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Agrément Certificate No 87/1907
*Third issue**

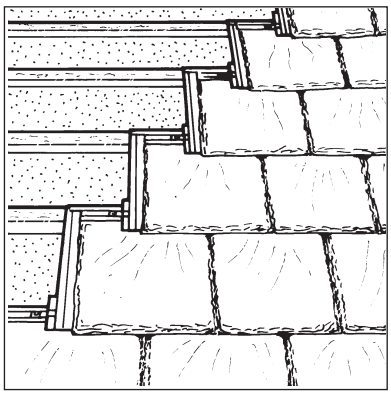
Designated by Government to issue European Technical Approvals

REDLAND CAMBRIAN INTERLOCKING SLATES

Parement extérieur
Verkleidung Bedachung

Product

- *THIS CERTIFICATE REPLACES CERTIFICATE No 85/1536 AND RELATES TO REDLAND CAMBRIAN INTERLOCKING SLATES.*
- *The product is for use on conventional pitched timber roofs with a rafter pitch of 15° and over, or hung vertically as a cladding on the outer face of external walls.*
- *It is essential that the product is installed in accordance with the conditions set out in the* Design Data *and* Installation *parts of this Certificate.*



Building Regulations

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

The Secretary of State has agreed with the British Board of Agrément the aspects of performance used by the BBA in assessing the compliance of roof finishes and wall cladding products with the Building Regulations. In the opinion of the BBA, Redland Cambrian Interlocking Slates, if used in accordance with the provisions of this Certificate, will meet the relevant requirements.

Requirement:	B4(1)	External fire spread
Comment:		Redland Cambrian Interlocking Slates have a Class 2 surface and can be used in the situations set out in section 8.5 of this Certificate. See also section 8.4.
Requirement:	B4(2)	External fire spread (roofs)
Comment:		A roof incorporating Redland Cambrian Interlocking Slates meets this Requirement provided the installation complies with the conditions set out in section 6.2 of this Certificate. See also sections 8.1 and 8.2.
Requirement:	C4	Resistance to weather and ground moisture
Comment:		A roof or wall cladding incorporating Redland Cambrian Interlocking Slates meets this Requirement provided the installation complies with the conditions set out in section 6.2 of this Certificate. See also section 9.
Requirement:	Regulation 7	Materials and workmanship
Comment:		Redland Cambrian Interlocking Slates are an acceptable product. See section 11.1 of this Certificate.

2 The Building Standards (Scotland) Regulations 1990

In the opinion of the BBA, Redland Cambrian Interlocking Slates, if used in accordance with the provisions of this Certificate, will satisfy the various Regulations as listed below.

Regulation:	10	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		Redland Cambrian Interlocking Slates are an acceptable product.
Regulation:	12	Structural fire precautions
Standard:	D2.4	External wall claddings
Comment:		Redland Cambrian Interlocking Slates have a Class 2 surface and can be used in the situations set out in section 8.6 of this Certificate. See also section 8.4.
Standard:	D2.5	Separation of roofs and rooflights from boundaries
Standard:	D3.6	Roofs and rooflights of buildings ancillary to dwellings
Comment:		Redland Cambrian Interlocking Slates are unrestricted by these Standards. See sections 8.1 and 8.3 of this Certificate.
Regulation:	17	Preparation of sites and resistance to moisture
Standard:	G3.1	Resistance to precipitation
Comment:		A roof or wall cladding incorporating Redland Cambrian Interlocking Slates can satisfy the requirements of this Standard provided the installation complies with the conditions set out in section 6.2 of this Certificate. See also section 9.

3 The Building Regulations (Northern Ireland) 1994

In the opinion of the BBA, Redland Cambrian Interlocking Slates, if used in accordance with the provisions of this Certificate, will satisfy the various Building Regulations as listed below.

Requirement:	B2	Fitness of materials and workmanship
Comment:		Redland Cambrian Interlocking Slates are an acceptable product. See section 11.1 of this Certificate.
Regulation:	C5	Resistance to ground moisture and weather
Comment:		A roof or wall cladding incorporating Redland Cambrian Interlocking Slates can satisfy this Regulation provided the installation complies with the conditions set out in section 6.2 of this Certificate. See also section 9.
		Redland Cambrian Interlocking Slates have a Class 2 surface and can be used in the situations set out in section 8.6 of this Certificate. See also section 8.4.
Regulation:	E8	External fire spread
Comment:		A roof incorporating Redland Cambrian Interlocking Slates is unrestricted under this Regulation provided the installation complies with the conditions set out in section 6.2 of this Certificate. See also sections 8.1 and 8.3.

Technical Specification

4 Description

4.1 Redland Cambrian Interlocking Slates are manufactured from crushed slate and other fillers, polyester resin and chopped glass-fibre strands, mixed to a dough, extruded, cut to weight and moulded under pressure and heat. The exposed face is finished by shot-blasting to give the required shade of colour. When installed they give the appearance of natural riven slate (see Figure 1).

Figure 1 Redland Cambrian Interlocking Slates

4.2 Redland Cambrian Interlocking Slates do not contain asbestos.

4.3 Slates are available in the natural colours of grey, green and heather. Slight colour variations may exist between batches, therefore, slates should be randomised on site to achieve a consistent appearance when installed.

4.4 Quality control includes checks on the raw materials and tests on the finished slates for:

flexural strength
weight
cure
appearance and soundness
dimensions.

4.5 The covering dimensions (mm) of each slate are as follows:

	Width	Max gauge
standard slate	300	250
slate-and-a-half	450	250
double slate	600	250

4.6 A left-hand verge slate and slate-and-a-half are available for use at left-hand verges. Double width slates are also available to facilitate coursing. ThruVent slates are available for soil, mechanical and roofspace ventilation where required (see Figure 2).

4.7 Slates have an installed weight of between 17 kgm^{-2} and 20 kgm^{-2} depending on gauge.

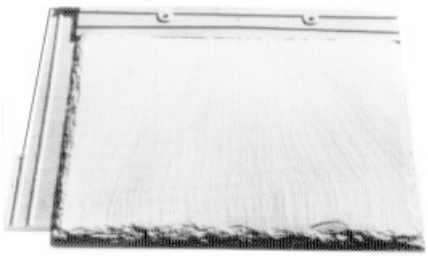
4.8 Each slate is fixed at the head by two stainless steel ring-shank nails and fastened at the tail with a stainless steel slate clip, eaves clip or verge clip, depending on its location. The nails and fixing clips are supplied by Redland Roof Tiles Ltd. No other nails or fixing clips should be used.

5 Delivery to site and storage

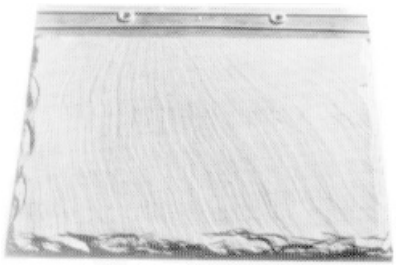
5.1 Slates are banded in packs of 10 and delivered to site on pallets of 600 protected by a polythene wrapping. ThruVent slates are available individually. Other fittings are available banded in packs of 10 except Double Slates which are banded in packs of 5. All material should be stored on a level base and away from the possibility of damage.

5.2 Each pallet carries a label bearing the BBA identification mark incorporating the number of this Certificate.

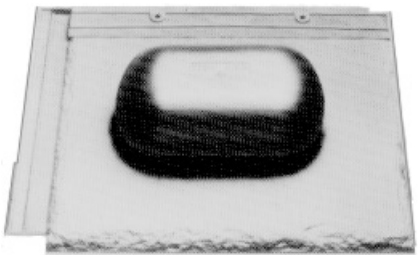
Figure 2 Types of slates



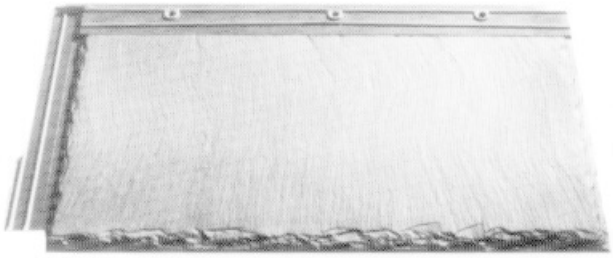
interlocking slate



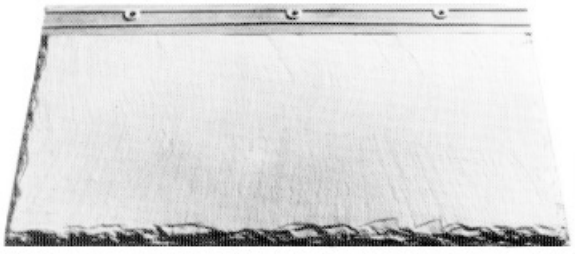
left hand verge interlocking slate



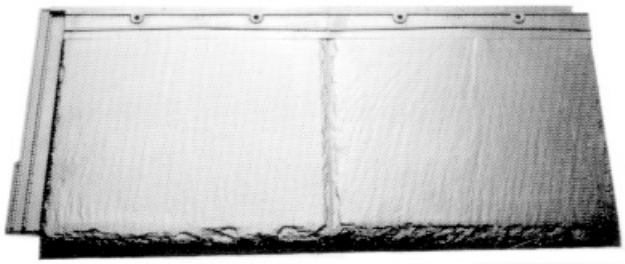
ThruVent interlocking slate



interlocking 'slate-and-a-half'



left hand verge interlocking 'slate-and-a-half'



double slate

Design Data

6 General

6.1 Redland Cambrian Interlocking Slates, when installed in accordance with this Certificate, are satisfactory for use on conventional pitched timber roofs with a rafter pitch of 15° and over, or as cladding on the outer face of external walls. It is essential that such roofs and walls are designed and constructed so as to incorporate the normal precautions to prevent moisture penetration and the formation of condensation.

6.2 Roofs and wall cladding incorporating Redland Cambrian Interlocking Slates that are subject to the Building Regulations 1991 (as amended 1994) (England and Wales), the Building Standards (Scotland) Regulations 1990 or the Building Regulations (Northern Ireland) 1994 should be designed and constructed in accordance with the relevant recommendations of BS 5534 : Part 1 : 1990, BS 5534 : Part 2 : 1986 and BS 8000 : Part 6 : 1990. In particular, the designer should follow the recommendations of clauses 16, 17 and 21 of BS 5534 : Part 1 : 1990, on weather resistance, structural stability and condensation, respectively, and select a construction appropriate to its location, paying due attention to design detailing, workmanship and materials to be used.

6.3 Other roofs and wall cladding incorporating Redland Cambrian Interlocking Slates that are not subject to any of the above regulations should be constructed in accordance with BS 5534 : Part 1 : 1990, BS 5534 : Part 2 : 1986 and BS 8000 : Part 6 : 1990.

7 Strength

7.1 Redland Cambrian Interlocking Slates have adequate resistance to damage during site handling and installation using conventional roofing methods.

7.2 When installed in accordance with this Certificate, the slates have adequate resistance to the uniformly distributed loads (eg wind and snow) likely to be imposed in service. In situations where high local snow loads may occur, the manufacturer's advice should be sought. Consideration should also be given to the guidance contained in BRE Digest 332.

7.3 When fixed in accordance with the manufacturer's instructions, the slates are resistant to the effects of wind uplift likely to be encountered in the United Kingdom. Where conditions of exposure may be severe, consideration should be given to the recommendations outlined in BS 5534 : Part 1 : 1990 and BS 5534 : Part 2 : 1986.

8 Properties in relation to fire

8.1 When tested in accordance with BS 476 : Part 3 : 1958, Redland Cambrian Interlocking Slates achieved an EXT.S.AA designation.

8.2 A roof incorporating Redland Cambrian Interlocking Slates is designated AA, as described in Appendix A of Approved Document B of the Building Regulations 1991 (as amended 1994) (England and Wales).

8.3 A roof incorporating Redland Cambrian Interlocking Slates is designated AA as described in item 7 of the Appendix to Part D of the Technical Standards for compliance with the Building Standards (Scotland) Regulations 1990 and consequently unrestricted by Standards D2.5 or D3.6 of these Standards. It would also be unrestricted by Regulation E8 of the Building Regulations (Northern Ireland) 1994.

8.4 When tested in accordance with BS 476 : Part 6 : 1968 and BS 476 : Part 7 : 1971 Redland Cambrian Interlocking Slates had a fire propagation index (I) of 12.3, a sub-index (i_1) of 0.1 and a Class 2 surface.

8.5 Redland Cambrian Interlocking Slates have a Class 2 surface and are suitable for use as an external cladding to walls less than 15 metres above the ground and at a distance of 1 metre or more from any point on the relevant boundary, as described in Approved Document B of the Building Regulations 1991 (as amended 1994) (England and Wales).

8.6 Redland Cambrian Interlocking Slates have a Class 2 surface and are suitable for use as an external cladding to walls less than 15 metres above the ground and at a distance of 1 metre or more from the boundary, as referred to in Standard D2.4 of the Technical Standards for compliance with the Building Standards (Scotland) Regulations 1990 and Regulation E8 of the Building Regulations (Northern Ireland) 1994.

9 Weathertightness

9.1 Wind tunnel driving rain tests show that Redland Cambrian Interlocking Slates are resistant to the ingress of wind-driven rain when installed on a roof with a pitch of 15°.

9.2 When used at pitches of 15° or greater in conjunction with a suitable underlay, the slates will provide a roof or wall cladding with satisfactory resistance to the passage of rain or snow.

10 Maintenance

10.1 Damaged slates can be replaced by following the manufacturer's instructions, and the relevant sections of BS 5534 : Part 1 : 1990 and BS 8000 : Part 6 : 1990. Any difference in appearance between new and existing slates may mellow with age.

10.2 The manufacturer's advice should be sought regarding the replacement of isolated slates.

10.3 Care is required when carrying out maintenance work on any roof or wall cladding in slating, and the recommendations contained in BS 5534 : Part 1 : 1990, Section 6, clauses 53.2 *Access* and 54 *Precautions*, and BS 8000 : Part 6 : 1990, Section 5, clause 5.2 *Safety*, should be followed.

11 Durability

11.1 Redland Cambrian Interlocking Slates will have a life expectancy of 60 years when used in the normal exposure conditions encountered in the United Kingdom. This opinion is based on test evidence obtained by subjecting samples of the material from which the slates are made to physical tests after both natural weathering and accelerated ageing processes. If the product is used in environments which subject the roof to abnormally high alkali levels (eg in the vicinity, and downwind, of cement works or chemical plants producing alkali pollution) the expected life may be reduced.

11.2 After natural weathering, some slight change in colour may occur. However, this process is not likely to be progressive.

Installation

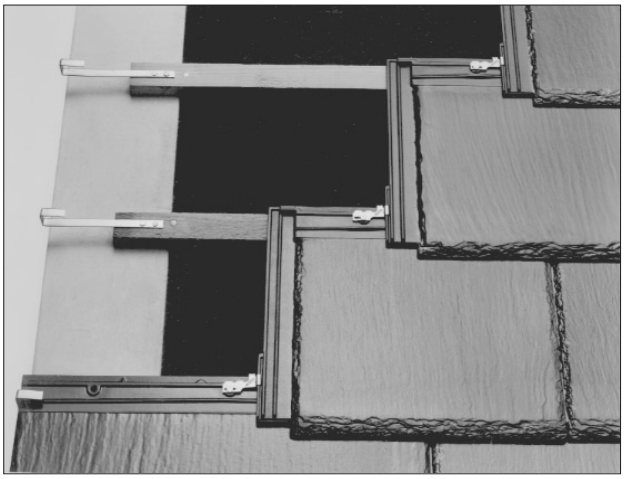
12 Procedure

12.1 Redland Cambrian Interlocking Slates are installed on pitched roofs or hung vertically as a cladding on the outer face of external walls strictly in accordance with the manufacturer's instructions and, where appropriate, BS 5534 : Part 1 : 1990 and BS 8000 : Part 6 : 1990. Consideration should also be given to the advice contained in BRE Defect Action sheets, Numbers 124 (*Design*) and 125 (*Site*)

Pitched roofs. Renovation of older type timber roofs — retiling and reslating.

12.2 Slates are laid to interlock and are each fixed using two 30 mm ring-shank, stainless steel nails and one stainless steel slate clip. Special clips are available for use at eaves and verges (see Figures 3 and 4).

Figure 3 Laying and fixing



12.3 It is essential that the fixing clips are correctly installed and the interlocks seat neatly in position.

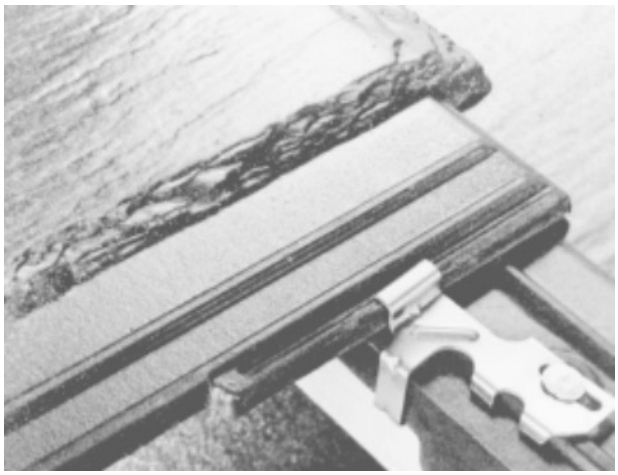
12.4 Care is required to ensure that nails are not overdriven. Nails should be tapped rather than driven home.

12.5 Where the product is to be used on an existing roof structure, the recommendations contained in BS 5534 : Part 1 : 1990, clause 51 and BS 8000 : Part 6, Section 5, clause 5.1.3 on re-covering, should be followed.

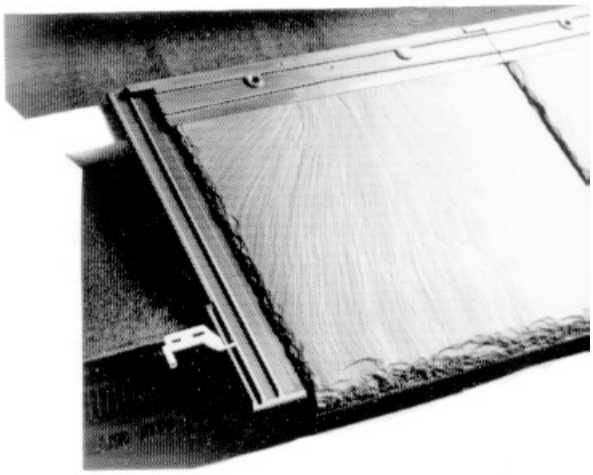
12.6 Ridge and hip details may be completed using the Redland Dry Ridge System or Redland Dry Hip System (see Agrément Certificate No 89/2189) or the Redland Cambrian Mitred Hip System and Redland Dry Vented Ridge System. Alternatively, traditional mortar bedded methods may be used.

12.7 Verge details are completed using the Redland Slate Dry Verge System (see Agrément Certificate No 89/2189). Alternatively, traditional mortar bedded methods can be used.

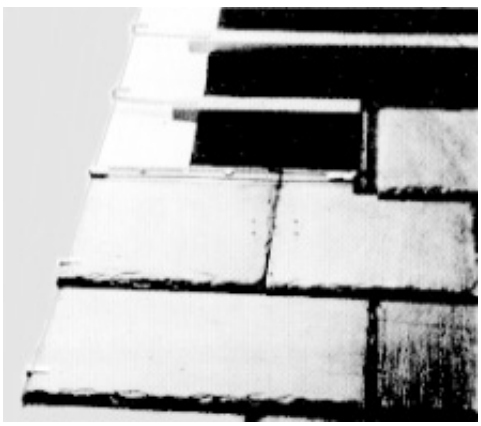
Figure 4 Fixing clips



slate clip



eave clip



verge clip

13 Cutting

13.1 Redland Cambrian Interlocking Slates may be cut (for use at abutments, verges, hips, valleys, etc) using a carborundum disc cutter. Additional holes may be drilled using a rotary masonry drill.

13.2 Where excessive concentrations of dust may be generated due to cutting of slates, the recommendations contained in section 14.1 should be followed.

14 Health and safety

14.1 If it is necessary to cut slates using a dust generating technique, and on such a scale as to generate excessive concentrations of dust, the measures defined in the Health and Safety Executive Guidance Note EH40 *Occupational Exposure Limits for unlisted substances* should be followed.

14.2 Any roof or wall cladding in slating should be treated as fragile, and the recommendations contained in clause 10.3 should be followed.

Technical Investigations

The following is a summary of the technical investigations carried out on Redland Cambrian Interlocking Slates.

15 Tests

As part of the assessment resulting in the issue of the previous Certificate No 87/1907:

(1) Tests were carried out to determine:

performance when tested in accordance with MOAT No 9 : 1973
thermal cycling and thermal shock resistance
bending strength
integrity

(2) Test data from independent laboratories, in relation to the following, were examined:

Fire tests to:

BS 476 : Part 3 : 1958
BS 476 : Part 6 : 1968
BS 476 : Part 7 : 1971
resistance to rain penetration
resistance to wind uplift
freeze/thaw resistance
colour stability.

16 Other investigations

16.1 Data on the durability of Petrarch Cladding (BBA Certificate No 86/1787) were examined and related to Redland Cambrian Interlocking Slates.

16.2 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.

17 Further investigations

17.1 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 issue Certificate No 87/1907 was based. The conclusions drawn from the original data remain valid.

17.2 Calculations and/or test data from the manufacturer's laboratory were examined in relation to:

mechanical characteristics
resistance to wind uplift
weathertightness at 15° pitch
resistance to sulphuric acid immersion
resistance to accelerated weathering and colour stability.

17.3 The manufacturer's laboratory was re-visited to inspect the test facilities and to examine the data.

17.4 A visit was made to a site in progress to assess the practicability of installation and the effectiveness of detailing techniques.

17.5 A user survey was conducted to evaluate performance in use.

17.6 Regular factory inspections have been carried out to ensure the quality is being maintained.

17.7 The behaviour of the product in use continues to be satisfactory and no failure has been reported to the BBA.

Bibliography

BS 476 *Fire tests on building materials and structures*
Part 3 : 1958 *External fire exposure roof test*
Part 6 : 1968 *Method of test for fire propagation for products*
Part 7 : 1971 *Surface spread of flame tests for materials*

BS 5534 *Code of practice for slating and tiling*
Part 1 : 1990 *Design*
Part 2 : 1986 *Design charts for fixing roof slating and tiling against wind uplift*

BS 8000 *Workmanship on building sites*
Part 6 : 1990 *Code of practice for slating and tiling of roofs and claddings*

MOAT No 9 : 1973 *Directive for the Assessment of Products in Glass-Reinforced Polyester for use in Building*

BRE Digest 332 *Loads on roofs from snow drifting against vertical obstructions and in valleys*

Conditions of Certification

18 Conditions

18.1 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.

18.2 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.

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

18.4 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 Redland Roof Tiles Ltd to market, install or maintain the product; and

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

18.5 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
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, Redland Cambrian Interlocking Slates are fit for their intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 87/1907 is accordingly awarded to Redland Roof Tiles Ltd.

On behalf of the British Board of Agrément

Date of Third issue: 19th March 1995

Director

**The original Certificate was issued on 4th September 1987. This amended version includes references to the revised Building Regulations, extended product colour range, new minimum roof pitch and new Cambrian tile clip.*

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