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Agrément Certificate
09/4625
Product Sheet 4

WETHERBY EXTERNAL WALL INSULATION SYSTEMS

EPSITEC STONE WOOL EXTERNAL WALL INSULATION SYSTEM FOR TIMBER FRAMED BUILDINGS

This Agrément Certificate Product Sheet (1) relates to the Epsitec Stone Wool External Wall Insulation System for Timber Framed Buildings, comprising mineral wool (MW) insulation slabs, mechanically fixed to sheathed timber framed substrates using either steel spacer rails or timber battens, with a glass-fibre-mesh reinforced basecoat and render finishes. The system is suitable for use, with height restrictions, on new or existing domestic and non-domestic buildings.

(1) Hereinafter referred to as 'Certificate'.

CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production†
- formal three-yearly review.†

KEY FACTORS ASSESSED

Thermal performance — the system can be used to improve the thermal performance of external walls and can contribute to satisfying the requirements of the national Building Regulations (see section 6).

Strength and stability — the system can adequately resist wind loads and impact damage (see section 7).

Behaviour in relation to fire — the system can have an A2-s1, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2007 and its use is restricted (see section 8).

Risk of condensation — the system can contribute to limiting the risk of interstitial and surface condensation (see section 11).

Durability — when installed and maintained in accordance with the Certificate holder's recommendations and this Certificate, the system will remain effective for at least 30 years (see section 13).

The BBA has awarded this Certificate to the company named above for the system described herein. This system has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

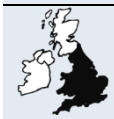
Date of Second issue: 29 June 2022
Originally certificated on 9 December 2019

Hardy Giesler
Chief Executive Officer

This Certificate was amended on 22 May 2024 as part of a transition of The BBA Agrément Certificate scheme delivered under the BBA's ISO/IEC 17020 accreditation. This Certificate was issued originally under accreditation to ISO/ IEC 17065. Sections marked with the symbol † are not issued under accreditation. Full conversion to the ISO/IEC 17020 format will take place at the next Certificate review. The BBA is a UKAS accredited Inspection Body (No.4345). ***Readers MUST check the validity of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.*** *Any photographs are for illustrative purposes only, do not constitute advice and must not be relied upon.*

Regulations

In the opinion of the BBA, Epsitec Stone Wool External Wall Insulation System for Timber Framed Buildings, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	**A1**	**Loading**
Comment:		The system can sustain and transmit wind loads to the structural frame. See sections 7.1 to 7.13 of this Certificate.
Requirement:	**B3(4)**	**Internal fire spread**
Comment:		The system is restricted by this Requirement. See section 8.3 of this Certificate.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The system is restricted by this Requirement. See sections 8.1 to 8.4 of this Certificate.
Requirement:	**C2(b)**	**Resistance to moisture**
Comment:		The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.
Requirement:	**C2(c)**	**Resistance to moisture**
Comment:		The system can contribute to minimising the risk of interstitial and surface condensation. See sections 11.2 and 11.4 of this Certificate.
Requirement:	**L1(a)(i)**	**Conservation of fuel and power**
Comment:		The system can contribute to satisfying this Requirement. See sections 6.1 and 6.2 of this Certificate.
Regulation:	**7(1)**	**Materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**7(2)**	**Materials and workmanship**
Comment:		The system is restricted by this Regulation. See sections 8.1 to 8.4 of this Certificate.
Regulation:	**26**	**CO_2 emission rate for new buildings**
Regulation:	**26A**	**Fabric energy efficiency rates for new dwellings (applicable to England only)**
Regulation:	**26A**	**Primary energy consumption rates for buildings (applicable to Wales only)**
Regulation:	**26B**	**Fabric performance values for new dwellings (applicable to Wales only)**
Comment:		The system can contribute to satisfying these Regulations. See sections 6.1 and 6.2 of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	**8(1)(2)**	**Durability, workmanship and fitness of materials**
Comment:		The system can contribute to a construction satisfying this Regulation. See sections 12 and 13.1 and the *Installation* part of this Certificate.
Regulation:	**9**	**Building standards applicable to construction**
Standard:	1.1	Structure
Comment:		The system can sustain and transmit wind loads to the structural frame. See sections 7.1 to 7.13 of this Certificate.
Standard:	2.4	Cavities
		The system is restricted by this Standard, with reference to clause 2.4.2[(1)(2)]. See section 8.3 of this Certificate.

Standard:	2.6	Spread to neighbouring buildings
Comment:		The system is restricted by this Standard, with reference to clauses 2.6.4(1)(2), 2.6.5(1) and 2.6.6(2). See sections 8.1 to 8.4 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The system restricted by this Standard, with reference to clause 2.7.1(1)(2). See sections 8.1 to 8.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system can satisfy this Standard, with reference to clauses 3.10.1(1)(2) and 3.10.2(1)(2). See section 10.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The system can satisfy this Standard, with reference to clauses 3.15.1(1), 3.15.4(1) and 3.15.5(1). See sections 11.3 and 11.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Buildings insulation envelope
Comment:		The system can contribute to satisfying these Standards, with reference to clauses 6.1.1(1)(2), 6.1.2(1)(2), 6.1.3(1), 6.1.6(1), 6.1.10(2), 6.2.1(1)(2), 6.2.3(1), 6.2.4(2), 6.2.5(2), 6.2.6(1), 6.2.7(1), 6.2.8(2), 6.2.9(1)(2), 6.2.10(1), 6.2.11(1), 6.2.12(2) and 6.2.13(1)(2). See sections 6.1 and 6.2 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the system can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4(1)(2) [Aspects 1(1)(2) and 2(1)], 7.1.6(1)(2) [Aspects 1(1)(2) and 2(1)] and 7.1.7(1)(2) [Aspect 1(1)(2)]. See section 6.1 of this Certificate.
Regulation:	**12**	**Building standards applicable to conversions**
Comment:		All comments given for this system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1(1)(2) and Schedule 6(1)(2).

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	**23**	**Fitness of materials and workmanship**
Comment:		The system is acceptable. See section 13.1 and the *Installation* part of this Certificate.
Regulation:	**28(b)**	**Resistance to moisture and weather**
Comment:		The system provides a degree of protection against rain ingress. See section 10.1 of this Certificate.
Regulation:	**29**	**Condensation**
Comment:		The system contributes to minimising the risk of interstitial condensation. See section 11.4 of this Certificate.
Regulation:	**30**	**Stability**
Comment:		The system can sustain and transmit wind loads to the structural frame. See sections 7.1 to 7.13 of this Certificate.
Regulation:	**35(4)**	**Internal fire spread**
Comment:		The system is restricted by this Regulation. See section 8.3 of this Certificate.

Regulation:	**36(a)**	**External fire spread**
Comment:		The system is restricted by this Regulation. See sections 8.1 to 8.4 of this Certificate.
Regulation:	**39(a)(i)**	**Conservation measures**
Regulation:	**40**	**Target carbon dioxide emission rate**
Comment:		The system can enable a construction to satisfy the requirements of these Regulations. See sections 6.1 and 6.2 of this Certificate.

Construction (Design and Management) Regulations 2015
Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.1) and 12 *Maintenance and repair* of this Certificate.

Additional Information

NHBC Standards 2021

In the opinion of the BBA, Epsitec Stone Wool External Wall Insulation System for Timber Framed Buildings, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards 2021*, Part 6 *Superstructure (excluding roofs)*, Chapters 6.2 *External timber framed walls* and 6.9 *Curtain walling and cladding*.

Technical Specification

1 Description

1.1 The Epsitec Stone Wool External Wall Insulation System for Timber Framed Buildings comprises mineral wool (MW) insulation slabs, mechanically fixed onto steel spacer rails or timber battens attached to a sheathed lightweight timber-framed structure. Either spacer rails or timber battens (placed at a maximum of 600 mm centres), are attached to the external surface of a minimum 11 mm thickness oriented strand board (OSB)(1), cement particle board (CPB) or plywood sheathing board, and are used to create a minimum 25 mm wide slightly ventilated and drained cavity when using timber battens, or 15 mm when using steel spacer rails. The system is finished with a reinforced basecoat (incorporating glass-fibre-reinforcement mesh) and render (see Figure 1).

(1) See section 4.7, and Table 2.

1.2 The components of the system comprise:

Base rail profile

- Base rail — 2500 mm long aluminium base rail for fixing to the sheathing board, with 10 mm diameter drainage holes at 150 mm centres, 125 mm from each side of the edge, creating a drained and vented cavity (with a ventilation rate of 588.5 mm^2 per metre length of wall).

Either, **steel spacer rails**

- Epsitec spacer rail — galvanized steel top-hat rail section through which the mechanical fixings pass to create the 15 mm wide cavity. Wider top hat sections can be used provided they have similar or better characteristics and have been approved by the Certificate holder.

Or, **timber battens**

- Treated timber battens (minimum dry strength grade C16 in accordance with BS EN 14081-1 : 2016) – minimum 50 by 25 mm, creating a minimum of 25 mm wide cavity.

Insulation[1][2]

- Mineral Wool Dual Density (MWDD) 036 — dual density mineral wool slabs in sizes up to 1200 by 600 mm and thicknesses from 80[2] to 250 mm, with nominal densities of 160/100 kg·m^{-3} (outer/inner layer), a minimum compressive strength of 10 kPa and a tensile resistance perpendicular to the faces of 10 kPa. Slabs are manufactured to comply with BS EN 13162 : 2012.

(1) For declared thermal conductivity values (λ_D), see section 6.1 of this Certificate
(2) Thicknesses less than 80 mm are for use on existing reveals.

Mechanical fixings[1]

- RAWL R-QCP-4550 Chipboard Screw – 4.5 mm diameter by 50 mm length screws, used for wood composite and timber, installation depth of 18 mm
- Self-Drilling Ejot Saphir LS Range Screws – 5.5 mm diameter by 32 mm length screws made of case-hardened carbon steel with a Climadur organic coat and used for fastening the base rail track to the sheathing board/timber frame substrate
- Self-Drilling TKR Range Screws — 4.8 mm diameter by 100 mm length screws made of case-hardened carbon steel with a Climadur organic coat and used with a 60 mm diameter Bravoll TIT shaft of 0.9 kN·mm^{-1} stiffness and 90 mm extended washer with a central hole to accommodate a screw of adequate length to suit the insulation thickness. Used for fastening the insulation to the timber battens or steel spacer rails.

(1) Other fixings may be used provided they can be demonstrated to have equal or higher pull-out, plate diameter and plate stiffness characteristics.

Basecoat

- Heck K+A Basecoat — a cementitious, ready mixed render conforming to BS EN 13139 : 2002, and supplied as a powder requiring the addition of 5 to 6 litres of clean water per bag. Applied in two layers to achieve a minimum thickness of 6 mm, with a coverage of 8 kg.m^{-2}.

Reinforcement

- Reinforcing mesh scrim —1 m wide (grid size 3.5 by 3.8 mm) multi-stranded, alkali-resistant glass fibre mesh with a polymer, organic content of 20%, PCS value of 8.17 MJ·kg^{-1} and a nominal weight of 160 gm^{-2}.

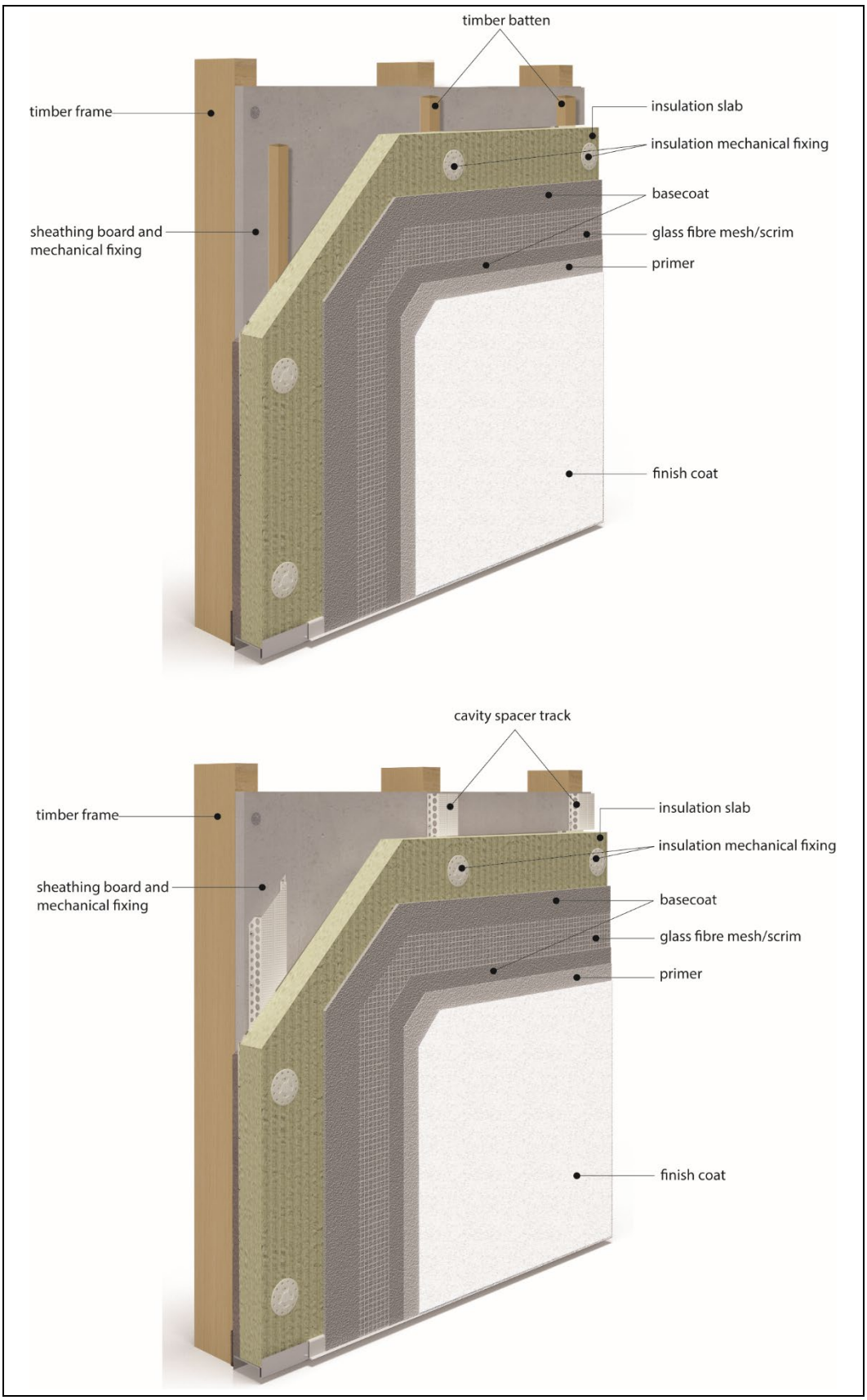
Primer

- Wetherby Silicone Primer — a silicone primer emulsion, used as a bonding agent and pre-coat, with a coverage rate of 0.2 to 0.3 litre per m^2.

Finishes

- Heck SHP Siliconharzputz K and Heck Siliconharzputz R render topcoats — silicone, ready mixed renders supplied as pastes, with 1.5 to 3 mm particle size, with a coverage of 2 to 2.4 kg.m^{-2}. If necessary, water can be added to adjust the consistency.

Figure 1 Epsitec Stone Wool External Wall Insulation System for Timber Framed Buildings through timber battens or steel spacer rails (top-hat sections)



1.3 Ancillary materials used with this system:

- aluminium edge profile, corner profile with mesh and optional PVC-U nosing, and render stop profile
- profile connectors and fixings

1.4 Ancillary materials also used with the system but outside the scope of this Certificate:

- timber-frame sheathed construction, including the exterior grade sheathing board
- fixings for timber battens
- fixings for sheathing boards
- breather membrane
- insect mesh
- cavity fire stops (intumescent strips)
- joint sealant
- aluminium or PVC-U movement joint
- aluminium or PVC-U expansion joint
- water drainage deflector channels (for use above openings)
- sills
- flashings.

2 Manufacture

2.1 The system components are either manufactured by the Certificate holder or bought-in from suppliers, to an agreed specification.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The management system of Wetherby Building Systems Limited has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015, BS EN ISO 14001 : 2015 and BS EN ISO 45001 : 2018 by Alcumus ISOQAR (Certificates 16512-QMS-001, 16512-EMS-001, and 16512-OHS-001, respectively).

3 Delivery and site handling

3.1 Components are delivered in the packaging and quantities listed in Table 1. Each package carries the product identification and manufacturer's batch number.

Table 1 Component supply details

Component	Quantity and packaging
Insulation	polythene wrapped
Base rail	2500 mm lengths
Reinforcing mesh scrim	50 by 1 m rolls
Steel spacer rail	Banded together
Timber battens	Banded together
Basecoat	25 kg bags
Primer	23 kg tubs
Finishing coats	25 kg tubs
Mechanical fixings	boxed by manufacturer

3.2 The insulation must be stored off the ground on a firm, clean, level base, protected from weather/frost, dry and under cover until required for use. Care must be taken during handling to avoid damage.
3.3 Additionally, the insulation should be protected from prolonged exposure to sunlight and any contact with solvents and bitumen.

3.4 The basecoat must be stored in dry conditions within 5 and 30°C, off the ground and protected from moisture.

3.5 The primer and finish coats should be stored in a safe area, under cover and protected from excessive heat and frost.

3.6 Any contaminated material must be discarded.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Epsitec Stone Wool External Wall Insulation System for Timber Framed Buildings.

Design Considerations

4 General

4.1 The Epsitec Stone Wool External Wall Insulation System for Timber Framed Buildings, when installed in accordance with the Certificate holder's instruction and this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external sheathed timber frame walls of new and existing buildings. It is essential that the detailing techniques specified in this Certificate are carried out to a high standard if the ingress of water into the insulation is to be avoided and the full thermal benefit obtained from treatment with the system (eg the insulation must be protected by an overhang, and window sills should be designed and installed so as to direct water away from the building).

4.2 For improved thermal/carbon-emissions performance, the designer should consider additional/alternative fabric and/or services measures.

4.3 The system is for application to the outside of sheathed timber frame buildings, on new or existing domestic and non–domestic buildings, with height restrictions (see section 8 of this Certificate). Prior to installation of the system, wall surfaces should comply with section 14 of this Certificate.

4.4 New walls subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of:

- BS EN 1995-1-1 : 2004 and its UK National Annex
- BS EN 1995-1-2 : 2004
- BS 8000-0 : 2014
- BS EN 338 : 2016
- BS EN 14081-1 : 2016
- BS EN 300 : 2006.

4.5 New walls not subject to regulatory requirements should also be built in accordance with the Standards identified in section 4.4.

4.6 Movement joints should be incorporated into the system in line with existing movement joints in the building structure and in accordance with the Certificate holder's recommendations for the specific installation. The designer should make provision for cumulative vertical shrinkage and/or creep deformation within the timber substrate. This aspect of performance is outside the scope of the Certificate and guidance should be sought from the Certificate holder on such requirements for each application.

4.7 The system must provide a minimum 25 mm wide cavity for the timber battens or a minimum of 15 mm wide cavity[(1)(2)] for the steel spacer rail, between the sheathing board and the insulation slabs. Openings of the base rail profiles should provide a ventilation rate of 588.5 mm^2 per metre of wall length (in the horizontal direction) for vertical air layers which will, therefore, affect the thermal performance of the insulation system. The openings must be kept clean and free of obstructions and must be capable of draining freely.

(1) Horizontal deflection channels which obstruct the cavity must not be used to support the insulating render system
(2) Cavities must not contain electrical cables other than meter tails.

4.8 The design of the structural frame of the building, including the sheathing boards, is the responsibility of the building designer and is outside the scope of this Certificate. However, the structural frame (and sheathing-associated

fixings) should be structurally adequate and must be designed to resist all permanent and variable load actions applied to the system (see Table 2 for the non-exhaustive minimum specifications for system installations relating to the timber frame and sheathing).

Table 2 Minimum timber frame construction requirements

Item	Characteristic	Specification
Timber-framed structure(1)	The timber structure should be at least 37 mm wide, with a minimum depth of 72 mm or 0.026 times the panel height in mm, whichever is greater	In accordance with BS EN 338 and BS EN 14081-1 and dry graded and marked in accordance with BS 4978.
Sheathing board(1)(2)	Cement particle board (CPB) Minimum 12 mm thickness	The board must be manufactured to BS EN 12467 Class 2
	OSB Minimum 11 mm thickness	The board must be manufactured to BS EN 300 Class 3
	Plywood Minimum 11 mm thickness	The board must be manufactured to BS EN 636, minimum Service Class 2

(1) The board and the structural timber frame must be of an exterior grade and to the minimum acceptable specification given here. However, both components are outside the scope of this Certificate

(2) All substrates should achieve a minimum reaction to fire classification of D-s2, d0 to BS EN 13501-1.

4.9 The system will improve the weather resistance of a wall and provide a decorative finish. However, care should be taken to ensure that walls are adequately weathertight prior to application. The system should only be installed where there are no signs of dampness on the inner surface of the wall.

4.10 The effect of the system on the acoustic performance of a construction is outside the scope of this Certificate.

4.11 The fixing of sanitary pipework, plumbing, rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items to the system is outside the scope of this Certificate.

4.12 External pipework and ducts should be removed before installation, and alterations made to underground drainage to accommodate repositioning of the pipework to the finished face of the system. The Certificate holder can advise on suitable fixing methods.

4.13 The designer should select a construction appropriate to the local wind-driven rain index, paying due regard to the design detailing, quality of work and materials to be used. The sheathing board must be of a suitable exterior grade with appropriately sealed joints, sealed penetrations, breather membrane and vapour control layers (vcl) where required.

4.14 The designer should make sure that windows, doors, flashings and other similar items have been specifically designed for use with this type of system – particular attention should be paid to the prevention of water ingress into the system. For example, junctions between the system and window and door openings must avoid creating a direct path that could facilitate the transfer of water from the external surface of the wall into the wall construction or to the internal surface. In addition, opening and penetration details should be designed to deflect water away from the insulation and onto the external face of the wall.

4.15 It is essential that this system is installed and maintained in accordance with the conditions set out in this Certificate.

5 Practicability of installation

The system should be installed only by approved contractors who have successfully undergone training and registration by the Certificate holder (see section 15 of this Certificate).

Note: The BBA operates a UKAS-accredited Approved Installer Scheme for external wall insulation; details of approved installer companies are included on the BBA website (www.bbacerts.co.uk).

6 Thermal performance

6.1 Calculations of the thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2006, using the declared thermal conductivity (λ_D) given in Table 3.

Table 3 Declared thermal conductivity of the insulation (λ_D)

Insulation	Thickness (mm)	λ_D value ($W \cdot m^{-1} \cdot K^{-1}$)
MW Dual Density 036	80 to 250	0.036

6.2 The U value of a wall construction will depend on the selected insulation thickness, the degree of ventilation to the cavity, the fixing method, the insulating value of the substrate and its internal finish. Example U values for a timber-framed construction with a drained cavity are given in Table 4.

Table 4 Insulation thickness required to achieve typical design values(1)(2)(3)

U value ($W \cdot m^{-1} \cdot K^{-2}$)	Thickness of the insulation (mm) for timber frame construction	
	Using timber battens	Using cavity spacer rail
0.17	250	250
0.18	230	240
0.20	200	210
0.21	190	190
0.22	180	180
0.23	170	170
0.25	150	150
0.26	140	150
0.27	130	140
0.28	130	130
0.30	120	120
0.35	90	100

(1) Wall construction:
- 15 mm plasterboard ($\lambda = 0.21$ $W \cdot m^{-1} \cdot K^{-1}$)
- 100 mm air cavity bridged by 15% by timber ($\lambda = 0.13$ $W \cdot m^{-1} \cdot K^{-1}$)
- 10 mm CPB board ($\lambda = 0.23$ $W \cdot m^{-1} \cdot K^{-1}$)
- 15 mm drained and slightly ventilated air cavity with a maximum ventilation rate 588.5 mm^2 per metre of length (in the horizontal direction) for vertical air layers of the wall. Bridged at 600 mm centres by 50 mm wide timber battens ($\lambda = 0.13$ W·m–1·K–1) or 0.7 mm steel cavity spacer rails ($\lambda = 50$ $W \cdot m^{-1} \cdot K^{-1}$)
- Insulation layer
- 8 mm render ($\lambda = 1$ $W \cdot m^{-1} \cdot K^{-1}$)
- 8.3 galvanized steel fixings per m^2 with a point thermal transmittance (X_P) of 0.004 $W \cdot K^{-1}$ per pin

(2) Calculations based on using 8.3 galvanized steel fixings per m^2 to the insulation layer, with a point thermal transmittance (X_P) of 0.004 $W \cdot K^{-1}$ per fixing

(3) Based upon incremental insulation thicknesses of 10 mm

6.3 Care must be taken in the overall design and construction of junctions with other elements and openings, to minimise thermal bridges and air infiltration. Detailed guidance can be found in the documents supporting the national Building Regulations.

7 Strength and stability

General

7.1 The Certificate holder is ultimately responsible for the design of the system and it is the responsibility of the company installing the system to accurately follow the installation instructions (also see section 5 of this Certificate). The Certificate holder must also verify that a suitably experienced and qualified individual (with adequate professional indemnity) establishes that:

- the wind loads on the different zones of the building's elevation for the specific geographical location have been calculated correctly (see section 7.3)
- the system can adequately resist and safely transfer the calculated loads, accounting for all possible failure modes, to the substrate wall and supporting structure (see sections 7.3 to 7.7).

7.2 The substrate and supporting structure must be capable of transferring all additional loading due to the installation of the system, to the ground in a satisfactory manner. The adequacy of the substrate and supporting structure must be verified by the person or party responsible for the global stability of the building to which the system is applied. Any defects should be made good prior to the system being installed.

7.3 The wind loads on the walls should be calculated, taking into account all relevant factors such as location and topography, in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. All the factors affecting wind load on each elevation and specific zone of the building must be considered. In accordance with BS EN 1990 : 2002 and its UK National Annex, a partial factor of 1.5 must be applied to the characteristic values determined from BS EN 1991-1-4 : 2005 to establish the design wind load to be resisted by the system.

7.4 Installations correctly designed in accordance with this Certificate will safely accommodate the applied loads due to the self-weight of the system, wind and impact.

7.5 The system has been tested in accordance with the BBA method for combined self-weight and wind actions, to confirm its suitability when using the maximum insulation thickness of 250 mm of minimum stiffness, heaviest insulation and render system, and by adopting the fixing pattern shown in Figure 4 (minimum number of fixings) using insulation fixing type self-drilling TKR Range Screws with a 60 mm diameter Bravoll TIT with 90 mm washer (see section 1.2). It is essential that seals and interfaces with the render system should be designed and detailed to accommodate vertical displacement.

7.6 Positive wind load is transferred to the substrate wall directly via compression through the render, insulation and steel spacer rail or timber battens.

7.7 Negative wind load is transferred to the substrate wall via(1):

- the bond between the insulation and the render system
- the pull-out resistance of the insulation fixing from the steel spacer rail or timber battens
- the pull-through resistance of the insulation fixing
- the pull-through resistance of the steel spacer rail or timber batten fixing from the steel spacer rails or timber battens
- the pull-out resistance of the steel spacer rail or timber batten fixing from the substrate (see sections 7.8 and 7.9)

(1) Further guidance is given in BBA Guidance Note 1, available on the BBA website (www.bbacerts.co.uk).

7.8 The design pull-out resistance of the steel spacer rail fixings from the substrate obtained from site tests (N_{RD1}) must not be less than the maximum design wind load (W_e). The characteristic pull-out resistance based on site tests is determined in accordance with the guidance given in EOTA TR051 (characteristic pull-out resistance = 0.6 x mean of 5 lowest test results). To obtain the site design pull-out resistance of the fixings, the characteristic site pull-out resistance should be divided by the partial factor given in Table 5 for a similar substrate.

7.9 The typical characteristic pull-out resistance ($N_{rd.Typ}$) for the fixing used in the test was as per Table 5 for a similar substrate and can be used as a reference guide.

Table 5 Typical characteristic pull-out resistance values of profile fixings from the substrate

Fixing type	Substrate facing	Characteristic pull-out resistance[(1)] (kN)	Partial factor[(2)]
RAWL R-QCP self-drilling range screws	Through the cavity spacer track, 11 mm sheathing board thickness	1.2	1.5
Self-Drilling TKR Range Screws	Fixed through the insulation board into the Epsitec rail	1.2	1.5
Self-drilling LS Range 5.5 mm diameter screws	Through the cavity spacer track, 11 mm sheathing board thickness	1.2	1.5

(1) Values obtained from the fixing's datasheet
(2) To obtain the typical design pull-out resistance ($N_{rd.Typ}$) of the fixing, the characteristic pull-out resistance should be divided by the partial factor given.

7.10 The dynamic wind uplift test was carried out on a sheathed frame building and the system installed with vertical steel profiles at 600 mm horizontal spacing; the steel profiles were fastened to 11 mm thick OSB board (providing a minimum 15 mm cavity), with screws at maximum 300 mm vertical centres in both flanges. Insulation slabs were fastened to the vertical profiles with insulation anchors, with the layout and spacing as shown in Figure 4. The maximum design negative wind load that can be sustained by the system as determined from the dynamic wind uplift test (Rd_{Test}) is equal to 1.7 $kN \cdot m^{-2}$.[(1)(2)]

(1) The maximum design wind load that can be resisted by the system corresponds to the maximum allowed spacing and centres of fixings and profiles and as described in this section. This fixing and profile configuration with appropriately selected fixings will also adequately transfer the system's self-weight, wind and impact loads to a suitable substrate wall.
(2) The design resistance is determined by dividing the characteristic resistance value obtained from a dynamic wind uplift test by a partial safety factor of 2.5.

7.11 The horizontal local deflection of the supporting structure due to variable loads should be within acceptable limits. The suggested limit for the maximum horizontal local deflection is the height of the storey/500, in accordance with BS EN 1995-1-1 : 2004. The Certificate holder may advise on the limiting deflection for the system.

7.12 The data derived from sections 7.8 to 7.11 must be assessed against the design wind load, and the following expressions must be satisfied:

For safe design:

$Rd_{Test} \geq W_e$ and $N_{RD1} \geq W_e$

Where:

$N_{RD1} = N_{Rk_1}/\gamma_m$
$Rd_{Test} = N_{Rk_2}/\gamma_m$

Rd_{Test} is the negative wind load design resistance of the system based on test ($kN.m^{-2}$)
W_e is the maximum design wind load ($kN \cdot m^{-2}$)
N_{RD1} is the design pull-out resistance based on site tests (kN)
N_{Rk_1} is the characteristic resistance obtained from the pull-out test
N_{Rk_2} is the characteristic resistance obtained from the wind uplift test
γ_m is the partial safety factor (determined by the mode of failure).

7.13 For a system comprising timber battens, if the spacing of the fixings and vertical timber battens are identical to those in section 7.10 of the Certificate, the same maximum design negative wind resistance (Rd_{Test} = 1.7 $kN.m^{-2}$) can be used. Fixings should be positioned centrally along the line of the timber battens.

Impact resistance

7.14 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in all Use Categories(1).

(1) The Use Categories are defined in ETAG 004 : 2013 as:

- Category I — a zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use
- Category II — a zone liable to impacts from thrown or kicked objects, but in public locations where the height of the system will limit the size of the impact; or at lower levels where access to the building is primarily to those with some incentive to exercise care
- Category III — a zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.

8 Behaviour in relation to fire

8.1 The system can have an A2-s1, d0 reaction(1) to fire classification in accordance with BS EN 13501-1 : 2007.

(1) Exova Warringtonfire Test Report WF 406081.

8.2 The classification applies to the full range of insulation thicknesses covered by this Certificate and render colour 'white'. The classification of other colours and the permissible areas of use for such systems should be confirmed by reference to the documents supporting the national Building Regulations.

8.3 The mineral wool insulation material in isolation is classified A1 to BS EN 13501-1 : 2007.

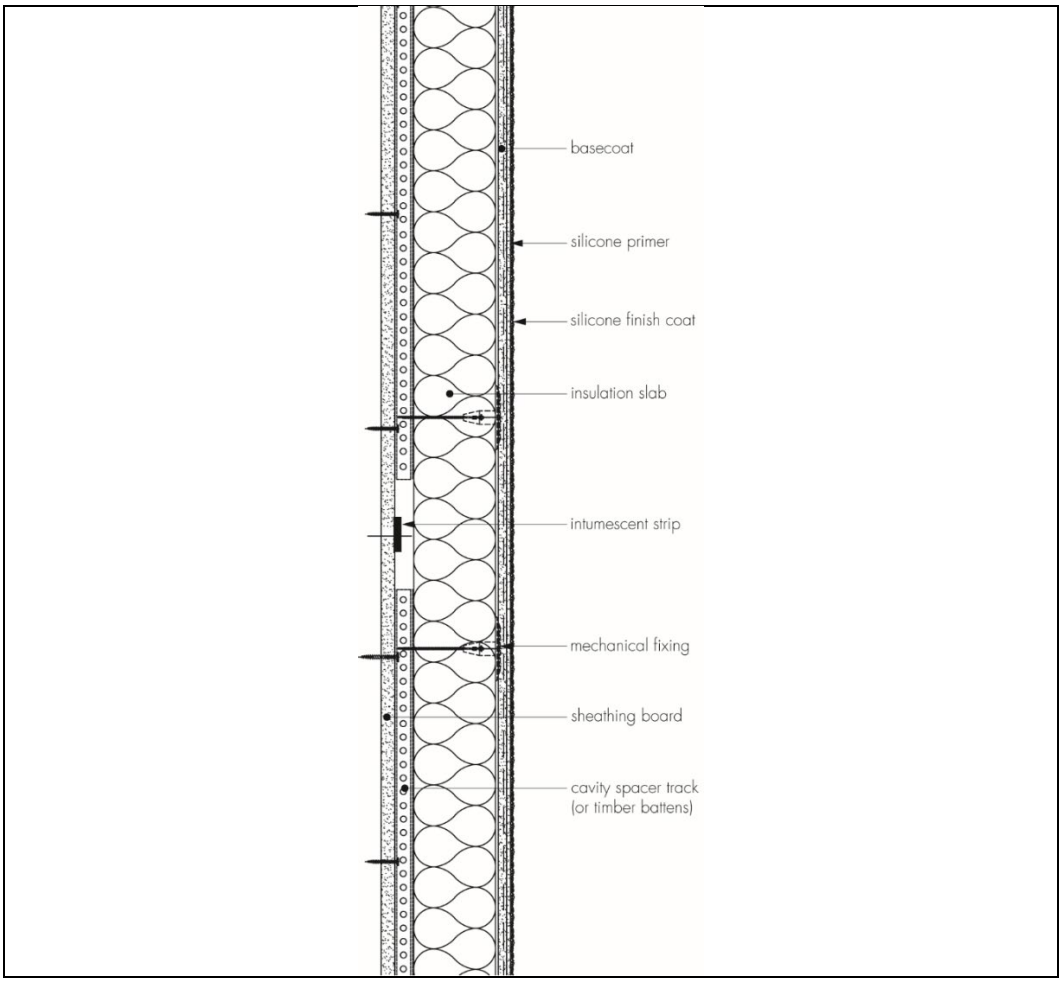
8.4 The system described in sections 8.1 and 8.2 is not subject to any restriction on proximity to boundaries. The system is restricted for use in buildings up to 18 m in height.

8.5 For application to second storey walls and above, it is recommended that the designer considers at least one stainless steel fixing per square metre and fire barriers (see Figure 2) in line with compartment walls and floors, as advised in BRE Report BR 135 : 2013.

8.6 NHBC Standards require in all cases that a minimum of one non-combustible fixing through the reinforcing mesh, per square metre or per insulation slab, whichever provides the greater number, should be provided, in addition to the other fixings.

8.7 Designers should refer to the relevant national Building Regulations and guidance for detailed conditions of use, particularly in respect of requirements for substrate fire performance, service penetrations and combustibility limitations for other materials and components used in the overall wall construction.

Figure 2 Fire barriers



9 Proximity of flues and appliances

Detailed guidance can be found in the documents supporting the national Building Regulations for the provisions that are applicable when the system is installed in close proximity to certain flue pipes and/or heat-producing appliances.

10 Water resistance

10.1 The system will provide a degree of protection against rain ingress. However, care should be taken to ensure that walls are adequately weathertight prior to its application. It may only be installed where there are no signs of dampness on the inner surface of the substrate other than those caused solely by condensation.

10.2 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of rain ingress. Only details approved by the Certificate holder should be used.

10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the weathertightness of wall constructions. The designer should select a construction appropriate to the local wind-driven index, paying due regard to the design detailing, quality of work and materials to be used.

10.4 The sheathing board substrate must be of a suitable exterior grade, with appropriately sealed joints, sealed penetrations and breather membrane in all cases.

10.5 At the top of walls, the system should be protected by an adequate overhang or other detail designed for use with this type of system (see Figure 9).

11 Risk of condensation

11.1 Designers must ensure that an appropriate condensation risk analysis has been carried out for all parts of the construction, including openings and penetrations at junctions between the insulation system, to minimise the risk of condensation. The recommendations given in BS 5250 : 2021 should be followed.

Surface condensation

11.2 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 0.7 $W \cdot m^{-2} \cdot K^{-1}$ at any point and the junctions with other elements and openings comply with section 6.3 of this Certificate.

11.3 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed 1.2 $W \cdot m^{-2} \cdot K^{-1}$ at any point. Guidance may be obtained from BS 5250 : 2021 Section 2, and BRE Report BR 262 : 2002.

Interstitial condensation

11.4 Walls incorporating the system will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2021 (sections 11.1 and 11.4) and section 11.5 of this Certificate.

11.5 The water vapour resistance factor (μ) for the insulation, and the equivalent air layer (S_d) of the reinforced basecoat applied with a finish coat, are shown in Table 6:

Table 6 Water vapour resistance factors and equivalent air layer thickness

Material	Thickness (mm)	S_d (m)	μ
Mineral Wool Dual Density (MWDD)	80 to 250	–	1.0(1)
Heck K+A Basecoat, Wetherby Silicone Primer, HECK SHP (Siliconharzputz K or Siliconharzputz R) 1.5 render topcoat	7.5	1.0	–

(1) Value obtained from BS EN ISO 10456 : 2007, Table 4.

12 Maintenance and repair

12.1 An initial inspection should be made within 12 months and regularly thereafter to include:

- visual inspection of the render for signs of damage. Cracks in the render exceeding 0.2 mm must be repaired
- visual inspection of architectural details designed to shed water to confirm that they are performing properly
- visual inspection to ensure that water is not leaking from external downpipes or gutters, as such leakage could penetrate the rendering
- necessary repairs effected immediately and the sealant joints at window and door frames replaced at regular intervals
- maintenance schedules, which should include the replacement and resealing of joints (for example, between the insulation system and window and door frame).

12.2 Damaged areas must be repaired using the appropriate components and procedures detailed in the Certificate holder's installation instructions and in accordance with BS EN 13914-1 : 2005.

13 Durability

13.1 The system will remain effective for at least 30 years, provided any damage to the surface finish is repaired immediately, and regular maintenance is undertaken as described in section 12.

13.2 The renders may become discoloured with time, the rate depending on the initial colour, the degree of exposure and atmospheric pollution, as well as the design and detailing of the wall. In common with traditional renders, discoloration by algae and lichens may occur in wet areas.

13.3 To maintain a high quality aesthetic appearance, it may be necessary to periodically overcoat the building as recommended by the Certificate holder and in accordance with BS EN 1062-1 : 2004. Care should be taken not to adversely affect the water vapour transmission or fire characteristics of the systems. The advice of the Certificate holder should be sought as to the suitability of a particular product.

Installation

14 Site survey and preliminary work

14.1 A pre-installation survey of the property must be carried out to determine whether repairs are required to the sheathing board or timber frame; any repairs should be carried out before application of the system. A specification is prepared for each elevation of the building indicating, for example:

- position of starter tracks, cavity spacer tracks and render beads
- additional reinforcing mesh scrim at corners of openings
- detailing around windows, doors and at eaves
- damp-proof course (dpc) level
- location and type of weather seals to be used and location of water-deflection channels
- areas where suitable silicone sealants must be used
- position of fire barriers and cavity fire stops.

14.2 The survey should include tests conducted on the sheathed structural timber frame wall of the building by the Certificate holder or their approved applicators (see section 15) to determine the pull-out resistance of the proposed mechanical fixings. An assessment and recommendation is made on the type and number of fixings required to withstand the building's expected wind loading based on calculations using the relevant wind speed data for the site and the pull-out resistances (see section 7).

14.3 Surfaces should be sound, clean and free from loose material. The flatness of surfaces must be checked; this may be achieved by using a straight-edge spanning the storey height. Excessive irregularities, ie greater than 10 mm, must be made good prior to installation to ensure that the timber frames are installed with a smooth, in-plane finished surface.

14.4 On existing buildings, purpose-made window sills must be fitted to extend beyond the finished face of the system (see section 16.8). New buildings should incorporate suitably deep sills.

14.5 Internal wet work, eg screeding or plastering, should be completed and allowed to dry prior to the application of a system.

14.6 All modifications, such as provision for fire stopping (see section 8) and necessary repairs to the building, must be completed before installation commences.

15 Approved Installers

Application of the system, within the context of this Certificate, must be carried out by approved installers recommended or recognised by the Certificate holder. Such an installer is a company:

- employing operatives who have been trained and approved by the Certificate holder to install the system
- which has undertaken to comply with the Certificate holder's application procedure, containing the requirements for each application team to include at least one member-operative trained by the Certificate holder
- subject to at least one inspection per annum by the Certificate holder to ensure suitable site practices are being employed. This may include unannounced site inspections.

16 Procedure

General

16.1 Application of the system is carried out in accordance with the Certificate holder's current installation instructions and this Certificate.

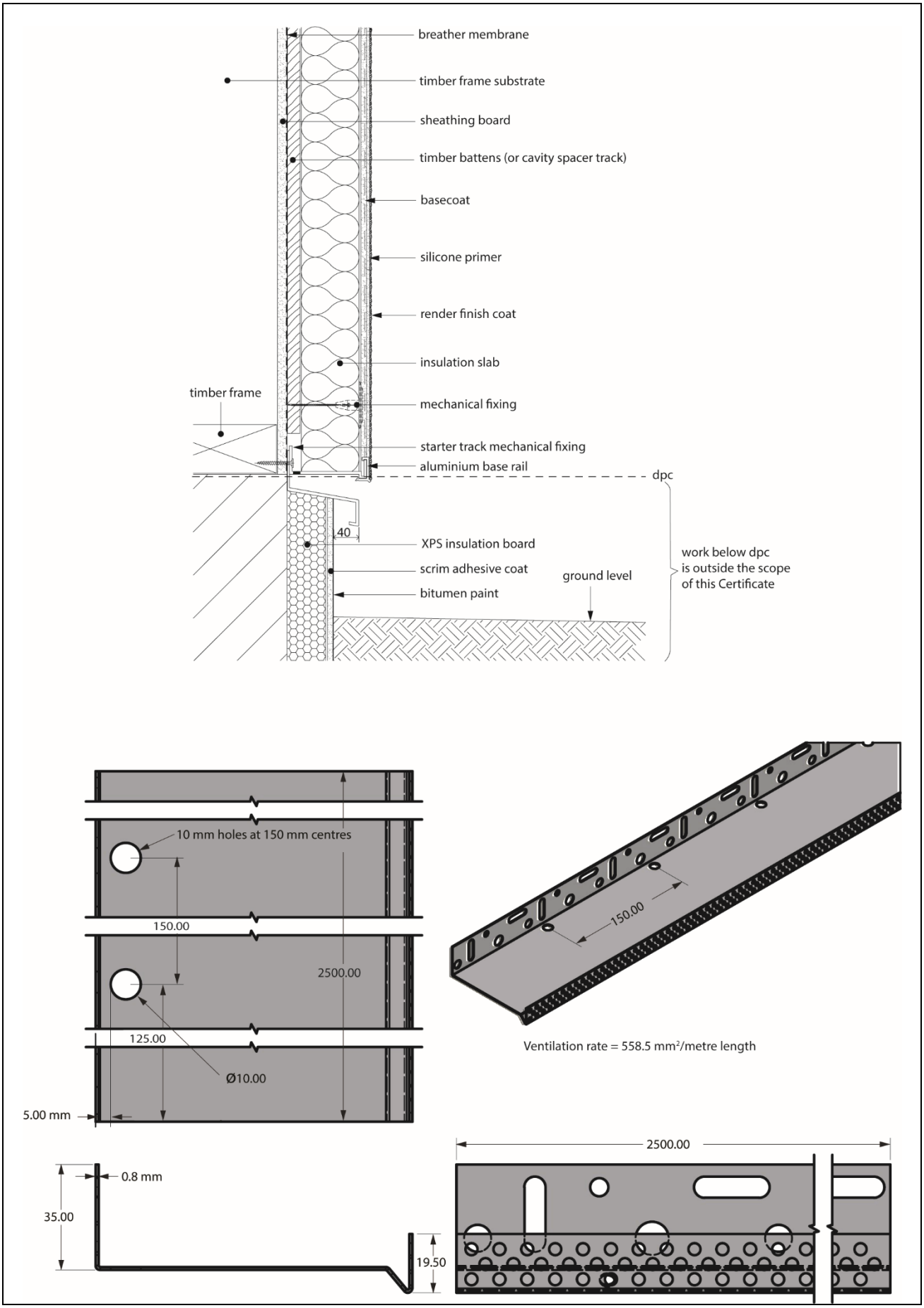
16.2 Application of renders must not be carried out at temperatures below 5°C or above 30°C, or if exposure to frost is likely, and the render must be protected from rapid drying. Weather conditions, therefore, should be monitored to ensure correct curing conditions.

16.3 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2005.

Positioning and securing insulation slabs

16.4 The base rail is mechanically fixed and secured to the sheathing board above the dpc using profile fixings (see Figure 3).

Figure 3 Typical section of base rail



16.5 Vertical steel spacer rails or timber battens are mechanically fixed at maximum 600 mm horizontal centres to the sheathing board and at a maximum of 300 mm centres either side of the rail. Rails may need packing to ensure they are true to line and level. Drainage-deflection channels are mechanically fixed over all window and door openings, and horizontal intumescent strips are installed following the designer's instructions. Fire barriers must be installed following the designer's instructions.

16.6 The first insulation slab is positioned on the starter track and secured into the steel spacer rails or timber battens using a self-drilling, self-tapping fastening. Subsequent slabs are positioned so that the joints are staggered and overlapped at the building corners (see Figures 4 and 5). Care must be taken to ensure the fixings are not overdriven.

Figure 4 Arrangement of insulation slabs and typical fixing pattern

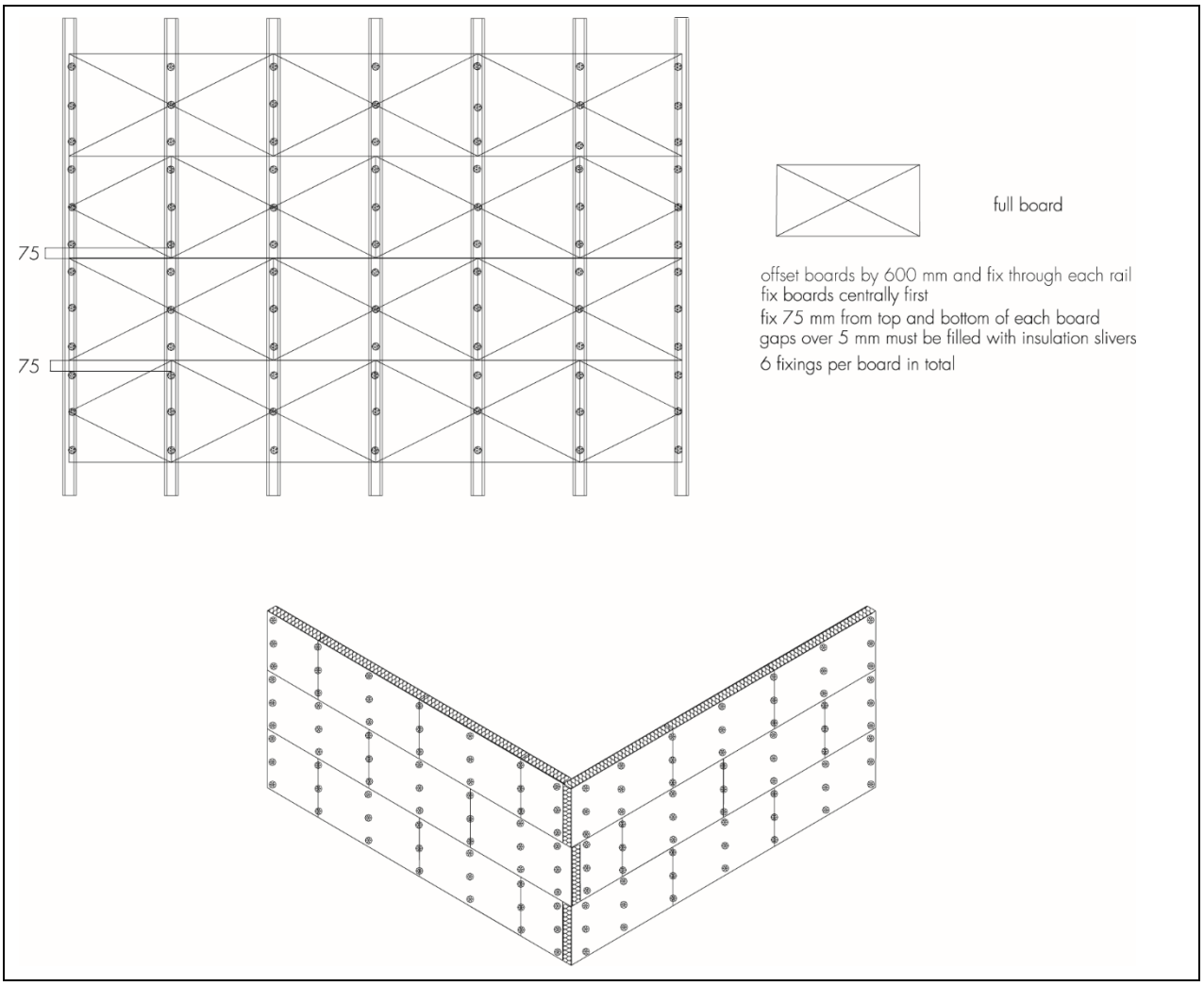
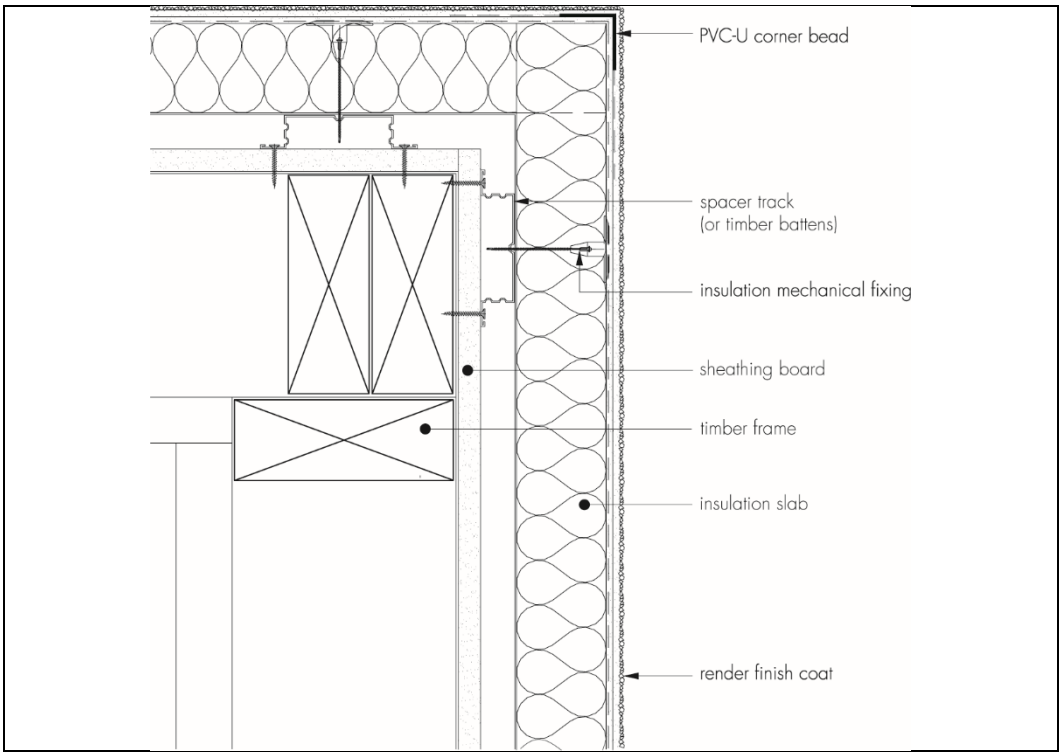


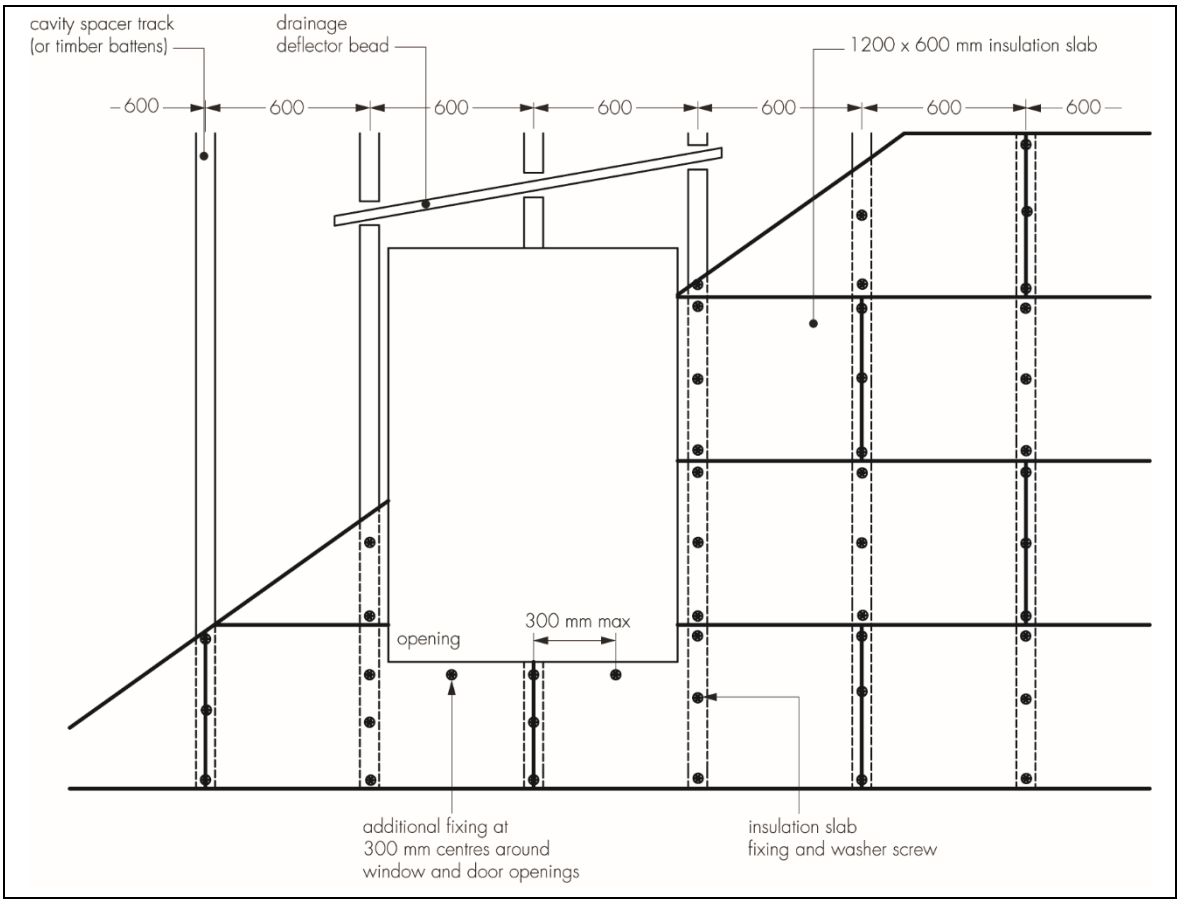
Figure 5 Typical corner detail



16.7 Care must be taken to ensure that all insulation slab edges are butted tightly together; alignment must be checked as work proceeds. The surface of the slabs should be smooth without high spots or irregularities.

16.8 To fit around details such as doors and windows, insulation slabs may be cut with a sharp knife or a fine-toothed saw. Purpose-made window-sills, seals and deflection channels are fitted (see Figure 6), which are designed to prevent water ingress and allow water to be shed clear of items bridging the cavity.

Figure 6 Typical opening details showing deflection channel



16.9 Installation continues until the substrate is completely covered including, where appropriate, the building soffits.

Movement joints

16.10 The system incorporates provision for movement joints (see Figure 7).

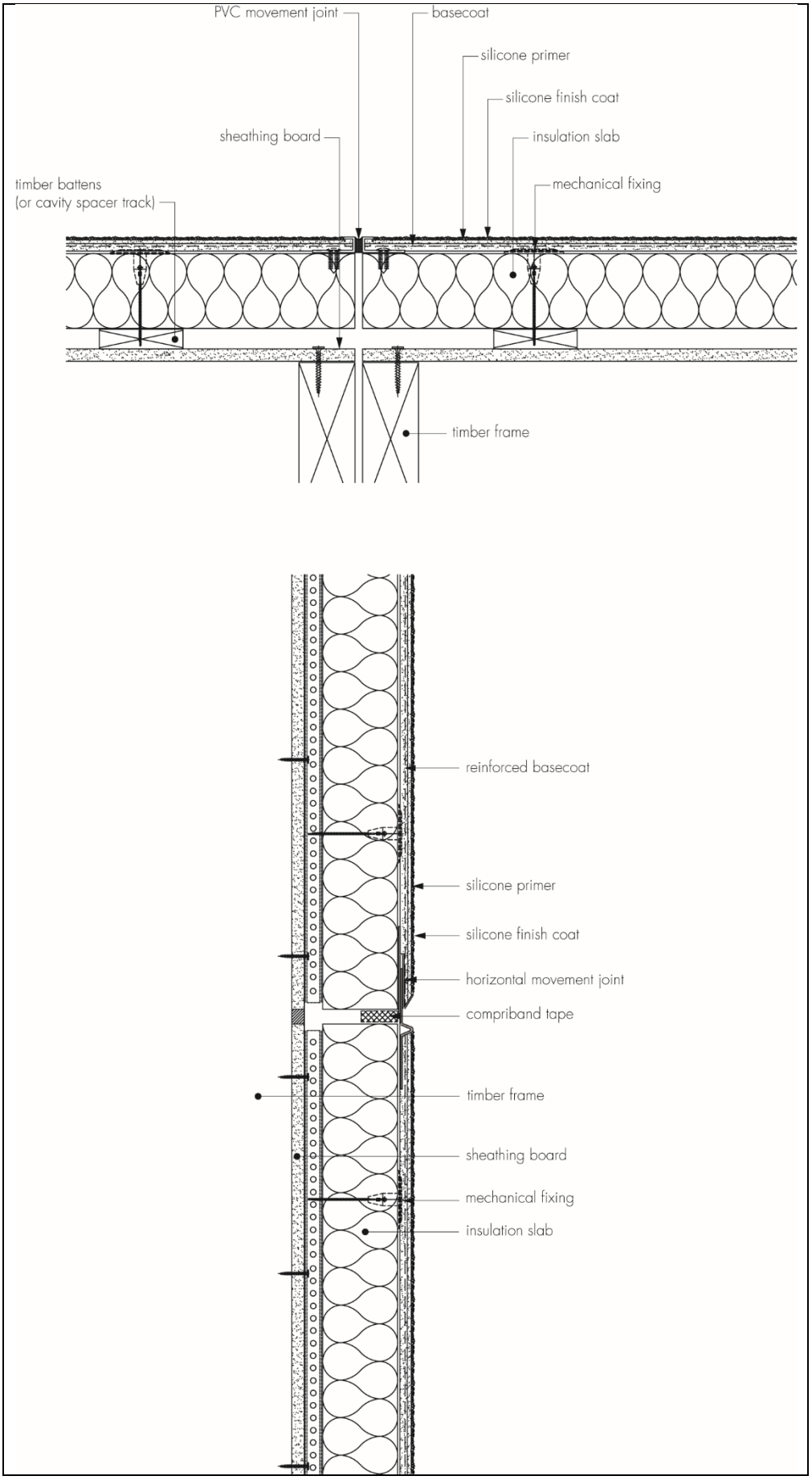
16.11 Expansion beads are fixed horizontally and vertically in predetermined positions, according to the installation specification and the individual requirements of each project.

16.12 Surface-mounted PVC render beads are fixed with firtree fixings to the insulation slabs where required.

Reinforcing, rendering and finishing

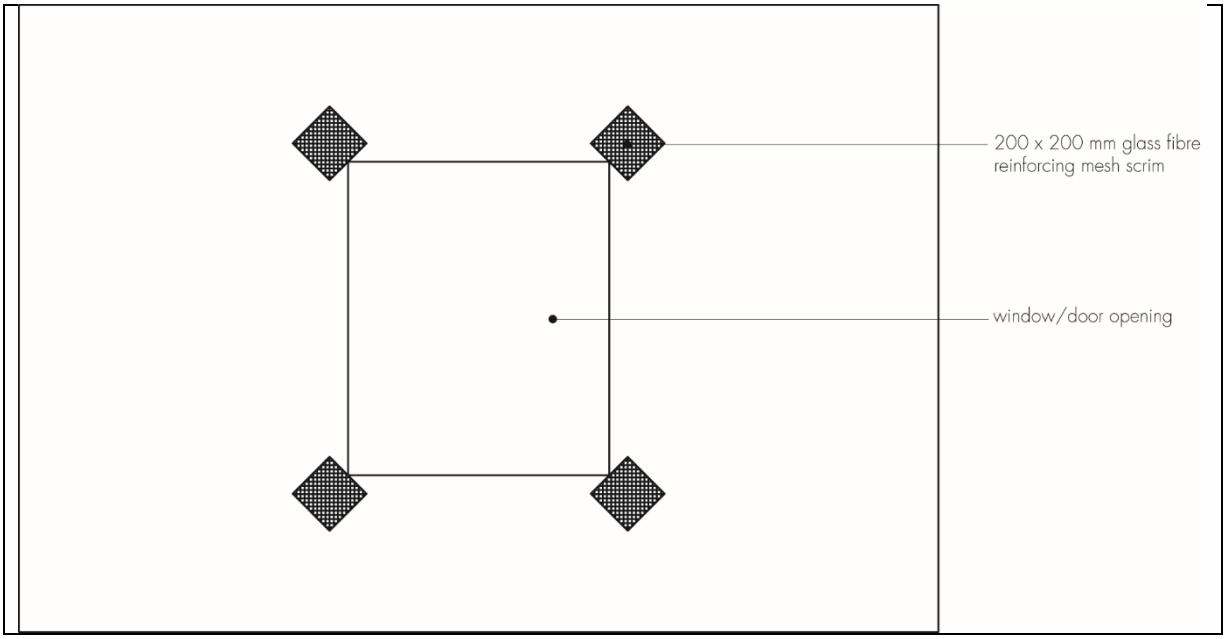
16.13 The Heck K+A Basecoat render is prepared by mixing the contents of each 25 kg bag with approximately 5 to 6 litres of cold, clean water, using a paddle mixer. Mixing time should be at least five minutes after the addition of the last bag of render, to allow an even dispersion of resins.

Figure 7 Vertical and horizontal movement joint details



16.14 The mixed basecoat render is trowel-applied to the surface of dry insulation slabs to a thickness of 4 to 6 mm. The reinforcing mesh scrim is bedded into the basecoat with 100 mm laps at joints, ensuring all PVC wings of beading are overlapped with reinforcing mesh scrim. Additional reinforcement should be applied at the corners of windows and doors or similar openings as shown in Figure 8.

Figure 8 Corner reinforcement



16.15 The PVC meshed corner beads are bedded into the basecoat at external corners and around openings as required.

16.16 In multi-storey buildings, holes are drilled at 1 m centres for additional fixings before the basecoat hardens, and stainless steel fixings are inserted through the reinforcing mesh scrim, insulation and into the substrate wall. Mesh scrim patches, 100 by 100 mm, are required over each stainless steel fixing head.

16.17 The drying period of the basecoat will depend on weather conditions; however, once applied, it must be left to harden for at least one day before application of a further layer.

16.18 The second coat is applied to a thickness of between 2 and 3 mm and finished smooth.

16.19 Continuous surfaces should be completed without a break.

16.20 When the basecoat render is dry, the primer coat is applied.

16.21 The topcoat is supplied pre-mixed in a tub and is lightly mixed and then trowel-applied in a continuous motion to a wet edge, to produce an even thickness appropriate to the grain size.

16.22 Prior to setting, the render is polished with a plastic float to give an even texture and to remove all trowel lines. Elevations should be completed in one application and finished to natural breaks in the render, ie beads or building corners. The texture should be checked to ensure the same batches are applied to each elevation; where necessary drums can be batch-mixed to ensure colour consistency.

16.23 Relevant seals are positioned and installed at all openings (for example, windows and doors), overhanging eaves, gas and electric meter boxes, and wall vents, or where the render abuts any other building material or surface.

16.24 Care should be taken in the detailing of the system around such features as openings, projections and at eaves (see Figures 9 and 10), to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

16.25 On completion of the installation, external fittings, eg rainwater goods, are securely fixed to timber grounds or extended fixings that have been built into the system during installation.

Figure 9 Typical roof eaves detail

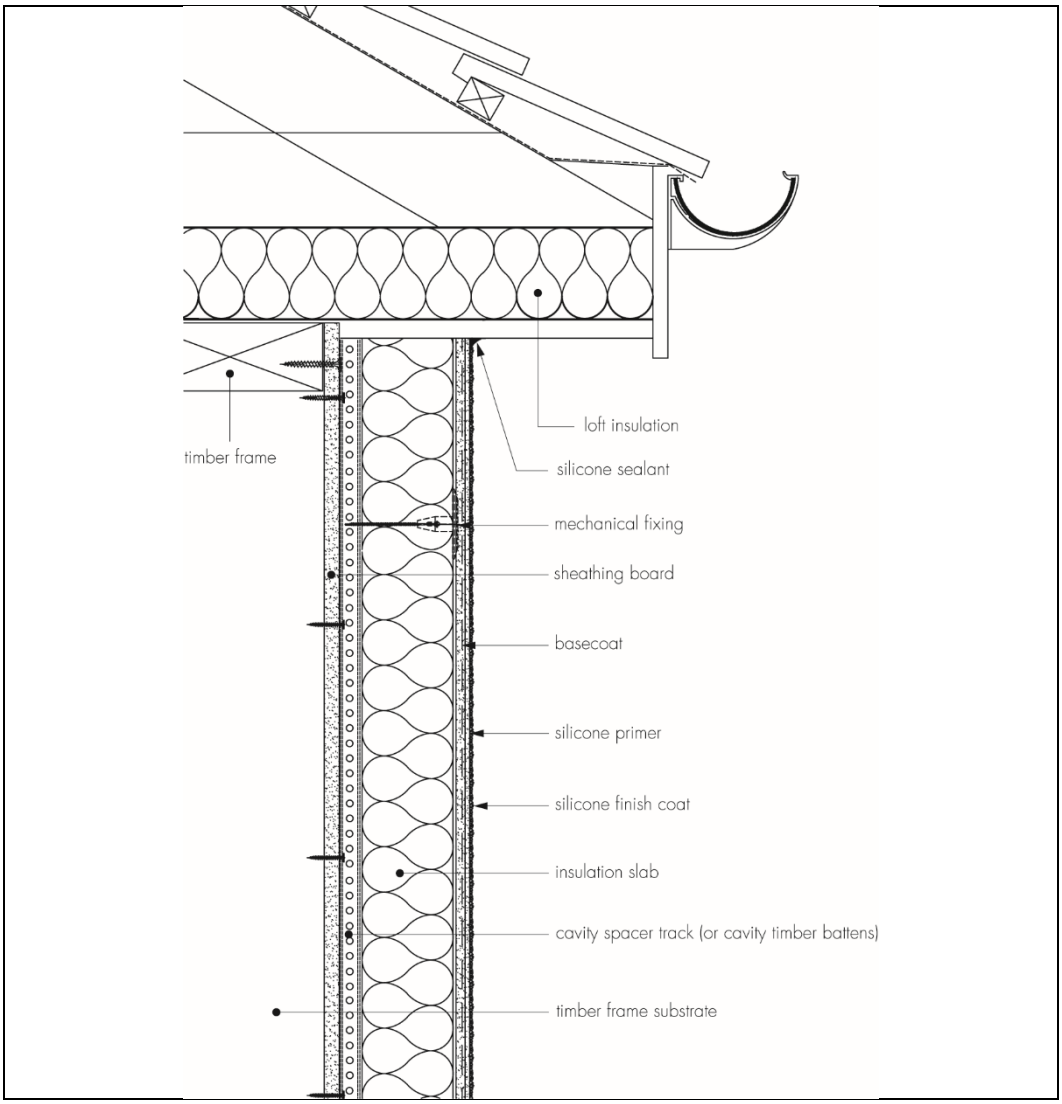
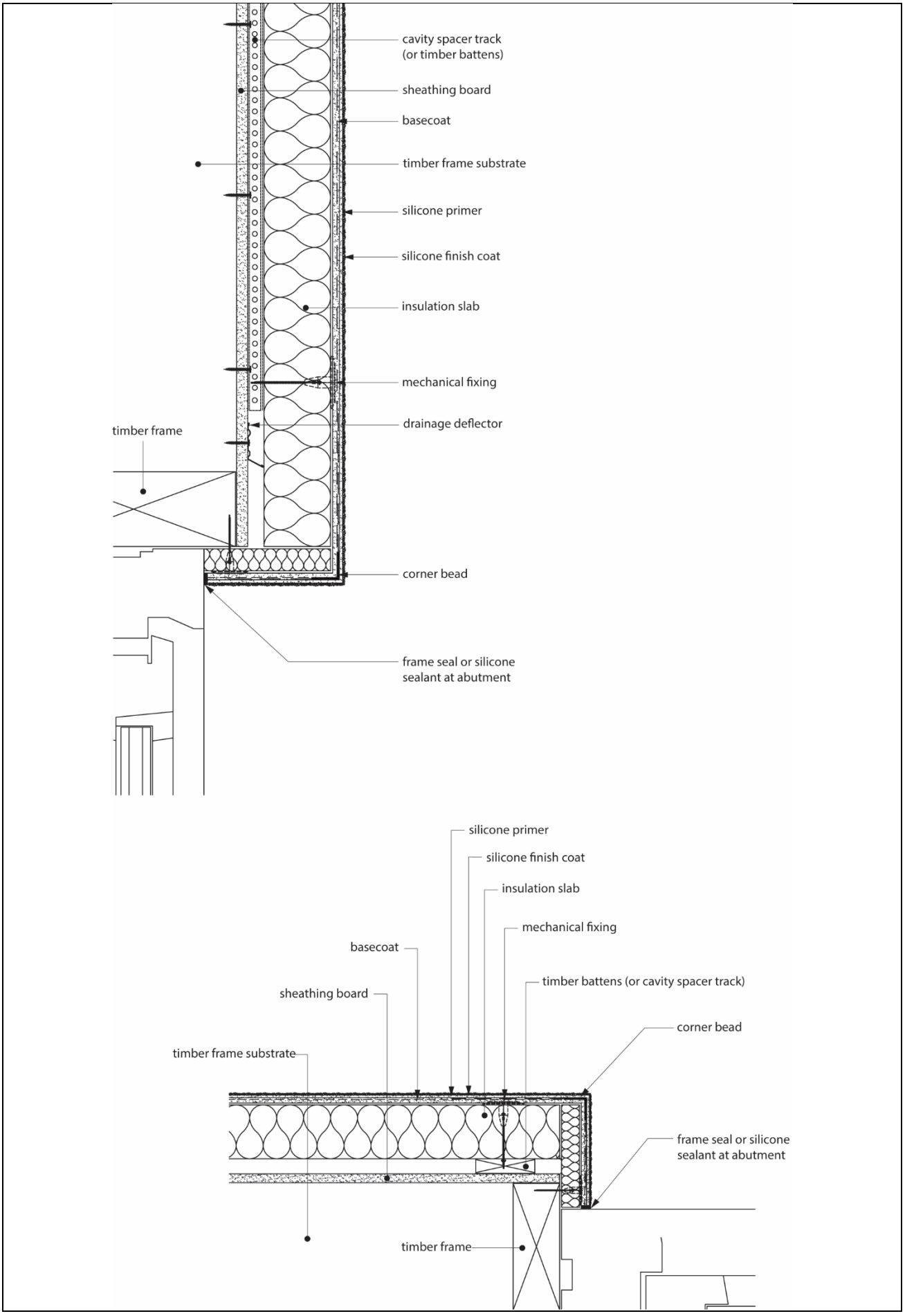


Figure 10 Typical window head and jamb details



17 Tests

An examination was made of data relating to:

- heat/spray cycling
- resistance to freeze/thaw
- impact resistance
- water vapour permeability
- fire performance
- durability of finish coatings
- bond strength between basecoat and insulation
- pull-through resistance
- displacement/dead load test performance.

18 Investigations

18.1 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

18.2 A condensation risk analysis was carried out.

18.3 Example U-value calculations were carried out.

18.4 An assessment was made of the structural stability.

18.5 The practicability of installation and the effectiveness of detailing techniques were examined.

Bibliography

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BS 4978 : 2007 + A2 : 2017 *Visual strength grading of softwood – Specification*

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BS EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using data from reaction to fire tests*

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BS EN ISO 14001 : 2015 *Environmental Management systems — Requirements with guidance for use*

ETAG 004 : 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems with Rendering.*

Conditions

1. This Certificate:

- relates only to the product that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- is valid only within the UK
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- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

4. The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

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- any claims by the manufacturer relating to UKCA, UKNI or CE marking.

6. Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product which is contained or referred to in this Certificate is the minimum required to be met when the product is manufactured, supplied, installed, used, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care.

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