EXPIRES FEB 2019

BEAL Appraisal Certificate

The Plasterpol™ EPS Polystyrene Facade System

Product

1.1 The Plasterpol™ EPS Polystyrene Facade system, is an Exterior Insulation Finishing System, incorporating a 20mm drained and ventilated cavity. It is designed for new and remedial work where an economical coated and plastered monolithic finish is required.

1.2 The Plasterpol system consists of 50mm thick H grade Expanded polystyrene board or 50mm thick H Grade Expanded polystyrene Platinum board fixed over either timber, EPS or PVC battens and finished with Supercoat's Plaster and paint system.

Building Regulations

2.1 In the opinion of BEAL Testing Services (BTS), the Plasterpol™ Polystyrene Facade System, if designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet the following provisions of the New Zealand Building Code:

2.2 Clause B2 DURABILTY

Performance B2.3.1(b) 15 years for new or repair work and Performance B2.3.1(c) 5 years where additional protection of a substrate with easy access is sought. The Plasterpol™ Polystyrene Facade System meets this requirement. See paragraphs 9.1 - 9.3

2.3 Clause E2 EXTERNAL MOISTURE

Performance E2.3.2. walls featuring the Plasterpol™ Polystyrene Facade System contribute to meeting this requirement. See paragraphs 10.1 - 10.2

2.4 Clause F2 HAZARDOUS BUILDING MATERIALS

Performance F2.3.1. The Plasterpol™ Polystyrene Facade System meets this requirement and will not present a health hazard to people. See paragraph 11.1

2.5 The Plasterpol™ Polystyrene Facade System has been appraised as an **Acceptable Solution** in terms of New Zealand Building Code Compliance.

Applicant:

Lowenhaus Ltd.
75 Reid Road,
Dunedin, 9044.
TEL: 0274 114102
E–Mail: info@plasterpol.co.nz
www.Plasterpol.co.nz

Appraiser:

BEAL
2A Plimmerton Drive
Plimmerton, Porirua, NZ
Tel: +64 233 6661
Fax: +64 233 6662
E-Mail: sales@beal.co.nz
www.beal.co.nz

Scope and Limitations

3.1 The Plasterpol™ Polystyrene Facade System (PPFS) has been appraised for use as an Exterior Insulation Finishing System, incorporating a 20mm drained and ventilated cavity, within the following scope:

- Scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; and,
- Constructed with timber framing complying with the NZBC; and,
- Constructed with steel framing complying with the NZBC; and,
- Utilising a wind-tight frame protection system incorporating underlay, seam tape, flashing tape and boots for pipe penetrations; and,
- Can be situated in up to and including 'Very High' wind zones as described in NZS 3604 Building Wind Zones

3.2 The PPFS has also been appraised for structural wind loading when used for timber or steel framed buildings subject to specific design up to a design differential ultimate limit state (ULS) wind pressure of 2500Pa.

3.3 The PPFS must only be installed on vertical framing.

3.4 The PPFS is appraised for use with window and door joinery that is installed with vertical jambs and horizontal heads and sills. (The Appraisal of the PPFS relies on joinery meeting the requirements of NZS 4211 for the relevant building wind zone or being specifically designed for use in specifically designed buildings).

3.5 Installation of components and accessories supplied by Lowenhaus Ltd must be carried out only by personnel trained and approved by Lowenhaus Ltd.

Technical Literature

4.1 Refer to PPFS System Technical Manual PP v1.0. The Plasterpol™ Technical Literature PP v1.0 must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained within the Technical Literature 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.Plasterpol.co.nz

Technical Specification

5.1 Materials and accessories supplied by Lowenhauss Ltd. are as follows:

- **H Grade EPS Sheet**

Only H Grade Expanded polystyrene sheet is used.

- **Cavity Battens**

The cavity battens are either 20mm x 45mm H3.1 timber, 18mm x 45mm H Grade EPS or 18mm x 45 PVC.

- **uPVC Components**

Lowenhaus supply a range of uPVC components including a Plasterpol™ Foot Capping, Plasterpol™ Sill Flashing, Plasterpol™ Jamb Flashing, Plasterpol™ Head Flashing, Plasterpol™ Pre-meshed Corner Bead, Corner Soakers, Plasterpol Poly Washers and a Plasterpol™ Pre-meshed Control Joint.

- **Fixings - Timber framing**

100mm long 4.0mm dia galvanized, flat head nails shall be used.

- **Fixings - Light gauge Steel framing**

For 50mm thick EPS, 90mm long 10g self-drilling AS3566 Corrosion Class 3 screws shall be used.

- **EPS Washers**

43mm diameter high density polyethylene Plasterpol™ washers must be used with the sheet fixings at stated centres.

- **Flexible Sealant**

Maxilam Sealant is specified.

- **Low Foaming PU foam**

Maxilam's Sabre-fix LF PU foam is specified.

- **Key Coat Plaster**

Supercoat™ Multitex is specified.

- **Base Coat Plaster**

Supercoat™ Superbuild Render or Supercoat™ Superbase Render is specified.

- **Texture Plasters**

The following textures are specified:
- Supercoat™ Supersponge 1mm
- Supercoat™ Supersponge 2mm
- Supercoat™ Acrylic Texture 1mm
- Supercoat™ Acrylic Texture 2mm
- Supercoat™ Superadobe

- **Reinforcing Mesh**

Supercoat™ Grid Mesh supplied by Lowenhaus Ltd is specified.

- **Long Life Protective Acrylic Paint Systems**

Refer to the Supercoat™ Coating Systems Technical Manual (SCSTM v2.5) available for download at www.supercoat.co.nz

Handling and Storage

5.2 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 acrylic products, in the original unopened containers, have a shelf life of 24 months from date of manufacture. The cementitious class products have a shelf life of 6 months from date of manufacture.

Design Information

Framing

Timber Framing

6.1 Timber used in timber framing shall be treated as required by NZS 3602.

6.2 Timber framing must comply with NZS 3604 for both buildings or parts of buildings within the scope limitations of NZS 3604. Where buildings or parts of buildings are outside the scope of NZS 3604 then they must be to specific design in accordance with NZS 3603 and AS/NZS 1170. Where specific design is required, the framing must be of at least the equivalent stiffness to the framing provisions of NZS 3604. In all cases, studs must be at a maximum of 600mm centres.

6.3 Timber framing must have a maximum moisture content of 18% at the time of Facade application *(Problems could arise later on due to timber shrinkage if over 18%).*

Steel Framing

6.4 Steel framing must be to a specific design meeting the requirements of the NZBC. (NASH 3405: 2006)

6.5 The minimum steel framing specification is 'C' section studs and nogs of overall section dimensions of 75mm web by 32mm flange. Steel thickness must be a minimum 0.55mm.

6.6 For steel framed buildings situated within NZS3604 defined wind zones up to and including 'Very High', studs

must be at maximum 600mm centres. All other buildings studs must be at maximum 400mm centres.
Dwangs must be fitted flush with the stud.

EPS Sheet & Mesh Layout

6.7 EPS sheets and reinforcing mesh are installed as per the instructions shown in the Technical Manual PP v1.0.

General

7.1 The Plasterpol™ Base Capping vents provide a minimum ventilation opening area of 1000mm² per lineal metre of wall, when fixed at 1000mm centres.

7.2 The ground clearance between the finished floor level and ground level as outlined in NZS 3604 must be adhered to at all times. At ground level, paved surfaces must be kept clear from the bottom edge of the PPFS by a minimum of 100mm, and unpaved surfaces by 175mm

7.3 At balcony, deck or roof to wall junctions, the bottom edge of the Facade must be kept clear of any adjacent surface, or above the top surface of any adjacent roof flashing by a minimum of 35mm.

7.4 Where the PPFS System abuts other Facade systems, designers must detail the junction to meet their own requirements whilst meeting performance requirements of the NZBC. The Technical Literature does provide some guidance. Details not included within the Technical Literature have not been assessed and are therefore outside the scope of this Appraisal.

7.5 All buildings must have barriers to airflow into the framing such as a 'frame protection system' or use of interior linings with all joints stopped, or where walls are not lined, such as attic spaces at gable end, a rigid sheathing or air barrier suited to the relevant Wind Zone, complying with the performance requirements of the New Zealand Building Code.

7.6 PVC sheathed electrical cables must be prevented from direct contact with the EPS cavity battens. When cables must penetrate the EPS cavity battens for electrical connections, the cable must be directly supported by passing through an electrical conduit.

Control Joints

8.1 Control joints where EPS sheets are used must be constructed in accordance with the Technical Literature and as follows;

- Horizontal control joints in walls clad with Plasterpol™ must be located at a maximum of 6m vertical centre locations.
- Mid-floor control joints are to be located at every floor level where unseasoned timber is used. Where seasoned or steel framimg is used, mid-floor control joints are only required at floor levels above 7.0m.
- Vertical control joints in the Plasterpol™ Facade System must be located at intervals not exceeding 20m in length, aligned with any control joint in the structural framing, where building frame movement is likely, or where the system abuts other construction. It is recommended that vertical control joints are located at 6 - 10m centres. Where vertical control joints are to be inserted the Builder must ensure that double studs are fixed in place so that the Vertical Plasterpol™ Pre-Mesh Control Joint can be glued and nailed in place. *(Note: Control joints shall not be located in line with window and door openings. Horizontal and vertical control joints must be located over structural supports. The Technical Literature provides some guidance for the design of vertical control joints where the system abuts different Facade types. Details not included within the Technical literature or those that are marked as 'Specific Design Only' are outside the scope of this Appraisal Certificate and are the responsibility of the designer.)*

Durability - Clause B2

9.1 The PPFS 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 for new or repair work and 5 years where additional protection of a substrate with easy access is sought.

Maintenance

9.2 The maintenance of the completed Supercoat™ Coating System application of the Plasterpol™ Polystyrene Facade System is described in the Supercoat™ Coating Systems Technical Manual (SCSTM v2.5). This consists of annual inspection and, where necessary, cleaning of materials that could reduce the performance and/or life of the protective coating.

9.3 In the event of damage to the protective coating, the location and details along with photos shall be recorded with a copy supplied to the Plasterpol™ distributor for actioning. No applicator may carry out repairs without the prior approval of the Plasterpol™ distributor.

External Moisture—Clause E2

10.1 The long term performance of the PPFS, is reliant on the construction details and maintenance described in the Technical Manuals being strictly followed.

10.2 The design of details not included within the Technical Literature 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 Plasterpol™ Polystyrene Facade System when installed according to the requirements of this appraisal meets this requirement.

Installation Information

Installation Skill Requirement

12.1 Installation of the PPFS must be completed by Lowenhaus Ltd. approved and trained applicators who have experience in the application of EIFS systems and knowledge of waterproofing principles.

Preparation of Substrates

13.1 EPS substrates must be dry, clean and prepared before application of the plaster and coating system commences.

13.2 The moisture content of any new timber substructure must be no higher than 18%.

Plaster and Coating Application

14.1 The Supercoat™ plaster application of the Plasterpol™ Polystyrene Facade System must not be undertaken when the air temperature is below 5°C or if it is likely to drop below 5°C during drying/curing time.
The Supercoat™ acrylic application of the Plasterpol™ Polystyrene Facade System must not be undertaken when the air temperature is below 10°C or if it is likely to

drop below 10°C during drying/curing time.

Remedial Work

15.1 The installation of the Plasterpol™ Polystyrene Facade System over any new substructures or repaired parts of the wall other than very minor repairs, is subject to specific design and outside the scope of the this Appraisal Certificate.

Health and Safety

16.1 The safe use and handling of the plaster system and related products are provided in the Technical Literature. The products must be used in conjunction with the relevant materials safety data sheet for each product.

Basis of Appraisal

BEAL use a risk assessment and the 'compliance verification procedure' to determine suitable criteria and performances in order to verify compliance with the relevant clauses of the New Zealand Building Code. The following is a summary of the technical investigations carried out:

Assessments

17.1 The following assessments of the PPFS have been undertaken by BEAL:
Review of test data and technical literature supplied by Lowenhaus Ltd.

Tests

18.1 The following testing of the Plasterpol™ Polystyrene Facade System has been undertaken by BEAL to verify compliance:

- Durability of adhesion of the plaster system by way of adhesion testing to the nominated substrate, before and after accelerated age conditioning

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

Other Investigations

19.1 An opinion has been given by BEAL of the durability of The Plasterpol™ Polystyrene Facade System based on test data and in-service history.

19.2 The installation of the Plasterpol™ Polystyrene Facade 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
- Ease of repair or maintenance

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

Quality

20.1 The manufacture of the Plasterpol™ Polystyrene Facade System components 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.

20.2 The quality of materials, components and accessories supplied by Lowenhaus Ltd. is managed through the use of a Risk Management Plan (PQP).

20.3 The Lowenhaus Ltd.'s PQP ensures continuous conformance with the quality requirements from purchase to supply of components.

20.4 Lowenhaus Ltd.'s PQP is reviewed and audited at least annually by BEAL.

20.5 Designers are responsible for the substructure design, and building contractors are responsible for the quality of construction of the substructure or new substrate in accordance with the instructions of the substrate manufacturer and this Appraisal Certificate.

20.6 Building owners are responsible for the maintenance of the Plasterpol™ Polystyrene Facade System in accordance with the technical literature and this Appraisal Certificate.

Sources of Information

- TR20130125 Adhesion & Durability from BTS
- NZS 3604:2011 Timber framed Buildings
- Compliance Document for Clause E2, Department of Building and Housing, Third edition May 2008, incorporating amendments 1 to 5 and Errata 2.
- The Building Regulations 1992, up to, and including, July 2011 Amendment.
- Test data and technical literature supplied by the manufacturer covering the fibregalss mesh, PVC mouldings, plaster system, and the acrylic coating system.
- BRANZ Appraisal covering the use of the Lowenhaus's mouldings, mesh, plaster and coating systems.
- BRANZ Appraisal 419 covering the compliance of Holdfast Fix All 220LM MS Polymer Sealant.
- Test data from the manufacturer of the EPS battens and sheets.
- BRANZ Appraisal 440 covering the compliance of Holdfast Gorilla Nail Power Flexi Expanding Foam™.

Concluding statement

21.1 In the opinion of BEAL, the Plasterpol™ Polystyrene Facade 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 Lowenhaus Ltd., and is valid until further notification, subject to the conditions of this Appraisal.

Conditions of Appraisal

1. This appraisal Certificate :
   a) Relates only to the Plasterpol™ Polystyrene Facade 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 Lowenhaus Ltd. PQP and has the plan audited and Appraisal certificate revalidated by BEAL on an annual basis.

3. Lowenhaus 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 - Manager
BEAL Testing Services
[February 2018]

BEAL BUILDING ELEMENT ASSESSMENT LABORATORY LIMITED

BEAL APPRAISED BUILDING CODE COMPLIANT C1227