Certificate of Testing

Certificate Number: 2020/96D

Date: March 2021

System: **Vitradual rainscreen**

System supplier: Valcan
Dunball House
Unit N
Woodlands Court Business park
Bristol Road
Bridgewater
Somerset
TA6 4FJ

Tests performed:

Watertightness – dynamic	✓
Wind resistance – serviceability	✓
Wind resistance – safety	✓
Soft body impact	✓
Hard body impact	✓
Hose test	✓

In accordance with 'Standard for Systemised building envelopes CWCT, 2006

Test Witness

Director

CWCT Services Ltd, The Studio, Entry Hill, Bath, BA2 5LY
Tel: 01225 330945, email: cwct@bath.ac.uk www.cwct.co.uk

Company registered in England at Baker Tilly, 25 Farringdon Street, London, EC4 4AB
Number 2536548; VAT number: 600 9915 52

Description of system tested

Rainscreen system: Valcan rainscreen with Vitradual panels supported on Vitrafix vertical rails

Panel material: 2mm Vitradual grade 5052 PVDF coated aluminium for cassettes
3mm Vitradual grade 5754 PVDFcoated aluminium for cassettes and flat sheet

Panel description: Flat sheet and cassette

Flat sheets face fixed to rails with stainless steel rivets at maximum spacing of 600 mm

Cassettes with overall depth of 36mm formed by double folding panel edges. Both 2mm and 3mm aluminium factory grooved before folding - residual thickness after grooving 0.8mm.

Cassettes with shorter dimension greater than 1000mm provided with stiffeners across the short dimension of the panel. at centres shown below (spacings shown are the maximum value for each cassette). Stiffeners formed of 2mm 5005 aluminium folded to form top hats with overall width of 150mm and height of 25mm. Stiffeners fixed to back of panels using stud welds at 220mm maximum centres. Stiffeners not fixed to support rails.

Cassettes fixed to rails by screws through flanges at panel edges; flanges of adjacent panels overlap. At each fixing location 1 screw through first panel to be fixed then second screw through both panels. Fixing locations at maximum 600mm spacing in vertical joints and at each rail in horizontal joints.

Panel size:	Height (mm)	Width (mm)	Stiffeners	Material
Flat panel	3000	180	None	3mm Vitradual
	2460	1260	None	3mm Vitradual
	1500	3000	None	3mm Vitradual
	1500	500	None	3mm Vitradual
	1060	1060	None	3mm Vitradual
	1000	1500	None	3mm Vitradual
	1000	250	None	3mm Vitradual
	540	1260	None	3mm Vitradual
	500	500	None	3mm Vitradual
	440	1060	None	3mm Vitradual
	250	1000	None	3mm Vitradual
Cassette	3000	1250	3 No horizontal, 750 c/c	3mm Vitradual
	2000	500	None	3mm Vitradual
	2000	250	None	3mm Vitradual
	1250	3000	3No vertical	3mm Vitradual
	1000	1000	1No vertical,	3mm Vitradual
	1000	750	None	3mm Vitradual
	800	800	None	3mm Vitradual
	800	200	None	3mmVitradual
	700	200	None	3mm Vitradual
	500	2000	None	3mm Vitradual
	300	800	None	3mm Vitradual
	250	2000	None	3mm Vitradual

250	800	None	3mm Vitradual
250	200	None	3mm Vitradual
200	800	None	3mm Vitradual
2820	1120	3No horizontal	2mm Vitradual
2020	520	None	2mm Vitradual
1340	260	None	2mm Vitradual
1120	2820	3 No horizontal, 700c/c	2mm Vitradual
1120	540	None	2mm Vitradual
1020	520	None	2mm Vitradual

Panel joints: Flat panel system- 10 mm gap, vertical joints closed by rail behind joint, horizontal joints open
Cassette system – closed joints formed by overlap of flanges along panel edges

Support rails: Vitrafix L (50x50x2) and T (100x45x2) vertical rails supported by Vitrafix 180 brackets. Brackets fixed to horizontal galvanised steel top hats which are fixed to the back wall by screws through the sheathing board into the studs. Spacing between rails and span between brackets vary as shown on drawings.

Fixings: Face fixed panels: VFSSR4.816 Vitrafix 4.8x16mm rivets
Cassettes: VFSD 5.525 Vitrafix self drill 5.5 x 25mm panhead screws screws
Rails to brackets: VFSD Vitrafix 4.825 self drill 4.8x25mm screws
Brackets to top hats: VFSD 5.525 Vitrafix self drill 5.5 x 25mm screws
Tophats to back wall: VFSD 5.535 Vitrafix self drill 5.5x35mm screws

Drainage and ventilation: Rainscreen cavity drained by 10mm gap between rainscreen panels and aluminium flashing at bottom of sample and at change from flat panels to cassettes.

Ventilation of cavity provided by 10mm gap between top of panels and aluminium flashing at top of sample and at change from flat panels to cassettes.

Backing wall: Lightweight steel studs 150mm deep at 600mm centres with 12mm Ywall sheathing on outer face. Wraptite self adhesive breather membrane on outer face of sheathing board.

Window: PVC window incorporated in bottom section of wall with Vitradual cassettes. At the window opening the breather membrane was returned into the opening of the back wall and the window sealed to the breather membrane with sealant.

At the window head an aluminium flashing was provided to drain water from the rainscreen cavity clear of the window. The joint between the flashing and the window was sealed with sealant. At the jambs the rainscreen cavity was closed by a return on the edge of the rainscreen panel fixed to a vertical aluminium angle fixed to the back wall. The gap between this closure and the edge of the window was sealed with sealant. At the cill, an aluminium cill pressing was sealed to the underside of the window frame with sealant.

Test arrangements

Date of test:	16/17 October 2019
Testing laboratory:	Wintech Engineering Ltd Halesfield 2, Telford, TF7 4QH
Registration No:	UKAS No 2223
Independent testing authority:	Wintech Engineering Ltd Halesfield 2, Telford, TF7 4QH
Witness:	Alan Keiller CWCT The Studio Entry Hill Bath BA2 5LY
Fabricator:	Valcan Dunball House Unit N Woodlands Court Business Park Bristol Road Bridgewater Somerset TA6 4FJ
Installer:	Valcan Dunball House Unit N Woodlands Court Business Park Bristol Road Bridgewater Somerset TA6 4FJ

Summary of results

Watertightness - dynamic:	PASS Rainscreen system During the test some water entered the rainscreen cavity. The rainscreen cavity is designed to allow drainage of this water and there was no standing water in the rainscreen cavity at the end of the test. The performance of the rainscreen is acceptable provided the back wall is capable of preventing water that enters the rainscreen cavity from penetrating further into the building. The back wall included in the test sample was to facilitate testing of the rainscreen and does not form part of the tested system. Water penetration through the back wall was not assessed during the test. Window interface The window interface detail was assessed for water penetration and no leakage through the window interace was found during the test.
Watertightness - hose	PASS Hose testing was limited to the window interface. No water penetrated the seal between the window and the back wall.
Wind resistance:	PASS
Serviceability test pressure:	2400Pa
Safety test pressure:	3600Pa All panels remained secure at 3600Pa. Further details of wind load tests are given in the Table on the next page.
Soft body impact test to CWCT Technical Note 76:	No visible damage under a serviceability impact of 120Nm for all panels. This is classified as Class 1. Visible damage causing a permanent depression of up to 15mm under a safety impact test of 500Nm. This did not affect the safety and security of the panels. This is classified as negligible risk.
Hard body impact test to CWCT Technical Note 76:	Small dents were caused by to 10Nm hard body impacts For the 2mm aluminium cassettes the dents were visible from more than 5m. This is classified as negligible risk at the safety level or Class 3 at the serviceability level. For the 3mm aluminium cassettes and flat sheet the dents were only visible from within 5m. This is classified as negligible risk at the safety level or Class 2 at the serviceability level.

Wind resistance test results

Panel details		Deflection limit (mm)	Measured deflection at 2400Pa	
	Span (mm)		Positive (mm)	Negative (mm)
3mm Vitradual flat panel				
Bay of panel with fixing centres 500mm x 500mm	715	7.9	4.3	6.4
Bay of portrait panel panel with fixing centres 450mmx450mm	620	6.9	5.1	6.1
2mm vitradual cassette				
Bay of portrait panel 1120mm wide and 2820 mm high with stiffeners at 699mm centres	1060	11.8	11.3	6.5
3mm Vitradual cassette				
Bay of landscape panel 3000 mm wide and 1250 mm high with stiffeners at 744mm centres	940	10.4	4.2	2.8

Notes:

Span has been taken as diagonal dimension between fixings or panel bay.

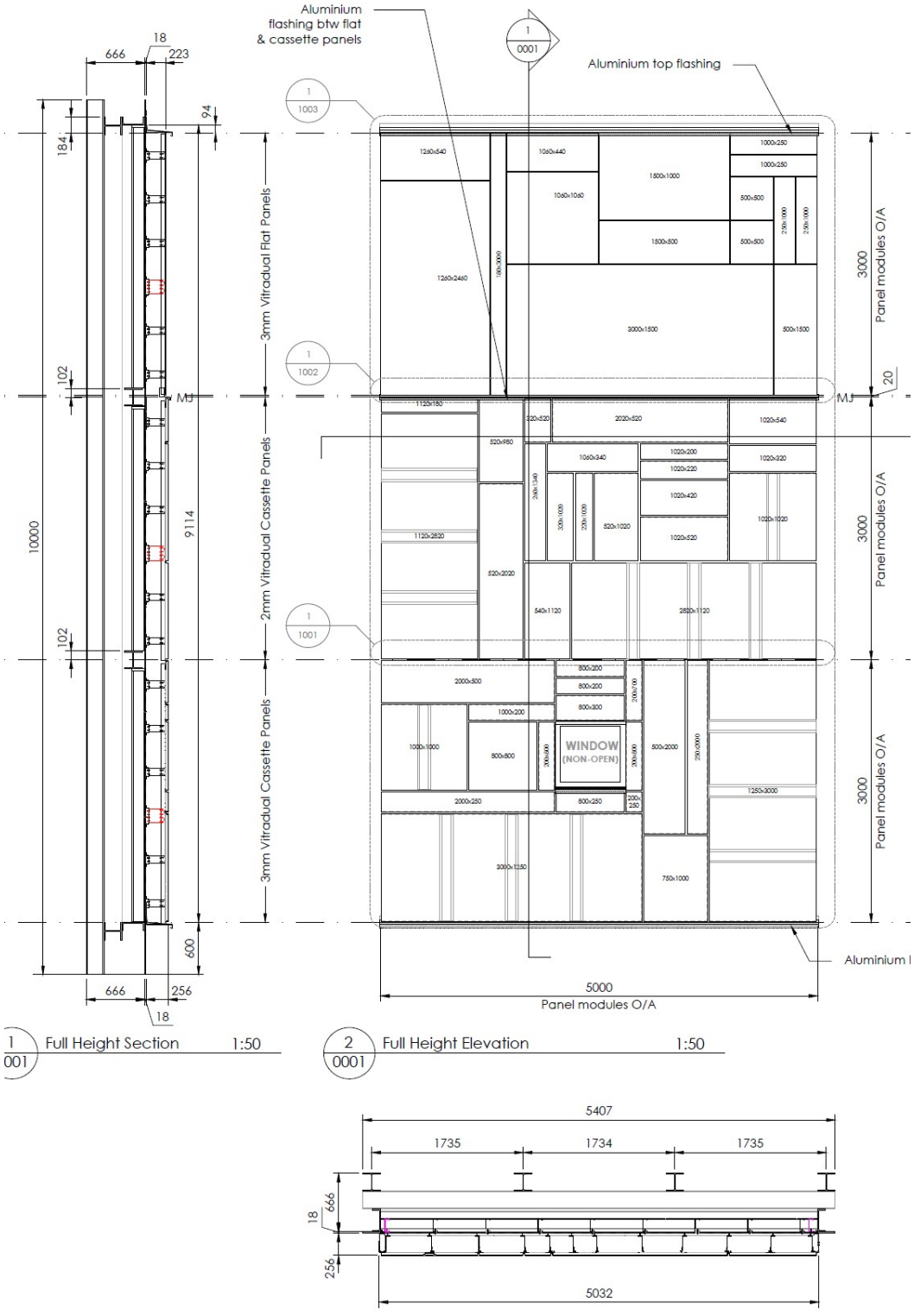
For the flat panels a bay has been taken as the area bounded by 4 fixings. Larger panels would be expected to give deflections no greater than those measured provided that fixings are on a regular grid with a diagonal dimension between fixings no greater than for the tested panels.

For the cassette panels deflection was measured on a bay of the panel bounded by the panel edges and stiffeners. Other sizes of panel would be expected to give deflections no greater than than those measured provided both dimensions of the panel bay are no greater than those for the tested panel..

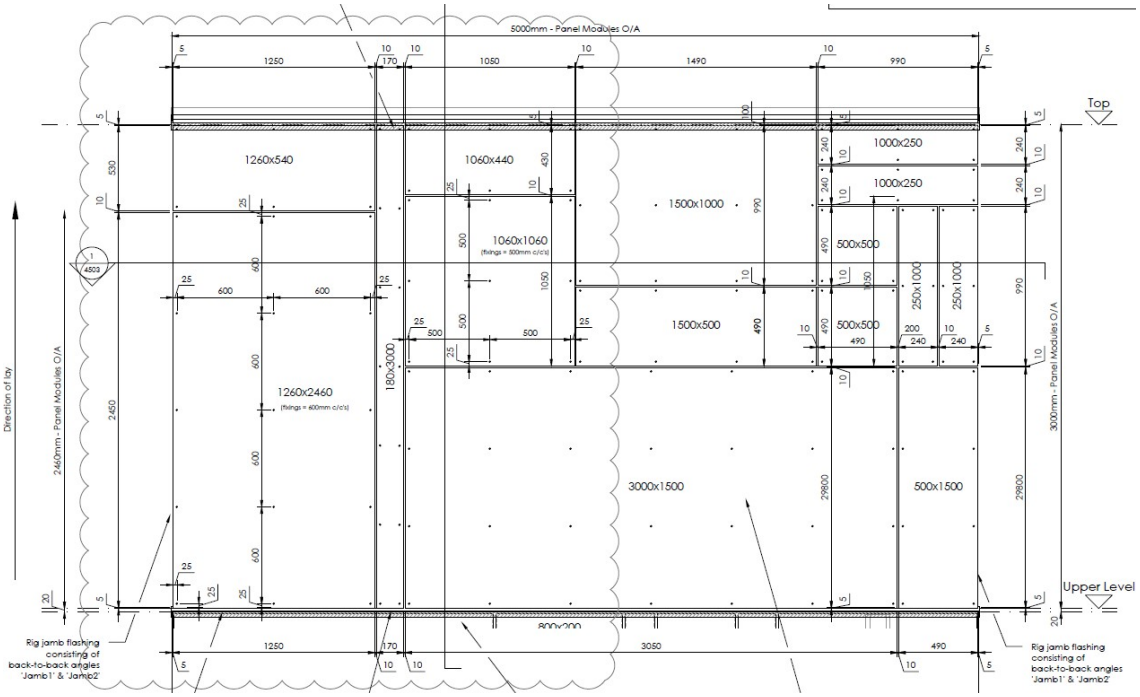
The criteria for serviceability are maximum deflection under load and recovery of deflection on unloading.

Failure to recover from deflection on unloading may indicate plastic deformation which could lead to fatigue failure after a number of load cycles. In all cases acceptable recovery was obtained after loading to 2400Pa.

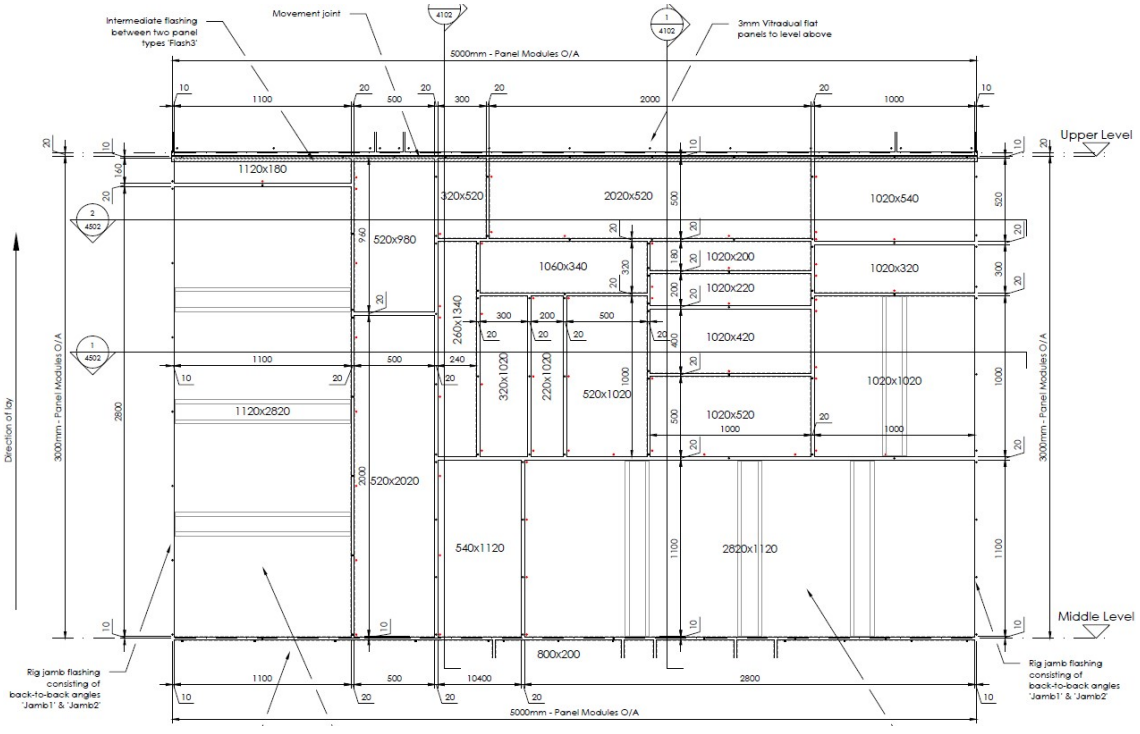
Drawings



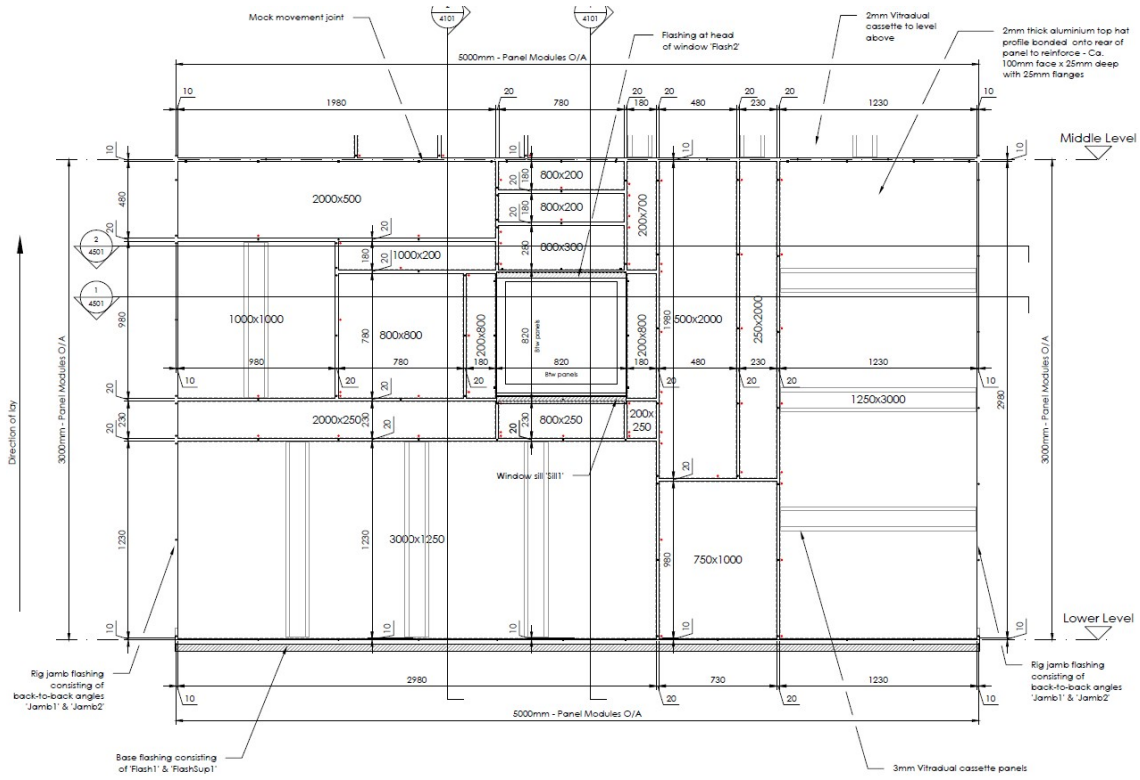
Elevation and sections of wall showing arrangement of panels



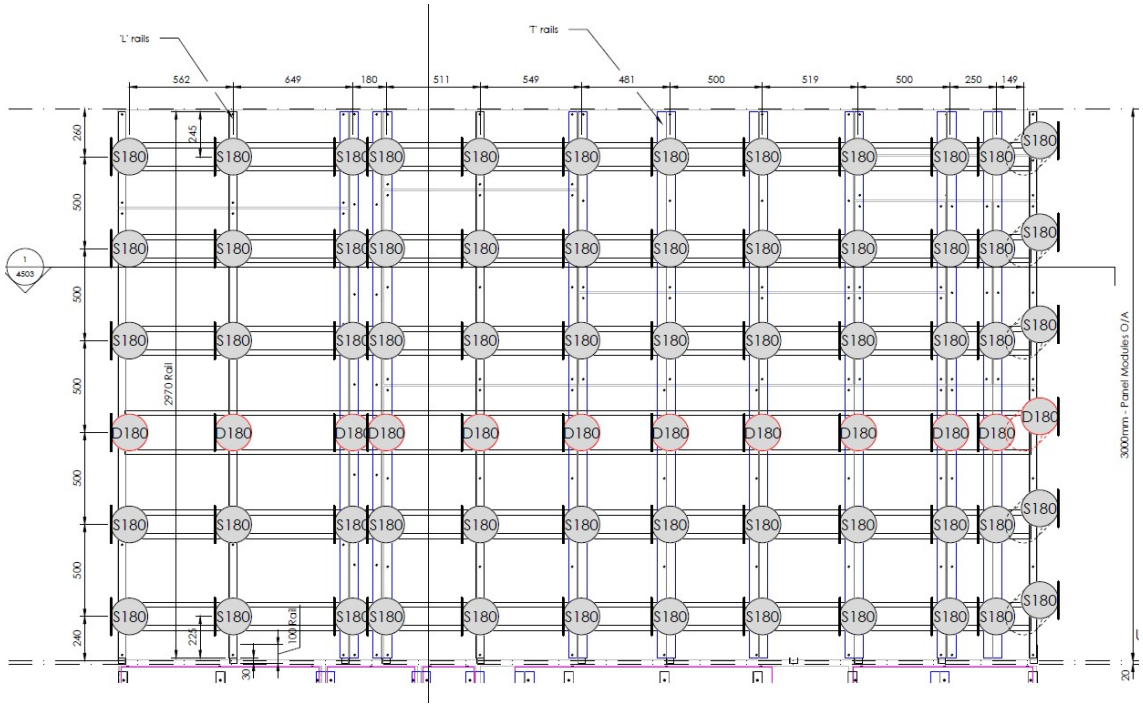
Panel layout for flat 3mm Vitradual panels



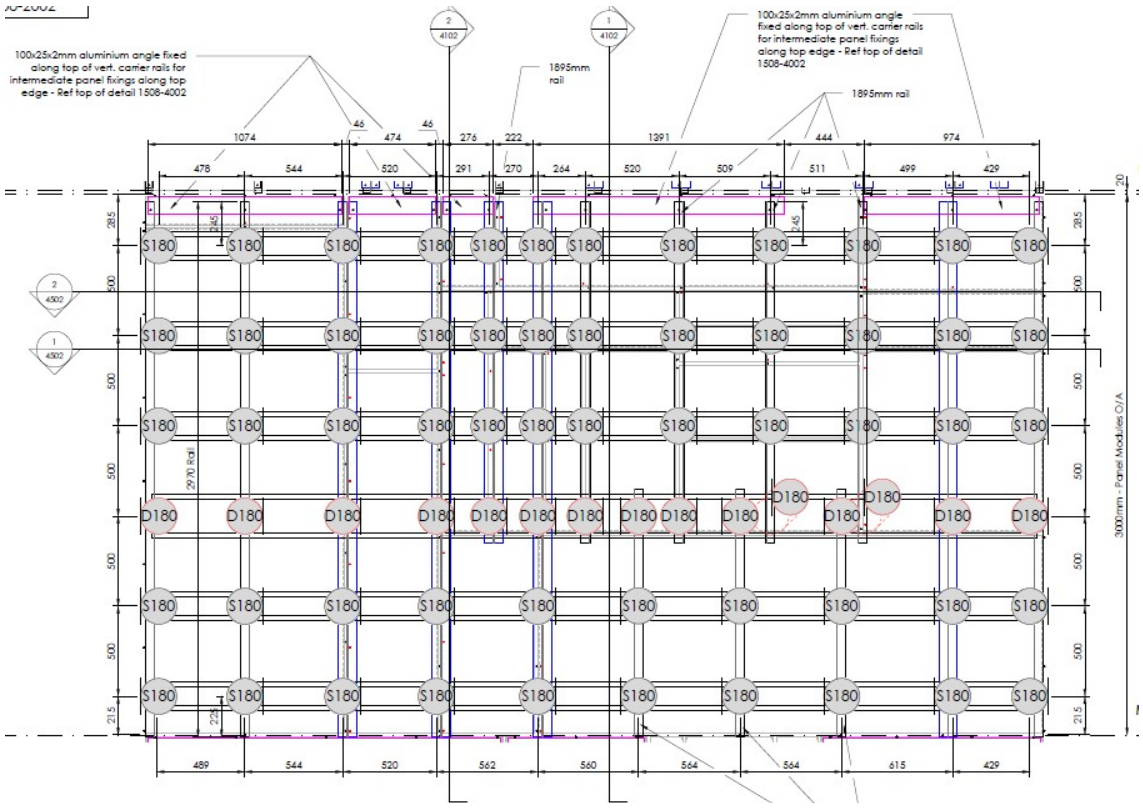
Panel layout for 2mm Vitradual cassette panels



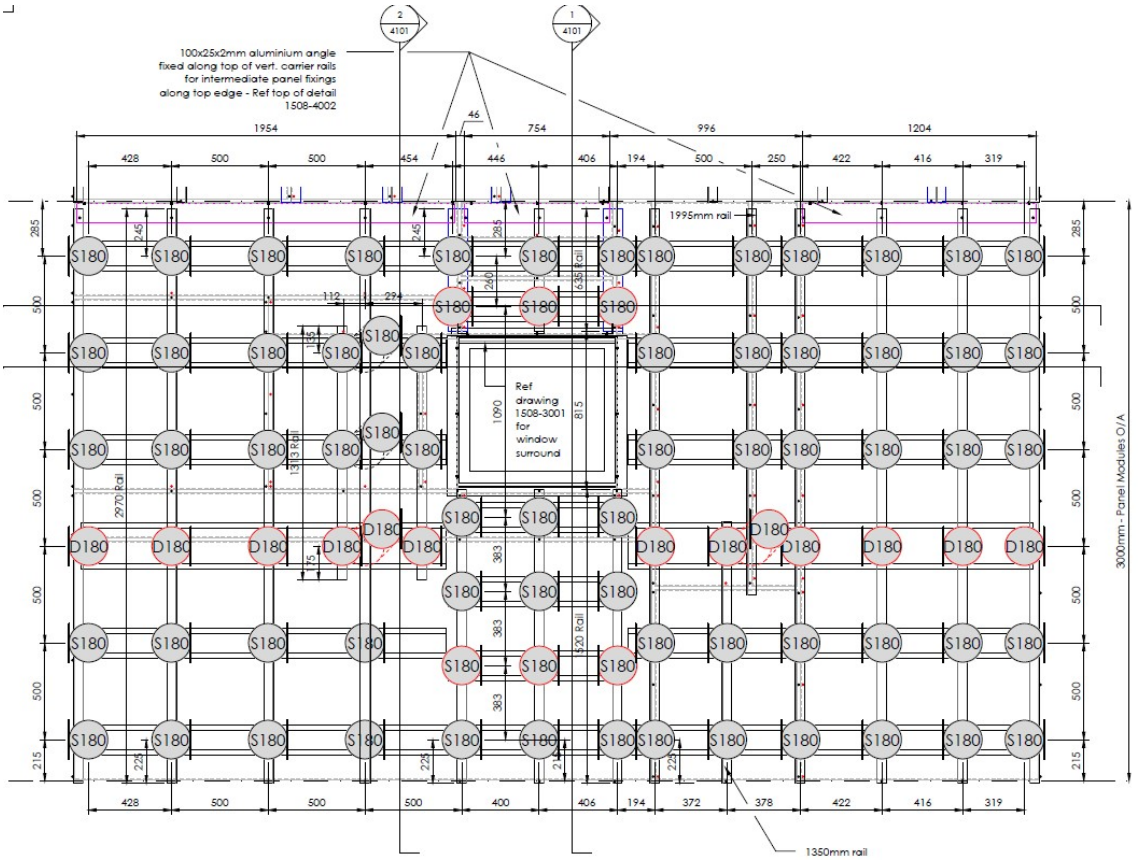
Panel Layout for for 3mm Vitradual cassetes



Bracket and support rail arrangement for Vitradual flat panels



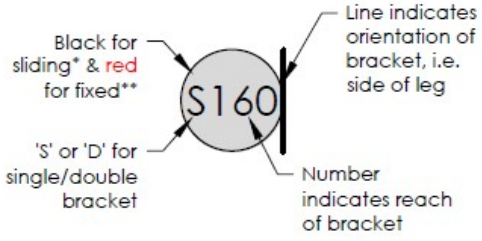
Bracket and support rail arrangement for 2mm Vitradual cassettes



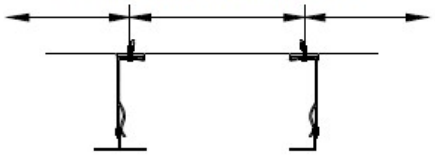
Bracket and support rail arrangement for 3mm Vitradual cassettes

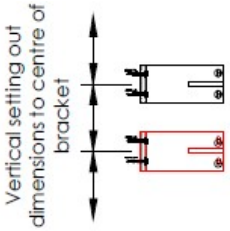
Drawing for the setting out of top hat rails, cladding carrier bracket & carrier rails.

To be read in conjunction with drawing series listed below in Associated Drawings



Horizontal setting out dimensions to centre of fixing point in bracket



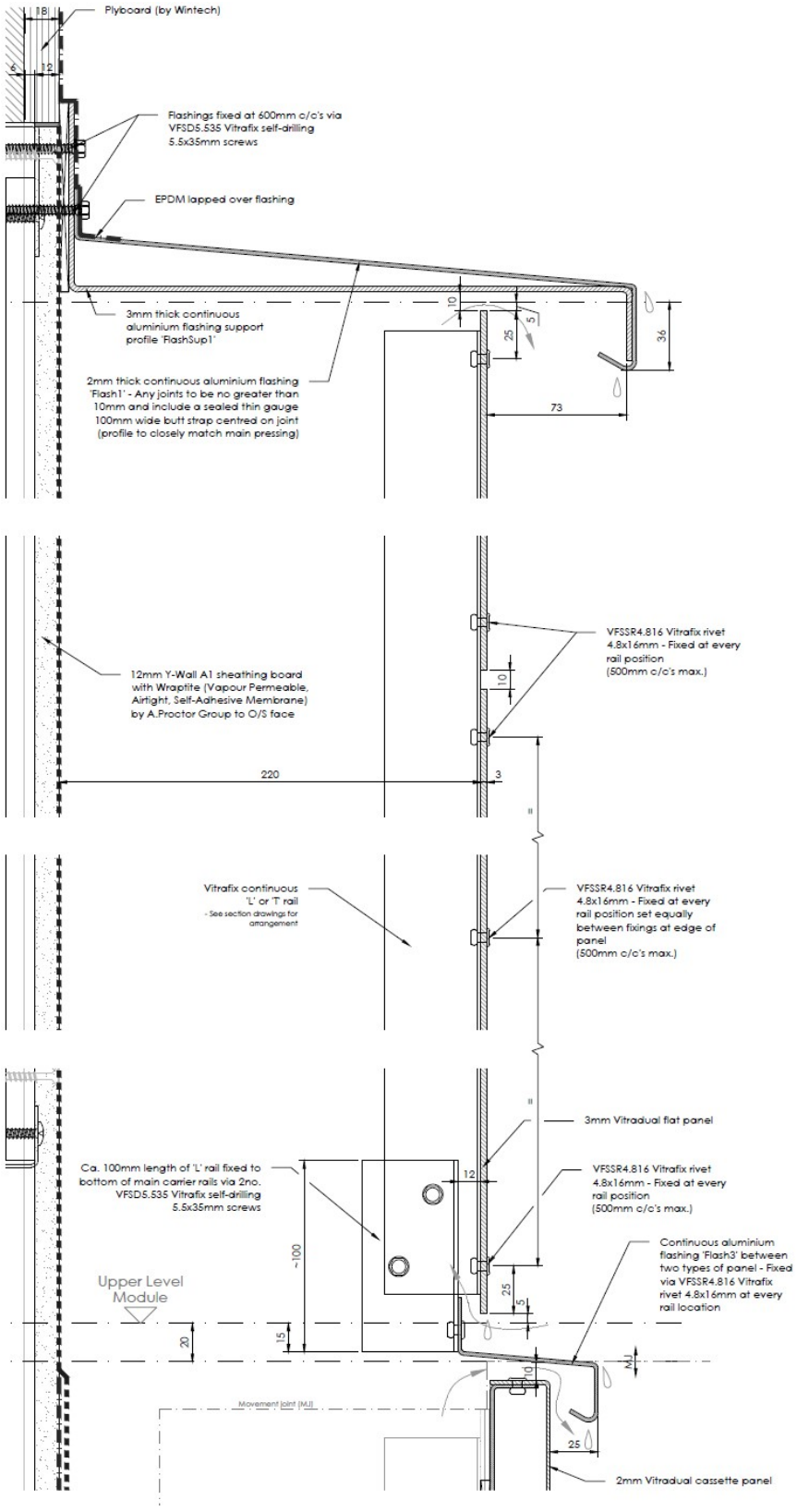


* Sliding point = fixings in **centre** of slots

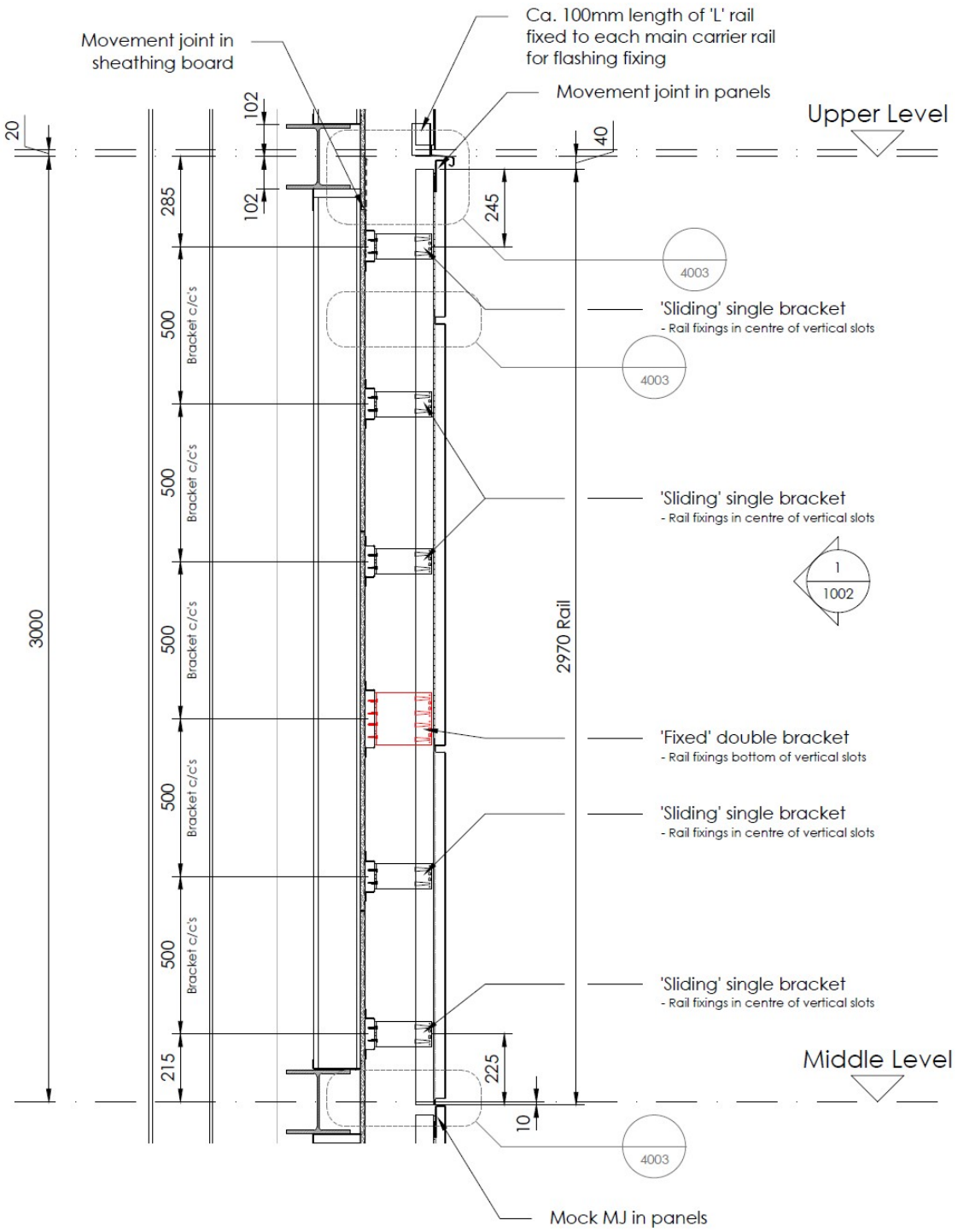
** Fixed point = fixings in **bottom** of slots

'L' rails used typically - 'T' rails identified in **blue**

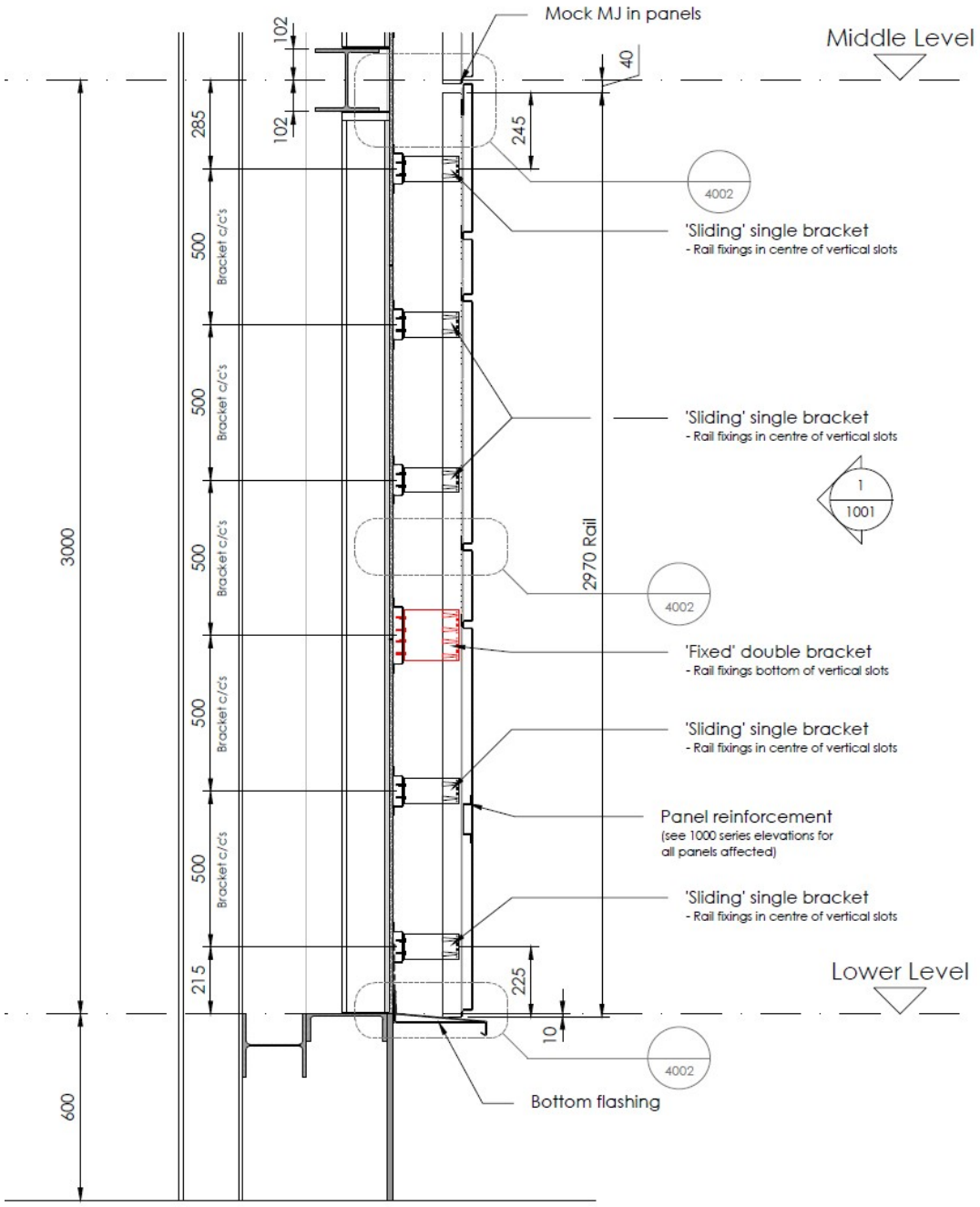
Key to bracket and support rail drawings



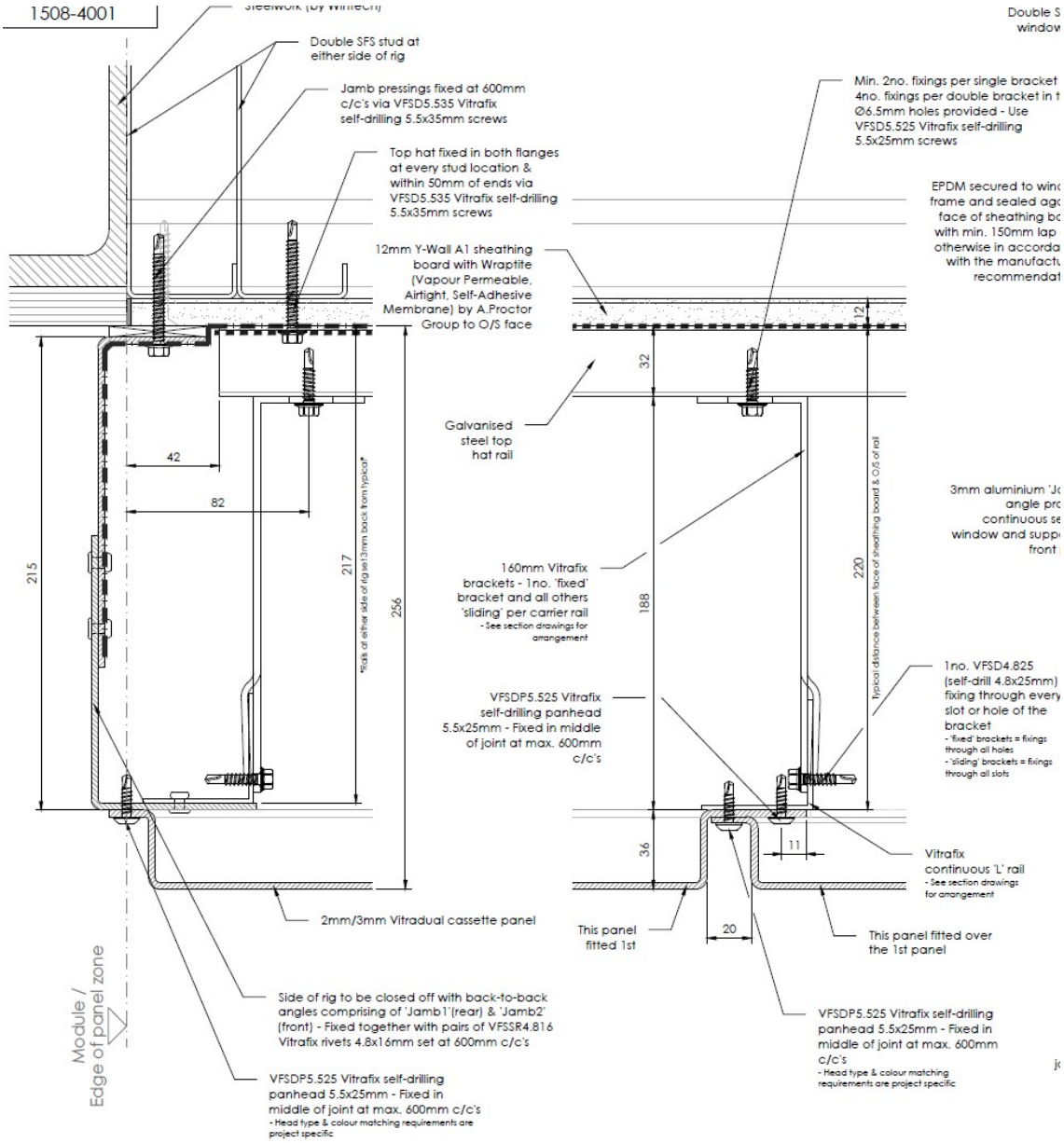
Vertical section through upper section of wall with Vitradual flat panels



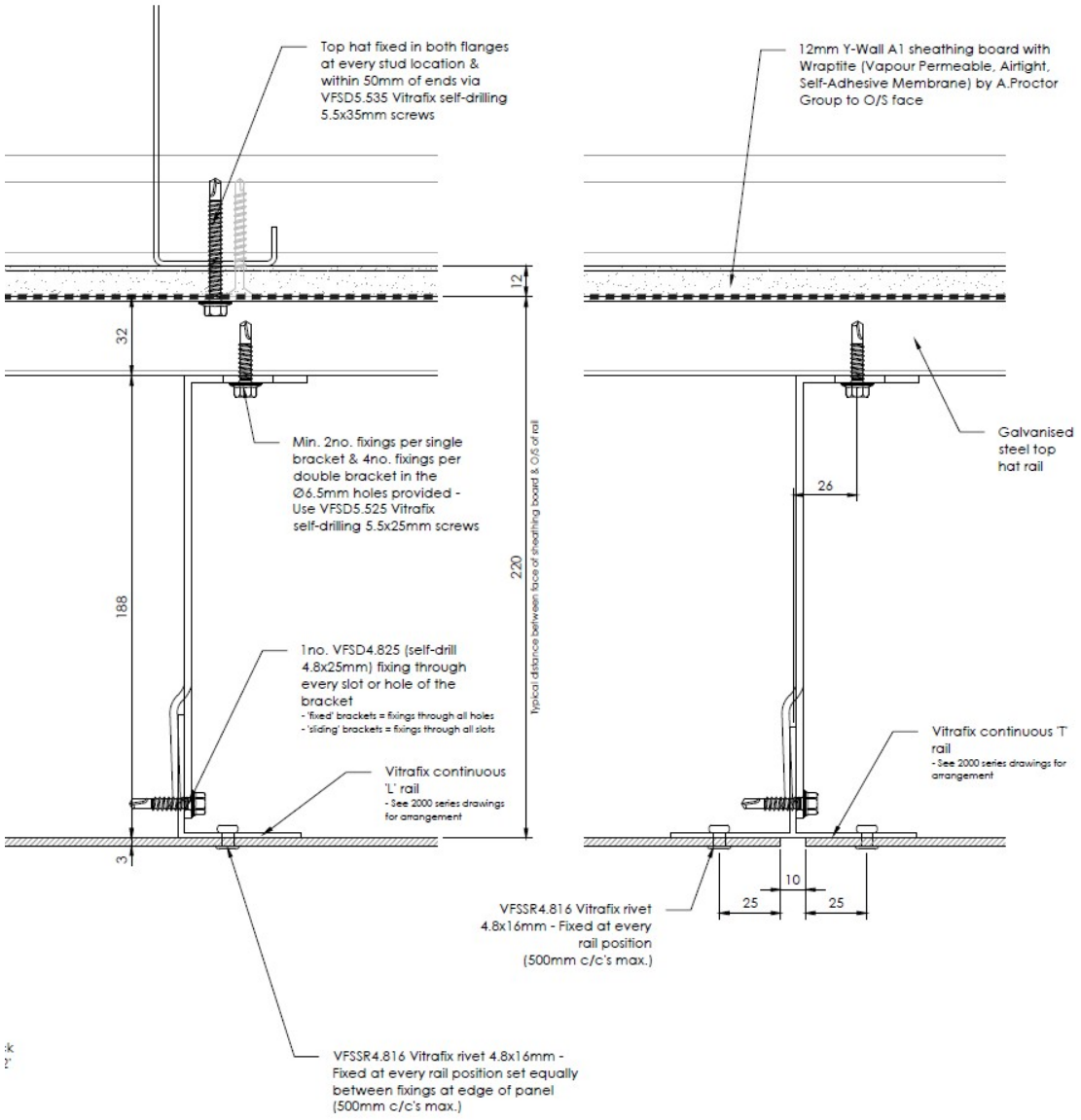
Vertical section through central section of wall with 2mm Vitradual cassettes



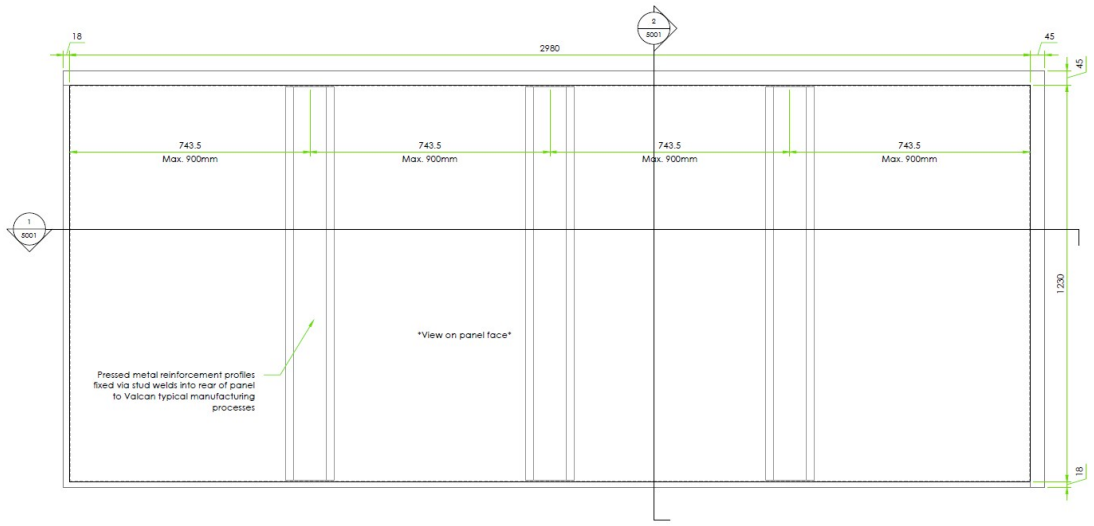
Vertical section through lower section of wall with 3mm Vitradual cassettes



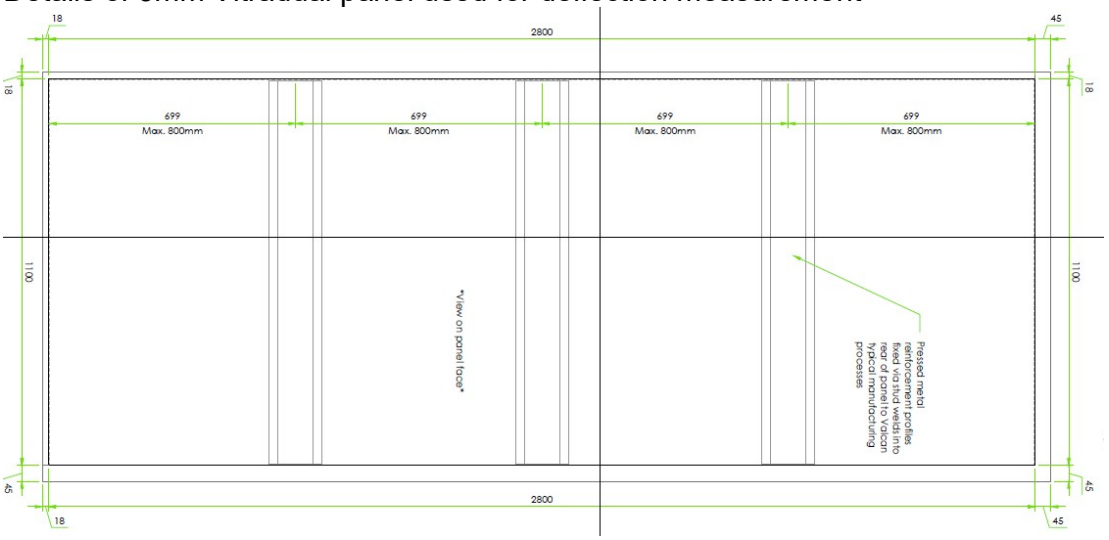
Horizontal sections showing fixing details for cassettes



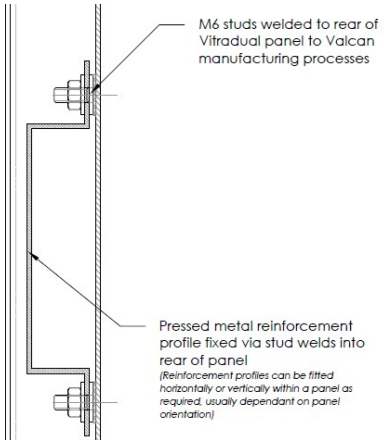
Horizontal section through upper part of wall showing fixing details for flat panels



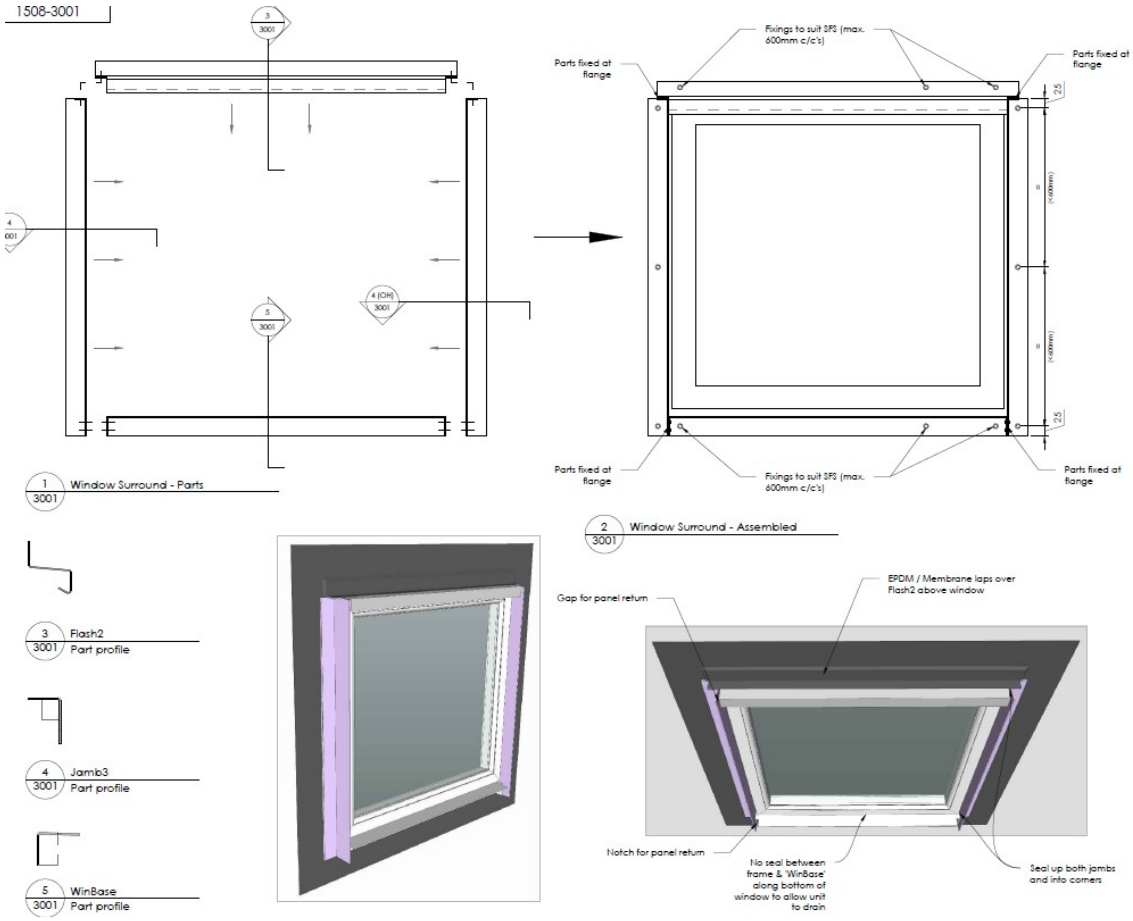
Details of 3mm Vitradual panel used for deflection measurement



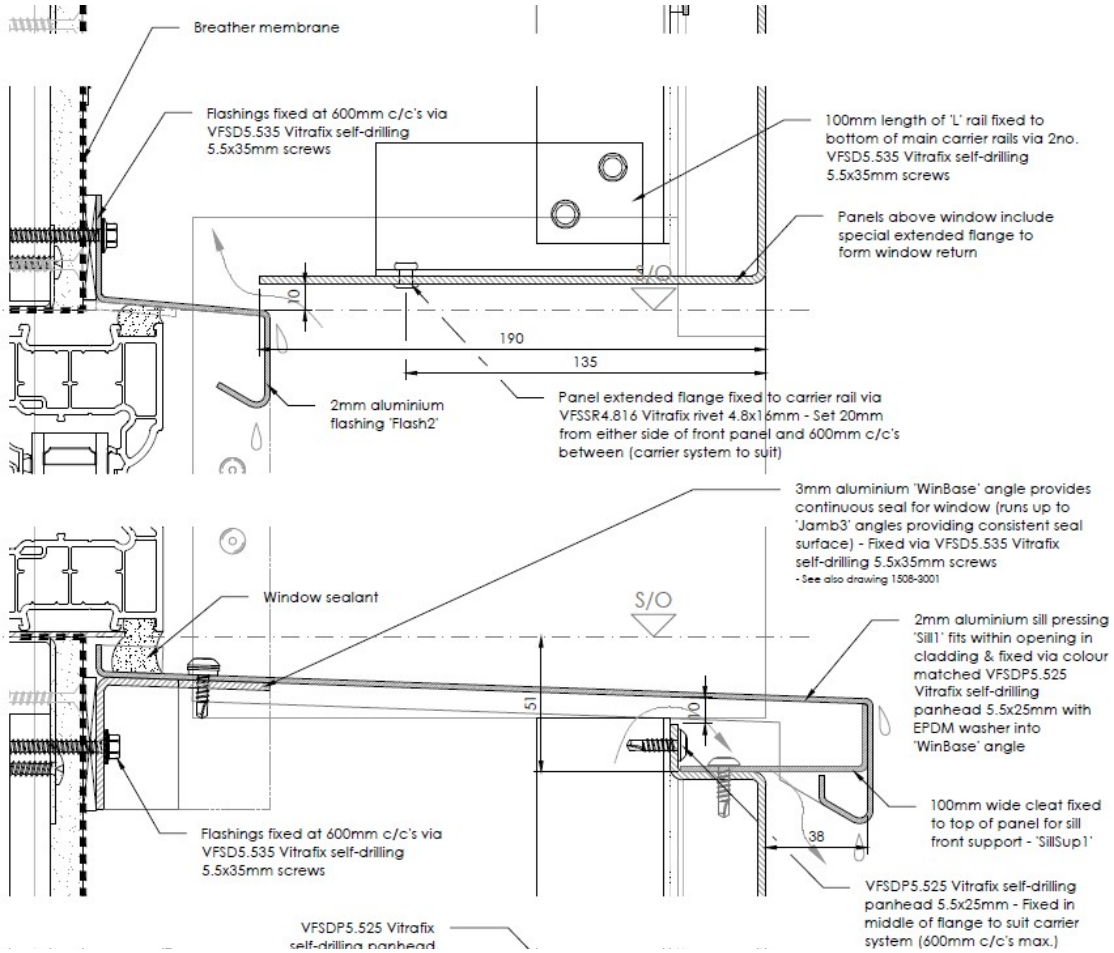
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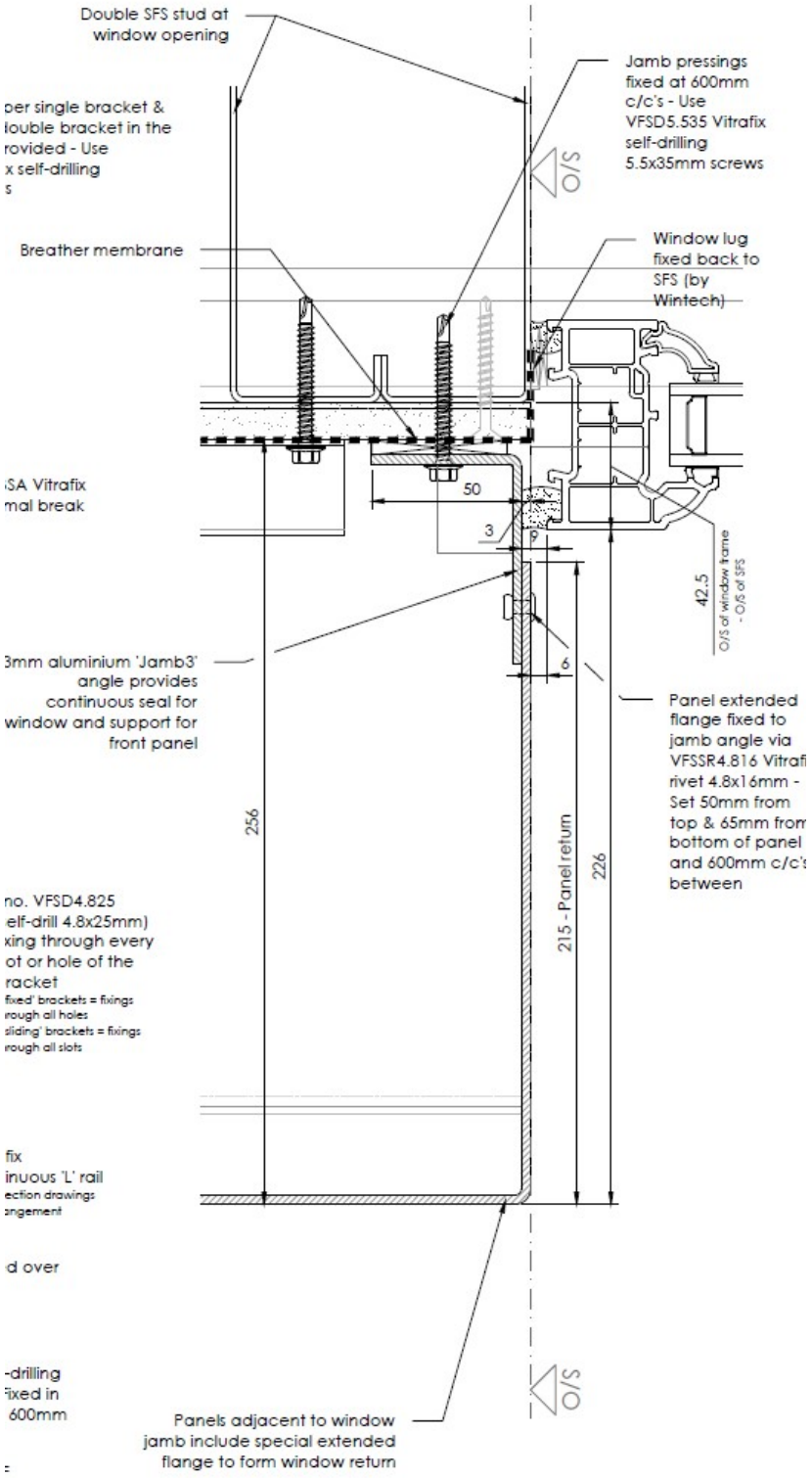
Stiffener attachment detail



Aluminium flashings for closing rainscreen cavity around window



Vertical section showing window interface seals.



Horizontal section showing sealing of interface at window jamb