



BRANZ Appraised

Appraisal No. 1084 [2019]

REIDBAR™ REINFORCING BAR CONNECTION SYSTEM

Appraisal No. 1084 [2019]

Amended 10 September 2021



BRANZ Appraisals

Technical Assessments of products for building and construction.



Construction Systems

ITW New Zealand
[trading as Reid
Construction Systems]

23-29 Poland Road
Glenfield
Auckland 0627

Tel: 0800 882 212

Email: info@ramsetreid.co.nz

Web: www.reidconstructionssystem.com



BRANZ

BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz



Product

- 1.1 The ReidBar™ Reinforcing Bar Connection System incorporates different solutions for connecting ReidBar™ reinforcing bars within concrete elements. The system includes ReidBar™ Grout Sleeves, ReidBar™ Threaded Inserts, ReidBar™ Flange Nuts, ReidBar™ Couplers, ReidBar™ continuously threaded reinforcement bars, and Ramset grout and epoxy filler to make the connections.

Scope

- 2.1 The ReidBar™ Reinforcing Bar Connection System has been appraised for use as a reinforcement bar mechanical connectors and anchors as specified in NZS 3101 for use with in-situ and precast concrete structural elements.
- 2.2 The following conditions and limitations apply to the ReidBar™ Reinforcing Bar Connection System:
 - the reinforcing bars used in the ReidBar™ Reinforcing Bar Connection System must be ReidBar™ reinforcing bars; and,
 - the final orientation of the ReidBar™ Grout Sleeve connectors in-service shall be vertical; and,
 - the system must not be used where the in-service temperature may drop below -5°C ; and,
 - the system must not be used when it is subjected to high cycle fatigue;
 - concrete cover to the connectors must meet the minimum requirements of NZS 3101.1, Clause 3.11.3 and Table 3.6 as appropriate; and,
 - installations must be subject to specific engineering design by a Chartered Professional Engineer and installed under the supervision of a Chartered Professional Engineer.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, the ReidBar™ Reinforcing Bar Connection 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 B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.4. The ReidBar™ Reinforcing Bar Connection System meets the requirements for loads arising from self-weight, imposed gravity loads arising from use, earth pressure, water and other liquids, earthquake, snow, wind, impact, and time dependent effects [i.e. B1.3.3. [a], [b], [d], [e], [f], [g], [h], [j], and [q]]. See Paragraphs 8.1-8.5.

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years. The ReidBar™ Reinforcing Bar Connection System meets this requirement. See Paragraphs 9.1-9.4.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The ReidBar™ Reinforcing Bar Connection System meets this requirement.



Technical Specification

4.1 The components of the ReidBar™ Reinforcing Bar Connection System supplied by Reid Construction Systems are:

- **ReidBar™ Grout Sleeves** – are reinforcement bar mechanical connectors for precast concrete building elements such as panels and columns, and is used to make connections to the building structure where the connectors are in a vertical orientation. These are available in sizes suitable for splicing the ReidBar™ reinforcing bar listed below. The ReidBar™ Grout Sleeves are manufactured from Grade 600/3 Spheroidal Graphite Cast Iron, manufactured using a proprietary casting process. The ReidBar™ Grout Sleeves model numbers are:

• RB12GS • RBA16GS • RB20GS • RB25GS • RB32GS

The ReidBar™ Grout Sleeves are marked with the model number and manufacturing batch number.

- **ReidBar™ Threaded Inserts** - are reinforcement bar mechanical anchors for precast or in-situ concrete structural building elements. The anchors can be used in vertical or horizontal orientation. These are available in sizes suitable for anchoring ReidBar™ reinforcing bar listed below. The ReidBar™ Threaded Inserts are manufactured either from Grade 600/3 Spheroidal Graphite Cast Iron using a proprietary casting process, or from mild steel. Both material options are available with and without a galvanised coating. The ReidBar™ Threaded Inserts model numbers are:

Ductile Cast Iron Threaded Inserts:

• RB12TI • RBA16TI • RB20TI
• RB12TIG • RBA16TIG • RB20TIG

Steel Threaded Inserts:

• RB12TIS • RBA16TIS • RB20TIS
• RB12TISG • RBA16TISG • RB20TISG

The ReidBar™ Threaded Inserts are marked with the model number and manufacturing batch number.

- **ReidBar™ Flange Nuts** - are reinforcement bar mechanical anchors for precast or in-situ concrete structural building elements. The anchors can be used in vertical or horizontal orientation. These are available in sizes suitable for anchoring ReidBar™ reinforcing bar listed below. The ReidBar™ Flange Nuts are manufactured from mild steel and are available with and without galvanised coating. The ReidBar™ Flange Nuts model numbers are:

• RB12FNS • RBA16FNS • RB20FNS • RB25FNS • RB32FNS
• RB12FN SG • RBA16FN SG • RB20FN SG • RB25FN SG • RB32FN SG

The ReidBar™ Flange Nuts are marked with the model number and manufacturing batch number.

- **ReidBar™ Threaded Couplers** - are reinforcement bar mechanical couplers for precast or in-situ concrete structural building elements. The anchors can be used in vertical or horizontal orientation. These are available in sizes suitable for coupling ReidBar™ reinforcing bar listed below. The ReidBar™ Threaded Couplers are manufactured from mild steel and are available with and without galvanised coating. The ReidBar™ Threaded Couplers model numbers are:

• RB12CS • RBA16CS • RB20CS • RB25CS • RB32CS
• RB12CSG • RBA16CSG • RB20CSG • RB25CSG • RB32CSG

The ReidBar™ Threaded Couplers are marked with the model number and manufacturing batch number.

- **ReidBar™ reinforcing bar** – are available in 12 mm, 16 mm, 20 mm, 25 mm and 32 mm diameters. The ReidBar™ reinforcing bar is a continuously threaded, hot-rolled Grade 500E reinforcing bar that is manufactured in New Zealand to meet the requirements of AS/NZS 4671. The deformed surface of the ReidBar™ gives the continuous thread.



- **Ramset™ POZIFLO™ HS** – a cementitious grout, supplied in 20 kg bags with a shelf life of 8 months after the date of manufacture.
- **Ramset™ Epcon™ C8 Xtrem™ Filler** – a two-part epoxy which is used in the threads of the grout sleeve. It is supplied in 450 ml two-component tubes with a shelf life of two years.

Handling and Storage

- 5.1 All components of the ReidBar™ Reinforcing Bar Connection System must be kept clean and dry before installation.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the ReidBar™ Reinforcing Bar Connection 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 The ReidBar™ Reinforcing Bar Connection System is a reinforcement bar mechanical connectors and anchors for precast concrete building elements such as panels, columns and foundations.
- 7.2 The ReidBar™ Reinforcing Bar Connection System shall be subject to specific engineering design by a Chartered Professional Engineer in accordance with the requirements of NZS 3101.

ReidBar™ Grout Sleeves

- 7.3 ReidBar™ Grout Sleeves are used to connect precast concrete elements. The connections are made between horizontal precast element surfaces, with the sleeves and ReidBar™ in the vertical orientation. The ReidBar™ Grout Sleeves and ReidBar™ are cast into the individual precast concrete elements. The ReidBar™ connections are made by using Ramset POZIFLO™ Grout HS injected into the sleeves. The completed connection will transfer tension and compression forces between precast concrete structural elements.

ReidBar™ Threaded Inserts

- 7.4 ReidBar™ Threaded Inserts are used in precast or in-situ concrete to connect ReidBar™ to these concrete elements. Ramset™ Epcon™ C8 Xtrem™ Filler must be used to support the mechanical connection between the insert and the ReidBar™.

ReidBar™ Flange Nuts

- 7.5 ReidBar™ Flange Nuts are used in precast or in-situ concrete to terminate and anchor ReidBar™ within the concrete building element. Ramset™ Epcon™ C8 Xtrem™ Filler must be used to support the mechanical connection between the ReidBar™ Flange Nuts and the ReidBar™.

ReidBar™ Threaded Couplers

- 7.6 ReidBar™ Threaded Couplers are used in precast or in-situ concrete to couple two ReidBar™ together. Ramset™ Epcon™ C8 Xtrem™ Filler must be used to support the mechanical connection between the ReidBar™ Threaded Couplers and the ReidBar™.



Structural Design

- 8.1 The ReidBar™ Reinforcing Bar Connection System meets the performance requirements for use as mechanical connections, in particular, structures designed for earthquake effects as defined by NZS 3101.1.
- 8.2 ReidBar™ Reinforcing Bar Connection System connectors have been tested and assessed against the requirements of NZS 3101, Clause 8.9.1.3 [a]. Only the ReidBar™ Flange Nuts made from mild steel and ReidBar™ Threaded Couplers made from mild steel have been tested against NZS 3101, Clause 8.9.1.3 [b], and can be used where high cycle fatigue is a design consideration. All other components of the ReidBar™ Reinforcing Bar Connection System have not been assessed against NZS 3101, Clause 8.9.1.3 [b], and cannot be used where high cycle fatigue is a design consideration.
- 8.3 The ReidBar™ Reinforcing Bar Connection System meets the stiffness requirement of NZS 3101.1, Clause 8.9.1.3 and does not need to be staggered within the member, and may all be placed at the one location.

Durability

- 9.1 The ReidBar™ Reinforcing Bar Connection System will meet the performance provisions of NZBC B2.3.1 [a] not less than 50 years, provided that the concrete cover to the connectors meets the minimum requirements of NZS 3101.1, Clause 3.11.3 and Table 3.6 as appropriate.
- 9.2 Designers must consider the larger diameter of the ReidBar™ Reinforcing Bar Connection System when designing the members for the purposes of concrete cover to the elements.
- 9.3 Joints between precast concrete panels exposed to weather or moisture conditions must be sealed and maintained so that moisture does not reach the connectors.

Maintenance

- 9.4 The ReidBar™ Reinforcing Bar Connection System will not normally require maintenance. However, if damage occurs to the cover concrete then repairs must be carried out to ensure the integrity of the structure.

Installation Information

Installation Skill Level Requirement

- 10.1 Installation of the ReidBar™ Reinforcing Bar Connection System must be carried out by precast concrete manufacturers or building contractors under the guidance of a Chartered Professional Engineer.

General

- 11.1 The ReidBar™ Reinforcing Bar Connection System must be installed in accordance with the Technical Literature, the technical information provided by Reid Construction Systems and the requirements of NZS 3101.
- 11.2 The reinforcing bar should be free of any excessive dirt, concrete, slurry, rust or other contaminant that may affect the performance of the ReidBar™ Reinforcing Bar Connection System.
- 11.3 The ReidBar™ threaded reinforcement must be tightened to the recommended torque and adhered using Ramset™ Epcon™ C8 Xtrem™ Filler into the ReidBar™ Grout Sleeves, ReidBar™ Threaded Inserts, ReidBar™ Flange Nuts or ReidBar™ Threaded Couplers following the instructions in the Technical Literature. ReidBar™ Grout Sleeves and ReidBar™ starter bars must be accurately aligned before concreting the individual precast elements. In installation, ReidBar™ starter bars must project the ReidBar™ Grout Sleeve embedment length plus the designed space between the individual precast concrete elements.

ReidBar™ Grout Sleeve

- 11.4 The grouting of the ReidBar™ Grout Sleeves with Ramset™ POZIFLO™ Grout HS must be carried following the instructions in the Technical Literature.



Basis of Appraisal

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

Investigations

- 12.1 Assessments of the durability and structural aspects of the ReidBar™ Reinforcing Bar Connection System have been made by BRANZ technical experts.
- 12.2 The manufacturer's Technical Literature and installation instructions have been reviewed by BRANZ and found to be satisfactory.
- 12.3 Site inspections have been undertaken by BRANZ to assess the practicability of installation.

Quality

- 13.1 The manufacture of the components of the ReidBar™ Reinforcing Bar Connection System 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.
- 13.2 The quality of the ReidBar™ Reinforcing Bar Connection System supplied by Reid Construction Systems is the responsibility of Reid Construction Systems.
- 13.3 The ReidBar™ is covered by ACRS accreditation, Certification No. 40503.
- 13.4 Chartered Professional Engineers specialising in structural design are responsible for incorporating the ReidBar™ Reinforcing Bar Connection System within the design of the structure.
- 13.5 Building contractors are responsible for the quality of the installation of the ReidBar™ Reinforcing Bar Connection System in accordance with the instructions of Reid Construction Systems.
- 13.6 Building owners are responsible for the maintenance of the structure such that suitable concrete cover to the ReidBar™ Reinforcing Bar Connection System is maintained.

Sources of Information

- AS/NZS 4671:2019 Steel for the reinforcement of concrete.
- NZS 3101.1: 2006 A3 Concrete structures standard Part 1 – The design of concrete structures.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No.1, dated 02 October 2020.

This Appraisal has been amended to update the scope, the structural design information and other minor editorial changes.

Amendment No.2, dated 10 September 2021.

This Appraisal has been amended to introduce the ReidBar™ Reinforcing Bar Connection System by including ReidBar™ Threaded Inserts, ReidBar™ Flange Nuts, ReidBar™ Couplers to the ReidBar™ Grout Sleeve System.



BRANZ Appraised
Appraisal No. 1084 [2019]

BRANZ Appraisal
Appraisal No. 1084 [2019]
13 December 2019

REIDBAR™ REINFORCING BAR
CONNECTION SYSTEM



In the opinion of BRANZ, the **ReidBar™ Grout Sleeve 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 **ITW New Zealand [trading as Reid 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. **ITW New Zealand [trading as Reid 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 **ITW New Zealand [trading as Reid 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 **ITW New Zealand [trading as Reid Construction Systems]** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

13 December 2019