



BRANZ Appraised

Appraisal No. 289 [2018]

GIB® FIRE RATED SYSTEMS

Appraisal No. 289 [2018]

This Appraisal replaces 289 [2012] dated 8 November 2012



BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 GIB® Fire Rated Systems are a range of fire-rated constructions based on the use of GIB® plasterboards. The range consists of timber and steel framed wall, floor/ceiling and ceiling systems as well as solutions for steel beams, steel columns, risers, shafts, ducts and service penetrations.

Scope

- 2.1 GIB® Fire Rated Systems have been appraised for use as fire-rated load bearing and non-load bearing framed construction elements in buildings.

Building Regulations

New Zealand Building Code [NZBC]

- 3.1 In the opinion of BRANZ, the GIB® Fire Rated Systems, 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. GIB® Fire Rated Systems meet the requirements for loads arising from self-weight and impact [i.e. B1.3.3 (a) and (j)]. See Paragraphs 10.1 – 10.3.

Clause B2 DURABILITY: Performance B2.3.1 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.1 (c) 5 years. GIB® Fire Rated Systems meet the requirements. See Paragraphs 11.1 – 11.3.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4(a) and C3.7. GIB® Fire Rated Systems meet the requirements by providing passive fire and smoke protection. See Paragraphs 13.1 – 13.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. GIB® Fire Rated Systems meet this requirement and will not present a health hazard to people.

Technical Specification

General

- 4.1 GIB® Fire Rated Systems are primarily based on two types of GIB® plasterboard, GIB® Standard plasterboard and GIB Fyrelite®. Other GIB® plasterboards may be substituted as follows:
- 4.2 10 or 13 mm GIB Braceline®, GIB Noiseline®, GIB Aqualine® and GIB Ultraline® and 13 mm GIB® Standard and GIB Toughline® may be substituted for 10 mm GIB Fyrelite®.
- 4.3 Similarly 13 mm GIB Braceline®, GIB Noiseline®, GIB Aqualine®, GIB Toughline® and GIB Toughline® Aqua may be substituted for 13 mm GIB Fyrelite®.

GIB® Plasterboards

GIB Fyrelite®

- **GIB Fyrelite®** is a paper-bound gypsum-plaster core sheet lining material. Glass fibre and other additives are added to the core during manufacture. The sheets have a taper on the two long sheet edges. GIB Fyrelite® is available in thicknesses of 10 mm, 13 mm, 16 mm and 19 mm with a sheet width of 1200 mm. Sheet thicknesses of 10 mm and 13 mm are available in standard lengths between 2400 mm and 3600 mm and sheet thicknesses of 16 mm and 19 mm are available in standard lengths between 2400 mm and 3000 mm. The nominal weight is 7 kg/m², 10.5 kg/m², 14.8 kg/m², and 16.5 kg/m² for 10 mm, 13 mm, 16 mm and 19 mm thick sheet respectively. GIB Fyrelite® face paper is pink in colour.

GIB® Standard Plasterboard

- **GIB® Standard** plasterboard is a paper-bound gypsum-plaster core sheet lining material. GIB® Standard plasterboard is available in 10 mm and 13 mm thicknesses and a sheet width of 1200 mm and 1350 mm (GIB Wideline®). The sheets have a taper on the two long sheet edges. The 10 mm thick sheets are also available with a square edge. Sheets are available in various lengths from 2400 mm to 6000 mm. The nominal weights are 6.5 kg/m² and 8.5 kg/m² for 10 mm and 13 mm thick sheets respectively. GIB® Standard plasterboard face paper is a light buff colour.

Fastenings

- GIB® Grabber® High Thread Drywall screws for fixing to timber:
 - 6g x 25, 32 and 41 mm and 7g x 51 and 57 mm.
- GIB® Grabber® Self Tapping Drywall Screws for fixing to light gauge steel:
 - 6g x 25, 32 and 41 mm; 7g x 51 mm and 8g x 63 and 76 mm.
- GIB® Grabber® Laminator Screws for laminating plasterboard to plasterboard:
 - 38 mm x 10g
- GIB® Grabber® Drill Point Fine Thread Screws for fixing to heavy gauge steel:
 - 32 mm x 8g

Ceiling Systems

- Rondo Donn® ScrewFix® Suspension System
- Rondo Xpress® Drywall Grid Ceiling System
- Rondo® KEY-LOCK™ steel frame suspension system
- GIB® Rondo® Ceiling Batten System
- GIB® Clip
- Rondo® CH-Studs
- Rondo® J-Track

Accessories and Compounds

- A combination of GIB® Tape, GIB-Cove®, Trims and compounds are used. The requirements are specified in the GIB® Fire Rated Systems Technical Literature and details of the products and installation are found in the GIB® Site Guide Technical Literature.

Boundary Wall Bottom Plate Connections

- The single storey light timber framed boundary fire wall detail contained in the Technical Literature relies on GIB® HandiBrac® brackets to provide structural stability.
- GIB HandiBrac® - a one piece, 2 mm thick, galvanised - steel angle bracket approximately 95 mm high, 65 mm long and 54 mm wide. The bracket is supplied with 5 Type 17 screws 14 g x 35 mm.
- Proprietary concrete anchors with a minimum characteristic uplift capacity of 8 kN. Note: For corrosion protection requirements refer to NZS 3604: 2011 Section 4.

Handling and Storage

- 5.1 The best results are achieved when GIB® plasterboards are treated as a finishing material and protected from damage. Sheets must be stacked flat and kept dry at all times. For limits on stack heights see the GIB® Site Guide. Sheets must be carried on edge and not dragged.
- All accessories must be kept dry.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for GIB® Fire Rated Systems. 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 GIB® Fire Rated Systems Technical Literature contains solutions for the passive fire protection of loadbearing and non-load bearing, timber or steel-framed elements, wall, floor/ceiling and ceiling systems, riser, shaft and ducts, columns and beams and service penetrations.
- 7.2 GIB® Fire Rated Systems are used where a Fire Resistance Rating (FRR) is required and as part of the total GIB® lining system or specific fire partitioning design.
- 7.3 GIB® plasterboards must not be exposed to temperatures of 52°C or greater for prolonged periods. Refer to appliance and fitting manufacturers for installation details.

Control Joints

- 8.1 Where control joints are required, the joints must be specifically designed to maintain the integrity of the fire rated system.

GIB® Fire Rated Systems

- 9.1 The GIB® Fire Rated Systems Technical Literature describes a range of design options for the construction of loadbearing and non-loadbearing fire resistant construction elements. All FRRs are given in minutes for structural adequacy, integrity and insulation up to a maximum of 240 minutes. The following systems are addressed:

Fire Rated Wall Systems

- Two Way FRR – Timber Frame Walls,
- Two Way FRR – Steel Frame Walls,
- One Way FRR – Timber or Steel Frame.

Fire Rated Floor/Ceiling Systems, Suspended Ceilings, Universal Ceilings, Risers, Shafts and Ducts, Steel Beams and Columns

- Floor*/Ceiling Systems,
- Floor*/Ceiling Systems – Suspended Grid*,
- Ceiling Systems – Timber or Steel Frame,
- Risers, Shafts and Ducts.

* Note: Proprietary floor joist systems, suspended ceiling systems, metal supports, and flooring have not been assessed for other than fire and sound properties and are otherwise outside the scope of this Appraisal.

Junction Details for Fire and Smoke Separations, Chase Walls

9.2 The Technical Literature describes the construction requirements at wall-to-wall, wall-to-ceiling, wall-to-floor, wall-to-floor/ceiling and drywall-to-masonry/concrete junctions of fire separations, chase wall construction details and control joints. Construction in accordance with these details will preserve the FRR of the fire rated elements and prevent the passage of smoke.

Penetrations in GIB® Fire Rated Systems

9.3 Construction details and requirements for services penetrations in and through GIB® Fire Rated Systems are described in the Technical Literature. Proprietary penetration seals and sealants have not been assessed and are outside the scope of this Appraisal.

Stability of Fire Rated Elements

9.4 The Technical Literature describes the NZBC requirements for Structural Stability of fire rated elements and provides details of a single storey light timber framed boundary fire wall.

Structure

Framing

- 10.1 Supporting framing must comprise one of the following subject to the minimum sizes, dwang centres and all other frame requirements of the GIB® Fire Rated Systems Technical Literature:
- 10.2 Timber framing must be designed and constructed in accordance with NZS 3604, or to a specific design using NZS 3603 and AS/NZS 1170.
- 10.3 Steel framing must be designed to withstand loads in accordance with AS/NZS 1170.

Impact Resistance

10.4 GIB® plasterboards provide adequate resistance to soft body impact, based upon experience of use in domestic and light commercial applications

Boundary Walls

10.5 The Technical Literature provides details for a single storey light timber framed boundary fire wall, which can resist a possible force of 0.5 kPa in any direction as specified by NZBC Verification Method B1/VM1, Clause 2.2.4 [iii].

Durability

- 11.1 The ability of the systems to maintain their FRR for at least 50 years is dependent on their regular maintenance and remaining dry in service.
- 11.2 Framing and cladding systems must have durabilities which meet the performance requirements of NZBC B2. The integrity of fire rated sealants and packing must be maintained. These have not been assessed and are outside the scope of this Appraisal.
- 11.3 Lining systems must be protected from internal and external moisture in accordance with NZBC E2 and E3. In particular Boundary Walls must be installed with a drained cavity cladding system complying with NZBC Acceptable Solution E2/AS1 to achieve a 15 year durable life.

Maintenance

- 11.4 Any cracks or damage which may occur as a result of events such as exposure to excessive moisture or flooding, local outbreak of fire, wind or earthquake, timber shrinkage, or excessive impact, must be repaired immediately. Repair will include the replacement of any damaged sheets, materials or components.
- 11.5 Fire rated sealants must be regularly inspected, at least annually, and maintained in accordance with the instructions of the sealant manufacturer. Sealant joints must be repaired or replaced as necessary.

Prevention of Fire Occurring

- 12.1 Separation or protection must be provided to GIB® Fire Rated Systems from heat sources such as stoves, heaters, flues and chimneys.
- 12.2 Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 and NZBC Verification Method C/VM1 provides methods for separation and protection of combustible materials from heat sources.

Fire Affecting Areas Beyond the Fire Source

Internal Surface Finishes

- 13.1 GIB® plasterboards without applied paint or wallpaper finishes achieve a Material Group Number of 1-S. GIB® plasterboards can be used as internal surface linings where permitted by NZBC Performance Clause C3.4 [a].
- 13.2 When an applied finish is used over GIB® plasterboards, the Material Group Number for the completed lining system must be obtained from the manufacturer of the finish product or system.

Fire Resistance Ratings (FRRs)

- 13.3 GIB® Fire Rated Systems can be used to provide FRRs as determined by NZBC Acceptable Solutions C/AS1 – C/AS7 and NZBC Verification Method C/VM2.

Structural Stability during Fire

- 14.1 In order to satisfy the requirements of NZBC C6 Structural Stability, designers must ensure that fire rated elements are supported by building elements having at least the same FRR as the fire rated element they are supporting.

External Moisture

- 15.1 Lining systems must be protected from external moisture in accordance with NZBC E2.
- 15.2 The Boundary Wall detail provided in the Technical Literature requires installation of a drained cavity wall cladding system in accordance with the requirements in NZBC Acceptable Solution E2/AS1. The GIB® plasterboard must be kept dry during the installation of the cladding system and in service.

Note: The drained cavity wall cladding system has not been assessed and is outside the scope of this Appraisal.

Internal Moisture

- 16.1 GIB® plasterboards are intended for use in dry internal situations and must not be used where they are likely to be exposed to liquid water or be installed where extended exposures to humidity above 90% RH can reasonably be expected.

Airborne and Impact Sound

- 17.1 The GIB® Fire Rated Systems Technical Literature gives noise attenuation properties for the fire rated systems. Refer to GIB Noise Control® Systems for further information.

Installation

Installation Skill Level Requirement

- 18.1 Installation must be carried out by contractors experienced in plasterboard installation and the principles of fire rated construction.

General

- 19.1 GIB® Fire Rated Systems must be installed in accordance with the specifications contained in the GIB® Fire Rated Systems and the GIB® Site Guide Technical Literature. For inspection reference must be made to the Technical Literature.

Cutting Sheets

- 19.2 GIB® plasterboard sheets are cut by scoring the paper face with a sharp, short-bladed trimming knife. The plasterboard is then snapped away from the cut face before cutting the back paper. Cutouts for switch boxes and other penetrations should be made using a keyhole saw. Note that penetrations in fire separations require careful planning and detailing.

Wall Framing

- 19.3 Construction details for the framing, in particular type, dimensions and spacings, must be strictly in accordance with the specifications outlined in GIB® Fire Rated Systems and the specific design documentation for the building project.
- 19.4 All framing must be plumb, level and in true alignment.
- 19.5 The GIB® Site Guide specifies timber framing with a moisture content less than 18% at the time interior linings are installed. The use of kiln-dried timber is recommended.

Fixing

- 19.6 The GIB® Fire Rated Systems Technical Literature includes options for the orientation of linings (e.g. horizontal or vertical fixing). The installer must ensure that the specifications for these options are strictly adhered to. All joints must be made over framing.
- 19.7 The length and spacing of GIB® Grabber® screws for the fixing of GIB® plasterboard linings to framing must be strictly in accordance with the specifications. Care must be taken to ensure that fastener heads only indent the paper liner surface and do not damage the paper itself.

Jointings and Finishing

- 19.8 All joints in single or outer layers of multiple layer linings must be tape-reinforced. A minimum of two layers of bedding compound are required to achieve the stated fire resistance rating (FRR). Inner sheet joints of multiple layer linings do not require stopping.

Health and Safety

- 20.1 Dust resulting from the sanding of boards, jointing or finishing compounds may be a respiratory irritant, therefore the use of suitable respiratory protection is recommended. Where sealants, insulation and other materials are used, the instructions of the manufacturer must be followed.

Basis of Appraisal

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

Tests

- 21.1 The following tests have been carried out by BRANZ:
- Testing to determine the FRR of a range of wall and floor/ceiling systems, and penetrations.
 - Cone calorimeter tests to ISO 5660.

Other Investigations

- 22.1 The GIB® Fire Rated Systems and GIB® Site Guide Technical Literature has been examined by BRANZ and found to be satisfactory.
- 22.2 Site visits were carried out by BRANZ to assess the practicability of the installation of the systems, and to view completed installations.



- 22.3 Opinions on the fire resistance of variations to systems tested in accordance with AS 1530.4 were given by BRANZ experts.
- 22.4 An assessment was made of the durability of the systems by BRANZ technical experts and found to be satisfactory.
- 22.5 Winstone Wallboards Limited GIB® plasterboards have been assessed for the following properties: MOR, MOE, paper tensile strength, paper shear strength, nail pull resistance, Hunter hardness, inspection for fungal spores, hard and soft body impact tests.

Quality

- 23.1 Winstone Wallboards Limited's manufacturing process and details of the quality composition of the materials, have been examined by BRANZ and found to be satisfactory.
- 23.2 The quality management systems of Winstone Wallboards Limited have been assessed and registered with TELARC as meeting the requirements of ISO 9001.
- 23.3 Winstone Wallboards Limited is responsible for the quality of the product supplied.
- 23.4 The quality of the application and finish on site is the responsibility of the installation and stopping contractors.
- 23.5 Designers are responsible for the design of buildings.
- 23.6 Building owners are responsible for the maintenance in accordance with the instructions of Winstone Wallboards Limited.

Sources of Information

- AS 1530: 2005 Part 4 Fire-resistance tests of elements of building construction.
- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2588: 1998 Gypsum Plasterboard.
- ISO 5660 Reaction-to-fire tests – heat release, smoke production and mass loss rate – Part 1: Heat release rate [cone calorimeter method] and Part 2: Smoke production rate [dynamic measurement].
- NZS 3603: 1993 Timber structures standard.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- New Zealand Building Code Clauses C1-C6 Protection from Fire, Ministry of Business, Innovation and Employment, 10 April 2012.
- The Building Regulations 1992.



In the opinion of BRANZ, **GIB® Fire Rated Systems** 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 **Winstone Wallboards 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. **Winstone Wallboards 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 **Winstone Wallboards 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 **Winstone Wallboards Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

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30 November 2018