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BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

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Agrément Certificate No 91/2638
*Second issue**

Designated by Government to issue European Technical Approvals

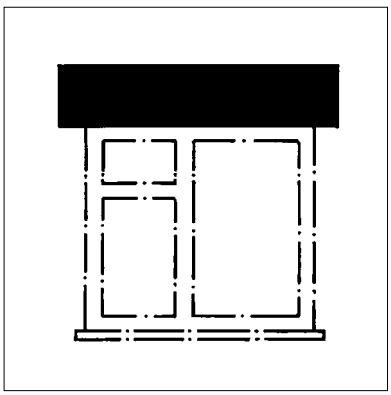
CATNIC LINTELS

Linteaux d'acier doux
Fensterstürze

Product

- *THIS CERTIFICATE REPLACES AND EXTENDS CERTIFICATE No 86/1674 AND REPLACES CERTIFICATE No 85/1453 AND RELATES TO CATNIC LINTELS, A RANGE OF PRESSED STEEL LINTELS.*
- *The lintels are for use in external and internal masonry walls (brickwork or blockwork) including external leaves of timber frame walls.*
- *They provide support to vertical loads from walls, floors, and roofs, or combinations of these, above window or door openings.*
- *BS 5977 : Part 2 : 1983 relates to prefabricated lintels but does not contain the full specification of products known to be fit for their purpose.*

These Front Sheets must be read in conjunction with the accompanying Detail Sheets, which provide information specific to particular products.



Building Regulations — Detail Sheet 1

1 The Building Regulations 1991 (as amended 1994) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which lintels can contribute in achieving compliance. In the opinion of the BBA, Catnic Lintels, if used in accordance with the provisions of this Certificate, will contribute to meeting the relevant requirements.

Requirement:	A1	Loading
Comment:		The lintels have sufficient strength and stiffness provided: (a) they are correctly installed. See section 7 of the relevant Detail Sheet. (b) design loads are in accordance with section 3 of the relevant Detail Sheet.
Requirement:	B3(1)	Internal fire spread (structure)
Comment:		When protected in accordance with this Certificate, the lintels will have the periods of fire resistance as given in section 4.1 of the relevant Detail Sheet.
Requirement:	L1	Conservation of fuel and power
Comment:		When installed in accordance with this Certificate, the lintels will have the thermal properties described in section 5 of the relevant Detail Sheet.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See sections 10.1 to 10.3 of these Front Sheets.

In addition to the contribution which Catnic Lintels can make to meeting the relevant requirements, the following comments should be noted.

Requirement:	C4	Resistance to weather and ground moisture
Comment:		When used in external cavity walls the lintels will not adversely affect the resistance of the wall to the passage of moisture.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, Catnic Lintels, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and Standards as listed below.

Regulation:	10	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The products are acceptable.
Regulation:	11	Structure
Standard:	C2.1	Construction
Comment:		The lintels have sufficient strength and stiffness provided: (a) they are correctly installed. See section 7 of the relevant Detail Sheet. (b) the design loads are in accordance with section 3 of the relevant Detail Sheet.
Regulation:	12	Structural fire precautions
Standard:	D2.2	Fire resistance
Comment:		When protected in accordance with this Certificate, the lintels will have the periods of fire resistance as given in section 4.1 of the relevant Detail Sheet.

continued

continued

Standard:	D2.3	Non-combustibility
Comment:		The lintels are non-combustible and therefore meet the requirements of this Standard.
Regulations:	**17 and 18**	Preparation of sites and resistance to moisture
Standard:	G3.1	Resistance to precipitation
Comment:		When used in external wall constructions and relied on to restrict the passage of moisture from rain or snow, the lintels will be satisfactory provided they are correctly specified and installed. See section 7 of the relevant Detail Sheet.
Standard:	G4.1	Interstitial condensation
Standard:	G4.2	Surface condensation
Comment:		When used in external cavity wall constructions as shown in the appropriate figures in the relevant Detail Sheets, interstitial or surface condensation will only occur in the lintel area under extreme conditions of temperature and humidity. Therefore, when correctly specified and installed, the lintels will be satisfactory. See section 6 of the relevant Detail Sheet.
Regulation:	**22**	Conservation of fuel and power
Standard:	J2.1	Rules for the use of this part
Comment:		When installed in accordance with this Certificate, the lintels will have the thermal properties described in section 5 of the relevant Detail Sheet.

3 The Building Regulations (Northern Ireland) 1994 (as amended 1995)

In the opinion of the BBA, Catnic Lintels, if used in accordance with the provisions of this Certificate, will satisfy the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable when installed and used in accordance with sections 10.1 to 10.3 of these Front Sheets.
Regulation:	C5	Resistance to ground moisture and weather
Comment:		When used in external wall constructions and relied on to restrict the passage of moisture from rain or snow, the lintels will be satisfactory provided they are correctly specified and installed. See section 7 of the relevant Detail Sheet.
Regulation:	C7	Condensation
Comment:		When used in external wall constructions interstitial condensation will only occur in the lintel area under extreme conditions of temperature and humidity. Therefore, when correctly specified and installed, the lintels will be satisfactory. See section 6 of the relevant Detail Sheet.
Regulation:	D2	Stability
Comment:		The lintels have sufficient strength and stiffness provided: (a) they are correctly installed. See section 7 of the relevant Detail Sheet. (b) the design loads are in accordance with section 3 of the relevant Detail Sheet.
Regulation:	E6	Internal fire spread — Structure
Comment:		When protected in accordance with this Certificate, the lintels will have the periods of fire resistance as given in section 4.1 of the relevant Detail Sheet.
Regulation:	F2	Conservation of fuel and power
Comment:		When installed in accordance with this Certificate, the lintels will have the thermal properties described in section 5 of the relevant Detail Sheet.

Technical Specification

4 Description

4.1 Catnic Lintels are available in various profiles, as detailed in the relevant Detail Sheets. Some lintels incorporate perforation, on the appropriate faces, to provide a key for plastering.

4.2 The lintels are fabricated from either:

(1) hot dipped galvanized steel to BS EN 10142 : 1991, grade DX51D, and Z275 or Z600 coating type, with a minimum yield stress of 250 Nmm^{-2}, and further protected against corrosion* by an epoxy or polyester resin coating applied to all external surfaces of the lintel to a minimum thickness of 0.025 mm, or

(2) stainless steel to BS 1449 : Part 2 : 1983, Grade 304 S15.

*Except lintels types CN9, CN10, CN91 and CN101.

4.3 Galvanized or stainless steel coil is slit, perforated if necessary, straightened and cut to length to provide blanks from which the lintel's

components are formed by press braking or roll forming. The components are then assembled by spot welding or press joining to form the completed lintel.

4.4 An epoxy or polyester powder coating is applied to the galvanized steel lintels' external surfaces and cut edges, and is heat cured.

4.5 Quality control checks include:

incoming steel

chemical composition
dimensional tolerance
mechanical properties
thickness
quality of galvanizing.

during manufacture

dimensions
weld quality
thickness
quality of the resin coating.

5 Delivery and site handling

5.1 The lintels are delivered to site or to builders' merchants singly or in bundles carrying a label bearing the manufacturer's name and the BBA identification mark incorporating the number of this Certificate.

5.2 Reasonable care must be taken during unloading, stacking and storage to avoid damaging the protective coating. Lintels that have suffered deformation or major damage to the protective coating must not be used; minor damage to the coating must be repaired by using compatible epoxy or polyester resin coatings.

5.3 The lintels must be stored off the ground to avoid the risk of either mechanical damage or contamination by corrosive substances.

5.4 When lifting or carrying, consideration must be given to the size and weight of the product (see manufacturer's brochure).

Design Data

6 General

Catnic Lintels are satisfactory for use in internal walls, at external cavity or solid walls of brickwork and/or blockwork to provide support to wall, roof or floor loads (or a combination of these) above window or door openings.

7 Practicability of installation

7.1 The lintels are installed easily by methods commonly used in building practice.

7.2 The lintels are lighter than conventional concrete lintels and can be positioned by one or two operatives.

7.3 The galvanized epoxy powder or galvanized polyester coated steel lintels obviate the need for a separate damp-proof tray at the lintel position.

7.4 The use of stopends and weep holes to the lintels should be incorporated as recommended in BS 5628 : Part 3 : 1985.

7.5 When correctly installed, the curtain track fixing clips provide adequate support; installation can be carried out easily.

7.6 Where relevant, the perforated steel lintel soffit faces and insulated surfaces provide a suitable substrate for plastering.

8 Corrosion protection

The lintels have adequate protection against corrosion subject to the following conditions:

(1) The protective zinc, epoxy or polyester resin coating is undamaged.

(2) Mortar must comply with the requirements of BS 5628 : Part 3 : 1985.

(3) Timber door or window frames in contact with the lintels may be treated with boron compounds or organic solvent type preservatives. The composition and application of any such treatment must be in accordance with BS 5589 : 1989. The risks of corrosion associated with other forms of preservative treatment and with treatment with inorganic flame retardant salts are described in BRE Digest 301.

(4) Structural timber in contact with timber frame lintels may be preservative treated in accordance with BS 5268 : Part 5 : 1989. Where copper/chrome/arsenic preservative is used it is essential to allow sufficient time for complete fixation of the preservative (about seven days) and to ensure that the timber is subsequently re-dried after fixation.

9 Maintenance

There are no maintenance requirements, but the exposed toe of the lintel (except for internal wall lintels) may be painted to improve appearance, using finishes compatible with epoxy or polyester resin coating.

10 Durability

10.1 The lintels will have adequate durability subject to the following conditions:

(1) The lintels are to be installed and used within the temperature and humidity conditions described in this Certificate.

(2) The conditions, specified in section 8 of these Front Sheets and section 6 of the relevant Detail Sheet, must be observed.

10.2 The durability of the lintels will not be impaired by contact with conventional cavity insulation material or mortar admixtures.

10.3 External solid single-leaf walls incorporating the lintels must be protected by a suitable weathertight facing, eg a ventilated cladding.

Bibliography

BS 1449 *Steel plate, sheet and strip*
Part 2 : 1983 *Specification for stainless steel and heat-resisting steel plate, sheet and strip*

BS 5268 *Structural use of timber*
Part 5 : 1989 *Code of practice for the preservative treatment of structural timber*

BS 5589 : 1989 *Code of practice for preservation of timber*

BS 5628 *Code of practice for use of masonry*
Part 3 : 1985 *Materials and components, design and workmanship*

BS EN 10142 : 1991 *Specification for continuously hot-dip zinc coated low carbon steel sheet and strip for cold forming: technical delivery conditions*

BRE Digest 301 : 1985 *Corrosion of metals by wood*

Conditions of Certification

11 Conditions

11.1 Where reference is made in this Certificate to any Act of Parliament, Regulation made thereunder, Statutory Instrument, Code of Practice, British Standard, manufacturer's instruction or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certificate.

11.2 The quality of materials and the method of manufacture have been examined and found satisfactory by the BBA and must be maintained to this standard during the period of validity of this Certificate. This Certificate will remain valid for an unlimited period provided:

(a) the specification of the product is unchanged; and

(b) the manufacturer continues to have the product checked by the BBA.

11.3 This Certificate will apply only to the product that is installed, used and maintained as set out in this Certificate.

11.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of patent or similar rights subsisting in the product; and

(b) the legal right of the Certificate holder to market, install or maintain the product; and

(c) the nature of individual installations of the product, including methods and workmanship.

11.5 It should be noted that any recommendations relating to the safe use of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory or Common Law duties 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 use of this product.

BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Catnic Lintels are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 91/2638 is accordingly awarded to Caradon Catnic Ltd.

On behalf of the British Board of Agrément

Date of Second issue: 6th February 1997

Director

**Original Certificate issued 28th March 1991. This amended version includes change of name of Certificate holder and references to the revised Building Regulations and associated text.*

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(31.9) Hh2

BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

Caradon Catnic Ltd

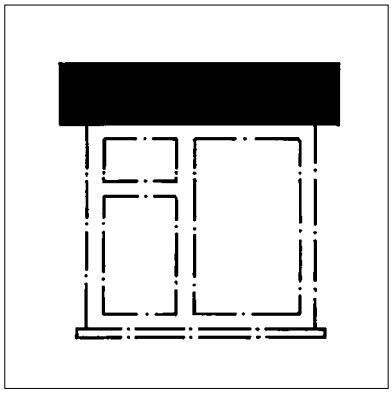
CATNIC CLASSIC AND COUGAR RANGE OF CAVITY WALL LINTELS

Certificate No 91/2638

DETAIL SHEET 2

*Second issue**

Product



- *THIS DETAIL SHEET RELATES TO CATNIC CLASSIC AND COUGAR RANGE OF CAVITY WALL LINTELS.*
- *The lintels are for use in masonry external cavity walls.*
- *They provide support to vertical loads from walls, floors and roofs, or combinations of these, above door or window openings.*
- *The lintels constitute a damp-proof tray.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 Catnic Classic and Cougar Cavity Wall Lintels are available in the profiles shown in Tables 1, 2 and 3. To provide a key for plastering, incorporated into the lintels (except profiles CN1 and CN2) are:

- perforations on the appropriate steel faces, and
- castellations on the appropriate insulation systems.

Classic lintels

1.2 The Classic lintels are available in two types: standard and eaves. They are available to suit various cavity inner and outer leaf widths. Outer leaf lintel Types CN1 and CN2 are to be used in conjunction with a suitable structural support to the inner leaf (see Figure 1).

1.3 Types CN3, CN4, CN7, CN7M, CN7MI, CN8, CN11, CN12, CN45 and CN55 incorporate expanded polystyrene insulation to BS 3837 : Part 1 : 1986. In the factory cut pieces of the polystyrene board are inserted into the lintel (see Table 1) and secured by injected polyurethane foam.

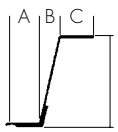
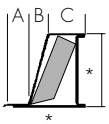
1.4 Spring clips manufactured from 2.0 mm diameter galvanized steel wire to BS 5216 : 1991 are available for fixing timber inserts required to support curtain tracks.

Cougar lintels

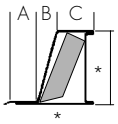
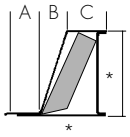
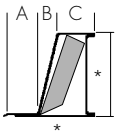
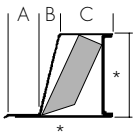
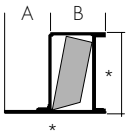
1.5 The Cougar lintels are available in three types: flush, rebated and closed eaves (see Tables 2 and 3): flush for standard cavity wall construction, rebated for checked reveal construction, and the closed eaves at the eaves. All Cougar lintels are available with wider inner flanges to accommodate wider inner leaves within the limits set out in section 3.4 of this Detail Sheet.

1.6 All Cougar lintels are fully insulated with expanded polystyrene bead (density 18 kgm^{-3}). The beads are moulded into the lintel and form a ribbed finish on the underside face to provide a key for plastering.

Table 1 Classic Lintels

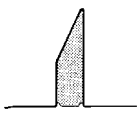
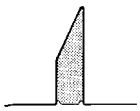
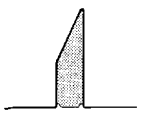
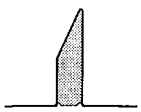
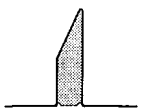
Lintel profiles	Lintel type	Sheet thickness (mm) Base	Back	Front	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Working load (UDL) (tonnes)	Installation detail Figure No
 A = 95, B = 50, C = 88; 153 (CN1) 2 courses; 231 (CN2) 3 courses	CN1C	–	–	3.2	600–1650	300–1350	150	See section 3.2 of this Certificate	1
	CN2C	–	–	3.2	1800–2850	1500–2550	150		
	CN2CD	3.2	–	3.2	3000–4575	2700–4275	150		
 A = 76, B = 100, C = 100; 190 2 courses	CN7MA	1.6	2.0	2.0	600–2700	300–2400	150	2.0	4
	CN7MB	2.0	2.5	2.5	2850–3300	2550–3000	150	3.0	
	CN7MC	2.0	3.2	3.2	3450–3900	3150–3600	150	3.0	

continued

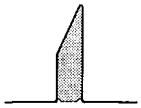
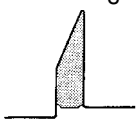
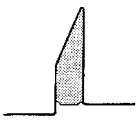
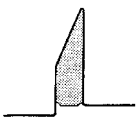
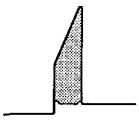
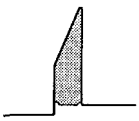
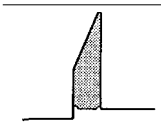
Lintel profiles	Lintel type	Sheet thickness (mm) Base	Back	Front	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Working load (UDL) (tonnes)	Installation detail Figure No
 A = 95 B = 50 C = 100; 190 2 courses	CN7M1A	1.6	2.0	2.0	600–2700	300–2400	150	2.0	6
	CN7M1B	2.0	2.5	2.5	2850–3300	2550–3000	150	3.0	
	CN7M1C	2.0	3.2	3.2	3450–3900	3150–3600	150	3.0	
 A = 95 B = 50 C = 100; 143 (CN7) 2 courses 219 (CN8) 3 courses	CN7E	1.6	1.6	1.6	750–1500	450–1200	150	1.75	6
	CN7F	1.6	1.6	2.0	1650–2100	1350–1800	150	2.0	
	CN7A	1.6	2.0	2.0	2250–2700	1950–2400	150	2.0	
	CN8A	1.6	2.0	2.0	2250–2700	1950–2400	150	3.0	
	CN8B	2.0	2.5	2.5	2850–3750	2550–3450	150	3.0	
	CN8C	2.0	3.2	3.2	3900–4575	3600–4275	150	3.0	
 A = 95 B = 70 C = 100; 143 (CN3) 2 courses 219 (CN4) 3 courses	CN3E	1.6	1.6	1.6	750–1500	450–1200	150	1.75	2
	CN3F	1.6	1.6	2.0	1650–2100	1350–1800	150	1.85	
	CN3A	1.6	2.0	2.0	2250–2700	1950–2400	150	2.0	
	CN4A	1.6	2.0	2.0	2250–2700	1950–2400	150	3.0	
	CN4B	2.0	2.5	2.5	2850–3750	2550–3450	150	3.0	
	CN4C	2.0	3.2	3.2	3900–4575	3600–4275	150	3.0	
 A = 95 B = 50 C = 140; 143 (CN11) 2 courses 219 (CN12) 3 courses	CN11E	1.6	1.6	1.6	750–1500	450–1200	150	2.0	3
	CN11F	1.6	1.6	2.0	1650–2100	1350–1800	150	2.25	
	CN11A	1.6	2.0	2.0	2250–2700	1950–2400	150	2.0	
	CN12A	1.6	2.0	2.0	2250–2700	1950–2400	150	3.0	
	CN12B	2.0	2.5	2.5	2850–3750	2550–3450	150	3.0	
	CN12C	2.0	3.2	3.2	3900–4575	3600–4275	150	3.0	
 A = 75 B = 100; 143 (CN55) 2 courses 78 (CN45) 1 course	CN45E	1.6	1.6	1.6	750–1500	450–1200	150	1.4	5
	CN55E	1.6	1.6	1.6	750–2100	450–1800	150	2.0	
	CN55A	1.6	2.0	2.0	2250–2700	1950–2400	150	2.0	

*Plaster key

Table 2 Cougar Lintels

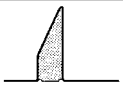
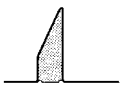
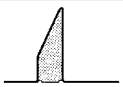
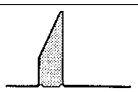
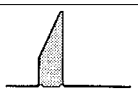
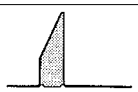
Lintel profiles[1]		Lintel type	Sheet thickness (mm)	Overall height of lintel (mm)	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Safe working load (kN)[2]	Installation detail Figure No
Flush range									
	Outer brick/block width 100	CG	1.6	140	750–1200	450–900	150	12	7, 10, 12
	Cavity width 50–65	50/100	2.0	140	1350–1500	1050–1200	150	15	
	Inner block width 100–115		2.5	140	1650–1800	1350–1500	150	18	
			2.5	160	1950–2100	1650–1800	150	20	
			2.5	180	2250–2400	1950–2100	150	22	
			2.5	220	2550–3000	2250–2700	150	26	
			3.2	220	3300–3900	3000–3600	150	26	
	Outer brick/block width 100	CG	1.6	140	750–1200	450–900	150	12	7, 10, 12
	Cavity width 70–85	70/100	2.0	140	1350–1500	1050–1200	150	15	
	Inner block width 100–115		2.5	140	1650–1800	1350–1500	150	18	
			2.5	160	1950–2100	1650–1800	150	20	
			2.5	180	2250–2400	1950–2100	150	22	
			2.5	220	2550–3000	2250–2700	150	26	
			3.2	220	3300–3900	3000–3600	150	26	
	Outer brick/block width 100	CG	1.6	140	750–1200	450–900	150	12	7, 10, 12
	Cavity width 90–105	90/100	2.0	140	1350–1500	1050–1200	150	15	
	Inner block width 100–115		2.5	140	1650–1800	1350–1500	150	18	
			2.5	160	1950–2100	1650–1800	150	20	
			2.5	180	2250–2400	1950–2100	150	22	
			2.5	220	2550–3000	2250–2700	150	26	
			3.2	220	3300–3900	3000–3600	150	26	
	Outer brick/block width 100	CG	2.0	140	750–1200	450–900	150	12	7, 10, 12
	Cavity width 50–65	50/125	2.5	140	1350–1800	1050–1500	150	17	
	Inner block width 125–140		2.5	180	1950–2400	1650–2100	150	20	
			3.2	220	2550–3000	2250–2700	150	26	
	Outer brick/block width 100	CG	2.0	140	750–1200	450–900	150	12	7, 10, 12
	Cavity width 70–85	70/125	2.5	140	1350–1800	1050–1500	150	17	
	Inner block width 125–140		2.5	180	1950–2400	1650–2100	150	20	
			3.2	220	2550–3000	2250–2700	150	26	

continued

Lintel profiles[1]		Lintel type	Sheet thickness (mm)	Overall height of lintel (mm)	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Safe working load (kN)[2]	Installation detail Figure No
	Outer brick/block width 100	CG	2.0	140	750–1200	450–900	150	12	7, 10, 12
	Cavity width 90–105	90/125	2.5	140	1350–1800	1050–1500	150	17	
	Inner block width 125–140		2.5	180	1950–2400	1650–2100	150	20	
			3.2	220	2550–3000	2250–2700	150	26	
Rebated range									
	Outer brick/block width 100	CGR	1.6	160	750–1200	450–900	150	12	8, 11
	Cavity width 50–65	50/100	2.0	160	1350–1500	1050–1200	150	15	
	Inner block width 100–115		2.5	160	1650–1800	1350–1500	150	18	
			2.5	180	1950–2100	1650–1800	150	20	
			2.5	200	2250–2400	1950–2100	150	22	
			2.5	240	2550–3000	2250–2700	150	26	
			3.2	240	3300–3900	3000–3600	150	26	
	Outer brick/block width 100	CGR	1.6	160	750–1200	450–900	150	12	8, 11
	Cavity width 70–85	70/100	2.0	160	1350–1500	1050–1200	150	15	
	Inner block width 100–115		2.5	160	1650–1800	1350–1500	150	18	
			2.5	180	1950–2100	1650–1800	150	20	
			2.5	200	2250–2400	1950–2100	150	22	
			2.5	240	2550–3000	2250–2700	150	26	
			3.2	240	3300–3900	3000–3600	150	26	
	Outer brick/block width 100	CGR	1.6	160	750–1200	450–900	150	12	8, 11
	Cavity width 90–105	90/100	2.0	160	1350–1500	1050–1200	150	15	
	Inner block width 100–115		2.5	160	1650–1800	1350–1500	150	18	
			2.5	180	1950–2100	1650–1800	150	20	
			2.5	200	2250–2400	1950–2100	150	22	
			2.5	240	2550–3000	2250–2700	150	26	
			3.2	240	3300–3900	3000–3600	150	26	
	Outer brick/block width 100	CGR	2.0	160	750–1200	450–900	150	12	8, 11
	Cavity width 50–65	50/125	2.5	160	1350–1800	1050–1500	150	17	
	Inner block width 125–140		2.5	200	1950–2400	1650–2100	150	20	
			3.2	200	2550–3000	2250–2700	150	26	
	Outer brick/block width 100	CGR	2.0	160	750–1200	450–900	150	12	8, 11
	Cavity width 70–85	70/125	2.5	160	1350–1800	1050–1500	150	17	
	Inner block width 125–140		2.5	200	1950–2400	1650–2100	150	20	
			3.2	200	2550–3000	2250–2700	150	26	
	Outer brick/block width 100	CGR	2.0	160	750–1200	450–900	150	12	8, 11
	Cavity width 90–105	90/125	2.5	160	1350–1800	1050–1500	150	17	
	Inner block width 125–140		2.5	200	1950–2400	1650–2100	150	20	
			3.2	200	2550–3000	2250–2700	150	26	

(1) All dimensions in millimetres.
(2) Load ratio from 1:1 to 1:3 (outer:inner).

Table 3 Cougar Closed Eaves Lintels

Lintel profiles[1]		Lintel type	Sheet thickness (mm)	Overall height of lintel (mm)	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Safe working load (kN)[2]	Installation detail Figure No
	Outer brick/block width n/a	CGE	2.5	95	750–1500	450–1200	150	25	9
	Cavity width 50–65	50/100	2.5	115	1650–2100	1350–1800	150	22	
	Inner block width 100–115		3.2	115	2250–2700	1950–2400	150	20	
	Outer brick/block width n/a	CGE	2.5	95	750–1500	450–1200	150	25	9
	Cavity width 70–85	70/100	2.5	115	1650–2100	1350–1800	150	22	
	Inner block width 100–115		3.2	115	2250–2700	1950–2400	150	20	
	Outer brick/block width n/a	CGE	2.5	95	750–1500	450–1200	150	25	9
	Cavity width 90–105	90/100	2.5	115	1650–2100	1350–1800	150	22	
	Inner block width 100–115		3.2	115	2250–2700	1950–2400	150	20	
	Outer brick/block width n/a	CGE	2.5	115	750–1500	450–1200	150	25	9
	Cavity width 50–65	50/125	2.5	140	1650–2100	1350–1800	150	25	
	Inner block width 125–140		3.2	140	2250–2700	1950–2400	150	25	
	Outer brick/block width n/a	CGE	2.5	115	750–1500	450–1200	150	25	9
	Cavity width 70–85	70/125	2.5	140	1650–2100	1350–1800	150	25	
	Inner block width 125–140		3.2	140	2250–2700	1950–2400	150	25	
	Outer brick/block width n/a	CGE	2.5	115	750–1500	450–1200	150	25	9
	Cavity width 90–105	90/125	2.5	140	1650–2100	1350–1800	150	25	
	Inner block width 125–140		3.2	140	2250–2700	1950–2400	150	25	

(1) All dimensions in millimetres.
(2) All load to be applied to inner leaf.

2 General

Catnic Classic and Cougar Cavity Wall Lintels are satisfactory for use in external cavity walls of brickwork and/or blockwork to provide support to wall, roof or floor loads (or a combination of these), above window or door openings.

3 Structural performance

Classic lintels

3.1 Classic standard lintels types CN3, CN4, CN7, CN7M, CN7MI, CN8, CN11 and CN12 and eaves types CN45 and CN55 have adequate strength and stiffness to sustain the uniformly distributed working loads given in Table 1, subject to the following conditions:

(1) The defined cavity widths, size of masonry unit and clear spans are not exceeded.

(2) The specified loads in Table 1 relate to simply-supported lintels laterally and torsionally unrestrained. Therefore there are no requirements for composite action with, or restraint by, adjacent elements of construction.

(3) Not more than half the total load on the lintel is supported at the outer leaf position (excluding lintels types CN45 and CN55).

(4) Where part of the loading is applied as concentrated loads, each concentrated load must be supported over a length of lintel of not less than 200 mm. In such cases the total applied loading must not produce bending moments, shear forces or reactions greater than those produced by the uniformly distributed loads specified in Table 1.

3.2 Outer leaf lintels types CN1 and CN2 have adequate strength and stiffness to sustain the uniformly distributed working loads given in Table 4, subject to the following conditions:

(1) The load applied to the lintel at the outer leaf position must not exceed 3.4 kNm^{-1}, uniformly distributed. The loading imposed by a 45° triangle of brickwork (density not exceeding 22 kNm^{-3}) will not produce moments or shear forces greater than those imposed under this uniformly distributed load. Where loads are transferred to the lintel from the effect of openings above, consideration must be given to their effect.

(2) The total distributed load (W_s) supported by the lintel must not exceed the appropriate value given in Table 4, and must be calculated from the expression:

$$W_s = \left(\frac{E_s I_s}{E_i I_i + E_s I_s}\right) W$$

where:

E_s and E_i are the moduli of elasticity for steel and for the inner leaf lintel, respectively.

I_s is the second moment of area of the outer leaf lintel about the horizontal centroidal axis (see Table 4).

I_i is the second moment of area of the inner leaf about the horizontal centroidal axis.

W is the sum of the loads applied at the inner and outer leaf positions.

Table 4 Second moments of area and allowable total loads

Lintel type	Overall length (mm)	Depth (mm)	Second moment of area (I_s) (mm^4)	Total distributed safe working load (W_s)* (kNm^{-1} run)
CN1	600–1650	153	3.18×10^6	18.1
CN2C	1800–2850	228	8.16×10^6	9.8
CN2CD	3000–4575	228	10.57×10^6	4.0

*See section 3.2(2) of this Detail Sheet.

(3) The loads transmitted through the masonry inner leaf must be sufficient to ensure that the top flange of the CN1 or CN2 outer leaf lintel bears securely upon the top surface of the inner leaf lintel. In a non-loadbearing wall this condition may normally be assumed to be satisfied when the brickwork or blockwork in the inner leaf is raised to approximately the same level as the brickwork in the outer leaf.

(4) When designing the inner leaf lintel, load transfer from the outer leaf must be taken into account. Unless an appropriate assessment of this factor is carried out in relation to a specific inner leaf lintel, it is recommended that the load on the inner leaf lintel (W_i) should be calculated as either:

(a) the load applied at the inner leaf position or, if greater,

(b) the load calculated from the expression[1]:

$$W_s = \left(\frac{E_i I_i}{E_i I_i + E_s I_s}\right) W$$

(1) The notation is defined in section 3.2(2) of this Detail Sheet.

(5) Consideration must also be given to the need to provide lateral restraint to the inner leaf lintel, for example, by means of the floor or roof.

(6) Where a part of the loading is applied as concentrated loads, each load must be supported over a length of lintel of not less than 200 mm. In such cases, the total applied loading must not produce bending moments, shear forces or reactions greater than those produced by the uniformly distributed loads specified in Table 4.

Cougar lintels

3.3 The Cougar flush lintels types CG50/100, CG70/100, CG90/100, CG50/125, CG70/125, CG90/125 and

Cougar rebated lintels CGR50/100, CGR70/100, CGR90/100, CGR50/125, CGR70/125, and CGR90/125, have adequate strength and stiffness to sustain the uniformly distributed working loads given in Table 2, subject to the following conditions:

(1) The defined cavity width, size of masonry unit and clear spans are not exceeded.

(2) Not more than half of the total load on the lintel is supported at the outer leaf position.

(3) The specified loads in Table 2 relate to simply-supported lintels laterally and torsionally unrestrained. Therefore there are no requirements for composite action with, or restraint by, adjacent elements of construction.

(4) Where part of the loading is applied as concentrated loads, each concentrated load must be over a length of not less than 200 mm. In such cases the total applied loading must not produce bending moments, shear forces or reactions greater than those produced by the uniformly distributed loads specified in Table 1.

Cougar closed eaves lintels

3.4 The Cougar closed eaves lintels types CGE50/100, CGE70/100, CGE90/100, CGE50/125, CGE70/125 and CGE90/125 have adequate strength and stiffness to sustain the uniformly distributed loads given in Table 4, subject to the following conditions:

(1) The defined cavity width, size of masonry unit and clear spans are not exceeded.

(2) The specified loads in Table 3 relate to lintels laterally and torsionally restrained as shown in Figure 10. Therefore it is imperative that the construction above the lintels comprising blockwork and timber wallplate is fully cured prior to the application of further roof loads.

(3) The specified loads given in Table 3 are to be applied to the inner leaf position only.

(4) Where part of the loading is applied as concentrated loads, each load must be supported over a length of lintel of not less than 200 mm. In such cases the total applied loading must not produce bending moments, shear forces or reactions greater than those produced by the uniformly distributed loads specified in Table 3.

General

3.5 In addition to the requirements specifically referred to in this Certificate, structures of brickwork or blockwork in which the lintels are incorporated must be designed and constructed to comply with the following technical specifications, as appropriate:

(1) BS 5628 : Part 1 : 1992 and BS 5628 : Part 3 : 1985.

(2) Section 1, Part C of Approved Document A1/2 to the Building Regulations 1991 (as amended 1994) (England and Wales).

(3) Small Buildings Guide for compliance with Part C of the Building Standards (Scotland) Regulations 1990 (as amended).

(4) Section 3 of DoE (NI) Technical Booklet D : 1994 *Structure*.

3.6 Guidance for the assessment of loads on lintels in masonry is given in BS 5977 : Part 1 : 1981(1986).

4 Behaviour in relation to fire

4.1 The construction details shown in Figures 1 to 5, 7 to 9, and 12 have been assessed as capable of satisfying the Building Regulations 1991 (as amended 1994) (England and Wales), the Building Standards (Scotland) Regulations 1990 (as amended) and the Building Regulations (Northern Ireland) 1994 (as amended 1995) in situations where a one-hour fire resistance is required.

4.2 Where any other form of wall construction incorporating the lintels is subject to fire resistance requirements, an appropriate assessment or test must be carried out by a National Measurement Accreditation Service (NAMAS)[1] accredited laboratory for the test concerned.

(1) NAMAS is now part of the United Kingdom Accreditation Service (UKAS).

5 Thermal transmittance

Evaluated constructions

5.1 The construction details containing Cougar flush lintels types CG50/100, CG70/100, CG90/100, CG50/125, CG70/125 and CG90/125 (see Figure 7) and Cougar rebated lintels types CGR50/100, CGR70/100, CGR90/100, CGR50/125, CGR70/125 and CGR90/125 (see Figure 8), are similar to the partial cavity fill lintel detail shown in Diagrams 3 and 7 of Approved Document L of the Building Regulations 1991 (as amended 1994) (England and Wales) and therefore are satisfactory. The construction details containing Classic lintels types CN3, CN4, CN7, CN7M, CNM7I, CN8, CN11, CN12, CN45 and CN55 (see Figures 2 to 6) and Cougar closed eaves lintels types CGE50/100, CGE70/100, CGE90/100, CGE50/125, CGE70/125 and CGE90/125 (see Figure 9), were evaluated to determine their likely hygrothermal performance.

5.2 Example details were modelled numerically to determine the heat loss due to thermal bridging and the results compared to those obtained for the box and other lintels details given in Diagrams 3 and 7 of the Approved Document L for which the additional heat loss may be ignored. The analysis showed that for details shown in Figures 2 to 6 the additional heat loss will be similar to that which could be expected for the satisfactory detail, and for Figure 9 it will be lower. Other details using the lintels, where the U value of the basic wall

construction is 0.45 $Wm^{-2}K^{-1}$ or less, should have similar performances.

5.3 The additional thermal energy passing through these lintel assemblies is sufficiently small in the context of domestic dwellings for it to be discounted when assessing the overall building energy consumption, and in general may be included with the wall heat transmission term. However, in certain low energy constructions this may not be the case and the heat loss should be determined for the particular detail and accounted for.

5.4 In Part J of the Technical Standards of the Building Standards (Scotland) Regulations 1990 (as amended) and Part F of the Building Regulations (Northern Ireland) 1994 (as amended 1995) a requirement is set out to limit the severity of thermal bridging permitted in lintel and similar assemblies. The analysis showed that for the details examined the resultant surface temperatures are within the effective practical limits of the stipulated maximum U value requirement of 1.2 $Wm^{-2}K^{-1}$ given in the Regulations[1].

(1) Standard J2 in Scotland and Technical Booklet F in Northern Ireland.

Other constructions

5.5 Where lintels are used in other details an assessment or an appropriate test should be carried out to determine the thermal performance of the detail proposed.

5.6 The thermal properties of a lintel area incorporating types CN1 and CN2 lintels are dependent on other items used in the detail. As a guide only, example installations of these lintels are shown in Figure 1. Other details are possible and the actual construction proposed will need to be assessed.

6 Condensation risk

Evaluated constructions

6.1 The construction details containing Cougar rebated lintels types CGR50/100, CGR70/100, CGR90/100, CGR50/125, CGR70/125 and CGR90/125 (see Figure 8) are similar to the partial cavity fill lintel detail shown in Diagrams 3 and 7 of Approved Document L of the Building Regulations and therefore are satisfactory.The construction details containing Classic lintels types CN3, CN4, CN7, CN7M, CN7MI, CN8, CN11, CN12, CN45 and CN55 (see Figures 2 to 6) and Cougar flush lintels types CG50/100, CG70/100, CG90/100, CG50/125, CG70/125 and CG90/125 (see Figure 7), and Cougar closed eaves lintels types CGE50/100, CGE70/100, CGE90/100, CGE50/125, CGE70/125 and CGE90/125 (see Figure 9), were evaluated to determine their likely hygrothermal performance.

6.2 Example details were modelled numerically to determine the difference in temperature between the lintel soffit area and the remainder of the wall. These temperatures were compared to those obtained for the box and other lintels given in Diagrams 3 and 7 of Approved Document L, which are stated as being satisfactory. The analysis showed that for details shown in Figures 2 to 7 and 9, the minimum surface temperatures predicted were no less than those which could be expected from the satisfactory details, and the risk of surface condensation therefore will be similar.

6.3 In normal domestic circumstances the extent and severity of any resulting interstitial or surface condensation is judged to be insufficient to cause any significant problem. Where the details are likely to be exposed to relative humidities of more than 70% at 20°C for considerable periods of time, special precautions will be needed to prevent condensation accumulating around the details in the region of the soffit.

6.4 To avoid possible condensation and moisture accumulation on and around Classic eaves lintels types CN45 and CN55 and Cougar closed eaves lintels CGE50/100, CGE70/100, CGE90/100, CGE50/125, CGE70/125 and CGE90/125, it is essential that particular attention is paid to ensuring that the insulation is properly installed over the lintel.

Other constructions

6.5 Where lintels are used in other details an assessment or appropriate test to determine the extent of likely condensation accumulation should be carried out in accordance with the principles described in BS 5250 : 1989.

6.6 The risk of condensation of the lintel area incorporating a type CN1 or CN2 lintel is highly dependent on other items used in the detail. As a guide only, example installations of these lintels are shown in Figure 1. Other details are possible and the actual construction proposed will need to be assessed.

6.7 Consideration should be given to the possible need either to isolate the window head from the lintel or to use preservative treated timber for the head member (see section 8 of the Front Sheets).

Installation

7 General

7.1 Typical installation details are shown in Figures 1 to 12. Catnic Classic and Cougar Cavity Wall Lintels must be installed with at least the minimum end bearing dimensions given in Tables 1, 2 and 3 and illustrated in Figure 13, and be fully bedded on bricklaying mortar.

7.2 The outer leaf lintels CN1 and CN2 must be used in conjunction with correctly designed, specified and installed inner leaf lintels.

7.3 The inner and outer leaves supported by the lintels must be raised together to avoid excessive eccentricity of loading.

7.4 Weep holes must be provided in the outer leaf above the lintel to drain moisture from the cavity. A minimum of two weep holes must be provided per lintel. For fair-faced masonry, weep holes should be provided at centres not greater than 450 mm. The use of stopends to the lintels should also be applied as recommended in BS 5628 : Part 3 : 1985, particularly in areas of severe exposure and where full-fill cavity insulation is specified.

7.5 To comply with NHBC requirements in Scotland, Northern Ireland and areas of severe exposure, as defined in BRE Report *Thermal Insulation: avoiding risks. Second Edition,* separate damp-proof protection must be provided over cavity wall lintels, and stopends to the lintels and cavity trays are required under all exposure conditions.

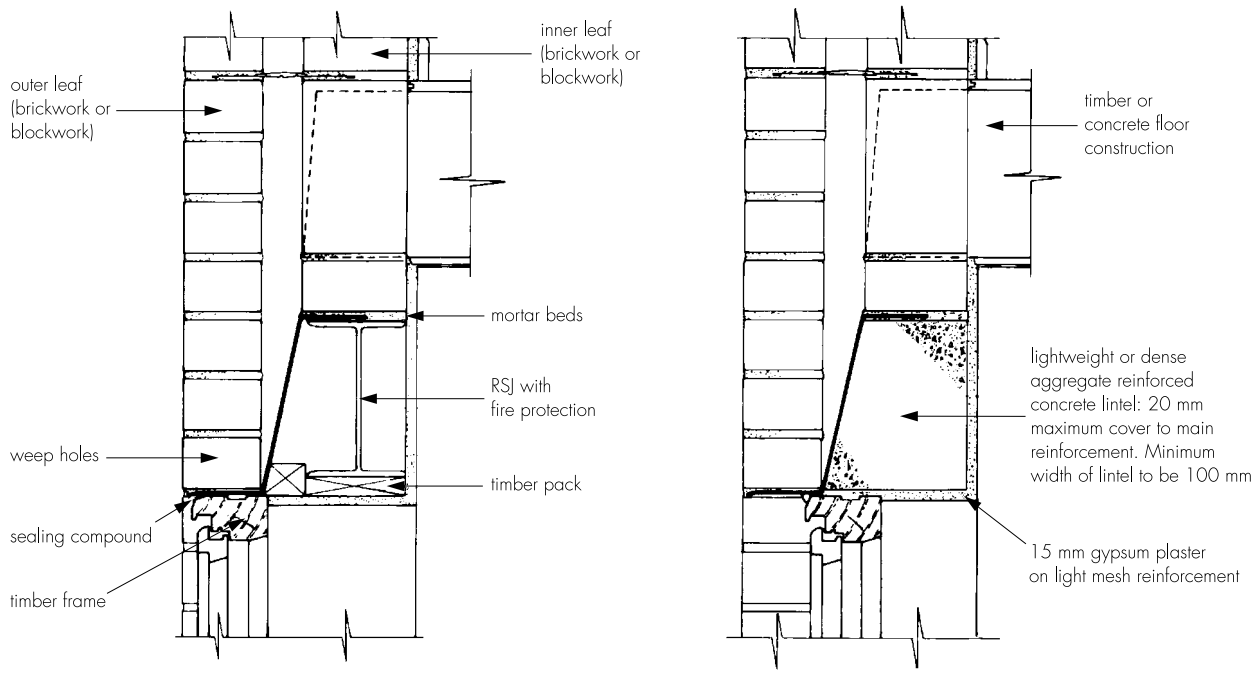
7.6 To comply with Zurich Municipal requirements in areas of severe and very severe exposures separate damp-proof protection must be provided over cavity wall lintels.

7.7 The durability assessment assumes that water does not collect on the lintel, therefore weep holes should be kept clear of slurry or debris.

7.8 Operations likely to damage the protective coatings or impair the strength of the lintels (for example, cutting, welding or drilling) must not be undertaken. Cleaning of excess mortar must be carried out with a soft implement to avoid damaging the coating.

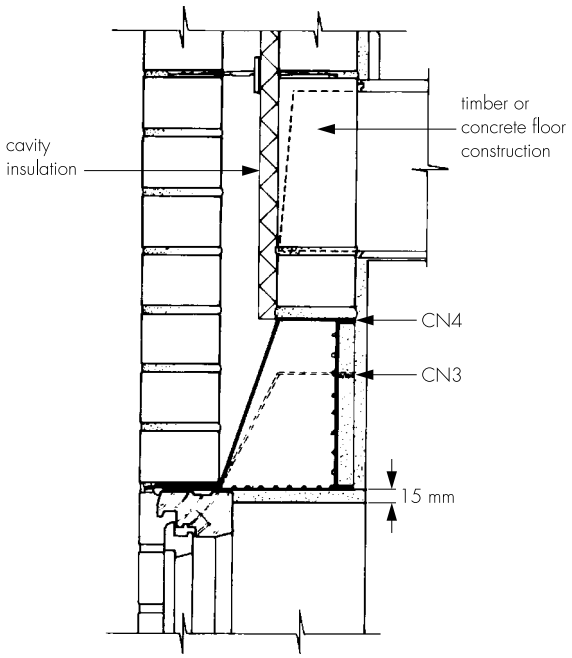
7.9 A 19 mm by 38 mm softwood insert may be fixed to the back of the lintels (excluding lintels types CN1 and CN2), with the spring clips supplied, at 400 mm centres to provide a fixing for curtain tracks.

Figure 1 Typical installation details for lintels types CN1 and CN2



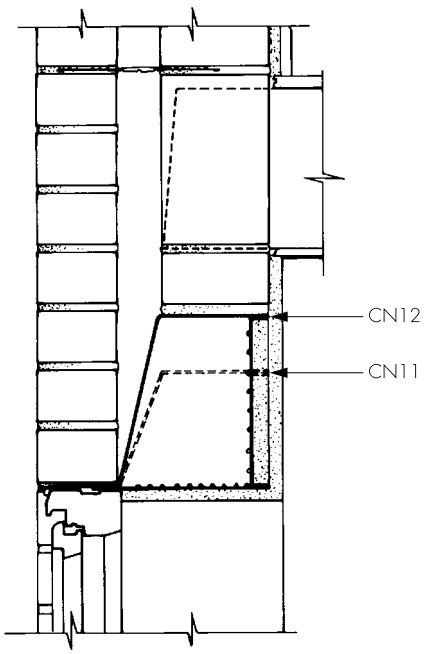
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

*Figure 2 Typical installation details for lintels types CN3 and CN4**



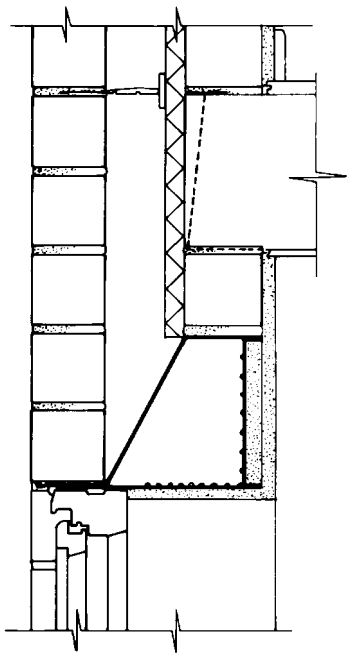
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.
*Full lintel detail, including insulation, is shown in Table 1.

*Figure 3 Typical installation details for lintels types CN11 and CN12**



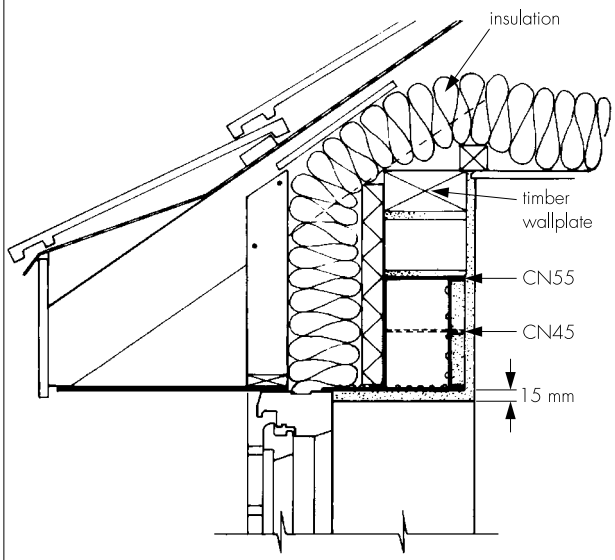
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.
*Full lintel detail, including insulation, is shown in Table 1.

*Figure 4 Typical installation details for lintels types CN7M**



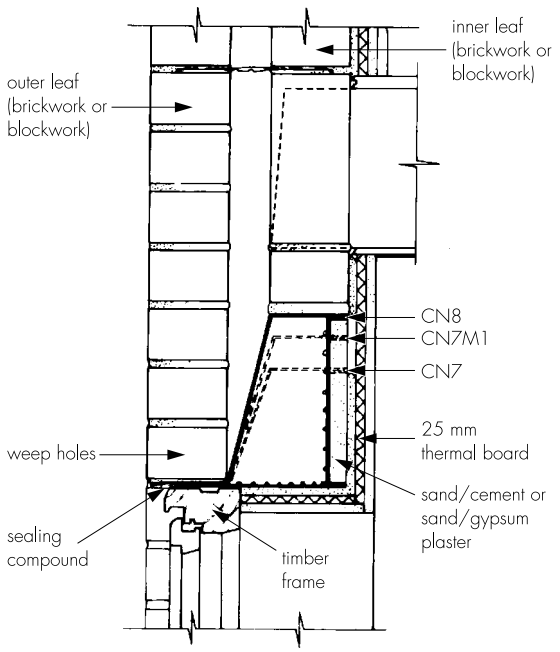
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.
*Full lintel detail, including insulation, is shown in Table 1.

*Figure 5 Typical installation details for lintels types CN45 and CN55**



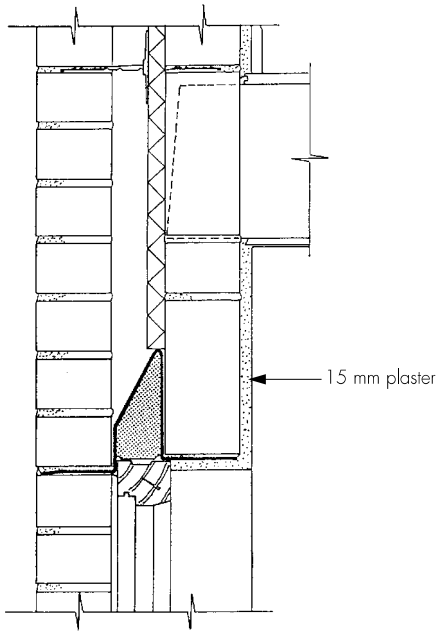
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.
*Full lintel detail, including insulation, is shown in Table 1.

*Figure 6 Typical installation details for lintels types CN7, CN7M1 and CN8**



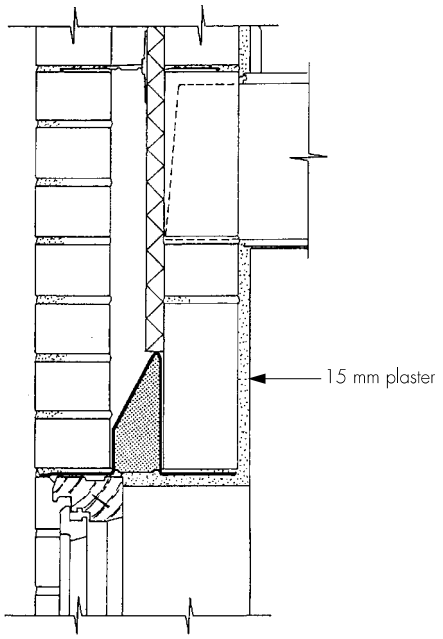
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.
*Full lintel detail, including insulation, is shown in Table 1.

Figure 8 Typical installation details for Cougar rebated lintels (types CGR)



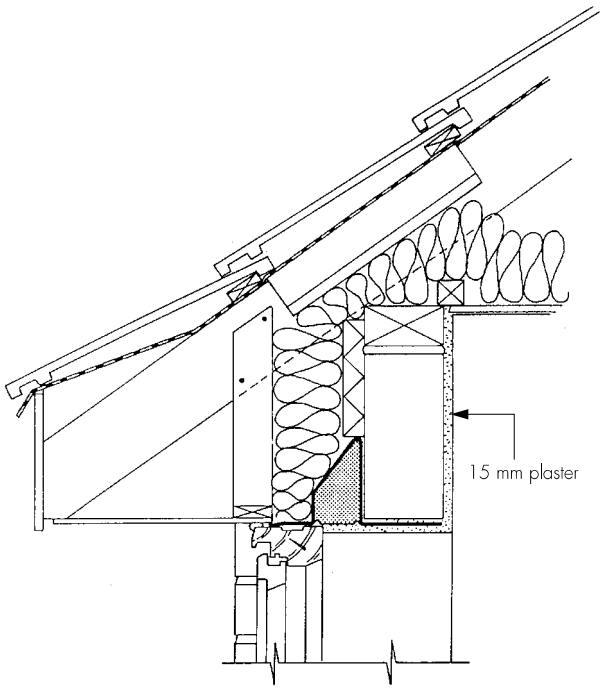
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 7 Typical installation details for Cougar flush lintels (types CG)



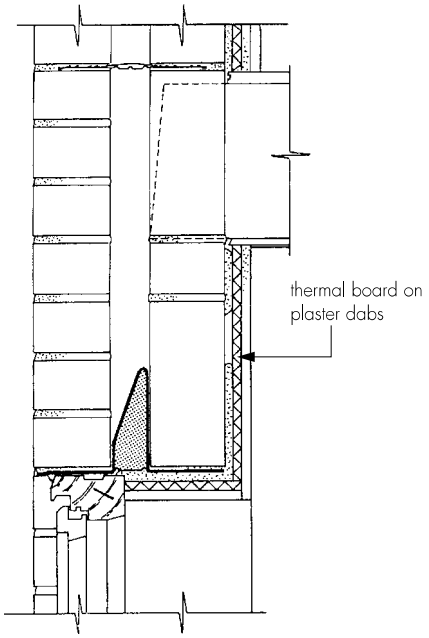
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 9 Typical installation details for Cougar closed eaves lintels (types CGE)



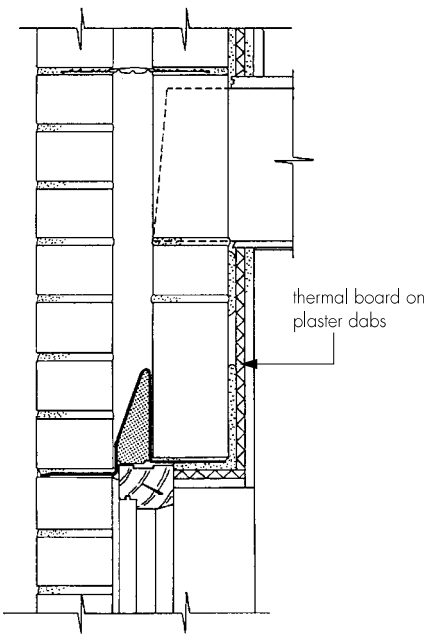
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 10 Alternative details for Cougar flush lintels (types CG)



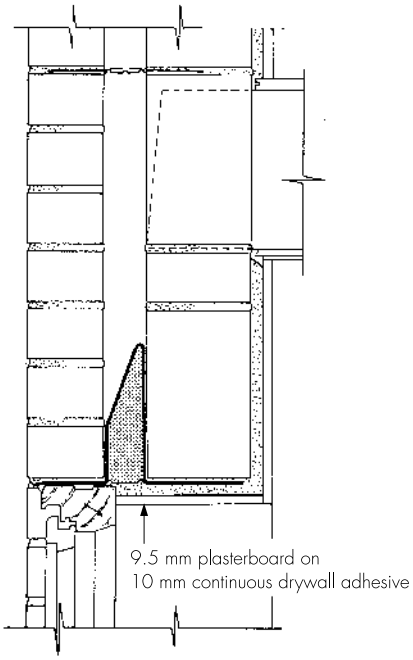
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 11 Alternative details for Cougar rebated lintels (types CGR)



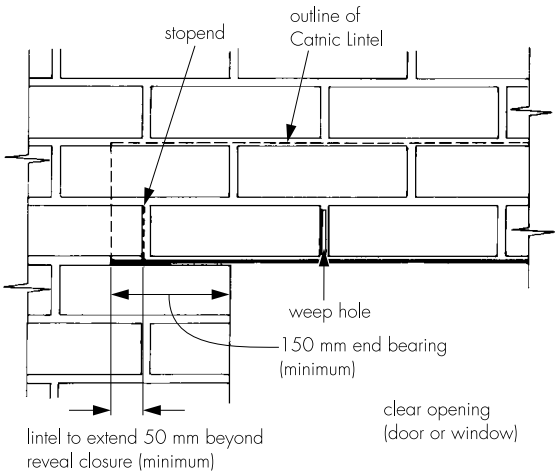
Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 12 Alternative details for Cougar flush lintels (types CG)



Note: To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 13 Detail showing minimum end bearing stop-ends and weep holes



Technical Investigations

The following is a summary of the technical investigations carried out on Catnic Classic and Cougar Cavity Wall Lintels.

8 Tests

As part of the assessment resulting in the issue of the previous Certificates, tests were carried out to establish:

(1) load deflection characteristics of Catnic Classic Cavity Wall Lintels

(2) fire resistance of selected lintel profiles to BS 476 : Part 1 : 1953 and BS 476 : Part 8 : 1972

(3) the quality of the spot welding and its effect on the galvanizing

(4) thickness and quality of galvanizing and epoxy and polyester resin coatings

(5) resistance to damage of the epoxy and polyester resin coatings

(6) thermal transmittance and condensation risk on the CN7 lintel using the BBA guarded hot box apparatus (BBA Information Sheet No 21 : 1984).

9 Other investigations

9.1 As part of the assessment resulting in the issue of the previous Certificate the following investigations were made:

(1) Calculations were undertaken, and examined in conjunction with the results of the load-deflection tests referred to in paragraph 8(1) to establish structural performance.

(2) Existing information relating to the suitability of the corrosion protection was examined, including results of long-term exposure tests on galvanized steel carried out by the British Steel Corporation.

(3) Data relating to the effectiveness of the lintels as damp-proof trays and their effect on the weathertightness of cavity walls were also examined.

9.2 Calculations were undertaken to determine:

(1) the U value in accordance with CIBSE Guide 1986, Part A3, and

(2) condensation risk.

9.3 The results of the tests carried out under paragraph 8(1) were examined in conjunction with these calculations.

9.4 From existing data an assessment was made of:

behaviour in fire
practicability of installation.

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

9.6 As part of the assessment resulting in the issue of this Certificate the following investigations were made:

(1) A re-examination was made of the data and investigations on which the previous Certificate was based. The conclusions drawn from the original data remain valid.

(2) Tests were carried out on Catnic Cougar Cavity Wall Lintels to establish load deflection characteristics.

(3) Calculations were undertaken on Catnic Cougar Cavity Wall Lintels and examined in conjunction with the results of the load/deflection tests referred to above, to establish structural performance.

(4) Suitability of the corrosion resistance of the stainless steel.

9.7 Regular factory inspections have been carried out to ensure that quality is being maintained.

9.8 No failure of the product in use has been reported to the BBA.

Bibliography

BS 476 *Fire tests on building materials and structures*
Part 1 : 1953 *Fire tests on building materials and structures*
Part 8 : 1972 *Test methods and criteria for the fire resistance of elements of building construction*

BS 3837 *Expanded polystyrene boards*
Part 1 : 1986 *Specification for board manufactured from expandable beads*

BS 5216 : 1991 *Specification for patented cold drawn steel wire for mechanical springs*

BS 5250 : 1989 *Code of practice for control of condensation in buildings*

BS 5628 *Code of practice for use of masonry*
Part 1 : 1992 *Structural use of unreinforced masonry*
Part 3 : 1985 *Materials and components, design and workmanship*

BS 5977 *Lintels*
Part 1 : 1981(1986) *Method for assessment of load*

BBA Information Sheet No 21 : 1984 *Measurement of the Thermal and Hygrothermal Properties of Materials*

CIBSE Guide 1986 : Part A3 *Thermal properties of building structures*

On behalf of the British Board of Agrément

Date of Second issue: 6th February 1997

Director

Original Detail Sheet issued 28th March 1991. This amended version includes references to the revised Building Regulations and associated text, and the addition of the Cougar range.

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BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

Caradon Catnic Ltd

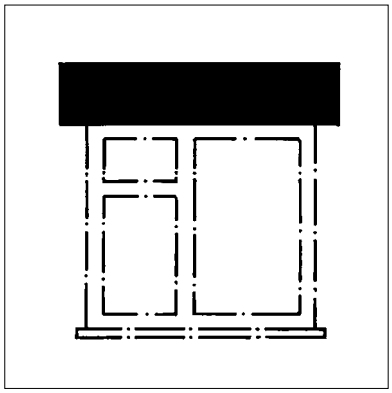
Certificate No 91/2638

DETAIL SHEET 3

*Second issue**

CATNIC EXTERNAL SOLID WALL LINTELS

Product



- *THIS DETAIL SHEET RELATES TO CATNIC EXTERNAL SOLID WALL LINTELS.*
- *They provide support to vertical loads from walls, floors and roofs, or combinations of these, above door or window openings in domestic dwellings and garages (but see section 6 of this Detail Sheet).*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 Catnic External Solid Wall Lintels are available in the profiles shown in Table 1. The lintels incorporate perforations on the appropriate faces to provide a key for plastering.

1.2 Spring clips manufactured from 2.0 mm diameter galvanized steel wire to BS 5216 : 1991 are available for fixing timber inserts required to support curtain tracks.

1.3 Types CN71 and CN81 incorporate polystyrene insulation.

Design Data

2 General

Catnic External Solid Wall Lintels are satisfactory for use in external walls of brickwork and/or blockwork to provide support to wall, roof or floor loads (or a combination of these), above window or door openings.

3 Structural performance

3.1 Types CN5, CN6, CN46, CN52, CN56, CN66, CN71 and CN81 have adequate strength and stiffness to sustain the uniformly distributed working loads given in Table 1, subject to the following conditions:

(1) The defined sizes of masonry unit and clear spans are not exceeded.

(2) With types CN71 and CN81 not more than half the total load on the lintel is supported at the outer leaf position.

(3) The specified loads in Table 1 relate to simply-supported lintels laterally and torsionally unrestrained. Therefore there are no requirements for composite action with, or restraint by, adjacent elements of construction.

(4) Where part of the loading is applied as concentrated loads, each load must be supported over a length of lintel of not less than 200 mm. In such cases the total applied loading must not produce bending moments, shear forces or reactions greater than those produced by the uniformly distributed loads specified in Table 1.

3.2 In addition to the requirements specifically referred to in this Detail Sheet, structures of brickwork or blockwork in which the lintels are incorporated must be designed and constructed to comply with the following technical specifications as appropriate:

(1) BS 5628 : Part 1 : 1992 and BS 5628 : Part 3 : 1985.

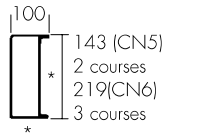
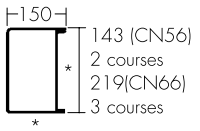
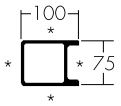
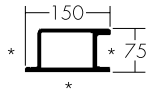
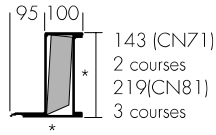
(2) Section 1, Part C of Approved Document A1/2 to the Building Regulations 1991 (as amended 1994) (England and Wales).

(3) Small Building Guide for compliance with Part C of the Building Standards (Scotland) Regulations 1990 (as amended).

(4) Section 3 of DoE (NI) Technical Booklet D : 1994 *Structure*.

3.3 Guidance for the assessment of loads on lintels in masonry is given in BS 5977 : Part 1 : 1981(1986).

Table 1 Lintels for external solid masonry walls

Lintel profiles	Lintel type	Sheet thickness (mm) Base	Back	Front	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Working load (UDL) (tonnes)	Installation detail Figure No
	CN5E	1.6	1.6	1.6	600–2100	300–1800	150	2.0	2
	CN5A	2.0	2.0	2.0	600–2700	300–2400	150	2.0	
	CN6A	2.0	2.0	2.0	2250–2700	1950–2400	150	3.0	
	CN6B	2.5	2.5	2.5	2850–3750	2550–3450	150	3.0	
	CN6C	3.2	3.2	3.2	3900–4575	3600–4275	150	3.0	
	CN56E	1.6	1.6	1.6	600–2100	300–1800	150	2.0	3
	CN56A	2.0	2.0	2.0	600–2700	300–2400	150	2.0	
	CN66A	2.0	2.0	2.0	2250–2700	1950–2400	150	3.0	
	CN66B	2.5	2.5	2.5	2850–3750	2550–3450	150	3.0	
	CN66C	3.2	3.2	3.2	3900–4575	3600–4275	150	3.0	
	CN52E	1.6	1.6	1.6	750–1500	450–1200	150	1.4	2
	CN46E	1.6	1.6	1.6	750–1500	450–1200	150	1.4	3
	CN71E	1.6	1.6	1.6	750–1500	450–1200	150	2.1	1
	CN71F	1.6	1.6	2.0	1650–2100	1350–1800	150	2.5	
	CN71A	1.6	2.0	2.0	600–2700	300–2400	150	2.0	
	CN81A	1.6	2.0	2.0	2250–2700	1950–2400	150	3.0	
	CN81B	2.0	2.5	2.5	2850–3750	2550–3450	150	3.0	
	CN81C	2.0	3.2	3.2	3900–4575	3900–4275	150	3.0	

*Plaster key

4 Behaviour in relation to fire

4.1 The construction details shown in Figures 1 to 3 have been assessed as capable of satisfying the Building Regulations 1991 (as amended 1994) (England and Wales), the Building Standards (Scotland) Regulations 1990 (as amended) and the Building Regulations (Northern Ireland) 1994 (as amended 1995) in situations where a one-hour fire resistance is required.

4.2 Where any other form of wall construction incorporating Catnic lintels is subject to fire resistance requirements, an appropriate assessment or test must be carried out by a National Measurement Accreditation Service (NAMAS)[1] accredited laboratory for the test concerned.

(1) NAMAS is now part of the United Kingdom Accreditation Service (UKAS).

Figure 1 Indicative installation details for lintels types CN71 and CN81

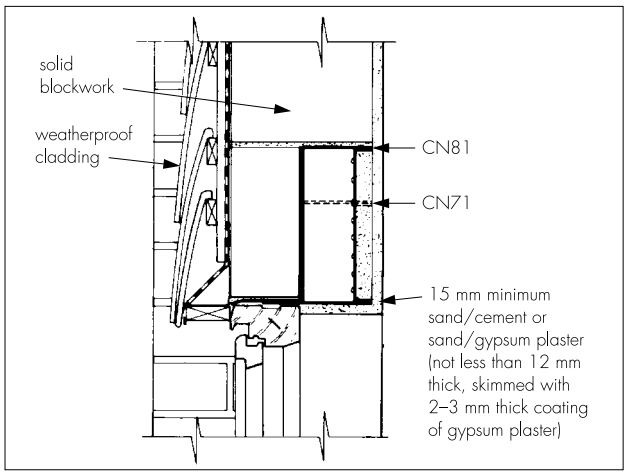


Figure 2 Indicative installation details for lintels types CN52, CN5 and CN6

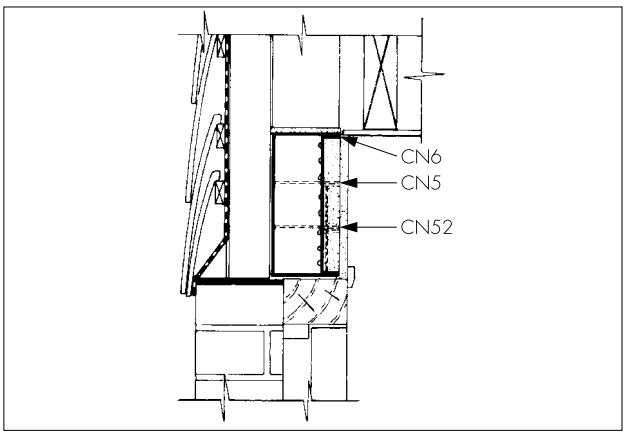
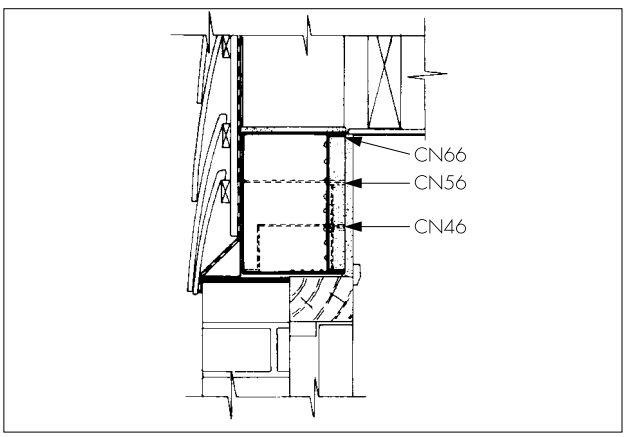


Figure 3 Indicative installation details for lintels types CN46, CN56 and CN66



Note: To suit normal Scottish practice, frames must be set so that the outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

5 Thermal transmittance

Evaluated constructions

5.1 The typical construction details containing lintels types CN71, CN81, CN5, CN6, CN46, CN52, CN56 and CN66 (see Figures 1 to 3) were modelled numerically to determine their likely hygrothermal performance. The analysis of the details examined showed that the additional thermal energy passing through the lintel assemblies is sufficiently small in the context of domestic dwellings for it to be discounted in assessing the overall building energy consumption, and in general may be included with the wall heat transmission term. Other details using the lintels where the U value of the solid wall is similar to that of the detail assessed should have a similar performance.

5.2 The basic U values of all the solid walls in the details assessed is such that they should only be used where one of the calculation procedures [Target U-value method/Calculated trade-offs (method 2)/Calculated trade-off approach or Energy Rating method/Energy targets (method 3)/ Energy target approach or Calculation method or Energy Use method] is being used to show compliance to the thermal requirements or where the Elemental method/approach is being used and there is no requirement (ie external walls of garages and other unheated spaces). Similar details but with the tile hanging could also be used in semi-exposed walls, provided the basic U value of the wall is less than 0.6 $Wm^{-2}K^{-1}$, when using the Elemental method/approach.

5.3 In Part J of the Technical Standards of the Building Standards (Scotland) Regulations 1990 (as amended) and Part F of the Building Regulations (Northern Ireland) 1994 (as amended 1995) a requirement is set out to limit the severity of thermal bridging permitted in lintel and similar assemblies. The analysis showed that for the details examined the resultant surface temperatures are within the effective practical limits implied by the stipulated maximum U value requirement of 1.2 $Wm^{-2}K^{-1}$ given in the Regulations[1].

(1) Standard J2 in Scotland and Technical booklet F in Northern Ireland.

Other constructions

5.4 Where other forms of construction are to be used and compliance with the thermal requirements has to be shown, an assessment or an appropriate test must be carried out on the actual detail proposed.

6 Condensation risk

Evaluated constructions

6.1 The typical construction details containing lintels types CN71, CN81, CN5, CN6, CN46, CN52, CN56 and CN66 (see Figures 1 to 3) were modelled numerically to determine their likely hygrothermal performance. The numerical analysis gave the likely difference in temperature between the lintel soffit area and the remainder of the wall.

6.2 The analysis showed that, for the details described in Figure 1, in normal domestic circumstances the extent and severity of any resulting interstitial or surface condensation will be insufficient to cause any significant problem. Where the details are likely to be exposed to relative humidities of more than 70% at 20°C for considerable periods of time, special precautions will be needed to prevent condensation accumulating around the details in the region of the soffit.

6.3 The analysis showed that, for the details described in Figures 2 and 3, condensation will occur and moisture may accumulate on and around the lintel area under conditions of high internal humidity. This type of construction therefore would be acceptable for domestic garages and similar situations, but not for dwellings, residential buildings or for parts of other buildings where high internal humidities are predicted.

Other constructions

6.4 Where Catnic lintels are used in details not described in this Detail Sheet, an assessment or appropriate test to determine the extent of any likely condensation accumulation should be carried out in accordance with the principles described in BS 5250 : 1989.

6.5 Consideration should be given to the possible need to isolate the window head from condensation from the lintel or to use preservative treated timber for the head member (see section 8 of the Front Sheets).

Installation

7 General

7.1 Typical installation details are shown in Figures 1 to 3. The lintels must be installed with at least the minimum end bearing dimensions given in Table 1 and be fully bedded on bricklaying mortar.

7.2 Operations likely to damage the protective coatings or impair the strength of the lintels (for example, cutting, welding or drilling) must not be undertaken.

7.3 A 19 mm by 38 mm softwood insert may be fixed to the back of the lintels with the spring clips supplied, at 400 mm centres, to provide a fixing for curtain tracks.

Technical Investigations

The following is a summary of the technical investigations carried out on Catnic External Solid Wall Lintels types CN5, CN6, CN46, CN52, CN56, CN66, CN71, CN81.

8 Tests

As part of the assessment resulting in the issue of the previous Certificates, tests were carried out to establish:

(1) load deflection characteristics

(2) fire resistance of selected lintel profiles to BS 476 : Part 1 : 1953 and BS 476 : Part 8 : 1972

(3) the quality of the spot welding and its effect on the galvanizing

(4) thickness and quality of galvanizing and epoxy and polyester resin coatings

(5) resistance to damage of the epoxy and polyester resin coatings.

9 Other investigations

9.1 As part of the assessment resulting in the issue of the previous Certificates the following investigations were made:

(1) Calculations were undertaken, and examined in conjunction with the results of the load-deflection tests referred to in section 8.1(1), to establish structural performance.

(2) Existing information relating to the suitability of the corrosion protection was examined, including results of long-term exposure tests on galvanized steel carried out by the British Steel Corporation.

(3) Calculations were undertaken to determine:

the U value in accordance with CIBSE Guide 1986, Part A3 and condensation risk.

(4) Existing data were used to make an assessment of:

behaviour in fire
practicability of installation.

(5) The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

9.2 As part of the assessment resulting in the issue of this Certificate the following investigations were made:

(1) A re-examination was made of the data and investigations on which the previous Certificate was based. The conclusions drawn from the original data remain valid.

(2) Tests were carried out on lintels types CN5E, CN46, CN52, CN56E, CN71E and CN71F to establish load deflection characteristics.

(3) Calculations were undertaken on lintels types CN5E, CN46, CN52, CN56E, CN71E and CN71F and examined in conjunction with the results of the load/deflection tests referred to above, in order to establish structural performance.

(4) Suitability of the corrosion resistance of the stainless steel.

9.3 Regular factory inspections have been carried out to ensure that quality is being maintained.

9.4 No failure of the product in use has been reported to the BBA.

Bibliography

BS 476 *Fire tests on building materials and structures*
Part 1 : 1953 *Fire tests on building materials and structures*
Part 8 : 1972 *Test methods and criteria for the fire resistance of elements of building construction*

BS 5216 : 1991 *Specification for patented cold drawn steel wire for mechanical springs*

BS 5250 : 1989 *Code of practice for control of condensation in buildings*

BS 5628 *Code of practice for use of masonry*
Part 1 : 1992 *Structural use of unreinforced masonry*
Part 3 : 1985 *Materials and components, design and workmanship*

BS 5977 *Lintels*
Part 1 : 1981(1986) *Method for assessment of load*

CIBSE Guide 1986 : Part A3 *Thermal properties of building structures*

BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

On behalf of the British Board of Agrément

Date of Second issue: 6th February 1997

Director

**Original Detail Sheet issued 28th March 1991. This amended version includes references to the revised Building Regulations and associated text.*

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ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

Caradon Catnic Ltd

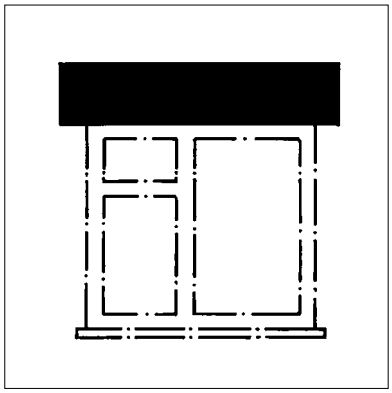
Certificate No 91/2638

DETAIL SHEET 4

*Second issue**

CATNIC TIMBER FRAME LINTELS

Product



- *THIS DETAIL SHEET REPLACES CERTIFICATE No 85/1453 AND RELATES TO CATNIC TIMBER FRAME LINTELS.*
- *The lintels are for use in external masonry leaves of timber frame walls.*
- *They provide support to facing brickwork above door or window openings.*
- *The lintels provide a damp-proof tray.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 Catnic Timber Frame Lintels are available in the profiles shown in Table 1.

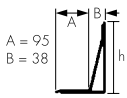
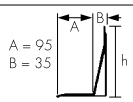
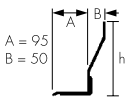
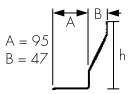
1.2 Lintels are supplied with retaining clips (see section 3.2).

Design Data

2 General

Catnic Timber Frame Lintels are satisfactory for use in timber frame construction to support facing brickwork over window or door openings.

Table 1 Lintels for external solid masonry walls in timber frame construction

Lintel profiles	Lintel type	Sheet thickness (mm) Base	Back	Front	Overall height (h) of lintel (mm)	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Working load (UDL) (tonnes)	Installation detail Figure No
 A = 95 B = 38	CN22A	—	1.6	2.0	187	600–2100	300–1800	150	0.5	
	CN23B	—	2.0	2.5	266	2250–3750	1950–3450	150	1.0	1
	CN23C	—	2.5	3.2	266	3900–4575	3600–4275	150	1.0	
 A = 95 B = 35	CN30A	—	1.0	2.0	129	750–1500	450–1200	150	0.5	
	CN31A	—	1.2	2.0	129	1650–2400	1350–2100	150	0.75	2
	CN31B	—	1.6	2.5	184	2550–3000	2250–2700	150	0.9	
 A = 95 B = 50	CN28B	—	—	2.5	130	750–1500	450–1200	150	0.5	
	CN29B	—	—	2.5	186	1650–2100	1350–1800	150	0.75	2
	CN29C	—	—	3.2	186	2250–2700	1950–2400	150	0.75	
	CN29CD	3.2	—	3.2	186	2850–3000	2550–2700	150	1.0	
 A = 95 B = 47	CTF5	—	—	2.0	128	600–1200	300–900	150	0.4	2
		—	—	2.5	128	1350–1500	1050–1200	150	0.5	2
		—	—	2.5	183	1650–2400	1350–2100	150	0.75	2
		—	—	3.2	183	2550–3000	2250–2700	150	0.7	2
		—	—	3.2	218	3300–3600	3000–3300	150	0.9	2
		—	—	3.2	256	3900–4800	3600–4500	150	1.0	2

3 Structural performance

3.1 The lintels have adequate strength and stiffness to sustain the uniformly distributed working loads given in Table 1, provided the defined cavity widths, size of masonry unit and clear spans are not exceeded.

3.2 The retaining clips are used to restrain rotation of the lintel. The clip design allows for relative vertical movement between the timber inner leaf and the facing brickwork.

3.3 During design, the load transfer from the outer leaf must be taken into account.

3.4 In addition to the requirements specifically referred to in this Detail Sheet, structures of brickwork or blockwork in which the lintels are incorporated must be designed and constructed to comply with the following technical specifications as appropriate:

(1) BS 5628 : Part 1 : 1992 and BS 5628 : Part 3 : 1985.

(2) Section 1, Part C of Approved Document A1/2 to the Building Regulations 1991 (as amended 1994) (England and Wales).

(3) Small Building Guide for compliance with Part C of the Building Standards (Scotland) Regulations 1990 (as amended).

(4) Section 3 of DoE (NI) Technical Booklet D : 1994 *Structure*.

3.5 The structural timber framework must be designed and constructed in accordance with BS 5268 : Part 2 : 1995.

3.6 Guidance for the assessment of loads on lintels in masonry is given in BS 5977 : Part 1 : 1981(1986).

4 Behaviour in relation to fire

4.1 The construction details shown in Figures 1 and 2 have been assessed as capable of satisfying the Building Regulations 1991 (as amended 1994) (England and Wales), the Building Standards (Scotland) Regulations 1990 (as amended) and the Building Regulations (Northern Ireland) 1994 (as amended 1995) in situations where a half-hour fire resistance is required.

4.2 Where any other form of wall construction incorporating Catnic lintels is subject to fire resistance requirements, an appropriate assessment or test must be carried out by a National Measurement Accreditation Service (NAMAS)[1] accredited laboratory for the test concerned.

(1) NAMAS is now part of the United Kingdom Accreditation Service (UKAS).

Figure 1 Typical installation details for lintels types CN22, CN23, CN30 and CN31

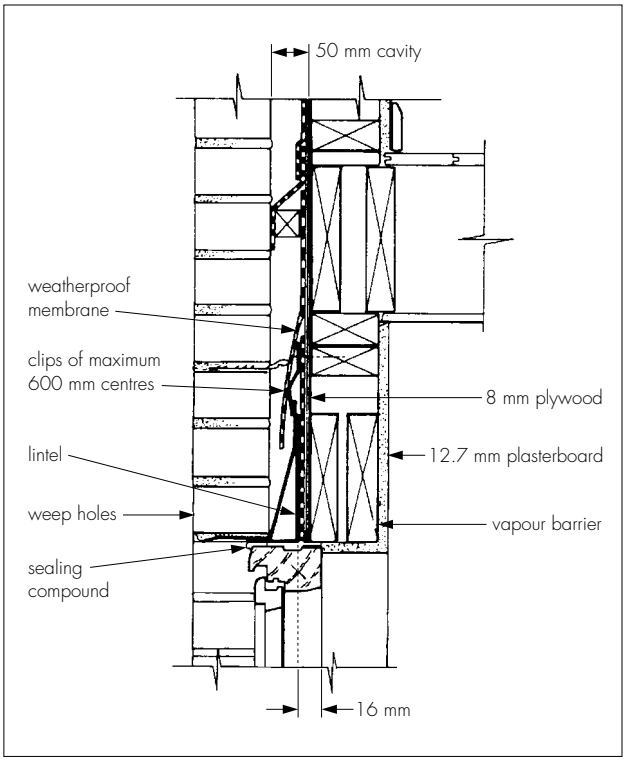
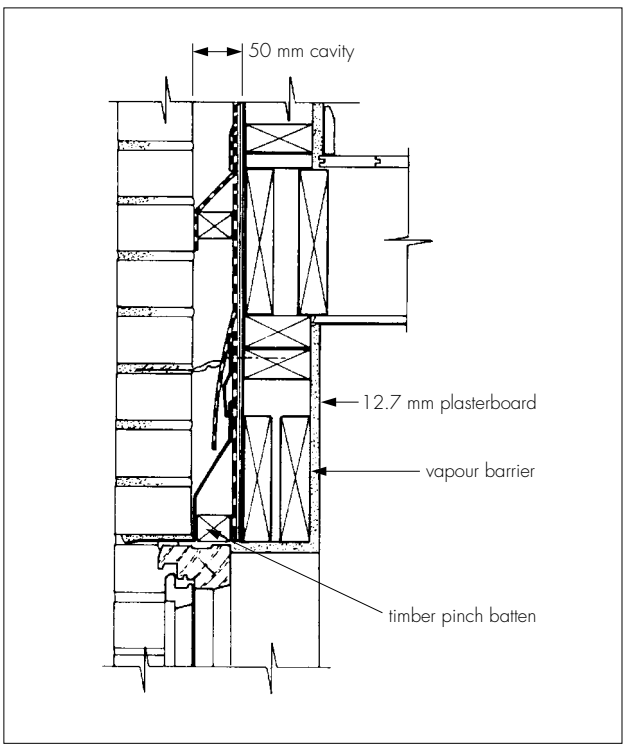


Figure 2 Typical installation details for lintels types CN28, CN29 and CTF5



(1) The structural timber frame must be capable of satisfying the stability and integrity requirements of BS 476 : Part 8 : 1972 for not less than one half-hour. As a guide, a lining of 12.7 mm thick plasterboard on the room side and 8 mm thick WPB sheathing grade plywood on the cavity side has been assessed as suitable in this respect.

(2) To suit normal Scottish practice, frames must be set so that the outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

5 Thermal transmittance

Evaluated constructions

5.1 The typical construction details as outlined in Figures 1 and 2 were modelled numerically to determine their likely hygrothermal performance. Similar details should have a similar performance.

5.2 The analysis of the detail examined showed that the additional heat loss due to thermal bridging will be similar to that to be expected from the lintel details given in Diagrams 3 and 7 of Approved Document L of the Building Regulations 1991 (as amended 1994) (England and Wales), and therefore can be ignored.

5.3 In the context of domestic dwellings, the additional thermal energy passing through the lintel assembly is sufficiently small for it to be discounted when assessing the overall energy consumption of the building and, in general, may be with the term for wall heat transmission. The timber inner lintel should be treated in the same manner as the timber studding when determining the standard U value of the wall [see Appendix B of Approved Document L of the Building Regulations 1991 (as amended 1994) (England and Wales)].

5.4 The U value of the example details given in Figures 1 and 2 is less than the stipulated maximum U value requirement of 1.2 $Wm^{-2}K^{-1}$ given in Standard J2 of the Building Standards (Scotland) Regulations 1990 (as amended) and Technical Booklet F of the Building Regulations (Northern Ireland) 1994 (as amended 1995).

6 Condensation risk

Evaluated constructions

6.1 The typical construction details as outlined in Figures 1 and 2 were modelled numerically to determine their likely hygrothermal performance. Similar details should have similar performances.

6.2 The minimum surface temperatures predicted by the analysis were similar to those which could be expected from lintel details given in diagrams 3 and 7 of Approved Document L and the risk of surface condensation will, therefore, be similar. The analysis also showed that if the door/window frame below the lintel is moved further out than shown, the minimum surface temperature will be lower and the associated risk of surface condensation higher than the details in Approved Document L.

6.3 The analysis also showed that in common with other timber frame lintel assemblies, unless a fully effective vapour barrier (eg 500 gauge polythene) is provided around the assembly, moisture may accumulate on and around the lintel and associated timber. It is essential, therefore, that particular attention is paid to ensuring that the vapour barrier is continuous at the lintel position (ie it continues round into the soffit and reveals and is suitably sealed at the corners).

6.4 In normal domestic circumstances the extent and severity of any resulting interstitial or surface condensation is judged to be insufficient to cause any significant problem. Where the details are likely to be exposed to relative humidity of more than 75% at 20°C for considerable periods of time, special precautions will be needed to prevent condensation accumulating around the details in the region of the soffit.

6.5 Other details are possible and the actual construction proposed should be assessed or an appropriate test carried out in accordance with the principles described in BS 5250 : 1989.

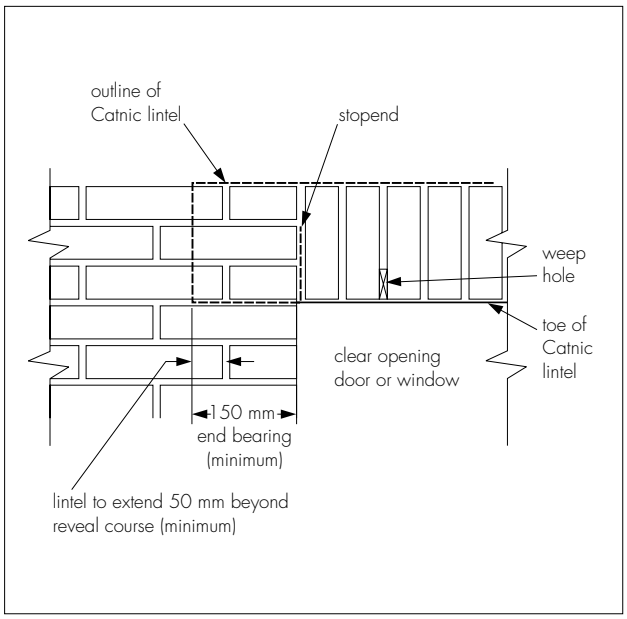
6.6 Consideration should be given to the possible need either to isolate the window head from condensation from the lintel or to use preservative treated timber for the head member (see section 7 of this Detail Sheet).

Installation

7 General

7.1 Typical installation details are shown in Figures 1 and 2. Catnic Timber Frame Lintels must be installed with at least the minimum end bearing dimensions given in Table 1 and illustrated in Figure 3, and be fully bedded on bricklaying mortar.

Figure 3 Detail showing minimum end bearing, stop-ends and weep holes



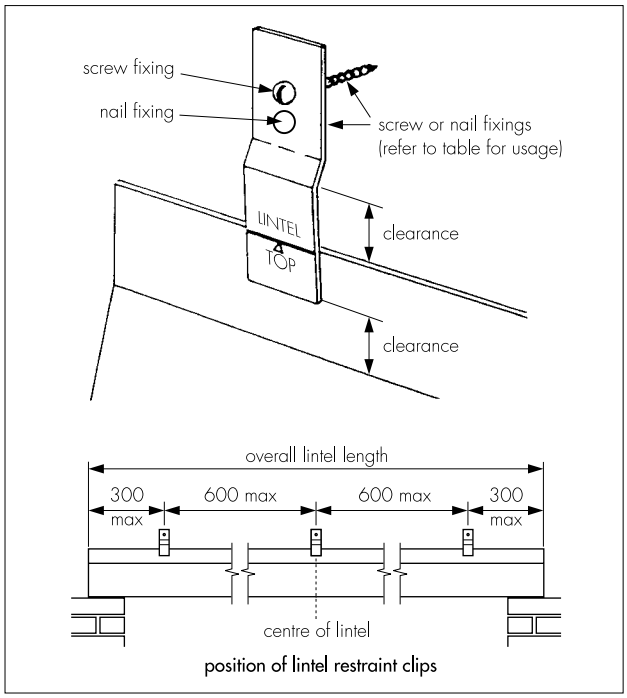
7.2 The lintels must be used in conjunction with a timber frame construction designed and installed in accordance with BS 5268 : Part 2 : 1995.

7.3 The lintels must be restrained by screwing or nailing the clips provided to the timber inner leaf at not more than 600 mm centres (see Table 2 and Figure 4). The clip should be positioned to allow a relative vertical movement of 12 mm for two storeys or 18 mm for three storeys between the timber lintel and the facing brickwork resulting from timber shrinkage (see Figure 4).

Table 2 Lintel lengths and fixings

Lintel type/code	Lintel lengths (mm)	Clip fixings
CN30, CN31, CN23	Refer to load/ span table	38 mm × No 10 RD/HD sherardised woodscrews
CTF5	3900-4800	
CTF5	600-3600	50 mm × 3.35 mm diameter plain head galvanized nails
CN28, CN29	750-3000	

Figure 4 Installation details for retaining clips



7.4 Lintels types CN28, CN29 and CTF5/series must be used with a suitably positioned and sized timber pinch batten (see Figure 2).

7.5 Weep holes must be provided in the outer leaf above the lintel to drain moisture from the cavity. A minimum of two weep holes must be provided per lintel. For fair-faced masonry weep holes should be provided at not greater than 450 mm centres. The use of stopends at the lintel should also be applied as recommended by BS 5628 : Part 3 : 1985, particularly in areas of severe exposure and where full fill cavity insulation is specified.

7.6 To comply with NHBC requirements in Scotland, Northern Ireland and areas of severe exposure, as defined in BRE Report *Thermal insulation : avoiding risks*, Second edition, separate damp-proof protection shall be provided over cavity wall lintels and stopends to the lintel and cavity tray are required under all exposure conditions.

7.7 To comply with Zurich Municipal requirements in areas of severe and very severe exposures, as defined by BRE Report *Thermal insulation : avoiding risks*, Second edition, separate damp-proof protection must be provided over cavity wall lintel.

7.8 The NHBC may require a separate cavity tray to be used with lintels types CN28, CN29 and part of CTF5/series as they do not have a 100 mm upstand from the point where mortar can build up.

7.9 The durability assessment assumes that water does not collect on the lintel; therefore mortar must not be allowed to build up on the lintel to such an extent that it blocks the weep holes.

7.10 No operation shall be undertaken that is likely to damage the protective coatings or impair the strength of the lintels (for example, cutting, welding or drilling). Cleaning of any excess mortar must be carried out with a soft material to avoid damaging the cavity.

Technical Investigations

The following is a summary of the technical investigations carried out on Catnic Timber Frame Lintels types CN22, CN23, CN28, CN29, CN30, CN31 and CTF5/series.

8 Tests

As part of the assessment resulting in the issue of this Detail Sheet, tests were carried out to establish:

load/deflection characteristics
the quality of the spot welding and its effect on the galvanizing
thickness and quality of galvanizing and epoxy and polyester resin coatings
resistance to damage of the epoxy and polyester resin coatings.

9 Other investigations

9.1 As part of the assessment resulting in the issue of the previous Certificates the following investigations were made:

(1) Calculations were undertaken, and examined in conjunction with the results of the load/deflection tests referred to in section 8.1, to establish structural performance.

(2) Existing information relating to the suitability of the corrosion protection, including results of long-term exposure tests on galvanized steel carried out by the British Steel Corporation, was examined.

(3) Data relating to the effectiveness of the lintel as a damp-proof tray and their effect on the weathertightness of cavity walls were also examined.

(4) Calculations were undertaken to determine:

the U value in accordance with CIBSE Guide 1986, Part A, and
condensation risk.

(5) Existing data were used to make an assessment of:

behaviour in fire
practicability of installation.

(6) The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

9.2 As part of the assessment resulting in the issue of this Certificate a re-examination was made of the data and investigations on which the previous Certificate was based. The conclusions drawn from the original data remain valid.

9.3 Regular factory inspections have been carried out to ensure that quality is being maintained.

9.4 No failure of the product in use has been reported to the BBA.

Bibliography

BS 5250 : 1989 *Code of practice for control of condensation in buildings*

BS 5628 *Code of practice for use of masonry*
Part 1 : 1992 *Structural use of unreinforced masonry*
Part 3 : 1985 *Materials and components, design and workmanship*

BS 5977 *Lintels*
Part 1 : 1981(1986) *Method for assessment of load*

BBA Information Sheet No 21 : 1984 *Measurement of the Thermal and Hygrothermal Properties of Materials*

CIBSE Guide 1986 : Part A3 *Thermal properties of building structures*

BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

On behalf of the British Board of Agrément

Date of Second issue: 6th February 1997

Director

**Original Detail Sheet issued 28th March 1991. This amended version includes references to the revised Building Regulations and associated text.*

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BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

Caradon Catnic Ltd

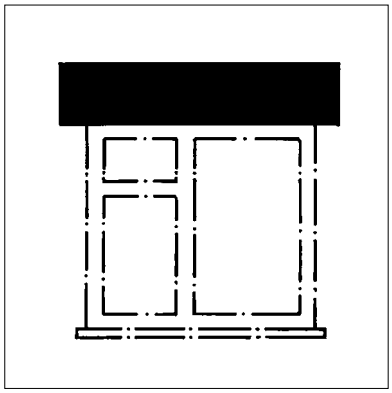
Certificate No 91/2638

DETAIL SHEET 5

*Second issue**

CATNIC INTERNAL WALL LINTELS

Product



- *THIS DETAIL SHEET RELATES TO CATNIC INTERNAL WALL LINTELS.*
- *The lintels are for use for internal masonry walls or partitions.*
- *They provide support to vertical loads from walls, floors and roofs, or combinations of these, above openings.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the building regulations, general information relating to the product, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 Catnic Internal Wall Lintels are available in the profiles shown in Table 1. The lintels (except types CN9 and CN10) incorporate perforations on the appropriate faces (see Table 1) to provide a key for plastering.

Design Data

2 General

Catnic Internal Wall Lintels are satisfactory for use in internal walls of brickwork or blockwork to provide support to wall, roof or floor loads, or a combination of these, above openings.

3 Structural performance

3.1 The lintels have adequate strength and stiffness to sustain the uniformly distributed working loads given in Table 1, subject to the following conditions:

(1) The defined size of masonry units and clear spans is not exceeded.

(2) The specified loads in Table 1 relate to simply-supported lintels laterally and torsionally unrestrained. Therefore there are no requirements for composite action with, or restraint by, adjacent elements of construction.

(3) Where part of the loading is applied as concentrated loads, each concentrated load must be supported over a length of lintel of not less than 200 mm. In such cases, the total applied loading must not produce bending moments, shear forces or reactions greater than those produced by the uniformly distributed loads specified in Table 1.

3.2 In addition to the requirements specifically referred to in this Certificate, structures of brickwork or blockwork in which the lintels are incorporated must be designed and constructed to comply with the following technical specifications as appropriate:

(1) BS 5628 : Part 1 : 1992 and BS 5628 : Part 3 : 1985.

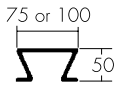
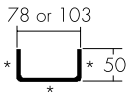
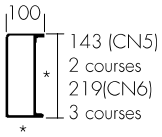
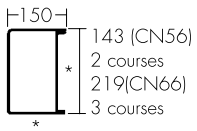
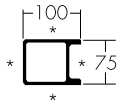
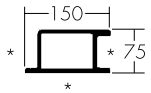
(2) Section 1, Part C of Approved Document A1/2 to the Building Regulations 1991 (as amended 1994) (England and Wales).

(3) Small Buildings Guide for compliance with Part C of the Building Standards (Scotland) Regulations 1990 (as amended).

(4) Section 3 of DoE (NI) Technical Booklet D : 1994 *Structure*.

3.3 Guidance for the assessment of loads on lintels in masonry is given in BS 5977 : Part 1 : 1981(1986).

Table 1 Lintels for internal masonry walls or partitions

Lintel profiles	Lintel type	Sheet thickness (mm)	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Working load (UDL) (tonnes)	Installation detail Figure No
	CN9 CN10	1.0 1.0	1050 1050	900 900	75 75	0.25 0.25	2
	CN91 CN101	2.0 2.0	1050 1050	900 900	75 75	0.25 0.25	1
	CN5E CN5A CN6A CN6B CN6C	1.6 2.0 2.0 2.5 3.2	600—2100 600—2700 2250—2700 2850—3750 3900—4575	300—1800 300—2400 1950—2400 2550—3450 3600—4275	150 150 150 150 150	2.0 2.0 3.0 3.0 3.0	4
	CN56E CN56A CN66A CN66B CN66C	1.6 2.0 2.0 2.5 3.2	600—2100 600—2700 2250—2700 2850—3750 3900—4575	300—1800 300—2400 1950—2400 2550—3450 3600—4275	150 150 150 150 150	2.0 2.0 3.0 3.0 3.0	3
	CN52E	1.6	750—1500	450—1200	150	1.4	4
	CN46E	1.6	750—1500	450—1200	150	1.4	3

*Plaster key

4 Behaviour in relation to fire

4.1 The construction details shown in Figures 1 to 4 have been assessed as capable of satisfying the Building Regulations 1991 (as amended 1994) (England and Wales), the Building Standards (Scotland) Regulations 1990 (as amended) and the Building Regulations (Northern Ireland) 1994 (as amended 1995) in situations where a one-hour fire resistance is required.

4.2 Where any other form of wall construction incorporating Catnic lintels is subject to fire resistance requirements, an appropriate assessment or test must be carried out by a National Measurement Accreditation Service (NAMAS)[1] accredited laboratory for the test concerned.

(1) NAMAS is now part of the United Kingdom Accreditation Service (UKAS).

Figure 1 Indicative installation details for lintels types CN91 and CN101

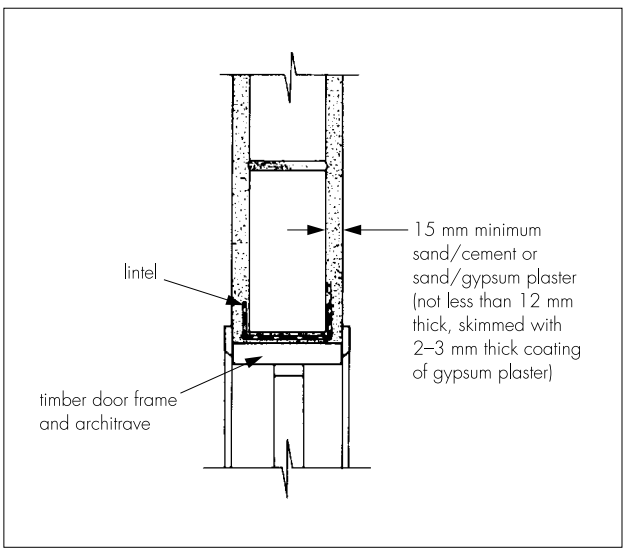


Figure 2 Indicative installation details for lintels types CN9 and CN10

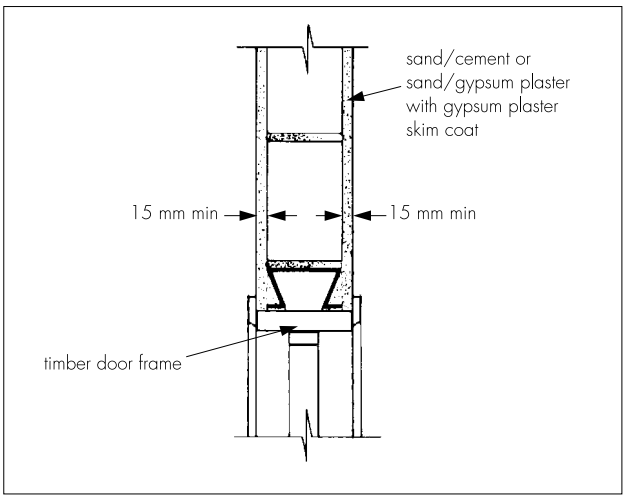


Figure 3 Indicative installation details for lintels types CN46, CN56 and CN66

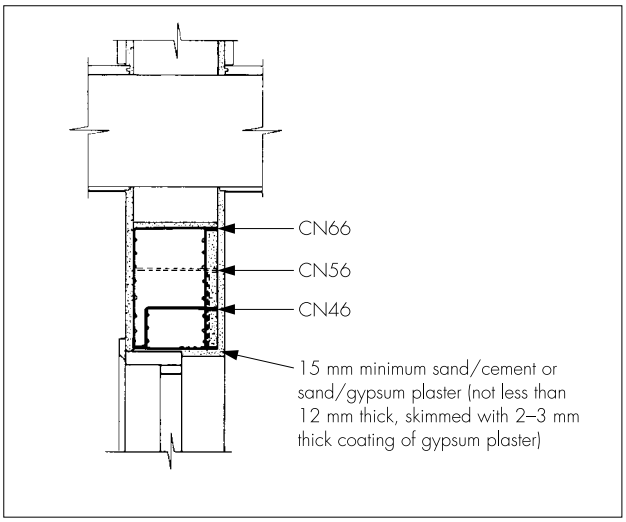
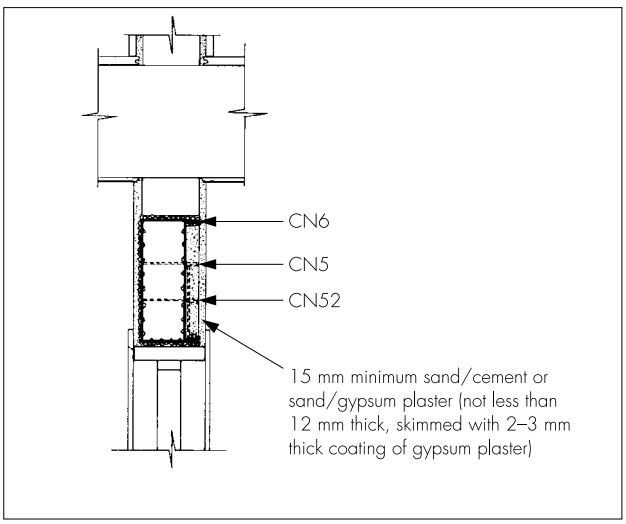


Figure 4 Indicative installation details for lintels types CN52, CN5 and CN6



5 Thermal transmittance

No specific thermal requirements apply to internal walls. Therefore the thermal transmittance of walls incorporating the lintels has not been assessed.

6 Condensation risk

The lintels have a low thermal admittance and therefore are capable of responding rapidly to temperature changes, hence transient condensation is unlikely. Should surface condensation occur under extreme conditions, it will dissipate rapidly as conditions return to normal.

Installation

7 General

7.1 Typical installation details are shown in Figures 1 to 4. The lintels must be installed with at least the minimum end bearing dimensions given in Table 1 and be fully bedded on bricklaying mortar.

7.2 Operations likely to damage the protective coatings or impair the strength of the lintels (for example, cutting, welding or drilling) must not be undertaken.

Technical Investigations

The following is a summary of the technical investigations carried out on Catnic Internal Wall Lintels types CN5, CN6, CN9, CN10, CN46, CN52, CN56, CN66, CN91 and CN101.

8 Tests

As part of the assessment resulting in the issue of the previous Certificates, tests were carried out to establish:

load/deflection characteristics
the quality of the spot welding and its effect on the galvanizing
thickness and quality of galvanizing and epoxy and polyester resin coatings
resistance to damage of the epoxy and polyester resin coatings.

9 Other investigations

9.1 As part of the assessment resulting in the issue of the previous Certificate the following investigations were made:

(1) Calculations were undertaken, and examined in conjunction with the results of the load/deflection tests referred to in section 8, to establish structural performance.

(2) Existing information relating to the suitability of the corrosion protection was examined, including results of long-term exposure tests on galvanized steel carried out by the British Steel Corporation.

(3) Existing data were used to make an assessment of:

behaviour in fire
practicability of installation.

(4) The manufacturing process was examined, including the methods adopted for quality control,

and details were obtained of the quality and composition of the materials used.

9.2 As part of the assessment resulting in the issue of this Certificate the following investigations were made:

(1) A re-examination was made of the data and investigations on which the previous Certificate was based. The conclusions drawn from the original data remain valid.

(2) Suitability of the corrosion resistance of the stainless steel.

(3) Tests were carried out on lintels types CN5E, CN46, CN52 and CN56E to establish load/deflection characteristics.

(4) Calculations were undertaken on lintels types CN5E, CN46, CN52 and CN56E and examined in conjunction with the results of the load/deflection tests referred to above, to establish structural performance.

9.3 Regular factory inspections have been carried out to ensure that quality is being maintained.

9.4 No failure of the product in use has been reported to the BBA.

Bibliography

BS 5628 *Code of practice for use of masonry*
Part 1 : 1992 *Structural use of unreinforced masonry*
Part 3 : 1985 *Materials and components, design and workmanship*

BS 5977 *Lintels*
Part 1 : 1981(1986) *Method for assessment of load*

On behalf of the British Board of Agrément

Date of Second issue: 6th February 1997

Director

**Original Detail Sheet issued 28th March 1991. This amended version includes reference to the revised Building Regulations and associated text.*

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BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

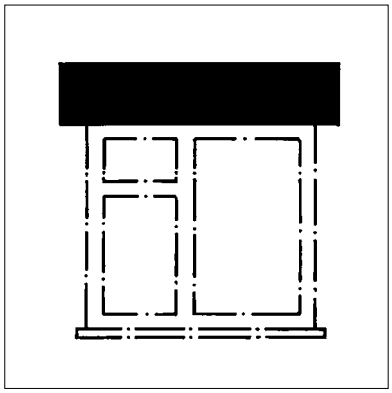
Corus (UK) Ltd

CATNIC COUGAR II RANGE OF CAVITY WALL LINTELS

Certificate No 91/2638

DETAIL SHEET 6

Product



- *THIS DETAIL SHEET RELATES TO CATNIC COUGAR II RANGE OF CAVITY WALL LINTELS.*
- *The lintels are for use in masonry external cavity walls.*
- *They provide support to vertical loads from walls, floors and roofs, or combinations of these, above door or window openings.*
- *The lintels constitute a damp-proof tray.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the product, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 Catnic Cougar II Range of Cavity Wall Lintels are available in the profiles shown in Table 1. To provide a key for plastering, incorporated into the lintels are:

- perforations on the inner flange, and
- castellations on the appropriate insulation systems.

1.2 The lintels are available as flush type with a black polyester coating (see Table 1) for standard cavity wall construction.

1.4 All Cougar II lintels are fully insulated with expanded polystyrene bead (density 18 kgm^{-3}). The beads are moulded into the lintel and form a ribbed finish on the underside face to provide a key for plastering.

Design Data

2 General

2.1 Catnic Cougar II Range of Cavity Wall Lintels are satisfactory for use in external cavity walls of brickwork and/or blockwork to provide support to wall, roof or floor loads (or a combination of these), above window or door openings.

2.2 The Cougar II lintels covered by this Detail Sheet have a current BSI Kitemark Licence No KM 07234 to BS 5977-2 : 1983, issued to Corus UK Ltd.

3 Structural performance

3.1 The Cougar II flush lintels types CG50/100, CG70/100, CG90/100, CG50/125, CG 70/125 and CG90/125, have adequate strength and stiffness to sustain the uniformly distributed working loads given in Table 1, subject to the following conditions:

(1) The defined cavity width, size of masonry unit and clear spans are not exceeded.

(2) Not more than half of the total load on the lintel is supported at the outer leaf position.

(3) The specified loads in Table 1 relate to simply-supported lintels laterally and torsionally unrestrained. Therefore there are no requirements for composite action with, or restraint by, adjacent elements of construction.

(4) Where part of the loading is applied as concentrated loads, each concentrated load must be over a length of not less than 200 mm. In such cases the total applied loading must not produce bending moments, shear forces or reactions greater than those produced by the uniformly distributed loads specified in Table 1.

Table 1 Cougar II Lintels [1]

Lintel profiles[2]		Lintel type	Sheet thickness (mm)	Nominal weight (kgm^{-1})	Overall height of lintel (mm)	Manufactured length (mm)	Clear span (mm)	Minimum end bearing (mm)	Safe working load[3] (kN)	Installation detail Figure No
Outer brick/block width	100	CG	1.6	5.8	140	750–1500	450–1200	150	14.7	1, 2 and 3
Cavity width	50-65	50/100	2.0	7.3	140	1650–1800	1350–1500	150	17.7	
Inner block width	100–115		2.0	8.0	160	1950–2100	1650–1800	150	19.6	
			2.0	8.6	180	2250–2400	1950–2100	150	21.6	
			2.0	9.8	220	2550–2700	2250–2400	150	25.5	
			2.5	12.3	220	2850–3000	2550–2700	150	25.5	
			3.1	16.0	220	3150–3900	2850–3600	150	25.5	
Outer brick/block width	100	CG	1.6	6.0	140	750–1500	450–1200	150	14.7	1, 2 and 3
Cavity width	70-85	70/100	2.0	7.5	140	1650–1800	1350–1500	150	17.7	
Inner block width	100–115		2.0	8.1	160	1950–2100	1650–1800	150	19.6	
			2.0	8.7	180	2250–2400	1950–2100	150	21.6	
			2.0	10.0	220	2550–2700	2250–2400	150	25.5	
			2.5	12.5	220	2850–3000	2550–2700	150	25.5	
			3.1	16.3	220	3150–3900	3850–3600	150	25.5	
Outer brick/block width	100	CG	1.6	6.1	140	750–1500	450–1200	150	14.7	1, 2 and 3
Cavity width	90–105	90/100	2.0	7.6	140	1650–1800	1350–1500	150	17.7	
Inner block width	100–115		2.0	8.3	160	1950–2100	1650–1800	150	19.6	
			2.0	8.9	180	2250–2400	1950–2100	150	21.6	
			2.0	10.2	220	2550–2700	2250–2400	150	25.5	
			2.5	13.0	220	2850–3000	2550–2700	150	25.5	
			3.1	16.6	220	3150–3900	2850–3600	150	25.5	
Outer brick/block width	100	CG	1.6	6.3	140	750–1200	450-900	150	11.8	1, 2 and 3
Cavity width	50-65	50/125	2.0	7.8	140	1350–1800	1050–1500	150	16.7	
Inner block width	125–140		2.0	9.0	180	1950–2400	1650–2100	150	19.6	
			2.5	12.9	220	2550–2700	2250–2400	150	25.5	
			3.1	16.6	220	2850–3000	2550–2700	150	25.5	
Outer brick/block width	100	CG	1.6	6.3	140	750–1200	450-900	150	11.8	1, 2 and 3
Cavity width	70-85	70/125	2.0	8.0	140	1350–1800	1050–1500	150	16.7	
Inner block width	125–140		2.0	9.2	180	1950–2400	1650–2100	150	19.6	
			2.5	13.1	220	2550–2700	2250–2400	150	25.5	
			3.1	16.9	220	2850–3000	2550–2700	150	25.5	
Outer brick/block width	100	CG	1.6	6.5	140	750–1200	450-900	150	11.8	1, 2 and 3
Cavity width	90–105	90/125	2.0	8.1	140	1350–1800	1050–1500	150	16.7	
Inner block width	125–140		2.0	9.4	180	1950–2400	1650–2100	150	19.6	
			2.5	13.3	220	2550–2700	2250–2400	150	25.5	
			3.1	17.2	220	2850–3000	2550–2700	150	25.5	

(1) The Cougar II lintels covered by this Detail Sheet have a current BSI Kitemark Licence No KM 07234 to BS 5977-2 : 1983, issued to Corus UK Ltd.

(2) All dimensions in mm

(3) Load ratio from 1:1 to 1:3 (outer:inner)

General

3.2 In addition to the requirements specifically referred to in this Certificate, structures of brickwork or blockwork in which the lintels are incorporated must be designed and constructed to comply with the following technical specifications, as appropriate:

(1) BS 5628-1 : 1992 and BS 5628-3 : 1985.

(2) the national Building Regulations:

England and Wales

Approved Document A1/2, Section 1, Part C

Scotland

Part C, *Small Building Guide*

Northern Ireland

Technical Booklet D.

3.3 Guidance for the assessment of loads on lintels in masonry is given in BS 5977-1 : 1981(1986).

4 Behaviour in relation to fire

4.1 The construction details shown in Figures 1 to 4 have been assessed as capable of satisfying the national Building Regulations in situations where a one-hour fire resistance is required.

4.2 Where any other form of wall construction incorporating the lintels is subject to fire resistance requirements, an appropriate assessment or test must be carried out by a UKAS[1] accredited laboratory for the test concerned.

(1) United Kingdom Accreditation Service.

5 Thermal transmittance

Evaluated constructions

5.1 The construction details containing Cougar II flush lintels types CG50/100, CG70/100, CG90/100, CG50/125, CG70/125 and CG90/125 (see Figure 1), are similar to the partial cavity fill lintel detail shown in Diagram 3 of Approved Document L of the Building Regulations and, therefore, are satisfactory.

5.2 Example details were modelled numerically to determine the heat loss due to thermal bridging and the results compared to those obtained for the box and other lintels details given in Diagram 3 of the Approved Document L for which the additional heat loss may be ignored. The analysis showed that details using the lintels, where the U value of the basic wall construction is 0.45 $Wm^{-2}K^{-1}$ or less, should have similar performances.

5.3 The additional thermal energy passing through these lintel assemblies is sufficiently small in the context of domestic dwellings for it to be discounted when assessing the overall building energy consumption, and in general may be included with the wall heat transmission term. However, in certain low-energy constructions this may not be the case and the heat loss should be determined for the particular detail and accounted for.

5.4 In Part J of the Technical Standards of the Building Standards (Scotland) Regulations and Part F of the Building Regulations (Northern Ireland) a requirement is set out to limit the severity of thermal bridging permitted in lintel and similar assemblies. The analysis showed that, for the details examined, the resultant surface temperatures are within the effective practical limits of the stipulated maximum U value requirement of 1.2 $Wm^{-2}K^{-1}$ given in the Regulations[1].

(1) Standard J2 in Scotland and Technical Booklet F in Northern Ireland.

Other constructions

5.5 Where lintels are used in other details, an assessment or an appropriate test should be carried out to determine the thermal performance of the detail proposed.

6 Condensation risk

Evaluated constructions

6.1 The construction details containing Cougar II flush lintels types CG50/100, CG70/100, CG90/100, CG50/125, CG70/125 and CG90/125 (see Figure 1), were evaluated to determine their likely hygrothermal performance.

6.2 Example details were modelled numerically to determine the difference in temperature between the lintel soffit area and the remainder of the wall. These temperatures were compared to those obtained for the box and other lintels given in Diagram 3 of Approved Document L, which are stated as being satisfactory. The analysis showed that, for details shown in Figure 1, the minimum surface temperatures predicted were no less than those which could be expected from the satisfactory details, and the risk of surface condensation, therefore, will be similar.

6.3 In normal domestic circumstances, the extent and severity of any resulting interstitial or surface condensation is judged to be insufficient to cause any significant problem. Where the details are likely to be exposed to relative humidities of more than 70% at 20°C for considerable periods of time, special precautions will be needed to prevent condensation accumulating around the details in the region of the soffit.

Other constructions

6.4 Where lintels are used in other details an assessment or appropriate test to determine the extent of likely condensation accumulation should be carried out in accordance with the principles described in BS 5250 : 1989(1995).

6.5 Consideration should be given to the possible need to either isolate the window head from the lintel or use preservative treated timber for the head member (see section 8 of the Front Sheets).

Installation

7 General

7.1 Typical installation details are shown in Figures 1 to 3. Catnic Cougar II Cavity Wall Lintels must be installed with at least the minimum end bearing dimensions given in Table 1 and illustrated in Figure 4, and be fully bedded on bricklaying mortar.

7.2 The inner and outer leaves supported by the lintels must be raised together to avoid excessive eccentricity of loading.

7.3 Weep holes must be provided in the outer leaf above the lintel to drain moisture from the cavity. A minimum of two weep holes must be provided per lintel. For fair-faced masonry, weep holes should be provided at centres not greater than 450 mm. The use of stopends to the lintels should also be applied as recommended in BS 5628-3 : 1985, particularly in areas of severe exposure and where full-fill cavity insulation is specified.

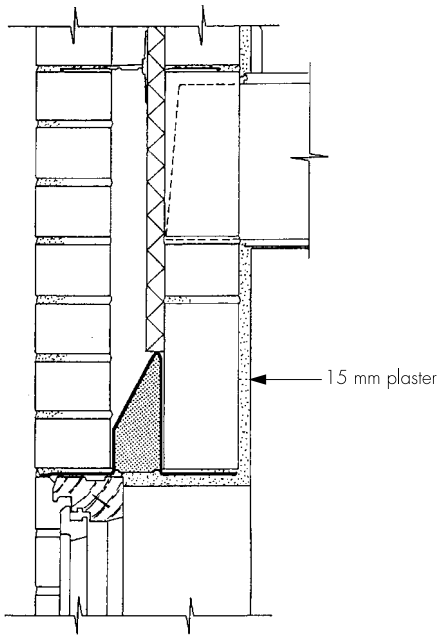
7.4 To comply with NHBC requirements in Scotland, Northern Ireland and areas of severe exposure, as defined in BRE Report *Thermal Insulation: avoiding risks* (Second Edition), separate damp-proof protection must be provided over cavity wall lintels, and stopends to the lintels and cavity trays are required under all exposure conditions.

7.5 To comply with Zurich Building Guarantees Technical Standards requirements in areas of severe and very severe exposures, separate damp-proof protection must be provided over cavity wall lintels.

7.6 The durability assessment assumes that water does not collect on the lintel, therefore weep holes should be kept clear of slurry or debris.

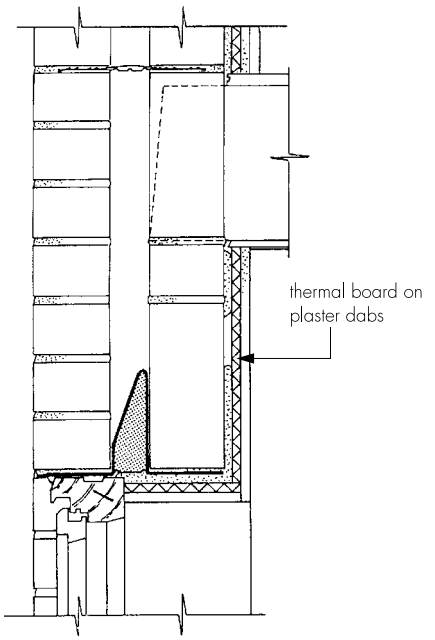
7.7 Operations likely to damage the protective coatings or impair the strength of the lintels (for example, cutting, welding or drilling) must not be undertaken. Cleaning of excess mortar must be carried out with a soft implement to avoid damaging the coating.

Figure 1 Typical installation details for Cougar II flush lintels (types CG)



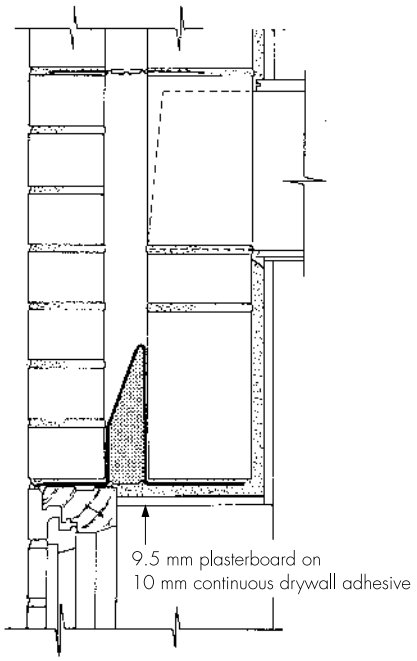
To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 2 Alternative details for Cougar II flush lintels (types CG)



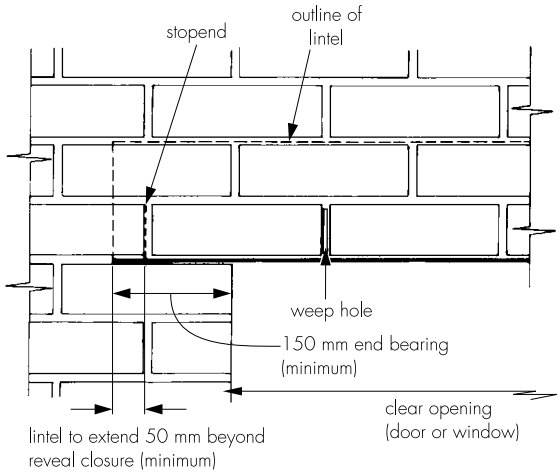
To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 3 Alternative details for Cougar II flush lintels (types CG)



To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Figure 4 Detail showing minimum end bearing stopends and weep holes



To suit normal Scottish practice, frames must be set so that their outer face does not project beyond the line of the inner face of the outer leaf of the cavity wall.

Technical Investigations

The following is a summary of the technical investigations carried out on Catnic Cougar II Range of Cavity Wall Lintels.

8 Tests

As part of the assessment resulting in the issue of the previous Certificates, tests were carried out to establish:

(1) load deflection characteristics of Catnic Cougar II Cavity Wall Lintels

(2) fire resistance of selected lintel profiles to BS 476-1 : 1953 and BS 476-8 : 1972

(3) thickness and quality of galvanizing and epoxy and polyester resin coatings

(4) resistance to damage of the epoxy and polyester resin coatings.

9 Other investigations

9.1 As part of the assessment resulting in the issue of the previous Certificate, the following investigations were made:

(1) Calculations were undertaken, and examined in conjunction with the results of the load-deflection tests referred to in section 8(1) to establish structural performance.

(2) Existing information relating to the suitability of the corrosion protection was examined, including results of long-term exposure tests on galvanized steel carried out by the British Steel Corporation.

(3) Data relating to the effectiveness of the lintels as damp-proof trays and their effect on the weathertightness of cavity walls were also examined.

9.2 Calculations were undertaken to determine:

(1) the U value in accordance with CIBSE Guide 1986 : Part A3 *Thermal properties of building structures*, and

(2) condensation risk.

9.3 The results of the tests carried out under section 8(1) were examined in conjunction with these calculations.

9.4 From existing data an assessment was made of:

behaviour in fire
practicability of installation.

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

9.6 As part of the assessment resulting in the issue of this Certificate, the following investigations were made:

(1) A re-examination was made of the data and investigations on which the previous Certificate was based. The conclusions drawn from the original data remain valid.

(2) Tests were carried out on Catnic Cougar II Cavity Wall Lintels to establish load deflection characteristics.

(3) Calculations were undertaken on Catnic Cougar II Cavity Wall Lintels and examined in conjunction with the results of the load/deflection tests referred to above, to establish structural performance.

(4) Suitability of the corrosion resistance of the stainless steel.

9.7 Regular factory inspections have been carried out to ensure that quality is being maintained.

9.8 Failure of the product in use has not been reported to the BBA.

Bibliography

BS 476 *Fire tests on building materials and structures*
BS 476-1 : 1953 *Fire tests on building materials and structures*
BS 476-8 : 1972 *Test methods and criteria for the fire resistance of elements of building construction*

BS 5216 : 1991 *Specification for patented cold drawn steel wire for mechanical springs*

BS 5250 : 1989(1995) *Code of practice for control of condensation in buildings*

BS 5628 *Code of practice for use of masonry*
BS 5628-1 : 1992 *Structural use of unreinforced masonry*
BS 5628-3 : 1985 *Materials and components, design and workmanship*

BS 5977 *Lintels*
BS 5977-1 : 1981(1986) *Method for assessment of load*
BS 5977-2 : 1983 *Specification for prefabricated lintels*

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

On behalf of the British Board of Agrément

Date of issue: 27th March 2002

Chief Executive

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