



## BRANZ Appraised

Appraisal No. 781 [2012]

## SIKA CAR PARK DECK SYSTEM

Appraisal No. 781 [2012]



### BRANZ Appraisals

Technical Assessments of products for building and construction.



BUILDING TRUST

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BRANZ

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### Product

- 1.1 Sika Car Park Deck System is a flexible polyurethane car park deck coating system providing a crack bridging, waterproof wear surface for exposed and protected car parking and pedestrian decks.

### Scope

- 2.1 Sika Car Park Deck System has been appraised as a car deck waterproofing membrane and trafficable surface on buildings within the following scope:
  - with building structures the subject of specific design; and,
  - with car deck structures of continuous suspended insitu reinforced concrete slabs complying with NZS 3101 and AS/NZS 1170.
- 2.2 Sika Car Park Deck System has also been be appraised as a car deck trafficable surface on buildings within the following scope:
  - with building structures the subject of specific design; and,
  - with car deck structures of reinforced concrete 'slab-on-ground' not subject to hydrostatic pressure and complying with NZS 3101 and AS/NZS 1170.
- 2.3 The design and construction of the substrate, movement and control joints is specific to each building, and therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.
- 2.4 The Sika Car deck System must be installed in accordance with the Sika [NZ] Ltd Technical Literature and by Sika [NZ] Ltd trained installers.

## Building Regulations

### New Zealand Building Code (NZBC)

**3.1 In the opinion of BRANZ, Sika Car Park Deck 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 B2 DURABILITY:** Performance B2.3.1 [b] 15 years. Sika Car Park Deck System meets this requirement. See Paragraph 10.1.

**Clause D1 ACCESS ROUTES:** Performance D1.3.3 [d] Sika Car Park Deck System meets this requirement. See Paragraph 7.5.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1, E2.3.2 and E2.3.6. Car Parking decks incorporating Sika Car Park Deck System meet these requirements. See Paragraphs 13.1 – 13.3.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Sika Car Park Deck System meets this requirement and will not present a health hazard to people.

**3.2 This is an Appraisal of an Alternative Solution in terms of New Zealand Building Code compliance.**

## Technical Specification

**4.1 Materials supplied by Sika [NZ] Ltd are as follows:**

- **Sikafloor 156** – is a low viscosity, solvent free two part epoxy resin primer. It is supplied as Part A 12 kg clear liquid and Part B 4 kg brown liquid.
- **Sikafloor 161** – is a two part, low viscosity epoxy resin primer. It is supplied as Part A 14.35 kg brown liquid and Part B 3.81 kg clear liquid.
- **Sika Aggregate 501** – a graded aggregate used to provide a heavy duty, non skid surface. It is supplied in 25 kg bags and graded between 0.1 – 1.2 mm.
- **Sikafloor 350N** – is a two part, solvent free, highly elastic polyurethane resin. It is supplied as a Part A – 9 kg and Part B – 21 kg and is coloured pebble grey.
- **Sikafloor 359N** – is a two part, tough-elastic, coloured, non-yellowing, crack bridging polyurethane seal coat. It is supplied as a Part A – 25.35 kg and a Part B – 7.15 kg and it is available in a range of colours.
- **Sikafloor 375** – is a two part, solvent free, low viscosity, tough elastic, crack-bridging polyurethane resin. It is supplied as a Part A – 24 kg and as a Part B – 6 kg and is available in a range of colours.
- **Sikafloor 400N** – is a one part, highly elastic, solvent containing, UV resistant, coloured, moisture curing polyurethane resin coating. It is supplied in 6 or 18 kg units and is available in a range of colours.

## Handling and Storage

**5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The materials in the original unopened packaging have a shelf life of 24 months from date of manufacture. Once opened, the materials must be used immediately.**

## Technical Literature

**6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Sika Car Park Deck System. The Technical Literature must be read in conjunction with this Appraisal. 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 Sika Car Park Deck System is for use on car parking decks where an impervious, trafficable waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 The system is designed for car traffic but regular checks must be made to ensure no physical damage has occurred i.e. chemical attack, tyre burnout marks etc.
- 7.3 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to BRANZ publication "Good Practice Guide to Membrane Roofing".
- 7.4 Movement and control joints may be required depending on the shape and size of the deck.
- 7.5 Sika Car Park Deck System has been tested and has a slip resistance of greater than 0.6 $\mu$  which exceeds the requirement of a minimum slip resistance when wet of 0.4 $\mu$  as specified in NZBC D1/AS1, Paragraph 2.1.1.

### Structure

- 8.1 Sika Car Park Deck System is suitable for use in areas subject to maximum wind pressures of 6 kPa ultimate limit state.

### Substrates

#### Concrete

- 9.1 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101.

### Durability

#### Serviceable Life

- 10.1 Sika Car Park Deck System, when subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 15 years provided it is designed, used, installed and maintained in accordance with this Appraisal and the Technical Literature.

### Maintenance

- 11.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the aggregate topcoat system remains intact. Regular checks must be made of the system to ensure it is sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by recoating with the topcoat system in accordance with the Sika [NZ] Ltd Technical Literature and the manufacturer's recommendations.
- 11.2 Drainage outlets must be maintained to operate effectively and the finish must be kept clean. Cleaning materials that may affect polyurethane based membranes must not be used.

### Outbreak of Fire

- 12.1 The system must be protected from heat sources such as flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS 1 – C/AS 6, Paragraph 7.5.9 for the protection of combustible materials.

### External Moisture

- 13.1 Car parking decks must be designed and constructed to shed precipitated moisture. They must also take account of snowfalls in snow prone areas. A means of meeting code compliance with NZBC Clause E2.3.1 is given by the Technical Literature.
- 13.2 When installed in accordance with this Appraisal and the Technical Literature, Sika Car Park Deck System will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The system is impervious to water and will give a weathertight car deck.

- 13.3 Sika Car Park Deck System is impermeable; therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with NZBC Clause E2.3.6.
- 13.4 The minimum fall to car parking decks must be specified by the designer.
- 13.5 Car parking deck falls must be built into the substrate.
- 13.6 Allowance for deflection and settlement of the substrate must be made in the design of the car deck to ensure falls are maintained and no ponding of water can occur.
- 13.7 Drainage flanges must be used for any outlet and must be fitted with a grate or cage to reduce potential sources of blockages. An overflow must be provided where the car parking deck does not drain to an external gutter or spouting.
- 13.8 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by blockage of car parking deck drainage.
- 13.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

## Installation Information

### Installation Skill Level Requirement

- 14.1 Installation of the system must be completed by Sika [NZ] Ltd trained installers that have experience in the application of waterproofing systems and understand waterproofing principles.
- 14.2 Installation of substrates must be completed by tradespersons with an understanding of car parking deck construction, in accordance with instructions given within the Sika [NZ] Ltd Technical Literature and this Appraisal.

### Preparation of Substrates

- 15.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents. All surface defects must be filled to achieve an even and uniform surface.
- 15.2 The concrete must be cured for a minimum of 28 days or reached a minimum of 25 MPa.
- 15.3 Substrates must be primed with Sikafloor 156 or Sikafloor 161 as indicated in the Technical Literature and allowed to cure before the system is installed.

### Membrane Installation

- 16.1 Installation must not be undertaken where the substrate surface temperature is below 5°C or above 30°C.
- 16.2 All products that make up the Sika Car Park Deck System must be mixed thoroughly before applying.
- 16.3 The system should be applied as a basecoat at the rates set out in the Technical Literature (a second coat may be required if pinholing is evident) and a topcoat with aggregate broadcast in the wet coating followed when cured [12 hours] with a final layer of UV protective topcoat of either Sikafloor 359N or 400N.
- 16.4 Application should be made by trowel, roller and brush [long bristle].
- 16.5 It is strongly recommended that the membrane is protected with temporary covers until it is fully cured in case of mechanical damage or rain wetting.
- 16.6 Clean up may be undertaken with Sika Thinner C.

## Inspections

- 17.1 Critical areas of inspection for waterproofing systems are:
- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
  - Moisture content of the substrate prior to the application of the system.
  - Acceptance of the substrate by the system installer prior to application of the system.
  - Installation of the system to the manufacturer's instructions, particularly installation to the correct thickness, use of reinforcement and a slip resistant finish.
  - System curing and integrity prior to the installation of topcoat, including protection from moisture, frost and mechanical damage during curing.

## Health and Safety

- 18.1 Safe use and handling procedures for the system are provided in the Technical Literature. The products must be used in conjunction with the relevant Materials Safety Data Sheet for the system.

## Basis of Appraisal

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

### Tests

- 19.1 The following testing of Sika Car Park Deck System has been undertaken by various organisations:
- Adhesion strength, thermal shock in the presence of salt, by-pass tear, tear opening, abrasion resistance, impact strength, water vapour permeability, capillary water uptake, water absorption, skid resistance, crack bridging, frost/thaw, chemical resistance and accelerated weathering.
- The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

### Other Investigations

- 20.1 An assessment was made of the durability of the Sika Car Park Deck System by BRANZ technical experts.
- 20.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 20.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

### Quality

- 21.1 The manufacture of the membrane 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.
- 21.2 The quality of supply of the membrane system materials to the market is the responsibility of Sika [NZ] Ltd.
- 21.3 Quality on site is the responsibility of the Sika [NZ] Ltd trained installers.
- 21.4 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Sika [NZ] Ltd and this Appraisal.
- 21.5 Building owners are responsible for the maintenance of the topcoat system in accordance with the instructions of Sika [NZ] Ltd.

### Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- NZS 3101: 1995 The design of concrete structures.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition [Amendment 12, 10 October 2011].
- The Building Regulations 1992.
- Good Practice Guide, Membrane Roofing, BRANZ, October 2003.



In the opinion of BRANZ, **Sika Car Park Deck 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 **Sika [NZ] 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. **Sika [NZ] 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 **Sika [NZ] 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 **Sika [NZ] Ltd** or any third party.

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**For BRANZ**



**Pieter Burghout**

Chief Executive

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07 December 2012