# BEAL Appraisal Certificate

**APPRAISAL #: C1405 v4.1** **EXPIRY DATE: 30 April 2027**

## The Magnum Board Rigid Air Barrier System

# Product

**1.1 The Magnum Board Rigid Air Barrier (MBRAB) system is a mineral sheet-based 'rigid air barrier' to be used over timber framing or light gauge steel framing for use in wind zones up to and including 'extra-high' as defined by NZS3604. It is designed to provide seamless water-proofing and wind penetration resistance through framing with its insulation in high wind environments.**

1.2 The system consists of 9mm Magnum Board sheets 1200mm x 2400mm using specified nail fixings together with Thermakraft tapes, that provides an easy to install, reliable barrier to moisture and the passage of air.

1.3 The MBRAB system is to be installed by suitably experienced tradespersons under the supervision of a Licensed Building Practitioner, as described in the appraisal-holder's technical literature.

# NZ Building Regulations

2.1 Based on the evidence supplied, in the opinion of BEAL*, the MBRAB system, when designed, installed in accordance with the statements and conditions of this Appraisal Certificate, will meet the following provisions of the New Zealand Building Code:

**Clause B1 STRUCTURE**
Performance B1.3.3(a) & (h) self-weight & resistance to high winds. Refer 'Test Reports' under Sources of Information, p3.

**Clause B2 DURABILTY**
Performance B2.3.1(a) 50 years. Refer 'Test Reports' under Sources of Information, p3.

**Clause E2 EXTERNAL MOISTURE**
Performance E2.3.2. Refer 'Test Reports' under Sources of Information, p3.

**Clause F2 HAZARDOUS BUILDING MATERIALS**
Performance F2.3.1. The MBRAB system meets this requirement and will not present a health hazard to people. Refer 'Other investigations under Basis of this Appraisal, p3.

2.2 The Magnum Board Rigid Air Barrier System has been appraised as an Alternative Solution in terms of compliance with the New Zealand Building Code.

*BEAL is a New Zealand based & recognized testing a certification body providing specialist services to numerous clients throughout New Zealand, Australia & overseas. Refer to Who is BEAL?


Applicant:
**Health Based Building Ltd**
1062 Colombo St, Edgeware
Christchurch, 8014
Phone 03 366 4044
E–Mail: enquiries@healthbasedbuilding.co.nz

Appraised by:
**BEAL***
6B Cedric Street
Plimmerton, Porirua, NZ
**P**: +64 4 233 6661
**E**: bts@beal.co.nz
www.beal.co.nz



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# Scope and Limitations

3.1 The MBRAB system has been appraised for use as a rigid air barrier with bracing capacity for use behind cladding systems within the following scope:

- Attached directly to new and existing timber conforming to NZS3604 and/or light gauge steel framing conforming to the NASH standard, designed and constructed to comply with the requirements of the NZBC; and,
- situated in wind zones up to and including 'extra-high' as per NZS 3604 Building Wind Zones or 63m/s when the specified nailing centres are used. Refer to the MBRAB Technical and installation manual.

3.2 The MBRAB system shall be installed only by suitably experienced tradespersons under the supervision of a Licensed Building Practitioner.

# Technical Literature

4.1 The MBRAB system Technical Manual v5.1 (incorporating the use of Thermakraft tapes) must be read in conjunction with this appraisal. All aspects of design, use, installation contained within the Technical Manual and scope of this Appraisal Certificate must be followed.

4.2 For a copy of this technical literature and any subsequent updates, please refer to www.healthbasedbuilding.com

# Technical Details

5.1 Materials and accessories which are used with the MBRAB system are as follows:

- **MBRAB**

MBRAB is a proprietary white magnesium oxide (MgO) mineral board with a number of attributes including minimal moisture absorption. It is supplied in the following sizes (9mm thick): 2.4m x 1.2m, 2.7m x 1.2m, and 3.0m x 1.2m.

- **Thermakraft tapes**

The Thermakraft tape system is comprised of two tapes suited for use with the Magnum Board:
a) Thermakraft 'Thermaflash' for sealing to window openings, and,
b) Thermakraft 'Premium Joining Tape' for sealing joins between Magnum Boards.

- **SIFCO Fixings** (Cat#:FRP50V8SS/8)

The SIFCO coil wire-collated Nail is a 50 x 2.8mm Stainless Steel Flat head nail with annular groove shank that can be obtained in collated form for use with the SIFCO FCN90LB-ST Coil Nailer gun. Nails are available in boxes of 3,600.

- **ECKO Fixings**

The ECKO HAMMAHAND Round Head Coil Nails are 50 x 2.8mm Stainless Steel Flat head nails with annular groove shank that can be obtained in collated form for use with the ECKO WB75 Weatherboard Nailer. Nails are available in boxes of 3,000, cat HHSS-50V8R.

5.2 Refer to the MBRAB Technical Manual for the required method of installation of these nails.

### Handling and Storage

5.3 All products must be stored inside in a well ventilated area, up off concrete floors, kept dry, out of direct sunlight and away from freezing conditions. The Thermakraft Tape products, in the original packaging, have a shelf life of 12 months from date of manufacture.

# Advice for Designers

### General

6.1 The MBRAB system is for use on new and existing timber framing, or for installation over light gauge steel framing, to provide a wind and moisture resistant barrier when the building is situated in high to extra high wind zones.

6.2 The system is designed to comply with performance clause B2.3.1(a), being a minimum 50 years or the life of the building, being difficult to access.

6.3 Before an installation can be carried out, it is essential that a survey of the framing be carried out to ensure compliance with NZS3604:2011 for timber framing or the NASH Standard for light gauge steel framing, and that the stud and dwang centres meet the requirements set out in the MBRAB Technical Manual.

### 6.4 Penetrations

The installation of the MBRAB system is reliant on all openings and penetrations being constructed in accordance with the requirements set out in the Technical Manual.

### Structural performance - Clause B1

6.5 The MBRAB system, when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use, is expected to tolerate wind forces up to and including extra-high as defined in NZS3604:2011.
Based on P21 testing, the bracing BU wind = 136 (113 BU/m) as limited by the ultimate load capacity and BU Earthquake = 121 (101 BU/m) as limited by the ultimate load capacity.

### Durability - Clause B2

6.6 The MBRAB system, when used in accordance with this Appraisal Certificate and subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 50 years. A warranty of 30 years is available from Health Based Building Ltd. Refer to www.healthbasedbuilding.com

6.7 No maintenance of the installed MBRAB system is required.

### External Moisture - Clause E2

6.8 The installation of the MBRAB system is reliant on the correct application of the Thermakraft tape system to meet the requirements of clause E2.

6.9 The design of details not included within the Technical Manual are subject to specific design and are outside the scope of this Appraisal Certificate.

### Hazardous Building Materials - Clause F2

6.10 Performance F2.3.1. The MBRAB system, when installed according to the requirements of this appraisal, meets this requirement.

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# Installation Requirements

### Installation Skill Requirement

7.1 Installation of the MBRAB sheets and Thermakraft tape system products must be completed by suitably experienced tradespersons, under the supervision of a Licensed Building Practitioner, preferably by those who have experience in the installation of Rigid Air Barriers.

### Preparation of Timber Framing

7.2 The moisture content of any new timber framing must be no higher than 18%.

### Thermakraft Tape Application

7.3 The application of the Thermakraft tape system must not be undertaken when the substrate temperature is below 10°C.

### Health and Safety

7.4 The safe use and handling of the Magnum Board and Thermakraft tape system products are described in the technical literature. These products must be used in conjunction with the relevant material safety data sheet for each product.

# Basis of this Appraisal

BEAL uses the compliance verification procedure to demonstrate compliance with the relevant clauses of the NZBC, based on a risk analysis procedure. The following is a summary of the technical investigations carried out:

### Assessments

8.1 A review of all test data and technical literature supplied by Health Based Building Ltd.

### Tests

8.2 The following testing of the MBRAB system has been undertaken by BEAL to verify compliance:

- Weathertightness based on testing based on AS/NZS4284:2008 Testing Building Facades, to suit.
- Suitability of the specified fixings and their layout
- Durability by way of tape adhesion testing to the Magnum Board before and after accelerated age conditioning.

8.3 The above test methods, assessments and respective laboratory test reports have been assessed by BEAL and found satisfactory.

### Other Investigations

8.4 An opinion has been given by BEAL experts of the durability and non-hazardous nature of the MBRAB system based on research, test data and in-service history.

8.5 The installation of the MBRAB system was also evaluated (including site visits) in practical building situations assessing the following:

- Ease of installation
- Potential risks of non-performance when being installed
- Any external factors that could affect the quality of the installed product

8.6 The technical literature has been examined by BEAL and found to be satisfactory.

### Quality

8.7 The manufacture of the Magnum Board has been considered by BEAL, with details regarding the quality and composition of the materials used, and found to be satisfactory.

8.8 The quality of materials, components and accessories supplied by Health Based Building Ltd. is managed through the use of a Product Quality Plan (PQP), ver 2.4.

8.9 The Health Based Building Ltd. Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase of the Magnum Board sheets to supply of specified components.

8.10 Health Based Building Ltd.'s Product Quality Plan is reviewed and audited at least annually by BEAL.

8.11 Designers are responsible for the framing design, and building contractors are responsible for the quality of construction of the framing. The building owner is responsible for the supply and correct installation of windows and doors and any other penetrations.

# Sources of Information

- The Building Regulations 1992, as at 15 November 2021.
- NZS 3604:2011 Timber-framed Buildings
- NASH Standards 1 & 2.
- ICC-AC386 – Acceptance Criteria for Fibre-reinforced Magnesium-oxide Based Sheets.
- Test data and technical literature supplied by the Magnum Board manufacturer in the USA. This includes the test report from ICC-Evaluation Service (equivalent to BRANZ) using the ICC-AC386 - 'ACCEPTANCE CRITERIA FOR FIBER-REINFORCED MAGNESIUM-OXIDE-BASED SHEETS' originally issued 1 July 2015 and updated since.
- Letter concerning 50-year durability from Thompson Global Partners LLC dated 27 August 2018.
- Test Reports from BEAL:
  TR140712-1 Weathertightness (using Blue Barrier)
  TR140723-1 Nail shear strength
  TR250122-1 Fixing pull-through resistance
  TR140725-2 Staged fixing shear resistance
  TR140805-1 Cyclic shear performance of a fixing
  TR140807-1 Nail & Adhesive Shear Resistance
  TR220218-1&2 and TR250430-1; 180° Peel Adhesion Tests of 2 Thermakraft Tapes (High Adhesion Flashing Tape and Premium Jointing Tape, before and after accelerated ageing.
- Fixing capacity testing was also peer reviewed by a Chartered Structural Engineer.

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# Concluding Statement

10.1 In the opinion of BEAL, the MBRAB system is fit for purpose and will comply with the NZBC to the extent specified, provided that it is used, designed, installed as set out in this Appraisal Certificate.
The Appraisal Certificate is issued only to Health Based Building Ltd., and is valid until the date of expiry described on the front of this appraisal, subject to the conditions of this Appraisal.

# Conditions of Appraisal

1. This appraisal Certificate:
a) Relates only to the MBRAB system as described herein;
b) Must be read, considered and used in full, together with the current version of the Technical Literature
c) Does not address any legislation, regulations, codes or standards, not specifically named herein;
d) Is copyright of BEAL.

2. The Appraisal Certificate holder continues to meet the quality requirements of the Health Based Building Ltd. Building Product Quality Plan and has the plan audited and Appraisal Certificate revalidated by BEAL on an annual basis.

3. Health Based Building Ltd. shall notify BEAL and obtain approval of any changes of the product specification or quality assurance prior to product being marketed including any trade literature, web site info or the like.

4. BEAL makes no representation 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 the Appraisal Certificate holder.

5. BEAL's verification of the building product or system complying with one or more of the above-mentioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the NZBC at the date of this Appraisal Certificate. In the event that the criteria is withdrawn or amended at a later date, this Appraisal may no longer remain valid.

6. Any reference in this Appraisal Certificate to any other publication shall be read as a reference to the version of publication specified in this Appraisal Certificate.

Authorised Signatory

C R Prouse - Director
**BEAL** (Building Element Assessment Laboratory Ltd)
[Revised and updated April 2025]

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