TEST REPORT

Lucideon Reference:	192979 (QT-56093/1/JB)/Ref. 1/Supp1
Project Title:	Durability Testing of NaturAl - X Cladding System in Accordance with EAD 090062-00-0404
Client:	Ash & Lacy Building Systems Ltd Bromford Lane West Bromwich West Midlands B70 7JJ
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This report supersedes the report issued on 28.11.19.

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1 INTRODUCTION

Ash & Lacy Building Systems Ltd produced a new cladding system incorporating a NaturAl - X Brick Slip Finish, and wished to establish the durability performance of the system in accordance with EAD 090062-00-0404 and the results can be seen in this report.

2 TEST SAMPLES

The system referenced as NaturAl – X Brick Slip Cladding System incorporates the following components:

- Light gauge steel frame.
- 12 mm Fermacell cement based sheathing boards.
- AXL-HB90S-TP single HB aluminium brackets and pads.
- AXL-HB90D-TP double HB aluminium brackets and pads.
- BM-LS55 fixings.
- Aluminium vertical rails.
- Aluminium brick rails.
- BST19 fixings.
- Ash & Lacy NaturAl – X brick slips.
- Arbosil 1090 low modulus silicone sealant (Batch No. 31291 0120).
- Evo-Stik 007 multi-purpose adhesive & sealant CH DB19122367.
- AL-X Portland historic pointing mortar (25 kg bag), Batch No. MO/95807, produced 10-07-19 EAZ071.

3 SAMPLE CONSTRUCTION

Lucideon Limited installed a light gauge steel frame into a 3.2 x 2.4 m metal frame with a top and bottom rail and studs at 600 mm centres. 12 mm thick 1.2 x 2.4 m Fermacell cement based sheathing boards, were fixed to the light gauge steel frame with Tec screws at approximately 400 mm centres. A window opening approximately 400 mm x 600 mm was left in the middle of the wall, approximately 500 mm from the top of the metal frame.

AXL-HB90S-TP single HB aluminium brackets and pads, were fixed to the sheathing board and light gauge steel frame, by the Technical Team from Ash & Lacy Building Systems Ltd, with BM-LS55 fixings at 600 mm centres horizontally and vertically on the entire wall, except the bottom course, which was fixed with AXL-HB90D-TP double HB aluminium brackets, and pads at 600 mm centres.

Aluminium rails were fixed vertically to the brackets with BM-LS55 fixings at 600 mm centres

Aluminium brick rails were fixed horizontally to the vertical rails, using BST19 fixings at 75 mm centres.

A PVC window sill was fixed to the aluminium brick rail with BST19 fixings. The PVC window frame was fixed to the aluminium rails with BST19 fixings.

Ash & Lacy NaturAl – X brick slips were slotted in the aluminium brick rails and butted up to the window frame.

The window frame and sill was sealed in with Arbosil 1090 low modulus silicone sealant and when cured, Evo-Stik 007 multi-purpose adhesive and sealant was applied around the window and sill.

AL-X Portland historic pointing mortar was mixed with 4-4.5 litres of water, for 1-2 minutes with a paddle mixer. The mortar was allowed to stand for up to 5 minutes, then remixed for 1–2 minutes until loose and consistent. The mortar was put in a pointing gun tube, and applied between the brick slips, slightly over filling the joints. When the mortar was suitably dried, then the mortar was tooled with a brick bucket handle jointer, to seal the brick slips.

The wall was allowed to cure at a temperature of 20°C and 55% Relative Humidity for 28 days, and was monitored daily for any signs of distress including blistering, cracking, crazing and detachment.

4 METHOD OF TEST

4.1 Hygrothermal Testing

Testing was carried out in accordance with the method described for Hygrothermal and Freeze/Thaw Performance in EAD 090062-00-0404 July 2018: Kits for External Wall Claddings Mechanically Fixed, formerly ETAG 034. The testing involved subjecting a wall panel to repeated heat-rain cycles, followed by repeated heat-cold cycles at controlled humidity conditions, designed to simulate naturally occurring conditions. With additional wet/freeze cycles to BS EN 16383:2016 - Thermal insulation products for building applications - Determination of the hygrothermal behaviour of external thermal insulation composite systems with renders (ETICS) and ETAG 017:2005 Guideline for European Technical Approval of Venture Kits – Prefabricated Units for External Wall Insulation.

4.1.1 Heat-Rain - 80 Cycles

The panel was subjected to cyclic heat-rain conditions, followed by freeze/thaw cycles according to the following programme.

Heating to 70°C rising over 1 hour and was maintained at 70°C ± 5 at 10-15% Relative Humidity (RH) for a further 2 hours.

Followed by spraying with water (water temp ± 15°C) at 1 l/m^2/min for 1 hour. Draining for 2 hours.

On completion of the heat-rain cycles, the wall was conditioned for 48 hours at a temperature between 10 and 25°C, with a minimum RH of 50%.

4.1.2 Heat-Cold – 5 Cycles

Exposure to 50°C ± 5 with a rise of 1 hour and maximum 10% RH for 7 hours.

Exposure to -20°C ± 5 with a fall over 2 hours and hold for 14 hours.

The test panel was inspected every 4 heat-rain cycles, and daily under the heat-cold cycles, to observe changes to the physical characteristics of the panel.

4.1.3 Wet/Freeze Testing

30 cycles, wetting, freezing and thawing:

The test wall was initially conditioned by wetting for 8 hours with an amount of 1.5 ± 0.5 l/(m^2 min) water, with a temperature of 15 ± 5°C.

Then the following cycles were applied:

The surface of the test wall was frozen within 2 hours, to −20 ± 5°C and maintained for 4 hours (in total 6 hours).

The wall was then thawed for 1 hour at temperature of 20 ± 5°C.

The wall was then wetted for 1 hour with an amount of 1.5 ± 0.5 l/(m^2 min) water, with a temperature of (15 ± 5) °C.

After the 30 cycles, the wall was conditioned at ambient temperature (20 ± 10) °C.

5 RESULTS

5.1 Hygrothermal Testing

According to EAD 090062-00-0404 and ETAG 017 no cracking, delamination or detachment of the cladding element or irreversible deformation, should have occurred, once the cycles are completed.

Upon inspection of the Ash & Lacy Building Systems Ltd system no cracking, delamination or detachment of the cladding element, or irreversible deformation was found on the panel therefore, the wall was deemed to have passed.

NOTE: The results given in this report apply only to the samples that have been tested.

END OF REPORT

PLATES

Plate 1 – Installation of AXL-HB90S-TP Single HB Aluminium Brackets and Pads

Plate 2 – Installation of AXL-HB90D-TP Double HB Aluminium Brackets and Pads

Plate 3 – Installation of Aluminium Vertical Rails

Plate 4 – Installation of Aluminium Brick Slip Rails

Plate 5 – Installation of UPC Window

Plate 6 – Installation of NaturAl - X Brick Slips

Plate 7 – Pointing of Brick Slips

Plate 8 – Tooling of Mortar

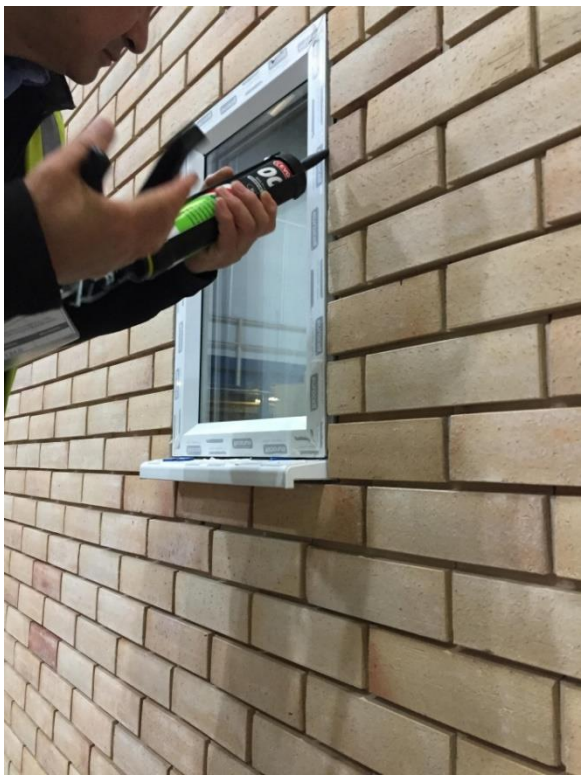

Plate 9 – Sealing around the Window

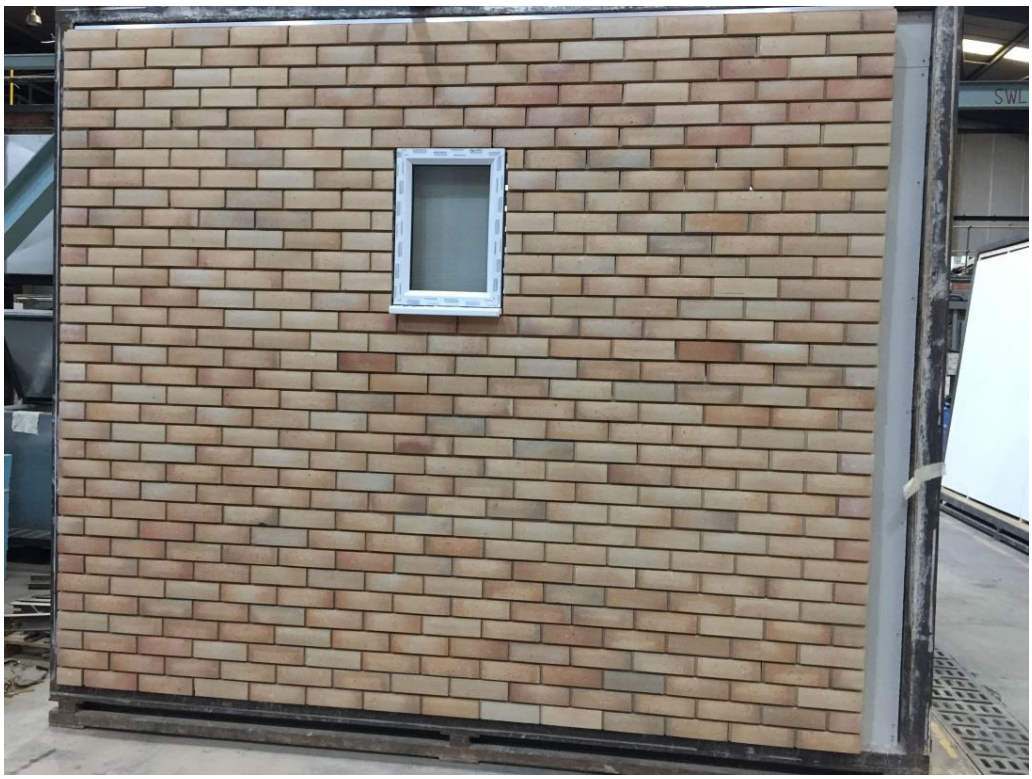

Plate 10 – Finished Wall

APPENDIX 1 – Products and Batch Codes

Product	Description	Batch Number	Image of Label
Aluminium Brackets and Pads	AXL-HB90S-TP and AXL-HB90D-TP double HB aluminium brackets & pads	-	
Fixings for Brackets	BM-LS55 fixings	-	-
Vertical Rails	Aluminium vertical rails	-	
Brick Slip Rails	Aluminium brick rails	-	
Fixings for Rails	BST19 fixings	-	-
Brick Slips	Ash & Lacy NaturAl – X brick slips	-	
Pointing Mortar	AL-X Portland historic pointing mortar	Batch No. MO/95807, produced 10 -07-19 EAZ071	

Product	Description	Batch Number	Image of Label
Sealant for Around the Window	Arbosil 1090 low modulus silicone sealant Evo-Stik 007 multi-purpose adhesive & sealant	Batch No. 31291 0120	
Sealant for Around the Window	Evo-Stik 007 multi-purpose adhesive & sealant	CH DB19122367