

Product Manual

313

Curtain Wall

glostal 
SYSTEMS

April 1994

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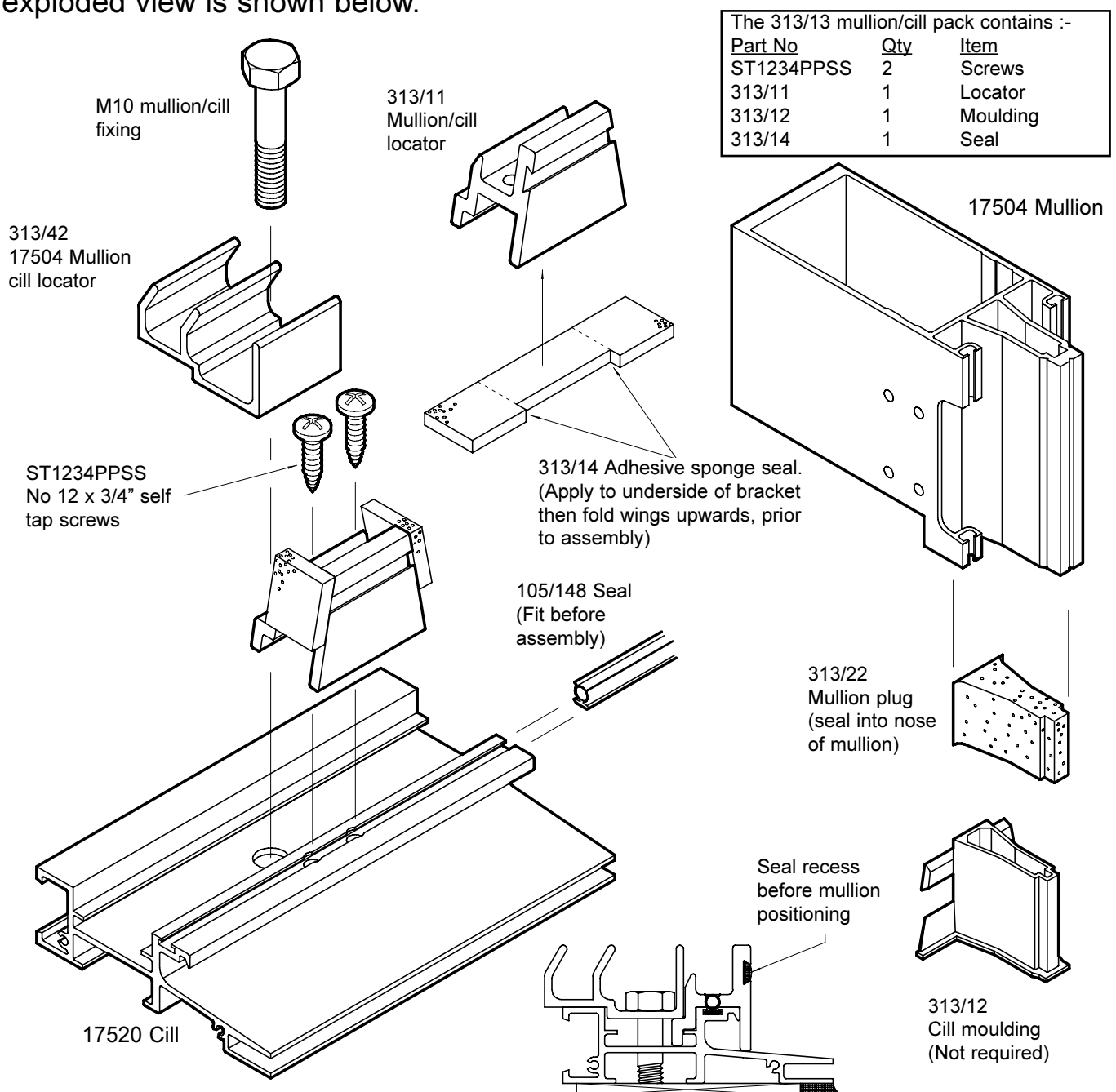
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Technical Bulletin No. 298

313 Curtain Wall

Alternative Cill Assembly For Mullion 17504, Due To Web Across The Profile Nose.

Please note that mullion 17504 needs alternative cill assembly. Proceed with mullion/cill assembly as per the current curtain wall manual as shown on page 5-1, replacing 313/12 cill moulding with 313/22 mullion plug. For your convenience an exploded view is shown below.



PLEASE ENSURE THIS INFORMATION IS CIRCULATED TO ALL DEPARTMENTS FOR ACTION AS APPROPRIATE.



January 1996

Technical Bulletin No. 224

Modification to 313/260 Router Plate

It is very important that the mullion cut out to receive the rail on 313 curtain walling is prepared accurately. Due to the difficulties in achieving this with the router plate 313/260 all future deliveries of this tool will no longer have this preparation available to them. Also Glostal do not recommend the use of existing 313/260 router plates for this preparation. Instead use press tool 3131270 this gives the necessary accuracy required.

All other preparations on the router plate are not effected.

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Glostal Limited, Ashchurch, Tewkesbury, Glos. GL20 8NB. Telephone: 01684 297073 Fax: 0f684 293904

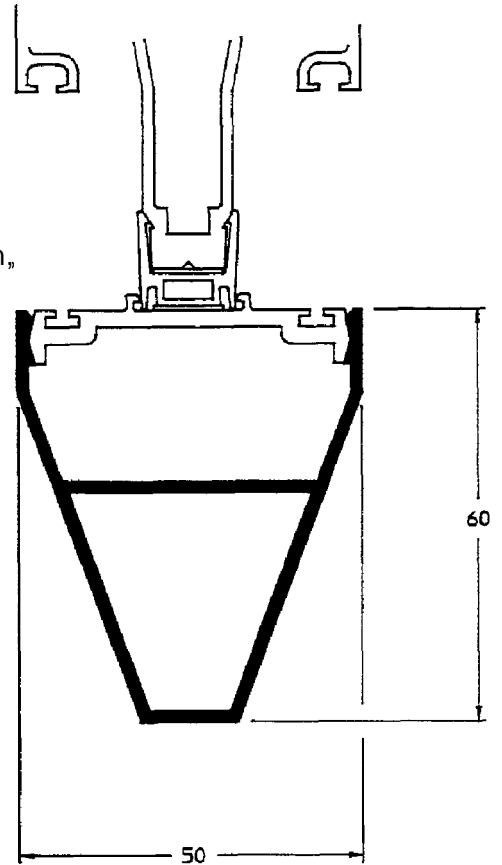
Dealer Information

August 1993

Technical Bulletin No 196

Additional Capping for 312/3 13 Curtain Walling

We are now introducing a new 60mm Mullion Capping 17235 to complement the existing range, details as shown, for use on both 312 and 313 Curtain Wall systems.



Gross Selling Prices

			per length	Per metre
17235	6100	ML	32.70	5.36
		SP	45.20	7.41
		ES	39.41	6.46
		B7	48.14	7.89

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December 1994

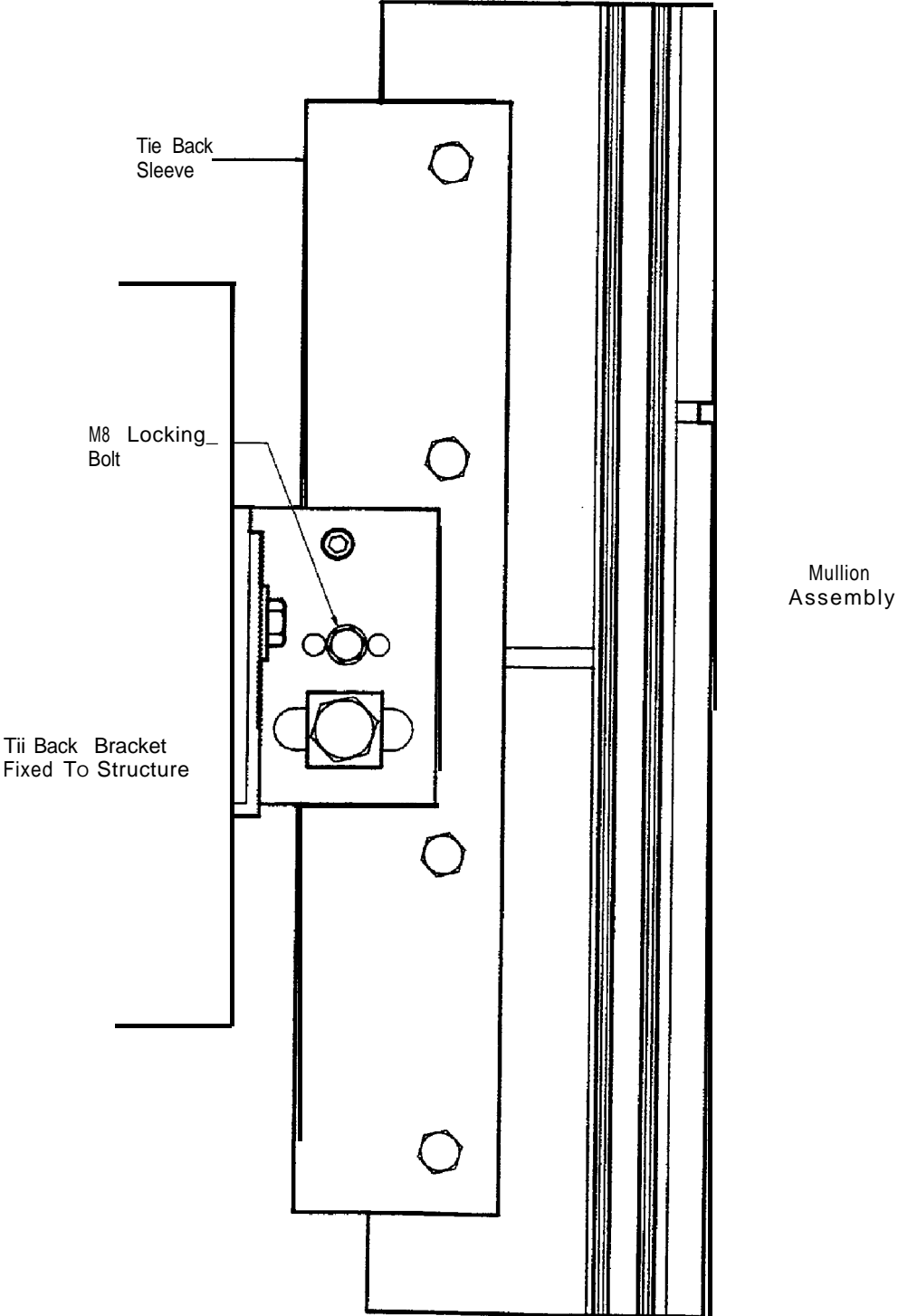
Technical Bulletin No 215

313 CURTAIN WALLING -TIE BACK LOCKING BOLT

An additional locking bolt has been added to the 313 Curtain Wall Tie Back to lock out all adjustment after the mullion has been plumbed into its final position. This locking Bolt is in the form of an M8 nut and bolt.

To fit the locking bolt a 9.0 mm dia hole must be drilled through the mullion tie back sleeve using the relevant pre-punched hole in the tie back bracket as a guide. The M8 bolt must then be fitted through the tie back bracket and the mullion sleeve, and held in position by fitting the M8 nut.

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Dealer Information Technical Bulletin No 216

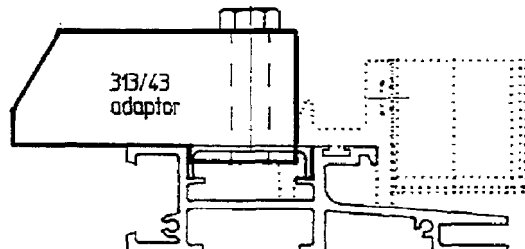
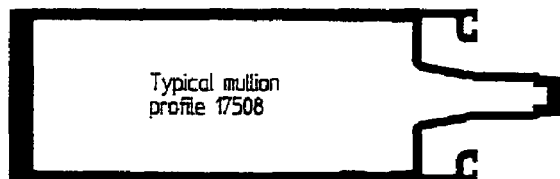
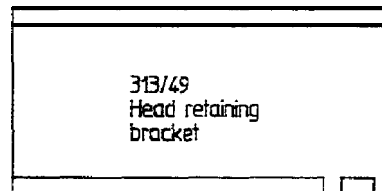
Modification to 313 mullion profiles

To improve the quality of the finish on the side walls of the curtain wall mullions, the central web is being removed to prevent die blend lines. (see typical mullion 17508 shown below)

This means that an adaptor block will be required at the head and cill to take up the difference between the head and cill brackets and the back of the various mullions. The adaptor block is fixed to the structure through the cill using an M10 bolt as shown except in the case of the adaptor for mullion 17502 where a no.12 selftapping screw is used to secure the block directly to the cill. At the head there are now various retaining brackets from the range of mullions. The 313/17 mullion plug can still be used with the 17500 mullion, but for all other mullions a new plug (313/37) is being introduced which is partially cut for easy breaking off for each mullion depth.

The range of mullions are listed below together with the appropriate cill adaptor block and head retaining brackets. Also shown below is a typical head and cill detail showing the use of the adaptor block.

Mullion	Adaptor Block	Head Bracket
17500	<i>None</i>	313/25 313/46
17508	313/41	313/47
17504	313/42	313/48
17508	373/43	313/49



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Specification

Scope

This specification details the basic design concept, construction, materials, fixings and performance of the Glostal 313 50mm Vertical Curtain Wall.

Design

The profiles and components in this range have been specially designed by Glostal to provide a simple form of thermally insulated construction which will have a universal application.

The 313 Curtain Walling system has been designed to be pressure equalised and zone drained. The system has been designed to be assembled using a minimum of "wet" sealants, thus reducing the effect of inclement weather and inadequate sealants on the wall structure during installation. The use of predictable life span materials such as moulded gaskets, etc. have been incorporated where possible and give the specifier a more reliable installation.

Materials

Aluminium profiles are extruded aluminium alloy 6063 T6 complying with the recommendations of BS 1474, with stainless steel fixings and appropriate high quality seals used throughout.

Polyester powder coated finishes are available to BS 6496 in a wide range of colours. Anodised finishes are to BS 3987 Grade AA25, etch silver and Glostal bronze.

Construction

Many years of practical experience have been built into the form of stick construction adopted, which consists of main mullion members with intermediate rails, fitted to prepared brackets to form the basic framing grid. The infill of glass, panels or opening lights is then applied and the installation completed by the application of the outer clamp plates and capping.

Assembly & Installation

Detailed instructions are provided in this publication, which must be strictly conformed to.

Glazing/Infill

The range has been designed for a 24mm or 32mm glass or panel thickness.

All glazing must comply with BS 6262 for thickness and type, and confirmation of the suitability of any other infill material must be obtained from the supplier.

A range of opening lights and doors can be directly accommodated in the vertical glazing.

Performance

The unique construction allows for a very effective inside seat which is free from any stress caused by thermal movement. This, combined with the automatic pressure equalisation and drainage, means that any correctly installed Curtain Wall framing will comply with BS 6375 Part 1, 1989 Class "2000 Special".

In testing, the system far exceeded the 600Pa air and water resistance required to qualify for this maximum classification under BS 6375. Levels in excess of 900Pa for both air and water resistance were achieved.

For wind resistance, the Curtain Wall framing will meet any **specified** requirement subject to adjustment of spans and fixings.

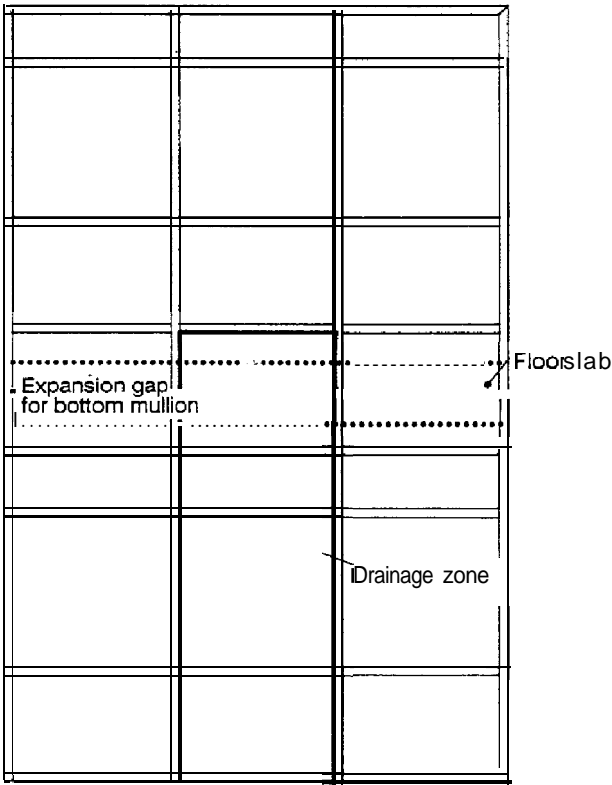
Performance (Inserts)

As will be appreciated, the weather performance of any insert will depend on the unit concerned and the appropriate technical details should be consulted.

Sapa's policy is one of continual system development and we reserve the right to incorporate design improvements and changes. Every effort is made to ensure that all details are correct at time of publication. However, it is the responsibility of the customer to check the accuracy of the relevant facts and information before entering into any contract or other commitment. Up to date information is freely available from the Sapa Building Systems Webshop.

All Products and systems which Sapa supply are supplied subject to Sapa's standard Terms and Conditions of Sale current from time to time.

Zone Drainage Principle



The 313 curtain walling system is designed to be pressure equalised and “zone” drained, each zone being from mullion to mullion wide and floor to floor high. The zones are maintained airtight from each other by the thermal break spacer which runs the full length of all mullions and the full length of all rails which occur at floor levels. The joint between continuous thermal breaks vertically and horizontally is completed by a rail drainage moulding.

All intermediate rails have 50mm lengths of thermal break under each clamp plate fixing screw. This allows air to circulate freely within each zone. The bottom of each zone is drained by means of the drainage moulding at each end of the bottom rail in every zone with the exception of the cill, which drains directly outside.

All mullions are supported from their base (‘prop’ condition) either by resting on the cill member or by means of a tie back fixing bracket at intermediate floor levels. Vertical thermal movement is taken up at the top of each mullion. The design of the tie back fixing bracket allows the removal of a given zone of curtain walling without affecting the structural stability of adjacent areas for repair or access.

Building tolerances and movement

The openings, columns and floor beams of any building will wander out of position while being formed and even when finished can settle or flex.

In view of this, it is very important to establish at the start the amount of tolerance or movement which the curtain wall must accommodate so that it can be allowed for.

This manual shows the standard tie back fixing bracket. However, where special conditions occur, consideration must be given to purpose made brackets and checked for their structural properties.

Fixing anchorage points

Effective fixing of any curtain wall requires that the structure is accurately prepared.

This normally involves the casting into concrete of channel type fixing inserts which will receive the fixing bolts or the provision of supporting steelwork to which they can be attached.

It is very important that the necessary provision is agreed at an early stage and that acceptable positioning tolerances are agreed. The standard fixing bracket for example will allow for ± 20 mm of horizontal movement and ± 20 mm of in and out or vertical movement.

Curtain wall tolerances

Curtain wall members must be accurately machined to ensure that there is no variation from the basic sizes.

The 313 mullions are especially designed so that their side walls can flex to accommodate horizontal thermal movement without any stress on the rail seals.

Small vertical tolerances can be taken up at the mullion joints.

Curtain wall thermal movement

The coefficient of thermal expansion is 0.000024 per degree centigrade. When considering that the majority of the curtain wall mullion is on the inside of the building, it will therefore experience only a limited temperature range for the majority of its surface. Whilst the system provides for vertical thermal movement of ± 1 mm per 1000mm of span, it is unlikely that this extreme will ever be reached.

As mentioned above the curtain wall mullions have been designed to accommodate all horizontal thermal movement without any stress on the main seals. Vertical movement is catered for in the following way:

The ground floor mullion rests directly onto the cill and all thermal movement is taken up at the tie back fixing bracket. The first floor mullion is supported at the tie back fixing bracket and vertical thermal movement is taken up either at a subsequent tie back fixing bracket (if multi storey) or if at the extreme head, by the head retaining bracket.



Curtain wall wind loading

All curtain wall members and infill must be strong enough to support the maximum wind pressure or suction which results from the local wind gust speed and the building shape.

Full details are given in British Standard CP3, Chapter 5, part 2, but the Glostal "Wind Loading & Strength Calculations Manual" gives a simplified procedure to allow for the correct selection of members.

Curtain wall fixings

The complete fixing arrangement at any one point must be capable of supporting at least twice the maximum loadings to which it may be subjected (wind, live and dead load).

The materials used must also be effectively protected against any danger of corrosion and wherever possible should be either aluminium or stainless steel. In certain areas, such as London, the use of rustproofed steel may not be permitted.

It is important that dead loads on tie back fixing brackets are calculated and checks made as to the suitability of the bracket. In **case** of difficulty calculating the above, Glostal must be contacted.

Curtain wall fire resistance

The 313 curtain walling will not support the spread of fire and in itself it has no significant fire resistance (aluminium melts at about 660°C).

This means that wherever fire resistance is a specific requirement, it must be achieved either by the provision of back up walls or the use of suitable infill panels with independent fire resistant fixings.

It is the specifiers responsibility to detail the precise requirements which, as these will vary from one area to another, must be cleared at an early stage.

British standards

Fabricators should obtain copies of the following relevant British Standards for reference:

CP3 Chapter 5 Part 2 : Wind Loadings.

CP1 18 : Structural Use of Aluminium.

BS 5516 : Patent Glazing.

BS 6262 : Glazing.

BS 8200 : External Building Enclosure (Curtain Walling).

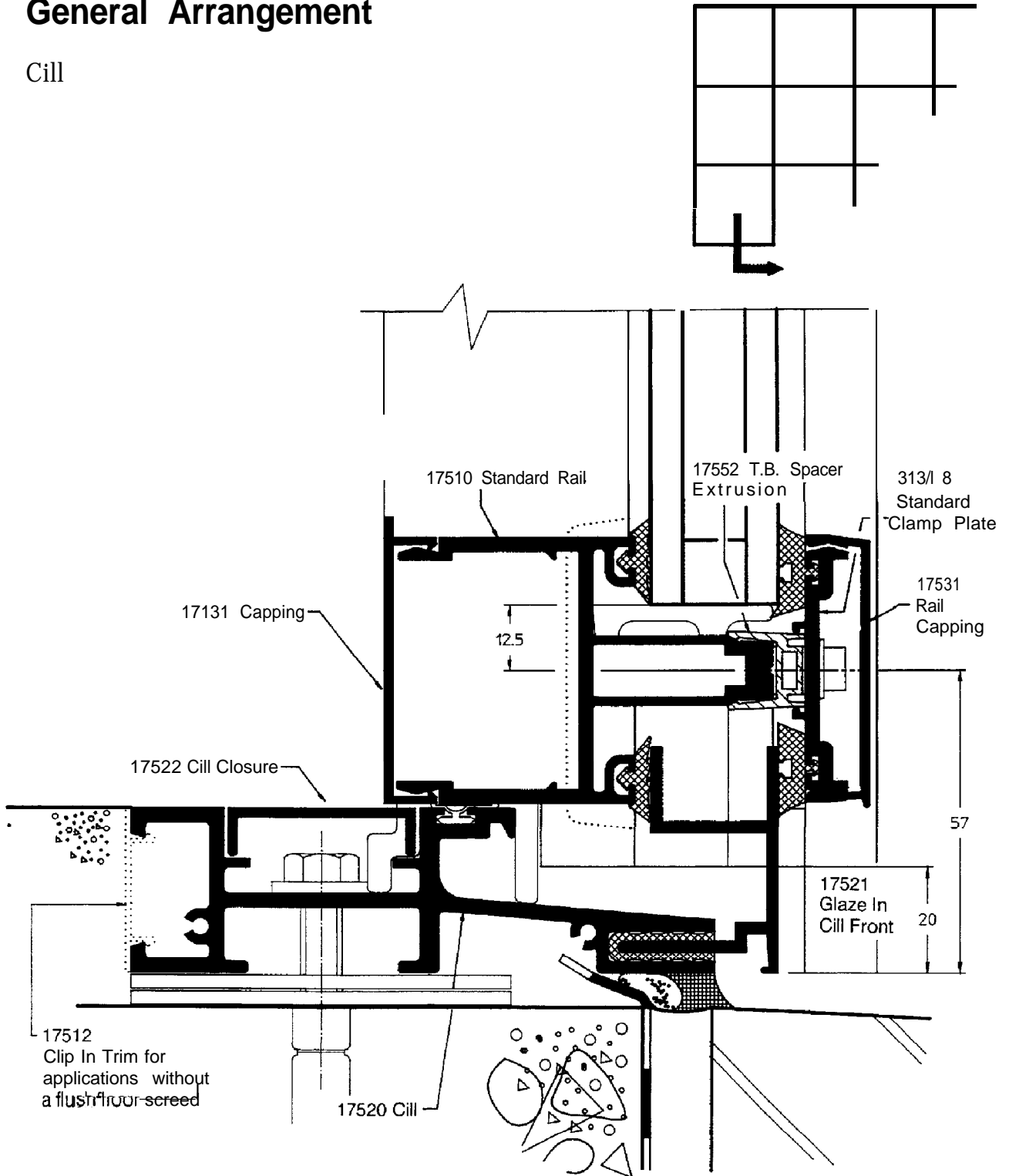
Important note

If further guidance, information or interpretation is required, the technical advice department at Glostal should be contacted.



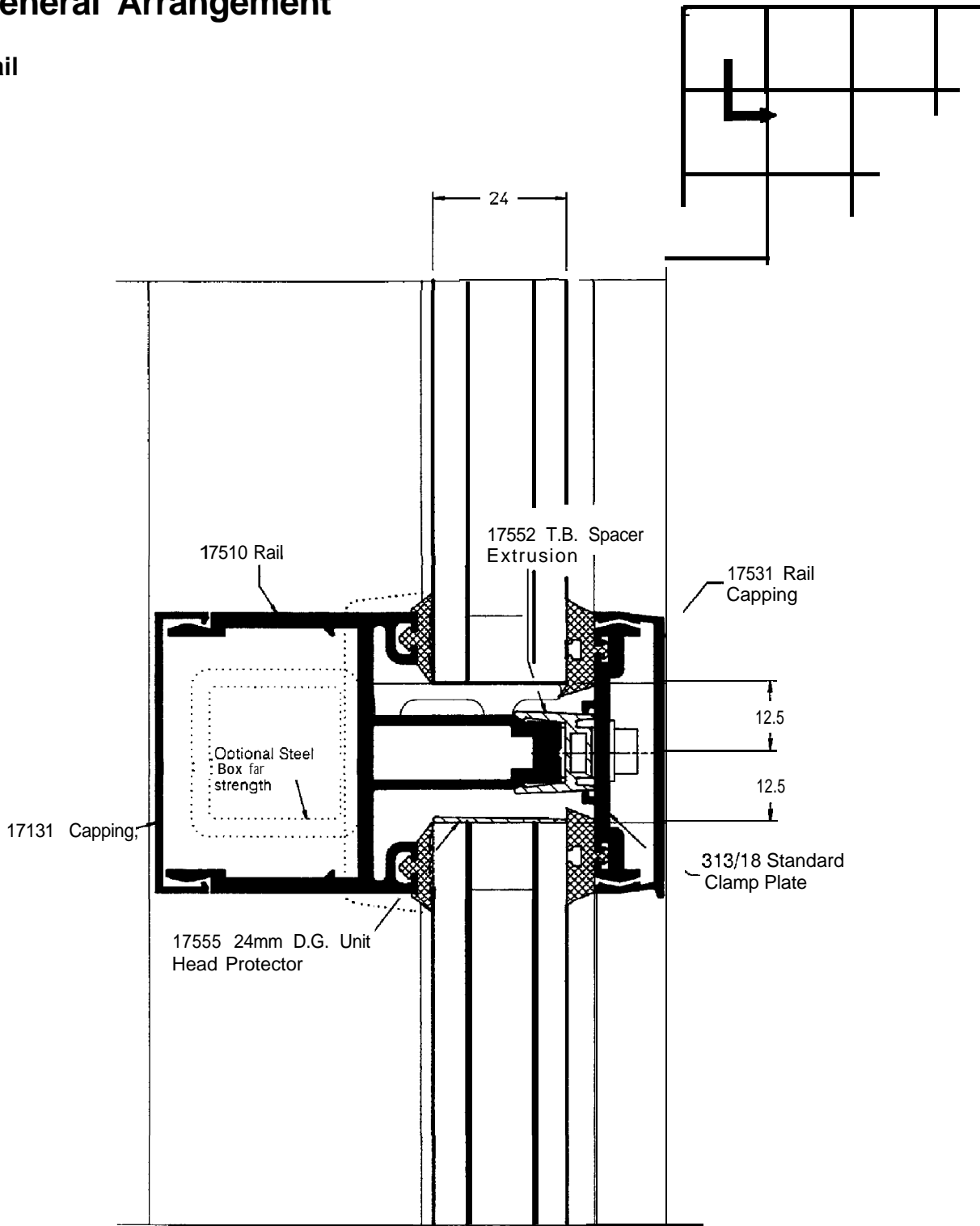
General Arrangement

Cill



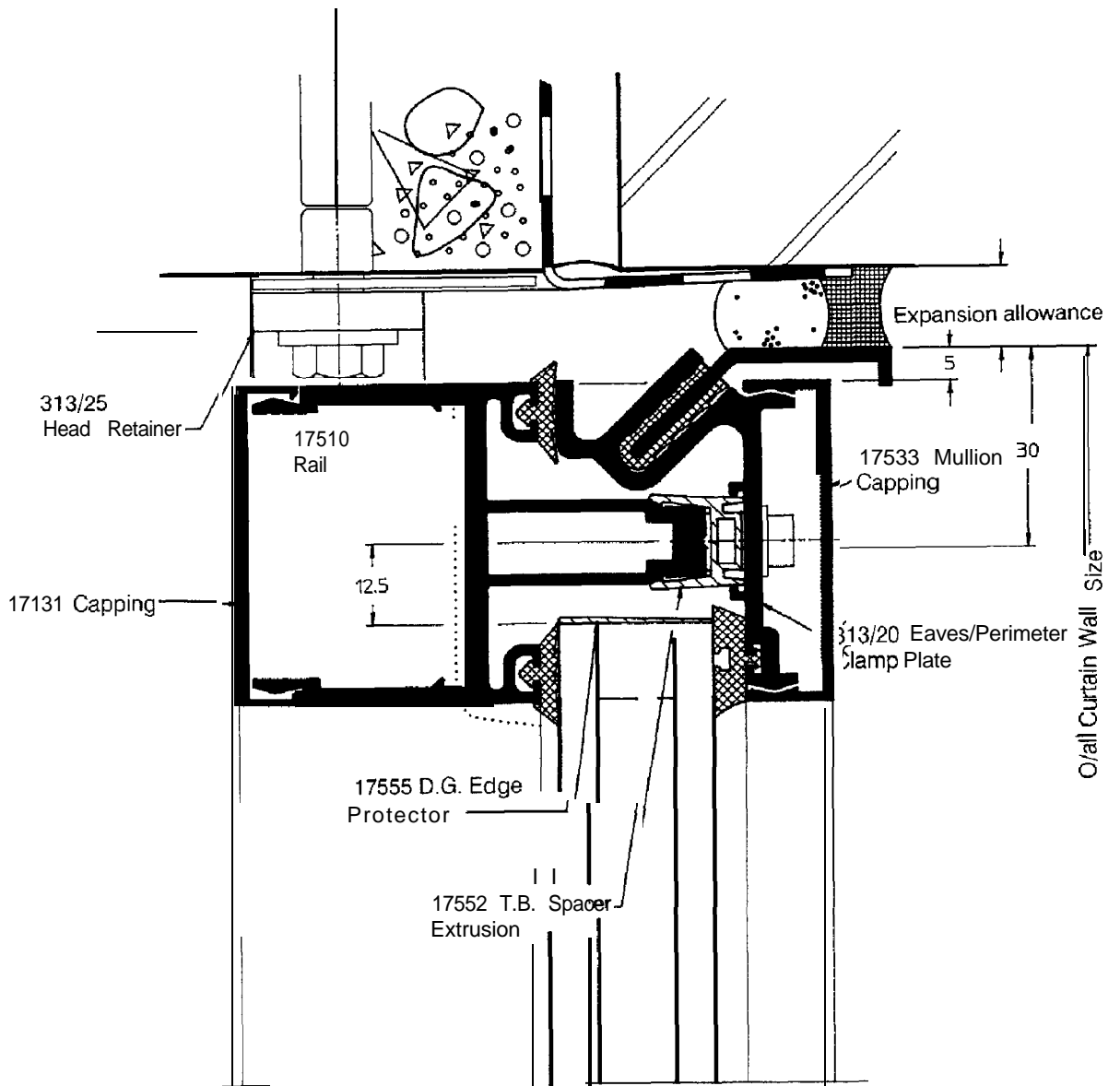
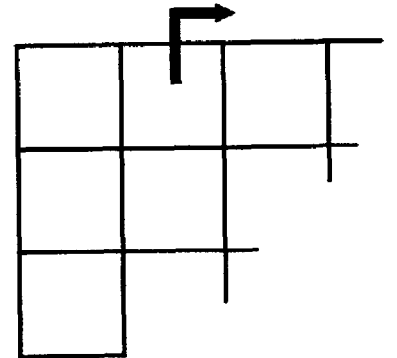
General Arrangement

Rail



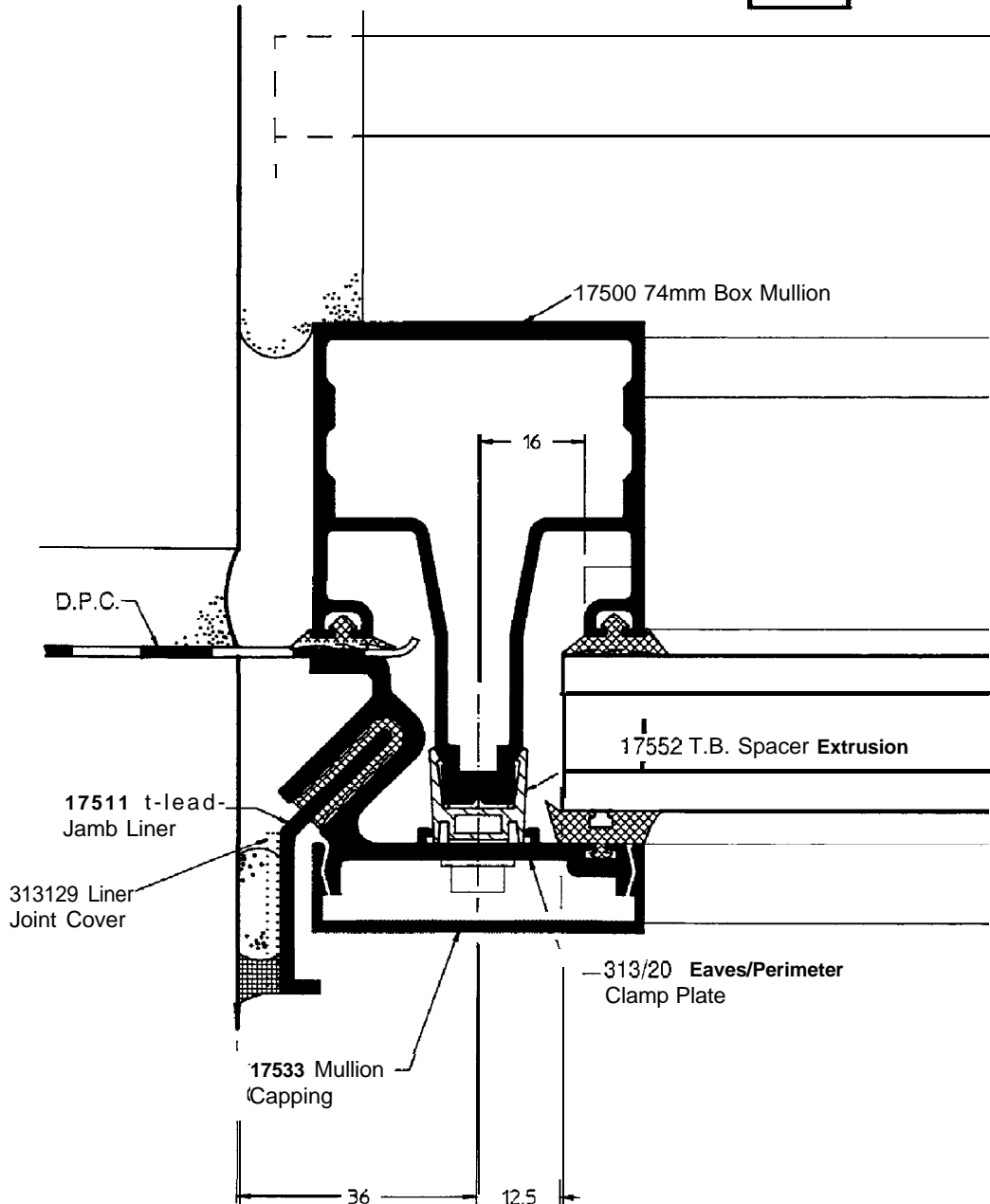
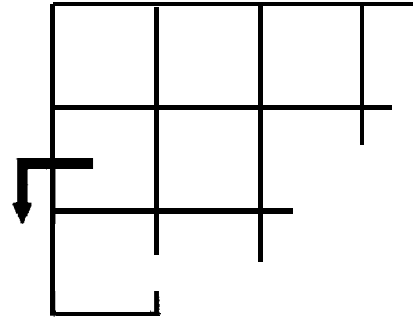
General Arrangement

Head



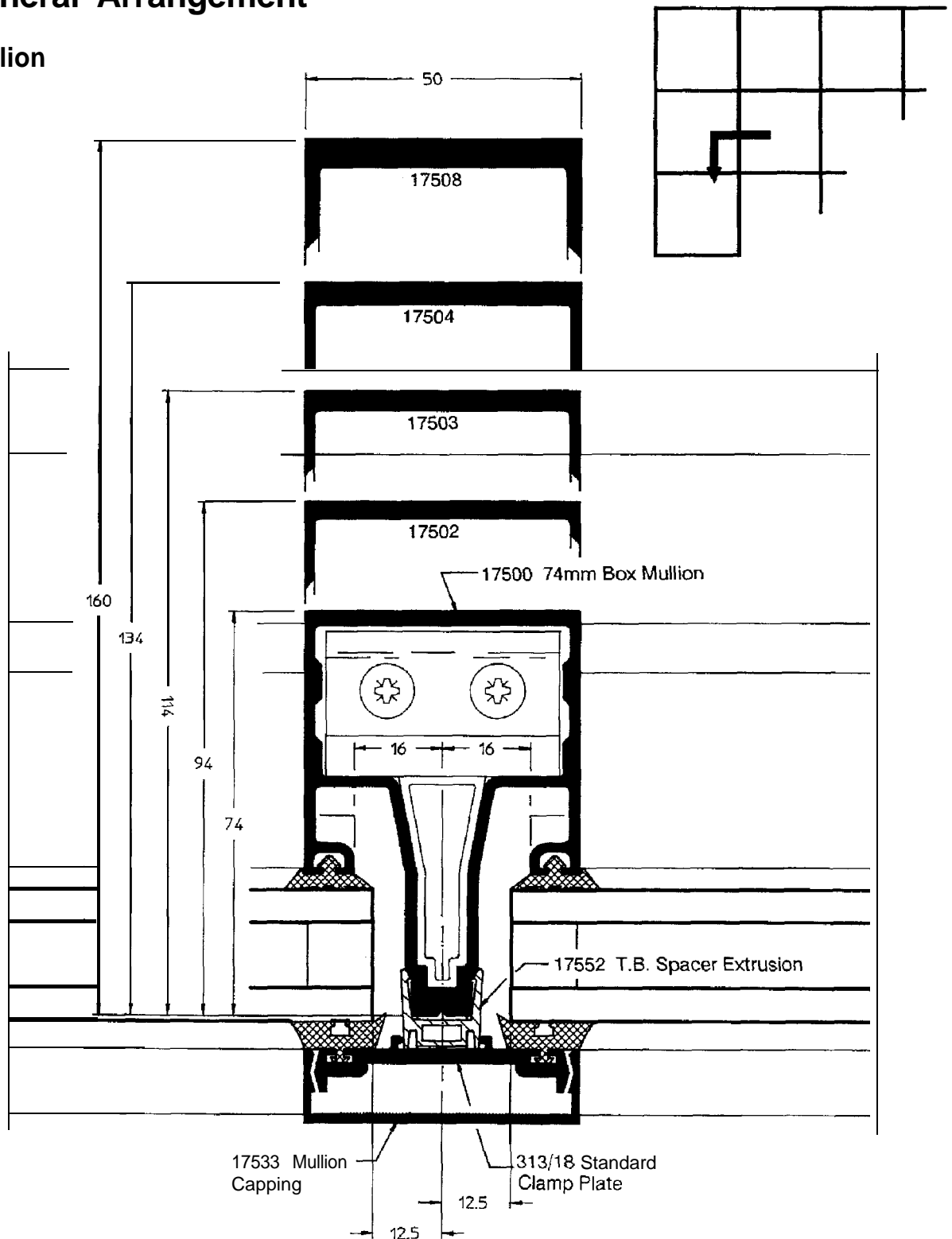
General Arrangement

Mullion Jamb



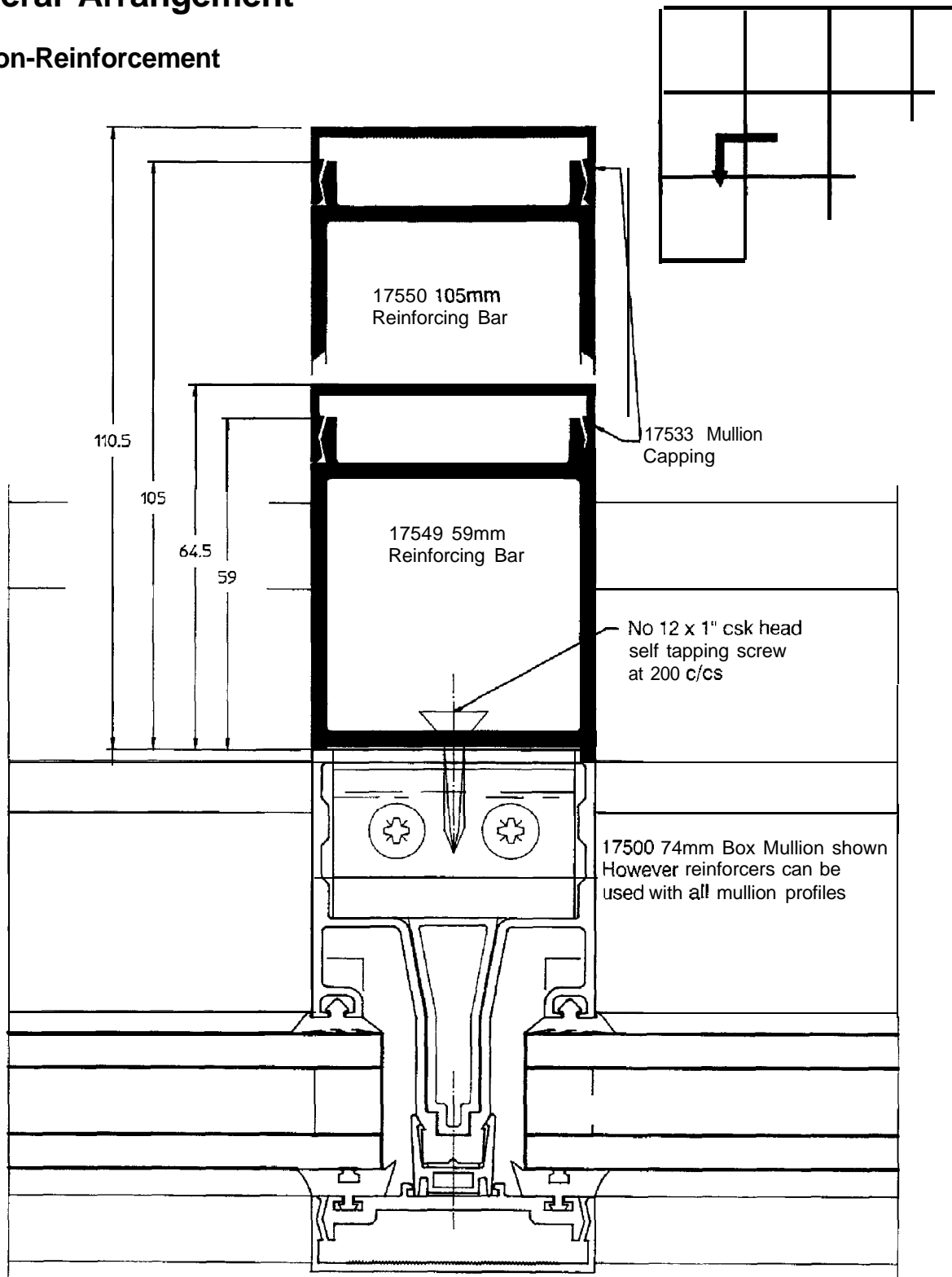
General Arrangement

Mullion



General Arrangement

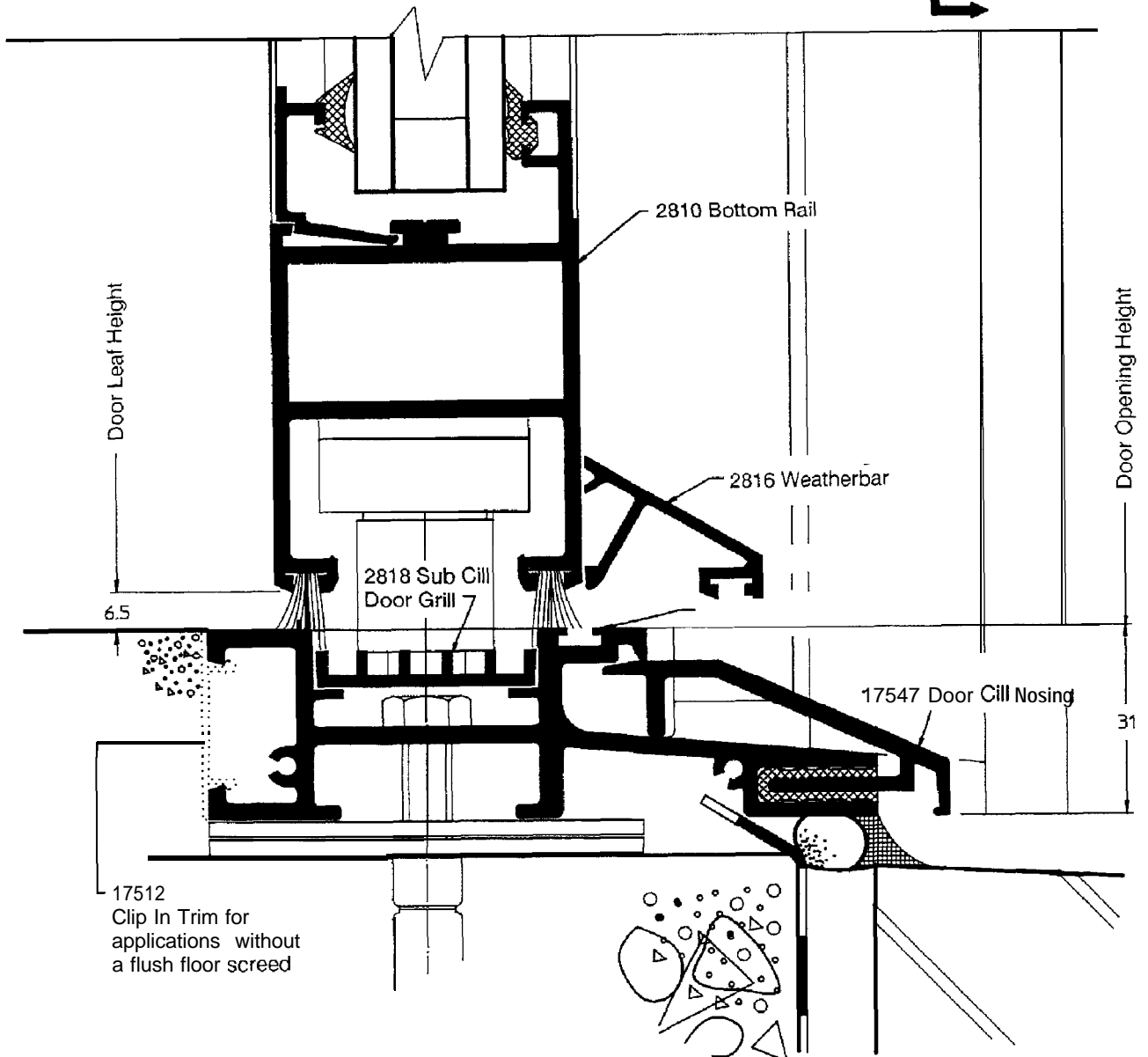
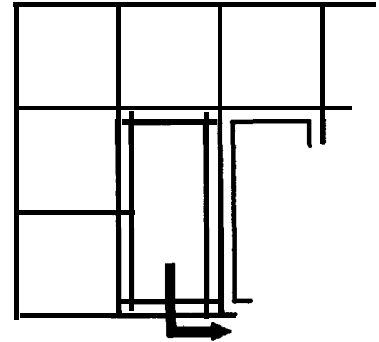
Mullion-Reinforcement



General Arrangement

Door Cill

The continuous cill is designed to directly accept the Glostal 202 High Performance Door

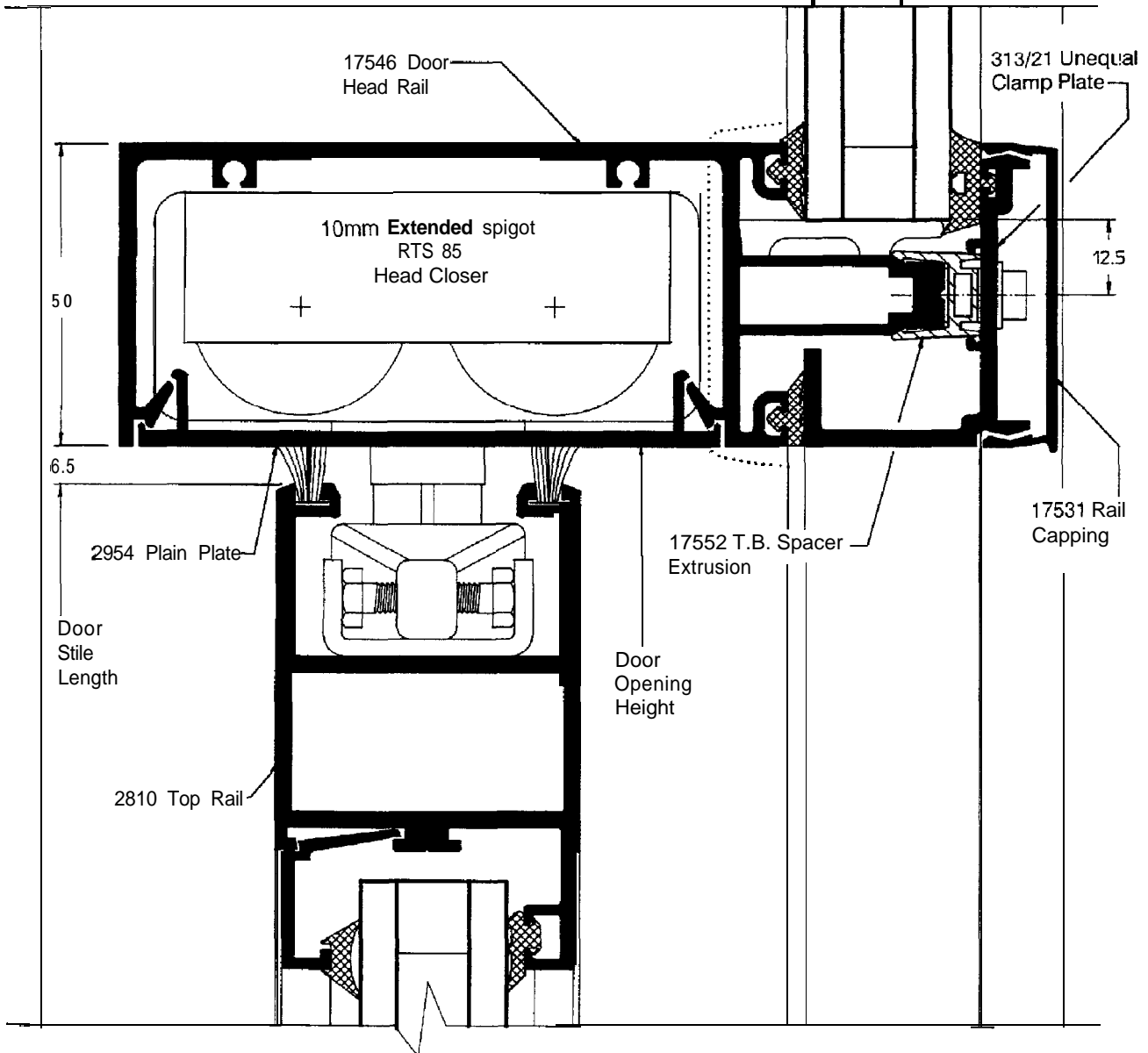
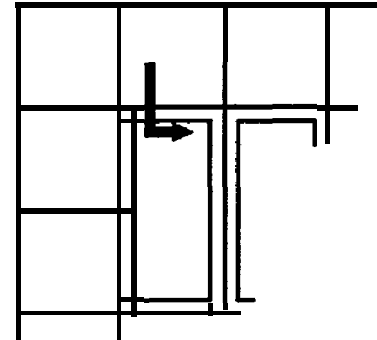


General Arrangement

Door Head Rail

Note: The same mullion profile must be used throughout the curtain wall to avoid problems at the tie back fixing bracket, but at door jambs the mullion must be made up to a minimum depth of 136mm using profiles 17549 or 17550 in order to accommodate the door head rail.

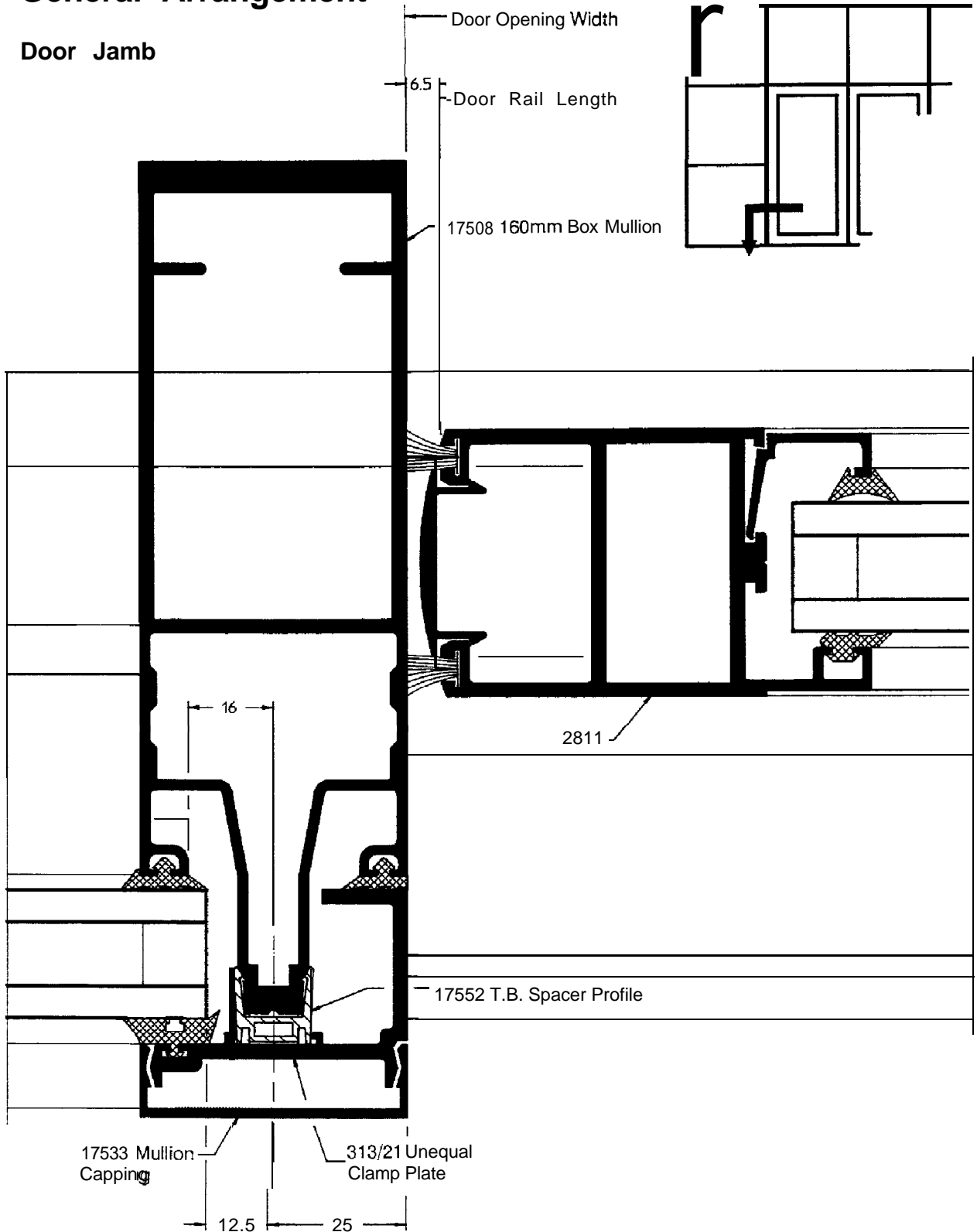
The 17546 Door Head Rail is designed to directly accept the Glostal 202 High Performance Door





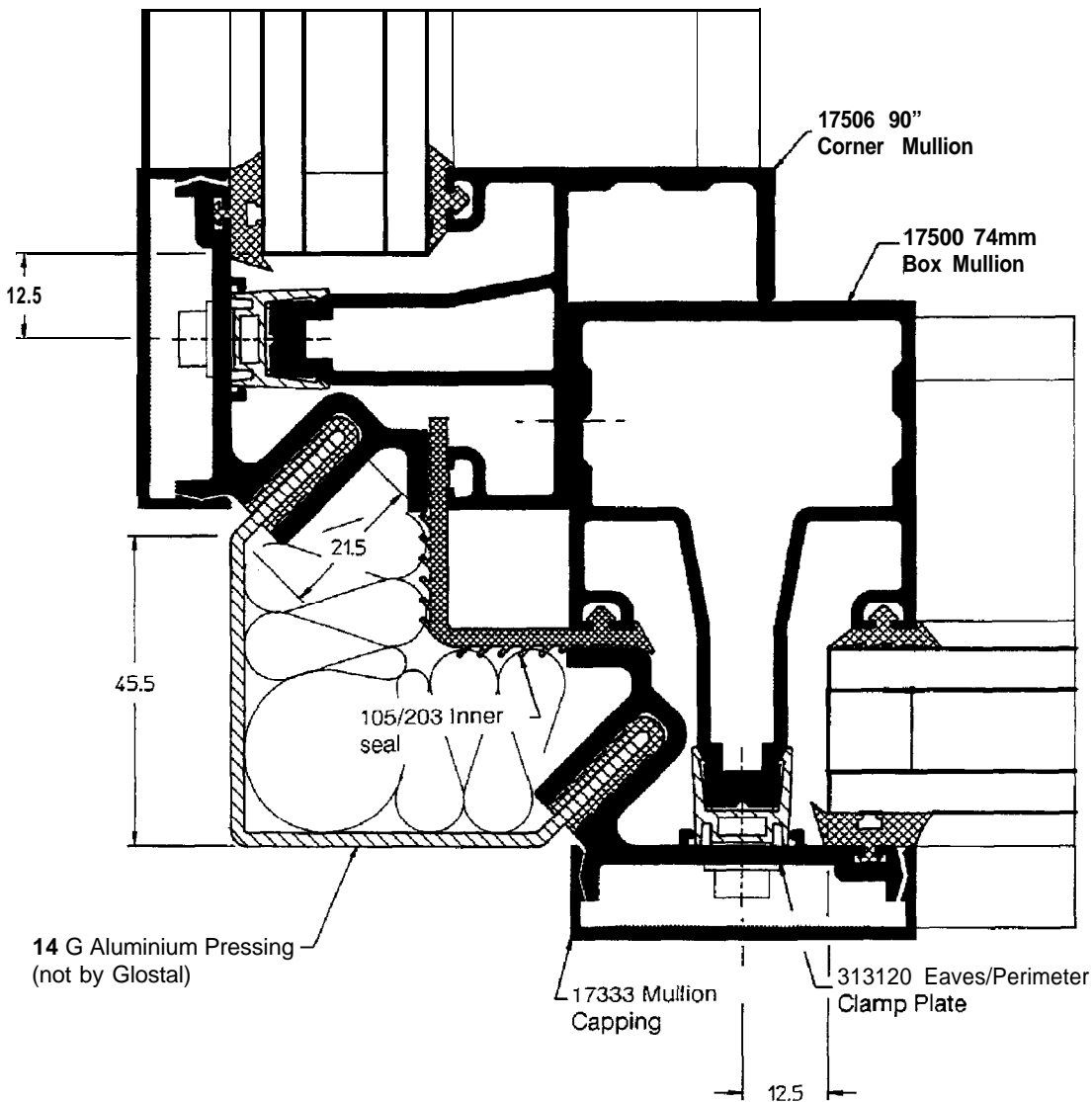
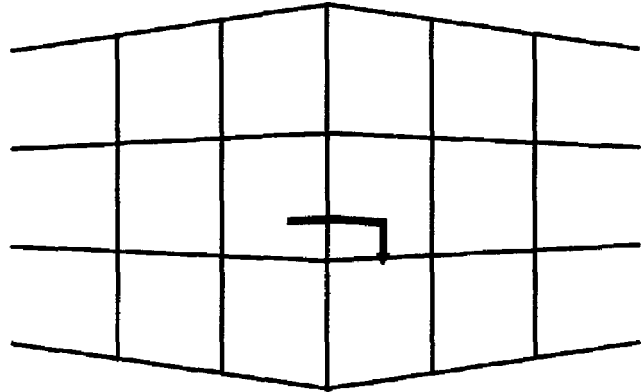
General Arrangement

Door Jamb



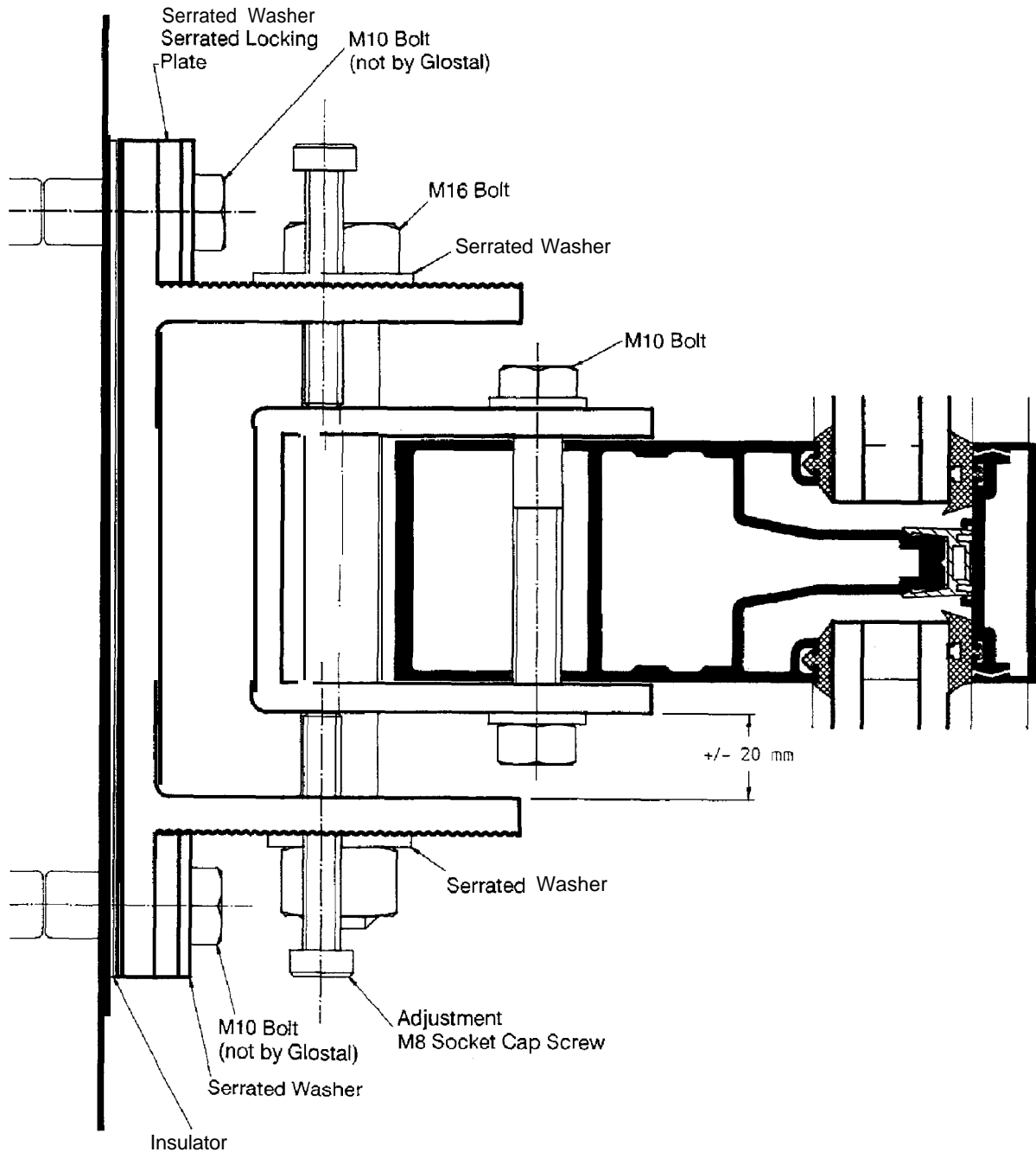
General Arrangement

90° Corner



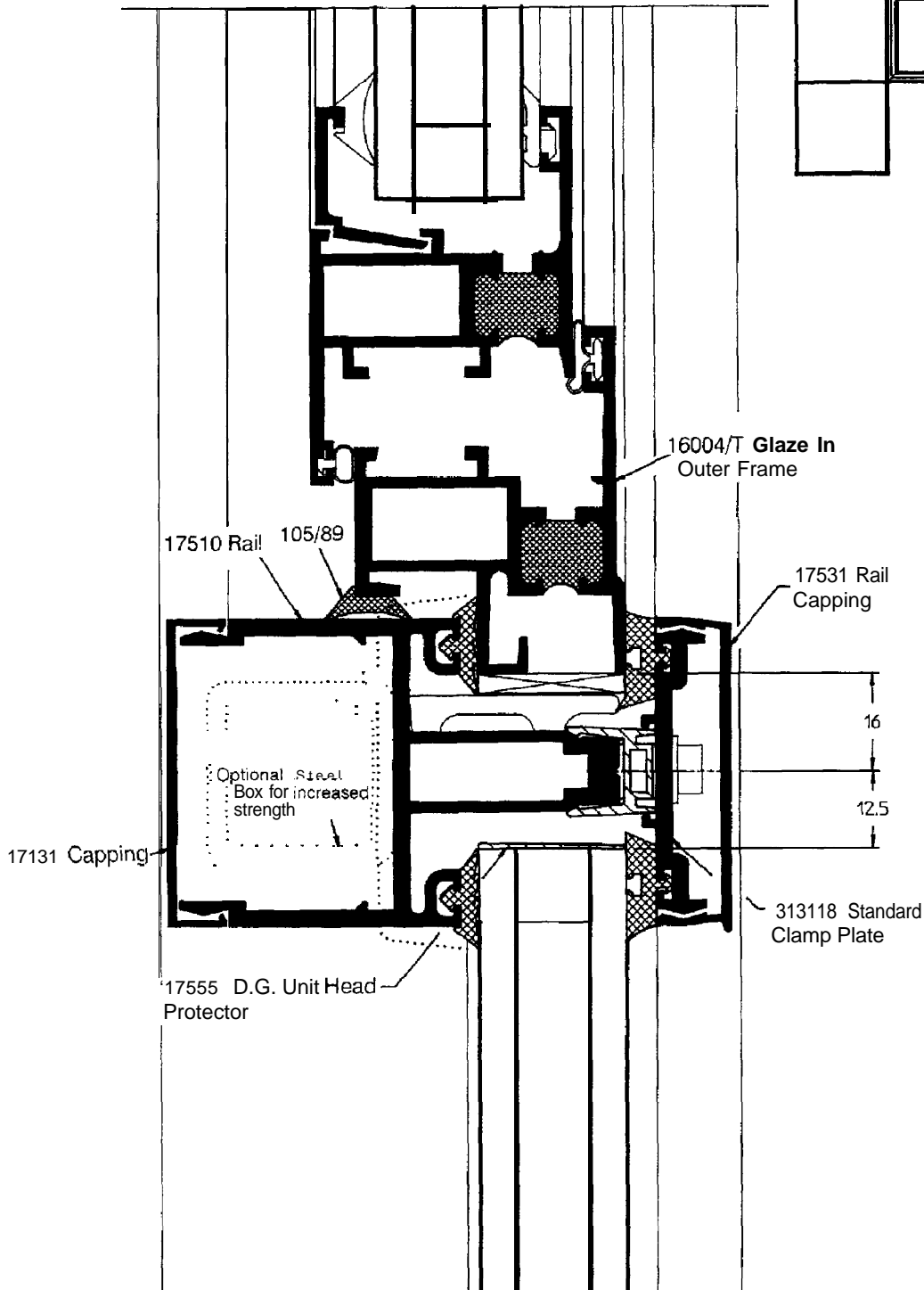
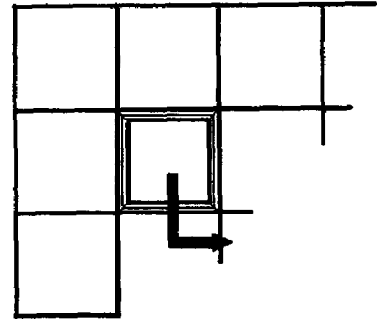
General Arrangement

Tie Back Fixing Bracket



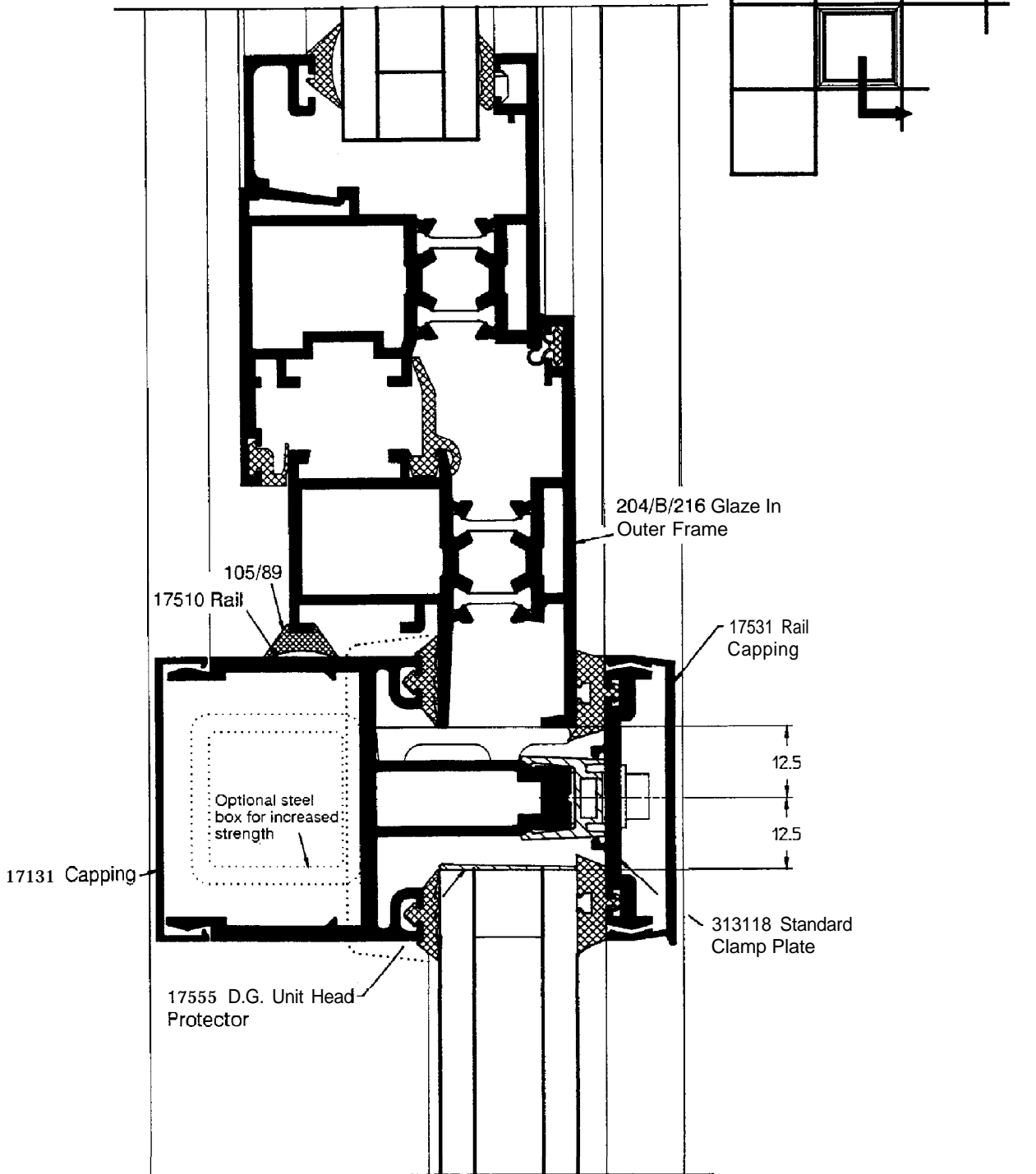
General Arrangement

316 Glaze In Vent



General Arrangement

318 Glaze In Vent

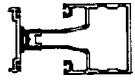



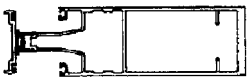





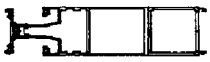
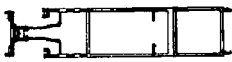
General Arrangement

Inertia Values - Vertical Walling

The information on the following pages must be used for the selection of the most suitable members to meet the requirements calculated from the Wind Loading & Strength Calculations Manual.

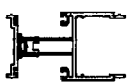


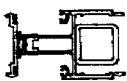








These pages give the inertia values of the various mullion assemblies and also the inertia values of the standard rail bar. It should be used to establish which member is required by comparing with the inertia value required as calculated in the Wind Loading & Strength Calculations Manual.

Profile	Inertia mm ⁴	
 17500	→	490,000
	↑	150,000
 17502	→	920,000
	↑	215,000
 17503	→	1,430,000
	↑	260,000
 17504	→	2,150,000
	↑	304,000
 17508	→	3,970,000
	↑	448,000

Profile	Inertia mm ⁴	
 17500 & 17549	→	1,470,000
	↑	285,000
 17502 & 17549	→	2,185,000
	↑	355,000
 17503 & 17549	→	3,120,000
	↑	398,000
 17504 & 17549	→	4,328,000
	↑	442,000
 17508 & 17549	→	6,544,000
	↑	586,000

General Arrangement

Inertia Values - Vertical Walling











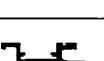




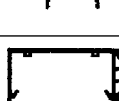


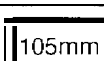
Profile	Inertia mm ⁴	
 17510		291,000
		172,000
 17510 with 30 x 30 x 3.2 Steel Box		419,000
		300,000
 17549		214,000
		198,000
 17550		969,000
		328,000






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Part List





Aluminium Profiles

Illustration	Part No	Description
	17131	Internal rail capping
	17500	74mm Box mullion
	17502	94mm Box mullion
	17503	114mm Box mullion
	17504	134mm Box mullion
	17506	90° Corner adaptor
	17508	160mm Box mullion
	17510	Standard rail
	17511	Head/Jamb liner
	17512	Clip in cill trim
	17520	Cill
	17521	Cill nosing
	17522	Cill closure
	17531	Rail capping
	17533	Mullion capping
	17546	Door head rail
	17547	Door cill nosing
	17549	59mm Reinforcing bar
	17550	105mm Reinforcing bar







Clamp Plates

Illustration	Part No	Description
	313/18	Standard clamp plate
	313/20	Eaves/Perimeter clamp plate
	313/21	Unequal leg clamp plate

PVC Profiles

Illustration	Part No	Description
	17552	24mm Glazing T.B. spacer
	17553	32mm Glazing T.B. spacer
	17555	24mm D.G. Unit head protector
	17556	32mm D.G. Unit head protector

Gaskets & Weatherseals

Illustration	Part No	Description
	105/89	4mm Wedge gasket (for use with 316 & 318)
	105/134	5mm Outer gasket
	105/142	Insulation gasket
	105/148	Weatherseal gasket
	105/200	3mm Inner gasket
	105/203	Eaves/Corner post inner seal

Part List

'L' Gaskets

	Part No	Description
	313/32	L Gasket 450 x 450
	313/33	L Gasket 600 x 600
	313/34	L Gasket 750 x 750

Note: Panes over 1500 in any direction must use Tyred Gaskets.

Tyred Gasket

	Part No	Description
	313/31/HW	3mm Inner tyred gasket H= height & W width

Note: To order tyred gaskets, specify height and width of glass for which gasket is required.

Components

Illustration	Part No	Description
	313/1	Mullion joint sleeve cover moulding
	313/2	Cill joint cover
	313/3	Rail to mullion joint moulding
	313/4/1 313/4/2	L.H.) Rail drainage RH.) moulding (24mm)
	313/5	Cill stop end
	313/6	Jamb plug
	313/7	Door cill plug
	313/8/1 313/8/2	L.H.) Head rail drainage R.H.) moulding (24mm)

Components

Illustration	Part No	Description
	313/10	Rail to mullion bracket
	313/13	Mullion cill locator pack
	313/15/1	Tie back fixing bracket assy 1st fixing pack
	313/15/2	Tie back fixing bracket assy 2nd fixing pack
	313/16	Head plug
	313117	Mullion plug
	313/22	Head mullion plug
	313/23	Mullion to zone rail joint moulding
	313/24	Door head rail to mullion bracket
	313125	Head retainer bracket
	313126	Mullion/Top rail capping plug
	313/27	Cruciform plug
	313/28/1 313/28/2	L.H.) Plug for mullion R.H.) over door head
	313/29	Head/Jamb liner joint cover
	313/30	Reinforcer end cap
	313/81	Glazing packer (24mm)

Part List

Fixing Screws

Size	Head	Description
No 8 x 3/4" ST834CPSS	Csk	Self tap screw - Cill end stop
No 8 x 1" ST81PPSS	Pan	Self tap screw - Rail to bracket
No 10 x 1.1/4" ST10114PPSS	Pan	Self tap screw - Rail bracket to mullion
No 12 x 3/4" ST1234PPSS	Pan	Self tap screw - Mullion retainer to cill
No 12 x 1" ST121CPSS	Csk	Self tap screw - reinforcing bar fixing
No 12 x 1" ST121HSS	Hex	Self tap screw for clamp plate screw replacement - 24mm glazing
No 12 x 1.1/4" SDST12114HSS	Hex	Self drill self tap for clamp plates - 24mm glazing
No 12x1.1/2" ST121.12HSS	Hex	Self tap screw for clamp plate screw replacement - 32mm glazing
No 12 x 2" SDST122HSS	Hex	Self drill self tap for clamp plates - 32mm glazing

Tooling

Part No	Description
313/250	Drill jig for mullion retainer & cill fixing holes
313/251	Drill jig for rail bracket to mullion fixing holes, door head rail to mullion & mullion head/cill preparations
313/252	Drill jig for rail to rail bracket clearance holes & cut back
313/253	Drill jig for reinforcing bar clearance & fixing holes
313/260	Router plate for mullion cut out to accommodate rail gasket & mullion tie back preparations including joint sleeve slot & vertical clamp plate drain slots
313/270	Press tool for mullion rail cut out & rail end preparation

Drill Sizes

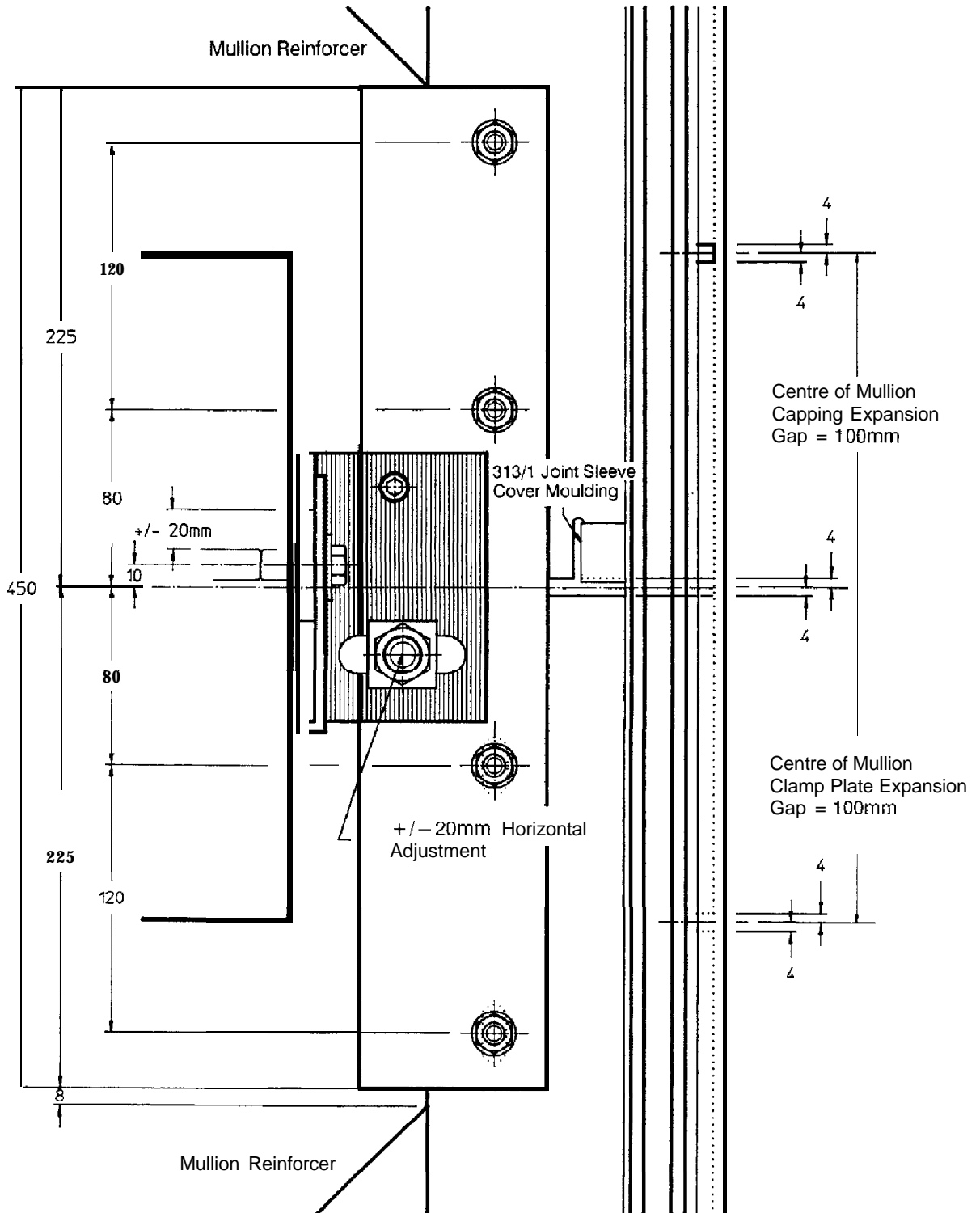
Size	Description
4.2	For mullion retainer, reinforcer, rail bracket to mullion
4.5	Clearance holes for rail to rail bracket fixing screws
5.0	Fixing holes for hex head self tapping screws
6.0	For clearance hole in clamp plate
13.9/6.0 *	Step drill for access hole & clearance hole for reinforcing bar

* Available from Glostal - Part 108/359



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Tie Back Fixing Bracket - Dimensional Relationships



Cutting & Machining

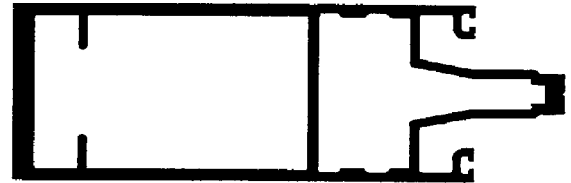
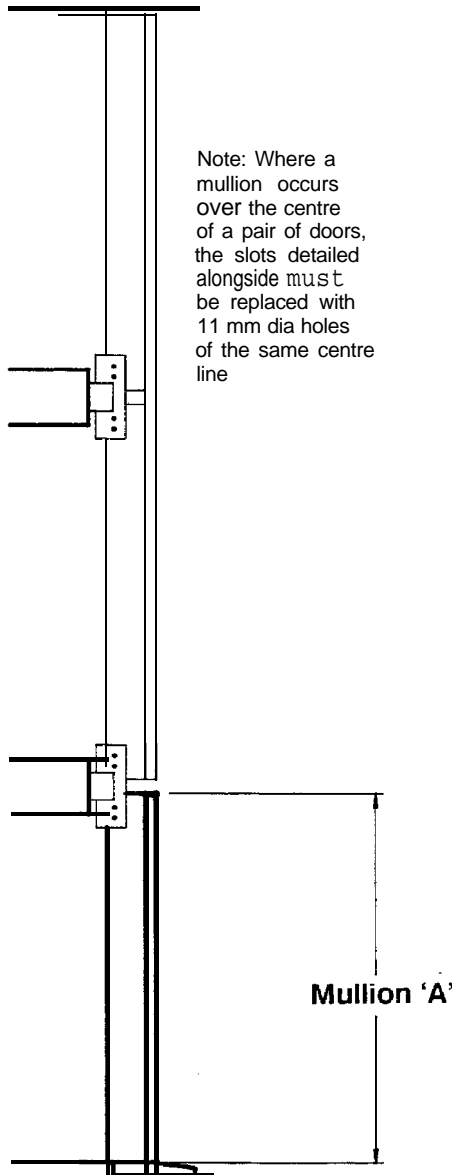
Mullion "A"

Profiles 17500, 17502, 17503, 17504 & 17508.

As shown on page 4-1 the allowance for the mullion at the Tie Back Fixing Bracket is 4mm off of the Tie Back Fixing Bracket Centre Line. The allowance at the Cill is 20mm and can be found on page 2-1.

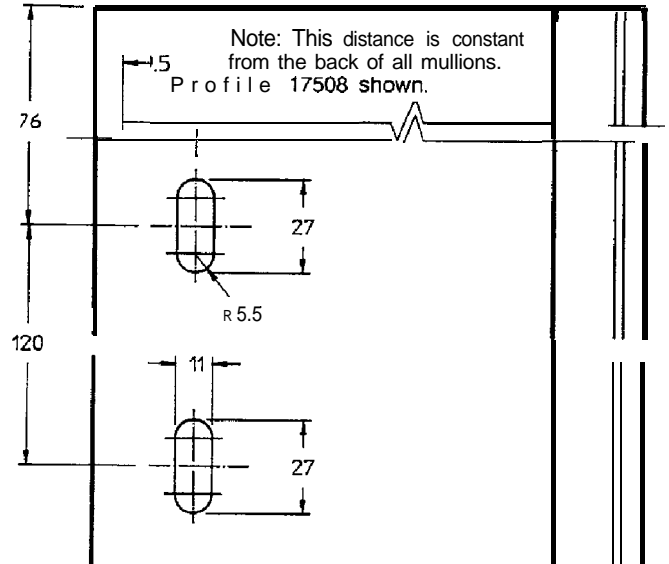
Use press tool 3131270 or router plate 3131260 for notches and drill jig 313/251 for rail fixing holes & cill cut-out.

Use router plate 313/260 for Tie Back Fixing Bracket preparation.



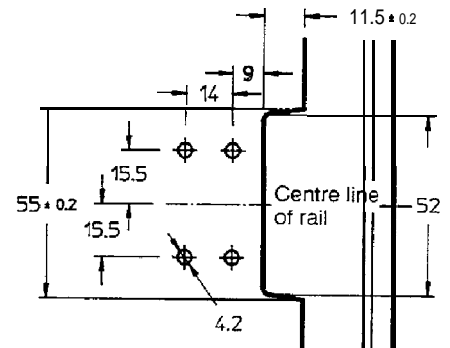
Tie Back Fixing Bracket Preparation

Use Router plate 313/260



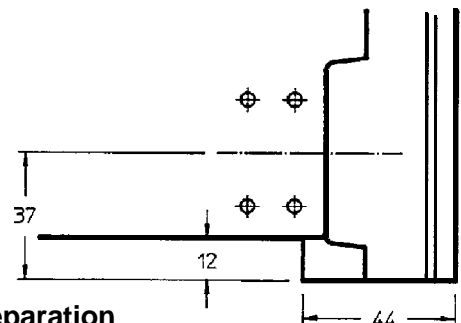
Rail Preparation

Use Jig 313/251



Cill Preparation

Use Jig 3131251



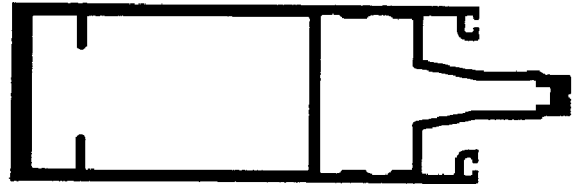
Cutting & Machining

Mullion "B"

Profiles 17500, 17502, 17503, 17504 & 17508.

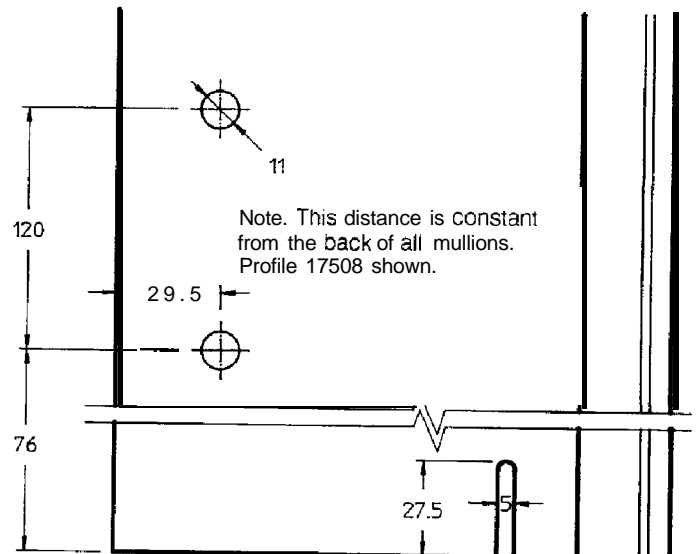
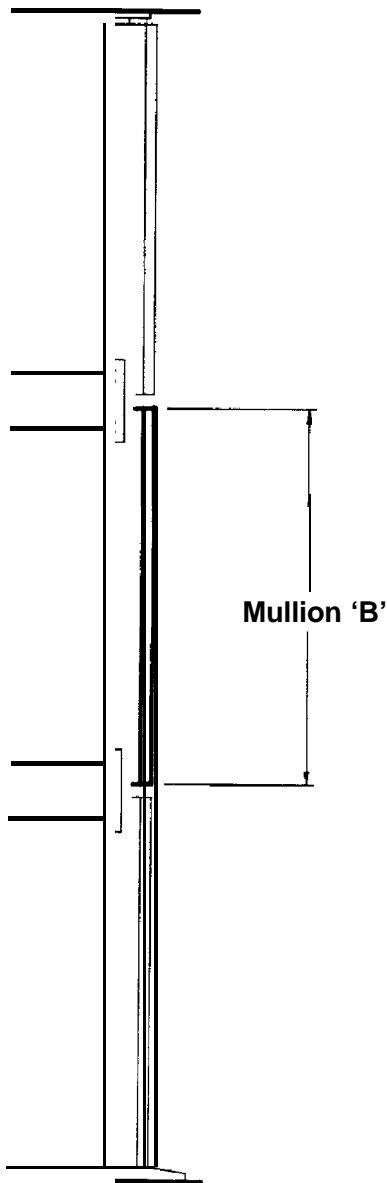
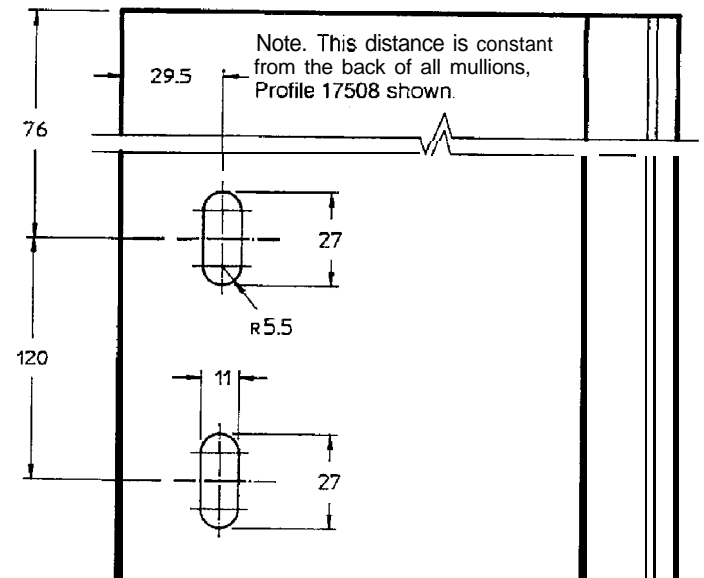
As shown on page 4-1 the allowance for the mullion at the Tie Back Fixing Bracket is 4mm off of the Tie Back Fixing Bracket Centre Line,

Use router plate 313/260 for top & bottom Tie Back Fixing Bracket preparation.



Tie Back Fixing Bracket Preparation (Top)

Use Router plate 313/260



Tie Back Fixing Bracket Preparation (Bottom)

Use Router plate 313/260

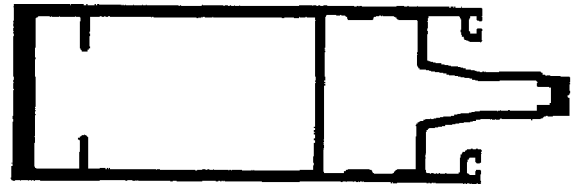
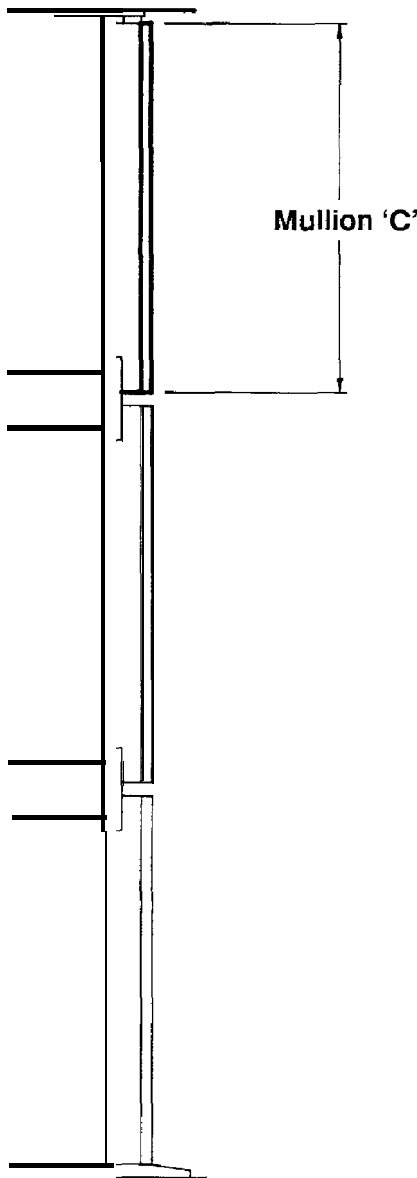
Cutting & Machining

Mullion "C"

Profiles 17500, 17502, 17503, 17504 & 17508.

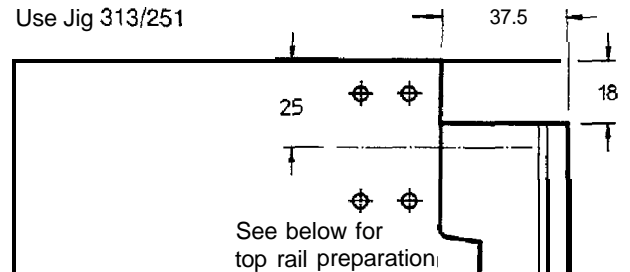
As shown on page 4-1 the allowance for the mullion at the Tie Back Fixing Bracket is 4mm off of the Tie Back Fixing Bracket Centre line. The allowance at the Head is 5mm and can be found on page 2-4.

Use press tool 313/270 or router plate 313/260 for notches & lower Tie Back Fixing Bracket preparation and jig 313/251 for rail fixing holes.



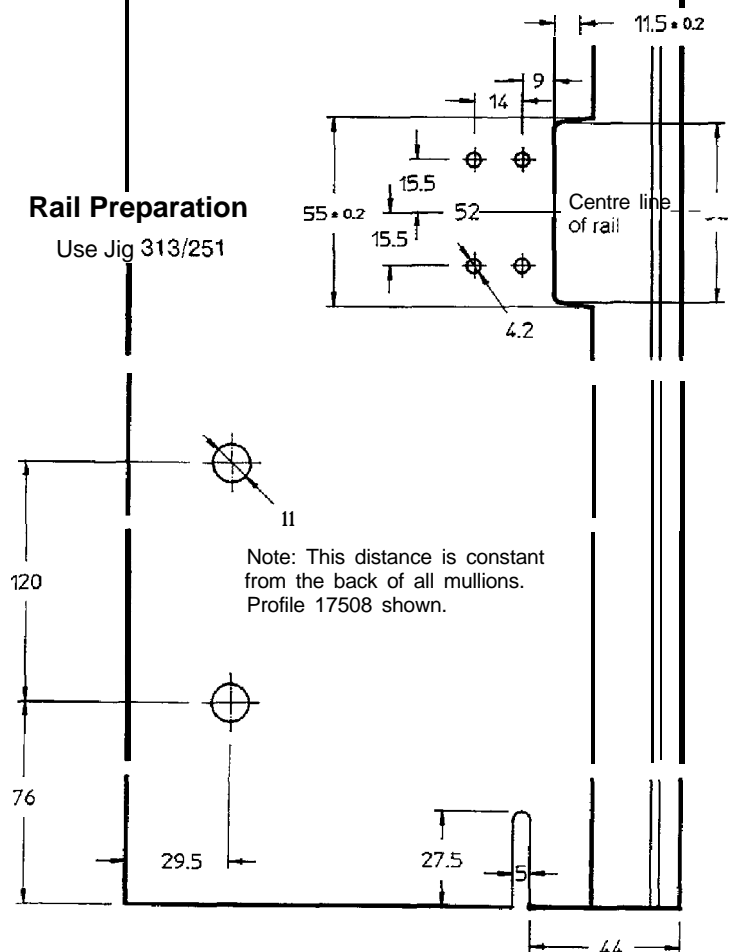
Head Preparation

Use Jig 313/251



Rail Preparation

Use Jig 313/251



Tie Back Fixing Bracket Preparation (Bottom)

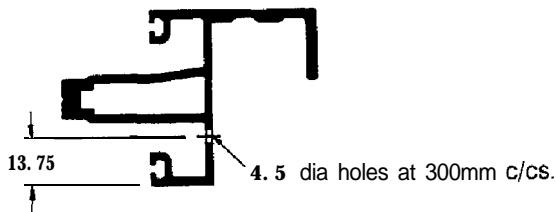
Use Router plate 313/260

Cutting & Machining

90° Corner Adaptor

Profile 17506.

This profile must be cut to same length as the mullion to which it is to be attached. It must also have rail preparations in the same way as the mullion. The only other preparations necessary are the clearance fixing holes for fitting to the mullion,

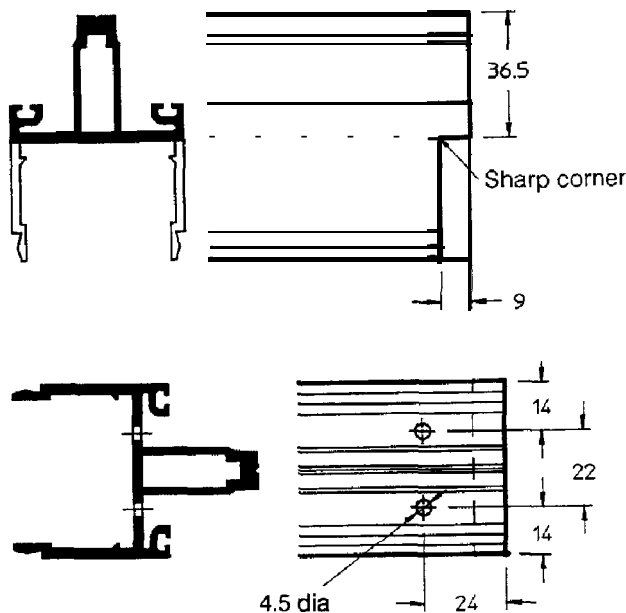


Rails

Profile 17510.

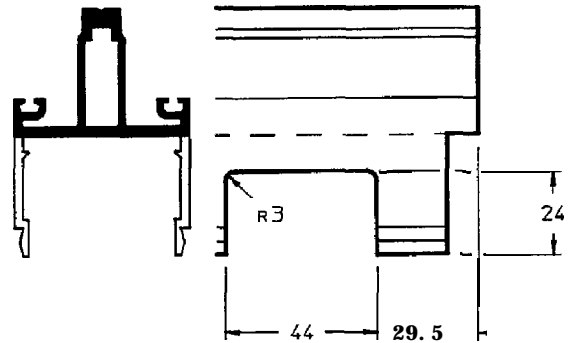
Cut length = mullion c/cs. minus 32mm

All rails must have end notching and drilling as shown below to allow jointing to mullions. Use drill jig 313/252 for holes & cut back. Alternatively use press tool 313/270 for cut back.



Rails (cont)

On extreme top rails additional machining is required as shown below to avoid the head retaining bracket fixing screws.



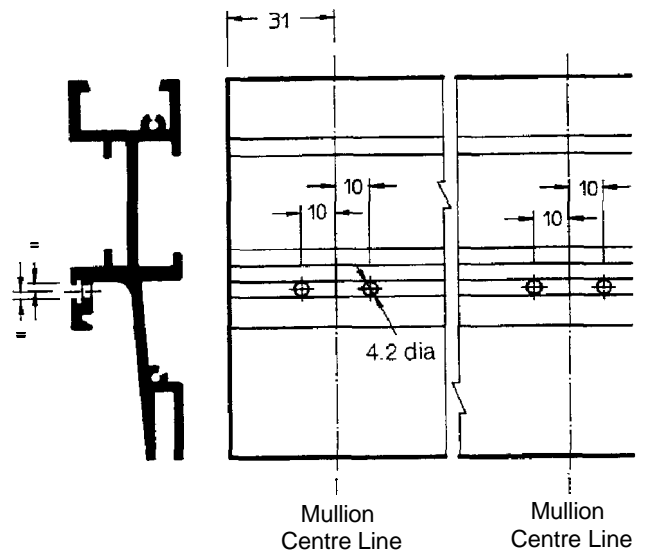
Cill

Profile 17520

Cut length = extreme mullion centres plus 62mm.

Prepare as below at each mullion centre.

Use drill jig 313/250.

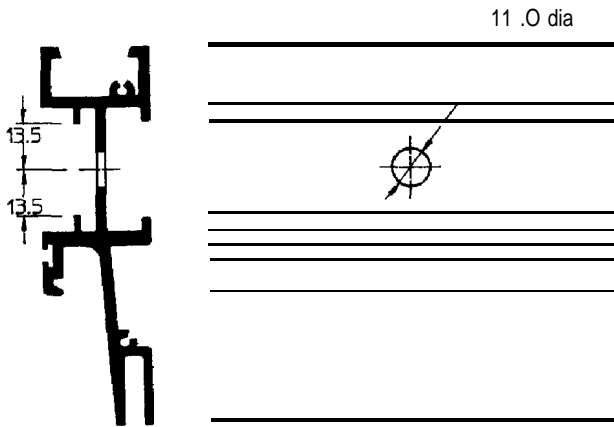


Cutting & Machining

Cill (cont)

In addition to the previous preparation, if custom made cill fixing lugs are not being used then fixing holes need to be prepared as below 150mm from each end and at no more than 300mm centres. NOTE: Where a door opening occurs the heads of fixing screws must be sealed to the cill to prevent water penetration.

Use drill jig 313/250.

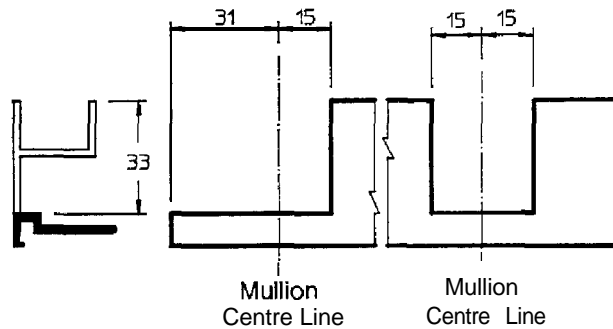


Cill Nosing

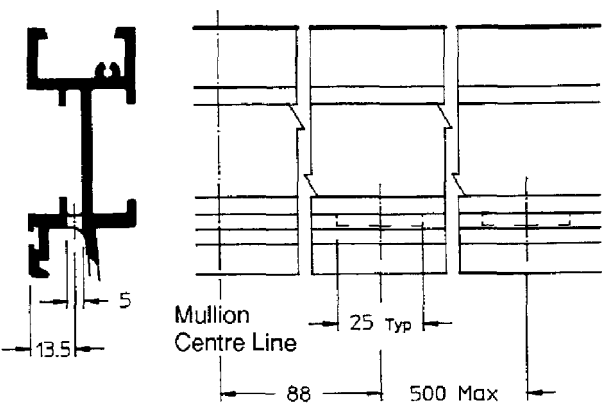
Profile 17521.

Cut length = extreme mullion centres plus 62mm.

Prepare as below at each mullion centre.



At every door opening, drainage preparation is required in the cill consisting of a 25 x 5 slot, as shown below, 88mm in from the mullion centre either side of the door and at no more than 500mm centres,





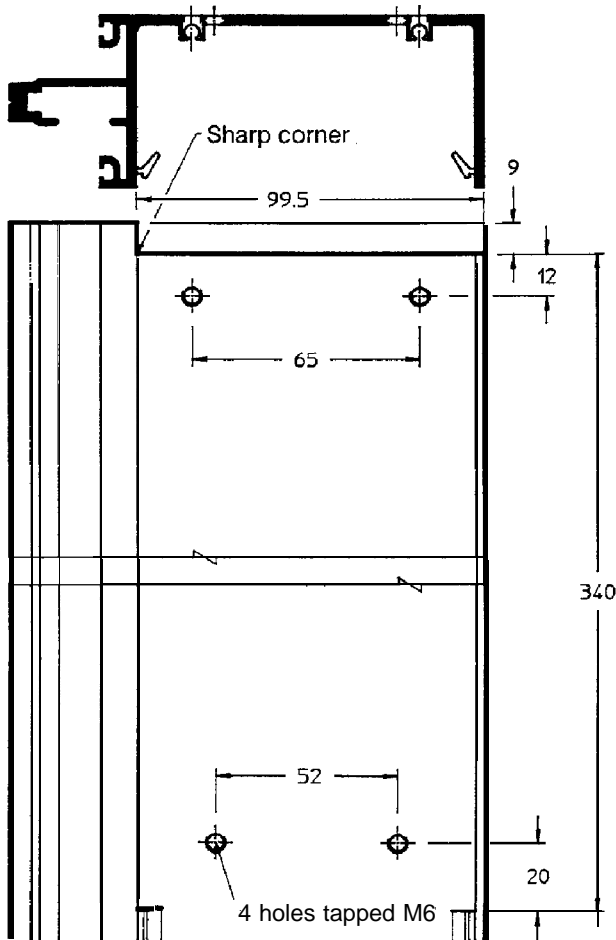
Cutting & Machining

Door Head Rail

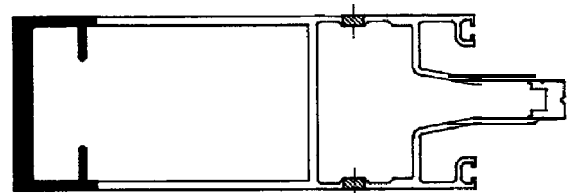
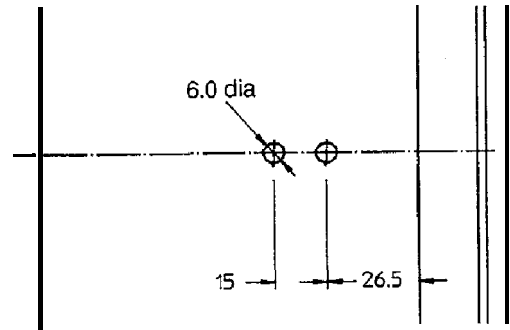
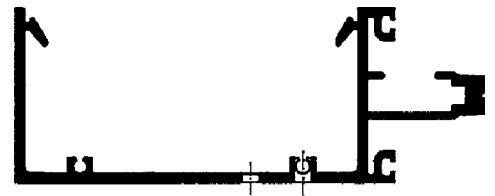
Profile 17546.

Cut Length = mullion c/cs. minus 32mm.

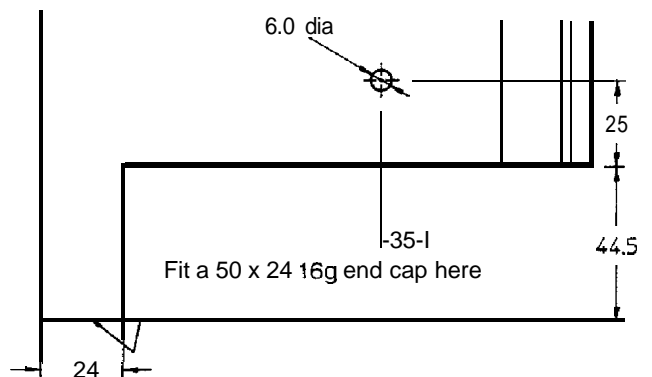
This profile must be end notched and have end fixing holes and overhead closer preparation as shown below. On double doors this machining must be repeated at both ends of the bar. On single doors only the extreme end holes and 9mm notch are required at the lock stile end.



Where a mullion comes down on top of the door head rail (i.e. at the centre of a pair of doors) the head rail and mullion must be prepared as shown below, and jointed using a modified 313/24 bracket.



Where a narrower mullion that that shown is used the end notch can be omitted and the reinforcer profile which must be fitted to the back of the mullion can be mitre cut and finished off with a 313130 end cap.



Door Cill Nosing

Profile 17547.

Cut length = mullion c/cs. (either side of door) minus 50mm.

No machining is necessary.

NOTE: The 17521 nosing must butt up against the 17547 nosing on either side and therefore allowance must be made in the cut length of the 17521 to accommodate it.



Cutting & Machining

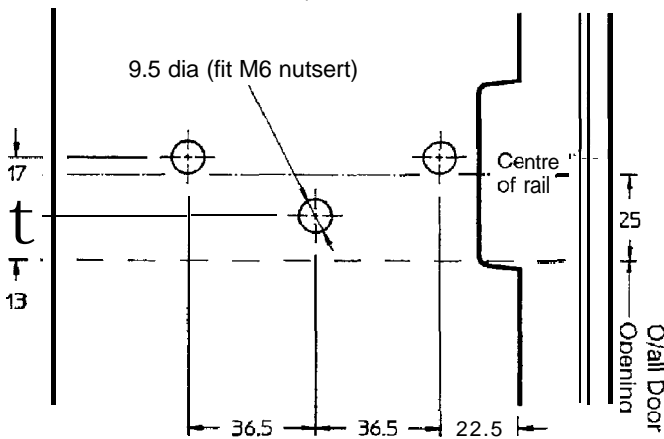
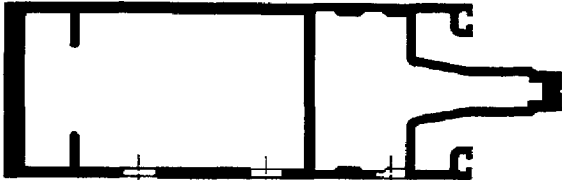
Mullion Preparation at Door Head Rail

Where a door head rail meets a mullion the notch in the mullion is the same as for the normal rail. However, the rail fixing holes must be as below.

As stated on General Arrangement page 2-10 the same mullion profile must be used throughout the curtain wall to avoid problems with the tie back fixing bracket. To enable the 202 High Performance Door to be fitted, the total mullion depth must be made up to a minimum of 136mm by the use of reinforcer profiles 17549 or 17550

Where these profiles are used the reinforcer must be fitted to the mullion prior to carrying out the following preparation.

Use drill jig 3131251.

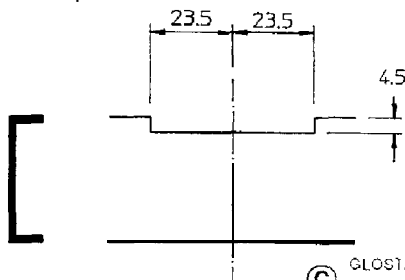


Cill Closure

Profile 17522.

This profile is square cut to the same length as the cill i.e. extreme mullion c/cs. plus 62mm. Any joints in this profile must occur at mullion centre position

Notch profile as shown below at each mullion centre.



Clamp Plates

Components 313/18, 313/20 & 313/21.

Rail clamp plate length = mullion c/cs. minus 55mm.

Glazing gasket on underside of rail clamp plates must be cut back for 50mm commencing 50mm from each end.

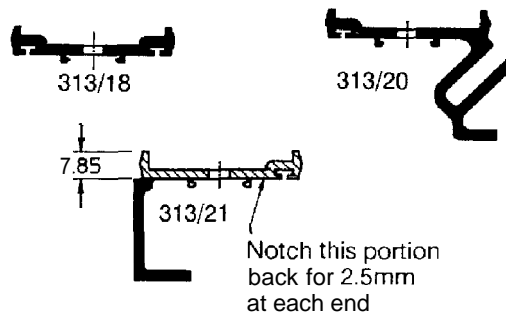
The allowance at the cill for the mullion clamp plate is 20mm as shown on page 2-1. The allowance at the head is 57.5mm except at the jambs where the allowance is NIL. The allowances at the tie back are shown on page 4-1.

Where 313/20 is used around the perimeter of the curtain walling, the top rail clamp plate runs continuously along the head and is mitred onto the jamb clamp plate. The cut length of the head clamp plate = extreme mullion c/cs. plus 60.5mm. Where the head capping exceeds 6 metres in length, it must be jointed by square cutting and allowing a 6mm expansion gap before starting the next clamp plate. This break in the clamp plate at the head must occur at the mid-point between two mullions.

The head clamp plate requires the T.B. spacer engagement legs to be removed for 7.5mm either side of each mullion centre line. The glazing gasket must also be notched back for the same distance.

Where 313/21 is round a door opening the cut length of the horizontal clamp plate = mullion centres minus 50mm and the hatched portion of the illustration below is notched back at both ends for 2.5mm. The vertical clamp plate cut length = distance from underside of sub cill to centre of door transom minus 31 mm.

All clamp plates are supplied with 6mm dia fixing holes at 200mm centres. When cut to length additional end fixing holes must be prepared when necessary to ensure that end holes are a maximum of 50mm from the end of the clamp plate.

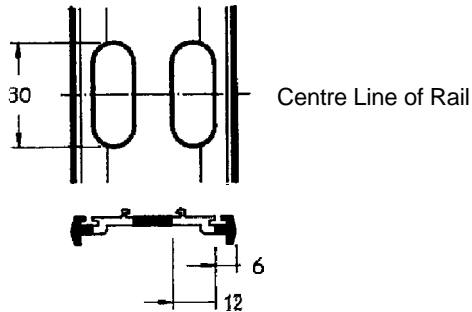


Cutting & Machining

Clamp Plates (cont)

In addition to the 6mm dia fixing holes the preparation shown below is required on vertical clamp plates at any rail centre where drainage mouldings occur.

Use router plate 313/251.

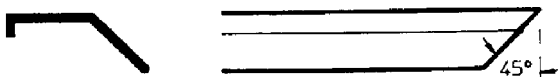


The glazing gasket must be notched back for 7.5mm either side of the centre line of rail.

Head/Jamb Liner

Profile 1757 1.

This profile is cut to the same length as the 313/20 clamp plate. It is mitre cut as shown below at the joint between the jambs and the head.



Reinforcing Bars

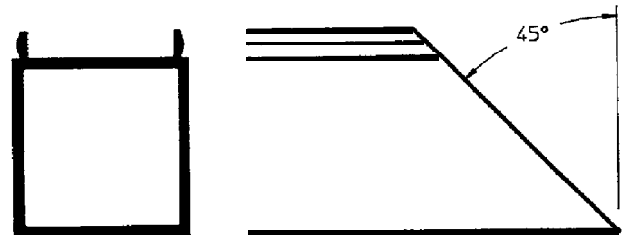
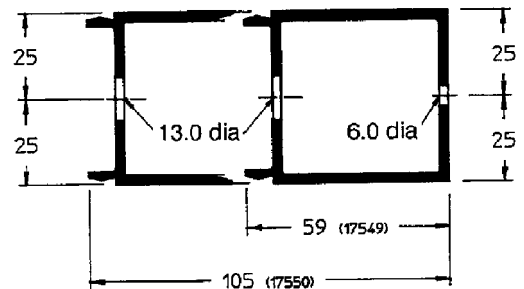
Profiles 17549 & 17550.

The allowances for these profiles are the same as those for the mullions on pages 4-2 & 4-4 except that at the tie back where the reinforcer is mitre cut as shown below. The allowances at the tie back and mitre cut are shown on page 4-1.

The reinforcers must have holes prepared as below at a maximum of 50mm from each end at no more than 200mm centres for fixing to mullions etc..

The mullions must also have 5.0 dia holes at the same centres to accept the reinforcements.

Use drill jig 313/253.



Mitre cut at tie back



Cutting & Machining

External Rail Capping

Profile 17531.



Cut length = mullion c/cs. minus 50mm.

The above formula gives the nominal size of the capping. However to take account of manufacturing and assembly tolerances, cappings are best cut to size on site to suit. No further preparation is necessary.

Internal Rail Capping

Profile 17533 or 17131.



Cut length = mullion c/cs. minus 50mm.

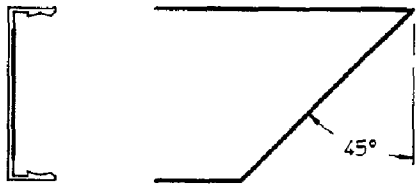
The above formula gives the nominal size of the capping. However to take account of manufacturing and assembly tolerances, cappings are best cut to size on site to suit. No further preparation is necessary.

Mullion/Top Rail Capping

Profile 17533.

The allowance at the head for the mullion capping is 55mm. The allowance at the cill is NIL. The allowances at the tie back are shown on page 4-1. The cut length of the top rail capping = extreme mullion c/cs. plus 50mm. Where the overall length of the top rail capping exceeds 6 metres, it must be jointed by square cutting and allowing an expansion gap of 6mm before starting the next capping. This break in the capping must occur 200mm away from the break in the top rail clamp plate to give a baffle effect.

Where the top rail capping meets the jamb capping they must be mitre cut as shown below.



Reinforcing Capping

Profile 17533.

The allowance at the head for the capping is 5mm. The allowance at cill is NIL. The allowances at the tie back are shown on page 4-1. The capping must be mitre cut as shown below at the tie back.



Thermal Break Spacer

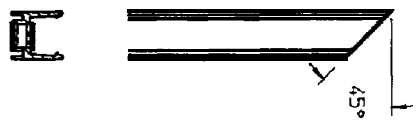
Profiles 17552 & 17553.

Mullions:- The allowance at the head for this profile is 23mm. The allowance at the cill is 20mm. The allowances at the tie back are as shown for the clamp plate on page 4-6. All square cut except tops of jambs which must be mitred as below.

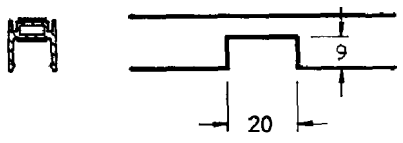
Rails:- The top rail spacer runs continuously along the full width of the curtain wall and must be mitre cut and jointed to jamb spacer as shown below. The cut length = extreme mullions c/cs. plus 13mm. At each mullion centre it must be notched as shown below.

On rails which are at the top and bottom of drainage zones (except cill rail) the spacer must run continuously along the length of the rails. Cut length = mullion c/cs. minus 32mm.

On intermediate rails a 50mm piece of spacer must be fitted centrally over each clamp plate fixing hole.



Notch at mullion centres of head rail spacer



Double Glazed Unit Head Protector

Profiles 17555 & 17556.



This rigid PVC profile is square cut to the following formula.

Mullion centres minus 25mm.

Assembly & Installation

Cill

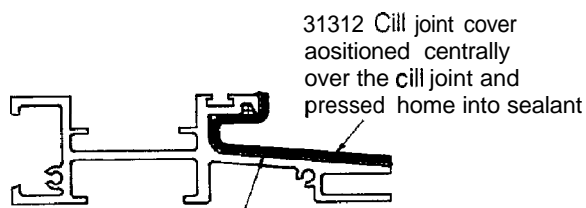
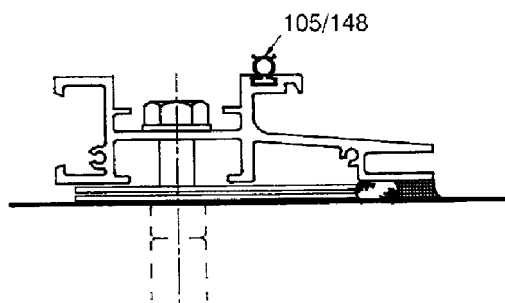
Before fixing the cill, the end stops 31315 must have fixing holes countersunk on the required side to give the correct handing. They must then be effectively sealed to extreme ends of the cill using small joint sealant and fixed using No 8 x 3/4" csk self tapping screws. If the cill exceeds 6 metres in length it must be square cut and butt jointed in maximum lengths possible avoiding the mullion centres or door openings by at least 200mm. Every cill joint must be completely sealed using silicone and a 313/2 joint cover, as shown below.

The cill must be fixed securely to the floor slab using either custom made stainless steel fixing lugs (not supplied by Glostal) with M10 set screws through, or M10 set screws directly through pre-pared holes in the rear channel of the cill. NOTE: If using the latter method, where a door opening occurs using the 202 high performance door, the heads of the screws must be completely sealed against the cill to prevent water penetration.

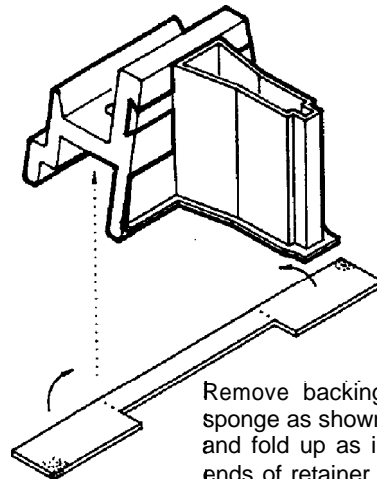
The cill must be installed flat and level (in both planes).

The gasket 105/148 must now be fitted to the cill as shown below, in one continuous length, cutting slightly oversize to prevent shrinking back. NOTE: It may be helpful to mark the cill upstand at each mullion centre since the 105/148 covers the fixing holes.

Before proceeding, if a 202 High Performance Door is to be fitted, the pivot, flush bolt and threshold bolt tapping plates must be slid into the bottom of the rear channel of the cill profile.

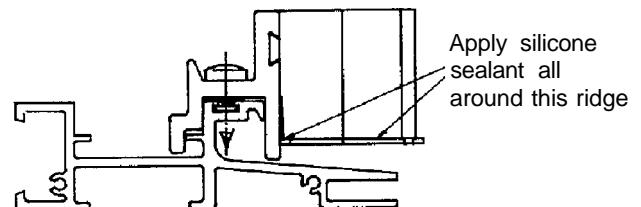


Silicone sealant either side of cill joint



Remove backing paper and apply sponge as shown, adhesive side up, and fold up as indicated to stick to ends of retainer

The cill retainer must be fixed to cill as shown below using No 12 x 3/4" pan head self tapping screws supplied. The 105/148 gasket must run unbroken under the retainer with only the screws piercing it. Tighten the retainer to fully compress the gasket.



Fit cill closure profile 17522.

Before placing the mullions onto the cill retainer, silicone sealant must be applied all around the ridge provided at the bottom of the retainer moulding.

If finished floor level does not come flush with the top of the cill, clip in Cill Trim profile 17512 must be fitted in maximum lengths possible.

Assembly & Installation

Fitting of mullions

If not already fitted in the factory, fit 313110 rail brackets at each rail fixing position on every mullion using 4 No 10 x 1.1/4" pan head self tapping screws, except at cill where one screw is omitted as shown. Before fitting mullions a 313/17 mullion plug must be completely sealed into the front mullion tube using small joint sealant, and then pushed up so that there is 50mm of clear space below it. This procedure must be repeated at the extreme top of the curtain walling.

Drop the first mullion onto the mullion locator on the cill. Secure the top of the mullion into the Tie Back Fixing Bracket using the lower two M10 x 80mm bolts.

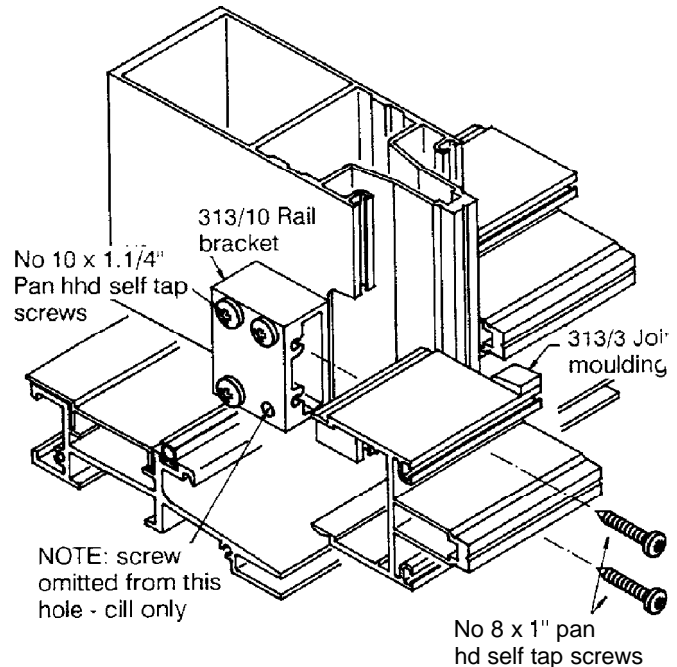
The two top M10 x 80mm bolts should be withdrawn. The lower end of the upper mullion should now be placed into the Tie Back Fixing Bracket and the bolts re-applied. The head of this mullion should be retained by fitting it into the next Tie Back Fixing Bracket or by sliding in the head retaining bracket 313/25 and fixing it securely to the structure, using M10 bolts of an adequate length.

At this point the bolts connecting the Tie Back Fixing Bracket to the structure should be loosened. Insert a 8mm dia bar through the mullion expansion gap which will position the Tie Back Fixing Bracket in its correct vertical position. Fully tighten the two M10 bolts attaching the Tie Back Fixing Bracket to the structure.

Repeat with the next mullion. Before proceeding with the next mullion, fit bottom rail between two mullions by firstly removing the backing paper from 2 off 31313 joint mouldings and fitting to both ends of the rail. Then lightly smear the surfaces of the joint moulding which mate with the cut out in the mullions with petroleum jelly and carefully slide the rail on from the front. Lightly tap the gasket on each shoulder of the rail in turn with a mallet until the rail is fully home. Fit internal rail capping 17531 or 17533 (see page 6-3). Lower mullions and check that cill bulb seal is in place and compressed. Clean off excess sealant from bottom of mullions.

Fix rail to mullions using 2 No 8 x 1" pan head self tapping screws per bracket by tightening each screw in turn until the gasket groove shoulders of the rail sit flush with the mullion shoulders. Using a Stanley knife or similar, cut the shoulders of the rail joint gasket off flush with the mullion and rail gasket groove shoulders.

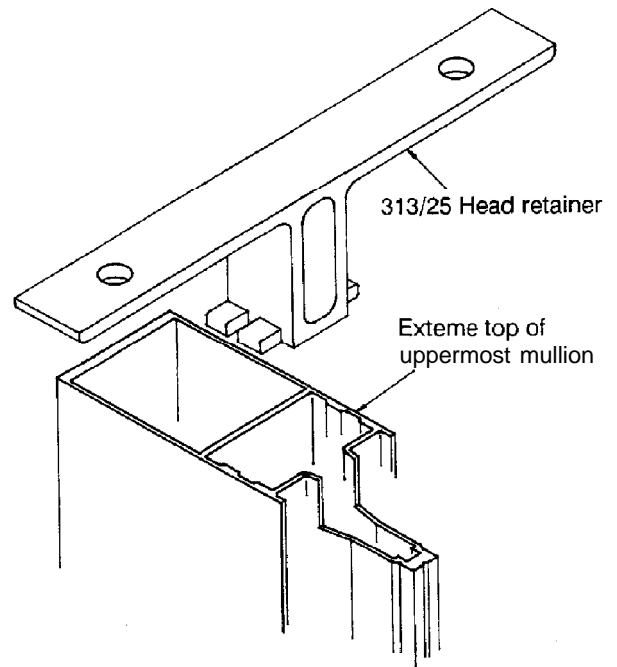
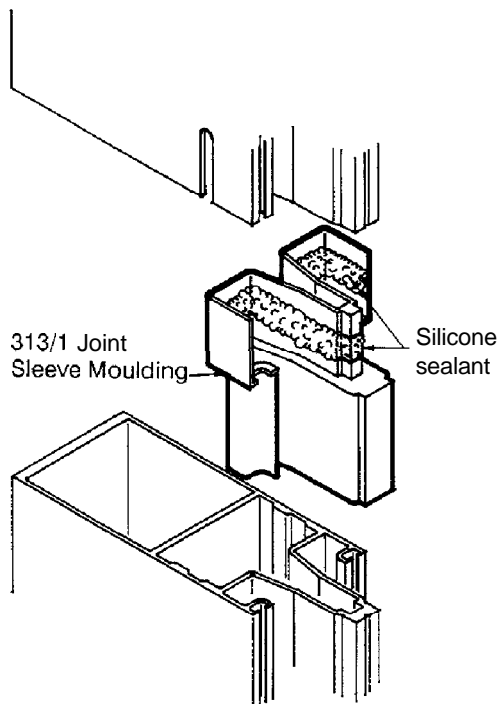
Fit next mullion and the rail in between. Continue with this procedure until all first floor mullions are fitted. When all rails have been fitted and tightened, the flanges of the joint moulding which protrude past the gasket groove of the mullions and rails must be trimmed back flush.



Assembly & Installation

Fitting of mullions (cont)

Locate 313/1 joint sleeve cover moulding into top of all mullions. Apply silicone sealant to top moulding as shown below. Take first floor mullion and locate into Tie Back Fixing Bracket and joint sleeve cover moulding at top of ground floor mullions. Ensure that the head of the uppermost mullion is plumb with the base of the ground floor mullion. Adjustment at the Tie Back Fixing Bracket is achieved by turning the two M8 set screws on the side either clockwise or anti-clockwise depending on which direction adjustment is required. Front to back adjustment is achieved by slackening off the M16 bolt. The entire sleeve assembly can then be moved forwards or backwards. When the mullion is plumb the M16 bolt must be re-tightened, ENSURING THAT THE SERRATED WASHERS MESH WITH THE SERRATIONS ON THE BRACKET.

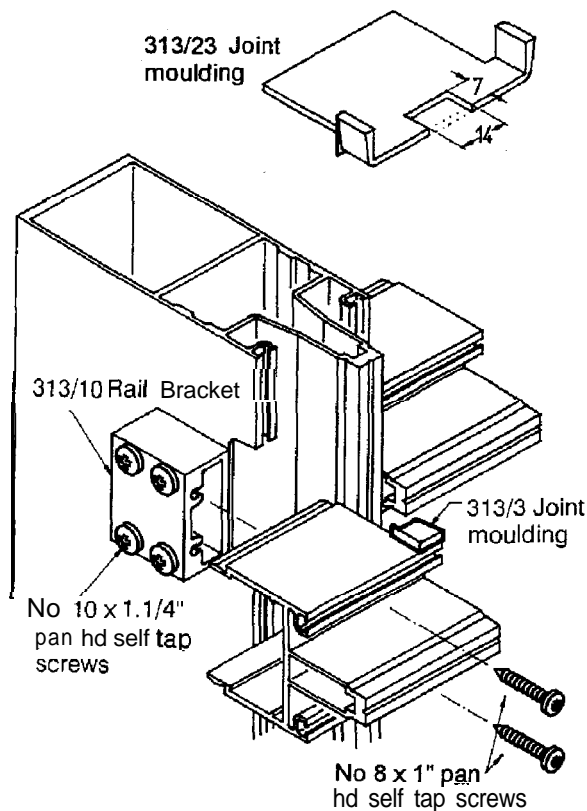


NOTE: DO NOT FIX MULLION TO HEAD RETAINER TO ALLOW FOR EXPANSION

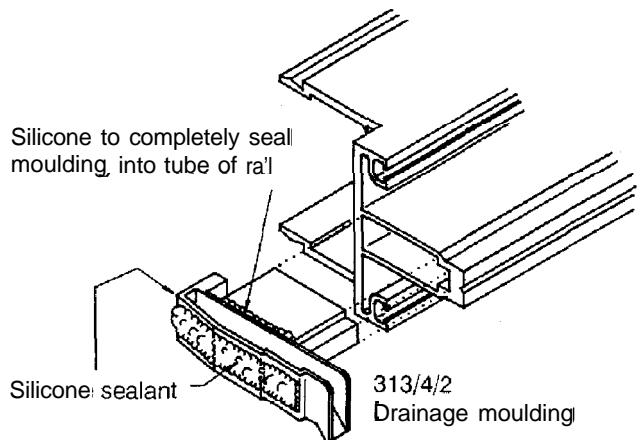
Assembly & Installation

Fitting of rails

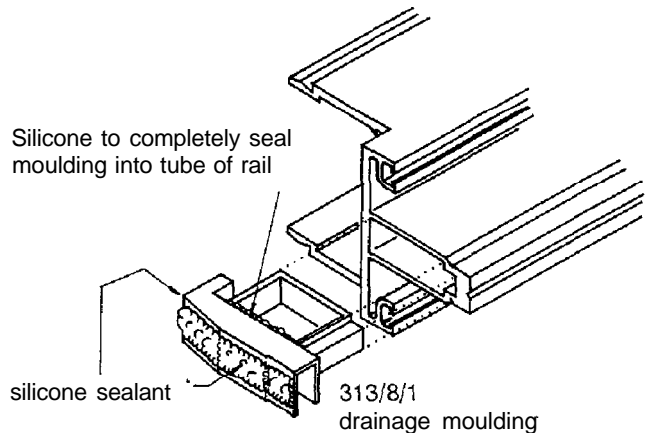
Proceed to fit rails as previously described for bottom rail, except at top and bottom of drainage zones (i.e. extreme top rail and rail immediately above any mullion joint). At these rails the drainage moulding **313/4/1 & 313/4/2** and **313/8/1 & 313/8/2** must be fitted as shown for each condition. Also the rail joint gasket **313/23** must be fitted as shown below.



Rails immediately above the tie back



Rails at extreme head



Fitting of Rail - 202 High Performance Door

Fitting of door head rail profile 17546 is the same as for the standard rails, but the 313110 bracket is replaced with the closer fixing bracket from the concealed overhead door closer pack. Fix the bracket into the ends of the rail using the M5 screws supplied with the closer. and stick the 31313 gaskets to the ends of the rail as previously described. Fit rail into the mullion as described for the standard rail, then clamp the rail tight into the mullion using 'G' clamps or similar. Fix the rail to the mullion using 3 M6 screws supplied with the closer. Trim the tops off the joint gaskets as previously described.

If fitting a mullion above the centre of a door (i.e. particularly a double door) use bracket 313/24. Completely seal end of mullion with small joint sealant. Fix bracket into mullion using 2 No 12 x 3/4" pan head self tapping screws. Then fix from underside of transom using 2 No 12 x 3/4" pan head self tapping screws. Fit 31312811 & 2 plugs into front channels of mullion by completely coating in small joint sealant and ensuring that slope on top falls towards outside.

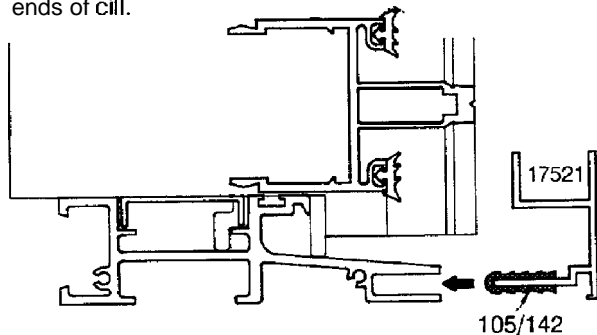
Fit door cill nosing profile 17547 using gasket 105/142 in the same way as shown overleaf for profile 17521. Fit 31317 plug into rear channel of cill at each jamb of door. Completely seal into cill using small joint sealant. Then refer to 202 High Performance Door Manual for fitting door. At the glazing stage fit 313/21 clamp plates around perimeter of door. Trim top off glazing gasket flush with clamp plate see General Arrangement pages 2-7, 2-8 & 2-9.

Assembly & Installation

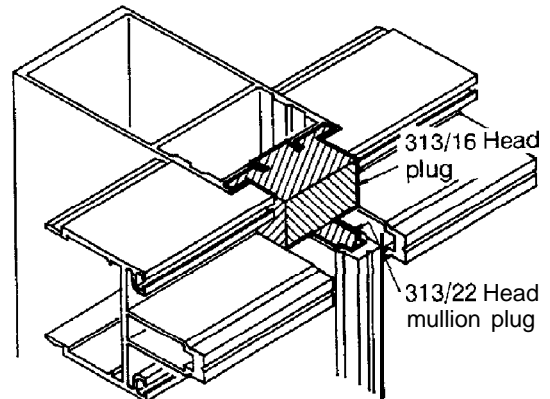
Fitting of Rails (cont)

When all rails have been-fitted the internal gasket 105/200 must be fitted to the perimeter in one continuous piece by pressing home into its groove up the outside of all jambs, and across the top of the head. Apply in rail length pieces across the bottom of all bottom rails. Cut slightly oversize and bed ends in silicone sealant to prevent shrinking back. Now fit all "tyred" inner gaskets into their appropriate openings.

Fit cill nosing 17521 to cill using 105/142 insulation gasket as shown below. Ensure ends of nosing are flush with ends of cill.



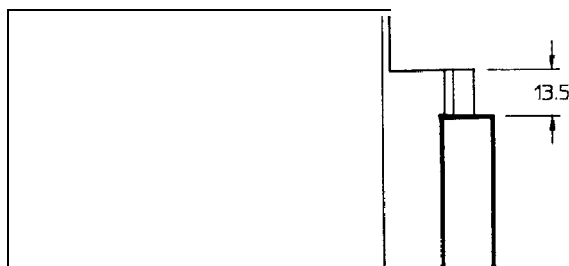
Fit 313/22 head mullion plug as shown below at extreme head of all upper mullions, then fit 313/16 on top.



Fitting of thermal break spacers

Fit mullion and rail thermal break spacers by clipping onto nosing of rail or mullion. Fit continuous pieces of spacer to all mullions, butting tightly against both ends of the joint sleeve moulding and lining flush with the bottom of the mullion at the cill. At the head the spacer must finish 13.5mm short of the notch in the mullion as shown below. At the extreme top rail the spacer runs continuous across the entire head of the curtain walling and is notched over the mullion nosings and must be tightly mitred against the jamb spacer. At rails immediately above the tie back, the spacer runs for the full length of the rail nosing. At all other rails short pieces of nosing are positioned centrally under each clamp plate fixing hole. Take care when fitting the spacers not to damage the sponge sealing strips on either side of the spacer.

Top of Mullion



Before glazing, all double glazed units must have unit head protector profile 17555 or 17556 completely sealed to the top edge using silicone. Take care when fitting units to ensure that the taper on the profile falls towards the outside. If the head of the unit is slightly stepped, as sometimes occurs during manufacture, ensure that highest point of step is towards the inside before fitting head protector.

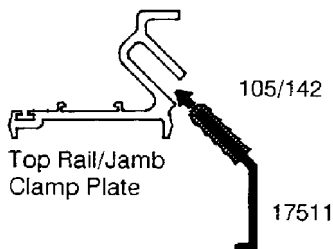
Glazing

Fit 313181 glazing packers 100mm in from each end of every rail. Fit 105/134 gasket to all clamp plates without stretching, cutting slightly oversize. On the top rail clamp plate the gasket must be notched away for 15mm to line up with the notches in the clamp plate. Also on mullion clamp plates at the centre line of rails immediately above the tie back, the gasket on both sides of the clamp plate must be notched away for 15mm. Also on all rail clamp plates the gasket must be cut back for 50mm commencing 50mm from each end on the underside.

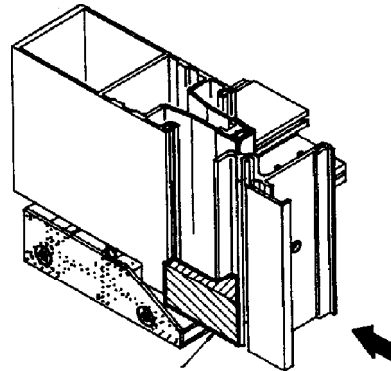
The No 12 self drill self tap screws must be driven home using a power driver with an 8mm A/F bit and an adjustable torque setting. The torque must be set to 8Nm and this must be checked with a calibrated torque wrench.

To aid glazing small pieces of clamp plate (50 -100mm long) with one fixing hole and gasket fitted can be used at the centre of each rail to temporarily 'stitch' each pane in position. This is not possible at the head rails since the clamp plate runs continuously across the entire head, so here fit the 'stitches' near the top of the mullion.

Before fitting top rail and jamb clamp plates the head/jamb liner profile 17.511 must be fitted using 105/142 gasket as shown below. Fit 313129 joint cover to any joints in liner by adding silicone to one side only.



When all panes have been temporarily fitted, the top rail clamp plate must be fitted ensuring an equal overlap at both ends. Remove the 'stitches' from the top of the mullions and fit the top rail clamp plate. Use No 12 x 1.114" hex head self drill self tapping screw. Next fit all top mullion clamp plates leaving a gap of 2.5mm between the top of the mullion clamp plate and the underside of the top rail clamp plate. Next fit all lower mullion and jamb clamp plates ensuring correct expansion gap between upper and lower clamp plates.



Hold 313/6 plastazote plug in place while fitting clamp plate (use small spot of silicone)

Glazing

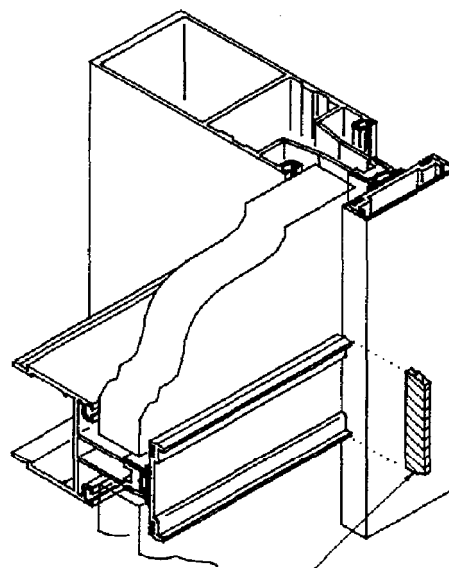
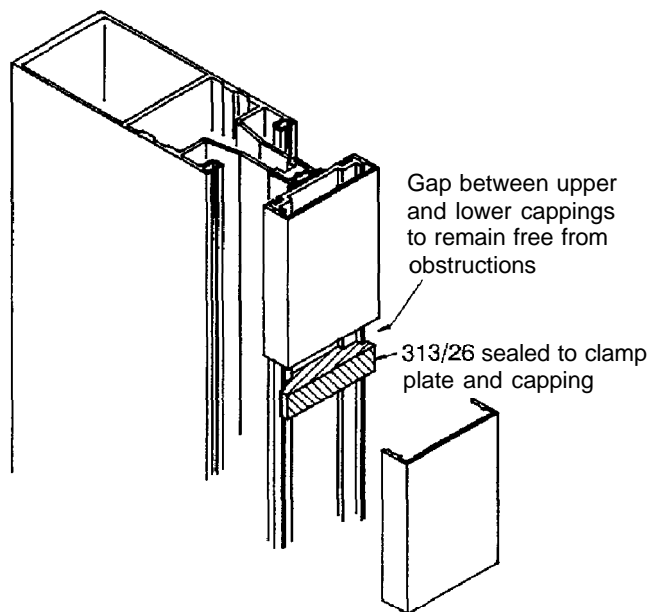
When all vertical clamp plates have been fitted, the temporary 'stitches' can be removed from the rails and then the rail clamp plates must be refitted ensuring a 2.5mm gap between the ends of the rail clamp plates and the edges of the mullion clamp plates.

It is very important that the self drill self tap screws are tightened to the correct torque setting (8 Nm) If, for any reason, a self drill self tap has to be removed once fitted, the same screw must not be re-used since the thread, which is roll formed in the section, will be damaged by the drill tip on withdrawal and therefore, if re-fitted, the screw will strip the thread and hence will not be tightened to the correct torque. If it is necessary to remove a screw, use a hex head self tapping screw into the same hole – No 12 x 1" for 24mm glazing or No 12 x 1.1/2" for 32mm glazing.

Fitting of External Cappings

Fit the top rail capping first, ensuring equal overlap at each end. Where the top rail capping exceeds 6 metres in length an expansion gap of 6mm must have been allowed for in the cutting calculations. Where the gap occurs insert a 313126 plug to bridge the gap between the cappings. Next fit the top jamb cappings and ensure a snug fit to the top rail capping. Use a spot of silicone to adhere the centre of the mullion capping to the clamp plate to prevent it gradually slipping down the clamp plate over a period of time. This procedure must also be repeated with all other mullion cappings. Next fit all of the top mullion cappings. Ensure that they fit tight up against the top rail capping. The lower mullion and jamb cappings can now be fitted, ensuring that the correct expansion gap is left between upper and lower cappings. Where the expansion gap is visible the mill finish of the clamp plate may be coated using a Syntha Pulvin touch-up paint of matching colour. Follow the instructions supplied with the paint and use correct primer.

Use a 313126 plug at the top of all lower mullion cappings as shown below, using silicone sealant to completely seal the plug to both the capping and the clamp plate. When all vertical cappings have been fitted, the rail cappings must be fitted. However, before fitting each rail capping a 313/27 plug must be fitted at each rail to mullion junction as shown alongside. If not already cut to size, the rail cappings must be trimmed to suit each individual rail to obtain a tight fit up against each mullion capping.



Push 313/27 into gap between mullion capping and rail clamp plate

Glazing

Fitting of internal cappings

Fit all internal rail cappings by trimming to obtain a snug fit against mullions.

Fit internal cappings to reinforcer bars 17549 and 17550 where fitted.

Sealing

For perimeter sealing of aluminium to masonry, choose a permanently flexible material capable of forming an effective watertight contact on both aluminium and surround.

The material chosen must have a prolonged service life, i.e. be compatible with Glostal products, which are extremely durable and require minimum maintenance.

Fit backing strip where necessary and apply sealant (by extruding or tooling), in a minimum 6 x 6 cross section, or in accordance with sealant manufacturers instructions.

Cleaning after installation

If excess sealant is to be cleaned off using solvent, ensure that the solvent will not damage any metal finishes, synthetic rubber or plastics which may be present.

Warning

Take particular care if there is any cement or plaster on the aluminium. It is harmful to the metal finish and ideally should be washed off while still wet. DO NOT RUB or particles of grit will permanently damage the metal or paint finish.

Routine cleaning

This is only necessary from the point of view of appearance.

Use non alkaline detergent and warm water applied with a soft cloth or sponge. A bristle brush or nylon pad should only be used with care where necessary.

**THIS SUPPLEMENT IS TO BE READ IN
CONJUNCTION WITH THE CURRENT
GLOSTAL 313 CURTAIN WALLING
PRODUCT MANUAL**

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Specification

Scope

This specification details the basic design concept, construction, materials and fittings of the Glostal 313 50mm sloped Glazing System.

Design

The profiles and components in this range have been specially designed by Glostal to provide a simple form of thermally insulated construction which will have a universal application and which are fully compatible with the Glostal 313 vertical curtain walling system using many of the same profiles and components.

The 313 sloped Glazing System has been designed to be pressure equalised and zone drained. The system has been designed to be assembled using a minimum of 'wet' sealants, thus reducing the effect of weather and inadequate sealants on the roof structure during installation. The use of predictable life span materials such as moulded gaskets, etc. have been incorporated where possible and give the specifier a more reliable installation.

Roof angles of 15° to 45° can be accommodated as standard with 46° to 60° possible by special arrangement.

Materials

Aluminium profiles are extruded aluminium alloy 6063 T6 complying with the recommendations of BS 1474, with stainless steel fixings and appropriate high quality seals used throughout.

Polyester powder coated finishes are available to BS 6496 in a wide range of colours. Anodised finishes are to BS 3987 Grade AA25, etch silver and Glostal bronze as standard, with a range of special anodised finishes on application.

Construction

Many years of practical experience have been built into the form of stick construction adopted, which consists of main mullion members with intermediate rails, fitted to prepared brackets to form the basic framing grid. The infill of glass, panels or opening lights is then applied and the installation completed by the application of the outer clamp plates and capping.

Assembly & Installation

Detailed instructions are provided in this publication, which must be strictly conformed to.

Glazing/Infill

The range has been designed for a 24mm or 32mm glass or panel thickness.

All glazing must comply with BS 6262 for thickness and type, and confirmation of the suitability of any other infill material must be obtained from the supplier.

Performance

The unique construction allows for a very effective inside seal which is free from any stress caused by thermal movement. This combined with the automatic pressure equalisation and drainage, means that any correctly installed sloped Glazing will perform to a very high standard.

For wind resistance, the sloped Glazing will meet any specified requirement subject to snow and imposed loads, spans, fixings and mullion depth.

Building tolerances and movement

The openings, columns and floor beams of any building will wander out of position while being formed and even when finished can settle or flex.

In view of this, it is very important to establish at the start the amount of tolerance or movement which the curtain wall must accommodate so that it can be allowed for.

Fixing anchorage points

Effective fixing of any curtain wall requires that the structure is accurately prepared.

This normally involves the provision of supporting steelwork to which the tie back brackets must be fixed.

It is very important that the necessary provision is agreed at an early stage and that acceptable positioning tolerances are agreed.

Sloped glazing tolerances

Sloped glazing members must be accurately machined to ensure that there is no variation from the basic sizes.

The 313 sloped glazing is designed to accommodate horizontal thermal movement without any stress on the rail seals.

Sloped glazing thermal movement

The coefficient of thermal expansion is 0.000024 per degree centigrade. When considering that the majority of the sloped glazing is on the inside of the building, it will therefore experience only a limited temperature range for the majority of its surface.

As mentioned above the sloped glazing mullions have been designed to accommodate all horizontal thermal movement without any stress on the main seals.

Specification

Sloped glazing wind loading

All Sloped Glazing members and infill must be strong enough to support the maximum wind pressure or suction which results from the local wind gust speed and the building shape.

Full details are given in British Standard 6399: part 2: 1995.

Sloped glazing fixings

The complete fixing arrangement at any one point must be capable of supporting at least twice the maximum loadings to which it may be subjected (wind, live, dead and snow loads).

The materials used must also be effectively protected against any danger of corrosion and wherever possible should be either aluminium or stainless steel. In certain areas, such as London, the use of rustproofed steel, may not be permitted.

It is important that dead loads on fixing brackets are calculated and checks made as to the suitability of the bracket. In case of difficulty calculating the above, Gränges Building Systems must be contacted.

Sloped glazing fire resistance

The 313 sloped glazing will not support the spread of fire and in itself it has no significant fire resistance (aluminium melts at about 660°C).

This means that whenever fire resistance is a specific requirement, it must be achieved either by the provision of back up walls or the use of suitable infill panels with independent fire resistant fixings.

It is the specifier's responsibility to detail the precise requirements which, as these will vary from one area to another, must be cleared at an early stage.

British standards

Fabricators should obtain copies of the following relevant British Standards for reference:

BS 6399 : Part 2 : Loadings for buildings

BS 8118 Parts 1 & 2 : Structural use of aluminium

BS 5516 : Patent glazing

BS 6262 : Glazing

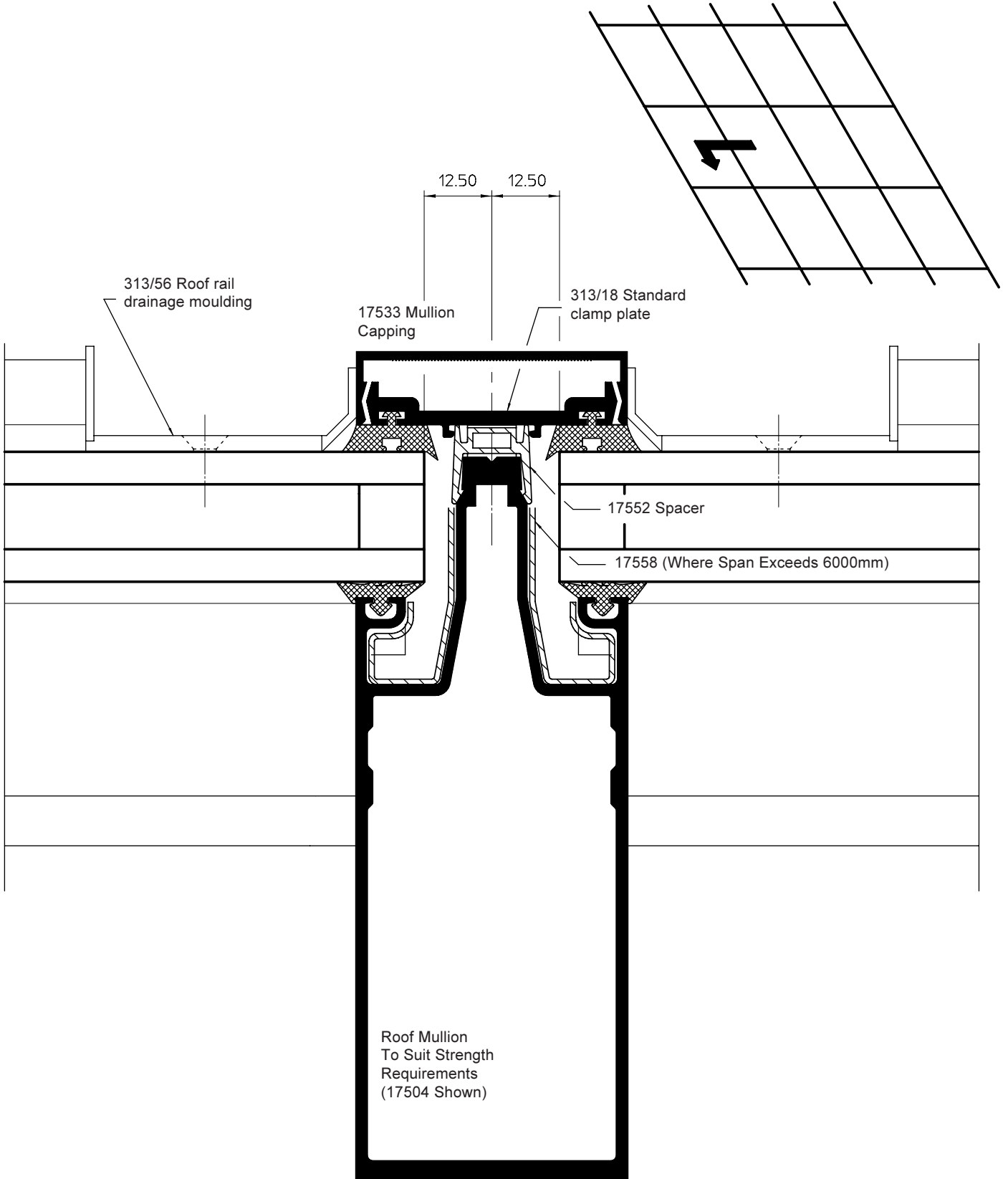
BS 8200 : External building enclosure (Curtain walling).

Important note

When further guidance, information or interpretation is required, the sales liaison department at Gränges Building Systems should be contacted.

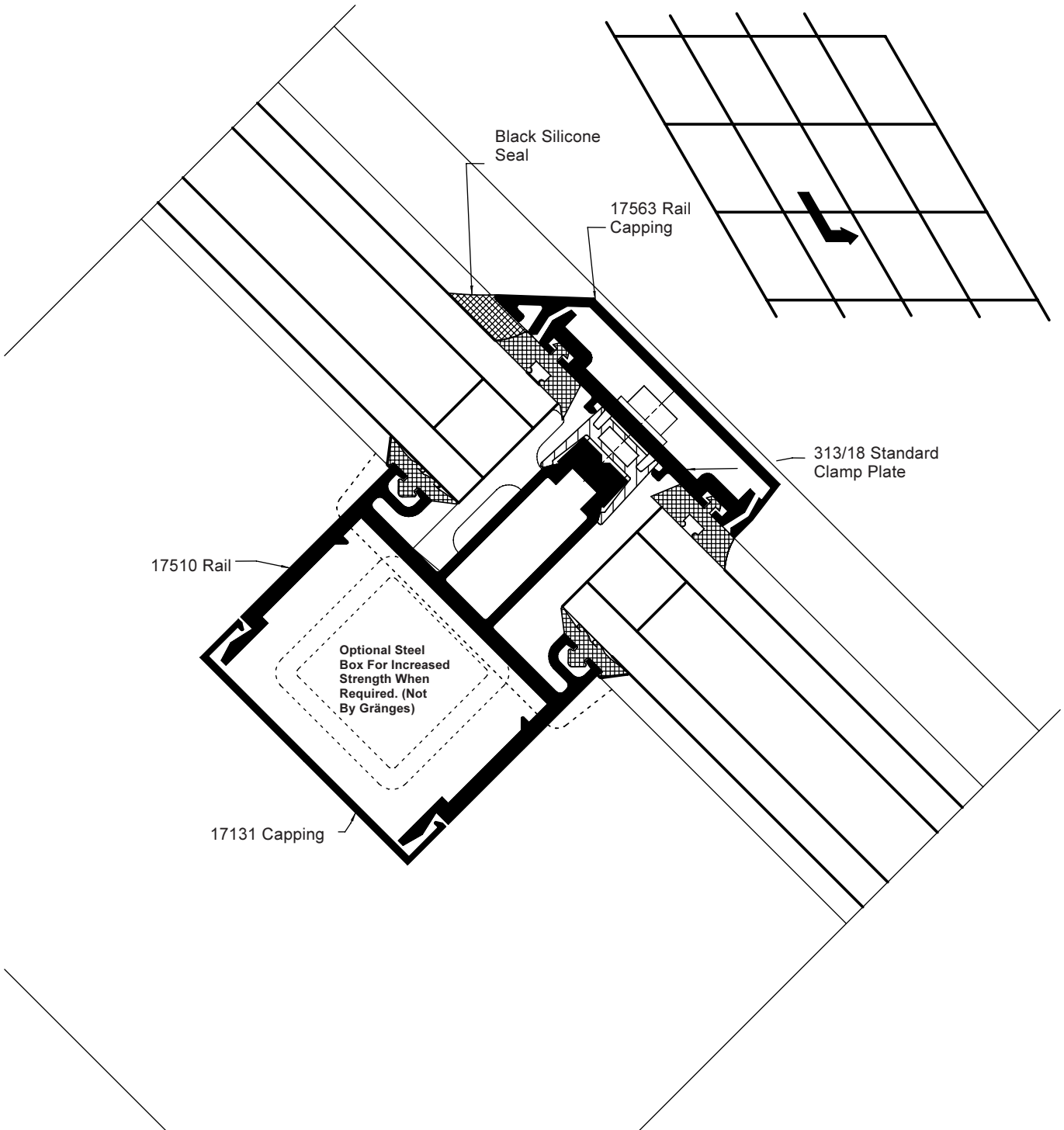
General Arrangement

Sloped Mullion

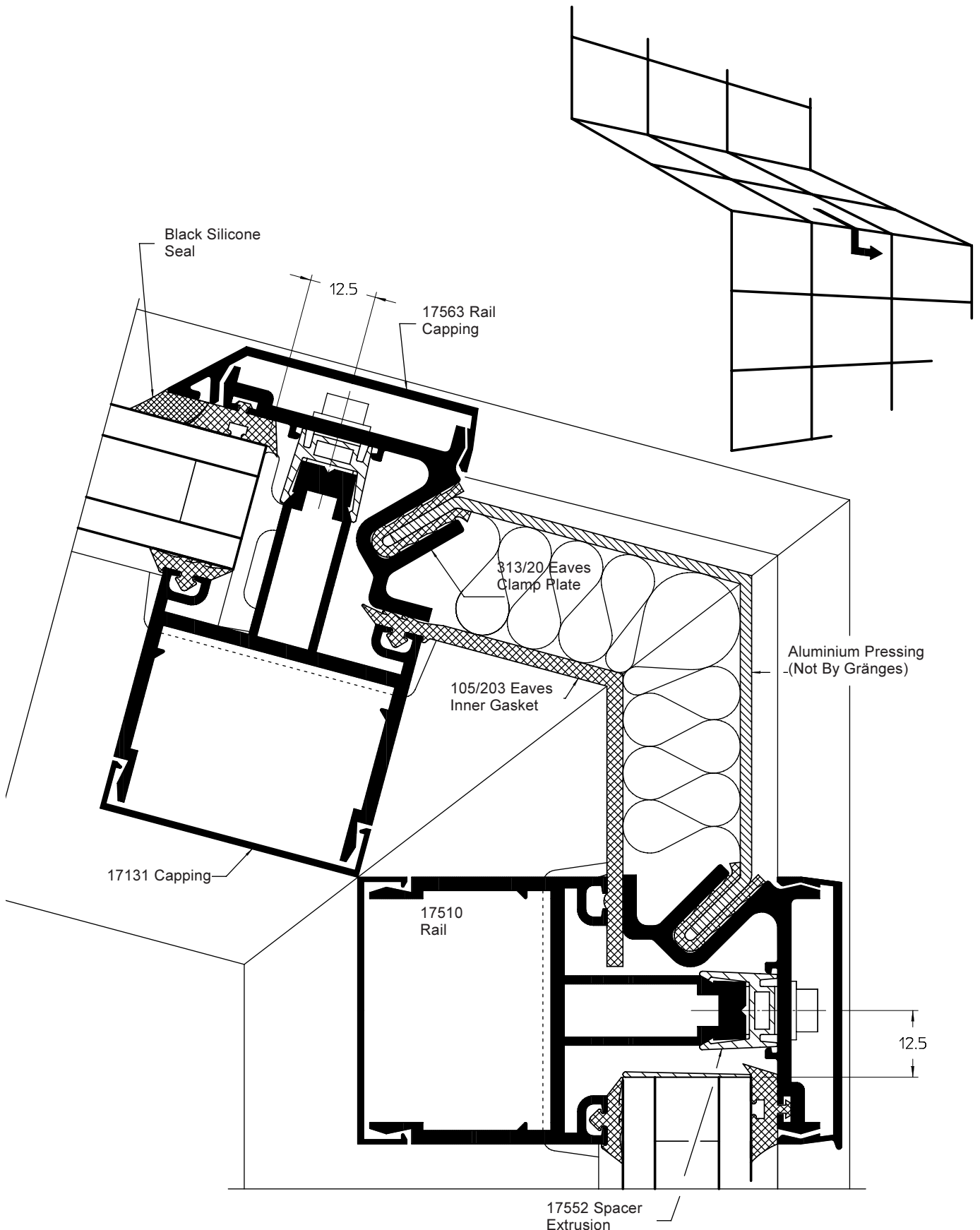


General Arrangement

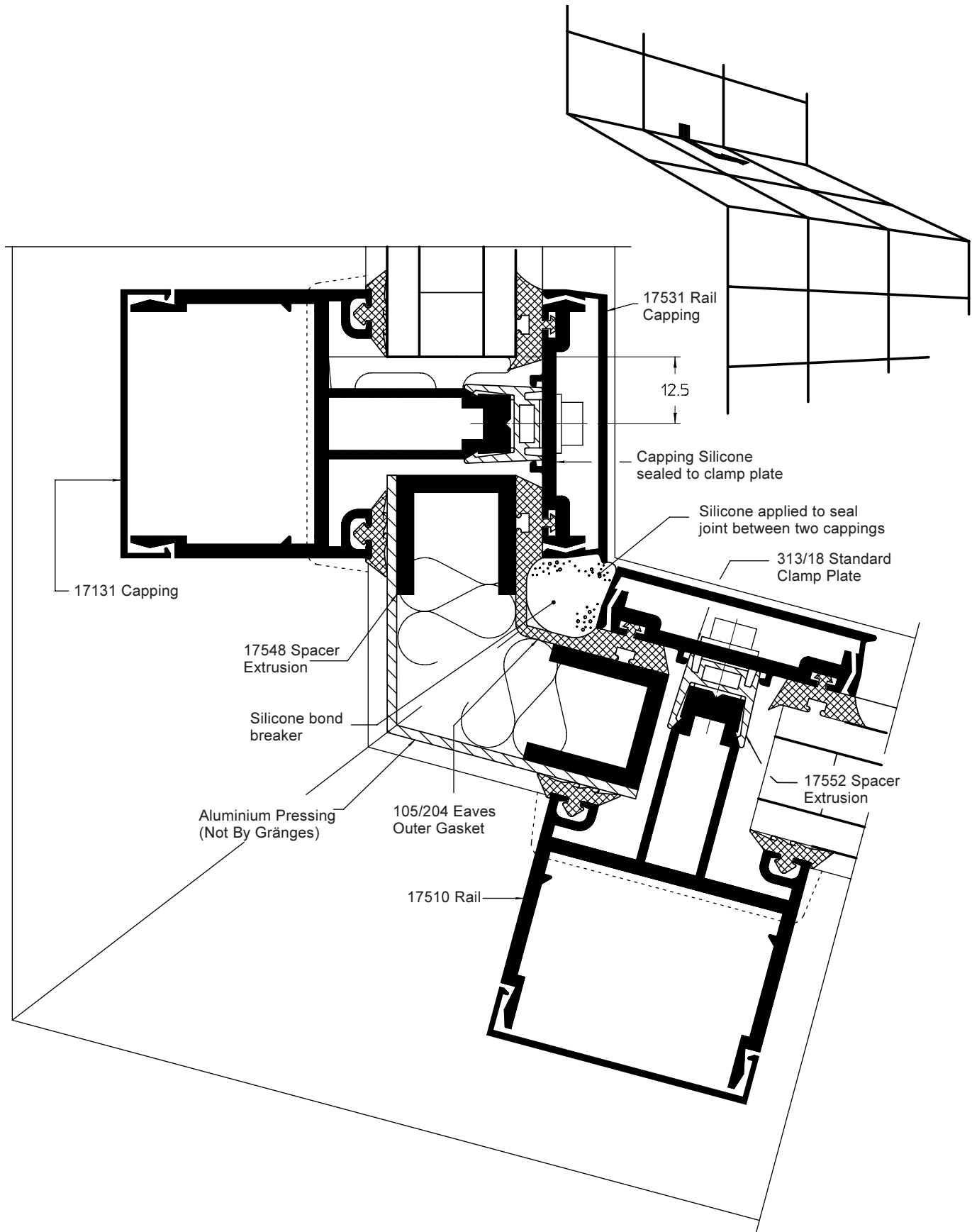
Sloped Rail



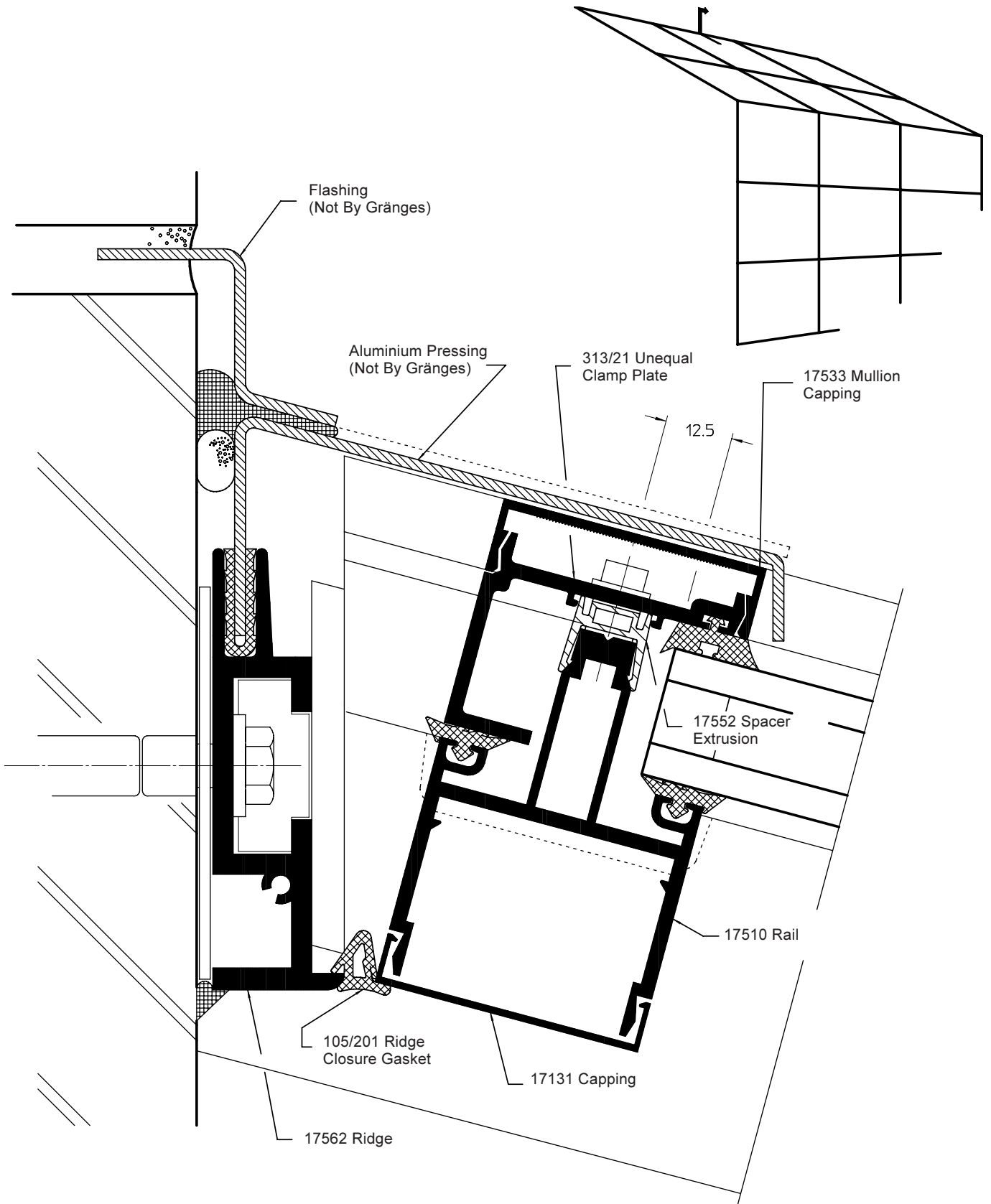
General Arrangement
External Eaves

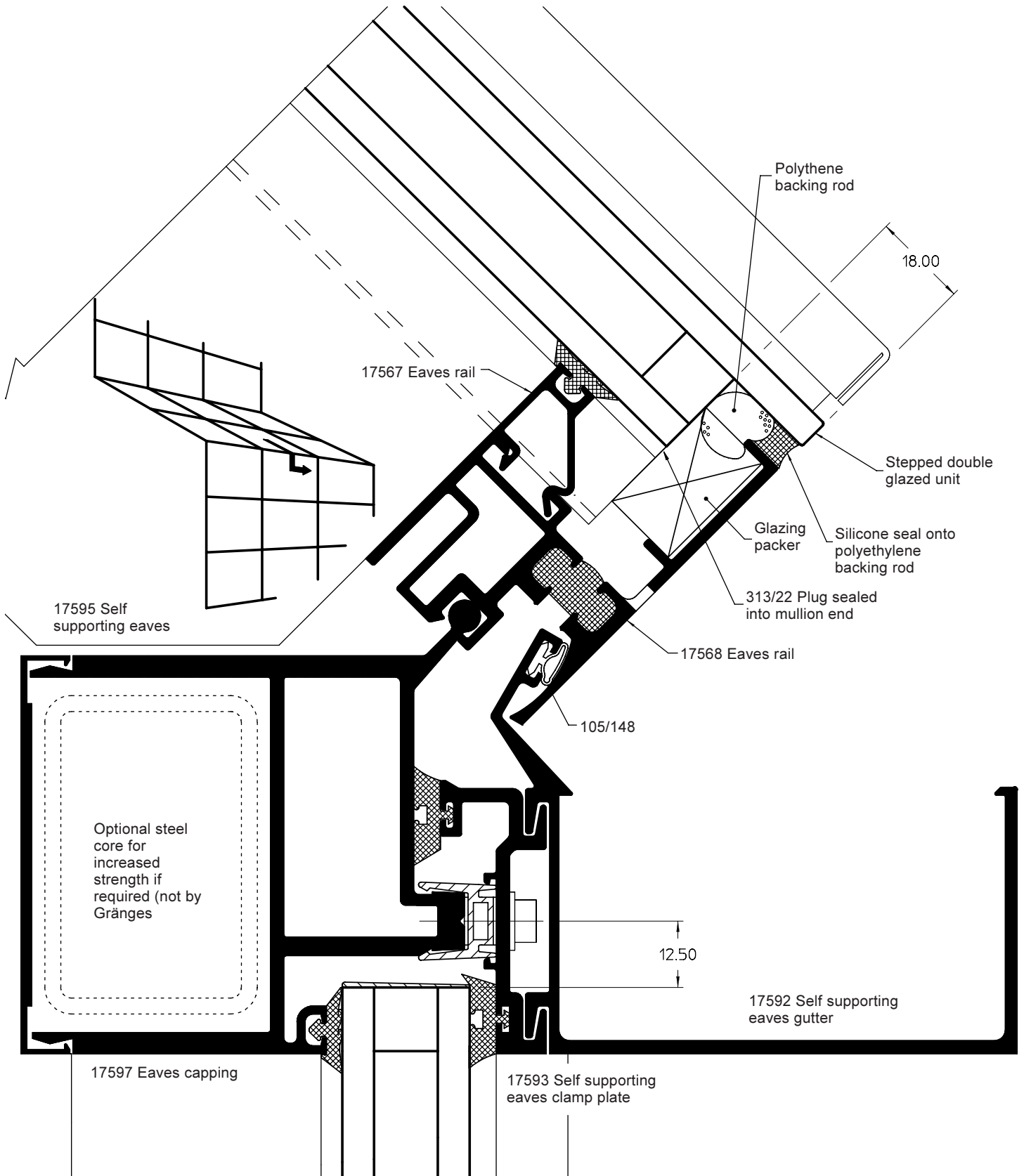


**General Arrangement
Internal Eaves**



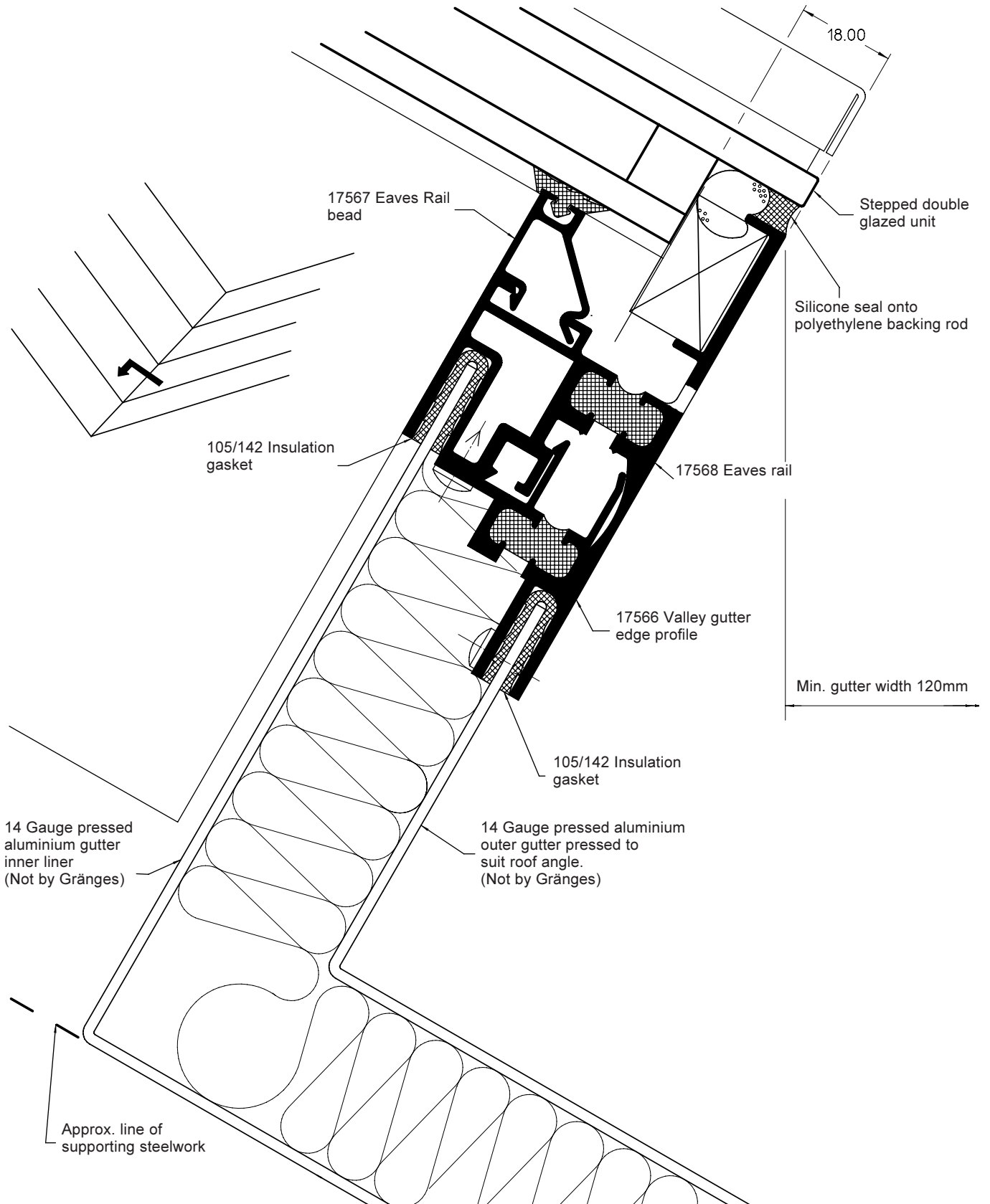
General Arrangement
Half Ridge (Wallplate)





General Arrangement



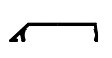







Valley Gutter



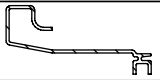
Parts List

Note that the following parts list is to be read in conjunction with the parts list shown in the 313 50mm curtain walling manual. The parts shown below are only those parts which are specific to 313 sloped glazing.


Profiles

Illustration	Part No	Description
	17545	Mullion to ridge fixing bracket
	17562	Ridge/Wall plate
	17563	Sloped rail capping
	17566	Valley gutter edge profile
	17567	Eaves rail bead
	17568	Eaves rail
	17592	Self supporting eaves gutter
	17593	Self supporting eaves clamp plate
	17595	Self supporting eaves
	17597	Self supporting eaves inner capping


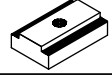
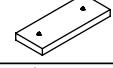

PVC Profiles - Sloped Glazing

Illustration	Part No	Description
	17558	Sloped mullion liner sleeve

Gaskets & Weatherseals - Sloped Glazing

Illustration	Part No	Description
	105/204	Eaves outer gasket

Components - Sloped Glazing

Illustration	Part No	Description
	313/56	Sloped rail drainage moulding
	313/57	Ridge tapping plate
	313/58	Eaves rail tapping plate
	313/67	Eaves rail joint sealing plug

Screws - Sloped Glazing

Size/Pt No.	Head	Description
M6 x 6mm MM66CPSS	Csk	Machine screw - Roof mullion to eaves rail
No 6 x 3/8" ST638PPSS	Pan	S/Tap Screw - Valley gutter liner fixing
No 8 x 1/2" ST812PPSS	Pan	S/Tap Screw - Valley gutter edge to eaves rail
No 10 x 1" ST812PPSS	Csk	S/Tap Screw - Standard eaves junction

Tooling - Sloped Glazing

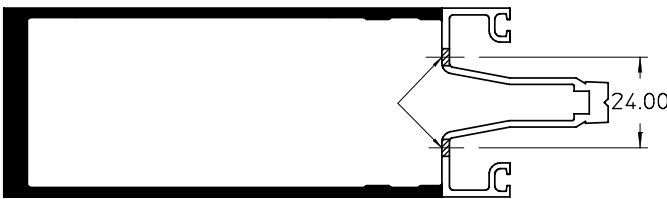
Part No	Description
313/254	Cropping tool for cut-out in 17558 liner
313/255	Drill jig - Mullion to eaves rail

Machining Details

Sloped Mullion Eaves Preparation

Profiles 17500, 17502, 17503, 17504, 17508 & 17608

The end of each sloped mullion which joins onto the self supporting eaves condition must be machined as shown below. The solid lines indicate the maximum roof angle of 45° and the dashed lines indicate the minimum roof angle of 15°. The dotted lines indicate the differing depths of mullion available (17508 is shown in solid)

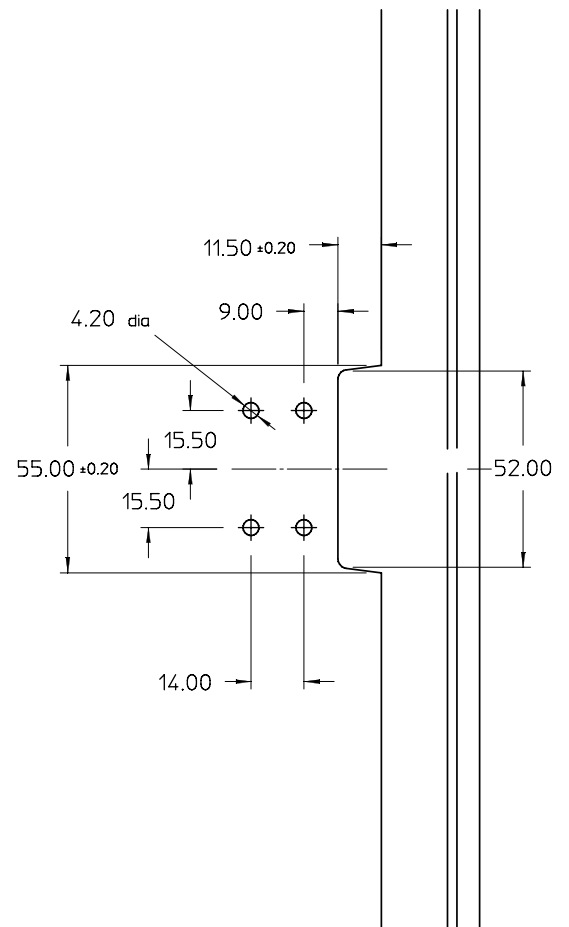
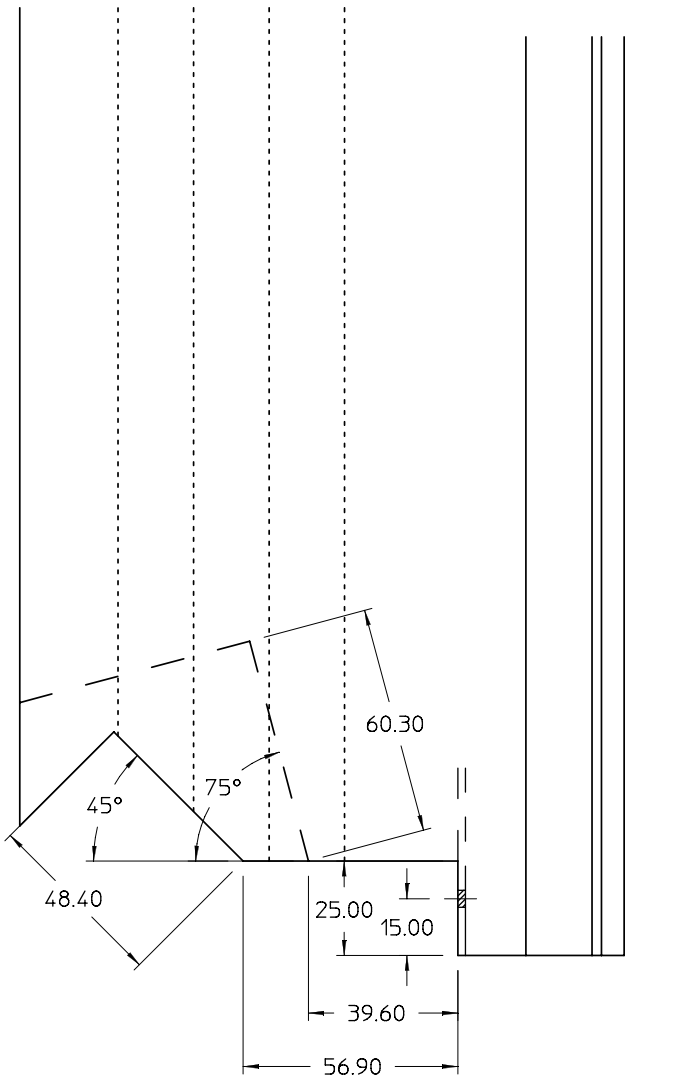
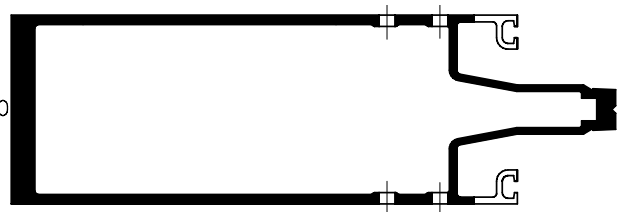


Sloped Mullion Rail Preparation

Profiles 17500, 17502, 17503, 17504, 17508 & 17608

At each rail junction the preparation shown below must be carried out.

Use Press tool 313/270 & drill jig 313/251



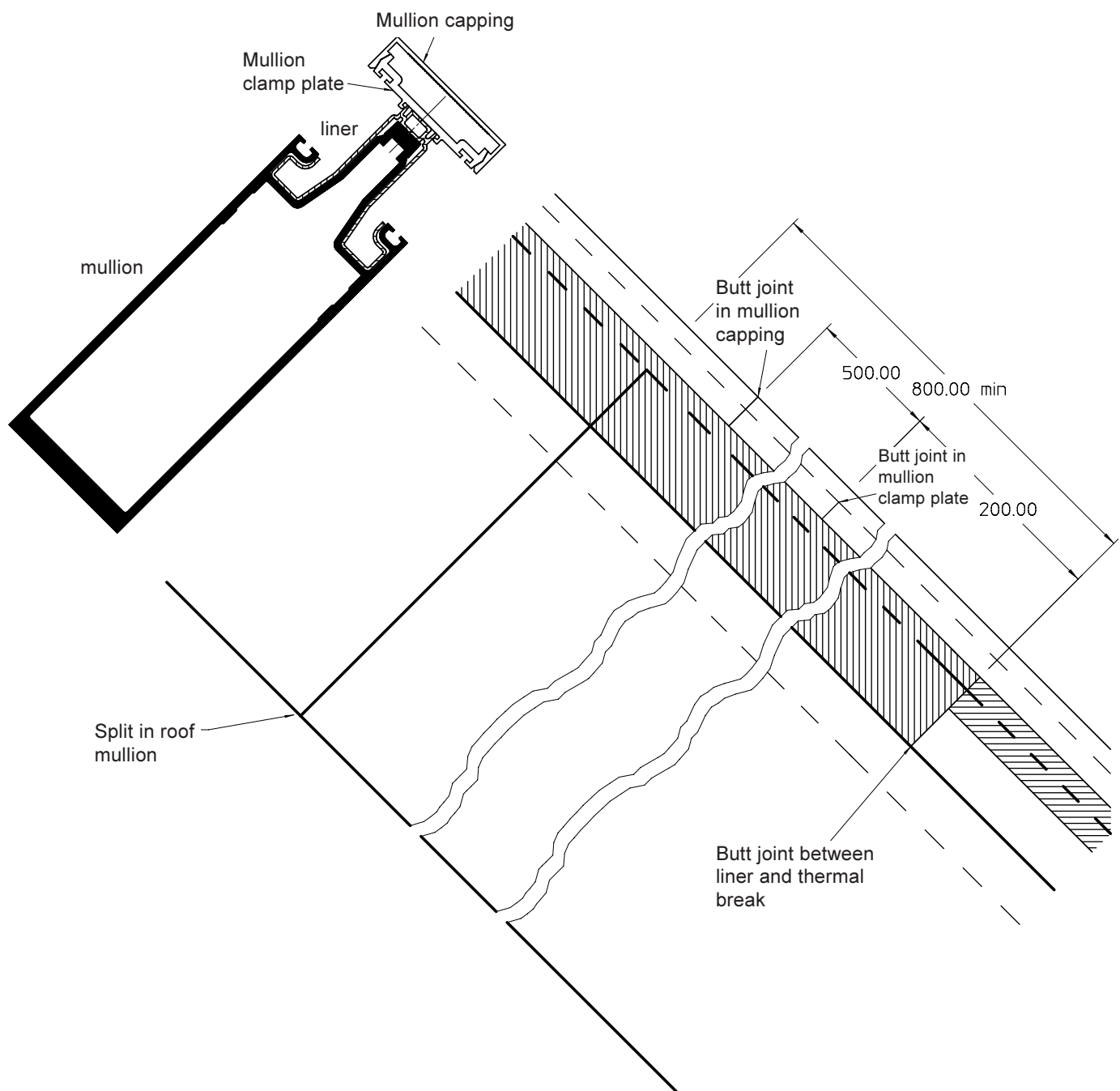
Machining Details

Relationships At Sloped Mullion split

Profiles 17500, 17502, 17503, 17504 & 17608

At any splits in the sloped mullion the relationships between the joints in the mullion, clamp plate, capping and thermal break/liner must be as shown below.

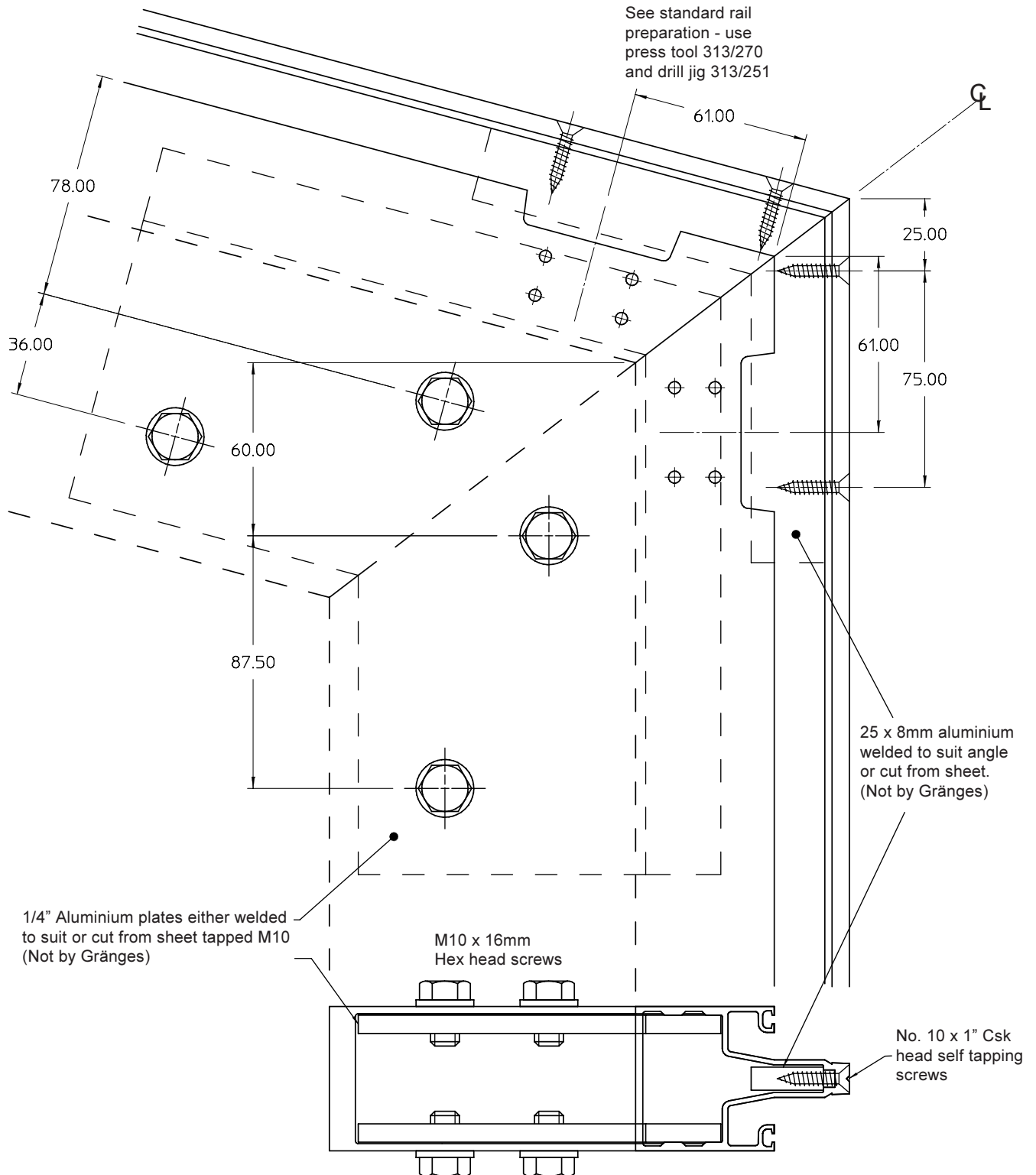
All splits must be jointed using purpose made jointing plates to suit (not by Gränges). Structural support must be provided at all splits



Machining Details

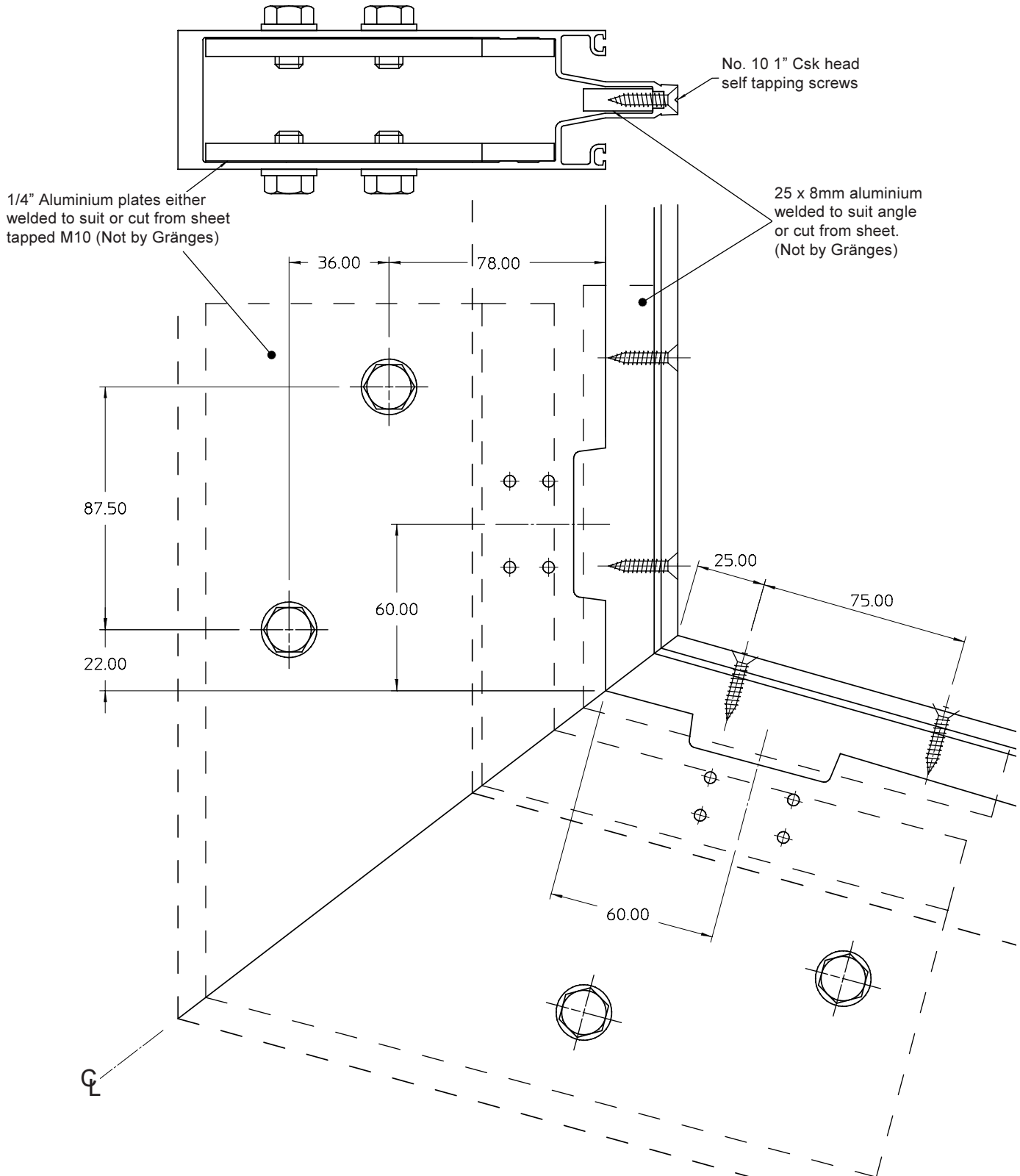
Standard Eaves Mullion Machining

Profiles 17500, 17502, 17503, 17504, 17508 & 17608



Machining Details

Internal Eaves Mullion Machining



Machining Details

Eaves Rail

Profile 17568

39 x 5 Drainage slots as shown below must be prepared in the eaves rail as follows:-

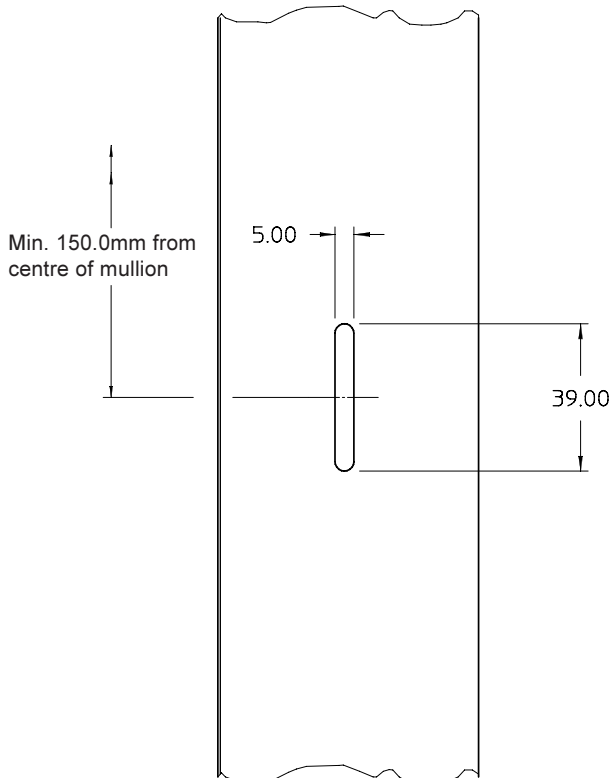
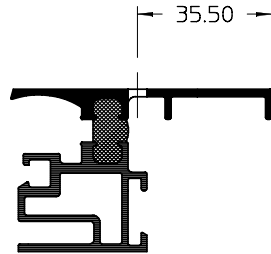
For sloped mullion c/cs up to 500mm -

1 slot at the centre of each pane

For sloped mullion c/cs from 501mm–1000mm -

2 slots each 150mm in from mullion c/c

For each additional 500mm c/cs add one drain slot.



Machining Details

Sloped Rail

Profile 17510

The sloped rail machining is identical to the machining shown in the 313 curtain walling manual.

Sloped Rail Clamp Plate

Profile 313/18



Cut length = mullion c/cs minus 152mm.

All clamp plates are supplied with 6mm dia fixing holes at 200mm centres. When cut to length additional end fixing holes must be prepared when necessary to ensure that end holes are a maximum of 50mm from the end of the clamp plate.

Glazing gasket on underside of rail clamp plates must be cut back for 50mm commencing 50mm from each end.

All other clamp plates are cut and prepared as shown in the 313 curtain walling manual.

Sloped Rail Capping

Profile 17563



Cut length = mullion c/cs minus 150mm.

The above formula gives the nominal size of the capping. However to take account of manufacturing and assembly tolerances, cappings are best cut slightly oversize and cut to suit on site.

Internal Eaves – Rail Capping

Profile 17531

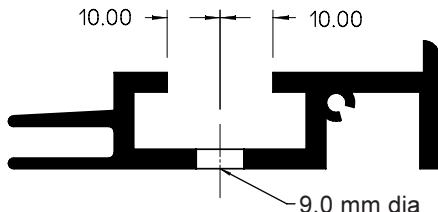


Cut length = mullion c/cs minus 150mm.

The above formula gives the nominal size of the capping. However to take account of manufacturing and assembly tolerances, cappings are best cut slightly oversize and cut to suit on site.

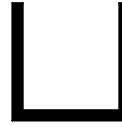
Ridge

Profile 17562



The ridge profile must be square cut to the overall length of the roof. 9.0 dia fixing holes must be drilled as shown below 150mm either side of each mullion centre and at no greater than 450mm centres in between mullions.

Profile 17548



The internal eaves spacer must be square cut to the formula shown below. No other machining is necessary.

Mullion centres minus 25mm.

Sloped Rail Capping At Apex

Profile 17533



This capping is fitted to all roof rails at the apex. It is cut to following formula:-

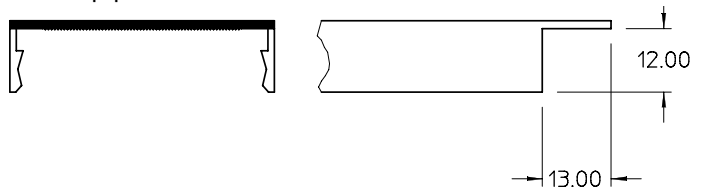
Sloped mullion centres minus 50mm.

Sloped Mullion Capping

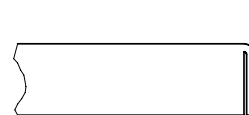
Profile 17533



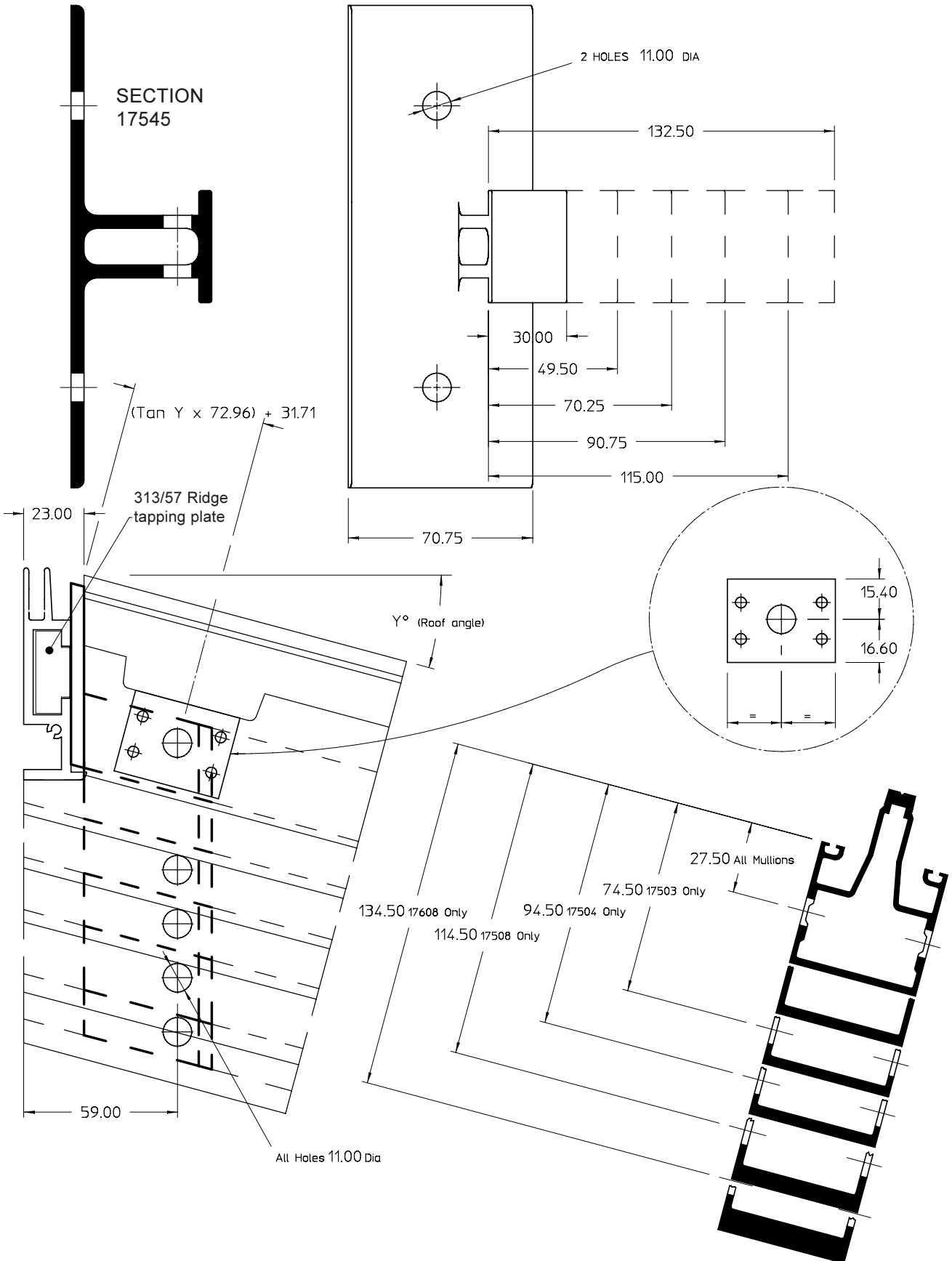
This capping is fitted to all roof mullions. It finishes flush with the end of the roof mullion clamp plate at the apex. Where a self supporting eaves is fitted it runs over the end of the roof mullion clamp plate to finish flush with the outside of the eaves rail with a 13mm overhang notched as shown below then formed over to cover the end of the clamp plate.



Form end of mullion capping over to cover end of clamp plate



Machining Details - Mullion To Ridge



Machining Details

Eaves Rail Bead

Profile 17567

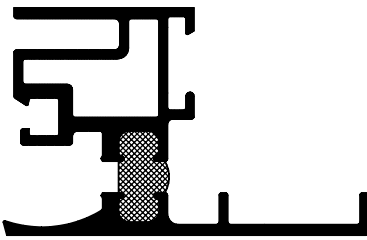


Cut length = mullion c/cs minus 50mm.

The above formula gives the nominal size of the beading. However to take account of manufacturing and assembly tolerances, the profile is best cut slightly oversize and cut to suit on site after assembly.

Eaves Rail

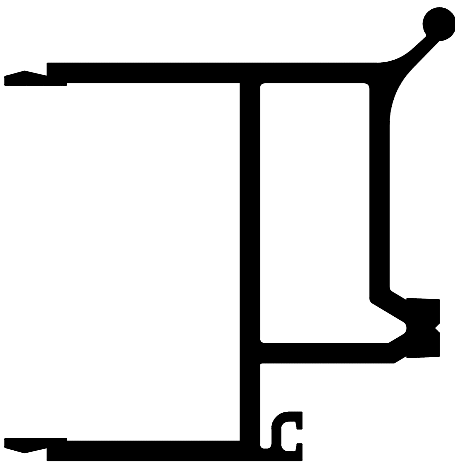
Profile 17568



This member runs continuously along the eaves profile. It can be butt jointed as shown in the assembly details. At any corners on plan it must be compound mitre cut. The Compound angles will depend upon the roof angle and the plan intersection angle.

Self Supporting Eaves

Profile 17595

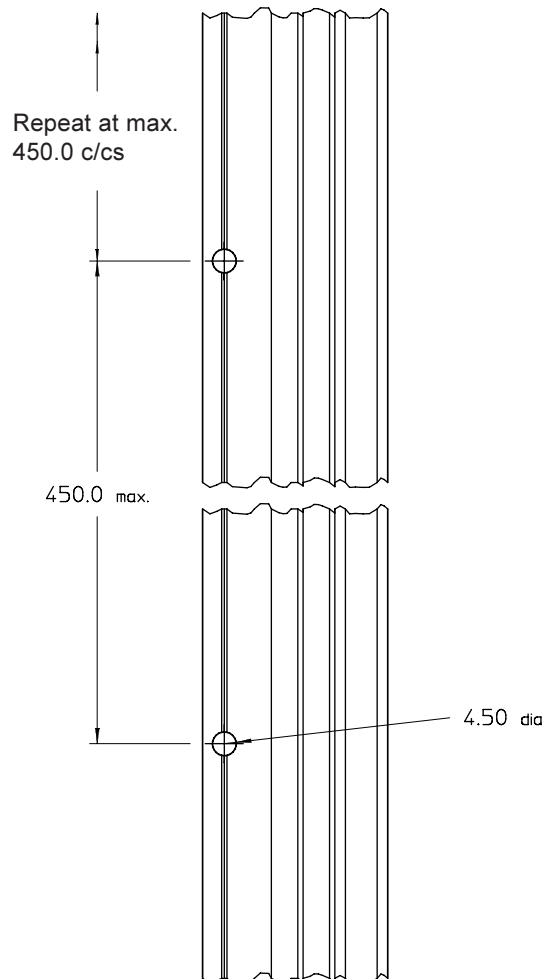
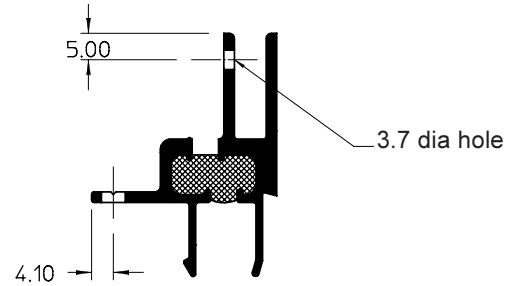


This member runs continuously along the eaves detail. It can be butt jointed as shown in the assembly details. At any corners on plan it must be mitre cut.

Valley Gutter Edge Profile

Profile 17566

Prepare 3.7mm dia holes in the profile as shown below at 450mm centres to receive No 6 x 1/2" pan head self tapping screws to lock in the outer pressed aluminium gutter liner. Also prepare 4.5mm dia holes at max. 450mm centres as shown below.

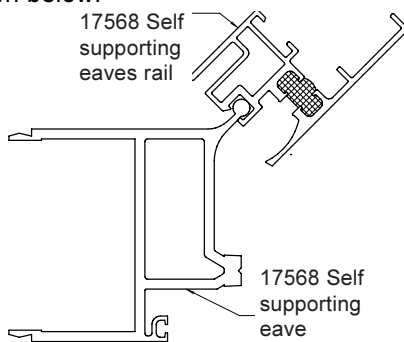


Assembly & Installation

Self Supporting Eaves

Slide the required number of 313/58 tapping plates into the groove on the 17568 eaves rail.

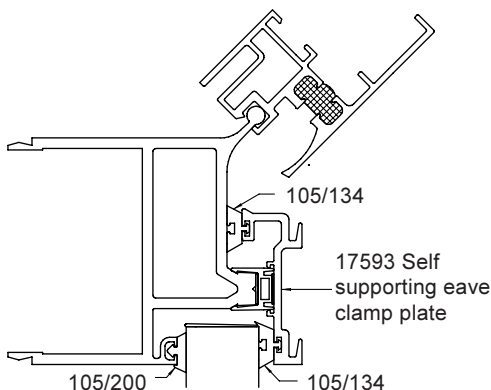
Before the self supporting eave is offered up onto the top of the mullions or the supporting wall depending upon the condition on site, the 17568 self supporting eaves rail must be slid into position onto the 17595 self supporting eave as shown below.



Once the self supporting eaves rail has been slid onto the self supporting eave the whole assembly must be offered onto the curtain wall, or structure and securely fixed either to the vertical glazing or the structure, ensuring that the fixings are suitable for carrying the loads that will be applied to them.

The glazing gasket 105/134 must now be inserted into both grooves within the 17593 self supporting eaves clamp plate. At this point the 17552 spacer must be fitted to the nose of the 17595 self supporting eave, with any joints being sealed with small joint sealant, and the 105/200 gasket in one continuous piece.

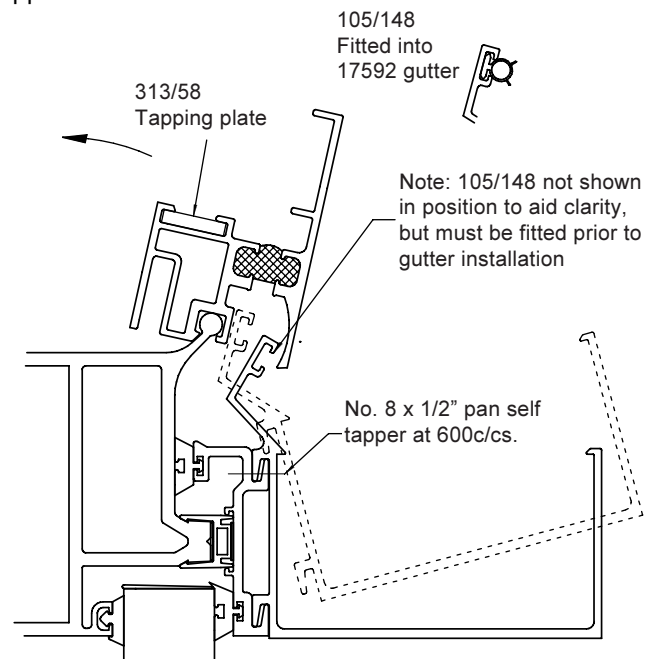
The self supporting eaves clamp plate 17593 must now be secured to the 17595 self supporting eave, using either the self drill self tap screw or by drilling 5.0mm diameter holes through the pre-punched holes in the clamp plate and No. 12 x 1/4" Csk stainless steel screws.



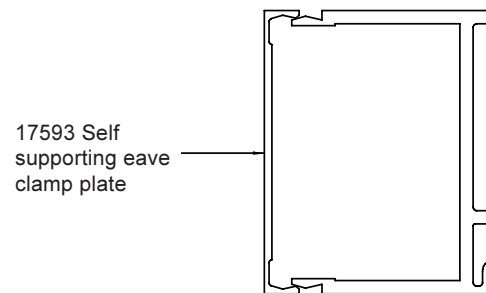
The 17592 self supporting eave gutter must now have the 105/148 bulb gasket slid into position. Care should be taken to avoid stretching the gasket and the end secured to prevent shrinkage.

The 17568 self supporting eave rail must now be rotated out of the way and the gutter hooked into position, 17568 self supporting eave rail must then be rotated back into position over the 105/148 gasket.

To hold the gutter in place drill 3.5 dia hole through top edge into the clamp plate and fit a No. 8 x 1/2" pan self taper as shown below.



Once the 17592 gutter has been fitted the internal capping can be fitted into place on the self supporting eave. This should be carried out using a block of wood and a mallet taking care not to damage the finish.

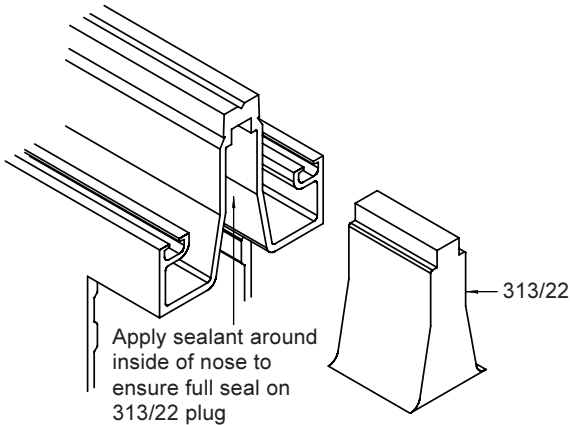


Assembly & Installation

Sloped Mullions – Self Supporting Eaves

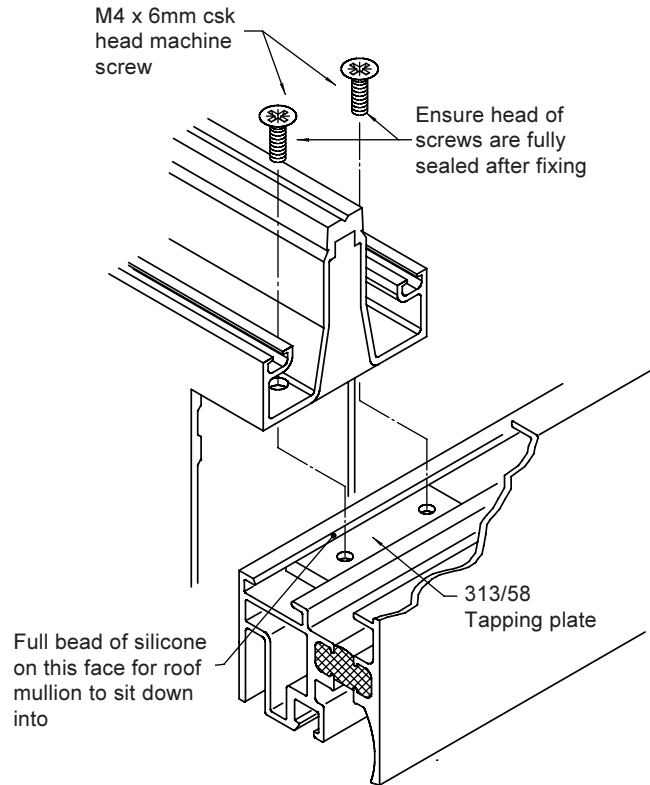
The roof mullions must now be prepared ready for fitting to the self supporting eave, if the mullions require jointing to produce a non standard bar length this must be done now, ensuring that the joint is well sealed and that the sleeve is adequate for the condition. Care must be taken when sliding the two bars together not to damage the 17558 plastic liner projecting from the upper bar as this has to dress water over the joint.

Once this has been done all roof mullions must have a 313/22 mullion plug sealed into their lower end as shown in the illustration below.

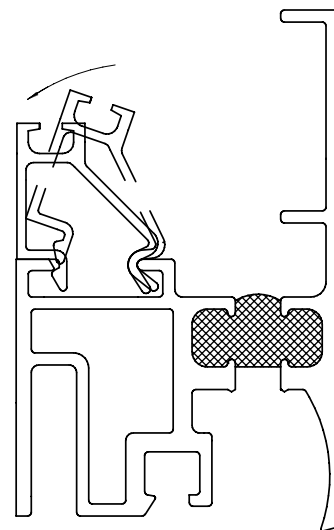


Once any mullions that require jointing have been completed the mullion must be positioned onto the 17568 self supporting eaves rail over the 313/58 tapping plate, ensuring that the mullion sits down onto a full bed of silicone sealant. The top ends of the mullions must be joined using appropriate bracketry for the head condition and loads that will be applied to it. Care must be taken to ensure that any joints are adequately sealed to prevent water penetration into mullions, any visible sealant must be carefully cleaned off.

Once the roof mullions have been positioned and sealed fix down using two M4 x 6mm csk head machine screws into the 313/58 tapping plate as shown. Seal around the heads of the screws before final tightening. This procedure must now be repeated until all roof mullions are fixed and sealed into position.



When all mullions have been finally positioned and all fixing screws tightened, fit 17567 eaves rail bead between mullions as shown below. This bead must be an accurate fit with both ends sealed in using small joint sealant and any excess cleaned off the internal visible surfaces.



Assembly & Installation

Sloped Mullions

Using cropping tool 313/254 cut out liner profile 17558 around all rail preparations.

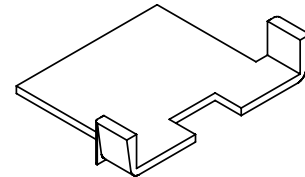
Once the roof mullions have been sealed and fixed into position the rails must be fitted into the cut outs in the mullion.

Before doing this the 313/3 joint moulding must have been fitted to each end of the rail and silicone sealant applied along the lip of the mullion cut out to prevent water running off of the rail and behind the plastic mullion liner.

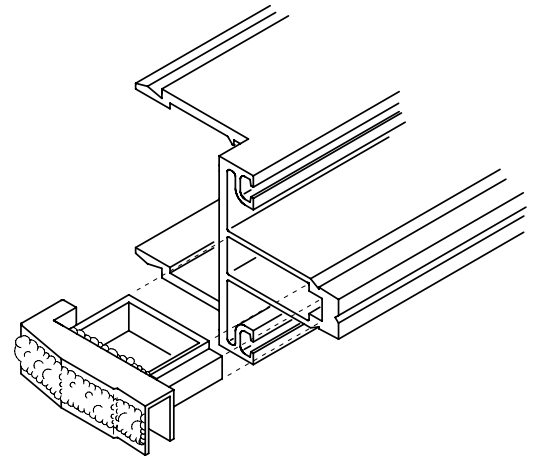
The rail is attached to the mullion using two No. 8 x 1" pan head stainless steel self tapping screws into the brackets at both ends of the rail. Care must be taken to ensure that both screws are tightened evenly and that the saddle moulding sits back into the cut out correctly.

Additionally the rails immediately below the ridge detail must have the 313/8/1 or 2 drainage moulding sealed into the end of each rail. This will require using the 313/23 joint moulding as shown on the illustrations on this page.

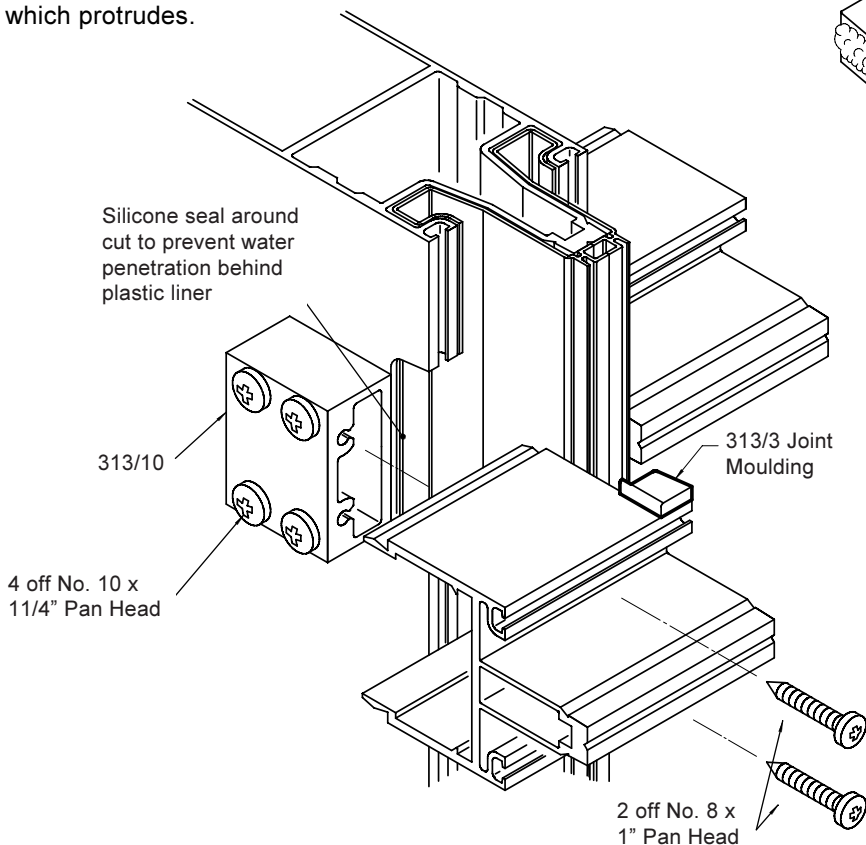
Using a sharp knife cut-off any excess saddle gasket which protrudes.



313/23 Joint Moulding



313/8/1 or 2 Drainage moulding



Assembly & Installation

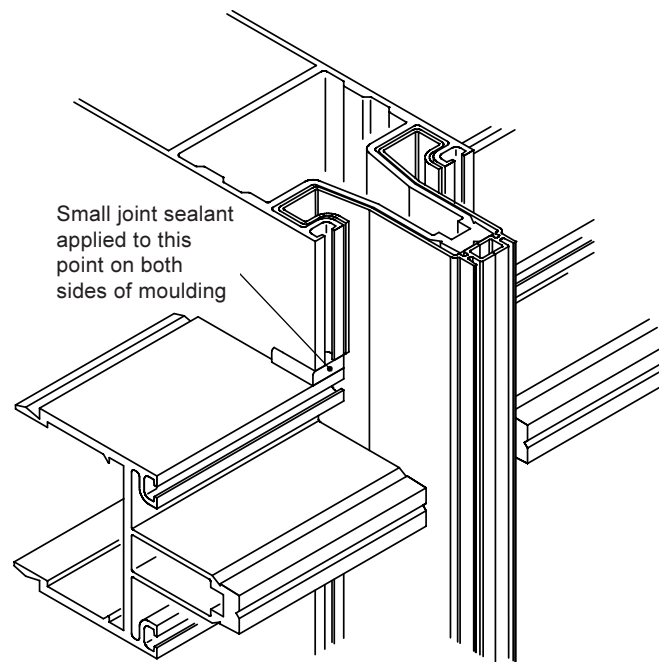
Sloped Mullions

The internal gaskets must now be fitted into the mullions and the rails. These can take the form of either complete tyres, or by jointing four of the 'L' shaped gaskets.

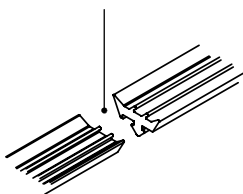
When fitting the inner gaskets a small spot of small joint sealant must be applied to the top of the 313 rail joint moulding prior to the corner of the gasket being pressed home. This is shown on the illustration below.

When using 'L' shaped gaskets the joint at the centre must be sealed using small joint sealant, this will stop water penetration and prevent the gasket from shrinking back.

At the apex of the roof linear pieces of 105/200 must be cut to fit into the top gasket groove of the rail.



Small joint sealant must be applied to these faces to form a water tight seal at any joins in the gasket



Fitting Of Thermal Break Spacers

The thermal break spacer 17552 must now be fitted to the nose of the rails and the mullions, the spacers are fitted in the following way.

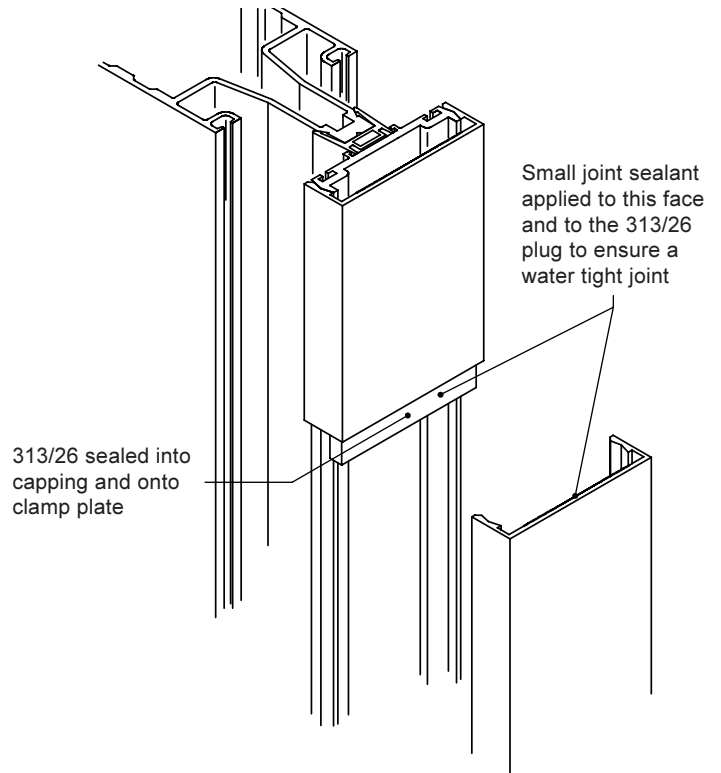
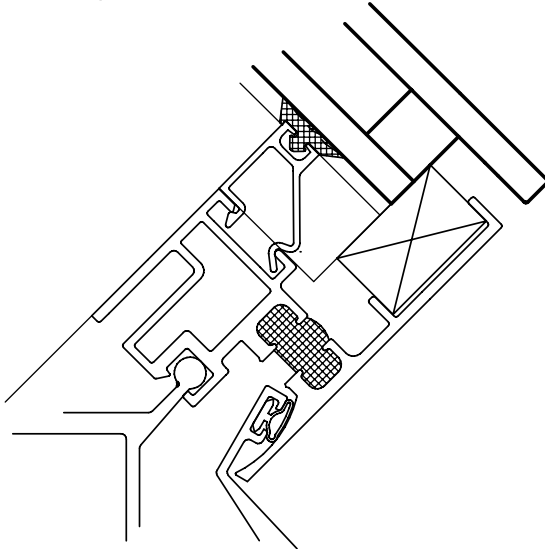
- i) On mullions the spacer must be fitted in one continuous piece from top to bottom with any joints being sealed with small joint sealant.
- ii) The top rail on both sides of the apex must have continuous pieces of spacer fitted to them, and it must be ensured that this is adequately sealed to the mullion thermal break to prevent air leakage into the building.
- iii) All intermediate rails must have 50mm pieces of spacer positioned under the fixing holes in the clamp plate, this will allow air to freely circulate around the glass pressure equalising the cavity.
- iv) Where 17558 liner is fitted to a jointed mullion the thermal break spacer. Must butt up against the 17558 & be sealed with small joint sealant.

Glazing

Self Supporting Eaves

Fit 24 x 11mm glazing packers to all rails approximately 100mm in from the corner of each unit.

Lift glass into position as shown below.



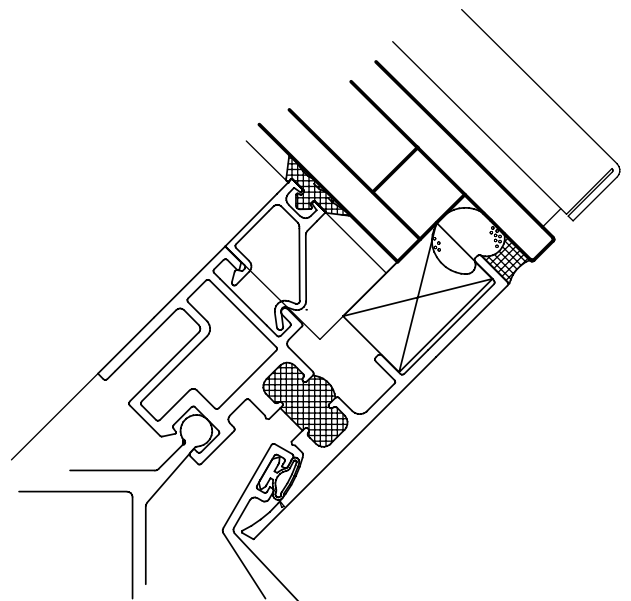
The clamp plates can now be applied to the roof. These should be fitted in the following order.

Firstly the clamp plates must be fitted to the sloped mullions with any joints being sealed to prevent the entry of water into the system. Note both the joint in the clamp plate and the gasket must be sealed.

Note all clamp plates are fixed with No. 12 self drilling screws that must be torqued to a value of 8Nm using a calibrated torque wrench.

When all the mullion clamp plates have been fitted, the mullion cappings must be fitted, with any joints being sealed as shown in the illustration alongside.

Seal edge of stepped double glazed unit to eaves rail as shown below using polyethylene backing strip and high quality silicone sealant.

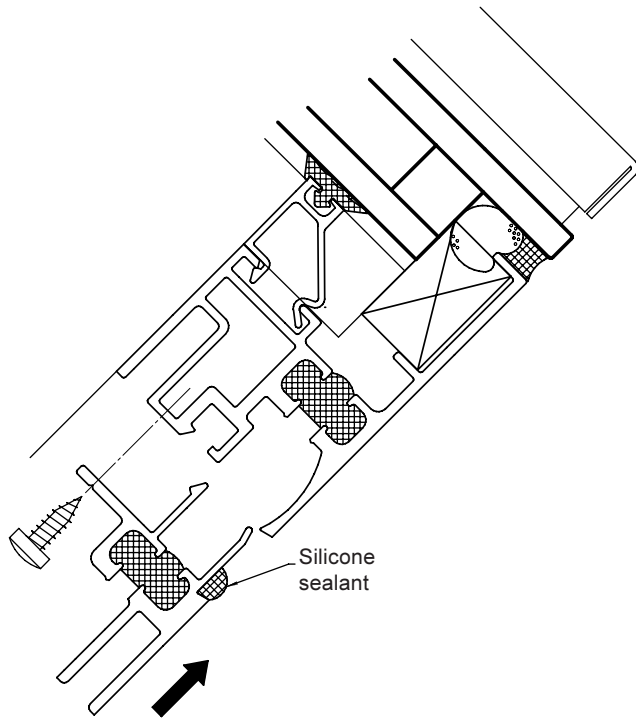


Glazing

Valley Gutter

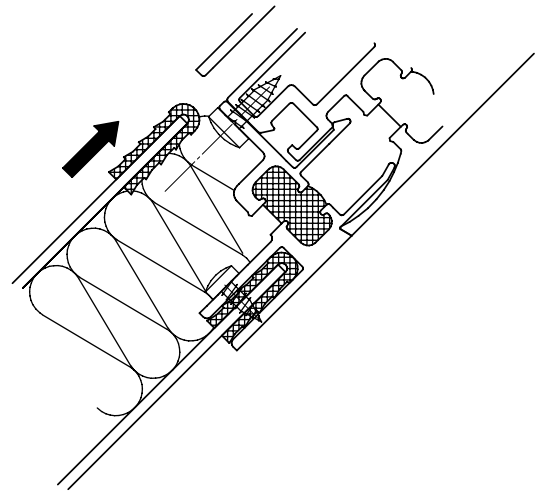
Where a valley gutter is required fix mullions to eaves rail and fit eaves rail bead as previously described for eaves condition. Run a bead of silicone along the liner profile 17566 then clip fit onto eaves rail 17568 as shown below. Drill 3.5 dia holes through the pre-prepared holes in the liner into the eaves rail.

Fix using No. 8 x 1/2" pan head self tapping screws.



Fit 105/142 insulation gasket to edges of outer gutter liner then push into receptacle on valley gutter liner as shown below. Drill 3.2 dia through pre-prepared holes in liner profile then fix using No. 6 x 3/8" pan head screws.

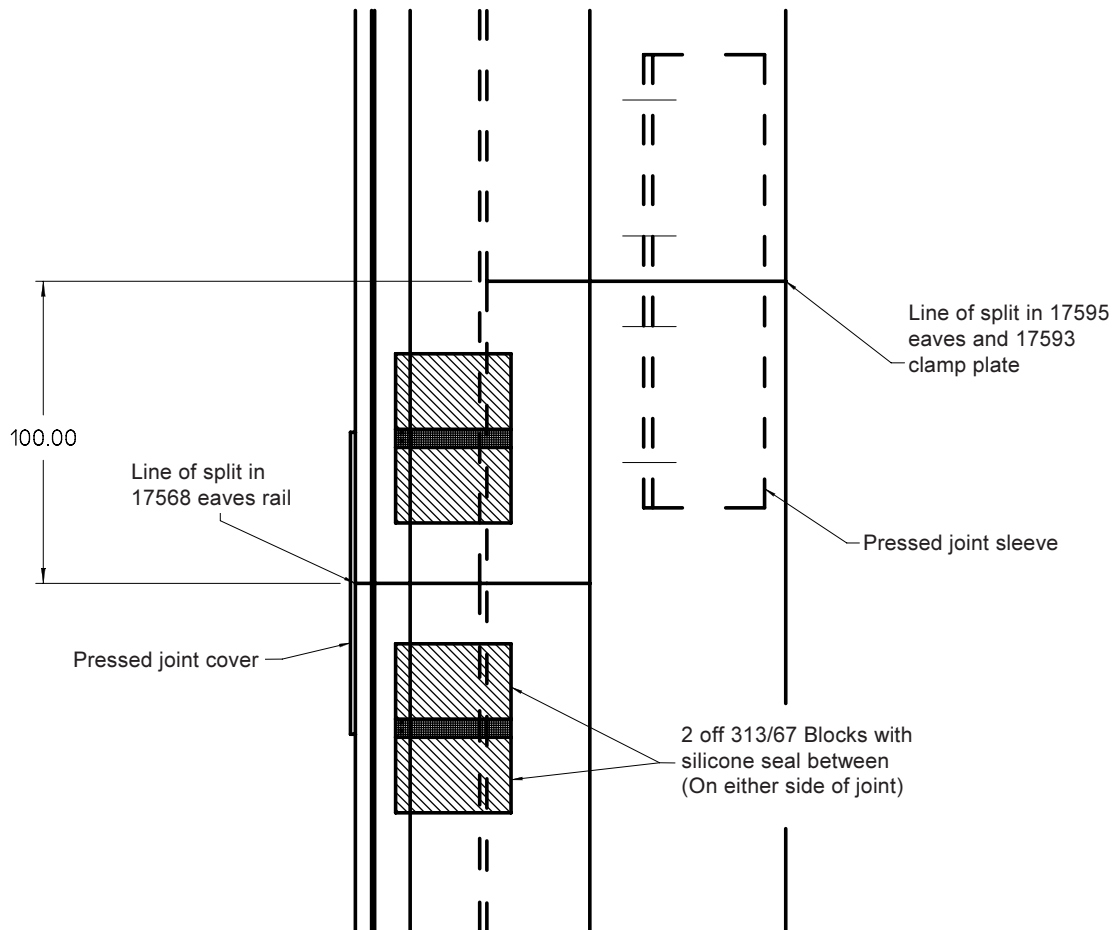
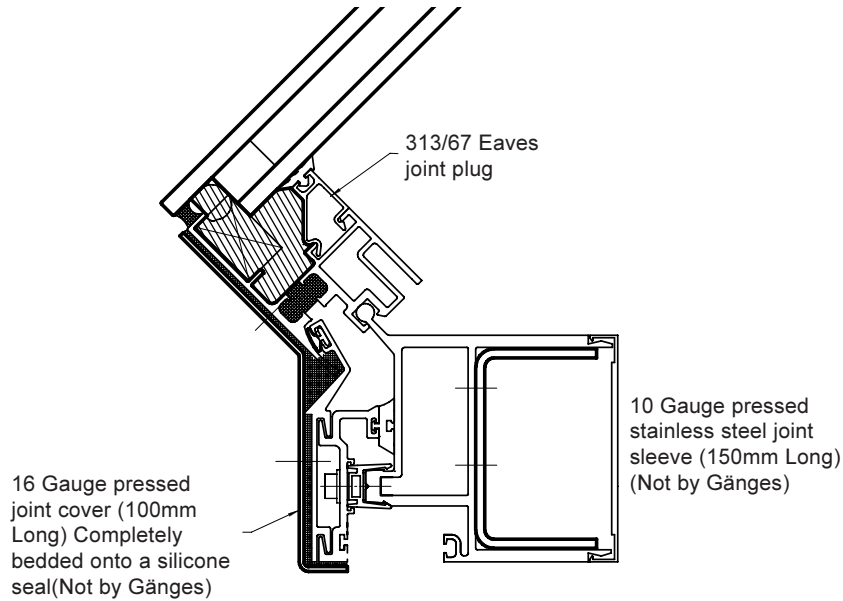
Fit insulation then fit inner gutter liner as shown below using 105/142 insulation gasket.



Glazing

Self Supporting Eaves Joints

Where a self supporting eaves exceeds 6000mm a butt joint must be incorporated as shown below.



Glazing

Fitting Of Rail Clamp Plates and Cappings

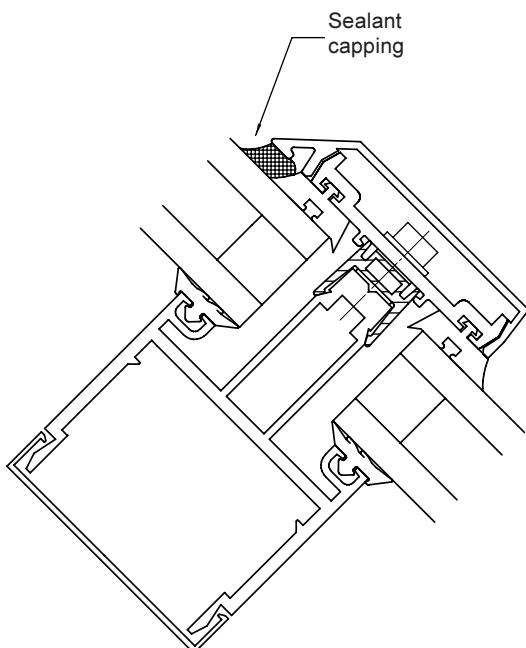
Once all the mullion cappings have been fitted and correctly sealed the horizontal clamp plates can begin to be fitted. The unequal leg clamp plate at the apex should be fitted first and then the 17533 capping clipped into position.

The clamp plate must be fixed with No. 12 self drill screws and torqued to a value of 8Nm.

Once all the apex clamp plates and cappings have been fitted the intermediate clamp plates can begin to be fitted. To do this the 313/56 roof drainage mouldings must be positioned at both ends of the rail, this moulding must be sealed to the glass and the side of the mullion capping to prevent water penetration into the glazing system. Fix using No 8 x 1" csk head self tapping screw. Once the mouldings are in position the clamp plate must be positioned between them with silicone sealant being applied to the ends to form a water tight seal between the moulding and the clamp plate taking care to ensure that the notches in the glazing gasket are at the bottom.

Once the screws have been tightened to 8Nm the special 17563 capping must be clipped over the clamp plate and the top edge sealed with silicone sealant as shown on the illustration below.

This procedure must be repeated down the roof until all mouldings, clamp plates and cappings have been fitted.



313

Structural Silicone
Glazing

glostal

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Specification

Scope

This specification details the basic design concept, construction, materials, fittings and performance of the Glostal 313 Structural Silicone Glazing.

Design

The profiles and components in this range have been specially designed by GRANGES to provide a simple form of Structural Silicone Glazing.

The silicone glaze system is based on the stick construction method as used on 313 Curtain Walling. This system is constructed in factory conditions allowing for silicone to be applied and set before sending to site.

Materials

Aluminium profiles are extruded aluminium alloy 6063T6 complying with the recommendations of BS 1474, with stainless steel fixings and appropriate high quality seals used throughout.

Polyester powder coated finishes are available to BS 6496 in a wide range of colours. Anodised finishes are to BS 3987 Grade AA25, etch silver and Glostal bronze.

Construction

The silicone glaze system is constructed using the form of stick construction used for curtain walling, which consists of main mullion members with intermediate rails, fitted to prepared brackets to form the basic framing grid. The infill of glass, panels or opening lights is then applied and sealed with silicone. Installation is completed by a final silicone seal to the outer surface.

Assembly and Installation

Detailed instructions are provided in this publication, which must be strictly conformed to.

Glazing

The structural silicone glazing has been designed for 24 mm double glazing or panel thickness.

All glazing must comply with BS 6262 for thickness and type, and confirmation of the suitability of any other infill material must be obtained from the supplier.

Concealed opening lights and standard doors can be directly accommodated into the structural silicone glazing system

IMPORTANT NOTE: All silicone glazed panels/panes must be constructed and sealed by silicone glaze specialists.

eg. Structural Glazing Ltd
Hortonwood 10
Telford
Shropshire
TF1 4ES
TEL: 01952-608019
FAX: 01952-670469

Performance

The unique construction allows for a very effective inside seal which is free from any stress caused by thermal movement. This, combined with the automatic pressure equalisation and drainage, means that any correctly installed curtain wall framing will comply with BS 6375 Part 1, 1989 Glass '2000 Special'.

For wind resistance, the curtain wall framing will meet any specified requirement subject to the adjustment of spans, fixings and mullions used.

Size Limitations

The size and span of the curtain walling is determined by the wind loading upon it, this can be calculated using the Glostal 'Wind Loading & Strength Calculations Manual'.

The maximum glass size for the panels is also determined by wind loading. This must be checked by the structural silicone glaze specialists.

Maximum Size For Silicone Glaze Panel

Max Height: 2200mm

Max Width: Dependent on rail span, wind loading & strength calcs (absolute max 2200mm)

Concealed Opening Light.

Vent Frame Size Limitations (O/A Outerframe)

Top Hung

Friction Stay	10"	12"	16"	22"	26"
Max Width	2040mm	2040mm	2040mm	2040mm	2040mm
Max Height	675mm	827mm	1130mm	1540mm	2040mm
Min Width	307mm	675mm	827mm	1130mm	1310mm
Max Weight	37kg	45kg	55kg	75kg	100kg
Opening Angle	50°	50°	50°	45°	20°

Side Hung

Friction Stay	10"	16"
Max Width	700mm	878mm
Max Height	–	–
Min Width	340mm	490mm
Max Weight	38kg	47kg
Opening Angle	85°	90°

Guidance notes

All curtain walling needs a great deal more care than a normal window installation and we have written the following notes as a general guide to the various factors which must be considered.

Building tolerances and movement

The openings, columns and floor frame of any building will wander out of position while being formed and even when finished can settle or flex.

In view of this it is very important to establish at the start the amount of tolerance or movement which the curtain wall must accommodate so that it can be allowed for.

This manual shows the standard tie back fixing bracket, however, where special conditions occur consideration must be given to purpose made brackets and checks made as to their structural properties.

Fixing anchorage points

Effective fixing of any curtain wall requires that the structure is accurately prepared.

This normally involves the casting into concrete of channel type fixing inserts which will receive the fixing bolts or the provision of supporting steelwork to which they can be attached.

It is very important that necessary provision is agreed at an early stage and that acceptable positioning tolerances are agreed. The standard fixing bracket for example will allow for +/- 20mm of horizontal movement, +/- 15mm in and out or vertical movement.

Curtain wall tolerances

Curtain wall members must be very accurately machined to ensure that there is no variation from the basic sizes.

The 313 mullions are specially designed so that their side walls can flex to accommodate horizontal thermal movement without any stress on the rail seals.

Small vertical tolerances can be taken up at the mullion joints.

Curtain wall thermal movement

The coefficient of thermal expansion for aluminium is 0.000024 per degree centigrade. When considering that the majority of the curtain wall mullion is on the inside of the building, it will therefore experience only a limited temperature range for the majority of its surface. Whilst the system provides for vertical thermal movement of +/- 1mm per 1000mm of span it is unlikely that this extreme will ever be reached.

The curtain wall mullions have been designed to accommodate all horizontal thermal movement without any stress on the main seals. Vertical movement is catered for in the following way:

The ground floor mullion rests directly onto the cill and all thermal movement is taken up at the tie back fixing bracket. The first floor mullion is supported at the tie back fixing bracket and vertical thermal movement is taken up either at a subsequent tie back fixing bracket (if multi storey) or if at the extreme head, by the head retaining bracket.

Curtain wall wind loading

All curtain wall members and infill must be strong enough to support the maximum wind pressure or suction which results from the local wind gust speed and the building shape.

Full details are given in British Standard BS 6399 Part 2, but the Glostal 'Wind Loading & Strength Calculations Manual' gives a simplified procedure to allow for the correct selection of members.

Curtain wall fixings

The complete fixing arrangement at any one point must be capable of supporting at least twice the maximum loadings to which it may be subjected (wind, live and dead load).

The materials used must also be effectively protected against any danger of corrosion and wherever possible should be either aluminium or stainless steel. In certain areas, such as London, the use of rustproofed steel may not be permitted.

Curtain wall fire resistance

The 313 curtain walling will not support the spread of fire but in itself it has no significant fire resistance (aluminium melts at about 660°C).

This means that wherever fire resistance is a specific requirement, it must be achieved either by the provision of back up walls or the use of suitable infill panels with independent fire resistant fixings.

It is the specifier's responsibility to detail the precise requirements and, as these will vary from one area to another, they must be cleared at an early stage.

Curtain wall weather performance

Resistance to air and water penetration of the main curtain wall structure will meet the maximum requirements of BS 6375: Part 1: 1981. It will also meet the wind resistance requirements.

The weather performance of any opening lights will obviously be at the level of the unit concerned.

Glazing/Infill

All glass thicknesses must comply with BS 6262, and confirmation of their suitability for any other infill materials must be obtained from the supplier.

British Standards

Fabricators should obtain copies of the following relevant British Standards for reference.

BS 6399 Part 2: Wind Loadings

BS 8118 Part 1 & 2: Structural Use of Aluminium

BS 5516: Patent Glazing

BS 6262: Glazing

BS 8200: External Building Enclosure (Curtain Walling)

Important note

If further guidance or information is required Gränges should be contacted.

Important Information

Structural Glazing Method Statement

The following list explains the process that needs to be carried out to glaze the structural silicone frames. THIS PROCEDURE MUST BE CARRIED OUT BY STRUCTURAL SILICONE SPECIALISTS ONLY.

1. Collect detail drawings, glass specification and required exposure rating and supply all to structural silicone sealant specialist for written assessment.
2. Obtain sample extrusion, with actual coating to be used, and supply to structural silicone sealant specialist for adhesion testing.
3. Set up job file containing written replies to the above, and prepare job card noting the depth of silicone seal, size of Norton Tape, and the priming requirements.
4. Upon receipt of glass and frames, check that they conform to the notified specified and number all frames.
5. Wipe off residues from the frame and glass with isopropyl alcohol.
6. Apply Norton V2100 glazing tape to the frame.
7. Wipe the prime sealant contact areas with specified primer.
8. Insert heat cured silicone rubber setting blocks on the cill only.
9. Insert glass, spacing carefully in the frame.
10. Apply masking tape in vision areas, before applying freshly mixed structural silicone sealant with an air gun.
11. Tool off firmly to promote adhesion.
12. Remove masking tape and clean off when appropriate.
13. Remove to storage. DO NOT transport outside the factory for 72 hours.
14. Complete all records to show date gunned, sealant batch used and operatives details.
15. Make up and supply a manual for the works, if requested.

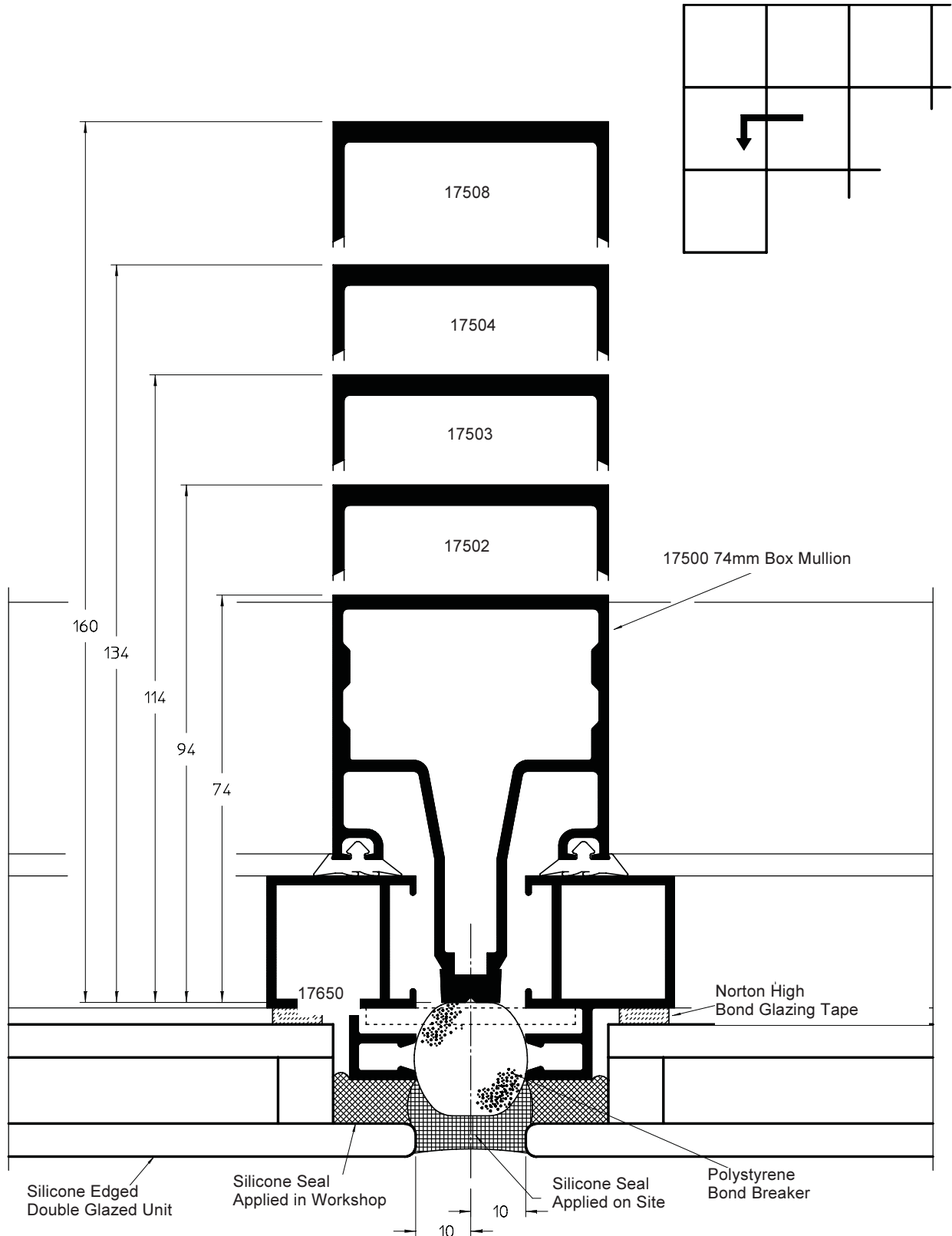
Important Information

Structural Glazing Method Statement

Structural silicone glazing is a technique which requires careful consideration and preparation to enable the project to be constructed to the highest standards of safety and workmanship to ensure the long term performance of the facade. The structural silicone specialists have specific procedures that should be followed for each project to confirm that all structural glazing details comply with the specialists recommendations. These procedures are as follows ...

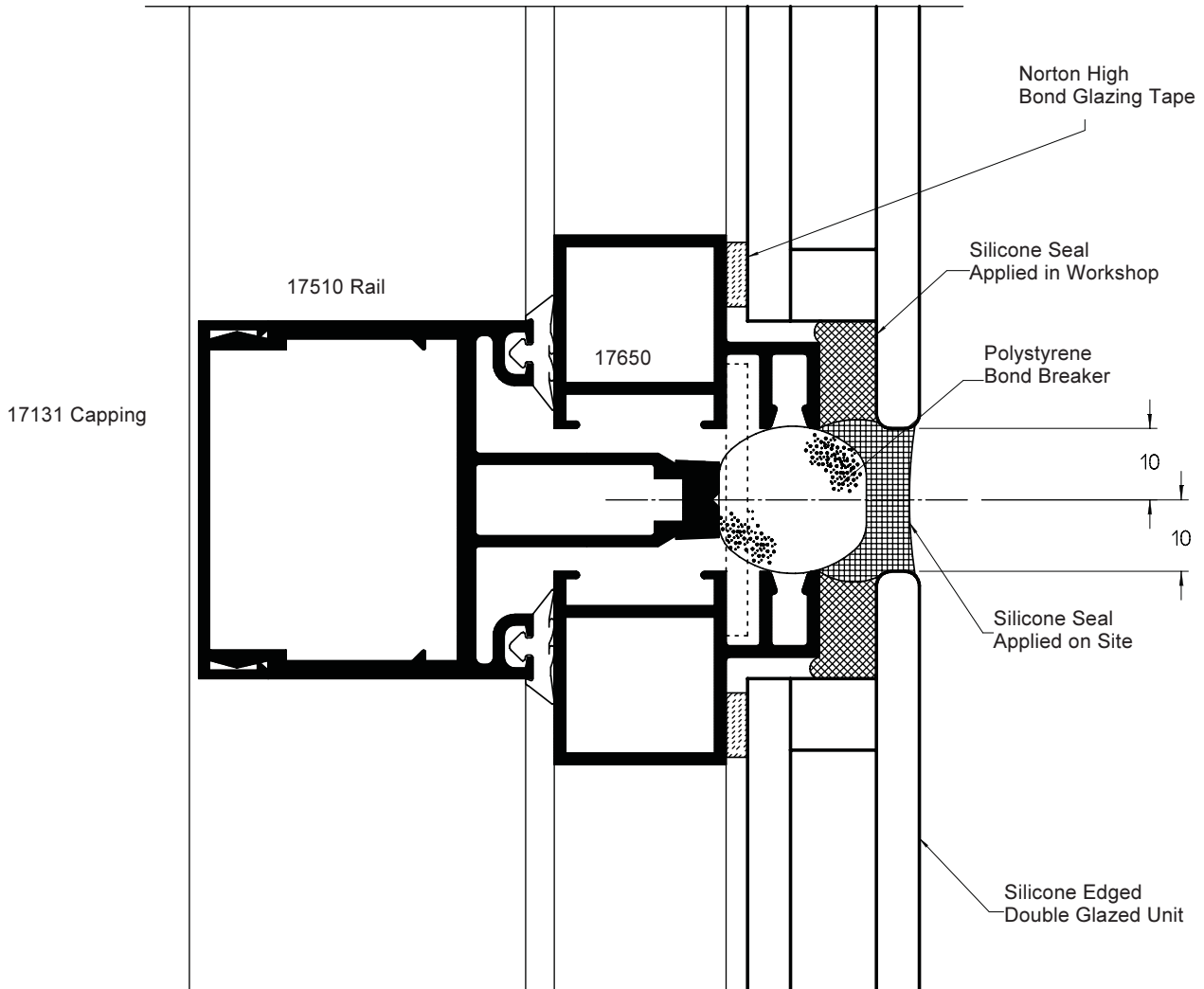
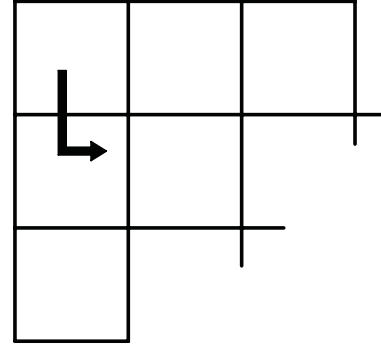
Procedure	Requirements
1. Calculation of structural sealant bite	a. Supply of glass size and loading information. b. Completion of structural glazing project check list
2. Review of all sealant details	a. Supply a set of construction drawings showing sealant details.
3. Adhesion and compatibility testing of all substrates to be in contact with the silicone sealant.	a. Supply of samples for test: 6 No. 150mm lengths of metal profile, 6 No. x 150mm glass samples 500mm length of gaskets etc.

**General Arrangement
Mullion Detail**



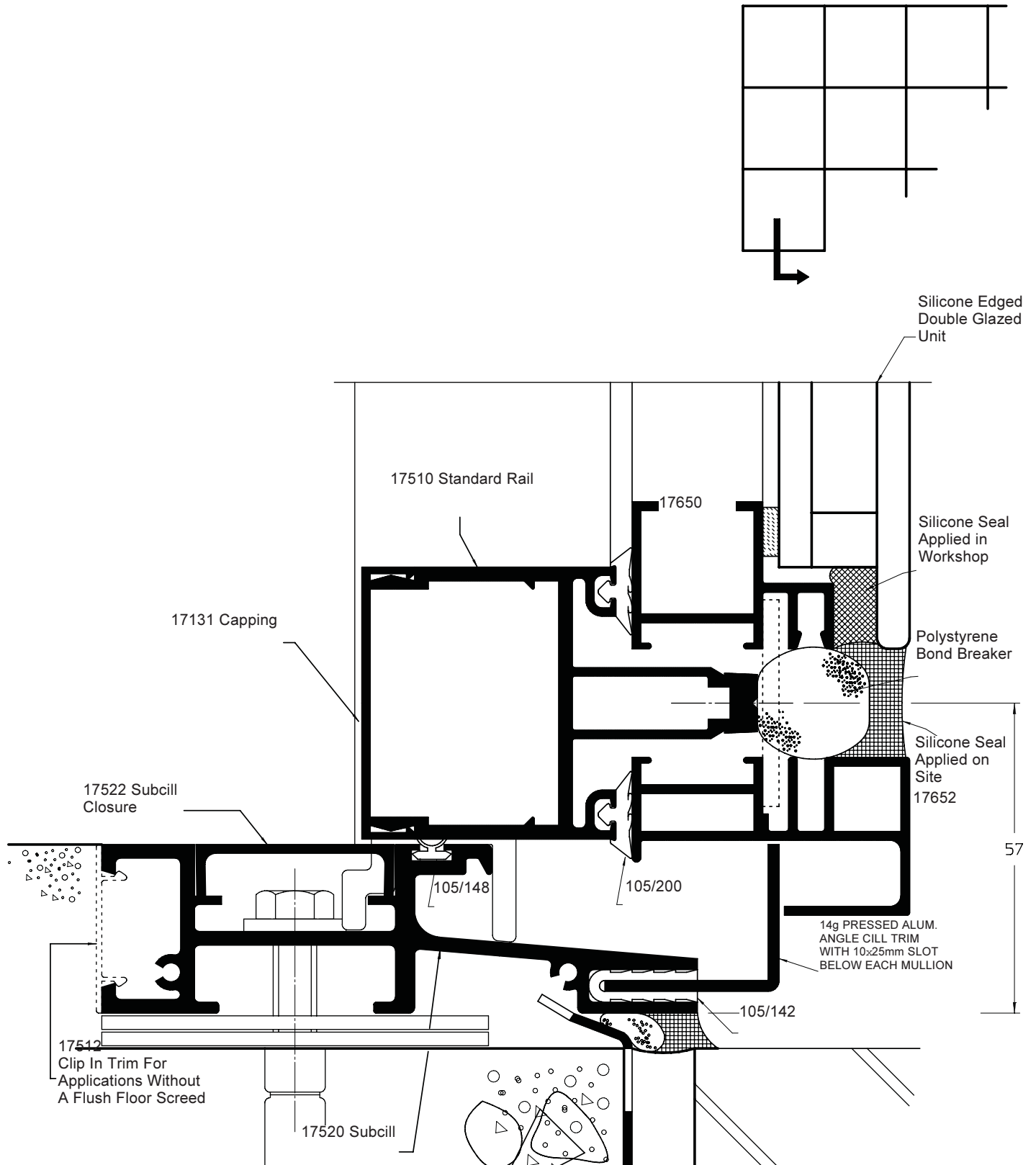
General Arrangement

Rail Detail

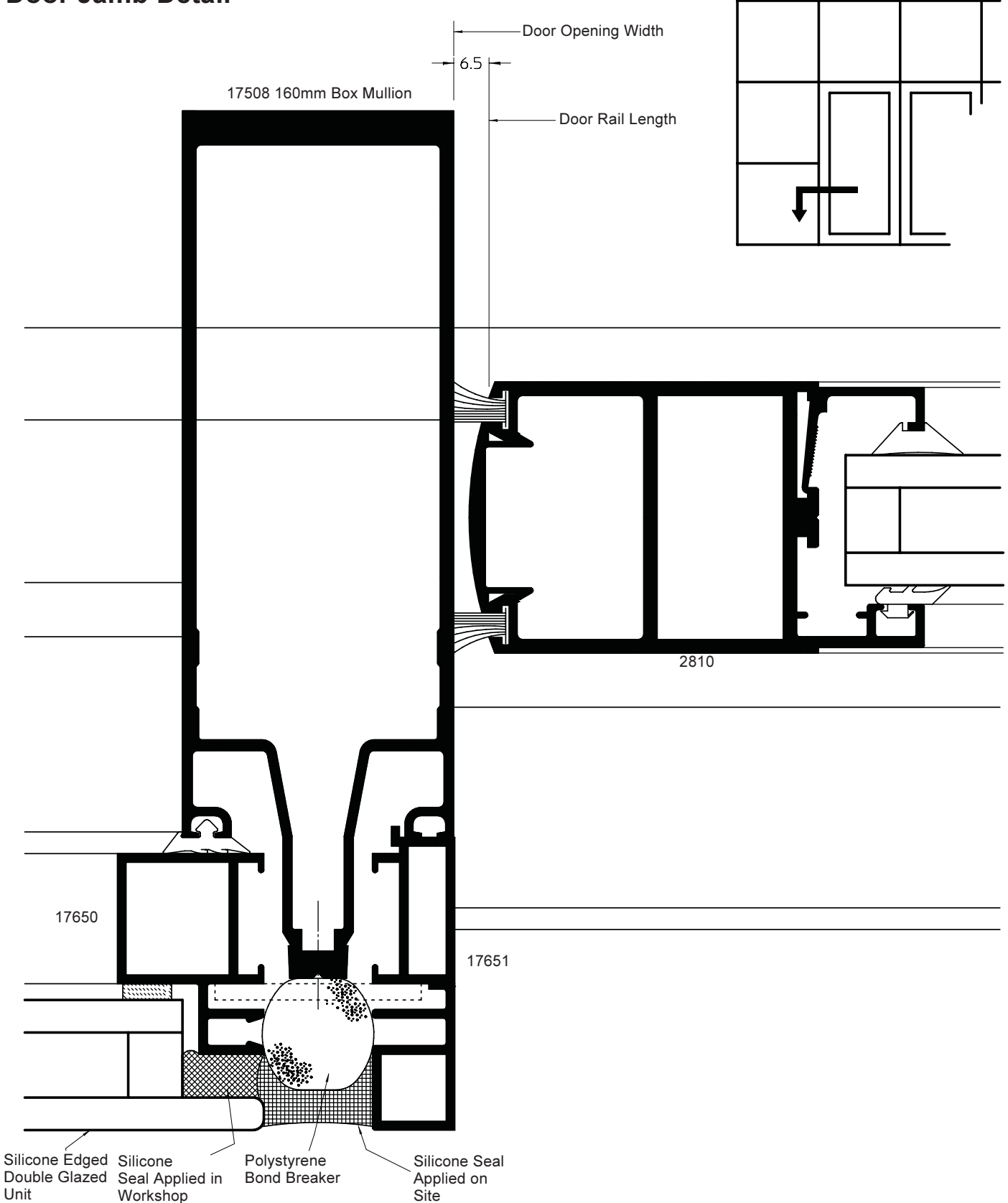


General Arrangement

Cill Detail

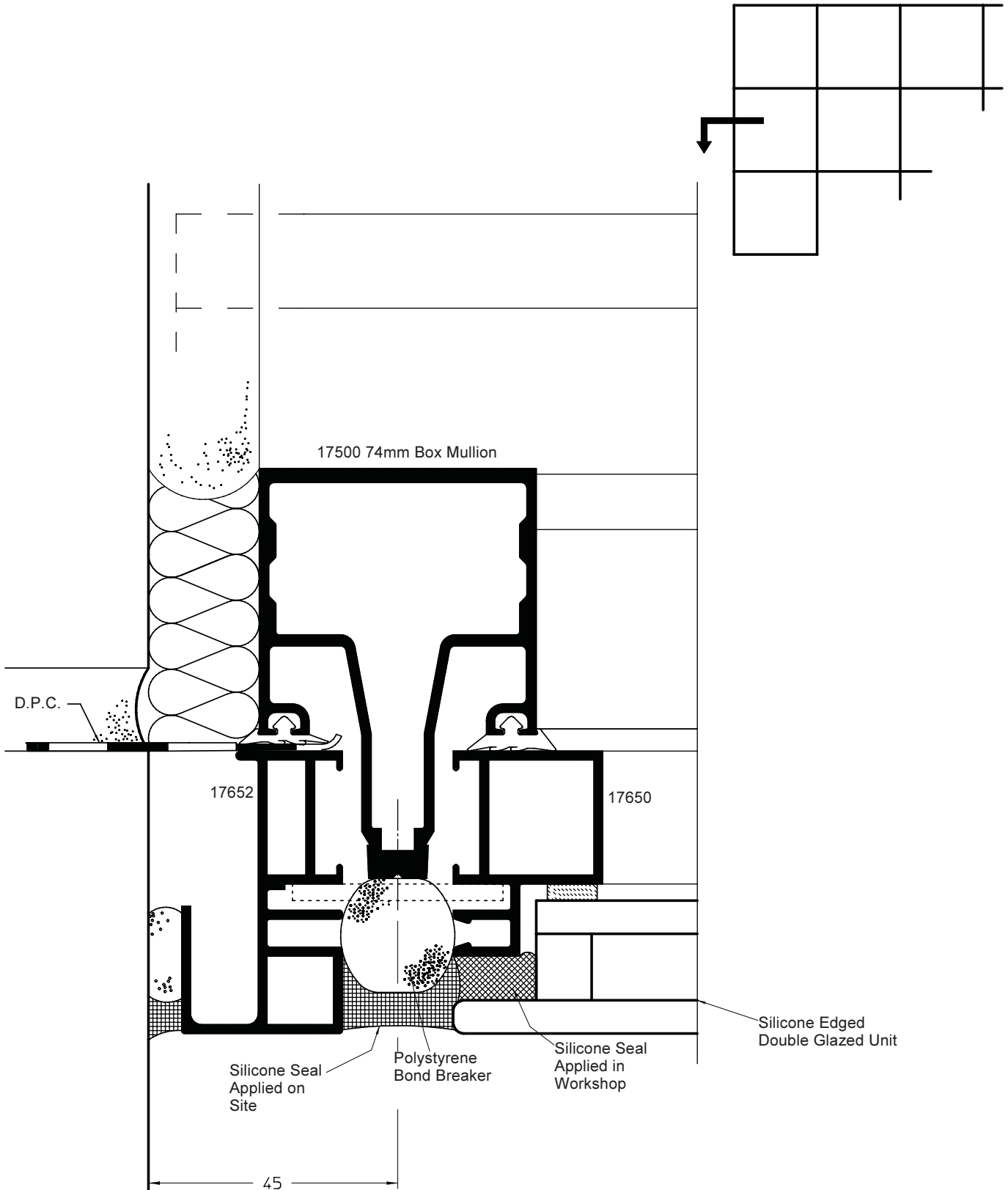


General Arrangement
Door Jamb Detail



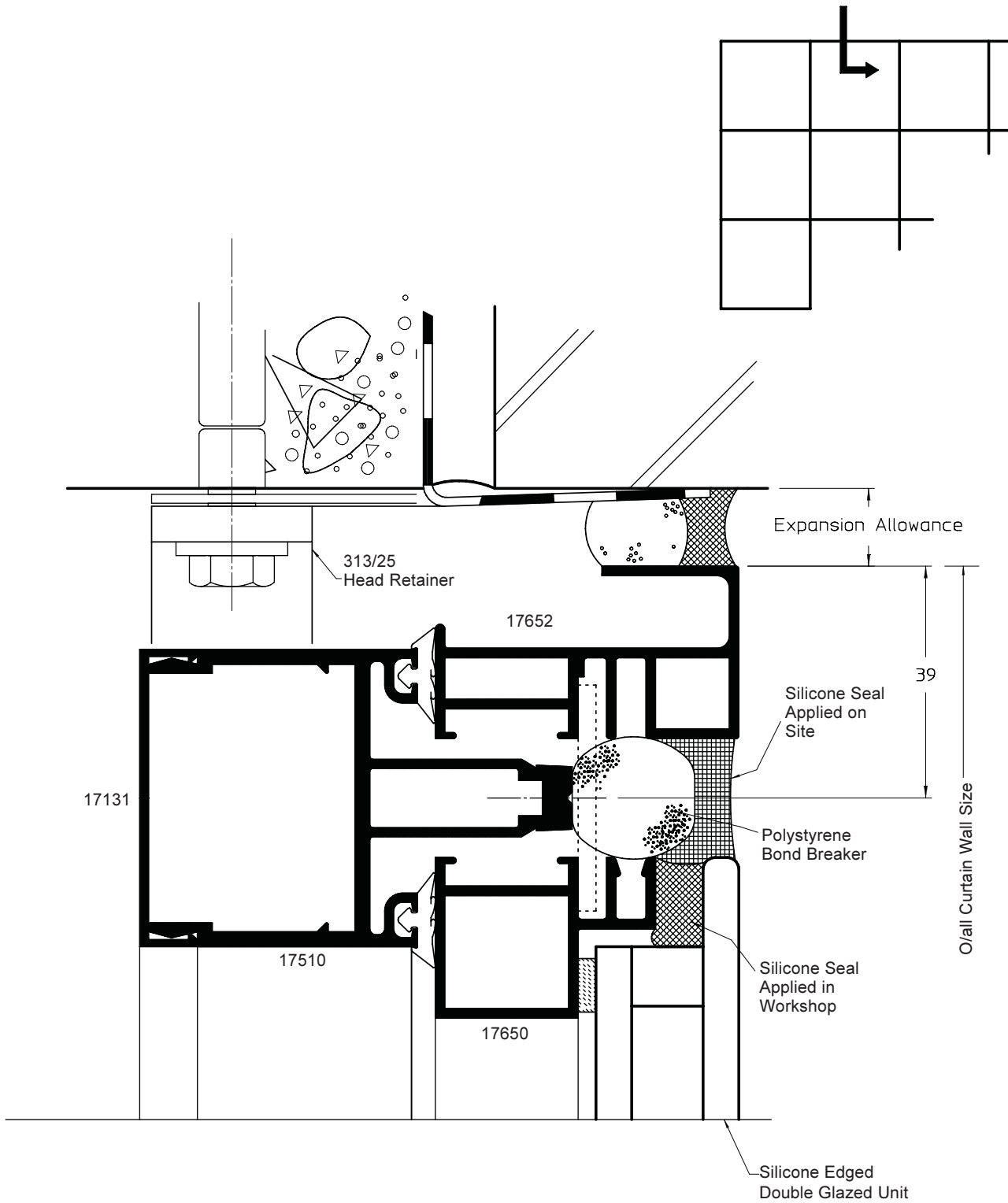
General Arrangement

Mullion Jamb



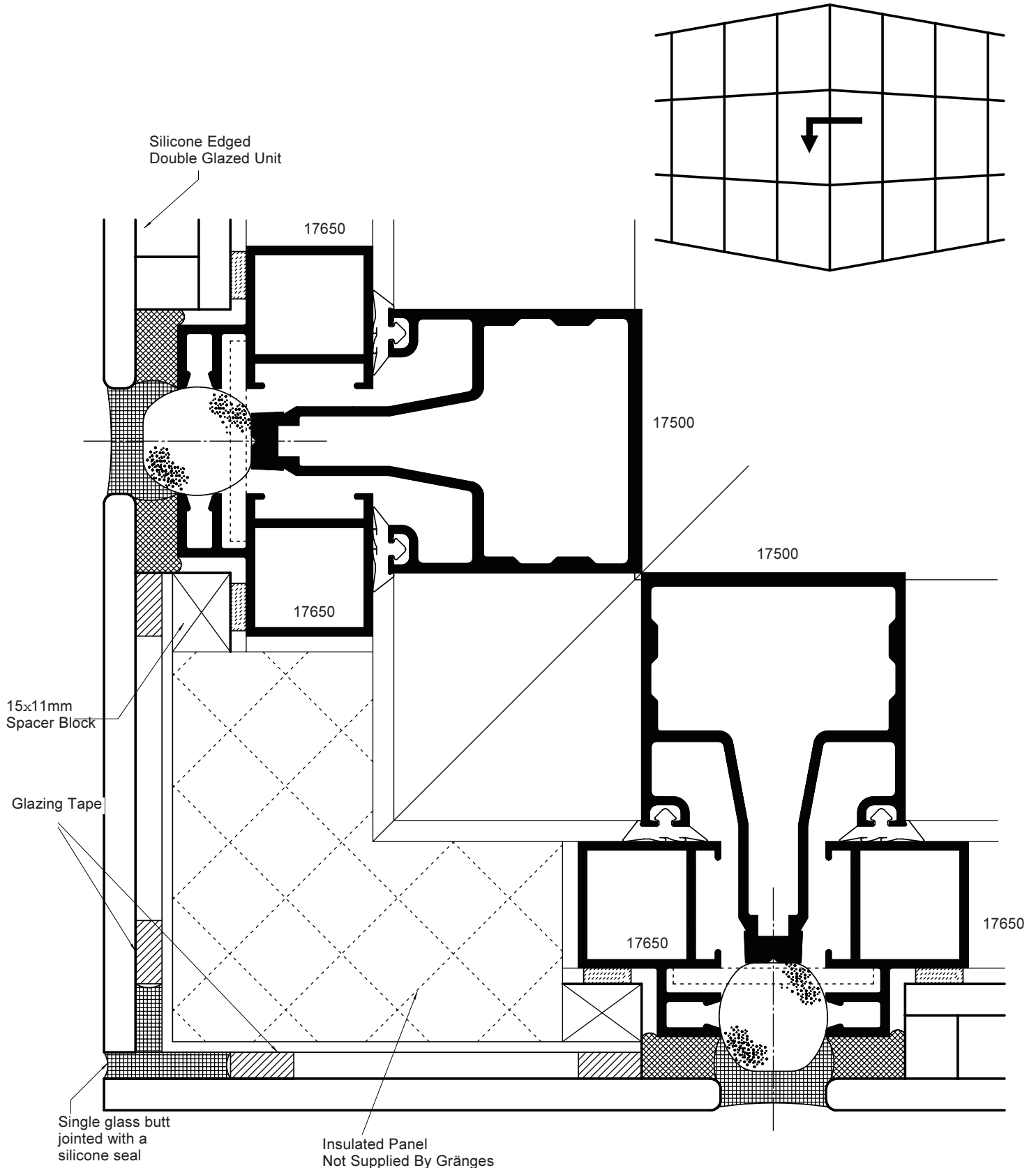
General Arrangement

Head Detail

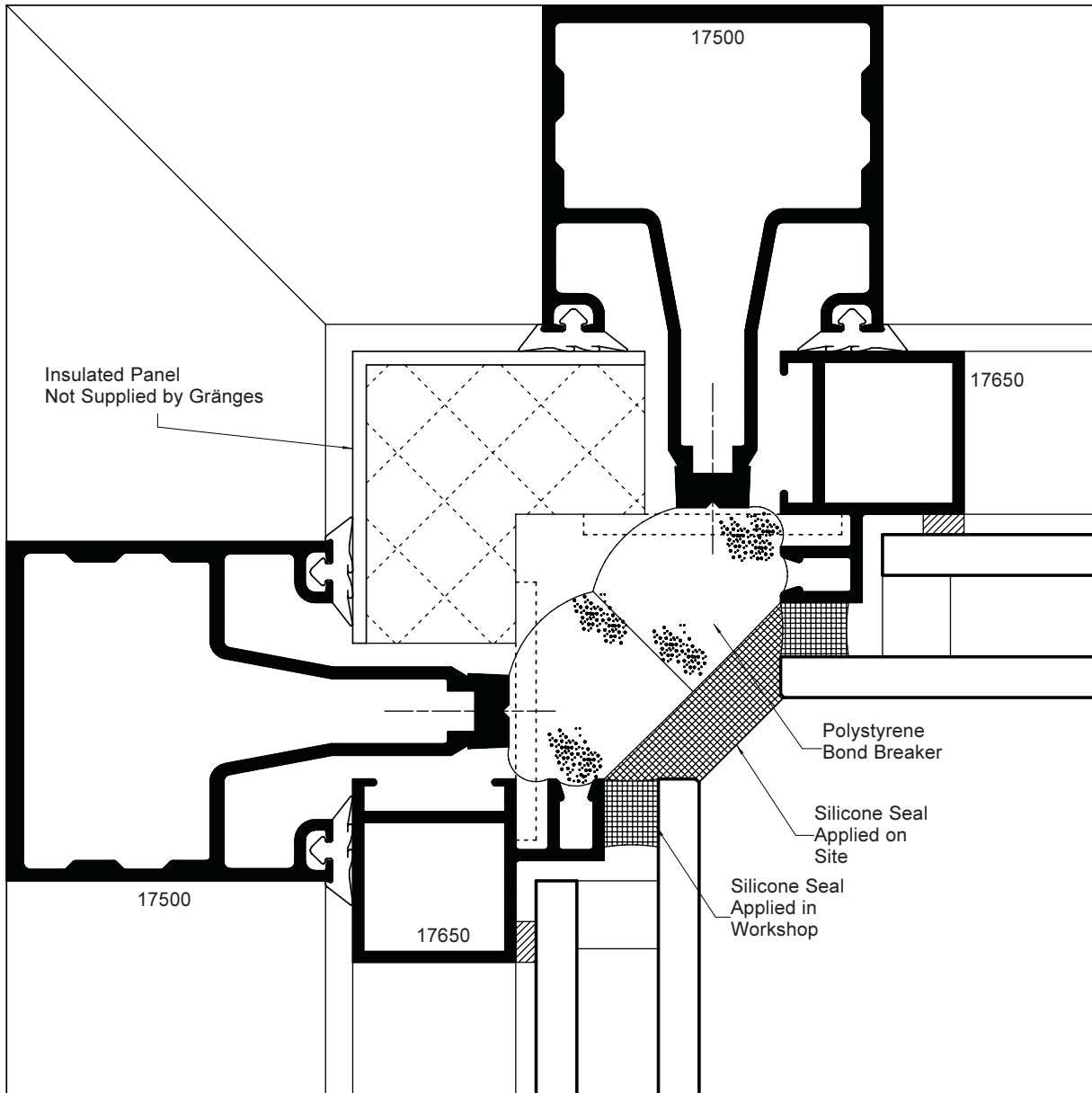
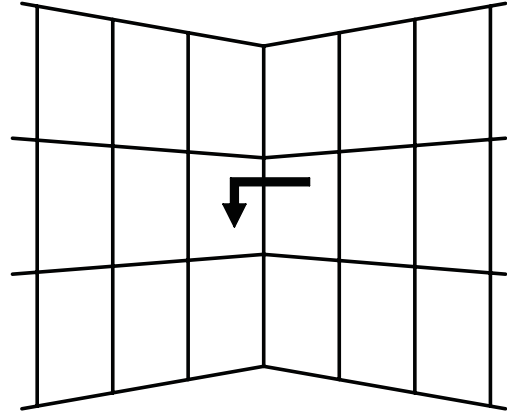


General Arrangement

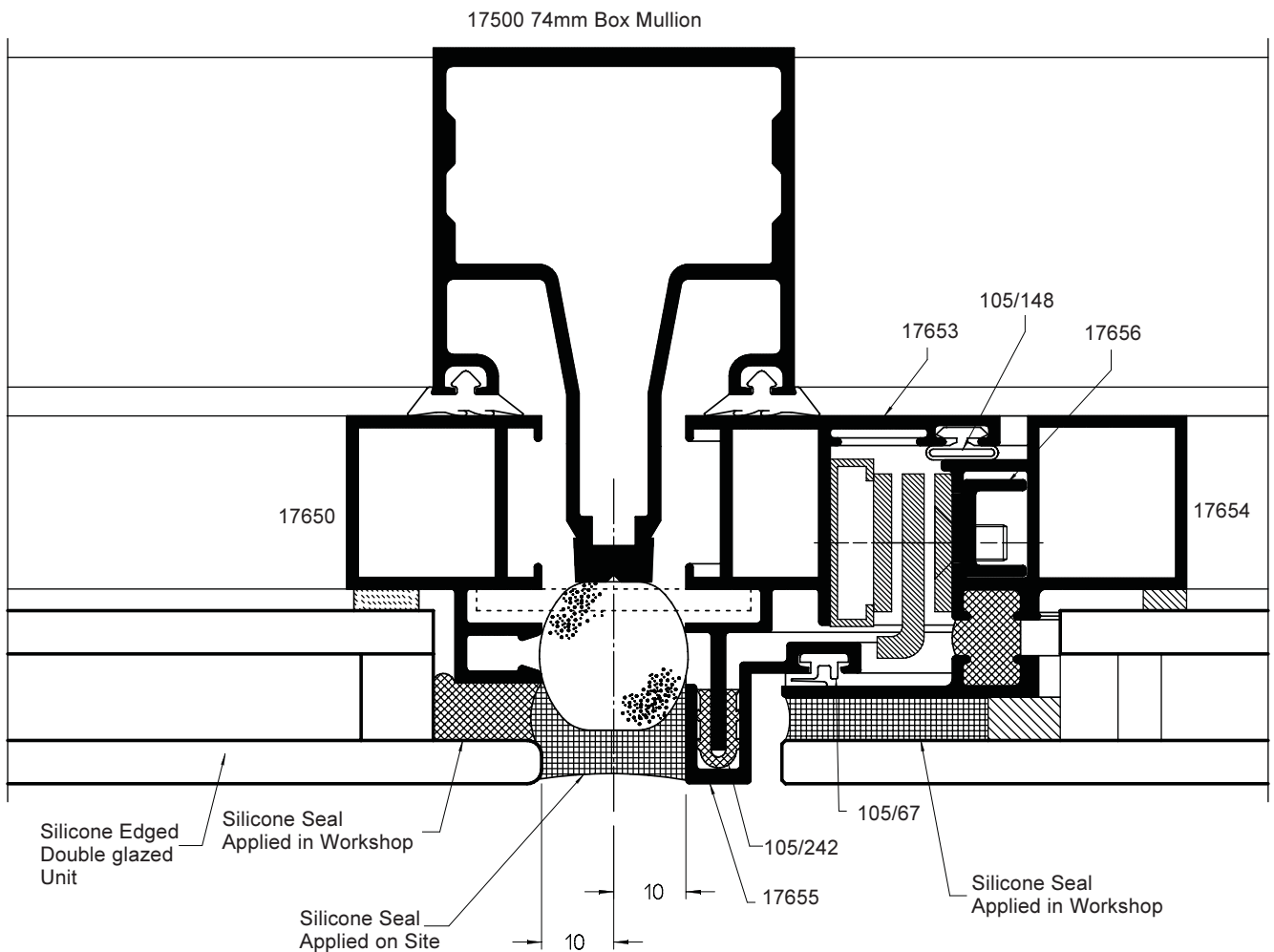
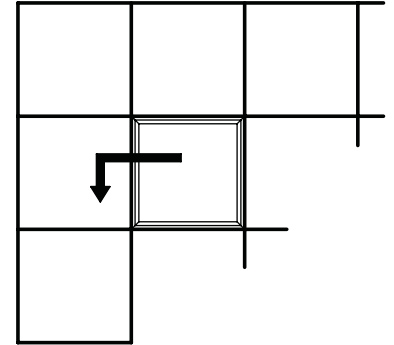
90° External Corner Detail



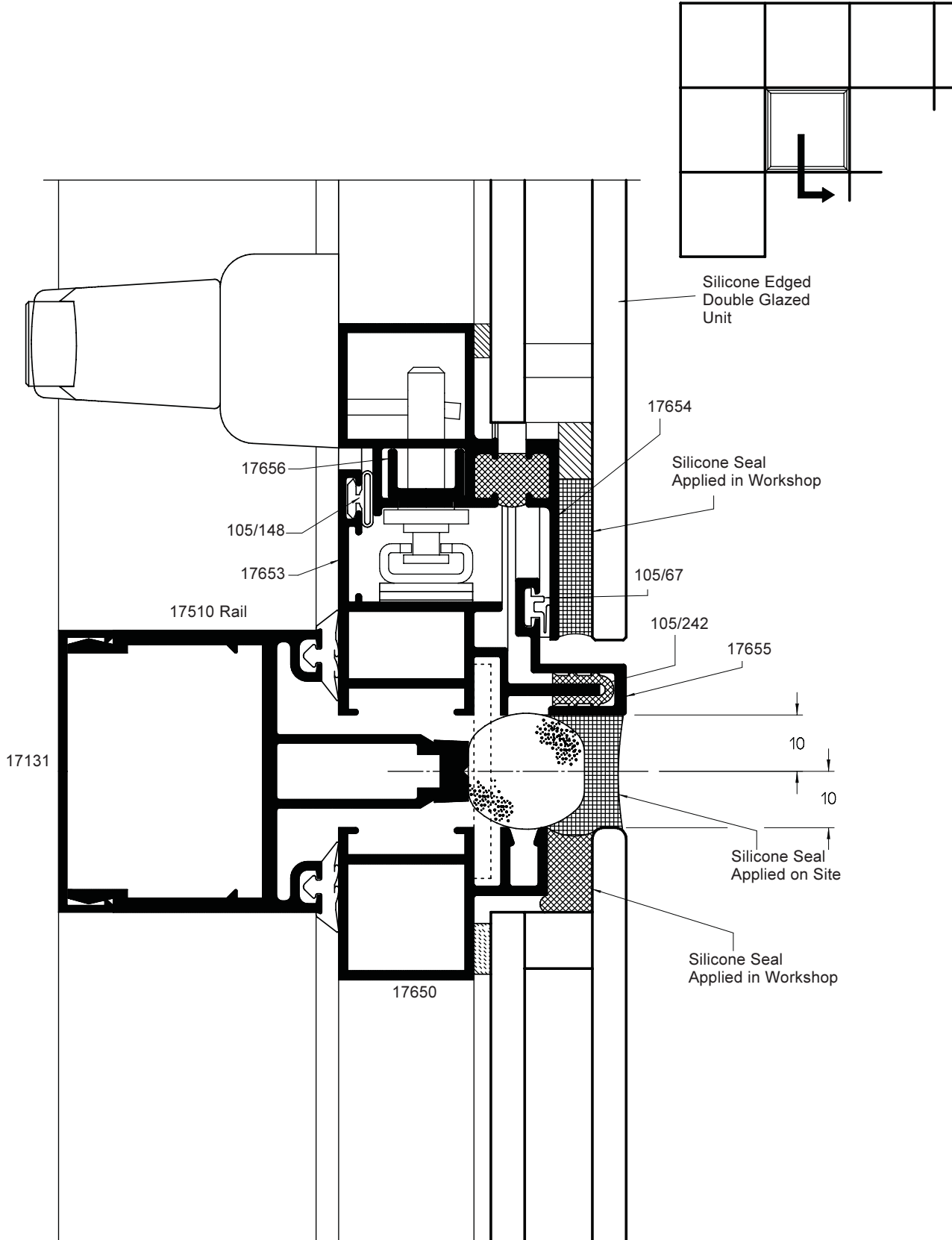
General Arrangement 90° Internal Corner Detail



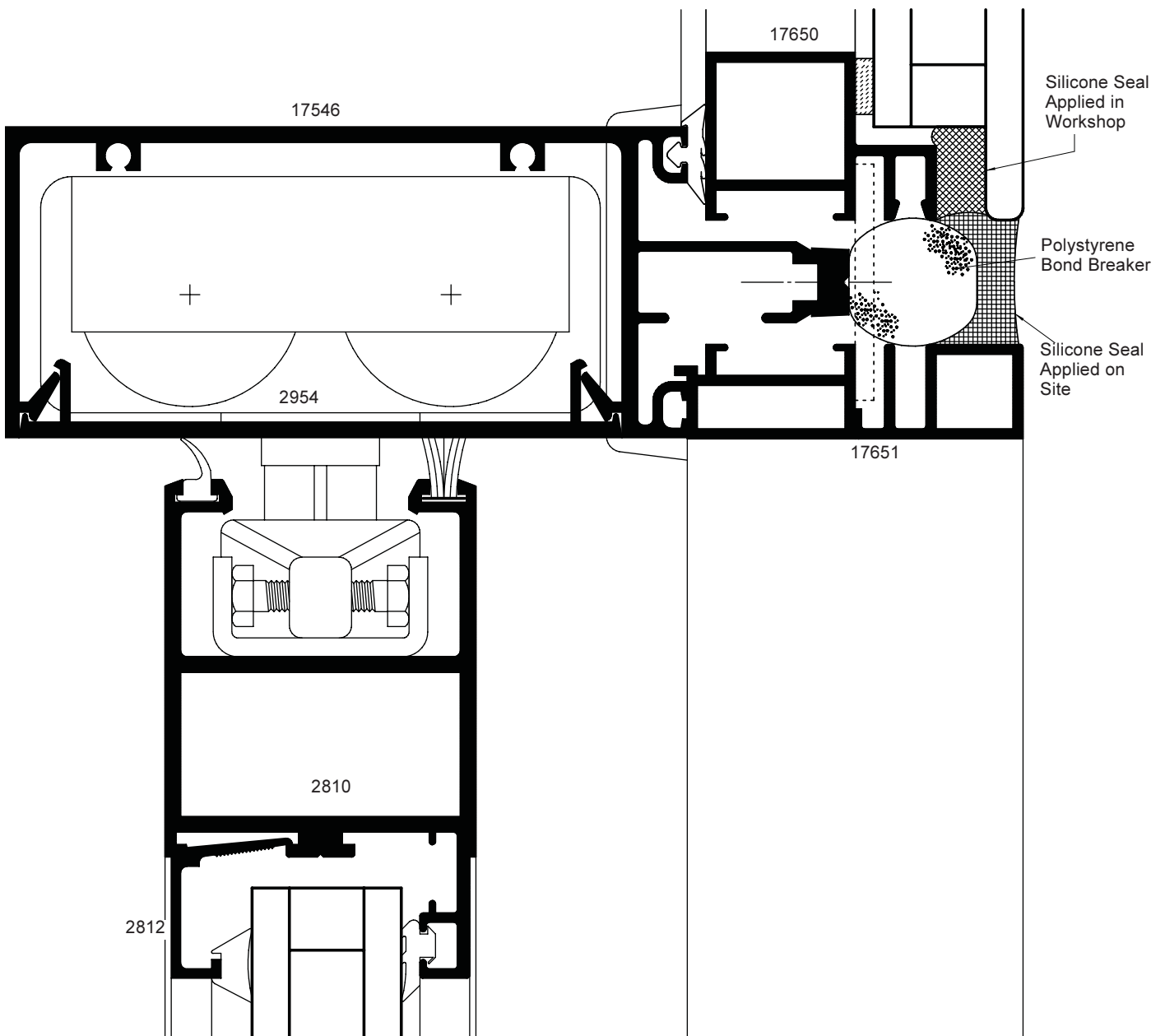
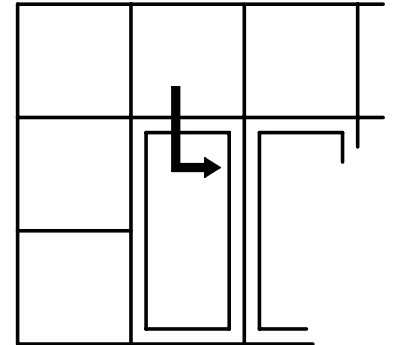
General Arrangement
Opening Light Jamb Detail



**General Arrangement
Opening Light Cill Detail**

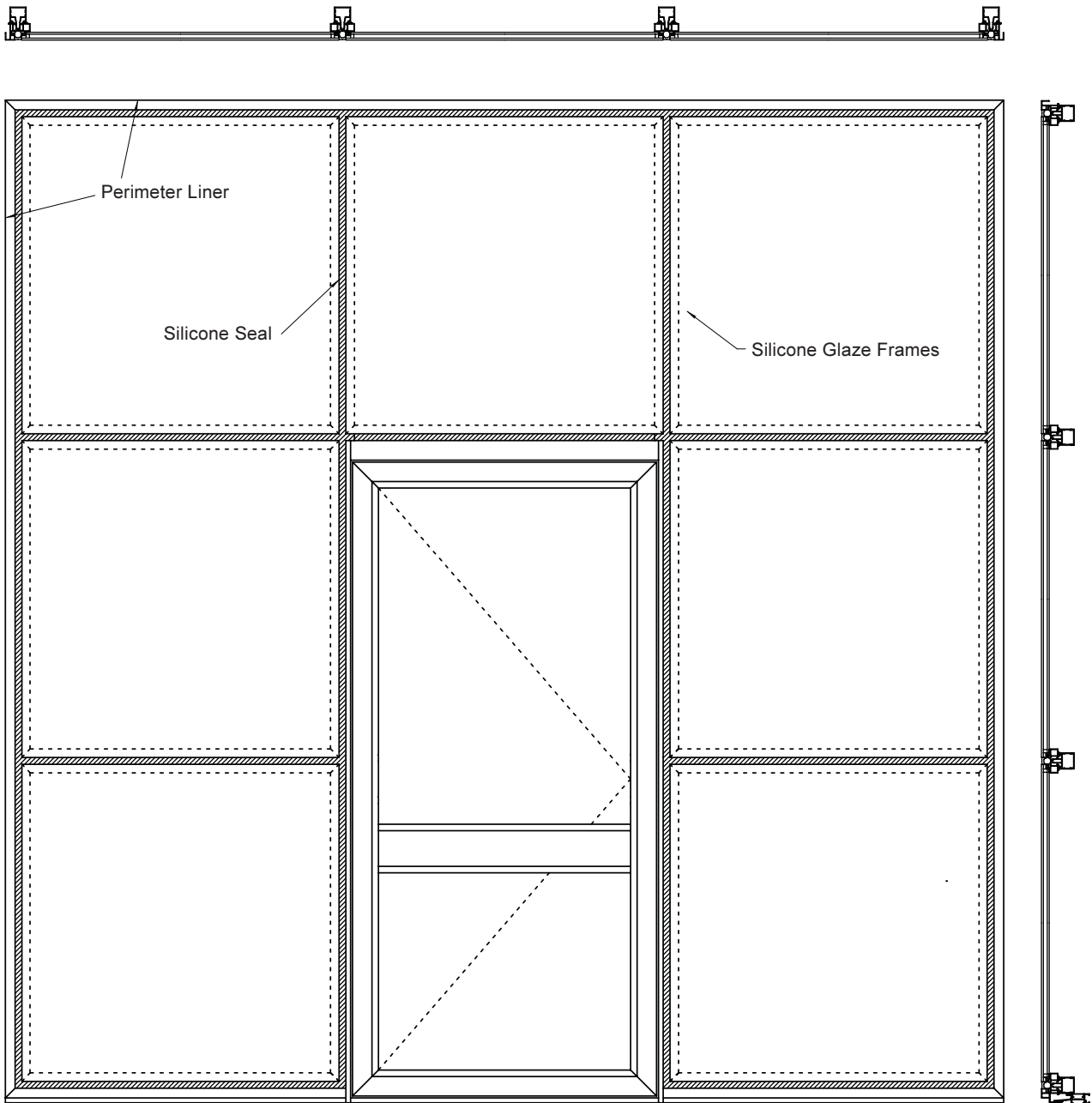


General Arrangement Door Head Detail



General Arrangement




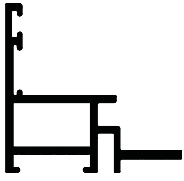
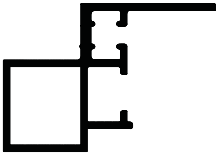

Typical Elevation



VIEWED FROM OUTSIDE








Profile Inertia Values

This page gives the inertia values of the outerframes and vent frames. It should be used to establish which member is required by comparing with the inertia value required as calculated in the Wind Loading and Strength Calculations Manual.


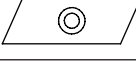

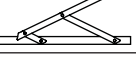

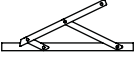
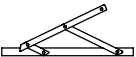
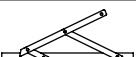
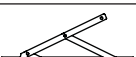
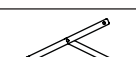


Profile	Inertia mm ⁴
 17650	← 30,970 ↓ 16,056
 17651	← 74,720 ↓ 6,840
 17652	← 84,130 ↓ 21,285
 17653	← 45,470 ↓ 32,738
 17654	← 48,320 ↓ 47,189
 17655	← 4,080 ↓ 4,704

Parts List

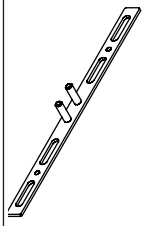

Aluminium Profiles

Illustration	Part No	Description
	17650	Structural Glazing Carrier
	17651	Structural Glazing Door Liner
	17652	Structural Glazing Perimeter Liner
	17653	Structural Glazing Vent Outer Frame
	17654	Structural Glazing Vent Frame
	17655	Structural Glazing Vent Frame Adaptor
	17656	Structural Glazing Vent Frame Fixing Channel

Components

Illustration	Part No	Description
	313/90	Structural Glazing Corner Cleat
	313/91	Structural Glazing Fixing Toggle
	325/25	Vent Outer Frame Corner Cleat
	313/129	10" Sterling Top Hung Hinge
	313/130	12" Sterling Top Hung Hinge
	313/131	16" Sterling Top Hung Hinge
	313/132	22" Sterling Top Hung Hinge
	313/133	26" Sterling Top Hung Hinge
	313/134	10" Sterling Side Hung Hinge
	313/135	16" Sterling Side Hung Hinge
	317/8	Corner Tie
	313/92	Perimeter Liner Corner Cleat

Components

Illustration	Part No	Description
	317/139	Non Locking Espag Handle LH
	317/140	Non Locking Espag Handle RH
	317/239	Locking Espag Handle RH
	317/240	Locking Espag Handle LH
	702/43	250mm Espagnolette Bar
	702/44	400mm Espagnolette Bar
	702/45	600mm Espagnolette Bar
	702/46	800mm Espagnolette Bar
	702/47	1000mm Espagnolette Bar
	702/48	1200mm Espagnolette Bar
	313/93	Espagnolette Accessory Pack
	313/94	Door Liner Corner Cleat
	313/97	Structural Glaze Frame Packer

Note: When ordering Section 17655 you must order it in a colour that will match the external sealant.

Parts List

Sterling Friction Stays

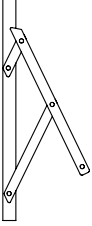
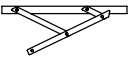


Illustration	Part No	Description	Recommended maximum Vent Frame Parameters		
			Width mm	Height mm	Weight kg
	313/129	10" Top Hung Friction Stay (Pair)	2040	675	37
	313/130	12" Top Hung Friction Stay (Pair)	2040	827	45
	313/131	16" Top Hung Friction Stay (Pair)	2040	1130	55
	313/132	22" Top Hung Friction Stay (Pair)	2040	1540	75
	313/133	26" Top Hung Friction Stay (Pair)	2040	2040	100

Illustration	Part No	Description	Width mm	Height mm	Weight kg
	313/134	10" Side Hung Friction Stay (Pair)	700	–	38
	313/135	16" Side Hung Friction Stay (Pair)	878	–	47

Parts List

Gaskets & Weatherseals

Illustration	Part No	Description
	105/67	Outer Flipper Seal
	105/242	Insulation Gasket

Tooling

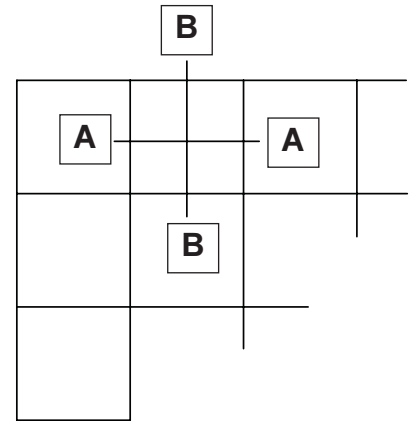
Part No	Description
325/154	Drill Jig – Cockspur Handle Prep
317/250	Drill Jig – Espagnolette Handle Prep
325/160	Router Plate – Drainage Preparation
325/162	Router Plate – Espagnolette Handle Prep
313/107	Crimper Conversion Kit
325/170	Crimper Conversion Kit

Screws

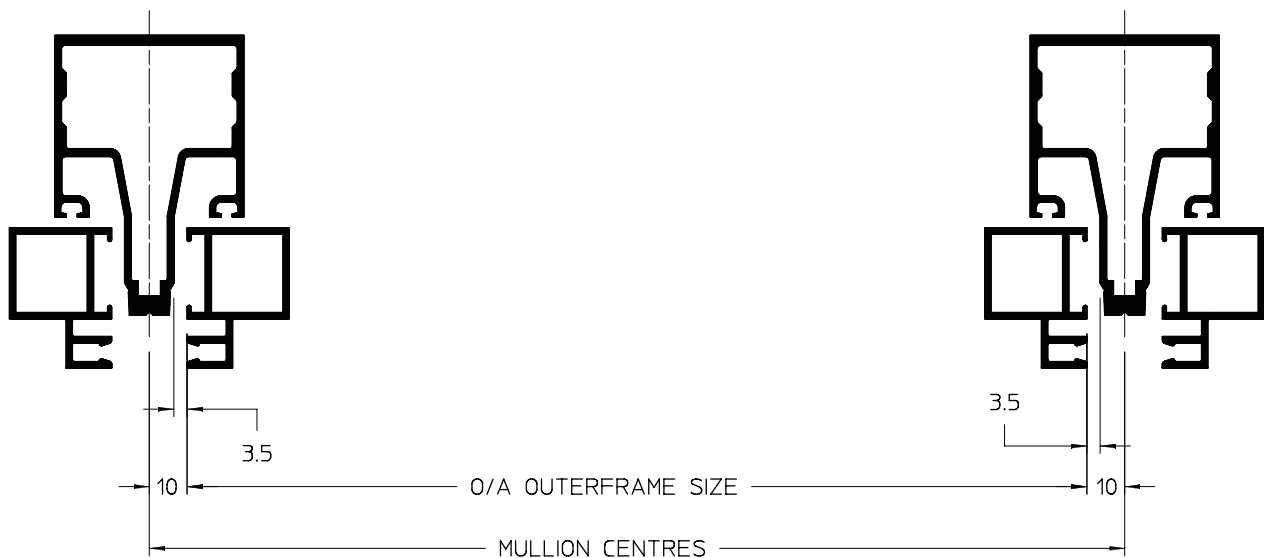
Size/Part No	Head	Description
No10 x 1/2" ST1012CPSS	Csk	Friction Stay Fixing
No12 x 1" ST121CPSS	Csk	Toggle Fixing & Friction Stay Fixing
M5 x 10mm MM510CPSS	Csk	Friction Stay Fixing
M5 Nutsert NM5ZN		Friction Stay Fixing

Cutting Calculations

Metal Sizes for Fixed Frame



A-A & B-B

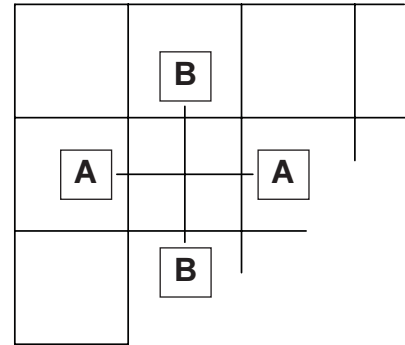


NOTE:

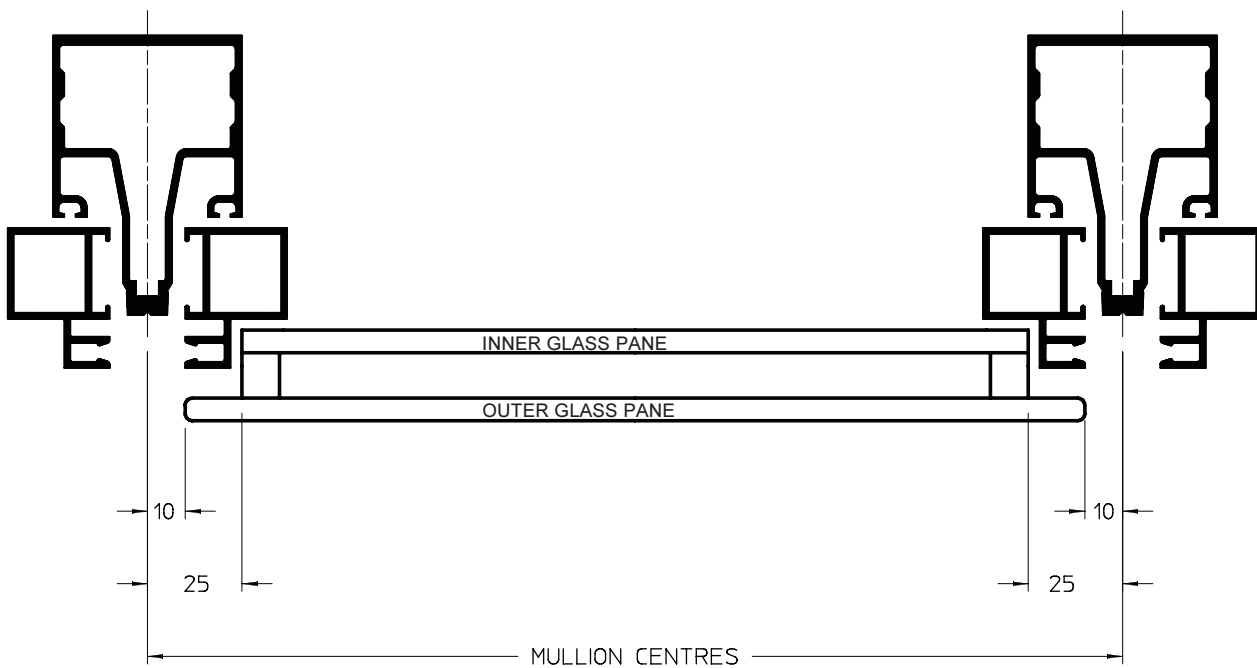
ALL MULLION AND RAIL CALCULATIONS ARE IN THE 313 PRODUCT MANUAL

Cutting Calculations

Glass Sizes for Fixed Frame



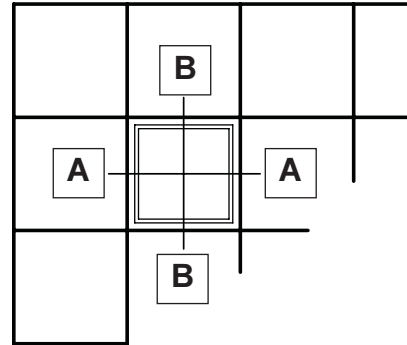
A-A & B-B



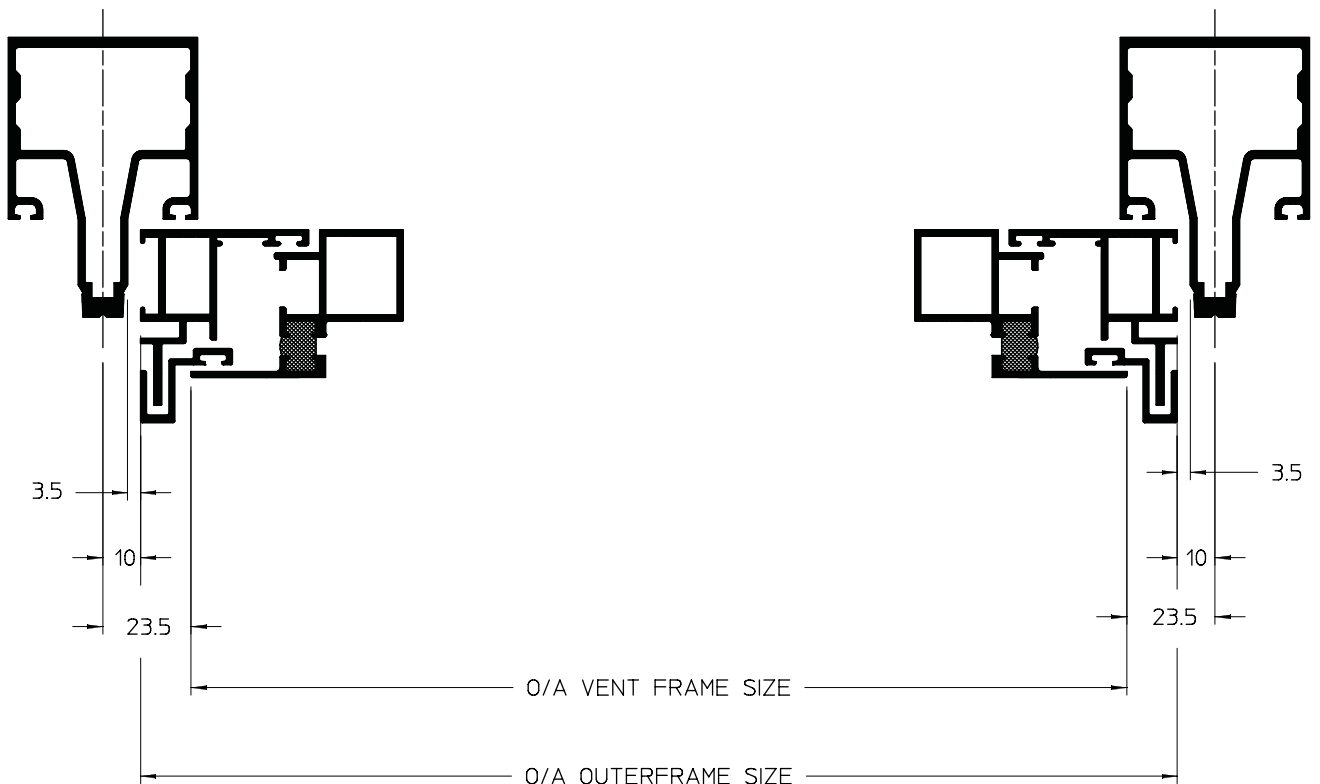
NOTE:
THE OUTER GLASS PANE MUST ALWAYS BE THE LARGER

Cutting Calculations

Metal Sizes For Vent Frame

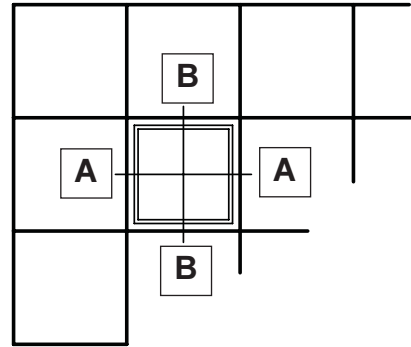


A-A & B-B

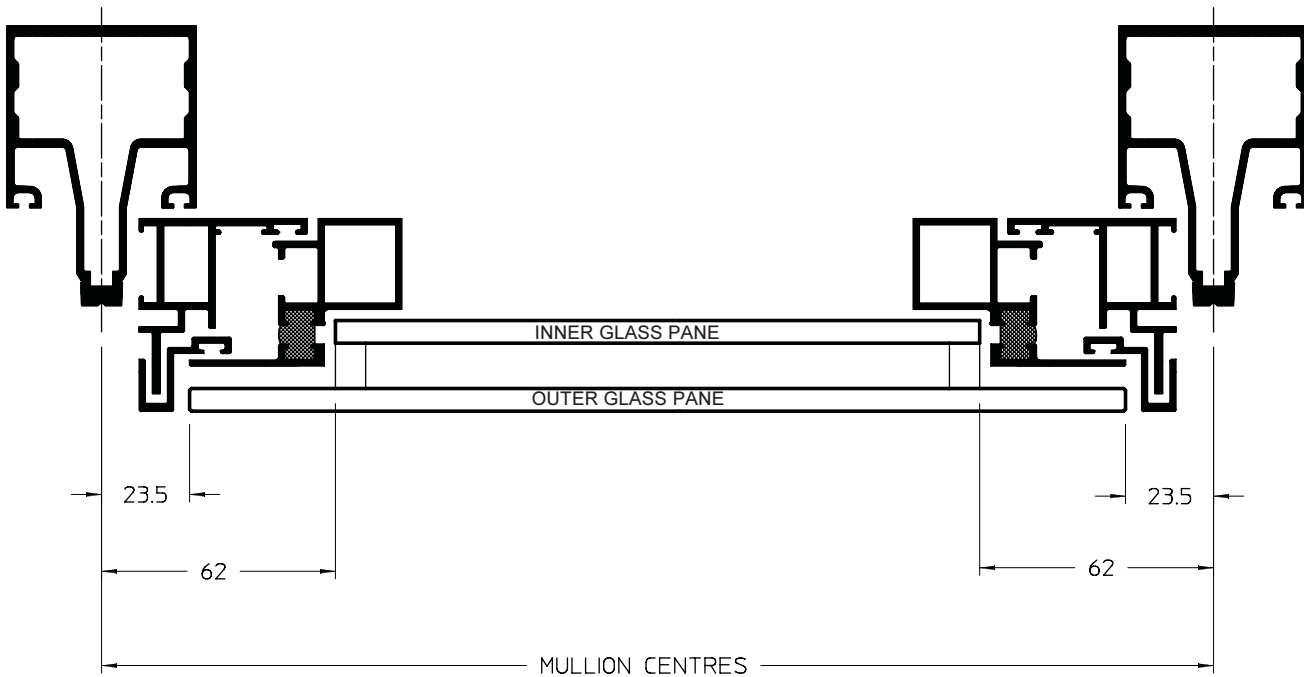


Cutting Calculations

Glass Sizes For Vent Frame



A-A & B-B



Cutting Calculations

Metal Sizes – Fixed Frame

SILICONE GLAZE OUTER FRAME 17650

Horizontal	Mullion Centre minus 20mm
Vertical	Rail Centre minus 20mm

SILICONE GLAZE DOOR LINER 17651

Horizontal	Mullion Centre minus 20mm
Vertical	Door leaf height plus 28mm

SILICONE GLAZE PERIMETER LINING 17652

Horizontal	Mullion Centre plus 78mm
Vertical	Full Height of Mullions plus 14mm

Glass Sizes – Fixed Frame

OUTER PANE

Horizontal	Mullion Centre minus 20mm
Vertical	Rail Centre minus 20mm

INNER PANE

Horizontal	Mullion Centre minus 50mm
Vertical	Rail Centre minus 50mm

NOTE: All other metal calculations are in the 313 Product Manual

Metal Sizes – Vent Frame

VENT OUTER FRAME 17653

Horizontal	Mullion Centre minus 20mm
Vertical	Rail Centre minus 20mm

SILICONE GLAZE VENT FRAME 17654

Horizontal	Mullion Centre minus 47mm
Vertical	Rail Centre minus 47mm

SILICONE GLAZE VENT FRAME ADAPTOR 17655

Horizontal	Mullion Centre minus 20mm
Vertical	Rail Centre minus 20mm

VENT FRAME FIXING CHANNEL 17656

Horizontal	Length of Espagnolette Bar
Vertical	Length of Friction Stay

Glass Sizes – Vent Frame

OUTER PANE

Horizontal	Mullion Centre minus 47mm
Vertical	Rail Centre minus 47mm

INNER PANE

Horizontal	Mullion Centre minus 124mm
Vertical	Rail Centre minus 124mm

NOTE: All other metal calculations are in the 313 Product Manual

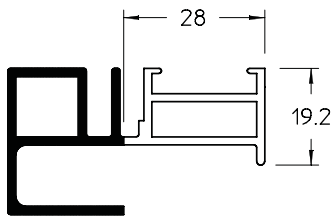
NOTE: When ordering the double glaze units, ensure that the spacer is either black or bronze dependant on glass colour to avoid unattractive sight lines.

Specification

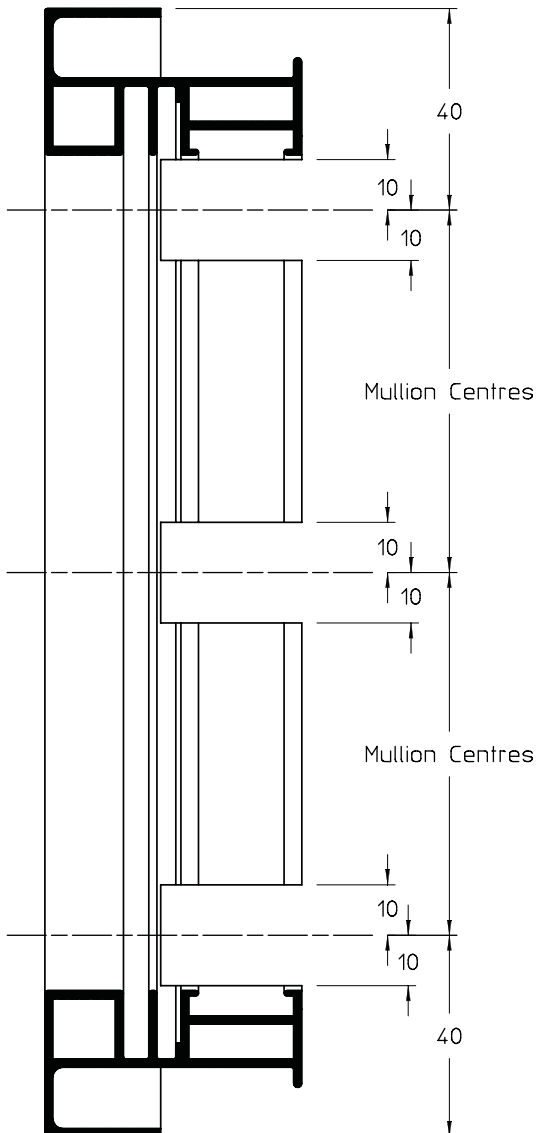
Perimeter Liner at Head & Cill

Profile 17652

This section runs continuous along the cill/head and is mitre cut at both ends. The preparation below is to allow the perimeter liner to fit around the mullions.



Mitre cut end

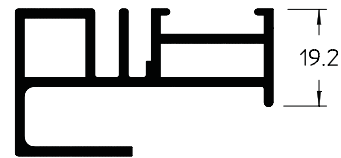


Perimeter Liner For Mullion Jambes

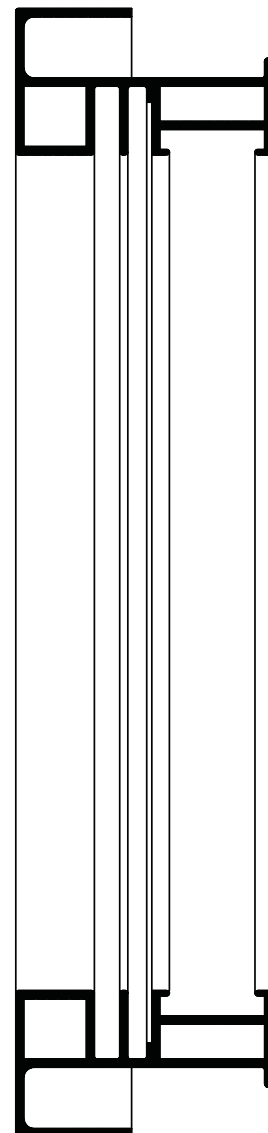
Profile 17652

This section runs continuous for the height of the mullions. The profile is mitre cut at both ends.

No preparation is required.



Mitre cut end



Cutting & Machining
Vent Frame – Handle Preparation

Profile 17654

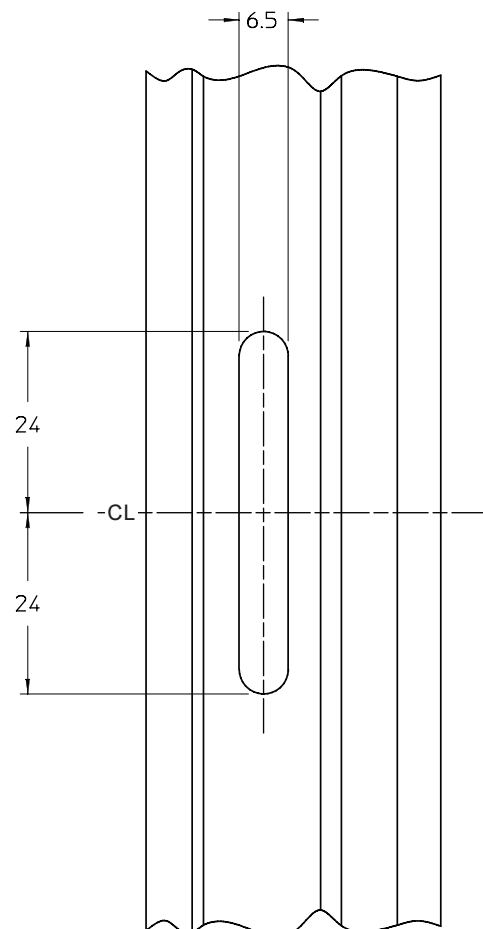
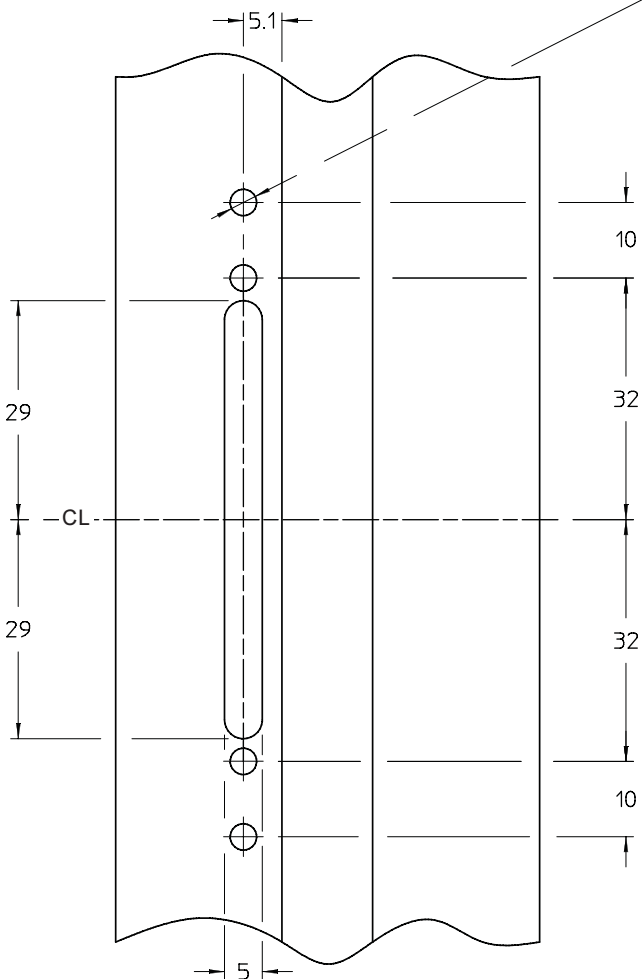
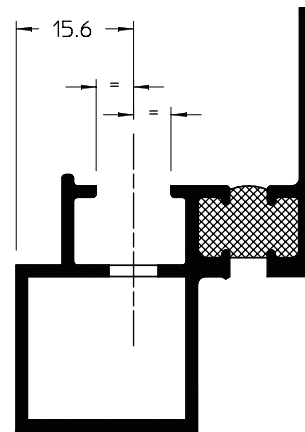
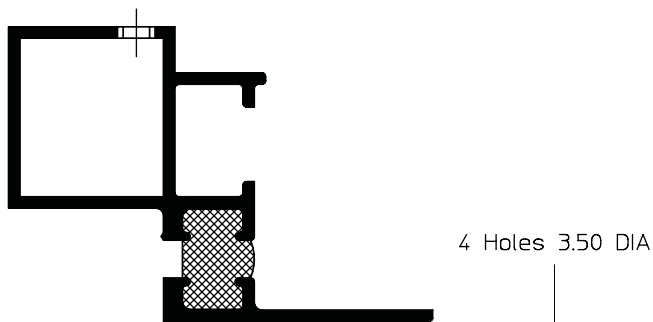
The preparation shown below must be carried out at the centre of the bottom opening light member.

User router plate 325/162 and drill jig 317/250

(RESET STYLUS BETWEEN PREPARATIONS)

Profile 17654

NOTE: When carrying out the preparation below the fixing channel 17656 must be inserted into the vent frame before routing takes place.



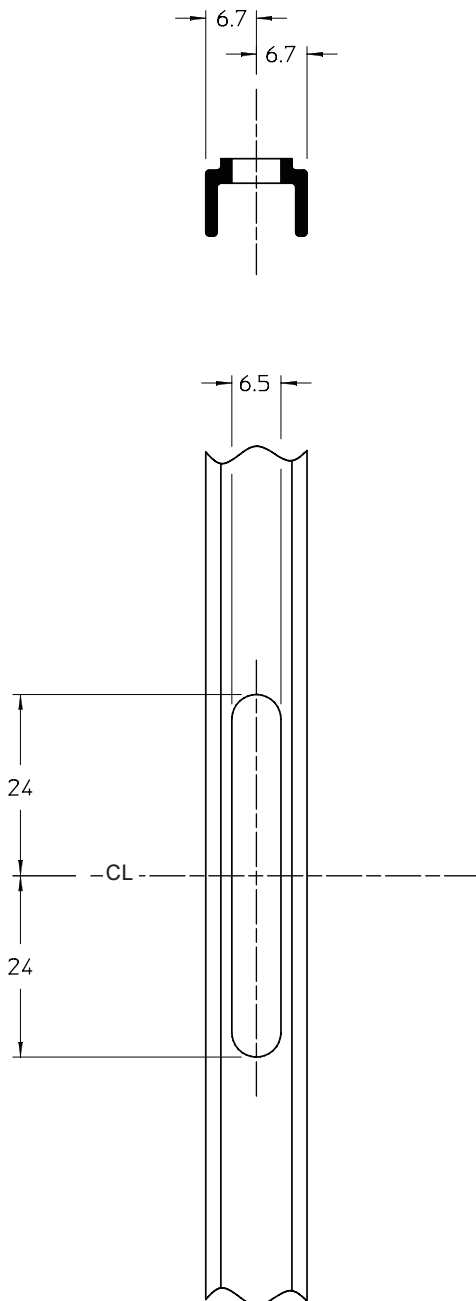
Cutting & Machining

Vent Frame – Handle Preparation

Profile 17656

This preparation must be carried out when the fixing channel has been inserted into the vent frame, so that all the preparations will line through.

User Router Plate 325/162



Cutting & Machining

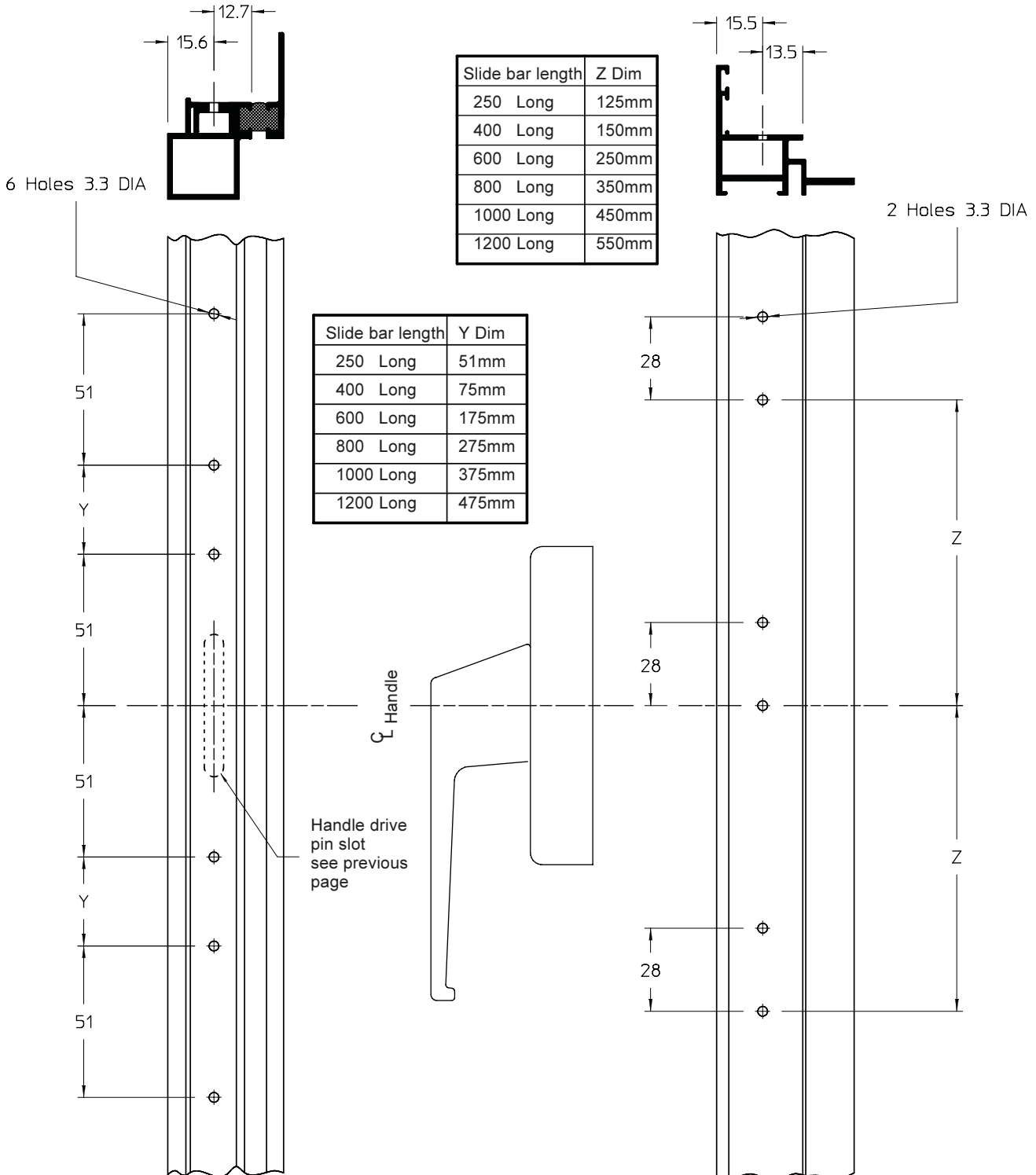
Preparation for espagnolette gear and keeps

Profile 17656

The preparation shown below is required on the centre line of the handle position. The fixing channel section 17656 must be slid into the frame before drilling.

Profile 17663

The preparation shown below is required in line with the centre line of the handle on the outer frame. (NOTE HANDLE DIRECTION).

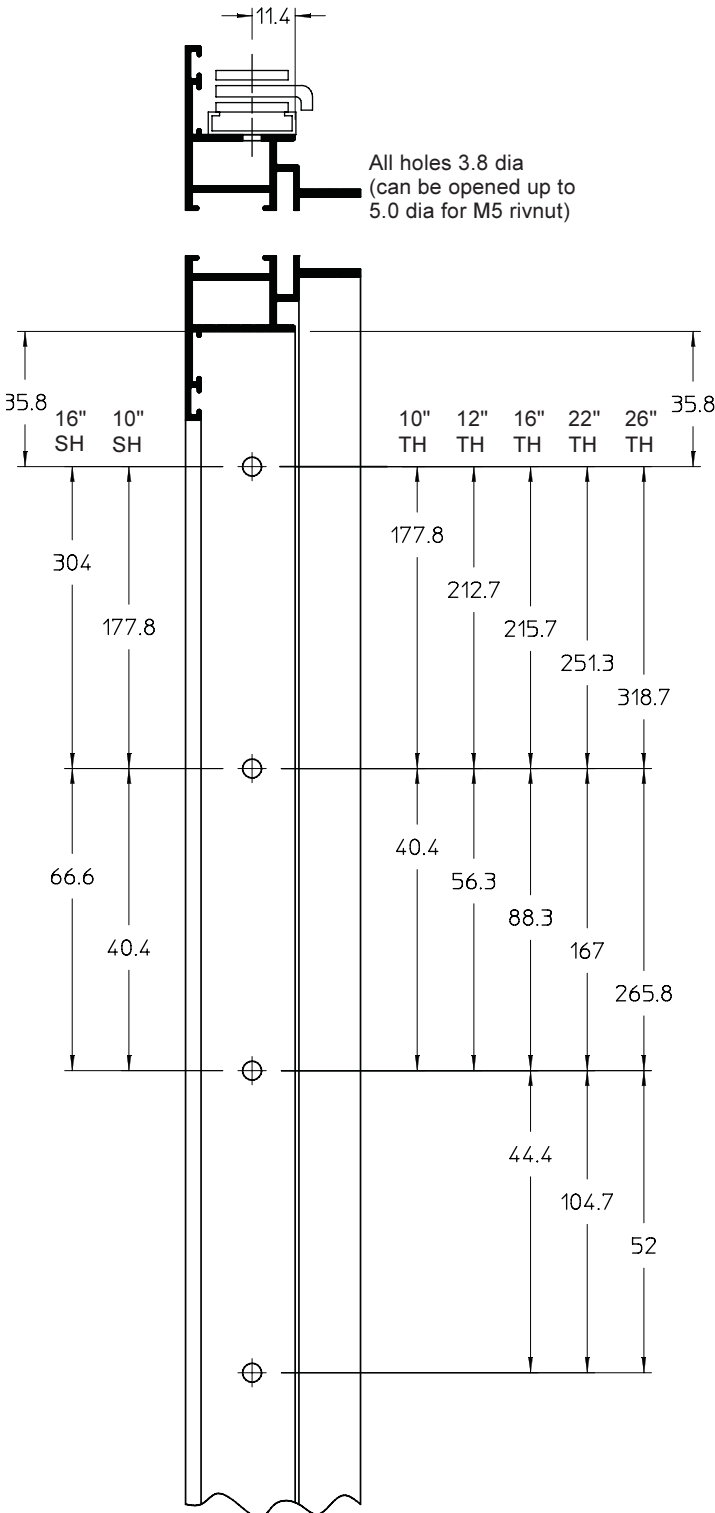


Cutting & Machining

Friction Stay (Sterling) Preparation

Profile 17653

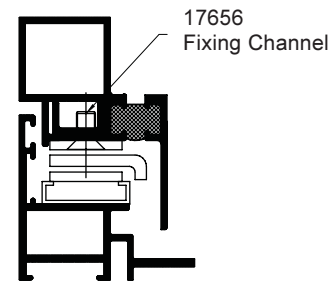
The jamb members of top hung units and head and cill members of side hung units must have friction stay preparation as shown below for each size of friction stay.



Friction Stay (Sterling) Preparation

Profile 17654

The stile members of top hung units and top and bottom rail members of side hung units require no machining as the stays are secured in to the section using a fixing channel.



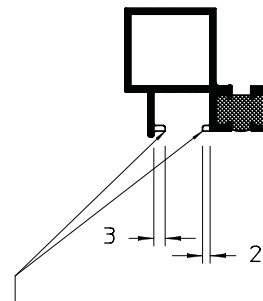
SEE ASSEMBLY PAGE 6-11

Friction Stay Fixing Channel

Profile 17654

The ends of vent frame members must be accurately mitre cut at 45° to the overall dimensions as detailed on page 4-5.

All ends of the opening members must then have the retaining flanges machined back slightly so that the friction stay fixing channel can be inserted after frame assembly.



Retaining flanges to be cut back at mitred end to allow fitting of fixing channel.

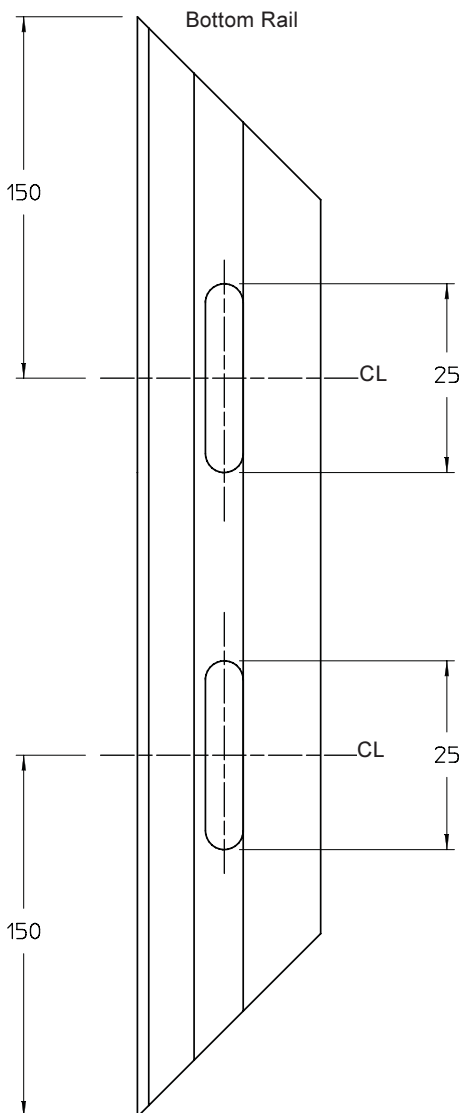
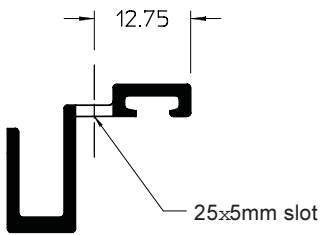
Cutting & Machining

Drainage Preparation

Profile 17655

The bottom member of each opening light must have drainage preparation at each end as detailed below. For vents over 1500m wide add another slot at the centre.

Use router plate 325/160



Assembly & Installation

Assembly of Perimeter Liner

The frames should be cut to the length as specified on the calculations page 4-5.

Coat the mitred ends of the frame with Tremco small joint sealant, or equivalent, and insert corner cleats 313/92 into the ends of the outer frame horizontal (or vertical) members.

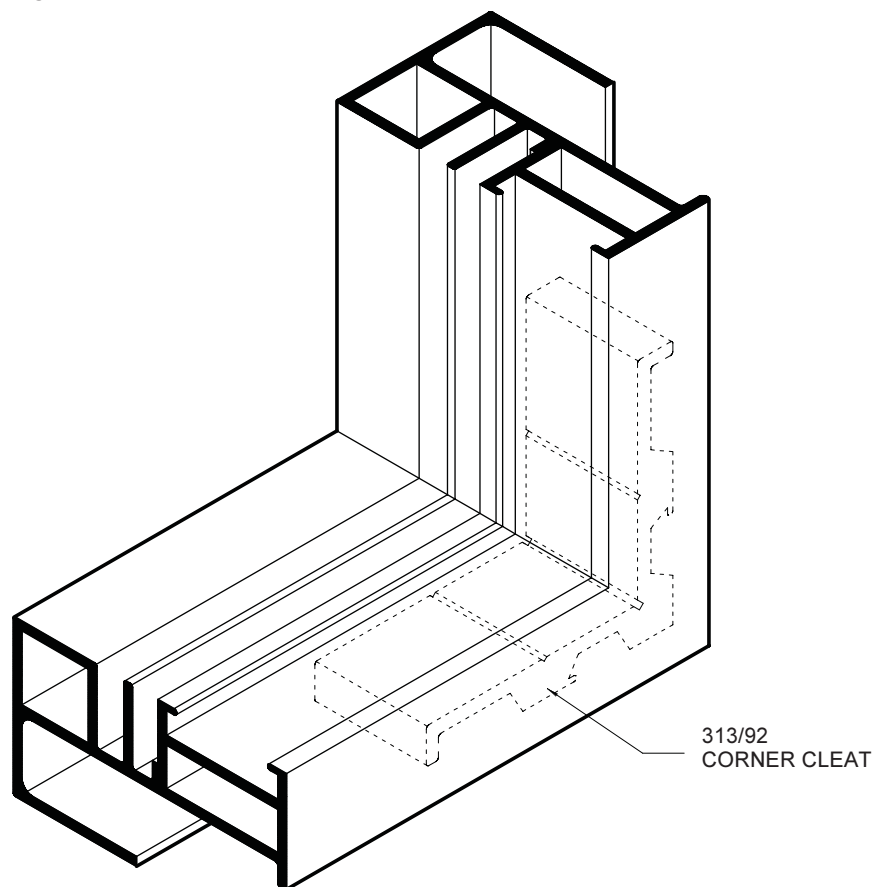
NOTE: A two part adhesive must additionally be used to bond the corners to increase the strength of the corner joints. This adhesive is applied to the corner cleats and/or profiles prior to jointing.

Suggested Adhesives: Araldite 2004 (Hand mix)
3M EPX DP190 (Applicator mix)

Assemble the frames ensuring that the corner cleats are correctly located.

Ensure that all joints are fully closed and effectively filled with sealant, then clean off any excess sealant on the outer surfaces only.

NOTE: THIS PROFILE IS NOT CRIMPED



Assembly & Installation

Assembly of Door Liner

The frames should be cut to the length as specified on the calculations page 4-5.

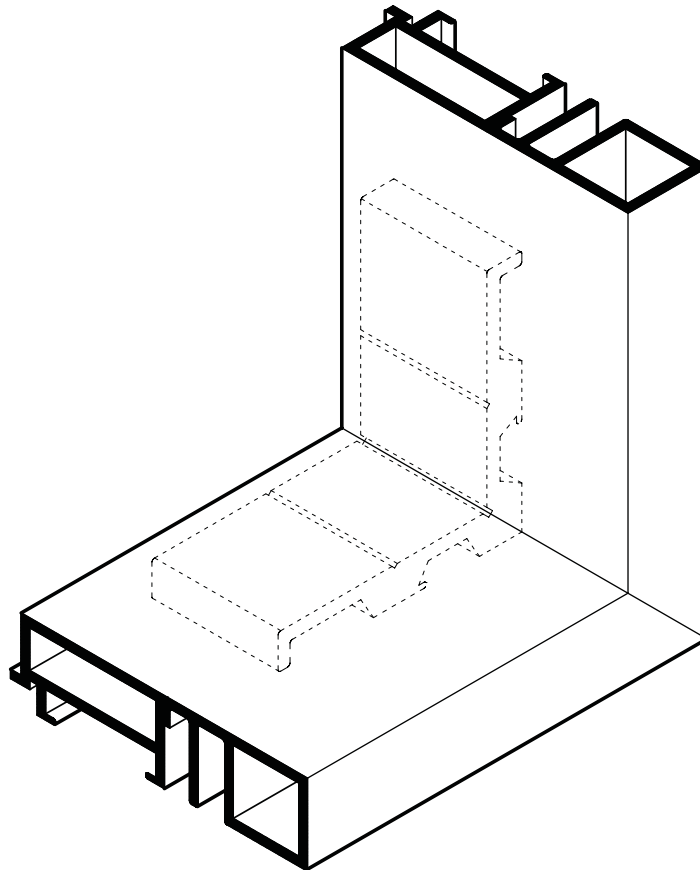
Coat the mitred ends of the frame with Tremco small joint sealant, or equivalent, and insert corner cleats 313/94 into the ends of the outer frame horizontal (or vertical) members.

NOTE: A two part adhesive must additionally be used to bond the corners to increase the strength of the corner joints. This adhesive is applied to the corner cleats and/or profiles prior to jointing.

Suggested Adhesives: Araldite 2004 (Hand mix)
3M EPX DP190 (Applicator mix)

Assemble the frames ensuring that the corner cleats are correctly located.

After ensuring that all joints are fully closed and effectively filled with sealant, crimp the frame into the corner cleat recesses using the crimper conversion kit 325/170, and clean off any excess sealant on the outside surfaces only.



Specification

Assembly of Silicone Glaze Frames

The frames must be constructed under factory conditions so that the silicone, when applied to the frames is allowed to set properly to give a strong bond between the frame and the glass.

The frames should be cut to the length as specified on the calculations page 4-5.

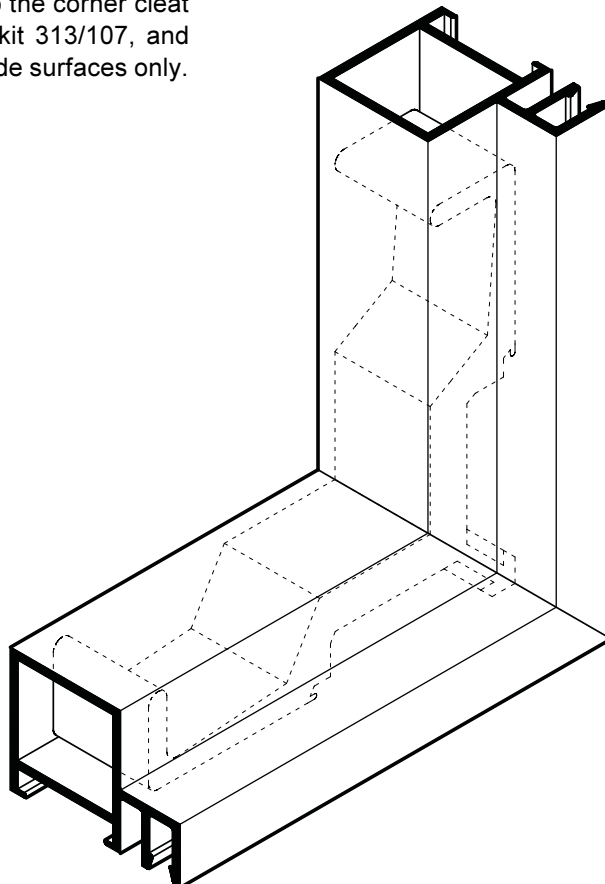
Coat the mitred ends of the frame with Tremco small joint sealant, or equivalent, and insert corner cleats 313/90 into the ends of the outer frame horizontal (or vertical) members.

NOTE: A two part adhesive must additionally be used to bond the corners to increase the strength of the corner joints. This adhesive is applied to the corner cleats and/or profiles prior to jointing.

Suggested Adhesives: Araldite 2004 (Hand mix)
3M EPX DP190 (Applicator mix)

Assemble the frames ensuring that the corner cleats are correctly located.

After ensuring that all joints are fully closed and effectively filled with sealant, crimp the frame into the corner cleat recesses using the crimper conversion kit 313/107, and clean off any excess sealant on the outside surfaces only.



Assembly and Installation

Glazing of Frames

When producing silicone glazing the actual glazing of the frames has to be carried out under factory conditions so that the sealants are given time to cure to produce a strong bond.

Once the frame is constructed the double glaze panel can be installed.

Apply the high bond glazing tape to the four sides of the frame as shown cutting the joints at 45° so that they match the mitred corners of the frame.

Fit the double glaze unit into the frame with the larger pane to the outside ensuring that the frame is square and equally spaced around all four sides.

Apply the black silicone sealant into the recess as shown below ensuring the sealant goes into the corners and completely fills the recess. This must be carried out around all four sides of each individual frame.

Clean off any excess sealant from the frame and glass.

Leave the frames to cure in accordance with the sealant manufacturers instructions before transporting to site.

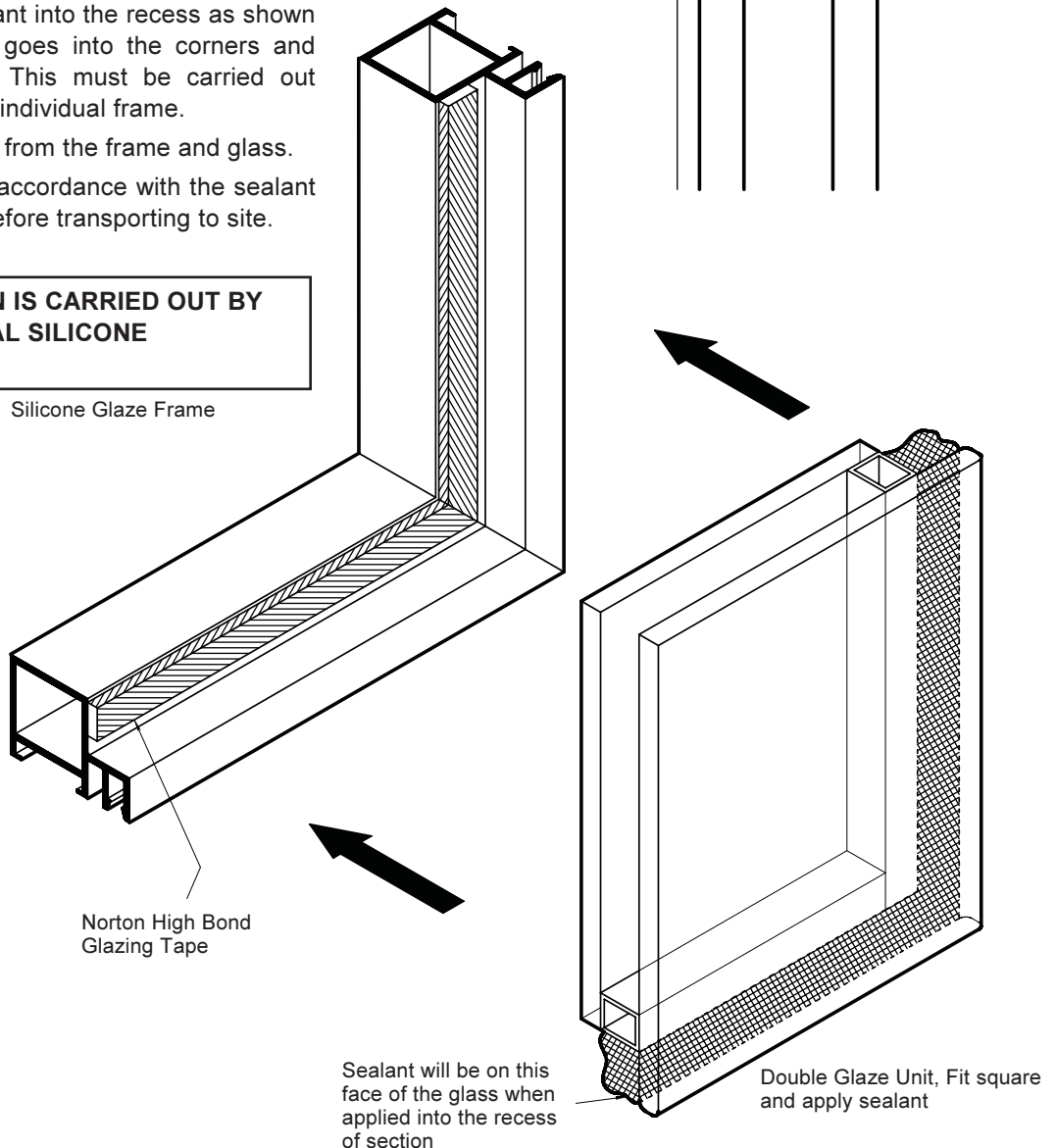
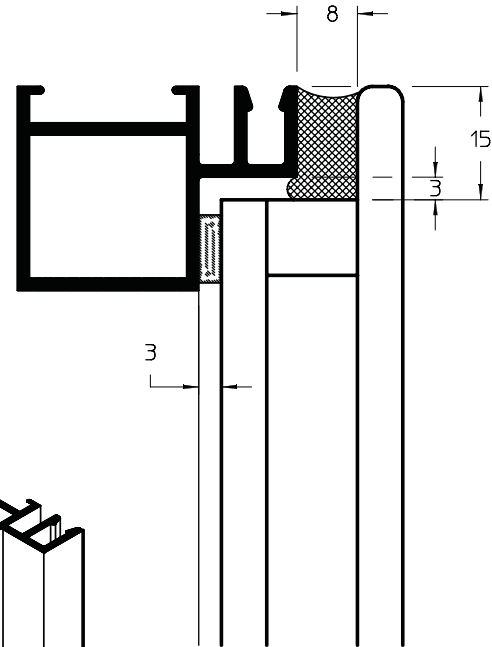
NOTE: THIS OPERATION IS CARRIED OUT BY QUALIFIED STRUCTURAL SILICONE APPLICATORS ONLY.

Silicone Glaze Frame

Norton High Bond Glazing Tape

Sealant will be on this face of the glass when applied into the recess of section

Double Glaze Unit, Fit square and apply sealant



Assembly and Installation

Fitting of Silicone Glaze Frames

To fix the silicone frames to the curtain wall a small fixing toggle 313/91 has to be fixed to the curtain wall mullions and rails as shown below at 200mm centres.

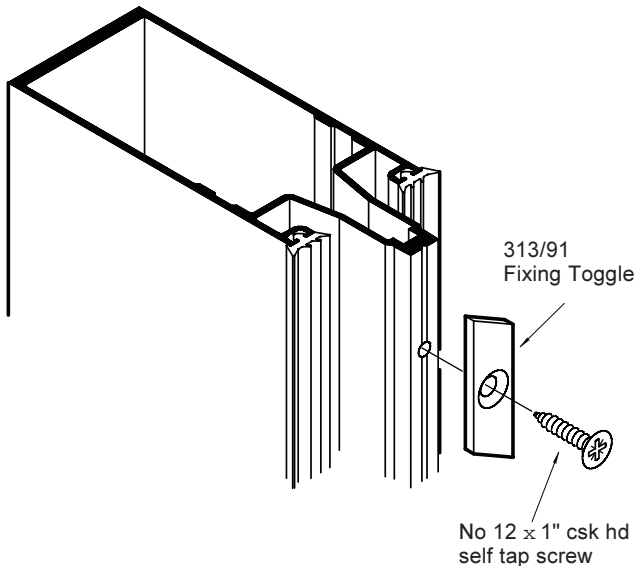
313/91 is used so that the frames are located correctly and that a consistent gap is created.

Drill a 4.8mm dia hole through the mullion as shown below and fix the 313/91 in a vertical position using a No12 x 1" csk self tapping screw. Do not tighten the screw fully at this stage as the toggle needs to be rotated 90°.

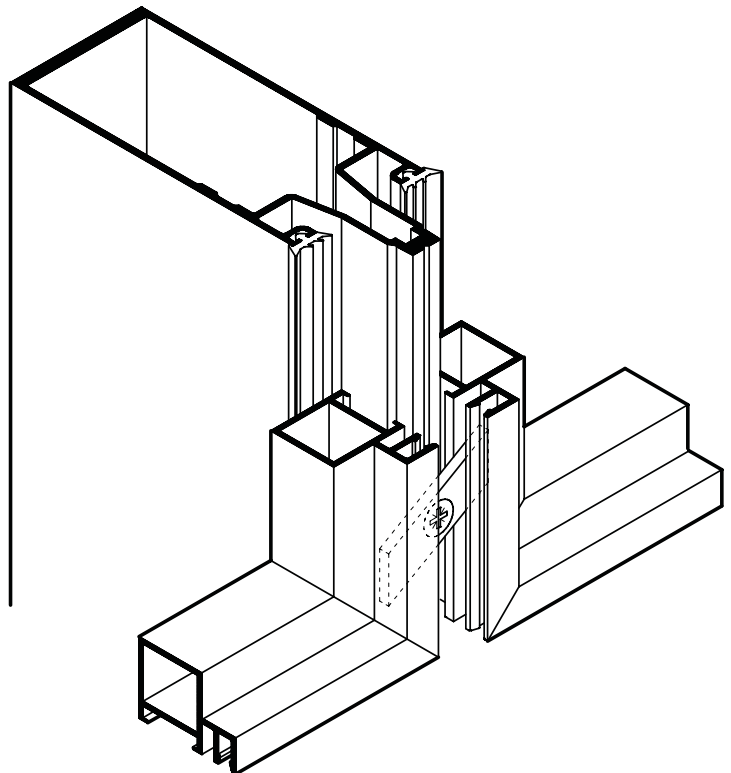
Fit 313/97 Packers 100mm in from each end of every rail. The silicone glazed frames will then sit on the packers.

Once the toggles are in place the silicone glaze frames can be fitted. Position the frames so that they butt up against the 105/200 gasket and then the toggles can be rotated 90°. The toggle will locate into a channel in the aluminium section.

Now tighten the No12 x 1" csk screw so that the frame is held in position and the 105/200 gasket is in compression to form a good seal, this should be done carefully to avoid damage to the unit.



Fix 313/91 toggle to the mullion with a No12 x 1" csk screw



Align fixed frames onto toggle, rotate toggle and tighten screw

Assembly and Installation

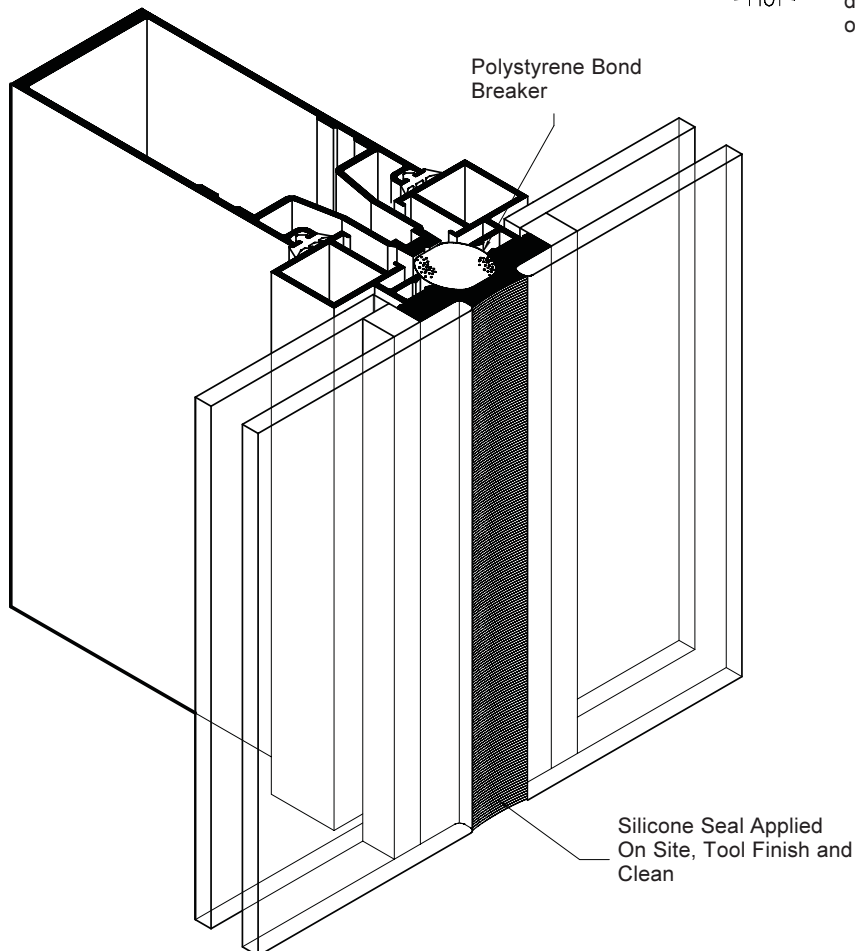
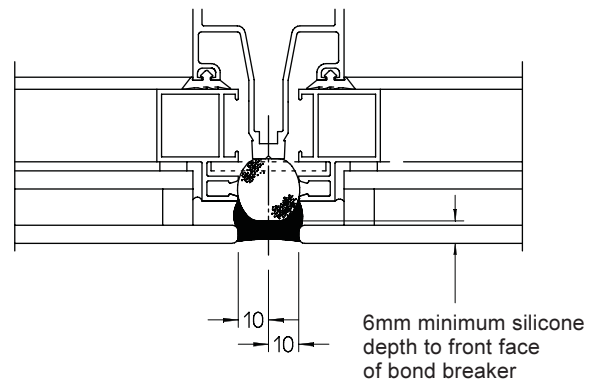
Sealing of Silicone Frames

Once the frames are in position the final silicone seal can be applied.

Cut the polystyrene bond breaker the full length of the mullions and rails. Press the polystyrene bond breaker into the gap between the mullion and the silicone glaze frame so that it butts up against the nose of the mullion/rail. The bond breaker will hold itself in position so no glue or fixing is required. The front face of the bond breaker must be compressed enough so that a silicone seal of 6mm depth can be achieved (or in accordance with sealant manufacturers instructions).

Apply the silicone sealant (black) to the structure by pumping the silicone into the recess making sure that the sealant goes into all corners and that no air pockets are left.

Tool finish the silicone joint leaving sight lines neat and clean.



Assembly and Installation

Assembly of Vent Frames

The frames must be constructed under factory conditions so that the silicone, when applied to the frames is allowed to set properly to give a strong bond between the frame and the glass.

The frames should be cut to the length as specified on the calculations page 4-5.

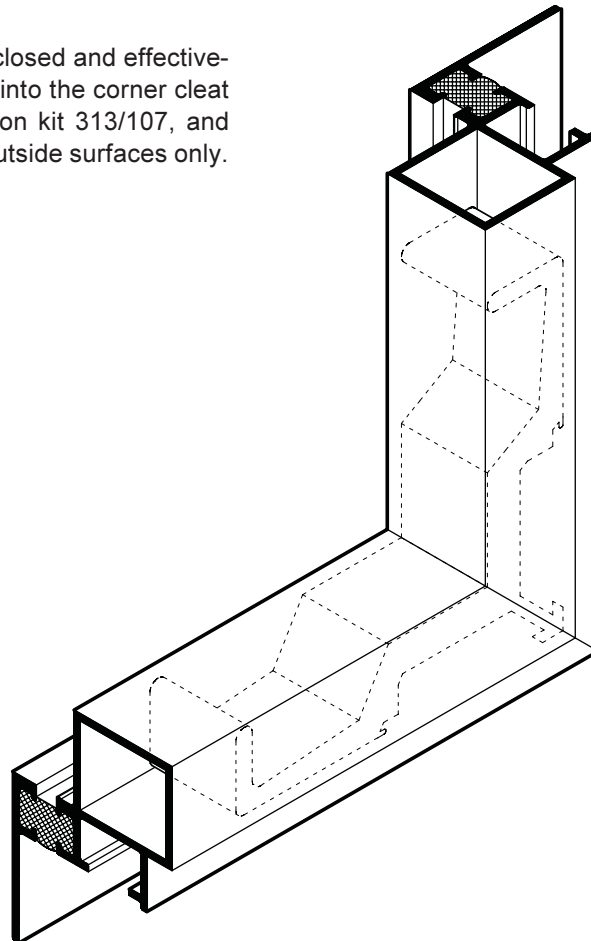
Coat the mitred ends of the frame with Tremco small joint sealant, or equivalent, and insert corner cleats 313/90 into the ends of the outer frame horizontal (or vertical) members.

NOTE: A two part adhesive must additionally be used to bond the corners to increase the strength of the corner joints. This adhesive is applied to the corner cleats and/or profiles prior to jointing.

Suggested Adhesives: Araldite 2004 (Hand mix)
3M EPX DP190 (Applicator mix)

Assemble the frames ensuring that the corner cleats are correctly located.

After ensuring that all joints are fully closed and effectively filled with sealant, crimp the frame into the corner cleat recesses using the crimper conversion kit 313/107, and clean off any excess sealant on the outside surfaces only.



Assembly and Installation

Assembly of Opening Light Outer Frame

The frames must be constructed under factory conditions so that the silicone, when applied to the frames is allowed to set properly to give a strong bond between the frame and the glass.

The frames should be cut to the length as specified on the calculations page 4-5.

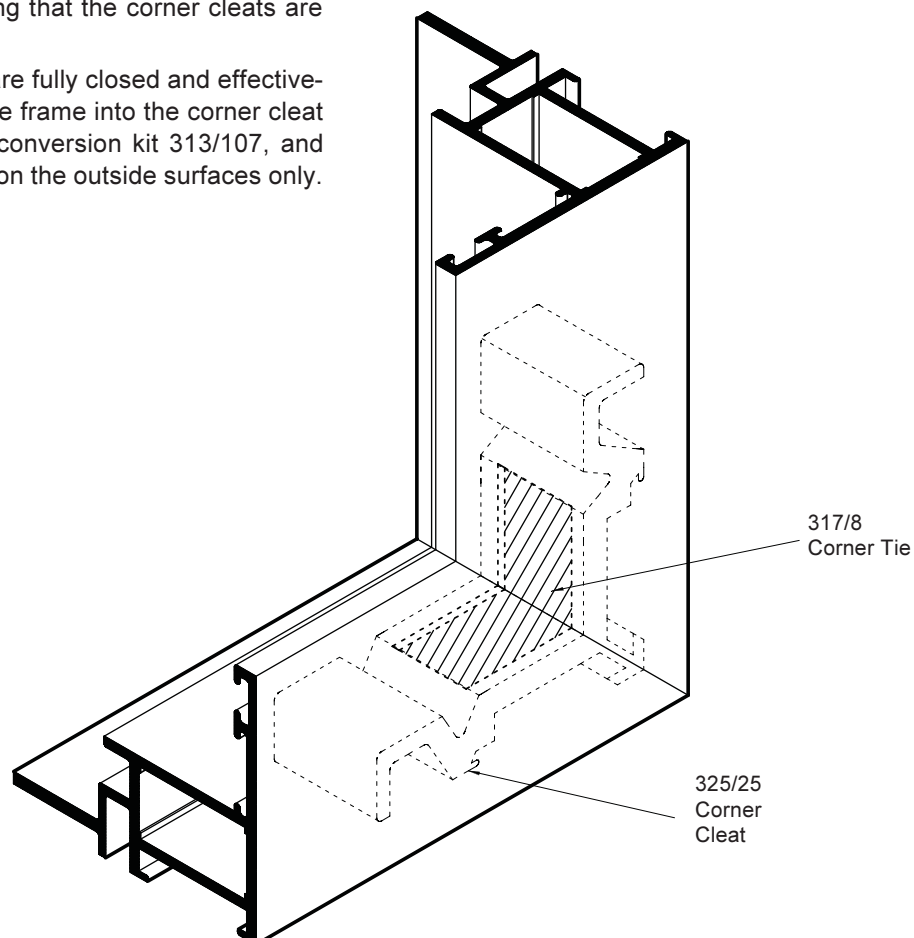
Coat the mitred ends of the frame with Tremco small joint sealant, or equivalent, and insert corner cleats 325/25 and corner tie 317/8 into the ends of the outer frame horizontal (or vertical) members.

NOTE: A two part adhesive must additionally be used to bond the corners to increase the strength of the corner joints. This adhesive is applied to the corner cleats and/or profiles prior to jointing.

Suggested Adhesives: Araldite 2004 (Hand mix)
3M EPX DP190 (Applicator mix)

Assemble the frames ensuring that the corner cleats are correctly located.

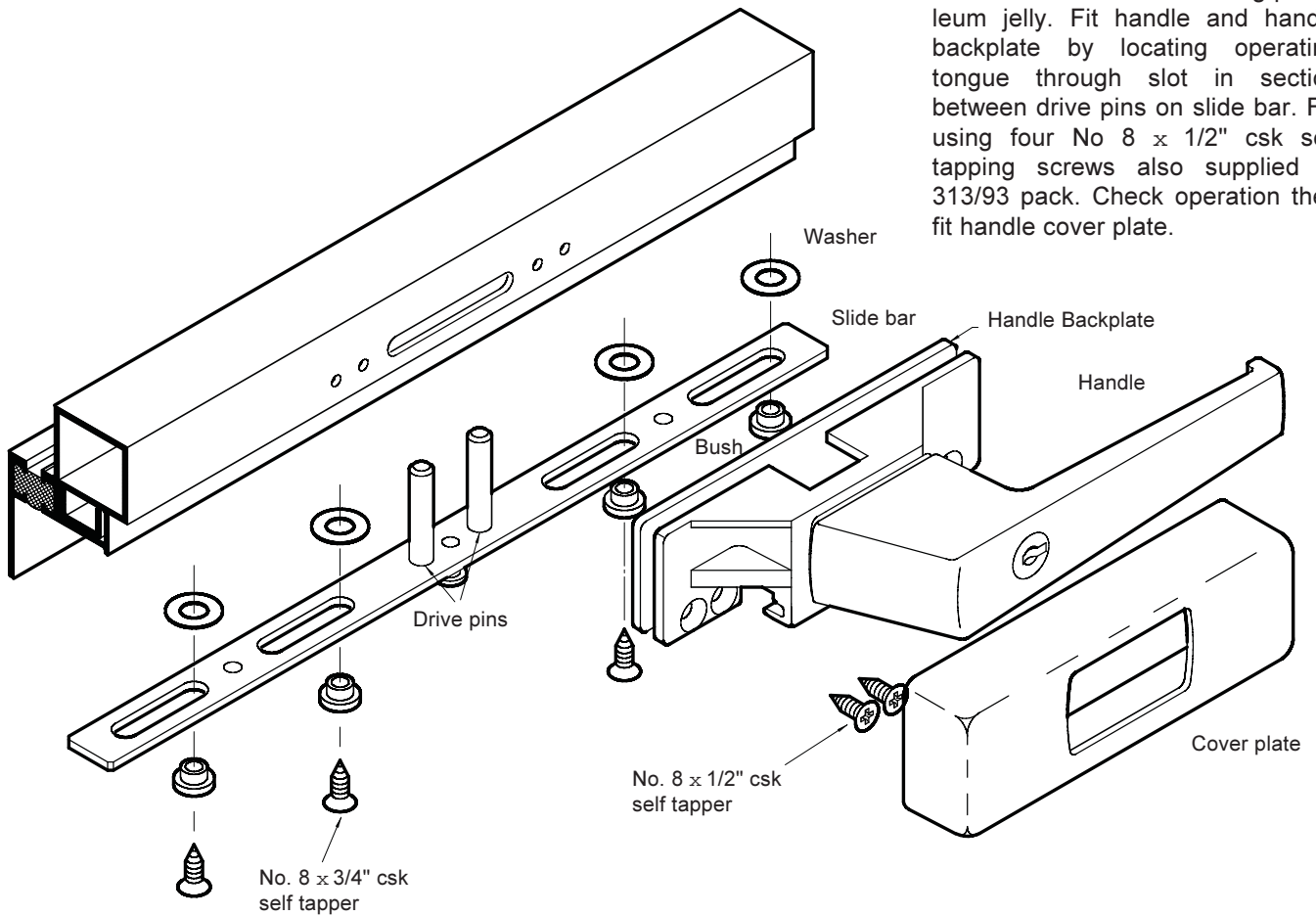
After ensuring that all joints are fully closed and effectively filled with sealant, crimp the frame into the corner cleat recesses using the crimper conversion kit 313/107, and clean off any excess sealant on the outside surfaces only.



Assembly and Installation

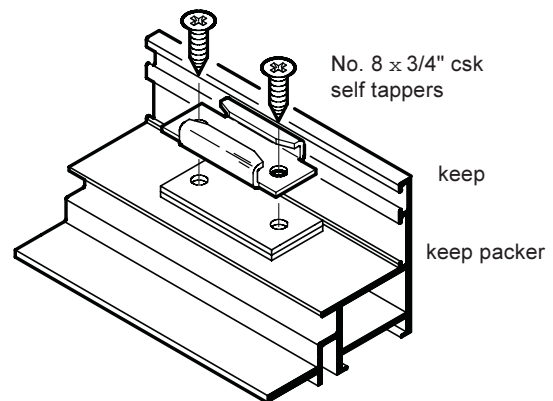
Espagnolette gear

Assemble slide bar onto profile as shown below using washers, bushes and No 8 x 3/4" csk self tap screws supplied in 313/93 pack. Lubricate underside of each bush using petroleum jelly. Fit handle and handle backplate by locating operating tongue through slot in section between drive pins on slide bar. Fix using four No 8 x 1/2" csk self tapping screws also supplied in 313/93 pack. Check operation then fit handle cover plate.



Espagnolette keeps

Fit keeps to outer frame as shown alongside using keep packer and two No 8 x 3/4" csk self tapping screws supplied in 313/93 pack. Lubricate locking pins and keeps with petroleum jelly then close window and check operation of espagnolette.



Assembly

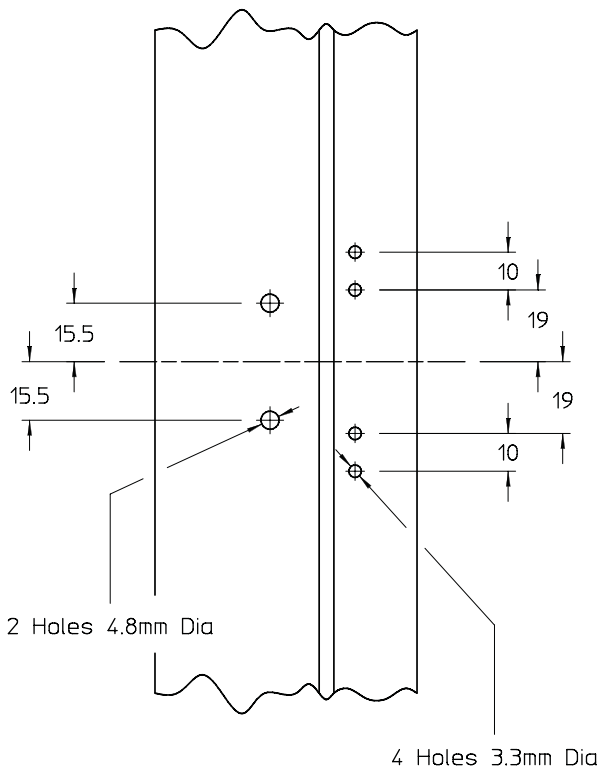
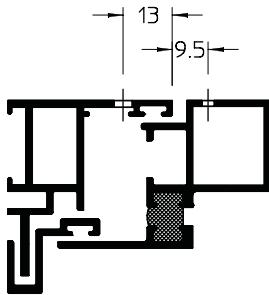
Fitting of cockspur handles

This preparation must be carried out on assembled frames after adjustment of the stays to ensure that the relationship between the handle and wedge or keep is correct. Preparation is as detailed below for a typical assembly.

Non Locking Handles 211/50 and 211/51

Locking Handles 325/90 and 325/91

Use drill jig 325/154

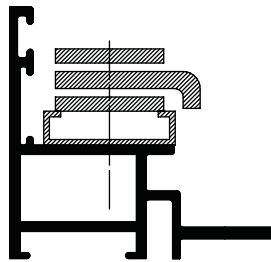


Assembly and Installation

Fitting of Friction Stays

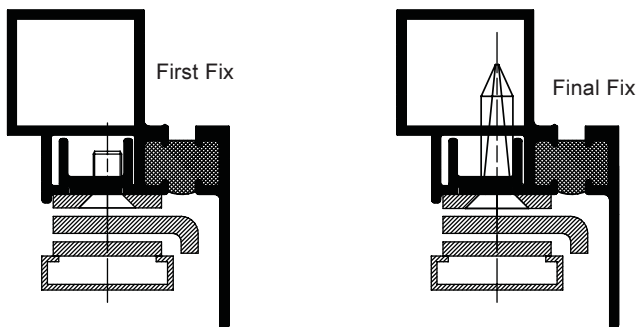
Position the appropriate stay as shown below onto the outer frame so that the fixing holes in the stay line through with the pre-drilled holes in the outer frame.

Fix the stay to the outer frame using No 10 x 1/2" pan head screws through the end holes only.



Insert the stay fixing channel 17656 into the vent frame channel.

Position the stay onto the vent frame roughly in the position it is required and attach to the fixing channel using M5 x 10mm csk machine screws through the slotted holes only.



At this stage check that the action of the friction stay and the overlap of the opening light to the outer frame. Adjust if necessary by slackening the friction stay fixing screws and sliding the stay to give the correct overlap and gaps.

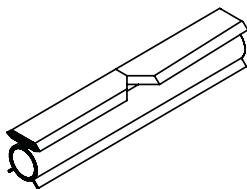
Re-tighten the screws then lock into position by drilling and fixing as above through the remaining fixing holes on the opening light and outer frame. It is important that these final fixings are carried out as they prevent the vent from slipping when operated.

NOTE: Final fixing of the opening light is achieved by drilling through the web in the vent frame. Fix with No12 x 1" csk head screws.

Assembly and Installation

Outer frame

The bulb weatherseal 105/148 is fitted into the groove on the vent outer frame (17653) in one continuous piece around all four sides of the frame with one joint at the head only. Care must be taken to cut the weatherseal approximately 1% oversize to prevent shrinking back. Notch back the weatherseal at the corners to reduce distortion as shown below.



Outer Frame Adaptor

Fit 105/67 weather seal into the groove around all four sides of the outer frame adaptor. It must be mitre cut at the corners. When fitting the weather seal care must be taken not to stretch the gasket.

Finishing Off

Sealing

For perimeter sealing of aluminium to masonry, use the same silicone sealant which was used to seal off the structural glazing.

Fit backing strip where necessary and apply sealant (by extruding or tooling), in a minimum 6 x 6 cross section, or in accordance with sealant manufacturers instructions.

Cleaning after Installation

If excess sealant is to be cleaned off using solvent, ensure that the solvent will not damage any of the metal finishes, synthetic rubbers or plastics which may be present.

Warning

Take particular care if there is any cement or plaster on the aluminium. It is harmful to the metal finish and ideally should be washed off while still wet. DO NOT RUB or particles of grit will permanently damage the metal or paint finish.

Routine Cleaning

This is only necessary from the point of view of appearance. Use non alkaline detergent and warm water applied with a soft cloth or sponge. A bristle brush or nylon pad should only be used with care where necessary.