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Agrément Certificate

02/3883

Product Sheet 1 Issue 4

SIMPSON STRONG-TIE WALL EXTENSION PROFILES

CROCODILE C2K WALL EXTENSION PROFILES

This Agrément Certificate Product Sheet⁽¹⁾ relates to Crocodile C2K Wall Extension Profiles, comprising austenitic stainless steel profiles and coach screws, for tying new masonry walls to existing masonry walls up to three storeys high.

(1) Hereinafter referred to as 'Certificate'.

The assessment includes

Product factors:

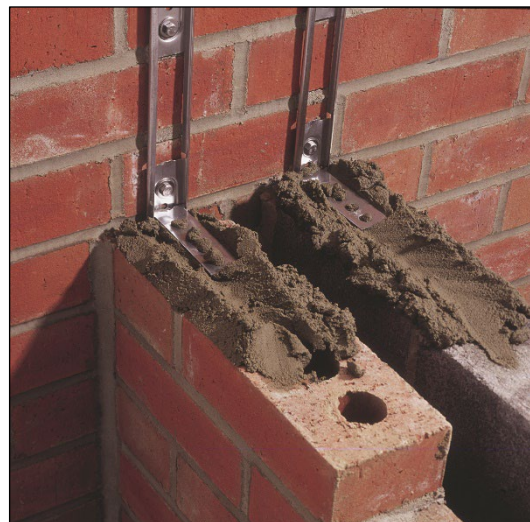
- compliance with Building Regulations
- compliance with additional regulatory or non-regulatory information where applicable
- evaluation against technical specifications
- assessment criteria and technical investigations
- uses and design considerations

Process factors:

- compliance with Scheme requirements
- installation, delivery, handling and storage
- production and quality controls
- maintenance and repair

Ongoing contractual Scheme elements†:

- regular assessment of production
- formal 3-yearly review



KEY FACTORS ASSESSED

- Section 1. Mechanical resistance and stability
- Section 2. Safety in case of fire
- Section 3. Hygiene, health and the environment
- Section 4. Safety and accessibility in use
- Section 5. Protection against noise
- Section 6. Energy economy and heat retention
- Section 7. Sustainable use of natural resources
- Section 8. Durability

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

Date of Fourth issue: 26 April 2024
Originally certified on 27 February 2002

Hardy Giesler
Chief Executive Officer

This BBA Agrément Certificate is issued under the BBA's Inspection Body accreditation to ISO/IEC 17020. Sections marked with † are not issued under accreditation.

The BBA is a UKAS accredited Inspection Body (No. 4345), Certification Body (No. 0113) and Testing Laboratory (No. 0357).

Readers MUST check that this is the latest issue of this Agrément Certificate by either referring to the BBA website or contacting the BBA directly.

The Certificate should be read in full as it may be misleading to read clauses in isolation.

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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SUMMARY OF ASSESSMENT AND COMPLIANCE

This section provides a summary of the assessment conclusions; readers should refer to the later sections of this Certificate for information about the assessments carried out.

Compliance with Regulations

Having assessed the key factors, the opinion of the BBA is that Crocodile C2K Wall Extension Profiles, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations:



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

Requirement:	A1	Loading
Comment:		The product can contribute to satisfying this Requirement. See sections 1 and 9 of this Certificate.
Requirement:	B3(1)	Internal fire spread (structure)
Comment:		The product can contribute to satisfying this Requirement. See section 2 of this Certificate.
Requirement:	7(1)	Materials and workmanship
Comment:		The product is acceptable. See section 8 and 9 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 8 and 9 of this Certificate.
Regulation:	9	Building - construction
Standard:	1.1(a)(b)	Structure
Comment:		The product can contribute to satisfying this Standard. See section 1 of this Certificate.
Standard:	2.3	Structural protection
Standard:	2.4	Cavities
Comment:		The product can contribute to satisfying these Standards. See section 2 of this Certificate.
Standard:	2.6	Spread to Neighbouring buildings
Comment:		The product can contribute to satisfying this Standard with reference to 2.3.1 ⁽¹⁾⁽²⁾ , 2.3.3 ⁽¹⁾⁽²⁾ and 2.6.1 ⁽¹⁾⁽²⁾ .
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The product can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
Regulation:	12	Building standards - conversion
Comment:		All comments given for the 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 (as amended)

Regulation:	23(a)	Fitness of materials and workmanship
Comment:	(i)(iii)(b)	The product is acceptable. See sections 8 and 9 of this Certificate.
Regulation:	30	Stability
Comment:		The product can contribute to satisfying this Regulation. See section 1 of this Certificate.
Regulation:	35(1)	Internal fire spread — Structure
Comment:		The product can contribute to satisfying this Regulation. See section 2 of this Certificate.
Regulation:	36(a)	External fire spread
Comment:		The product can contribute to satisfying this Regulation. See section 2 of this Certificate.

Additional Information

NHBC Standards 2024

In the opinion of the BBA, Crocodile C2K Wall Extension Profiles, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapters 6.1 *External masonry walls* and 6.3 *Internal walls*.

Fulfilment of Requirements

The BBA has judged Crocodile C2K Wall Extension Profiles to be satisfactory for use as described in this Certificate. The product has been assessed as for tying new masonry walls to existing masonry walls up to three storeys high.

ASSESSMENT

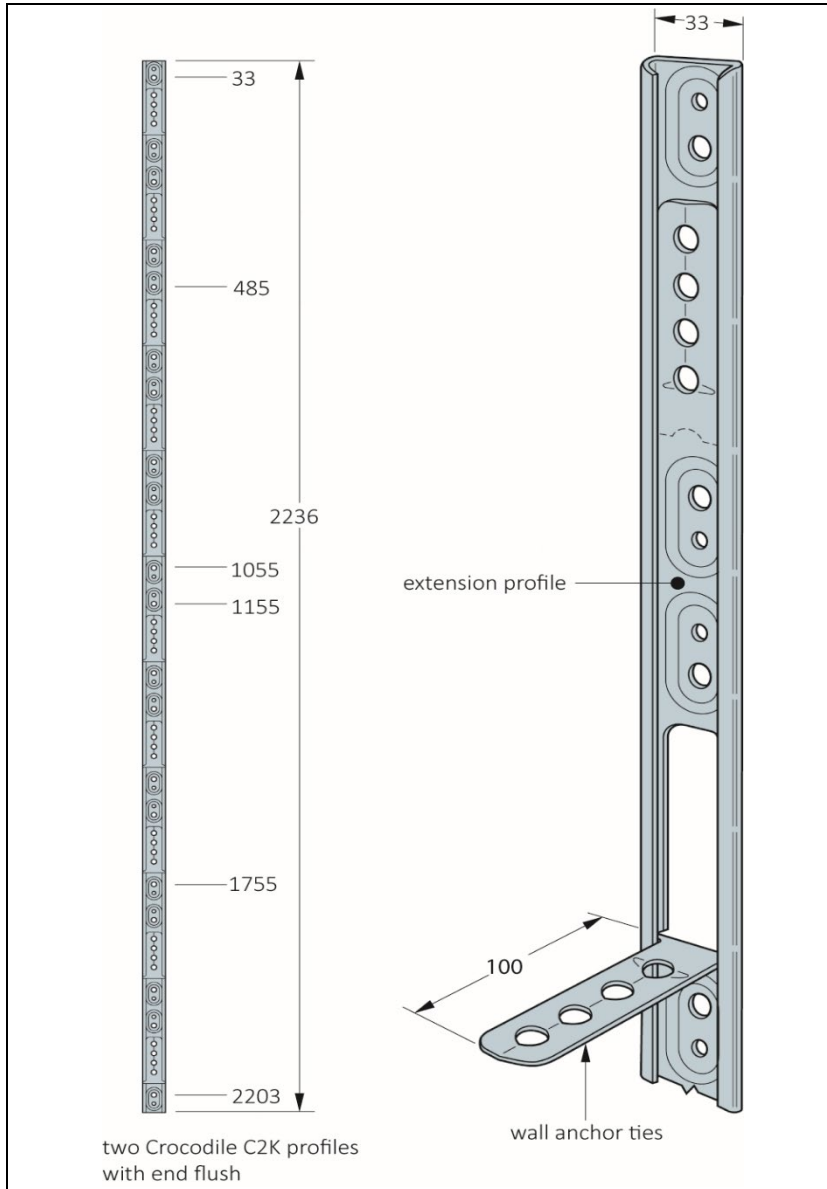
Product description and intended use

The Certificate holder provided the following description for the product under assessment. Crocodile C2K Wall Extension Profiles (see Figure 1) are 33 mm wide by 2236 mm long, and are available in stainless steel (C2KS), as detailed in Table 1.

Crocodile C2K Wall Extension Profiles consists of:

- coach screws — M6 by 50 mm long screws and washers (1.6 mm thick by 18 mm outer diameter) are available in or austenitic stainless steel
- austenitic stainless steel profiles — the wall extension profiles and fixing components are manufactured to the specification of materials defined in Table 1.

Figure 1 Crocodile C2K Wall Extension Profiles (all measurements in mm)



The product has the nominal characteristics given in Table 1.

Table 1 Nominal characteristics of Crocodile C2K Wall Extension Profiles

Model Number	Material specification					
	Component	Pack quantity	Material	Additional protection	Material standard	Size (mm)
C2KS	Profile	2	Austenitic stainless steel	—	Grade 1.4301 to BS EN 10088-2 : 2014 or Grade 1.4597 to BS EN 10088-2 : 2014	0.6
	Tie ⁽¹⁾	10	Austenitic stainless steel	—	Grade 1.4301 to BS EN 10088-2 : 2014 or Grade 1.4597 to BS EN 10088-2 : 2014	0.6
	Coach screws	6	Austenitic stainless steel	—	BS EN ISO 10683 : 2018 and Grade A2 to BS EN ISO 3506-1 : 2020	M6 x 50
	Washers	6	Austenitic stainless steel	—	BS EN ISO 10683 : 2018 and Grade A2 to BS EN ISO 3506-1 : 2020	1.6 x 18 OD
	Masonry plug	6	High density polyethylene	—	—	10 x 44

(1) The tie is incorporated within the profile.

Ancillary Items

The Certificate holder recommends the following ancillary items for use with the product, but these materials have not been assessed by the BBA and are outside the scope of this Certificate:

- masonry plugs — high-density polyethylene masonry plugs (10 by 44 mm)
- polymer-based sealant
- damp-proof course (DPC).

Applications

The product is intended for use in internal and external walls for tying new masonry walls (ranging from 60 to 250 mm thick) of up to three storeys (maximum height 8 metres) to existing masonry walls on domestic and non-domestic buildings.

Product assessment – key factors

The product was assessed for the following key factors, and the outcome of the assessments is shown below. Conclusions relating to the Building Regulations apply to the whole of the UK unless otherwise stated.

1 Mechanical resistance and stability

Data were assessed for the following characteristics.

1.1 Strength and stability

1.1.1 Structural test and calculations were completed on the Crocodile C2K Extension profile and the result is given in Table 2.

Table 2 Design shear strength

Product assessed	Assessment method	Requirement	Result
			Design strength ⁽¹⁾
Crocodile C2K Wall Extension Profiles	BS EN 1996-2 : 2006 BS EN 1996-3 : 2006 BS EN 1996-1-1 : 2005 PD 6697 : 2019	Value achieved	3.5 kN

(1) This value is for two wall profiles over the height of 2236 mm, using three fixings per profile.

1.2 On the basis of data assessed, Crocodile C2K Extension profile will have adequate strength to provide lateral support, when fixed to existing masonry of solid clay bricks, solid dense and lightweight aggregate concrete blocks and solid aerated concrete blocks of minimum crushing strength $3.5 \text{ N}\cdot\text{mm}^{-2}$.

2 Safety in case of fire

Data were assessed for the following characteristics.

2.1 Reaction to fire

The stainless steel components have an A1 reaction to fire classification in accordance with Commission Decision 96/603/EC.

2.2 Resistance to fire

Where a junction incorporating the product is required to achieve a period of fire resistance, its performance must be confirmed by a suitably qualified and experienced individual or by a test from a suitably accredited laboratory.

3 Hygiene, health and the environment

Not applicable.

4 Safety and accessibility in use

Not applicable.

5 Protection against noise

Not applicable.

6 Energy economy and heat retention

Not applicable.

7 Sustainable use of natural resources

Data were assessed for the following characteristics.

7.1 Reuse and recyclability

The product comprises stainless steel, which can be recycled.

8 Durability

8.1 The potential mechanisms for degradation and the known performance characteristics of the materials in this product were assessed.

8.2 Durability

The polymer and stainless steel ties and steel channels will not be adversely affected by mortar (including mortar incorporating conventional mortar admixtures) or cavity insulation materials.

8.3 Service life

Under normal service conditions, the product will have a service life equivalent to the structure in which it is incorporated, provided it is designed, installed, and maintained in accordance with this Certificate and the Certificate holder's instructions.

PROCESS ASSESSMENT

Information provided by the Certificate holder was assessed for the following factors:

9 Design, installation, workmanship and maintenance

9.1 Design

9.1.1 The design process was assessed by the BBA, and the following requirements apply in order to satisfy the performance assessed in this Certificate.

9.1.1.1 Crocodile C2K Wall Extension Profiles must be used in accordance with the requirements of BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their UK National Annexes and PD 6697 : 2019.

9.1.1.2 Structure of brickwork or blockwork in which the Crocodile C2K Wall Extension Profiles are incorporated must be designed and constructed in accordance with BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their UK National Annexes, and PD 6697 : 2019, and one or more of the following technical specifications:

- the reaction along the edge of the wall may normally be assumed to be uniformly distributed
- fixings for the extension profiles must be made into bricks or blocks and not into mortar joints
- as with conventional toothing and bonding, the designer must ensure that the existing wall has adequate strength, stability and integrity to accommodate the new wall. The effect of any proposed modification to the existing wall, such as cutting a vertical DPC, must also be checked.

9.1.2 When used in two- or three-storey construction, the new wall must be effectively tied at the roof and intermediate floor level in accordance with the recommendations of BS EN 1996-3 : 2006.

9.1.3 The profile must be designed to accommodate up to 10 mm of vertical movement, due to differential foundation movements, without a significant loss of strength.

9.1.4 The product has not been assessed for use where the masonry fixings will be subject to direct tensile load.

9.1.5 For determination of tensile and compressive load capacity and load displacement characteristics, the method from BS EN 846-5 : 2012 must be followed.

9.1.6 For determination of shear load capacity and load displacement characteristics, the method from BS EN 846-7 : 2012 must be followed.

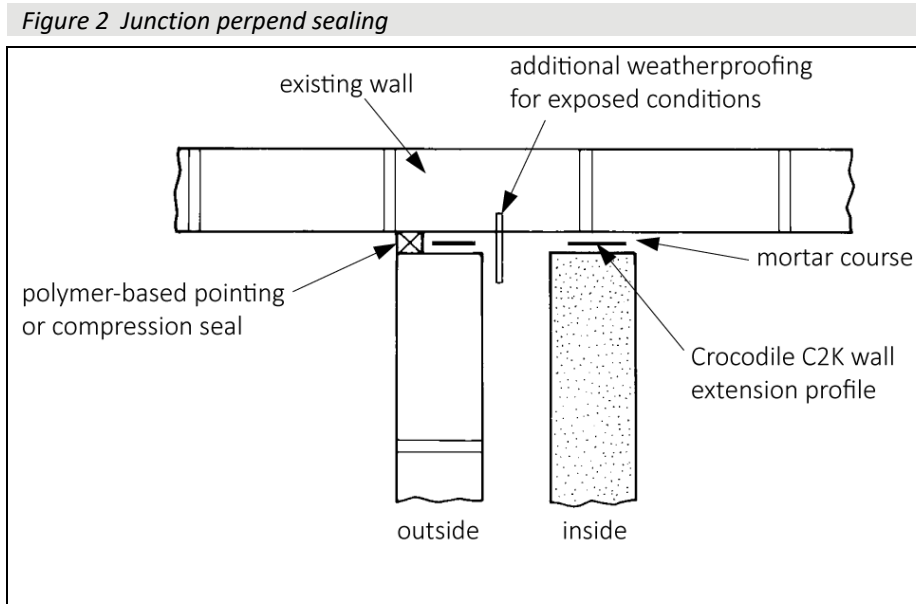
Performance in relation to fire

9.1.7 It is important to ensure that any gaps between the existing wall and each leaf include a continuous seal of either mortar or a proprietary intumescent sealant (outside the scope of this Certificate) to retard the spread of fire or smoke. Guidance on the fire-resistance of cavity walls is given in BS EN 1996-1-1 : 2005, BS EN 1996-1-2 : 2005, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their UK National Annexes, and PD 6697 : 2019.

Weathertightness

9.1.8 Where exposure conditions can be classified as being equal to, or in excess of, moderate or severe (see BS EN 1996-3 : 2006), in common with other wall extension systems and conventional toothing or bonding methods, additional protection from moisture penetrating to the inside of the building should be considered. This can take the form of an extended vertical DPC, as shown in Figure 2, which will prevent moisture from being transmitted through the existing masonry wall and also shed any moisture that may penetrate the perpend joint to the bottom of the new wall cavity.

9.1.9 The weathertightness of the joint will not be affected by the normal building movement.



Condensation risk

9.1.10 The construction of a new external wall, whether jointed by traditional toothing and bonding or by the use of a metal profile, will create a thermal bridge through the original wall. The use of any metal profile used at this junction will not significantly affect the U-value of the wall. Extensions should be assessed for condensation risk in accordance with BS 5250 : 2021 and, where necessary, appropriate Insulation included in the construction to minimise the risk of local condensation, particularly if the new wall is of solid construction.

Airborne sound

9.1.11 Where particular sound insulation properties are required (eg separating walls), tests should be conducted in accordance with BS EN ISO 16283-1 : 2014 and the results assessed in accordance with BS EN ISO 717-1 : 2020 and BS EN ISO 717-2 : 2020 with regards to compliance with the relevant national Building Regulations.

9.2 Installation

9.2.1 Installation instructions provided by the Certificate holder were assessed and judged to be appropriate and adequate.

9.2.2 Installation must be carried out in accordance with this Certificate and the Certificate holder's instructions.

9.2.3 The existing masonry must be structurally sound with a flat, vertical surface.

9.2.4 For cavity wall construction, a wall extension profile must be used with each leaf.

9.2.5 For external walls, the bottom edge of the lower wall connector must be above the DPC.

9.2.6 For external walls, the vertical joint between the existing wall and the outer leaf of the wall must be weather sealed, as detailed in section 9.1.8.

9.2.7 The wall extension profiles must be positioned so that they are on the centre line of the new masonry wall. For cavity walls, the required cavity width and the thickness of each masonry leaf will need to be taken into account.

Preparation

9.2.8 Rendered or pebble-dash finish must be removed to ensure that wall connector profiles are fixed directly to the existing masonry.

9.3 Workmanship

Practicability of installation was assessed, on the basis of the Certificate holder's information. To achieve the performance described in this Certificate, installation of the product must be carried out by a competent general builder, or a contractor, experienced with this type of product.

9.4 Maintenance and repair

9.4.1 Ongoing satisfactory performance of the product in use requires that it is suitably maintained. The guidance provided by the Certificate holder was assessed and found to be appropriate and adequate.

The following requirements apply in order to satisfy the performance assessed in this Certificate:

9.4.2 During routine maintenance, the sealant joint should be checked. If necessary, the joint must be raked out and re-made.

9.4.3 Brittle finishes, eg plaster and rendering, may be cracked where differential vertical movement occurs and may require repair.

9.4.4 To prevent water penetration at the joint between the existing wall outer leaf and the new wall, polymer-based sealant should be positioned either behind the wall extension profile or in the junction perpend, as shown in Figure 2.

10 Manufacture

10.1 The production processes for the product have been assessed, and provide assurance that the quality controls are satisfactory according to the following factors:

10.1.1 The manufacturer has provided documented information on the materials, processes, testing and control factors.

10.1.2 The quality control operated over batches of incoming materials has been assessed and deemed appropriate and adequate.

10.1.3 The quality control procedures and product testing to be undertaken have been assessed and deemed appropriate and adequate.

10.1.4 The process for management of non-conformities has been assessed and deemed appropriate and adequate.

10.1.5 An audit of each production location was undertaken, and it was confirmed that the production process was in accordance with the documented process, and that equipment has been properly tested and calibrated.

† 10.2 The BBA has undertaken to review 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.

11 Delivery and site handling

11.1 The Certificate holder stated that the product is supplied in packs containing two profiles and one packet of fixings. Each pack carries the product identification code, fixing instructions and the BBA logo incorporating the number of this Certificate.

11.2 Delivery and site handing must be performed in accordance with the Certificate holder's instructions and this Certificate.

Supporting information in this Annex is relevant to the product but has not formed part of the material assessed for the 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.

Management Systems Certification for production

The management system of Simpson Strong-Tie has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 by BSI Management System (Certificate FM14704).

Additional information on installation

Procedure

- A.1 A plumb line is marked on the existing wall to aid the alignment of the profile.
- A.2 If required a vertical cut is made into the existing wall in readiness for the vertical DPC (see section 9.1.8 and Figure 2).
- A.3 The wall extension profiles are installed starting with the lowest profile at the bottom of the proposed joint and working upwards to the highest profile.
- A.4 The first profile is placed over the marked centre-line and the fixing positions marked as shown in Figure 1. This ensures that the profile is positioned above the DPC and that all fixing positions avoid mortar joints. If necessary, the alternative positions are used of 450 and 600 mm.
- A.5 The holes are drilled and plugged using a 10 mm diameter masonry drill.
- A.6 The first profile is lightly attached to the masonry, with the coach screws and washers provided, at the two lower fixing positions only.
- A.7 The second profile is positioned directly above the lower profile so that both ends are flush. If necessary, the second profile is cut to length to accommodate the height of the new wall by cutting at one end only.
- A.8 The procedures outlined in Annexes A.4 and A.5 are repeated for the second profile.
- A.9 For any additional profiles required to complete the joint, the procedures outlined in Annexes A.6 and A.7 are repeated.
- A.10 When specified, polymer-based sealant is positioned behind the wall extension profile (see section 9.1.8 and Figure 2).
- A.11 The wall extension profiles are aligned, and all coach screws tightened.
- A.12 Brickwork or blockwork for the new wall is laid in the conventional way, with a full mortar joint between the existing and the new walls. As the bricks are laid, ties are snapped off from the extension profiles and adjusted in position in the profile channel to sit on a mortar course of the new wall (see Figure 1). Further mortar is applied over the top so that the ties are completely surrounded by mortar.
- A.13 Ties are inserted into the new wall at maximum 300 mm centres.

A.14 When specified, at the completion stage of the new wall, the polymer-based sealant is inserted at the junction perpend (see section 9.1.8 and Figure 2).

A.15 If required, the extended vertical DPC is inserted into the aperture cut as described in Annex A.2.

Bibliography

BS 5250 : 2021 *Management of moisture in buildings — Code of practice*

BS EN 846-5 : 2012 *Methods of test for ancillary components for masonry — Determination of tensile and compressive load capacity and load displacement characteristics of wall ties (couplet test)*

BS EN 846-7 : 2012 *Methods of test for ancillary components for masonry — Determination of shear load capacity and load displacement characteristics of shear ties and slip ties (couplet test for mortar joint connections)*

BS EN 1996-1-1 : 2005 + A1 : 2012 *Eurocode 6 — Design of masonry structures — General rules for reinforced and unreinforced masonry structures*

NA to BS EN 1996-1-1 : 2005 + A1 : 2012 *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 + A1 : 2014 to BS EN 1996-3 : 2006 *UK National Annex to Eurocode 6 — Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*

BS EN 10088-2 : 2014 *Stainless steels — Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

BS EN ISO 717-1 : 2020 *Acoustics — Rating of Sound Insulation in Buildings and of Building Elements*

BS EN ISO 717-2 : 2020 *Acoustics — Rating of sound insulation in buildings and of building elements — Impact sound insulation*

BS EN ISO 10683 : 2018 *Fasteners — Non-electrolytically applied zinc flake coatings*

BS EN ISO 3506-1 : 2020 *Mechanical properties of corrosion-resistant stainless steel fasteners — Bolts, screws and studs*

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

BS EN ISO 16283-1 : 2014 + A1 : 2017 *Acoustics — Field measurement of sound insulation in buildings and of building elements — Airborne sound insulation*

PD 6697 : 2019 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*

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 marking and 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.