

Certificate of Testing



Certificate Number: 2018/081

Date: 18 April 2018

System: **LineAL-X (extruded plank) system**

System supplier: Ash and Lacy Solutions Ltd
Bromford Lane
West Bromwich
West Midlands
B70 7JJ

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 'P. K. Keller'.

Director

CWCT Services Ltd, The Studio, Entry Hill, Bath, BA2 5LY
Tel: 01225 330945, : email: cwct@cwct.co.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:** LineAL-X extruded plank system
- Panel material:** 6063 T6 Aluminium
- Panel description:** Extruded aluminium planks with overall depth of 26 mm and face width of 65, 140, 190, 240 and 290 mm. Planks can be fixed with gap of 3, 10 or 20mm. Aluminium face 3mm thick. Planks can be laid spanning horizontally or vertically.
- Planks of all sizes included in test sample spanning both vertically and horizontally.
- Vertically spanning planks tested at 1.2 m span between support rails with planks continuous over four spans.
- Horizontally spanning planks tested at 1.25 m span between support rails. Planks tested both single span and continuous two span arrangement.
- Joints:** Longitudinal joints between planks closed by interlocking detail for both vertically and horizontally spanning planks.
- Joints between ends of horizontally spanning planks baffled by support rail.
- No joints between ends of vertically spanning planks included in test specimen.
- Support rails:** Vertical profiles composed of 6063 T6 Aluminium supported by brackets at 600mm centres for horizontally spanning planks. L profiles (60x40x2.2mm) at sides of test panel, T profile (60x80x2.2mm) for central rail. Rails at 1.25m spacing
- Horizontal L profiles (60x40x2.2mm) composed of 6063 T6 aluminium supported by brackets at 600mm centres for vertically spanning planks. Rails at 1.2m spacing
- Fixings:** Planks fixed to rails by screws along one edge – one screw at each rail/plank intersection. Opposite edge of plank engages with clamp block fixed with screw fixing of adjacent plank.
- Rails fixed to brackets by screws.
- Screws manufactured by Ash and Lacy and supplied as part of system.
- Drainage and ventilation:** Drainage and ventilation provided at top and bottom of test sample. Vertical joint in horizontally spanning panels provides additional ventilation.
- Backing wall:** Steel studs with plywood sheathing. Back wall provided to facilitate testing but not part of the tested system.

Test arrangements

Date of test: 15 January 2018

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: Ash and Lacy
Bromford Lane
West Bromwich
West Midlands
B70 7JJ

Installer: Ash and Lacy
Bromford Lane
West Bromwich
West Midlands
B70 7JJ

Summary of results

Watertightness - dynamic: PASS

Note:

During the test some water entered the rainscreen cavity.

For vertically spanning planks, the amount of water reaching the back wall was small causing some dampness but insufficient to cause rundown however it is recommended that any surfaces that would be adversely affected by the presence of water should be protected by waterproof membrane.

For horizontally spanning planks there was greater water penetration, primarily through the vertical joint between the simply supported planks in the upper half of the specimen. This was sufficient to cause rundown on the back wall behind the vertical joint. Elsewhere there was little evidence of water being blown through the horizontal joints. A waterproof membrane is required to protect any materials that would be adversely affected by water.

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

Wind resistance: PASS

Serviceability test pressure: 2400Pa

Safety test pressure: 3600Pa

Further details of the wind load tests are given in the Table on the following page

Soft body impact test to CWCT Technical Note 76: No visible damage under a serviceability impact of 120Nm. This is classified as Class 1.

Minor damage with a maximum depression of 2mm under a safety impact test of 500Nm. This is classified as negligible risk.

Hard body impact test to CWCT Technical Note 76: Small dents were caused by by hard body impacts.

At 3Nm these were not visible from more than 1m and the performance at the serviceability level is given as class 1.

At 6Nm dents were not visible from more than 5m and the performance at the serviceability level is given as class 2.

At 10Nm dents were visible from more than 5m however this is partly due to the reflective surface. The maximum depth of indentation was estimated as 1mm and performance at the serviceability level is given as Class 3.

Hard body impacts at 3, 6 and 10Nm would be classed as negligible risk at the safety level.

Wind resistance test results

| Panel details | | | Deflection limit (mm) | Measured deflection at acceptable serviceability wind load | | Acceptable serviceability wind load (Pa) |
|---------------|------------|-----------|-----------------------|--|---------------|--|
| Orientation | Width (mm) | Span (mm) | | Positive (mm) | Negative (mm) | |
| Vertical | 290 | 1200 | 13.3 | 3.7 | 4.5 | 2400 |
| Horizontal | 190 | 1250 | 13.9 | 2.5 | 2.3 | 2400 |

Notes:

Span has been taken as the distance between the supporting rails.

The deflection recorded is the total movement at mid span. There was some movement at the supports so the true deflection would be slightly less than the recorded values.

For the vertically spanning planks, deflection was measured on the end span of a plank which is continuous over several supports. A simply supported plank of the same span would be expected to give a greater deflection. Deflection was measured on a 290 mm wide plank. Narrower planks would be expected to give lower deflections for the same load as all planks have the same edge details which provide the greatest contribution to stiffness and wider panels are formed by a wider face which is of uniform thickness.

For the horizontally spanning plank, deflection was measured on one span of a 190mm wide plank which is continuous across two spans. A simply supported plank of the same span would be expected to give a higher deflection. Narrower planks would be expected to give lower deflections and wider planks would be expected to give higher deflections.

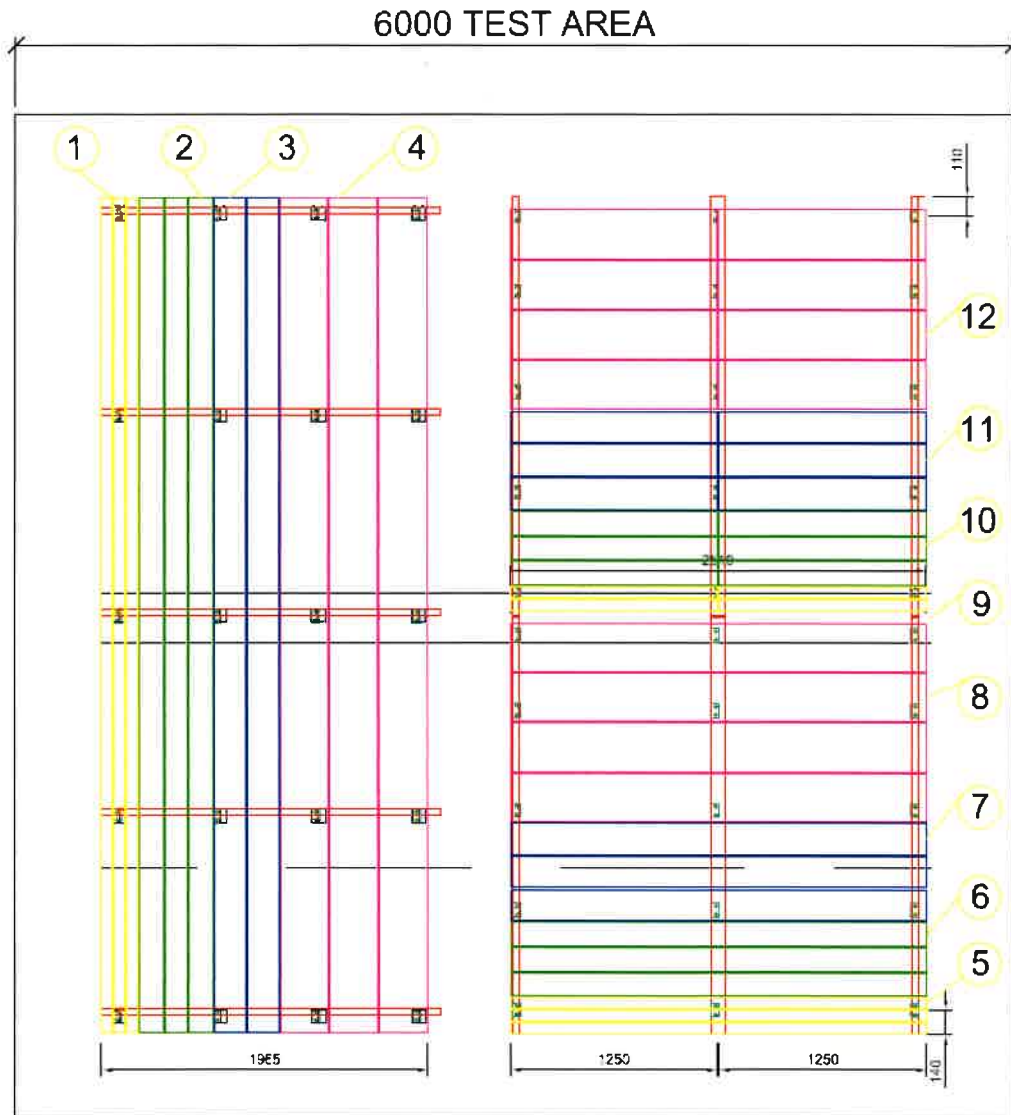
The criteria for serviceability are maximum deflection under load and recovery of deflection on unloading.

Deflection is limited for aesthetic reasons and to prevent alarm to building occupants and the public. The limit set in the CWCT Standard is span/90.

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.

One fixing was disturbed during the safety wind load test. The panel remained secure and there was no evidence of failure of other fixings in locations where the fixings are subject to significantly greater loads.

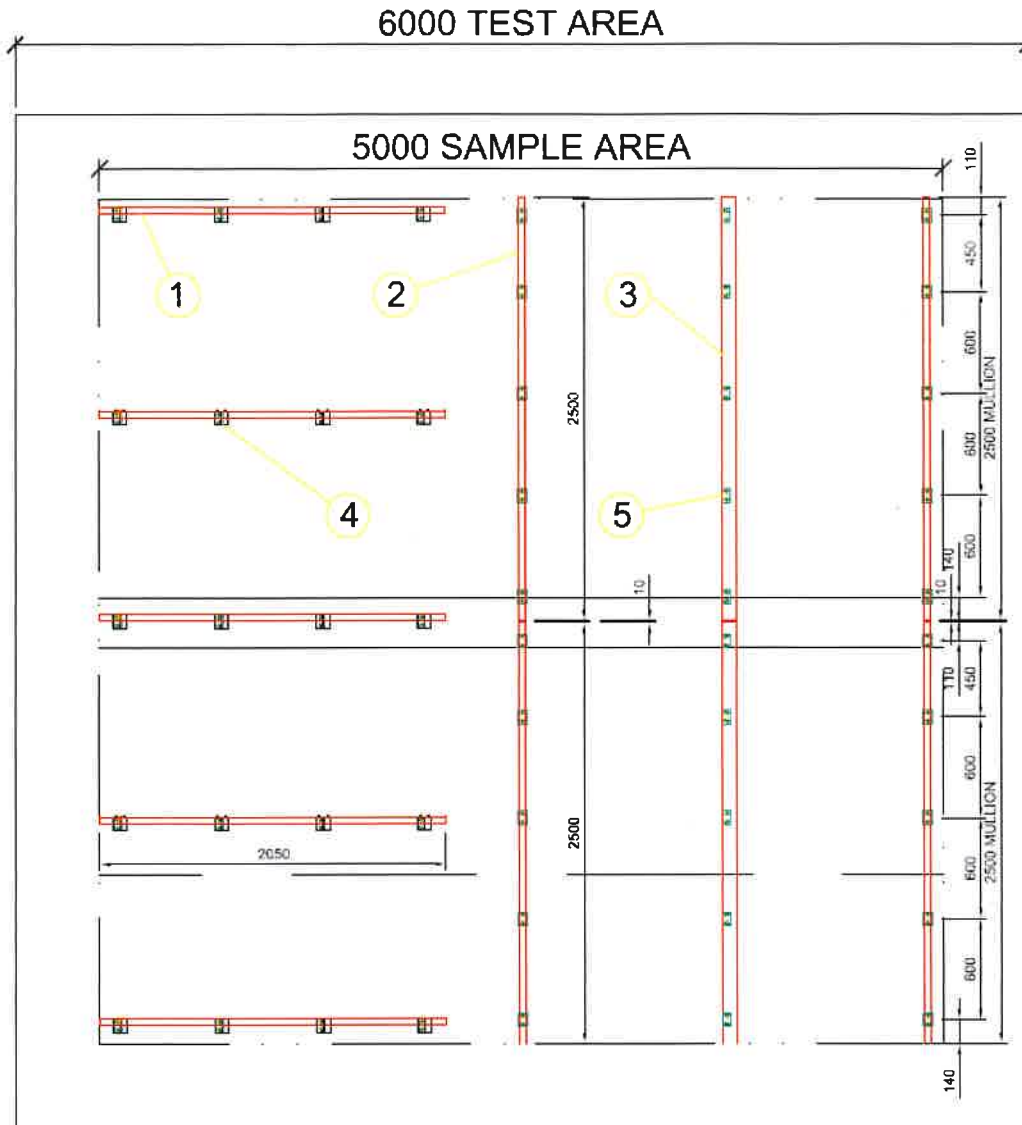
Drawings



Key

1. 3 off PSD065 Plank, 5000 m long
2. 3 off PS140 Plank, 5000 m long
3. 2 off PS190 Plank, 5000 m long
4. 3 off PS290 Plank, 5000 mm long
5. 3 off PS065 Plank, 2500 mm long
6. 3 off PS140 Plank, 2500 mm long
7. 3 off PS190 Plank, 2500 mm long
8. 4 off PS290 Plank, 2500 mm long
9. 6 off PS065 Plank, 1250 mm long
10. 6 off PS140 Plank, 1250 mm long
11. 6 off PS190 Plank, 1250 mm long
12. 8 off PS290 Plank, 1250 mm long

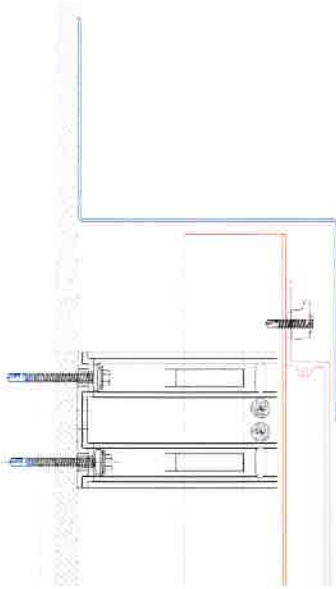
Elevation of test wall showing plank arrangement



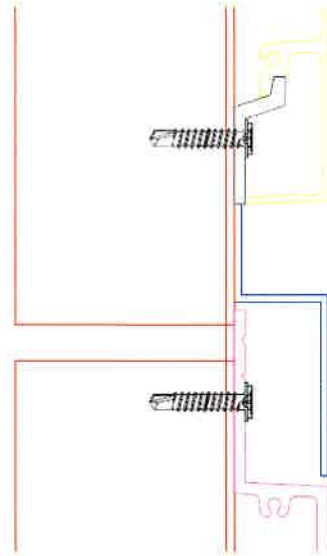
Key

1. 5 off M14 - L60X40X2.2 Rail, 2050 mm long
2. 4 off M14- L60X40X2.2 Rail, 2500 mm long
3. 2 off M15 - T60X80X2.2 Rail, 2500 mm long
4. 20 off HB090HS2-TP Single Adapted H Bracket with Pad
5. 30 off HB120S-TP Single HB Bracket With Pad

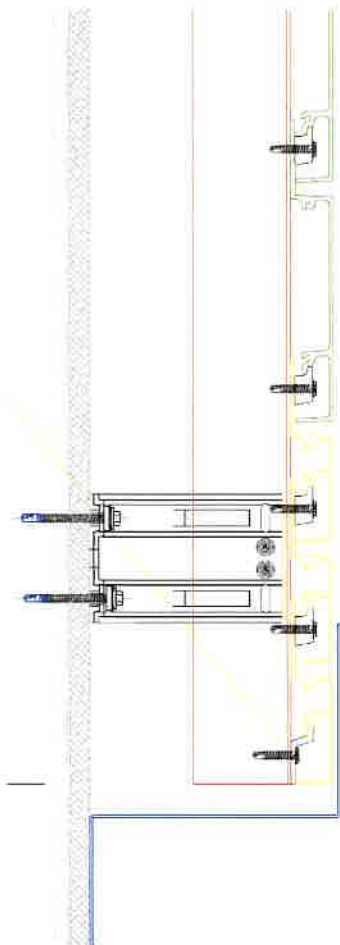
Elevation of test wall showing support rails and brackets



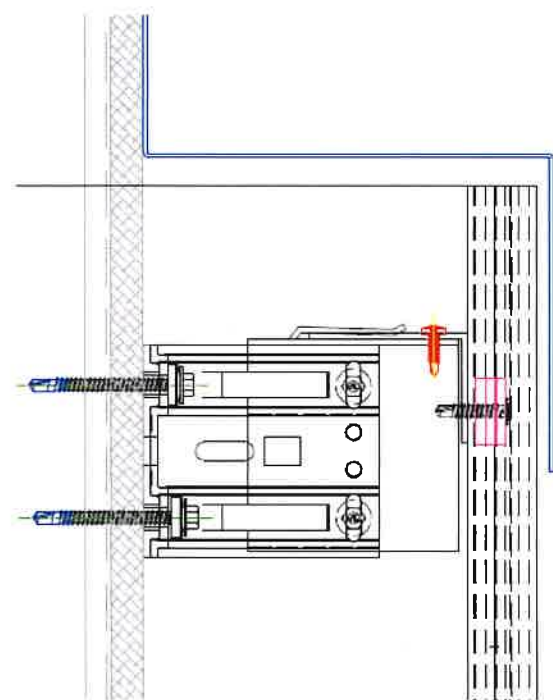
Vertical section through top flashing for horizontal planks



Vertical section through movement joint at floor level for horizontal planks



Vertical section through bottom flashing for horizontal planks. Also shows fixing detail for planks



Vertical section through top flashing for vertical planks. Also shows bracket and fixing details

Detail drawings of test wall