JUB kemična industrija d.o.o
Dol pri Ljubljani 28
SI-1262 Dol pri Ljubljani
Slovenia

Tel: 00 386 1 588 42 82 Fax: 00 386 1 588 42 50
e-mail: info@jub.eu
website: www.jubrenders.co.uk

Agrément Certificate
11/4838
Product Sheet 1

JUB EXTERNAL WALL INSULATION SYSTEMS

JUBIZOL CR EXTERNAL WALL INSULATION SYSTEM (LWSF)

This Agrément Certificate Product Sheet(1) relates to the Jubizol CR External Wall Insulation System (LWSF), comprising expanded polystyrene (EPS) insulation boards, mechanically fixed using rail profiles, with a reinforced basecoat and render finishes. The system is suitable for use, with height restrictions, on the outside of sheathed lightweight steel framed (LWSF) constructions of 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 be designed to resist the wind loads experienced for a particular location and has adequate impact resistance (see section 7).

Behaviour in relation to fire — the system may have a B-s2, d0 reaction to fire classification in accordance with BS EN 13501-1 : 2007 and its use is restricted (see section 8).

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 the terms of 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

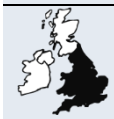
Date of Fourth issue: 3 February 2022

Originally certificated on 19 May 2011

Hardy Giesler
Chief Executive Officer

Regulations

In the opinion of the BBA, the Jubizol CR External Wall Insulation System (LWSF), if installed, used and maintained in accordance with the provisions of 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 substrate wall. See sections 7.1 to 7.11 of this Certificate.
Requirement:	**B3(4)**	**Internal fire spread**
Comment:		The system is restricted by this Requirement. See section 8.4 of this Certificate.
Requirement:	**B4(1)**	**External fire spread**
Comment:		The system is restricted by this Requirement. See sections 8.1 to 8.5 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 8.5 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 although compensatory fabric/services measures may need to be taken. 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 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 substrate wall. See sections 7.1 to 7.11 of this Certificate.
Standard:	2.4	Cavities
Comment:		The system is restricted by this Standard, with reference to clause 2.4.2[(1)(2)]. See section 8.4 of this Certificate.
Standard:	2.6	Spread to neighbouring buildings
Comment:		The system is restricted by this Standard, with reference to clauses 2.6.1[(1)(2)], 2.6.1[(1)(2)], 2.6.4[(1)(2)], 2.6.5[(1)] and 2.6.6[(2)]. See sections 8.1 to 8.4, 8.6 and 8.7 of this Certificate.
Standard:	2.7	Spread on external walls
Comment:		The system is restricted by this Standard, with reference to clause 2.7.1[(1)(2)]. See sections 8.1 to 8.4, 8.6 and 8.7 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The system will contribute to satisfying 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 the requirements of this Standard, with reference to clauses 3.15.1[(1)(2)], 3.15.4[(1)(2)] and 3.15.5[(1)(2)]. 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 the 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)] [Aspect 1[(1)(2)] and 2[(1)]], 7.1.6[(1)(2)] [Aspect 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 the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to 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 can contribute 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 substrate wall. See sections 7.1 to 7.11 of this Certificate.
Regulation:	**35(4)**	**Internal fire spread**
Comment:		The system is restricted by this Regulation. See section 8.4 of this Certificate.
Regulation:	**36(a)**	**External fire spread**
Comment:		The system is restricted by this Regulation. See sections 8.1 to 8.5 of this Certificate.
Regulation:	**39(a)(i)**	**Conservation measures**
Regulation:	**40**	**Target carbon dioxide emission rate**
Comment:		The system can contribute to satisfying 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 3.3) and 12 *Maintenance and repair* of this Certificate.

Additional Information

NHBC Standards 2022

In the opinion of the BBA, the Jubizol CR External Wall Insulation System (LWSF), if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*(1) *2021*, Part 6 Superstructure (excluding roofs), Chapters 6.9 *Curtain walling and cladding* and 6.10 *Light steel framed walls and floors*.

(1) There is a general requirement in NHBC Standards Chapter 6.9 for fire-retardant-treated EPS insulation to be used with this system, in accordance with BS EN 13163 : 2012.

Technical Specification

1 Description

1.1 The Jubizol CR External Wall Insulation System (LWSF) (see Figure 1) comprises expanded polystyrene (EPS) insulation boards mechanically fixed onto a horizontal rail support system, with reinforced renders. Base rail profiles are fixed at 300 mm centres to the external surface of a sheathed (12 mm cement particle board) lightweight steel frame (LWSF) structure, using cavity spacers to create a 15 mm (minimum) drainage cavity. The system is finished with a reinforced basecoat (containing a glass fibre reinforcement mesh), primer and a render finish to the required thickness.

1.2 The system components are detailed below:

Base rail profile

- base profile — 45 mm wide, by 1 mm thick, by 2500 mm long aluminium base rail with 4 by 20 mm diameter drainage holes at 500 mm centres, creating a drained and unventilated cavity (that is, with a ventilation rate less than 500 mm^2 per metre length of wall in the horizontal direction)

- base profile fixings — CLT self-drilling JT3-3 range stainless steel 304 grade fixings, 5.5 to 6.3 mm diameter, with a shank length of 50 to 80 mm.

Horizontal rail support system

- horizontal rail profiles — PVC-U or aluminium holding/supporting rails, fastened to the substrate through the shims and sheathing board at 300 mm centres in the horizontal direction and 500 mm centres in the vertical direction
- vertical splines — PVC or aluminium T-sections fitted into grooves in the insulation boards to support edges
- cavity spacers — PVC spacers ('packers') in a range of thicknesses to maintain the design drainage cavity width of 15 mm (minimum)
- mechanical fixings(1) — CLT self-drilling JT3-3 range stainless steel 304 grade fixings, 5.5 to 6.3 mm diameter, with a shank length of 50 to 80 mm, for fixing profiles to the substrate.

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

Insulation(1)

- Expanded polystyrene (EPS 70 white) insulation boards — 500 by 500 mm grooved-edge boards, in a range of thicknesses between 50(2) and 200 mm in 10 mm increments, with a nominal density of 17 $kg.m^{-3}$, a minimum compressive strength of 70 $kN.m^{-2}$ and nominal tensile strength of ≥ 100 $kN.m^{-2}$. The boards are manufactured to comply with the requirements for EPS 70, Class E material, to BS EN 13163 : 2012.

(1) For the declared thermal conductivity value (λ_D), see Table 3.
(2) Insulation thicknesses of 20, 30, 40 and 50 mm would generally be used in reveals.

Basecoat

- Jubizol basecoat — an adhesive mortar render supplied as a powder to which 4 to 5 litres of clean water is added. Applied in two layers to a coverage of 1.6 $kg.m^{-2}$ to give a minimum thickness of 6 mm.

Reinforcement mesh

- Jubizol reinforcing mesh — a glass fibre mesh with a nominal weight per unit area of 160 $g.m^{-2}$, and grid size of 4.1 by 5.1 mm.

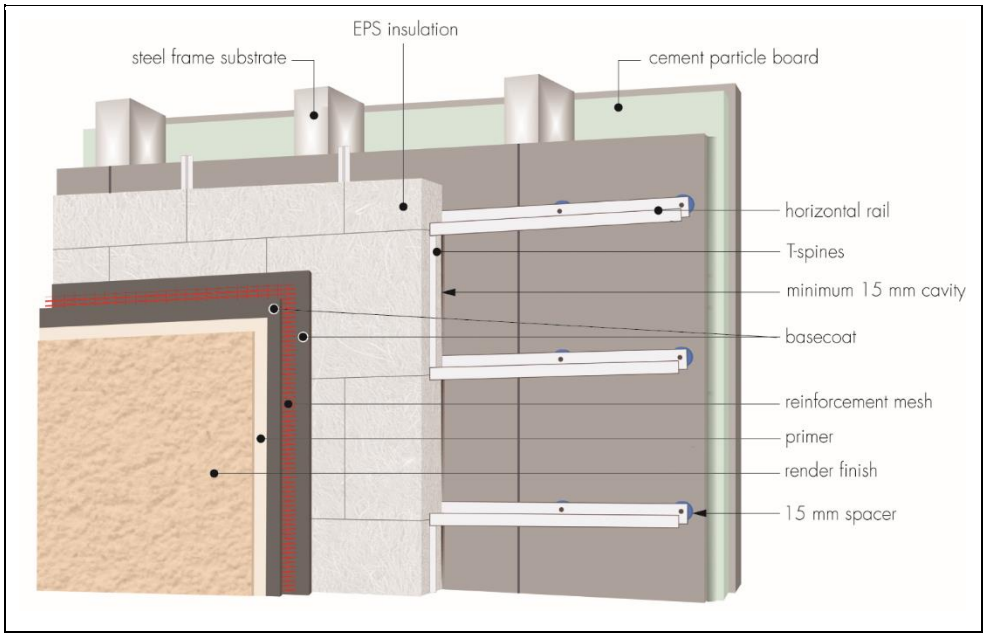
Primer

- Jubizol Unigrund primer — an acrylic slurry emulsion, applied by roller to the basecoat. It is used as a bonding agent and pre-coat, with a coverage rate of 0.25 kg per m^2.

Finish coats

- Jubizol Silicate Trowelled/Smooth Renders — silicate-based renders, supplied pre-mixed in a range of colours with particle sizes of 1.5 to 2.5 mm and a coverage of 1.7 $kg.m^{-2}$. Applied to a thickness of 2 to 2.5 mm for the trowelled version, and 1.5, 2 and 2.5 mm for the smooth version
- Jubizol Silicone Trowelled/Smooth Renders — silicone-based renders, supplied pre-mixed in a range of colours with particle sizes of 1.5 to 2.5 mm and a coverage of 1.7 $kg.m^{-2}$. Applied to a thickness of 2 to 2.5 mm for the trowelled version, and 1.5, 2 and 2.5 mm for the smooth version.

Figure 1 Jubizol CR External Wall Insulation System (LWSF)



1.3 Ancillary materials used with the system:

- aluminium or PVC-U corner profiles with mesh and optional PVC-U nosing
- profile connectors and fixings
- water drainage deflector channels (for use above windows).

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

- LWSF sheathed construction, including the CPB
- breather membrane
- insect mesh
- aluminium or PVC-U movement joint (also known as 'expansion joint')
- joint sealant and polyurethane foam filler
- intumescent strips
- cavity fire stops.

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 JUB d.o.o. has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015, BS EN ISO 14001 : 2015 and BS EN ISO 50001 : 2018 (Certificates SI-Q-159, SI-E-034 and SI-En-024 respectively).

3 Delivery and site handling

3.1 The system components are delivered to site in the packaging and quantities listed in Table 1. Each package carries the product identification, manufacturer's batch number and the BBA logo incorporating the number of this Certificate.

Table 1 Component supply details

Component	Quantity/packaging
Insulation boards	sealed packs
Base profile	lengths of 2500 mm
Horizontal rail profiles	lengths of 2500 mm
Vertical splines	lengths of 450 mm
Cavity spacers	100 per boxes
Mechanical fixings	200 per boxes
Jubizol basecoat	25 kg bags
Jubizol reinforcing mesh	50 by 1 m rolls
Jubizol Unigrund primer	18 kg plastic containers
Jubizol Silicate/Jubizol Silicone finishes	25 kg containers

3.2 The insulation must be stored on a firm, clean, level base, off the ground and under cover until required for use. Care must be taken when handling to avoid damage.

3.3 The insulation must be protected from prolonged exposure to sunlight, either by storing opened packs under cover or re-covering with opaque polythene sheeting. Care must be taken to avoid contact with solvents or materials containing volatile organic components. The boards must not be exposed to open flame or other ignition sources. Boards that become damaged, soiled or wet should be discarded.

3.4 The basecoat, primer and all cementitious materials must be stored in dry conditions between 5 and 30°C, off the ground and protected from moisture. Contaminated material must be discarded.

3.5 The finishes should be stored in a safe area, under cover and protected from excessive heat and frost at all times.

3.6 The rails must be protected from humidity and stored indoors.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Jubizol CR External Wall Insulation System (LWSF).

Design Considerations

4 General

4.1 The Jubizol CR External Wall Insulation System (LWSF), when installed in accordance with the Certificate holder's instructions and this Certificate, is satisfactory for use in reducing the thermal transmittance (U value) of external sheathed steel framed 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 LWSF buildings sheathed with panels, on new or existing domestic and non-domestic buildings with height restrictions (see section 8). 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 1993-1-1 : 2005 and its UK National Annex
- BS EN 1993-1-3 : 2006 and its UK National Annex
- BS 8000-0 : 2014
- BS EN 10346 : 2015
- BS EN 634-2 : 2007.

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.

4.7 The system must provide a minimum 15 mm wide drained cavity(1)(2) between the sheathing board and the insulation panels. This cavity is vented to allow limited outside air ingress; however, it is classed as an unventilated cavity in accordance with BS EN ISO 6946 : 2017 and will not affect the U-value calculations of the wall. Openings should provide a ventilation rate of up to 500 mm^2 per metre length of wall (in the horizontal direction) for vertical layers. 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 loads actions applied to the system (see Table 2 for the non-exhaustive minimum specifications for system installations relating to the light gauge steel and sheathing). It is essential that appropriate movement joints are incorporated into the system (see section 4.6).

Table 2 Minimum steel frame construction requirements

Item	Characteristic	Specifications
Steel framed structure(1)	Cold-formed steel frame members should have a maximum flange width-to-thickness ratio ≤ 50 in accordance with BS EN 1993-1-3 : 2006. The steel structure studs should be at least 1.2 mm thick, with 50 mm (minimum) flanges	In accordance with BS EN 10346 : 2015 type S 320 GD +Z275
Sheathing board(1)(2)	12 mm thick (minimum)	Cement particle board manufactured to BS EN 634-2 Class 1 with fire classification of D-s2, d0 or better to BS EN 13501-1 : 2018

(1) These components are outside the scope of this Certificate.
(2) The board must be of an exterior grade, with the minimum acceptable specification as indicated in this Table.

4.9 The system will improve the weather resistance of a wall and provide a decorative finish.

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 and vapour control layers (vcl) where required. For guidance, examples of relevant detailing for external wall insulation systems are given in the SCI publication *P343 Insulated Render Systems Used with Light Steel Framing* (Steel Construction Institute, 2006).

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 the system is installed and maintained in accordance with the conditions set out in this Certificate.

5 Practicability of installation

The system should only be installed by specialised 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 (non-mandatory); details of approved installer companies are included on the BBA's website (www.bbacerts.co.uk).

6 Thermal performance

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

Table 3 Thermal conductivity of the insulation (λ_D value)

Insulation type	Thickness (mm)	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)
EPS 70E white	50 to 200	0.038

6.2 The U value of a completed wall will depend on the selected insulation thickness, the degree of ventilation of the cavity, fixing method and type of fixing, and the insulating value of the substrate and its internal finish. Example U values for LWSF constructions with a drained cavity in accordance with the national Building Regulations are given in Table 4 and are based on the thermal conductivity given in Table 3. In order to take account of the correction in a combined method U value calculation, Tables 5 and 6 may be used.

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

U value ($W \cdot m^{-1} \cdot K^{-2}$)	Thickness of insulation (mm)(4)	
	Aluminium rails	PVC rails
0.18	—	200
0.19	200	190
0.25	150	140
0.26	140	140
0.28	130	130
0.30	120	120
0.35	105	90

(1) Wall construction inclusive of 12.5 mm plasterboard (λ = 0.21 $W \cdot m^{-1} \cdot K^{-1}$), 100 mm air cavity bridged by 28% of uninsulated steel profile C sections (λ = 0.13 $W \cdot m^{-1} \cdot K^{-1}$), 50 mm flanges ($\lambda$ = 50 $W \cdot m^{-1} \cdot K^{-1}$), 15 mm cavity spacer to form a drainage cavity (this cavity is considered to be 'unventilated' according to BS EN ISO 6946 : 2017), PVC fixing rail (λ = 0.17 $W \cdot m^{-1} \cdot K^{-1}$) or aluminium fixing rail (λ = 160 $W \cdot m^{-1} \cdot K^{-1}$), EPS insulation ($\lambda$ = 0.038 $W \cdot m^{-1} \cdot K^{-1}$) and 8 mm render thickness

(2) Based upon incremental insulation thickness of 10 mm

(3) Based upon calculations in accordance with BS EN ISO 6946 : 2017

(4) See section 4.2.

Table 5 Corrections to U values for PVC profiles and splines using a combined method

Insulation thickness (mm)	Rail length, L (m)	Wall area, A (m^2)	PVC profile/spline linear thermal transmittance, ψ ($W \cdot m^{-1} \cdot K^{-1}$)
100	1	1	0.002
110	1	1	0.002
120	1	1	0.002
130	1	1	0.001
140	1	1	0.001
150	1	1	0.001
160	1	1	0.001
170	1	1	0.001
180	1	1	0.001
190	1	1	0.001
200	1	1	0.001

Note: correction to U value should be made as follows:

$U = U_0 + [L^* \psi] / A$

Where:

U_0 is U value of wall without rail present
Ψ is linear thermal transmittance of rail
L is length of rail
A is wall area.

Table 6 Corrections to U values for aluminium profiles and splines using a combined method

Insulation thickness (mm)	Rail length, L (m)	Wall area, A (m^2)	Aluminium profile/spline linear thermal transmittance, ψ ($W \cdot m^{-1} \cdot K^{-1}$)
100	1	1	0.017
110	1	1	0.014
120	1	1	0.012
130	1	1	0.011
140	1	1	0.009
150	1	1	0.008
160	1	1	0.007
170	1	1	0.006
180	1	1	0.006
190	1	1	0.005
200	1	1	0.005

Note: correction to U value should be made as follows:

$U = U_0 + [L^* \psi] / A$

Where:

U_0 is U value of wall without rail present
Ψ is linear thermal transmittance of rail
L is length of rail
A is wall area.

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 7.6).

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 Positive wind load is transferred to the substrate wall directly via compression through the render, insulation and profiles.

7.6 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 rail fixing from the sheathing board (see sections 7.7 and 7.8)
- the pull-through resistance of the rail fixing from the rails
- the strength of the rail profiles.

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

7.7 The design pull-out resistance of the profile 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 (N_{Rk1}) = 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 7 for a similar substrate.

7.8 The typical characteristic pull-out resistances for the fixings tested on a similar substrate are as per Table 7, and can be used as a reference guide.

Table 7 Typical characteristic pull-out resistances of profile fixings from the substrate

Fixing type – JT3-3 range	Substrate facing	Characteristic pull-out resistance(1) (kN)	Partial factor(2) (γ_m)
5.5 mm diameter self-drilling fixing, with S16 washer	Through the support rails, cavity spacer, 12 mm thick CPB	1.03	1.5
6.3 mm diameter self-drilling fixing, with S19 washer		1.03	1.5

(1) Values obtained from tests
(2) To obtain the typical design pull-out resistance (N_{RD1}) of the fixing, the characteristic pull-out resistance should be divided by the partial factor given.

7.9 The dynamic wind uplift test was carried out on a sheathed steel-frame building structure and the system installed with horizontal rail profiles at 500 mm vertical spacing; the horizontal rail profiles were fastened to 12 mm thick CPB sheathing board (providing a 20 mm cavity), with screws at 300 mm horizontal centres. The insulation boards slotted into the horizontal rail profiles and vertically connected board edges with T-splines as shown in Figure 1. 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 0.6 $kN \cdot m^{-2}$.(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 7.9. 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 (N_{Rk2}) obtained from the dynamic wind uplift test by a partial safety factor of 3.

7.10 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/360, in accordance with BS EN 1993-1-1 : 2005. The Certificate holder may advise on the limiting deflection for the system.

7.11 The data derived from sections 7.7 to 7.10 must be assessed against the design wind load, and the following expressions must be satisfied:

For safe design:

$Rd_{Test} \geq W_e$ and $N_{RD1} \geq W_e$
$N_{RD1} = NRk_1/\gamma m$
$Rd_{Test} = NRk_2/\gamma m$

Where:

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)
NRk_1 is the characteristic resistance obtained from the pull-out test
NRk_2 is the characteristic resistance obtained from the wind uplift test
γm is the partial safety factor (determined by the mode of failure).

Impact resistance

7.12 Hard body impact tests were carried out in accordance with ETAG 004 : 2013. The system is suitable for use in the Categories(1) up to and including those specified in Table 8 of this Certificate.

Table 8 System impact resistance

Render systems: Basecoat, primer and finishing coat indicated below:	Use Category(1)
Jubizol basecoat, Jubizol Unigrund primer and Jubizol Silicate finish	III
Jubizol basecoat, Jubizol Unigrund primer and Jubizol Silicone finish	

(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 reaction to fire classification(1) for the system in 'Red Brick' colour is B-s2, d0 in accordance with BS EN 13501-1 : 2007.

(1) ZAG Ljubljana Department for Building Physics Fire Laboratory Test Report P 0983/11-530-5 – copies available from the Certificate holder

8.2 The classification applies to the full range of thicknesses covered by the Certificate and the 'Red Brick' colour only. The classifications for other colours should be confirmed by reference to the requirements of documents supporting the national Building Regulations.

8.3 The EPS insulation in isolation is classified Euroclass E to BS EN 13501-1 : 2007.

8.4 The reverse side of the system (insulation facing into the cavity) has a reaction to fire classification of E to BS EN 13501-1 : 2007.

8.5 In England, Wales and Northern Ireland, the system may be used on buildings at any proximity to a boundary. The system is restricted for use to buildings up to 18 m in height.

8.6 In Scotland, the system may be used on buildings more than 1 m from a boundary and, on houses, 1 m or less from a boundary. With minor exceptions, the system should be included in calculations of unprotected area, except on houses where the external wall behind has the appropriate fire resistance.

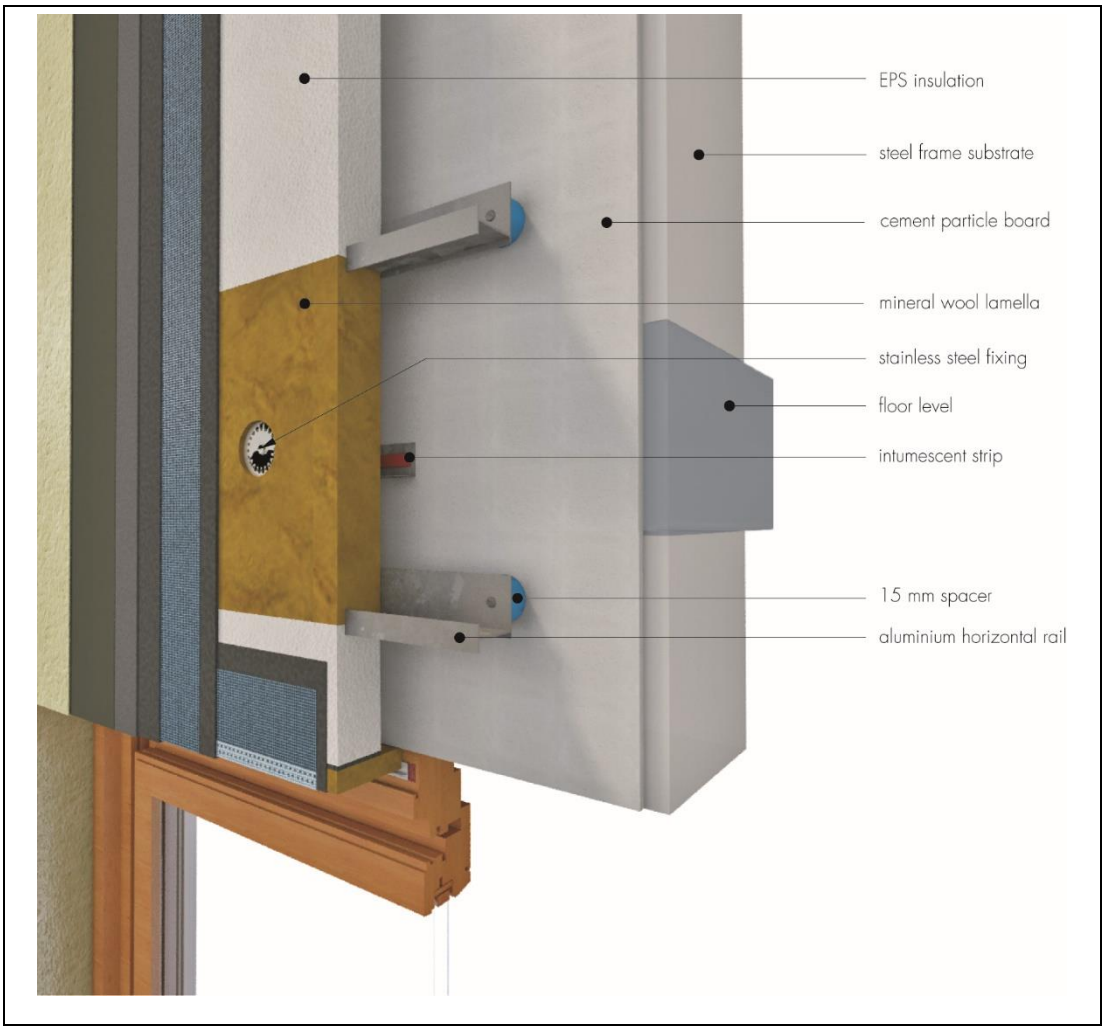
8.7 In Scotland, the system should not be used on any building with a storey more than 11 m above the ground, or on any entertainment or assembly building with a total storey area more than 500 m^2, or on any hospital or residential care building with a total storey area more than 200 m^2.

8.8 For application to second storey walls and above, fire barriers must be installed in line with compartment walls and floors, as advised in BRE Report BR 135 : 2013 (see Figure 2 of this Certificate).

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

8.10 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, cavity barriers, service penetrations and combustibility limitations for other materials and components used in the overall wall construction.

Figure 2 Fire barrier detail



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 watertight prior to application of the system. The system must 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.

10.3 The guidance given in BRE Report BR 262 : 2002 should be followed in connection with the watertightness of wall constructions. 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.

10.4 At the top of walls, the system should be protected by a coping, overhang or other detail designed for use with this type of system (see section 16).

11 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 and windows, to minimise the risk of condensation. The recommendations of BS 5250 : 2011 should be followed.

Surface condensation

11.2 Walls will limit the risk of surface condensation adequately 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 : 2011, Section 4, 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 : 2011 (Section 4 and Annexes D and G) and section 11.5 of this Certificate.

11.5 The water vapour resistance factor (μ) for the insulation and the equivalent air layer thickness (s_d) of the reinforced basecoat with finish coat may be taken from Table 9.

Table 9 Water vapour resistance factor and equivalent air layer thickness

Insulation	Thickness (mm)	s_d (m)	μ
EPS 70 white	50 to 200	—	20 to 40(1)
Jubizol basecoat, Jubizol Unigrund primer and Jubizol Silicate finish (trowelled or smooth)	8.5	0.1(2)	—
Jubizol basecoat, Jubizol Unigrund primer and Jubizol Silicone finish (trowelled or smooth)			

(1) The insulation values were obtained from BS EN ISO 10456 : 2007, Table 4. It is recommended that the lower figure is used when assessing the interstitial condensation analysis.
(2) These values were obtained with 2 mm grain particle size.

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
- examination of the sealant around openings and service entry points
- 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; 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 : 2016.

13 Durability

13.1 The system will have a service life of 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. The appearance may be restored by a suitable power wash or, if required, by overcoating.

13.3 To maintain a high quality aesthetic appearance, it may be necessary to periodically overcoat the building using system-compatible coatings as described in section 1.2, and 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 system. 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 suitability for treatment and any repairs necessary to the building structure before application of the system. A specification is prepared for each elevation of the building indicating:

- the position of beads
- detailing around windows, doors and at eaves
- damp-proof course (dpc) level
- exact position of expansion joints, if required
- areas where flexible sealants must be used
- any alterations to external plumbing, where required
- the position of fire and cavity stop barriers.

14.2 The survey should include tests conducted on the walls of the building by the Certificate holder or their approved installers (see section 15), to determine the pull-out resistance of the specified mechanical fixings for the substrate to withstand the building's expected wind loading, based on calculations using the fixing's pull out resistance test data. In addition, the type and minimum number of fixings are selected (see section 7). The advice of the Certificate holder should be sought to ensure the proposed fixing pattern is sufficient.

14.3 Surfaces should be sound, clean, and free from loose material. The flatness of surfaces must be checked; this may be achieved using a straight edge spanning the storey height. Any irregularities must be made good prior to installation to ensure that the insulation boards are installed with a smooth, in-plane finished surface; the weather tightness of joints of the sheathed board must be checked prior to installation.

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

14.5 For new buildings, internal wet work, eg screed or plastering, should be completed and allowed to dry prior to the installation of the system.

14.6 All modifications and necessary repairs to the building structure 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 requirement 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 must be carried out in accordance with the Certificate holder's current installation instructions and this Certificate.

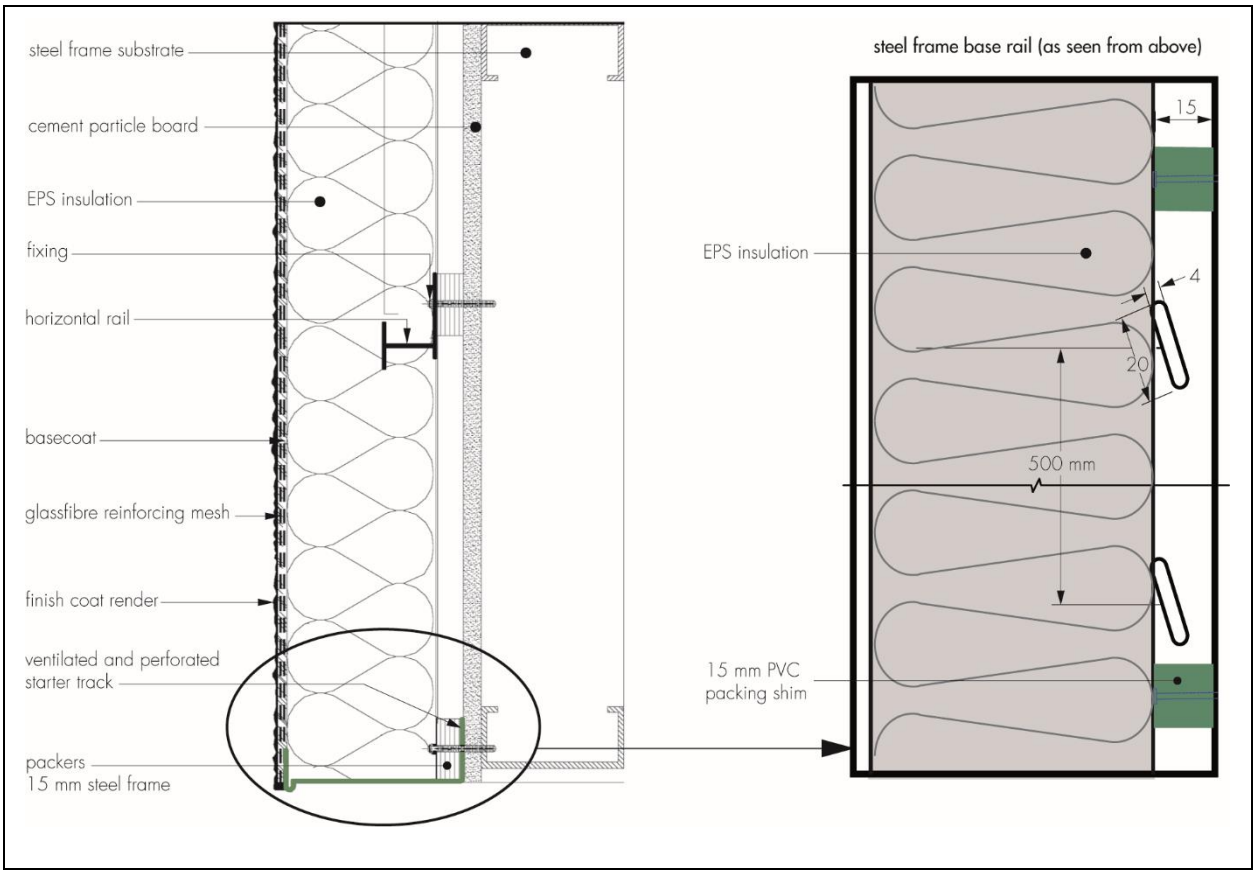
16.2 Weather conditions should be monitored to ensure correct application and curing conditions. Application of coating materials must not be carried out at temperatures below 5 or above 30°C, or if exposure to frost is likely, and the coating must be protected from rapid drying.

16.3 All rendering should be in accordance with the relevant recommendations of BS EN 13914-1 : 2016.

Positioning and securing insulation boards

16.4 The base profile is secured to the cement particle board above the dpc (see Figure 3) using the profile fixings listed in section 1.1 at approximately 300 mm centres. Base profile connectors are inserted at the base of the system's joints. Extension profiles are fixed to the front lip of the base profile. Stop end profiles are installed where required.

Figure 3 Typical section of base profile rail

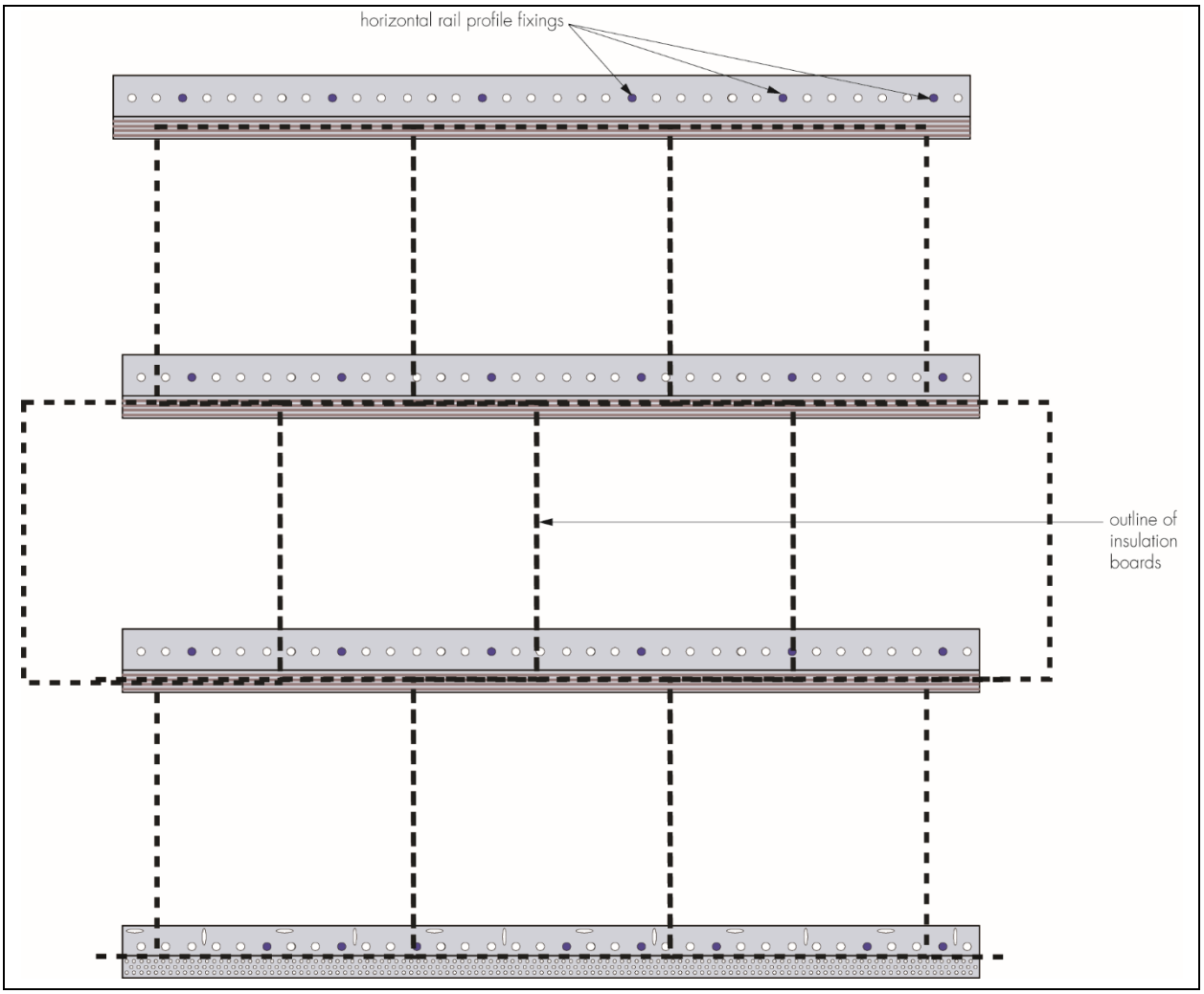


16.5 Cavity spacers are used at fixing points behind the base profile where it is necessary to overcome surface irregularities and to maintain alignment of the face of the insulation.

16.6 The horizontal rail profiles and 15 mm wide spacers are mechanically fixed to the sheathing board as well as the LWSF studs with hammer-drive screws, at a maximum of 300 mm centres. Rails may need extra spacers to ensure they

are true to line and level. Drainage deflection channels are mechanically fixed over all window and door openings (see Figure 4), and horizontal and vertical intumescent strips are installed following the designer's instructions. Care should be taken not to overdrive the fixings.

Figure 4 Rail profile fixing pattern



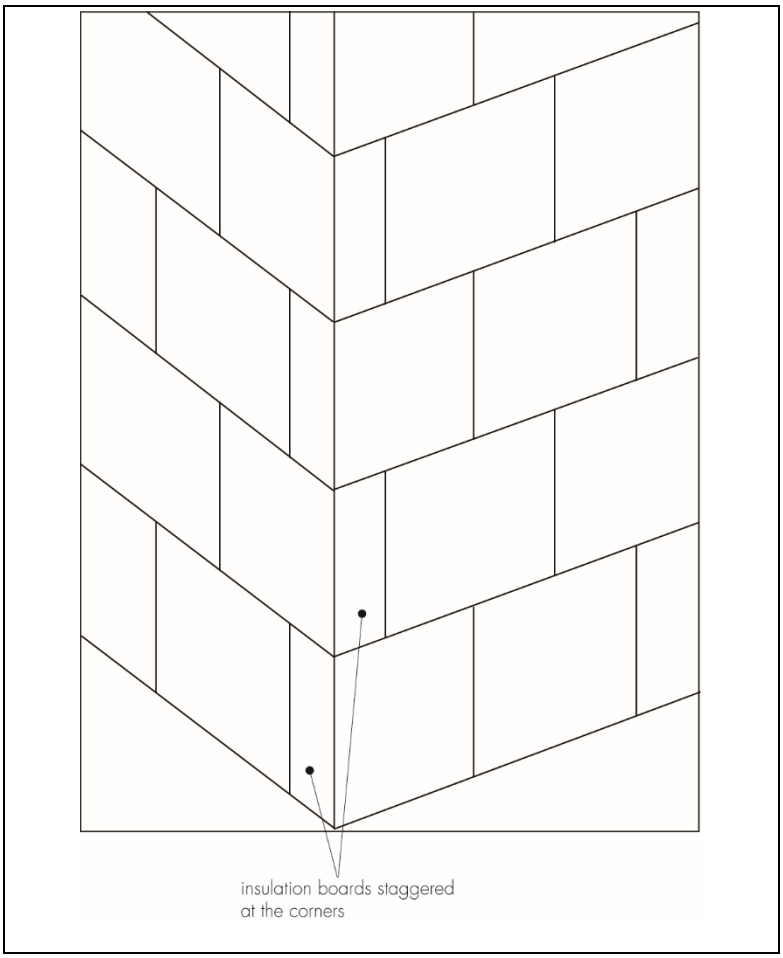
16.7 The first insulation board is positioned onto the base profile and is used to position the first horizontal rail. The fixing rail slots into the pre-cut groove in the insulation board. The level is checked, and the rail is positioned away from the substrate using the 15 mm spacer (see Figure 2).

16.8 Once the horizontal fixing rails are in position and the insulation board is placed onto the fixing rail, the vertical splines are positioned into the EPS grooves. The next insulation board is slotted into place. It is important to ensure that the fixing rails fit securely into the grooved insulation and that the insulation boards are tightly butted together, particularly at corners.

16.9 Joints greater than 2 mm between boards should be filled with slivers of insulation board or polyurethane foam. Gaps greater than 10 mm should be closed by repositioning, or where appropriate, by cutting boards to fit.

16.10 Subsequent boards are positioned so that the vertical joints are staggered by a minimum of 100 mm and any open joints in the insulation system filled and overlapped at the building corners (see Figure 5). Installation continues until the whole wall is completely covered including, where appropriate, the building soffits.

Figure 5 Typical arrangement of insulation boards at corners



16.11 Care must be taken to ensure alignment is checked as work proceeds. The surface of the boards should be smooth without high spots or irregularities. Fire barriers must be installed, where required, following the designer's instructions.

16.12 To fit around details such as doors and windows, insulation boards may be cut with a sharp knife or a fine-toothed saw. Purpose-made window-sills, seals and deflection channels are fitted; these are designed to prevent or manage water ingress and allow water to be shed clear of items bridging the cavity. Corner profiles are fixed to all building corners and to door and window heads and jambs.

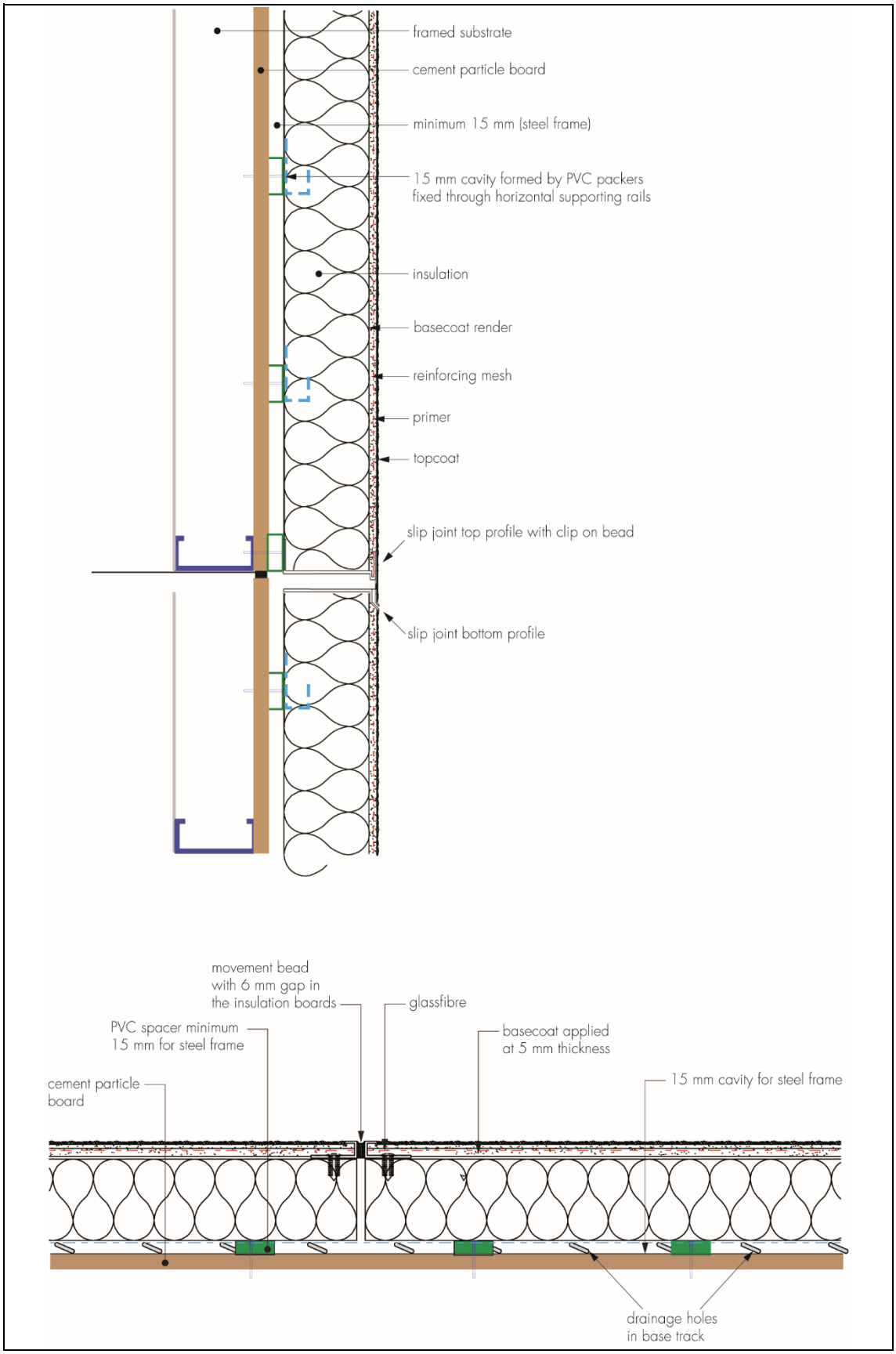
16.13 All corners are fixed with mesh angles installed with adhesive mortar.

Movement joints

16.14 If a horizontal movement joint is already incorporated in the substrate, a movement joint must be provided in the system (see sections 4.6 and 4.8).

16.15 Where required, vertical movement joints extend through the full insulation system, made with the expansion joint profile (see Figure 6).

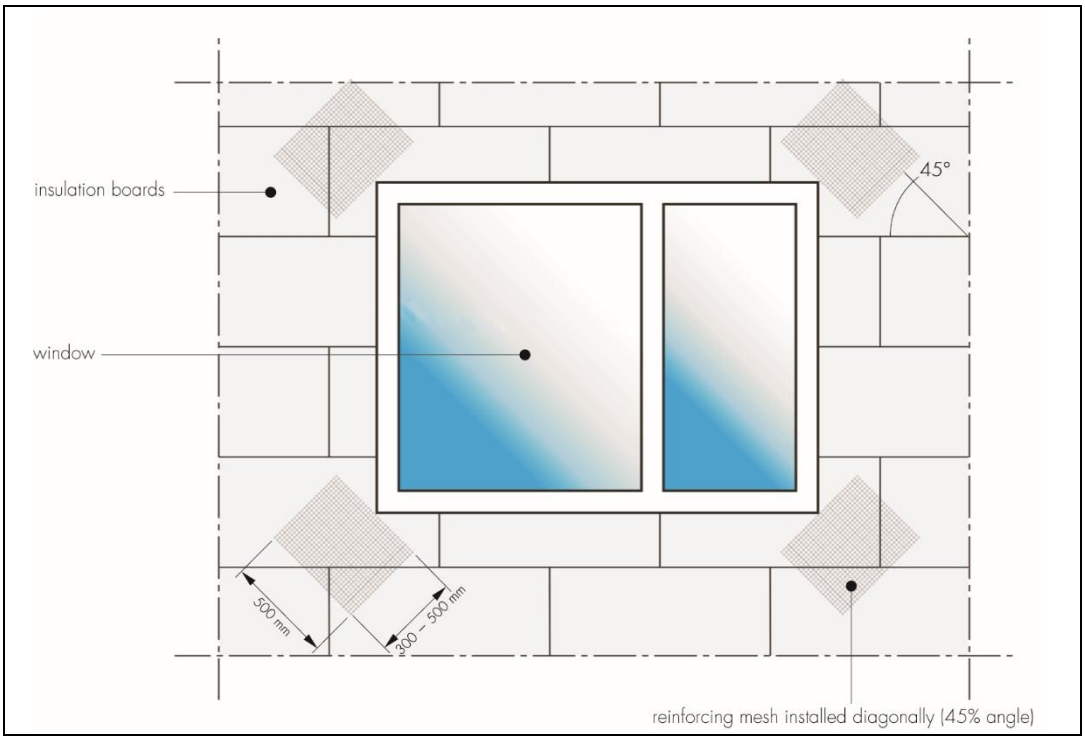
Figure 6 Vertical and horizontal movement joint detail



16.16 Expansion beads are fixed vertically in predetermined positions where necessary, according to the installation specification and the individual requirements of each job.

16.17 In all cases, additional pieces of reinforcing mesh (500 mm, by 300 to 500 mm) are used diagonally at the corners of openings, as shown in Figure 7. The mesh angles are installed with basecoat.

Figure 7 Additional reinforcement at openings



16.18 After sufficient stabilisation of the installed insulation system (normally 48 hours, during which time the insulation should be protected from exposure to extreme weather conditions to prevent degradation), the wall is ready for the application of the basecoat and reinforcement mesh.

Application of basecoat and reinforcement mesh

16.19 Prior to the application of the basecoat, pre-compressed sealing tape is inserted at window and door frames, overhanging eaves, gas and electric meter boxes, and wall vents. Alternatively, gun-applied joint sealants or proprietary sealing beads can be used in accordance with the Certificate holder's instructions.

16.20 The basecoat is prepared by mixing the contents of each 25 kg bag with approximately 4 to 5 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. The first layer of basecoat is applied over the insulation boards using a stainless steel trowel, and floated with a Darby float to an approximate thickness of 4 mm. Reinforcement mesh is applied (with its concave surface to the wall) and is immediately embedded into the basecoat by trowelling from the centre to the edge; an additional light layer of basecoat is then applied (whilst the first coat is still wet) to ensure the mesh is free of wrinkles.

16.21 Further basecoat is applied as required, to ensure the mesh is completely covered and that the minimum 6 mm thickness is achieved. The mesh must be placed in the top one third of the basecoat.

16.22 The basecoat is applied progressively, working in one-metre sections in a vertical or horizontal direction. The reinforcement mesh should be overlapped at joints by at least 100 mm.

16.23 The basecoat should be left to dry thoroughly and harden before application of the primer. The drying time will depend upon weather conditions, but at least 48 hours should elapse.

16.24 The primer is applied to the entire area with a roller.

Render finishes

16.25 Once the primer is dry, Jubizol Silicate or Silicone Trowelled/Smooth Render finishes are applied (thickness dictated by particle size), using a stainless steel trowel and finished with a plastic trowel to create a textured finish.

16.26 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.

16.27 The drying time is dependent on ambient conditions but will typically be 12 hours.

16.28 Care should be taken in the detailing of the system around such features as openings, projections and at eaves (see Figures 8, 9, 10 and 11) to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

16.29 On completion of the installation, external fittings (eg rainwater goods) must be securely fixed to timber grounds and extended to the face of the system.

Figure 8 Roof eaves detail

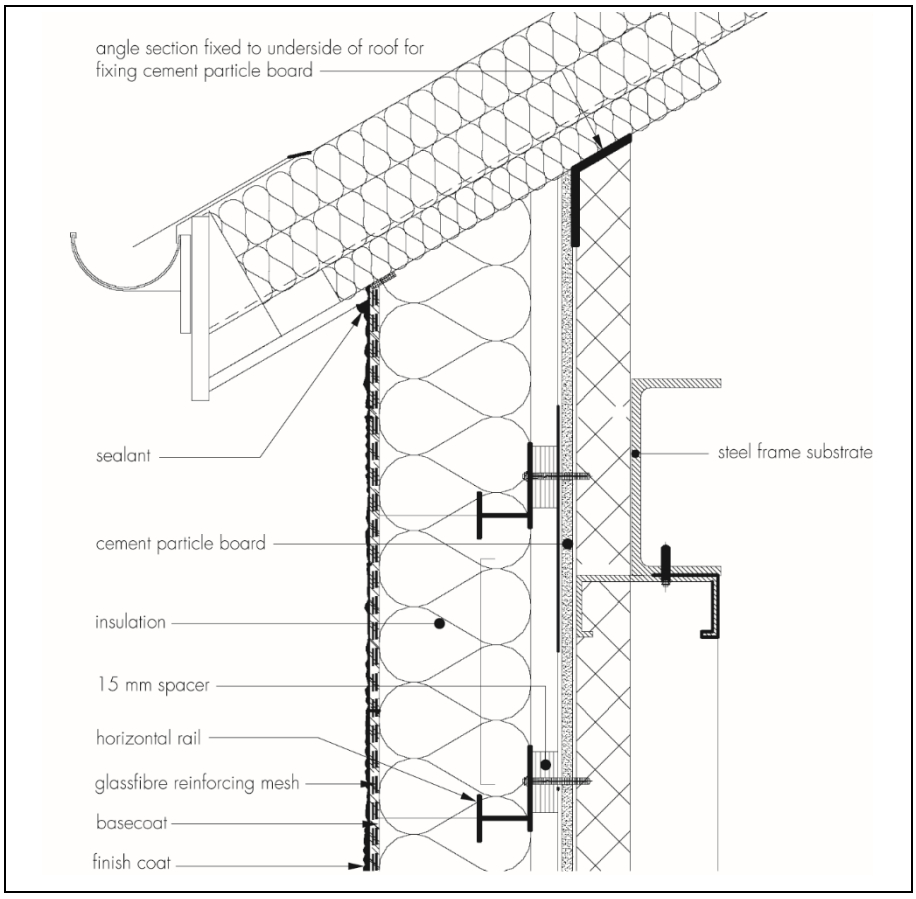


Figure 9 Insulated window head detail

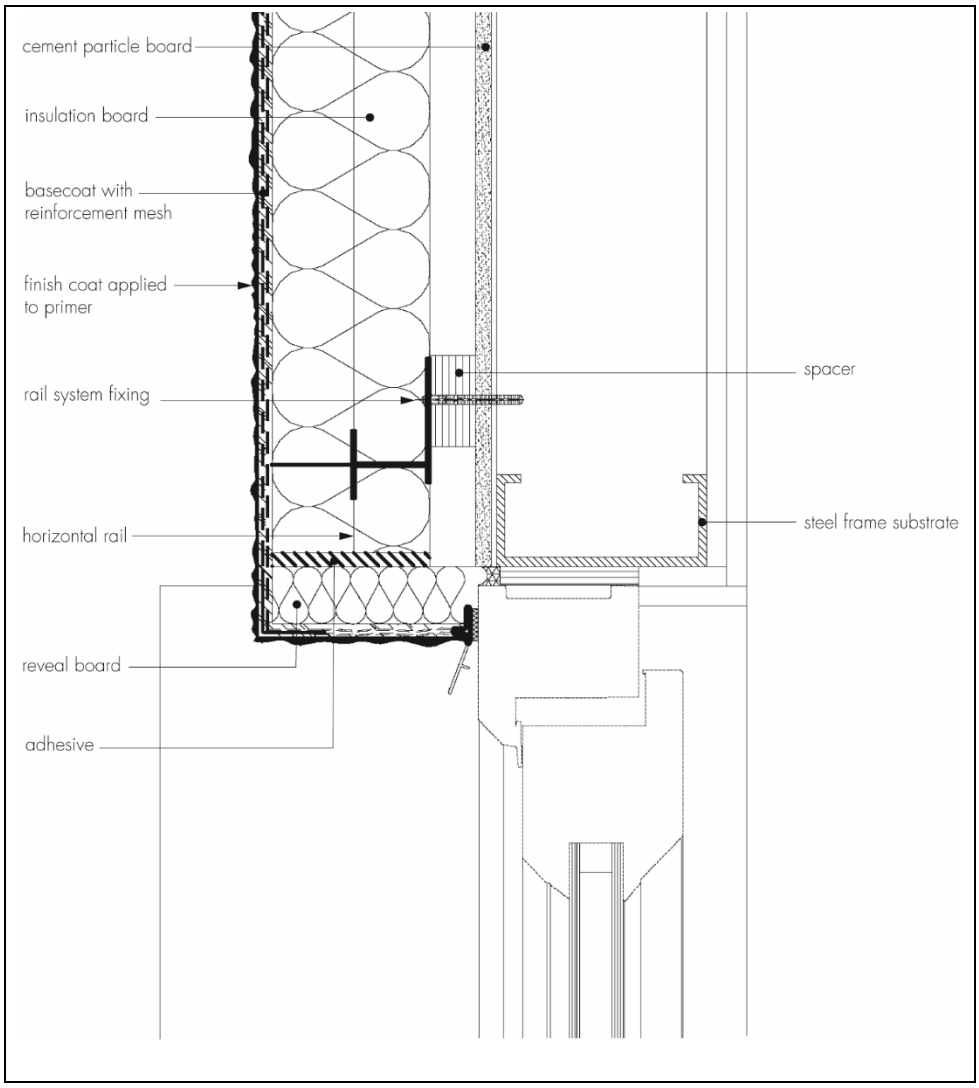


Figure 10 Window sill detail

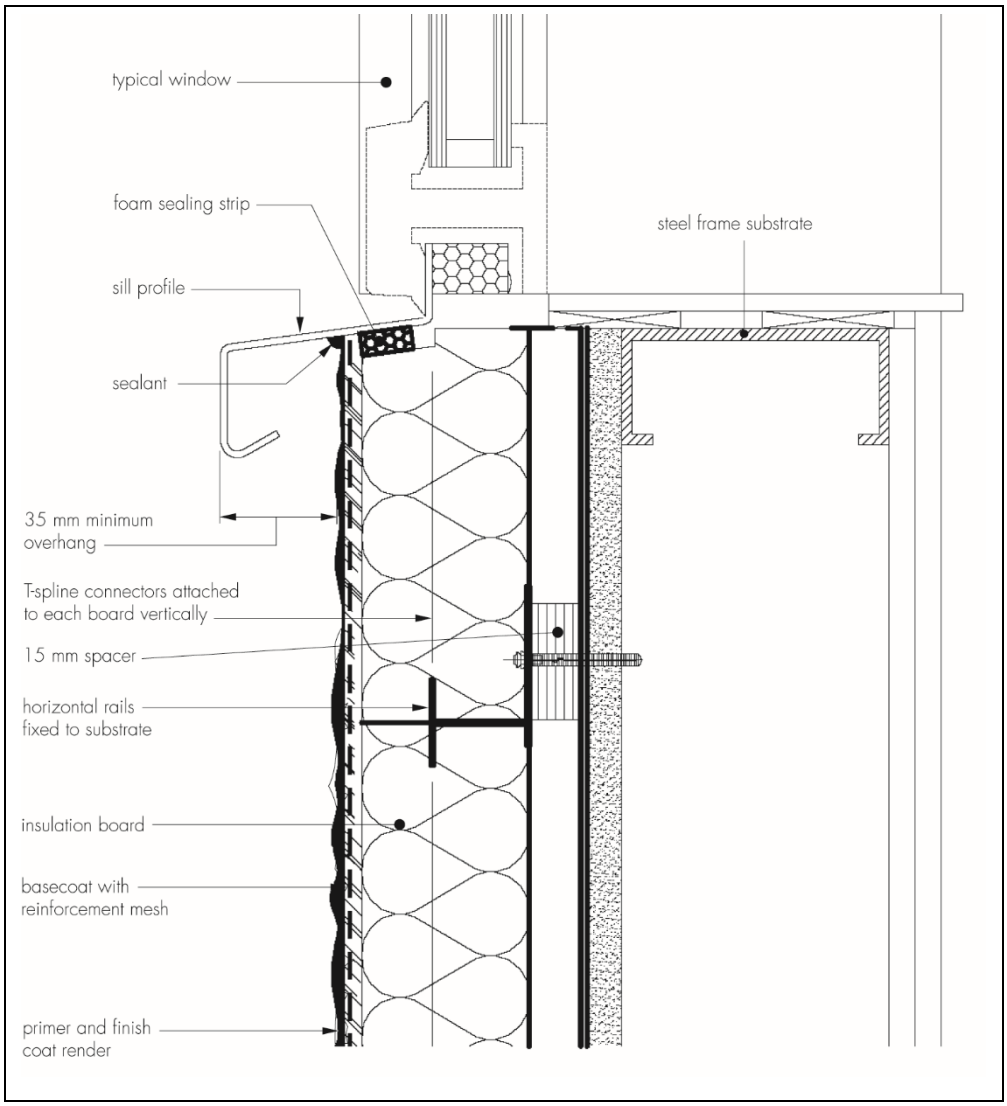
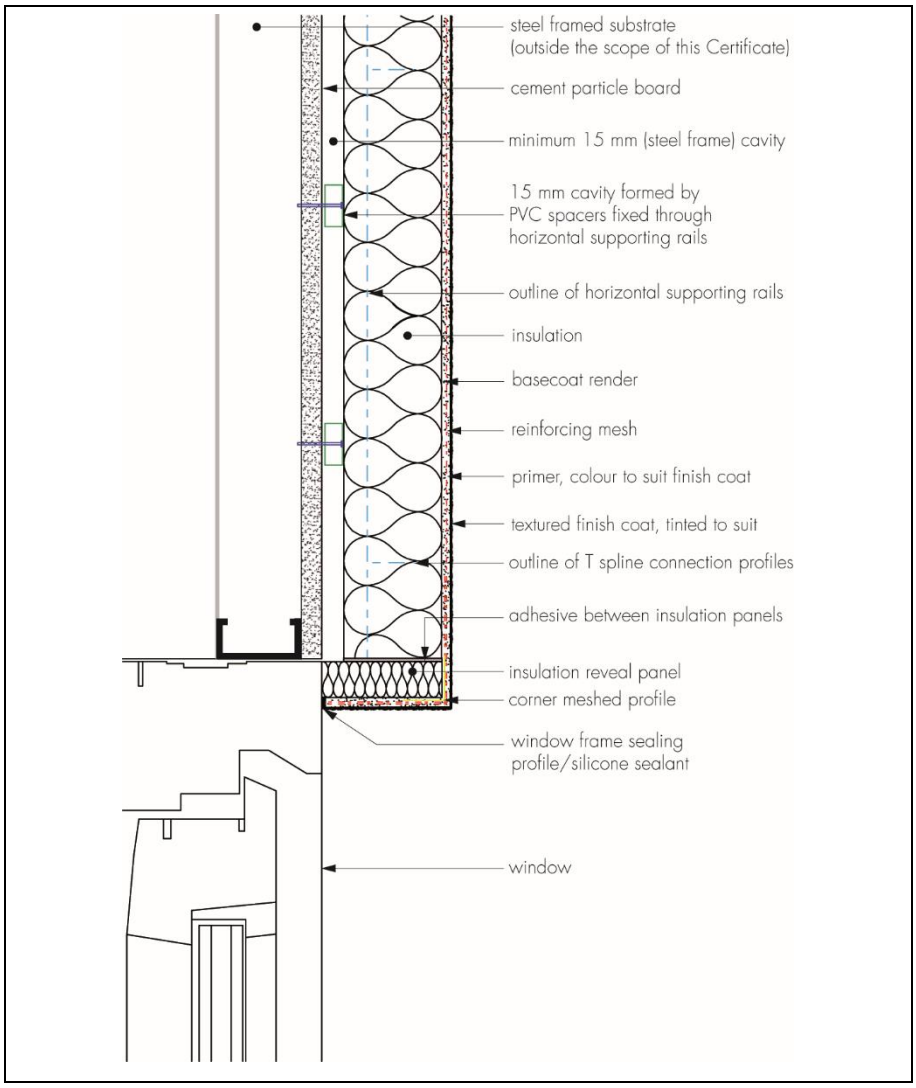


Figure 11 Insulated window reveal detail



Technical Investigations

17 Investigations

17.1 Tests were conducted and the results assessed to determine:

- reaction to fire performance in accordance with BS EN 13501-1 : 2007
- bond strength
- hygrothermal performance and resistance to freeze thaw
- resistance to hard and soft body impacts
- watertightness – resistance to wind-driven rain under pulsating pressure
- water absorption of render and water vapour permeability
- wind load resistance
- pull-through strength of fixings
- pull out of the fixings from sheathed substrates.

17.2 An assessment was made of data relating to:

- durability
- the risk of interstitial condensation
- thermal conductivity.

17.3 The practicability of installation and the effectiveness of detailing techniques were assessed.

17.4 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.

Bibliography

BS 5250 : 2011 + A1 : 2016 *Code of practice for control of condensation in buildings*

BS 8000-0 : 2014 *Workmanship on construction sites – Introduction and general principles*

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BS EN 1062-1 : 2004 *Paints and varnishes — Coating materials and coating systems for exterior masonry and concrete — Classification*

BS EN 1990 : 2002 + A1 : 2005 *Eurocode — Basis of structural design*
NA to BS EN 1990 : 2002 + A1 : 2005 UK National Annex for *Eurocode — Basis of structural design*

BS EN 1991-1-4 : 2005 + A1 : 2010 *Eurocode 1 — Actions on structures — General actions*
NA to BS EN 1991-1-4 : 2005 + A1 : 2010 UK National Annex to *Eurocode 1 — Actions on structures — General actions*

BS EN 1993-1-1 : 2005 + A1 : 2014 *Eurocode 3— Design of steel structures — General rules and rules for buildings*
NA to BS EN 1993-1-1 : 2005 + A1 : 2014 UK National Annex to *Eurocode 3 — Design of steel structures — General rules and rules for buildings*
BS EN 1993-1-3 : 2006 *Eurocode 3 — Design of steel structures — General rules — Supplementary rules for cold-formed members and sheeting*
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BS EN 10346 : 2015 *Continuously hot-dip coated steel flat products for cold forming — Technical delivery conditions*

BS EN 13501-1 : 2007, and 2018 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

BS EN 13163 : 2012 + A2 : 2016 *Thermal insulation products for buildings — Factory made expanded polystyrene (EPS) products — Specification*

BS EN 13914-1 : 2016 *Design, preparation and application of external rendering and internal plastering — External rendering*

BS EN ISO 6946 : 2017 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 9001 : 2015 *Quality management systems — Requirements*

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

BS EN ISO 50001 : 2018 *Energy management systems — Requirements with guidance for use*

BRE Report 135 (BR 135 : 2013) *Fire performance of external thermal insulation for walls of multi-storey buildings*

BRE Report 262 (BR 262 : 2002) *Thermal insulation: avoiding risks*

BRE Report 443 (BR 443 : 2006) *Conventions for U-value calculations*

ETAG 004 : 2013 *Guideline for European Technical Approval of External Thermal Insulation Composite Systems (ETICS) 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
- has to be read, considered and used as a whole document – it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English Law.

2. Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

3 This Certificate will be displayed on the BBA website, and the Certificate Holder is entitled to use the Certificate and Certificate logo, provided that the product and its manufacture and/or fabrication, including all related and relevant parts and processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- 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.

5. In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product or any other product
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product
- actual installations of the product, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product, including its manufacture, supply, installation, use, maintenance and removal
- 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.

British Board of Agrément
1st Floor, Building 3, Hatters Lane
Croxley Park, Watford
Herts WD18 8YG
tel: 01923 665300
clientservices@bbacerts.co.uk
www.bbacerts.co.uk