

Goalpost
by Ultraframe

A Simple Guide | Structural Support

Conservatories and Glazed Extensions

A simple guide to specifying structural support when building a conservatory or glazed extension.

The trend for ‘grand design’-style home extensions means homeowners today are opting for large open spans of contemporary bi-fold or sliding doors, opening up homes to the garden and beyond. These contemporary conservatories and extensions flood the home with natural light and provide homeowners with open, uninterrupted views.

When designing these beautiful conservatories and glazed extensions, less structural elements like fixed window panes, brick walls and pillars are used. With less structure in the elevations below the roof, it is extremely important that the correct structural support for the building is included to manage both vertical and lateral forces.

Specifying structural support, unless you are a qualified structural engineer, can seem like a daunting task. For this reason, we have laid out 4 questions that you need to ask yourself when specifying a glazed extension and the tools that you need to complete your design.

1

What are the dimensions of your extension?

Consider the width, projection and height of your conservatory. The larger your building, the greater the loads are that need to be managed over large door spans.

2

What size of opening do you want to achieve?

Some large openings will need additional strength to manage the downward deflection of the roof under snow loads to ensure the roof stays in position and the doors don’t stick.

3

Do the elevations have sufficient structure to maintain lateral stability?

A structure with walls and pillars usually has sufficient strength to withstand side to side (lateral) forces like side winds, however if you choose an extension with large spans or doors and lots of windows, goalpost reinforcement maybe needed around the corners to help stop the building ‘racking’.

4

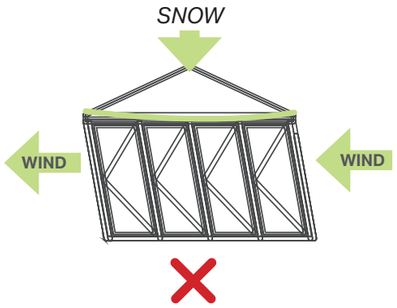
What structural support solution do I need?

If your building has plenty of structure you may only need a reinforced eaves beam above large door spans, however if you need to increase the lateral stability of your building structure you may need a goalpost solution.

Lateral Stability Explained

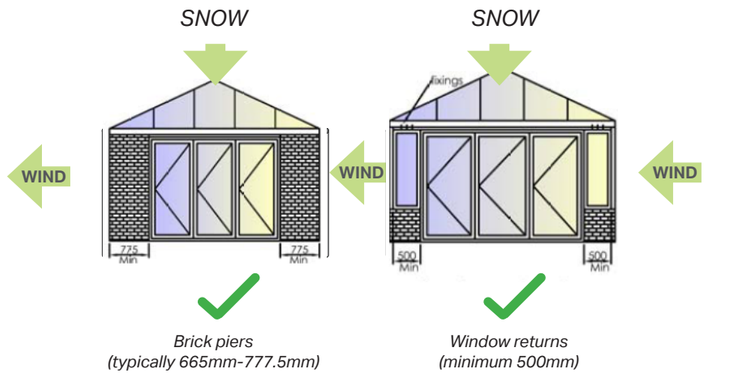
Vertical forces, such as snow load, can cause deflection on an eaves beam. To manage vertical stability an eaves beam reinforcement can be added to limit deflection and allow for larger door spans.

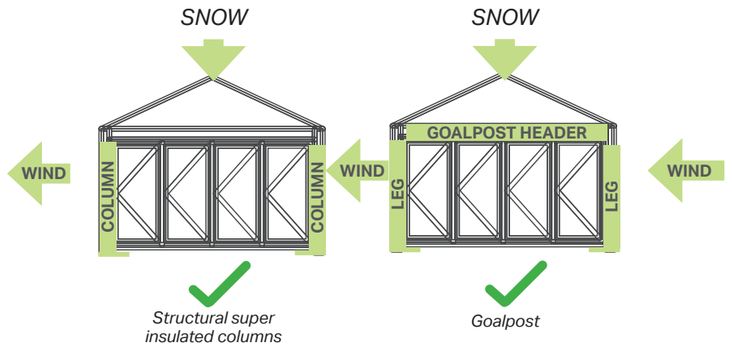
To design a larger, more open structure lateral forces must also be taken into account. Lateral stability can be achieved by having a fixed structure at both ends of the elevation in question.



On a typical project we would expect to see one of the following to support lateral stability:

- Brick pillars designed and sized in accordance with Building Regulations Document A - typically between 665mm and 777.5mm.
- Window returns should be a minimum of 500mm. Frames should be fixed tight, fully packed and reinforced.
- Super Insulated Columns can also be used to support lateral stability. See page 13
- A goalpost.

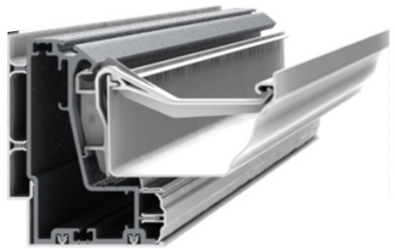




Choosing the right beam for large door spans

Ultraframe offer a wide range of beam reinforcements to prevent deflection on your roof, allowing your doors to move more freely. Goalpost header beams may be required to manage larger spans and have the added benefit of providing additional structure at the corners to manage any lateral forces too.

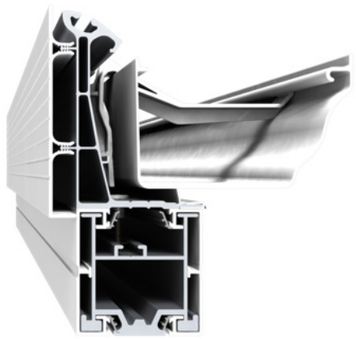




A taller, stronger version of our standard eaves beam, this beam reinforcement must be used all the way around the eaves.

Super Duty Eaves

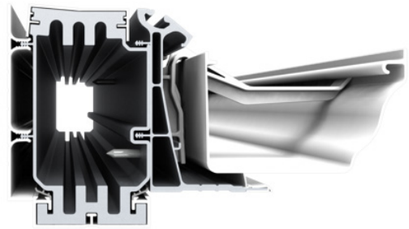




Designed to work with bi-folds, this beam enhancement sits under the eaves beam on the elevations with large door spans. Packers will need to be used to maintain an even frame height all the way around.

Bi-fold Support Beam

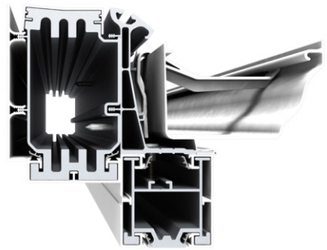




Located behind the eaves beam, this beam reinforcement is discreet and needs only to be used on the elevations with large door spans to keep costs low.

Eaves Super Bolster

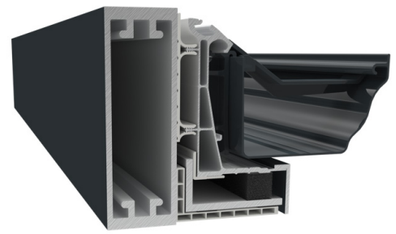




Combine the bi-fold support beam AND the super-bolster to deliver the extra reinforcement needed to support even larger spans. NB. These pillars are too narrow to support lateral stability and have a windpost inside

Combined Bolstered Eaves





A selection of goalpost options are available – see page 10.

Goalpost

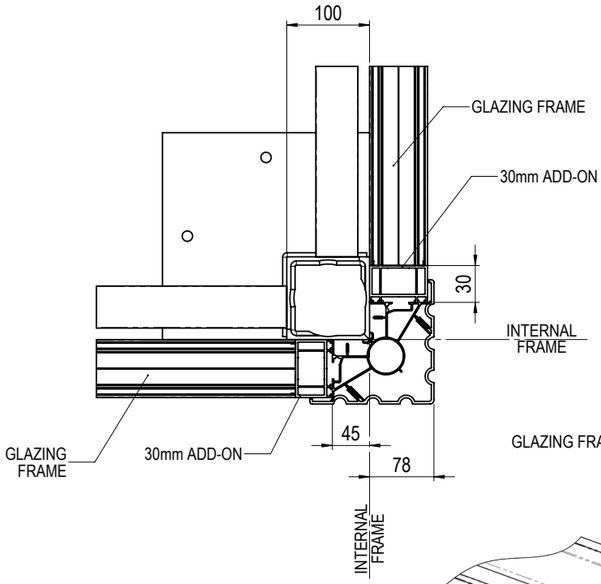
Doors

Deflection limits

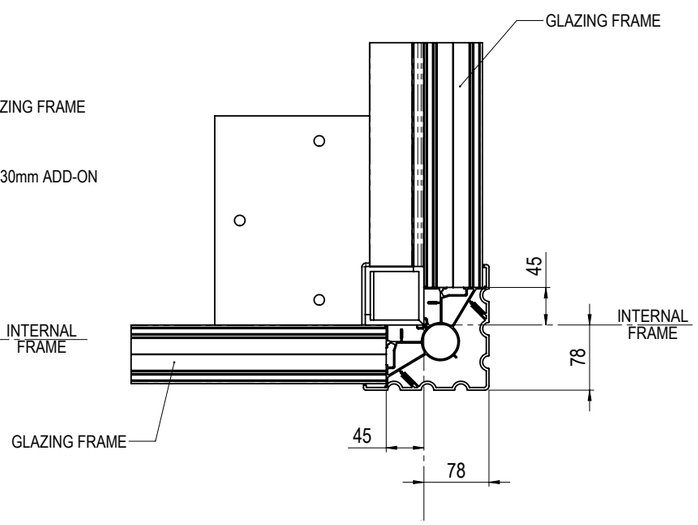
The Ultraframe Goalpost solutions can accept both top hung and bottom running doors. We allow a 6mm deflection limit on all Ultraframe Structural Eaves Solutions, including Goalposts. If more deflection than this is required, a Beam Deflection System will be needed to absorb up to 6mm additional deflection, see page 11 for more details.

Goalpost and standard corner posts

PLAN VIEW: WINDOW WIDGETS ON A 90 BI-FOLD DOOR

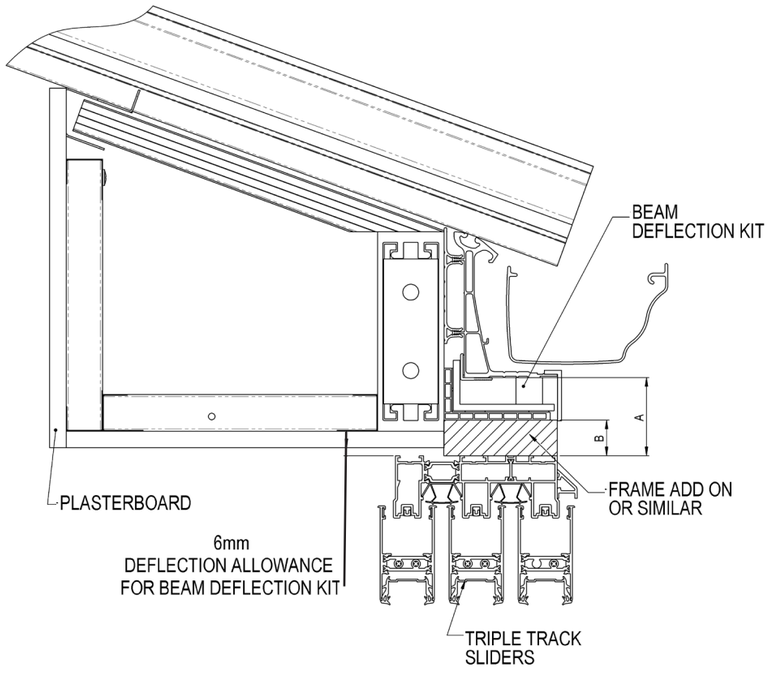


PLAN VIEW: WINDOW WIDGETS



WHEN A 90 BI-FOLD IS SPECIFIED AND A 100mm SQUARE POST USED 30mm. ADD-ONS MUST BE USED DOWN THE VERTICAL FRAMES

If doors open inwards, it must be ensured that they can clear the header beam. A packer may be needed.



What is an unsupported opening?

Bi-fold doors

When bi-fold doors are specified on a conservatory or extension, the open span is classed as the full width of the bi-fold doors.



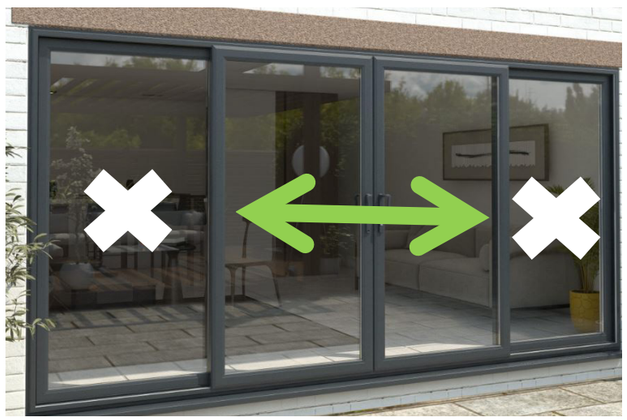
Sliding doors

When sliding patio doors are chosen, the whole span of the door frames will be classed as an open span.



Unsupported sliding doors

We assume that the entire length of your sliding door set is unsupported and have supplied the correct beam to support this span. If your doors have reinforced fixed panes capable of supporting vertical and lateral loads then this 'unsupported span' can be reduced.



Sliding doors with reinforced fixed panes on both sides

Choosing the right beam for large door spans

If you decide to use large door spans in your building design, you can determine which Ultraframe eaves beam reinforcement you require using the span charts below.

Eaves beam reinforcements can be used with both Glass Roofs and Livinroofs, but the loads of each system is different. Use either the Glass Roof or the Livinroof charts.

Standard Eaves and Super-duty Eaves are different eaves beam systems that need to be used on all elevations, however the Bi-fold Support Beam (BFS), Eaves Super Bolster (ESB), Combined Bolstered Eaves (CBE) and Goalposts are added to Standard Eaves and therefore are only needed on the elevation with the large span.

Glassroof
By Ultraframe

Chart A

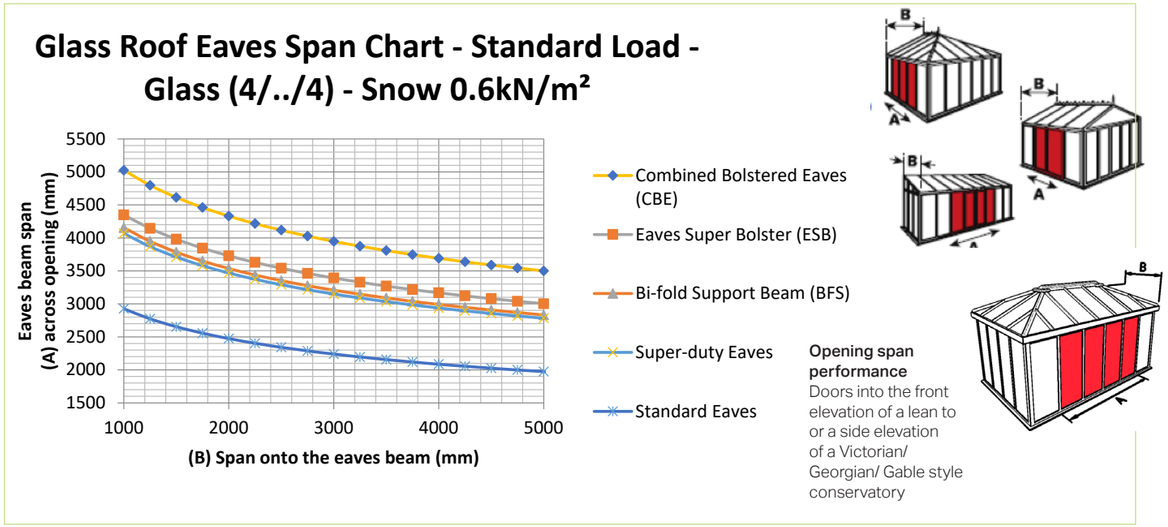
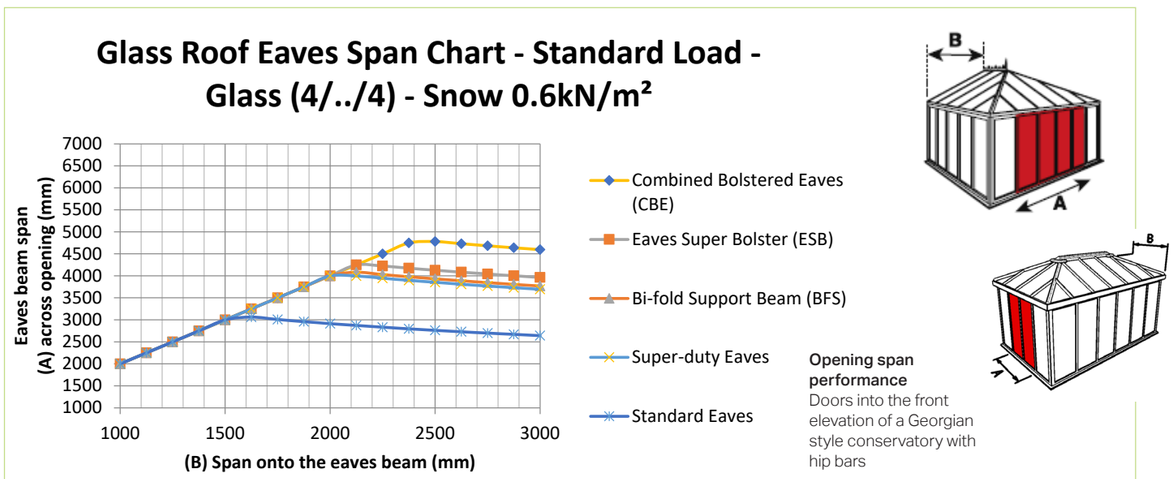


Chart B



Disclaimer: Please note these span charts only indicate which eaves beam reinforcement is required to manage the downward deflection and load on the doors. They do not take into account any information about the building structure and it's ability to withstand any lateral forces. Please refer to page 3 regarding structural support for lateral forces.

Useful tools

Enhanced Structural Design Guide

When specifying your roof in UDesign, you can use the Enhanced Structural Design Guide which shows the maximum door span possible under the eaves depending on which eaves beam is selected. Increase your beam reinforcement on your specified roof until your desired door span is possible.

If using a PDF/ Paper order form, select 'Structual' for the Superduty eaves system, for any beam reinforcement select 'bolstered eaves' or tick goalpost if you require a goalpost. You will need to provide extra elevation detail.

Beam Deflection Calculator

You can also use the Ultraframe Beam Deflection Calculator to determine which eaves beam reinforcement you require. This is a separate document available in the media library on our trade website ultraframetrade.co.uk

Livinroof®
By Ultraframe

Chart A

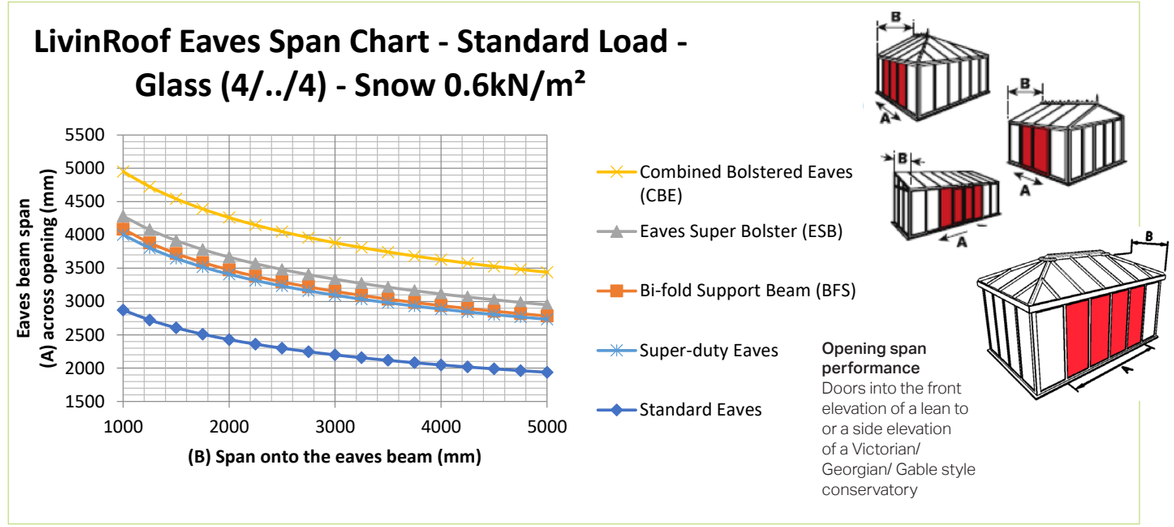
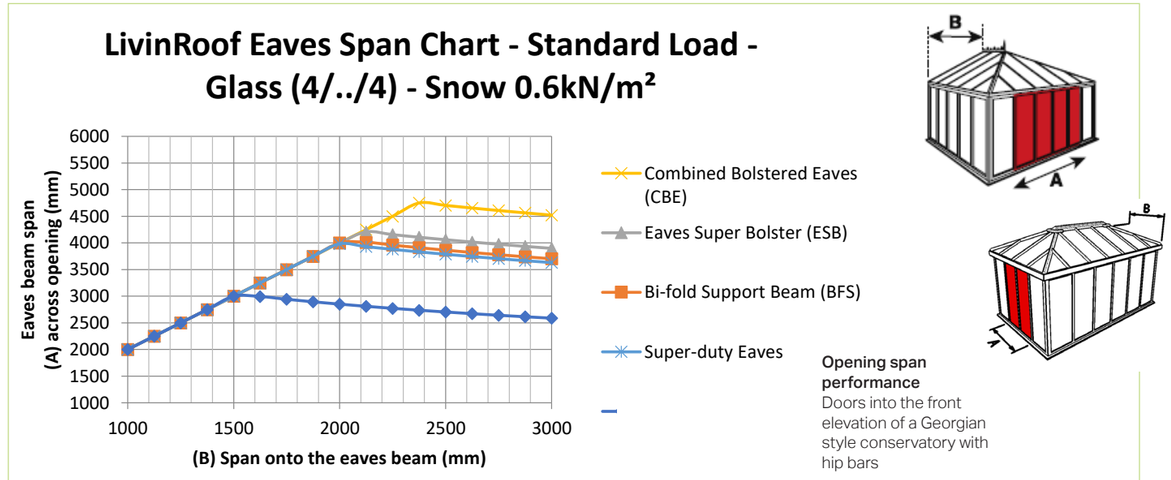


Chart B



Ultraframe Goalpost Solutions

To manage lateral forces and avoid any 'racking' your extension will require sufficient structure at the corners. Brick pillars and or window returns need to be large enough to withstand side winds. Choose a goalpost if you wish to have a more open structure.

On a typical project we would expect to see one of the following to support lateral stability:

- Brick pillars designed and sized in accordance with Building Regulations Document A - typically between 665mm and 777.5mm
- Window returns should be a minimum of 500mm. Frames should be fixed light, fully packed and reinforced.
- Super Insulated Columns can also be used to support lateral stability. See page 14.
- A goalpost.

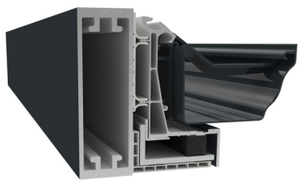
Made from Aluminium, Ultraframe Goalposts have been engineered to be as light as possible for an easy installation without heavy lifting equipment.

They are designed to work perfectly with the Ultraframe Glass Roof and Livinroof as they sit behind the eaves beam for a minimalist look. They can also be hidden from view in the internal pelmet system.

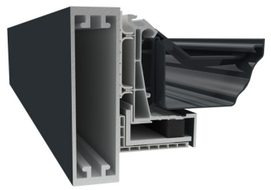
Easy to order along with your roof, let Ultraframe take care of the structural calculations giving you and your customers peace of mind. Each Goalpost is structurally engineered on application to provide you with the most cost effective solution for your conservatory or extension design.

The Ultraframe Goalpost suite includes a range of header sizes to suit the height of the door frame so that there are no restrictions to the movement of the doors. The length of the header beam is produced to order.

Header Beams with Goalposts



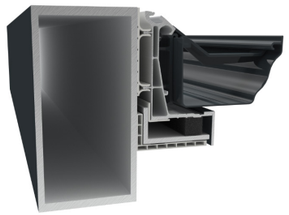
150x50mm



180x50mm



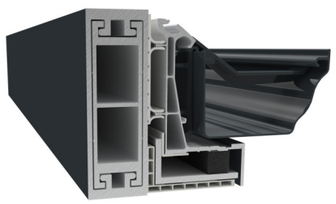
250x50mm



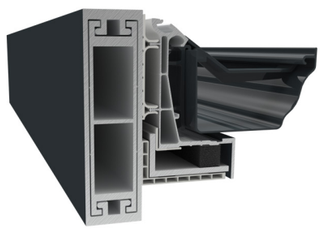
200x102mm

Reinforced Header Beams with Goalposts

The reinforced header beams provide comparable strength to the next largest header beam size, their small size offering a solution to any height limitations.



150x50mm



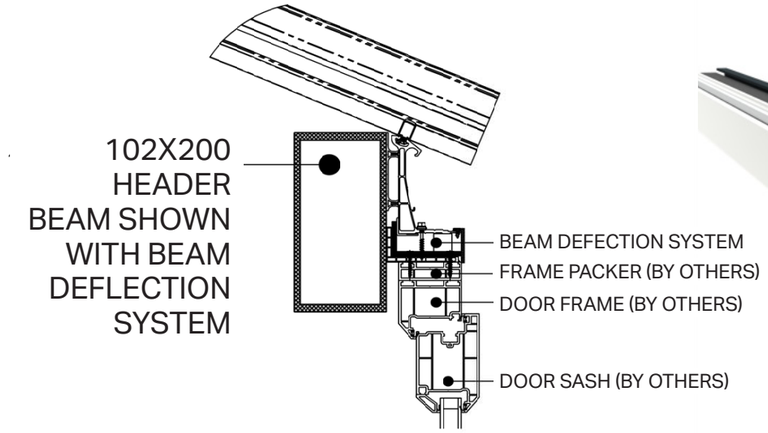
180x50mm



250x50mm

Beam Deflection System

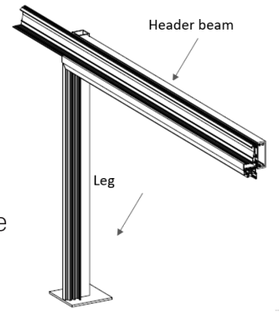
The goalpost can be supplied with a beam deflection system which acts as a cushion or spring. This allows the header beam to safely deflect by an additional 6mm to the 6mm already offered by the standard goalpost, without affecting the head of the door frame and the smooth operation of the doors below.





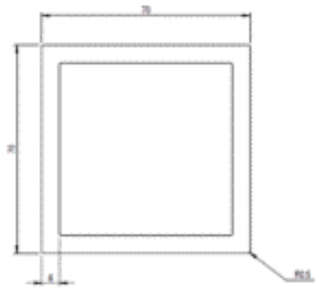
Goalpost Leg Options

To accompany the header beams, Ultraframe offer two square leg options and an in-line leg. Ultraframe goalpost solutions are flexible to cater for many different layout situations, if the header beam will be butting up against a host wall then a leg can be replaced by a wall plate or, a spreader plate for a brick pier and, if the header beam runs round more elevations, the goalpost can have more than two legs*. Goalposts are available in mill finish or powder coated in any RAL colour.

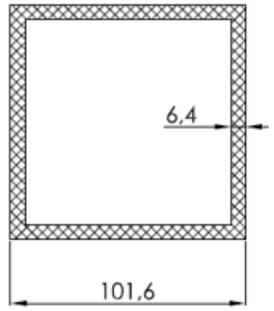


70x 70mm (square)	102x 100mm (square)	150x50mm (in-line)

The 70x 70mm square leg is used as standard.

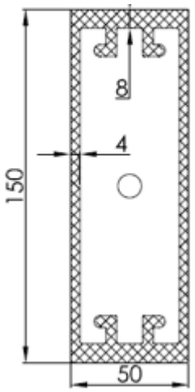


The 200x 102mm header beam uses the 102x 100mm square beam as standard.



The 150x 50mm header beam can also be used as a goalpost leg if this is aesthetically preferable.

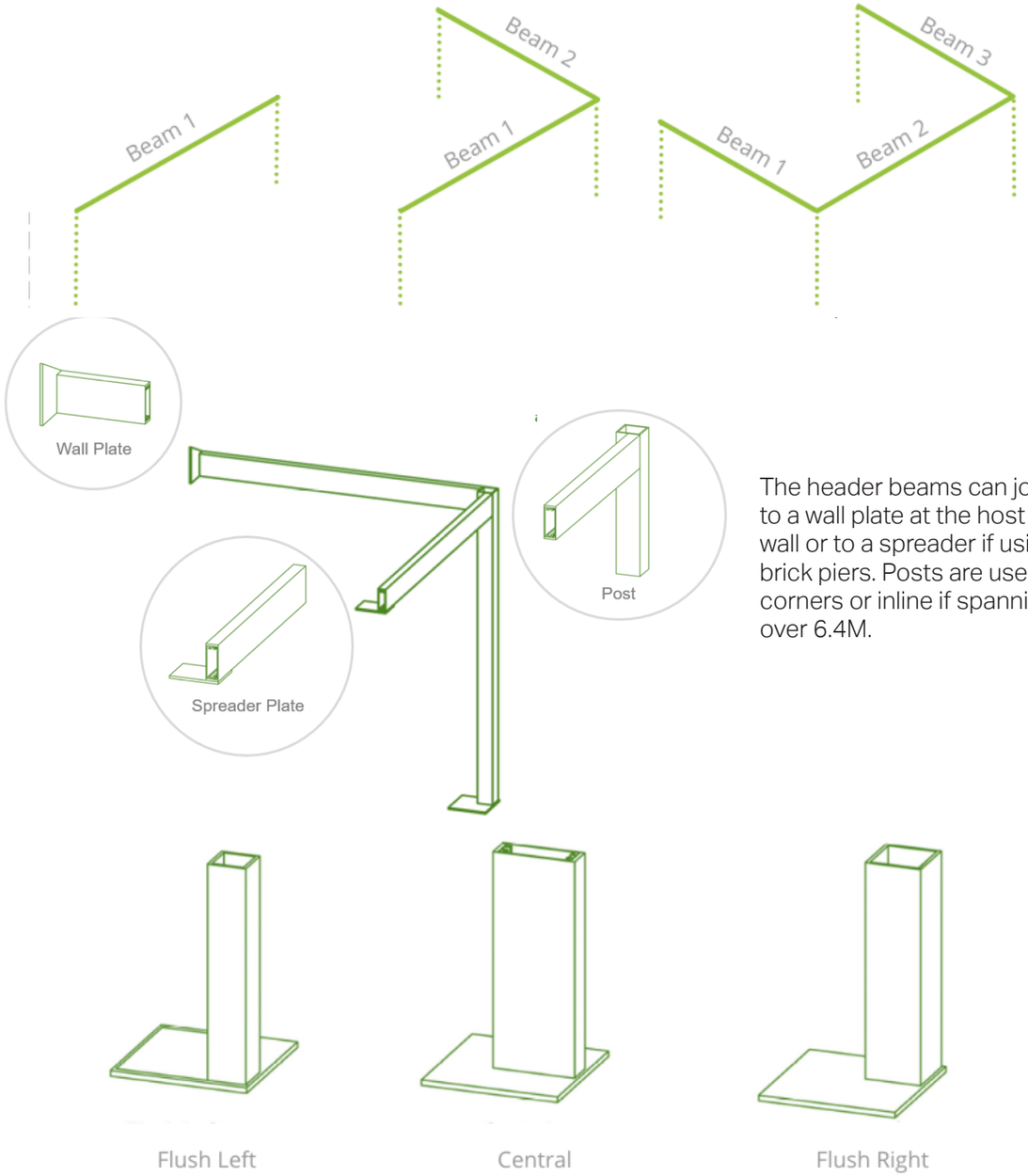
This leg can be used as an in-line goalpost leg to sit behind the middle door frame if a larger span is required.



*if a spreader plate is used on a brick pier, the brick pier must be strong enough to provide sufficient lateral stability for the build (See page 3).

Connection Details

Single header beams are used on each elevation with a large door span. Double or triple header beams can be used for more open structures.



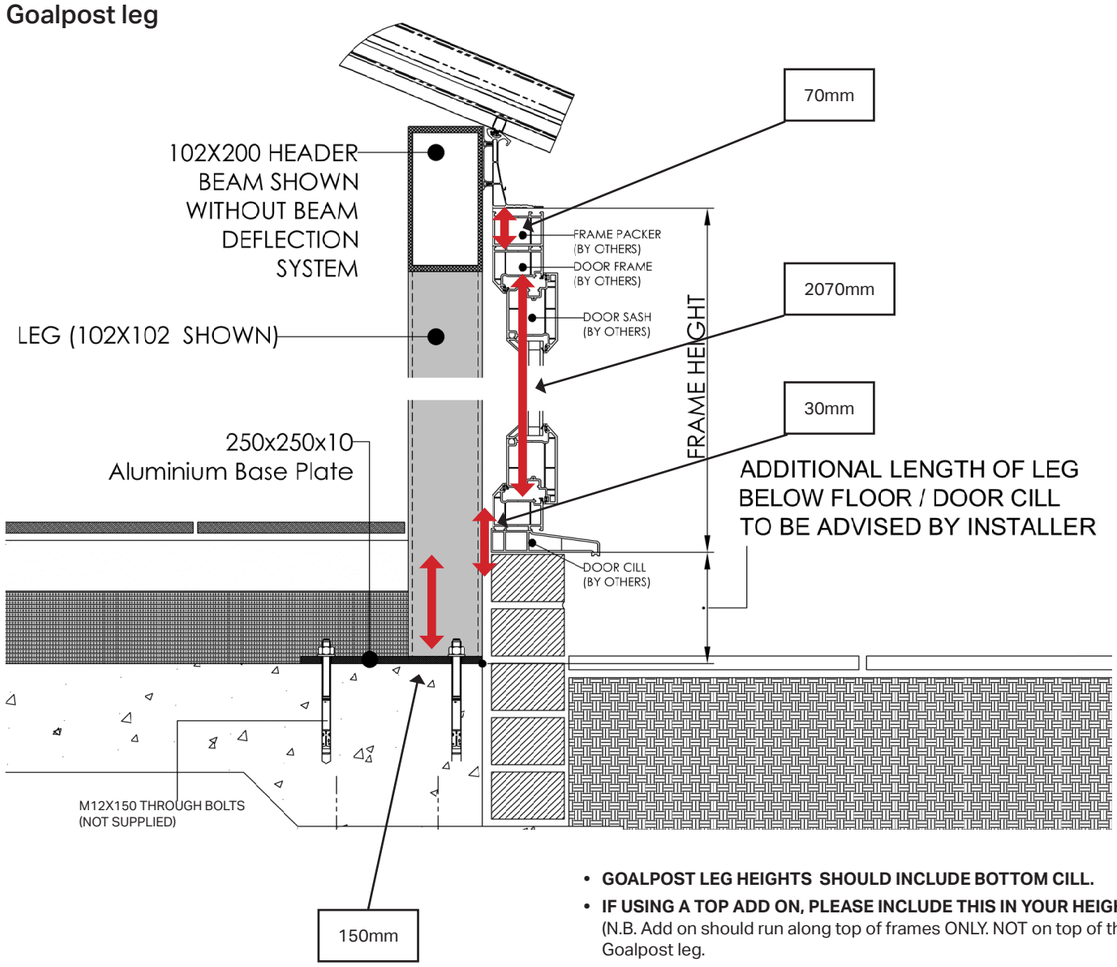
The header beams can join to a wall plate at the host wall or to a spreader if using brick piers. Posts are used at corners or inline if spanning over 6.4M.

Base plates are provided with 4 pre-drilled holes for bolting down and 4 pre-drilled holes for fixing to the post. Post can be fixed centrally or at the corner on site.

How to measure

Use this information to fill in the Goalpost leg HEIGHT section in our order forms.

Goalpost leg



- **GOALPOST LEG HEIGHTS SHOULD INCLUDE BOTTOM CILL.**
- **IF USING A TOP ADD ON, PLEASE INCLUDE THIS IN YOUR HEIGHT.** (N.B. Add on should run along top of frames ONLY. NOT on top of the Goalpost leg.

.eg.	**70mm**	ADD ON
+	**2070mm**	FRAME
+	**30mm**	CILL
+	**150mm**	LEG BELOW FLOOR LEVEL
=	**2320mm**	Goalpost WORKING HEIGHT

Disclaimer:

Ultraframe does not take responsibility for the structural stability of the entire structure, only the products provided by Ultraframe. To ensure the rest of the structure is suitable, it is the installers responsibility to ensure that all walls, foundations and building structure are compliant with Document A of Building Regulations. Any adjoining window frames must be a minimum of 70mm reinforced PVC frames, coupled in accordance with the manufacturer's recommendations. Host walls must be suitable to take the additional load and forces of the new building.

All beam end plates (WP and SP) must be bolted to a suitable substrate with adequate anchors. For the WP, the host wall suitability to accept the increased forces must be checked. The SP should be positioned on a suitable concrete padstone built into the supporting wall and strapped down to at least two additional courses.

Baseplates must be anchored using a minimum of 3no. M12 through bolts (minimum 6kN Tension/Uplift capacity per bolt). Foundations or floor slabs must be designed to accept the additional forces.

Super Insulated Column as a structural solution

Super Insulated Columns can be used instead of a brick pier or fixed window frame, when coupled with the correct beam reinforcement, to manage lateral stability.

There are 3 options for using a Super Insulated Column as a structural solution:

1. Super Insulated Column with a cill and 500mm fixed frames either side- only suitable on projections up to 3.8m.



2. A full height structural super insulated column- that is fully fixed at the base. Detailed on p16 in *Super Insulated Column System Overview.*



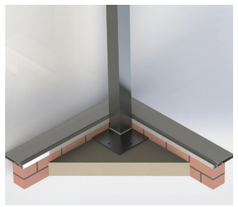


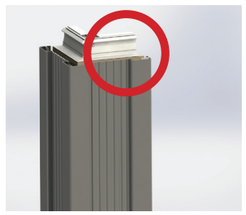
Structural anchor



Structural post

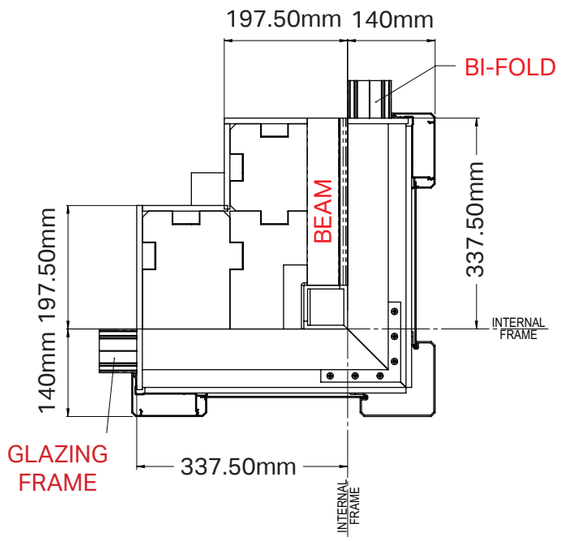
3. Super Insulated Column with a Goalpost inside the column.



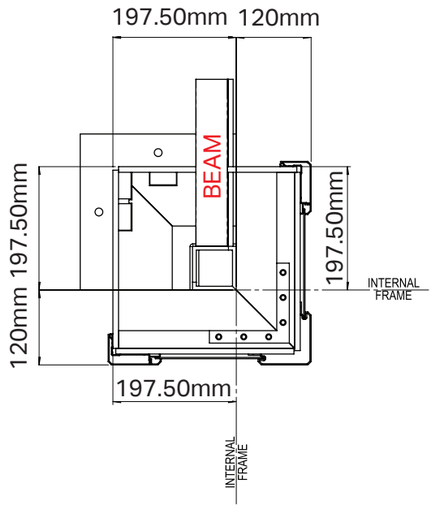


Please refer to the Super Insulated Columns: System Overview and Design Guide.

Plan view large corner super-insulated column



Plan view small corner super-insulated column



External corner of the 70mm corner post lining through with the internal frame lines.

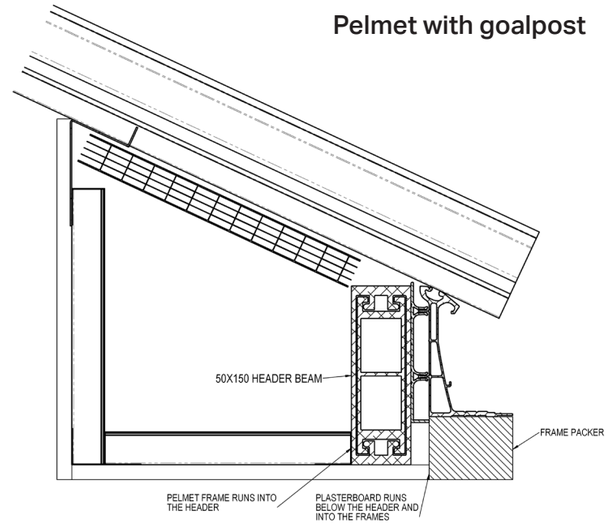
Internal Pelmet

The points below must be considered when specifying an internal pelmet:

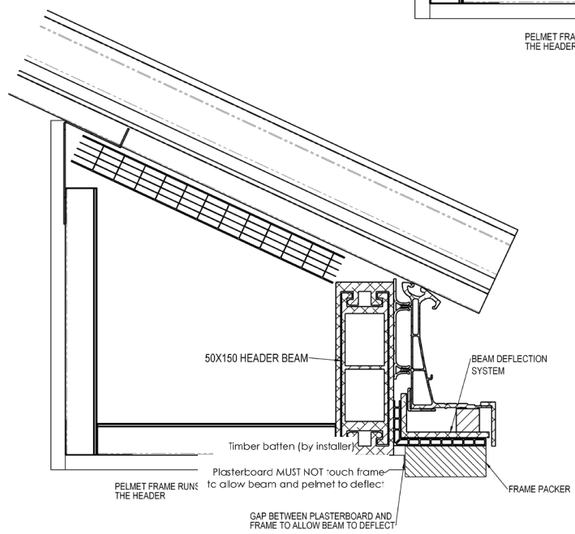
- An internal pelmet can be used with any header beam
- The internal pelmet height is increased so that the metal ladder frame runs up to the header beam
- The internal pelmet height must be the same on all sides of the roof, therefore consideration of frame packers should be addressed by the designer
- Without BDS the plasterboard is attached to the door frame packer. This is because the whole area is designed to bend <6mm
- With BDS the plasterboard MUST have a stop edge bead on the end. This allows the beam and internal pelmet to deflect <12mm independent of the door header.
- An internal pelmet can be fitted with or without cornice
- Seek Technical advice if door frames wider than 70mm are being incorporated.

BDS = Beam Defection System.

Pelmet with goalpost



Pelmet with goalpost and Beam Deflection System



Choosing the right Goalpost for large door spans

If the large door span is parallel to the ridge please use chart A and if it is perpendicular to the ridge, please use chart B.

Depending on the structure below the roof, an Ultraframe goalpost is designed specifically for each job using the Lateral Stability Design Guide in U-design.

Goalpost by Ultraframe

Chart A

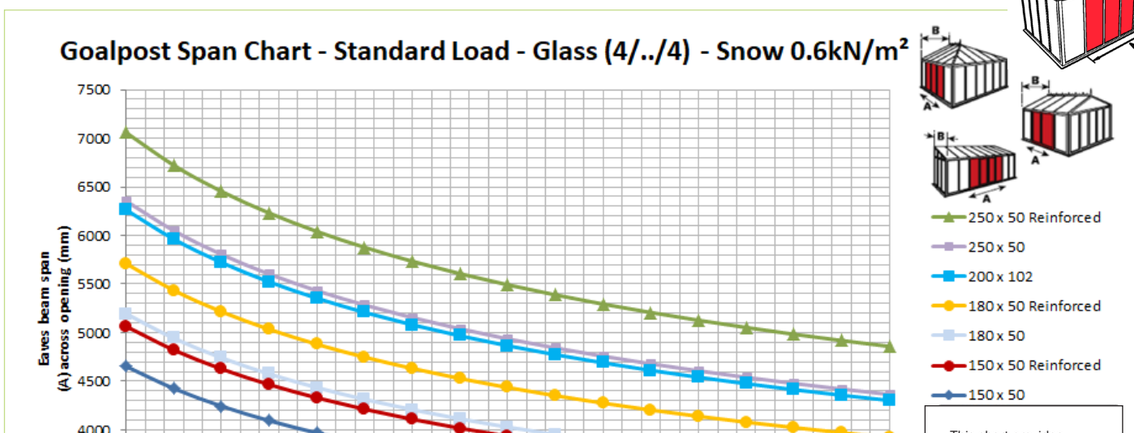
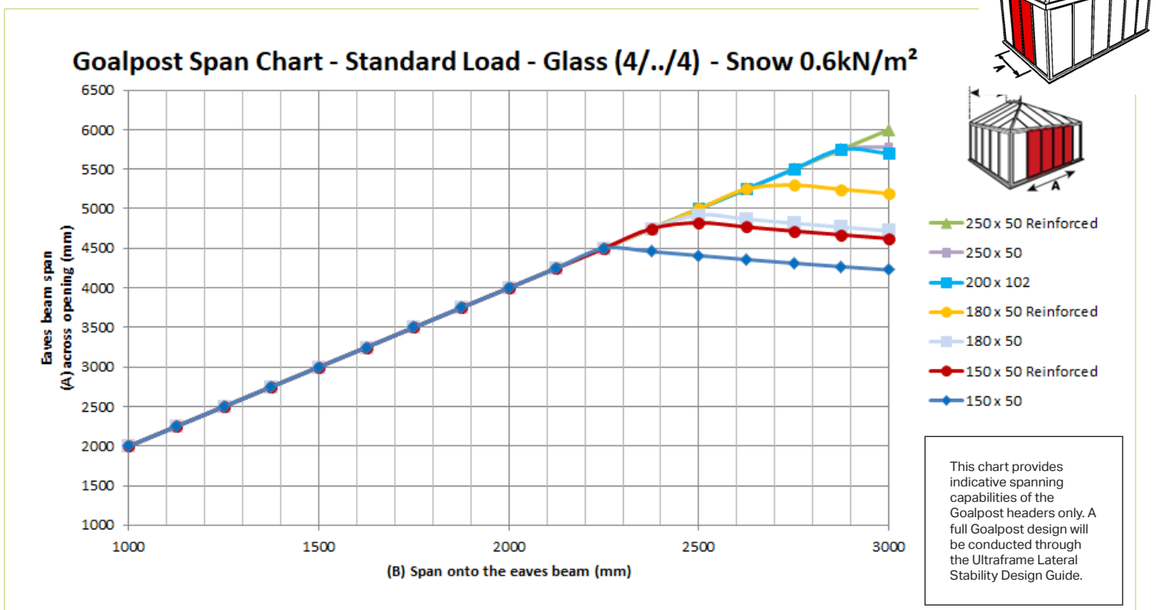


Chart B



Goalpost and Beam Deflection System

The following 2 charts show the spanning capabilities of the Goalpost header beams with a Beam Deflection System see page 11 for more information.

Goalpost by Ultraframe

Chart A

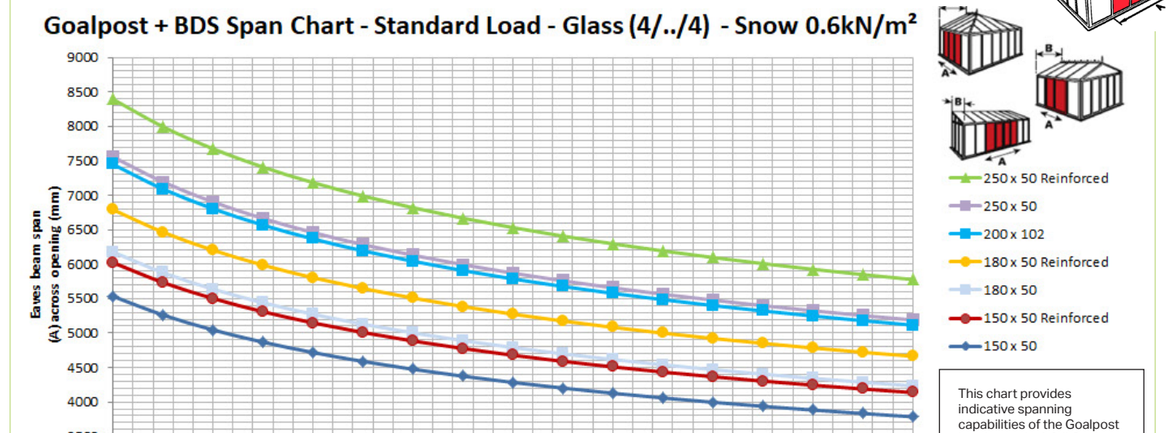
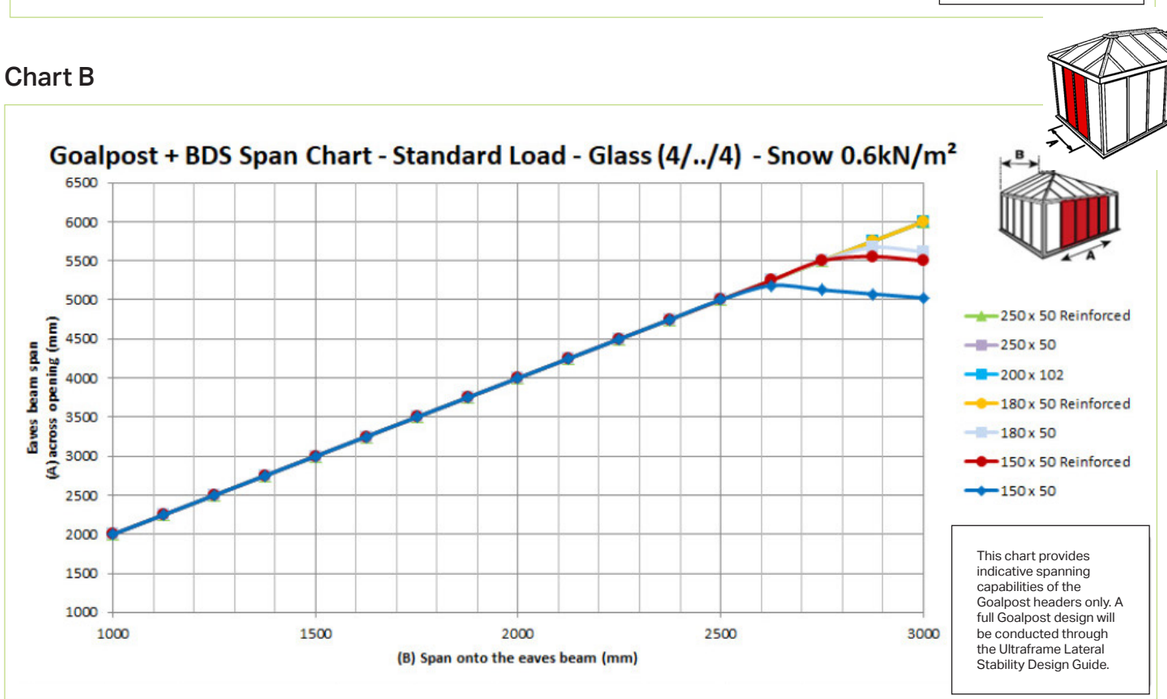


Chart B



These span charts provide indicative vertical spanning capabilities of the Goalpost header beams only. They assume that there is no tie bar over an opening on Duopitch roofs. Depending on the structure below the roof, an Ultraframe goalpost is designed specifically for each job using the Lateral Stability Design Guide in U-design.

Goalpost

by Ultraframe

A Simple Guide | Structural Support

Conservatories and Glazed Extensions

Job No: 8094 V2 11/26