

## ReidBar™ Grout Sleeve – NZS3101:2006 Compliance

This product update presents testing on the ReidBar™ Grout Sleeve System performance against the requirements of NZS3101:2006 Amendment 3.

The ReidBar™ Grout Sleeve System is manufactured from Spheroidal Graphite Ductile Cast Iron. This is a summary of test results for performance-based design considerations against the *New Zealand Building Code*. The ReidBar™ Grout Sleeve System shall be used as a reinforcement splice when installed as per the ReidBar™ Grout Sleeve System installation instructions using the following components:

- ReidBar™ Grout Sleeve (Grade 600/3 Spheroidal Graphite Ductile Cast Iron).
- ReidBar™ reinforcing bar (Grade 500E), diameters 12mm, 16mm, 20mm, 25mm and 32mm.
- Ramset™ POZIFLO Grout HS
- Ramset™ Epcon™ C8, EXTREM™ Filler.

### Summary of Performance Areas

- Upper bound breaking strength
- Mechanical Anchorage
- Tension or compression at a Stress of 0.7fy
- Low Cycle (large strains) fatigue performance
- Brittle Fracture resistance



### Summary

#### 1. Mode of Failure of ReidBar Ductile Cast Iron Components – cl 8.6.11.1,2 & 3.

- Upper bound breaking strength of bar, Ductile yielding of the bar & No thread stripping.

Ramsetreid Product	Product	Test Report Reference	Compliance with NZS 3101-1:2006 A3 Clause 8.6.11.1,2&3
12mm ReidBar™ Grout Sleeve	RB12GS	ITW QA LAB - Batch ID ZCH	✓
16mm ReidBar™ Grout Sleeve	RBA16GS	ITW QA LAB - Rep No.16298	✓
20mm ReidBar™ Grout Sleeve	RB20GS	ITW QA LAB - Rep No.16183	✓
25mm ReidBar™ Grout Sleeve	RB25GS	ITW QA LAB - Rep No.16238	✓
32mm ReidBar™ Grout Sleeve	RB32GS	ITW QA LAB - Rep No.16463	✓

**2. Elongation & Low Cycle Fatigue Compliance - cl 8.7.5.2 (b) & cl 8.9.1.3 (a)**

- Max. elongation requirement at 0.7fy and low cycle loading to ISO 15835-2:2009 cl 5.6

Ramsetreid Product	Product	Test Report Reference	Compliance with NZS 3101-1:2006 A3 Clause 8.7.5.2 (b) & Clause 8.9.1.3 (a)
12mm ReidBar™ Grout Sleeve	RB12GS	WSP - OPUS 4-18/532 A1/30,31 & 32	✓
20mm ReidBar™ Grout Sleeve	RB20GS	WSP - OPUS 4-18/532 A1/35,36 & 37	✓
32mm ReidBar™ Grout Sleeve	RB32GS	WSP - OPUS 4-18/532 A1/50,51 & 52	✓



Figure 1. Sample preparation for Grout Sleeves – ReidBar™ to thread connection



Figure 2. Sample preparation for Grout Sleeves – ReidBar™ to grout connection



Figure 3. Tensile testing of Grout Sleeves – MoF ductile yielding

### 3. Brittle fracture resistance Compliance - cl 8.6.11.4

- Resistance to brittle fracture of ReidBar™ Ductile Cast Iron components

Ramsetreid Product	Product	Test Report Reference	Compliance with NZS 3101-1:2006 A3 Clause 8.6.11.4
ReidBar™ Components 600/3 Grade, Spheroidal Graphite Ductile Cast Iron Systems.	All	Static & Dynamic Test report 25/05/18 UoA Charles Clifton letter - 29/08/18	

#### Conclusion drawn from University of Auckland Testing

- Findings from impact tensile testing at 0°C and below

University of Auckland testing shows that ReidBar™ systems manufactured from 600/3 grade, spheroidal graphite ductile cast iron is appropriate for use in locations where the in-service temperature is above -5deg.

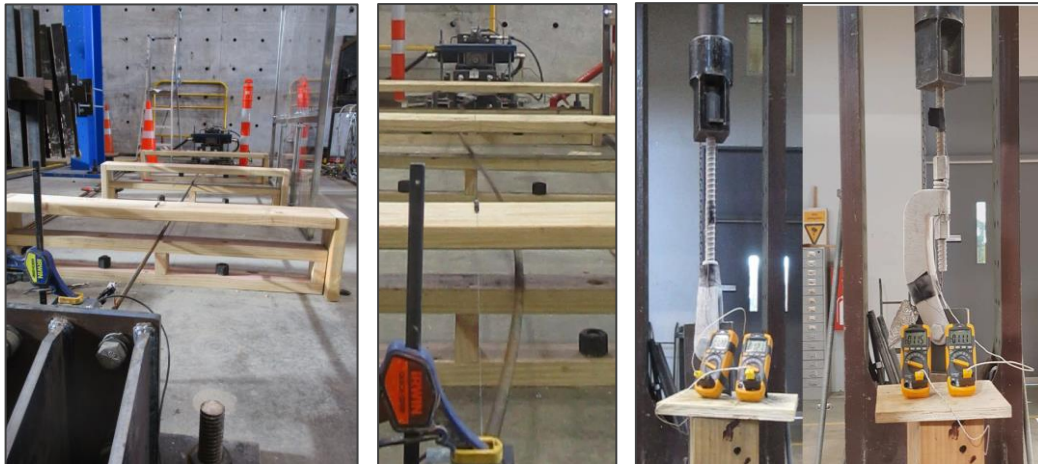


Figure 4. – impact tensile loading of Ductile Cast Iron ReidBar™ Systems, University of Auckland.

### Conclusion

This update shows that the ReidBar™ Grout Sleeve Systems manufactured from spheroidal graphite ductile cast iron meets the performance requirements of NZS3101:2006 Amendment 3 listed within this document. Furthermore, it has been demonstrated that the Ductile Cast Iron Material has been tested for resistance to brittle fracture in an onerous open environment test, subjecting the material to magnitudes of cyclic movement that would not occur when the component is cast into concrete.

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