BRANZ Appraised
Appraisal No. 964 [2017]

ALLIED SUPERSLAB CONCRETE FLOORS

Appraisal No. 964 (2017)

Amended 15 October 2021

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Allied Superslab floors are reinforced concrete slab-on-ground floors incorporating polystyrene or QPOD moulded plastic pods and may also include the QuickSet permanent insulated formwork system.

Scope

2.1 Allied Superslab has been appraised for use as reinforced concrete slab-on-ground floors incorporating polystyrene or QPOD moulded plastic pods for buildings within the following scope:

- timber-framed buildings, up to 2-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 floor maximum length of 30 m unless detailed with free joints in accordance with the Technical Literature; and,
- situated in NZS 3604 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 Concrete Floors, 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 Concrete Floors meet 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 7.1–7.6.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years. Allied Superslab Concrete Floors meet this requirement. See Paragraphs 8.1–8.4.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.3. Allied Superslab Concrete Floors meet this requirement. See Paragraphs 10.1–10.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Allied Superslab Concrete Floors meet this requirement.

Technical Specification

General

4.1 Allied Superslabs are reinforced concrete slab-on-ground floors incorporating polystyrene or QPOD moulded plastic pods, 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 Three types of reinforcing steel can be used in Allied Superslab:

- **Steel Mesh** – Allied Superslab top reinforcement is SE62 grade 500E steel mesh which must meet the requirements of Paragraph 14.0 in NZBC Verification Method B1/VM1.
- **Reinforcing Bar (steel mesh alternative)** - D10 grade 300, class E steel reinforcing bar at 300 mm centres each way.
- **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 or 1,100 mm x 1,100 mm x 300 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 reinforcement (steel mesh/loose bars) to achieve a minimum of 25 mm cover to the polystyrene pods.

QPODs

4.6 QPODs 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, they 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 spacers 100 mm, 300 mm and 400 mm are used to space pods to form ribs and footings, and to locate and support reinforcing steel.

QuickSet Components

4.7 The components of the Quickset include:

- **QuickSet Top Cap** - manufactureed from grade 6060 aluminium, these come in two sizes to give either an 85 mm or 100 mm slab topping.
- **QuickSet Back Rail** - manufactured from grade 6060 aluminium, these are supplied already clipped and secured to the top of the insulated form.
- **QuickSet Joiner** - manufactured from grade 6060 aluminium and powder coated, these are used to join shutter sections.
- **QuickSet Corner** - manufactured from grade 6060 aluminium and powder coated, these are used for joining shutter sections at corners.
- **QuickSet Form Receiver** - made from grade 6060 aluminium, used to lock the shutter at the base.
- **QuickSet Insulated Form** – grey PVC foam sheet with an R-value of 0.22 m^2K/W. Attached to the inner face is a 20 mm (for 90 mm wall framing and with an R-value of 0.63 m^2K/W) or 25 mm (for 140 mm wall framing and with an R-value of 0.78 m^2K/W) thick layer of XPS board.
- **QuickSet Stirrup Widget** – manufactured from 100% recycled NZ plastic, these slide into the QuickSet Back Rail to allow QuickSet Stirrups to be clipped to the QuickSet Insulated Form.

- **QuickSet Stirrup** – manufactured from 100% recycled NZ plastic, these hold reinforcing steel in place as well as internally bracing the form until concrete is placed.
- **QuickSet Insulated Base Member** – manufactured from H grade polystyrene or XPS, these locate the QuickSet Form Receivers and QuickSet Stirrup Locks. They are 2,400 mm long, 600 mm wide and 25 mm thick with an R-value of 0.69 m^2K/W.
- **QuickSet Stirrup Lock** – manufactured from the PVC foam sheet as used in the QuickSet Insulated Form, these secure the QuickSet Stirrups to the QuickSet Insulated Base Member.

Damp-Proof Membrane

4.8 A damp-proof membrane (DPM) in accordance with NZS 3604, Clauses 7.5.4–7.5.7.

Handling and Storage

5.1 The polystyrene pods, QPODs and/or QuickSet components must be stored so that they are secure on-site, and remain free from dirt. Protection from direct ultraviolet (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 2-storey, timber-framed buildings.

7.2 Allied Superslabs 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.

7.5 Shrinkage control joints in Allied Superslab floors must be made by saw cuts at maximum 6 m 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.

7.6 Where QuickSet permanent insulating formwork is used, hold downs as per the Technical Literature must be installed at the slab edges.

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.

8.4 The exposed QuickSet Insulated Form must be protected from UV with a maintained protective coating or covering, in accordance with the Technical Literature.

Maintenance

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

External Moisture

10.1 A suitable DPM 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 m^2K/W, 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. The QuickSet permanent insulating formwork will also aid in increasing the R-value of the flooring system.

11.2 If the Allied Superslab floor is heated then it must achieve a construction R-value of 1.9 m^2K/W.

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.
- DPM – the DPM 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. Where the QuickSet formwork is used, this must be installed in accordance with the installation instructions.
- 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 Allied Superslab into the design of buildings.

15.4 Building owners are responsible for the maintenance of 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 – Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment 1, dated 11 December 2018

This Appraisal has been amended to include the QPODs.

Amendment 2, dated 15 October 2021

This Appraisal has been amended to include the option to use QuickSet permanent insulating framework system and steel bars as an alternative to steel mesh reinforcement in the slab.

BRANZ

In the opinion of BRANZ, Allied Superslab Concrete Floors 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 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.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
21 April 2017