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**Agrément Certificate**

**08/4553**

Product Sheet 1

### XELLA CONSTRUCTION PRODUCTS

### SILKA CALCIUM SILICATE THIN-JOINT SYSTEM

This Agrément Certificate Product Sheet<sup>(1)</sup> relates to the Silka Calcium Silicate Thin-Joint System, comprising Silka Calcium Silicate Elements laid on a thin bed of mortar, for use in the construction of internal loadbearing and non-loadbearing walls including separating walls and the inner leaf of external cavity walls, above the damp-proof course in new and existing domestic and non-domestic buildings without height restrictions.

(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 is suitable for use in internal loadbearing walls 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 associated UK National Annexes, and PD 6697 : 2010 (see section 6).

**Properties in relation to fire** — the system is 'non-combustible' and classified as Class A1 as defined in the national Building Regulations (see section 7).

**Sound insulation** — the system is suitable for use in separating walls and in internal leaves of flanking elements to separating walls (see section 8).

**Durability** — walls constructed using the thin-joint systems will have a design life of 60 years - the same as traditional masonry (see section 12).



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

Hardy Giesler  
Chief Executive Officer

Date of Third issue: 5 June 2020

Originally certificated on 30 April 2008

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.

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## Regulations

In the opinion of the BBA, the Silka Calcium Silicate Thin-Joint System, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



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

<b>Requirement:</b>	<b>A1</b>	<b>Loading</b>
<b>Requirement:</b>	<b>A2</b>	<b>Ground movement</b>
Comment:		Walls designed and constructed using the system can satisfy these Requirements. See sections 4 and 6.1 to 6.7 of this Certificate.
<b>Requirement:</b>	<b>B3(1)(2) (3)(a)(4)</b>	<b>Internal fire spread (structure)</b>
Comment:		The system can contribute to a construction satisfying this Requirement. See section 7 of this Certificate.
<b>Requirement:</b>	<b>E1</b>	<b>Protection against sound from other parts of the building and adjoining buildings</b>
Comment:		Separating walls designed and constructed with the system can contribute to satisfying this Requirement. See sections 8.1, 8.5 and 8.7 of this Certificate.
<b>Requirement:</b>	<b>E2(a)</b>	<b>Protection against sound within a dwelling-house etc.</b>
Comment:		Internal partitions designed and constructed with the system can satisfy this Requirement. See sections 8.1, 8.5 and 8.7 of this Certificate.
<b>Regulation:</b>	<b>7(1)</b>	<b>Materials and workmanship</b>
Comment:		The system is acceptable when specified and installed in accordance with this Certificate. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>7(2)</b>	<b>Materials and workmanship</b>
Comment:		The system is unrestricted by this Regulation. See section 12 of this Certificate.



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

<b>Regulation:</b>	<b>8(1)</b>	<b>Durability, workmanship and fitness of materials</b>
Comment:		Use of the system satisfies the requirements of this Regulation. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>9</b>	<b>Building standards applicable to construction</b>
Standard:	<b>1.1(a)(b)</b>	Structure
Comment:		Walls constructed with the system can satisfy this Standard, with reference to clause 1.1.1 <sup>(1)(2)</sup> . See sections 4 and 6.1 to 6.7 and the <i>Installation</i> part of this Certificate.
Standard:	<b>2.1</b>	Compartmentation
Standard:	<b>2.2</b>	Separation
Standard:	<b>2.3</b>	Structural protection
Standard:	<b>2.4</b>	Cavities
Standard:	<b>5.1</b>	Noise separation
Comment:		Separating walls designed and constructed with the system can contribute to satisfying these Standards, with reference to clauses 5.1.1 <sup>(1)(2)</sup> to 5.1.4 <sup>(1)(2)</sup> , 5.1.7 <sup>(2)</sup> and 5.1.8 <sup>(1)</sup> . See sections 7, 8.1 and 8.5 of this Certificate.
Standard:	<b>5.2</b>	Noise reduction

Comment:		Internal partitions designed and constructed with the system can satisfy this Standard, with reference to clauses 5.2.1 <sup>(1)(2)</sup> and 5.2.2 <sup>(1)(2)</sup> . See sections 8.1 and 8.5 of this Certificate.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The system can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard.
<b>Regulation:</b>	<b>12</b>	<b>Building standards applicable to conversions</b>
Comment:		Comments given for this 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)

<b>Regulation:</b>	<b>23(a)(i)</b>	<b>Fitness of materials and workmanship</b>
Comment:	<b>(iii)(b)</b>	The system is acceptable. See section 12 and the <i>Installation</i> part of this Certificate.
<b>Regulation:</b>	<b>30(a)</b>	<b>Stability</b>
Comment:		Walls designed and constructed with the system are capable of satisfying the requirements of this Regulation. See sections 4 and 6.1 to 6.7 of this Certificate.
<b>Regulation:</b>	<b>35(1)(3)(4)</b>	<b>Internal fire spread — Structure</b>
Comment:		The system can contribute to a construction satisfying this Regulation. See section 7 of this Certificate.
<b>Regulation:</b>	<b>49</b>	<b>Protection against sound from other parts of the building and from adjoining buildings</b>
Comment:		Separating walls designed and constructed with the system can contribute to satisfying this Regulation. See sections 8.1 and 8.5 of this Certificate.
<b>Regulation:</b>	<b>50(a)</b>	<b>Protection against sound within a dwelling or room for residential purposes</b>
Comment:		Internal partitions designed and constructed with the system can satisfy this Regulation. See sections 8.1 and 8.5 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: 1 *Description* (1.3) and 3 *Delivery and site handling* (3.1 and 3.5) of this Certificate.

## Additional Information

### NHBC Standards 2020

In the opinion of the BBA, the Silka Calcium Silicate Thin-Joint System, 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*.

### CE marking

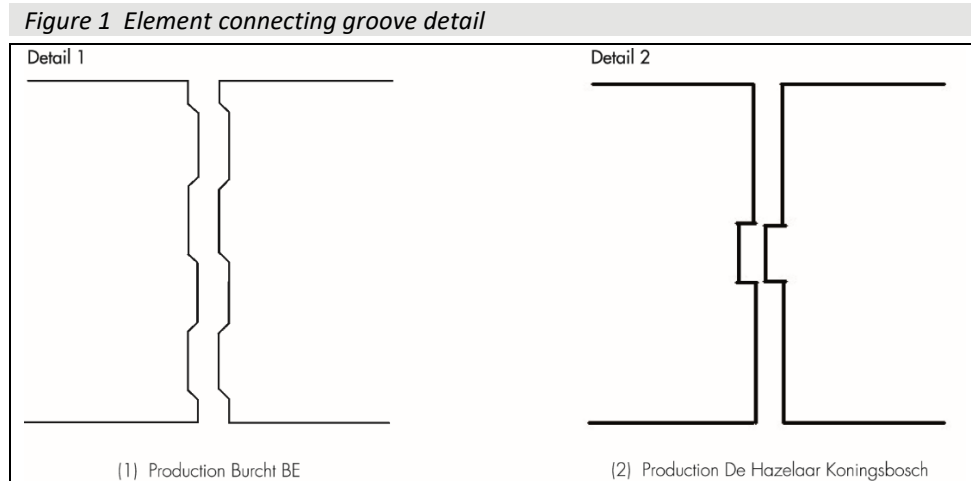
The Certificate holder has taken the responsibility of CE marking the elements in accordance with harmonised European standard BS EN 771-2 : 2011 + A1 : 2015.

## Technical Specification

### Description

1.1 The Silka Calcium Silicate Thin-Joint System is a jointing system for Silka Calcium Silicate Elements using a thin layer of mortar complying with BS EN 998-2 : 2016.

1.2 Silka Calcium Silicate Elements are rectangular solid large format building elements with a connecting groove in two different styles (see Figure 1) comprising slaked lime and sand. The elements are available in three normalised compressive strengths (see Table 1), with a unique identification code of the product type CS12, CS20 and CS28.



1.3 The elements have the characteristics shown in Table 1 and nominal dimensions<sup>(1)</sup> (in mm) of:

width	100, 120, 150, 175, 214, 240, 300
length	897, 997
height	543, 598, 623, 643.

(1) The elements meet the dimension tolerances for the TLM (Category T2, thin-layer mortar) in BS EN 771-2 : 2011.

*Table 1 Element characteristics*

Product grade	Normalised compressive strength <sup>(1)</sup> (N·mm <sup>-2</sup> )	Dry density (kg·m <sup>-3</sup> )
CS12	12	
CS20	20	1750
CS28	28	

(1) The compressive strength is indicated by the product designation (eg CS12) where the figure shows the value for compressive strength  $f_b$  in N·mm<sup>-2</sup> in accordance with BS EN 771-2 : 2011 + A1 : 2015 (tested in accordance with BS EN 772-1 : 2011 + A1 : 2015).

1.4 Other components to be used with the system, comprise:

- Silkafix Thin-Layer Mortar — water-retaining mortar, available in summer and winter grades to BS EN 998-2 : 2016 (bed joint thickness – 2 mm, perpend joint thickness – 3 mm).
- Silka Kicker-Course Mortar — with a normalised compressive strength of 20 N·mm<sup>-2</sup>

1.5 Ancillary components, which are outside the scope of the Certificate, comprise:

- cavity wall ties — in accordance with BS EN 10088-1 : 2014 and BS EN 845-1 : 2013 (further information can be obtained from the Certificate holder)
- coupling strips — in accordance with BS EN 10088-1 : 2014 and BS EN 845-1 : 2013 (further information can be obtained from the Certificate holder)
- special anchoring means — for rigid and flexible wall joints (further information can be obtained from the Certificate holder)

- centring dowels — plastic dowels to be placed in the dowel mortice of an element to facilitate horizontal centring of the element that is to be positioned on top.

## 2 Manufacture

2.1 Silka Calcium Silicate Elements are manufactured in an automated process, consisting of mixing sand, quicklime and water into 'mortar', which is then compressed into shape and placed in an autoclave for hardening.

2.2 Silkafix Thin-Layer Mortar is manufactured from a mixture of Portland-cement-based polymer-reinforced powder, graded sand, shrinkage-compensating components and plasticising agents and is manufactured to meet the requirements of BS EN 998-2 : 2016.

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

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

2.4 The management system of Xella BE has been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2015 and BS EN ISO 14001 : 2015 by SKG IKOB (Certificates SKGIKOB.010886.02.EN and SKGIKOB.010336.02.EN, respectively).

## 3 Delivery and site handling

3.1 The elements are supplied banded and shrink-wrapped in standard packs, or banded and shrink-wrapped to pallets (to order) suitable for off-loading with mechanical grabs or fork-lift trucks.

3.2 The elements are delivered to site wrapped in foil. They must be stored on a level area and kept free from moisture.

3.3 Cut elements are delivered on pallets and must be protected by covering with a tarpaulin or similar.

3.4 The thin-layer mortar is supplied dry and in pre-mixed 25 kg bags and must be stored off the ground in dry, frost-free conditions.

3.5 An element stacker per squad is used next to an approved clamping device for lifting the Silka elements with the element stacker.

## Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on the Silka Calcium Silicate Thin-Joint System.

## Design Considerations

### 4 Use



4.1 The Silka Calcium Silicate Thin-Joint System is satisfactory for use in the construction of internal loadbearing and non-loadbearing walls (including separating walls and the inner leaves of cavity walls) above the damp-proof course.

4.2 The Silka Calcium Silicate Elements comply with the requirements of BS EN 771-2 : 2011 + A1 : 2015.

## 5 Practicability of installation

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

## 6 Strength and stability



6.1 Construction of walls should be in accordance with BS EN 1996-1-1 : 2005 + A1 : 2012, 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.

6.2 The elements have the normalised compressive strengths given in Table 1.

6.3 Compressive strength should be calculated in accordance with BS EN 1996-1-1 : 2005 + A1 : 2012, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their respective UK National Annexes, and PD 6697 : 2010.

6.4 Increased local stresses may be permitted in the masonry provided that the member applying the load is sensibly rigid and of appropriate bearing area, or a suitable spreader is introduced. The design should be in accordance with BS EN 1996-1-1 : 2005 + A1 : 2012, clause 6.1.3, and its UK National Annex.

6.5 Wall ties and spacing should be in accordance with BS EN 1996-1-1 : 2005 + A1 : 2012, BS EN 1996-2 : 2006 and BS EN 1996-3 : 2006 and their respective UK National Annexes, and PD 6697 : 2010.

6.6 The characteristic initial shear strength of designed masonry mortars in combination with the elements must be as follows, in accordance with BS EN 998-2 : 2016:

- 0.15 N·mm<sup>2</sup> for general purpose and lightweight mortar
- 0.30 N·mm<sup>2</sup> for thin layer mortar.

6.7 Flexural strength values  $f_{xk1}$  and  $f_{xk2}$  to be used for general purpose mortars are given in BS EN 1996-1-1 : 2005 + A1 : 2012 and its UK National Annex, Table NA.6.

6.8 For low-rise buildings, the design of masonry walls should be in accordance with BS 8103-2 : 2013.

6.9 Joist hangers may be used in conjunction with the product provided that:

- when designed in accordance with BS EN 1996-1-1 : 2005 + A1 : 2012, 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 : 2010, the full effect of the maximum eccentric load at the joist hanger detail is taken into account. In addition, since it should be assumed that joist hangers are not sensibly rigid in terms of localised stresses, when calculating the local bearing stress under single hangers, the effective load applied via the hanger should be determined by an acceptable elastic theory
- they are compatible with elements of normalised compressive strengths of 12, 20 and 28 N·mm<sup>-2</sup> and the thin mortar joints and dimensions used in the design, and that they are manufactured from appropriate materials as set out in BS EN 1996-2 : 2006, Annex C
- supervision and workmanship<sup>(1)</sup> are adequate to ensure that:
  - installation is in accordance with the hanger manufacturer's instructions
  - the thin joint element course to carry the hangers is level and at the correct height, with any adjustments being made before the course is laid
  - the hanger bears directly on a complete unit with the back plate flat against the face
  - the gap between the joist and the back plate does not exceed 6 mm
  - construction complies with the conditions used in the design, and restraint-type hangers are used when specified
  - the thin-joint element work above the hanger is completed and cured before any load is applied to the hanger.

(1) Further guidance may be obtained from BRE Direct Action Sheet 58 : 1984 *Suspended timber floors : joist hangers in masonry walls — installation*.

## 7 Properties in relation to fire



7.1 The system has a reaction to fire classification of A1 to BS EN 13501-1 : 2007 and is classified as 'non-combustible' and it is not subject to any restriction on building height or proximity to boundaries as defined in the national Building Regulations.

7.2 When tested to EN 1363-1 : 1999 and EN 1365-1 : 1999, a wall of Silka Calcium Silicate Elements and Silkafix Thin-Layer Mortar as detailed below achieved the classification of REI 300. Designers should refer to the MPA BS fire Test Report No. 3196/804/08, available from the Certificate holder:

- Silka Calcium Silicate Elements with dimensions of 897 mm x 214 mm x 643 mm (L x W x H) with dry density of 1780 kg·m<sup>-3</sup> and normalised compressive strength of 22.9 N·mm<sup>-2</sup>
- Silkafix Thin-Layer Mortar.

7.3 The result derived from section 7.2 suggests that a wall comprising Silka Calcium Silicate Elements and Silkafix Thin-Layer Mortar for wall thicknesses of 100, 120, 150, 175 and 214 mm can achieve a fire resistance in accordance with tables NA 2.1 and NA 2.2 in the UK National Annex of BS EN 1996-1-2: 2005.

## 8 Sound insulation



8.1 Laboratory tests to EN ISO 140-3 : 1995 achieved the results shown in Table 2.

*Table 2 Weighted sound reduction index<sup>(1)</sup>*

Element thickness <sup>(2)</sup> (mm)	$R_w(C;C_{tr})$ dB
214	56 (-2;-6)
240	57 (-1;-5)

(1) Laboratory measurements, report reference A 1689-1E dated 4 August 2008, does not include flanking sound transmission.

(2) No finishes.

8.2 Separating walls in England, Wales, Scotland and Northern Ireland are subject to pre-completion testing. Exceptions for smaller developments are described in the relevant national regulatory guidance.

8.3 Care must be taken in the design and construction to avoid gaps and other paths for direct and indirect transmission of sound.

8.4 Walls constructed from the system (excluding finishes) will have the nominal mass per unit area shown in Table 3.

*Table 3 Nominal mass per unit area (element dry density 1750 kg·m<sup>-3</sup>, thin joint (2 mm) mortar at 1450 kg·m<sup>-3</sup>)*

Element thickness <sup>(2)</sup> (mm)	mass per unit area <sup>(1)</sup> (kg·m <sup>-2</sup> )
100	175
120	210
150	262
175	306
214	374
240	420
300	525

(1) Excludes finishes and dowel recesses.



## Separating walls



8.5 The elements can be used in separating walls, Type 1 (solid) or Type 2 (cavity), in conjunction with appropriate flanking elements, to satisfy the national Building Regulation requirements for limiting airborne sound transmission when they are constructed as described in:

**England and Wales** — Approved Document E, Section 2  
**Scotland** — Mandatory Standard 5.1, clause 5.1.3<sup>(1)(2)</sup>

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

**Northern Ireland** — Technical Booklet G, Section 2.

## External flanking walls

8.6 The elements can be used as the inner leaf of external flanking walls to separating walls and floors when incorporated in suitable constructions as defined in the guidance to the relevant national Building Regulations.

## Internal partitions



8.7 Partitions have a minimum mass per unit area, excluding finishes, exceeding  $120 \text{ kg}\cdot\text{m}^{-2}$  (see section 8.4) and may therefore be used in internal partitions Type C (Type 3 in Scotland) as defined in the relevant regulatory guidance.

## 9 Hygrothermal properties

9.1 Thermal transmittance (U value) calculations of walls should be carried out in accordance with BS EN ISO 6946 : 2017 and BRE Report BR 443 : 2006 using a design thermal conductivity<sup>(1)</sup> of  $0.76 \text{ W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$  for the elements. The thin mortar joints can be ignored in accordance with section 4.2 of BR 443.

(1) based on a mean dry density of  $1740 \text{ kg}\cdot\text{m}^{-3}$ , a design moisture content of 1% by volume, a moisture coefficient ( $f_w$ ) of  $10 \text{ m}^3\cdot\text{m}^{-3}$  and Table A.2 of BS EN 1745 : 2012.

9.2 For the purpose of calculating risk of interstitial condensation, the moisture diffusion coefficient ( $\mu$ ) of the elements may be taken as 25.

## 10 Movement

10.1 The drying shrinkage of the elements may be taken as a nominal value of 0.035%. Movement joints to accommodate all aspects of construction including drying shrinkage must be calculated at the design stage by a competent structural designer.

10.2 Movement joints must be provided in accordance with clause 2.3.4 of BS EN 1996-2 : 2006 and clause NA.2.1 of its UK National Annex; Table NA.1 of PD 6697 : 2010; and the Certificate holder's instructions.

## 11 Maintenance

As the Silka Calcium Silicate Thin-Joint System is generally overcoated with a conventional finish and has suitable durability (see section 12), maintenance is not required.

## 12 Durability



As the Silka Calcium Silicate Thin-Joint System is made from durable material, internal walls constructed from the elements will have a design life of 60 years and will fulfil their intended function for the life of the building into which they have been installed.



### 13 General

13.1 Installation of the Silka Calcium Silicate Thin-Joint System must be carried out strictly in accordance with the provisions detailed in this Certificate. Technical advice should be sought from the Certificate holder for particular installations, as required.

13.2 The system is resistant to damage and should be handled in accordance with BS EN 1996-2 : 2006, Section 3 *Execution*.

13.3 The level of supervision during installation of the system and the associated structure must be sufficient to ensure the quality of workmanship described in BS EN 1996-2 : 2006, BS 8000-3 : 2001 and BS 8000-0 : 2014.

#### Kicker course construction

13.4 A kicker course structure is built first using Silka Kicker-Course Mortar<sup>(1)</sup> to achieve a flat base. The kicker course products must be laid flat and level in both transverse and longitudinal directions, then built up to the line height using the mortars, with a mortar height of 20 mm ± 10 mm.

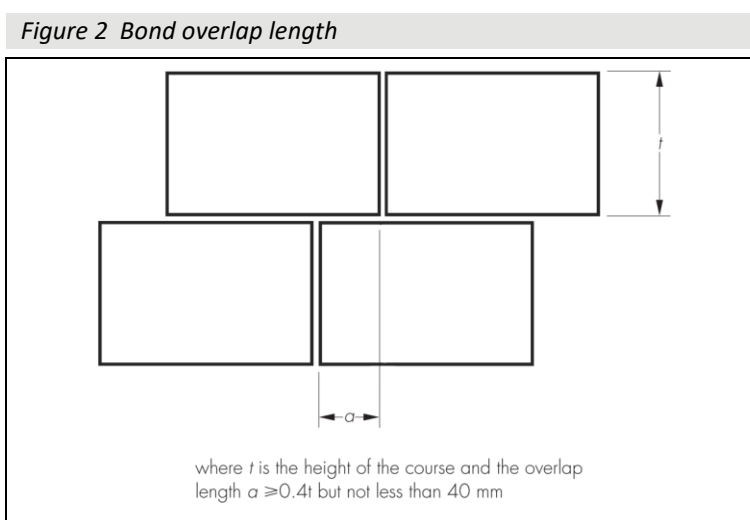
(1) Alternatively, mortar meeting the requirements of BS EN 998-2 : 2016, in the mixture ratios shown below, may be used:

- for CS12 products — proprietary mortar ≥M7.5, or 1 part cement : ½ part lime : 4½ parts sand (mixed on site), or 1 part cement : 3 parts sand + 10% thin-layer mortar, if necessary (mixed on site)
- for CS20 products — proprietary mortar ≥M10
- for CS28 products — proprietary mortar ≥M20 (Silka Kicker-Course Mortar,  $f'm$  of 20 N·mm<sup>-2</sup>).

13.5 The vertical joints should be made using Silkafix Thin-Layer Mortar. The kicker course structure must have cured sufficiently to prevent subsidence when the wall is built and should be supported by and/or rest fully on the underlying floor.

#### Erecting walls

13.6 The Silka Calcium Silicate Elements must be bonded with Silkafix Thin-Layer Mortar in the standard brickwork bond types, subject to certain restrictions (see Figure 2).



13.7 The thin-layer mortar should be mixed in accordance with the Certificate holder's instructions. Once mixed, the mortar should not be re-tempered and should be spread using the special tool supplied to provide a finished thickness of 2 mm ± 0.5 mm. Cavity battens should be used to catch mortar droppings.

13.8 For cavity walls, for sound insulation between two houses, a minimum cavity width of 50 mm should be maintained.

13.9 Bonded anchors must be suitable for this type of system and should be fully bedded-in and totally covered by thin-layer mortar.

13.10 Concrete floors can be laid directly on a calcium silicate wall without the need for intermediate support materials. The top of the wall should be built level. When poured in-situ floors are used, it is recommended that a separating layer of PE foil is applied. The use of support materials (such as felt) can have a negative effect on the structure. These factors should be evaluated by the main contractor.

### **Finishing**

13.11 Repairs to a damaged system resulting from the fitting of pipes or electric wall sockets must be carried out in accordance with the Certificate holder's instructions.

13.12 The system may be finished using conventional materials. The advice of the Certificate holder should be sought as to the suitability of a particular finish.

## **14 Fixings**

14.1 Fixings must be selected and installed in accordance with the fixing manufacturer's instructions and the Certificate holder's recommendations, paying particular attention to drilling depth, drill diameter, minimum spacings and minimum edge distance.

14.2 Guidance on some typical loads applied by relevant components (eg for services and finishing) can be obtained from BS EN 1991-1-1 : 2002 and BS EN 1991-1-7 : 2006 + A1 : 2014 and their respective UK National Annexes.

## **Technical Investigations**

## **15 Tests**

Tests were conducted on the Silka Calcium Silicate Thin-Joint System and the results assessed to determine:

- compressive strength of the elements in accordance with BS EN 771-2 : 2011 and BS EN 772-1 : 2011
- gross density (including 4% moisture) of the elements in accordance with BS EN 771-2 : 2011 and BS EN 772-13 : 2000
- strength properties of thin-bed mortar determined in accordance with BS EN 998-2 : 2016, including compressive strength, bending tensile strength and bond strength.

## **16 Investigations**

16.1 An assessment was made of data relating to:

- strength in the event of fire, spread of fire and classification to fire class in accordance with BS EN 13501-1 : 2007
- spread of smoke in accordance with NEN 6075 : 2011
- soundproofing in accordance with NEN 5077 : 2006
- thermal resistance determined in accordance with NEN 1068 : 2012 (calculation method)
- air leakage and energy performance.

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

## Bibliography

- BS 8000-0 : 2014 *Workmanship on construction sites — Introduction and general principles*
- BS 8000-3 : 2001 *Workmanship on building sites — Code of practice for masonry*
- BS 8103-2 : 2013 *Structural design of low-rise buildings — Code of practice for masonry walls for housing*
- BS EN 771-2 : 2011 + A1 : 2015 *Specification for masonry units — Calcium silicate masonry units*
- BS EN 772-1 : 2011 + A1 : 2015 *Methods of test for masonry units — Determination of compressive strength*
- BS EN 772-13 : 2000 *Methods of test for masonry units — Determination of net and gross dry density for masonry units (except for natural stone)*
- BS EN 845-1 : 2013 *Specification for ancillary components for masonry — Ties, tension straps, hangers and brackets*
- BS EN 998-2 : 2016 *Specification for mortar for masonry — Masonry mortar*
- BS EN 1745 : 2012 *Masonry and masonry products. — Methods for determining thermal properties*
- BS EN 1991-1-1 : 2002 *Eurocode 1 — Actions on structures — General actions —Densities, self-weight, imposed loads for buildings*
- NA to BS EN 1991-1-1 : 2002 UK National Annex to *Eurocode 1 — Actions on structures — General actions — Densities, self-weight, imposed loads for buildings*
- BS EN 1991-1-7 : 2006 + A1 : 2014 *Eurocode 1 : Actions on structures — General actions — Accidental actions*
- NA to BS EN 1991-1-7 : 2006 UK National Annex to *Eurocode 1: Actions on structures — General actions — Accidental actions*
- 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 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 UK National Annex to *Eurocode 6: Design of masonry structures — Simplified calculation methods for unreinforced masonry structures*
- BS EN 10088-1 : 2014 *Stainless steels — List of stainless steels*
- BS EN 13501-1 : 2007 *Fire classification of construction blocks and building elements — Classification using test data from reaction to fire tests*
- EN 1363-1 : 1999 *Fire resistance tests — General requirements*
- EN 1365-1 : 1999 *Fire resistance tests for loadbearing elements — Walls*
- EN ISO 140-3 : 1995 *Acoustics – Measurement of sound insulation in buildings and of building elements – Laboratory measurement of airborne sound insulation of building elements*
- NEN 1068 : 2012 *Thermal insulation of buildings — Calculation*
- NEN 5077 : 2006 *Sound insulation in buildings — Calculation methods for the parameters for sound insulation of external divisions, airborne sound insulation, sound insulation, noise caused by plants and reverberation time*
- NEN 6075 : 2011 *Determination of the resistance to smoke passage between areas*
- BS EN ISO 6946 : 2017 *Building components and building elements – Thermal resistance and thermal transmittance – Calculation methods*
- BS EN ISO 9001 : 2015 *Quality management systems — Requirements*
- BS EN ISO 14001 : 2015 *Environmental management systems — Requirements with guidance for use*
- PD 6697 : 2019 *Recommendations for the design of masonry structures to BS EN 1996-1-1 and BS EN 1996-2*
- BRE Report BR 443 : 2006 *Conventions for U-value calculations*

### 17 Conditions

#### 17.1 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.

17.2 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.

17.3 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.

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

17.5 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.

17.6 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.