

Certificate of Assessment

Certificate Number: 158/12 Revision: 10

PermaRock Products Limited

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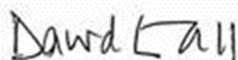
Is authorised to use the BRE Global Certification Mark in association with the product(s) listed in this certificate and appendix.

Products

PermaRock External Wall Insulation & Render Systems (PEWIRS)

- PermaRock Mineral Fibre EWIRS
- PermaRock Phenolic EWIRS
- PermaRock EPS EWIRS
- PermaRock Track-EPS EWIRS

This certificate and appendix is maintained and held in force through regular surveillance activities.



Signed for BRE Global Ltd.

David Gall

Associate Director, BRE Global

29 January 2020

Date of Revision

01 June 2012

Date of First Issue



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PermaRock External Wall Insulation & Render Systems (PEWIRS)

Summary

PermaRock External Wall Insulation and Render Systems (PEWIRS) consist of (mono- or dual- density) mineral fibre, phenolic foam or expanded polystyrene (EPS) insulation finished externally with polymer modified renders, polymeric coatings with aggregate finishes, or brick slips or brick-effect render to simulate brickwork.

The PermaRock Systems are for application to external vertical walls of new or existing buildings of masonry, dense and no fines concrete, timber or light gauge steel frame construction. Carrier rails can be used in conjunction with EPS insulation to provide a 20mm drained cavity where required.

The components of the external wall insulation and renders system are as follows:

- Carrier rails
- Adhesive
- Fixings for insulation
- Insulation (mineral fibre, EPS and phenolic foam)
- Base coat materials
- Reinforcing mesh
- Fixings for reinforcement layers
- Primers
- External finishes

The systems have been assessed to confirm their suitability, within limitations, as weather-resistant external decorative finishes on new or existing walls of brick and block masonry, dense and no fines concrete and sheathed light gauge steel or timber frame construction above DPC level, in the United Kingdom.

Characteristics of the products and their methods of application have been reviewed with respect to current Building Regulations, British and European Standards and other publications in the United Kingdom current at the date of certificate issue.

The assessment is described in the following pages which form integral parts of this certificate and should be read in its entirety.



This certificate has been reviewed to take account of regulatory changes related to fire performance of external walls that have been introduced in England (from December 2018), Scotland (from October 2019) and Wales (from January 2020).

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PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****Conditions of Use**

PEWIRS are for use onto backing walls of new or existing buildings in locations in the UK, for forming a weather resistant external insulation and render system. The backing wall can be brick and block masonry, dense and no fines concrete and sheathed light gauge steel or timber frame construction above DPC level.

The number and type of fixings to masonry backing walls shall be determined in accordance with BS 5080-1 *Structural fixings in concrete and masonry. Method of test for tensile loading*. Where required consideration should also be given to BS 5080-2 *Structural fixings in concrete and masonry. Method for determination of resistance to loading in shear*.

Timber frame and light gauge steel frame backing walls shall be designed and constructed in accordance with BS 5268 *Structural use of timber* or BS 5950 *Structural use of steelwork in building*, or the relevant Eurocodes.

Framed structures shall be clad with sheathing board of minimum thickness 9mm.

Specifiers shall ensure that backing walls and fixings to them are suitably designed to carry the weight of the PEWIRS and wind loads calculated in accordance with BS 6399 part 2: *Loadings on buildings: wind loadings*.

PEWIRS shall not be considered as providing any contribution to the overall structural performance of the building or for support of any temporary structure.

Specifiers shall ensure that the fire performance classifications (reaction to fire and/or fire resistance) are adequate for the intended application and relate specifically to the PEWIRS in use. Specifiers shall also be responsible for checking the relevant building regulation requirements. These are summarised as follows at the time of review of this certificate:

For England - Building (Amendment) Regulations 2018 (SI 2018/1230) which apply to buildings and building work in England came into force on 21st December 2018. This requires that all materials forming a part or element of an external wall or attachment must now achieve a class A2-s1, d0 or A1 when classified in accordance with BS EN 13501-1:2007+A1:2009 for use on buildings with a storey height 18m or greater above ground level. For full details and exemptions in relation to the regulatory requirements, this certificate should be read alongside The Building (Amendment) Regulations 2018 (SI 2018 No. 1230).

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PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)**

For Scotland - New Domestic and Non-domestic Technical Handbooks came into effect in Scotland on 1st October 2019. This certificate should be read in conjunction with the Domestic and/or Non-domestic Technical Handbooks. New requirements for any building with a storey height at least 11 m above ground level were introduced. To comply with the new requirements either all components within the external wall system shall achieve European Class A2-s1,d0 or Class A1 when tested and classified in accordance with BS EN 13501-1:2007 + A1:2009 or as an alternative, the external cladding system shall have achieved a classification in accordance with BR 135, 'Fire Performance of external thermal insulation for walls of multi-storey buildings' when tested to BS 8414: Part 1: 2015+A1: 2017 or BS 8414: Part 2: 2015+A1: 2017.

It should be noted that reaction to fire classifications using BS 476 are no longer accepted.

For Wales

Building (Amendment) (Wales) Regulations 2019 (2019 No. 1499) which apply to buildings and building work in Wales came into force on 13th January 2020. This requires that all materials forming a part or element of an external wall or attachment must now achieve a class A2-s1, d0 or A1 when classified in accordance with BS EN 13501-1:2007+A1:2009 for use on buildings with a storey height 18m or greater above ground level.

For full details and exemptions in relation to the regulatory requirements, this certificate should be read alongside The Building (Amendment) (Wales) Regulations 2019 (2019 No. 1499).

For Northern Ireland - For any building with a storey height at least 18 m above ground level either all components within the external wall system shall achieve European Class A2-s1,d0 or Class A1 when tested and classified in accordance with BS EN 13501-1:2007 + A1:2009 or as an alternative, the external cladding system shall have achieved a classification in accordance with BR 135, 'Fire Performance of external thermal insulation for walls of multi-storey buildings' when tested to BS 8414: Part 1: 2015+A1: 2017 or BS 8414: Part 2: 2015+A1: 2017.

Table 2.1 of the Appendix to Certificate No. 158/12 sets out those PEWIRS that have been classified A2-s1,d0 or A1 in accordance with BS EN 13501-1:2007 + A1:2009 and Annex A details the PEWIRS cladding systems that have achieved classification in accordance with BR 135. Confirmation of the fire performance classification of PEWIRS shall be obtained from the certificate holder.

Acoustic performance of PEWIRS has not been assessed.

The need for vapour control on external walls of framed buildings shall be assessed on a project by project basis and the relevant action taken (e.g. the fitting of vapour control layers and/or breather membranes) to eliminate the risk of interstitial condensation.

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Where NHBC approval is required with a timber frame building system, a minimum 15mm wide cavity which is drained and ventilated is required in accordance with NHBC Standards. When used to clad a light gauge steel frame building system, a minimum 15mm wide cavity which is drained is required to comply with NHBC requirements. The supporting framework to produce the required cavity and the ancillary components necessary for fire stopping, drainage and ventilation are not covered by this certificate as they are designed on a project specific basis. The ancillary components and framework selected should be agreed in advance with PermaRock, who operate a technical support service, to ensure that they are suitably durable and compatible with PEWIRS.

Where required, frost resistant mortars and brick slips shall be used below dpc level.

PEWIRS shall be stored, handled, installed and maintained strictly in accordance with the requirements of this certificate and PermaRock's Technical Installation Manual as inspected by BRE Global.

The performance of PEWIRS depends on correct installation. The quality of installation achieved on site is not covered by this certificate and therefore it is recommended that the quality of installation and workmanship is subject to appropriate checks by a competent person.

Periodic inspections shall be made to confirm the condition of rendering and especially the sealants to ensure adequacy of the seal. Damage shall be repaired promptly. Repairs shall be in accordance with the PermaRock repair procedures.

PEWIRS shall only be installed by operatives trained, approved and monitored by PermaRock Products Limited and the company shall continue to provide a technical consultancy service.

This certificate remains valid while the conditions contained in clause 6.1 are met.

Statement

PEWIRS are satisfactory for use on masonry, brick and block, dense and no fines concrete, light gauge steel and timber framed structures. They are satisfactory for use within the stated conditions provided that they are used in accordance with the certificate holder's instructions and the requirements of this certificate. All aspects of these Conditions of Use must be applied for this Certificate to be valid.

PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****1 Technical Specification****1.1 Description of Product****1.1.1 General**

PEWIRS consist of (mono- or dual- density) mineral fibre, phenolic foam or EPS insulation finished externally with polymer modified renders, polymeric coatings with aggregate finishes or brick slips with adhesive to simulate brickwork. The products are described in Section 1.1 and some typical construction details are presented in Appendix C (see Figures C1 to C4). The PEWIRS have been examined for certain performance characteristics and the outcomes are described in Section 2.

PEWIRS have been assessed for use as weather resistant thermally insulating decorative exterior finishes to brick and block masonry, dense and no fines concrete and sheathed light gauge steel or timber frame backing walls. The system comprises a number of different insulation materials, fixing components, reinforcement and specified external finishes. The system components which can be used in the combinations shown in Table 1.1 are described in more detail in the following paragraphs.

1.1.2 Adhesive, basecoat and primer

- 1.1.2.1 PermaRock Adhesive and PermaRock Lamella Adhesive are polymer modified cement-based powders that requires only the addition of water and are used for fixing insulation to the backing wall (substrate).
- 1.1.2.2 PermaRock Bedding Mortar is a polymer modified cement-based powder, requiring only the addition of water. It can be applied directly to insulation materials and it can also be over-coated with specified external finishes (as detailed in section 1.1.4).
- 1.1.2.3 PermaRock K & R Primer is used for priming surfaces before application of acrylic/silicone K textured finishes and is applied onto PermaRock Bedding Mortar.

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PermaRock External Wall Insulation & Render Systems (PEWIRS)

1.1.3 Insulation materials

The insulation materials that can be used as part of the PermaRock External Wall Insulation System are as follows:

- 1.1.3.1 PermaRock Mineral Fibre insulation slabs are manufactured and supplied in accordance with BS EN 13162 *Thermal insulation products for buildings. Factory made Mineral Fibre (MW) products. Specification.*
- 1.1.3.2 PermaRock EPS insulation is manufactured and supplied in accordance with BS EN 13163 *Thermal insulation products for buildings. Factory made products of expanded polystyrene (EPS). Specification.*
- 1.1.3.3 PermaRock Phenolic Foam insulation is manufactured and supplied in accordance with BS EN 13166 *Thermal insulation products for buildings. Factory made products of phenolic foam (PF). Specification.*

Table 1.1 Combinations of system components

Background	Carrier rail ¹	Adhesive	Insulation	Basecoat	Primer	Finish coat
Brick and block masonry, dense and no fines concrete, sheathed light gauge steel and timber frames	PermaRock Track EPS System	PermaRock Adhesive or PermaRock Lamella Adhesive	Mineral Fibre EPS Phenolic Foam	PermaRock Bedding Mortar and Reinforcing Mesh	None	<ul style="list-style-type: none">• Dashing Mortar• Alpine Finish• Brick Effect Render (2 coat)• Scratch Render
					PermaRock K & R Primer	<ul style="list-style-type: none">• Acrylic K Finish• Silicone K Finish• Silicone^{ULTRA} K & R Finish
					PermaRock K & R Primer	<ul style="list-style-type: none">• PermaRock Brick Slips and PermaRock Brick Slip Adhesive & PermaRock Brick Slip Pointing Mortar
1 Optional for use with EPS insulation only where a 20mm cavity is required						

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1.1.3.4 A summary of the information provided for each insulation material in terms of product specification is presented in Table 1.2 below.

Table 1.2 Typical properties of insulation materials declared by the manufacturer

Property	Test method	Thermal insulation			
		Mineral fibre [mono density]	Mineral fibre [dual density]	Expanded polystyrene (EPS)	Phenolic foam
Product standard	-	EN 13162	EN 13162	EN 13163	EN 13166
Density (kg/m ³)	EN 1602	115	118-104 ⁽¹⁾	14-16	35
Thickness range (mm)	EN 823	30-160	50-250 ⁽²⁾	10-125	20-100
Thermal conductivity $\lambda_{90/90}$ value (W/mK)	EN 12667	0.038	0.036	0.038 (white)	>45mm - 0.020 25-44mm - 0.021 20-24mm - 0.023
				0.032 (grey)	
Reaction to fire	EN 13501-1	A1	A1	E ⁽³⁾	C-s2, d0 ⁽³⁾

NOTES (For Table 1.2):

1. Commensurate with combined thickness
2. For the Condition of Use and clause 2.3.4 – Fire spread on external walls relating to buildings having a floor more than 18 metres above the ground level surrounding the building in England and 11m in Scotland,, the maximum thickness of insulation shall be limited to 160 mm for single density mineral fibre and 250mm for dual density mineral fibre.
3. These insulation products are no longer suitable for use in some external wall constructions. See “Conditions of Use” and Clause 2.3.4 for limitations on their use at the time of review of this certificate.

1.1.4 External finishes

The external finishes described below are within the scope of this certificate for use with PEWIRS.

1.1.4.1 Cement based decorative finishes:

- **PermaRock Dashing Mortar** is a coloured polymer modified cement-based render with a selected stone aggregate dashing.
- **PermaRock Alpine Finish** is a coloured polymer modified cement-based render with selected aggregates applied with an appropriate float to create a patterned effect.
- **PermaRock Brick Effect Render** is a two-coat system that consists of a base layer of render (which becomes brick joints) and a face layer that becomes the face of the brick effect.

PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****1.1.4.2 Lime based decorative finish:**

- **PermaRock Scratch Render** is a lime-based render applied in a nominal thickness range 12-14mm followed by scraping back with a spiked tool or float to provide the required texture and finish thickness (nominal 10mm).

1.1.4.3 Cement-free decorative finishes:

- **PermaRock Acrylic K Finish** is an acrylic polymer finish offering UV and weather protection and water vapour permeability with a stippled or rolled appearance achieved by trowelling. The finishes are through coloured renders that are available in a wide colour range.
- **PermaRock Silicone K Finish, Silicone^{Ultra} K Finish and Silicone^{Ultra} R Finish** offer UV and weather protection and water vapour permeability with a stippled or rolled appearance achieved by trowelling. The finishes are through coloured renders that are available in a wide colour range.
- **PermaRock Mineral Colour Coat** is an inorganic colour wash used to give dark and/or strong colours on the mineral finishes which are mostly available in pastel colours.

1.1.4.4 Brick slip decorative finish:

- **PermaRock Brick Slips** are an alternative to the render finishes and comprise polymer bound brick effect facing slips nominally 215 mm by 65 mm. PermaRock Brick Slip Adhesive, a synthetic resin-based adhesive, is supplied as a ready to use paste to bed the brick slips. PermaRock Brick Slip Pointing Mortar is a ready-mixed compound used to point the joints between the brick slips.

1.1.5 Fixing components for insulation

A number of proprietary fixings are supplied as part of the PEWIRS and these are outside the scope of the certificate. The type and specification for the fastener is determined by the nature of the substrate, insulation thickness, overall weight of the system, the exposure environment and fire performance. The fixing pins shall be stainless steel, non-ferrous or other material that does not corrode. In addition and as part of the fire performance requirements, one fire resistant (stainless steel) fixing per square metre of insulation board/slab shall be used. Further information and advice should be obtained direct from PermaRock.

1.1.6 Reinforcement materials

PermaRock Reinforcing Mesh is an alkali resistant reinforcing mesh of glass fibre with a polymer coating that is supplied for general reinforcement in conjunction with PermaRock Bedding Mortar. Where additional reinforcement is required to provide increased resistance to impact PermaRock Armoured Mesh is also available.

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1.1.7 Ancillary components (outside scope of the certificate)

Other components required to complete the works are as follows:

- PermaRock Dubbing Out Compound
- PermaRock Profile Fixings
- PermaRock Beads, trims and flashings:
 - PermaRock Metal profiles and accessories
 - PermaRock Mesh Bandage
 - PermaRock Silicone Sealant and External Acrylic Sealant
- PermaRock Moss and Mould Remover.

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2 Product Performance

2.1 General

Where indicated the performance claims for either components or whole systems that have been assessed are described in the following sections of this certificate (see certificate sections 2.2 to 2.8 and Section 5 for a summary of product and system testing details).

2.2 Structure

External wall insulation and render systems are considered to be non-loadbearing and therefore do not make any contribution to the structural performance of the building.

The type of mechanical fastener used depends on the type of backing wall and shall be specified by the designer/structural engineer for each individual project and is therefore outside the scope of this certificate.

2.3 Fire

2.3.1 General

Where fire performance testing and assessments have been carried out for PermaRock external wall insulation and render system and/or the individual components the results are tabulated in the following sub sections (see Tables 2.1, Annex A and Annex B - Table B1 and Table B2). For further information about the fire test reports and any fire assessment reports cited in this certificate, please contact the certificate holder.

2.3.2 Fire resistance

The overall fire resistance for external walls onto which PermaRock insulation and render systems have been installed depends on the nature of the backing wall and is therefore outside the scope of this certificate.

2.3.3 Insulation and Render (reaction to fire)

Reaction to fire test data have been declared by the certificate holder for a range of external finishes applied onto either Mineral Fibre or EPS or Phenolic insulation boards. The tests were carried out in accordance with BS 476-6 *Fire tests on building materials and structures. Method of test for fire propagation for products* and BS 476-7 *Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products*. The reaction to fire testing for the PermaRock insulation and render systems that have been declared by the certificate holder are provided in Annex B for information and are therefore outside the scope of this certificate. Confirmation of the reaction to fire performance of the specific PEWIRS should be obtained from the certificate holder. It should also be noted, that from 1st October 2019, the reaction to fire classifications in Annex B are no longer be accepted in the Scottish Building Standards Domestic and Non-domestic Technical Handbooks.

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PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****2.3.4 Fire spread on external walls****For England**

Building (Amendment) Regulations 2018 (SI 2018/1230) which apply to buildings and building work in England came into force on 21st December 2018. This requires that all materials forming a part or element of an external wall or attachment must now achieve a class A2-s1, d0 or A1 when classified in accordance with BS EN 13501-1:2007+A1:2009 for use on buildings with a storey height 18m or greater above ground level.

For full details and exemptions in relation to the regulatory requirements, this certificate should be read alongside The Building (Amendment) Regulations 2018 (SI 2018 No. 1230).

For Scotland

New Domestic and Non-domestic Technical Handbooks came into effect in Scotland on 1st October 2019. This certificate should be read in conjunction with the Domestic and/or Non-domestic Technical Handbooks. New requirements for any building with a storey height at least 11 m above ground level were introduced. To comply with the new requirements either all components within the external wall system shall achieve European Class A2-s1,d0 or Class A1 when tested and classified in accordance with BS EN 13501-1:2007 + A1:2009 or as an alternative, the external cladding system shall have achieved a classification in accordance with BR 135, 'Fire Performance of external thermal insulation for walls of multi-storey buildings' when tested to BS 8414: Part 1: 2015+A1: 2017 or BS 8414: Part 2: 2015+A1: 2017.

It should be noted that reaction to fire classifications using BS 476 are no longer accepted.

For Wales

Building (Amendment) (Wales) Regulations 2019 (2019 No. 1499) which apply to buildings and building work in Wales came into force on 13th January 2019. This requires that all materials forming a part or element of an external wall or attachment must now achieve a class A2-s1, d0 or A1 when classified in accordance with BS EN 13501-1:2007+A1:2009 for use on buildings with a storey height 18m or greater above ground level.

For full details and exemptions in relation to the regulatory requirements, this certificate should be read alongside The Building (Amendment) (Wales) Regulations 2019 (2019 No. 1499).

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For Northern Ireland

For any building with a storey height at least 18 m above ground level either all components within the external wall system shall achieve European Class A2-s1,d0 or Class A1 when tested and classified in accordance with BS EN 13501-1:2007 + A1:2009 **or** as an alternative, the external cladding system shall have achieved a classification in accordance with BR 135, 'Fire Performance of external thermal insulation for walls of multi-storey buildings' when tested to BS 8414: Part 1: 2015+A1: 2017 or BS 8414: Part 2: 2015+A1: 2017.

Table 2.1 of the Appendix to Certificate No. 158/12 sets out those PEWIRS that have been classified A2-s1,d0 or A1 in accordance with BS EN 13501-1:2007 + A1:2009 and Annex A details the PEWIRS cladding systems that have achieved classification in accordance with BR 135. Confirmation of the fire performance classification of PEWIRS shall be obtained from the certificate holder.

Table 2.1 of this Appendix sets out those PEWIRS that have been classified A2-s1,d0 in accordance with BS EN 13501-1:2007 + A1:2009.

Table 2.1: Reaction to Fire Classification (European Classification System: BS EN 13501-1:2007 + A1:2009)			
System	Insulation type & thickness	Basecoat & finish	Classification
Where required – See <i>Conditions of Use</i> and clause 2.3.4 – <i>Fire spread on external walls</i>			
PermaRock Mineral Fibre System PermaRock Mineral Fibre Insulation	30 - 170 mm (incl.)	PermaRock Bedding Mortar, PermaRock Reinforcing Mesh PermaRock Silicone ^{ULTRA} K-Finish 1.5 mm (All Colours)	A2-s1,d0 ⁽¹⁾
		PermaRock Bedding Mortar, PermaRock Reinforcing Mesh PermaRock Brick Slips (All Colours)	
		PermaRock Bedding Mortar, PermaRock Reinforcing Mesh PermaRock Brick-effect Render (All Colours)	
Where permissible - See <i>Conditions of Use</i> and clause 2.3.4 – <i>Fire spread on external walls</i>			
PermaRock Mineral Fibre System PermaRock Mineral Fibre Insulation	30 - 170 mm (incl.)	PermaRock Bedding Mortar, PermaRock Reinforcing Mesh PermaRock Acrylic K-Finish 1.5 mm (Black)	B-s2,d0 ⁽²⁾
		PermaRock Bedding Mortar, PermaRock Reinforcing Mesh PermaRock Acrylic K-Finish 1.5 mm (White)	
(1)	A system with an A2-s1,d0 classification is considered suitable for use on or at any distance from the boundary and there is no height restriction on its use.		
(2)	Limitations on the use of these systems apply. The building regulations and supporting guidance in the relevant Country should be checked by a competent professional to ensure that these systems satisfy the requirements.		

PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****2.3.5 Other fire related construction detail requirements**

- 2.3.5.1 All insulation types - As part of the fire performance requirements one fire resistant (stainless steel) fixing per square metre of insulation board/slab shall be used.
- 2.3.5.2 Cavities - Where cavities are present, they shall be separated by horizontal and vertical fire barriers at locations defined in the relevant supporting documents to the Building Regulations.

2.4 Environment**2.4.1 Weather resistance**

- 2.4.1.1 PEWIRS will provide a weather resistant external wall insulation cladding to new and existing backing walls of brick and block masonry, dense and no fines concrete and sheathed light gauge steel and timber frame construction provided that the external finish and construction details at openings, fixtures and penetrations are installed and maintained in accordance with the requirements of this certificate and supplier's installation instructions.
- 2.4.1.2 For timber frame and light gauge steel frame the systems shall comply with the appropriate structural requirement from the relevant parts of BS 5268 *Structural use of timber* or BS 5950 *Structural use of steelwork in building* respectively to ensure water penetration resistance is maintained.
- 2.4.1.3 Where the wind driven rain exposure classification is very severe (refer to BS 5628-3 *Code of practice for the use of masonry. Materials and components, design and workmanship* and BS 8104 *Code of practice for assessing exposure of walls to wind-driven rain*) further information to ensure that appropriate construction detailing is provided under these exposure conditions can be found in BR 262 (1994) *Thermal insulation - avoiding risks* and by reference to the certificate holder.

2.4.2 Condensation Risk Assessment and Interstitial Condensation

- 2.4.2.1 For PEWIRS used for dwellings the project designer shall determine the condensation risk assessment in accordance with BS 5250 *Code of practice for control of condensation in buildings*.
- 2.4.2.2 The condensation risk assessment shall be carried out in accordance with BS EN ISO 13788 *Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation. Calculation methods*.

2.4.3 Project specific condensation risk assessments are required for dwellings.

- 2.4.3.1 Advice on construction detailing for thermal insulation materials is provided in BRE publication BR 262.
- 2.4.3.2 Steel and timber framed construction shall be designed to avoid the accumulation of condensation. Once the design process is completed additional insulation shall not be placed within the frame cavity or against the inner face of the construction neither shall insulation be removed from the PEWIRS.

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- 2.4.3.3 For steel and timber framed construction it is essential that any vapour control layer on the warm side of the structure is fully effective. Advice on U-value calculation modifications can be found in BRE Digest 465 *U-values for light steel frame construction*.

2.5 Safety in use**2.5.1 Wind loading**

- 2.5.1.1 The ultimate wind load to be resisted by the PermaRock Insulation and Render systems has been determined using BS 6399-2 *Loading for buildings. Code of practice for wind loads*. In locations where there are high wind load pressure coefficients the need for additional fixings and/or adhesive may be necessary.
- 2.5.1.2 The performance of the PermaRock Drained Cavity Track EPS system using the dynamic wind uplift test method specified in European Technical Approval Guideline (ETAG)-004 Wind load resistance was carried out. The test result obtained for the maximum unfactored wind loading (suction) was 2.85 kPa. The system was loaded in tension and the backing wall failed leaving the system intact.
- 2.5.1.3 The performance of the PermaRock Mineral Fibre system using the dynamic wind uplift test method specified in European Technical Approval Guideline (ETAG) 004 Wind load resistance was carried out. The characteristic failure load of the system as tested is 3.645 kPa. The system failed as a result of a fixing withdrawing from the substrate.

2.5.2 Impact resistance

- 2.5.2.1 The PEWIRS has adequate resistance to impact damage in situations other than those with public access below a line 1.5m above adjacent ground or floor levels exposed to pedestrians with little incentive to exercise care. Additional reinforcement is required below this level in the coating finishes. In these circumstances the certificate holder will provide a solution which is outside the scope of this certificate. Localised impact damage can occur to the brick slip finish at ground floor level.

2.6 Noise

PermaRock does not claim any acoustic performance for their external wall insulation and render systems.

2.7 Energy**2.7.1 General**

The thermal performance of the PEWIRS has not been assessed by BRE Global.

PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****2.7.2 U-value calculations**

U-value calculations shall be carried out for external wall constructions in accordance with BS EN ISO 6946 *Building components and building elements. Thermal resistance and thermal transmittance. Calculation method* and BRE Report BR443:2006 *U-value Conventions in Practice*. The thermal conductivity values to be used in calculations are presented in Table 1.2. Table 2.2 (below) shows insulation thicknesses to be applied to a 229mm thick solid brick wall to obtain a U-value of 0.30 W/m²K.

Table 2.2 Thickness of insulation required to obtain U-value of 0.30W/m²K for solid external brick (229mm) wall construction.

Insulation	Thickness (mm)
Mineral fibre	100
EPS (white)	100
Phenolic foam	60

Notes (for Table 2.2)

- 1 U-value calculations, refer to BRE report BR 443 Conventions for U-value calculations
- 2 External wall construction details (from outside to inside)
 - External surface
 - PermaRock Dashing Mortar
 - Reinforced PermaRock Bedding Mortar
 - Fixings including adhesive
 - Insulation (thickness required varies – see above)
 - Brickwork (solid – 229mm)
 - Dense plaster

2.8 Durability**2.8.1 Hygrothermal testing**

Hygrothermal testing for PermaRock Insulation and Render systems was carried out in accordance with MOAT 22, for Mineral Fibre and Phenolic insulation using Grey Bedding Mortar and standard reinforcement mesh and a number of external finishes. The results are included in Table 5.1.

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2.8.2 Periodic maintenance

Periodic maintenance checks should be undertaken by the building owner on the external render finish particularly on joints, at the junctions with flashings and sills, and around any penetration through the render, e.g. for plumbing, flues, etc as for any render system. Penetrations through an external wall are subject to The Building (Amendment) Regulations 2018 (SI 2018 No. 1230) for buildings in England. This means that only plumbing products, flues and other products that are not on the exempt list and that are classified as A2-s1, d0 or A1 in accordance with BS EN 13501-1:2007 +A1:2009 shall be used in the external walls of buildings with a storey height 18m above ground level. The PEWIRS shall be maintained in accordance with the PermaRock “Maintenance and care/repair manual”.

2.8.3 Design Life

PEWIRS can be considered to have a design working life of at least 30 years provided that the system has been installed in accordance with the requirements of the manufacturer and of this certificate, is properly maintained and any accidental damage to the finish is effectively repaired.

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3 Building Regulations

3.1 General

The PermaRock External Wall Insulation and Render Systems, when used in accordance with this certificate and the certificate holder's installation instructions, can assist in demonstrating that the works within which they are installed will meet the relevant requirements of the following building regulations and standards.

3.2 England

For England the Building Regulations (2010) and the Building (Amendment) Regulations 2018 (SI 2018/1230), incorporating the latest amendments to the Approved Documents for use in in England.

Regulation 2	Interpretation
Regulation 4	Requirements relating to building work
Regulation 5	Meaning of change of use
Regulation 6	Requirements relating to material change of use
Regulation 7	Materials and workmanship
A1	Loading
B Vol. 1	Fire safety - Dwellinghouses
B Vol. 2	Fire safety – Buildings other than dwellinghouses
C2	Resistance to moisture
L1A	Conservation of fuel and power in new buildings
L1B	Conservation of fuel and power in existing buildings
L2A	Conservation of fuel and power in new buildings other than dwellings
L2B	Conservation of fuel and power in existing buildings other than dwellings

3.3 Wales

For Wales the Building Regulations (2010) and the Building (Amendment) (Wales) Regulations 2019 (2019 No. 1499), incorporating the latest amendments to the various Approved Documents for use in in Wales.

Regulation 4	Requirements relating to building work
Regulation 6	Requirements relating to material change of use
Regulation 7	Materials and workmanship
A1	Loading
B Vol. 1	Fire safety - Dwellinghouses
B Vol. 2	Fire safety – Buildings other than dwellinghouses
C2	Resistance to moisture
L1A	Conservation of fuel and power: New dwellings
L1B	Conservation of fuel and power: Existing dwellings
L2A	Conservation of fuel and power: New buildings other than dwellings
L2B	Conservation of fuel and power: Existing buildings other than dwellings

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3.4 Scotland

The Building (Scotland) Regulations 2004 incorporating the latest amendments to the various Technical Handbooks; specifically, in the Building (Scotland) Regulations 2004:

Regulation 8	Fitness and durability of materials and workmanship
Regulation 9	Building standards applicable to design and construction

and in the Building standards technical handbook 2019: Domestic buildings and Building standards technical handbook 2019: Non-domestic buildings, specifically sections:

1	Structure
2	Fire
3	Environment
6	Energy

3.5 Northern Ireland

The Building (Northern Ireland) Regulations 2012 incorporating the latest amendments to the various Technical Booklets

B	Materials and workmanship
C	Site preparation and resistance to contaminants and moisture
D	Structure
E	Fire Safety
F1	Conservation of fuel and power in dwellings
F2	Conservation of fuel and power in buildings other than dwellings

3.6 Construction (Design and Management) – CDM Regulations

- Construction (Design and Management) Regulations 2015
- Construction (Design and Management) Regulations (Northern Ireland) 2007 (as amended)

The certificate should form part of the information used by the client, CDM coordinator, designer and contractors to discharge their responsibilities under these Regulations.

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4 Installation/Practical Application

4.1 General

The performance of the PermaRock Insulation and Render systems depends on correct installation. They shall be installed strictly in accordance with the Certificate holder's installation instructions, taking account of the delivery, storage and handling requirements of this certificate and the structural design engineer. The quality of installation actually achieved on specific sites is not covered by this certificate. Therefore, it is recommended that the quality of installation and workmanship is subject to appropriate checks by a competent person for each installation.

4.2 Approved Installers

Installation of the PEWIRS shall be carried out in accordance with the PermaRock Technical Installation Manual and shall only be carried out by installers trained, approved, registered and monitored by PermaRock Products Ltd.

4.3 Storage, handling and packaging

Products shall be stored in accordance with the "PermaRock Technical Installation Manual" and with reference to the technical data sheet and materials safety data sheet for each product.

All powder products should be stored in dry well-ventilated container storage, designated for this purpose.

K & R Finishes, K & R Primer, Brick Slip Adhesive and Brick Slip Pointing Mortar shall be protected from frost. The minimum storage temperature is 5°C, below this temperature heated storage or insulation covering for product containers is required.

PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****Table 4.1 Packaging and identification information**

Product description	Packaging type	Pack size
PermaRock Adhesive	Green/white paper valve bags	25kg
PermaRock Lamella Adhesive	Yellow/white paper valve bags	25kg
PermaRock Bedding Mortar	Light blue/white paper valve bags	25kg
PermaRock Dashing Mortar	Cream/white paper valve bags	25kg
PermaRock Scratch Render	Green/white paper valve bags	25kg
PermaRock Brick Effect Render (Base and Face Layer)	Green/white paper valve bags	25kg
PermaRock K & R Primer	White plastic tubs	25kg
PermaRock Acrylic and Silicone K Finish	Plastic pail	25kg
PermaRock Silicone ^{ULTRA} K & R Finish	Blue plastic buckets	20kg
PermaRock Brick Slip Adhesive	White plastic tubs	25kg
PermaRock Brick Slip Pointing Mortar	White plastic tubs	25kg
PermaRock Reinforcing Mesh	Roll	50m x 1m
PermaRock Armoured Mesh	Roll	25m x 1m

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5 Technical Appraisal

5.1 Performance Tests

Performance tests and inspection of test data have been carried out to determine the properties and performance of the PEWIRS, these include:

- Resistance to wind loading
- Bonding properties
- Performance in relation to fire
 - Reaction to fire
- Resistance to water penetration and water vapour transmission
- Resistance to impact
- Thermal properties
- Durability
 - Thermal cycling
 - Resistance to freeze/thaw cycles

Assessment has been made of the products and practicality of installation which was found to be suitably addressed by the certificate holder's installation instructions.

5.2 Quality Control

Traceable records are maintained by the certificate holder. The certificate holder carries out checks at regular intervals to ensure the quality of the product is maintained within the defined product specification. BRE Global undertakes regular monitoring of the factory production against an agreed Quality plan for each product.

PermaRock operates processes and procedures that are in accordance with ISO 9001 Quality Management Systems.

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Table 5.1 Summary of product performance for external wall insulation and render systems

Characteristic	Test method	Product	Insulation type		
			Mineral Fibre	Phenolic Foam	Expanded Polystyrene (EPS)
Reaction to fire ^{1,2}	BS 476-6 & 7		See Tables B.1 and B.2		
Fire resistance	N/A		See Note 2		
Wind load resistance ³	ETAG-004	Cavity Track	-	-	2.85kPa
	ETAG-004	Mineral Fibre System	3.465kPa	-	-
	Project specific	Fixings	4kN/m ²	-	-
Impact (hard body)	BS 8200	Alpine	>10Nm	-	>10Nm
		Dashing	>10Nm	-	>10Nm
		Scratch	>3Nm	-	>3Nm
		Brick	>3Nm	-	>3Nm
		Brick slip	<3Nm	-	<3Nm
		Acrylic K	>3Nm	-	-
		Silicone K	>3Nm	-	-
		Silicone ^{Ultra} K	>3Nm	-	-
Condensation and U-value calculations	BS 5250 & EN ISO 6946	System	Example calculations show no harmful condensation risk, U-value calculations are project specific		
Hygrothermal test	MOAT 22	System	Pass - At least 25 years		
Water vapour resistance of system (excluding insulation) ⁴	BS 7374 BS 7374 BS 7374 BS 7374 BS 7374 BS EN 12086 BS 7374	Alpine Dashing Scratch Brick Brick slip Acrylic K Silicone K Silicone ^{Ultra} K	The indicative water vapour resistance for the whole system (but excluding the insulation layer) does not exceed 10 MNs/g.		
Freeze thaw	MOAT 22	System	Pass - At least 25 years		

NOTES (for Table 5.1)

1. Reaction to fire tests (RTF) for defined finishes (no longer accepted in Scotland)
2. It is the responsibility of the specifier to ensure that the fire performance classifications are adequate for the intended application and relate specifically to the PEWIRS in use.
3. Wind load resistance including the statistical factor but excluding the safety factor
4. To obtain values of water vapour resistance or for condensation risk assessments for specific systems please consult PermaRock Products Limited.

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PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****5.3 Standards**

The following British Standards and Codes of Practice, and CEN documents have been referred to for this assessment:

BS EN 823:1995	Thermal insulating products for building applications. Determination of thickness
BS EN 1602:1997	Thermal insulating products for building applications. Determination of the apparent density
BS EN 1991-1-4:2005	Eurocode 1. Actions on structures. General actions. Wind actions
BS EN 12086:1997	Thermal insulating products for building applications. Determination of water vapour transmission properties
BS EN 12667:2001	Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance.
BS EN 13162:2008	Thermal insulation products for buildings. Factory made Mineral Fibre (MW) products. Specification
BS EN 13163:2008	Thermal insulation products for buildings. Factory made products of expanded polystyrene (EPS). Specification
BS EN 13165:2008	Thermal insulation products for buildings. Factory made products of rigid polyurethane foam (PU). Specification.
BS EN 13166:2008	Thermal insulation products for buildings. Factory made products of phenolic foam (PF). Specification
BS EN ISO 6946:2007	Building components and building elements. Thermal resistance and thermal transmittance. Calculation method
BS EN ISO 13788: 2002	Hygrothermal performance of building components and building elements. Internal surface temperature to avoid critical surface humidity and interstitial condensation. Calculation methods.
BS 476-6:1989	Fire tests on building materials and structures. Method of test for fire propagation for products

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BS 476-7:1997	Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products
BS 7374:1990	Method of test for water vapour transmission resistance of board materials used in buildings
BS 5250:2011	Code of practice for control of condensation in building
BS 5268-2:2002	Structural use of timber. Code of practice for permissible stress design, materials and workmanship
BS 5628-1:2005	Code of practice for the use of masonry. Structural use of unreinforced masonry
BS 5628-3:2005	Code of practice for the use of masonry. Materials and components, design and workmanship
BS 5080-1:1993	Structural fixings in concrete and masonry. Method of test for tensile loading
BS 5080-2:1986	Structural fixings in concrete and masonry. Method for determination of resistance to loading in shear
BS 5950-5:1998	Structural use of steelwork in building. Code of practice for design of cold formed thin gauge sections
BS 6399-2:1997	Loading for buildings. Code of practice for wind loads
BS 8104:1992	Code of practice for assessing exposure of walls to wind-driven rain
BS 8200:1985	Design of non-loadbearing external vertical enclosures of buildings
BS 8414-1:2002	Fire performance of external cladding systems. Test methods for non-loadbearing external cladding systems applied to the face of a building
BS 8414-2:2005	Fire performance of external cladding systems. Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame

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European Technical Approval Guidelines (ETAG):

Note: From the end of 2018 all existing ETAGs were withdrawn by EOTA but remain available online to enable users to review test methods used. At the date of publication of this Certificate revision no strictly comparable European Assessment Document (EAD) was available.

ETAG 004 External Thermal Insulation Composite Systems (ETICS) with Rendering

Union Européenne Pour L' Agrement Technique Dans le Construction (UEAtc) document:

MOAT 22:1988 Directives for the assessment of external insulation systems for walls.

BRE Publications

BR 135: 2013 Fire performance of external thermal insulation for walls of multi-storey buildings. Third edition

BR 135: 2007 Fire performance of external thermal insulation for walls of multi-storey buildings. Second edition

BR 262: 2002 Thermal insulation – avoiding the risks (Third edition)

BR 465: 2002 U-values for light steel frame construction

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6 Conditions of Certificate Issue

6.1 Validity

This certificate will be valid for a period of three years from date of issue. It will remain valid in so far as:

- a) The materials and method of manufacture are unchanged or BRE Global has assessed any changes and found them to be satisfactory.
- b) The designs and specifications are unaltered from those examined by BRE Global.
- c) The certificate holder continues to have the product checked by BRE Global.

6.2 Health and Safety

This certificate and the recommendations herein do not purport in any way to restate the requirements of the Health and Safety at Work Act 1974 or any statutory or common law duty of care which exists now or in the future: nor is compliance with these recommendations to be assumed as satisfying the requirements of the said Act or any existing or future statutory or common law duty of care.

6.3 References to Other Documentation

Where reference is made in this certificate to any Act of Parliament, Regulation, Code of Practice, British or other Standard or other publications, it shall be construed as reference to such publication in the form in which it is in force at the date of issue of the certificate.

6.4 Patents

BRE Global make no representational warranty that any patent or similar industrial property right is valid or that the manufacture, use, sale, lease or any other dealing or disposition of the product in whole or in part is not an infringement of any patent or industrial property right not owned by the certificate holder.

6.5 Confirmation of validity

Confirmation that the certificate is current shall be obtained from the BRE Global website at www.redbooklive.com.

PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****ANNEX A -Details of constructions tested to requirements of BR 135 (see Table 2.1)****System 1 - PermaRock Track EPS Drained Cavity System, 120mm EPS insulation Finish Colours (Verona 145 and Agave 110) – Classified to BR 135 Second Edition Annex B (2007)**

- Lightweight steel stud framework 100mm wide (Protektor) supplied by Stanta which was fixed between each floor. The bottom track was fixed to the concrete lintel using multi-monto 7.5 x 50mm concrete fixings and the top track was shot fixed to the steel angle member using “Hilti gun and nail system”. Stud to track fixing was achieved using SFS SD3 5.5 x 22mm low profile self-drilling self-tapping screws.
- A 12mm Styroc cement bonded particle board was fixed to the external face of the Stanta Ltd stud frame. 50mm thick RWA45 Rockwool (density 45kg/m³) were friction fitted between the studs and 15mm fire resistant plasterboard sheets (Lafarge Firecheck wallboards 2400mm x 1200mm x 15mm) were fixed to the inner face of the stud frame using 25 and 44mm DSD self-drilling screws.
- A PermaRock base rail (ref 6700/12) was fitted to the Styroc cement bonded particle board using self-drilling self-tapping low-profile head screws at 300mm centres, and PermaRock packing shims (698/01) were used to provide a nominal 20mm drainage gap between the back and the base rail and the face of the Styroc board. 120mm PermaRock Drained Cavity System EPS Insulation boards (500mm x 500mm x 120mm Density 15kg/m³ FR grade to BS EN 13163) were fitted onto the base rail. Vertical T-splines (ref: 633/00 – PVC) were inserted into the vertical grooves between the boards. A horizontal intermediate rail (ref: 632/00 PVC and ref: 632/01 – galvanised steel for fire break positions) was then interlocked into the vertical splines and fixed to the substrate at nominal 300mm centres with a packing shim fitted at each point to maintain the cavity. Use of track system means that insulation is not in direct contact with the substrate and that a nominal drainage cavity was created behind the insulation system. An inclined cavity drainage profile was fitted above the combustion chamber opening, 0.5 m above the combustion chamber opening and then every 2.5m PermaRock cavity fire barriers (25mm wide) were compression fitted into the cavity at the same locations.
- Insulation boards were covered with PermaRock Bedding Mortar and an alkali resistant, twisted multi-strand glass fibre reinforcing mesh (PermaRock Reinforcing Mesh), 160g/m² with a mesh size of 3.5mm x 3.5mm worked into it. Joints were overlapped by a minimum 100mm. An additional 2-3mm layer of PermaRock Bedding Mortar was used to provide a float finish to the system.
- PermaRock K and R primer was applied to the system at a rate of 250g/m² and allowed to dry. The finish coat applied to this was 1.5 to 2mm PermaRock Acrylic K finish that was applied using a stainless-steel trowel and textured plastic float. The test specimen was finished in two colours (Up to 1.5m above the top of the combustion chamber (finished in Verona 145) and above this (finish colour was Agave 110).

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PermaRock Products Limited**PermaRock External Wall Insulation & Render Systems (PEWIRS)****System 2 - PermaRock Insulated Render System (30-160mm single density or 30 mm-250mm dual density mineral fibre insulation) – Classified to BR 135 Third Edition Annex A (2013)**

- PermaRock starter track/base profiles and profile fixings fixed to blockwork substrate at 300mm centres and additional fixings 50mm from each end.
- PermaRock Mineral Fibre Insulation (1000 x 500mm) tested at thicknesses of 30mm, 110mm and 160mm. The insulation board density was nominal 140kg/m³ (RWF14 Issue 3 dated 12.05.09).
- PermaRock Adhesive or PermaRock Lamella Adhesive applied around perimeter 50mm from edge and as vertical strips 300mm in from outer edges at a nominal coverage rate of 3.5 to 4.5kg/m².
- Vertical joints (gaps) were filled with slivers of insulation.
- PermaRock stainless steel fixing is installed through the centre of each insulation panel/slab/batt into blockwork substrate.
- PermaRock Bedding Mortar trowel applied with a nominal application rate 4 to 4.5kg/m². Whilst base coat is wet. PR Reinforcing Mesh troweled into surface of basecoat. All internal corner joints and mesh sheet joints are overlapped by a minimum of 100mm. Stress patches 250mm by 500mm are also applied diagonally across the corners of the combustion chamber opening. All external corner details are also overlapped to the standard reinforcing mesh by 100mm and are fitted with PermaRock Corner Profiles.
- PermaRock Bedding Mortar is trowel applied to the rasped and dust free surface of the insulation boards at a nominal application rate of 4 to 4.5 kg/m². Whilst the base coat is wet, PermaRock Reinforcing Mesh is troweled into the surface of the basecoat. All internal corner joints and mesh sheet joints are overlapped by a minimum 100mm.
- PermaRock Stainless Steel fixings are installed through the basecoat layer, reinforcing mesh, insulation board and adhesive layer into the blockwork at a minimum rate of 7.5 fixings per m². These fixings are hammered into the substrate through pre-drilled holes through the full thickness of the system. The maximum grid spacing for the fixings is set at 365mm vertically and horizontally with a minimum of 150mm spacing to external corners and maximum 150mm spacing from the substrate corner.
- A second layer of PermaRock Bedding Mortar is then trowel applied to hardened base coat at a nominal thickness of 4 kg/m².
- Primer and topcoats are applied once the base coat layers have hardened. A full coat of PermaRock K and R primer is applied to the surface of the system using a roller at a nominal rate of 350g/m². The white PermaRock Acrylic K finish is trowel applied to hardened primer basecoat layer at a nominal rate of 2.7 kg/m². The system is then allowed to dry for 28 days prior to testing.

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ANNEX B – Reaction to fire classification summary table (Informative)

Table B.1 Reaction to fire classification summary table for PermaRock Acrylic K, Silicone K and Silicone^{Ultra} K Finish each incorporating PermaRock Bedding Mortar and PermaRock Reinforcing Mesh

Finish	Finish colour	Insulation type		
		Mineral Fibre	Phenolic Foam	Expanded Polystyrene (EPS)
PermaRock Acrylic K Finish	White	Class 0	Class 0	Class 0
	Black	Class 0	Class 0	Class 0
PermaRock Acrylic K Finish	White	B-s2,d0	Class 0	Class 0
	Black	B-s2,d0	Class 0	Class 0
PermaRock Silicone K Finish	White	Class 0	Class 0	Class 0
	Yellow	Class 0	Not Tested	Class 0
	Black	Class 0	Class 0	Class 0
PermaRock Silicone ^{Ultra} K Finish	White	Class 0	Class 0	Class 0
	Yellow	Class 0	Not Tested	Class 0
	Black	Class 0	Class 0	Class 0

Notes.

- Results are applicable to finish colours with a manufacturer's declared maximum organic content of 9.2%.
- Full details are presented in BRE Global fire assessment report CC 254252 issue 01
- Reaction to fire classifications (UK) cannot be assumed to correlate with a given European class unless they have been tested accordingly
- Note that Class 0 is a product performance classification for wall and ceiling linings, it is not a classification identified in any British Standard. This is achieved if a material or the surface of a composite product is either:
 - composed throughout of materials of limited combustibility; or
 - a Class 1 material which has a fire propagation index (I) of not more than 12 and sub-index (i1) of not more than 6.

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Table B.2 Reaction to fire classification summary table for PermaRock Dashing Mortar, PermaRock Scratch Render PermaRock Mineral K Finish and PermaRock Brick Effect Render each incorporating PermaRock Reinforcing Mesh

No.	Finish	Finish colour	Insulation type		
			Mineral Fibre	Phenolic Foam	Expanded Polystyrene (EPS)
1	Dashing Mortar	White, Yellow, Red	Class 0	Class 0	Class 0
2	Scratch Render	White, Yellow, Red	Class 0	Class 0	Class 0
3	Brick Effect Render	White, Yellow, Red	Class 0	Class 0	Class 0

Notes.

- For 1, 2 and 3 full details are presented in BRE Global fire assessment report CC 249809 Issue 02
- BRE Global was not involved in the sampling process and therefore cannot comment upon the relationship between the samples supplied for test and the system supplied to market.
- Reaction to fire classifications (UK) cannot be assumed to correlate with a given European class unless they have been tested accordingly
- Note that Class 0 is a product performance classification for wall and ceiling linings, it is not a classification identified in any British Standard. This is achieved if a material or the surface of a composite product is either:
 - composed throughout of materials of limited combustibility; or
 - a Class 1 material which has a fire propagation index (I) of not more than 12 and sub-index (i1) of not more than 6.

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ANNEX C – List of Figures (All Informative)

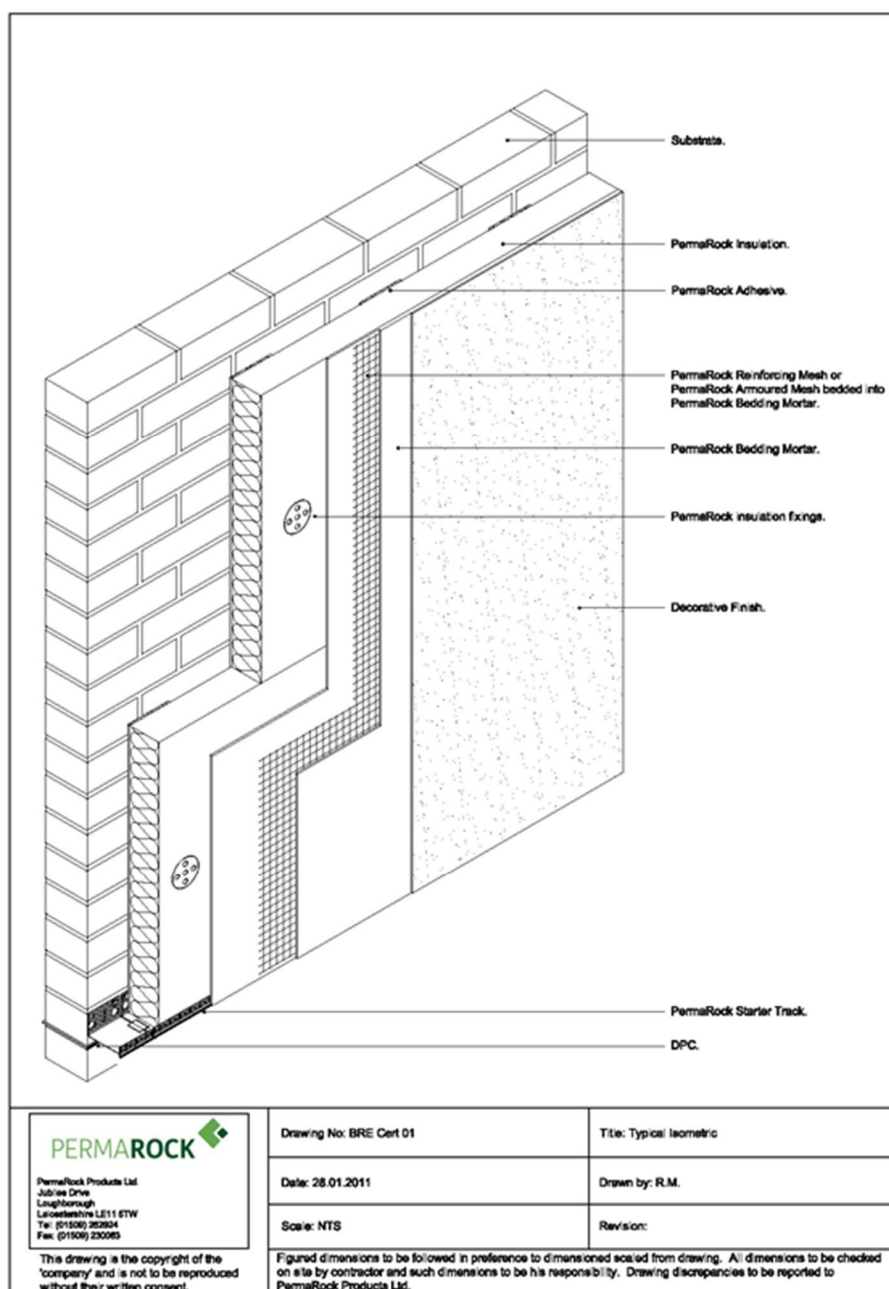


Figure C1. Typical EWI system components (Informative)

Note – PermaRock Lamella Adhesive can also be used where figure indicates PermaRock Adhesive

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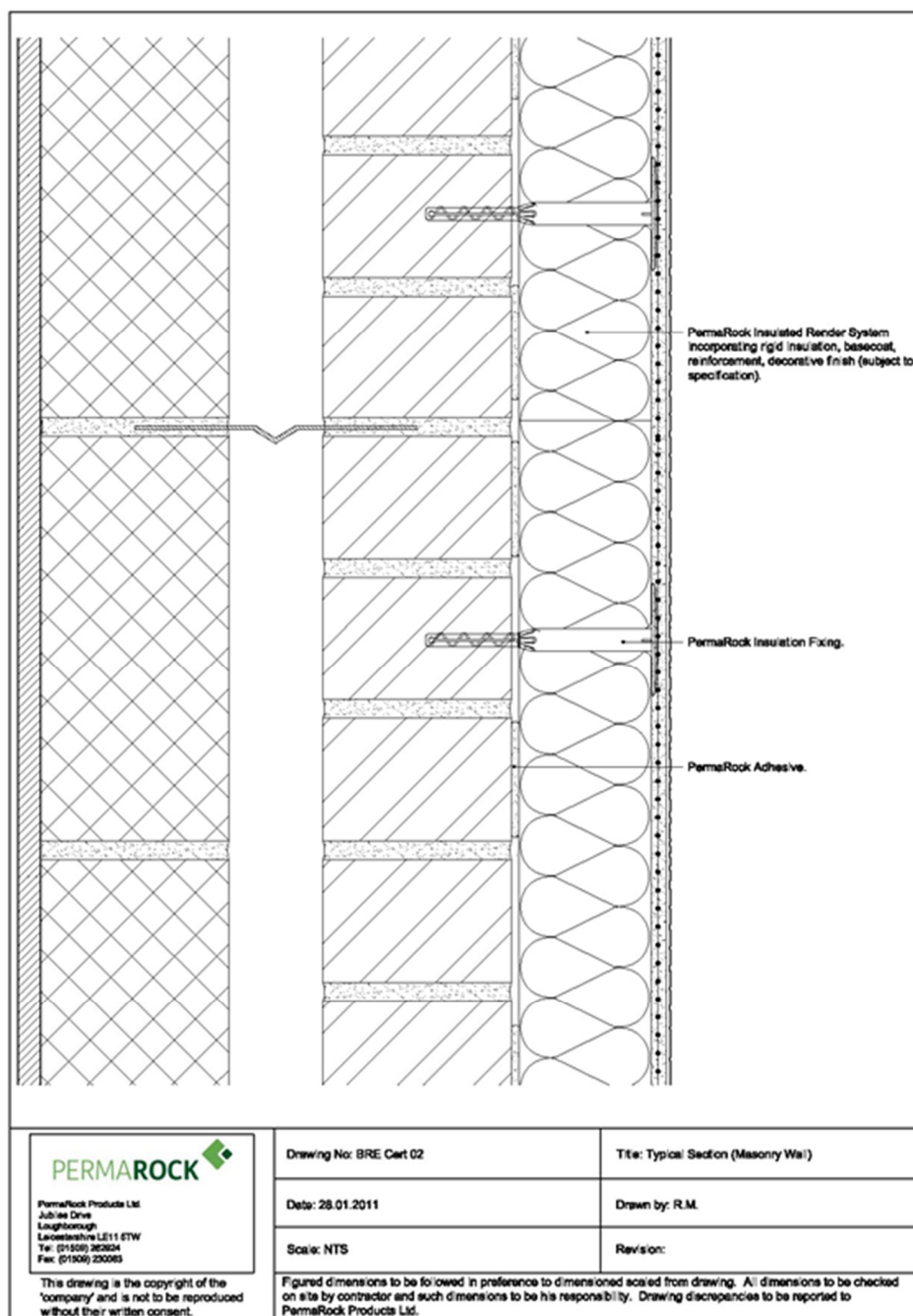


Figure C2. Typical section masonry wall with cavity (Informative)

Note – PermaRock Lamella Adhesive can also be used where figure indicates PermaRock Adhesive

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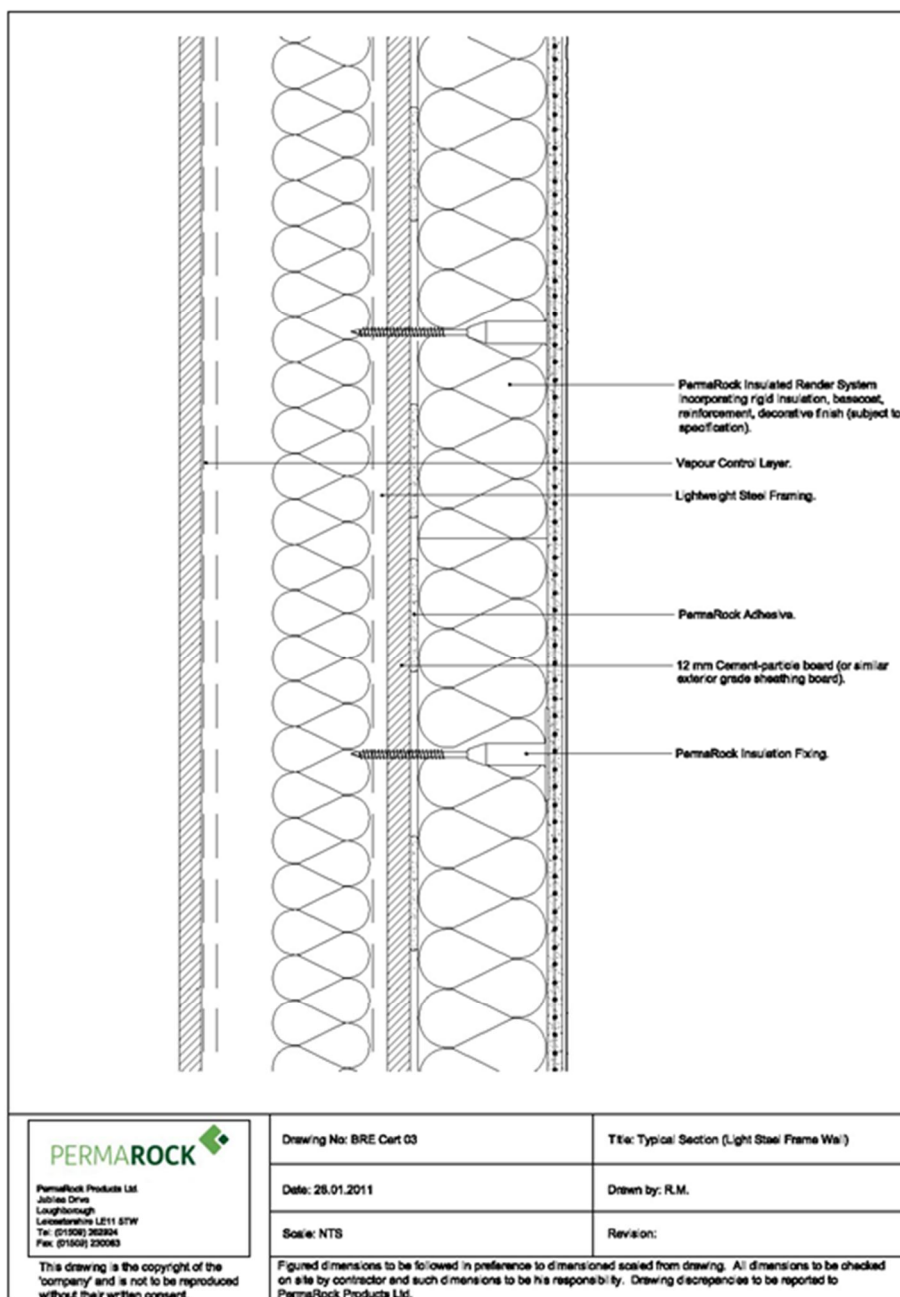


Figure C3. Typical section for framed backing wall (Informative)

Note – PermaRock Lamella Adhesive can also be used where figure indicates PermaRock Adhesive

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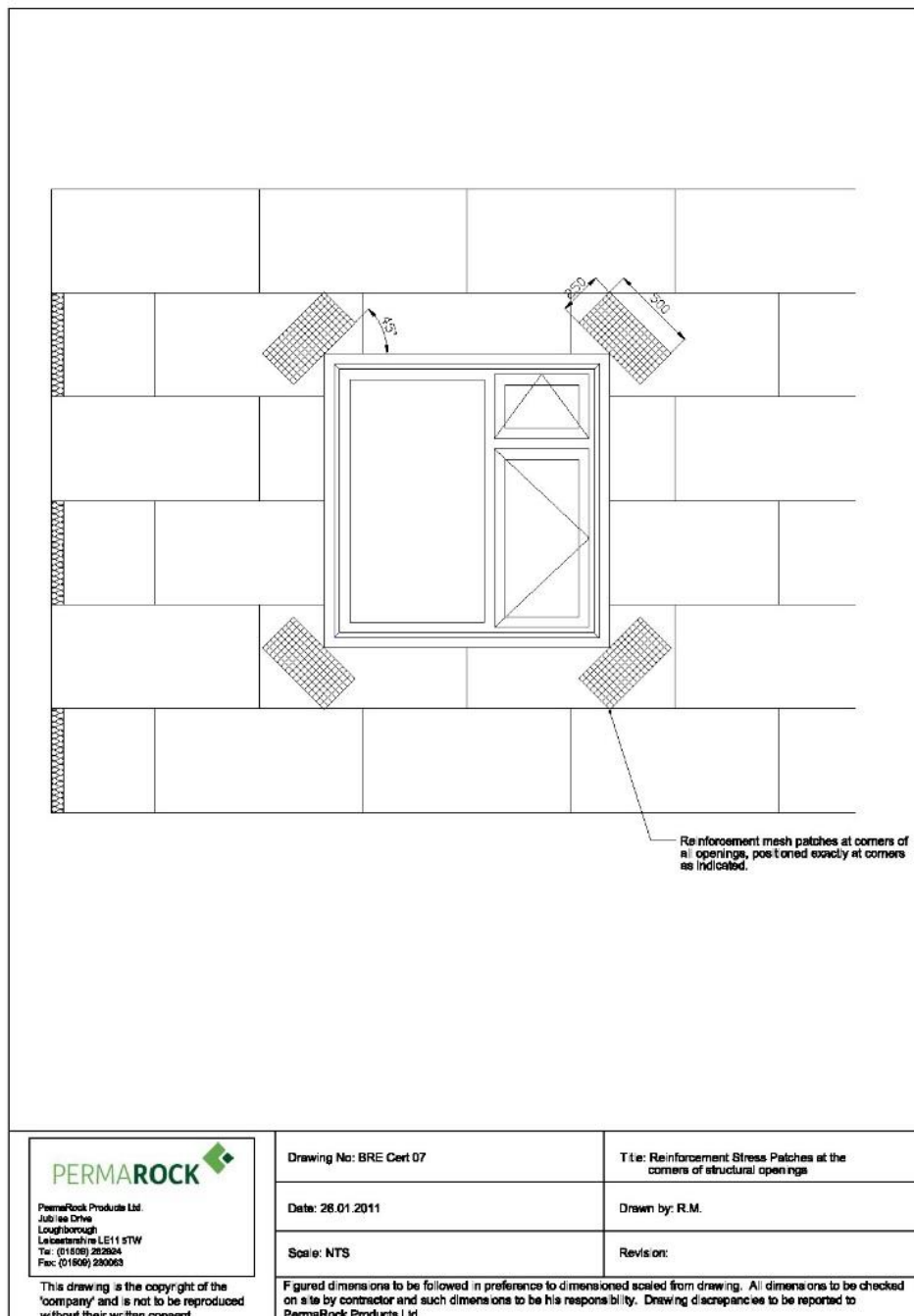


Figure C4. Reinforcement pattern for structural openings (Informative)