



## BRANZ Appraised

Appraisal No. 964 [2017]

## ALLIED SUPERSLAB CONCRETE FLOORS

Appraisal No. 964 [2017]

Amended 11 December 2018



### BRANZ Appraisals

Technical Assessments of products for building and construction.

### Allied Concrete

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### BRANZ

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## Product

- 1.1 Allied Superslab are polystyrene or QPOD moulded plastic pod, reinforced concrete, slab-on-ground floors.

## Scope

- 2.1 Allied Superslab has been appraised for use as polystyrene or QPOD moulded plastic pod reinforced concrete, slab-on-ground floors for buildings within the following scope:
  - Timber framed buildings, up to two storeys high, within the scope of NZS 3604; and
  - With a maximum height of 10 m measured from the ground to the apex; and
  - Supported on "good ground" as defined for Acceptable Solutions and Verification Methods for NZBC Clause B1 Structure; and
  - With a maximum plan floor area of 300 m<sup>2</sup> and a maximum length of 30 m; and
  - Situated in Wind Zones up to and including Extra High.
- 2.2 Allied Superslab is not suitable for soils that are expansive or prone to liquefaction or differential settlement.

## Building Regulations

### New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Allied Superslab if designed, installed, used 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. Allied Superslab meets the requirements for loads arising from self-weight, imposed gravity loads, earthquake, wind, differential movements and time dependent effects including creep and shrinkage. [i.e. B1.3.3 (a), (b), (f), (h), (m) and (q)]. See Paragraphs 7.1 – 7.5.

**Clause B2 DURABILITY:** Performance B2.3.1 (a) not less than 50 years. Allied Superslab will meet this requirement. See Paragraphs 8.1 – 8.3.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.3. Allied Superslab meets this requirement. See Paragraphs 10.1 – 10.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Allied Superslab will meet this requirement.

## Technical Specification

### General

- 4.1 Allied Superslab are polystyrene or QPOD moulded plastic pod, reinforced concrete, slab-on-ground floors constructed using the following:

### Concrete

- 4.2 The concrete for use with Allied Superslab is either 20 MPa, 25 MPa or 30 MPa, Allied CSS or RSS mixes only. These mixes must be manufactured in accordance with NZS 3104 and in Allied Concrete plants audited by the New Zealand Ready-Mixed Concrete Association Audit Committee.

### Reinforcing Steel

- 4.3 Two types of reinforcing steel are used in Allied Superslab.
- Steel Mesh – Allied Superslab top reinforcement is SE62 steel mesh which must meet the requirements of Paragraph 14.0 in NZBC Verification Method B1/VM1.
  - Reinforcing Bar – HD12 grade 500, class E steel reinforcing bar.

### Polystyrene Pods

- 4.4 Polystyrene pods that have dimensions of 1,100 mm x 1,100 mm x 220 mm.

### Bar Chairs and Pod Spacers

- 4.5 Generic pod spacers are used to provide the correct spacing for the polystyrene pods and to support the reinforcing steel at the correct location at the bottom of the Allied Superslab ribs. Over the top of the polystyrene pods 40 mm bar chairs are used for positioning the steel mesh.

### QPODs

- 4.6 QPOD are manufactured from recycled plastic. They have two closed sides and two opened sides for clipping the pods together. Each pod is 550 mm x 550 mm x 220 mm and when four are clipped together form an 1,100 mm x 1,100 mm pod. They have a raised section in the center of each pod to hold the reinforcing steel mesh at the correct height. QPOD extensions and end caps are available. Beam spaces 100 mm, 300 mm, 400 mm are used to space pods to form ribs and footings, and to locate and support reinforcing steel.

### Damp-Proof Membrane

- 4.7 A damp-proof membrane in accordance with NZS 3604, Clauses 7.5.4 – 7.5.7.

## Packaging, Handling and Storage

- 5.1 The polystyrene pods or QPODs must be stored so that they are secure on site, and remain free from dirt. Protection from direct UV exposure should be provided. Installation of the pods must only be undertaken once the reinforcing steel and mesh is also ready to place, as this is needed to hold the pods in position and prevent them from being blown around.
- 5.2 Reinforcing steel should be stored supported up off the ground and kept clean.

## Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Allied Superslab. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, installation, use and maintenance contained within the Technical Literature and within the scope of this Appraisal must be followed.



## Design Information

### General

- 7.1 Allied Superslabs designed and constructed in accordance with the Technical Literature will meet the requirements of NZBC Clause B1 Structure. Allied Superslab floors are intended for single and two storey, timber framed buildings.
- 7.2 Allied Superslab must be supported on "good ground" as described in Paragraph 2.1.
- 7.3 Pipes and services are not permitted to run along or within ribs and footings, or penetrate up through ribs and footings without special detailing. Pipes are permitted to cross perpendicular through a rib or footing if they are located in the middle third depth of the waffle slab and are 50 mm in diameter or less.
- 7.4 Pipes penetrating concrete or under buildings must be in accordance with NZBC Verification Method G12/VM1, NZBC Acceptable Solution G12/AS1, NZBC Acceptable Solution G13/AS2 and NZBC Acceptable Solution G13/AS3, as applicable.
- 7.2 Shrinkage control joints in Allied Superslab floors must be made by saw cuts at maximum 6 metre centres. Saw cutting of Allied Superslab should be carried out as soon as the concrete surface can endure the saw cutting process, but not later than 24 hours after placement. It is recommended that shrinkage control joints extend from re-entrant corners.

### Durability

#### Serviceable Life

- 8.1 Allied Superslab is expected to have a serviceable life equal to that of standard concrete floors and slabs.
- 8.2 The concrete mix used to construct the Allied Superslabs will be determined by the NZS 3604 Exposure Zone. Allied Superslabs in Zones B and C are constructed using a 20 MPa concrete mix, and in Exposure Zone D a 25 MPa concrete mix.
- 8.3 Cover to steel must meet minimum values set out in NZS 3604, Paragraph 4.5.1.

### Maintenance

- 9.1 Conventional maintenance procedures may be used for floors and slabs constructed using Allied Superslab.

### External Moisture

- 10.1 A suitable damp-proof membrane in accordance with NZS 3604, Clauses 7.5.4 – 7.5.7 must be used under Allied Superslabs.
- 10.2 Ground clearances in accordance with NZS 3604, Figure 7.11 and NZBC E2/AS1, Paragraph 9.1.3.1 must be maintained throughout the life of the building.

### Energy Efficiency

- 11.1 Concrete slab-on-ground floors are deemed to achieve a construction R-value of 1.3, as is required for unheated floors for construction in accordance with NZS 4218. A higher R-value may be achieved by calculation or physical testing. The Technical Literature contains information on the R-value of Allied Superslab floors based on the area to perimeter ratio.
- 11.2 If the Allied Superslab floor is heated then it must achieve a construction R-value of 1.9.



## Installation Information

- 12.1 Installation of Allied Superslab must be in accordance with the Technical Literature. The main items for consideration are summarized here.
- Site preparation – a flat, level platform must be prepared. Any services that are to be placed under Allied Superslab must be done at this stage.
  - Damp-proof membrane (DPM) – the damp-proof membrane must be correctly placed on the prepared site.
  - Boxing – this must be of the correct height and levels, ensuring that boxing supports do not penetrate the DPM layer. All rebates for brickwork, garage door thresholds or joinery should be allowed for in the boxing.
  - Pod set out – the polystyrene pods or QPODs must be placed on the DPM in accordance with the set-out drawings ensuring the correct dimensions for all perimeter footings and internal ribs. Polystyrene pod layout and cutting should be arranged so that no pod is less than 200 mm wide.
  - If QPODs are used with extensions the overall dimension of each pod must not exceed 1,100 mm x 1,100 mm
  - Reinforcing – all steel reinforcing must be laid out in accordance with the set-out drawings. Correct covers must be ensured.
- 12.2 The concrete for Allied Superslab must be placed, finished and cured in accordance with the requirements of NZS 3109.

## Health and Safety

- 13.1 Wet concrete is a highly alkali substance and all necessary protective clothing should be worn when handling, placing and working with it.

## Basis of Appraisal

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

### BRANZ Investigations

- 14.1 The structural engineering for Allied Superslab Technical Literature was undertaken by a Chartered Professional Engineer. This has been reviewed by BRANZ structural engineers and found to be satisfactory.
- 14.2 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.
- 14.3 Inspections of Allied Superslab installations being placed and completed installations have been made by BRANZ.

### Quality

- 15.1 Allied Concrete Limited is responsible for the quality of the concrete supplied for Allied Superslab.
- 15.2 Quality on site is the responsibility of the building contractor.
- 15.3 Designers are responsible for incorporating the Allied Superslab into the design of buildings.
- 15.4 Building owners are responsible for the maintenance of the Allied Superslab in accordance with the instructions of Allied Concrete Limited.

### Sources of Information

- AS/NZS 4671: 2001 Steel reinforcing materials.
- NZS 3104: 2003 Specification for concrete production.
- NZS 3109: 1997 Concrete construction.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4218: 2009 Thermal insulation – Housing and small buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



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## Amendments

### Amendment 1, dated 11 December 2018

Appraisal has been amended to include the QPODs



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FLOORS



In the opinion of BRANZ, **Allied Superslab Concrete Floors** 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 **Allied Concrete Limited**, 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. **Allied Concrete Limited:**
  - 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 **Allied Concrete Limited**.
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 **Allied Concrete Limited** or any third party.

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For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

21 April 2017