1.5m + less than 2.5m	2 tie bars at finial positions

NOTE: FOR RIDGE LENGTHS GREATER THAN 2.5m SEE RULES ABOVE

Diagrams are for guidance only. For specific rules refer to figures quoted

Tie bar rules apply to Vic 3 and 5 bay and Georgian roofs. These are based on 0.6kN/m² and 0.8kN/m² snow load and polycarbonate.

Roofs at 15°–19.9º pitch (glass)

RIDGE LENGTH	CONSERVATORY WIDTH: Up to 3000mm		3001mm to 4000mm		4001mm to 5000mm		5001mm to 5700mm (5300 georgian)	
0 - 1000mm		Ridge length without Tie Bars. ❶ Max 750		Ridge length without Tie Bars. ❶ Max 500		Ridge length without Tie Bars. ❶ Max 500		Ridge length without Tie Bars. ❶ Max 500 (0 for Georgians)
1001mm - 1500mm		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000
1501mm - 2000mm		Tie Bar centres for longer ridges ❸ Max 2000		Tie Bar centres for longer ridges ❸ Max 2000		Tie Bar centres for longer ridges ❸ Max 1600		Tie Bar centres. ❸ Max 1600
2001mm - 3000mm								
3001mm - 4000mm								

Roofs at 20°–30° pitch (glass)

for roofs outside this matrix and the guidelines on pages 29–30 contact Ultraframe technical dept.

RIDGE LENGTH	CONSERVATORY WIDTH: Up to 3000mm		3001mm to 4000mm		4001mm to 5000mm		5001mm to 5700mm (5300 georgian)	
0 - 1000mm		Ridge length without Tie Bars. ❶ Max 2000		Ridge length without Tie Bars. ❶ Max 1500		Ridge length without Tie Bars. ❶ Max 1000		Ridge length without Tie Bars. ❶ Max 500
1001mm - 1500mm		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000		Distance from the Finial. ❷ Max 1000
1501mm - 2000mm		Tie Bar centres for longer ridges ❸ Max 2400		Tie Bar centres for longer ridges ❸ Max 2400		Tie Bar centres for longer ridges ❸ Max 1900		Tie Bar centres. ❸ Max 1900
2001mm - 3000mm								
3001mm - 4000mm								

❶ Ridge length without Tie Bars

❷ Distance from the Finial

Tie Bar centres ❸

5 way tie bar rules

Georgian roofs greater than 4.7m Width
Victorian roofs greater than 5.5m overall width
or a front facet greater than 3.5m

Tie bar requirements –

Double ended ridges/hipped back conservatory roofs.
See page 33 for box gutter support guide.

Tie bars (see table right)

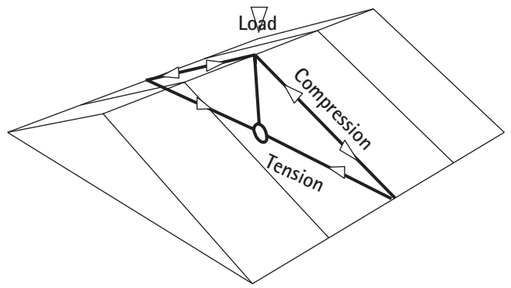
Conservatory span

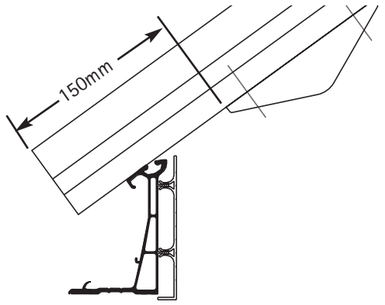
Conserv. Span	Ridge length	Tie Bar Required
less than 3.5m	less than 1m	None
less than 3.5m	greater than 1m + less than 2.5m	1 central tie bar
greater than 3.5m	less than 1.5m	1 central tie bar
greater than 3.5m	greater than 1.5m + less than 2.5m	2 tie bars at finial positions

NOTE: FOR RIDGE LENGTHS GREATER THAN 2.5m SEE RULES ABOVE

Basic tie bar rules

1. The requirements for tie bars within a conservatory are primarily dependant on the length of the ridge (measured from house wall to finial point).
2. Loading on the roof (snow or dead) will cause a minimal vertical deflection along the ridge length which in turn imparts a horizontal reaction (thrust) at the eaves beam through the glazing bars.
3. The tie bar system restrains the horizontal reaction minimising horizontal spread of the eaves beam.
4. Tie bars should always be positioned in line with and **directly under glazing bars** (forming a vertical triangle) and supporting the ridge.
5. Standard fixing detail is to the glazing bar with bracket connection to eaves beams and other areas possible though advice should be sought on individual instances.

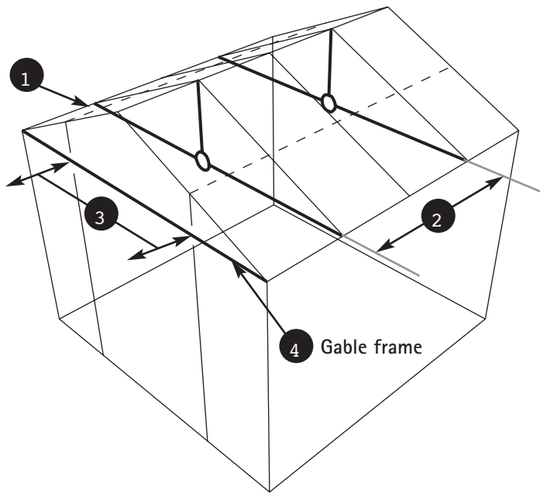




gable ended roofs

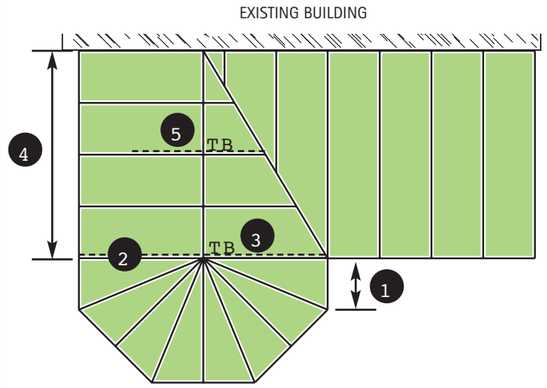
1. Position the first tie bar at penultimate glazing bar to gable end, this is to minimise any loads imparted on the gable frame.
2. Tie bars need to be positioned in line with and directly under glazing bars (refer to Georgian tie bar rules on page 25-28)

   Spacing of the tie bars to be as guidelines on pages 25-28
3. On gable frame assemblies (also lean to roofs) attention should be given to the strength required of the mullions and transoms for resistance to wind loads (see no. 3 right)
4. The critical detail where a mullion or transom transfers wind loads to the roof structure requires specific attention.
   All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for vertical and lateral loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. For specific guidance consult your side frame system supplier.



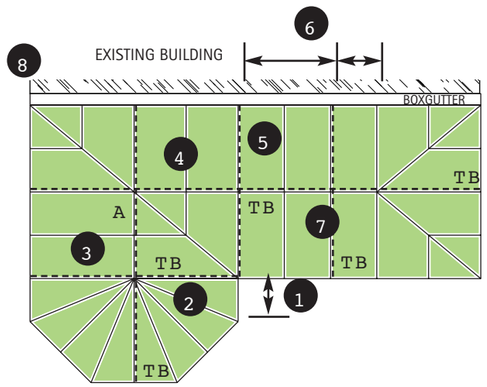
"P" shape

1. Length of return ideally to be 300mm to ease fabrication of corner with incoming valley member
2. Finial point to be positioned in line with lean-to external wall or beyond when Victorian section width is greater than 3.0m (glass or polycarbonate)
3. Position glazing bar and tie bar at finial position
4. Spacing of tie bars along the ridge as stated in tie bar spacing guidelines on pages 25-28 of this guide
5. All tie bars and glazing bars **MUST BE IN-LINE**



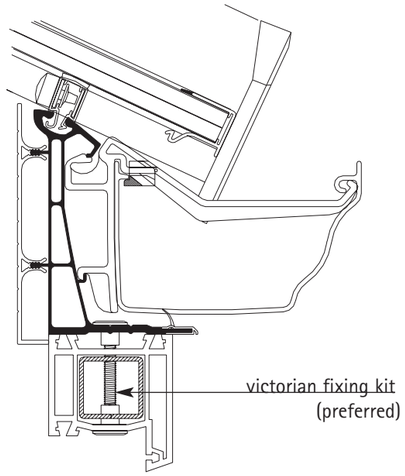
"L" shape

1. Length of return to be ideally 300mm to ease fabrication of corner with incoming valley member
2. Finial point to be aligned in line with lean-to return wall or beyond
3. Position glazing bar at finial position along with 3/5 way tie bar as required
4. Specify 5 way tie bar in either position (*) or both if required by width of georgian ends to support position 'A'
5. Position tie bar in-line with return wall
6. Spacing of remaining tie bars as stated in the tie bar guidelines
7. All tie bars and glazing bars **MUST BE IN-LINE**
8. Position gallows bracket/brick pier under the boxgutter at the tie bar positions



eaves beam

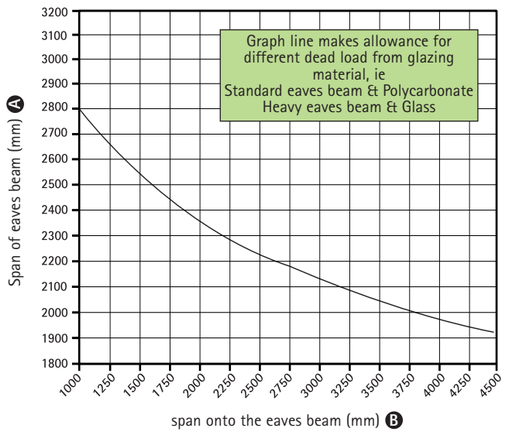
Multi-eaves beam

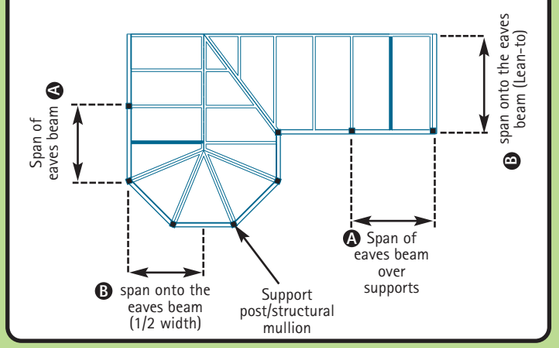


Multi-eaves beam chart

Light - Polycarbonate Heavy - Glass

Eaves beam charts based on eaves beam spanning between posts with tie bars aligned with posts / frame stiffener





guidelines for use

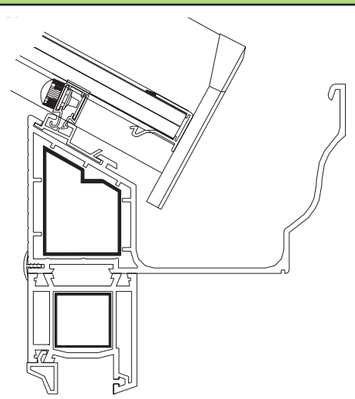
Generally use standard multi-eaves beam, except as below.

Use the heavy duty multi-eaves beam for these roof types-

- Glass
- Where tie bars are included

Ultraframe recommend the use of victorian fixing kits on all roofs when possible

Ultraquick



Victorian roofs:
three bay & five bay - maximum width of roof recommended when using Ultraquick is 4750mm for polycarbonate glazing & 4250mm for glass.

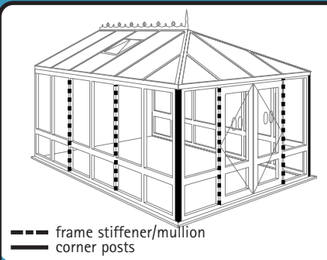
Georgian roofs:
square fronted - maximum width of roof recommended when using Ultraquick is 4250mm for polycarbonate glazing & 3900mm for glass.

Lean-to roofs:
width of roof should not exceed the spans recommended for glazing bars (see glazing bar loading graphs for information)

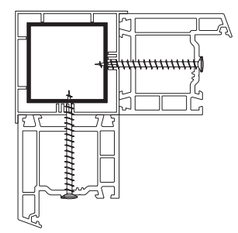
For conservatories in excess of the above sizes, we recommend using heavy duty multi-eaves beam

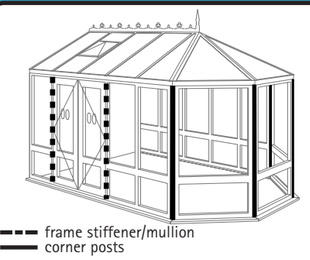
corner post selection and use

Ultraframe supply a range of corner posts to suit all frame thicknesses and profile colours, including mahogany and light oak. These can provide vertical support for the roof transferring loads from the eaves beam to the base of the conservatory. This avoids over stressing the side walls of the conservatory which may not have been designed to support the roof.

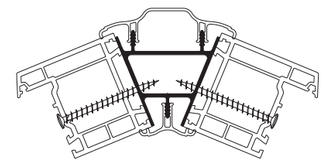


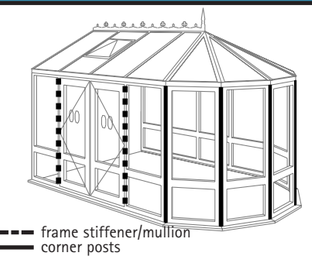
90° Corner Post



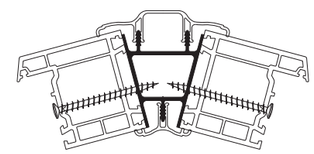


135° Corner Post

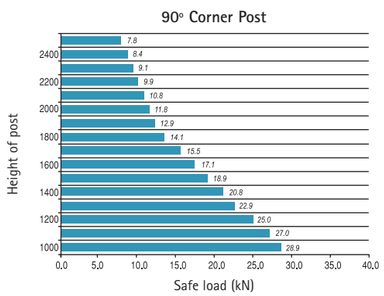


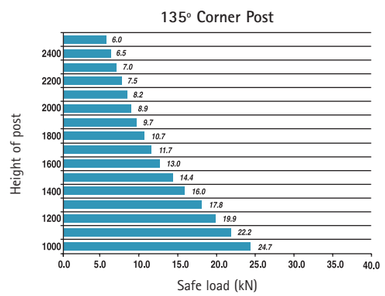


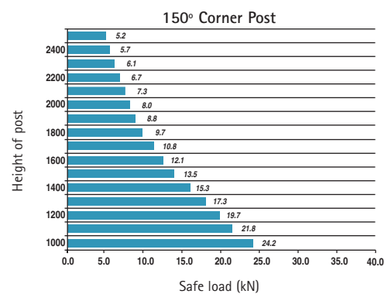
150° Corner Post



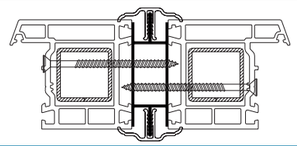
- Based on 0.6kN/m² snow load and 6/6 double glazed units, total load is 0.93kN/m² ie approximately (1kN/m²)
- A 2.1m high 150° corner post has a safe load capacity of 7.3kN, which is equivalent to supporting an approximate area of 7.3m²
- Window profile <u>must</u> be positively fixed to the corner post at 500mm centres min.





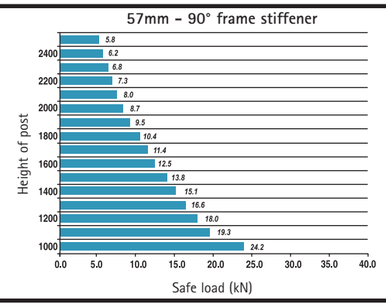


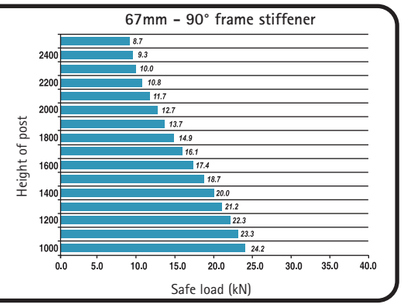
Based on 60mm frame corner post being unrestrained in both directions. 135° and 150° 73mm frame corner posts are available - contact Ultraframe Technical support team if larger capacities than those given.



Frame Stiffener

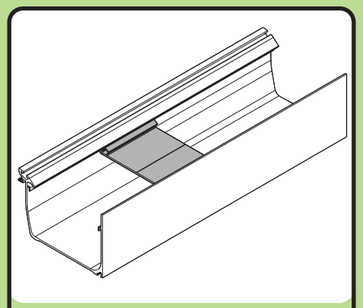
- Based on the window profile providing restraint against lateral buckling
- Window profile <u>must</u> be positively fixed to the frame stiffener at 500mm centres min.



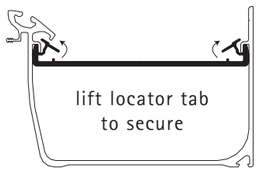


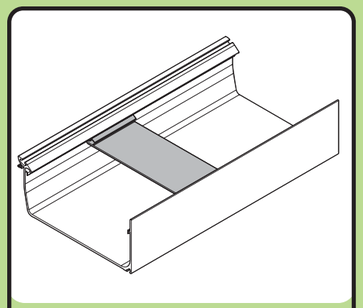
boxgutter support systems

Boxgutter Straps -

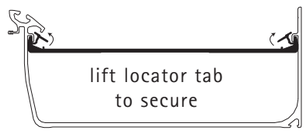


165 Boxgutter Strap





265 Boxgutter Strap



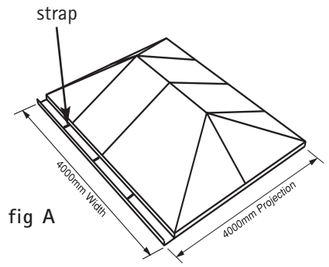


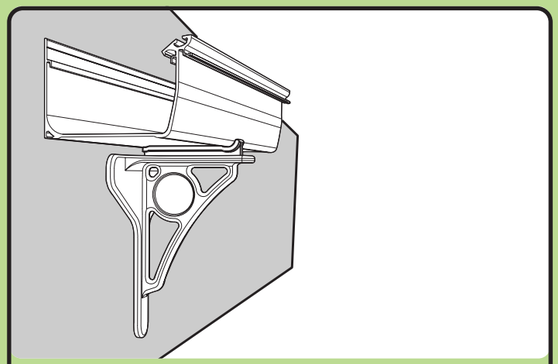
fig A

The structural performance of the boxgutter system relies on the correct specification of fixings, please consult fixings supplier for advice

Requirements

- Strap all Boxgutters for glass roofs
- Strap all Boxgutters for roofs with Tie Bars
- Strap all Boxgutters for polycarbonate roofs over 4.0m in width and/or projection (see fig A)
- Straps to be positioned within 75mm of glazing bar centres (centre of strap to centre of bar)
- For clear spanning boxgutters consult Ultraframe for advice
- Strap all boxgutters with width greater than 165, ie. 265, 300 and fabricated boxgutters

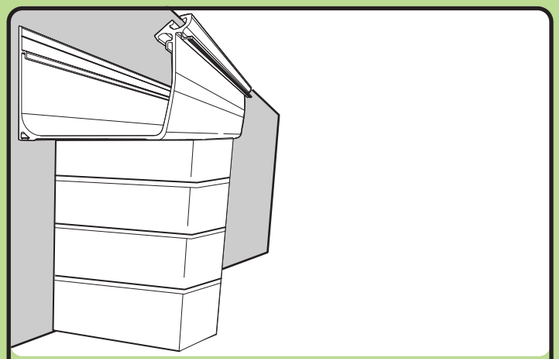
Gallows Bracket -



Requirements for Gallows Bracket -

- Roofs with Tie Bars require a gallows bracket at each Tie Bar position
- Polycarbonate roofs over 4.5m in width or projection and glass roofs over 3.0m in width or projection require a gallows bracket at every third glazing bar (ie typically at 2.0m to 2.4m Centres
- Maximum span of 2.25m for unsupported boxgutters

Alternative Support -



- Unless the strength of the masonry to which the gutter is to be attached is known, Ultraframe generally recommends the use of brick piers to support the boxgutter
- With timber soffits and fascias, Ultraframe generally recommends the use of brick piers to support the boxgutter

Lantern Roofs in Glass or Polycarbonate

Pitch	Georgian/Faceted Georgian	3 Bay Victorian
MAIN ROOF	25° (+1/-4)	25° (+1/-4)
LANTERN ROOF	25° Fixed	25° Fixed

Glazing Bar Series	Georgian/Faceted Georgian	3 Bay Victorian
MAIN ROOF	7 Series	7 Series
LANTERN ROOF	5 / 6 Series	5 / 6 Series

Roof Sizes	Georgian/Faceted Georgian	3 Bay Victorian
MAIN ROOF WIDTH	4500mm	3750mm
MAIN ROOF LENGTH	6000mm	6000mm
LANTERN ROOF WIDTH	0.3 x overall width - max 1200mm	0.3 x overall width - max 1125mm

(WIDER ROOFS ARE POSSIBLE PLEASE CONSULT ULTRAFRAME)

A glazing bar is always required in a central position on the front facet

Tie Bars & Struts	Georgian/Faceted Georgian	3 Bay Victorian
FREQUENCY (see below)	1500mm centres - Glass	1500mm centres - Glass
	1800mm centres - Polycarbonate	1800mm centres - Polycarbonate

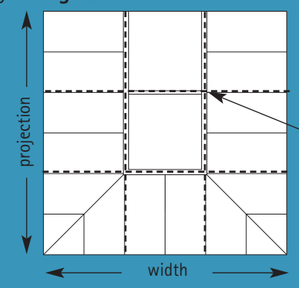
Wider Georgian conservatories and faceted georgians require 5 way tie bars.

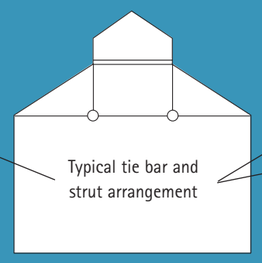
FOR FULL ROOF SPECIFICATIONS CONTACT ULTRAFRAME

Tie bar and Strut requirements:-

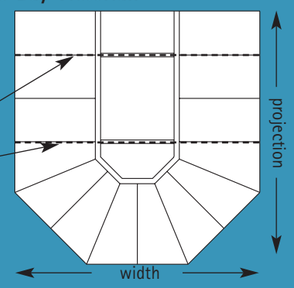
NB TIE BARS AND STRUTS TO ALIGN WITH GLAZING BARS

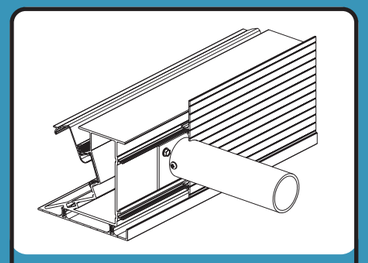
e.g. **Georgian***





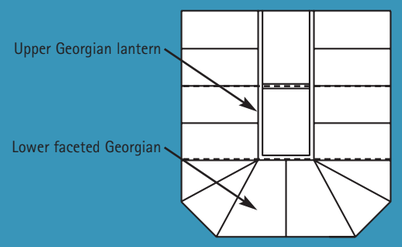
e.g. **3 Bay Victorian**





strut

e.g. **Faceted Georgian**



Faceted Georgian with Georgian lantern allows wider spans

United Kingdom

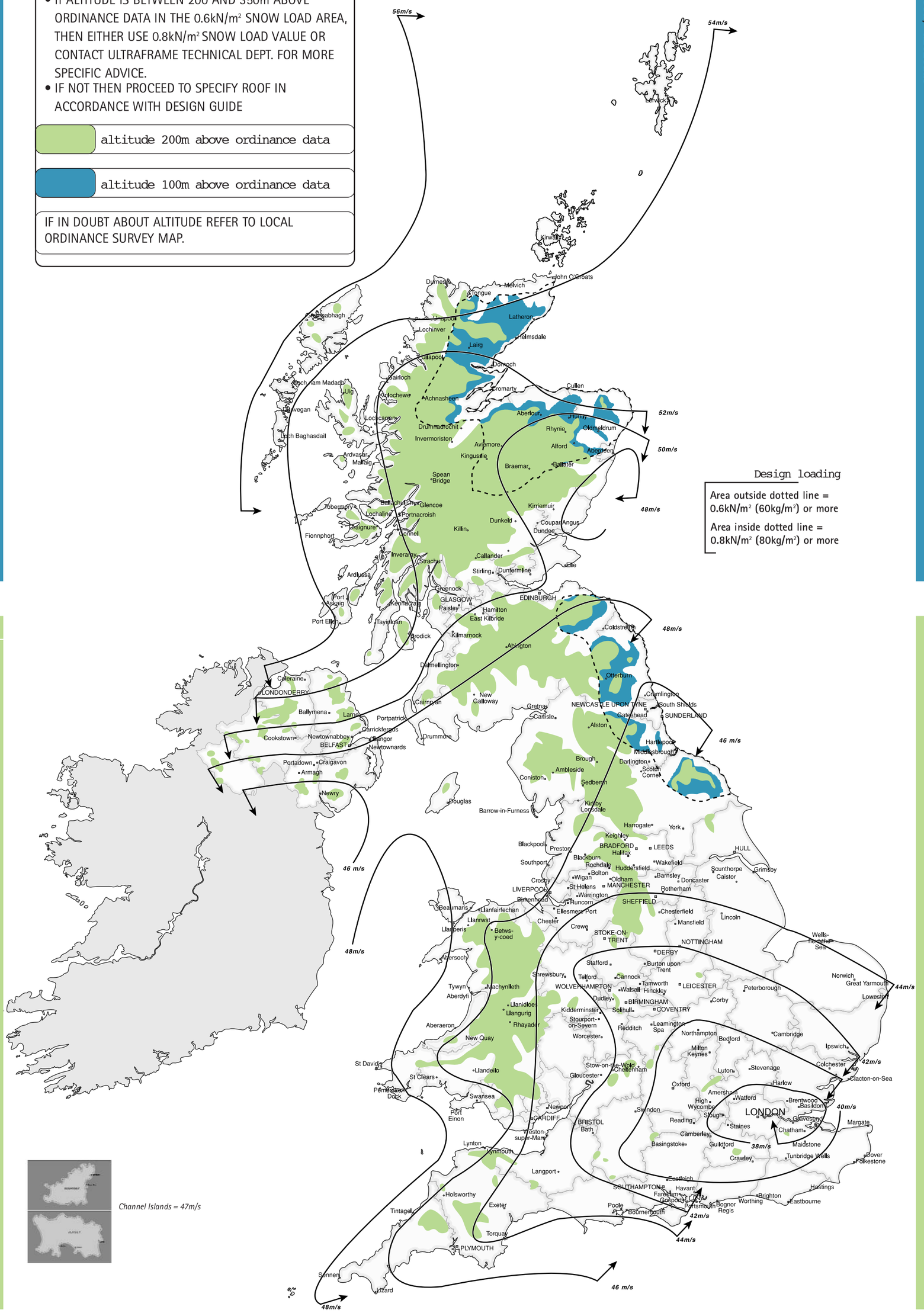
(snow, wind speed, altitude

- CHECK LOCATION FOR EXTREME CONDITIONS OF ALTITUDE AND SNOW LOAD
- IF SITE IS LOCATED IN EITHER THE BLUE OR GREEN AREAS CONTACT ULTRAFRAME TECH DEPT
- If ALTITUDE IS BETWEEN 200 AND 350m ABOVE ORDINANCE DATA IN THE 0.6kN/m² SNOW LOAD AREA, THEN EITHER USE 0.8kN/m² SNOW LOAD VALUE OR CONTACT ULTRAFRAME TECHNICAL DEPT. FOR MORE SPECIFIC ADVICE.
- IF NOT THEN PROCEED TO SPECIFY ROOF IN ACCORDANCE WITH DESIGN GUIDE

altitude 200m above ordinance data

altitude 100m above ordinance data

IF IN DOUBT ABOUT ALTITUDE REFER TO LOCAL ORDINANCE SURVEY MAP.



Altitude of towns and cities in the UK (rounded up to 60m intervals)

GRID REF	LOCATION	ALTITUDE
NJ9406	Aberdeen, Grampn	060
SO3014	Abergavenny, Gwent	120
SN5881	Aberystwyth, Dyfed	060
NU1813	Alnwick, Northum	060
SU9798	Amersham, Bucks	180
SU3645	Andover, Hants	120
SK1846	Ashbourne, Derby	180
TR0142	Ashford, Kent	060
NZ2787	Ashington, Northum	060
ST5178	Avonmouth, Avon	060
SP8113	Aylesbury, Bucks	120
NS3320	Ayr, Strath	060
SH9236	Bala, Gwyn	240
SP4540	Banbury, Oxon	180
SH5771	Bangor, Gwyn	120
SE3406	Barnsley, S.Yks	180
SS5533	Barnstaple, Devon	060
SD1969	Barrow-in-Furness, Cumbr	060
TQ7088	Basildon, Essex	060
SU6352	Basingstoke, Hants	120
ST7464	Bath, Avon	060
SK6593	Bawtry, S.Yks	060
SU9390	Beaconsfield, Bucks	120
TM4290	Beccles, Suff	060
TL0449	Bedford, Beds	060
NT9953	Berwick-upon-Tweed, Northum	060
SH7956	Betws-y-Coed, Gwyn	240
SS4526	Bideford, Devon	060
SJ3288	Birkenhead, Mers	000
SP0787	Birmingham, W.Mids	120
NZ2029	Bishop Auckland, Durham	120
TL4821	Bishop's Stortford, Herts	120
SD6828	Blackburn, Lancs	180
SD3035	Blackpool, Lancs	060
ST8806	Blandford Forum, Dorset	120
SX0767	Bodmin, Corn	180
SZ9399	Bognor Regis, W.Susx	000
SD7108	Bolton, G.Man	120
SJ3394	Bootle, Mers	060
TF3244	Boston, Lincs	060
SZ0991	Bournemouth, Dorset	060
SE1633	Bradford, W.Yks	180
NO1591	Braemar, Grampn	420
SO0428	Brecon, Powys	180
ST3037	Bridgwater, Somer	060
TA1866	Bridlington, N.Yks	060
TQ3104	Brighton, E.Susx	120
ST5973	Bristol, Avon	060
SO9670	Bromsgrove, H.&W	120
NY7914	Brough, Cumbr	240
SS2106	Bude, Corn	060
SO0451	Builth Wells, Powys	180
SD8432	Burnley, Lancs	180
SK2423	Burton upon Trent, Staffs	060
TL8564	Bury St Edmunds, Suff	060
SK0673	Buxton, Derby	420
SH4862	Caernarfon, Gwyn	060
TL4558	Cambridge, Cambs	060
NR7120	Campbeltown, Strath	060
SJ9810	Cannock, Staffs	180
TR1557	Canterbury, Kent	060
ST1876	Cardiff, S.Glam	060
SN1846	Cardigan, Dyfed	060
NY4055	Carlisle, Cumbr	060
SN4120	Carmarthen, Dyfed	060
TL7007	Chelmsford, Essex	060
SO9522	Cheltenham, Glos	120
ST5393	Chepstow, Gwent	060
SJ4066	Chester, Ches	060
SK3871	Chesterfield, Derby	120
SU8604	Chichester, W.Susx	060
SP0201	Cirencester, Glos	120
TQ3281	City of London, G.Lon	060
TM1714	Clacton-on-Sea, Essex	060
NY1230	Cockermouth, Cumbr	120
TM0025	Colchester, Essex	060
NT8439	Coldstream, Border	060
SJ8663	Congleton, Ches	120
NZ1051	Consett, Durham	300
SH7778	Conwy, Gwyn	120
NY9964	Corbridge, Northum	180
SP8888	Corby, Norhnts	120
SP3379	Coventry, W.Mids	120
TQ2736	Crawley, W.Susx	120
NN3825	Crianlarich, Central	240
TG2142	Cromer, Norf	060
TQ3365	Croydon, G.Lon	120
ST2995	Cwmbran, Gwent,	80
TQ5084	Dagenham, G.Lon	060
NZ2914	Darlington, Durham	060
SK3536	Derby, Derby	060
SE2422	Dewsbury, W.Yks	120
TM1179	Diss, Norf	060
SH7217	Dolgellau, Gwyn	300
SE5702	Doncaster, S.Yks	060
SY6890	Dorchester, Dorset	120
TQ1648	Dorking, Surrey	120
TR3141	Dover, Kent	060
TF6103	Downham Market, Norf	060
SO9490	Dudley, W.Mids	240
NX9776	Dumfries, D&G	060
NO4030	Dundee, Tays	120
TL0122	Dunstable, Beds	180
NZ2642	Durham, Durham	120
TQ3938	East Grinstead, W.Susx	180
TV6199	Eastbourne, E.Susx	060
NT2573	Edinburgh, Lothn	060
NJ2162	Elgin, Grampn	060
TL5380	Ely, Cambs	060
TQ1464	Esher, Surrey	060
SP0343	Evesham, H.&W	060
SX9292	Exeter, Devon	060
SW8032	Falmouth, Corn	060
SU5706	Fareham, Hants	060
TM2934	Felixstowe, Suff	060
SM9537	Fishguard, Dyfed	120
SD3247	Fleetwood, Lancs	060
TR2235	Folkestone, Kent	060
NO4550	Forfar, Tays	120
NN1073	Fort William, Highld	120
NJ9967	Fraserburgh, Grampn	060
ST7747	Frome, Somer	120
SK8189	Gainsborough, Lincs	060
NT4936	Galashiels, Border	180
NZ2560	Gateshead, T.& W	120
NS5865	Glasgow, Strath	060
ST4938	Glastonbury, Somer	060
SO8318	Gloucester, Glos	060
SK9135	Grantham, Lincs	120
TG5207	Great Yarmouth, Norf	060
NS2776	Greenock, Strath	060
TA2709	Grimsby, Humbs	060
SU9949	Guildford, Surrey	120
SE0925	Halifax, W.Yks	180
TL4510	Harlow, Essex	120
SE3055	Harrogate, N.Yks	120
NZ5132	Hartlepool, Cleve	060
TM2632	Harwich, Essex	000
TQ8109	Hastings, E.Susx	060
TL2208	Hatfield, Herts	120
SW6527	Helston, Corn	060
TL0507	Hemel Hempstead, Herts	120
SO5140	Hereford, H.&W	060
TL3212	Hertford, Herts	060
NY9364	Hexham, Northum	180
SU8593	High Wycombe, Bucks	120
SP4293	Hinckley, Leics	180
SH2482	Holyhead, Gwyn	060
ST1600	Honiton, Devon	120
TQ1730	Horsham, W.Susx	060
SE1416	Huddersfield, W.Yks	180
SU3368	Hungerford, Berks	120
TL2371	Huntingdon, Cambs	060
NH6645	Inverness, Highld	060
TM1644	Ipswich, Suff	060
NS3238	Irvine, Strath	060
NT6520	Jedburgh, Border	120
SD5192	Kendal, Cumbr	180
SP8678	Kettering, Northnts	120
SO8376	Kidderminster, H.&W	120
NS4238	Kilmarnock, Strath	120
TF6119	King's Lynn, Norf	060
TA0928	Kingston upon Hull, Humbs	060
TQ1869	Kingston upon Thames, G.Lon	060
SD6178	Kirkby Lonsdale, Cumbr	120
NT2791	Kirkcaldy, Fife	060
NG7627	Kyle of Lochalsh, Highld	120
SD4761	Lancaster, Lancs	060
SX3384	Launceston, Corn	180
SP3265	Leamington Spa Royal, Warw	060
SE3034	Leeds, N.Yks	060
SK5804	Leicester, Leic	060
SO4959	Leominster, H.&W	120
TQ4110	Lewes, E.Susx	060
SK1209	Lichfield, Staffs	120
SK9771	Lincoln, Lincs	060
SX2564	Liskeard, Corn	180
SJ3490	Liverpool, Mers	060
SN6322	Llandeilo, Dyfed	120
SN7634	Llandovery, Dyfed	180
SO0661	Llandrindod Wells, Powys	300
SH7882	Llandudno, Gwyn	120
SN5100	Llanelli, Dyfed	060
SJ2142	Llangollen, Clwyd	180
SN9180	Llangurig, Powys	420
SK5319	Loughborough, Leic	060
TM5493	Lowestoft, Suff	060
TL0921	Luton, Bed	120
SJ9173	Macclesfield, Ches	180
SH7400	Machynlleth, Powys	060
SU8881	Maidenhead, Berks	060
TQ7655	Maidstone, Kent	060
NM6796	Mallaig, Highld	060
SJ8397	Manchester, G.Man	060
SK5361	Mansfield, Notts	120
TL4196	March, Cambs	060
TR3571	Margate, Kent	040
SP7387	Market Harborough, Leic	180
SU1969	Marlborough, Wilts	180
SK3060	Matlock, Derby	300
SK7519	Melton Mowbray, Leic	120
SO0506	Merthyr Tydfil, M.Glam	240
NZ4920	Middlesbrough, Cleve	060
SU8821	Midhurst, W.Susx	060
SM9006	Milford Haven, Dyfed	060
SP8733	Milton Keynes, Bucks	120
SO5113	Monmouth, Gwent	060
SD4364	Morecambe, Lancs	060
NZ1986	Morpeth, Northum	120
SJ6552	Nantwich, Ches	060
SS7497	Neath, W.Glam	180
SK7953	Newark-on-Trent, Notts	060
SU4767	Newbury, Berks	120
NZ2464	Newcastle upon Tyne, T.& W	120
SJ8546	Newcastle-under-Lyme, Staffs	120
TQ4401	Newhaven, E.Susx	060
TL6463	Newmarket, Suff	060
ST3188	Newport, Gwent	060
NN7199	Newtonmore, Highld	420
SO1191	Newtown, Powys	120
SP7560	Northampton, Northnts	060
SJ6573	Northwich, Ches	060
TG2308	Norwich, Norf	060
SK5741	Nottingham, Notts	120
SP3691	Nuneaton, Leic	120
NM8530	Oban, Strath	060
SX5895	Okehampton, Devon	240
SD9204	Oldham, G.Man	240
TQ4665	Orpington, G.Lon	120
SJ2929	Oswestry, Shrops	180
SP5106	Oxford, Oxon	060
NS4864	Paisley, Strath	060
NT2540	Peebles, Border	240
SW4730	Penzance, Corn	060
NO1123	Perth, Tays	060
TL1998	Peterborough, Cambs	060
NK1346	Peterhead, Grampn	060
SU7423	Petersfield, Hants	120
SX4755	Plymouth, Devon	060
SZ0190	Poole, Dorset	060
SS7690	Port Talbot, W.Glam	060
SH5638	Porthmadog, Gwyn	000
SU6501	Portsmouth, Hants	060
SD5429	Preston, Lancs	060
SJ3168	Queensferry, Clwyd	060
TR3765	Ramsgate, Kent	060
SU7173	Reading, Berks	060
SP0467	Redditch, H.&W	120
TQ2850	Redhill, Surrey	120
SW7042	Redruth, Corn	180
TQ2750	Reigate, Surrey	120
SN9768	Rhayader, Powys	240
TQ1874	Richmond, G.Lon	060
SU1405	Ringwood, Hants	060
SE3171	Ripon, N.Yks	060
SD8913	Rochdale, G.Man	180
SO6024	Ross-on-Wye, H.&W	120
SK4492	Rotherham, S.Yks	120
SP3265	Leamington Spa, Warw	060
SJ5182	Runcorn, Ches	060
SJ1258	Ruthin, Clwyd	060
SU1429	Salisbury, Wilts	060
TA0488	Scarborough, N.Yks	060
SE8910	Scunthorpe, Humbs	060
TQ5255	Sevenoaks, Kent	120
TQ9174	Sheerness, Kent	060
SK3587	Sheffield, S.Yks,	120
SJ4912	Shrewsbury, Shrops	120
TF5663	Skegness, Lincs	060
SD4605	Skelmersdale, Lancs	120
TF0645	Sleaford, Lincs	060
SP1579	Solihull, W.Mids	180
NZ3666	South Shields, T.&W	060
SU4112	Southampton, Hants	060
TQ8785	Southend-on-Sea, Essex	060
SD3316	Southport, Mers	060
TL1407	St Albans, Herts	120
NO5016	St Andrews, Fife	060
SX0152	St Austell, Corn	120
SN2816	St Clears, Dyfed	060
SJ5095	St Helens, Mers	060
SJ9223	Stafford, Staffs	120
TQ0471	Staines, Surrey	060
TF0307	Stamford, Lincs	060
TL2324	Stevenage, Herts	120
NS7993	Stirling, Central	060
NZ4419	Stockton-on-Tees, Cleve	060
SJ8745	Stoke-on-Trent, Staffs	180
SJ9033	Stone, Staffs	120
SP1925	Stow-on-the-Wold, Glos	240
NX0660	Stranraer, D.&G	060
SP2055	Stratford-upon-Avon, Warw	060
SJ7994	Stretford, G.Man	060
SO8505	Stroud, Glos	180
TL8741	Sudbury, Suff	060
NZ3957	Sunderland, T&W	060
TQ2564	Sutton, G.Lon	060
TF8208	Swaffham, Norf	060
SS6593	Swansea, W.Glam	180
SU1585	Swindon, Wilts	120
SK2104	Tamworth, Staffs	120
ST2224	Taunton, Somer	060
SX4774	Tavistock, Devon	180
SJ6910	Telford, Shrops	180
SN1300	Tenby, Dyfed	060
SO8932	Tewkesbury, Glos	060
TL8783	Thetford, Norf	060
SE4382	Thirsk, N.Yks	060
ND1168	Thurso, Highld	060
TQ6376	Tilbury, Essex	060
SX8962	Torbay, Devon	120
SW8244	Truro, Corn	060
NZ3669	Tynemouth, T.&W	060
NH1294	Ullapool, Highld	060
SK0933	Uttoxeter, Staffs	120
SW9872	Wadebridge, Corn	060
SE3320	Wakefield, W.Yks	060
SJ2992	Wallasey, Mers	060
SP0198	Walsall, W.Mids	180
ST8644	Warminster, Wilts	180
SJ6088	Warrington, Ches	060
SP2865	Warwick, Warw	060
TQ1097	Watford, Herts	120
ST5445	Wells, Somer	060
SJ2207	Welshpool or Trallwng, Powys	180
SP0092	West Bromwich, W.Mids	180
TQ2979	Westminster, G.Lon	060
ST3261	Weston-super-Mare, Avon	060
SY6779	Weymouth, Dorset	060
NZ8910	Whitby, N.Yks	060
SJ5441	Whitchurch, Shrops	120
ND3650	Wick, Highld	060
SJ5185	Widnes, Ches	060
SD5805	Wigan, G.Man	060
SU0100	Wimborne Minster, Dorset	060
SU4729	Winchester, Hants	120
SD4198	Windermere, Cumbr	120
TF4609	Wisbech, Cambs	060
SO9198	Wolverhampton, W.Mids	180
SO8555	Worcester, H.&W	120
TQ1402	Worthing, W.Susx	060
SJ3350	Wrexham, Clwyd	120
SE6052	York, N.Yks	060

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