



BRANZ Appraised

Appraisal No. 1147 [2023]

AUBRICKS KILN-FIRED CLAY BRICKS



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BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 Aubricks Kiln-fired Clay Bricks are an external wall veneer cladding product for single storey buildings.

Scope

- 2.1 Aubricks Kiln-fired Clay Bricks have been appraised for use as a veneer cladding system for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
 - with a maximum veneer height of 4 m above the supporting foundation, gable ends up to 5.5 m, and a maximum veneer height above adjacent finished ground level of 7 m; and,
 - with a minimum veneer thickness of 70 mm; and,
 - with a depth of cavity of between 40 mm and 75 mm; and,
 - with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1 Table 2; and,
 - with timber framing constructed on slab-on-ground in accordance with NZS 3604 for brick veneer and/or concrete masonry foundation constructed in accordance with NZS 4229; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Aubricks Kiln-fired Clay Bricks are appraised for use with aluminium window and door joinery that is installed with vertical jambs and horizontal heads and sills, or any other BRANZ Appraised window systems that are suitable for use with brick veneer. *[Note: The Appraisal of the Aubricks Kiln-fired Clay Bricks relies on the joinery meeting the requirements of NZS 4211 for the relevant Wind Zone.]*

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Aubricks Kiln-fired Clay Bricks, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. Aubricks Kiln-fired Clay Bricks meet the requirements for loads arising from self-weight, earthquake, wind, impact, and creep and shrinkage [i.e. B1.3.3 (a), (f), (h), (j) and (q)]. See Paragraphs 8.1-8.15.

Clause B2 DURABILITY: Performance B2.3.1 (a) 50 years and (b) 15 years. Aubricks Kiln-fired Clay Bricks meet these requirements. See Paragraphs 9.1-9.4.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. Aubricks Kiln-fired Clay Bricks meet this requirement. See Paragraph 13.1-13.4.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Aubricks Kiln-fired Clay Bricks meet this requirement.

Technical Specification

Clay Bricks

4.1 Aubricks Kiln-fired Clay Bricks are extruded, cored, kiln-fired clay bricks. The bricks are available in the following ranges and colours:

- Valley Series are 70 mm thick and are supplied 230 mm long and 76 mm high and are available in pearl [white], red [red] and lava [slategrey].
- River Series are 70 mm thick and are supplied 230 mm long and 119 mm high and are available in pearl [white], red [red] and lava [slategrey].
- Hill Series are 70 mm thick and are supplied 290 mm long and 76 mm high and are available in pearl [white].

4.2 The Aubricks Kiln-fired Clay Bricks are manufactured in compliance with NZS 4455.

Accessories

4.3 Accessories and materials used with Aubricks Kiln-fired Clay Bricks that are supplied by the bricklayer or builder are:

- **Mortar** - in accordance with NZS 4210.
- **Metal brick ties and screw fixings** - complying with AS/NZS 2699.1.
- **Steel lintels** - steel lintels complying with AS/NZS 2699.3 and NZBC Acceptable Solution E2/AS1, Paragraph 9.2.9.
- **Steel shelf angles** - complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.9.
- **Flashings** - butyl rubber or bituminous flashings complying with either NZBC Acceptable Solution E2/AS1, Paragraph 4.3.9 or Paragraph 4.3.10. [Coated or galvanised steel flashings are not suitable for this application.]
- **Sill, head and jamb flashing tapes** - complying with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.4.
- **Wall underlay** - complying with NZBC Acceptable Solution E2/AS1, Table 23, breather-type membranes, or rigid wall underlays covered by a valid BRANZ Appraisal for use as wall underlays.
- **Flexible sill and jamb flashing tapes** - 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.
- **Joinery head flashings** - folded from aluminium or galvanised steel to suit window or door trim opening. Refer to NZS 3604, Section 4 and NZBC Acceptable Solution E2/AS1, Table 20 for material selection and durability requirements.
- **Window and door trim cavity air seals** - air seals 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.

Handling and Storage

- 5.1 Aubricks Kiln-fired Clay Bricks are packaged in plastic and are delivered on pallets. They must be handled with care to avoid physical damage, particularly to corners and edges, and must be stored so that they are protected from the weather.
- 5.2 Components such as brick ties, lintels, and shelf angles must be handled so as to avoid damage. They must also be stored in dry locations, protected from the weather.
- 5.3 Pre-bagged and pre-mixed mortar must be stored in dry locations, protected from the weather.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
 - NZ Brick Supplier Aubricks Technical Details, Version 1.0, 07/06/2023.
- 6.2 All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Aubricks Kiln-fired Clay Bricks shall be laid in a brick-bond pattern in accordance with NZBC Acceptable Solution E2/AS1.
- 7.2 The system and Technical Literature apply for use only with brick types, colours and thicknesses as specified in Paragraph 4.1.

Structure

Foundations

- 8.1 Foundation systems supporting the veneer must consist of concrete slab-on-ground systems complying with either NZS 3604 or NZS 4229.
- 8.2 Where the building under consideration is to be built on expansive soils as defined by AS 2870, control joints may be necessary, and the advice of a design professional should be obtained.

Framing

- 8.3 The system can be used as a masonry veneer cladding for timber-framed buildings complying with NZS 3604 or masonry construction complying with NZS 4229.
- 8.4 The maximum span of any external opening where the veneer is supported over the opening must be in accordance with the masonry veneer lintel sizes in Table 18E of NZBC Acceptable Solution E2/AS1.

Timber Treatment

- 8.5 Timber wall framing behind the Aubricks Kiln-fired Clay Bricks veneer must be treated as required by NZBC Acceptable Solution B2/AS1.

Timber Framing

- 8.6 Timber framing must comply with NZS 3604 for buildings or parts of a building within the scope limitations of NZS 3604. Buildings or parts of a building outside the scope of NZS 3604 must be to a specific design in accordance with NZS 3603 and the AS/NZS 1170 series. Studs must be at maximum 600 mm centres in Low, Medium, High and Very High Wind Zones and at maximum 400 mm centres in the Extra High Wind Zone. Dwargs must be fitted flush between the studs at maximum 800 mm centres.
- 8.7 The maximum span of any external opening where the veneer is supported over the opening must be in accordance with the lintel tables contained in NZS 3604 and NZBC Acceptable Solution E2/AS1.
- 8.8 The framing must have a maximum moisture content of 24% at the time of the cladding installation.
[Note: If the Aubricks Kiln-Fire Clay Bricks veneer system is fixed to framing with a moisture content of greater than 24% problems may occur later due to excessive timber shrinkage.]



Veneer Height

- 8.9 The maximum permitted height of veneer for Aubricks Kiln-fired Clay Bricks is 4 m above its foundation support. A gable end or pier may extend to 5.5 m in height above its foundation support. A pier is defined as a brick panel not exceeding 1 m in width. The maximum permitted height of veneer is 7 m above adjacent finished ground level.

Wall Bracing Requirements

- 8.10 Bracing demand requirements of walls may be calculated by using Tables 5.10 and 14.3 as applicable for the floor load in NZS 3604.

Mass

- 8.11 Aubricks Kiln-fired Clay Bricks have a mass of approximately 72 kg/m², resulting in a medium wall cladding classification as per NZS 3604.

Steel Lintel Angles

- 8.12 Lintel angle sizes and details are to be based on Table 18E of NZBC Acceptable Solution E2/AS1 for spans up to 4.8 m.

Brick Ties

- 8.13 Brick ties are to conform to the requirements of NZS 2699.1.
8.14 Brick ties are to be fixed to studs spaced at a maximum 600 mm centres and at maximum vertical spacing of 400 mm as per NZS 4210.

Concrete Masonry Buildings

- 8.15 Aubricks Kiln-fired Clay Bricks may also be used with concrete masonry buildings constructed in accordance with NZS 4229. A cavity, with a minimum width of 40 mm and a maximum of 75 mm, must be formed between the veneer and masonry structural wall, with the veneer attached to the concrete masonry by veneer ties mechanically fixed to the face of the masonry. The fixing of brick ties to masonry must be in accordance with NZS 4229, Appendix E.

Durability

Serviceable Life

- 9.1 Aubricks Kiln-fired Clay Bricks are expected to have a serviceable life of at least 50 years provided the system is maintained in accordance with this Appraisal and the Technical Literature.
9.2 Brick veneer ties and their fixings must meet the durability requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.2.7.
9.3 Flashings must comply with NZBC Acceptable Solution E2/AS1, Paragraph 9.2.4.
9.4 Lintel and shelf angles must meet the durability requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.2.9.

Maintenance

- 10.1 Regular maintenance is essential to ensure the performance requirements of the NZBC are continually met and to ensure the maximum serviceability of the system.
10.2 Aubricks Kiln-fired Clay Bricks should be inspected at least annually. Weep holes must be kept clear of dust, dirt, spider webs and the like to ensure that moisture can continue to drain from the cavity.
10.3 Where bricks or mortar are cracked the cause must be determined and repairs must be carried out to restore the cladding. This may require assessment by a structural engineer.

Prevention of Fire Occurring

- 11.1 Aubricks Kiln-fired Clay Bricks are considered non-combustible and need not be separated from heat sources such as fireplaces heating appliances and chimneys. However, when used in conjunction with, or attached to heat sensitive materials, these must be separated from fireplaces, heating appliances, and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

- 12.1 Clay bricks and mortars are non-combustible materials. When Aubricks Kiln-fired Clay Bricks are uncoated or are finished with a paint coating of not more than 1 mm in thickness, the exterior surface finish requirements of NZBC Acceptable Solution C/AS1, Paragraph 5.4 and Acceptable Solution C/AS2, Paragraph 5.8.1 do not apply, in accordance with NZBC Acceptable Solution C/AS1, Paragraph 5.4 and Acceptable Solutions C/AS2, Paragraph 5.8.2 a) respectively.

External Moisture

- 13.1 Aubricks Kiln-fired Clay Bricks must be detailed for weathertightness in accordance with NZBC Acceptable Solution E2/AS1, Section 9.2 Masonry Veneer and the Technical Literature.
- 13.2 Aubricks Kiln-fired Clay Bricks, when installed in accordance with this Appraisal and the Technical Literature [on buildings with a risk score of 0-20, calculated in accordance with NZBC Acceptable Solution E2/AS1, Table 2], prevents the penetration of moisture that could cause undue dampness or damage to building elements.
- 13.3 The cavity must be sealed off from the roof and subfloor space to meet compliance with NZBC Clause E2.3.5.
- 13.4 The Aubricks Kiln-fired Clay Bricks 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.

Installation Information

Installation Skill Level Requirement

- 14.1 All design and building work must be carried out in accordance with the Aubricks Kiln-fired Clay Bricks Technical Literature and this Appraisal by competent and experienced tradespersons conversant with Aubricks Kiln-fired Clay Bricks. Where the work involves Restricted Building Work [RBW] this must be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.
- 14.2 The materials and workmanship of the Aubricks Kiln-fired Clay Brick veneer system shall be in accordance with the SNZ HB 4236 for masonry veneer wall cladding.

System Installation

General

- 15.1 The guidelines and requirements for masonry veneer wall cladding given in SNZ HB 4236 must be followed.
- 15.2 During and after brick veneer installation it is recommended that, if possible, internal linings be attached to timber frames by screwing rather than nailing in order to avoid vibration to the cladding that could produce hairline cracks in the mortar.
- 15.3 Any brick veneer covered by this Appraisal may be painted, bagged, or plastered as long as the weight limitations of Table 2.3 of NZS 4210 are not exceeded for the type of brick tie used. Painting, bagging, or plastering is outside the scope of this Appraisal.

Wall Underlay and Tape Installation

- 15.4 The wall underlay and flashing tape system must be installed by the building contractor in accordance with the underlay and tape manufacturer's instructions and in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.5 prior to the installation of the clay bricks. Particular attention must be paid to the installation of the wall underlay and sill/jamb junction, and head/jamb junction tapes at window and door openings to ensure a continuous seal is achieved and all exposed timber in the opening is protected.

Joinery Installation

- 15.5 Joinery must be installed as per NZBC Acceptable Solution E2/AS1, Paragraph 9.2.10 with flashings installed as per Figures 73C and 73D, or for BRANZ Appraised systems in accordance with the instructions contained in their respective Technical Literature and Appraisal.
- 15.6 A continuous air seal must be provided in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.6.
- 15.7 Adequate weather protection must be provided around doors and window frames. Aluminium joinery must be installed so that a cover to the brick veneer of approximately 10-20 mm is provided when measured from the back of the brick to the front of the joinery flange.
- 15.8 Aluminium joinery must have a 7.5 mm nominal gap 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.
- 15.9 Head flashings must be provided at all openings of the brick veneer cladding. Jambs must be flashed with the likes of a DPC flashing material attached to the opening stud over the wall underlay in front of the sill flashings upstands. Sill flashings must be provided in the brick cavity under all openings.

Clay Brick Installation

- 15.10 If possible bricks should be of one single batch. If this is not possible, bricks from two batches should be thoroughly mixed to avoid obvious colour variations. It is recommended that bricks be selected from at least three different pallets or packs simultaneously.
- 15.11 Pallets or packs of bricks should always be kept covered so that they are laid dry. If rain is likely during construction, the top course and cavity should be covered to reduce the likelihood of efflorescence occurring on the surface of the bricks.
- 15.12 Brickwork should be cleaned thoroughly as construction progresses, as mortar stains can be difficult to remove later. If acid is used for cleaning, industry guidelines must be followed with respect to methods of use and disposal.
- 15.13 Mortar joints shall be ± 2 mm from the specified mortar joint thickness. The minimum mortar joint thickness permitted is 8 mm and the maximum 18 mm. Joints may be raked to a maximum depth of 6 mm and should be tooled to provide a hard, smooth surface to reduce water absorption.
- 15.14 If mortar is site batched, it must be carefully mixed (in the volumes described in NZS 4210, Table 2.1 for the required durability requirement) to ensure consistent colour and bond strength. Pre-mixed mortar is recommended for its consistency in both strength and colour, as well as its low level of chloride salts.

Brick Tie Installation

- 15.15 Brick ties must be screw fixed at a maximum of 600 mm centres horizontally and maximum 400 mm centres vertically and must angle down from the framing toward the brick veneer at a 5° slope.
- 15.16 Brick ties may be dry bedded, i.e. the tie is fixed so that it lies on the top surface of the brick and the mortar bed placed on top of it, rather than bedding the tie within the mortar bed.

Inspection

- 15.17 The Technical Literature must be referred to during the inspection of the Aubricks Kiln-fired Clay Bricks installation by building consent authorities and territorial authorities. Flashing installation is a critical point of inspection.

Health and Safety

- 16.1 Cutting of clay bricks with power tools should be carried out in well ventilated areas and a dust mask, eye, and hearing protection should be worn.



Basis of Appraisal

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

Investigations

- 17.1 Assessment has been made of the structural aspects and durability of the system and opinions given by BRANZ technical experts.
- 17.2 The Technical Literature has been examined by BRANZ and found to be satisfactory.
- 17.3 Site inspections were carried out by BRANZ to assess methods used for construction of the Aubricks Kiln-fired Clay Bricks and to inspect completed systems.

Quality

- 18.1 The manufacture of the clay bricks has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 18.2 The quality of materials, components and accessories supplied by Aubricks New Zealand Ltd is the responsibility of Aubricks New Zealand Ltd.
- 18.3 Designers are responsible for the design of the building and incorporating the wall cladding system in accordance with the Technical Literature and NZBC Acceptable Solution E2/AS1.
- 18.4 Quality on-site is the responsibility of the building contractor and the bricklayer in accordance with the instructions of Aubricks New Zealand Ltd.
- 18.5 Building owners are responsible for the maintenance of the Aubricks Kiln-fired Clay Bricks in accordance with the instructions of Aubricks New Zealand Ltd.

Sources of Information

- AS 2870:1996 Residential slabs and footings - Construction.
- AS/NZS 1170:2002 Structural design actions.
- AS/NZS 2699.1:2000 Built-in components for masonry construction - Wall ties.
- AS/NZS 4455:2008 Masonry units, pavers, flags and segmental retaining wall units.
- NZS 3603:1993 Timber structures standard.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4210:2001 Masonry construction: Materials and workmanship.
- NZS 4211:2008 Specification for performance of windows.
- NZS 4229:2013 Concrete masonry buildings not requiring specific engineering design.
- SHZ HB 4236:2002 Masonry veneer wall cladding.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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15 November 2023

AUBRICKS KILN-FIRED
CLAY BRICKS



In the opinion of BRANZ, **Aubricks Kiln-fired Clay Bricks** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Aubricks New Zealand 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. **Aubricks New Zealand 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 **Aubricks New Zealand 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 **Aubricks New Zealand Ltd** or any third party.

For BRANZ

Claire Falck

Chief Executive

Date of Issue:

15 November 2023