BRANZ Appraised
Appraisal No. 1060 [2019]

BGC STRATUM™ VERTICAL CAVITY CLADDING SYSTEM

Appraisal No. 1060 (2019)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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WFTAO
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Product

1.1 The BGC Stratum™ Vertical Cavity Cladding System is a cavity-based, shiplap-jointed wall cladding system. It is designed to be used as an external wall cladding system for residential and light commercial type buildings where domestic construction techniques are used.

1.2 The BGC Stratum™ Vertical Cavity Cladding System consists of Stratum™ fibre cement planks fixed over castellated timber battens to form a ventilated cavity. The fibre cement planks are finished with a paint system.

1.3 The system incorporates a primary and secondary means of weather resistance (first and second line of defence) against water penetration by separating the cladding from the external wall framing with a nominal 20 mm cavity.

Scope

2.1 The BGC Stratum™ Vertical Cavity Cladding System has been appraised as an external wall cladding system for buildings within the following scope:

- the 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,
- situated in NZS 3604 Wind Zones up to, and including Extra High.

2.2 The BGC Stratum™ Vertical Cavity Cladding System has also been appraised for weathertightness and structural wind loading when used as an external wall cladding system for buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to building height and floor plan area; and,
- constructed with timber framing subject to specific engineering design; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 2.5 kPa.

2.3 The BGC Stratum™ Vertical Cavity Cladding System must only be installed vertically on vertical surfaces.

2.4 The BGC Stratum™ Vertical Cavity Cladding System has been appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills. (The Appraisal of the BGC Stratum™ Vertical Cavity Cladding System will rely on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone or wind pressure.)

[Note: BGC Stratum™ Vertical Planks can be used to provide fire resistance rated construction, but this aspect has not been assessed by this Appraisal and is outside its scope.]

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, the BGC Stratum™ Vertical Cavity Cladding System, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:**

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2, and B1.3.4. The BGC Stratum™ Vertical Cavity Cladding System meets the requirements for loads arising from self-weight, wind and impact [i.e. B1.3.3 [a], [h] and [j]]. See Paragraphs 9.1 - 9.3.

Clause B2 DURABILITY: Performance B2.3.1 [b], not less than 15 years and B2.3.2. The BGC Stratum™ Vertical Cavity Cladding System meets this requirement. See Paragraph 10.1 - 10.3.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. The BGC Stratum™ Vertical Cavity Cladding System meets this requirement. See Paragraphs 14.1- 14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The BGC Stratum™ Vertical Cavity Cladding System meets this requirement and will not present a health hazard to people.

Technical Specifications

4.1 System components and accessories for the BGC Stratum™ Vertical Cladding Systems supplied by BGC [Australia] Pty Ltd are:

BGC Stratum™ Planks

- BGC Stratum™, Stratum™ Duo and Stratum™ Trio are 12 mm thick fibre cement planks are manufactured from BGC standard fibre cement formulation. The planks are formed, cut to length, and then cured by high pressure autoclaving. The planks have a smooth or woodgrain finish and are coated on the front face and four edges with a sealer and a primer. BGC Stratum™ Duo and Stratum™ Trio planks are available in a width of 300 mm, and lengths of 2700 mm and 4200 mm. The planks are manufactured to conform to the requirements of AS/NZS 2908.2.

Accessories

4.2 Accessories used with BGC Stratum™ Vertical Cladding System, which are supplied by BGC [Australia] Pty Ltd;

- **BGC edge sealer** - acrylic sealer supplied in a 400 g can to seal cut edges of BGC Stratum™ Vertical planks prior to installation.
- **External and internal corners** - aluminium external box corner and 90° internal 'W' corner. The corners are available in 3000 mm lengths.
- **'J' jamb flashing** - aluminium 'J' flashing, available in 2400 mm lengths.
- **BGC horizontal timber cavity battens** - Castellated 45 x 20 mm radiata pine H3.1 treated to timber battens with a 5° slope bevelled on the top and bottom edges.

4.3 System components and accessories for the BGC Stratum™ Vertical Cladding Systems, which are supplied by the building contractor are:

- **Flexible wall underlay** - building paper complying with NZBC Acceptable Solution E2/AS1 Table 23, or breather-type membranes covered by a valid BRANZ Appraisal for use as a wall underlay.
- **Flexible wall underlay support** - polypropylene strap at 300 mm centres fixed horizontally and drawn taut for securing the building wrap in place and preventing bulging of the bulk insulation into the drainage cavity where cavity battens are installed at greater than 450 mm centres [*Note: additional vertical battens may also be installed to provide support*]
- **Rigid wall underlays** - minimum 7 mm thick H3 treated plywood or 6 mm thick fibre cement complying with NZBC Acceptable Solution E2/AS1 Table 23, or rigid air barrier systems covered by a valid BRANZ Appraisal such as BGC Durabarrier™, which is covered by BRANZ Appraisal No. 721 [2019].
- **Flexible sill and jamb flashing tape** - flexible flashing tapes complying with NZBC Acceptable Solution E2/AS1, Paragraph 4.3.11, or flexible flashing tapes covered by a valid BRANZ Appraisal for use around window and door joinery openings.

- **Cavity vent strip** - PVC, aluminium or stainless steel, punched with 3-5 mm holes or slots complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3.
- **Window and door trim cavity air seal** - air seals and PEF rod complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6, or self-expanding, moisture cure polyurethane foam air seals covered by a valid BRANZ Appraisal for use around window, door and other wall penetration openings.
- **Flexible sealant/ Gap Filler** - sealant complying with NZBC Acceptable Solution E2/AS1, or sealant covered by a valid BRANZ Appraisal for use as a weather sealing sealant for exterior use.
- **Adhesive Sealant** - Bostik Seal'n'Flex FC, for sealing vertical joints of BGC Stratum Vertical planks and for adhering Stratum Vertical planks to the cavity batten if using the brad and adhesive fixing method.
- **Aluminium joinery head flashing** - as supplied by the joinery manufacturer or the contractor.
- **Flashings** - balustrade and parapet cap flashings, and inter-storey joint flashings. Refer to NZS 3604 Section 4, and NZBC Acceptable Solution E2/AS1, Table 20 for durability requirements.
- **Cavity batten fixings** - 65 x 2.87 mm Paslode RounDrive® or 60 x 2.8 mm jolt-head ring-shank galvanised nails.

Plank fixing

- **Plank nail fixings** - 65 x 2.87 mm Paslode RounDrive® ring-shanked galvanised or stainless steel nails. [Note: stainless steel must be Grade 304 or 316.]
- **Plank brad fixings** - 30 x 1.6 mm stainless steel brad-nails. [Note: Stainless steel must be Grade 304 or 316.]
- **Adhesive sealant** - Bostik Seal'n'Flex FC, for fixing BGC Stratum™ planks to the cavity battens.

Paint System Specification

- Paint systems are not supplied by BGC [Australia] Pty Ltd and have not been assessed by BRANZ and are therefore outside the scope of this Appraisal.
- All exposed faces and edges of BGC Stratum™ planks, including top edges at sills and all bottom edges of the plank and cavity battens must be finished with at least two coats of an exterior grade latex acrylic paint system complying with any of Parts 7, 8, 9 or 10 of AS 3730.

Handling and Storage

5.1 Handling and storage of all materials supplied by BGC [Australia] Pty Ltd or the building contractor, whether on site or off site, is under the control of the building contractor. BGC Stratum™ planks must be stacked flat, off the ground and supported on a level platform. They must be kept dry at all times, either by storing under cover or by providing waterproof covers to the stack. Care must be taken to avoid damage to edges and surfaces. The planks must always be carried on edge.

5.2 Cavity battens and other accessories must be stored so they are kept clean, dry and undamaged. All accessories must be used within the maximum storage period recommended by the manufacturer

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ Website for details of the current Technical Literature for the BGC Stratum Vertical Cavity Cladding System. 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 within the scope of this Appraisal must be followed.

Design Information

Framing

Timber Treatment

7.1 Timber wall framing behind the BGC Stratum™ Vertical Cavity Cladding Systems must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

7.2 Timber framing must comply with NZS 3604 for buildings or parts of buildings within the scope limitations of NZS 3604. Buildings or parts of buildings outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least equivalent stiffness to the framing provisions of NZS 3604. In all cases studs must be at maximum 600 mm centres. Nogs/dwangs must be in a continuous line and be fitted flush between the studs at a maximum 600 mm centres

7.3 Timber framing must have a maximum moisture content of 20% at the time of the cladding application. (Note: If the BGC Stratum™ Vertical Cavity Cladding System is fixed to framing with a moisture content of greater than 20%, problems may occur at a later date due to excessive shrinkage.

Cavity Battens

7.4 The BGC Stratum™ Vertical Cavity Cladding System incorporates horizontal castellated cavity battens which form the nominal 20 mm cavity behind the BGC Stratum™ planks.

BGC Stratum™ Vertical Plank Set Out

7.5 All BGC Stratum™ Vertical plank end joints must be made over a dwang. At the base of the wall, the planks must hang 50 mm below the supporting framing.

7.6 Additional framing may be required at soffits, internal and external corners and window and door openings for the support and fixing of plank ends.

General

8.1 When the BGC Stratum™ Vertical Cavity Cladding Systems are used for specifically designed buildings up to 2.5 kPa (ULS) wind pressure, only the weathertightness aspects of the cladding and BGC Stratum™ plank fixing centres are within the scope of this Appraisal. All other aspects of the building need to be specifically designed and are outside the scope of this Appraisal.

8.2 Punchings in the cavity vent strip must provide a minimum ventilation opening area of at least 1000 mm^2 per lineal metre of wall in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.3 (b).

8.3 At ground level, the bottom edge of the BGC Stratum™ Vertical planks must be kept clear of paved surfaces, such as footpaths, by a minimum of 100 mm and unpaved surfaces by 175 mm in accordance with NZBC Acceptable Solution E2/AS1, Table 18. The ground clearances to finished floor levels as set out in NZS 3604 must be adhered to.

8.4 At balcony, deck or low pitched roof/wall junctions, the bottom edge of the BGC Stratum™ planks must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35 mm in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.6.

8.5 All external walls of buildings must have barriers to airflow in the form of flexible wall underlays and interior linings with all joints stopped for wind zones up to and including Very High, and rigid wall underlays for buildings in the Extra High wind zone and specifically designed buildings up to 2.5 kPa design differential ULS wind pressure. Unlined gables and walls must incorporate a rigid sheathing or an air barrier (e.g. BGC Durabarrier) which meets the requirements of NZBC Acceptable Solution E2/AS1, Table 23. For attached garages, wall underlays must be selected in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.3.4. Where rigid underlays are used, the cavity batten fixing lengths must be increased by a minimum of the thickness of the underlay.

8.6 Where the system abuts other cladding systems, designers must detail the junction to meet their own requirements and the performance requirements of the NZBC. Details not included in the Technical Literature have not been assessed and are outside the scope of this Appraisal.

Inter-storey Junctions

8.7 Inter-storey junctions must be constructed in accordance with the Technical Literature. Inter-storey joints must be provided to limit continuous cavities to the lesser of 2-storeys or 7 metres in height, in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.4 (b).

Structure

Mass

9.1 The mass of the BGC Stratum™ planks when installed on the wall is 15 kg/m^2 at equilibrium moisture content (EMC). The BGC Stratum™ Vertical Cavity Cladding System is therefore considered as light wall claddings in terms of NZS 3604.

Impact Resistance

9.2 BGC Stratum™ Vertical Cavity Cladding Systems have good resistance to impacts likely to be encountered in normal residential use. The likelihood of impact damage to the system when used in light commercial situations should be considered at the design stage, and appropriate protection such as the installation of bollards and barriers should be considered for vulnerable areas.

Wind Zones

9.3 The BGC Stratum™ Vertical Cavity Cladding System is suitable for use in all Wind Zones of NZS 3604, up to and including Extra High where buildings are designed to meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 1.1, or up to 2.5 kPa design differential ULS wind pressure where buildings are specifically designed.

Durability

Serviceable Life

10.1 BGC Stratum™ Vertical Cavity Cladding Systems installations are expected to have a serviceable life of at least 30 years provided the paint coating to the BGC Stratum™ planks are maintained in accordance with this Appraisal, and the BGC Stratum™ planks and fixings are continuously protected by a weathertight coating and remain dry in service. BGC Stratum™ planks must be painted within three months of installation.

10.2 Coastal locations can be very corrosive to fasteners, especially locations within distances of up to 500 m from the sea including harbours, or 100 metres from tidal estuaries and sheltered inlets, and otherwise as shown in NZS 3604 Figure 4.2. These coastal locations are defined in NZS 3604 as Zone D. To achieve an extended serviceable life in Zone D, structural battens must be fixed with stainless steel or protected hot-dip galvanised steel fasteners. Batten fixings outside Zone D may be hot-dip galvanised steel.

10.3 Microclimatic conditions, including geothermal hot spots, industrial contamination and corrosive atmospheres, and contamination from agricultural chemicals or fertilisers can convert mildly corrosive atmosphere into aggressive environments for fasteners. The fixing of structural battens and BGC Stratum™ planks in areas subject to microclimatic conditions requires specific design in accordance with NZS 3604, Paragraph 4.2.4, and is outside the scope of this Appraisal.

Maintenance

11.1 Regular maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.

11.2 Regular cleaning (at least annually) of the paint coating is recommended to remove grime, dirt and organic growth, to maximise the life and appearance of the coating. Grime may be removed by brushing with a soft brush, warm water and detergent.

11.3 Paint systems must be recoated at approximately 5-10 year intervals in accordance with the paint manufacturer's instructions.

11.4 Annual inspections must be made to ensure that all aspects of the cladding system, including the paint coating system, flashings and any sealed joints remain in a weatherproof condition. The planks must be checked to ensure the fixings and adhesive bond are sound. Any damaged areas or areas showing signs of deterioration which would allow water ingress must be repaired immediately. Sealant and paint coatings must be repaired in accordance with the relevant manufacturer's instructions.

11.5 Minimum ground clearances as set out in this Appraisal and the Technical Literature must be maintained at all times during the life of the cladding. [Note: Failure to adhere to the minimum ground clearances given in this Appraisal and the Technical Literature will adversely affect the long term durability of the BGC Stratum™ Vertical Cavity Cladding Systems.]

Control of External Fire Spread

Vertical Fire Spread

12.1 This Appraisal only covers buildings 10m or less in height. NZBC Functional Requirement C3.2 identifies that external vertical fire spread to upper floors only needs be considered for buildings with a building height greater than 10m. Control of external vertical fire spread is therefore outside the scope of this Appraisal.

Horizontal Fire Spread

12.2 The BGC Stratum™ Vertical Cavity Cladding System has a peak heat release rate of less than 100 kw/ m2 and a total heat released of less than 25 MJ/m2. Testing was carried out as per Paragraph 5.4 of NZBC Acceptable Solution C/AS1 and Paragraph 5.8.1 of NZBC Acceptable Solution C/AS2, achieving a Type A performance. The BGC Stratum™ Vertical Cavity Cladding System can therefore be used within 1m of the relevant boundary.

12.2 Refer to NZBC Acceptable Solutions C/AS1 and C/AS2 and Verification Method C/VM2 for fire resistance rating and control of external fire spread requirements for external walls.

Prevention of Fire Occurring

13.1 When Stratum™ sheets are finished with a paint coating of not more than 1.0 mm in thickness, clearance separations from heat sources such as fire places, heating appliances, flues and chimneys are not required. However when used in conjunction with, or attached to heat sensitive materials the heat sensitive materials must be separated from heat sources such as fire places, heating appliances, flues and chimneys in accordance with Part 7 of NZBC Acceptable Solutions C/AS1, C/AS2 and NZBC Verification Method C/VM1.

External Moisture

14.1 The BGC Stratum™ Vertical Cavity Cladding System, when installed and maintained in accordance with this Appraisal and the Technical Literature will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

14.2 The cavity must be sealed off from the roof and sub-floor spaces to meet compliance with NZBC Clause E2.3.5.

14.3 The BGC Stratum™ Vertical Cavity Cladding System allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet compliance with NZBC Clause E2.3.6.

14.4 The details given in the Technical Literature for weather sealing are based on the principles of having a first and second line of defence against moisture entry for all joints, penetrations and junctions. The ingress of moisture must be excluded by detailing joinery and wall interfaces as shown in the Technical Literature. Weathertightness details that are developed by the designer are outside the scope of this Appraisal and are the responsibility of the designer for compliance with the NZBC.

14.5 The BGC Stratum™ Vertical Cavity Cladding Systems, where there is a designed cavity drainage path for moisture that penetrates the cladding, does not reduce the requirement for joints, penetrations etc to remain weather resistant.

Internal Moisture

15.1 Buildings must be constructed with an adequate combination of thermal resistance and ventilation, and space temperature must be provided to all habitable spaces, laundries and other spaces where moisture may be generated or may accumulate.

Water Vapour

15.2 The BGC Stratum™ Vertical Cavity Cladding System is not a barrier to the passage of water vapour, and when installed in accordance with this Appraisal will not create a risk of moisture damage resulting from condensation.

Installation Information

Installation Skill Level Requirements

16.1 Installation of BGC Stratum™ Vertical planks and accessories supplied by BGC (Australia) Pty Ltd and the building contractor must always be carried out in accordance with the BGC Stratum™ Vertical Cavity Cladding System Technical Literature and this Appraisal by, or under the supervision of a Licensed Building Practitioner (LBP) with the relevant Licence Class.

System Installation

Building Underlay and Flexible Sill and Jamb Tape Installation

17.1 The selected building underlay and flexible sill and jamb tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions prior to the installation of the cavity battens and the rest of the BGC Stratum™ Vertical Cavity Cladding System. Flexible building underlay must be installed horizontally and be continuous around corners. Underlay must be lapped 75 mm minimum at horizontal joints and 150 mm minimum over studs at vertical joints. Generic rigid sheathing materials must be installed in accordance with NZBC Acceptable Solution E2/AS1 and be overlaid with a flexible wall underlay. Proprietary systems (e.g. BGC Durabarrier) shall be installed in accordance with the manufacturer's instructions. Particular attention must be paid to the installation of the building underlay and sill and jamb tapes around window and door openings to ensure a continuous seal is achieved and all exposed wall framing in the opening is protected.

17.2 A wall underlay support must be installed over flexible wall underlay at maximum 300 mm vertical centres.

Horizontal Cavity Battens

17.3 Castellated horizontal cavity battens must be installed over the wall underlay to the wall framing (nogs/dwangs) at maximum 600 mm centres. The batten must be installed with the top edge sloping away from the wall underlay towards the back of the weatherboards. The cavity battens must be fixed in place with 65 X 2.87 mm Paslode RounDrive® or 60 x 2.8 mm jolt head nails at maximum 300 mm centres to fix the battens in place prior to installation of the cladding.

17.4 A wall underlay support must be installed over flexible wall underlay at maximum 300 mm horizontal centres.

Aluminium Joinery Installation

17.5 Aluminium joinery and associated head flashings must be installed by the building contractor in accordance with the Technical Literature. A nominal 10 mm gap must be left between the joinery reveal and the wall framing so a PEF rod and air seal can be installed after the joinery has been secured in place.

BGC Stratum™ Vertical Plank Installation

17.6 BGC Stratum™ Vertical planks may be cut using either hand or power tools. Holes and cut-outs may be formed by drilling a number of holes around the perimeter of the opening required and tapping out the centre with a hammer, or by using a hole saw.

17.7 BGC Stratum™ Vertical planks must be dry prior to installation. Cut edges must be sealed with BGC Edge sealer, prior to plank installation.

BGC Stratum™ Vertical Plank Fixing

17.8 BGC Stratum™ Vertical planks must be installed starting at the corner of the wall being clad. The first weatherboard must be installed plumb to assist with the installation of subsequent weatherboards. The weatherboards must overhang the bottom plate by a minimum of 50 mm. The weatherboards should be installed with the lap facing away from prevailing winds.

17.9 The first plank must commence from an external corner. Jointing of BGC Stratum™ planks must be made on 6 mm bead of Bostik Seal'n'Flex FC must be applied to the plank lap before the corresponding plank is fixed.

17.10 BGC Stratum™ planks can be either fixed with 65 x 2.87 Paslode® RounDrive ring shank nail or with C30 brad-nails and Bostik Seal'n'Flex FC adhesive. When nail fixing is specified, the planks are fixed through the cavity battens with one nail in the lap and a second nail through the face of the board approximately 50 mm from the sheet edge. For brad and adhesive fixing, a 6 mm bead of Bostik Seal'n'Flex FC adhesive is applied to all contact areas of the horizontal cavity batten (i.e. the adhesive must not block the castellations). The planks are then fixed to the cavity battens with a brad in the lap and a second brad through the face of the board approximately 50 mm from the sheet edge.

Finishing

17.11 The BGC Stratum™ planks must be finished with a paint coating system that will protect it from moisture. A latex exterior paint system complying with any of parts 7, 8, 9 or 10 of AS 3730 is suitable.

17.12 The paint coating manufacturer's instructions must be followed at all times for application of the paint finish. BGC Stratum™ planks must be dry before commencing painting.

Inspection

17.13 The Technical Literature must be referred to during the inspection of BGC Stratum™ Vertical Cavity Cladding System installations.

Health and Safety

18.1 Safe use and handling procedures for the components that make up the BGC Stratum™ Vertical Cavity Cladding System are provided in the manufacturer's Technical Literature.

18.2 Cutting of BGC Stratum™ Vertical planks must be carried out in well ventilated areas, and a dust mask and eye protection must be worn. When power tools are used for cutting, grinding or forming holes, safety measures as set out in the Technical Literature must be undertaken because of the amount of dust generated.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

19.1 Wind face load testing for the BGC Stratum™ Cavity Cladding System was completed by BRANZ. BRANZ determined design wind suction pressures, and by comparing these with the NZS 3604 design wind speeds and AS/NZS 1170 pressure coefficients, the fixing requirements were determined for timber framed walls.

19.2 BRANZ expert opinion on NZBC E2 code compliance for the BGC Stratum™ Vertical Cavity Cladding System was based on testing and evaluation of all details within the scope and as stated within this Appraisal. The BGC Stratum™ Vertical Cavity Cladding System was tested to E2/VM1. The testing assessed the performance of the foundation detail, window head, jamb and sill details, meter box head, jamb and sill details, vertical and horizontal joints, internal and external corners, balustrade junctions, parapet caps and junctions and pipe penetrations. In addition to the weathertightness test, the details contained within the Technical Literature have been reviewed, and an opinion has been given by BRANZ technical experts that the system will meet the performance levels of NZBC Acceptable Solution E2/AS1 for drained cavity claddings.

19.3 Cone calorimeter testing to determine the peak rate of heat release and total heat release of BGC NuLine weatherboard was completed by BRANZ and the results were used to provide an assessment of the BGC Stratum™ planks. The testing was carried out in accordance with AS/NZS 3837.

Other Investigations

20.1 Structural, durability and fire opinions have been given by BRANZ technical experts.

20.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.

20.3 The Technical Literature for the BGC Stratum™ Vertical Cavity Cladding System has been examined by BRANZ and found to be satisfactory.

Quality

21.1 The manufacture of BGC Stratum™ planks has been examined by BRANZ, including the methods for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

21.2 The quality of materials, components and accessories supplied by BGC (Australia) Pty Ltd is the responsibility of BGC (Australia) Pty Ltd.

21.3 The quality management system of the manufacturer of BGC Stratum™ planks, BGC (Australia) Pty Ltd, has been assessed and registered as meeting the requirements of ISO 9001:2015.

21.4 Quality of installation on site of components and accessories supplied by BGC (Australia) Pty Ltd and the building contractor is the responsibility of the installer.

21.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of framing systems and joinery, wall underlays, flashing tapes, airseals, joinery head flashings, cavity battens and BGC Stratum™ planks in accordance with the instructions of BGC (Australia) Pty Ltd.

21.6 Building owners are responsible for the maintenance of BGC Stratum™ Vertical Cavity Cladding System in accordance with the instructions of BGC (Australia) Pty Ltd.

Sources of Information

- AS 3730: Guide to the properties of paints for buildings.
- AS/NZS 1170 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products - flat sheet.
- AS/NZS 3837: 1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.
- AS/NZS 4680: 2006 Hot-dip galvanised (zinc) coatings on fabricated ferrous articles.
- ISO 5660.1: 2002 Heat release rate (cone calorimeter method)
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4211: 2008 Specification for performance of windows.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

BRANZ

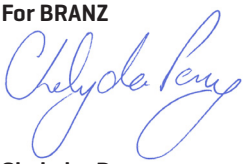
In the opinion of BRANZ, BGC Stratum™ Vertical Cavity Cladding System is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to BGC (Australia) Pty Ltd, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
   a) relates only to the product 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 BRANZ.
2. BGC (Australia) Pty Ltd.
   a) continues to have the product reviewed by BRANZ;
   b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
   c) abides by the BRANZ Appraisals Services Terms and Conditions;
   d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty 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 BGC (Australia) Pty Ltd.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to BGC (Australia) Pty Ltd or any third party.

For BRANZ



Chelydra Percy
Chief Executive

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