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BTS1921 - CERTIFICATE OF TEST: TR190514-1

WEATHERTIGHTNESS TEST OF A SAMPLE WALL

1.0 OBJECTIVE:

- 1.01 BEAL Testing Services (BTS) were contracted by Original Stone Ltd to verify that “when installed according to the manufacturer’s instructions, the Sumner Schist Cladding System will meet one of the essential requirements necessary for the system to contribute to the performance requirements of clause E2 of the NZ Building Code”.
- 1.02 The purpose of this test is to assess the weathertightness properties of the wall sample incorporating a “frame protection system” and utilised a typical aluminium window manufactured in NZ, by way of the BEAL weathertightness test procedure, which is based on the published Verification Method “E2/VM1”.
- 1.03 The test wall sample was constructed by BTS in accordance with the manufacturer’s design details and specifications, with photos taken of each stage.

2.0 METHODOLOGY:

- 2.01 Testing was undertaken following the recently revised BEAL weathertightness test procedure, which is based on sections 8.5 and 8.6 of ‘AS/NZS 4284:2008 - Testing of building facades’, together with elements taken from E2/VM1, but taking into account the use of a frame protection system. The size of test sample wall was approximately 2m x 1.6m.
- 2.02 Preconditioning: A preconditioning loading of ~1,800Pa of positive pressure was applied to the external face of the test sample for a period of 1 minute. Prior to the internal wall lining being attached, water with detergent was sprayed on the internal face of the sample wall, particularly around the penetrations, to ensure air seals for each were functioning correctly under the preconditioning load.
- 2.03 Series 1 - Static Water Penetration: The test wall was subjected to water sprayed completely and continuously over the exterior face of the test sample at a rate not less than 3L/m²min. for 5 min with zero air pressure differential on the facade. This was then followed by the face being subjected to the water spray for a further 15min at 455Pa pressure.
- 2.04 Series 1 - Cyclic Pressure Water Penetration: This test commenced within 5 minutes of Static Water Penetration Test. The test wall was subjected to water sprayed completely and continuously over the exterior face of the test sample at a rate not less than 3L/m²min for 5 min. A cyclic pressure was applied to the exterior face of the test wall that alternated from 455Pa to 910Pa within a cycle time of approximately 3-5 s.
- 2.05 Water Management Test of the window head flashing. Water was poured into the upper part of the cavity directly above the window head flashing to assess the water management of this.
- 2.06 Deviations: The size of the wall sample was approximately 2.0m by 1.6m.

3.0 CRITERIA:

- 3.01 The purpose of the Preconditioning test Paragraph 2.02 is to subject the ventilated cavity and air seals to the pressures expected in-service. Non-compliance is the appearance of bubbles in the detergent spray or mechanical failure of the air seals, cavity battens, flashings or other system components visible through the transparent internal lining, and transparent wall underlay.

- 3.02 Series 1 Static Water Penetration Test and Cyclic Pressure Test represent the wall sample operating in ideal (perfect) service condition. Non-compliance shall be the presence of water in the ventilated cavity or penetrating any further into the building envelope.
- 3.03 Series 2 Water Management Tests represent the wall sample operating in a poor service condition by the introduction of simulated defects. Water that passes through defects in the exterior cladding shall be controlled. It may contact battens and cavity surfaces, but no water shall be directed to the plane of the wall underlay by components within the cavity (water arriving on this plane may be expected under positive pressures in the cavity). No water may drip through the cavity where it is possible for water to impact on a surface within the cavity and splash onto the wall underlay. However spattering of water onto the underlay through introduced defects shall be ignored. Non-compliance shall be the observance of any water on the interior face of the wall underlay, cavity air sealing or structural framing or incorrect management of water within the cavity as described.
- 4.0 CONDITION OF SAMPLES
- 4.01 NA - the sample wall was prepared at BTS facilities
- 5.0 SAMPLE PREPARATION
- 5.01 An approximately 2 x 1.6m wall was constructed using timber framing and clad with the Sumner Schist Cladding System following the manufacturer's Technical Manual and Specifications.
- 5.02 The wall sample incorporated a "frame protection system" over the timber framing. i.e. all perimeter and overlapping edges of the underlay were taped with a vapour permeable waterproof tape. The gap between the underlay and the aluminium window frame was made both air-tight and waterproof by way of use of vapour permeable and waterproof tape, with split liner on the back, to enable one section of the length of the tape to be applied to the window frame, before the remaining section was applied to the surrounding underlay. Refer to the attached drawings.
- 5.03 The 500mm x 500mm window unit used in the construction of the sample wall, represented typical aluminium window. It was noted during the testing that the condensation drainage hole let water into the interior. This water ingress was not included in the assessment of the sample wall.
- 6.0 TEST CONDITIONS
- Room Temperature of ~18°C
- 7.0 TEST EQUIPMENT:
- BEAL Weathertightness Simulator, Detergent Spray Bottle
- 8.0 RESULTS:
- 9.01 Date of test: 14th May 2019

<i>Sample Wall</i>	<i>COMMENT</i>
Preconditioning Test pressure 1515Pa (Pressure only no water) Duration: 1 Min	<i>Complies</i>
Series 1: Static Water penetration Test pressure 455Pa Duration 15 mins	<i>Complies</i>
Series 1: Cyclic Water penetration Test pressure 455 – 910Pa (5s cycles) Duration 5 mins	<i>Complies</i>
Dye Stain Failure Testing and Visual Inspections	<i>Complies</i>
Comments	The Sumner Schist Cladding sample wall performed well in all tests. Preconditioning showed no visible air leaks. Series 1 tests showed no leakage through the wetwall during the cyclic testing representing typical in-service conditions in an extra-high wind zone.

9.0 CONCLUSION

10.01 The test results indicate that the *Sumner Schist Cladding System* having been subjected to this test methodology, demonstrates a performances as required by clause E2 of the NZ building Code.

Authorised signatory,



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11.0 ATTACHMENTS

Drawings 1 -3 – Drawings showing the application of tapes as part of a “frame protection system”

Figure 1. Sample window with tape.

Figure 2. Sample window with tape.

Figure 3. Sample window taped to underlay system.

Figure 4. Sample window taped to underlay system.

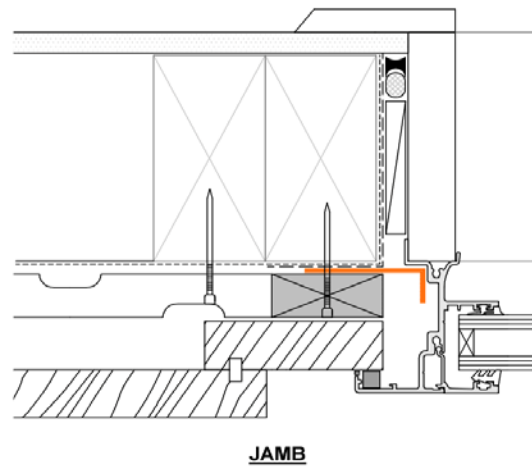
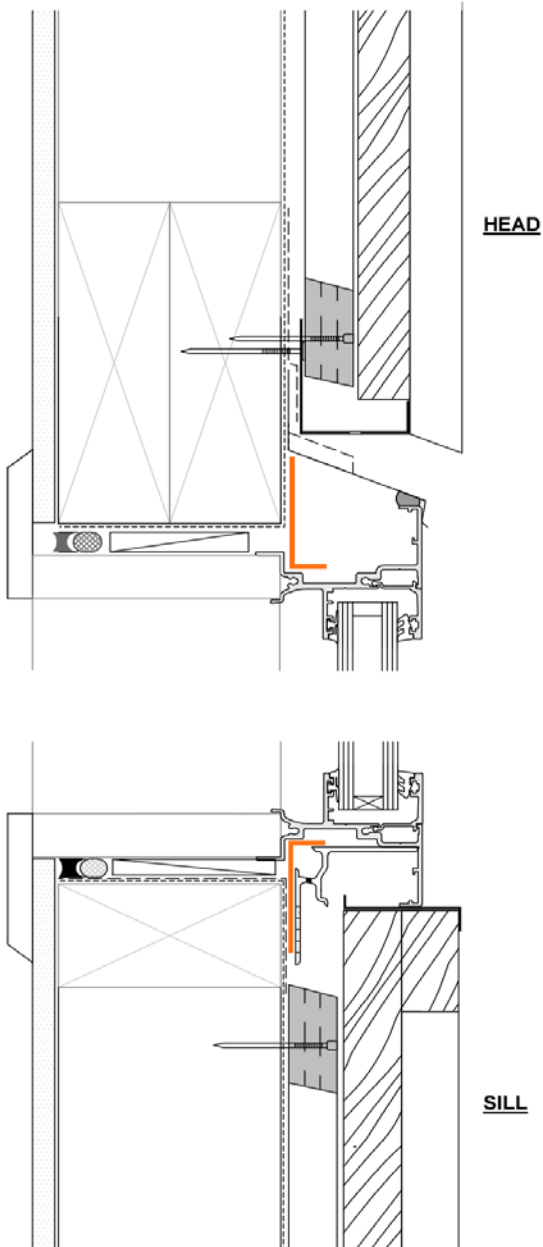
Figure 5. Application of foam tape on top of window.

Figure 6. Window Head Flashing installed.

Figure 7. Sample wall ready for application of stone.

Figure 8. Representative stone installed around the window.

Figure 9. Water management test above the window head flashing.



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Figure 3. Sample window taped to underlay system.

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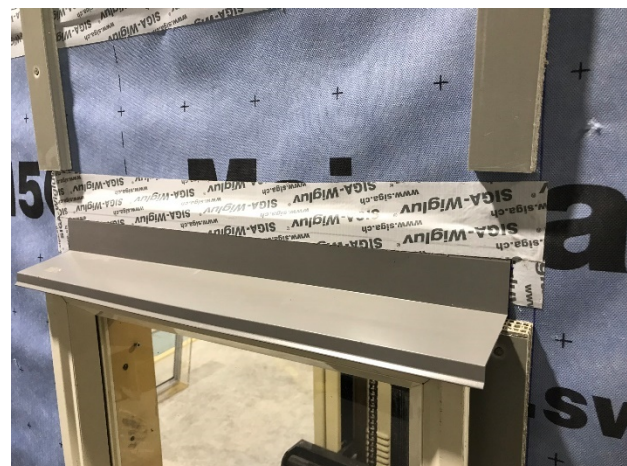


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Figure 9. Water management test above the window head flashing.