

## Eurobrick Systems Limited

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Agrément Certificate  
**13/5079**  
Product Sheet 1

### EUROBRICK CLADDING SYSTEMS

### X-CLAD EXTERNAL CLADDING SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the X-Clad External Cladding System, an insulated clay brick slip system for use as protective/decorative cladding with or without a cavity over solid masonry, timber- and steel-frame external walls in new and 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

**Strength and stability** — the system can adequately resist wind loads and impact damage (see section 6).

**Behaviour in relation to fire** — the system is classified as Class O as defined by the national Building Regulations and its use is restricted in some cases (see section 7).

**Thermal properties** — the system contributes to the overall thermal performance of the wall construction (see section 9).

**Condensation risk** — the system can contribute to limiting the risk of interstitial and surface condensation (see section 10).

**Weathertightness** — the system resists water penetration and reduces the risk of damage to the inner wall (see section 11).

**Durability** — with appropriate maintenance, the system will remain effective for at least 25 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: 26 September 2018

Originally certificated on 6th January 2014

Certificate amended on 18 January 2019 to include Regulation 7(2) for England and associated text.

Certificate amended on 13 January 2020 to include new regulatory guidance for fire in Scotland and Wales.

Paul Valentine  
Technical Excellence Director

Claire Curtis-Thomas  
Chief Executive

The BBA is a UKAS accredited certification body – Number 113.

The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at [www.bbacerts.co.uk](http://www.bbacerts.co.uk)

Readers MUST check the validity and latest issue number 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 should not be relied upon.

#### British Board of Agrément

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# Regulations

In the opinion of the BBA, the X-Clad External Cladding System, 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)

<b>Requirement:</b>	<b>A1</b>	<b>Loading</b>
<b>Comment:</b>		The system can sustain and transmit wind loads to the fixing into the substrate as set out in sections 4.4, 4.5, 4.7 and 6.2 of this Certificate.
<b>Requirement:</b>	<b>B4(1)</b>	<b>External fire spread</b>
<b>Comment:</b>		The system is restricted by this Requirement. See section 7.1 to 7.3, 7.8 and 7.9 of this Certificate.
<b>Requirement:</b>	<b>C2(b)</b>	<b>Resistance to moisture</b>
<b>Comment:</b>		The system will resist the passage of rainwater to the supporting structure. See section 11 of this Certificate.
<b>Requirement:</b>	<b>C2(c)</b>	<b>Resistance to moisture</b>
<b>Comment:</b>		The system contributes to minimising the risk of surface and interstitial condensation. See section 10.1 of this Certificate.
<b>Requirement:</b>	<b>L1(a)(i)</b>	<b>Conservation of fuel and power</b>
<b>Comment:</b>		The system can contribute to satisfying this Requirement. See section 9 of this Certificate.
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
<b>Comment:</b>		The system is acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>7(2)</b>	<b>Materials and workmanship</b>
<b>Comment:</b>		The system is restricted by this Regulation. See section 7.1 and 7.3 of this Certificate.
<b>Regulation:</b>	<b>26</b>	<b>CO<sub>2</sub> emission rates for new buildings</b>
<b>Comment:</b>		Walls can contribute to satisfying the Target Emission Rate. See section 9 of this Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

<b>Regulation:</b>	<b>8(1)(2)</b>	<b>Durability, workmanship and fitness of materials</b>
<b>Comment:</b>		The use of the system satisfies the requirements of this Regulation. See sections 12 and 13 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
<b>Standard:</b>	<b>1.1(b)</b>	<b>Structure</b>
<b>Comment:</b>		The system can sustain and transmit wind loads to the substrate. See sections 4.4, 4.5, 4.7 and 6.2 of this Certificate.
<b>Standard:</b>	<b>2.6</b>	<b>Spread to neighbouring buildings</b>
<b>Comment:</b>		The system is restricted by this Standard with respect to clauses 2.6.4 <sup>(1)(2)</sup> , 2.6.5 <sup>(1)</sup> and 2.6.6 <sup>(2)</sup> . See sections 7.1, 7.2, 7.4 and 7.5 of this Certificate.
<b>Standard:</b>	<b>2.7</b>	<b>Spread on external walls</b>
<b>Comment:</b>		The system is restricted by this Standard with reference to clause 2.7.1 <sup>(1)(2)</sup> . See sections 7.1, 7.2, 7.4 and 7.5 of this Certificate.
<b>Standard:</b>	<b>3.10</b>	<b>Precipitation</b>
<b>Comment:</b>		The system will contribute to satisfying this Standard, with reference to clauses 3.10.1 <sup>(1)(2)</sup> to 3.10.3 <sup>(1)(2)</sup> , and 3.10.5 <sup>(1)(2)</sup> . See section 11 of this Certificate.
<b>Standard:</b>	<b>3.15</b>	<b>Condensation</b>
<b>Comment:</b>		The system can satisfy or contribute to satisfying this Standard, with reference to clauses 3.15.1 <sup>(1)</sup> , 3.15.2 <sup>(1)</sup> , 3.15.4 <sup>(1)</sup> and 3.15.5 <sup>(1)</sup> . See section 10.1 of this Certificate.
<b>Standard:</b>	<b>6.1(b)</b>	<b>Carbon dioxide emission</b>
<b>Standard:</b>	<b>6.2</b>	<b>Building insulation envelope</b>
<b>Comment:</b>		The system will satisfy or contribute to satisfying these Standards, with reference to clauses 6.1.1 <sup>(1)(2)</sup> , 6.1.4 <sup>(1)</sup> , 6.1.5 <sup>(1)</sup> , 6.2.1 <sup>(1)(2)</sup> , 6.2.3 <sup>(1)</sup> , 6.2.4 <sup>(1)(2)</sup> , 6.2.5 <sup>(1)(2)</sup> , 6.2.6 <sup>(2)</sup> and 6.2.7 <sup>(2)</sup> . See section 9 of this Certificate.
<b>Standard:</b>	<b>7.1(a)(b)</b>	<b>Statement of sustainability</b>
<b>Comment:</b>		The system can contribute to meeting 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 <sup>(1)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ], 7.1.6 <sup>(1)(2)</sup> [Aspects 1 <sup>(1)(2)</sup> and 2 <sup>(1)</sup> ] and 7.1.7 <sup>(1)(2)</sup> [Aspect 1 <sup>(1)(2)</sup> ]. See section 9 of this Certificate.
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
<b>Comment:</b>		All comments given for the system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 <sup>(1)(2)</sup> and Schedule 6 <sup>(1)(2)</sup> . (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:		This system is acceptable. See section 13 and the <i>Installation</i> part of this Certificate.
Regulation:	28	Resistance to moisture and weather
Comment:		The system will contribute to satisfying this Regulation. See section 11 of this Certificate.
Regulation:	29	Condensation
Comment:		The system will satisfy the requirements of this Regulation. See section 10.1 of this Certificate.
Regulation:	30	Stability
Comment:		The system is acceptable as set out in sections 4.4, 4.5, 4.7 and 6.2 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The system is restricted by this Regulation. See sections 7.1 to 7.3 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide Emissions Rate
Comment:		The system will contribute to a building satisfying its Target Emission Rate. See section 9 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 16 *Procedure* (16.4) of this Certificate.

## Technical Specification

### 1 Description

1.1 The X-Clad External Cladding System (see Figure 1) comprises:

- insulated backerboard panels — 1200 mm wide by 2400 mm high composite panels consisting of a high-impact, high-gloss grey polystyrene (HIPS) profiled brick slip carrier sheet, bonded to a 17.5, 25 or 50 mm thick extruded polystyrene (XPS) insulation board with a two part polyurethane adhesive. The XPS insulation is manufactured in accordance with BS EN 13164 : 2012 and with the properties shown in Table 1 of this Certificate. The brick slip carrier sheet provides a horizontal joint spacing track for brick slips with track dimensions of 65.5 mm high with a 9.5 mm raised mortar joint profile as standard

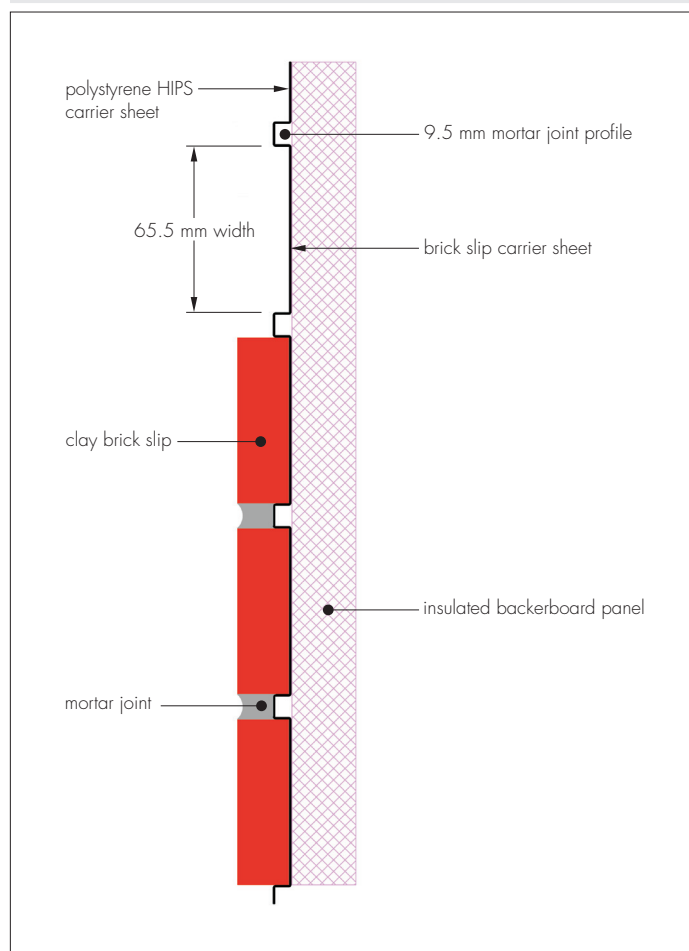
Table 1 Backerboard properties

Performance characteristic (unit)	Value
Density ( $\text{kg}\cdot\text{m}^{-3}$ )	28–34
Insulation compressive strength at 10% compression to BS EN 826 (kPa)	200 (declared value)

- clay brick slip — fired clay brick slips of nominal size 215 mm length, 65 mm height and 15 mm thickness<sup>(1)</sup>, available in a range of colours. The brick slips are either extruded (Britannia range) or cut (Classic range) from masonry units CE marked in accordance with EN 771-1 : 2011 as suitable for use in 'severe exposure' conditions (designation F2). In addition, L-shaped bricks 215 by 65 by 102 mm are available for external corners
- brick slip adhesive — Korapur 126 is a one-part polyurethane construction adhesive specified in accordance with BS 6213 : 2000 and used to attach the brick slips to the panel
- pointing grout/mortar — joints between brick slips are filled with proprietary cementitious mortar mix. Joints below damp-proof course (dpc) level may require a higher strength mortar to protect against potential degradation from frost attack. Mortar mixes must be selected in accordance with class 12, 6 or 4 to BS EN 998-2 : 2016.

(1) Brick slips with different dimensions are available from the manufacturer but are outside the scope of this Certificate.

Figure 1 The X-Clad External Cladding System



1.2 Ancillary components for use with the system, but outside the scope of this Certificate, include:

- backerboard panel fasteners — steel fixings suitable for the substrate incorporating a 45 mm diameter plastic nylon retaining washer used to attach the panel
- base angle — polymer-coated aluminium base angle with size chosen to suite thickness of panel used. This is supplied in 2500 mm lengths for cutting on site to provide a fixed datum for setting out panels
- urethane-based sealant — for use around openings and penetrations in accordance with BS EN ISO 11600 : 2003 and BS 6213 : 2000
- breather membrane — for use on the external side of framed substrate applications
- dpcs
- timber battens — 40 by 25 mm battens used at maximum of 400 mm centres to support sheathing in cavity applications
- sheathing — cement particle board used on the external side, and timber or cement particle board used on the internal side, of cavity applications
- components forming movement joints.

## 2 Manufacture

2.1 The XPS insulation component of the panel is manufactured to comply with BS EN 13164 : 2012. The HIPS profiled carrier sheet component is vacuum formed. Panels are produced by factory bonding the XPS insulation to the profiled carrier sheet using a two part spray polyurethane adhesive. Fastening washers from nylon material are injection moulded.

2.2 Clay brick slips are either extruded- or cut-slips to specified dimensions.

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

- agreed with the Certificate holder/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 non-conformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis as part of a surveillance process to ensure that standards are maintained and that the product or system remains as certificated.

2.4 The management system of Eurobrick Systems Limited has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by CQS Limited (Certificates GB2003636 and EM200081 respectively).

### 3 Delivery and site handling

3.1 The Panels are stacked on timber pallets. Each pack contains a label incorporating the manufacturer's name, product name, edge type, thickness, width, length, number of panels per pallet, pallet weight, recommended storage and handling method.

3.2 During transportation, an impermeable cover should be used to protect the panels.

3.3 Panels must be stored flat, level, clear of the ground on pallets out of direct sunlight and in dry conditions. Panels should ideally be stored indoors, however, should short-term storage outdoors be necessary, they must be covered with tarpaulin. Panels must not be exposed to volatile organic solvents. When moving manually, individual panels should be maintained in a vertical position.

3.4 Clay brick slips are delivered to site in shrink wrapped bundles on pallets. They must be stored covered and on dry level ground.

3.5 Containers of adhesive, mortar, sealants and expanding foam should be stored in dry conditions and protected against frost and excessive heat. Adhesive and mortar must be used within the date indicated on the packaging or the supplier's guidelines.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the X-Clad External Cladding System.

### Design Considerations

#### 4 Use

4.1 The X-Clad External Cladding System is suitable for use as a non-structural weather-resistant, thermally insulating external wall façade panel system to provide a protective and decorative cladding finish for new or refurbished buildings up to 18 m in height, of solid and cavity masonry, dense or no-fines concrete, timber-frame or light-gauge steel-frame construction with or without a vented cavity behind the system (see Figure 2). The system is restricted to sheltered areas (on timber- or steel-frame walls) and moderate areas (on masonry walls) where used without a cavity behind the system (see section 11.2). A map detailing the UK zones for exposure to driving-rain can be found in Approved Document C.

4.2 The system can be used above and below the dpc (see Figure 5). However, when used below the dpc, suitable brick slips and mortars must be specified in accordance with the Certificate holder's advice to resist the higher moisture levels.

4.3 The system will improve the weather resistance and reduce thermal transmission of a wall and provide a decorative finish. However, it may only be installed where other routes for moisture penetration have been dealt with separately and where dampness, other than that caused solely by condensation, is not evident on the inner surface of the wall. The system can contribute to minimising condensation on internal wall surfaces.



4.4 Existing buildings subject to the national Building Regulations should have wall surfaces in accordance with section 4.7.

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

- BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006
- BS 8000-3 : 2001.

4.6 Other buildings, not subject to any of the previous requirements, should also be built in accordance with requirements given in section 4.5.

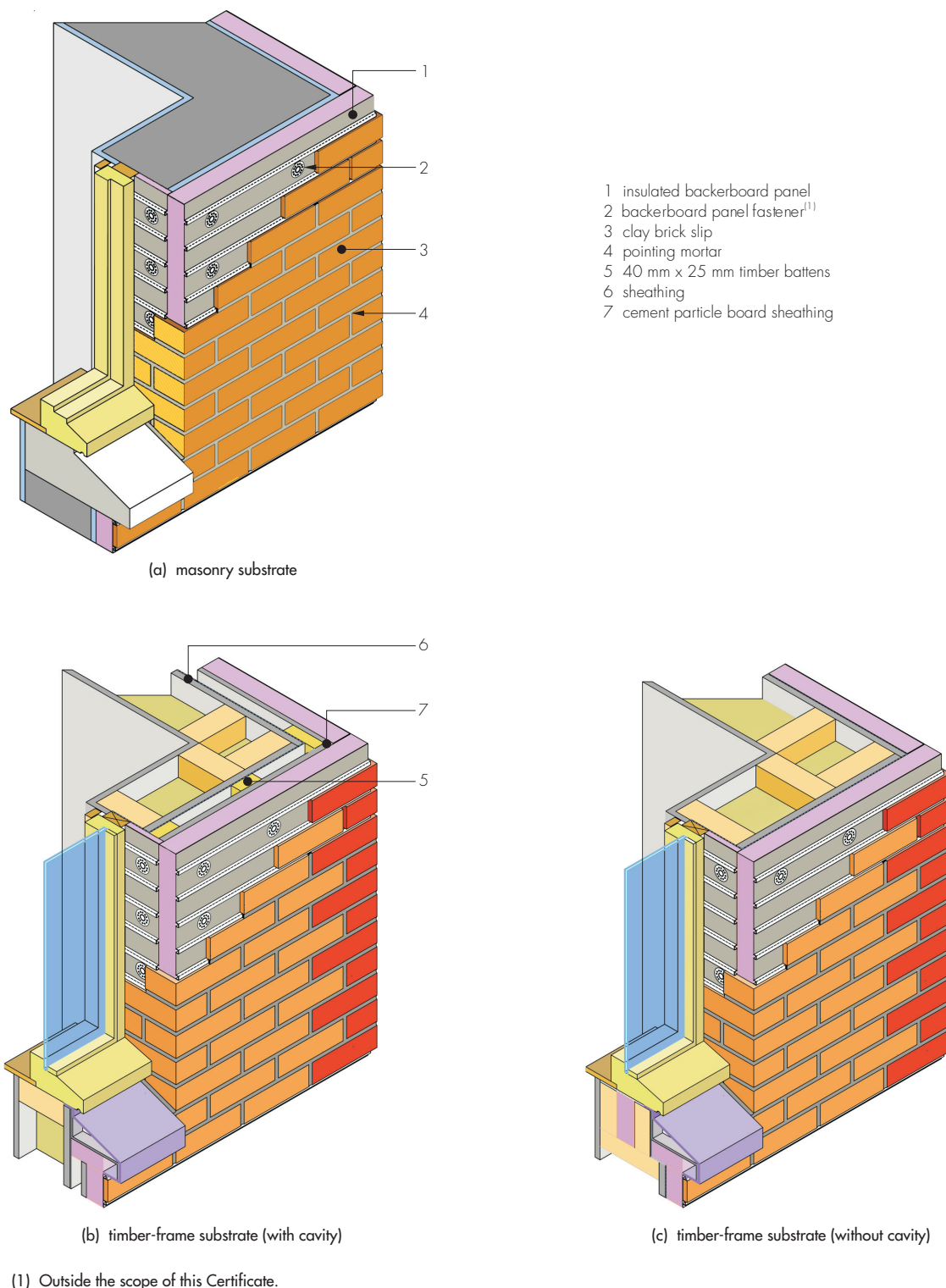


4.7 The wall and support frame to which the cladding is to be fixed should be structurally sound and constructed in accordance with the requirements of the relevant national Building Regulations and Standards:

- timber stud walls and timber battens must be structurally sound, designed and constructed in accordance with BS EN 1995-1-1 : 2004, and preservative treated in accordance with BS EN 351-1 : 2007
- galvanized steel framework must be structurally sound, designed and constructed in accordance with BS EN 1993-1-1 : 2005 and BS EN 1993-1-3 : 2006
- new masonry buildings subject to the national Building Regulations should be constructed in accordance with the relevant recommendations of BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006.



Figure 2 Typical X-Clad External Cladding System



4.8 The system transfers its self-weight and design wind loads to the substrate wall. The substrate and any supporting framework should be capable of resisting the associated loads. Particular care is required around window and door openings to ensure that the structure is capable of sustaining the additional weight of the system.

4.9 The system does not make any contribution to the overall structural performance of the building and must not be used for the support of any temporary structure.

4.10 In very severe exposure conditions, application of a high performance breather membrane should be considered.

4.11 The system must only be used in locations where the surface temperature will not exceed 65°C.

4.12 All externally exposed perimeters and penetrations of the panel must be sealed.

4.13 The fixing of rainwater goods, satellite dishes, clothes lines, hanging baskets and similar items are outside the scope of this Certificate. However, support fixings must pass through the cladding into the substrate wall so as not to exert any loadings on the cladding. Care must be taken not to overtighten the fixings, which could cause damage. Guidance must be sought from the Certificate holder.

## 5 Practicability of installation

The system should only be installed by installers who have been trained and approved by the Certificate holder.

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

## 6 Strength and stability

6.1 A suitably qualified and experienced individual must check the design and installation of the system to provide adequate resistance to design loads applicable in the UK.



6.2 Design wind actions should be calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex. Due consideration should be given to the higher pressure coefficients applicable to corners of the building, as recommended in this Standard and a wind load factor of 1.5 applied to determine the ultimate wind load to be resisted by the system.

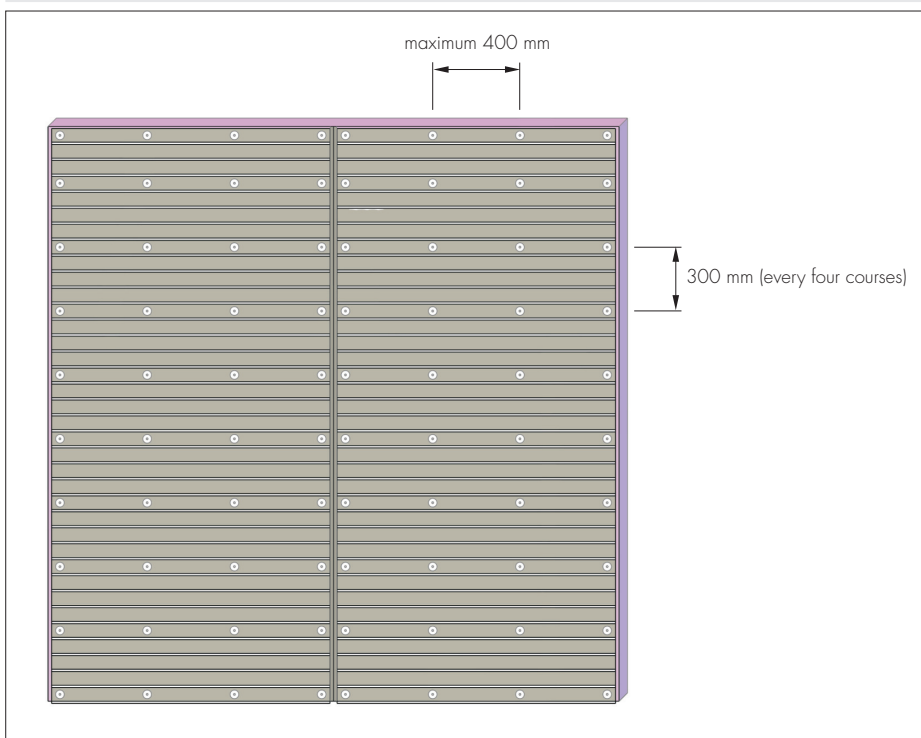
6.3 The substrate wall must be able to take the full wind loads, as well as any racking loads, on its own. No contribution from the cladding system may be assumed in this regard.

6.4 Positive wind load (pressure) is transferred to the substrate wall directly via bearings and compression of the brick slips and panel.

6.5 Negative wind load (suction) is resisted by the bond between each component. The panel is retained by fixings.

6.6 The structural adequacy of the fixings used to attach the panel to the substrate wall, including their pull-out strength, will depend on the type and condition of the individual substrate wall and must therefore be designed and selected on a project specific basis. The maximum spacing between these fixings should not exceed 400 mm horizontally and 300 mm vertically, as shown in Figure 3. Spacing of fixings around edges at openings should be reduced to 150 mm centres.

Figure 3 Typical fixing layout



6.7 When installed in accordance with the requirements of this Certificate and the Certificate holder's instructions, the panels will withstand, without damage or permanent deformation, wind pressure or suction not exceeding  $2 \text{ kN}\cdot\text{m}^{-2}$ .

6.8 The studs and support rails (the supporting framework) should be designed to limit the deflection to the lesser of  $1/350$  of its span or 15 mm.

6.9 The designer must ensure that:

- the substrate wall has adequate strength to resist additional loads that may be applied as a result of installing the system, ignoring any contribution from the system itself
- the proposed system and associated fixings (see section 1.2) and fixing pattern (see section 6.6) provide adequate resistance to negative wind loads
- the design pull-out values (based on site tests) provide adequate pull-out capacity of the fixings (not covered by this Certificate). The maximum allowable pull-out value of the fixing to be used for securing the panel to the structural substrate should be determined by tests using a minimum safety factor of 3 on the characteristic failure load or by a method agreed by the engineer responsible.

## Impact resistance

6.10 When tested for hard and soft body impact, a system without a cavity, comprising brick slips bonded to a 50 mm thick XPS insulation board, and with timber studs and panel fixing centres not exceeding the maximum values stated in this Certificate, achieved adequate resistance. The system is therefore suitable for use in all Use Categories as defined in Table 4 of ETAG 034 : 2012, Part 1 (reproduced in Table 2 of this Certificate).

*Table 2 Definition of Use Categories (reproduced from ETAG 034 Part 1, Table 4)*

Use Category	Description
I	A zone readily accessible at ground level to the public and vulnerable to hard body impacts but not subjected to abnormally rough use.
II	A zone liable to impacts from thrown or kicked objects, but in public locations where the height of the kit 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.
III	A zone not likely to be damaged by normal impacts caused by people or by thrown or kicked objects.
IV	A zone out of reach from ground level.

6.11 For system installations with a cavity, impact tests must be conducted to ETAG 004 : 2013 or other similar current Standard to verify suitability for use.

## 7 Behaviour in relation to fire



7.1 In England, Wales and Northern Ireland, the system is classified as Class O as defined by national Building Regulation. In Scotland, the system should be evaluated by reference to the requirement of the documents supporting the national Building Regulation.

7.2 The XPS insulation material has an F reaction to fire classification to BS EN 13501-1 : 2007.



7.3 In England and Wales and Northern Ireland the system is not classified as non-combustible or of limited combustibility and may be used on buildings at any proximity to a boundary and with no storey at least 1.8 m above the ground.



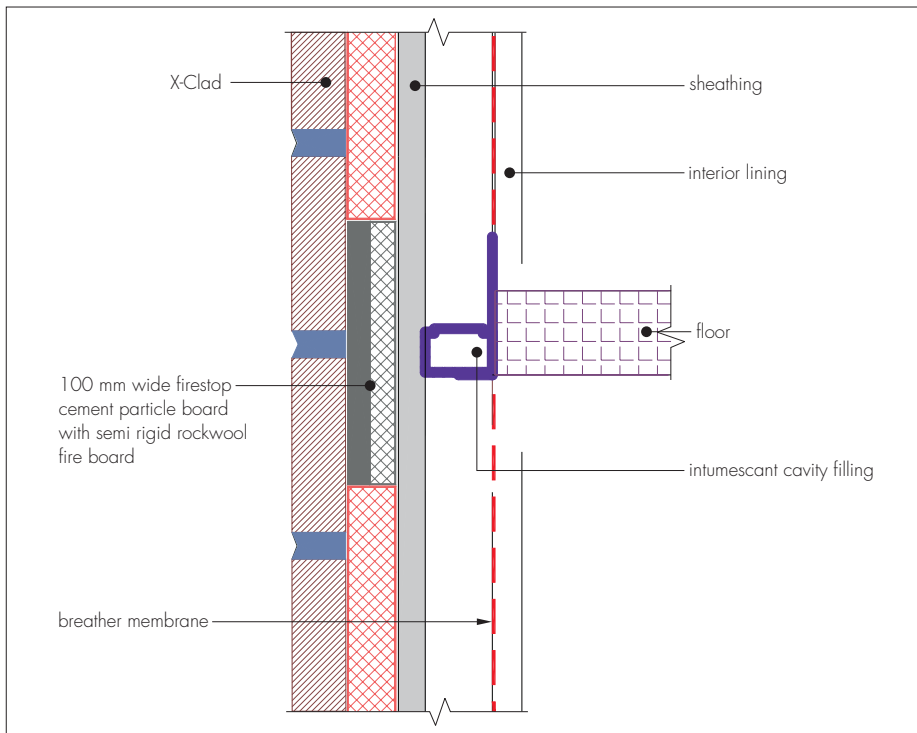
7.4 In Scotland the system is not classified as non-combustible and may be used on buildings more than 1 m from a boundary. With minor exceptions, the system should be included in calculations of unprotected area.

7.5 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 and assembly building with a total storey area more than 500 m<sup>2</sup>, or on any hospital or residential care building with a total storey area more than 200 m<sup>2</sup>.

7.6 For application to second storey walls and above, it is recommended that the designer includes at least one stainless steel fixing per square metre, and fire barriers in line with compartment walls and floors as advised in BRE Report BR 135 : 2013 (see Figure 4 of this Certificate).



Figure 4 Cavity/fire barriers



## 8 Proximity of flues and appliances

When the system is installed in close proximity to certain flue pipes the relevant provisions of the national Building Regulations should be satisfied:

England and Wales — Approved Document J


**Scotland** — Mandatory Standard 3.19, clause 3.19.4<sup>(1)(2)</sup>

*Northern Ireland* — Technical Booklet L.

(1) Technical Handbook (Domestic).

(2) Technical Handbook (Non-Domestic).

## 9 Thermal properties

 9.1 The system provides additional thermal resistance to an external wall. 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 thermal conductivity ( $\lambda_p$  value) of 0.033 W·m<sup>-1</sup>·K<sup>-1</sup> for XPS foam insulation.

9.2 The U value of a completed wall will depend on the selected insulation thickness, the number, type and method of fixings, the insulating value of the substrate wall and its internal finish. The thermal resistance of the system is primarily dependent upon the XPS foam insulation element as indicated in Table 3. Extra insulation is required to achieve the level of thermal performance required by the national Building Regulations.

Table 3 Contribution of thermal performance of the X-Clad External Cladding System

Component (thickness)	Thermal resistance (m <sup>2</sup> ·K·W <sup>-1</sup> )	Fixing diameter (mm) <sup>(1)</sup>
polystyrene (17.5 mm)	0.530	3.5
polystyrene (25 mm)	0.757	4.2
polystyrene (50 mm)	1.515	5.0
brick slip (15 mm)	0.019	–

(1) For the purpose of U value calculations, allowance must be made for 12 nylon and 1 stainless steel fixing per square metre having the diameters shown above.

9.3 The system can contribute to maintaining continuity of thermal insulation at junctions between elements and openings. Detailed guidance can be found in the documents supporting the national Building Regulations.

9.4 In conjunction with a substrate wall providing the required airtightness, the panels can contribute to the requirement for limiting heat loss through the building fabric and achieving the Target Emission Rate.

## 10 Condensation risk



10.1 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 of the BS 5250 : 2011 should be followed, including requirements for vapour control layers and breather membranes in timber-frame construction applications.

10.2 It is essential that walls incorporating the system are rain resistant and show no sign of water ingress. Careful attention must be paid to joints and junctions in and between components and elements.

10.3 Dynamic simulations to BS EN 15026 : 2007 indicate that the system is acceptable when installed creating a rain resistant wall. The simulations were done for a particular location, orientation and vapour resistance of the masonry substrate. The suitability of other constructions/parameters may be assessed by using an appropriate dynamic modelling package.

10.4 The risk of interstitial condensation in the external walling is greatest when the building is drying out after construction. Guidance on preventing condensation is given in BRE Digest 369 and BRE Report BR 262 : 2002.

10.5 The water vapour resistance factor ( $\mu$ ) for XPS is  $183.58 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$  and the equivalent air layer thickness ( $s_d$ ) for the HIPS layer is 100 m.

## 11 Weathertightness



11.1 The system resists the passage of moisture from the ground and from weather. Any water collecting in the vented cavity due to rain or condensation will be drained through openings at the base of each closed section of cavity.

11.2 For installation without a vented cavity, the system is limited to sheltered areas (wind-driven rain less than  $33 \text{ l}\cdot\text{m}^{-2}$  per spell) when used in conjunction with timber- or steel-framed substrate walls, and limited to moderate areas (wind-driven rain less than  $56.5 \text{ l}\cdot\text{m}^{-2}$  per spell) when used in masonry walls. A map detailing the UK zones for exposure to driving-rain can be found in Approved Document C. The wind-driven rain index can be more accurately calculated from the large scale maps and correction factors given in BS 8104 : 1992.

11.3 The brick slips are classified as F2 for resistance to freeze/thaw, in accordance with DD CEN/TS 772-22 : 2006 and are therefore suitable for conditions of severe exposure.

11.4 For the cavity installation on timber- and steel-frame constructions, the cavity should be at least 15 mm wide. The cavity must be drained and vented, incorporating perpendicular weep vents at 1.5 m centres, as defined in BS EN ISO 6946 : 2017. Ventilation and drainage openings should be suitably protected or baffled to prevent the ingress of birds, vermin and rain.

11.5 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 section 16.12).

11.6 Designers and installers should take particular care in detailing around openings, penetrations and movement joints to minimise the risk of rain ingress.

## 12 Maintenance



12.1 Regular maintenance inspections should be carried out to ensure that the ingress of water does not occur. Necessary repairs must be effected immediately. Annual inspections should be carried out to ensure the condition of sealants is satisfactory. Sealant should be reapplied where necessary. Damaged brick slips should be replaced in accordance with the Certificate holder's installation instructions.

12.2 The brick finish may become soiled over time. For normal soiling, the surface may be cleaned using a hot water/household detergent mix, applied with a suitable cleaning pad or sponge. For more difficult chemical soiling, the advice of the Certificate holder should be sought.

## 13 Durability



The durability and service life of the cladding panels will depend upon the building location and height, intended use of the building and the immediate environmental conditions to which it is exposed. Providing regular maintenance is carried out as described in section 12 and in accordance with the Certificate holder's instructions, the system should have a service life of at least 25 years when used in the normal exposure conditions found in the UK.

## 14 Reuse and recyclability

The system consists of brick and mortar which can be recycled.

## 15 Approved installers

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

- employs operatives who have been trained and approved by the Certificate holder to install the system
- 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
- is 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 General

16.1 The X-Clad External Cladding System must be installed in accordance with the Certificate holder's recommendations, the requirements of this Certificate and the specification laid down by the consulting engineer.

16.2 A dpc must be provided through the thickness of the system. In new constructions, the dpc in the substrate should be carried through the system. In existing buildings, an appropriate dpc must be fitted in line with the existing dpc.

16.3 When fixed to a framed substrate, a suitable breather membrane/vapour permeable membrane must be applied to the sheathing board.

16.4 The panels can be handled on site and can be cut or trimmed using a sharp knife or fine-toothed saw. Reasonable precautions must be taken to ensure panels are not damaged during, and subsequent, to installation. Protective glasses and masks must be worn when cutting the panels.

## 17 Procedure

17.1 Typical installation of the system on timber-frame and blockwork are shown in Figure 5.

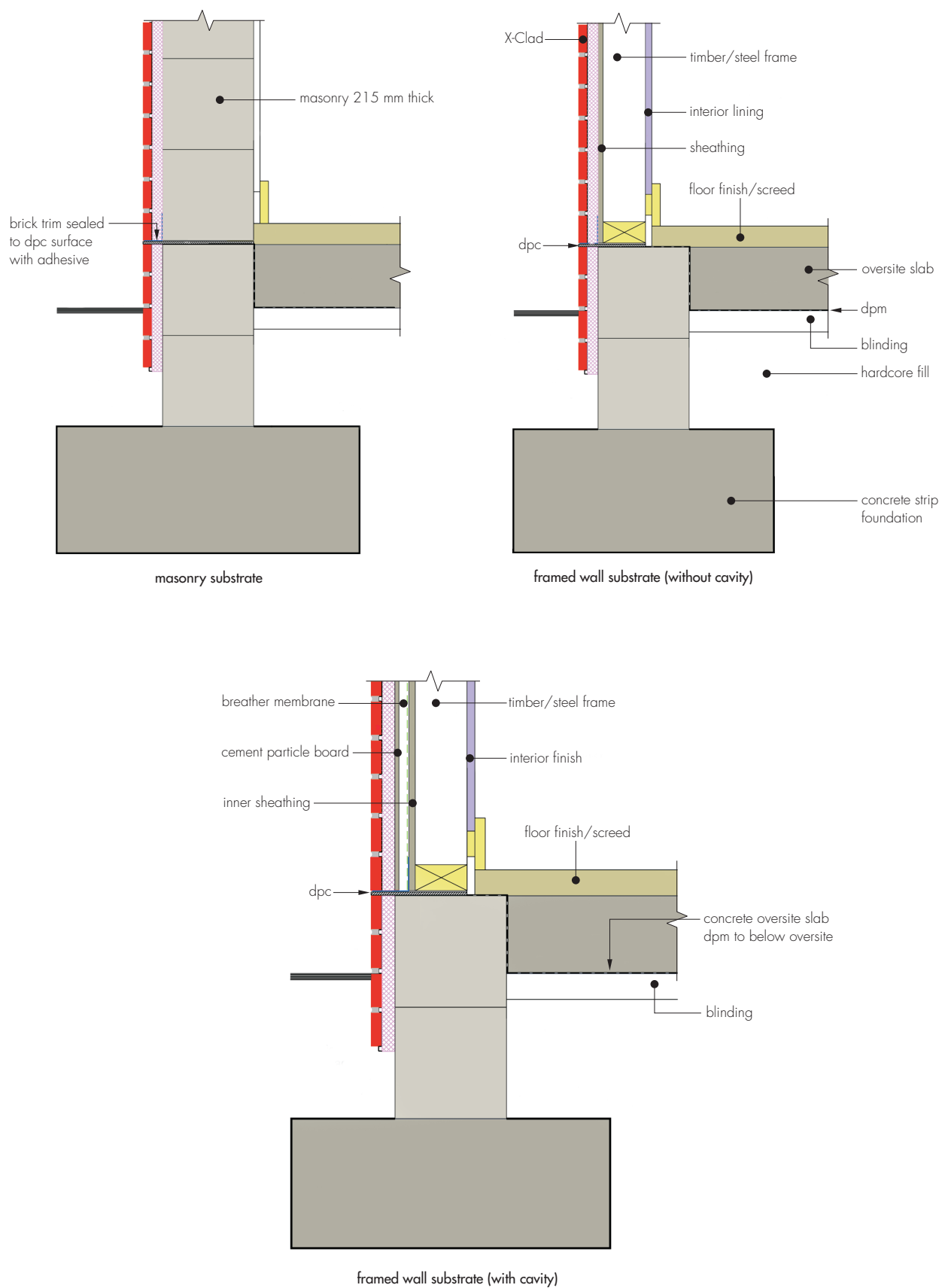
17.2 Before installation commences, the substrate to receive the panels must be flat and stable. Typically, installation starts from the outside corner working along the wall. A base channel is set at the appropriate height and fastened to the wall to provide a protective edge for the panels.

17.3 The panel with pre-formed brick slip carrier sheet is aligned with a spirit level against the substrate and fixing positions are marked (see section 6.6 and Figure 3).

17.4 The panel is fixed to the substrate with mechanical fixings. Care must be taken to ensure the fixing holes are drilled perpendicular to the surface of the panel.

17.5 At corners, the panels must overlap to prevent creating a void behind the brick slips.

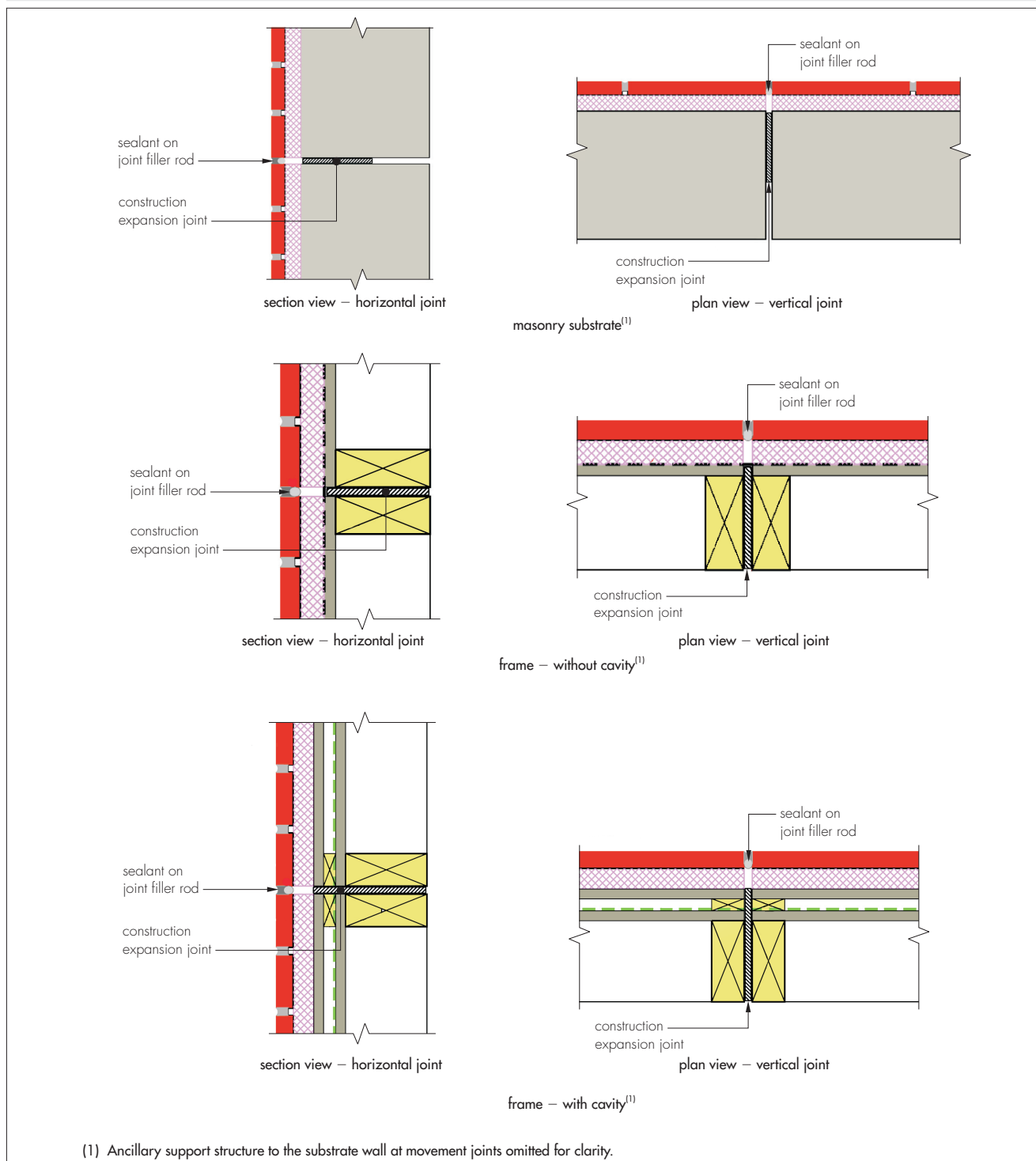
Figure 5 Installation detail



17.6 When installing onto timber-frame substrates, horizontal movement joints in accordance with BS EN 13914-1 : 2016 must be provided at every floor to accommodate vertical shrinkage in the timber-frame and to follow movement joints in the substructure. With steel-frame substrates, the details for deflection at floor level and movement joints in the substructure set out by the suitably qualified and experienced individual (eg the structural engineer) should be applied.

17.7 Vertical movement joints must be provided at a maximum of 7 metre intervals in accordance with the Certificate holder's recommendations. The actual spacing and position of the joints should coincide with movement joints in the structure and allow for the same degree of movement (see Figure 6).

Figure 6 Typical movement joints



17.8 The brick slip adhesive is applied between the ribs of the carrier sheet in accordance with the Certificate holder's instructions. Care must be taken to ensure an appropriate amount of adhesive is used to hold the brick slips to the panel.

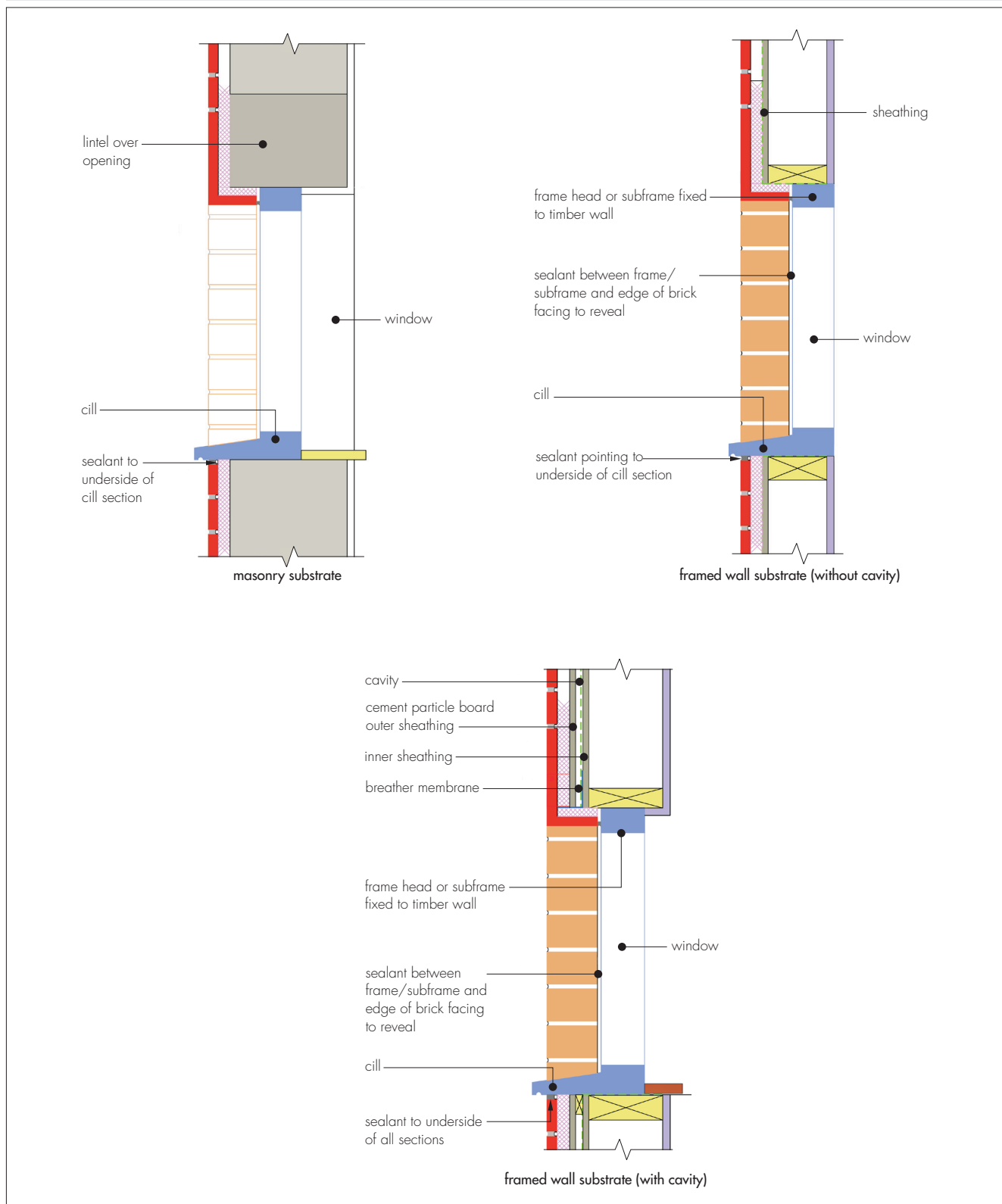
17.9 The clay brick slips are placed on horizontal bed joint ribs of the panel carrier sheet. The ribs are at 75 mm centres<sup>(1)</sup> and the brick slips sit directly on top of the flat face and must be pressed firmly against the carrier (see Figure 1). Alignment should be checked as work proceeds.

(1) For standard brick slip dimensions, listed in section 1.1. Alternative dimensions of brick slips are available from the manufacturer but are outside the scope of this Certificate.

17.10 Joints are filled with the pointing grout/mortar. Pointing should not take place at temperatures below 2°C and above 30°C. When pointing is completed, the mortar joints are tooled to the type of joint recommended by the Certificate holder and excess mortar removed with a soft brush.

17.11 To ensure weathertightness, all window and door openings must be sealed strictly in accordance with the Certificate holder's installation instructions (see Figure 7).

Figure 7 Typical window reveal



17.12 At the top of walls, the system must be protected by an adequate overhang or by an adequately sealed, purpose-made flashing.

17.13 Care must be taken in the detailing of the system around openings and projections to ensure adequate protection against water ingress and to limit the risk of water penetrating the system.

17.14 All movement joints are sealed using urethane sealant after brick application.



## 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 An investigation was made of the system's data relating to:

- strength and stability
- reaction to fire
- resistance to weathering
- freeze/thaw resistance
- thermal properties
- resistance to condensation
- durability.

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## Conditions of Certification

### 19 Conditions

19.1 This Certificate:

- relates only to the product/system 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.

19.2 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.

19.3 This Certificate will remain valid for an unlimited period provided that the product/system 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.

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

19.5 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/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

19.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system 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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