



BRANZ Appraised
Appraisal No. 1219 [2023]

INTEGRA LIGHTWEIGHT CONCRETE FLOORING SYSTEM



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BRANZ Appraisals

Technical Assessments of products
for building and construction.



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Product

- 1.1 The Integra Lightweight Concrete Flooring System is an autoclaved aerated concrete (AAC) flooring panel system for use on suspended timber and steel-framed floors of domestic, residential and light commercial buildings.

Scope

- 2.1 The Integra Lightweight Concrete Flooring System is appraised for use as a flooring panel system on suspended timber and steel-framed floors of buildings within the following scope:
 - where the supporting structure is subject to specific engineering design (SED); and,
 - where the floor loads do not exceed those specified in AS/NZS 1170.1, Table 3.1, category A2, up to and including 3 kPa and a 2.7 kN concentrated live load.
- 2.2 Building designers are responsible for the building design and for the incorporation of the Integra Lightweight Concrete Flooring System into their design, in accordance with the declared properties and the instructions of Resene Construction Systems.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, the Integra Lightweight Concrete Flooring System, 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. The Integra Lightweight Concrete Flooring System meets the requirements for loads arising from self-weight, imposed gravity loads arising from use and impact [i.e. B1.3.3 (a), (b) and (j)]. See Paragraphs 8.1-8.4.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years and B2.3.1 (b) 15 years. The Integra Lightweight Concrete Flooring System meets these requirements. See Paragraph 9.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Integra Lightweight Concrete Flooring System meets this requirement.

Clause G6 AIRBORNE AND IMPACT SOUND: Performance G6.3.1 and G6.3.2. The Integra Lightweight Concrete Flooring System will contribute to meeting these requirements. See Paragraphs 12.1 and 12.2.



Technical Specification

- 4.1 The components and accessories used with the Integra Lightweight Concrete Flooring System, which are supplied by Resene Construction Systems are:
- **Integra Lightweight Concrete Flooring panels** - AAC panels with a tongue and groove jointing system along both long edges. The panels are 1,800 mm long x 600 mm wide x 75 mm thick, incorporate a steel mesh reinforcement and have a density of approximately 45 kg/m².
 - **Integra fixings (timber frame)** - AS 3566 Corrosion Class 4 hot-dip galvanised wood screws with a head diameter of 14 mm, shank diameter of 5.1 mm and 100 mm long for the body of the panels, 150 mm long for the perimeter of the floor or 125 mm long if skew fixed into the panel ends.
 - **Integra fixings (steel frame)** - AS 3566 Corrosion Class 4 hot-dip galvanised self-drilling screws with a head diameter of 14 mm, a shank diameter of 5.1 mm and 100 mm long.
 - **AAC Adhesive** - polymer modified, cement-based dry plaster mix. Supplied in 20 kg bags.
 - **Zinc rich protective coating** - for coating of exposed reinforcement at cut panel ends.
- 4.2 Accessories used with the Integra Lightweight Concrete Flooring System, which are supplied by the building contractor are:
- **Plasterboard** - as listed in the Technical Literature for the Integra Lightweight Concrete Flooring System.
 - **Insulation** - as listed in the Technical Literature for the Integra Lightweight Concrete Flooring System.
 - **Floor coverings** - as listed in the Technical Literature for the Integra Lightweight Concrete Flooring System.
 - **Fire and acoustic sealants** - as listed in the Technical Literature for the Integra Lightweight Concrete Flooring System. Proprietary penetration seals and sealants have not been assessed and are outside the scope of this Appraisal.

Handling and Storage

- 5.1 The Integra Lightweight Concrete Flooring panels must be handled carefully at all times to avoid physical damage and kept dry under cover until ready for construction.
- 5.2 Handling and storage of all materials supplied by the building contractor, whether on-site or off-site, are under the control of the building contractor. Materials must be handled and stored in accordance with the relevant manufacturer's instructions.
- 5.3 Provision must be made if the Integra panels are stored on floor joists during construction to ensure the structure can support the load of the panels.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- Integra Lightweight Concrete Flooring System Technical Manual, Version 2, November 2022.
- 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 The Integra Lightweight Concrete Flooring System Technical Literature contains design information and procedures required to allow building designers to design structures incorporating the Integra Lightweight Concrete Flooring System.
- 7.2 The panels can be supported on either light timber or light steel floor framing. Framing may consist of timber joists, ply webbed joists, trussed joists, laminated timber joists, timber or steel beams, or any combination of the above. The floor framing system must be designed for the appropriate live load plus the in-service mass of the panels. Refer to Paragraph 8.2 for more information.
- 7.3 Integra Lightweight Concrete Flooring panels are suitable for joists placed at a maximum of 600 mm spacings and are intended to be installed perpendicular to the floor joists.
- 7.4 Floor coverings, ceiling linings and insulation must be as specified in the Integra Lightweight Concrete Flooring System Technical Literature to achieve the Sound Transmission Class [STC] and Impact Insulation Class [IIC] classification stated in the Technical Literature.
- 7.5 Penetrations within the Integra Lightweight Concrete Flooring System for the purposes of piped services, cables or the like have not been considered and are outside the scope of this Appraisal. The effect of the penetrations on acoustic and fire rating performance of the floor must be addressed separately and is the responsibility of the designer.
- 7.6 Should control joints be required in the Integra Lightweight Concrete Flooring System, the joints shall be specifically designed to maintain the integrity of the sound control and fire resistance ratings of the system.
- 7.7 When used in wet areas, Integra Lightweight Concrete Flooring System must be installed with a waterproofing membrane installed in accordance with the manufacturer's specification.

Structure

General

- 8.1 The Integra Lightweight Concrete Flooring System is for use with supporting structure subject to specific engineering design. See the Technical Literature for floor joist spacing.
- 8.2 Integra Lightweight Concrete Flooring System cannot be used as a floor diaphragm.

Bracing Walls

- 8.3 Where a bracing wall occurs on top of the Integra Lightweight Concrete Flooring System, it must have either supporting blocking or a joist directly underneath. For bracing walls parallel with the floor joists, the bracing wall shall either be over a joist or be supported by solid blocking. Blocking shall have a minimum width of 45 mm.
- 8.4 Coach screws for fixing brackets must be sized to achieve the minimum embedment into joists or blocking as required by the Winstone Wallboards Ltd Technical Literature.

Durability

- 9.1 The Integra Lightweight Concrete Flooring System is expected to have a serviceable life of at least 50 years when installed in dry, interior environments.

Maintenance

- 10.1 There are no specific requirements for routine maintenance of the Integra Lightweight Concrete Flooring System in-service. In the unexpected case that the flooring panels become damaged in-service, repair should be carried out in consultation with Resene Construction Systems.

Subfloor Ventilation

- 10.2 Adequate subfloor ventilation for timber-framed suspended ground floors must be maintained by ensuring vegetation or other obstructions are kept away from vents in perimeter foundation walls. Where ground vapour barriers exist, they must be maintained in a serviceable and effective condition.



Fire Affecting Areas Beyond the Fire Source

- 11.1 The Integra Lightweight Concrete Flooring System achieves a fire resistance rating of 15/15/15 when constructed in accordance with the Technical Literature.

Airborne and Impact Sound

- 12.1 The Integra Lightweight Concrete Flooring System, when installed in accordance with the Technical Literature and this Appraisal, will meet the requirements of NZBC Performance G6.3.1 and can be used to prevent undue noise transmission from other occupancies or common spaces, to the habitable spaces of household units.
- 12.2 The acoustic performance of other construction methods not in accordance with the Technical Literature have not been considered and are outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirement

- 13.1 All design and building work must be carried out in accordance with the Integra Lightweight Concrete Flooring System Technical Literature and this Appraisal by competent and experienced tradespersons conversant with the Integra Lightweight Concrete Flooring System. 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 License Class.

General

- 14.1 The Integra Lightweight Concrete Flooring System must be installed in accordance with the Technical Literature.
- 14.2 The panels shall be laid in full panels wherever possible, in a stretcher bond pattern. The panels can be readily cut to size to suit floor layout requirements and openings. Panels must be supported on a minimum of two joists. Panels overhanging a floor joist must be cut back so that it is flush and supported on the joist.
- 14.3 Integra Lightweight Concrete Flooring panels are screwed to the floor joists at maximum 150 mm centres around the perimeter of the floor area with 150 mm long screws and at 300 mm centres with 100 mm long screws along all intermediate joists. Two screws are required in each panel at each joist. A minimum edge distance of 50 mm is recommended from the short edge to the first screw. 125 mm long screws in the end edge of the panel may be skewed to achieve the 50 mm end distance.
- 14.4 Once the Integra Lightweight Concrete Flooring panels are laid, it is recommended that the floor is protected during subsequent construction activities, prior to finished floor coverings being installed. Thin plywood, or products intended to provide temporary floor protection during construction can be laid on top of the flooring where high construction traffic is expected (i.e. hallways and entrances). This will protect and minimise surface damage to the Integra Lightweight Concrete Flooring panels.

Inspection

- 14.5 The Technical Literature must be referred to during the inspection of Integra Lightweight Concrete Flooring System installations.

Health and Safety

- 15.1 Cutting of Integra Lightweight Concrete Flooring Panels must be carried out in well ventilated areas, and dust mask and eye protection must be worn.
- 15.2 When power tools are used for cutting, grinding or forming holes, health and safety measures must be observed because of the amount of dust generated.



Basis of Appraisal

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

Tests

- 16.1 Testing to determine the fire resistance rating (FRR) of the Integra Lightweight Concrete Flooring System has been completed by BRANZ in accordance with AS 1530.4.
- 16.2 Laboratory measurement of airborne sound insulation of the Integra Lightweight Concrete Flooring System has been carried out by the University of Auckland's Auckland Uniservices Ltd. The results of this testing have been assessed by Marshall Day Acoustics and found to be satisfactory.

Other Investigations

- 17.1 Structural and durability opinions have been provided by BRANZ technical experts.
- 17.2 Assessments on the fire resistance ratings of variations to systems tested to AS 1530.4 have been given by BRANZ fire experts.
- 17.3 Site inspections have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.
- 17.4 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 18.1 The manufacture of Integra Lightweight Concrete Flooring panels has been examined by an agent of BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 18.2 Resene Construction Systems is responsible for the quality of the product supplied.
- 18.3 Quality on-site is the responsibility of the building contractor.
- 18.4 Designers are responsible for incorporating the Integra Lightweight Concrete Flooring System into the design of their buildings.
- 18.5 Building owners are responsible for the maintenance of Integra Lightweight Concrete Flooring System in accordance with the instructions of Resene Construction Systems.

Sources of Information

- AS 1530.4:2014 Methods for fire tests on building materials, components and structures. Fire-resistance tests for elements of construction.
- AS 3566.1-2002 Self-drilling screws for the building and construction industries. General requirements and mechanical properties.
- AS/NZS 1170:2002 Structural design actions.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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26 April 2023

INTEGRA LIGHTWEIGHT
CONCRETE FLOORING SYSTEM



In the opinion of BRANZ, the **Integra Lightweight Concrete Flooring 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 **Rockcote Resene Ltd T/A Resene Construction Systems**, 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. **Rockcote Resene Ltd T/A Resene Construction Systems**:
 - 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 **Rockcote Resene Ltd T/A Resene Construction Systems**.
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 **Rockcote Resene Ltd T/A Resene Construction Systems** or any third party.

For BRANZ

Claire Falck
Acting Chief Executive

Date of Issue:
26 April 2023