BEAL Appraisal Certificate

APPRAISAL #: C2305

EXPIRY DATE: 28 Feb 2025

SUMNER Adhered Masonry Veneer System

Product

1.1 The SUMNER Adhered Masonry Veneer system (SAMV) uses a fibre-cement board as the cladding substrate, enabling the adhesion of a wide range of thin masonry finishes. SAMV provides a durable, weatherproof and attractive solution for thin masonry.

1.2 SUMNER Board is denser than other fibre-cement sheets, having a density of ~1.3 kg/m3, making it ideal for use as a substrate for adhering thin masonry ranging from 25kg/m2 to 92kg/m2.
1.3 SUMNER Board is screw fixed to timber or steel framing at 220mm centres around the perimeter and through the centre of the board. SUMNER Board is primed on the face to ensure it meets durability requirements. The use of special joint tape prevents moisture ingress at board junctions and in place of z-flashings at inter-storey junctions.
1.4 Stainless steel 'L-brackets' are combined with the adhesive to secure the thin masonry to the board and screws fixed at 600mm centres.
1.5 SAMV is applied by tradespersons trained and approved by Original Stone Ltd, within the scope and limitations described in the Appraisal-holder's Technical Manual.

NZ Building Regulations

2.1 In BEAL's opinion, the SAMV will meet the following provisions of the New Zealand Building Code when designed, installed and maintained as per the statements and conditions of this Appraisal Certificate:

2.2 Clause B1 STRUCTURE
Performance B1.3.1 and B1.3.3. SAMV meets the requirements for loads arising from self-weight, earthquake, wind, impact and creep [B1.3.3 (a), (f), (h), (j) and (q)] (refer to paragraph 6).

2.3 Clause B2 DURABILITY
Performance B2.3.1 (b), 15 years, B2.3.1 (c), five years, and B2.3.2. SAMV meets these requirement (refer to paragraph 6).

2.4 Clause E2 EXTERNAL MOISTURE
Performance E2.3.2. SAMV meets this requirement (refer to paragraph 6.7).

2.5 Clause F2 HAZARDOUS MATERIALS
Performance E2.3.2. SAMV meets this requirement (refer to paragraph 6.7).

2.6 The SAMV has been appraised as an 'Alternative Solution' in terms of compliance with the New Zealand Building Code.

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Scope and Limitations

3.1 The SAMV is appraised for use as an external wall cladding system for buildings within the following scope:

- Scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- Constructed with timber framing complying with the NZBC; and,
- Constructed with steel framing complying with the NZBC; and,
- With a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2; and,
- Can be situated in up to and including 'Extra High' wind zones as described in NZS 3604 Building Wind Zones.

3.2 The SAMV has also been appraised for weather tightness and structural wind loading when used for timber or steel framed buildings subject to specific design up to a design differential ultimate limit state (ULS) wind pressure of 2500Pa.
3.3 THE SAMV must only be installed on vertical surfaces as per the Technical Literature.
3.4 The SAMV is appraised for use with aluminium window and door joinery installed with vertical jambs and horizontal heads and sills. (The Appraisal of the SAMV relies on joinery meeting the requirements of NZS 4211 for the relevant building wind zone or following the Specific Engineered Design (SED).
3.5 Only tradespersons approved by Original Stone Ltd. shall install the SAMV.

Technical Literature

4.1 Installers must read the technical literature (SAMV Technical Manual version dated 5th March 2023) in conjunction with this Appraisal and follow all design, use, installation and maintenance instructions.
4.2 For a copy of this technical literature and any subsequent updates, please refer to the following: www.sumnerschist.co.nz/documents/document.html or from the BEAL web site under Appraisals.

Technical Details

5.1 SAMV components include:

SUMNER Board
SUMNER Boards are a fibre-cement type sheet, 2400mm by 1200mm, 9mm thick.

VERMINI Cavity Battens
They are manufactured from extruded polypropylene to be approximately 45 mm wide by 18 mm thick and supplied in 1200mm vertical and 550mm horizontal lengths.

SUMNER BOARD FASTENERS
For timber framed construction –
- 10g x 63mm Stainless Steel 316 screws
For steel framed construction –
- Galvanised Class 4 countersunk 10g x 60mm with wings
For masonry wall construction –
- Hilti HPS-1 R 6/40x65 anchors, or
- SPAX 6x60 A2 WH sleeved with HILTI HUD-L 8x60 (pre- drill 65mmx8mm at 300mm centres

SUMNER Prime
All surfaces must be brushed or rolled with SUMNER Prime before applying adhesive (excluding interior Tilt Slab, which needs cleaning down with water).

SUMNER Grip Plus
A two-part adhesive designed explicitly for heavyweight veneer classification. See the examples below.

SUMNER L-Fixings
These stainless steel 316 L-shaped brackets support the sheer weight of thin masonry during and after installation.

SUMNER Tape
It is a flashing tape used at the internal and external corners and control joints.

Thin Masonry Finishes
Examples include:
• Brick slips,
• Stone veneers (bluestone, basalt, schist, limestone etc),
• Porcelain or ceramic tiles.

5.2 Accessories, supplied by the owner or main contractor include:

- A rigid air barrier system or proprietary building wrap / underlay & tape system, that ensures all overlaps and edges of the RAB or wall wrap / underlay to be airtight and weathertight;
- Where a flexible wall wrap / underlay I used, the use of Polypropylene tape strapping for securing the building wrap or underlay in place and preventing bulging of the wall insulation into the frame cavity;
- Flexible flashing sill and jamb tapes that comply with AAMA 711-07 or a flexible flashing tape covered by a valid BEAL or BRANZ Appraisal for use around window and door joinery.
- Proprietary pipe gaskets as approved by SUMNER;
- Where required, window head, jamb and sill flashings that comply with the NZBC;
- Other penetrations through the wall shall be SED.

Handling and Storage

6.1 Handling and storing all SAMV materials, both on and off-site, are the main contractor's responsibility.
6.2 Dry storage must be provided on-site for SAMV components and protected from moisture and physical damage.
6.3 Handling of SUMNER Boards requires care to prevent damage to corners or excessive flexing.

Advice for designers

Timber Framing

7.1 Timber framing shall be treated as required by NZS 3602.
7.2 Timber framing must comply with NZS 3604 for both buildings or parts of buildings within the scope limitations of NZS 3604. Where buildings or parts of buildings are outside the scope of NZS 3604, then they must be to SED per NZS 3603 and AS/NZS 1170. Where SED is required, the framing must be of at least the equivalent stiffness to the framing provisions of NZS 3604. In all cases, studs must be at a maximum of 600mm centres.
7.3 Timber framing must have a maximum moisture content of 18% at the time of cladding application. (Problems could arise later on due to timber shrinkage if over 18%).

Steel Framing

7.4 Steel framing must be to a SED per NZBC and NASH 3405: 2006.
7.5 The minimum steel framing specification is 'C' section studs and nogs with overall section dimensions of 76mm web by 40mm flange. Steel thickness must be a minimum of 0.55mm.
7.6 Studs centres must be 600mm or less for steel framed buildings up to and including Very High wind zones as defined in NZS3604. Studs centres must be 400mm or less for wind zones that exceed Very High. Nogs must be fitted flush with the stud.
SAMV Board Layout
7.7 SUMNER Boards are installed vertically and supported behind fixing locations by vertical and horizontal battens. At the base of the wall, the SUMNER Boards can be either rested on a concrete rebate (75mm below the finished floor level) or hung 50mm below the finished floor level.

General

7.8 Cavity closer slots provide a minimum ventilated opening of 1000mm² per lineal metre as per the requirements of NZBC Acceptable Solution E2/AS1, paragraph 9.1.8.3 (b).
7.9 The ground clearance requirement between the finished floor level and ground level, as outlined in NZS 3604, must always be followed. At ground level, paved surfaces must be kept clear from the bottom edge of the SAMV by a minimum of 100mm and unpaved surfaces by 175mm per the requirements of NZBC Acceptable Solutions E2/AS1, Table 18.
7.10 At balcony, deck or roof-to-wall junctions, the SAMV bottom edge must be kept clear of any adjacent surface or above the top surface of any adjoining roof flashing by a minimum of 35mm per the requirements of NZBC Acceptable Solution E2/AS1, paragraph 9.1.3.6.
7.11 Where the SAMV abuts other cladding systems, designers shall detail the junction to meet the performance requirements of the NZBC. The technical literature provides limited guidance only. Details not included within the technical literature have not been assessed and are therefore outside the scope of this Appraisal.
7.12 As described earlier, all buildings must have a *frame protection system* to prevent the passage or air and moisture into the framing.
7.13 In cases where interior walls are not lined, such as attic spaces at the gable end, a proprietary frame protection system shall be installed to the interior of the unlined framing.

Control Joints

7.14 SUMNER Board control joints must be constructed as per the technical literature and as follows;

Horizontal control joints

o To be installed when intermediate floor joists are not seasoned or when the height of the wall exceeds 8.0m,

Vertical Control Joints

o 5.0m maximum centres
o They should align with any control joint within the structural framing or where the system abuts other cladding systems
o They are located at both internal and external corners.

(Note: Where possible, the location of control joints shall be in line with window and door openings. Horizontal and vertical control joints must be located over structural supports. The Technical Literature provides some guidance for designing vertical control joints where the system abuts different cladding types. Details not included within the technical manual or those marked as' Specific Design Only' are outside the scope of this Appraisal Certificate.)

Inter-story Junctions

7.15 At inter-story horizontal junctions, use of expanding flexible tape shall be incorporated into the frame protection design.

Structure - Clause B1

Mass

8.1 SAMV has an approximate mass of 45 to 92kg/m², considered a heavy wall cladding in NZS 3604.
Impact Resistance
8.2 The system has adequate resistance to impact loads that the cladding system will likely be subjected to when used in a residential situation. The likelihood of impact damage should be considered at the design stage for light commercial situations, with appropriate protection provided, such as bollards or barriers where necessary.

Wind Zone

8.3 SAMV is suitable for use in all building wind zones as per NZS 3604, up to and including 'Extra High' where the building design meets the performance requirements of NZBC Acceptable Solution E2/AS1, or up to the ultimate limit state (ULS) wind pressure of 2500Pa when the building is subject to specific design.

Durability – Clause B2

9.1 The SAMV will meet NZBC B2.3.1 (b) performance requirements, 15 years for the cladding system B2.3.1 (c), five years for any protective finish used, and B2.3.2 when used per this Appraisal Certificate and subjected to normal conditions of the environment and use.
Maintenance
9.2 Regular maintenance is essential to ensure SAMV meets the performance requirements of the NZBC and to ensure maximum serviceability.
9.3 Periodic cleaning of the wall is required to remove grime, dirt and organic growth as per the technical literature to maximize the life and appearance of the masonry finish.
9.4 A tradesperson must immediately repair any cracks, damaged areas or areas showing signs of deterioration that may be susceptible to water ingress. SAMV must be maintained and fixed per SAMV instructions.
9.5 The minimum ground clearance, as set out in this Appraisal and technical literature, must be maintained at all times during the system's life to ensure SAMV durability and weather tightness.

External Moisture - Clause E2

10.1 When installed in accordance with this Appraisal Certificate and Technical Literature, the SAMV will prevent the penetration of water that could cause undue dampness and/or damage to building elements and will therefore comply with clause E2.3.2.
10.2 The details provided within the technical manual for weather resistance are based on the design principle of employing both a 1st and 2nd line of defense against moisture ingress into the framing. Moisture ingress will be prevented by detailing the window and door joinery and other wall penetrations as detailed in the SAMV technical manual. Any weathertightness details not described in the SAMV Technical Manual and developed by a designer are outside the scope of this Appraisal Certificate.

Hazardous Building Materials Clause F2

11.1 Performance F2.3.1. The completed SAMV when installed according to the requirements of this appraisal meets this requirement and will not present a health hazard to people using the building.

Installation Requirements

Installation Skill Requirement

12.1 Approved experienced applicators must carry out the fitment of SAMV under the supervision of a Licensed Building Practitioner (LBP).
12.2 Installation of the accessories supplied by the building contractor must be completed by a tradesperson who understands cavity-based cladding construction, per instructions given within the SAMV Technical Manual and this Appraisal Certificate.
System Installation
12.3 The building contractor must install the selected building wrap and flexible flashing tape per the manufacturer's instruction before installing SAMV. The building wrap shall run horizontally and be continuous around corners. The wrap must be lapped not less than 75mm at horizontal joints and not less than 150mm over studs at vertical joints. The builder must take care when installing building wrap and flashing tape around window and door openings to ensure a continuous seal and protect any exposed wall framing.
12.4 The builder shall tape all laps and outer edges of the wall wrap to prevent wind ingress.
12.5 The building contractor must install aluminium joinery per SAMV technical literature. A nominal 7.5-10mm gap must be left between the joinery reveal and the wall framing to accommodate the PEF rod and air seal when fitting the joinery.
12.6 An approved installer must be used to fit SAMV and per the technical literature.
12.7 A building inspector must refer to SAMV technical literature during installation inspection.

Health and Safety

13.1 Considerations for tradespersons when fitting SUMNER Board:

- Cut the board in open-air or well-ventilated areas,
- use a dust mask,
- use eye protection,
- gloves must be worn.

13.2 All cutting, drilling or grinding aspects must comply with the latest regulations of the Labour Department's occupational safety and health division.
13.3 Refer to the technical literature from the relevant manufacturer for the safe use and handling of the components that make up the SAMV.

Basis of this Appraisal

14.1 BEAL use the compliance verification procedure to demonstrate compliance with the relevant clauses of the NZBC based on a risk analysis procedure. The following is a summary of the technical investigations carried out:

Tests

14.2 BEAL completed the following testing to verify compliance of the SAMV:

- Buildability
- Adhesion to the SUMNER Board before and after accelerated ageing of the SUMNER Grip Plus as per ASTM C297.
- Adhesion to low porosity porcelain tile before and after accelerated ageing of the SUMNER Grip Plus as per ASTM C297.

Weathertightness using a Driving Rain Test Booth to evaluate the weather tightness of the window head, jamb and sill details, and horizontal control joints, based on the use of a frame protection system. BEAL has also reviewed the details contained within the Technical Manual ver 4 (dated Mar 2023).

Other Investigations

15.1 Wind loadings, self-weight, seismic loadings, shear force, panel capacity, fastener pull-through testing and calculations for SAMV were determined by an independent Chartered Engineer concerning the requirements of compliance document B1 Structure. The engineer provided structural and durability opinions which support this Appraisal.
15.2 The technical literature for the SAMV has been examined by BEAL and found satisfactory.
Quality
15.3 BEAL assessed the manufacture and quality control of SUMNER Grip Plus. Details regarding the quality and composition of the materials used were obtained by BEAL and found to be satisfactory.
15.4 The quality of SAMV materials, components and accessories is managed using the Building Product Quality Plan.
15.5 SAMV's Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to the supply of components.
15.6 SAMV's Building Product Quality Plan is reviewed annually by BEAL.
15.6 Quality of installation of the SAMV on site is the responsibility of the tradespersons trained and approved by Original Stone Ltd.
15.7 Designers are responsible for the building design, and the owner is responsible for the quality of installation of framing systems, joinery, building wrap, flashing tapes, head flashings and air seals in accordance with the SAMV technical literature and per this Appraisal Certificate.
15.8 For a copy of the technical literature and any subsequent updates, please refer to: www.sumnerschist.co.nz
15.9 Building owners are responsible for the maintenance of the SAMV as per the warranty information and this Appraisal Certificate.

Sources of Information

- AS 3566 Self drilling screws for the building and construction industries.
- AS/NZS 1170:2002 Structural design actions
- ASTM C 297: Standard test method for flatwise tensile strength of sandwich constructions.
- AS/NZS 2908.2: Cellulose-cement products
- NASH 3405:2006 Steel framed buildings
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3603:1993 Timber structures standard
- NZS 3604:1999 Timber framed Buildings
- NZS 4211:1985 Specification for performance of windows
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, November 2021.
- The Building Regulations 1992, up to, and including 15 November 2022 amendments.

Concluding statement

16.1 In the opinion of BEAL after an independent assessment of the evidence, the SAMV is fit for purpose and will comply with the NZBC to the extent specified, provided it is designed, installed and maintained per the manufacturer's instructions and this Appraisal Certificate.
16.2 The Appraisal Certificate is issued only to Original Stone Ltd and is valid until further notification, subject to the conditions of this Appraisal.

Conditions of Appraisal

1. This appraisal Certificate:
a) Relates only to the SUMNER Adhered Masonry Veneer System as described herein;
b) Must be read, considered and used in full, together with the current version of the Technical Literature
c) Does not address any legislation, regulations, codes or standards, not specifically named herein;
d) Is copyright of BEAL

2. The Appraisal Certificate holder continues to meet the quality requirements of the Original Stone Ltd. Building Product Quality Plan and has the plan audited and Appraisal certificate revalidated by BEAL on an annual basis.

3. Original Stone Ltd. shall notify BEAL and obtain approval of any changes of the product specification or quality assurance prior to product being marketed including any trade literature, web site info or the like.

4. BEAL makes no representation as to:
a) The nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
b) The presence or absence of any patent or similar rights subsisting in the product or any other product;
c) Any guarantee or warranty offered by the Appraisal Certificate holder.

5. BEAL's verification of the building product or system complying with one or more above-mentioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the NZBC at the date of this Appraisal Certificate. In the event that the criteria is withdrawn or amended at a later date, this Appraisal may no longer remain valid.

6. Any reference in this Appraisal Certificate to any other publication shall be read as a reference to the version of publication specified in this Appraisal Certificate.

Authorised Signatory

C R Prouse - Principal Building Scientist
March 2023

