



BRANZ Appraised
Appraisal No. 570 [2014]

THRU-BRACKETS FOR TIMBER FRAMING

Appraisal No. 570 [2014]

This Appraisal replaces Appraisal
No. 570 [2007]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Brace-It Ltd

PO Box 558
Whangaparaoa
Auckland, 0943
Tel: 09 424 0916
Fax: 09 424 0475
web: www.brace-it.com
email: info@brace-it.com



BRANZ

1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
branz.co.nz



Product

- 1.1 THRU-brackets are a range of formed galvanised steel brackets for reinforcing Radiata Pine solid timber and LVL floor joists [THRU-JOIST], studs [THRU-STUD] and top plates [THRU-TOP PLATE] to allow holes to be made for services.

Scope

- 2.1 THRU-brackets have been appraised for use as reinforcement to timber floor joists, studs and top plates at holes made for services. They are for use in non-specific design situations where floor joists, studs and top plates are specified up to and including SG10 and LVL10 within NZS 3604, or Radiata Pine up to and including Stress Grade F8 within AS 1684.2.
- 2.2 THRU-TOP PLATE brackets have been appraised for use in Extra High wind zones in New Zealand and up to and including non-cyclonic N3 wind classifications in Australia.
- 2.3 THRU-brackets are for use in internal, dry, protected environments.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 **In the opinion of BRANZ, THRU-brackets, 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. THRU-brackets meet the requirements for loads arising from self-weight, imposed gravity loads arising from use, snow, wind and creep [i.e. B1.3.3 [a], [b] [g], [h] and [q]]. See Paragraphs 8.1 - 8.11.

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years. THRU-brackets meets this requirements. See Paragraph 9.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. THRU-brackets meet 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.

National Construction Code Series (NCC 2014) Building Code of Australia (BCA)

4.1 In the opinion of BRANZ, THRU-brackets, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the Building Code of Australia:

BCA Volume 2 - Class 1 and Class 10 Buildings

Part 2.1 Structural Provisions: Performance Requirement P2.1. THRU-brackets meet this requirement. See Paragraphs 8.1 - 8.11.

4.2 This is an Appraisal of an **Alternative Solution** in terms of Building Code of Australia compliance.

Technical Specification

5.1 A range of THRU-brackets are available as set out in Table 1.

Table 1: THRU-brackets range

	Depth (mm)	Length (mm)	Width (mm)	Drilling circle diameter (mm)	Max hole diameter (mm)
THRU-JOIST (Single)					
TJ140	140	300	45	90	68
TJ190	190	300	45	137	121
TJ240	240	300	45	187	121
TJ290	290	400	45	187	121
THRU-JOIST (double)					
TJD140	140	300	90	90	68
TJD190	190	360	90	137	121
TJD240	240	400	90	187	121
TJD290	290	400	90	187	121
THRU-STUD					
TS90	90	200	45	59	59
THRU-TOP PLATE					
TTP	90	350	-	59	59
TTPE	90	350		30 x 190*	30 x 190*

* Slot dimension 30 mm wide x 190 mm long

5.2 The brackets are manufactured from zinc-coated G250 coil steel with a base metal thickness of 1.15 mm through to 2.0 mm depending on the bracket size. The coating class is Z275. The steel is punched and folded to form the brackets. Each bracket has a central drilling circle and nail holes for a specific nailing pattern.

5.3 Nails are 30 x 3.15 mm [35 x 3.15 mm for Australia] hot-dip galvanised which are supplied by the installer.

5.4 12 g x 35 mm galvanised screws are provided for use on the THRU-TOP PLATE bracket.

Handling and Storage

6.1 THRU-brackets must be kept dry and under cover until used.

Technical Literature

7.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for THRU-brackets. 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

- 8.1 Floor and wall framing is to be designed and constructed in accordance with NZS 3604 or AS 1684.2.
- 8.2 THRU-brackets are for use in non-specific design situations with New Zealand timber grades up to and including SG10 and LVL10 or Australian Radiata Pine Stress Grades up to and including F8.
- 8.3 THRU-brackets provide a means of reinforcing joists, studs and top plates around service holes such that the strength and stiffness performance of the timber is not affected.
- 8.4 THRU-brackets are required to match the framing timber they are designed for:
 - THRU-JOIST brackets must match the joist depth, i.e. TJ140 = 140 x 45 mm joist.
 - THRU-STUD brackets are designed for use on 90 x 45 mm studs.
- 8.5 The TJ140 THRU-JOIST bracket has a 100 mm diameter drilling circle for holes up to a 68 mm diameter, the TJ190 THRU-JOIST bracket has a 135 mm diameter drilling circle and the TJ240 and TJ290 brackets have 185 mm diameter drilling circle for holes up to a 121 mm diameter. The THRU-STUD brackets and THRU-TOP PLATE brackets have a maximum hole diameter of 59 mm. Holes can be placed in any position within the drilling circle. To obtain falls for plumbing discharge, pipe holes can be drilled at varying heights within drilling circles on adjacent joists. The THRU-STUD bracket can be located at varying heights to achieve falls.
- 8.6 THRU-JOIST brackets can be installed in any location along the length of a joist. Where multiple brackets are required, they must be installed at a minimum spacing of 1500 mm between centres.
- 8.7 THRU-JOIST brackets will not significantly change the stiffness performance of the original floor joists. This may be important where floors have been designed to have a deflection limit of $L/360$, for example, in a wet area or under a tiled floor finish.
- 8.8 THRU-STUD brackets can be installed anywhere along the length of the stud. Where multiple brackets are required:
 - Brackets must be installed at a minimum spacing of 1500 mm between centres; or,
 - In the bottom quarter of the stud, two brackets can be installed at minimum 300 mm centres. In these situations the number of brackets are limited to two brackets per stud.
- 8.9 THRU-TOP PLATE brackets, when used in NZS 3604 Extra High wind zones, must have an additional dwang installed directly to the underside of the top plate.
- 8.10 THRU-TOP PLATE brackets have been appraised for use in non-cyclonic wind zones up to and including N3 in Australia.
- 8.11 THRU-TOP PLATE brackets are designed to be limited to one bracket per stud bay.

Durability

Serviceable Life

- 9.1 THRU-brackets are expected to have a serviceable life of at least 50 years, provided they are designed, used, installed and maintained in accordance with this Appraisal and the Technical Literature.

Maintenance

- 10.1 THRU-brackets will not normally require maintenance. However, if damage occurs to the floor or wall structure, then repairs or replacement must be carried out to ensure the integrity of the floor or wall.

Spread of Fire

- 11.1 The use of THRU-brackets with fire rated [New Zealand FRR, Australia FRL] suspended floor constructions or walls has not been assessed and is outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirement

12.1 Installation of THRU-brackets can be carried out by any competent contractor.

General

- 13.1 THRU-brackets must be installed in accordance with the information contained within the Technical Literature. The location of holes should take account of any required falls for plumbing discharge pipes.
- 13.2 THRU-brackets are located and installed firmly against the joists, stud or top plate. The brackets are then nailed or screwed to the framing. Every hole in the bracket must be fixed off prior to the holes being drilled. Holes up to 68 mm in diameter can be drilled in the TJ140 THRU-JOIST brackets drilling circle. Holes up to 121 mm diameter can be drilled in the other THRU-JOIST brackets drilling circles. The THRU-STUD and THRU-TOP PLATE brackets drilling circle can be drilled with a 59 mm maximum diameter hole.
- 13.3 THRU-JOIST brackets are normally installed from under the joist. However, if access to the joist is only available from above, the THRU-JOIST bracket may be seated over the top of the joist. This may be necessary in situations where the floor has been removed and the ceiling below is still in place, for example. Performance of the bracket, and the resulting strength of the joist, will not be affected by doing so.

Inspections

- 13.4 The critical areas of inspection are that the brackets sit tightly to the timber joist, stud or top plate and that all holes are nailed or screwed with the correct fixing.
- 13.5 THRU-brackets that are covered by this Appraisal are easily identified by the Appraisal number and logo being pressed into the spine of the bracket.

Basis of Appraisal

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

Tests

- 14.1 BRANZ has carried out flexural and shear tests on timber joists incorporating THRU-brackets. Compression and tension testing has been carried out on studs incorporating the THRU-STUD brackets.

Other Investigations

- 15.1 Structural and durability assessments have been provided by BRANZ technical experts.
- 15.2 Site visits to assess installation methods, the practicability of installation and to examine completed installations, have been made by BRANZ.
- 15.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 16.1 The manufacture of THRU-brackets has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 16.2 The quality of THRU-brackets supplied is the responsibility of Brace-It Ltd.
- 16.3 The installer is responsible for the quality of the installation.
- 16.4 Building owners are responsible for the maintenance of the building.



Sources of Information

- AS 1397: 2011 Continuous hot-dip metallic coated steel sheet and strip - Coatings of zinc and zinc alloyed with aluminium and magnesium.
- AS 1684.2: 2010 Residential timber-framed construction - Non cyclonic areas.
- AS/NZS 1365: 1996 Tolerances for flat-rolled steel products
- NZS 3602:2003 Timber and wood-based products for use in building.
- NZS 3604: 2011 Timber-framed buildings.
- National Construction Code Series, Building Code of Australia 2014 - Australian Building Codes Board.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



In the opinion of BRANZ, **Thru-Brackets for Timber Framing** 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 **Brace-It 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. **Brace-It 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 **Brace-It 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 **Brace-It Ltd** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

26 November 2014