



BRANZ Appraised

Appraisal No.759 [2011]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 759 (2011)**

**LENTON® LOCK
REINFORCING BAR
CONNECTORS**

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Product

1.1 LENTON® LOCK reinforcing bar connectors are a range of mechanical couplers for splicing deformed steel reinforcing bars. They are used for transferring tension and compression forces in reinforced concrete structural members.



Scope

2.1 LENTON® LOCK reinforcing bar connectors have been appraised for use as mechanical couplers for grade 500E micro-alloyed, deformed reinforcing steel for structural reinforced concrete to meet the requirements of NZS 3101:Part 1.

2.2 LENTON® LOCK reinforcing bar connectors have not been assessed for situations where fatigue may develop.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the LENTON® LOCK reinforcing bar connectors, 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. LENTON® LOCK reinforcing bar connectors meet the requirements for loads described in B1.3.3 as relevant. See Paragraph 8.1.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years. LENTON® LOCK reinforcing bar connectors meet this requirement. See Paragraph 10.1 – 10.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. LENTON® LOCK reinforcing bar connectors meet this requirement and will not present a health hazard to people.

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

Technical Specification

4.1 The LENTON® LOCK reinforcing bar connectors supplied by ERICO are:

- LL16B1
- LL20B1
- LL25B1
- LL32B1
- LL40B1.

Impact Gun Tool

4.2 Compressed air powered impact guns are used to install LENTON® LOCK reinforcing bar connectors. Specifications for suitable devices are available from ERICO. These tools are outside the scope of this Appraisal.

Handling and Storage

5.1 LENTON® LOCK reinforcing bar connectors 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 LENTON® LOCK reinforcing bar connectors. 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 LENTON® LOCK reinforcing bar connectors are a range of mechanical connectors that allow the splicing of reinforcing steel for uses such as installing precast elements.

Structure

8.1 LENTON® LOCK reinforcing bar connectors meet the requirements for use as mechanical splices in particular for structures designed for earthquake effects as defined by NZS 3101:Part 1.

Structural Design

9.1 No portion of the LENTON® LOCK reinforcing bar connectors shall be located within the beam/column joint region, or within one effective depth of the member from the critical section of a potential plastic hinge in a beam where stress reversals in spliced bars could occur.

9.2 In a column framing top and bottom into beams or other moment resisting elements, the centre of the LENTON® LOCK reinforcing bar connectors must be within the middle quarter of the storey height of the column unless it can be shown that a high level of protection is provided against the formation of plastic hinge regions, as defined in Appendix D of NZS 3101:Part 1.

9.3 LENTON® LOCK reinforcing bar connectors meet the stiffness requirement of NZS 3101:Part 1 Clause 8.9.1.3 and so do not need to be staggered along the member but may all be placed at the one location.

9.4 LENTON® LOCK reinforcing bar connectors have not been assessed for use in situations where fatigue may develop.

Durability

10.1 LENTON® LOCK reinforcing bar connectors 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:Part 1 Clause 3.11.3 and Table 3.6 as appropriate.

10.2 Designers must consider the larger diameter of the LENTON® LOCK reinforcing bar connectors when designing the members for the purposes of concrete cover to the elements.

Maintenance

10.3 LENTON® LOCK reinforcing bar connectors 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

11.1 Installation of LENTON® LOCK reinforcing bar connectors can be carried out by any competent building contractor.

General

12.1 LENTON® LOCK reinforcing bar connectors must be installed in accordance with the Technical Literature.

12.2 The reinforcing bar should be free of any excessive dirt, concrete, slurry, rust or other contaminant that may affect the performance of the LENTON® LOCK reinforcing bar connector.

12.3 The LENTON® LOCK reinforcing bar connector must be slid onto the reinforcing bar until the stop pin is reached.

12.4 If it is necessary to make a closure pour splice, that is a splice between two fixed members, then the Technical Literature must be followed.

12.5 If a bolt head does not shear during tightening the installer must verify that the appropriate level of torque was met in accordance with the Technical Literature. If a minimum cover must be maintained then the head can be cut off after the proper torque has been applied.

Basis of Appraisal

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

Tests

13.1 Testing of the LENTON® LOCK reinforcing bar connectors had been carried out by Opus Central Laboratories, and the results reviewed by BRANZ as complying with the requirements of NZS 3101:Part 1.

Quality

14.1 The manufacture of the LENTON® LOCK reinforcing bar connectors 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.

14.2 LENTON® LOCK reinforcing bar connectors are the subject of International Association of Plumbing and Mechanical Officials Evaluation Report Number O129.

14.3 The quality of the LENTON® LOCK reinforcing bar connectors supplied by ERICO is the responsibility of ERICO.

14.4 Structural engineers are responsible for incorporating the LENTON® LOCK reinforcing bar connectors within the design of the structure.

14.5 Building contractors are responsible for the quality of the installation of the LENTON® LOCK reinforcing bar connectors in accordance with the instructions of ERICO.

14.6 Building owners are responsible for the maintenance of the structure such that suitable concrete cover to the LENTON® LOCK reinforcing bar connectors is maintained.

Sources of Information

- NZS 3101:Part 1:2006 Concrete structures standard Part 1 – The design of concrete structures.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition September 2010.
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, LENTON® LOCK Reinforcing Bar Connectors 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 ERICO Products Australia Pty 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;
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 - d) is copyright of BRANZ.
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For BRANZ

P Burghout
Chief Executive

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