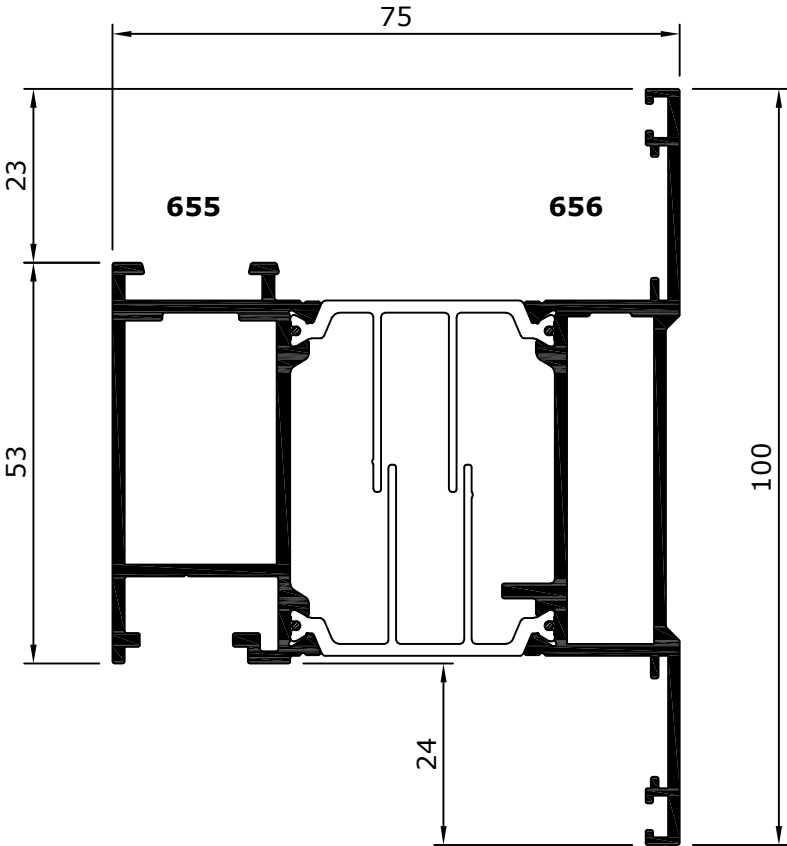
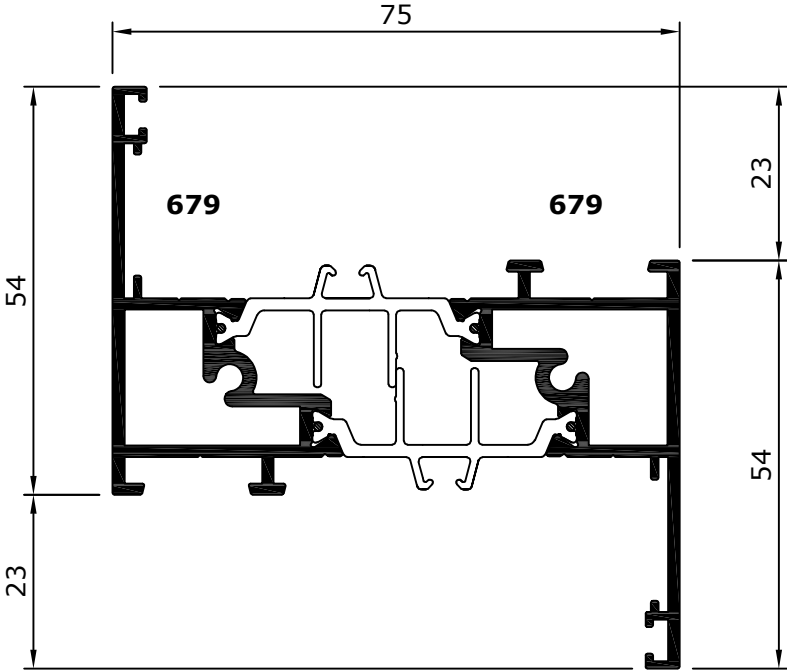


# Section Drawings



**655-656**  
RECESSED HEAVY DUTY  
EURO GROOVE SASH

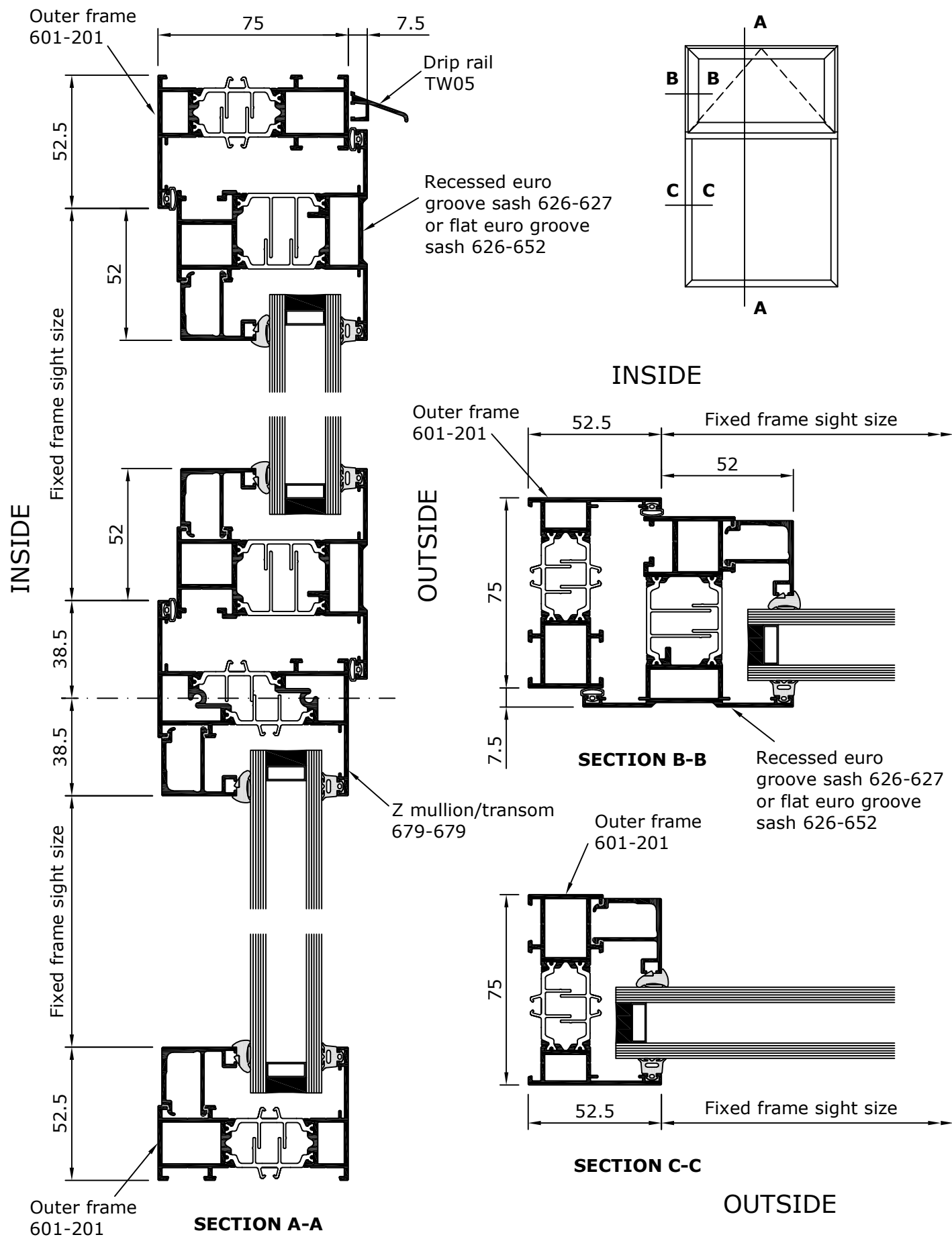


**679-679**  
Z MULLION/TRANSOM  
(Suitable for use with outer  
frames 600-200, 601-201,  
602-202, 602-212, 604-213)

Scale 1:1

# Euro Groove Glaze In Casement

## Z Mullion/Transom Applications



Scale 1:2

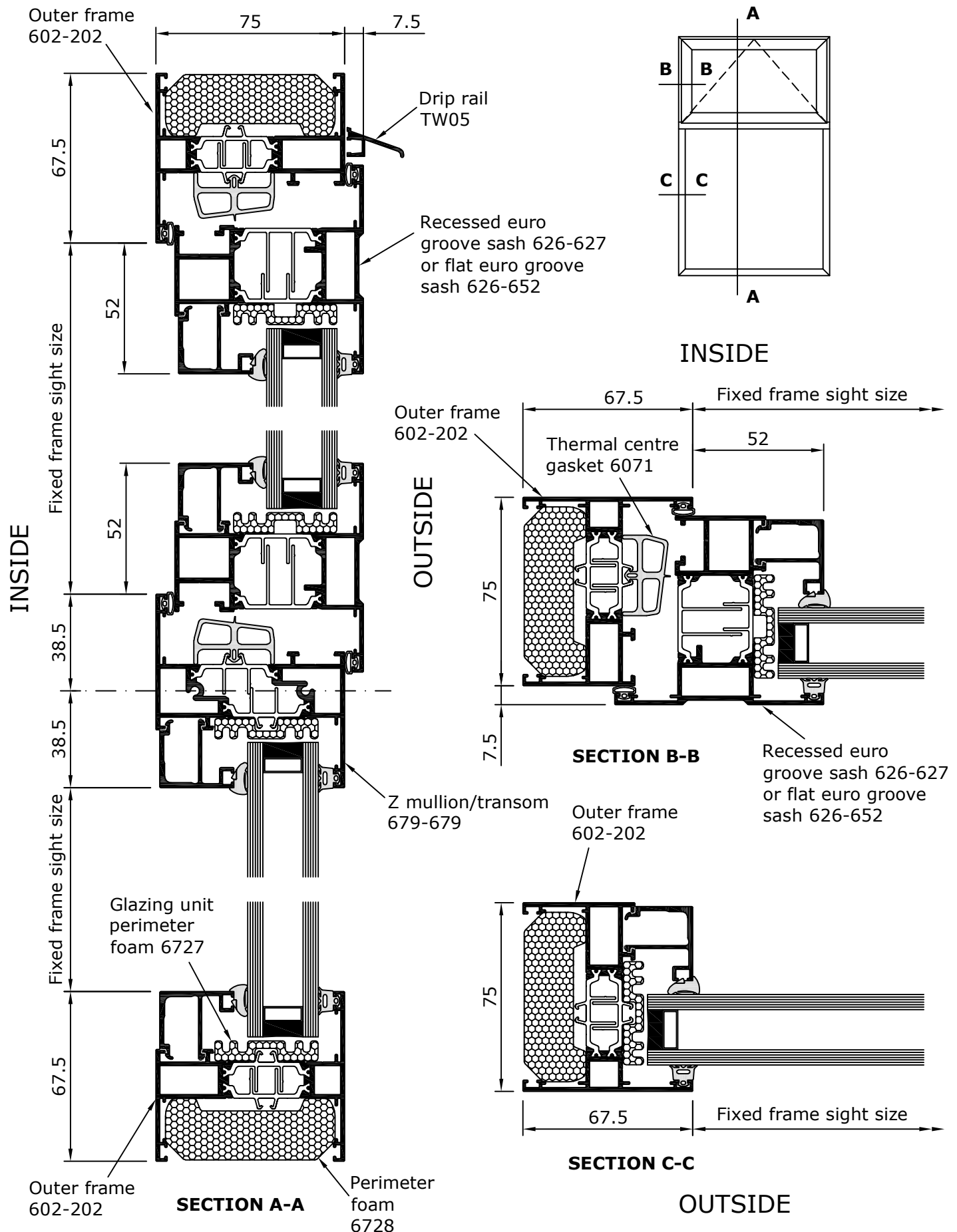
# Euro Groove Glaze In Casement

## Z Mullion/Transom Applications



**System 4-35 Hi+**

CASEMENT WINDOW



Scale 1:2

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SHEET 435Hi / 2 / 152

rev 0

27/06/20

# FFSS Ready Reckoner

## (To Calculate Fixed Frame Sight Sizes)



**System 4-35 Hi/Hi+**

CASEMENT WINDOW

The following grid can be used to calculate the fixed frame sight sizes (FFSS) directly from your fabrication sizes. Select the appropriate sections from the horizontal and vertical axes and read across to their point of intersection on the grid. Subtract the resultant figure from your fabrication size to obtain the appropriate fixed frame sight size (FFSS). All mullion/transom dimensions are calculated from the section centre line. When incorporating liner bar 685-686 add 60mm to the dimension stated in the grid and subtract the total from your fabrication size to determine your liner bar sight size (LBSS).

613-213 613-221 	87.75	92.75	97.75	-	107.75	78.75	102.75	75.5	78	89.25	80.5
606-206 606-207 607-206 607-207 	96.5	101.5	106.5	-	116.5	87.5	111.5	84.25	86.75	98	89.25
603-201 603-218 619-211 642-201 642-218 643-201 643-218 	85.25	90.25	95.25	-	105.25	76.25	100.25	73	75.5	86.75	78
609-200 640-200 641-200 	82.75	87.75	92.75	-	102.75	73.75	97.75	70.5	73	84.25	75.5
620-204 620-215 620-216 	-	-	-	-	-	-	125	97.75	100.25	111.5	102.75
679-679 	86	91	96	-	106	77	-	73.75	76.25	87.5	78.75
600-212 602-202 602-212 	115	-	-	-	135	106	-	102.75	105.25	116.5	107.75
647-649 	-	-	-	181	-	-	-	125.75	128.25	139.5	130.75
604-213 	-	-	115	-	-	96	-	92.75	95.25	106.5	97.75
601-201 	-	105	-	-	-	91	-	87.75	90.25	101.5	92.75
600-200 600-605 	95	-	-	-	115	86	-	82.75	85.25	96.5	87.75
	600-200 600-605 	601-201 	604-213 	647-649 	600-212 602-202 602-212 	679-679 	620-204 620-215 620-216 	609-200 640-200 641-200 	603-201 603-218 619-211 642-201 642-218 643-201 643-218 	606-206 606-207 607-206 607-207 	613-213 613-221 

Not to Scale

**System 4-35 Hi/Hi+**  
.....  
CASEMENT WINDOW  
.....

..... CASEMENT WINDOW .....



DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
OUTER FRAME 1 * (HEAD)	ONE	FFSS1 plus DIM A plus 27.5mm	VARIOUS	45° MITRE / SQUARE
OUTER FRAME 1 * (CILL)	ONE	FFSS1 plus DIM A plus 27.5mm	VARIOUS	SQUARE / 45° MITRE
OUTER FRAME 2 * (HEAD)	ONE	FFSS2 plus DIM A plus 27.5mm	VARIOUS	SQUARE / 45° MITRE
OUTER FRAME 2 * (CILL)	ONE	FFSS2 plus DIM A plus 27.5mm	VARIOUS	45° MITRE / SQUARE
OUTER FRAME (JAMB)	TWO	OVERALL FRAME HEIGHT	VARIOUS	45° MITRE BOTH ENDS
MULLION / TRANSOM	ONE	OVERALL FRAME HEIGHT / WIDTH	679-679	ENDS CUT SQUARE
CORNER CLEAT	SEE TABLE			
OUTER FRAME CLEAT	SEE TABLE			
BRACES	SEE TABLE			

**679-679**

Brace  
(see table)

SHEET 435Hi / 4 / 135  
.....  
rev 0 24/05/23

# Z Mullion Stiffener Prep



**System 4-35 Hi/Hi+**

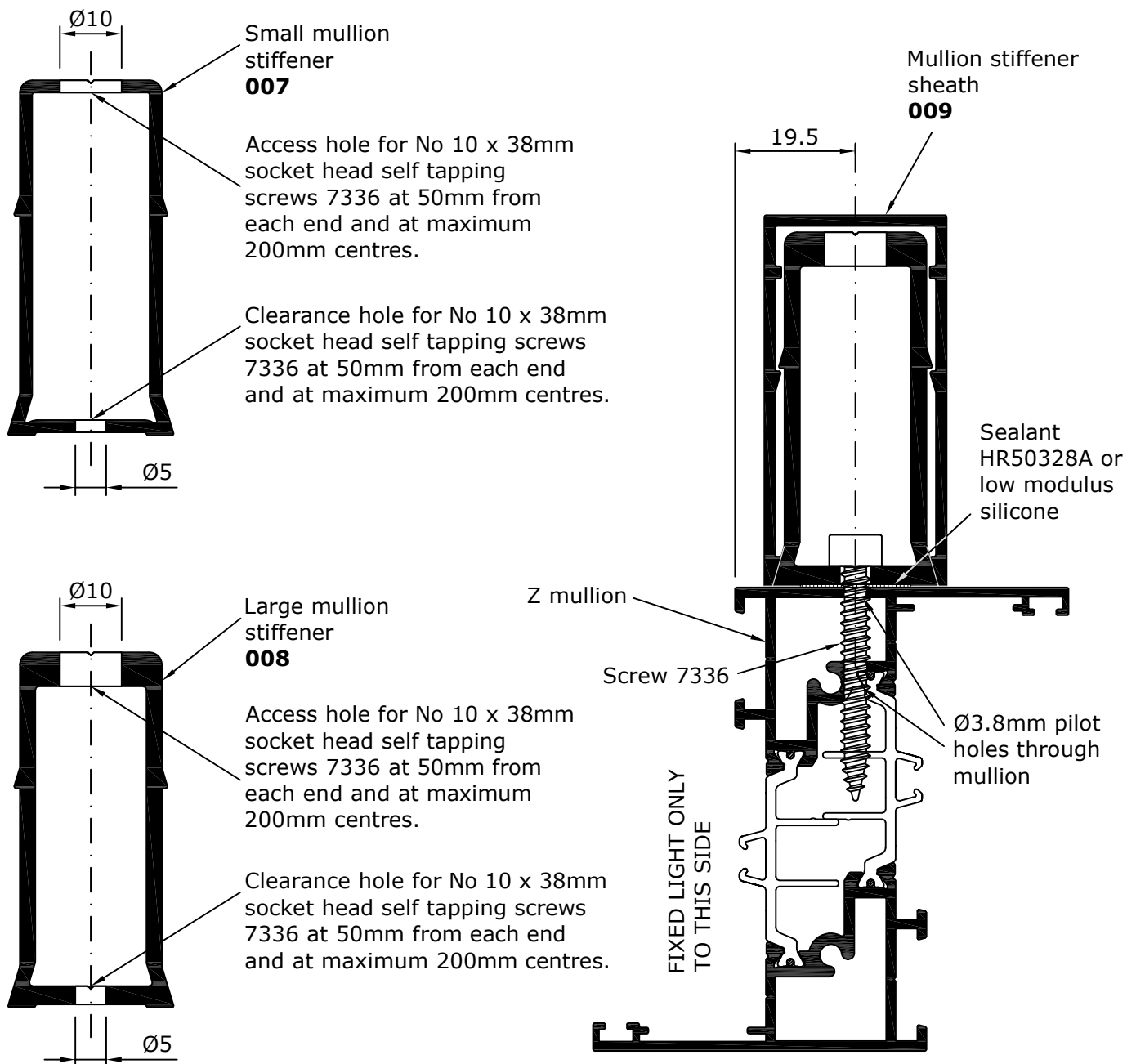
CASEMENT WINDOW

Metal Technology recommend that the No 10 x 38mm socket head self tapping screws 7336 are fixed at 200mm centres and sealed in position using HR50328A sealant or low modulus silicone. Variation from these centres will affect the structural performance of the combined mullion and must be checked and confirmed by the fabricator's structural engineer. All stresses on the fixings, and their attachment to the profiles, must also be checked and confirmed by the fabricator's structural engineer.

Cutting sizes to be calculated to suit site application.

Care should be taken to accommodate cill and head liner profiles.

Profiles 007, 008, and 009 are suitable for use with 679-679 Z mullion, but must be fixed to inside only.



Scale 1:1

# Outer Frame End Prep

Outer Frame Butt Joint to 679-679

Z Mullion / Transom



**System 4-35 Hi/Hi+**

.....  
CASEMENT WINDOW  
.....

Outer frames

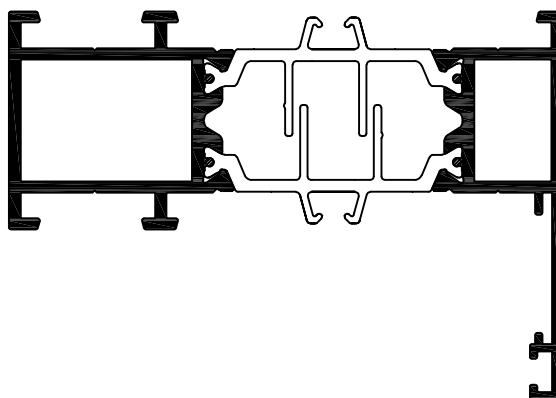
**600-200**

**601-201**

**602-202**

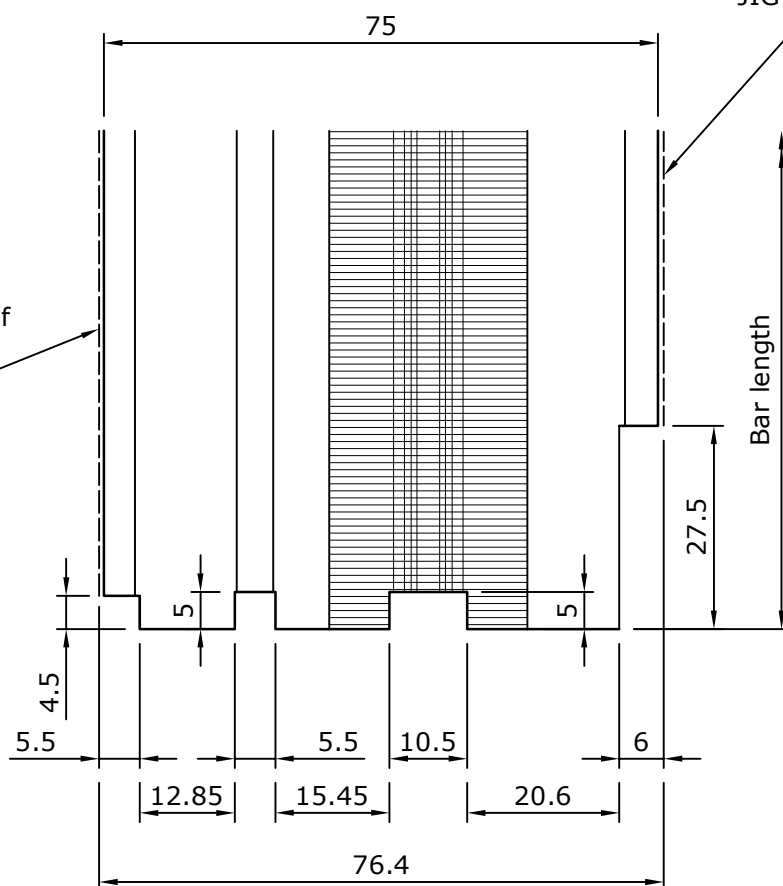
**602-212**

**604-213**

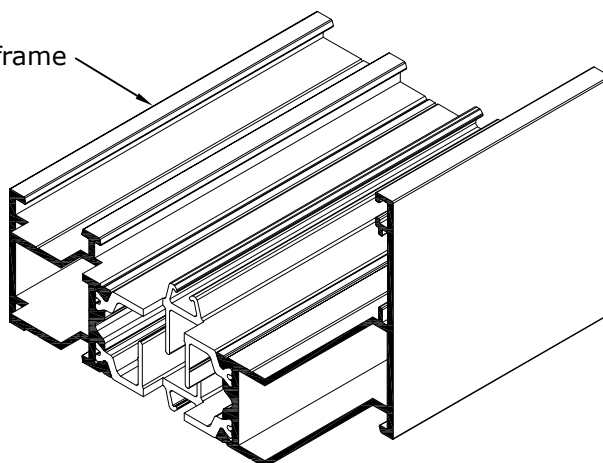


Outer edge of end  
milling blade set  
JIG4-35018

Outer edge of  
end milling  
blade set  
JIG4-35018



Outer frame



Scale 1:1

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SHEET 435Hi / 4 / 240

rev 0

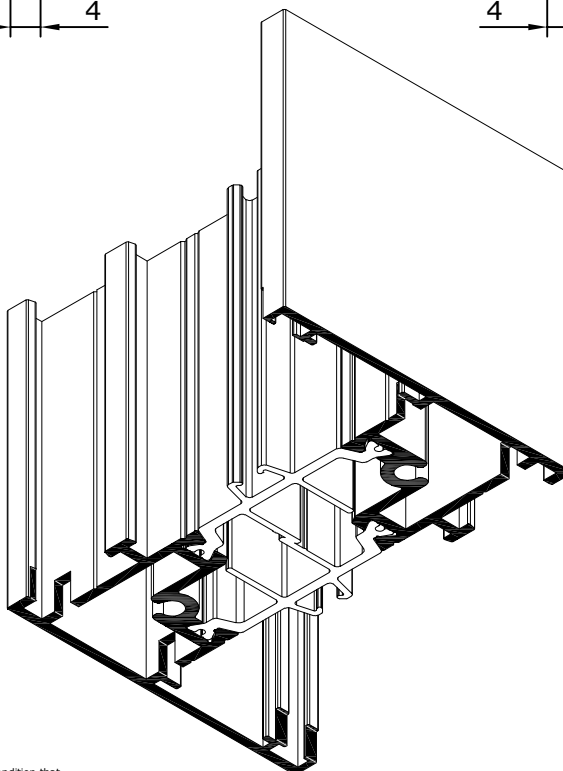
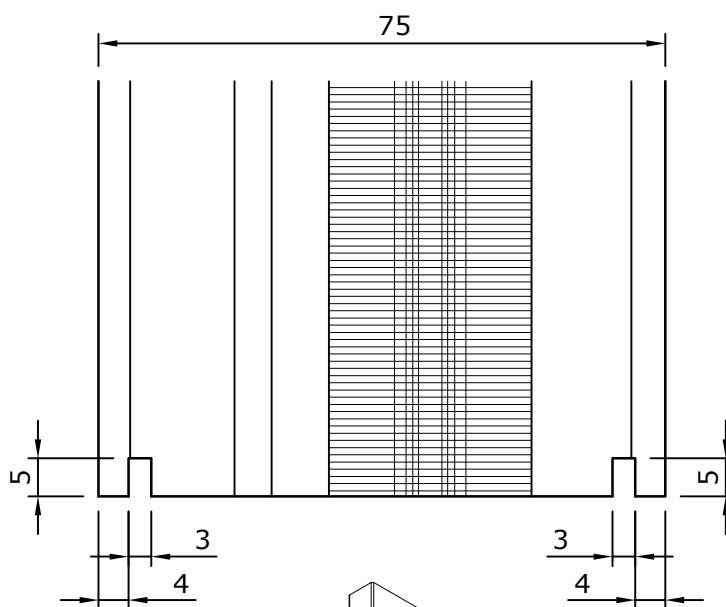
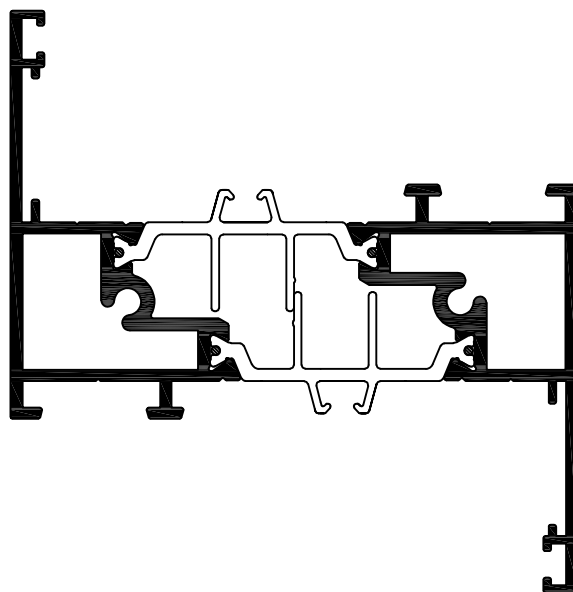
26/09/22

# 679-679 Z Mullion End Prep for Head and Cill Liner Options



**System 4-35 Hi/Hi+**  
.....  
CASEMENT WINDOW  
.....

Z mullion profile  
**679-679**



Scale 1:1

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SHEET 435Hi / 4 / 250  
rev 0 23/09/22

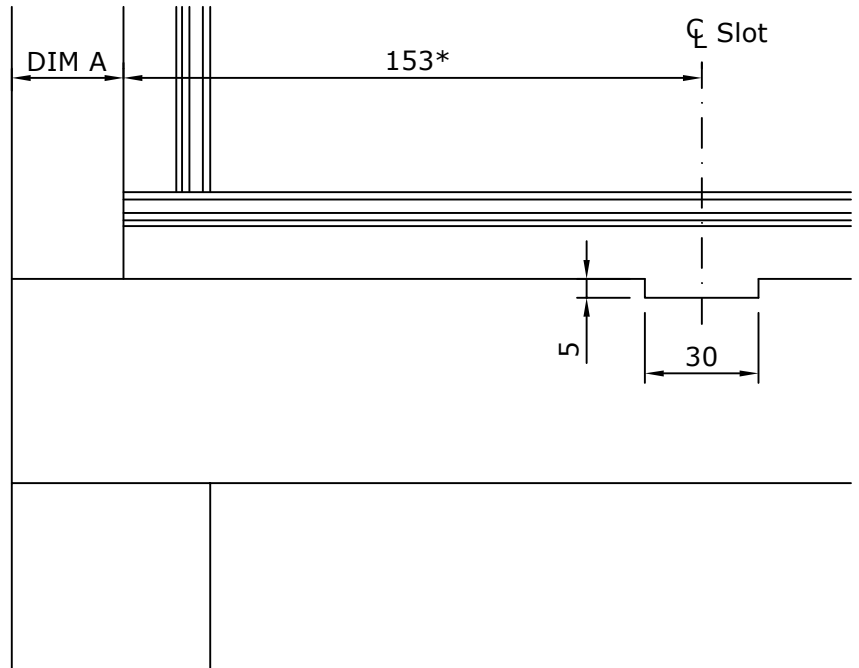
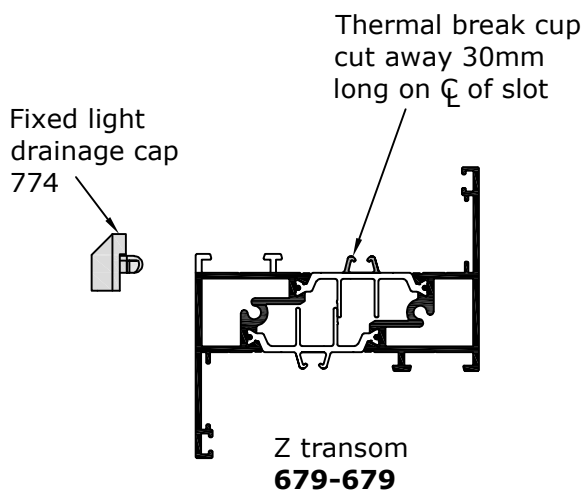


# Drainage Details

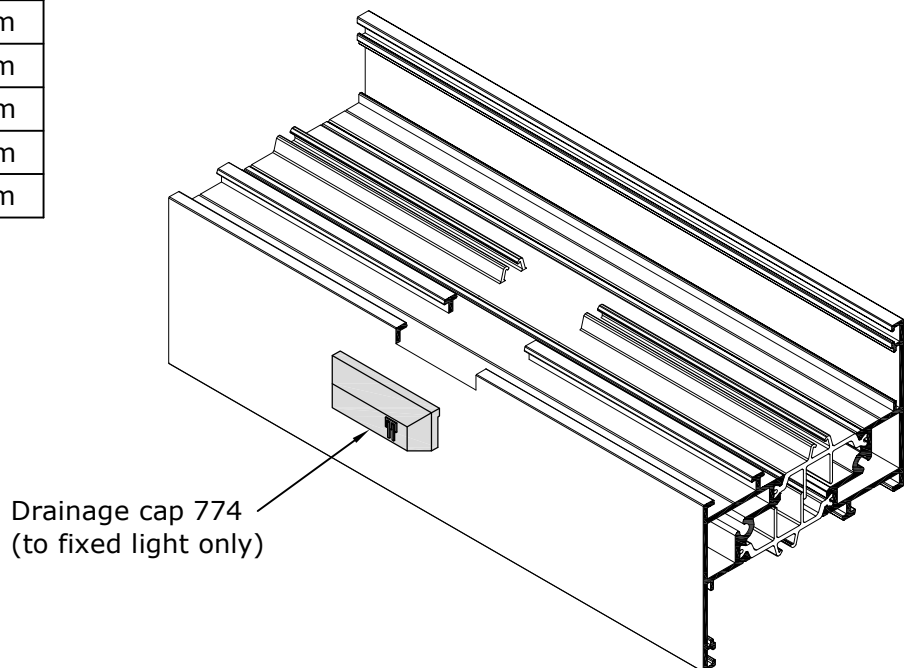
## To suit glaze out z transom 679-679

\* Note :

1. Positions of drainage slots may need to vary from positions shown:
  - (a) When using euro espag locking, in order to avoid compression keeps the position of the drainage prep should be amended from 153\* to 45mm in the opening sash outer frame only.
  - (b) For bottom hung butt hinged applications for sashes > 500mm wide the 153mm\* dimension should be increased to 215mm.
  - (c) In fixed lights when the FFSS is between 410mm and 180mm the drainage prep should be amended from 153\* to 45mm with the glazing supports positioned centrally, subject to approval by the glass unit supplier, and structural analysis of the transom profile. As manufacturing equipment varies, fabricator to ensure that their machinery is capable of crimping the required frame sizes.
2. In opening vent applications edges of drainage slots in outer frame should be filed/rounded.



Outer frame	DIM A
<b>600-200</b>	24.5mm
<b>601-201</b>	29.5mm
<b>602-202</b>	44.5mm
<b>602-212</b>	44.5mm
<b>604-213</b>	34.5mm



Where centres of drainage preps exceed 1000mm provide an extra central prep.

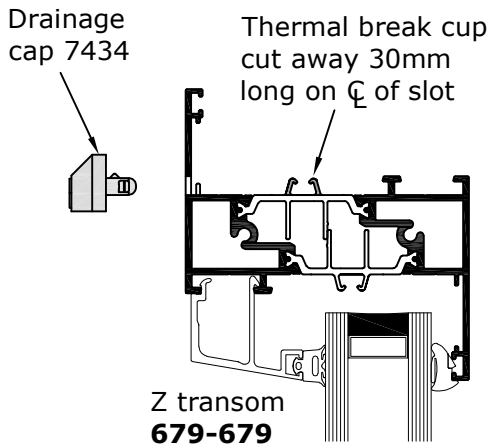
Scale 1:2

# Drainage Details

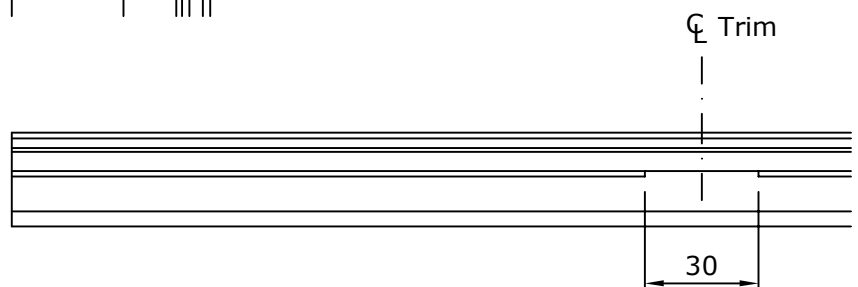
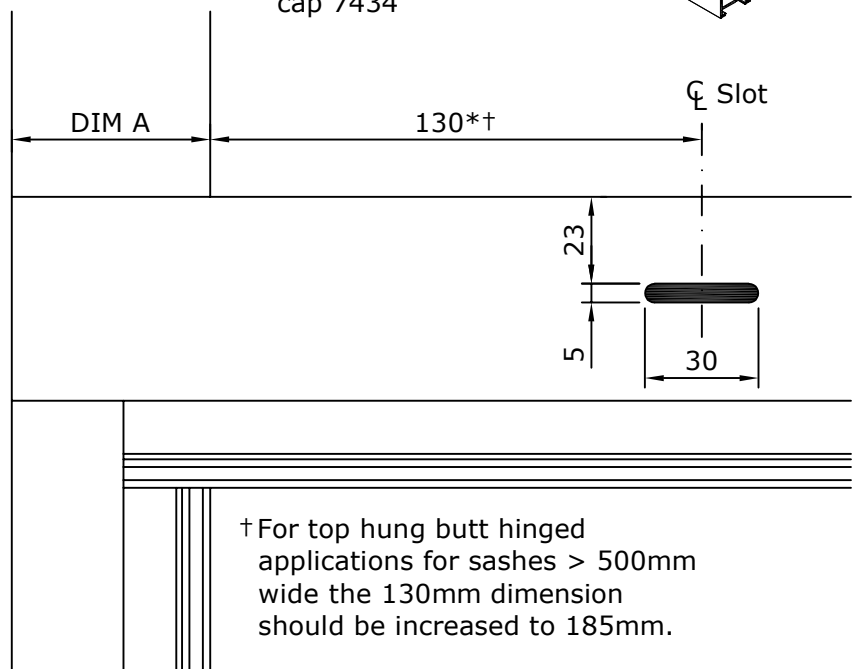
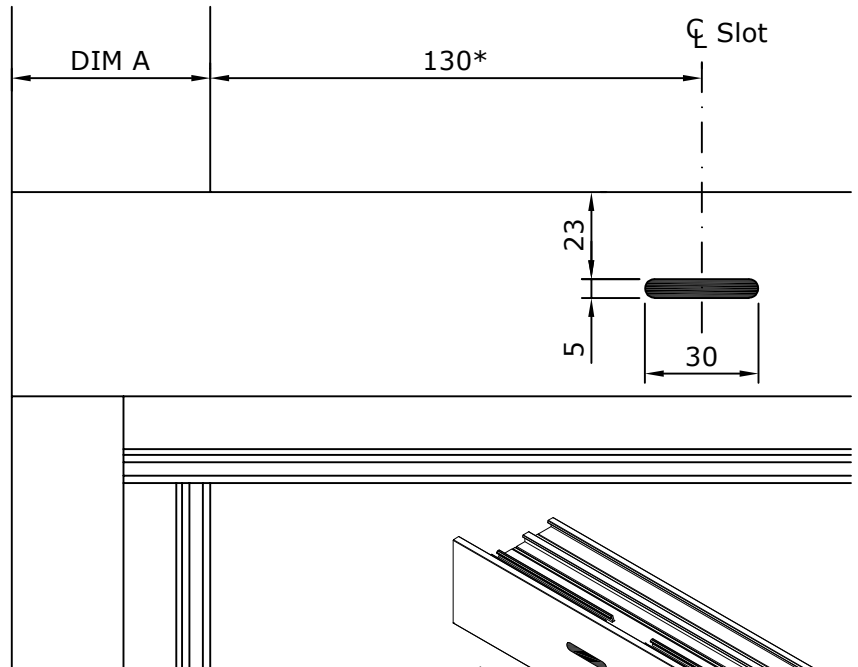
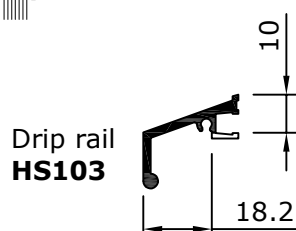
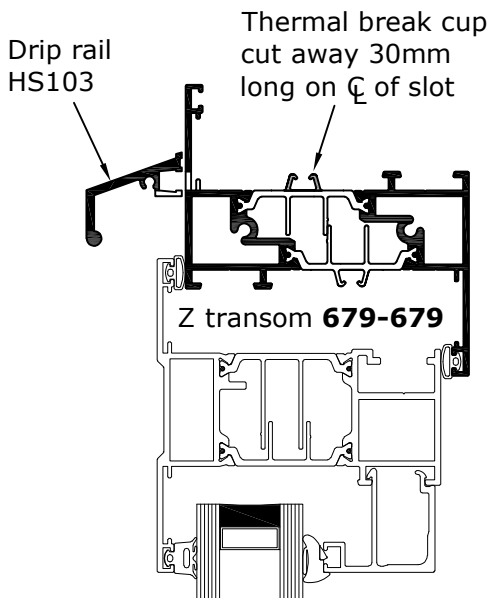
To suit glaze in z transom 679-679

\* Note :

Positions of drainage slots may need to vary from positions shown in fixed lights when the FFSS is between 410mm and 180mm. The drainage prep should be amended from 130\*/123\* to 22mm, and from 153\* to 45mm with the glazing supports positioned centrally, subject to approval by the glass unit supplier. As manufacturing equipment varies, fabricator to ensure that their machinery is capable of crimping the required frame sizes.



Outer frame	DIM A
<b>600-200</b>	47.5mm
<b>601-201</b>	52.5mm
<b>602-202</b>	67.5mm
<b>602-212</b>	67.5mm
<b>604-213</b>	57.5mm



Scale 1:2

Where centres of drainage preps exceed 1000mm provide an extra central prep.

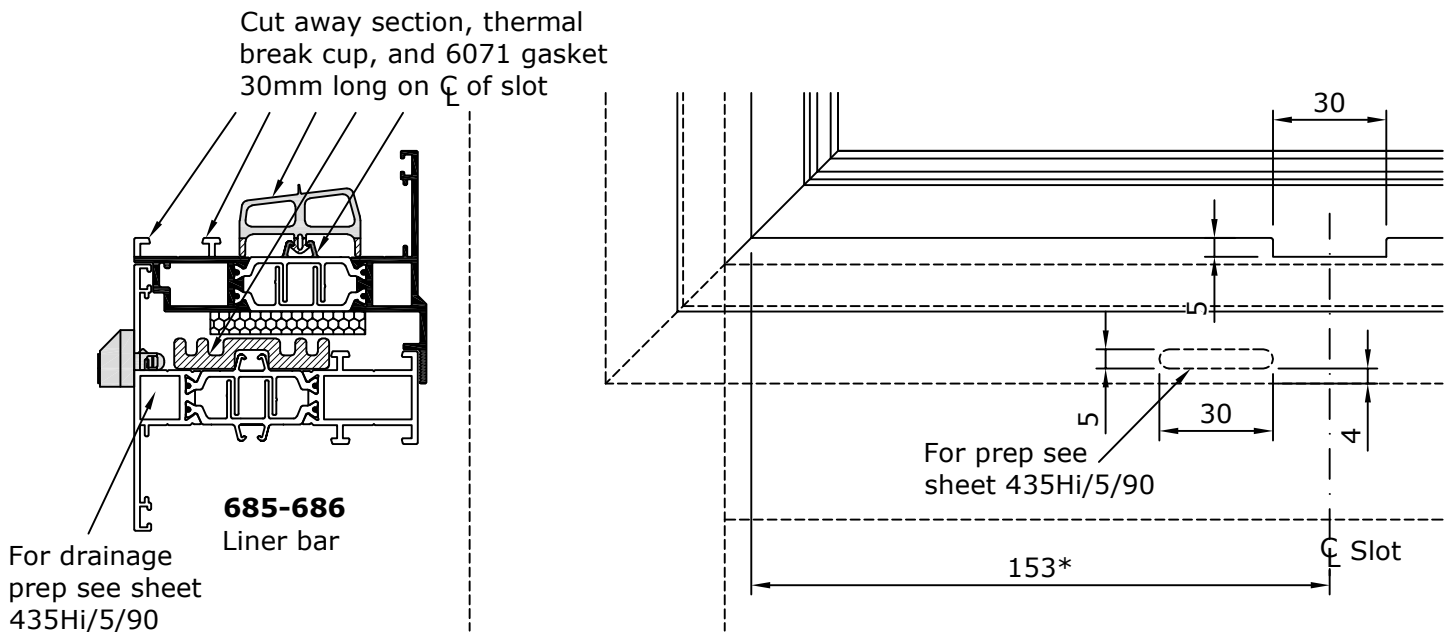
# Drainage Details

## To suit glaze out liner bar

\* Note :

1. Positions of drainage slots may need to vary from positions shown:
  - (a) When using euro espag locking, in order to avoid compression keeps the position of the drainage prep should be amended from 153\* to 45mm in the opening sash outer frame only.
  - (b) For bottom hung butt hinged applications for sashes > 500mm wide the 153mm\* dimension should be increased to 215mm.
  - (c) In fixed lights when the FFSS is between 410mm and 180mm the drainage prep should be amended from 153\* to 45mm with the glazing supports positioned centrally, subject to approval by the glass unit supplier, and structural analysis of the transom profile. As manufacturing equipment varies, fabricator to ensure that their machinery is capable of crimping the required frame sizes.
2. In opening vent applications edges of drainage slots in outer frame should be filed/rounded.

### Liner bar drainage for opening vent applications.



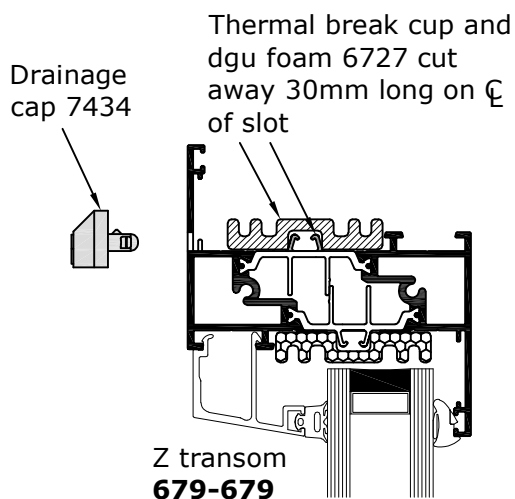
Scale 1:2

# Drainage Details

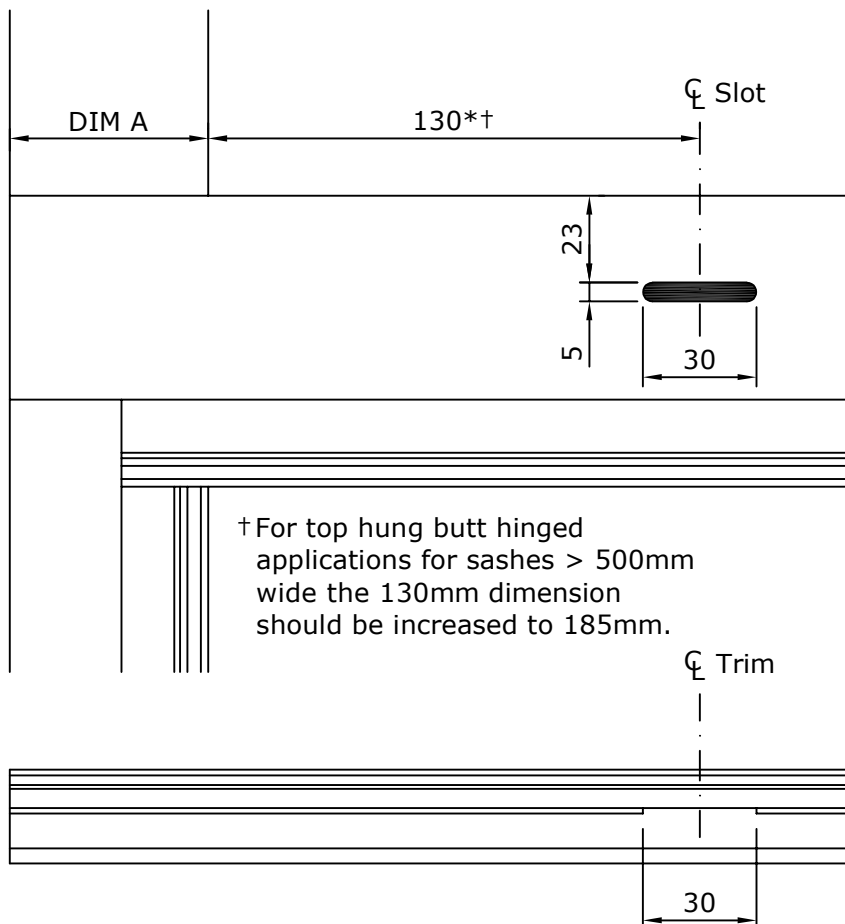
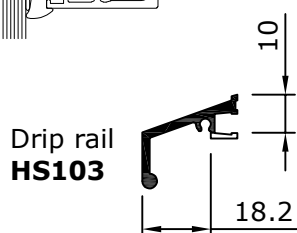
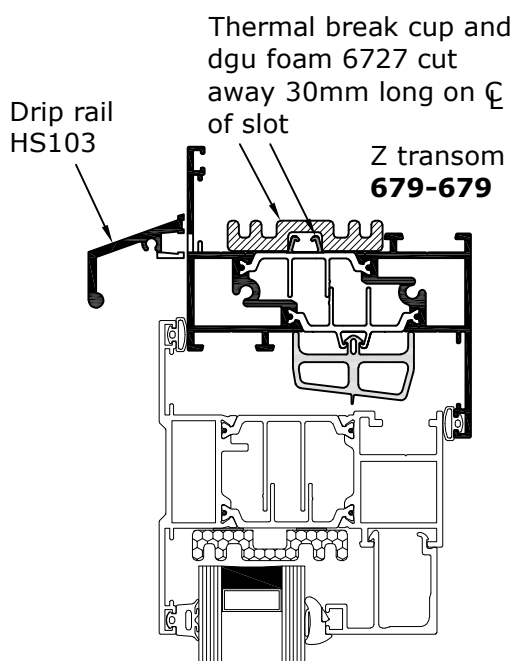
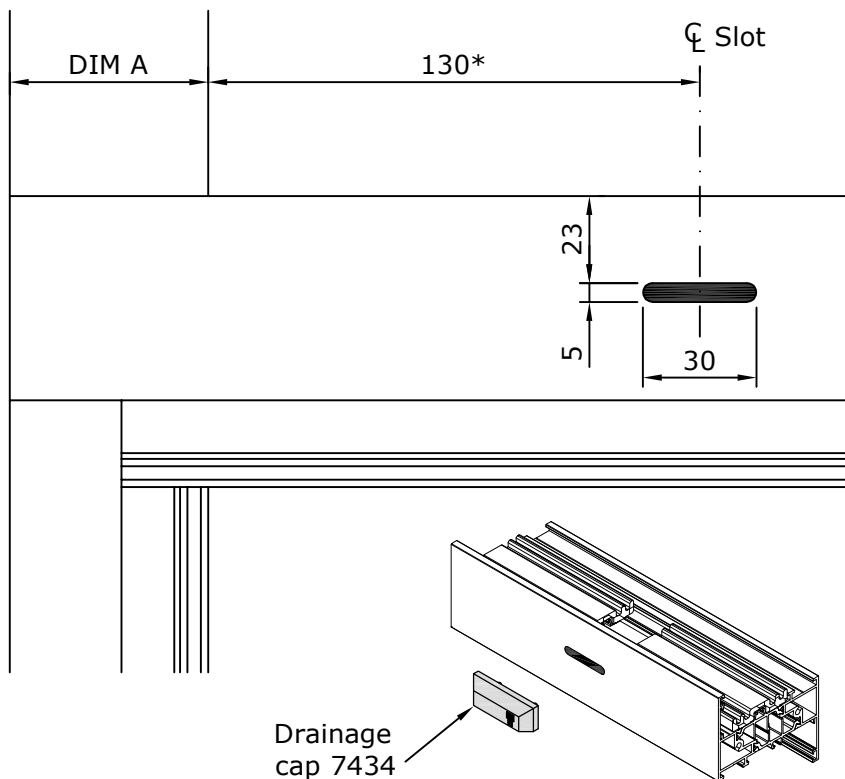
To suit glaze in z transom 679-679

\* Note :

Positions of drainage slots may need to vary from positions shown in fixed lights when the FFSS is between 410mm and 180mm. The drainage prep should be amended from 130\*/123\* to 22mm, and from 153\* to 45mm with the glazing supports positioned centrally, subject to approval by the glass unit supplier. As manufacturing equipment varies, fabricator to ensure that their machinery is capable of crimping the required frame sizes.



Outer frame	DIM A
<b>600-200</b>	47.5mm
<b>601-201</b>	52.5mm
<b>602-202</b>	67.5mm
<b>602-212</b>	67.5mm
<b>604-213</b>	57.5mm



Scale 1:2

Where centres of drainage preps exceed 1000mm provide an extra central prep.

# Outer Frame to 679-679 Z Mullion/Transom Assembly

## Cleated sections



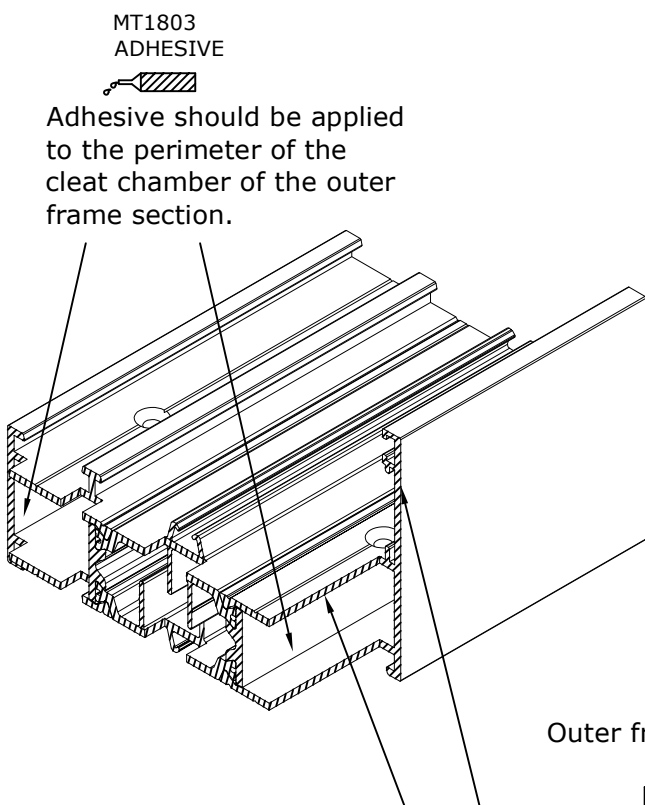
**System 4-35 Hi/Hi+**

CASEMENT WINDOW

IMPORTANT: PLEASE READ THESE NOTES BEFORE ASSEMBLY.

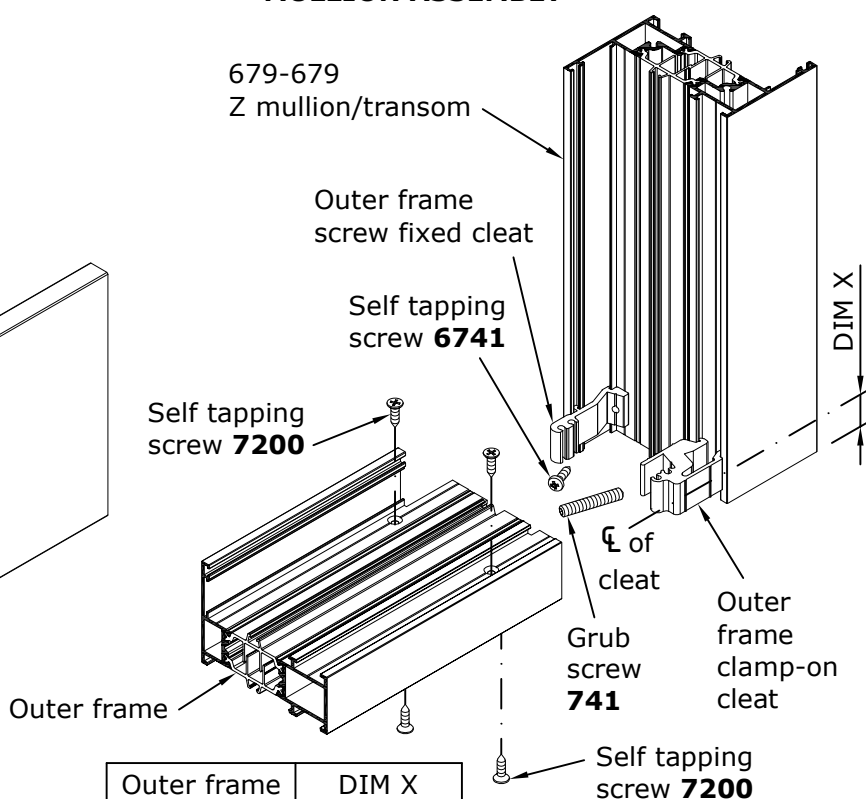
NOTE: Z mullion/transom must be installed before frame corners are crimped.

1. Using JIG4-35002 drill and countersink the offset screw holes in the outer frame at the positions shown.
2. Before applying MT1803 adhesive ensure all surfaces are free from grease or dust. Clean all aluminium mating surfaces with MT60 surface cleaner and allow to dry. Fabricator must ensure MT60 surface cleaner is fully compatible with surface finish on a project-by-project basis.
3. Mark centre line of outer frame clamp-on cleat on Z mullion/transom using DIM X to suit outer frame profile. Place JIG4-35001 on Z mullion/transom aligning appropriate cleat centre line with position marked.
4. Clip clamp-on cleat onto Z mullion/transom through appropriate aperture in jig. Tighten 741 grub screw (minimum torque setting 3.5Nm) and ensure cleat is firmly attached.
5. With JIG4-35001 still in position drill angled hole(s) in Z mullion/transom opposite clamp-on cleat.
6. Remove JIG4-35001 and attach screw fixed cleat with 6741 self tapping screw(s).
7. Apply MT1803 adhesive to the mating surfaces of the cut aluminium and thermal break profiles (as shown).
8. Apply MT1803 adhesive to the internal perimeter of the cleat chamber to sufficient depth to ensure full bonding/sealing of the cleat.
9. Align the sections over cleats and screw tightly into the offset screwports using 7200 self-tapping screws, ensuring all screws are bedded and sealed.
10. Promptly, before adhesive hardens, wipe away any excess adhesive from the joint using MT60 surface cleaner and allow to dry. Ensure all bead and gasket recesses are clear of adhesive.
11. Check the joint is tight on both sides and that there is no movement.
12. Clip transom braces 6746 into position. Bond and seal as "Transom Brace Application Detail" and "679-679 Z Mullion/Transom Sealing Detail" sheets.



PICTORIAL VIEW OF  
ADHESIVE APPLICATION  
TO ALL OUTER FRAME  
END PREPS

### OUTER FRAME TO MULLION ASSEMBLY



Outer frame	DIM X
<b>600-200</b>	12.25mm
<b>601-201</b>	14.75mm
<b>602-202</b>	32.25mm
<b>602-212</b>	32.25mm
<b>604-213</b>	17.25mm

Not to scale

# 679-679 Z Mullion/Transom Assembly

Cleated sections



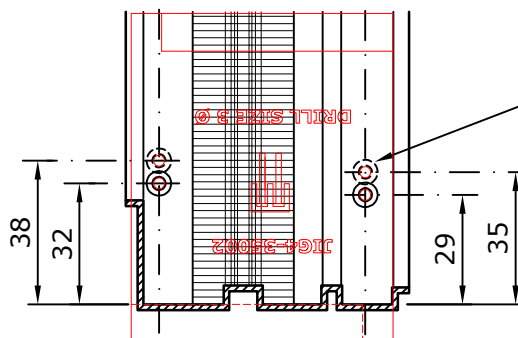
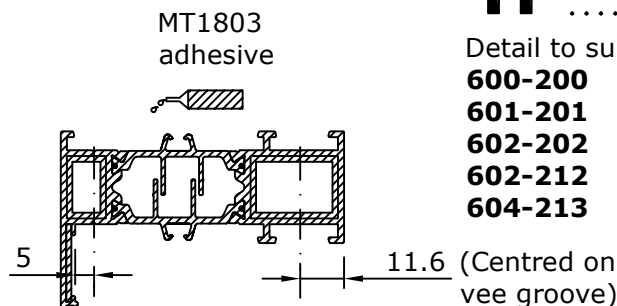
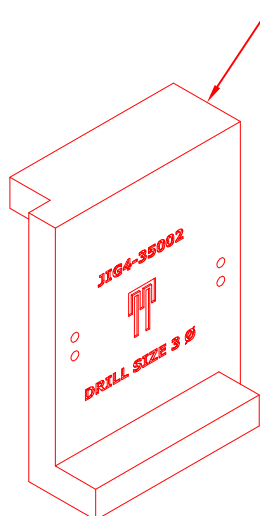
**System 4-35 Hi/Hi+**

CASEMENT WINDOW

Detail to suit

**600-200  
601-201  
602-202  
602-212  
604-213**

JIG4-35002



4 No holes (two each side) at offset centres drilled and countersunk for no 6 x 12mm self tapping screws 7200

Transom cleat  
6520 (16mm wide)  
6521 (11mm wide)  
6524 (21mm wide)  
See "Component Identification" page for section references

Transom cleat  
521 (11mm wide)  
522 (16mm wide)  
524 (21mm wide)  
See "Component Identification" page for section references

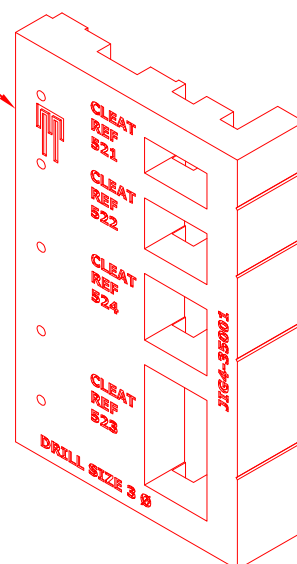
Detail to suit  
**679-679**

JIG4-35002

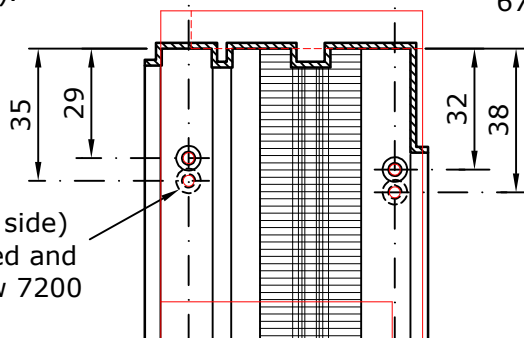
Grub screw 741 and hexagon allen key size 2.5mm A/F (minimum torque setting 3.5Nm).

No 6 x 13mm pan head stainless steel self tapping screws 6741

JIG4-35001



4 No holes (one each side) at offset centres drilled and countersunk for screw 7200

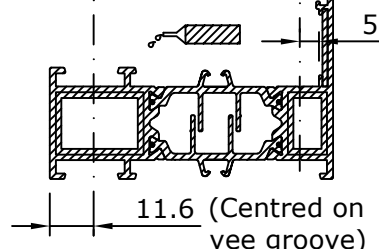


MT1803 adhesive

Detail to suit

**600-200  
601-201  
602-202  
602-212  
604-213**

For isometric details of joint assembly and adhesive/sealant application see "679-679 Z Mullion/Transom Sealing Detail" sheet.



Scale 1:2

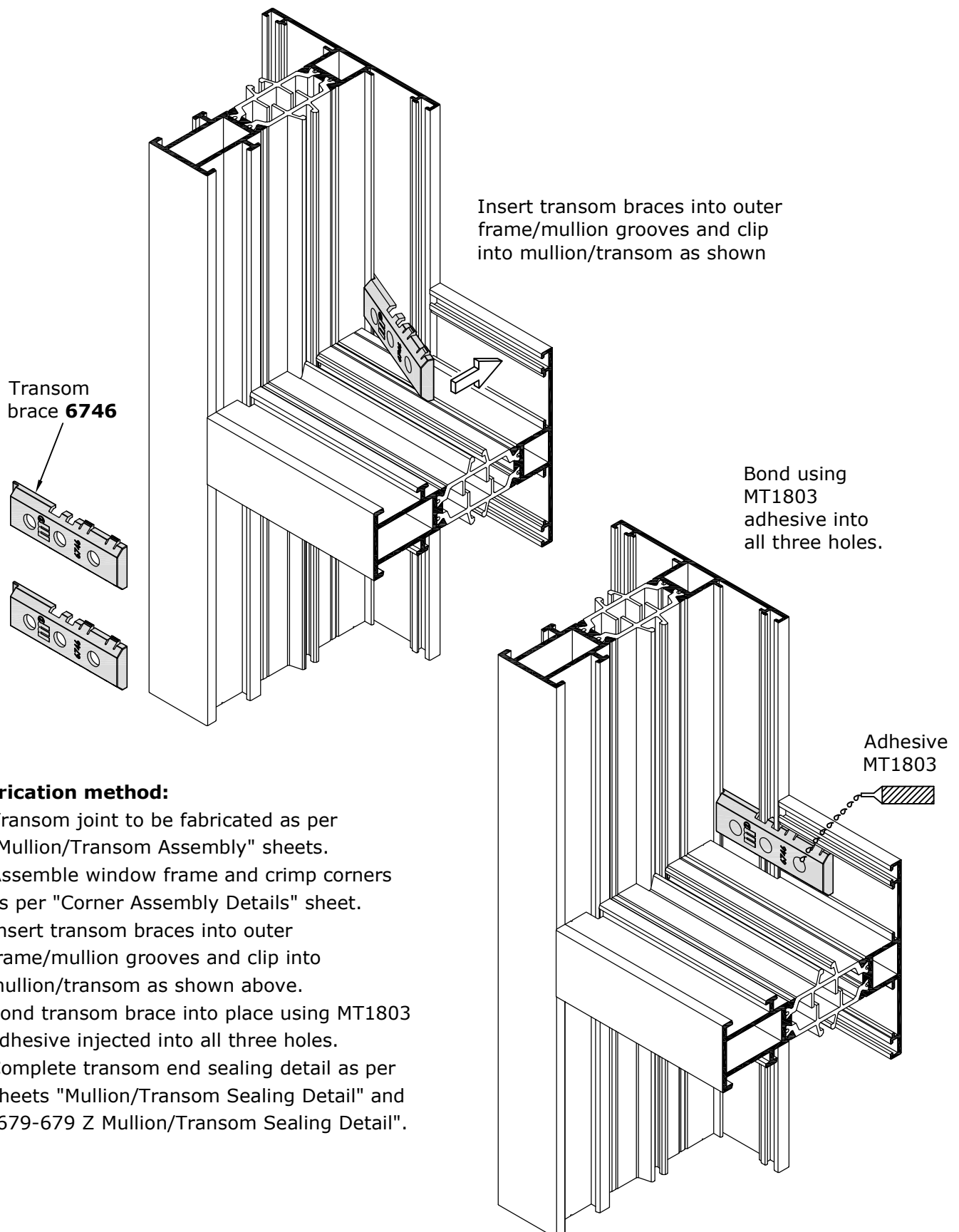
# Transom Brace Application Detail



System 4-35 Hi/Hi+

.....  
CASEMENT WINDOW  
.....

Transom brace 6746 must be used at both ends of all mullions and transoms (including muntin applications). Braces to be securely bonded using MT1803 adhesive.



## Fabrication method:

1. Transom joint to be fabricated as per "Mullion/Transom Assembly" sheets.
2. Assemble window frame and crimp corners as per "Corner Assembly Details" sheet.
3. Insert transom braces into outer frame/mullion grooves and clip into mullion/transom as shown above.
4. Bond transom brace into place using MT1803 adhesive injected into all three holes.
5. Complete transom end sealing detail as per sheets "Mullion/Transom Sealing Detail" and "679-679 Z Mullion/Transom Sealing Detail".

Not to scale

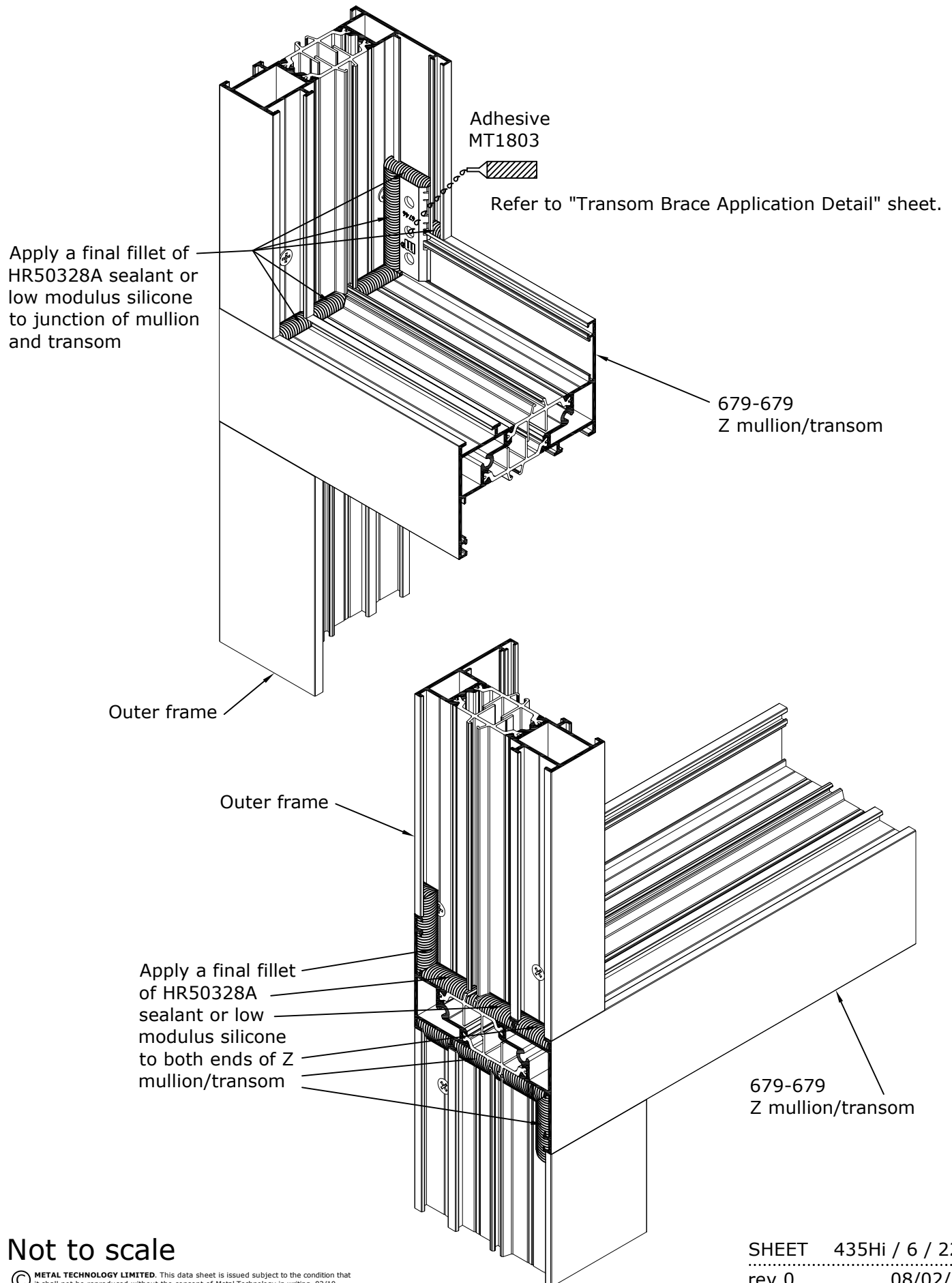
# 679-679 Z Mullion/Transom Sealing Detail



System 4-35 Hi/Hi+

CASEMENT WINDOW

THE FOLLOWING DETAIL SHOULD BE APPLIED TO ALL Z MULLION/TRANSOM SECTIONS. THESE DETAILS TO BE READ IN CONJUNCTION WITH ASSEMBLY DETAILS



Not to scale

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SHEET 435Hi / 6 / 222

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08/02/23



# Drip Rails

## Preparation Details for Vents Fitted below 679-679 Z transom



**System 4-35 Hi/Hi+**

CASEMENT WINDOW

### DETAIL IS APPLICABLE TO BOTH FRICTION HINGE AND BUTT HINGE APPLICATIONS.

All fixings must be sealed using HR50328A sealant or low modulus silicone.

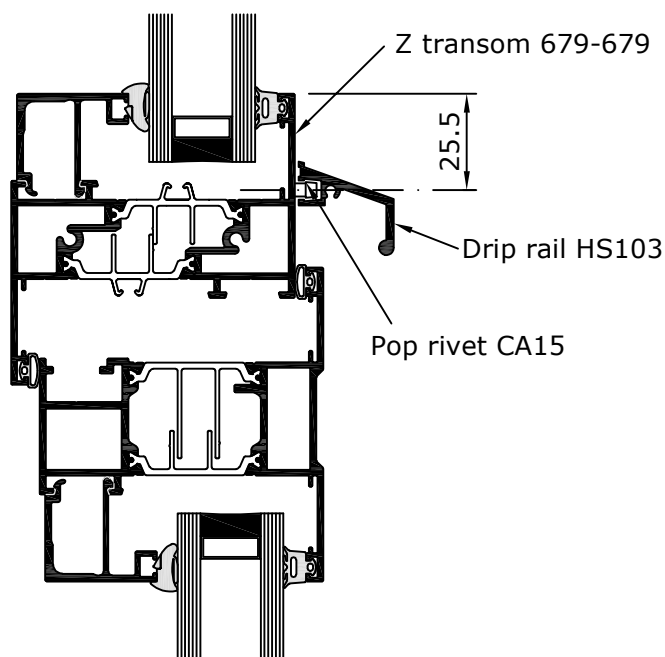
The drip rail should be used in all conditions. A length of drip rail (HS103) should be secured to the frame directly above the casement vent as shown below.

A series of 3mm pilot holes should be drilled, commencing 75mm in from each end and at the required intervals to accept the drip rail rivets (not exceeding 250mm centres).

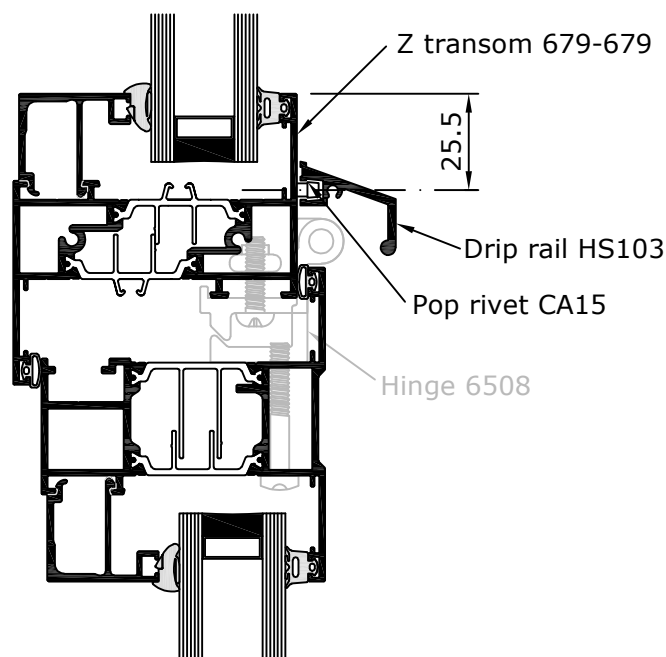
When the pop rivets are in place a bead of silicone should then be applied to the silicone groove extruded in the drip rail. The drip rail is then push-fitted over the rivets.

The length of the drip rail should be 20mm greater than the width of the sash and centralised over the sash.

### WITH FRICTION HINGE



### WITH BUTT HINGE



Scale 1:2

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SHEET 435Hi / 6 / 247

rev 0

26/09/22

# Drip Rails

## Transom and Outer Frame Selection Charts and Drip Rail Fixing Details



**System 4-35 Hi/Hi+**

CASEMENT WINDOW

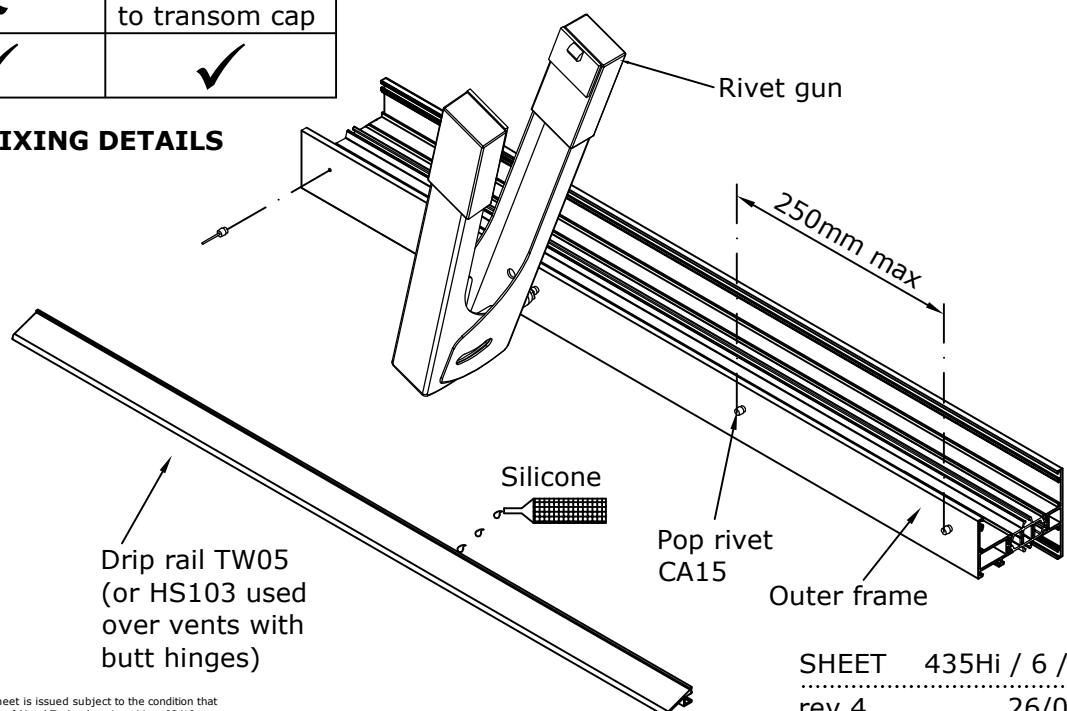
### TRANSOM AND OUTER FRAME/DRIP RAIL SELECTION CHARTS - TOP HUNG APPLICATIONS

TRANSOM	VENT OVER VENT with TW05 (with friction hinges)	FIXED OVER VENT with TW05 (with friction hinges)	VENT OVER VENT with HS103 (with butt hinges)	FIXED OVER VENT with HS103 (with butt hinges)	FIXED OVER VENT with HS103 (with friction hinges)
603-201	✗	✗	✗	✗	✗
606-206	✓	✓	✓	✓	✗
609-200	✗	✗	✗	✗	✗
613-213	✓	✓	✗	✗	✗
619-211	✗	✗	✗	✗	✗
679-679	✗	✗	✗	✓	✓

OUTER FRAME	TW05 (with friction hinges)	HS103 (with butt hinges)
600-200	✓	✗
601-201	✓	✗
600-212	✓	✓
602-202	✓	✓
602-212	✓	✓
604-213	✓	✗
620-204	✗	Drip rail fixed to transom cap
620-215	✗	Drip rail fixed to transom cap
620-216	✗	Drip rail fixed to transom cap
647-649	✓	✓

Where render finishes occur it may be necessary to check against site conditions to ensure that the drip rail can be fitted.

### DRIP RAIL FIXING DETAILS



Not to scale

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SHEET 435Hi / 6 / 250

rev 4

26/09/22

# Butt Hinge

## Available configurations



**System 4-35 Hi/Hi+**

CASEMENT WINDOW

All fixings must be sealed using HR50328A sealant or low modulus silicone.

This sheet must be read with the other "Butt Hinge" sheets.

Refer to tables below selecting appropriate sections in butt hinge applications.

Metal Technology do not recommend fixing butt hung sashes directly to the 685-686 liner bar as the load will be transferred to the thermal break which may fracture.

When hanging a top hung vent or supporting a bottom hung vent with butt hinges, additional loads are applied to the transom. Application-specific structural analysis, by the fabricator's structural engineer will be required.

OUTER FRAME	TOP HUNG APPLICATIONS	BOTTOM HUNG APPLICATIONS	SIDE HUNG APPLICATIONS
600-605	✗	✗	✗
600-200, 601-201	✗	✓	✓
600-212, 602-202 602-212, 604-213 620-204, 620-215 620-216, 647-649	✓	✓	✓

MULLION/ TRANSM	HINGE/ FIXED LIGHT	HINGE/ LINER BAR	HINGE/SASH	HINGE/HINGE
603-218, 642-218 643-218, 613-221 619-211	✗	✗	✗	✗
609-200, 640-200 641-200	✓	✓ *	✗	✗
603-201, 642-201 643-201	✓	✓	✗	✗
613-213	✓	✓	✓	✗
606-206‡, 606-207† 607-206, 607-207†	✓	✓	✓	✓
679-679‡	✓	✗	✗	✗

\* Liner bar to be cut away around butt hinge. Refer to "Butt Hinges and Liner Bar" sheet in this section of the manual.

‡ In fixed light over vent applications the heavy duty transom section 606-206 or z transom section 679-679 must be used.

† When using 606-207 or 607-607 heavy duty mullions with fins, in side hung applications, the window must not open beyond 90 degrees.

COUPLING MULLION	OUTER FRAMES			
	600-200	601-201	604-213	602-202 602-212
665-165, 667-165	✗	✗	✓	✓
665-166, 667-166	✓	✓	✓	✓
668-669	✗	✓	✓	✓

647-649 Not suitable in coupling applications. Refer to Metal Technology's Technical Department.