BEAL Appraisal Certificate

APPRAISAL #CA1820

EXPIRY DATE: 30 NOV 2024

Gao's Solid Stone Veneer Cladding System

Product

1.1 **Gao's Solid Stone Veneer Cladding System (GSSVCS) is an 'appraised cladding system' incorporating natural and manufactured stone veneer pieces, adhered to a fibre-cement substrate, which is attached to the framing over battens and underlay.**

1.2 Framing must comply with the requirements of NZS 3604 for timber framing or NASH Standard for Residential and Low-rise Steel Framing, Parts 1 and 2.

NZ Building Regulations

2.1 In the opinion of BEAL, Gao's Solid Stone Veneer Cladding System (GSSVCS) , if designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet the following provisions of the New Zealand Building Code (NZBC):

B1 STRUCTURE

Performance Clause B1.3.1 and B1.3.3 (a), (f), (h), (j) and (q) (GSSVCS) meets the structural requirements for loads arising from self weight, earthquake, wind, impact and creep; See paragraph 6.2

B2 DURABILTY

Performance B2.3.1(b). 15 years, B2.3.1 (c), 5 years, and B2.3.2. The product (GSSVCS) meets the durability requirements for the stone veneer, adhesive, fibre-cement sheet, battens & fixings and the underlay system See paragraph 6.3

E2 EXTERNAL MOISTURE

Performance Clause E2.3.2. The product (GSSVCS) is a face-sealed cladding system that meets the performance requirements of E2.3.2 See paragraph 6.4

F2 HAZARDOUS BUILDING MATERIALS

Performance F2.3.1. The (GSSVCS) meets this requirement and will not present a health hazard to people. See paragraph 6.5

2.2 Gao's Solid Stone Veneer Cladding system has been appraised as an Alternative Solution in terms of New Zealand Building Code Compliance.

Applicant:

GAO'S Environmental Art

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Appraised by:

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Scope and Limitations

3.1 Gao's Solid Stone Veneer Cladding System has been appraised for use as an external cladding system over timber or light gauge steel framing complying with the requirements of the New Zealand Building Code (NZBC) within the following scope:

- Scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, 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 'Very High' wind zones as described in NZS 3604:2011 Building Wind Zones.
- Incorporating the use of cavity battens, and wall underlay that complies with the NZBC**.**

3.2 The wall system is appraised for use with aluminium window and door joinery for use in a rebated opening as shown in the Technical and Installation Manual. In each situation the specified rebates to the head, jambs and sill details must be complied with. The air seals are to be installed as shown in the relevant drawings.

The performance of Gao's Solid Stone Veneer Cladding System relies on the window and door joinery meeting the performance requirements of the NZBC for the relevant Wind Zone or being specifically designed for use.

3.3 The (GSSVCS) shall be installed only by Gao's NZ Holdings Ltd & M. Y.Stone Ltd. trained and approved installers.

Technical Literature

4.1 Gao's Solid Stone Veneer Cladding System Technical and Installation Manual and Detail Drawings describes the correct method of installation and 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.beal.co.nz

Technical Details

5.1 Gao's Solid Stone Veneer Cladding System is deemed a Medium Weight wall cladding based on NZS 3604, being 40 to 50 kg /m^2, comprising of approximately 20 - 45mm thick pieces of light-weight manufactured stone of varying sizes (a proprietary masonry product) glued on their back to the nominated substrate using a proprietary acrylic-modified sand and cement based adhesive.

The adhesive is also used as the splash coat and grout between the pieces of manufactured stone to produce a weather resistant aesthetically attractive finish.

In order to prevent moisture ingress past the face of the cladding system, two coats of CS Water Repellent is applied over the finished wall or column once the installation of the manufactured stones is complete.

5.2 This cladding system is described throughout this appraisal as 'Gao's Solid Stone Veneer Cladding System' (GSSVCS).

5.3 The (GSSVCS) stones are supplied loose in cardboard boxes, of varying sizes and can be stored indefinitely when kept dry and out of the weather.

5.4 The (GSSVCS) Acrylic Stone admixture is supplied in 5 and 20 litre plastic containers. The CS graded sand is supplied in 20 kg paper sacks. The cement complying with NZS 3122 is obtained from trade suppliers in 25 kg paper sacks.

All products shall be stored in a dry space out of the weather and in a manner to prevent accidental damage.

Advice for Designers

General

6.1 The (GSSVCS) Technical and Installation Manual, and Detailed Drawings are designed to enable designers to understand the construction and installation details of the Classic Stone Cladding System.

Structure - Clause B1

6.2 Gao's Solid Stone Veneer Cladding System when used in accordance with this Appraisal will meet Performance Requirements of B1.3.1, and B1.3.3 (a), (b), (f) and (h) of the NZBC.

Durability - Clause B2

6.3 The (GSSVCS) when used in accordance with this Appraisal will meet Performance Requirement B2.3.1(b) of the NZBC. In other words, the product as appraised will be durable for at least 15 years.

External Moisture - Clause E2

6.4 The (GSSVCS) complies with performance clause E2.3.2 of the Building Code when installed in accordance with this Appraisal. In other words, the product as appraised will "prevent the penetration of water that could cause undue dampness, or damage to building elements".

Hazardous Building Materials - Clause F2

6.5 The product contains no hazardous materials and complies with clause F2.3.1 of the Building Code.

Maintenance

6.6 The maintenance of the completed application of the (GSSVCS) consists of annual inspection and, where necessary, cleaning and removal of contamination that could reduce the performance and/or life of the exterior.

6.7 In the event of damage to the exterior finish, the location and details along with photos shall be recorded with a copy supplied to the applicator company or (GSSVCS) for action. No installer may carry out repairs without the prior approval of (GSSVCS).

Installation Requirements

Installation Skill Requirement

7.1 Installation of the (GSSVCS) must be completed by (GSSVCS) approved and trained applicators who have experience in the application of stone veneer products.

Health and Safety

7.2 Guidance for the safe use and handling of the components and related materials of the (GSSVCS) is provided in the Technical Literature. The products must used in conjunction with the relevant materials safety data sheet for each product.

Basis of this Appraisal

BEAL use the compliance verification procedure to evaluate compliance with the relevant clauses of the NZBC including a risk analysis procedure. The following is a summary of the technical investigations carried out.

Assessments

8.1 The following assessments of the (GSSVCS) have been undertaken by BEAL:
Review of structural data test and Technical Literature supplied by (GSSVCS).

Tests

8.2 The following testing of the (GSSVCS) has been undertaken by BEAL to verify compliance:
•Weathertightness by way of testing using a method adapted for thermal mass walls based on E2/VM1.

Other Investigations

8.3 The ability of the (GSSVCS) to support self weight and wind loadings, was assessed by an independent engineer.

8.4 An opinion has been given by BEAL of the durability of The (GSSVCS) on other Technical Literature and in-service history.

8.5 The (GSSVCS) was also evaluated (including site visits) in practical building situations assessing the following:
Ease of installation;
Potential risks of non-performance when being installed;
Any external factors that could affect the quality of the installed product;
Ease of repair or maintenance.

8.6 The Technical Literature has been examined by BEAL and found to be satisfactory.

Quality

8.7 The manufacture of the (GSSVCS) has not been assessed by BEAL, but details regarding the quality and composition of the materials used were obtained by BEAL and found to be satisfactory.

8.8 The quality of materials, components and accessories supplied by (GSSVCS) managed through the use of a Building Product Quality Plan.

8.9 The (GSSVCS) Building Product Quality Plan (BPQP) ensures continuous conformance with the quality requirements from purchase to supply of components.

8.10 (GSSVCS) Classic Stone Ltd's Building Product Quality Plan is reviewed and audited at least annually by BEAL or appointed agent.

8.11 Designers are responsible for the substructure design, and building contractors are responsible for the quality of construction of the substructure or new substrate in accordance with the instructions of the substrate
manufacturer and this Appraisal Certificate.

8.12 Building owners are responsible for the maintenance of the (GSSVCS) in accordance with the instructions of (GSSVCS) and this Appraisal Certificate.

Sources of Information

- New Zealand Building Code
- Acceptable Solutions E2/AS1
- AS/NZS 1170:2002 Structural Design Actions
- AS/NZS 4284:2008 Testing of Building Facades
- NZS 3122:2009 Specification for Portland and Blended Cements
- NZS 4211:2008 Specification for Performance of Windows
- NZS 3604:2011 Timber-framed buildings
- NASH Standard Residential and Low-rise Steel Framing, Parts 1 and 2
- BEAL Test Reports

Concluding Statement

9.1 In the opinion of BEAL, the (GSSVCS) is fit for purpose and will comply with the NZBC to the extent specified provided that it designed, installed and maintained as set out in this Appraisal Certificate.

9.2 The Appraisal Certificate is issued only to (GSSVCS) and is valid until the expiry date on the front of this appraisal certificate.

Conditions of Appraisal

10.1 This appraisal Certificate :

a) Relates only to the (GSSVCS) 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.

10.2 The Appraisal Certificate holder continues to meet the quality requirements of the (GSSVCS) Building Product Quality Plan (BPQP) and has the plan audited and Appraisal certificate revalidated by BEAL on an annual basis.

10.3. (GSSVCS) 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.

10.4 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;

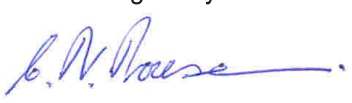
b) The presence or absence of any patent or similar rights subsisting in the product or any other product;

c) Any guarantee or warranty offered by the Appraisal Certificate holder.

10.5 BEAL's verification of the building product or system complying with one or more of the 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.

10.6 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
BEAL (Building Element Assessment Laboratory Limited)
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