



Also available in this series

JACK
ALUMINIUM SYSTEMS



SHOPFRONT

CENTRE FOR
**WINDOW AND
CLADDING**
TECHNOLOGY

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Common

Cills

Components

Joint Sleeves

Channels

Channel & Corner Post

Caps

Closers, Adapters & Cill Carriers

Reinforcing Bar & Fixing Bracket

Plates

Cills

Header Bar

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50 mm Transom & Mullion

75 mm Jamb, Head & Bottom

75 mm Transom & Mullion

100 mm Jamb, Head & Bottom

100 mm Transom & Mullion

125 mm Jamb, Head & Bottom

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Cill

Drainage Detail

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Arrangements

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Ras, Pantone & House

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50 mm Transom Panel

75 mm Outer Panel

75 mm Transom Panel

100 mm Outer Panel

100 mm Transom Panel

125 mm Outer Panel

125 mm Transom Panel

100 mm Effects of Glass, Space & Area

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Curtain Walling

The Jack Curtain Walling System is based on the highly successful clip in plate method of assembly which gives greater control of quality by enabling the construction to be managed in the factory rather than on the installation site. The process of manufacture is quick and simple which means quality can be maintained and on site installation is simple and therefore controllable.

The system incorporates a PVCu pressure plate to improve the thermal efficiency of the Curtain Wall. The pressure plate is retained by stainless steel washers at 200mm centres.

Materials

The aluminium profiles are extruded in the UK using aluminium alloy 6063.T6 to EN755-9.

Alupro reports that 73% of the 900,000 tonnes of aluminium used each year in the UK have been recycled, and in the building industry this rises to 95% because of the higher value of aluminium in these markets. Recycling aluminium uses only 5% of the energy consumed in the primary production. Because of the inorganic nature of aluminium the characteristics of aluminium do not diminish in the recycling process unlike many of its organic competitors.

Screws

The Pressure plate screw is a No. 12 x ¾ inch pozi drive pan head self tapping screw.

The frame assembly screw is a No. 10 x 1½ inch pozi drive pan head self tapping stainless screw.

M6 x 25 x 1.5 Penny washer stainless steel.

Finishing

Powder Coating

SP&PC Ltd is a Qualicoat approved applicator of Polyester Powder Coating registered to BS EN ISO 9001: 2000. In addition to Qualicoat approval, all aluminium powder coated products are tested to BS EN ISO 12206-1:2004. Details of the SP&PC range of finishes are under the same cover.

Anodizing:

Natural (silver) anodized to BS3897, 1991. A Bronze anodized finish is anodized to B.S.3897 1991. The Anodized finish is to a minimum of 25 microns (AA25).

Gaskets

Gaskets are manufactured in accordance with BS 3734 and BS 7412 Cat A. the gaskets are produced from a co-extrusion of Thermo Plastic Elastomer with a Polypropylene cord to minimize stretching and shrinking.

Glazing

All glazing should be carried out to the recommendations of BS 6262 The curtain walling system will accommodate single glazing 6 mm to double glazing up to 32 mm. The glazing depth is in response to the increasing demand for improved acoustic performance.

Centre for Window and Cladding Technology

As a member of the above organization all steps are taken to comply with standards and specifications of the CWCT.

Structure

The Jack curtain walling system is suitable for heights up to 12 meters.

The IXX and IYY values are supplied for the significant sections in this manual.

Test Reports

The screen has been independently tested by a UKAS accredited test house. A test report is available on request.

A summary of the results obtained are as follows

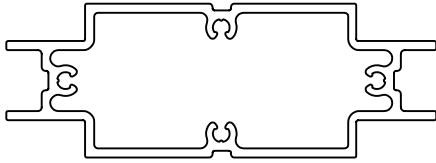
Tested to BS 6375: Part One: 2004 (test to EN 1026: 2000, EN 1027: 2000, EN 12211: 2000

Exposure Category	2000 Pascal, special
Air Permeability	600 Pascal
Water tightness	600 Pascal no leakage
Resistance to	
Wind loading	2400 Pascal

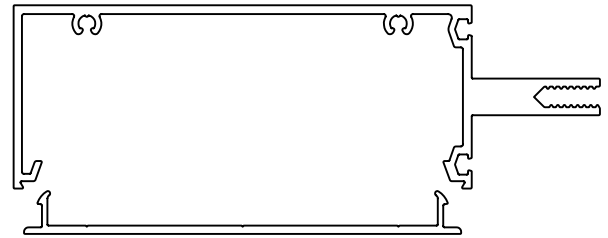
Thermal Testing

Independent thermal testing has been carried out. The results are available on application.

JC46
125 x 50 mm SLEEVE JOINT/COUPLING

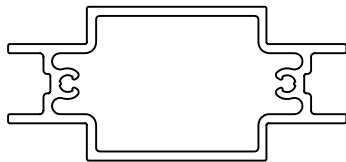


JC04
125 x 50 mm CURTAIN WALL CHANNEL

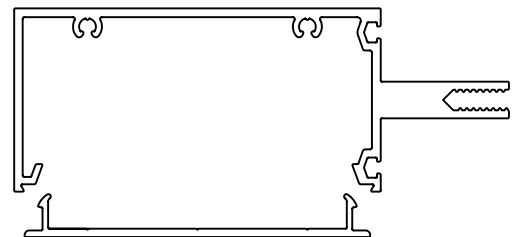


JC12
125 mm PLAIN PLATE

JC45
100 x 50 mm SLEEVE JOINT/COUPLING

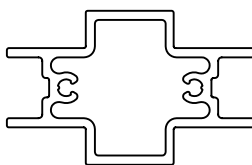


JC03
100 x 50 mm CURTAIN WALL CHANNEL

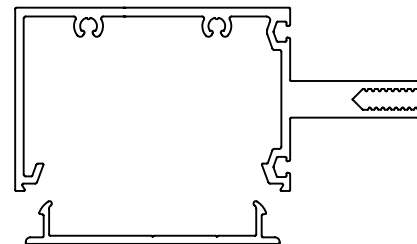


JC11
100 mm PLAIN PLATE

JC44
75 x 75 mm SLEEVE JOINT/COUPLING

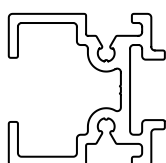


JC02
75 x 50 mm CURTAIN WALL CHANNEL

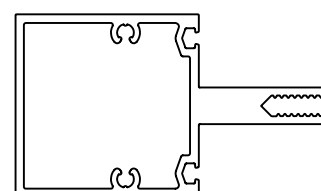


JC10
75 mm PLAIN PLATE

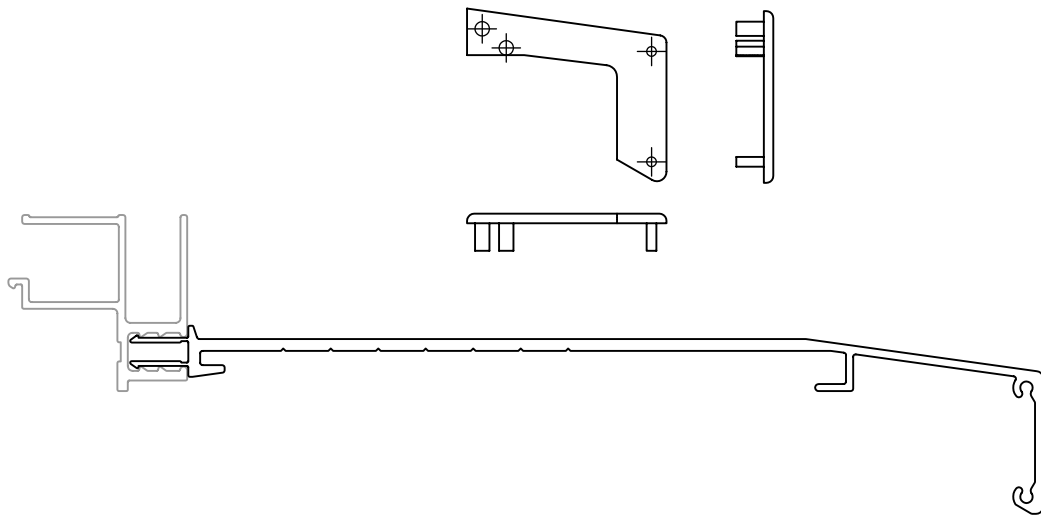
JC43
50 x 50 mm SLEEVE JOINT/COUPLING



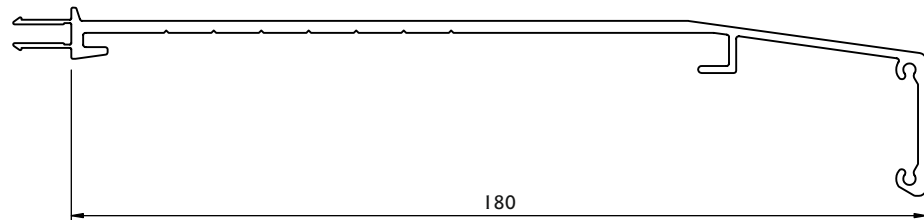
JC01
50 x 50 mm CURTAIN WALL CHANNEL



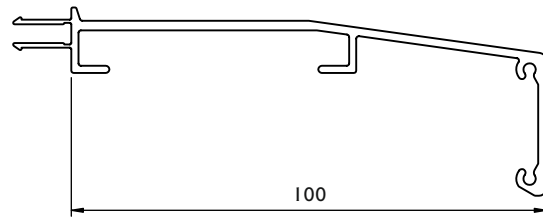
JC30



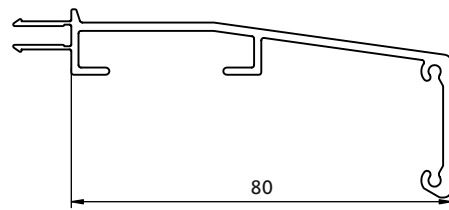
JC34



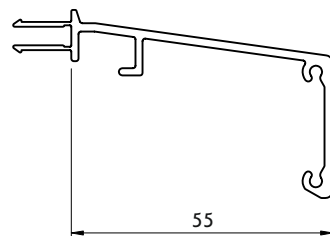
JC33



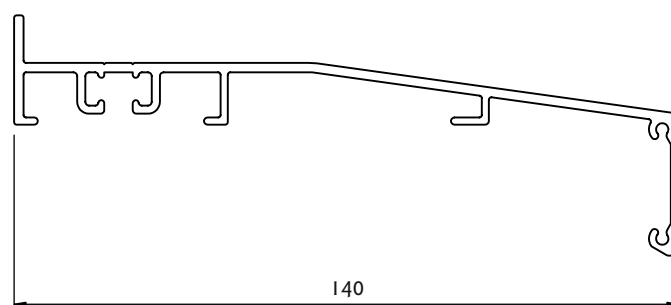
JC32

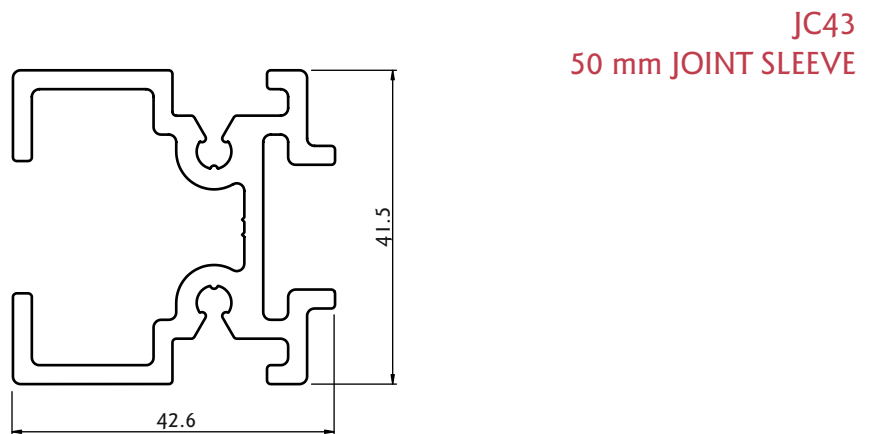
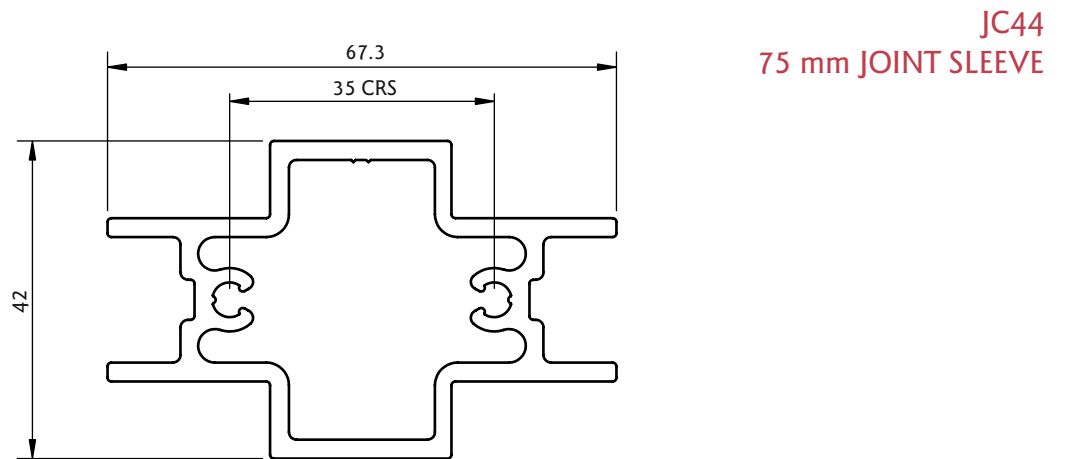
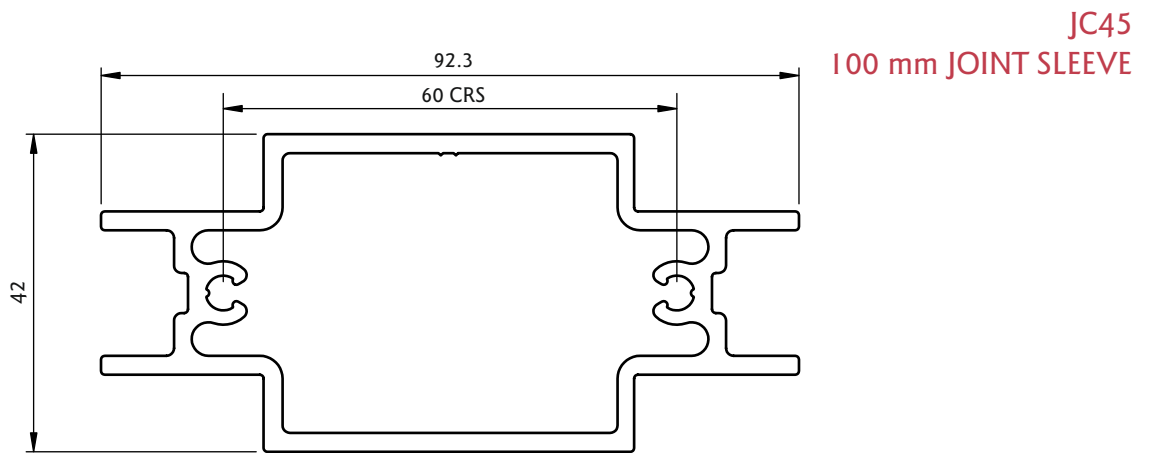
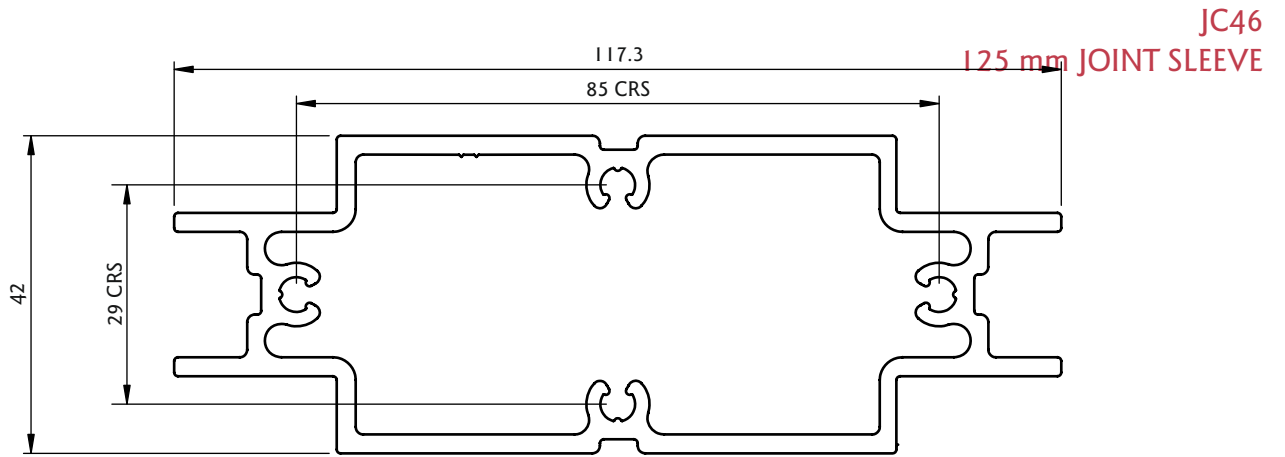


JC31

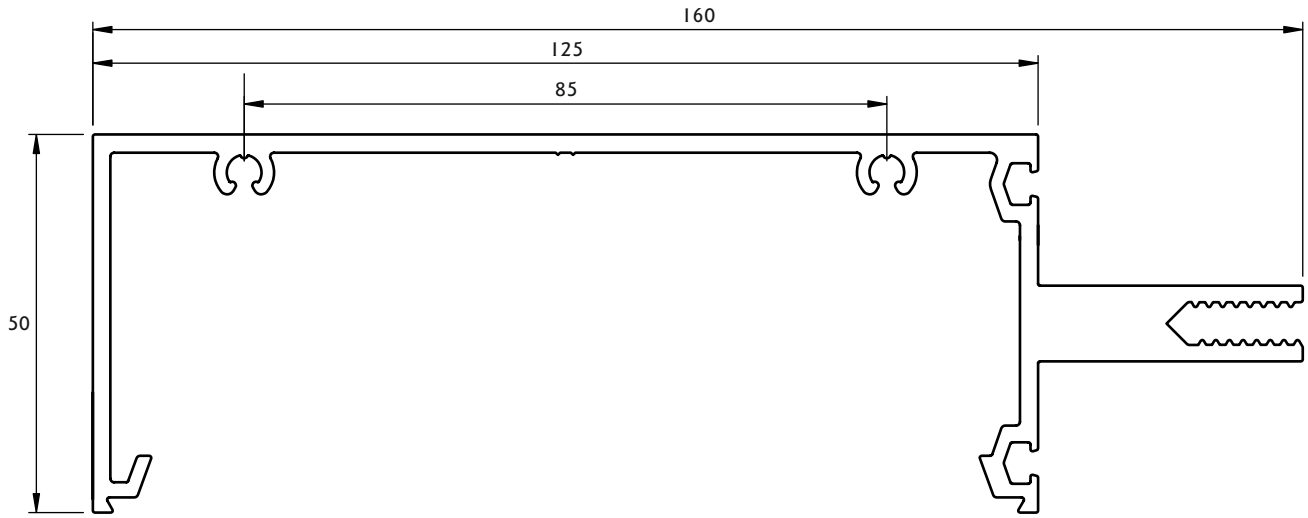


JC35

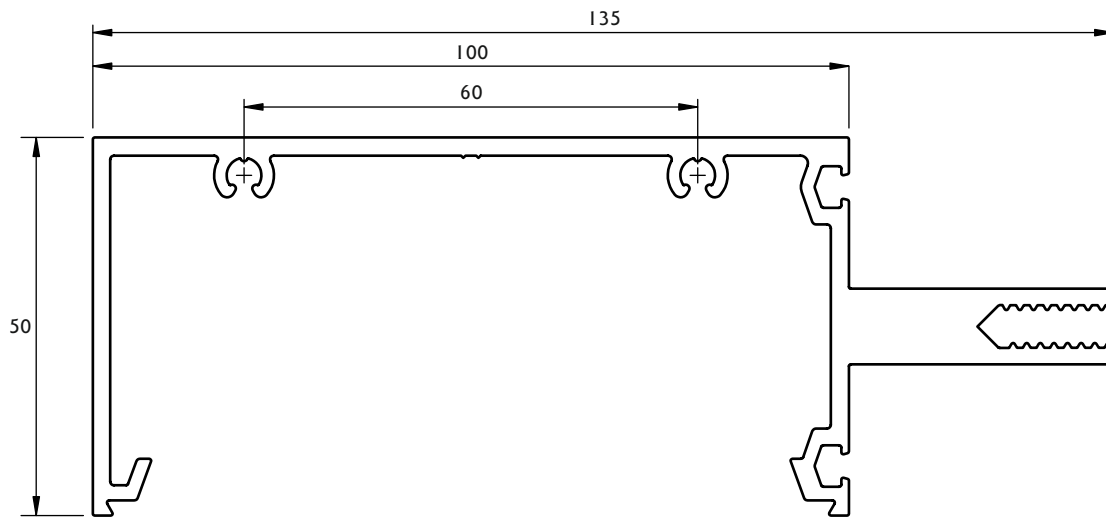




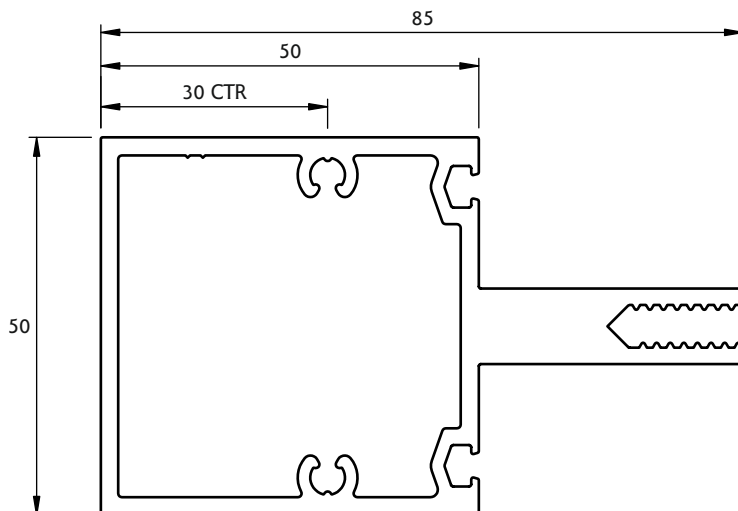
JC04
125 X 50 mm CHANNEL



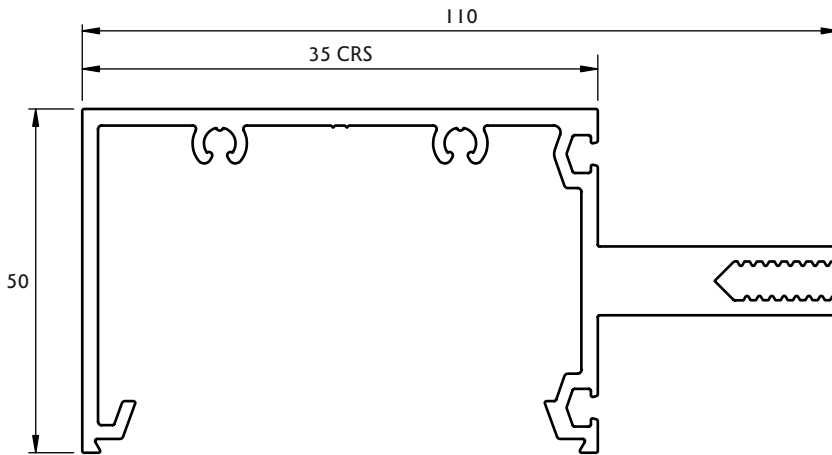
JC03
100 x 50 mm CHANNEL



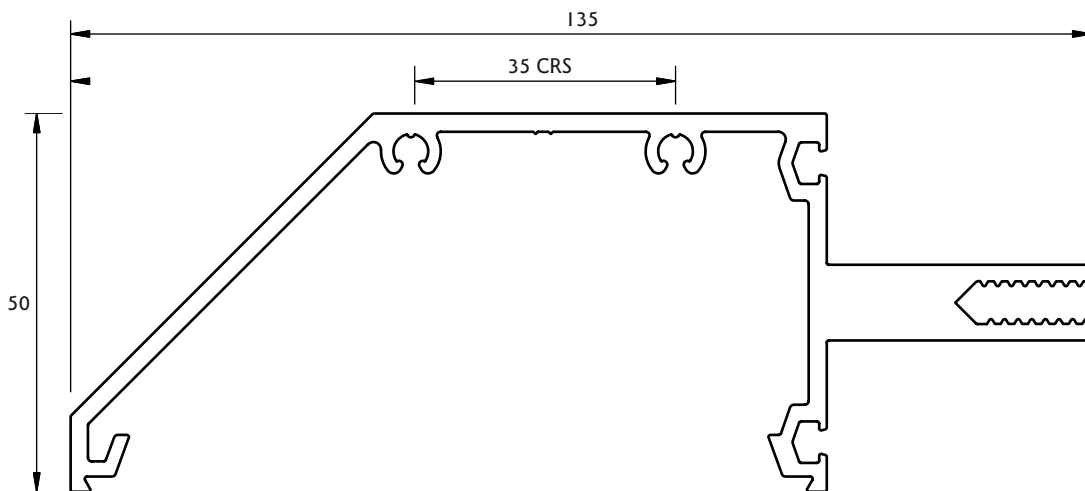
JC01
50 x 50 mm CHANNEL



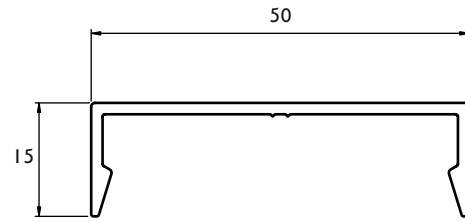
JC02
75 x 50 mm CHANNEL



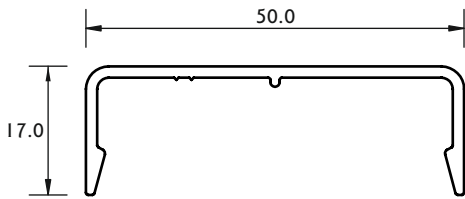
JC23
CORNER POST



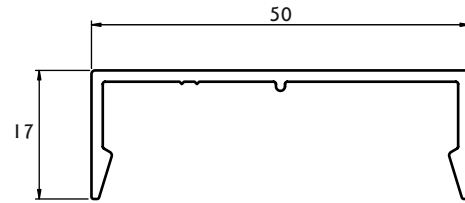
JC20
15 mm COVER CAP



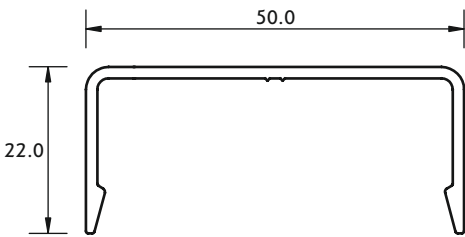
JC28
17 mm CURVED COVER CAP



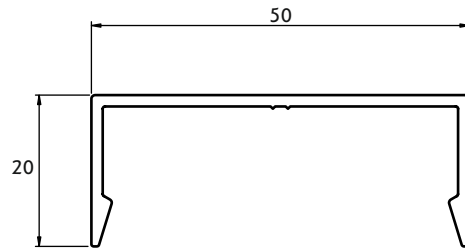
JC21
17 mm COVER CAP



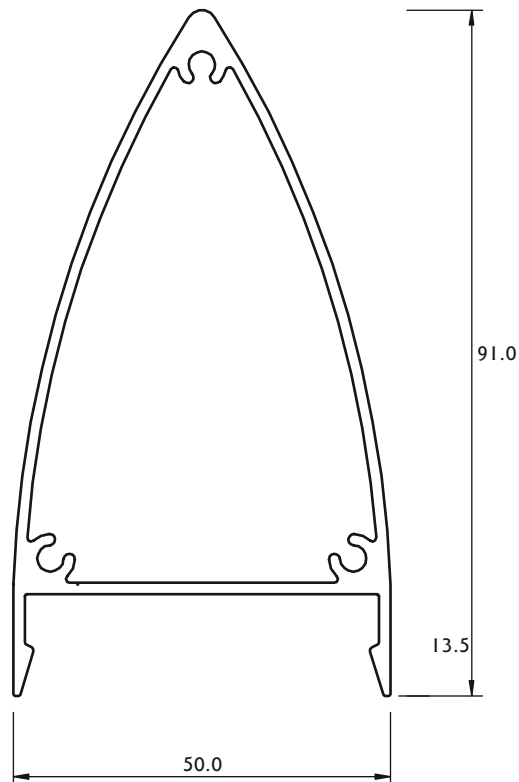
JC29
22 mm CURVED COVER CAP



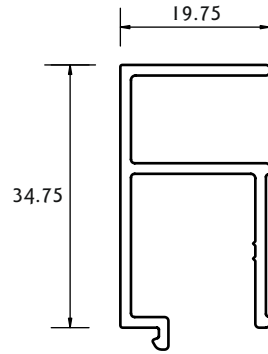
JC22
20 mm COVER CAP



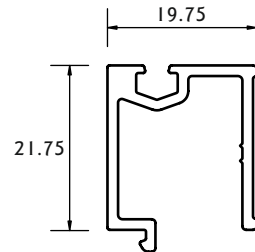
JC27
AEROFOIL CAP



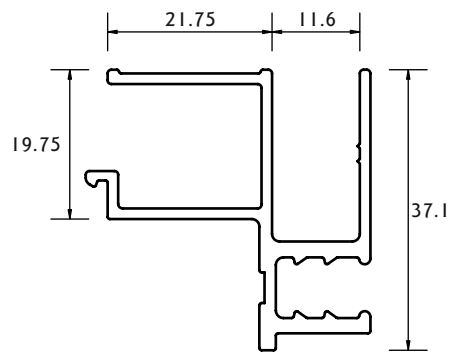
JC24
POCKET CLOSER



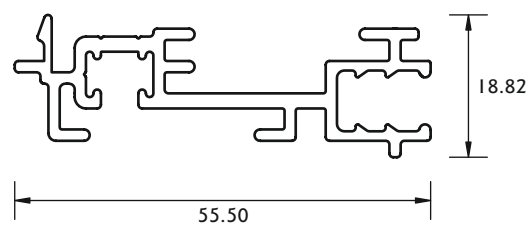
JC25
SINGLE GLAZED ADAPTOR



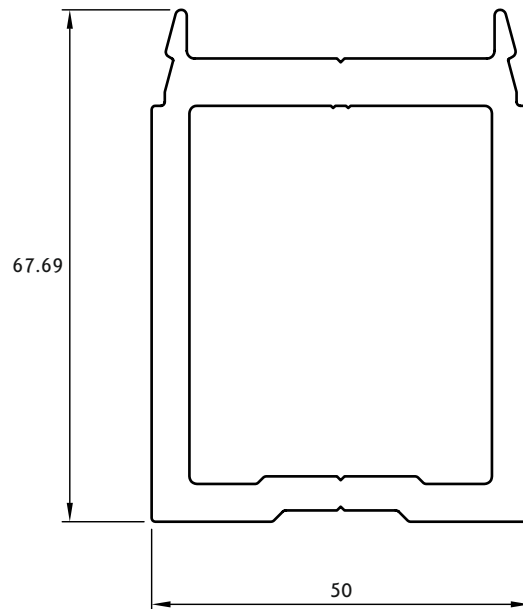
JC30
CILL CARRIER



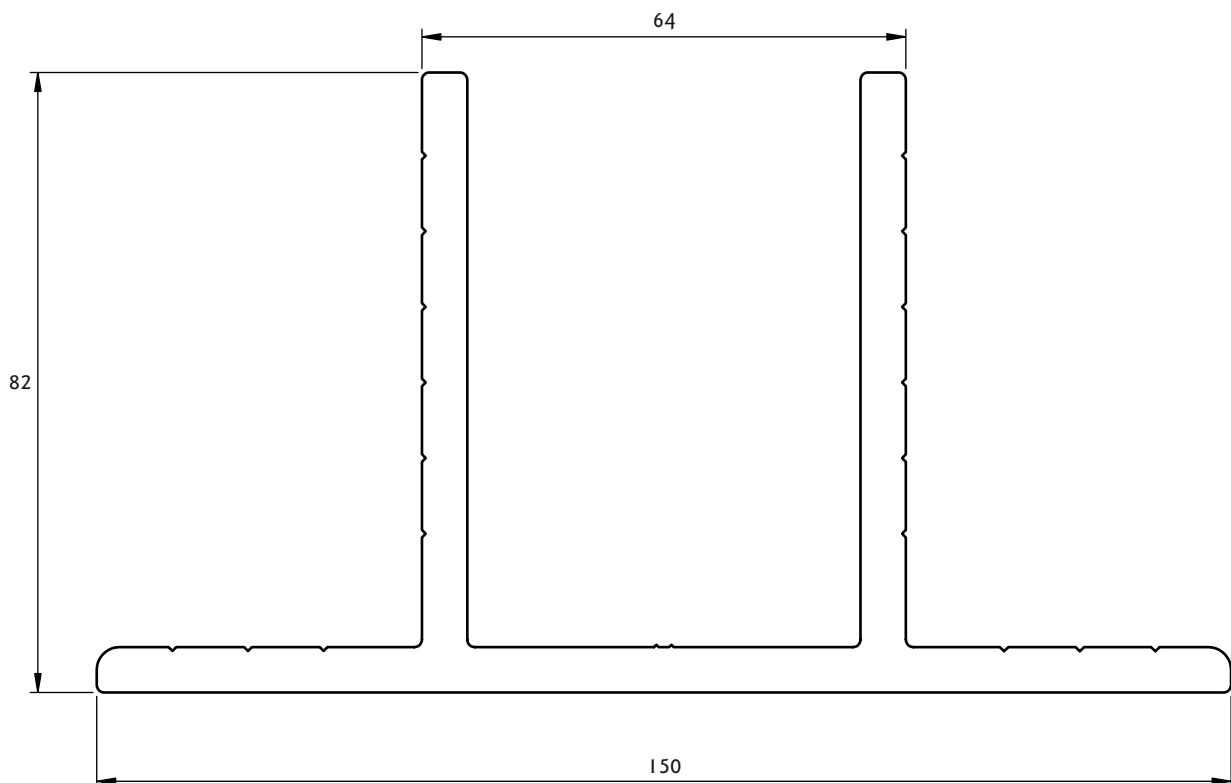
JC36
CILL CARRIER



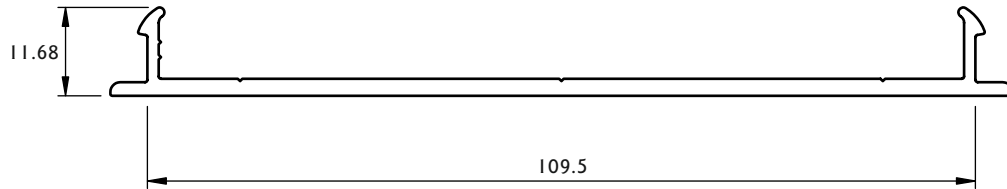
JC42
REINFORCING BAR



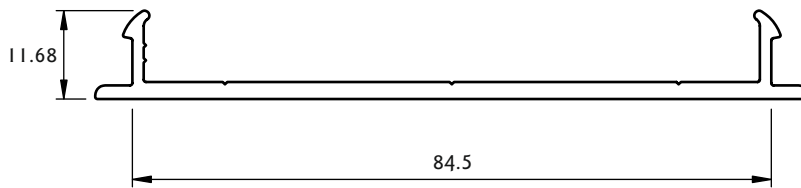
JC41
FIXING BRACKET



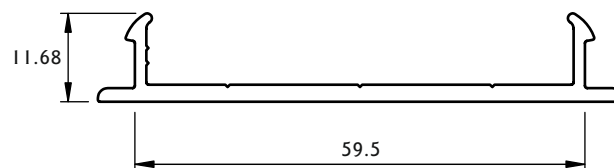
**JCI2
125 mm PLATE**



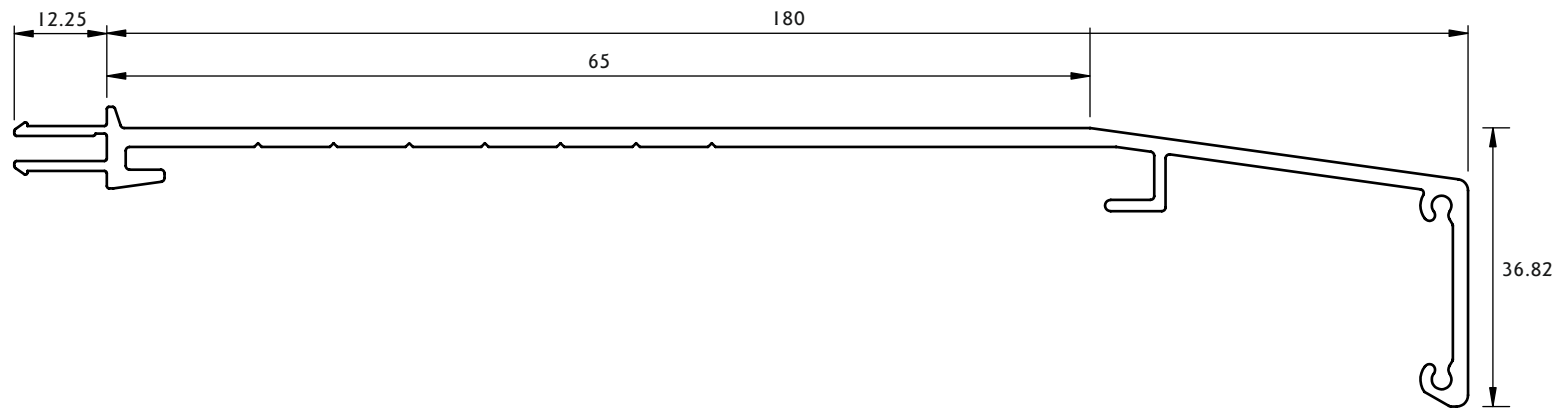
**JCI1
100 mm PLATE**



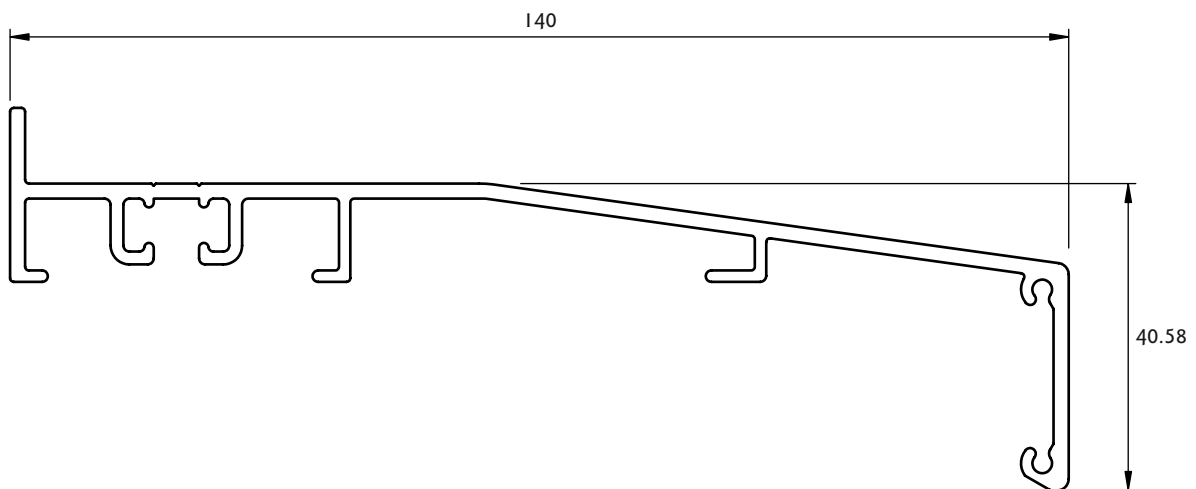
**JCI0
75 mm PLATE**



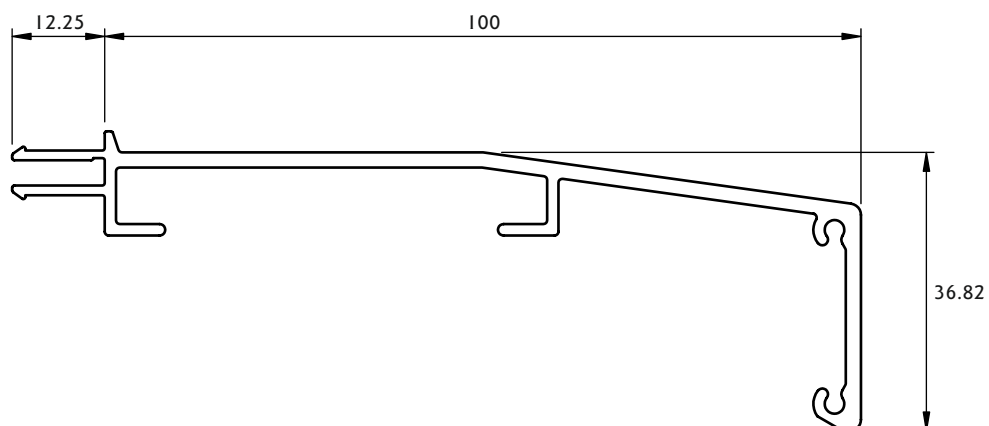
JC34
180 mm CILL



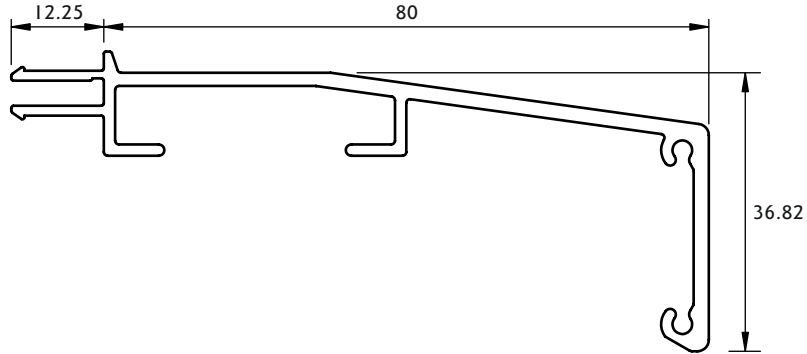
JC35
140 mm CILL



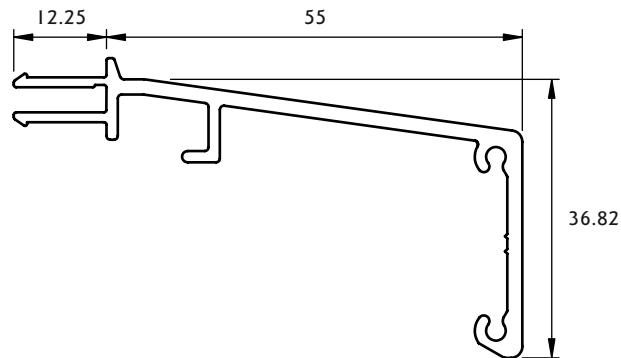
JC33
100 mm CILL



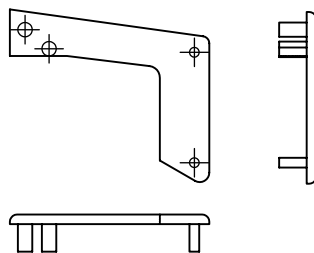
JC32
80 mm CILL



JC31
55 mm CILL

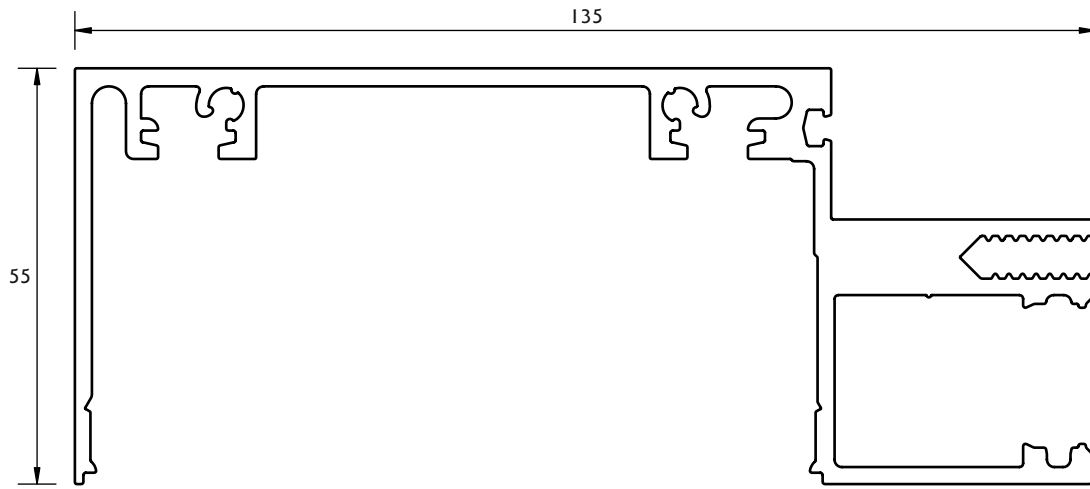


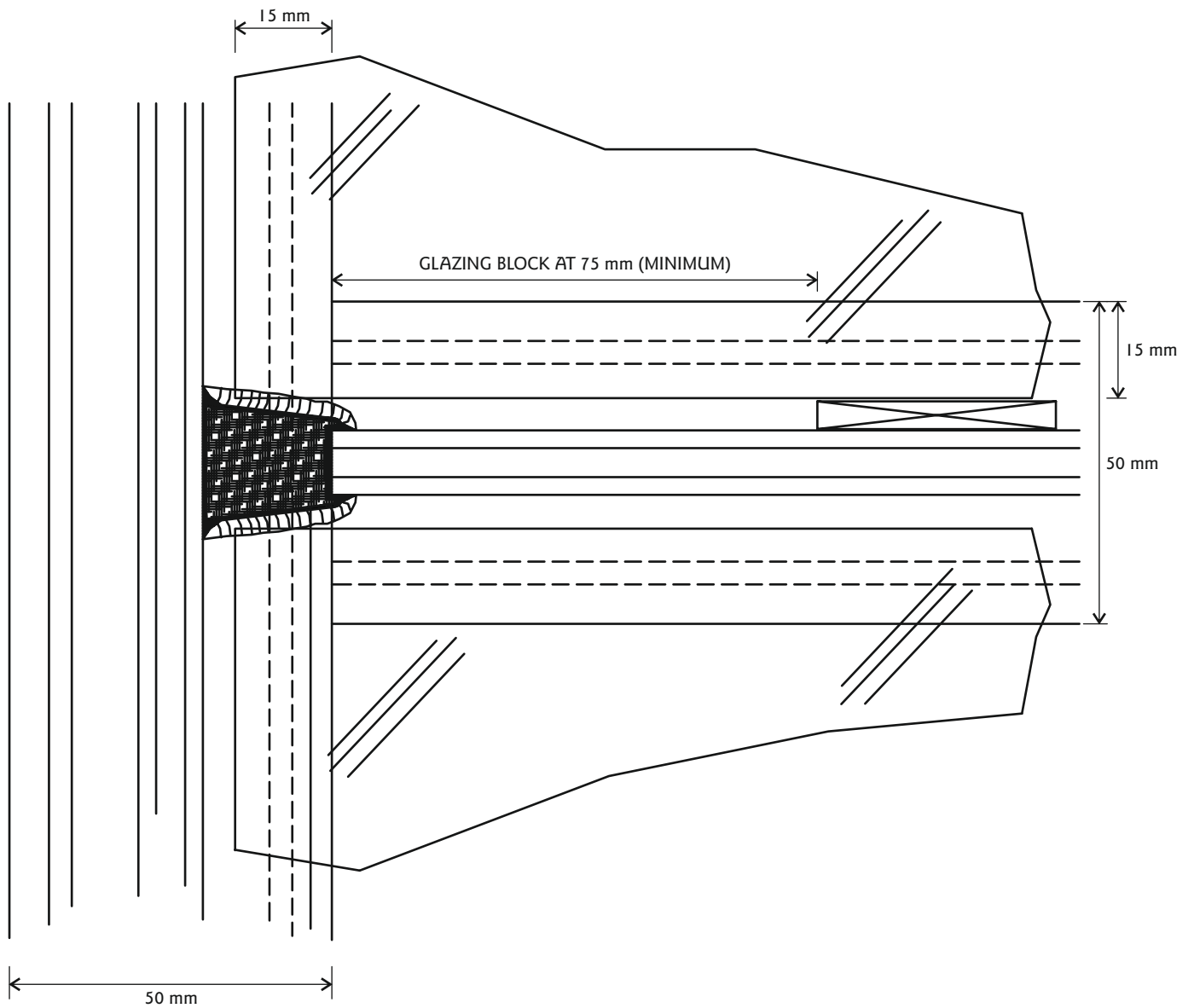
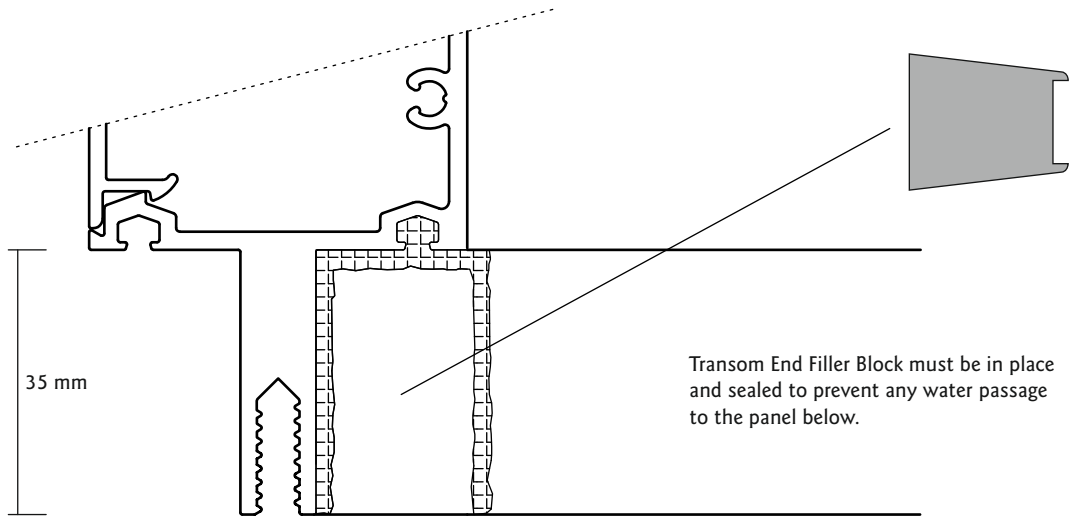
JCA58
END CAP



CURTAIN WALL
Header Bar

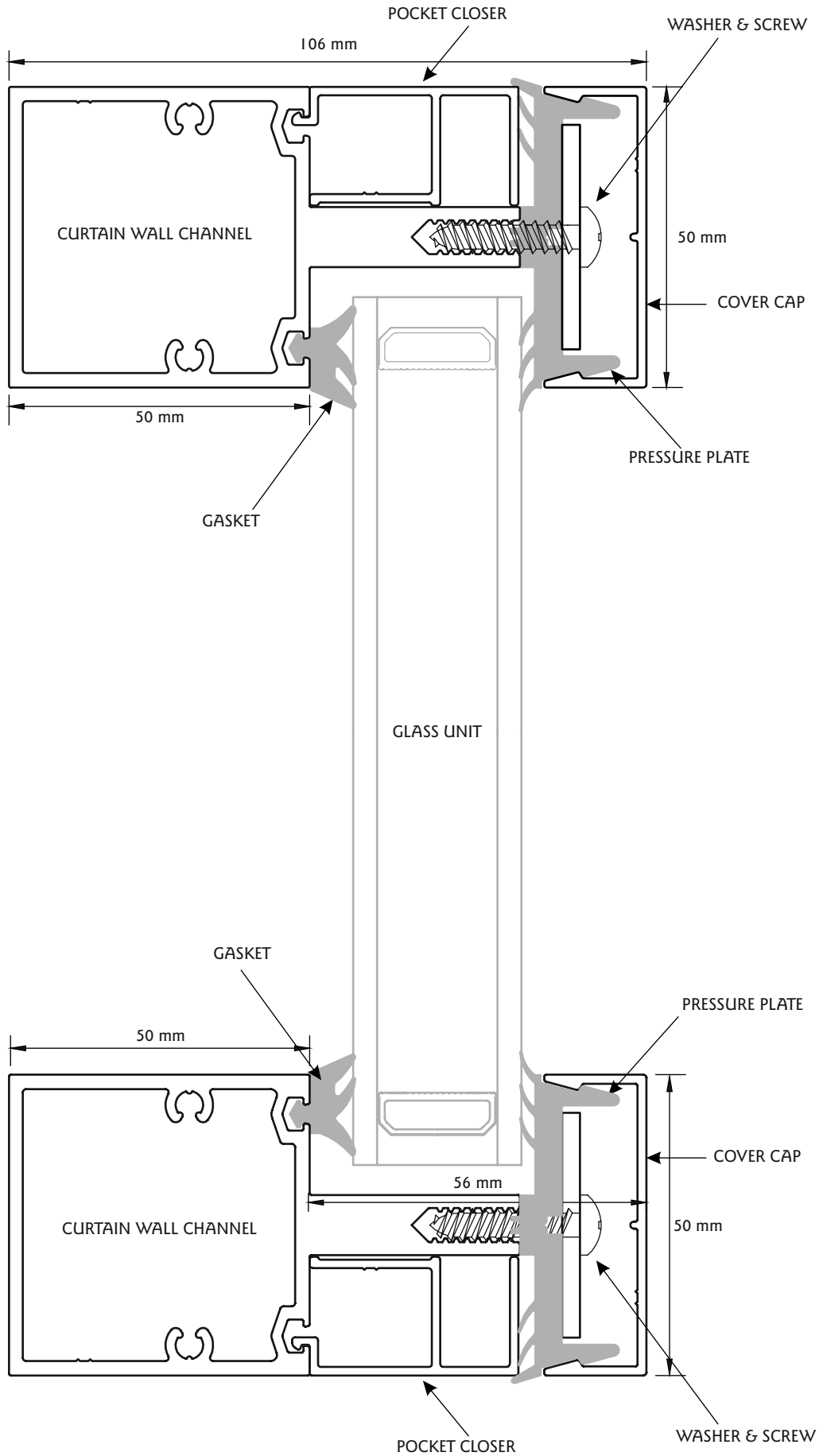
JC05
Header Bar 100 mm

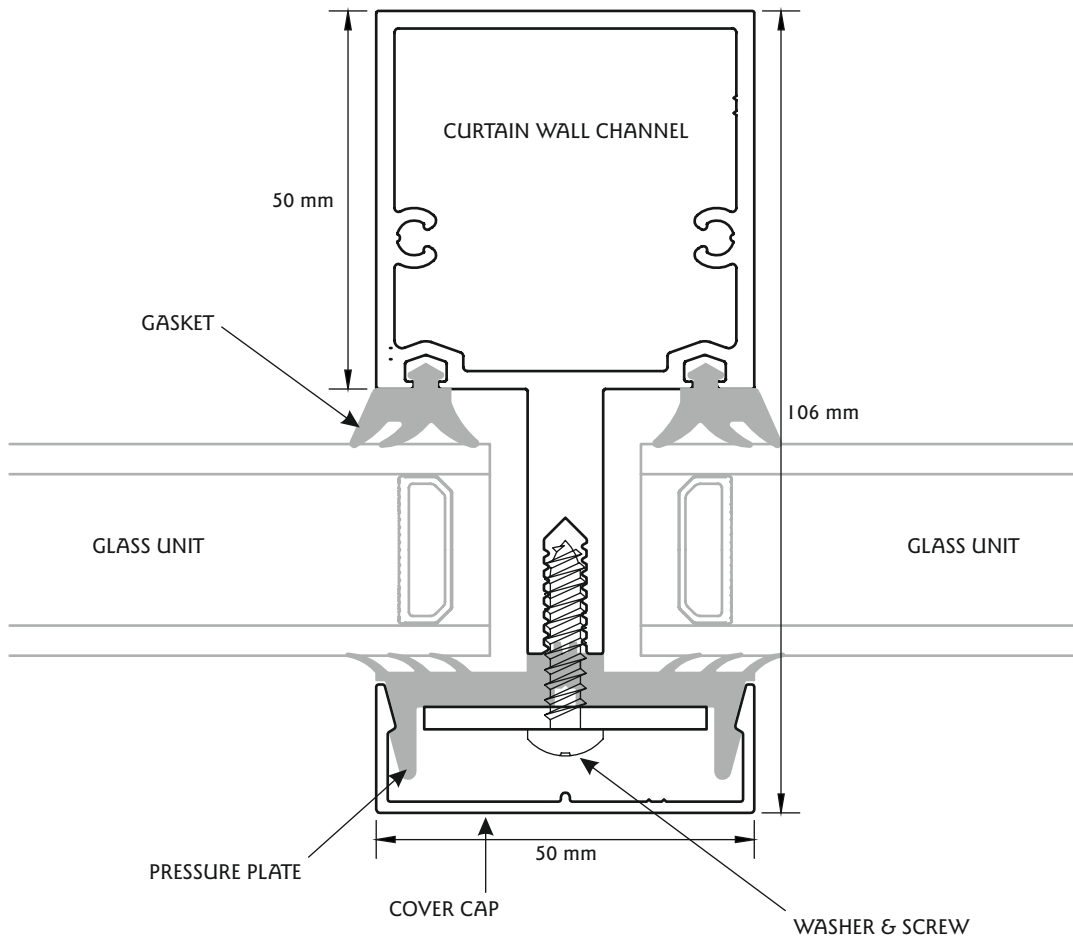
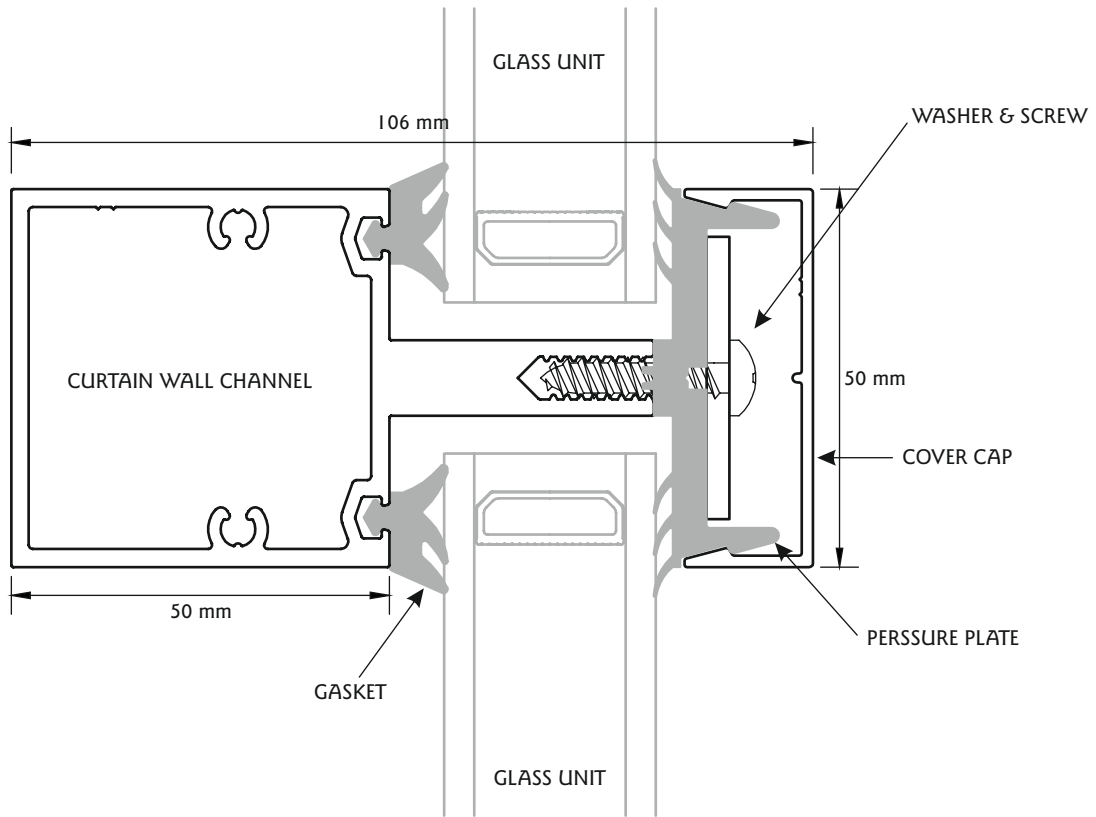




CURTAIN WALL

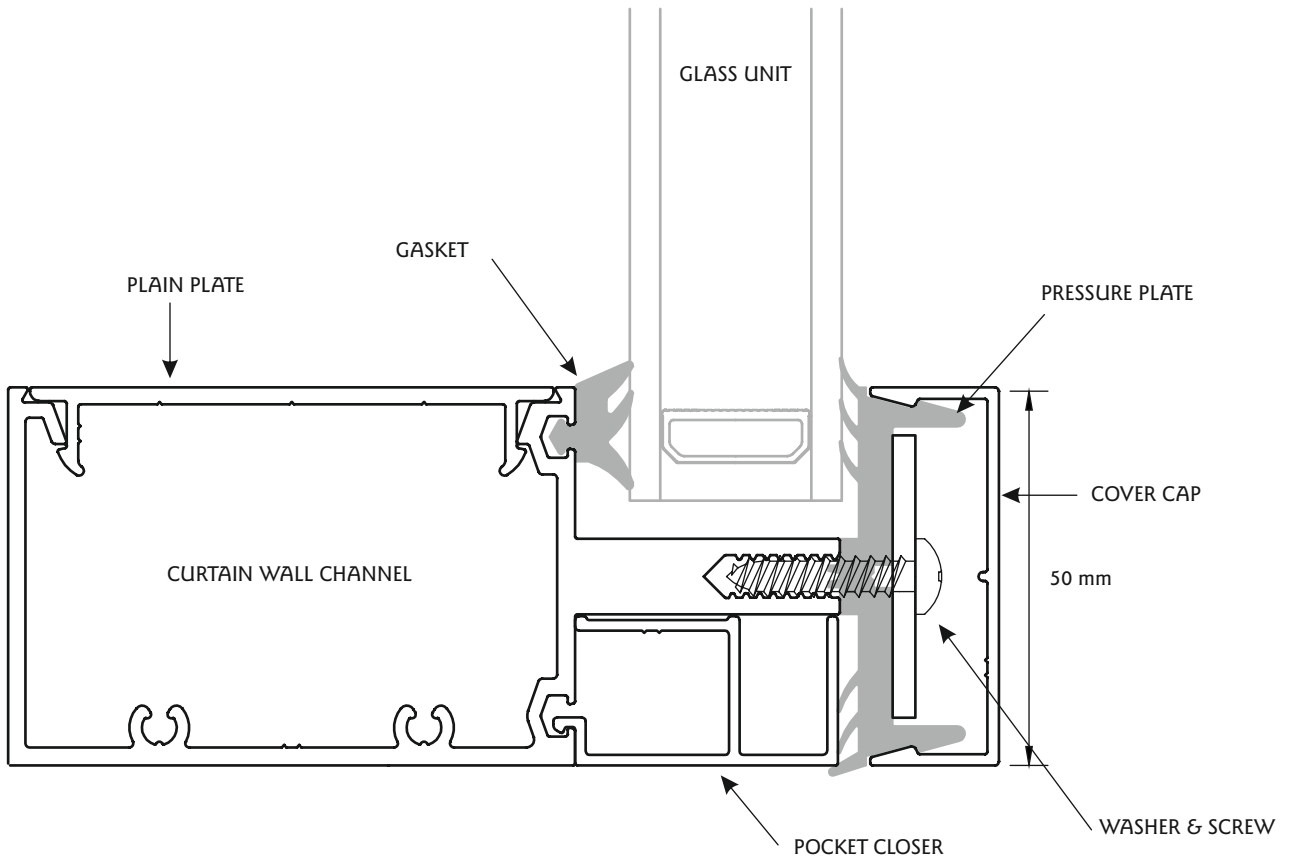
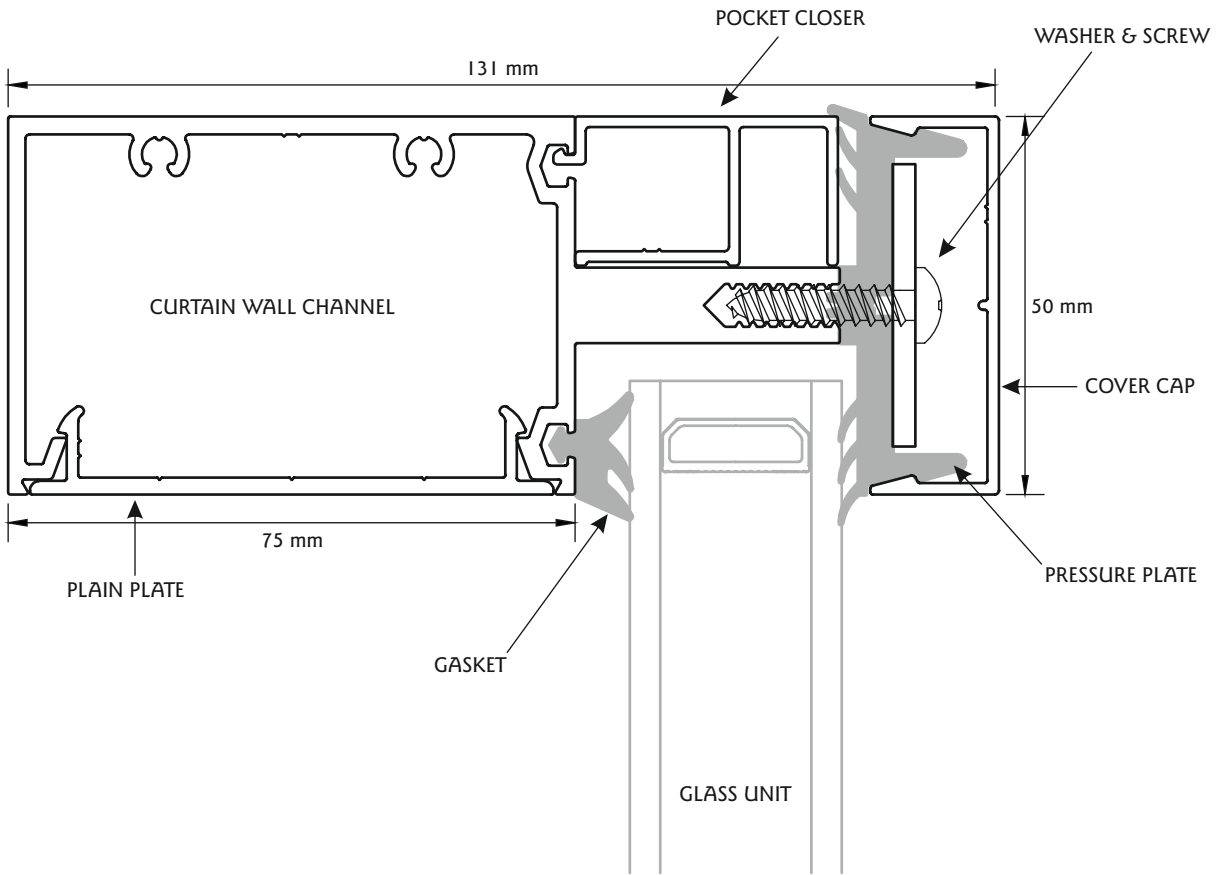
50 mm Jamb, Head & Bottom Assembly

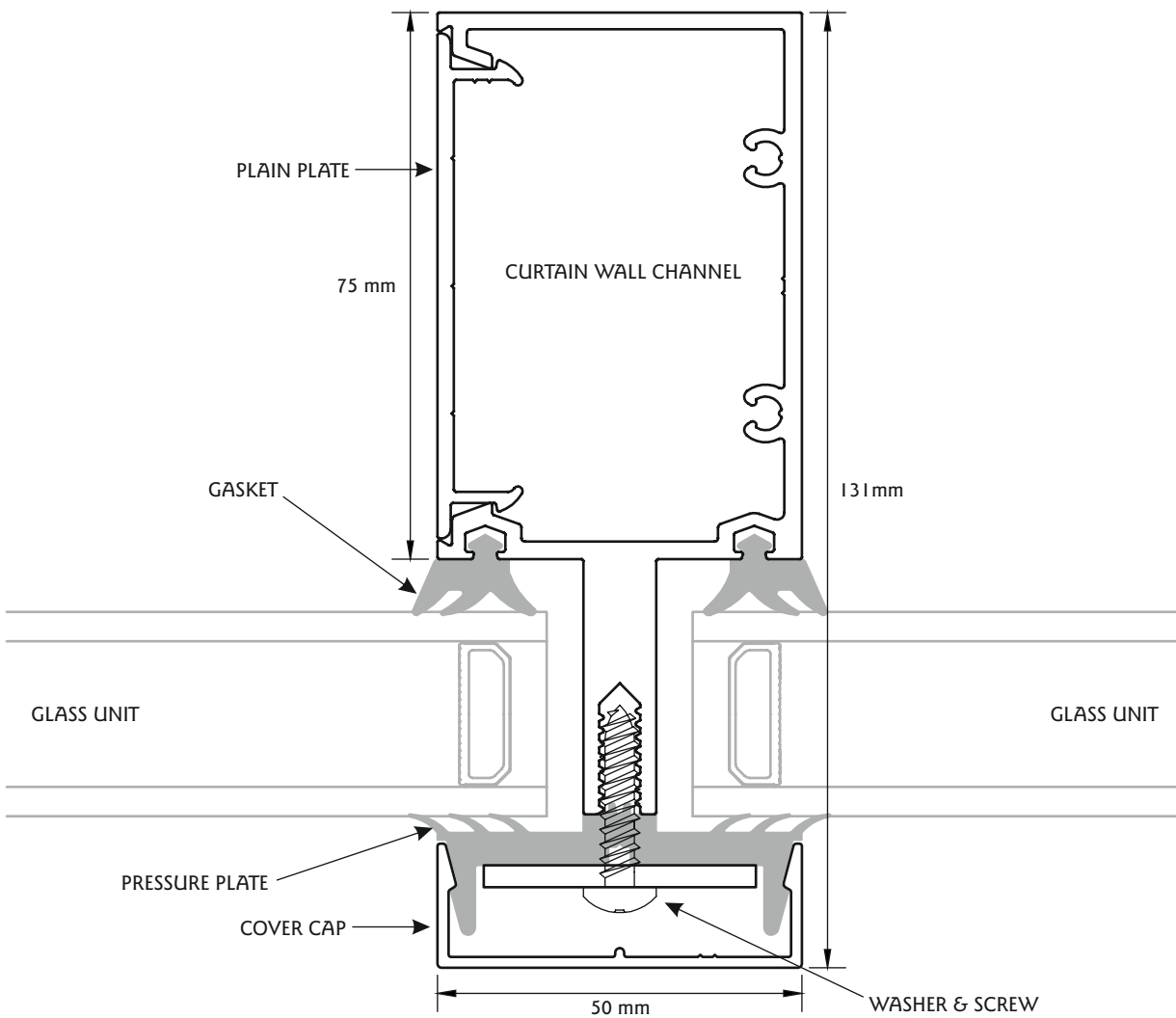
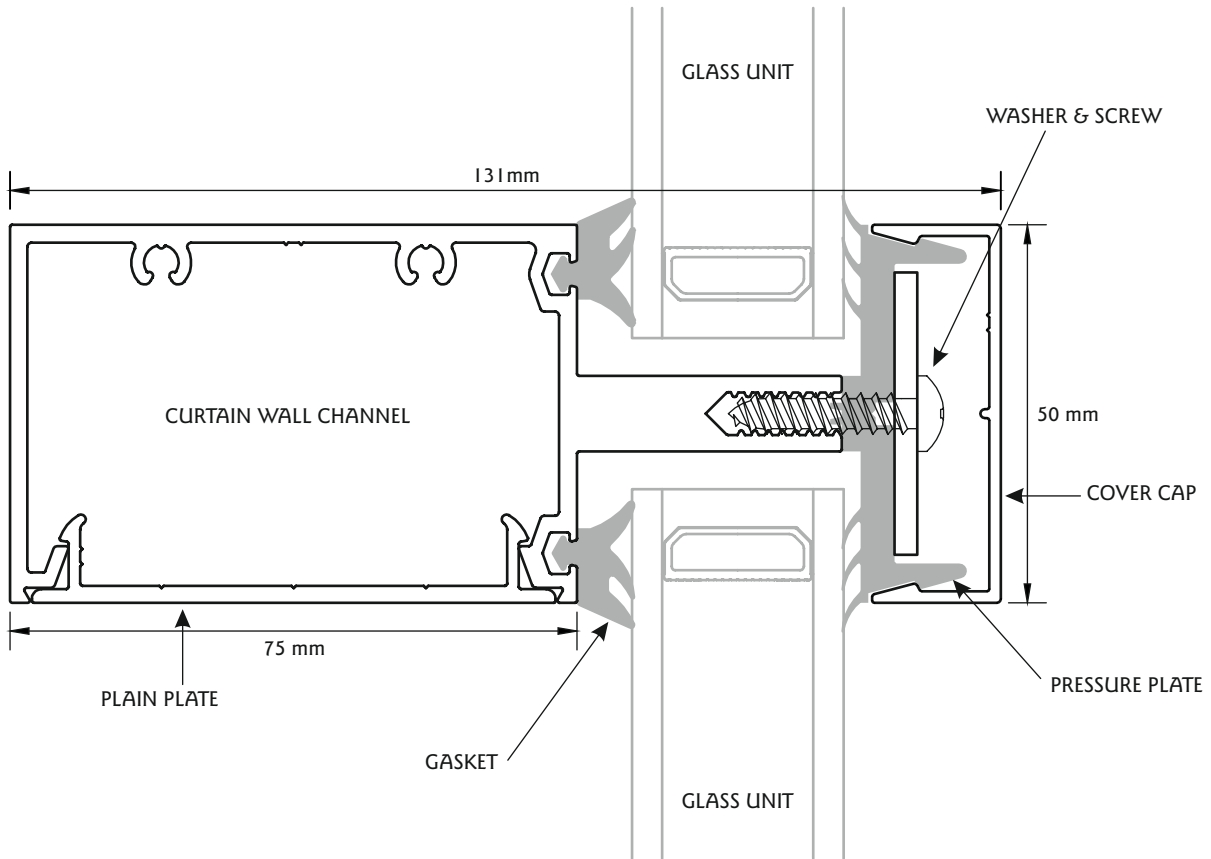




CURTAIN WALL

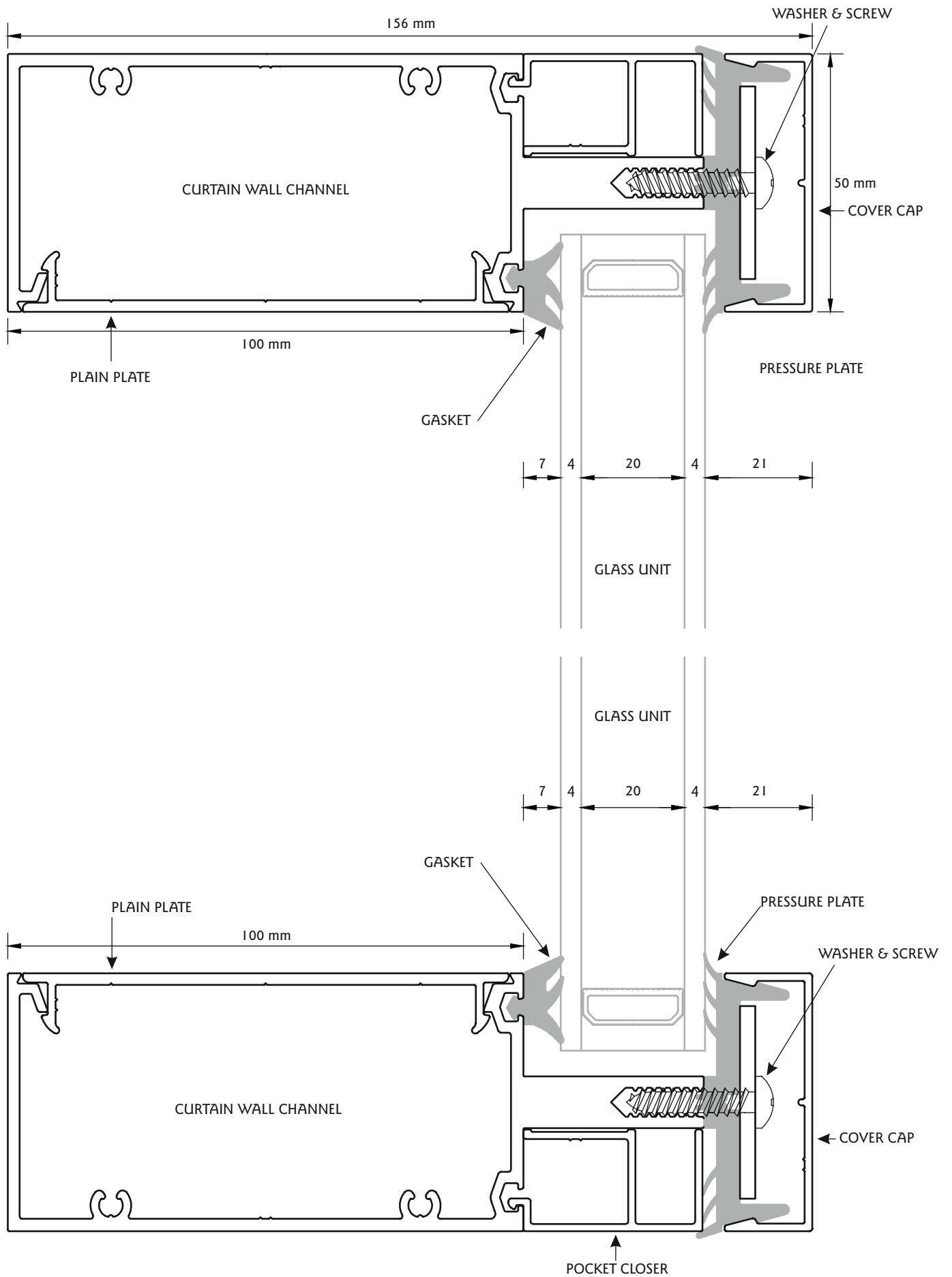
75 mm Jamb, Head & Bottom Assembly

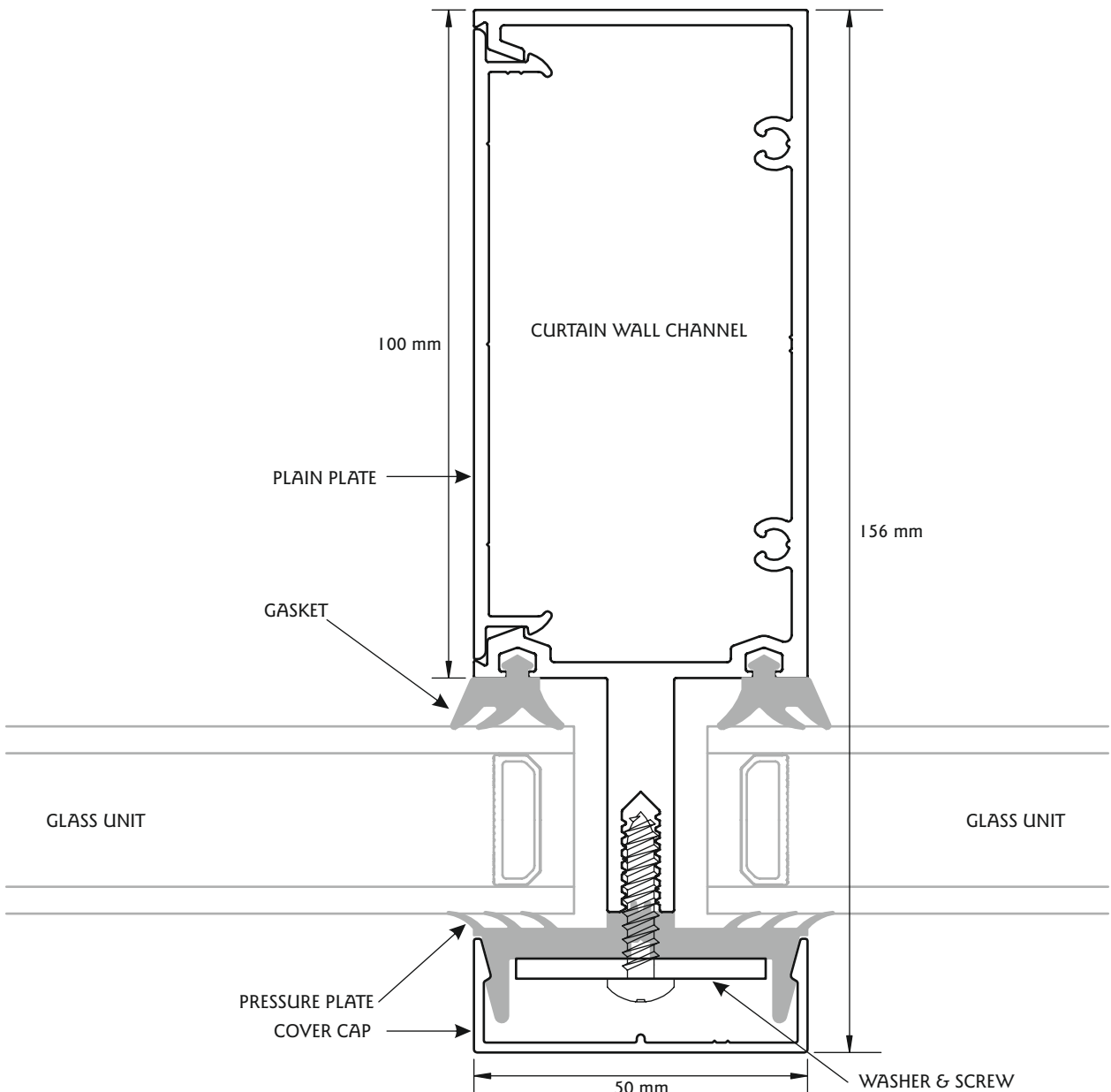
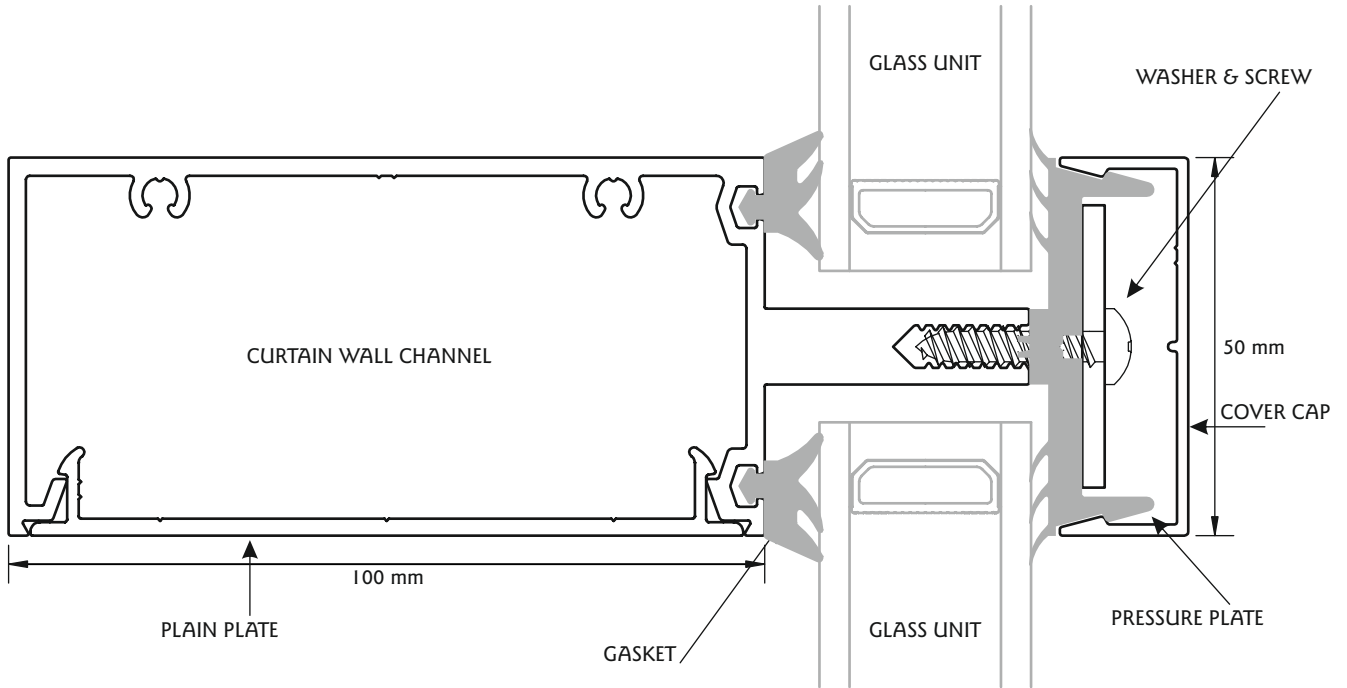




CURTAIN WALL

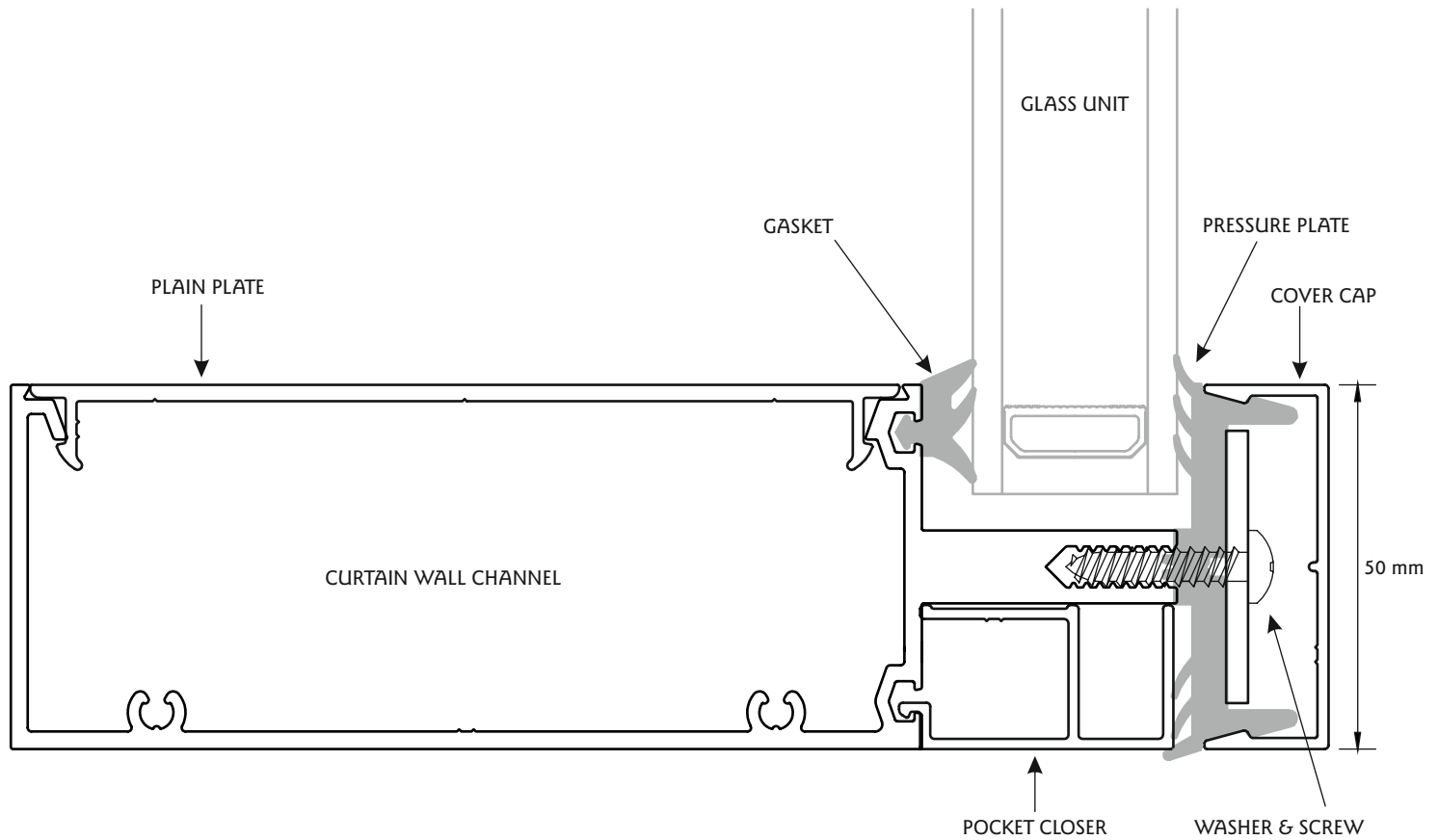
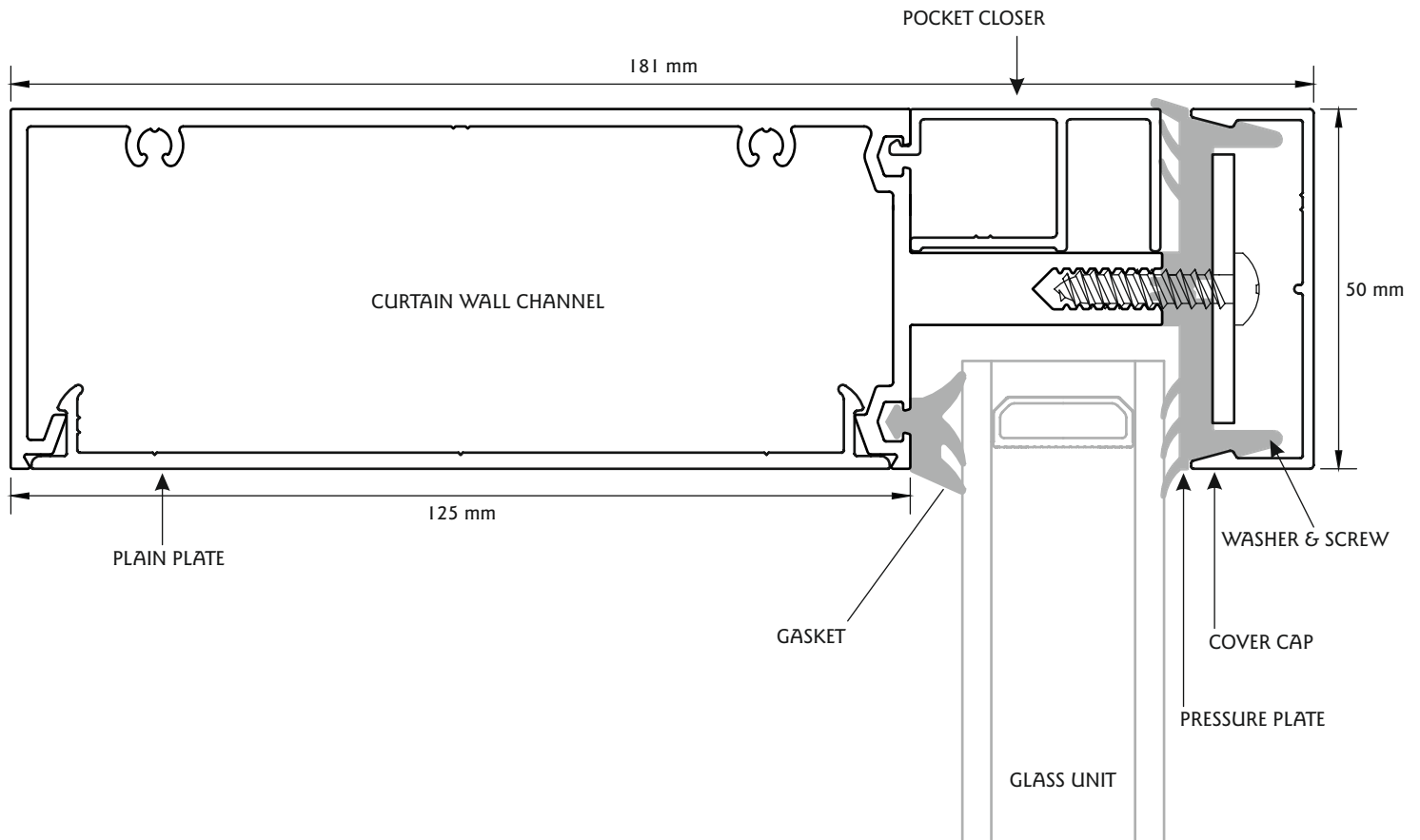
100 mm Jamb, Head & Bottom Assembly





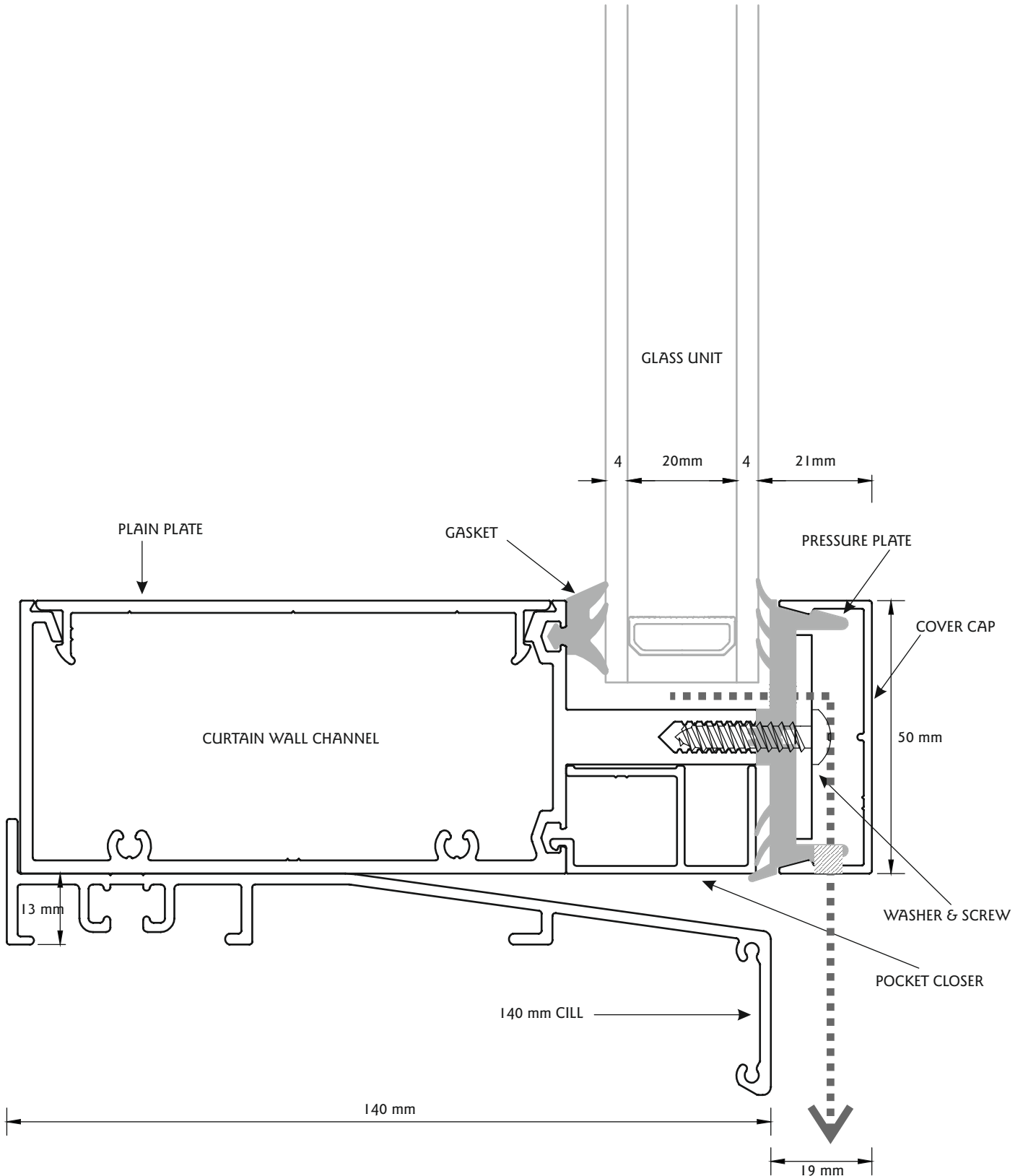
CURTAIN WALL

125 mm Jamb, Head & Bottom Assembly



Slot 8 x 15 to under side of Cap and Pressure Plate — 100 mm from both ends.

Seal both ends of Transom with Transom Block.

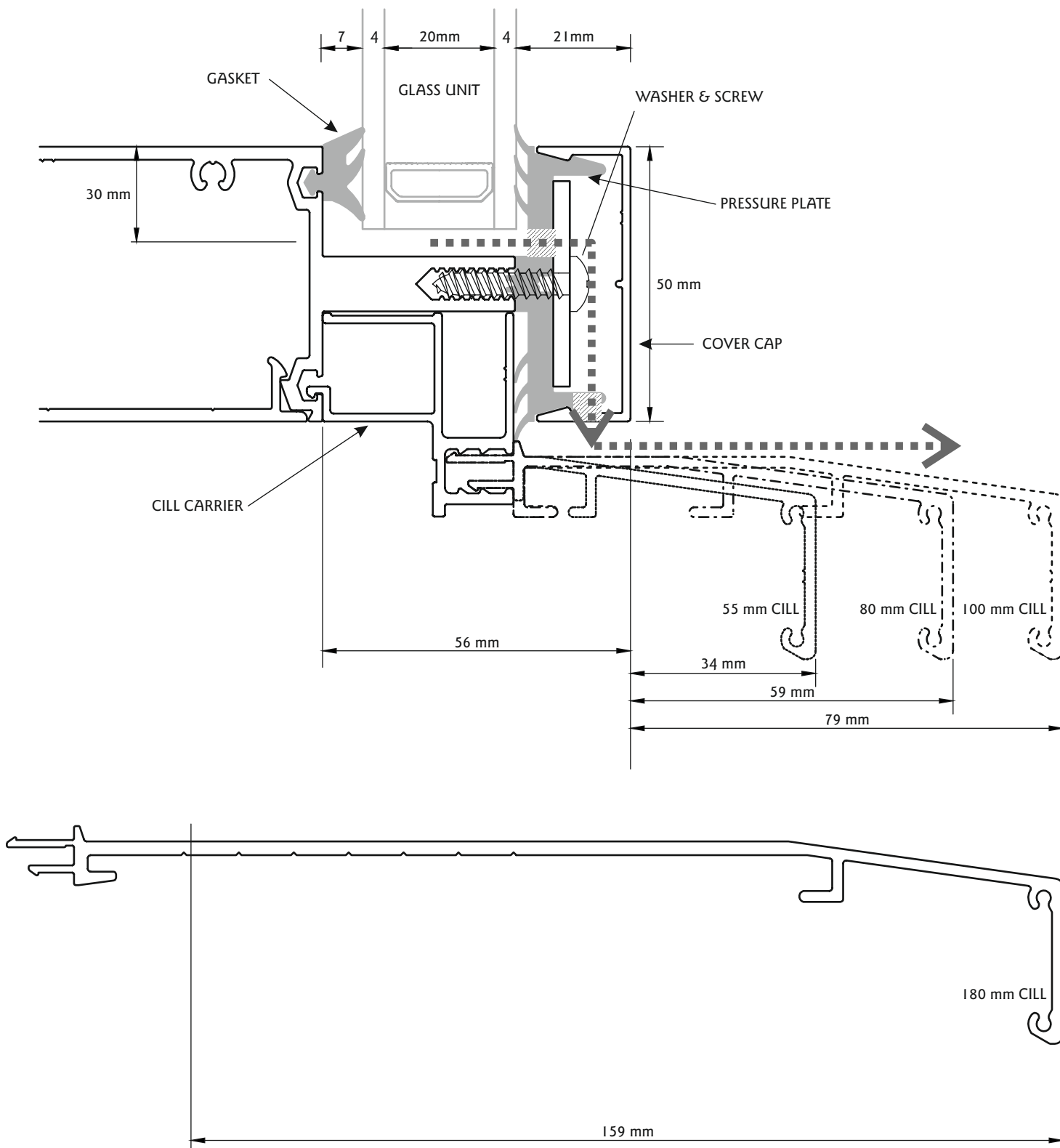


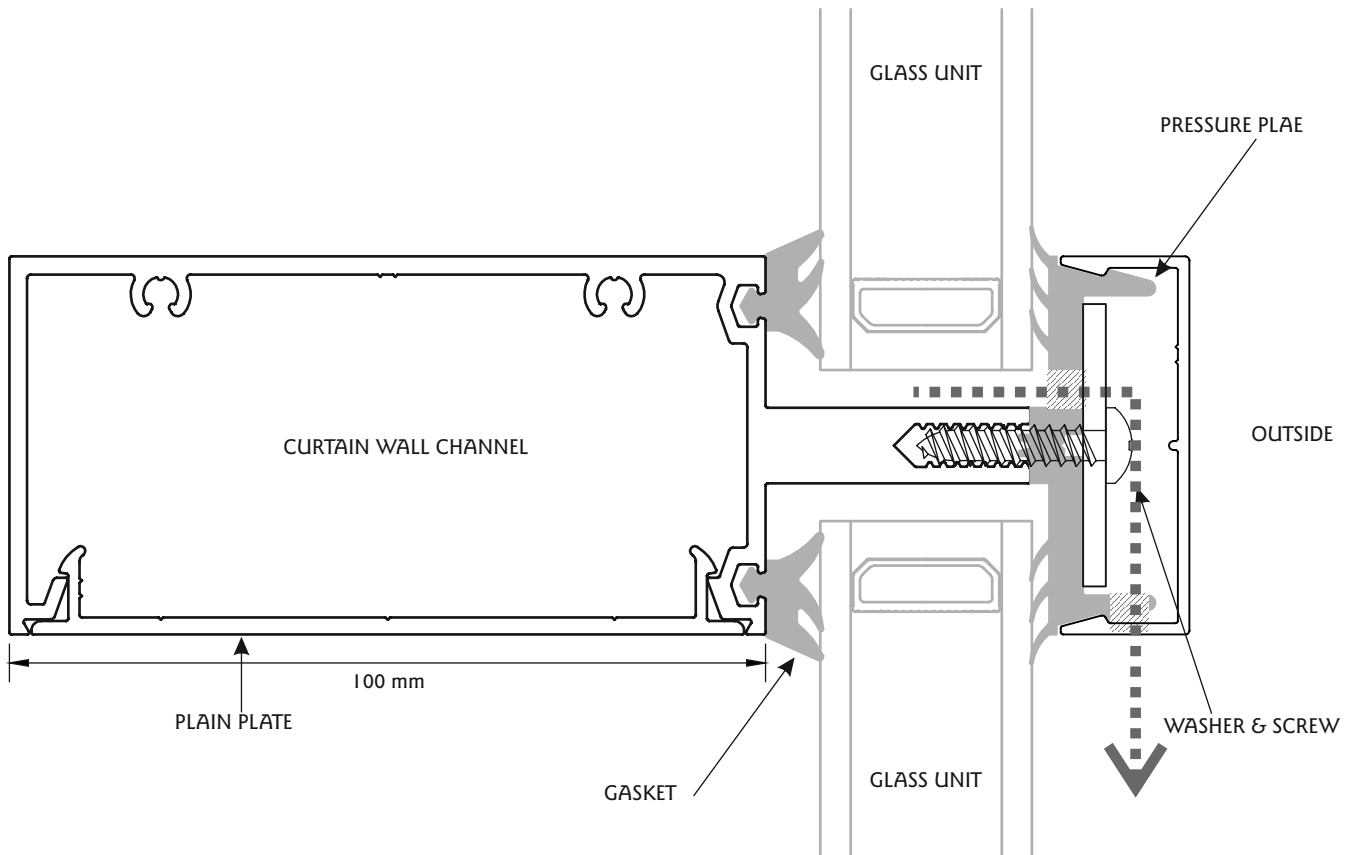
CURTAIN WALL

Cill Arrangement

Slot 8 x 15 to under side of Cap and Pressure Plate — 100 mm from both ends.

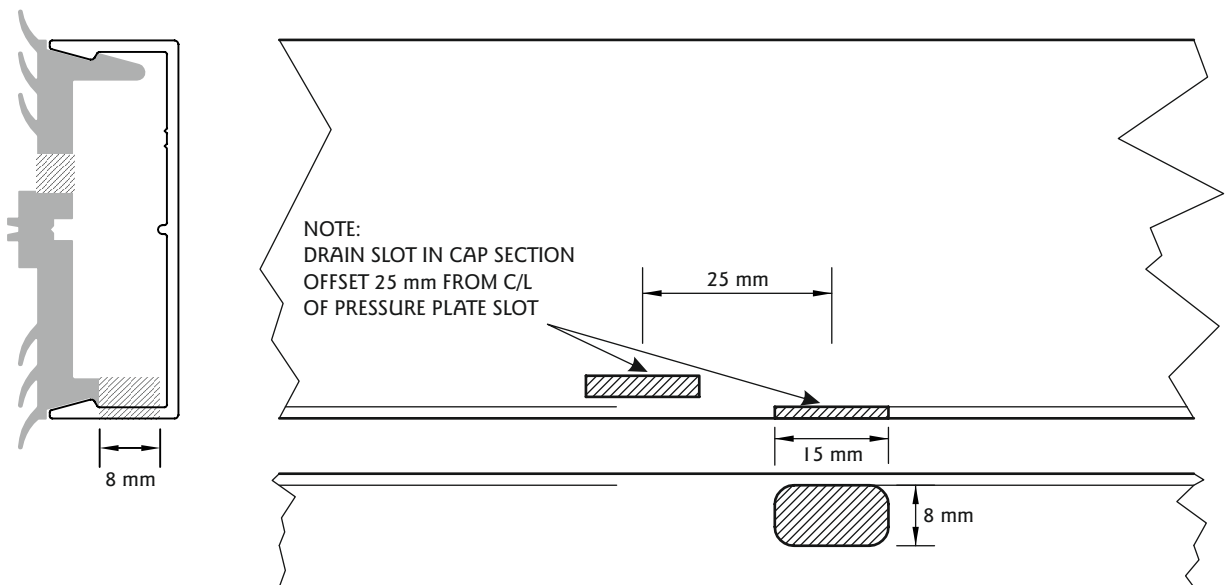
Seal both ends of Transom with Transom Block.





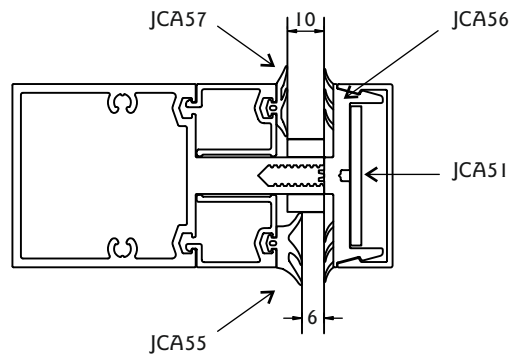
Slot 8 x 15 to under side of Cap and Pressure Plate — 100 mm from both ends.

Seal both ends of Transom with Transom Block.

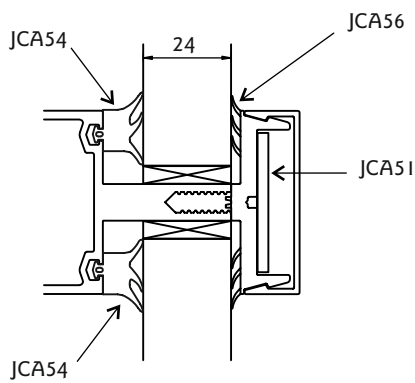


COVER CAP DRAINAGE SLOT
AT 15 x 8 mm IN UNDERSIDE OF CAP EXTRUSION

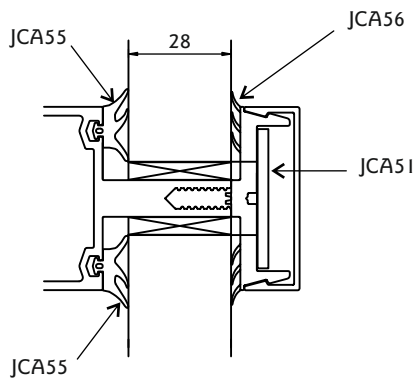
6.6 mm SINGLE GLAZED



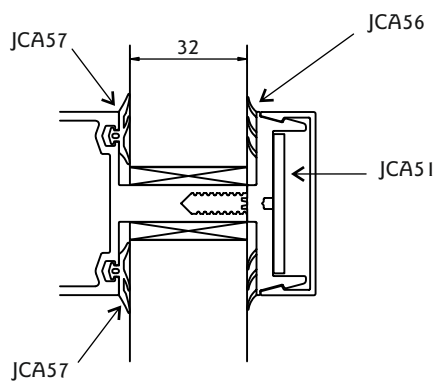
24 mm SEALED UNITS

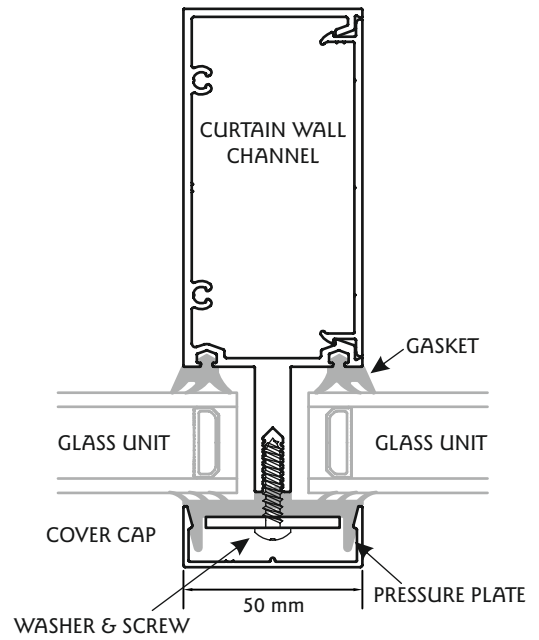
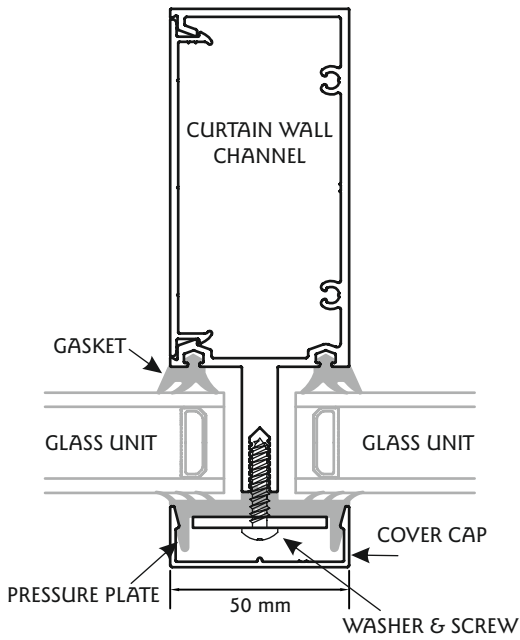


28 mm SEALED UNITS



32 mm SEALED UNITS





JAMB to MULLION

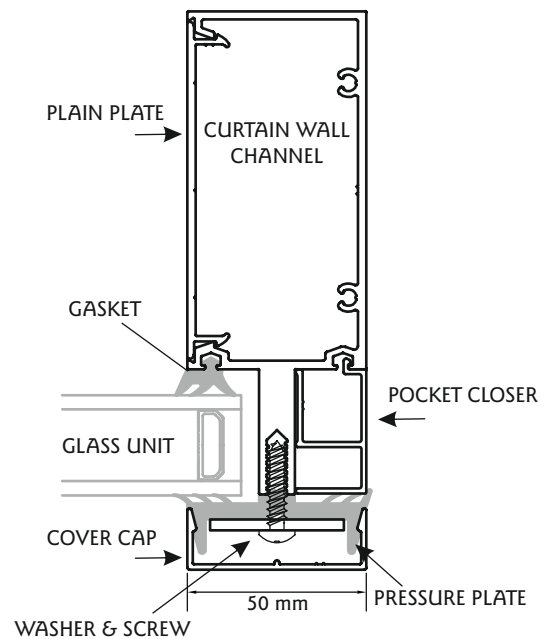
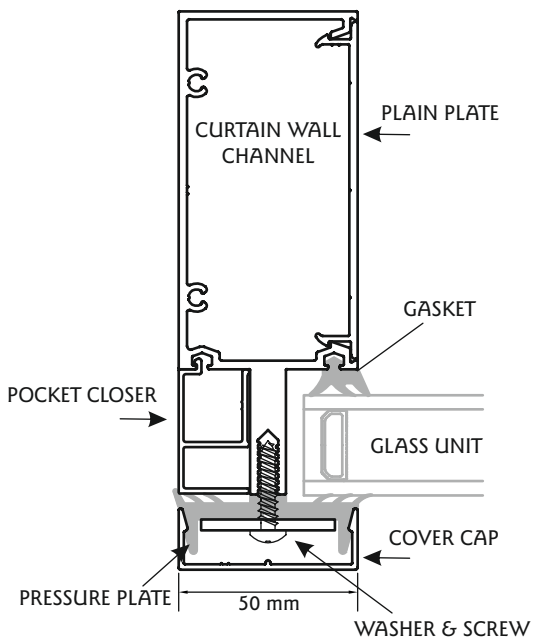
Glass:	-45 mm
Transom:	-75 mm
Pressure Plate:	-78 mm
Cover Plate:	-76 mm

MULLION to MULLION

Glass:	-20 mm
Transom:	-50 mm
Pressure Plate:	-53 mm
Cover Plate:	-51 mm

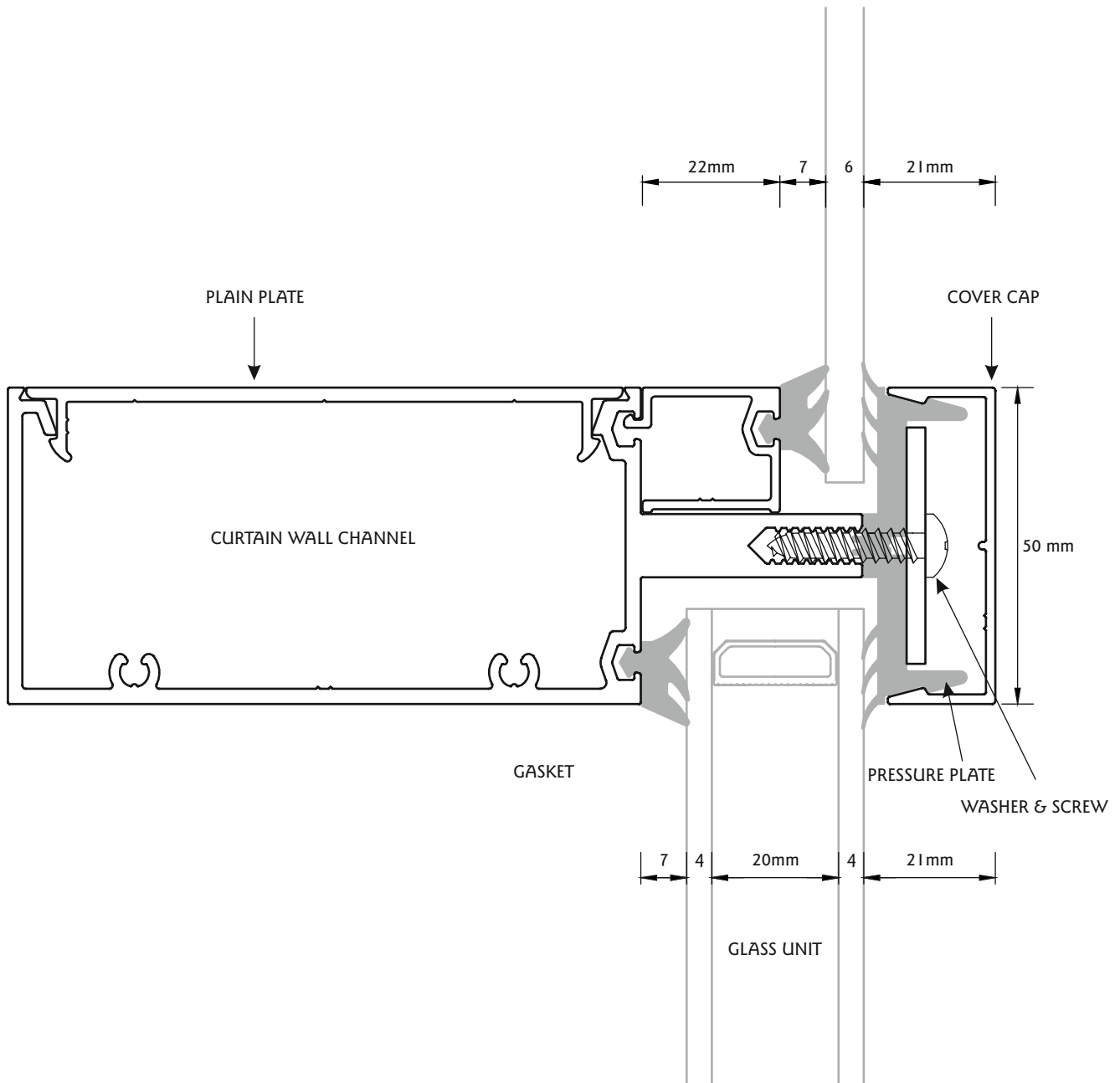
JAMB to JAMB

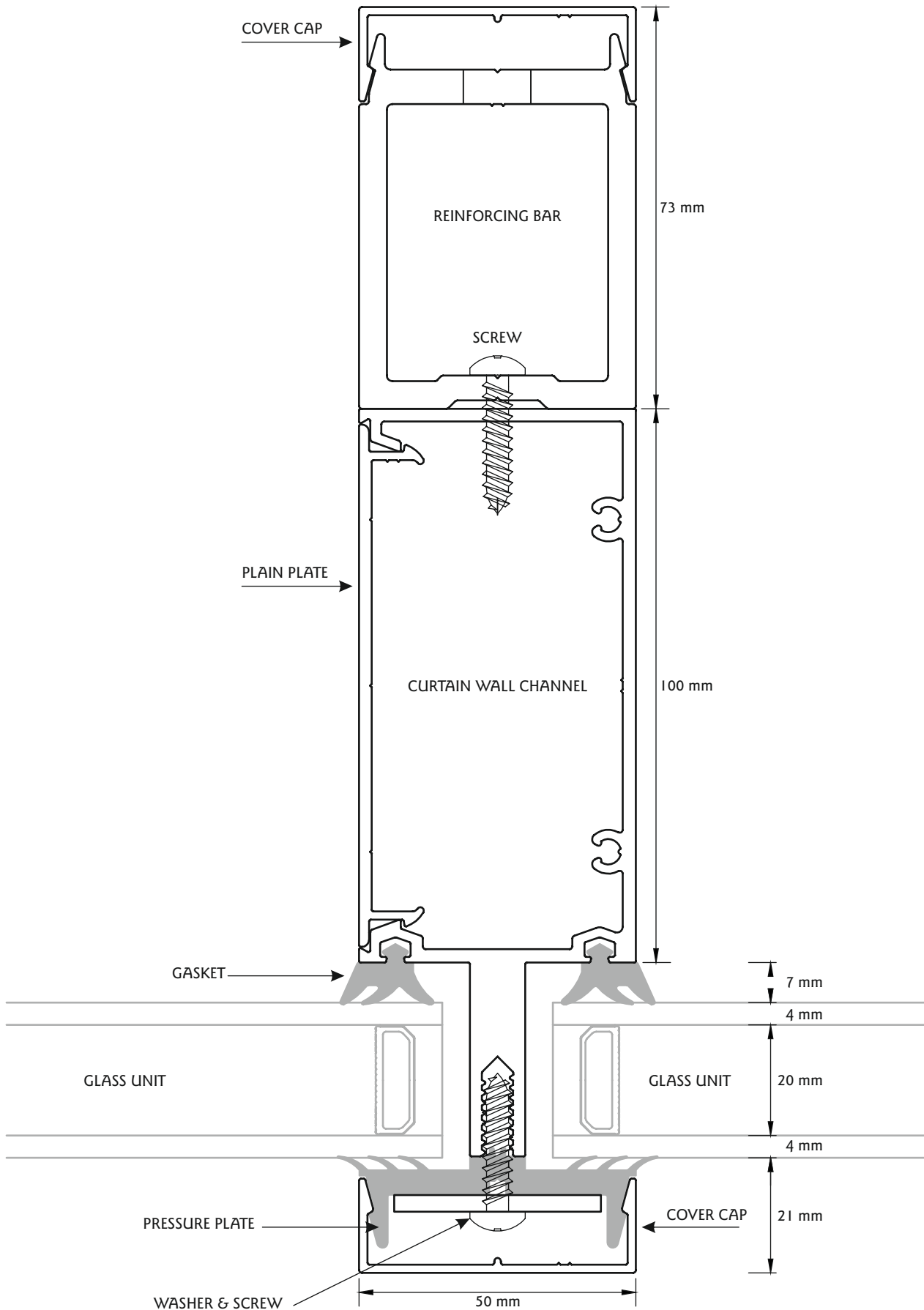
Glass:	-70 mm
Transom:	-100 mm
Pressure Plate:	-103 mm
Cover Plate:	-101 mm



CURTAIN WALL

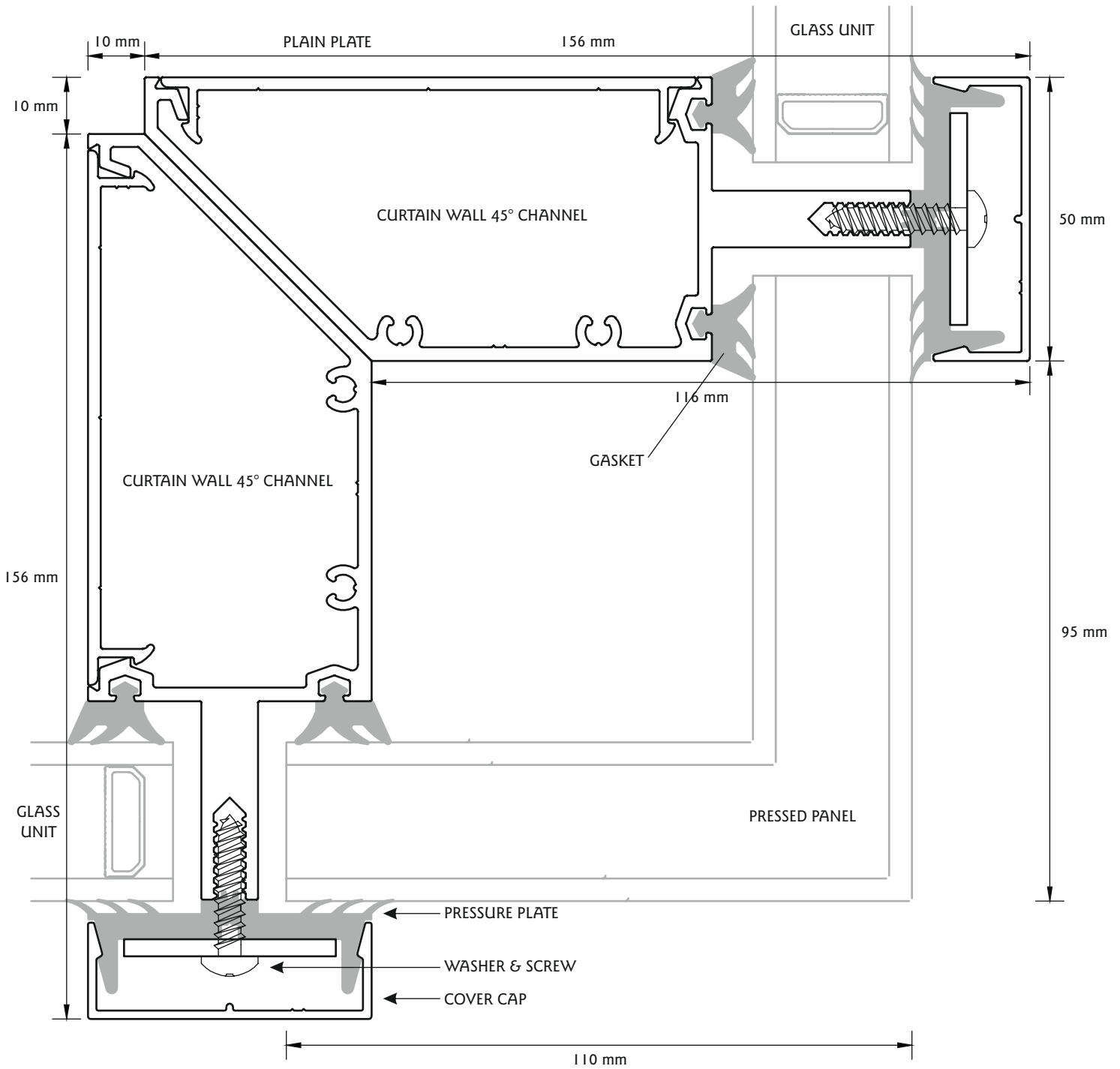
Single Glaze Arrangement

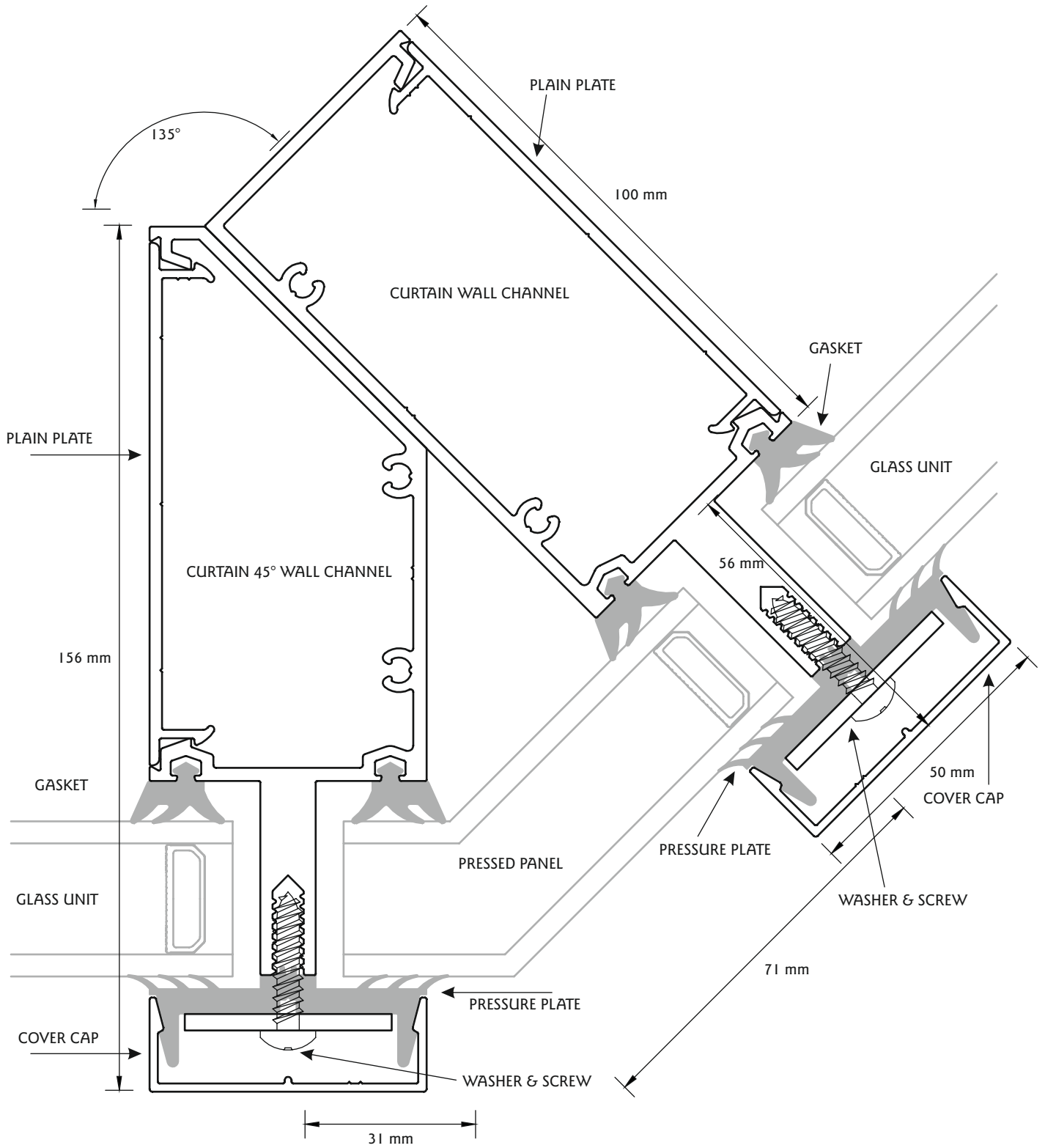




CURTAIN WALL

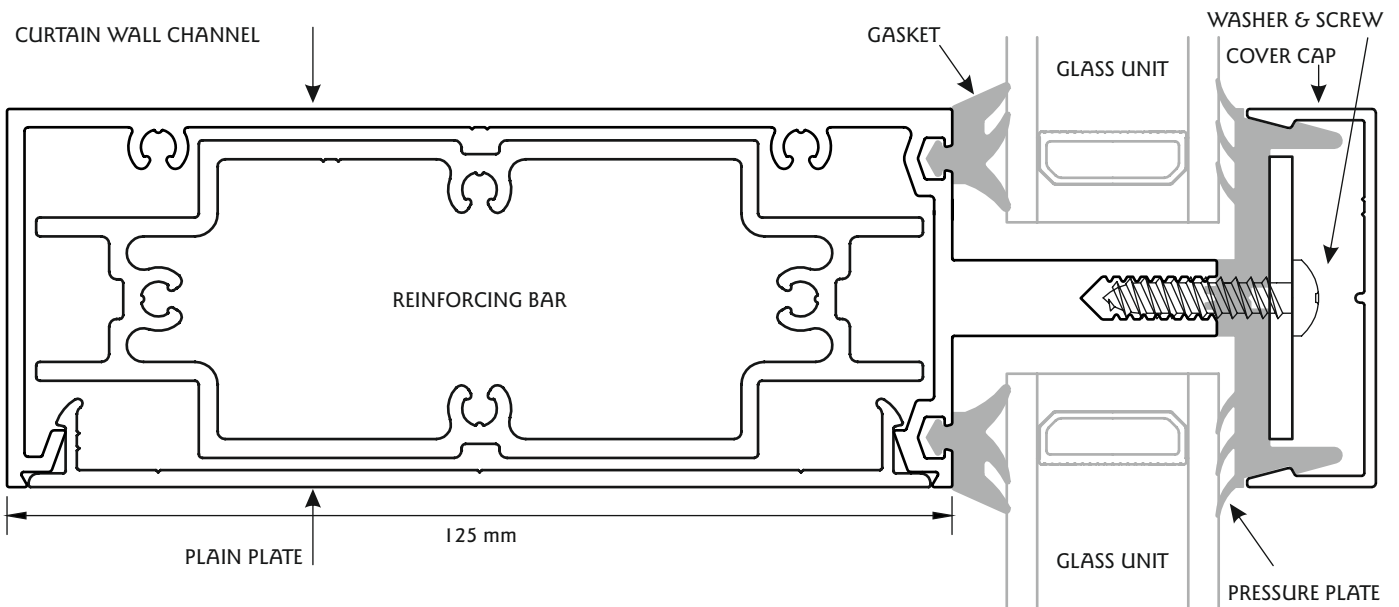
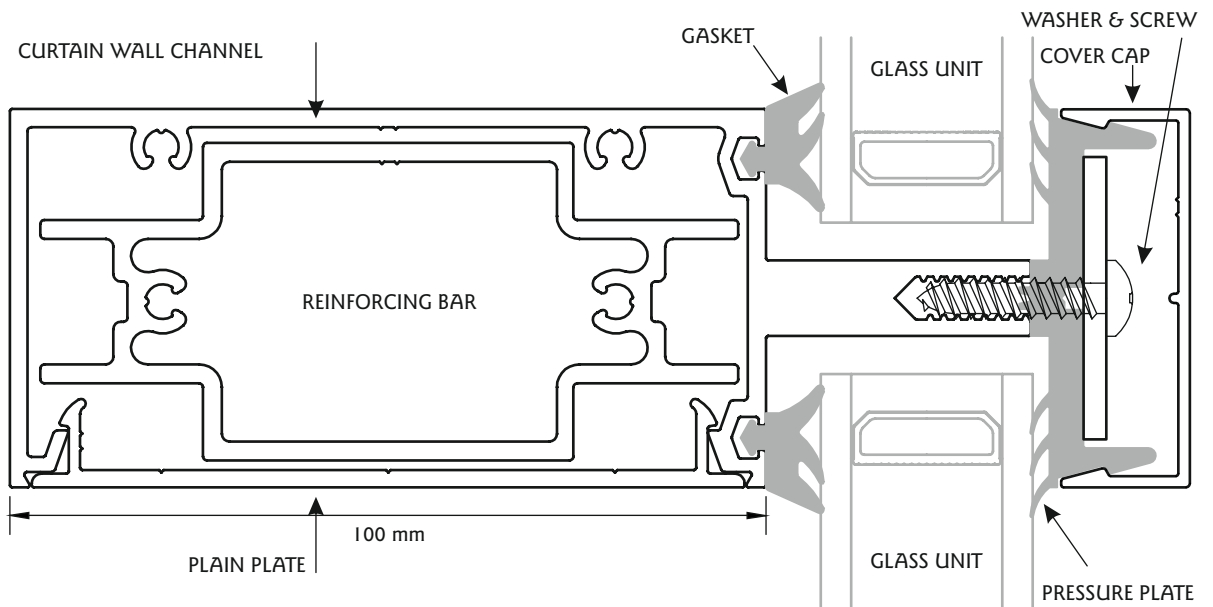
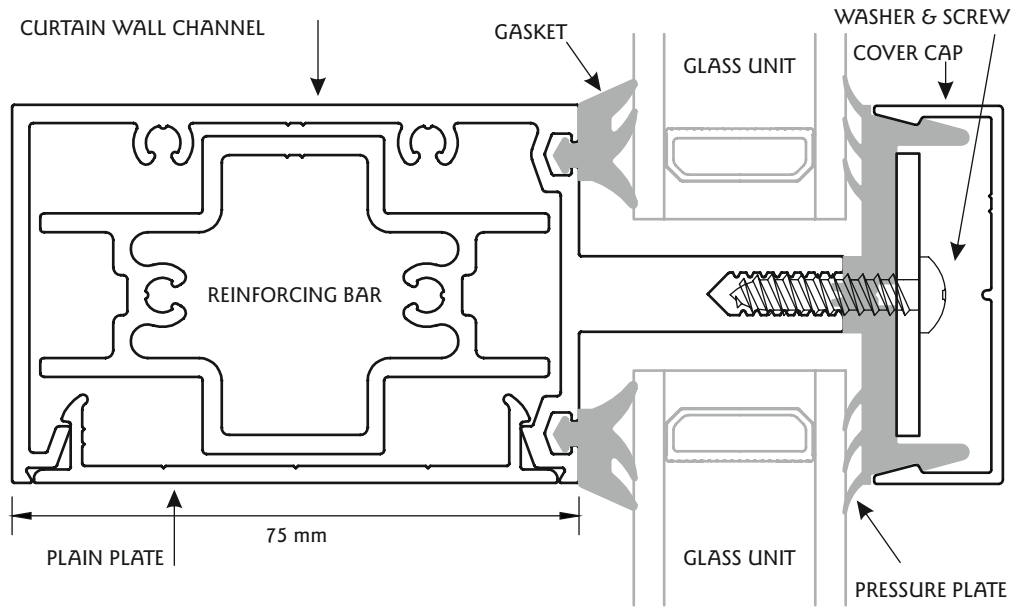
90° Corner Arrangement

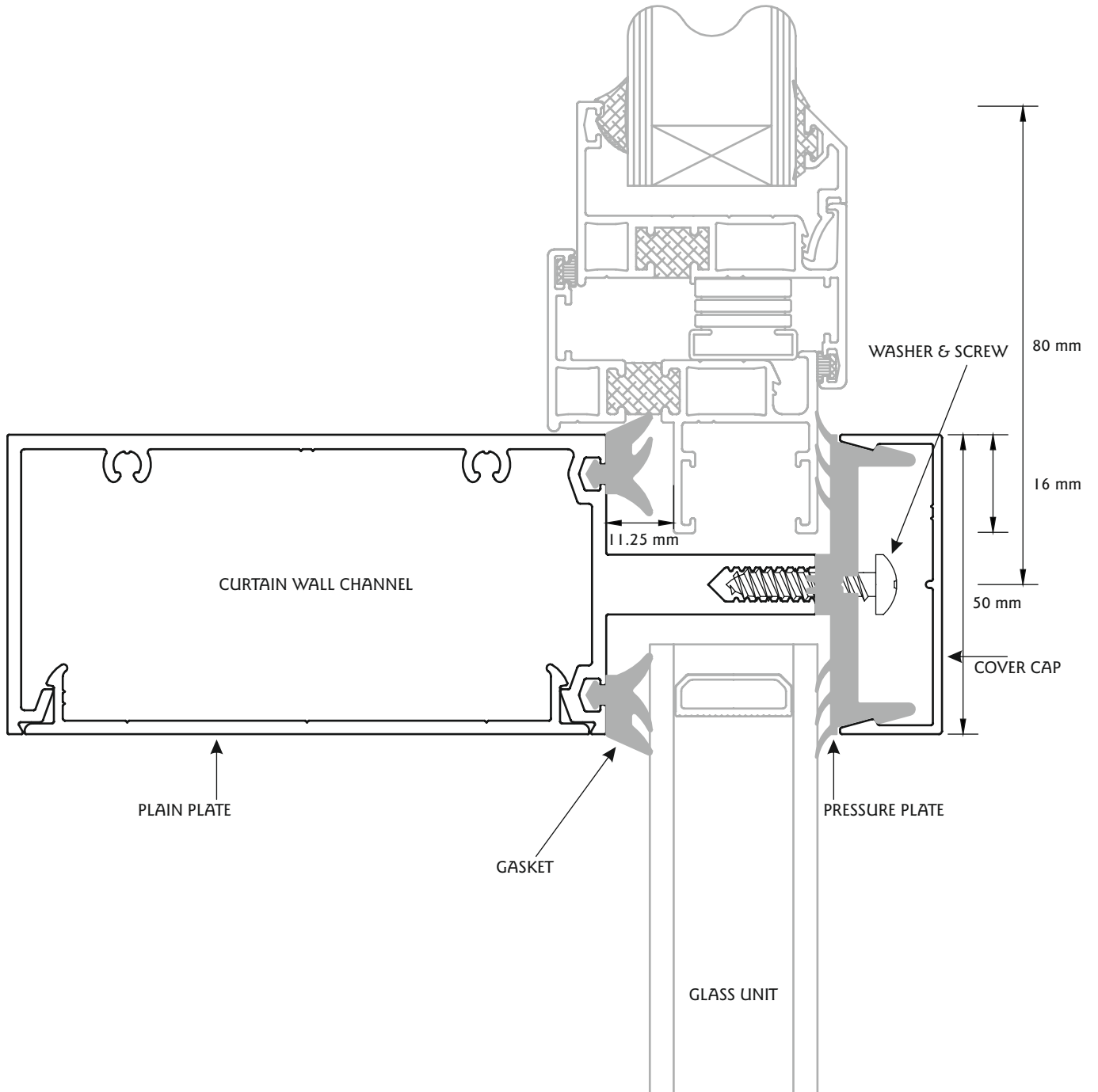




CURTAIN WALL

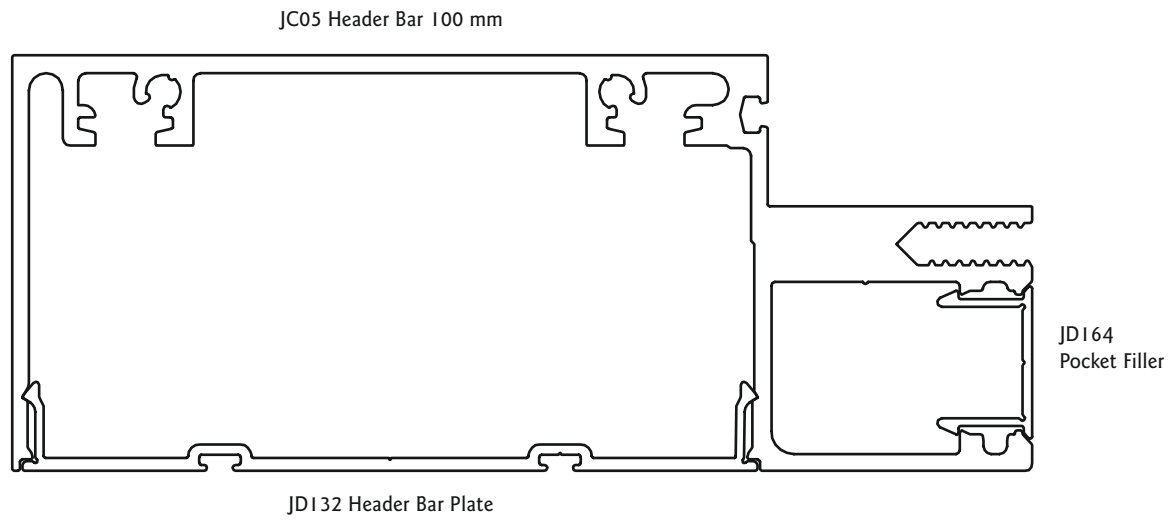
Channel Reinforcing Arrangement





CURTAIN WALL

Header Bar Arrangement



B.S. COLOURS

BS Nos.	GLOSS	CAT	SATIN	CAT	MATT	CAT
00A01					STD	B
00A05	STD	B	STD	B	STD	B
00A09	STD	C				
00A13					STD	B
00E55					STD	S
04C39	STD	B			STD	B
04E53	STD	D	STD	D	STD	D
06C33					STD	B
08B15					STD	B
08B29	STD	A	STD	A	STD	A
08C31	STD	A				
10A01					STD	B
10A03			STD	C	STD	C
10B15			STD	A		
10B19	STD	A			STD	A
12B29					STD	B

BS Nos.	GLOSS	CAT	SATIN	CAT	MATT	CAT
12C40					STD	B
14C39			STD	C		
14C40	STD	C				
14E53	STD	C			STD	C
16C37					STD	B
18B25					STD	B
18B29					STD	A
18C39					STD	B
18E53	STD	B				
20C33					STD	B
20D45	STD	C			STD	B
105	STD	C				
166	STD	C				
538	STD	D				
632			STD	C	STD	C

PANTONE COLOURS

SHADE	GLOSS	CAT	SATIN	CAT	MATT	CAT
300					STD	B

SHADE	GLOSS	CAT	SATIN	CAT	MATT	CAT

HOUSE COLOURS

SHADE	GLOSS	CAT	SATIN	CAT	MATT	CAT
2236					STD	
7104			STD	B		B
7903					STD	
8040	STD	CAT	STD	B		B
8070					STD	
8080					STD	

SHADE	GLOSS	CAT	SATIN	CAT	MATT	CAT
8080BN			STD	B		
8912			STD	A		
9910	STD	S	STD	A		
9911					STD	A
9920					STD	S
9920V			STD	S		

Please note:

Minimum order value for powder coating non metallic colours is £90.00

Minimum order value for powder coating metallic colours RAL 9006 & 9007 is £150.00

Metallic finishes at plus 40% standard paint price.

Catagory "C" colours carry a 25% surcharge.

Catagory "D" colours carry a 40% surcharge.

CURTAIN WALL

RAL Colours

RAL No.	Gloss	Cat	Satin	Cat	Matt	Cat
1000	STD	B				
1001	STD	B				
1002	STD	B			STD	B
1003	STD	B			STD	B
1004	STD	B				
1006	STD	C			S	C
1007	STD	B				
1011	STD	B				
1013	STD	B	STD	B	STD	B
1014	STD	B			STD	B
1015	STD	B	STD	B	STD	B
1016	STD	D				
1017	STD	C				
1018	STD	C			STD	C
1019	STD	B	STD	C	STD	B
1021	STD	C			STD	C
1023	STD	B				
1028	STD	D			STD	D
1032	STD	B				
2000	STD	C			STD	D
2001	STD	C				
2002	STD	C	STD	C	STD	C
2004	STD	C			STD	C
2008	STD	D			STD	D
3000	STD	D			STD	D
3001	STD	C				
3002	STD	D			STD	D
3003	STD	D	STD	C	STD	D
3004	STD	D			STD	D
3005	STD	D			STD	D
3007	STD	C				
3009	STD	B			STD	B
3011	STD	D				
3012	STD	C				
3013	STD	D				
3015					STD	C
3016	STD	C				
3017					STD	D
3020	STD	D	STD	D	STD	D
3022	STD	C				
5000	STD	B				
5001	STD	B				
5002	STD	C	STD	CD	STD	C
5003	STD	D	STD		STD	D
5004	STD	C			STD	C
5005	STD	B				

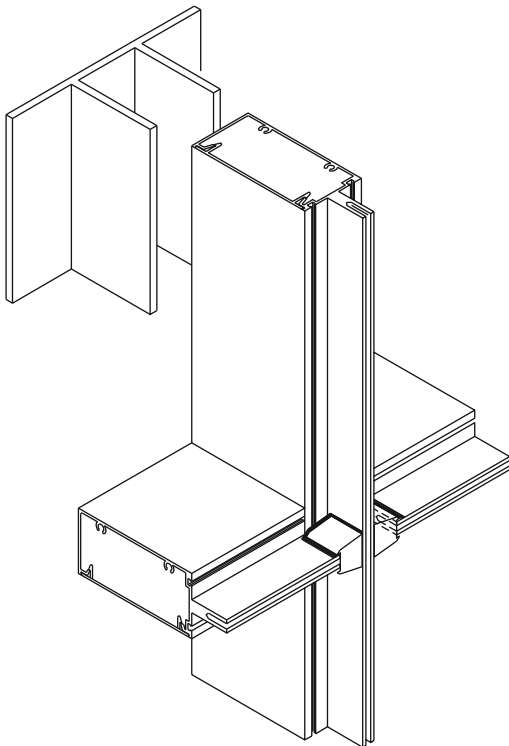
RAL No.	Gloss	Cat	Satin	Cat	Matt	Cat
5007	STD	B				
5008	STD	B			STD	B
5009	STD	B			STD	B
5010	STD	B	STD	B	STD	B
5011	STD	B			STD	B
5012	STD	B	STD	B	STD	B
5013	STD	C	STD	C	STD	C
5014	STD	B			STD	B
5015	STD	C	STD	C	STD	C
5017	STD	B			STD	C
5018	STD	B			STD	C
5019	STD	B				
5020	STD	C				
5021	STD	B				
5022	STD	C			STD	C
5023	STD	C				
5024	STD	B				
6000	STD	B			STD	B
6001	STD	B				
6002	STD	C			STD	C
6003	STD	B				
6004	STD	B				
6005	STD	B	STD	B	STD	B
6007	STD	B				
6009	STD	A			STD	A
6011	STD	B				
6012	STD	B				
6013	STD	A				
6014	STD	B				
6016	STD	C				
6017	STD	B			STD	B
6018	STD	C			STD	C
6019	STD	B			STD	B
6020	STD	B				
6021	STD	B				
6024	STD	C				
6025	STD	B				
6026	STD	B			STD	C
6027	STD	B				
6028	STD	B				
6029	STD	B				
6033	STD	B				
6034	STD	B				
7000	STD	A			STD	A
7001	STD	A	STD	A		
7002	STD	A				

RAL No.	Gloss	Cat	Satin	Cat	Matt	Cat
7004	STD	A				
7005	STD	A			STD	A
7006	STD	A				
7009	STD	A				
7010	STD	A				
7011	STD	A			STD	A
7012	STD	C			STD	C
7013	STD	A				
7015	STD	A	STD	A	STD	A
7016	STD	A	STD	B	STD	A
7021	STD	B	STD	A	STD	B
7022	STD	A			STD	A
7023	STD	A			STD	A
7024	STD	A			STD	A
7026	STD	A			STD	A
7030	STD	A	STD	A	STD	A
7031	STD	A	STD	B	STD	A
7032	STD	B			STD	B
7033	STD	A				
7034	STD	A	STD	A		
7035	STD	A			STD	A
7036	STD	A			STD	A
7037	STD	A	STD	B	STD	A
7038	STD	B			STD	B
7039	STD	A			STD	A
7040	STD	A				
7042	STD	A			STD	A
7043	STD	A			STD	A
7044	STD	A				
8000	STD	A				
8001	STD	A				
8002	STD	A				
8003	STD	A				
8004	STD	A				
8007	STD	A				
8011	STD	B			STD	B
8012	STD	A	STD	S		
8014	STD	A	STD	A	STD	A
8014V			STD	A		
8015	STD	A			STD	A
8016	STD	A	STD	A		
8017	STD	A			STD	A
8019	STD	A			STD	A
8022	STD	A				
8023	STD	A				

RAL No.	Gloss	Cat	Satin	Cat	Matt	Cat
8024	STD	A				
8025	STD	A			STD	A
8028	STD	A	STD	A	STD	A
9001	STD	A	STD	S	STD	S
9002	STD	S			STD	S
9003	STD	S				
9004			STD	S	STD	S
9005	STD	S	STD		STD	
9006			STD		STD	
9007			STD	A	STD	S
9010	STD	S	STD	A		
9010V			STD	S	STD	A
9011	STD	S	STD	S	STD	S
9016	STD	S	STD	A		
9016V			STD	C	STD	B
9017						
9018	STD	A				

Fabrication Issues

- 1) Always ensure the Transom end block has been installed in every corner and made watertight with a quality silicone (see installation guide non-setting butyl compound mastic).
- 2) Always ensure the transoms are properly drained by ensuring that the pressure plate (JCA46) has the drainage slots at the top and that the section has not been accidentally reversed. Notch the Pressure plate to ensure the water can escape freely and rout out drainage holes on the underneath of the cover cap to ensure drainage is rapid and effective.
- 3) Please ensure the PVCu pressure plate (JCA46) fits tight to the transom, preferably by starting at the centre and smoothing out. This avoids bunching in the middle.



Installation Instructions

Notes:

1. Perimeter: For the purposes of this guide it is assumed that the framing is to be installed into a Plumb and Square structural opening and that the frames themselves will be installed also in plumb and square position.

2. Fasteners: All fixings should be suitable for each applicable fixing condition and must comply with recommendations from the screw, bolt or anchor manufacturer regarding their use. Fixing plugs, where applicable should be of a size and type compatible with the screws in use. It is recommended that this be checked with the clients' fastener supplier to ensure suitability, in particular with regard to specific installation perimeters i.e. Brickwork, Blockwork, Stone, Steel etc.
3. Fixing Straps: Straps may be in 3mm Aluminium at 50mm wide or 1.5mm Galvanised Steel at 30 mm minimum width and should be fitted a) no more that 600 mm apart and b) 150 mm from each end of the Aluminium frame being fixed.
4. Structural Brackets: All brackets are supplied by customer and should be manufactured from either 6 mm minimum aluminium, or from 5 mm minimum steel.
5. Perimeter Clearances: Allowances should be 6mm minimum to enable correct keying of sealants and should allow for probable variances in structure edge alignments i.e. brick. A nominal 10 mm is recommended for general jamb and head clearances. Cill clearances should allow for cill additions or special drainage provisions as clients own details.

Framing should be assembled in the works and taken to site as finished frames, inserted into the structural opening on site at the agreed position from the face of the structural brickwork. The framework must be checked for plumb and square and any variations packed for around perimeter gaps.

Firstly, the framework needs to be secured in position as shown on the attached sketches then the primary seal applied at the base of the glazing pocket. It is essential that this position be used as at the primary seal position in order that the best weatherproofing be obtained in the simplest way possible. The secondary seal may be used at the outside edge of the 'pocket' to further exclude water prior to glazing and the application of the pressure plates, also as shown on the attached sketches. Head seal applications and cill additions should be carried out at the same time as at the jamb main seals.

Glass

Glass sizes are 'sight size' plus 30 millimetres. Glazing packs should be inserted equally covering both pieces of glass in the double-glazing unit at the nominal position of 75 millimetres from the end of the transoms. The void between the horizontal transom nosing and the of vertical

million nosing should be filled using the standard transom blocks, sealed in position using a low modulus silicone sealant or a non setting Butyl compound mastic (gun grade).

Pressure Plates

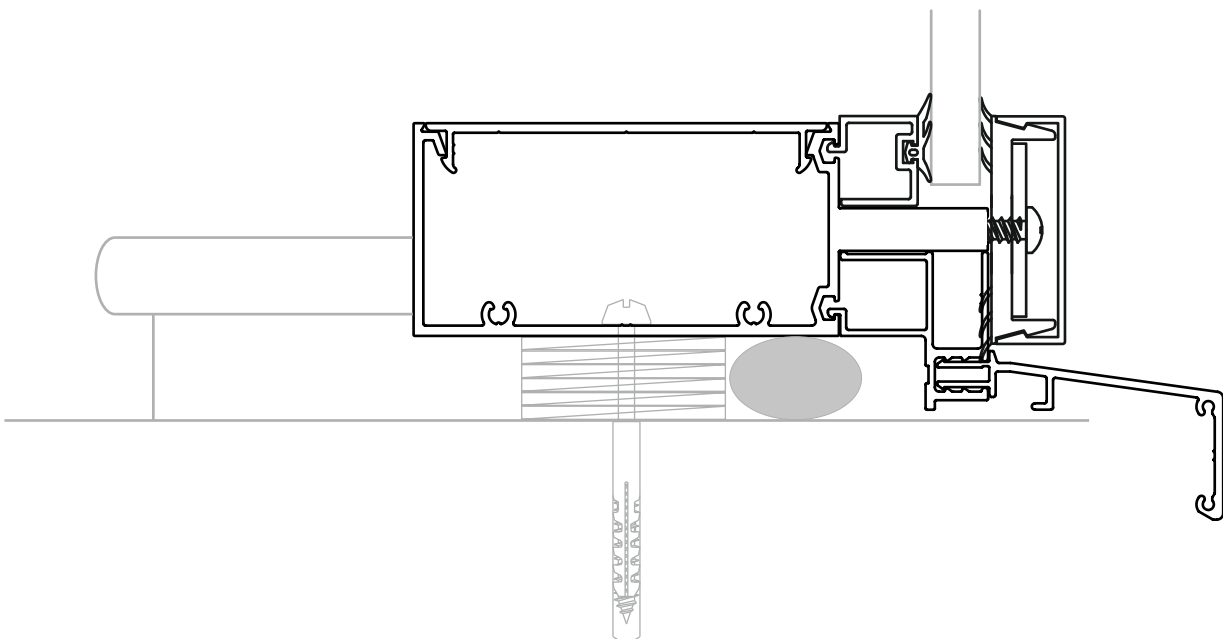
Vertical pressure plates run through to top and bottom of the framing. Horizontals, as deductions shown in the manuals are installed after the verticals. Drainage is allowed for in the horizontal pressures plates and through the base of the horizontal caps. All as shown in the general product manual.

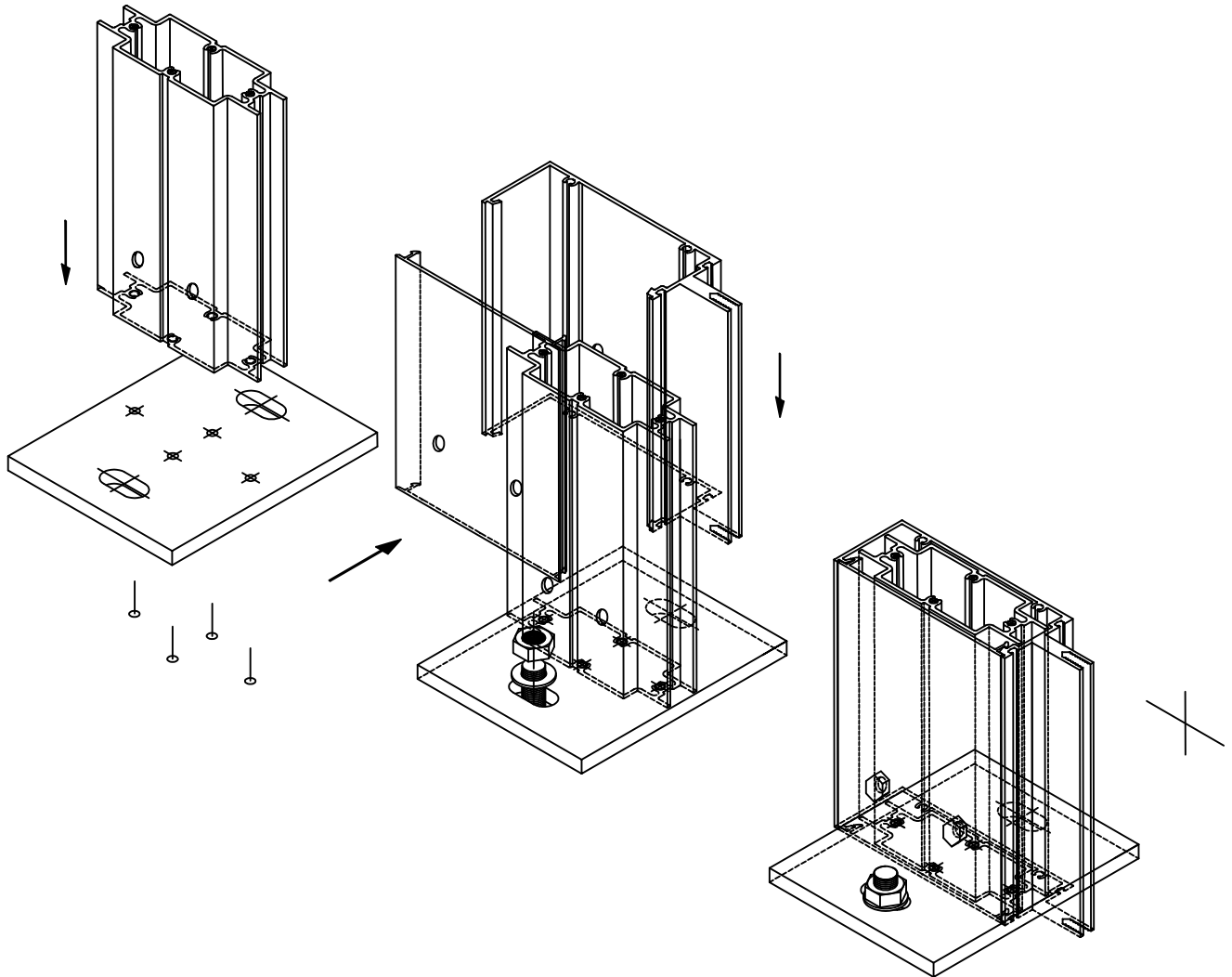
Fixing Brackets

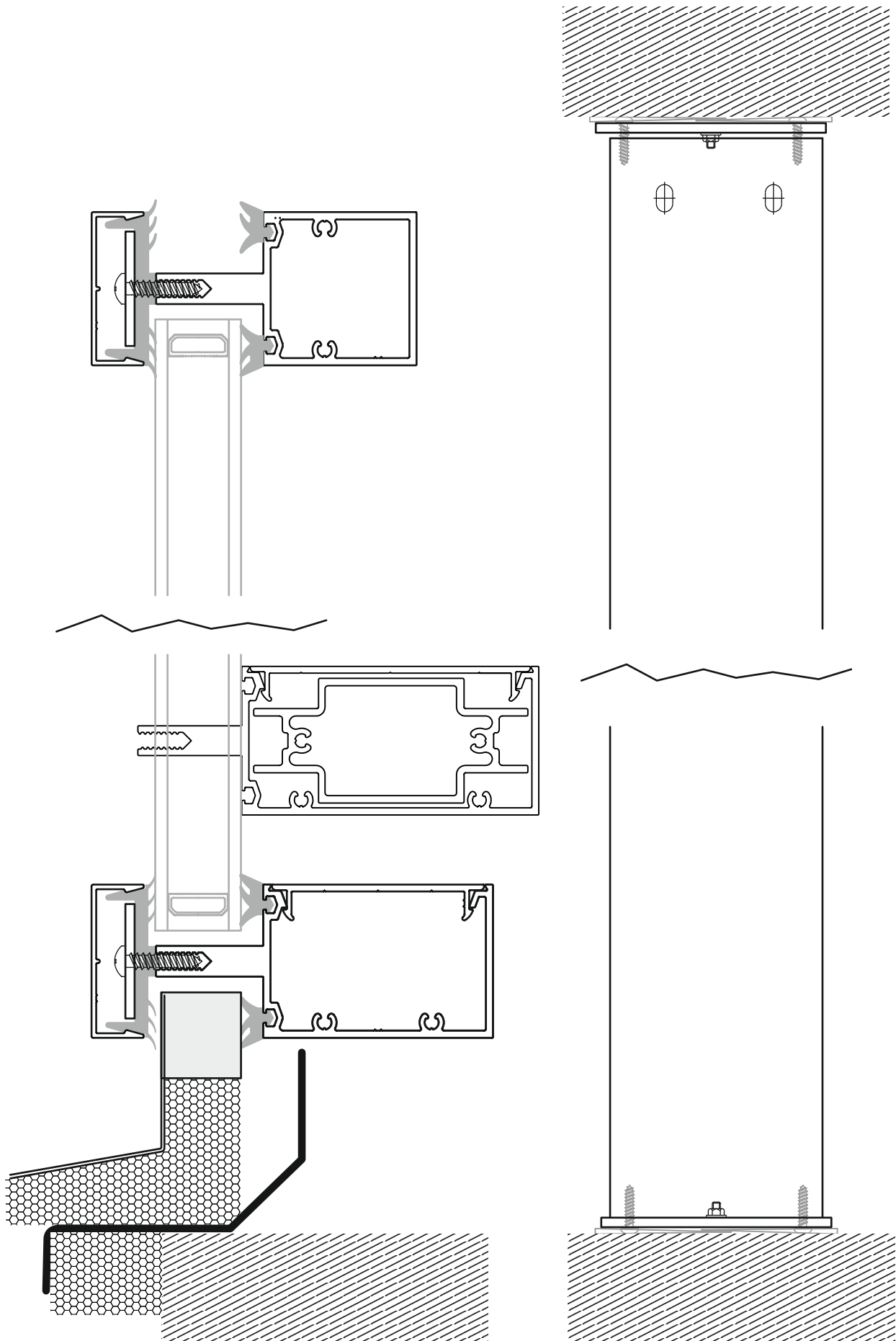
Fixing brackets (JC40) have been designed to suit the site conditions and the profile in aluminium extrusion. The attached sketches show a typical mullion installation using the fixing bracket installed at around the mullion with slotted holes (to allow some movement before final fixing). As a general rule all intermediate fixings should use M8 bolts with either lock nuts or double retaining nuts to hold the mullion in position.

Note:

Where the brackets are intended to support weight of Curtain Walling either above or below the bracket, an insert of 300 millimetres of the relevant sleeve joint section should be inserted into the hollow of the mullion section so that the bolts may be tightened down harder without damaging the extrusion.





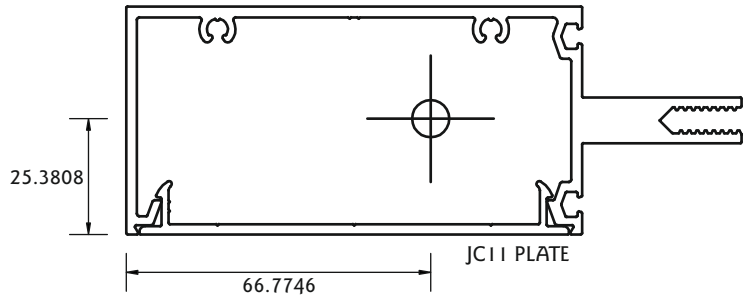


CURTAIN WALL

IXX Value Build Up on 100 mm Mullion

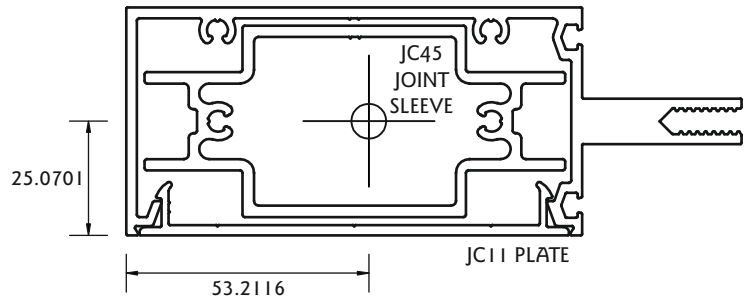
Area: 1051.0521 mm²
 Perimeter: 828.6156 mm
 Centroid:
 X: 66.7746 mm
 Y: 25.3808 mm
 Moments of Inertia:
 X: 343227.4816 mm⁴
 Y: 1873963.4181 mm⁴
 Product of Inertia XY: 1195.7462 mm⁴
 Radii of Gyration:
 X: 18.0709 mm
 Y: 42.2249 mm

JC03 and JC11 Acting as a Single Unit



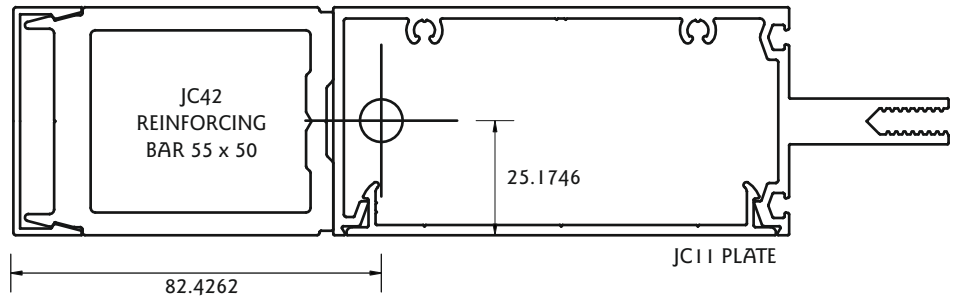
Area: 5664.9139mm²
 Perimeter: 1382.1978mm
 Centroid:
 X: 53.2116mm
 Y: 25.0701mm
 Moments of Inertia:
 X: 870355.7247 mm⁴
 Y: 3661584.1172mm⁴
 Product of Inertia XY: 6634.6200 mm⁴
 Radii of Gyration:
 X: 12.3951 mm
 Y: 25.4236 mm

JC03, JC45 and JC11 Acting as a Single Unit



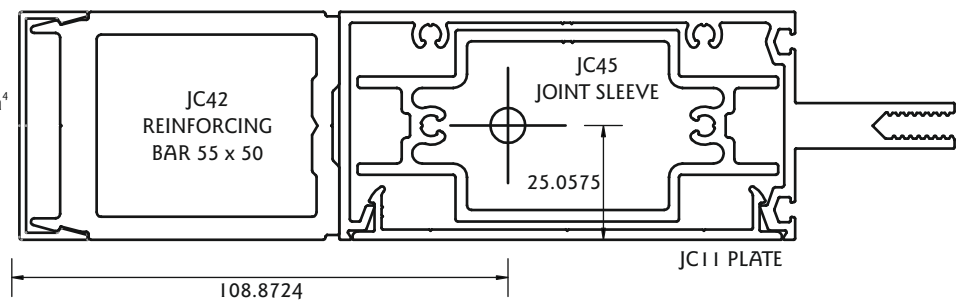
Area: 2292.2697 mm²
 Perimeter: 1409.4256 mm
 Centroid:
 X: 82.4246 mm
 Y: 25.1746 mm
 Moments of Inertia:
 X: 759775.7432 mm⁴
 Y: 8706616.7481 mm⁴
 Product of Inertia XY: 23705.6609 mm⁴
 Radii of Gyration:
 X: 18.2058 mm
 Y: 61.6300 mm

JC03, JC42 and JC11 Acting as a Single Unit

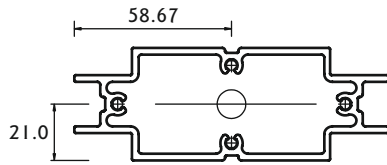


Area: 2292.2697 mm²
 Perimeter: 1409.0077 mm
 Centroid:
 X: 108.8724 mm
 Y: 25.0575 mm
 Moments of Inertia:
 X: 1286826.4488 mm⁴
 Y: 12656577.5749 mm⁴
 Product of Inertia XY: 13076.6245 mm⁴
 Radii of Gyration:
 X: 13.6503 mm
 Y: 42.8096 mm

JC03, JC45, JC42 and JC11 Acting as a Single Unit

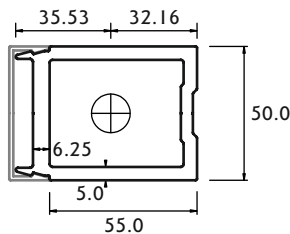


JC46 Sleeve Joint/Coupling



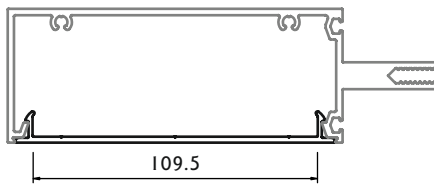
Area:	873.8917 mm ²
Weight:	2.37 kg/m
Perimeter:	703.7317 mm
Centroid:	X: 58.665 mm Y: 21.0 mm
Moments of Inertia:	X: 195720.2703 mm ⁴ Y: 1080744.3130 mm ⁴
Radii of Gyration:	X: 14.9654 mm Y: 35.1668 mm
Principal Movements and X-Y Directions about Centroid:	I: 195720.2703 along [1.00000 0.0000] J: 1080683.4075 along [0.0000 1.0000]

JC42 Reinforcing Bar



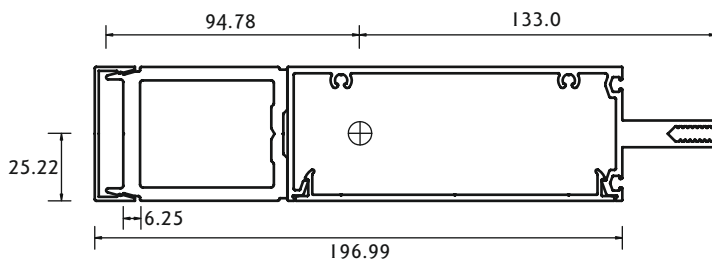
JC42	55 x 50 Reinforcing Bar
Area:	1059.9378 mm ²
Weight:	2.875 kg/m
External Perimeter:	245.1437 mm
Internal Perimeter:	179.233 mm
Centroid:	X: 32.1623 mm Y: 25.0 mm
Moments of Inertia:	X: 369063.1387 mm ⁴ Y: 538764.6395 mm ⁴
Radii of Gyration:	X: 18.6599 mm Y: 22.5455 mm
Principal Movements and X-Y Directions about Centroid:	I: 369063.1387 along [1.00000 0.0000] J: 538764.6395 along [0.0000 1.0000]

JC12 Plate



JC12	125 mm Plate
Area:	871.5229 mm ²
Weight:	2.364 kg/m
Perimeter:	645.4351 mm
Centroid:	X: 86.7428 mm Y: 33.4279 mm
Moments of Inertia:	X: 186696.8532 mm ⁴ Y: 2508891.4885 mm ⁴
Radii of Gyration:	X: 14.6362 mm Y: 53.6507 mm
Principal Movements and X-Y Directions about Centroid:	I: 17458.7834 along [0.9974 -0.0719] J: 2520706.5583 along [0.0719 -0.9974]

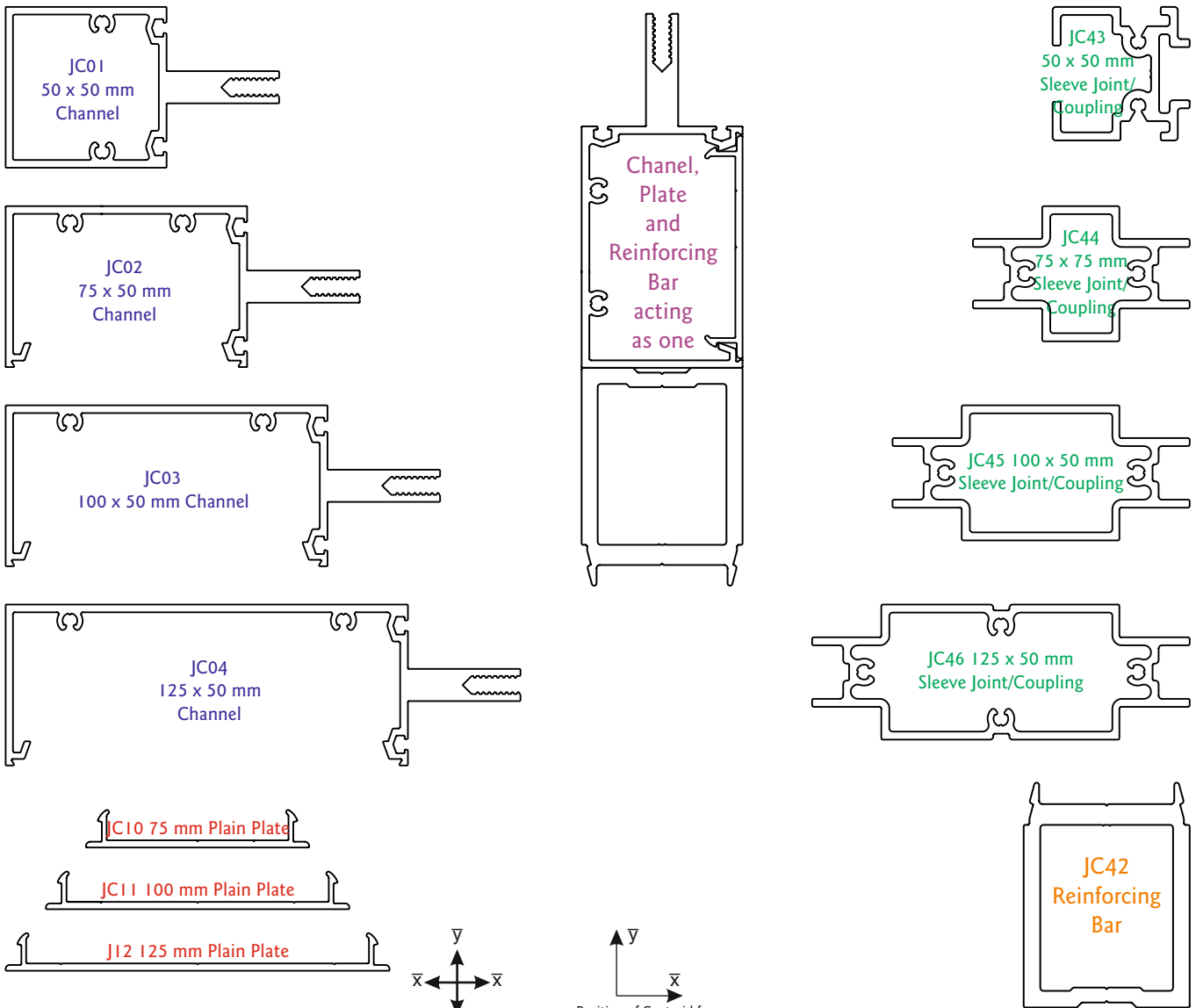
JC04, JC46, JC12 and JC42 Acting as a Single Unit



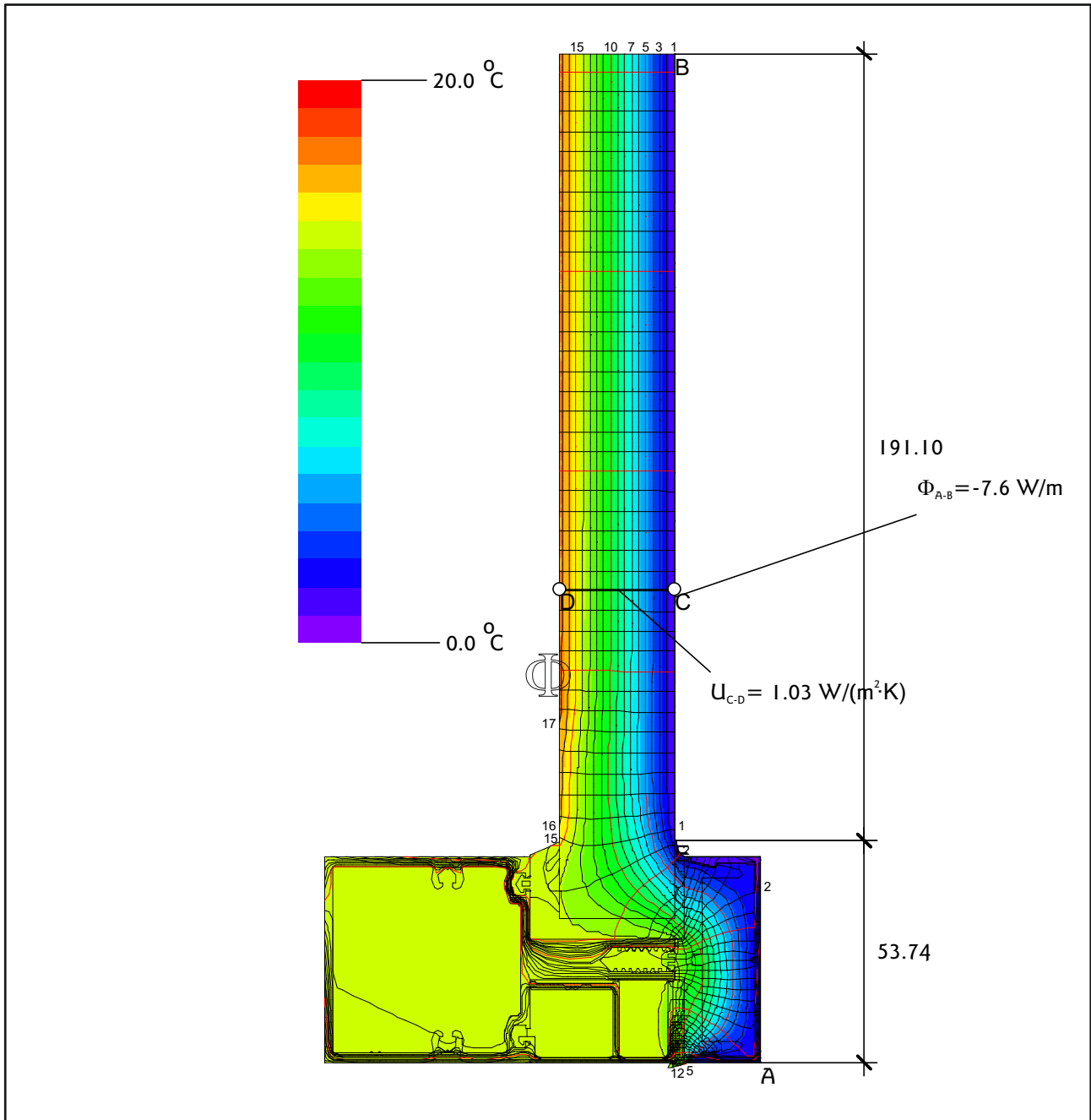
Area:	2218.4482 mm ²
Centroid:	X: 94.7836 mm Y: 25.2185 mm
Moments of Inertia:	X: 774680.4087 mm ⁴ Y: 10641079.3193 mm ⁴
Product of Inertia:	XY: 27114.9073
Radii of Gyration:	X: 18.6869 mm Y: 69.2577 mm
Principal Movements and X-Y Directions about Centroid:	I: 774605.8888 along [1.00000 0.0027] J: 10641153.8361 along [-0.0027 1.0000]

CURTAIN WALL

Section Properties



Code	Description	Moments of Inertia		Position of Centroid		Section Modulus		Radius of Gyration		c.s.a. mm ²
		l _{xx} mm ⁴	l _{yy} mm ⁴	X mm	Y mm	Z _{xx} mm ³	Z _{yy} mm ³	R _{xx} mm	R _{yy} mm	
JC01	50 mm Box Section Mullion	199627	455179	39.160	25.000	7985	11624	15.997	24.156	780.049
JC02	75 mm Channel Mullion	153804	900034	56.322	30.977	4965	15980	14.304	34.602	751.703
JC03	100 mm Channel Mullion	171483	1583485	71.730	32.295	5310	22076	14.535	44.168	811.703
JC04	125 mm Channel Mullion	186732	2508697	86.738	33.431	5586	28923	14.636	53.646	871.703
JC10	75 mm Plate	1287	84442	34.622	2.182	136	2439	2.652	21.475	183.099
JC11	100 mm Plate	1359	202951	47.119	1.934	139	4307	2.383	29.119	239.349
JC12	125 mm Plate	1413	396284	59.618	1.780	143	6647	2.186	36.614	295.599
JC43	Joint Sleeve 50mm	97281	74430	23.346	20.750	4688	3188	14.207	12.427	481.978
JC44	Joint Sleeve 75mm	86984	197322	33.650	21.000	4142	5864	12.386	18.655	566.980
JC45	Joint Sleeve 100mm	135807	530235	46.150	21.000	6467	11489	14.009	27.681	691.980
JC46	Joint Sleeve 125mm	195777	1080059	58.650	21.000	9323	18415	14.967	35.154	873.979
JC42	Reinforcing Bar	369063	538765	35.525	25.000	14763	15166	18.660	22.545	1059.938
JC02 + JC42	Acting as one profile	538580	4882178	72.240	27.480	19599	46299	17.241	51.912	1811.641
JC03 + JC42	Acting as one profile	565007	7083847	80.582	28.164	20061	58013	17.375	61.521	1871.641
JC04 + JC42	Acting as one profile	586005	9815723	89.329	28.819	20334	70892	17.456	71.444	1931.641



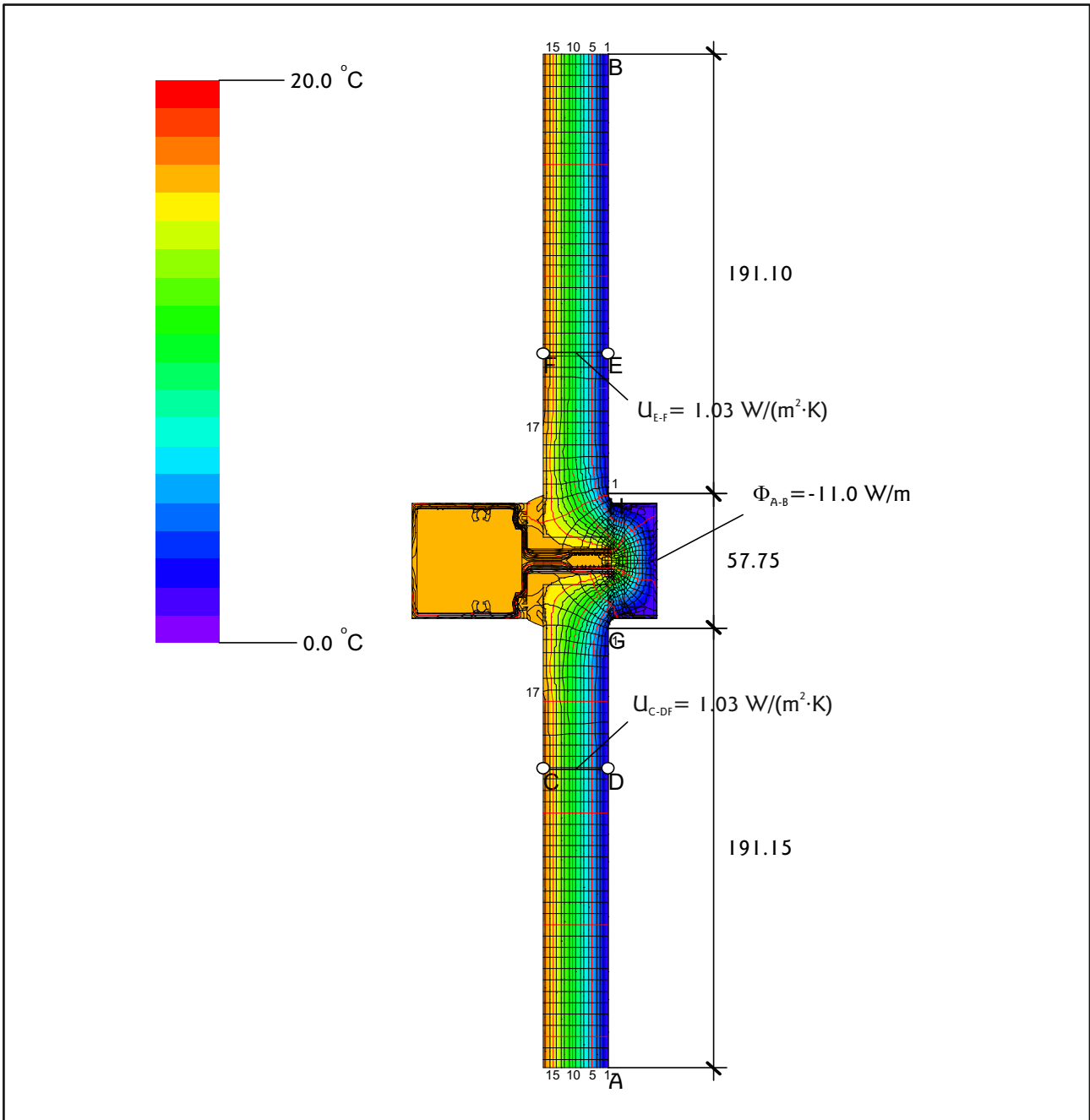
$$U_{fe} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{-7.643}{-20.000} - 1.031 \cdot 0.191}{0.054} = 3.445 \text{ W/(m}^2 \cdot \text{K)}$$

50 mm Curtain Wall Outer	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\psi}^{2D} - U_f b_f - U_g b_g$	0.054	0.063	0.038	0.043
$U_{Tj} = (L^{2d} - U_{FE1} A_{FE1} + U_{FE2} A_{FE2}) / b_f$	4.458	4.608	4.145	4.247

CURTAIN WALL

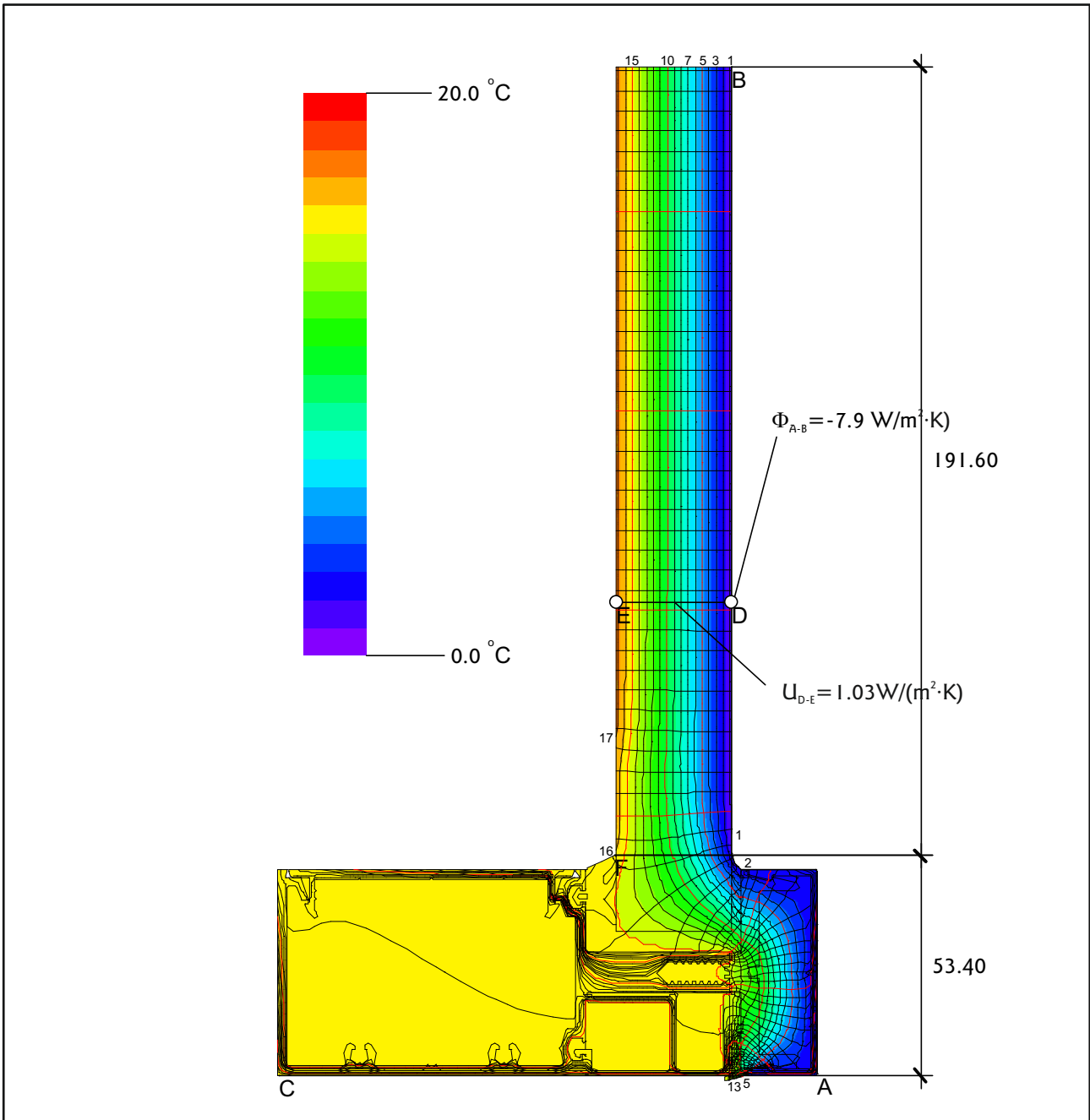
Thermal Performance Calculation per EN ISO 10077-2

50 mm Transom Panel



$$U_{iG,H} = \frac{\frac{\Phi}{\Delta T} \cdot (-U_{p1} \cdot b_{p1} - U_{p2} \cdot b_{p2})}{b_f} = \frac{\frac{-11.043}{-20.000} \cdot (-1.031 \cdot 0.191 - 1.031 \cdot 0.191)}{0.058} = 2.737 \text{ W}/(\text{m}^2 \cdot \text{K})$$

50 mm Curtain Wall Transom/Mullion	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\Psi}^{2D} - U_f \cdot b_f - U_g \cdot b_g$	0.069	0.076	0.049	0.053
$U_{Tj} = (L^{2d} - U_{FE1} \cdot A_{FE1} + U_{FE2} \cdot A_{FE2}) / b_f$	5.123	5.360	4.417	4.576



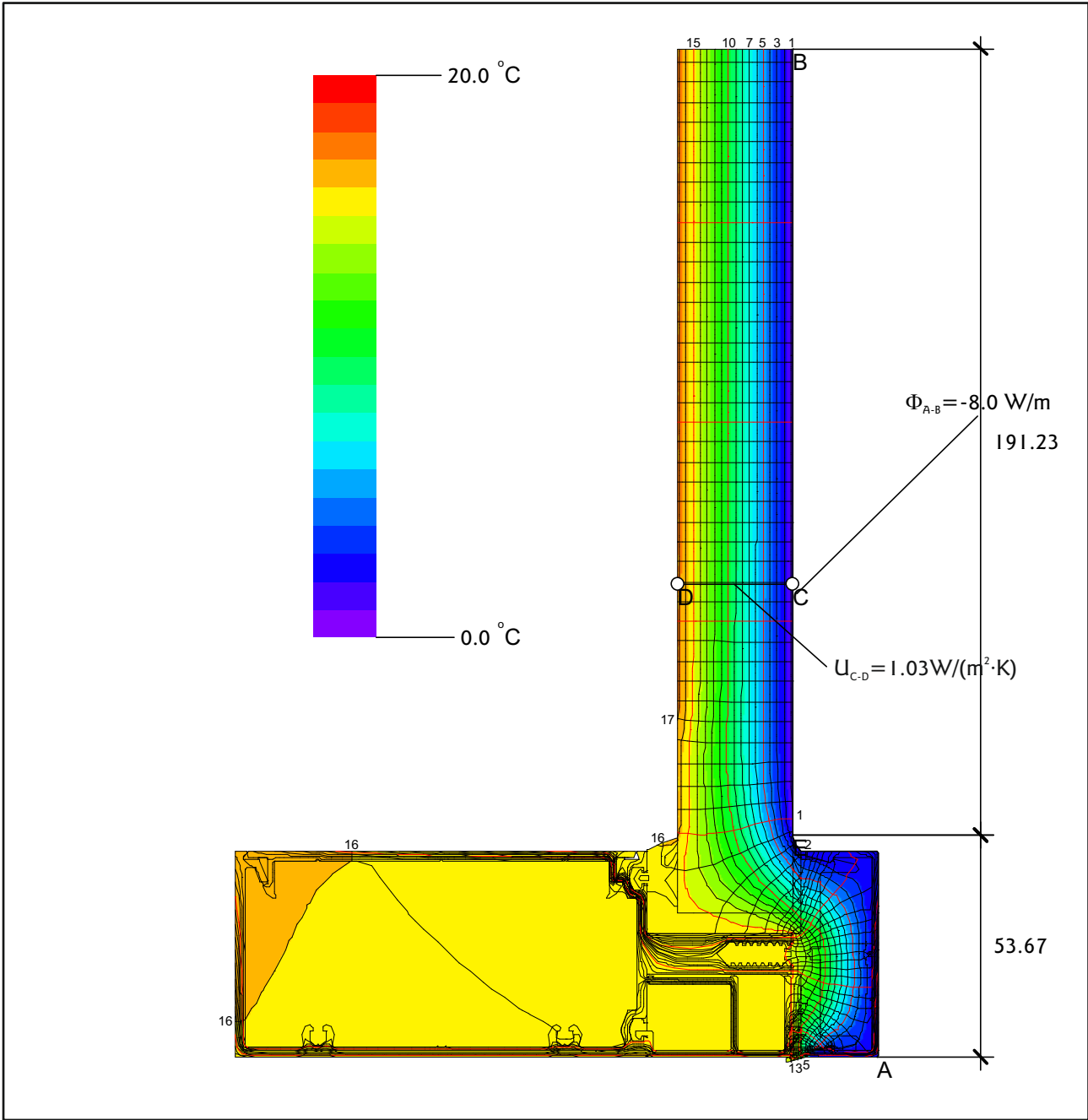
$$U_{fe} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{-7.854}{-20.000} - 1.031 \cdot 0.192}{0.053} = 3.655 \text{ W/(m}^2 \cdot \text{K)}$$

75mm Curtain Wall Outer	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\Psi}^{2D} - U_f b_f - U_g b_g$	0.062	0.070	0.043	0.048
$U_{Tj} = (L^{2d} - U_{FE1} A_{FE1} + U_{FE2} A_{FE2}) / bf$	4.822	4.963	4.470	4.558

CURTAIN WALL

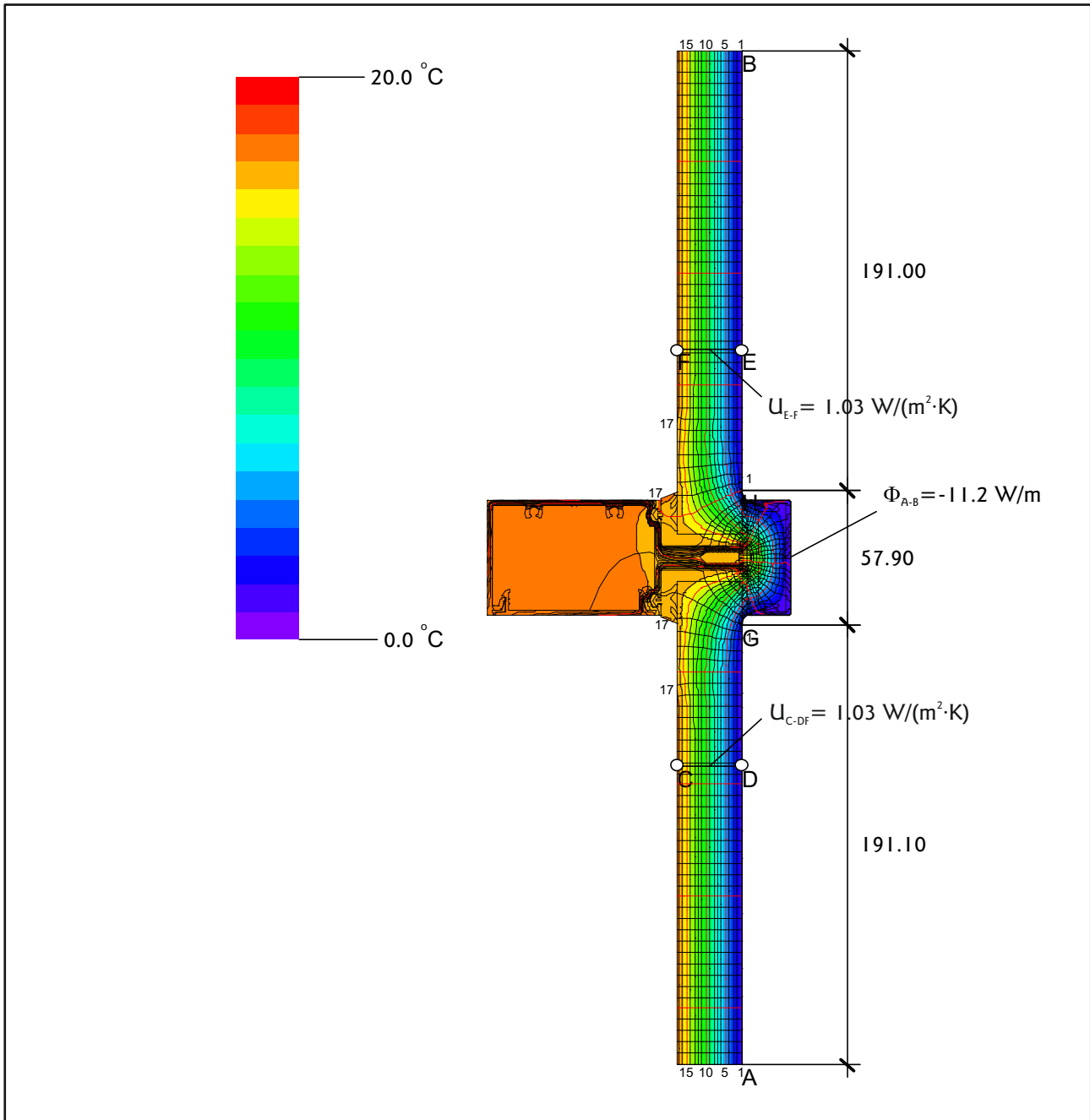
Thermal Performance Calculation per EN ISO 10077-2

100 mm Outer Panel



$$U_{FE} = \frac{\frac{\Phi}{\Delta T} \cdot -U_p \cdot b_p}{b_f} = \frac{\frac{-7.977}{-20.000} \cdot 1.031 \cdot 0.191}{0.054} = 3.758 \text{ W/(m}^2 \cdot \text{K)}$$

100mm Curtain Wall Outer	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\Psi}^{2D} - U_f b_f - U_g b_g$	0.068	0.073	0.047	0.050
$U_{Tj} = (L^{2d} - U_{FE1} A_{FE1} + U_{FE2} A_{FE2}) / b_f$	5.020	5.119	4.634	4.699



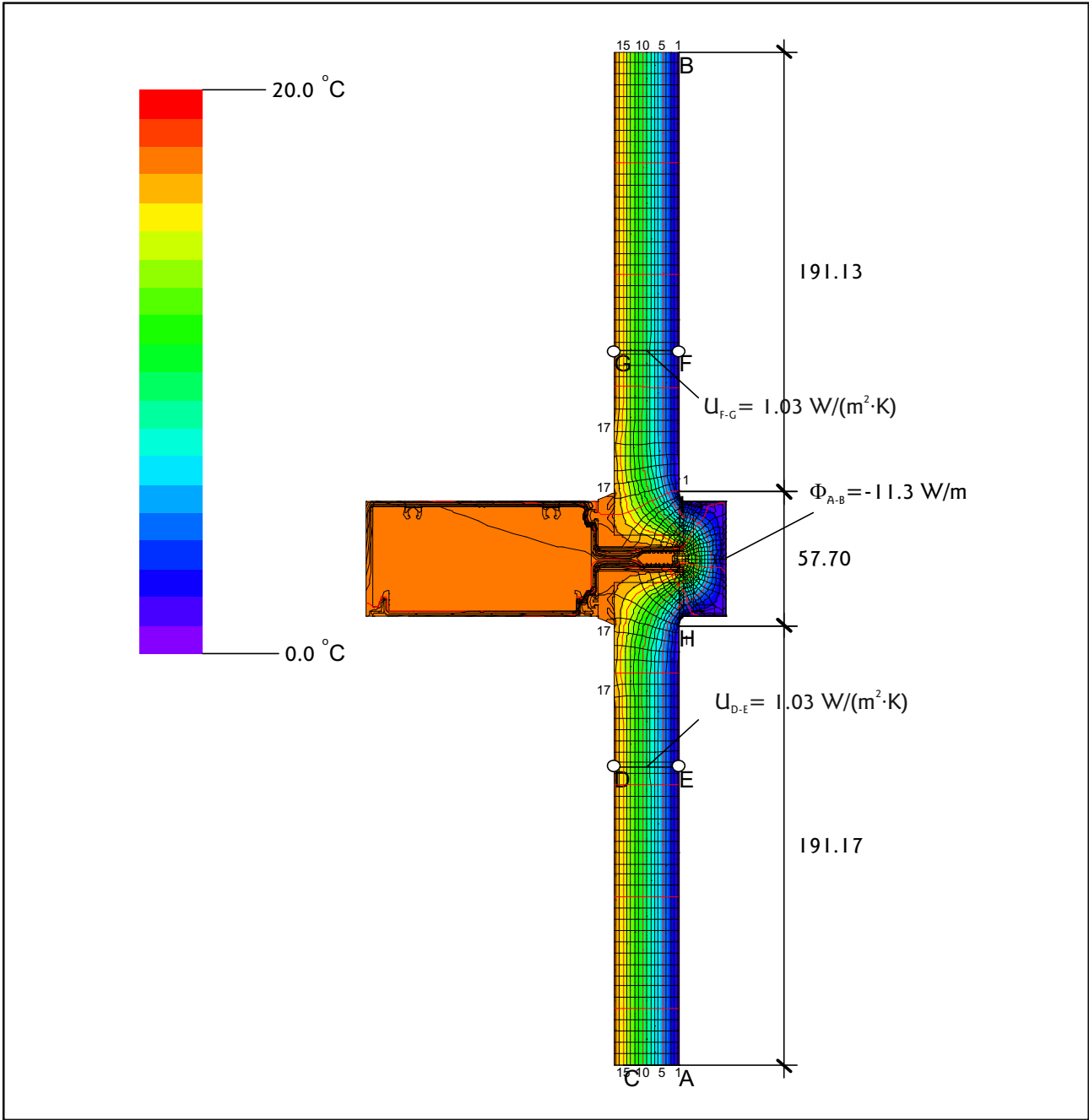
$$U_{fG,H} = \frac{\frac{\Phi}{\Delta T} \cdot (-U_{p1} \cdot b_{p1} - U_{p2} \cdot b_{p2})}{b_f} = \frac{\frac{-11.154}{-20.000} \cdot (-1.031 \cdot 0.191 - 1.031 \cdot 0.191)}{0.058} = 2.828 \text{ W}/(\text{m}^2 \cdot \text{K})$$

75 mm Curtain Wall Transom/Mullion	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\Psi}^{2D} - U_f b_f - U_g b_g$	0.075	0.081	0.053	0.057
$U_{Tj} = (L^{2d} - U_g b_g) / b_f$	5.420	5.632	4.656	4.795

CURTAIN WALL

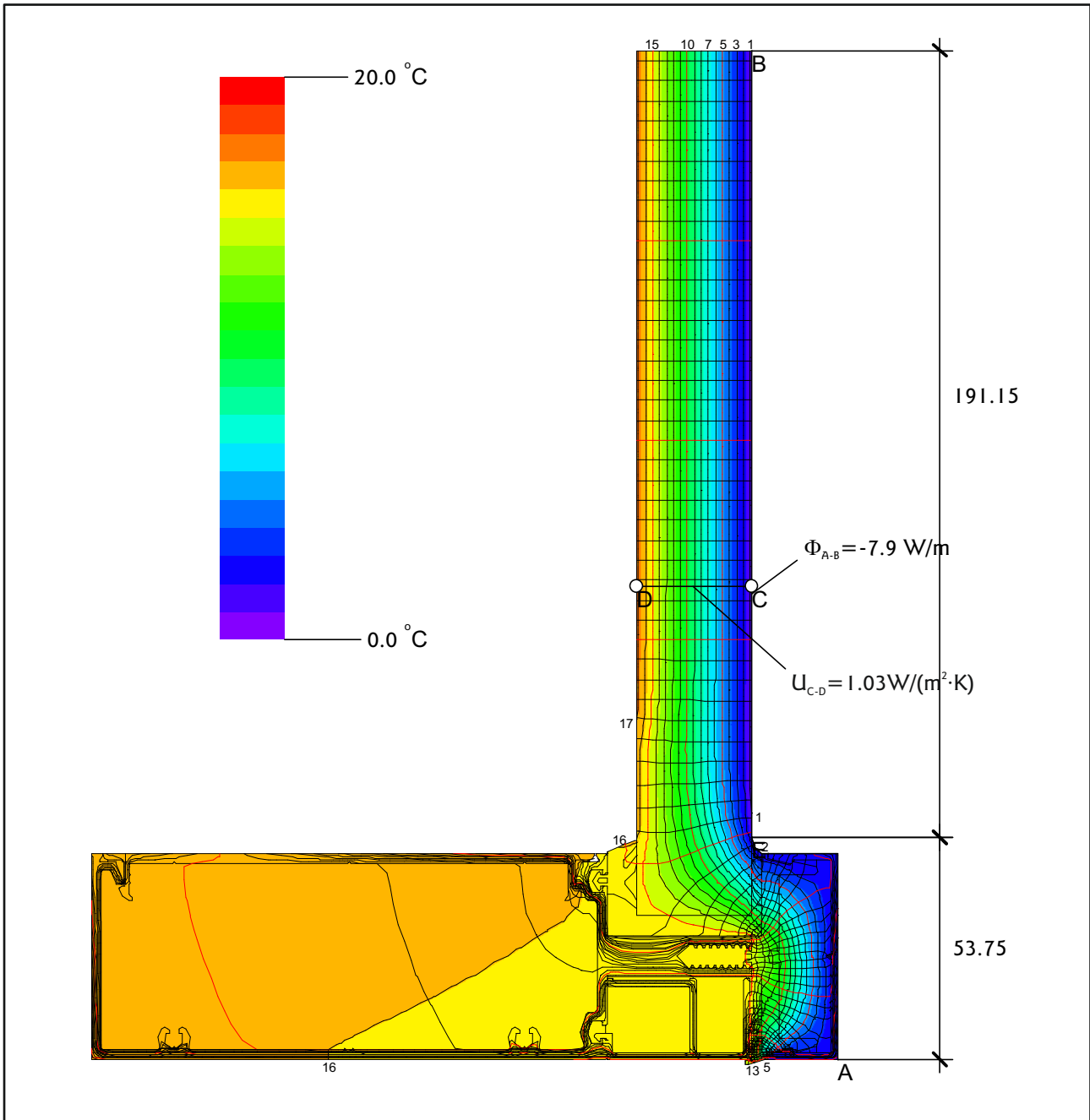
Thermal Performance Calculation per EN ISO 10077-2

100 mm Transom Panel



$$U_{f,h,i} = \frac{\frac{\Phi}{\Delta T} - U_{p1} \cdot b_{p1} - U_{p2} \cdot b_{p2}}{b_f} = \frac{\frac{-11.264}{-20.000} - 1.031 \cdot 0.191 - 1.031 \cdot 0.191}{0.058} = 2.93 \text{ W/(m}^2 \cdot \text{K)}$$

100 mm Curtain Wall Transom/Mullion	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\psi}^{2D} - U_f b_f - U_g b_g$	0.080	0.086	0.057	0.060
$U_{Tj} = (L^{2d} - U_{FE1} A_{FE1} + U_{FE2} A_{FE2}) / b_f$	5.705	5.913	4.896	5.025



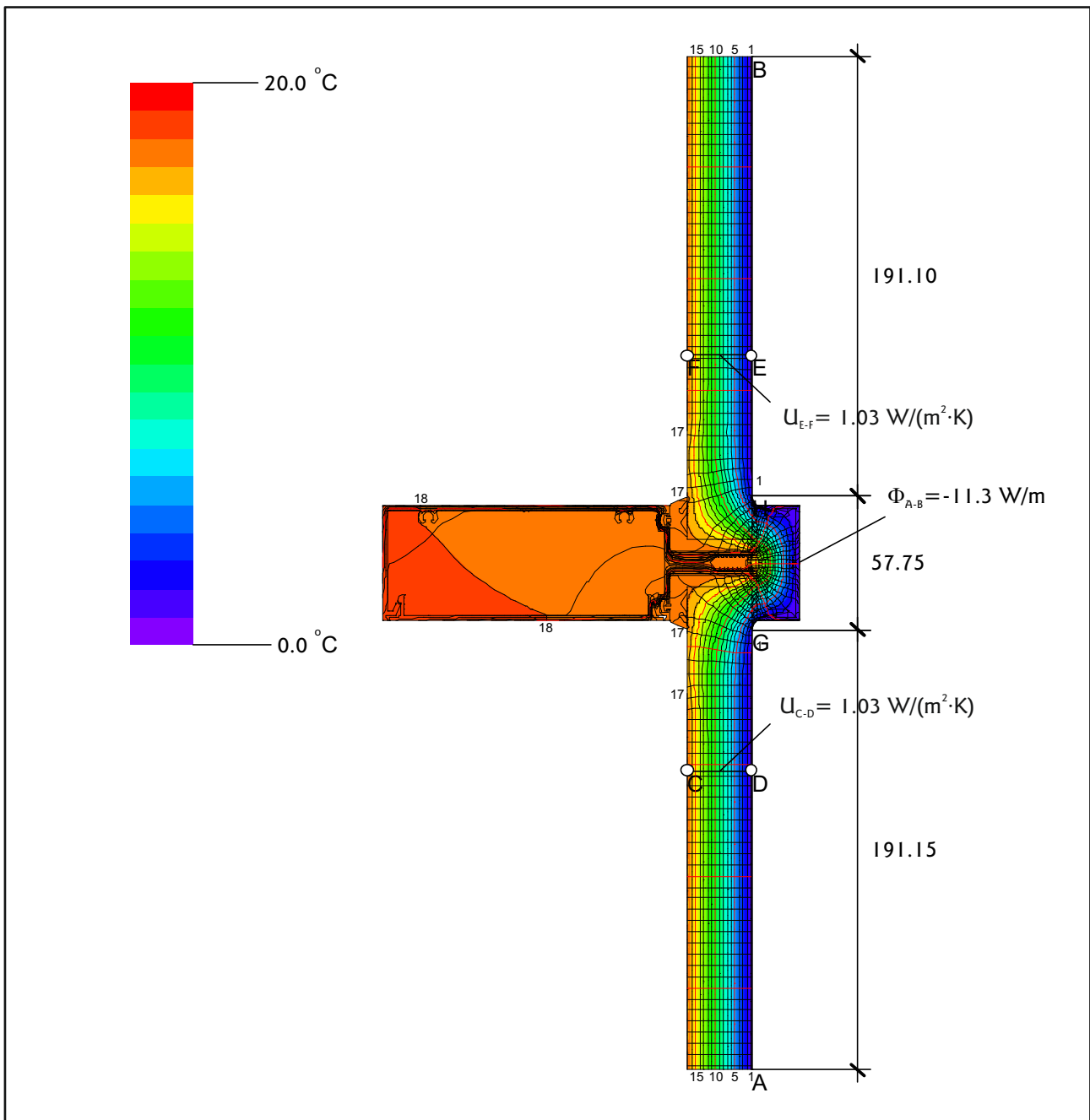
$$U_{FE} = \frac{\frac{\Phi}{\Delta T} - U_p \cdot b_p}{b_f} = \frac{\frac{-7.916}{-20.000} - 1.031 \cdot 0.191}{0.054} = 3.697 \text{ W/(m}^2 \cdot \text{K)}$$

125mm Curtain Wall Outer	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\Psi}^{2D} - U_f b_f - U_g b_g$	0.067	0.073	0.045	0.050
$U_{Tj} = (L^{2d} - U_{FE1} A_{FE1} + U_{FE2} A_{FE2}) / b_f$	4.941	5.048	4.537	4.637

CURTAIN WALL

Thermal Performance Calculation pr EN ISO 10077-2

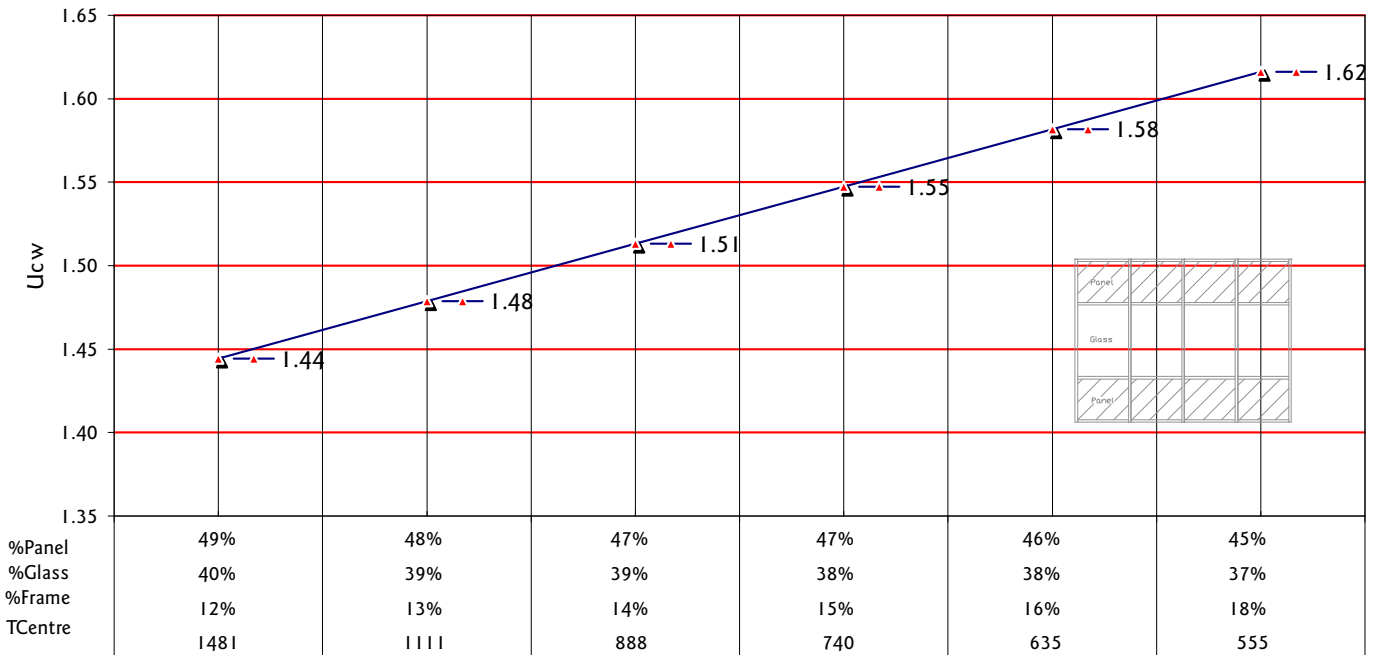
125 mm Transom Panel



$$U_{fG,H} = \frac{\frac{\Phi}{\Delta T} \cdot (-U_{p1} \cdot b_{p1} - U_{p2} \cdot b_{p2})}{b_f} = \frac{\frac{-11.288}{-20.000} \cdot (-1.031 \cdot 0.191 - 1.031 \cdot 0.191)}{0.058} = 2.950 \text{ W}/(\text{m}^2 \cdot \text{K})$$

125 mm Curtain Wall Transom/Mullion	1.7 Ali	1.2 Ali	1.7 Warm	1.2 Warm
$\Psi_{Tj} = L_{\Psi}^{2D} - U_f b_f - U_g b_g$	0.163	0.174	0.117	0.123
$U_{Tj} = (L^{2d} - U_{FE1} A_{FE1} + U_{FE2} A_{FE2}) / b_f$	5.767	5.969	4.968	5.087

100 mm Curtain Wall 4500 x 3200 1400 Glass 1800 Panel 1.2 Warm spacer



Factors Affecting Value

Centre Pane U_{Value} of Glass

Frame U_{Value}

Centre Pane U_{Value} of in fill panels

Lateral heat flow through spacer, etc.

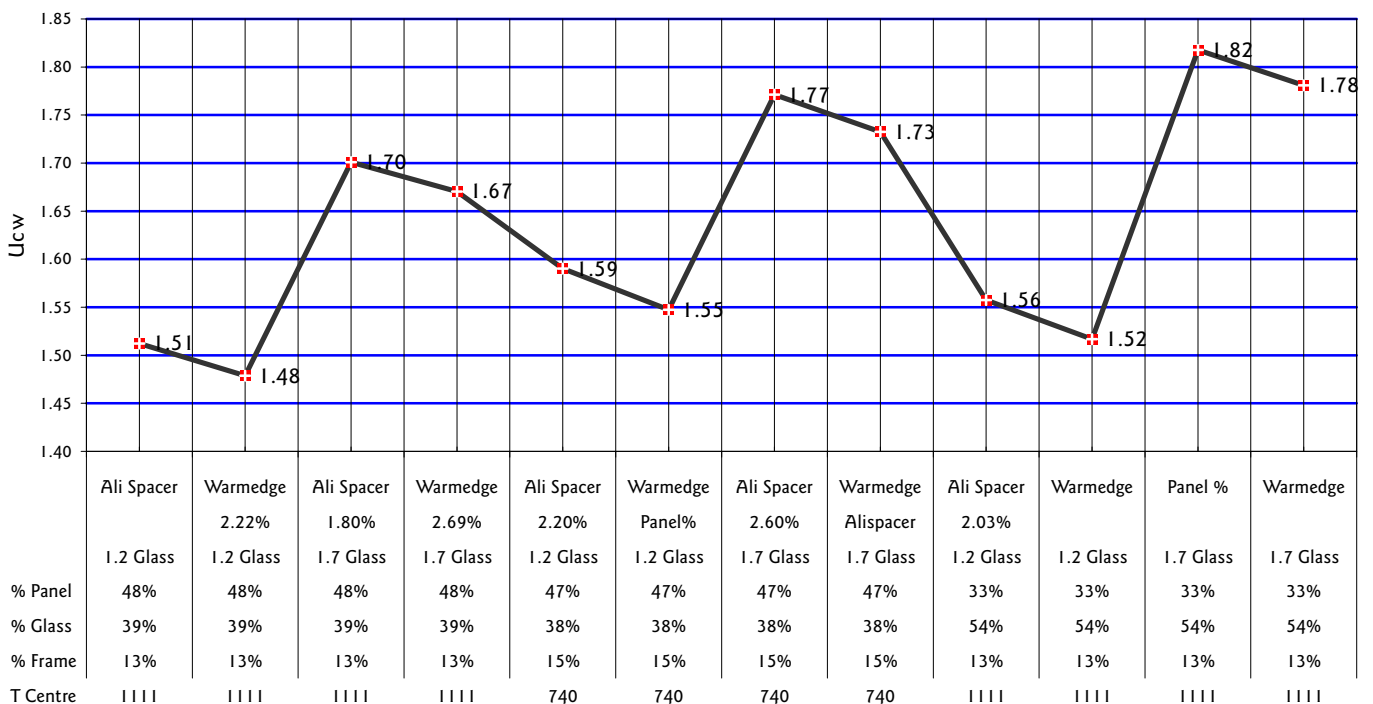
Mullion Spacing Increase/Decrease of Area in Relation to its Value

Increase the % of Glass in place of frame = Decrease in U Value (Mullion and Transom and Infill)

Decrease the % of Frame = Decrease in Value

Increase the % of Glass in place of Panel = Increase of U_{Value} (Value of panel < Glass)

Increase the % of Panel in place of Glass = Decrease of U_{Value} (Value of panel < Glass)





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