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Agrément Certificate
13/4981
Product Sheet 1

JAMES HARDIE CLADDING SYSTEMS

HARDIELINEA

This Agrément Certificate Product Sheet⁽¹⁾ relates to HardieLinea⁽²⁾, a fibre-reinforced cement plank for use as an exterior non-loadbearing lap cladding over timber stud or masonry walls.

(1) Hereinafter referred to as 'Certificate'.

(2) HardieLinea is a registered trademark of James Hardie Technology Ltd.

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 product has acceptable resistance to wind and impact loads (see section 6).

Behaviour in relation to fire — the product is classified as Class 0 or 'low risk' as defined in the various national Building Regulations (see section 7).

Weathertightness — the product, when installed, is not weathertight and must be used in conjunction with a suitable vapour permeable membrane (see section 8).

Durability — the product is durable and can be expected to have a service life in excess of 30 years (see section 10).

The BBA has awarded this Certificate to the company named above for the product described herein. This product 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

A handwritten signature in black ink, appearing to read 'Simon Wroe'.

Simon Wroe
Head of Approvals — Materials

A handwritten signature in black ink, appearing to read 'Greg Cooper'.

Greg Cooper
Chief Executive

Date of First issue: 16 April 2013

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

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, HardieLinea, if installed, used and maintained in accordance with this Certificate, will meet or contribute to meeting 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 product is acceptable for use as set out in sections 4.2 to 4.5 and 6 of this Certificate.
Requirement: B4(1)	External fire spread
Comment:	The uncoated product is unrestricted by this Requirement. See section 7 of this Certificate.
Requirement: C2(b)(c)	Resistance to moisture
Comment:	The product does not provide a watertight or airtight facing. To achieve a weatherproof barrier, a breather membrane must be provided. See section 8 of this Certificate.
Requirement: Regulation 7	Materials and workmanship
Comment:	The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation: 8(1)(2)	Fitness and durability of materials and workmanship
Comment:	The product can contribute to a construction satisfying this Regulation. See sections 9, 10 and the <i>Installation</i> part of this Certificate.
Regulation: 9	Building standards applicable to construction
Standard: 1.1(a)(b)	Structure
Comment:	The product is acceptable for use, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ and 1.2.1 ⁽¹⁾⁽²⁾ . See sections 4.2 to 4.5 and 6 of this Certificate.
Standard: 2.6	Spread to neighbouring buildings
Comment:	The product is not classified as 'non-combustible' and therefore use will be restricted under clauses 2.6.5 ⁽¹⁾ and 2.6.6 ⁽²⁾ of this Standard. See section 7 of this Certificate.
Standard: 2.7	Spread on external walls
Comment:	The product is not classified as 'non-combustible' and therefore use will be restricted under clause 2.7.1 ⁽¹⁾⁽²⁾ . See section 7 of this Certificate.
Standard: 3.10	Precipitation
Comment:	The product does not form a watertight or airtight facing. To achieve a weatherproof barrier a breather membrane must be provided to meet this Standard, with reference to clause 3.10.5 ⁽¹⁾⁽²⁾ . See section 8 of this Certificate.
Standard: 7.1(a)	Statement of sustainability
Comment:	The product 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.
Regulation: 12	Building standards applicable to conversions
Comment:	All comments given for this product under Regulation 9, Standards 1 to 6 also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ . (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012

Regulation: 23a(i)(iii)(b)(i)	Fitness of materials and workmanship
Comment:	The product is acceptable. See section 10 and the <i>Installation</i> part of this Certificate.
Regulation: 28(b)	Resistance to moisture and weather
Comment:	The product does not form a watertight or airtight facing. To achieve a weatherproof barrier, a breather membrane must be provided. See section 8 of this Certificate.
Regulation: 30	Stability
Comment:	The product is acceptable for use as set out in sections 4.2 to 4.5 and 6 of this Certificate.
Regulation: 36(a)	External fire spread
Comment:	The product is unrestricted by this Regulation. See section 7 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See sections: 1 *Description* (1.2) and 3 *Delivery and site handling* (3.1, 3.2 and 3.4) of this Certificate.

Additional Information

NHBC Standards 2013

NHBC accepts the use of HardieLinea, provided it is installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards, Part 6 Superstructures (excluding roofs)*, Chapters 6.1 *External masonry walls* and 6.2 *External timber framed walls*.

CE marking

The Certificate holder has taken the responsibility of CE marking the product in accordance with harmonised European Standard BS EN 12467 : 2004. An asterisk (*) appearing in this Certificate indicates that data shown is given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 HardieLinea is a fibre-reinforced Portland cement cladding plank, satisfying the requirements of Category A, Class 2 boards to BS EN 12467 : 2004.

1.2 The boards are available in a textured or smooth finish, and in standard weights with the characteristics of:

thickness (mm)*	16
width (mm)*	183, 210
length (mm)*	3655
weight (kg)*	17.4 and 19.6.

1.3 HardieLinea has a bevelled back and tongue-and-groove ends to provide a horizontal interlock.

1.4 The product is supplied factory finished with a high quality primer coat followed by two finishing coats. The performance of the primer and coating has not been assessed by the BBA and is outside of the scope of this Certificate.

1.5 Other items or components which may be used with the product, but which are outside of the scope of this Certificate are as follows:

- HardieLinea Accent Trim — a fibre-reinforced cement board, complying with the requirements of Category A, Class 1 boards to BS EN 12467 : 2004, for use as decorative trim around openings. It is available as 38 mm* thick, in lengths of 3655 mm* and widths of 90 mm* and 140 mm*
- EPDM joint tape — 20 m long roll available in 60 mm, 80 mm, 100 mm and 120 mm widths
- touch-up paint to seal the edges of the HardieLinea boards
- aluminium finishing profiles (internal and external corners) for continuity of design
- combination starter profile and ventilation grille to prevent insects and pests entering through the ventilation gap
- Type 1 wall breather membrane to BS 5250 : 2011.

Details of products/specifications may be obtained from the Certificate holder.

2 Manufacture

2.1 Raw materials are batched into a slurry, formed and then cut to the required size and thickness. The sheets pass through a pre-cure stage and are then autoclaved.

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.

3 Delivery and site handling

3.1 HardieLinea and HardieLinea Accent Trim are delivered on wrapped pallets weighing up to approximately 2200 kg and 800 kg respectively. They can be unloaded using mechanical handling equipment or by manually removing individual boards.

3.2 Both products should be stored on edge or flat, under cover, and on a dry, level surface. Stacks of loose planks should not exceed one metre in height.

3.3 At least two planks in each pallet row are marked with the product name, unique manufacturing code and the appropriate classification to ISO 8336 : 2009 Ed 2.

3.4 The products include crystalline silica and reference should be made to the current version of EH40 *Occupational Exposure Limits*. In particular, when cutting, drilling or sanding in confined areas, dust levels should be controlled using suitable extraction equipment.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hardielinea.

Design Considerations

4 Use

4.1 Hardielinea is suitable for use as a decorative and protective external facing over a timber stud or masonry wall.



4.2 The designer must ensure that the strength and integrity of the intended substrate is commensurate with that required of the cladding system.

4.3 Brickwork or blockwork walls should be constructed in accordance with the relevant sections of BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006, BS EN 1996-3 : 2006 and their respective UK National Annexes, and PD 6697 : 2010 or one of the technical specifications given in the national Building Regulations:

England and Wales — Approved Document A1/2, section 2C

Scotland — Mandatory Standards 1.1 and 1.2, clauses 1.1.1 and 1.2.1 respectively.

Northern Ireland — Technical Booklet D *Structure*.

4.4 Timber stud walls should be constructed in accordance with the relevant sections of BS EN 1995-1-1 : 2004 and the UK National Annex, and preservative treated in accordance with BS 8417 : 2011. Guidance on recommended wood preservation is also given in *NHBC Standards 2013, Part 2 Materials, Chapter 2.3 Timber preservation (natural solid timber)*.

4.5 Studding and framing should be adequately supported by noggings to ensure rigidity.

4.6 The product is fixed to preservative treated, good-quality timber battens aligned vertically at 400 mm, 600 mm or 900 mm centres. The minimum batten thickness over timber studs is 25 mm; over masonry substrates, thicker battens should be used to accommodate the 50 mm length of the fixings.

4.7 Care should be taken to ensure sufficient time is allowed for complete fixation or drying of the timber preservative before the panels are fixed.

4.8 Additional guidance on recommended cavity widths is given in *NHBC Standards 2013, Part 6 Superstructure (excluding roofs), Chapter 6.2 External Timber Framed Walls*.

5 Practicability of installation

The product is designed to be installed by a competent builder, or contractor, experienced with this type of product.

6 Strength and stability

Wind loading



6.1 Under wind loading, the most likely mode of failure of the cladding will be by failure of the plank at the fixing under wind suction.

6.2 When installed onto battens at 900 mm, 600 mm and 400 mm spacings in accordance with the requirements of this Certificate, the products can withstand dynamic wind pressures not exceeding 0.78 kPa, 2.0 kPa and 2.5 kPa respectively.

6.3 The permissible dynamic wind pressure may be increased by reducing batten spacing. This is particularly recommended at the corners of buildings and in exposed locations. In common with all cladding, the adequacy of a proposed installation should always be checked by a qualified engineer, and include the fixing of battens to the substrate (not covered by this Certificate).

6.4 The cladding should not be taken into account when designing a timber stud wall to resist racking forces.

Resistance to impact

 6.5 Impact resistance tests conducted on a product of similar specification gave satisfactory results. The product is suitable for use in areas where there is little possibility of impact or abrasion damage, ie at low levels in areas of restricted access or at higher levels in public areas (the areas described in categories C to F of Table 2 of BS 8200 : 1985 – see Table 1 below).

Table 1 Access categories

Category	Description	Examples	
C	Accessible mainly to those with some incentive to exercise care. Some chance of accident occurring and of misuse	Walls adjacent to private open gardens. Back walls of balconies	} Zone of wall up to 1.5 m above pedestrian or floor level
D	Only accessible, but not near a common route, to those with high incentive to exercise care. Small chance of accident occurring or of misuse	Walls adjacent to small fenced decorative gardens with no through paths	
E	Above zone of normal impacts from people but liable to impacts from thrown or kicked objects	1.5 m to 6 m above pedestrian or floor level in public areas	
F	Above zone of normal impacts from people but not liable to impacts from thrown or kicked objects	Wall surfaces of high positions other than those defined in E above	

7 Behaviour in relation to fire

 7.1 When tested in accordance with BS EN 13501-1 : 2002, the product achieved a reaction to fire classification of A2-s1, d0*.

7.2 The product is classified as Class 0 or 'low risk' as defined in the various national Building Regulations.

7.3 This performance may not be achieved when the product is overcoated and care should be taken to select a coating system with the appropriate performance in fire for the installation in question.

8 Weathertightness

 8.1 The product is not airtight, watertight or water vapourtight. When used on timber stud walls the product must be backed by a breather membrane acting as a vapour permeable water barrier, incorporated behind the cladding under the supporting battens. This breather membrane must meet the requirements of BS 5250 : 2011 and have a vapour resistance less than $0.6 \text{ MN}\cdot\text{s}\cdot\text{g}^{-1}$.

8.2 Where the product is used as a decorative facing attached to weathertight masonry walls, a water barrier is not necessary as the amount of water that will penetrate the cladding will be small and will not have an adverse effect on the wall.

8.3 If the product is used in the renovation of a masonry wall which is structurally sound but not fully weathertight, the use of a vapour permeable water barrier is advisable.

8.4 Provision must always be made to allow water that has penetrated behind the cladding to drain away.

9 Maintenance

 Periodic inspections should be carried out to assess the need for cleaning, maintenance painting, localised repairs and replace elements, such as joint seals and fixings. Advice regarding recoating and maintenance procedures can be obtained from the Certificate holder.

10 Durability

 10.1 When installed in accordance with this Certificate and the manufacturer's instructions and subjected to normal conditions of exposure and use, the product will have an estimated service life in excess of 30 years.

10.2 In common with other cementitious materials, the matrix material can become brittle with time. This may be minimised by the selection of an appropriate coating and regular maintenance painting.

Installation

11 General

11.1 HardieLinea is installed on external braced timber studs, in accordance with the provisions of this Certificate and the Certificate holder's instructions, by suitably experienced and trained personnel.

11.2 Cutting of boards can be performed using a circular saw fitted with a HardieBlade⁽¹⁾ of the appropriate size.

(1) HardieBlade is a registered trademark of James Hardie Technology Ltd.

11.3 Large cut-outs can be made using a jigsaw with a carbide-tipped blade designed for use with fibre cement. Small holes may be drilled using a carbide-tipped masonry bit.

12 Procedure

12.1 Where required, a breather membrane in accordance with section 1.5 is laid parallel to the direction of the planks along the wall, with minimum laps of 150 mm.

12.2 Timber wall battens are fixed over the breather membrane in accordance with section 4.6.

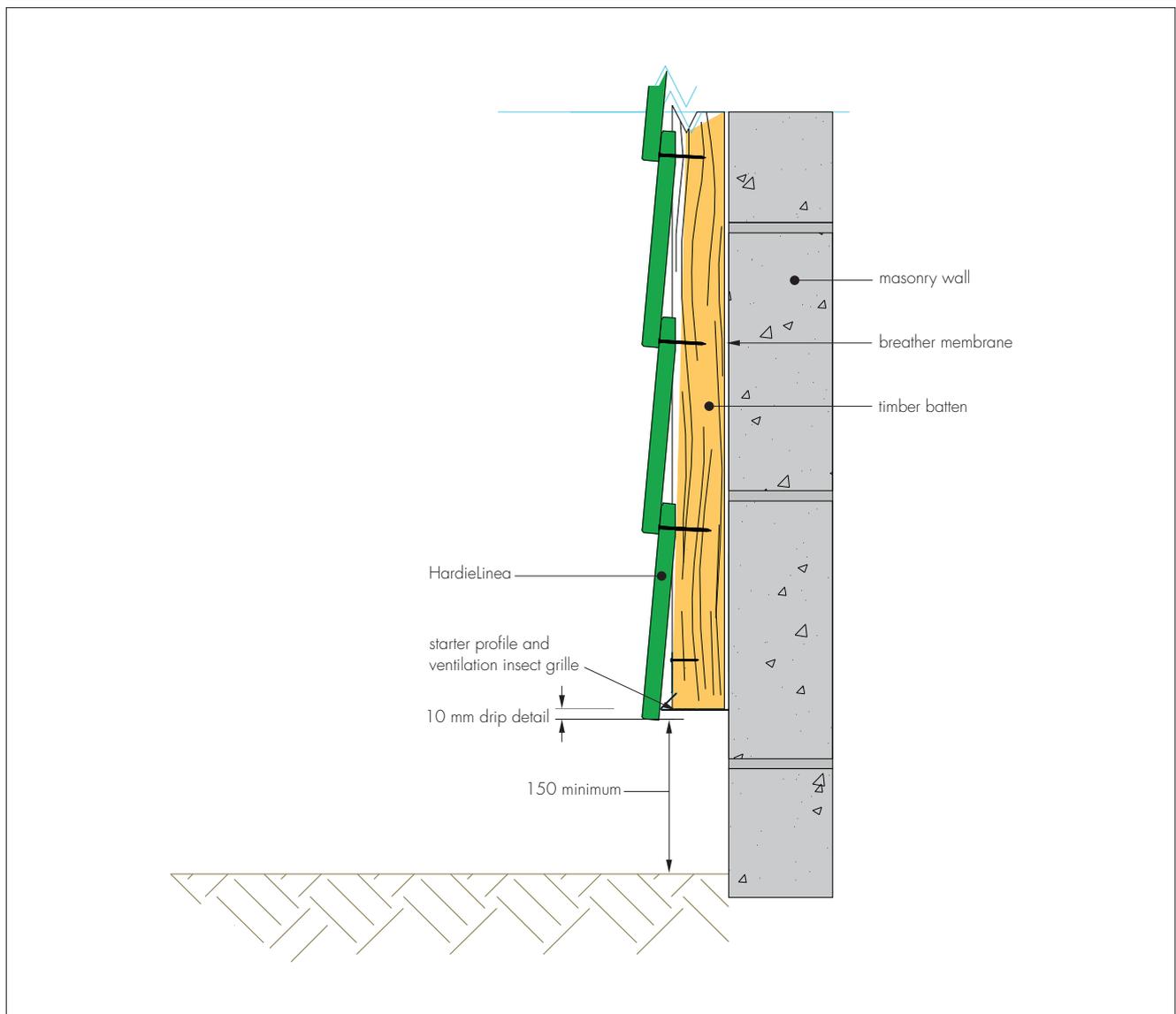
12.3 A ventilation gap of 20 mm must be provided between the cladding layer and the substrate and a combination starter profile and ventilation grille made from a corrosion-resistant wire mesh or similar fitted at the base, the top and above and below window frames.

12.4 A combination starter profile and ventilation grille is installed to kick out the first HardieLinea plank to match the lap of the wall. This is nailed along the front face of the battens so the lower edge of the strip lies along the line made by the bottom edge of the vertical battens.

12.5 The first course of the product is then installed, using 51 mm long by 2.95 mm diameter (head diameter 6.5 mm) ring shank nails, in accordance with the Certificate holder's instructions, leaving a 10 mm drip edge at the lower edge.

12.6 Subsequent courses are installed in the same way, allowing a 30 mm overlap of the lower edge over the previous row (see Figures 1 and 2).

Figure 1 Installation detail



12.7 Where end to end joints are required, the product can either be joined by engaging the tongues and grooves at the ends of the boards or, where the board ends have been trimmed (eg to reduce wastage), butted in moderate contact (see Figure 2). In the first option, joints must not be made within 100 mm of a batten to ensure that fixings do not interfere with the tongue and groove connection (see Figure 3). Under these circumstances, an EPDM strip is not required behind the joint. For butt joints, interlocking tongues and grooves must have been completely removed. Connections must be made directly on a batten with a strip of 100 mm x 200 mm long EPDM placed behind the joint.

Figure 2 Fixing detail

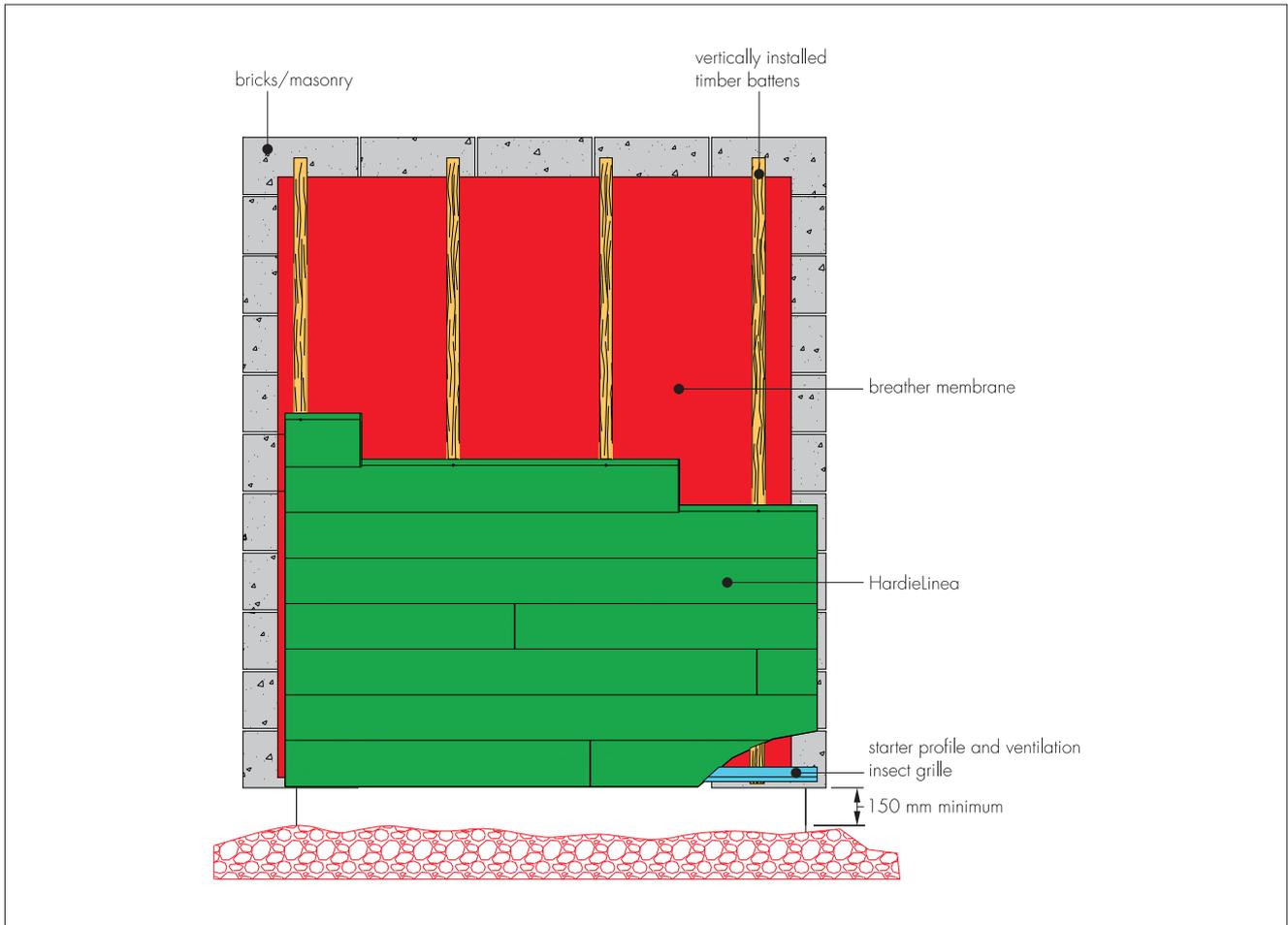
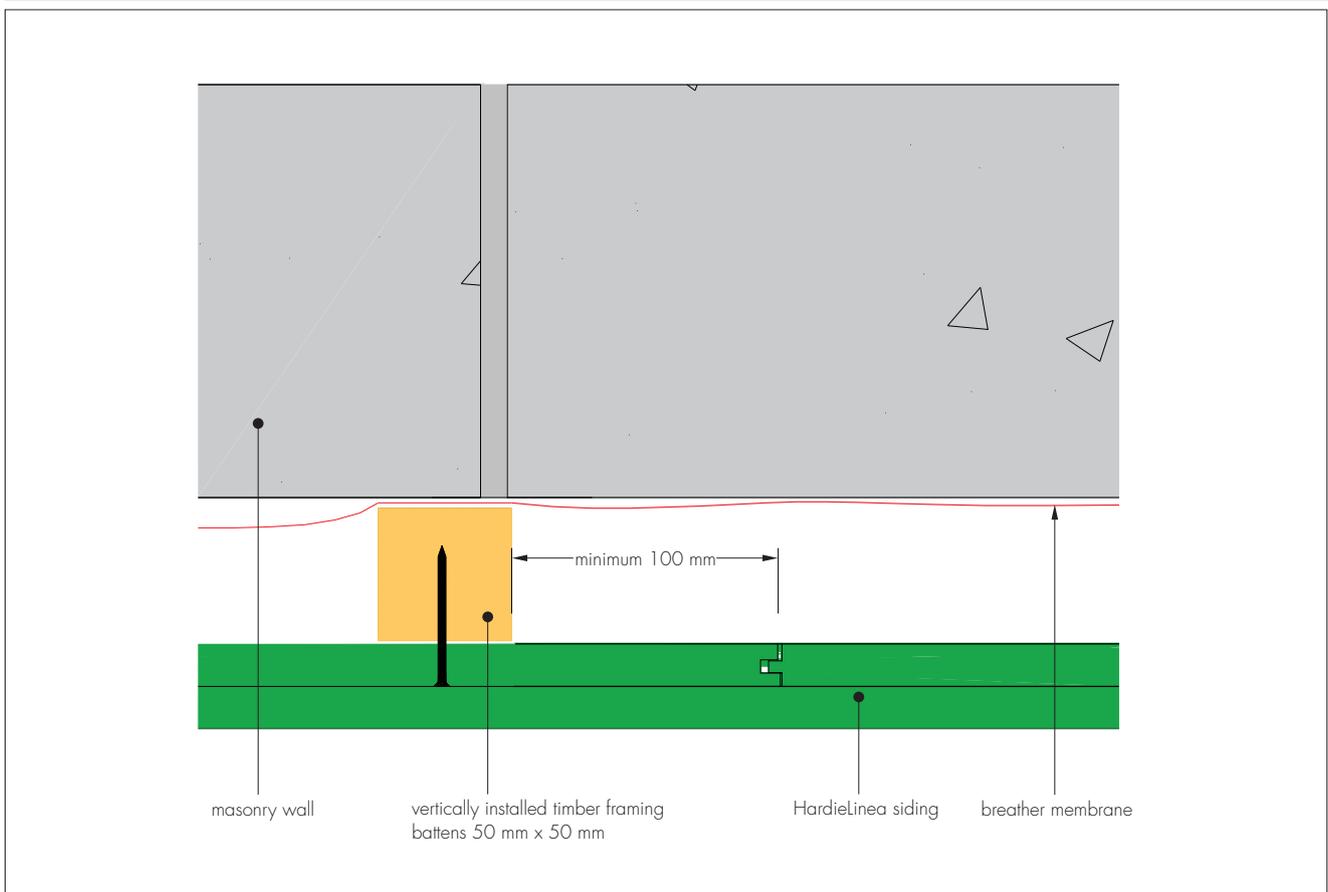
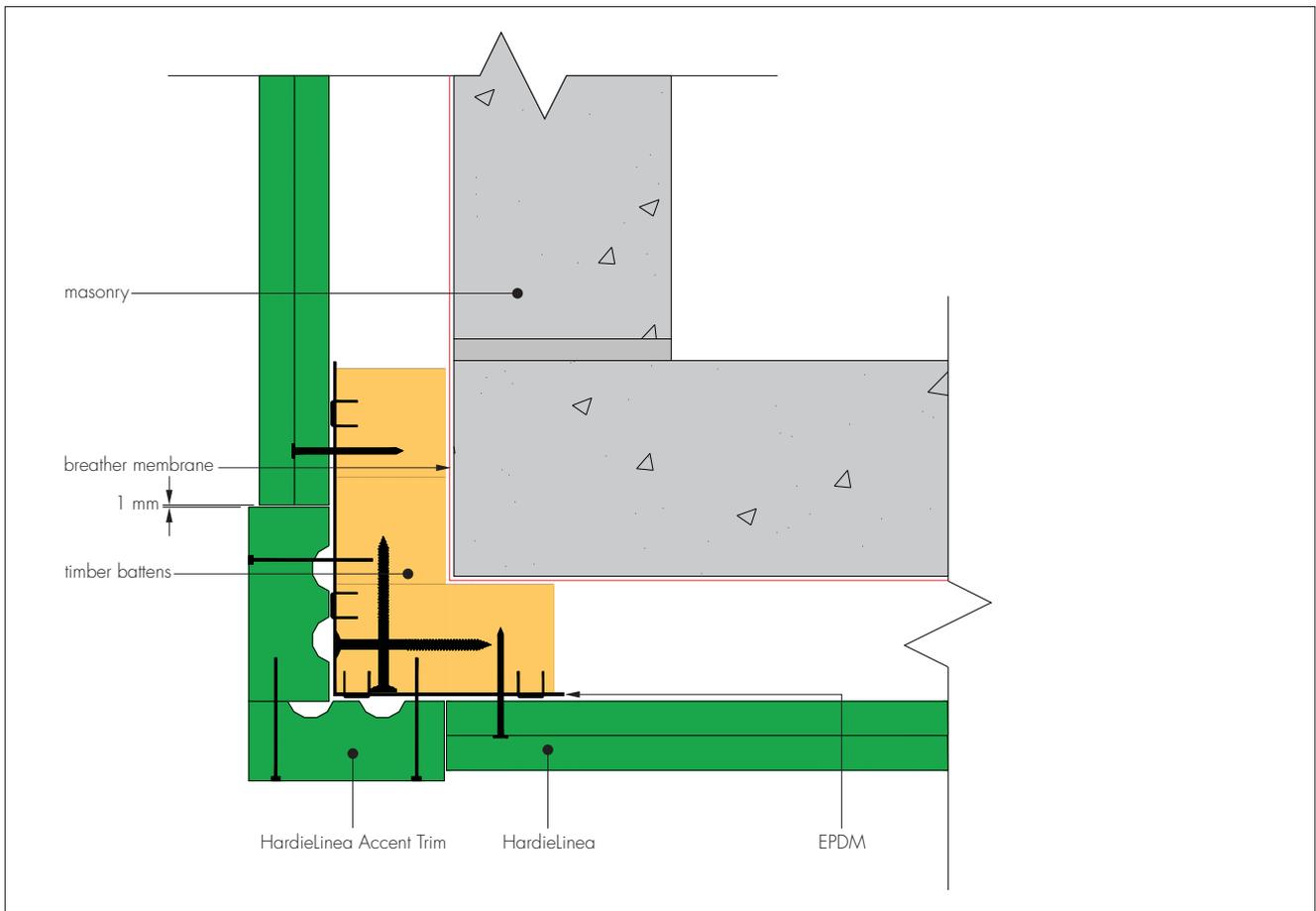


Figure 3 Joint detail



12.8 At corners, wall battens are fitted to form a solid corner for fixing of the Hardielinea and Hardielinea Accent Trim. The Hardielinea is butted up against the Hardielinea Accent Trim corner, as shown in Figure 4. The joint between must be weathered by the application of a 60 mm EPDM flashing stapled to the batten to form a continuous flashing the full length of the Hardielinea Accent Trim. A 1 mm gap is left between the ends of the Hardielinea and the side of the Hardielinea Accent Trim to allow for movement and water drainage.

Figure 4 Corner detail



12.9 Preformed aluminium finishing profiles can be installed at corners as an alternative to Hardielinea Accent Trim.

13 Repair

Under normal conditions of use, the product is unlikely to suffer damage, but should it occur, damaged planks must be replaced as soon as possible. This may require the temporary removal of undamaged planks above the affected area.

Technical Investigations

14 Investigations

14.1 An assessment was made of data to BS EN 12467 : 2004 in relation to:

- dimensions*
- bending strength*
- apparent density*
- resistance to freeze/thaw*
- resistance to water soak*
- resistance to soak/dry cycling*
- resistance to heat/rain cycling*
- water impermeability*.

14.2 An assessment was made of existing data relating to:

- moisture content
- moisture movement
- water absorption
- reaction to fire
- resistance to wind loading.

14.3 Existing test data from a product of similar specification were assessed relating to:

- fire propagation
- reaction to fire
- surface spread of flame
- resistance to soft body impact
- ease of overcoating
- adhesion of coatings
- water vapour permeability
- resistance to hard body impact.

Bibliography

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

BS 8200 : 1985 *Code of practice for design of non-load bearing external vertical enclosures of buildings*

BS 8417 : 2011 *Preservation of wood — Code of practice*

BS EN 1995-1-1 : 2004 + Amendment 1 : 2008 *Eurocode 5 — Design of timber structures — General — Common rules and rules for buildings*

NA to BS EN 1995-1-1 : 2004 + Amendment 1 : 2008 *UK National Annex to Eurocode 5 — Design of timber structures — General — Common rules and rules for buildings*

BS EN 1996-1-1 : 2005 *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

NA to BS EN 1996-1-1 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

BS EN 1996-1-2 : 2005 *Eurocode 6 — Design of masonry structures — General rules — Structural fire design*

NA to BS EN 1996-1-2 : 2005 *UK National Annex to Eurocode 6 — Design of masonry structures — General rules — Structural fire design*

BS EN 1996-2 : 2006 *Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

NA to BS EN 1996-2 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Design considerations, selection of materials and execution of masonry*

BS EN 1996-3 : 2006 *Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

NA to BS EN 1996-3 : 2006 *National Annex to Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

BS EN 12467 : 2004 *Fibre-cement flat sheets — Product specification and test methods*

BS EN 13501-1 : 2002 *Fire classification of construction products and building elements — classification using test data from reaction to fire tests*

ISO 8336:2009 Ed 2 *Fibre-cement flat sheets — Product specification and test methods*

PD 6697 : 2010 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*

15 Conditions

15.1 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.

15.2 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.

15.3 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.

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

15.5 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.

15.6 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.