



## H+H Celcon Ltd

Celcon House  
Ightham  
Sevenoaks  
Kent TN15 9HZ

Tel: 01732 886333 Fax: 01732 886810  
e-mail: [marketing@celcon.co.uk](mailto:marketing@celcon.co.uk)  
website: [www.celcon.co.uk](http://www.celcon.co.uk)

(16)	Ff4
------	-----

**Agrément  
Certificate  
No 05/4275**

Designated by Government  
to issue  
European Technical  
Approvals

## CELCON STANDARD BLOCKS (FOR FLOOR INFILL)

Blocs  
Blöcke

## Product



- THIS CERTIFICATE REPLACES CERTIFICATE No 90/2467 AND RELATES TO CELCON STANDARD BLOCKS (FOR FLOOR INFILL), AIRCRETE BLOCKS WITH A NOMINAL DENSITY OF  $600 \text{ kgm}^{-3}$  AND AN AVERAGE COMPRESSIVE STRENGTH OF  $3.6 \text{ Nmm}^{-2}$ .

- The blocks are for use as infill to precast concrete beams in beam and block floors in single-occupancy dwellings and domestic garage floors and other buildings where the floor is designed to meet the required loading.

## Regulations

### 1 The Building Regulations 2000 (as amended) (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of infill blocks used in the construction of beam and block floors with the Building Regulations. In the opinion of the BBA, Celcon Standard Blocks (for floor infill), if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: A1

Comment:

Loading

Floors built with the blocks will meet this Requirement provided the design and construction complies with the conditions set out in sections 7.1 to 7.3 of this Certificate.

Requirement: B3(3)

Comment:

Internal fire spread (structure)

The blocks are non-combustible. See sections 11.1 and 11.2 of this Certificate.

Requirement: C2(a)

Comment:

Resistance to moisture

Floors built with the blocks adequately resist the passage of moisture. See sections 9.1 and 9.2 of this Certificate.

Requirement: E2(b)

Comment:

Protection against sound within a dwelling-house etc

The blocks can be used as part of a construction to meet this Requirement. See section 10 of this Certificate.

Requirement: L1(a)(i)

Comment:

Conservation of fuel and power

Floors built with the blocks will contribute towards meeting the U value requirements. See section 9.3 of this Certificate.

continued

# Electronic Copy

continued

- The product complies with the requirements of BS EN 771-4 : 2003 and product packaging has CE Marking, accordingly.
- The blocks have not been assessed for use in separating floors.
- The blocks have been assessed for use with the finishes detailed in section 8 of this Certificate.

Requirement: Regulation 7

Materials and workmanship

Comment:

The blocks form an acceptable material. See section 12 of this Certificate.

## 2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, floors constructed from Celcon Standard Blocks (for floor infill), if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards listed below.

Regulation: 8

Fitness and durability of materials and workmanship

Regulation: 8(1)

Fitness and durability of materials and workmanship

Comment:

The blocks form an acceptable material and can contribute to satisfying this Regulation. See section 12 and the *Installation* part of this Certificate.

Regulation: 9

Building standards — construction

Standard: 1.1(a)(b)

Structure

Comment:

Floors constructed from the blocks in accordance with sections 7.1 to 7.3 can comply with this Standard.

Standard: 2.3

Structural protection

Comment:

The blocks are non-combustible and are unrestricted by this Standard, with reference to clauses 2.3.1<sup>(1)</sup>, 2.3.2<sup>(1)</sup> and 2.3.3<sup>(1)</sup>, respectively. See sections 11.1 and 11.2 of this Certificate.

Standard: 3.4

Moisture from the ground

Standard: 3.15

Condensation

Comment:

Floors built with the product adequately resist the passage of moisture and can contribute to satisfying these Standards, with reference to clause 3.15.1<sup>(1)</sup>, 3.15.3<sup>(1)</sup> and 3.15.4<sup>(1)</sup>. See sections 9.1 and 9.2 of this Certificate.

Standard: 6.2

Building insulation envelope

Comment:

Floors built with the blocks will contribute towards satisfying this Standard, with reference to clauses 6.2.1<sup>(1)</sup>, 6.2.2<sup>(1)</sup> and 6.2.3<sup>(1)</sup>, respectively. See section 9.3 of this Certificate.

(1) Technical Handbook (Domestic).

## 3 The Building Regulations (Northern Ireland) 2000 (as amended)



In the opinion of the BBA, Celcon Standard Blocks (for floor infill), if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation: B2

Fitness of materials and workmanship

Comment:

The blocks are acceptable. See section 12 of this Certificate.

Regulation: C4

Resistance to ground moisture and weather

Comment:

Floors built from the blocks adequately resist the passage of moisture. See sections 9.1 and 9.2 of this Certificate.

Regulation: D1

Stability

Comment:

Floors constructed in accordance with the *Installation* part of this Certificate have sufficient strength and stiffness to transfer the floor loads to the supporting walls. See sections 7.1 to 7.3 of this Certificate.

Regulation: E4

Internal fire spread — Structure

Comment:

The blocks are non-combustible. See sections 11.1 and 11.2 of this Certificate.

Regulation: F2(a)(i)

Conservation measures

Comment:

Floors built with the blocks will contribute towards satisfying the U value requirement. See section 9.3 of this Certificate.

## 4 Construction (Design and Management) Regulations 1994 (as amended)

### Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections:

5 *Description* (5.2 and 5.3) and 6 *Delivery and site handling* (6.1).

## Technical Specification

### 5 Description

5.1 Celcon Standard Blocks (for floor infill) are produced from cement, lime, sand and pulverized-fuel ash with aluminium powder added as the aerating agent. The blocks are formed by wire-cutting and curing in high-pressure steam autoclaves to obtain physical and chemical stability.

5.2 The blocks are manufactured to dimensions and tolerances in accordance with BS EN 771-4 : 2003, category General Purpose and Lightweight Mortar (GPLM). The sizes (in mm) are:

440 x 215 x 100

610 x 350 x 100.

5.3 The blocks have the performance characteristics given in Table 1, when tested in accordance with BS 6073-2 : 1981 and BS EN 771-4 : 2003.

Table 1 Performance characteristics

Gross dry density ( $\text{kgm}^{-3}$ )	600±50
Drying shrinkage (%)	0.4 mm.m <sup>-1</sup>
Average compressive strength ( $\text{Nmm}^{-2}$ ) <sup>(1)</sup>	3.6
Minimum individual block compressive strength ( $\text{Nmm}^{-2}$ )	2.9

(1) Conditioned to 6% moisture and surface ground.

5.4 Quality control of the process is operated automatically and continuously. Raw materials are checked against chemical and physical specifications and the final product is checked to BS EN 771-4 : 2003 for compressive strength and dimensional accuracy.


### 6 Delivery and site handling

6.1 The blocks are supplied banded or shrink-wrapped in standard packs. All blocks may be off-loaded using mechanical grabs; fork-lift trucks may be used to off-load palleted blocks.

6.2 The blocks must be stored clear of the ground on a firm, level surface and be protected from saturation. If supplied, the shrink-wrapping should be kept in place until the blocks are required for use.

## Design Data

### 7 General

 7.1 Celcon Standard Blocks (for floor infill) are suitable for use in the construction of beam and block floors in single-occupancy dwellings, domestic garages and other buildings where the floor is designed to meet the required loading (excluding separating floors). Where the floor is to be constructed above a basement, the ceiling should be provided with a suitable finish (see section 11.2).

7.2 The blocks should be specified in accordance with BS EN 771-4 : 2003.

7.3 Loadspans should be determined in accordance with BS 8110-1 : 1997. The following partial safety factors should be included in these determinations:

dead load partial safety factor	1.4
imposed load partial safety factor	1.6

7.4 Laboratory tests on grouted constructions of 2.9  $\text{Nmm}^{-2}$  and 4.1  $\text{Nmm}^{-2}$  blocks on commercially available, pre-stressed concrete floor beams when subjected to point loading, achieved the ultimate loads detailed in Table 2.

Table 2 Ultimate load failure

Block dimensions (mm)	Block strength ( $\text{Nmm}^{-2}$ )	Ultimate load failure (kN)
440 x 215 x 100	4.1	14.5
610 x 350 x 100	4.1	8.0
610 x 350 x 100	2.9	6.7

### 8 Finishes sub-bases

#### House floors

8.1 The screed should consist of a minimum of 50 mm sand/cement (3:1) screed in accordance with BS 8204-1 : 2003 or a proprietary screed to the manufacturer's recommended thickness.

8.2 The 50 mm sand/cement screed detailed for house floors can be laid directly on the grouted floor and, unless it is particularly moisture sensitive (as described in CP 102 : 1973), a damp-proof membrane need not be laid over the precast floor.

8.3 Flooring grade insulation board and 19 mm thick particle board surface finish in accordance with BS EN 312 : 2003, may be used.


#### Domestic garages

8.4 The screed should be a minimum of 50 mm thick concrete of minimum compressive strength 20  $\text{Nmm}^{-2}$ . Reference should be made to the beam manufacturer with particular regard to beam spacing and the need for reinforcement.

#### Other finishes sub-bases

8.5 Where finishes sub-bases other than those detailed in sections 8.2 and 8.3 are to be considered, advice must be sought from the Certificate holder.

### 9 Thermal transmittance and condensation risk

 9.1 At ground-floor level over a ventilated void the extent of condensation forming on the upper surface of a floor system will depend upon the infill blocks, the finish used and its moisture permeability properties, as well as on the temperatures and relative humidities of the surfaces and the air in contact with them. For a sand/cement screed finish over Celcon Standard Blocks (for floor infill), condensation is unlikely to

occur. Provision for a water vapour control layer may be necessary in areas of high humidity where additional insulation and particle board is used

9.2 If the product is to be used in floors of rooms expected to have high humidities, care must be taken to provide adequate permanent ventilation to avoid possible problems from the formation of interstitial condensation in the floor.

9.3 For the purpose of calculating thermal transmittance (U values), the thermal conductivity ( $\lambda$  value) of the blocks should be taken as  $0.15 \text{ Wm}^{-1}\text{K}^{-1}$ , for protected situations (as defined in CIBSE Guide A : 2006 *Environmental design*).

9.4 When designing floors, reference may be made to TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 and BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks*.

## 10 Sound insulation



An intermediate floor comprising 100 mm deep Celcon Standard Blocks (for floor infill), laid between 150 mm deep inverted, T precast concrete floor beams, at maximum 620 mm centres, with a minimum 40 mm thick sand-cement screed and finished with a 12.5 mm plasterboard ceiling, can meet the requirements of Table 2 to Approved Document E of the Building Regulations (England and Wales).

## 11 Properties in relation to fire



11.1 The floor blocks are non-combustible as defined in the national Building Regulations and have a reaction to fire of Class A1, to BS EN 13501-1 : 2002.

11.2 When used above a basement or at upper-floor levels, the ceiling finish must provide fire resistance capable of meeting the requirements of the national Building Regulations.

## 12 Durability



The exposure conditions beneath a suspended floor over a ventilated void and soil with no oversite concrete or other surface seal are classified as mild in accordance with BS 8110-1 : 1997 (Table 3.2). The product will have adequate durability for these exposure conditions.

## Installation

### 13 Site preparation

13.1 The ground beneath the floor should be free from topsoil and vegetation. Oversite concrete or other surface seal is not normally required.

13.2 Damp-proofing and ventilation arrangements must be in accordance with normal good practice, for example, provision of damp-proof sleeves to

ventilators and adequate drainage of the sub-floor (see also section 13.6).

13.3 A continuous damp-proof course should be laid along the support wall below the floor in accordance with CP 102 : 1973.

13.4 A void at least 150 mm deep must be provided between the underside of the floor and the ground surface. With good natural drainage or site drains provided to prevent water collecting and standing, the ground level beneath the floor does not need to be raised to the external ground level but, where the levels differ, the ability of the perimeter walls to act as retaining walls must be checked.

13.5 In Scotland, it is considered to be good practice [and is an NHBC (Scotland) requirement] that the solum area beneath all suspended floors be brought up at least to the level of the adjoining ground, except where an arrangement of damp-proof membranes or damp-proof courses is installed to prevent the ingress of groundwater to the solum set at a lower level.

13.6 Two opposing external walls should have ventilation openings placed ensuring the ventilating air will have a free path between opposite sides and to all parts of the floor void. The openings should be not less than either  $1500 \text{ mm}^2/\text{m}$  run of external wall or  $500 \text{ mm}^2/\text{m}^2$  of floor areas, whichever gives the greater opening area.

## 14 Floor installation

14.1 When deciding on the suitability and specification of any beam to be used with the blocks, reference should be made to prestressed concrete beam flooring systems which carry current BBA Certification<sup>(1)</sup> and the Certificate holder should be consulted. Reference should also be made to BS 8110-1 : 1997.

(1) Users are advised to check the BBA website for current Certificates.

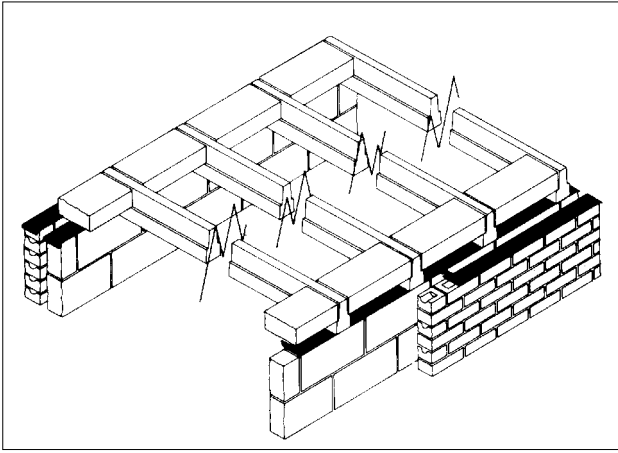
14.2 The beam manufacturer's recommendations for placement and fixing should be followed.

14.3 The infill blocks should be placed between the ends of the beam units as they are positioned to ensure correct spacing (see Figure 1). Where transmission of sound via a cavity is a consideration, infill blocks should be fully bedded and levelled, and vertical joints filled with mortar.

14.4 Normally, a whole block is used to bear on the first beam and the outside wall of a bay, except when a beam is laid alongside the wall. When this occurs, the block should be bedded on the wall with a normal mortar joint.

14.5 The blocks must be provided with adequate bearing by clearing the joist flanges of debris and ensuring adjacent blocks are abutted as close as possible.

Figure 1 Typical floor arrangement



14.6 The joints between the blocks and beams must not exceed 5 mm and must be grouted. The grout should be a mix of cement/sand with sufficient water added to produce a slurry of suitable consistency to suit the beam profile. The recommended application is by brushing or pouring into the joints.

14.7 Where the infill is of a non-standard block size (eg next to services) the void can be filled by cutting the blocks to fit. Cutting can be easily undertaken using a masonry handsaw (specialist equipment is not required). The blocks must not be cut or drilled in such a way as to impair their structural performance.

14.8 Care must be taken to avoid overloading the floor during construction. Once it has been fully grouted, it should only be used for short-term materials storage and construction traffic. Planks should be laid across the joists and as close as possible to the floor bearings, before stacking materials.

14.9 The floor should be thoroughly examined prior to the application of the finish and any damaged blocks must be replaced.

14.10 Application of the screed should be strictly in accordance with the relevant recommendations of BS 8204-1 : 2003.

14.11 In areas where there might be landfill gas or methane, and in areas where full radon precautions are required, a gas-proof barrier must be used. Full details are given in BRE Guidance Documents BRE Report 212 *Construction of new buildings on gas contamination land* and BRE Report 211 *Radon : Guidance on protective measures for new dwellings*.

## 15 Incorporation of services

15.1 Services must not be attached to beams or blocks in such a way as to impair their durability or strength.

15.2 Services must be protected from potential damage due to floor movement, eg by wrapping in

flexible materials or by ducting. Consideration must be given to the differential movements between the floor beams and other parts of the building and between adjacent beams, particularly where adjacent beams are of different spans.

15.3 Blocks must not be chased out to accommodate horizontal services. Horizontal services and conduit can be installed within the depth of the floor finish.

15.4 Vertical service pipes can be accommodated between infill blocks by reinstating the floor with in-situ concrete.

## Technical Investigations

The following is a summary of the technical investigations carried out on Celcon Standard Blocks (for floor infill).

### 16 Tests

As part of the assessment leading to the original Certificate:

- Tests were carried out to BS 6073-1 : 1981 and BS 6073-2 : 1981, to determine:
  - dimensional accuracy
  - drying shrinkage
  - dry density
  - compressive strength
- small test units incorporating either 4.1 Nmm<sup>-2</sup> blocks or 2.9 Nmm<sup>-2</sup> blocks with appropriate sections of commercially available, prestressed concrete floor beams were grouted and subjected to point loading to destruction under surveillance by the BBA
- the results of tests on infill blocks subjected to static and impact loads were examined
- test reports relating to resistance to airborne sound transmission of completed intermediate floor constructions were examined.

### 17 Investigations

As part of the assessment leading to the issue of the original Certificate:

- the manufacturing process for the blocks was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used
- a site visit was carried out to assess:
  - practicability of installation
  - resistance to site handling and site traffic
  - requirements for maintenance and repairs
- an assessment was made of the risk of condensation
- a user survey was conducted to evaluate the performance in use.

## Additional Information

The management systems of H+H Celcon Ltd have been assessed and registered as meeting the requirements of BS EN ISO 9001 : 2000 by the British Standards Institution Quality Assurance (Certificate No's FM28569, FM10369 and FM10059).

## Bibliography

BS 6073-1 : 1981 *Precast concrete masonry units — Specification for precast concrete masonry units*

BS 6073-2 : 1981 *Precast concrete masonry units — Method for specifying precast concrete masonry units*

BS 8110-1 : 1997 *Structural use of concrete — Code of practice for design and construction*

BS 8204-1 : 2003 *Screeds, bases and in-situ floorings — Concrete bases and cement sand levelling screeds to receive floorings — Code of practice*

BS EN 312 : 2003 *Particleboards — Specifications*

BS EN 771-4 : 2003 *Specification for masonry units — Autoclaved aerated concrete masonry blocks*

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

BS EN ISO 9001 : 2000 *Quality management systems — Requirements*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

## Conditions of Certification

### 18 Conditions

18.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- 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.

18.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant 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.

18.4 In granting this Certificate, the BBA is not responsible for:

- 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
- individual installations of the product or system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

18.5 Any information relating to the manufacture, supply, installation, use and maintenance 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 and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.



In the opinion of the British Board of Agrément, Celcon Standard Blocks (for floor infill) are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 05/4275 is accordingly awarded to H+H Celcon Ltd.

On behalf of the British Board of Agrément

Date of issue: 8th December 2006

Chief Executive

# Electronic Copy

---

**British Board of Agrément**

P O Box No 195, Bucknalls Lane  
Garston, Watford, Herts WD25 9BA  
Fax: 01923 665301

©2006

e-mail: [mail@bba.star.co.uk](mailto:mail@bba.star.co.uk)  
website: [www.bbacerts.co.uk](http://www.bbacerts.co.uk)



For technical or additional information, contact the Certificate holder (see front page).  
For information about the Agrément Certificate, including validity and scope, tel: Hotline 01923 665400, or check the BBA website.