

Certificate of Testing



Certificate Number: 2017/76

Date: 25 September 2017

System: **AMS Hook on panel rainscreen**

System supplier: Architectural Metal Solutions Ltd
Bentalls House
Bentalls
Basildon
Essex, SS14 3BS

Tests performed:

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

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

A handwritten signature in blue ink, appearing to read 'Mr P Keller'.

Test Witness

A handwritten signature in blue ink, appearing to read 'Pretalpa'.

Director

Description of system tested

Rainscreen system: AMS hook on rainscreen panels supported by Nvelope NV7 support rail system

Panel material: 2mm and 3mm thick 1050 aluminium

Panel description: 50mm deep aluminium cassette panels.
Larger panels provided with top hat stiffeners bonded with double sided 3M VHB tape 18mm wide 1mm thick, mechanically fixed to the panel by 6mm studs at mid length and riveted to cassette at end
Corners of 2mm panels welded.

Panel size:	Height (mm)	Width (mm)	stiffeners	Thickness (mm)
	1150	2380	1 vertical, 2 horizontal	3
	1150	2380	1 vertical, 2 horizontal	2
	2820	1180	5 horizontal	2
	2820	1180	5 horizontal	3
	1820	660	none	3
	1820	660	none	2
	2820	420	none	2
	480	1340	none	2
	480	1340	none	3
	1150	1180	1 vertical	3
	1150	1180	1 vertical	2
	1150	1180	2 horizontal	3
	1150	1180	2 horizontal	2
	1400	580	none	3
	1400	580	none	2

Horizontal joint: Labyrinth joint

Vertical joint: Closed joint; gap between back of return at edge of panel and face of rail filled with foam anti rattle strip

Support rails: Nvelope NV7 support rails and brackets.

Fixings: Slots in return on vertical edges of panels engage with hooks screwed to sides of rails. For wider panels hooks can also be used to restrain panels at stiffeners. Upstand at top of panels also secured to rails with DF3-SS-PL-5.5x35 screws.

Hooks screwed to rails with Ejot JT4-4-4.8x19 screws

Rails fixed to brackets with Ejot JT4-4-4.8x19 screws

Drainage and ventilation: Rainscreen cavity drained by flashing and open joint at bottom of wall. Ventilation provided by open joint at top of wall.

Backing wall: Steel studs at 600mm centres with plywood sheathing
Horizontal top hats of 2mm galvanised steel provided on face of back wall to transfer load from rainscreen rails to studs.

Test arrangements

Date of test: 28 February 2017

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
CWCT
The Studio
Entry Hill
Bath
BA2 5LY

Fabricator: Architectural Metal Solutions Ltd
Bentalls House
Bentalls
Basildon
Essex, SS14 3BS

Installer: Paneltec Services Ltd
Bentalls House
Bentalls
Basildon
Essex, SS14 3BS

Summary of results

Watertightness - dynamic: PASS

Note:

During the test some water entered the rainscreen cavity. This was sufficient to cause wetting of the face of the back wall but insufficient to cause streaming of water.

The amount of water reaching the back wall was small however it is recommended that any surfaces that would be adversely affected by the presence of water should be protected by waterproof membrane.

Flashings are also required to drain water from the bottom of the cavity.

Wind resistance: PASS

Serviceability test pressure: 2400Pa (max)

Although all the panels were subject to a serviceability wind load of 2400Pa not all panels gave acceptable deflections at this level. Full details of acceptable wind loads for the panels tested are given below.

Safety test pressure: 3600Pa

All panels remained secure after loading to +/- 3600Pa.

Soft body impact test to CWCT Technical Note 76: No visible damage under a serviceability impact of 120Nm.

All panels remained secure after a safety impact test of 500Nm. This is classified as negligible risk. Panels of 3mm aluminium remained undamaged but panels of 2mm aluminium suffered deformation up to 40mm deep which would require replacement of the panels.

Impacts were carried out at the centre of the bottom bay of the panels which has been shown to be the most vulnerable position.

Hard body impact test to CWCT Technical Note 76: Damage due to 3Nm hard body impact was generally undetectable. At 6Nm and 10Nm dents were visible on both the 2mm panels and 3mm panels on close inspection.

Wind resistance test results

Panel details			Deflection limit (mm)	Measured deflection at acceptable serviceability wind load		Acceptable serviceability wind load (Pa)
Height (panel/bay) (mm)	Widtht (Panel/bay) (mm)	Span (mm)		Positive (mm)	Negative (mm)	
2mm aluminium panels						
1150/383	2380/1190	1250	13.9	5.9	-10.5	1800
2820/470	1180	1270	14.1	5.3	-12.3	1200
1820/910	660	1124	12.5	9.3	-10.7	1800
2820	420	2851	20	8.7	-10.8	2400
480	1340	1423	15.8	15.2	-13.8	2400
1150	1180/590	1292	14.4	9	-12.5	1800
1150/383	1180	1240	13.8	8.4	-13.1	2400
1400	580	1515	16.8	13.2	-16.4	2400
3mm aluminium panels						
1150/383	2380/1190	1250	13.9	6.7	-12.5	2400
2820/470	1180	1270	14.1	7.4	-9.9	2400
1820/910	660	1124	12.5	6.9	-8.9	2400
480	1340	1423	15.8	11.1	-9.7	2400
1150	1180/590	1292	14.4	6.8	-9.4	2400
1150/383	1180	1240	13.8	5.6	-8.1	2400
1400	580	1515	16.8	7.6	-8.8	2400

Notes:

Panel bay is area bounded by panel edges or stiffeners

Span has been taken as diagonal dimension of panel or panel bay

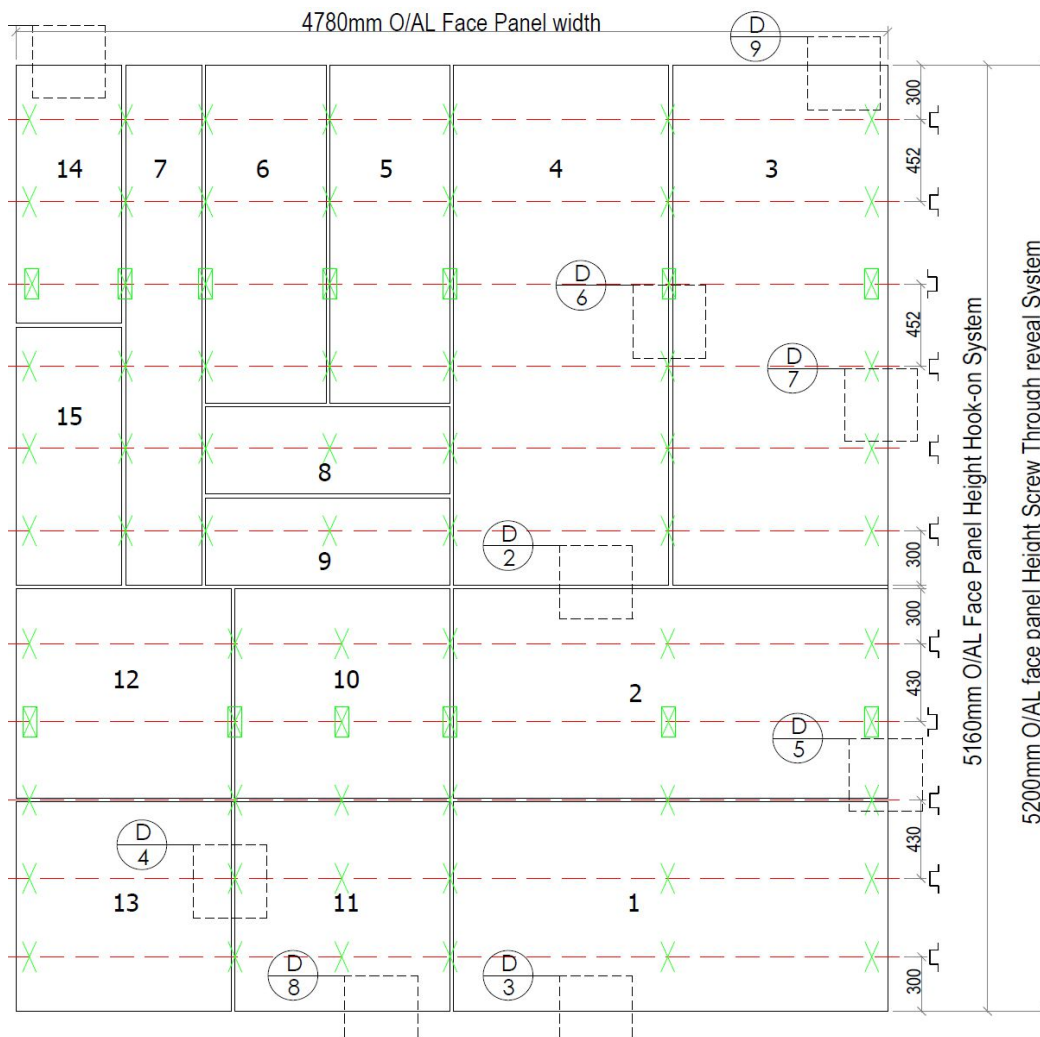
The criteria for serviceability are maximum deflection under load and recovery of deflection on unloading.

The deflection limit is span/90 with an upper limit of 20mm. This is subjective and higher deflection may be acceptable in some cases provided full recovery is obtained.

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.

The measured deflection has not been corrected for movement of the supports. The true deflection may therefore be slightly less than that recorded.

Drawings



ALUMINIUM HOOK-ON PANEL LAYOUT					
Panel Ref	Height		Length	Thickness	Hook Qty
1	1150	X	2380	3	6
2	1150	X	2380	2	6
3	2820	X	1180	2	8
4	2820	X	1180	3	8
5	1820	X	660	3	6
6	1820	X	660	2	6
7	2820	X	420	2	8
8	480	X	1340	2	4
9	480	X	1340	3	4
10	1150	X	1180	3	6
11	1150	X	1180	2	6
12	1150	X	1180	3	4
13	1150	X	1180	2	4
14	1400	X	580	3	6
15	1400	X	580	2	6

Key

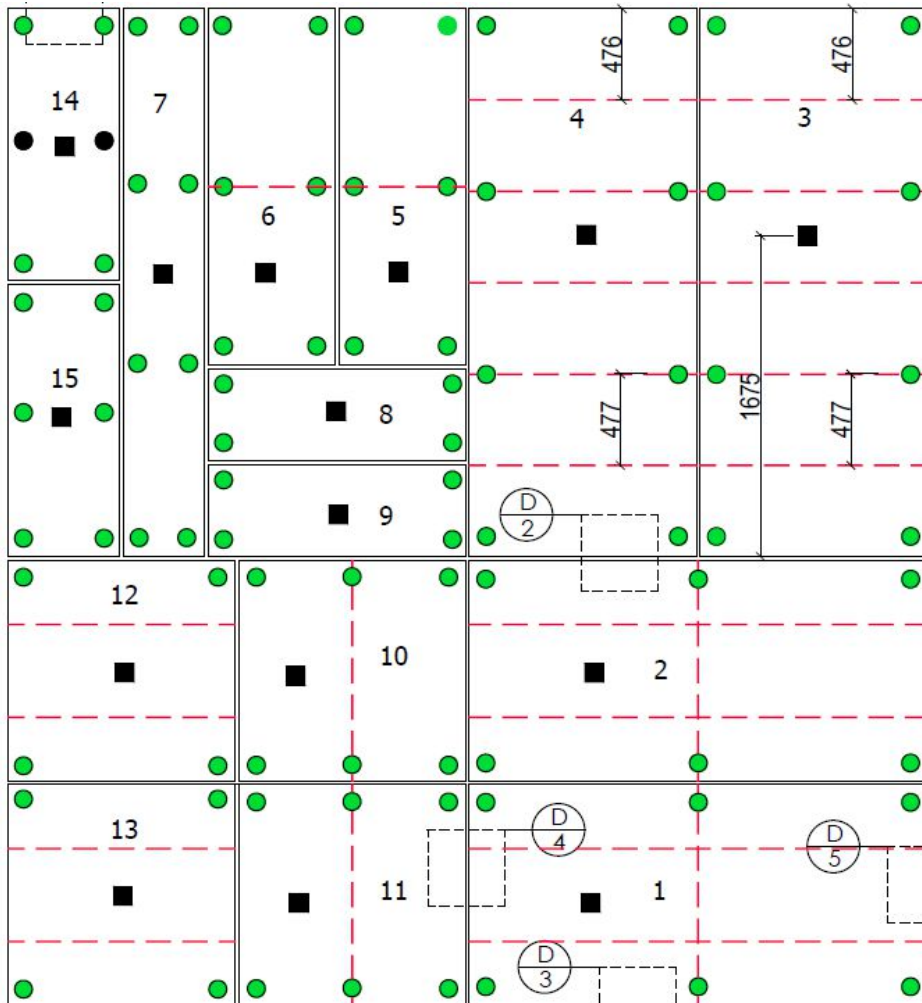
Horizontal top hats indicated by red dashed lines

Vertical rails supported by brackets shown in green as follows;

 Sliding Point Nvelope Bracket




 Fixed Point Nvelope Bracket

Elevation of test wall showing details of support structure

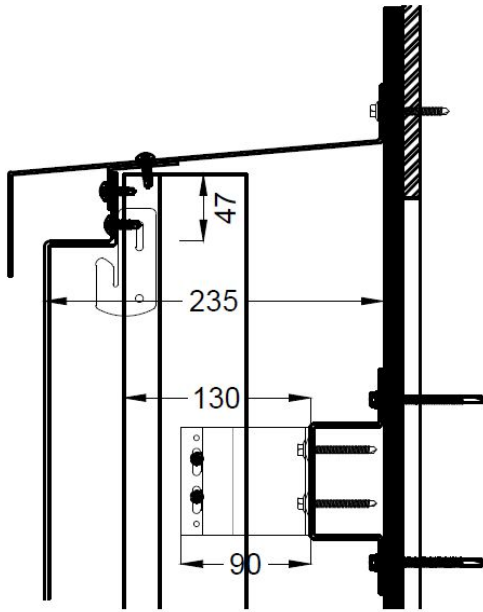


ALUMINIUM HOOK-ON PANEL LAYOUT					
Panel Ref	Height		Length	Thickness	Hook Qty
1	1150	X	2380	3	6
2	1150	X	2380	2	6
3	2820	X	1180	2	8
4	2820	X	1180	3	8
5	1820	X	660	3	6
6	1820	X	660	2	6
7	2820	X	420	2	8
8	480	X	1340	2	4
9	480	X	1340	3	4
10	1150	X	1180	3	6
11	1150	X	1180	2	6
12	1150	X	1180	3	4
13	1150	X	1180	2	4
14	1400	X	580	3	6
15	1400	X	580	2	6

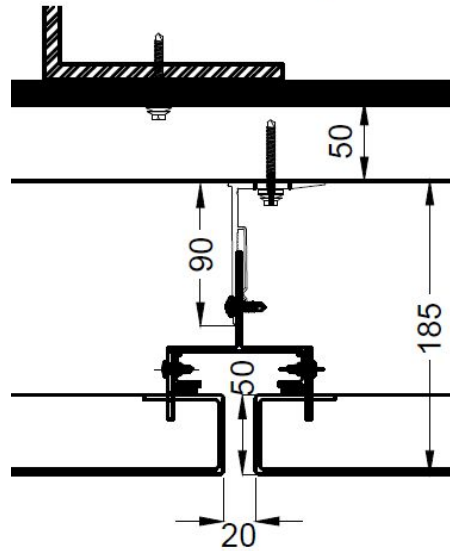
Key

-  Hook Position
-  Stiffener
-  Gauge Pos

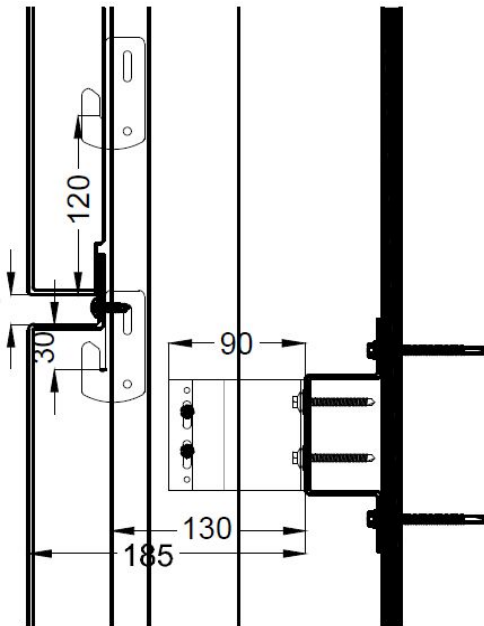
Elevation of test wall showing panel support details.



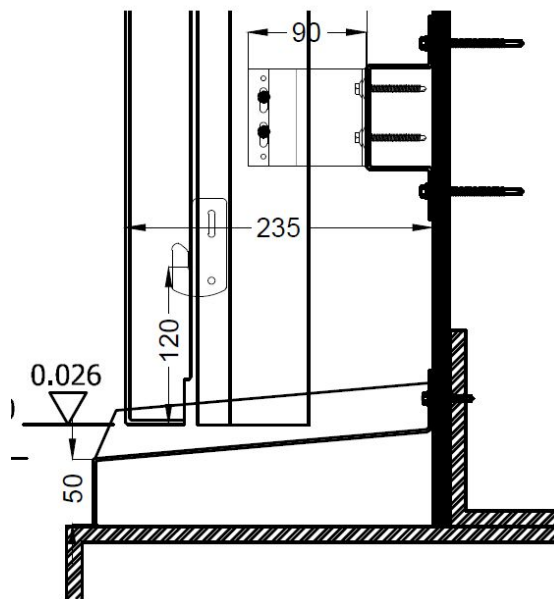
Vertical section through top flashing



Horizontal section through panel joint

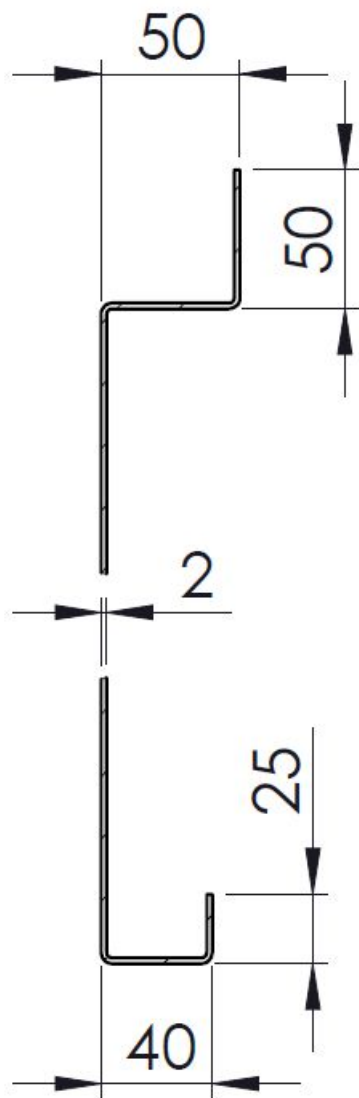


Vertical section through panel joint



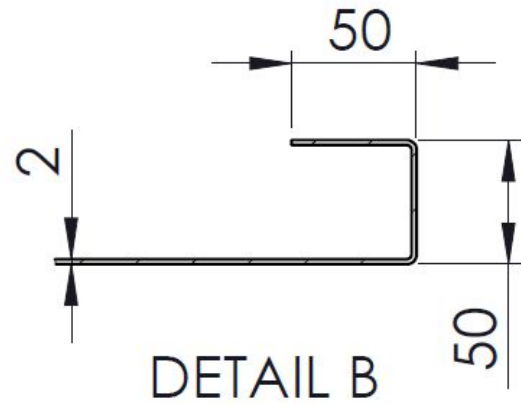
Vertical section through base flashing

Detail drawings of test wall



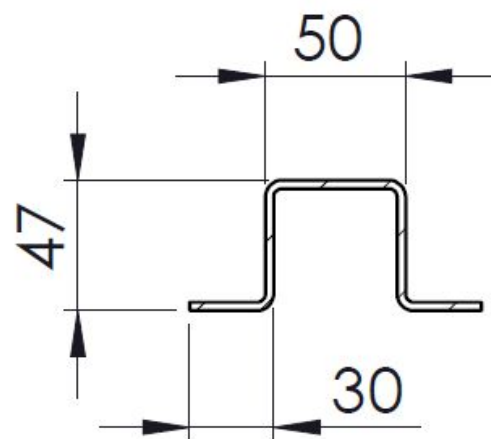
Vertical section through panel

Drawing shows panel of 2mm aluminium. For 3mm aluminium dimensions shown would remain the same except aluminium thickness



Horizontal section through panel edge

Drawing shows panel of 2mm aluminium. For 3mm aluminium dimensions shown would remain the same except aluminium thickness



Section through panel stiffener

Drawing shows stiffener for panels of 2mm aluminium. For 3mm aluminium panels stiffener height reduced to 46mm. stiffener composed of 3mm 1050 aluminium

Details of panel construction