

# Certificate of Testing



**Certificate Number:** 20/099

**Date:**

**System:** Sotech TFC+ Rainscreen

**System supplier:** Sotech  
Unit 2 Traynor Way  
Whitehouse Business Park  
Peterlee  
County Durham  
SR8 2RU

**Tests performed:**

Watertightness - dynamic	✓
Wind resistance - serviceability	✓
Wind resistance - safety	✓
Soft body impact	✓
Hard body impact	✓

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

**Signed:**  **Test Engineer**

**Signed**  **Director**

CWCT Services Ltd, The Studio, Entry Hill, Bath, BA2 5LY  
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**Description of components tested**

Rainscreen system: Sotech Optima TFC+ aluminium cassette rainscreen

Panel material: 2mm 1050 powder coated aluminium  
 3mm 1050 powder coated aluminium  
 2mm 3000 precoated aluminium  
 3mm 3000 precoated aluminium

Panel descriptions: 50mm deep cassette panels formed by folding edges of aluminium sheet.

Sides of panels double folded with return extending 18/24.5 mm from side of cassette. Panels fixed by screws through return at maximum 500mm centres.

Top of panel double folded with upstand of 35mm forming labyrinth joint with bottom of panel above.

Bottom edge of panel double folded to form upstand 15mm high and 34 mm back from face of cassette.

Top hat stiffeners fixed to back of panels with welded M8 aluminium studs. Stiffeners folded from same material as cassette with elevated section of top hat 40mm high and 45mm wide. Stiffeners start 5mm from edge of cassette with first stud 30mm from end of stiffener. Studs in pairs, one in each flange of top hat but staggered by 20 mm. Maximum spacing of studs 500mm. Horizontal stiffeners on portrait panels and vertical stiffeners on landscape panels.

For landscape panels, restraint brackets fixed to bottom edge of cassette on line of stiffeners. Brackets provide fixing points for bottom edge of cassettes.

Panel size:

Width (mm)	Height (mm)	Number of Stiffeners	Stiffener spacing
3mm 1050 powder coated aluminium			
1500	3850	6	610
3800	1350	4	760
2985	750	2	1050/968
3mm 3000 precoated aluminium			
3000	1350	3	750
2mm 1050 powder coated aluminium			
600	3850	0	-
3800	600	4	760
2985	750	4	597

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Panel sizes (cont)	Width (mm)	Height (mm)	Number of stiffeners	Spacing of stiffeners
	2mm 3000 precoated aluminium			
	730	1970	2	763
	3000	600	3	750
Joints:	Labyrinth horizontal joints formed by panel edges			
	Vertical joints closed by overlapping panel edges screwed to support rails			
Support system:	Hilti support rail system comprising T and L section vertical rails supported by Hilti MFT-MFI 185 M 6.5 wind load brackets and MFT-MFI 185 L 6.5 dead load brackets. L rails 40 x 60 x 1.8mm, T rails 80 x 60 x 1.8 mm. L rails used to support sides of panels and T rails used to support panels at vertical stiffeners.			
	Rails fixed to brackets by Hilti S-AD01S 5.5x19 screws, two screws per bracket for wind load brackets and four screws per bracket for dead load brackets.			
	Support rails aligned with panel edges and vertical stiffeners of landscape panels			
Panel fixings:	Panels fixed to vertical rails by Hilti S-AD 01S 5.5x19 screws. Screws at maximum 500mm centres in vertical edges of cassettes. Landscape panels also fixed to rails at stiffener locations; screw fixing through upstand at top of panel and through bracket attached to bottom edge of panel.			
Drainage and ventilation:	Drained and ventilated cavity behind rainscreen			
Backing wall:	Rigid backing wall consisting of hot rolled steel vertical studs spanning between horizontal steel channels. Plywood sheathing on outer face of steelwork. Back wall provided to allow testing of rainscreen and not part of certified system.			

**Test arrangements**

**Fabricator:**

Sotech  
Unit 2 Traynor Way  
Whitehouse Business Park  
Peterlee  
County Durham  
SR8 2RU

**Installer:**

Sotech  
Unit 2 Traynor Way  
Whitehouse Business Park  
Peterlee  
County Durham  
SR8 2RU

**Testing laboratory:**

Technology Centre  
Vinci Construction UK Ltd  
Stanbridge Road  
Leighton Buzzard  
Bedfordshire LU7 4QH

**Registration No:**

UKAS No 0057

**Independent testing authority:**

Technology Centre  
Vinci Construction UK Ltd  
Stanbridge Road  
Leighton Buzzard  
Bedfordshire LU7 4QH

**Witness:**

Alan Keiller, Principal Engineer  
Centre for Window and Cladding Technology  
The Studio, Entry Hill, Bath, BA2 5LY

Due to Coronavirus pandemic, test was not witnessed in person. Certificate issued based on reports and photographs supplied by Client and The Technology Centre

**Date of test:**

24 March 2020

**Report No:**

N950-20-17859

### Summary of Results

**Watertightness - dynamic:** PASS

Note: During the test some water was blown across the rainscreen cavity causing water to run down the face of the back wall. This is acceptable provided that any materials in the rainscreen cavity are resistant to intermittent wetting and the back wall is watertight or protected by a watertight membrane.

**Wind resistance:** PASS

Serviceability test pressure: 2400 Pa max, not all panels were acceptable at this wind load, details given in Table below.

Safety test pressure: 3600 Pa

### Impact

Soft body impact test to CWCT Technical Note 76  
Panels generally suffered minor damage which was not readily visible under a serviceability impact of 120Nm. The only exception was a panel with 2mm aluminium which suffered a depression of 43mm which would require replacement of the panel.

All Panels remained secure after a safety impact test of 500Nm. This is classified as negligible risk.

Impact performance for different panel materials and sizes is given in Table below.

Hard body test to CWCT Technical Note 76  
Panels suffered minor indentations when subject to hard body impacts up to 10Nm. This was only visible from within 1m.

This level of damage is class 1 at the serviceability level and negligible risk at the safety level.

The tests described in this certificate demonstrate that the test sample as constructed satisfies the performance requirements of the CWCT Standard for the properties tested. Variations from the tested arrangement should be verified by additional tests or calculation.

**Wind resistance test results**

Panel details			Deflection limit (span/90) (2) (mm)	Measured deflection at acceptable serviceability wind load (3)		Acceptable wind load Serviceability/safety (4) (Pa)
Width (panel/bay) (mm)	Height (panel/bay) (mm)	Span (1) (mm)		Positive (mm)	Negative (mm)	
<b>3mm 1050 aluminium</b>						
1500/1500	3850/610	1620	18.0	11.1	-10.8	2400/3600
3800/760	1350/1350	1550	17.2	15.8	-16.9	2400/3600
2985/1050	750/750	1290	14.3	7.6	-10.1	2400/3600
<b>2mm 1050 aluminium</b>						
600/600	3850/3850	3896	20	20	-15.4	2000/3600
3800/760	600/600	968	10.8	9.6	-8.1	1600/3600
2985/597	750/750	959	10.7	4.2	-3.9	2400/3600
<b>2mm 3000 precoated aluminium</b>						
730/730	1970/763	1091	12.1	7.5	-6.1	2400/3600
3000/750	600/600	960	10.7	7.8	-5.5	2400/3600

**Notes:**

- (1) Span taken as diagonal dimension of panel or bay of panel for panels with stiffeners.
- (2) Span/90 is the limit given in the CWCT Standard. Deflection capped at 20 mm; greater deflection may be acceptable if it is visually acceptable to the purchaser and full recovery of deflection is achieved on removal of load. Failure to recover from deflection on unloading may indicate plastic deformation which could lead to fatigue failure after a number of load cycles.
- (3) The measured deflection has been adjusted to take account of movement at the support points.
- (4) The table shows the highest wind pressure at which the panel complied with the requirements of the CWCT Standard. The Table only shows panels for which deflection results are available. At the serviceability level the deflection under load should be less than the limiting value and there should be full recovery of deflection on unloading. Full recovery is defined as a residual deflection of less than 1mm. At the safety load there should be no permanent damage to the system and the panels should remain secure. The CWCT Standard does not give a limit on residual deformation for rainscreen panels after application of the safety wind load. At the loads shown the residual deformation was less than span/500 which is the limit given for framing members.
- (5) The 3000 x 1350 mm landscape panel in 3mm precoated aluminium panel has not been included in the Table as it gave excessive residual movement after unloading. This may have been due to slip at a support location.

**Soft body impact test results**

Panel details		Impact Test			
Width (panel/bay) (mm)	Height (panel/bay) (mm)	120Nm Serviceability		500Nm Safety	
		Class	Comment	Class	Comment
3mm 1050 aluminium					
1500/1500	3850/610	Class 1	2mm max depression	Negligible risk	26 mm max depression
3800/1000	1350/1350	Class 1	1mm max depression	Negligible risk	10 mm max depression
3mm 3000 precoat aluminium					
3000/750	1350/1350	Class 1	1mm max depression	Negligible risk	15 mm max depression
2mm 1050 aluminium					
600/600	3850/3850	Class 3	43 mm max depression	Negligible risk	120 mm max depression
2mm 3000 precoat					
780/780	1970/763	Class 1	No damage	Negligible risk	8 mm max depression
3000/750	600/600	Class1	No damage	Negligible risk	5 mm max depression

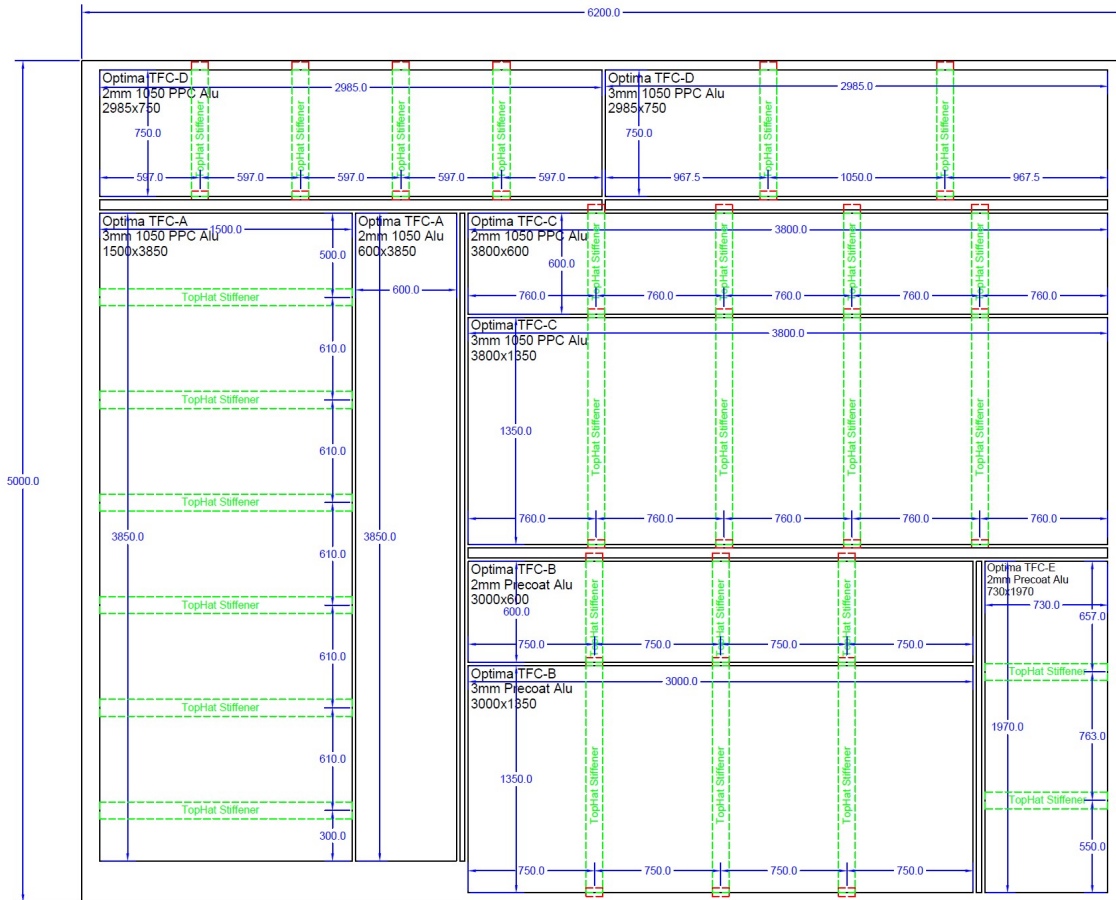
**Notes:**

Soft body tests were carried out in the centre of a panel bay, on stiffeners and near the bottom edge of the panel.

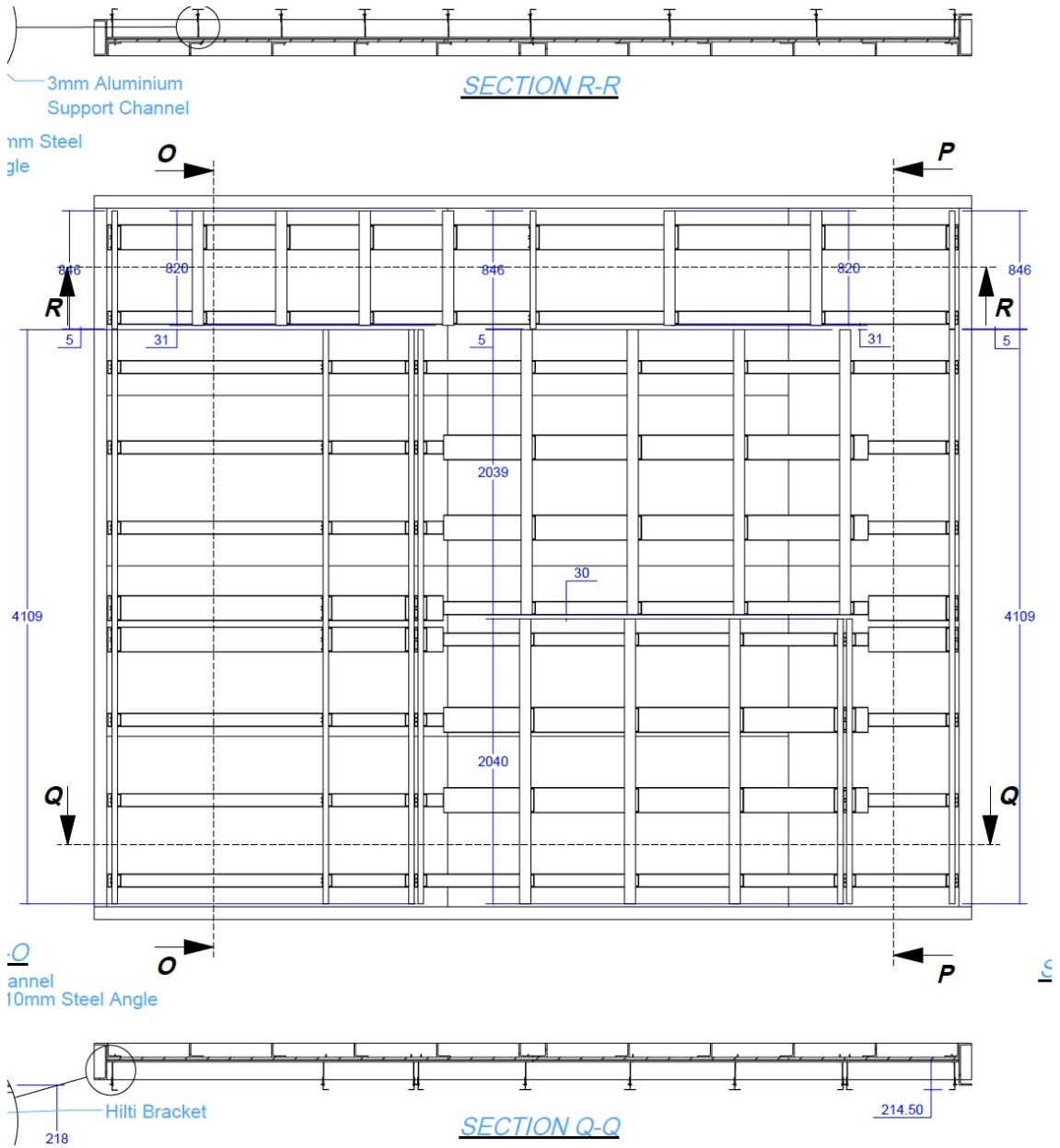
Serviceability performance is given in 5 classes; Class 1 is the highest class and indicates that no visible damage was caused by the impact. Class 3 indicates that the panel was damaged and would require replacement to maintain appearance but does not require replacement of adjacent panels or support structures.

Safety performance is given in four classes. Negligible risk is the highest performance class and indicates that no debris fell from the specimen during the test although severe distortion occurred in some cases which would require replacement of the panels.

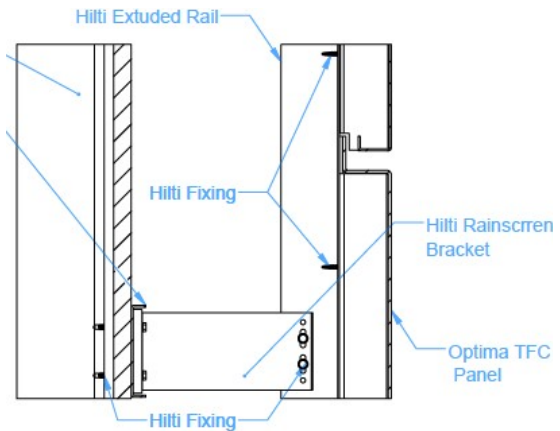
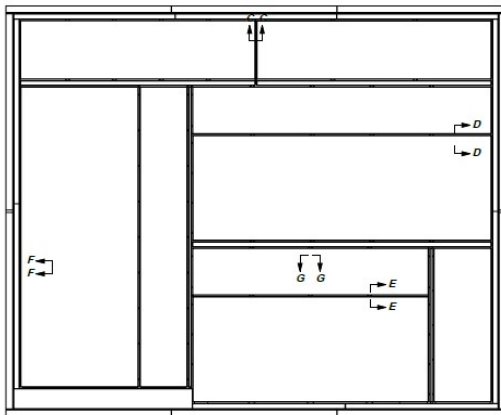
Drawings



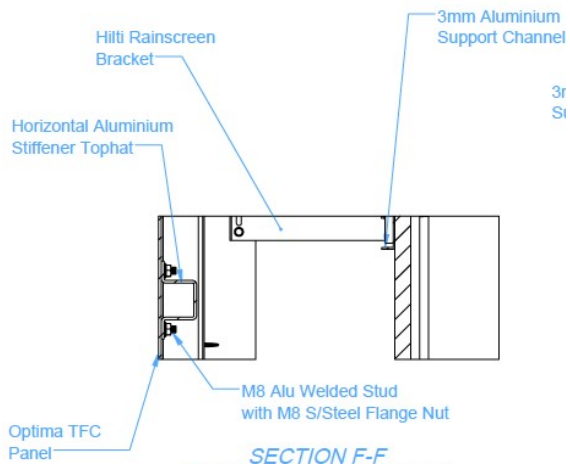
Elevation of test wall showing cassette arrangement



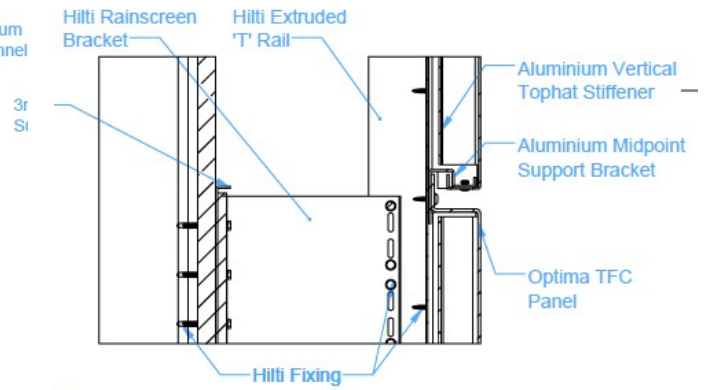
Elevation of sample showing support structure arrangement



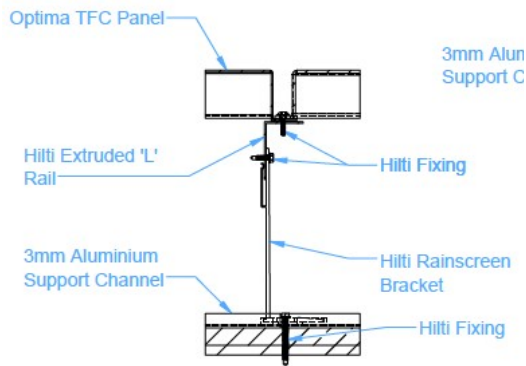
**SECTION D-D**  
*Horizontal Joint Detail*



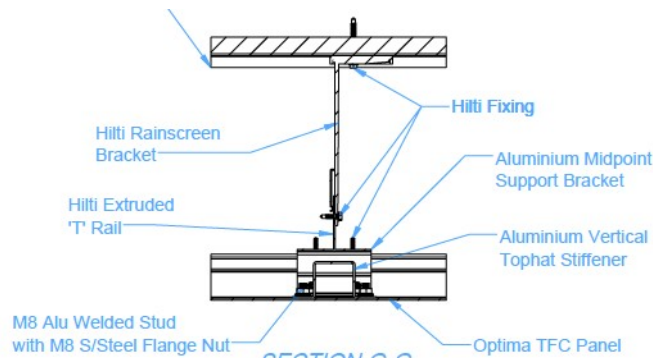
**SECTION F-F**  
*Horizontal Stiffener Detail*



**SECTION E-E**  
*Midpoint Support Bracket Detail*

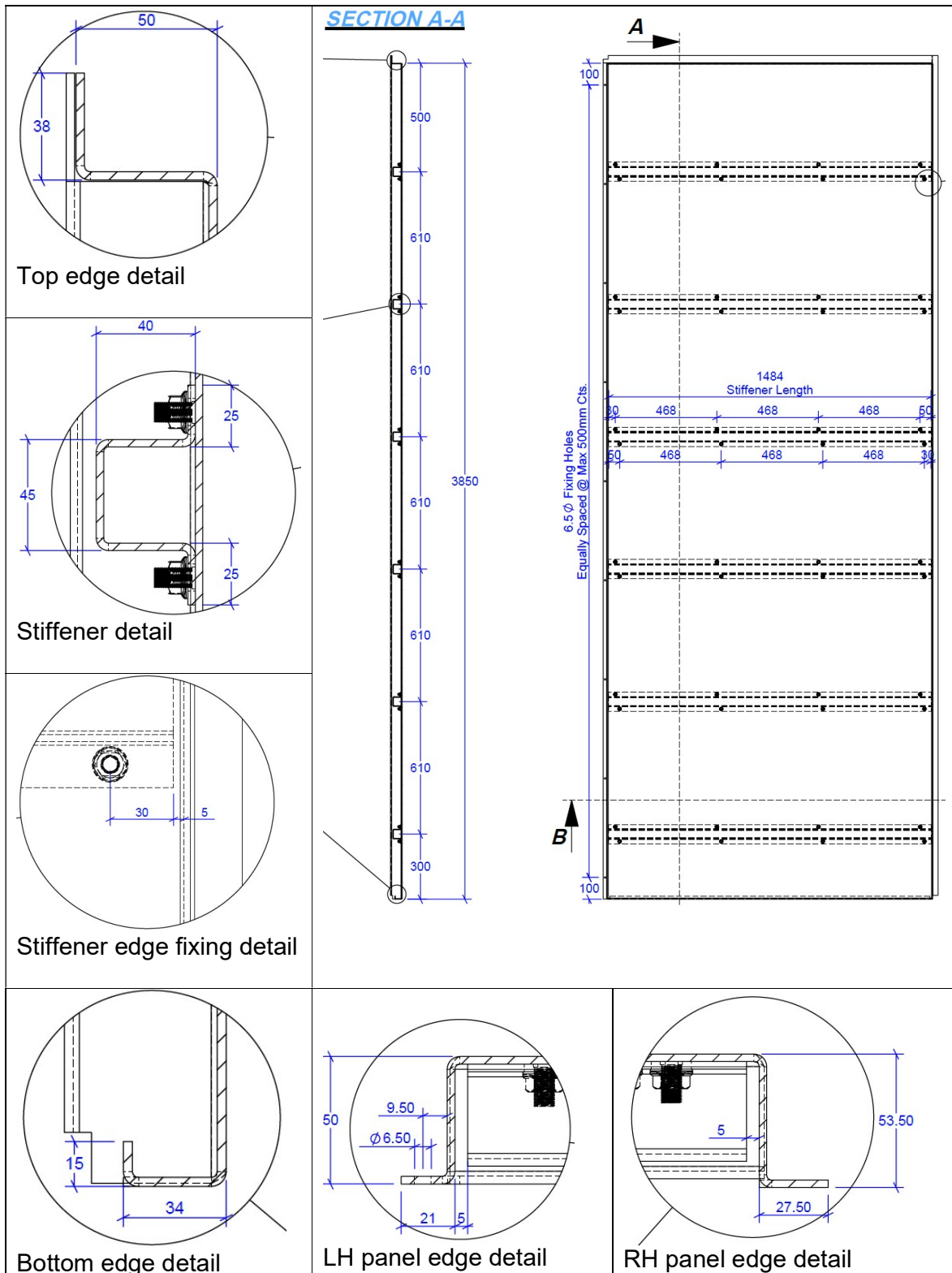


**SECTION C-C**  
*Vertical Joint Detail*

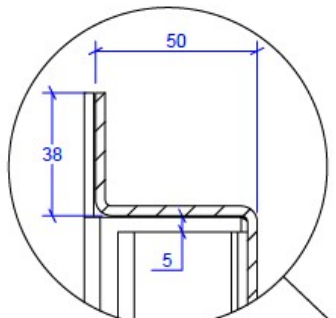
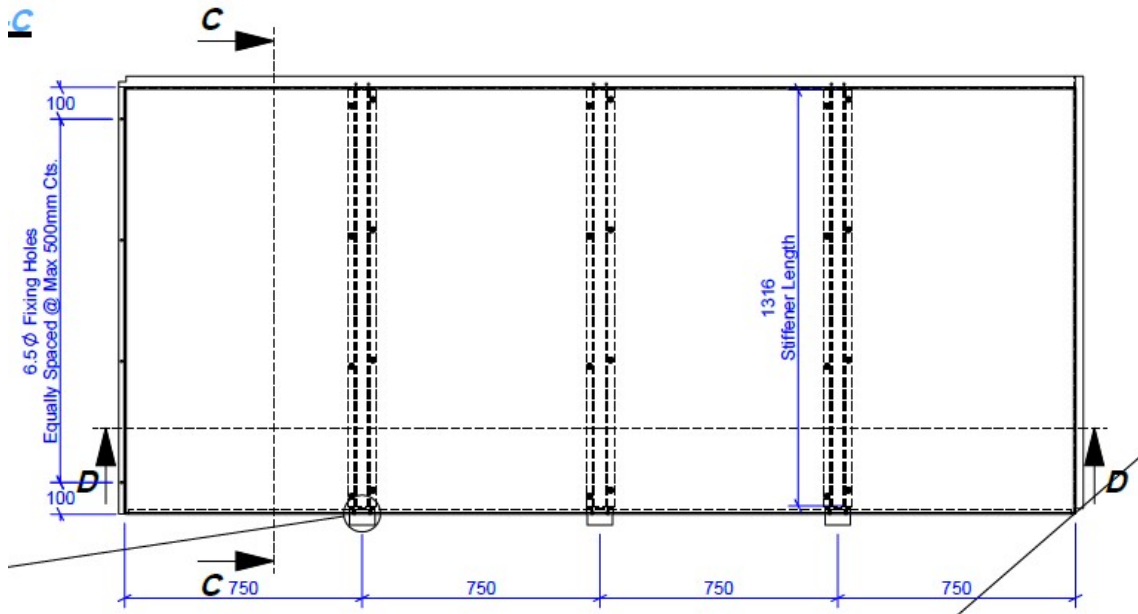


**SECTION G-G**  
*Vertical Stiffener Detail*

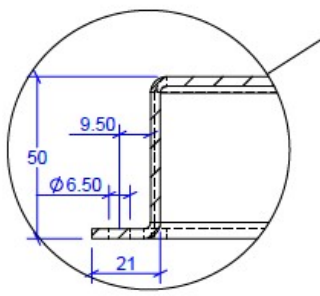
Construction details



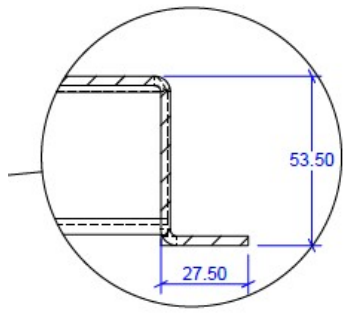
1500 x 3850 portrait panel showing typical edge and stiffener details for portrait panel



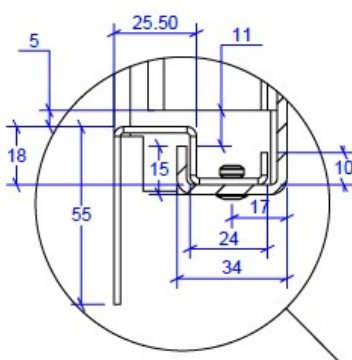
Top edge detail



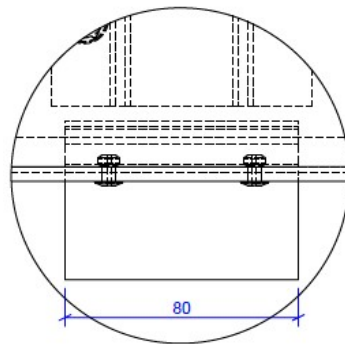
LH Panel edge detail



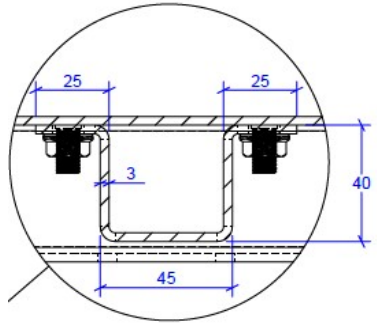
RH Panel edge detail



Restraint bracket connection to bottom of cassette



Restraint bracket connection to bottom of cassette



Stiffener detail

3000 x 1350 landscape panel showing typical edge and stiffener details for landscape panel