BEAL APPRAISED BUILDING CODE COMPLIANT C827

EXPIRES: 1 MAR 2020

BEAL Appraisal Certificate

BEAL BUILDING ELEMENT ASSESSMENT LABORATORY LIMITED

Stutex Stone NZ Ltd.

Stone Veneer Cladding System

STUTEX STONE
The New Age of Stone

Product

1.1 The Stutex Stone Veneer Cladding System (SSVCS) is based on the use of light-weight manufactured stone pieces adhered by way of a durable acrylic modified cement based adhesive to a nominated fibre-cement sheet substrate, fixed over battens to either timber or lightweight steel framing.

1.2 The nominated fibre cement sheet is the BGC Stonesheet, which is to be fixed over cavity battens according to the manufacturer's instructions and subject to the limitations described in this appraisal.

Building Regulations

2.1 In the opinion of BEAL, the SSVCS, if designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet the following provisions of the NZBC.

2.2 Clause B1 STRUCTURE

Performance B1.3.1 and B1.3.3. The SSVCS meets the requirements for loads arising from self weight, earthquake, wind, impact and creep i.e. B1.3.3 (a), (f), (h), (j) and (q). See paragraphs 10.1-10.4

2.3 Clause B2 DURABILTY

Performance B2.3.1 (b), 15 years, B2.3.1 (c), 5 years, and B2.3.2. The SSVCS meets this requirement. See paragraphs 11.1-11.5

2.4 Clause E2 EXTERNAL MOISTURE

Performance E2.3.2. The SSVCS meets this requirement. See paragraph 12.1-12.7

2.5 Clause F2 HAZARDOUS BUILDING MATERIALS

Performance F2.3.1. The SSVCS meets this requirement and will not present a health hazard to people.

2.6 The SSVCS has been appraised as an Alternative Solution in terms of New Zealand Building Code Compliance.

Applicant:

STUTEX STONE
The New Age of Stone

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Scope and Limitations

3.1 The SSVCS has been appraised for use as an external wall cladding system for buildings within the following scope:

- Scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.2; and,
- Constructed with timber framing complying with the NZBC; and or,
- Constructed with steel framing complying with the NZBC; and,
- With all framing protected from external wind and moisture by way of a Frame Protection System*;
- 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 'Very High' wind zones as described in NZS 3604 Building Wind Zones

3.2 The SSVCS has also been appraised for 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 SSVCS must only be installed on vertical framing.

3.4 The SSVCS is appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. (The Appraisal of the SSVCS relies on joinery meeting the requirements of NZS 4211 for the relevant building wind zone or being specifically designed for use in specifically designed buildings).

3.5 Installation of components and accessories supplied by Stutex Stone NZ Ltd must be carried out only by personnel trained and approved by Stutex Stone NZ Ltd.

* *The requirements of a Frame Protection System is described on the BEAL web site.*

Technical Literature

4.1 Refer to the SSVCS Technical Manual January 2018. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature and scope of this Appraisal Certificate must be followed .

4.2 For a copy of this Technical Literature and any subsequent updates please refer to:
www.stutexstone.co.nz

Technical Specification

5.1 System components and accessories supplied by Stutex Stone NZ Ltd as follows:

- BGC Stonesheet & fixings
- Stutex Stone Veneer Pieces
- Stutex StoneGrip stone adhesive
- Accessories including flashings and proprietary boots for sealing all penetrations of the underlay and the SSVCS.

5.2 Accessories supplied by the owner or builder include:

- Head flashings - Head flashing complying with NZBC in accordance with the Technical Literature
- Foam tape to be installed under the head flashing onto the top of the aluminium window or door joinery shall be Inseal 3259 single sided foam tape 3mm wide by 3mm thick length cut to suit.

Handling and Storage

6.1 Handling and storage of all the materials supplied by Stutex Stone NZ Ltd or the licensed contractor, both on and off site are under the control of Stutex Stone NZ Ltd licensed contractors.

6.2 Dry storage must be provided on site for all components and accessories including battens, uPVC flashing and mouldings which must be protected from direct sunlight and physical damage and stored flat and under cover. All liquid components shall be stored in dry, frost free conditions.

6.4 The Stutex StoneGrip stone adhesive in 20kg paper bags or 20 litre plastic bucket. Adhesives shall be stored in a dry space out of the weather and to prevent accidental damage.

Design Information

Framing

Timber Framing

7.1 Timber used in 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 specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design 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 specific design meeting the requirements of the NZBC. (NASH Standard for Residential and Low-rise Steel Framing Part 1, and, NASH Standard Part 2: 2019, Light Steel Framed Buildings)

7.5 The minimum steel framing specification is 'C' section studs and nogs of overall section dimensions of 76mm web by 40mm flange. Steel thickness must be a minimum 0.55mm.

7.6 For steel framed buildings situated within NZS3604 defined wind zones up to and including 'Very High', studs must be at maximum 600mm centres. All other buildings studs must be at maximum 400mm centres.
Dwangs must be fitted flush with the stud.

General

8.1 Openings in the slotted base cavity closer provide a minimum ventilation opening area of 1000mm² per lineal metre of wall.

8.2 The ground clearance between the finished floor level and ground level as outlined in NZS 3604 must be adhered to at all times. At ground level, paved surfaces must be kept clear from the bottom edge of the SSVCS by a minimum of 100mm, and unpaved surfaces by 175mm.

8.5 Where the SSVCS abuts other cladding systems, designers must detail the junction to a specific design whilst meeting performance requirements of the NZBC. Details not included within the Technical Literature have not been assessed and are therefore outside the scope of this Appraisal.

Control Joints

9.1 Control joints shall be designed and installed as per the BGC Stonesheet manufacturer's instructions. *(Note: Where possible control joints shall not be located in line with window and door openings. Horizontal and vertical control joints must be located over structural supports. Any details not included within the Technical literature are outside the scope of this Appraisal Certificate and are the responsibility of the designer.)*

Fixing shall be by way of stainless steel nails or screws as described in the 'BGC Stonesheet 'Fixing Guide'. It is essential that the fixings are not closer than 12mm from the edge of the sheets and not over-tightened.

Structure - Clause B1

Mass

10.1 The mass of SSVCS has a approximate mass of 32kg/m², considered a medium wall cladding in terms of NZS 3604.

Impact Resistance

10.2 The system has adequate resistance to impact loads that the cladding system is likely to be subjected to when used in a residential situation. The likelihood of impact damage to the system when used in light commercial situations should be considered at the design stage, with appropriate protection provided such as bollards or barriers where necessary.

Wind Zone

10.3 The SSVCS is suitable for use in all building wind zones as per NZS 3604, up to, and including 'Very High' where buildings are designed to meet 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

11.1 The SSVCS when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use will meet the performance requirements of NZBC B2.3.1 (b), 15 years for the cladding system.

Maintenance

11.2 Regular maintenance is essential to ensure the performance requirements of the NZBC are met and to ensure the maximum serviceability of the SSVCS .

11.3 Regular cleaning (at least annually) of the cladding is required to remove grime, dirt and organic growth as per the Technical Literature in order to maximize the life and appearance of the stone veneer.

11.4 Regular inspections (at least annually) must be made on the system to ensure that all aspects of the SSVCS and any sealed joints remain in a weatherproof condition. Any cracks, damaged areas or areas showing signs of deterioration that could allow water ingress, must be repaired immediately. The SSVCS must be maintained and repaired in accordance with the instructions from Stutex Stone NZ Ltd.

11.5 Minimum ground clearance as set out in this Appraisal and Technical Literature must be maintained at all times during the life of the system to maintain the durability and weathertightness of the system.

External Moisture - Clause E2

12.1 When installed in accordance with this Appraisal Certificate and Technical Literature, the SSVCS 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.

12.2 The cavity must be sealed off from the roof and subfloor space in order to meet the performance requirement of E2.3.5.

12.3 The SSVCS allows excess moisture present at the completion of construction to be dissipated without causing permanent damage to the building elements to meet the performance requirement of Clause E2.3.6.

Non-hazardous Materials - Clause F2

13.1 When installed in accordance with this Appraisal Certificate and Technical Literature, the SSVCS contains no materials hazardous to users of the building.

Installation Information

Installation Skill Level Requirement

14.1 Installation and finishing of the components and accessories supplied by Stutex Stone NZ Ltd and the licensed contractors must be completed by trained installers/applicators, certified by Stutex Stone NZ Ltd.

14.2 Installation of the accessories supplied by the building contractor must be completed by a tradesperson who has an understanding of cavity based cladding construction, in accordance with instructions given within the SSVCS Technical Manual and this Appraisal Certificate.

14.3 All aspects of the installation of the SSVCS shall be under the supervision of a Licensed Building Practitioner.

Health and Safety

15.1 When cutting, drilling or grinding stone veneer, this must be carried out in an open air or well ventilated area. A dust mask, eye protection and gloves must be worn.

15.2 All aspects of cutting, drilling or grinding must comply with the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016, www.worksafe.govt.nz.

15.3 Refer to the Technical Literature from the relevant manufacturer for the safe use and handling of the components that make up the SSVCS.

Basis of Appraisal

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

16.1 The following testing of the SSVCS and its respective components has been undertaken by BEAL unless otherwise noted:

- Compliance with the performance requirements of Clause E2.3.2 was based on the evaluation of all details within the scope of this Appraisal and testing of the SSVCS using a methodology based on E2/VM1;
- The testing assessed the performance of the window head, jamb and sill details, meter box head, jamb and sill details, vertical control joints, internal and external corners;
- BEAL have also reviewed the details contained within the technical manual, and a opinion has been given by BEAL that the system will meet the performance levels of E2/AS1 for a drained cavity system.
- Adhesion and compatibility testing of the Stutex Stone NZ Ltd adhesives with the BGC Stonesheet was conducted in accordance with ASTM C297.

Other Investigations

17.1 Wind loadings, self weight, seismic loadings, shear force, panel capacity, fastener pull through testing and calculations for the SSVCS were determined by an independent Chartered Professional Engineer in respect to the requirements of compliance document B1 Structure.

17.2 Ease of application has been assessed by BEAL staff.

17.3 The Technical Literature for the SSVCS has been examined by BEAL and found satisfactory.

Quality

18.1 The manufacture of the stone veneer has not been assessed by BEAL, but product supplied by Stutex stone NZ Ltd indicates little likelihood of significant failure and non-compliance with performance clause B2.3.1(b).

18.2 The quality of materials, components and accessories supplied by Stutex Stone NZ Ltd is managed through the use of the Building Product Quality Plan.

18.3 The Stutex Stone NZ Ltd's Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to supply of components.

18.4 Stutex Stone NZ Ltd's Building Product Quality Plan is reviewed at least annually by BEAL.

18.5 Quality on site is the responsibility of personnel trained and approved by Stutex Stone NZ Ltd.

18.6 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems, joinery, building wrap, flashing tapes, head flashings and air seals in accordance with the instructions of Stutex Stone NZ Ltd and this Appraisal Certificate.

18.7 For a copy of this Technical Literature and any subsequent updates please refer to:
www.stutexstone.co.nz

18.8 Building owners are responsible for the maintenance of the SSVCS in accordance with instructions of Stutex Stone NZ Ltd 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 B117 Standard practice for operating salt spray apparatus;
- ASTM C 297: Standard test method for flatwise tensile strength of sandwich constructions;
- NASH Standard for Residential and Low-rise Steel Framing Part 1, and, NASH Standard Part 2: 2019, Light Steel Framed Buildings;
- NZS 3602:2003 Timber and wood-based products for use in building;
- NZS 3603:1993 Timber structures standard;
- NZS 3604:2011 Timber framed Buildings;
- NZS 4211:2008 Specification for performance of windows;
- BEAL Test Report TR090128B; Compression strength of the stone;
- BEAL Test Report TR090304; Moisture resistance of the stone;
- BEAL Test Report TR090626; Adhesion of the stone with two nominated stone adhesives (only one is now approved);
- BEAL Test Report TR090331B; Compatibility of the stone adhesives;
- BEAL Test Report TR090615; Weathertightness;
- New Zealand Building Code Handbook and Approved Documents, Building industry Authority, 1992;
- The Building Regulations 1992, up to, and including October 2004 Amendment.

Concluding statement

19.1 In the opinion of BEAL, the Stutex Stone Veneer Cladding System is fit for purpose and will comply with the NZBC to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate.

19.2 The Appraisal Certificate is issued only to Stutex Stone NZ 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 Stutex Stone Veneer Cladding System as described herein;
   - B) Must be read, considered and used in full together with 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 Stutex Stone NZ Ltd's Building Product Quality Plan and has the plan revalidated by BEAL on an annual basis.

3. Stutex Stone NZ Ltd, shall notify BEAL and obtain approval of any changes in 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 - Director

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