



BEAL Appraisal Certificate



APPRAISAL # C2104

EXPIRY DATE: 30 June 2024

The Enviro Square Rigid Air Barrier System



Product

1.1 Enviro Square Ltd.'s Rigid Air Barrier is a calcium silicate board in sheet form manufactured from non-toxic minerals, with the choice of a water-repellant or a weather-resistant coating for use in high driving rain situations, 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, exhibiting excellent fire and water-resistant properties.

1.2 The system consists of KAPO Board sheets nominally 6mm or 9mm, incorporating specified air and moisture sealing tapes over sheet joins and around the perimeter of the sheets to the framing.

1.3 The Enviro Square Rigid Air Barrier system (ESRAB system) is to be installed by trades persons, under the supervision of a Licensed Building Practitioner, within the scope and limitations described in the Appraisal-holder's Technical Manual.

Building Regulations

2.1 In the opinion of BEAL, the ESRAB system, when designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet or contribute to the following provisions of the New Zealand Building Code:

B1 - Structure: Performance Clause B1.3.3.

B2 - Durability: Performance Clause B2.3.1 (b).

C3 - Spread of Fire: Performance Clause C3.4 (a).

E2 - External Moisture: Performance Clause E2.3.2.


F2 - Hazardous Building Materials: Performance Clause F2.3.1.

NOTE: Other performance clauses have been taken into account and found not applicable.

2.2 The ESRAB system has been appraised as an 'Alternative Solution' in terms of compliance with the New Zealand Building Code.

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Scope and Limitations

3.1 The ESRAB system has been appraised for use as a rigid air barrier over framing and behind cladding systems within the following scope:

Attached directly to new and existing timber and or light gauge steel framing 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

3.2 The ESRAB system shall be installed only by trades persons, under the supervision of a Licensed Building Practitioner.

Technical Literature

4.1 The ESRAB system Technical Manual v1.0 (incorporating the use of HB Fuller and Rothoblaas Tapes) must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance 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.envirosquare.co.nz

Technical Details

5.1 Materials and accessories which are used as part of the ESRAB system are as follows:

- **Kapo Board RAB** - with the choice of a vapour permeable water-repellant or a weather-resistant coating, for use in high driving rain situations. The KAPO Board RAB is a 6mm thick Calcium Silicate mineral sheet incorporating on the exterior side, the choice of either a colourless water repellent or, special weather resistant coating - for use in high wind zone situations where there is a greater possibility of moisture getting past the exterior cladding - with a number of attributes including fire and moisture resistance. It is supplied in the following sizes: 2.4m x 1.2m, 2.7m x 1.2m and 3.0m x 1.2m.
- **EternaBond® RoofSeal Plus Microsealant Technology** Tape - for sealing sheet joints
- **Easy Band tape** from Rothoblaas - used for sealing between the water-repellent Kapo Board openings and the outside perimeter of the window or door frames
- Either **8g x 32mm stainless steel Tek screws** for fixing to light gauge steel framing or, **2.8mm x 40mm galvanised clouts** for fixing to timber framing.

5.2 Refer to the ESRAB system Technical Manual for the method of installation.

Handling and Storage

6.1 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 tape products, in the original packaging, have a shelf life of 12 months from date of manufacture.

Advice for designers

General

7.1 The ESRAB system is for use on new and existing

timber or LGS framing to provide a wind and moisture resistant barrier when the building is situated in medium to extra high wind zones.

7.2 The system is designed to comply with performance clause B2.3.1(b) being a minimum 15 years as a component of the building envelope.

7.3 Before an installation can be carried out, it is essential that an inspection of the completed framing be carried out to ensure compliance with NZS3604:2011 for timber framing and NASH Standards for Light Gauge Steel Framing.

7.4 Penetrations

Performance of the ESRAB system is reliant on all openings and penetrations meeting the requirements set out in the Technical Manual.

Structural performance - Clause B1

8.1 The ESRAB 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.

Durability - Clause B2

9.1 The ESRAB 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 15 years according to the design option selected.

9.2 No maintenance of the installed ESRAB system is required.

External Moisture - Clause E2

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

10.2 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

11.1 Performance F2.3.1. The ESRAB system when installed according to the requirements of this appraisal meets this requirement.

Installation Requirements

Installation Skill Requirement

12.1 Installation of the ESRAB system and specified tapes must be completed by tradespersons under the supervision of a LBP who have experience in the installation of Rigid Air Barriers.

Preparation of Timber Framing

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

EternaBond® and Easy Band tape application

12.3 The application of both the EternaBond® and or Easy Band tape system must not be undertaken when the substrate temperature is below 10°C.

Health and Safety

12.4 The safe use and handling of the water repellent Kapo Board and tape products are described in the Technical Literature. The products must be used in conjunction with the relevant materials safety data sheet for each product.

Basis of this Appraisal

BEAL use 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

13.1 The following assessments of the ESRAB system have been undertaken by BEAL:

Review of test data and technical literature supplied by Enviro Square Ltd.

Tests

13.2 The following testing of the ESRAB system has been undertaken by BEAL to verify compliance:

- Fixing performance,
- Durability by way of tape adhesion testing to the water repellent Kapo Board before and after accelerated age conditioning,
- Air and water resistance testing based on an adaptation of the E2/VM1 test procedure to suit.

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

Other Investigations

14.1 An opinion has been given by BEAL of the durability of The ESRAB system based on test data and in-service history.

14.2 The installation of the ESRAB 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

14.3 The Technical Literature has been examined by BEAL and found to be satisfactory.

Quality

15.1 The manufacture of the KAPO Board has not been assessed by BEAL, but details regarding the quality and composition of the materials used were obtained by BEAL and found to be satisfactory.

15.2 The quality of materials, components and accessories supplied by Enviro Square Ltd. is managed through the use of a 'Building Product Quality Plan'.

15.3 The Enviro Square Ltd.'s Building Product Quality Plan ensures continuous conformance with the quality requirements from purchase to supply of components.

15.4 Enviro Square Ltd.'s Building Product Quality Plan is reviewed and audited at least annually by BEAL.

15.5 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.

Sources of Information

- The Building Regulations 1992, reprinted 1 January 2017
- NZS 3604:2011 Timber framed Buildings
- NASH Standards 1 & 2
- AS 2908.2:2000 Cellulose-cement products – flat sheet
- BTS Test Report TR#201215-1a Weathertightness & fixing performance, without openings;
- BTS Test Report TR210906-1 Weathertightness & fixing performance, with openings
- BTS Test Report TR211220-1 Water resistance
- BTS Test Report TR211221-1 Water Absorption
- BTS Test Report TR220118-1 Water Vapour Transmission w SILAC Treatment
- BTS Test Report TR220119-1A Fixing Assessment using Simpson Strongtie's Quik Drive WSCBGHLA114SA 8g x 32mm screws into timber framing
- BTS Test Report TR220128-1A Fixing Assessment of BULDEX 10g x 25mm screws into Light Gauge Steel framing
- BTS Test Report TR220628-1 Shear Adhesion of the 50mm Roofseal Plus Microsealant Technology Tape from MERZ over 6mm KAPO Board.
- BTS Test Report TR220628-2 Shear Adhesion of the 50mm Rothoblaas EasyBand Tape over 6mm KAPO Board.
- A Test Report from SCION, Report № 49833148 on the performance of 'WATER PENETRATION RESISTANCE OF POWER COATED CALCIUM SILICATE BOARD'
- A Technical Data Sheet covering the properties of the Climate® Moisture Shield Powder Coating, not dated.

Concluding statement

16.1 In the opinion of BEAL, the ESRAB system is fit for purpose and will comply with the NZBC to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate.

The Appraisal Certificate is issued only to Enviro Square 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 ESRAB 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 Enviro Square Ltd. Building Product Quality Plan and has the plan audited and Appraisal certificate revalidated by BEAL on an annual basis.
3. Enviro Square 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 Limited)

