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TCA Presentation 85
Details in pursuant to
Planning Condition 3h &
Listed Building Condition 3e

London
15 November 2019

Planning Condition 3h & Listed Building Condition 3e

This document is prepared in pursuant to Planning Condition 3h of Planning Consent Application Ref: 2016/4877/L and Listed Building Condition 3e of Application Ref: 2017/4898/L. The details of the conditions are:

"Detailed drawings, or samples of materials as appropriate, in respect of the following, shall be submitted to and approved in writing by the local planning authority before the relevant part of the work is begun."

Planning Consent Application Ref: 2016/4877/L
3h) "Samples and manufacturer's details of new facing materials for the annexe building including bricks, mortar, and slates shall be submitted and shall be provided on site and retained on site during the course of the works."

Listed Building Condition 3e of Application Ref: 2017/4898/L
3e) "Samples and manufacturer's details of new facing materials for the annexe building including bricks, mortar, and slates shall be submitted and shall be provided on site and retained on site during the course of the works."

Contents

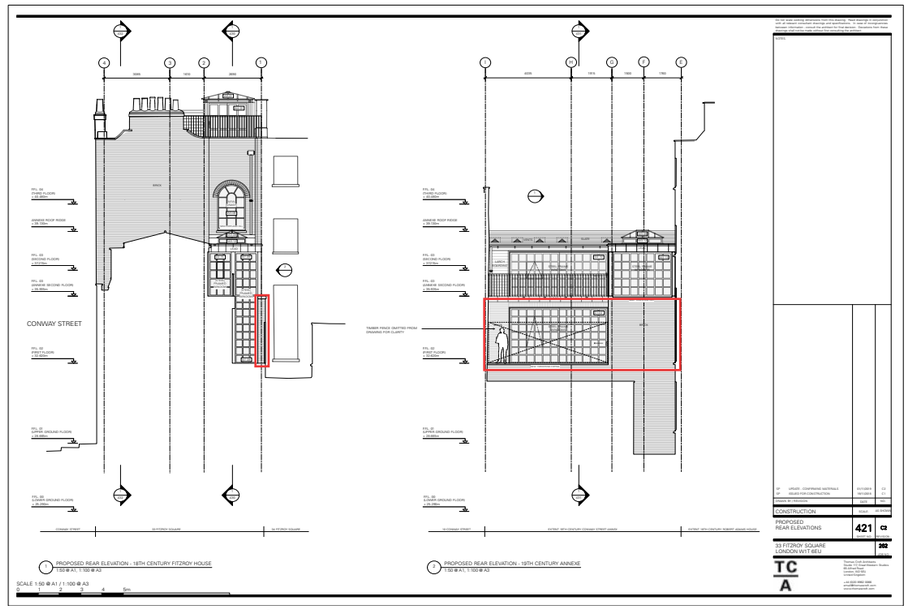
1. Proposed Reclaimed Bricks for Annexe External Walls

Mix of reclaimed bricks stored on site

Reclaimed London stock bricks for Annexe lintels

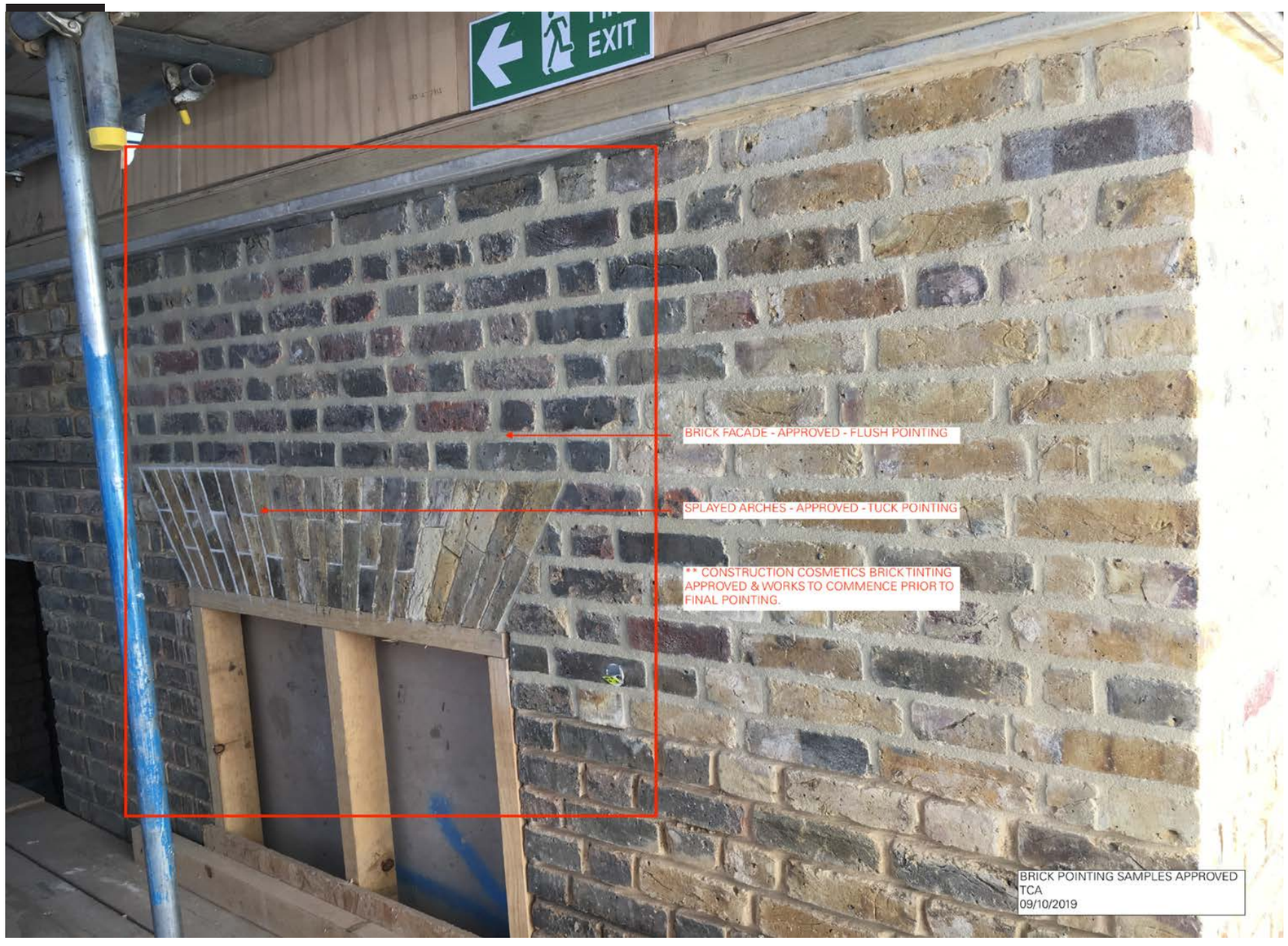
Reclaimed London stock bricks for party wall

Conway St elevation - area of extended external wall using reclaimed bricks



Rear elevation - area of Annexe/party wall using reclaimed bricks

2. Sample Area of Proposed Reclaimed Bricks and Mortar

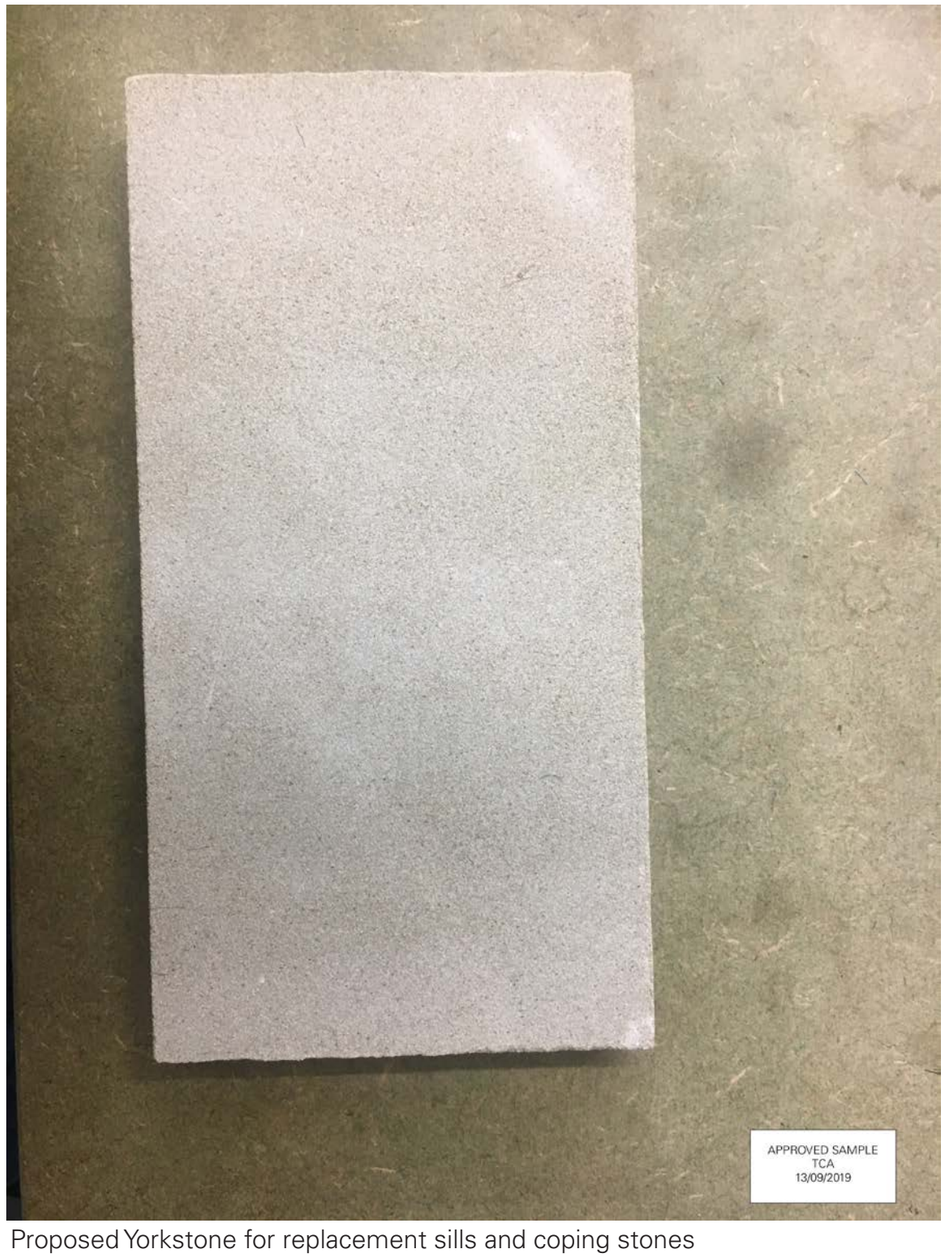


The final mortar mix as recorded in the photograph was selected following analysis of the existing mortar carried out by Sandberg (see report in Appendix E).

Photograph of brick pointing as seen on site by Senior Conservation Officer Elizabeth Martin on 11th September 2019.

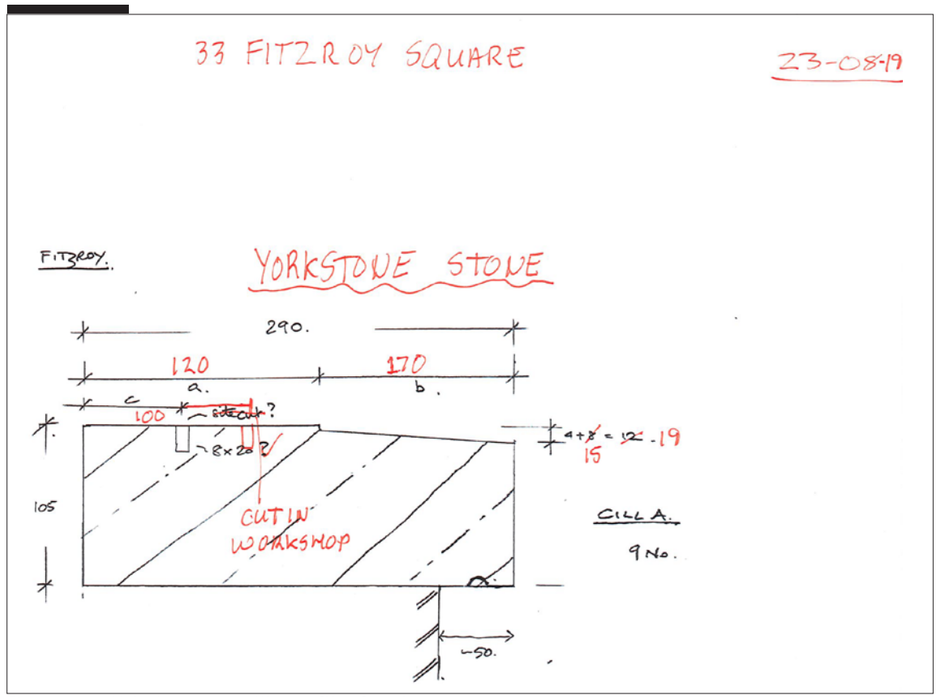
3. Proposed Yorkstone for coursing, Sills and Copings

Existing Yorkstone coping and proposed replacement Yorkstone for sills & coping

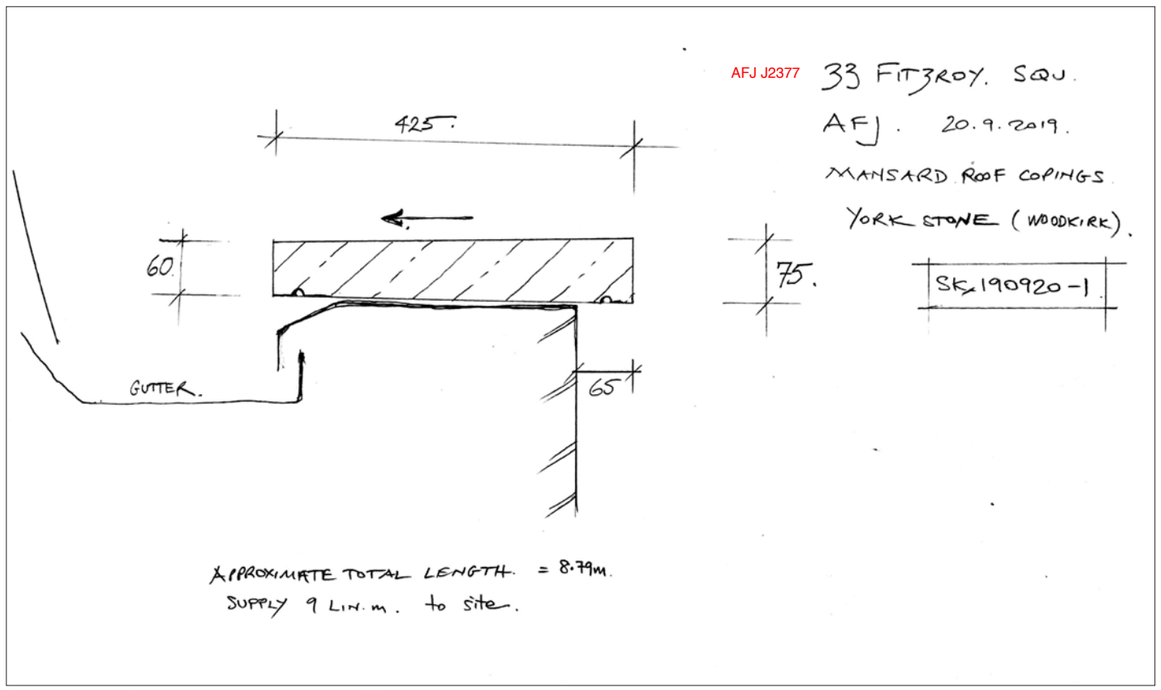


Proposed Yorkstone for replacement sills and coping stones

4. Proposed Profiles of Stone Sills and Copings



Proposed Yorkstone sill profile for Annexe



Proposed Yorkstone coping profile

5. Existing and Proposed Render

Existing modern sand/cement render on Conway St elevation (before demolition)

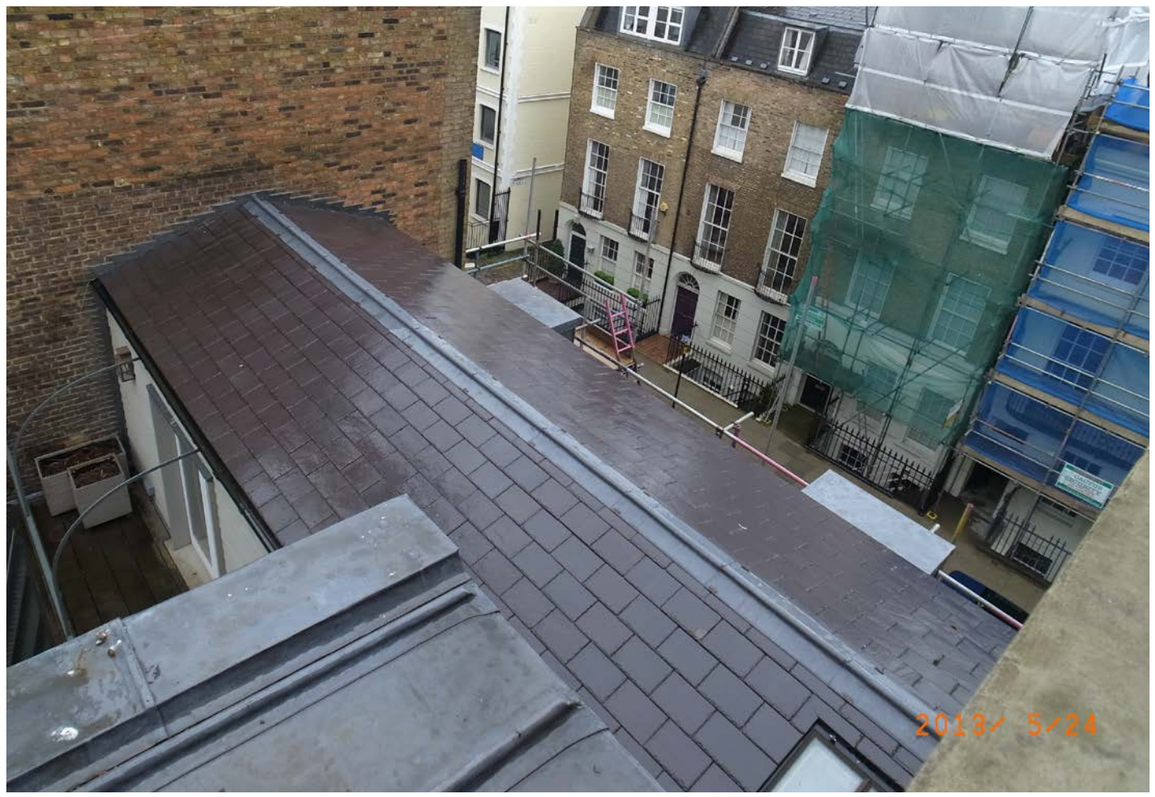
The proposed replacement render is a natural hydraulic lime produced by Telling Architectural.

The application consists of base and stone repair mortar (Unilit 65F), bonding bridge layer (Unilit 10 and stabilising mortar (unilit 30). (Refer to further product information in Appendix A).

Key elevation (Conway St) - indicationg area of proposed lime render

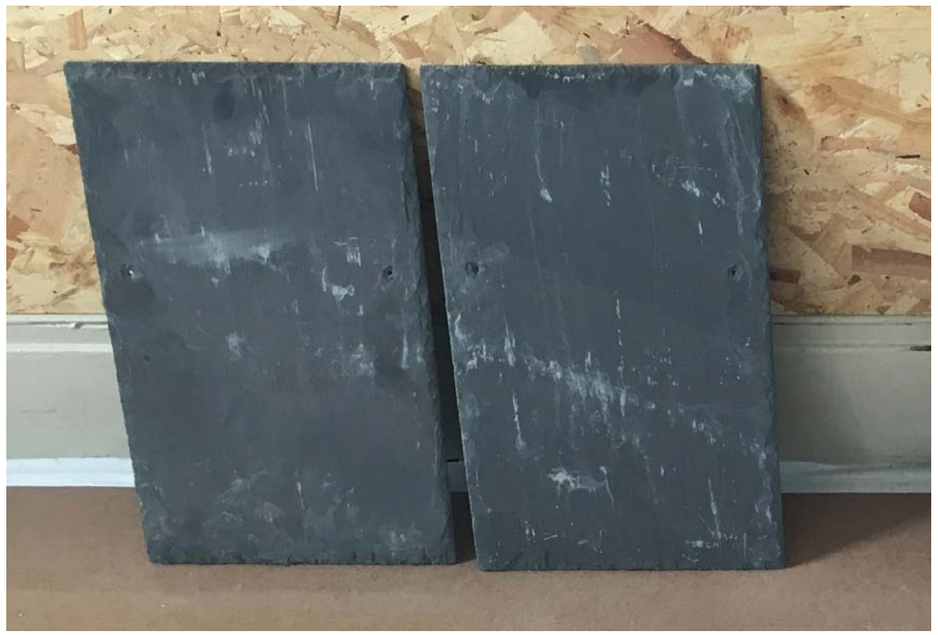
6. Existing and Proposed Roofing Slates

A survey was carried out to ascertain the condition of all the existing roofing slates (see report by Bridgehill Specialist Roofing Ltd in Appendix B).

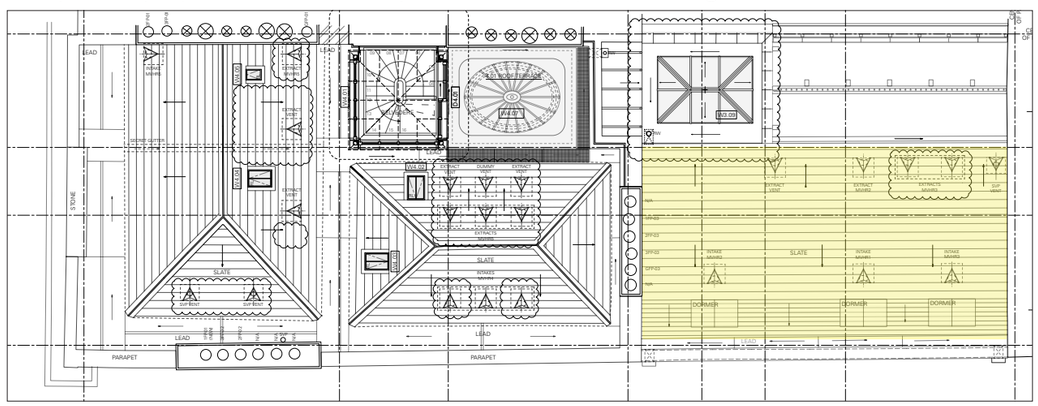


Annexe roof (before demolition)

The proposal is to use new Welsh 'Penryhn Heather Capital' slates each fixed to timber battens with 2no. copper slate nails. The nominal size of 500 x 300mm x 5.5 mm thick. The slates are 'purple' in colour and will match those of the existing as closely as possible. (Refer to product data in Appendix C).



Samples of proposed Welsh 'Penryhn Heather Capital' roofing slate



Key plan of slate roof

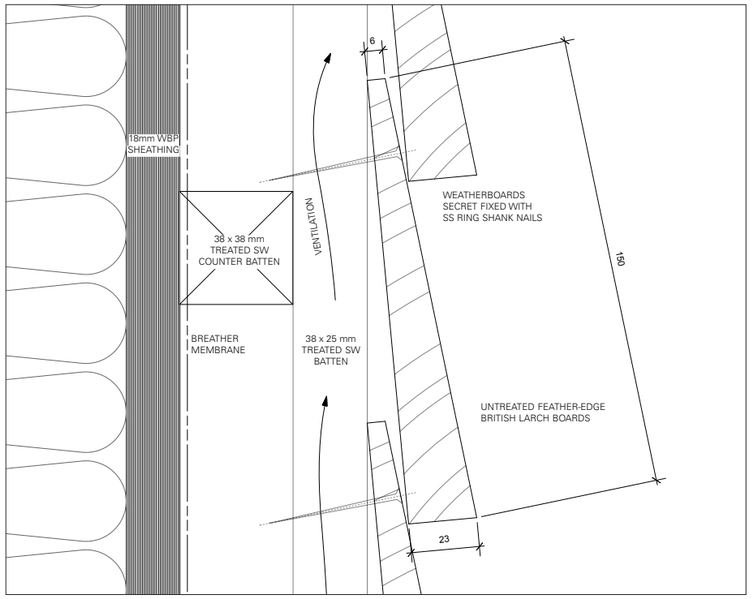
Annexe roof

7. Existing and Proposed Weatherboarding

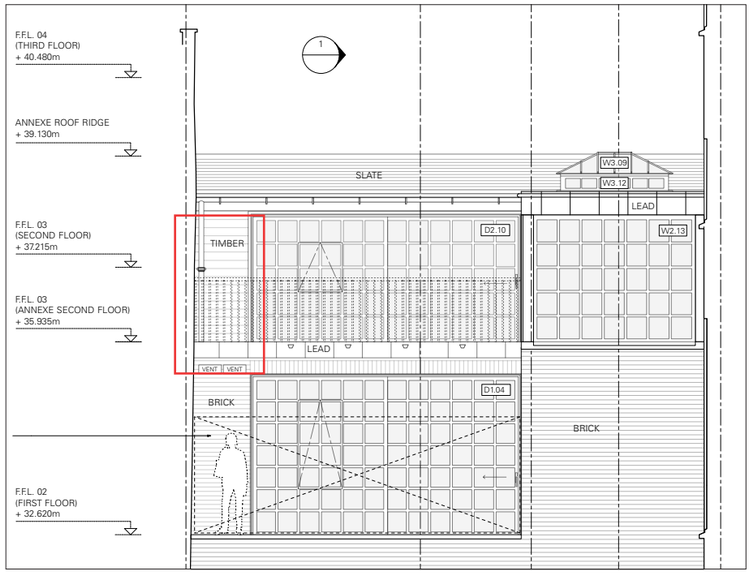
Existing weatherboarding (before demolition)

Proposed sample of Siberian larch weatherboard

Proposed sample of Siberian larch weatherboard

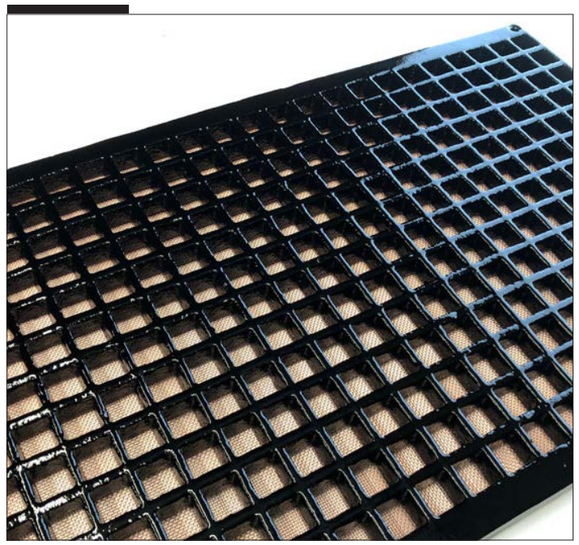


Proposed section of weatherboard



Key elevation (Annexe) - area of proposed weatherboarding

8. Proposed Airbricks



Type 1
Manufacturer: Cast Iron Air Brick Company
Model: MTM 5M or 9L Square Hole Grille

Type 2
Manufacturer: Cast Iron Air Brick Company
Model: Slot 12 Square Slotted Air Grille

Note: Refer to further product information in Appendix D.

Key elevation (Conway Street) - indicating location of proposed air bricks

1 - 1 no. Type 1 air brick 314mm (w) x 127mm (h)
2 - 3 no. Type 1 air brick 314mm (w) x 127mm (h)
3 - 1 no. Type 1 air brick 596mm (w) x 227mm (h)
4 - 2 no. Type 2 air brick 12” x 12”

Appendix A

Telling Architectural Lime Render Product Data

UNILIT 10 (TD13 PA)
bonding bridge layer

OUTLINE SPECIFICATION
plastering
rendering
tadelakt

PRODUCT DESCRIPTION

UNILIT 10 is a traditional, dry premixed mineral bonding bridge layer based on natural hydraulic lime as the binder and appropriate well-graded aggregates.
UNILIT 10 is characterised by a slow but strong bonding, a high plasticity, a low content of soluble salts and an excellent water vapour permeability.
The natural hydraulic lime mortar is inherently stable and designed to reduce problems of micro cracks along with premature drying out.
The natural hydraulic lime binder, used to prepare the preblend, conforms to the European Standard EN 495-1, NHL 5 for building limes. The mortar **UNILIT 10** conforms to the European Standard UNI EN 998-1.

AREA OF APPLICATION

UNILIT 10 is applied when the background is unsuitable to guarantee an optimum bonding of any base coat, either if the background shows little adherence (e.g. old powdering bricks or natural stones), or either if the background is characterised by a low water absorption, such as smooth concrete or granite surfaces. **UNILIT 10** can as well be applied as a bonding bridge on backgrounds which are saturated with water and/or soluble salts.

APPLICATION

Prior to application, the substrate must be cleaned and freed of all traces of oil and grease. The substrate benefits from being slightly dampened. Saturation of the substrate is not recommended, as this will influence negatively impact upon the bond of the hydraulic lime mortar to the substrate as well as the aesthetic appearence.

The mortar is mixed with clean water at a ratio of 7 to 8 litres of water to a bag of 30 kg ready mixed natural hydraulic lime powder. Mixing is undertaken with a slow speed electric paddle for a period of 3 to 5 minutes. A creamy workable mortar is obtained, which has approximately 2 hours of open time.
The mortar is applied manually or mechanically in an open structure, covering not more than 70% of the surface area. A drying time of at least 4 hours should be regarded.

The mortars must not be applied at temperatures below +5°C nor when a risk of frost exists. They should never be applied on to a frozen surface or in the case of thick fog. In hot, windy and dry conditions measures should be taken to prevent accelerated drying out of the freshly applied mortars. Applied mortars must be protected from frost and direct sunlight for 48 to 72 hours after their application.

TECHNICAL DATA

Granular sizing	max. 4 mm
Bulk density	ca. 1600 kg/m³
Adhesive strength (EN 1015-12)	> 0.6 N/mm²
Vapour diffusion resistance (μ)	10
pH	
fresh mortar paste	> 10.5
hardened mortar	~ 7
Fire resistance classification (EN 13501)	A1
Proportion water/preblend	0.25 l/kg
Mixing time	3 to 5 minutes
Consumption	2.5 - 3.5 kg/m²
Packing	powder in bags of 30 kg
Colour	beige

REMARKS

In case of doubt regarding the substrate (e.g. treatment with an impregnating product such as silicones or comparable), consult our technical service department.
The maximum storage time is 6 months, if stored in the original, hermetically closed packing in a suitable environment. The material must be stored dry and frost free above ground. Protect the material from heat sources.

Arte Constructo bvba | Molenberglei 18, B-2627 Schelle - Belgium
Tel +32 (0) 3 880 73 73 | Fax +32 (0) 3 880 73 70 | technical@arteconstructo.be | www.arteconstructo.be

UNILIT 30 (TD13 S)
stabilising mortar

OUTLINE SPECIFICATION
plastering
rendering
masonry and pointing
tadelakt

PRODUCT DESCRIPTION

UNILIT 30 is a traditional, dry premixed mineral stabilising mortar based on natural hydraulic lime as the binder and appropriate well-graded aggregates.
UNILIT 30 is characterised by a slow but strong bonding, a high plasticity, a low content of soluble salts and an excellent water vapour permeability. The natural hydraulic lime mortar is inherently stable and designed to reduce problems of micro cracks along with premature drying out. **UNILIT 30** is perfectly water repellent and, hence, performs perfectly where rising damp and capillary action is prevalent. Furthermore, the natural pore structure of hydraulic lime gives **UNILIT 30** a high resistance against salt crystallisation.
The natural hydraulic lime binder, used to prepare the preblend, conforms to the European Standard EN 495-1, NHL 5 for building limes. The mortar **UNILIT 30** conforms to the European Standard UNI EN 998-1.

APPLICATION AREA

UNILIT 30 is applied wherever, both from internally and externally, an important exposure to moisture and/or soluble salts is present. By the application of the stabilising mortar **UNILIT 30** the humidity present in the structure is seperated from the finishing layer to be applied, while its optimum vapour permeability allows humidity present in the wall to be able to rapidly migrate from the structure beneath. The seperation of the finishing layer from the humidity present in the structure stops the transport of soluble salts as well, which crystallise within the stabilising mortar layer.
UNILIT 30 can be applied to damp walls of buildings and cellars, as a plinth or pointing, both internally and externally, for the protection of the structure against the effects of rising damp or as a protection of the background within humid environments, such as showers, saunas and hammams. Therefore, **UNILIT 30** is essential within the realisation of a tadelakt finish.
UNILIT 30 can be applied as well for the stabilisation of salt loaden backgrounds.

APPLICATION

Prior to application, the substrate must be cleaned and freed of all traces of oil and grease. The substrate benefits from being slightly dampened. Saturation of the substrate is not recommended, as this will influence negatively impact upon the bond of the hydraulic lime mortar to the substrate as well as the aesthetic appearence.

The mortar is mixed with clean water at a ratio of 5 to 6 litres of water to a bag of 30 kg ready mixed natural hydraulic lime powder. Mixing is undertaken with a slow speed electric paddle for a period of 4 to 5 minutes. A creamy workable mortar is obtained, which has approximately 2 hours of open time.
The mortar is applied either manually or by mechanical means at a nominal thickness of 15 to 20 mm. A drying period of 3 to 4 days must be respected. If a finishing layer is applied to the **UNILIT 30** after 1 week a bonding layer of **UNILIT 15/P1** or **UNILIT 15/P2** is required.

The mortars must not be applied at temperatures below +5°C nor when a risk of frost exists. They should never be applied on to a frozen surface or in the case of thick fog. In hot, windy and dry conditions measures should be taken to prevent accelerated drying out of the freshly applied mortars. Applied mortars must be protected from frost and direct sunlight for 48 to 72 hours after their application.

TECHNICAL DATA

Granular sizing	max. 4 mm
Bulk density	1750 - 1850 kg/m³
Compressive strength (EN 1015-11)	
class CS III (3.5 N/mm² ≤ f_c ≤ 7.5 N/mm²)	
Modulus of elasticity	ca. 6130 N/mm²
Vapour diffusion resistance (μ)	10
Capillar water absorption (EN 1015-18)	
class W2 (c ≤ 0.05 kg/m²/min$^{1/2}$)	
pH	
fresh mortar paste	> 10.5
hardened mortar	~ 7
Fire resistance classification (EN 13501)	A1
Proportion water/preblend	0.18 l/kg
Mixing time	4 to 5 minutes
Consumption	15 - 18 kg/m²/cm
Maximum layer thickness	20 mm
Packing	powder in bags of 30 kg
Colour	beige

REMARKS

In case of doubt regarding the substrate (e.g. treatment with an impregnating product such as silicones or comparable), consult our technical service department.
The maximum storage time is 6 months, if stored in the original, hermetically closed packing in a suitable environment. The material must be stored dry and frost free above ground. Protect the material from heat sources.

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UNILIT 65 (TD13 SISKAL)
base and stone repair mortar

OUTLINE SPECIFICATION
flooring
roofing
tadelakt

PRODUCT DESCRIPTION

UNILIT 65 is a traditional, dry premixed mineral base and stone repair mortar based on natural hydraulic lime as the binder and appropriate well-graded aggregates.
UNILIT 65 is characterised by a slow but strong bonding, a high plasticity, a low content of soluble salts and an excellent water vapour permeability.
The natural hydraulic lime mortar is inherently stable and designed to reduce problems of micro cracks along with premature drying out.
The natural hydraulic lime binder, used to prepare the preblend, conforms to the European Standard EN 495-1, NHL 5 for building limes. The mortar **UNILIT 65** conforms to the European Standard UNI EN 998-1.

APPLICATION AREA

UNILIT 65 is especially suited for all kinds of applications applying traditional building materials both in new construction, renovation as well as restauration. Amongst others, **UNILIT 65** can therefore be applied onto a variety of substrates (e.g. traditional brickwork and natural stone masonry, pre-existing renders and plasters, etc.) as an undercoat or finishing layer for both plastering and rendering, as a bedding and pointing mortar in the case of traditional masonry constructions, as a bedding mortar for the gluing of terracotta tiles and stone slabs or for stone restoration purposes.
Thanks to its natural pore structure and low content of soluble salts, **UNILIT 65** regulates the moisture content within the masonry, eliminating practically all known problems related to frost, salt damage and lime bloom, providing that excessive damp and/or salt problems are not prevelant, and that the substrate is stable.

APPLICATION

Prior to application, the substrate must be cleaned and freed of all traces of oil and grease. The substrate benefits from being slightly dampened. Saturation of the substrate is not recommended, as this will influence negatively impact upon the bond of the hydraulic lime mortar to the substrate as well as the aesthetic appearence.

The mortar is mixed with clean water at a ratio of 5 to 6 litres of water to a bag of 30 kg ready mixed natural hydraulic lime powder. Mixing is undertaken with a slow speed electric paddle for a period of 3 to 4 minutes. A creamy workable mortar is obtained, which has approximately 3 hours of open time.
Depending on the application the mortar is applied either manually or by mechanical means at the required thickness. Stone repairs and/or undercoats at a nominal layer thickness and/or (re)pointing at a nominal joint width of 10 to 20 mm, respectively, require the application of the coarser **UNILIT 65N**. The somewhat finer granulated **UNILIT 65M** is applied at a nominal thickness of 5 to 8 mm, while even thinner applications require the application of **UNILIT 65F**. Layers exceeding 20 mm in thickness are applied in subsequent passes, each at a maximum layer thickness as specified above. If desired, a coloured finish can be applied afterward with a mineral paint, either a lime wash or either a silicate paint. A drying period of at least 1 week must be respected.

The mortars must not be applied at temperatures below +5°C nor when a risk of frost exists. They should never be applied on to a frozen surface or in the case of thick fog. In hot, windy and dry conditions measures should be taken to prevent accelerated drying out of the freshly applied mortars. Applied mortars must be protected from frost and direct sunlight for 48 to 72 hours after their application.

TECHNICAL DATA

Granular sizing	
UNILIT 65N	max. 4.0 mm
UNILIT 65M	max. 1.4 mm
UNILIT 65F	max. 0.8 mm
Bulk density	ca. 1550 kg/m³
Compressive strength (EN 1015-11)	
class CS II (1.5 N/mm² ≤ f_c ≤ 5 N/mm²)	
Adhesive strength (EN 1015-12)	≥ 0.3 N/mm²
Vapour diffusion resistance (μ)	12
pH	
fresh mortar paste	> 10.5
hardened mortar	~ 7
Fire resistance classification (EN 13501)	A1
Proportion water/preblend	0.18 l/kg
Mixing time	3 to 4 minutes
Consumption	15 - 18 kg/m²/cm
Maximum layer thickness	
UNILIT 65N	20 mm
UNILIT 65M	10 mm
UNILIT 65F	5 mm
Packing	powder in bags of 30 kg
Colour	beige

REMARKS

In case of doubt regarding the substrate (e.g. treatment with an impregnating product such as silicones or comparable), consult our technical service department.
The maximum storage time is 6 months, if stored in the original, hermetically closed packing in a suitable environment. The material must be stored dry and frost free above ground. Protect the material from heat sources.

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Appendix B

Report of Existing Roofing Slates by Bridgehill Specialist Roofing Ltd

BRIDGEHILL
Specialist Roofing Ltd.

Sizebreed Limited
Unit G.29
The Light Box
111 Power Road
London
W4 5PY

Email Only
brian.fyfe@sizebreed.com

ref. 1852

For the attention of Mr Brian Fyfe

18 February 2019

Dear Sirs,

33 Fitzroy Square

Further to the recent removal of the existing slates to the 2nr roofs located on the Main House, we write to advise that on further inspection of the existing slates it was found that the slates had already been re-used when the roofs were previously re-covered and could not be salvaged for re-use a third time.

We detail below a photograph showing the condition of the slates during the removal process which identifies that the slates had been re-used by the number of holes in the face of the slates.

Sudbury Stables, Sudbury Road, Downham, Billericay, Essex, CM11 1LB
Tel: 01268 711593 Fax: 01268 710800
Registered in England No. 06062332
Directors: **Paul Bridgeman** Email: p.j.bridgeman@btinternet.com **David Tuhill** Email d.tuhill@btinternet.com

The slates were also delaminating on the front face and the back of the slates were powdery which is an indication of deterioration and the slates should not be re-used.

With regards to the slates removed to the Mews Building, these slates have only been used once before and therefore have been carefully removed and put aside for re-use at a later date.

We trust the above is sufficient but should you have any queries please do not hesitate to contact the writer.

Yours faithfully,

P Bridgeman

Paul Bridgeman
Director

Sudbury Stables, Sudbury Road, Downham, Billericay, Essex, CM11 1LB
Tel: 01268 711593 Fax: 01268 710800
Registered in England No. 6062332
Directors: **Paul Bridgeman** Email: p.j.bridgeman@btinternet.com **David Tuhill** Email d.tuhill@btinternet.com

Appendix C

Welsh Slate Material Data Information

Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd. LL57 4YG United Kingdom Tel : +44(0)1248 600 656
www.welshslate.com

EN 12326-1:2014

Reference of this commercial document:	IMSD 8.2.4-22a	Date of issue	May 2016 (Issue 1)
Commercial document issued by: Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd, LL57 4YG United Kingdom			
Location of mine quarry : Penrhyn Quarry, Bethesda, Bangor, Gwynedd			
This document records the conformity of the product described below and is incomplete without the explanation of the meaning of the test results and the requirements of EN 12326-1:2014. The tests referred to and the criteria are contained in EN 12326-1:2014 and EN 12326-2:2011			
Date of sampling	March 2016	Date of testing	March - April 2016
Product description and commercial name Relation between bedding and cleavage	Penrhyn Capital Roofing Slate 300x200mm Beds parallel to cleavage		Conformity

1. Dimensional tolerances					
Format	Rectangular				
Deviation from declared length				±0mm	YES
Deviation from declared width				±1mm	YES
Deviation from declared squareness				0.1%	YES
Deviation from straightness of edges				1.0mm	YES
Slate type for deviation of flatness	Very flat	Flat (Capital)	Normal (County)	Non-flat (Celtic)	
Deviation from flatness	0.3%				YES
2. Thickness					
Nominal thickness and variation of individual thickness against nominal thickness	5.5mm, ± 35%				YES
3. Strength					
Characteristic MoR	Transverse	38.4 N/mm²	Longitudinal	58.0 N/mm²	NR
4. Water absorption	Code W1 (≤0.6): 0.14%				YES
5. Freeze thaw					NR
6. Thermal cycle test				T1	YES
7. Apparent calcium carbonate content				2.6%	YES
8. Sulfur dioxide exposure tests: ≤ 20% apparent calcium carbonate				S1	YES
8. Sulfur dioxide exposure tests: > 20% apparent calcium carbonate					NA
9. Non-carbonate carbon content				0.8%	YES
10. External fire exposure	Deemed to satisfy class B_{ROOF}				YES
11. Reaction to fire	Deemed to satisfy class A1				YES
12. Release of dangerous substances	None in conditions of use as roofing or external cladding				NR

Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd. LL57 4YG Unites Kingdom Tel : +44(0)1248 600 656
www.welshslate.com

Date of sampling and testing	If more than one date is applicable to sampling or testing they should be indicated against the individual test results
Product description	Slate for roofing and external cladding or carbonate slate for roofing and external cladding. Slate type and origin
1. Dimensional tolerances	
Length and width	Maximum deviation ± 5mm
Deviation from squareness	Maximum deviation ± 1% of the length
Deviation from straightness of edges	Slate length ≤ 500mm Permitted deviation ≤ 5mm
	Slate length > 500mm Permitted deviation ≤ 1% of the length

Flatness : The limits of deviation from the flatness are defined for four types of slate. The bevelled edges shall be applied to the convex face. Slates with deviation from flatness in excess of the limit may be used for special applications.

Slate type	Maximum deviation from flatness as a % of the slate length
Very flat	< 0.9
Flat	< 1.0
Normal	< 1.5
Non-flat	< 2.0

2. Thickness:	The basic nominal thickness is determined as a function of the bending strength using the formulae given in 3, local climate conditions and traditional construction techniques. The basic nominal thickness is increased in relation to the slates performance in the appropriate sulfur dioxide test (if required) as shown in 7 and 8 below.
3. Strength:	Longitudinal and transverse characteristic modulus of rupture; there is no limit for characteristic modulus. However the basic nominal thickness is determined as a function of the bend strength using the formulae given below, local climate conditions and traditional construction techniques.

$$el = X\sqrt{\frac{l}{Rcl}}$$

and

$$et = X\sqrt{\frac{b}{Rct}}$$

Where

el is the longitudinal thickness , (in mm);

et is the transverse thickness, (in mm);

l is the length of the slate, (in mm);

b is the width of the slate, (in mm);

Rcl is the characteristic longitudinal modulus of rupture, (in N/mm²);

Rct is the characteristic transverse modulus of rupture, (in N/mm²);

X is a constant determined as a function of climate and the traditional construction techniques (in N½.mm-½). NOTE: It may be different for each formula and is selected for the member state of use according to the table below.

National X Factors:

Member state	Transverse	Longitudinal	Member state	Transverse	Longitudinal
Belgium	1.0	1.0	Czech Repub.	1.2	1.2
Ireland	0.9	1.1	Italy	1.2	1.2
France	1.0	1.0	Spain	1.0	1.0
Germany	1.2	1.2	UK	0.9	1.1

Those member states that have not declared a national value should select a value or pair of values in relation to their countries climate and traditional construction techniques. It should not be less than the minimum value or pair of values given above.

el and et are determined by using the length *l* and the width b of the slates. The maximum value determined is the basic individual thickness of the slate, ebi. The basic individual thickness is increased in relation to the slates performance in the appropriate sulphur dioxide test as shown in 7 and 8 below.

Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd. LL57 4YG Unites Kingdom Tel : +44(0)1248 600 656
www.welshslate.com

4. Water Absorption:	Code W1 (≤0.6), W1 (>0.6), or W2
5. Freeze-thaw test:	Slates tested indicate the mean value of the modulus of rupture after 50 cycles in transverse and longitudinal directions before and after the freeze/thaw test, if relevant (test (if W1(>0.6)), or not required).
6. Thermal cycle test:	The following table explains the meaning of the test codes

Code	Observation in the test	Conformity to the standard
T1	No changes in appearance. Surface oxidation of metallic minerals. Colour changes that neither affect the structure nor form runs of discolouration.	Acceptable
T2	Oxidation or appearance changes of the metallic inclusions with runs of discolouration but without structural changes.	Acceptable
T3	Oxidation or appearance changes of the metallic minerals which penetrate the slate and risk the formation of holes.	Acceptable subject to the note below

NOTE : It is best only to use slates within code T3, which potentially may result in water penetration selectively with suitable methods of construction that avoid such penetration. Slates showing exfoliation splitting or other structural changes in this test are not acceptable.

7. Apparent calcium carbonate content:	There is no limit on apparent calcium carbonate content. However, the apparent calcium carbonate content determines which sulfur dioxide exposure test procedure should be carried out and, together with the strength, the minimum nominal thickness of the product. If the carbonate content is less than or equal to 20% then the sulfur dioxide exposure test procedure in EN 12326-2:2011, 14.1 applies. If the carbonate content is more than 20%, the sulfur dioxide exposure test procedure in EN 12326-2:2011, 14.2 applies. The minimum thickness is calculated using the table below.

8. Minimal nominal thickness in relation to apparent calcium carbonate content and sulfur dioxide exposure code

Carbonate content %	SO2 exposure test code from EN 12326-2:2011, 14.1	Depth of softened layer from EN12326-2:2011, 14.2	Thickness adjustment
≤ 5.0	S1		None
	S2		ebi + 5%
	S3		ebi ≥ 8.0mm or switch to the test in EN 12326-2:2011, 14.2
> 5.0	S1		ebi + 5%
	S2		ebi + 10%
≤ 20.0	S3		ebi ≥ 8.0mm or switch to the test in EN 12326-2:2011, 14.2
> 20.0		0mm to 0.70mm	ebi + 0.50mm + 7t²

ebi is the basic individual thickness obtained from 3 above (in mm)

t is the thickness of the softened layer obtained from EN 12326-2:2011, 14.2 (in mm)

9. Non-carbonate carbon content: The non-carbonate carbon content shall be less than 2%

Welsh Slate, Penrhyn Quarry, Bethesda, Bangor, Gwynedd. LL57 4YG Unites Kingdom Tel : +44(0)1248 600 656
www.welshslate.com

Welsh Slate roofing products conform to the requirements of the CE mark.

The following table provides the necessary information required to demonstrate conformity of

Penrhyn Capital Roofing Slate

CE 0086	
Welsh Slate Ltd, Penrhyn Quarry, Bethesda, Near Bangor, Gwynedd, Wales, UK, LL57 4YG	
10	
001PQ-DoP2015-05-28	
EN 12326-1:2014	
Penrhyn Capital	
Intended to be used as discontinuous roofing and external cladding	
Dimensional variation	
Nominal thickness	5.5mm
Individual thickness	5.5mm (< +/- 35%)
Deviation of length and width	Complies
Deviation of edge straightness	Complies
Deviation of rectangularity	Complies
Mechanical resistance (Characteristic modulus of rupture)	
Transverse	38.4 N/mm²
Longitudinal	58.0 N/mm²
Water permeability - water absorption	**W1** (≤0.6%)
Apparent calcium carbonate content	≤ 5%
Durability	
Water absorption	**W1** (≤0.6%)
Freeze-thaw cycling	Not required
Thermal cycling	**T1**
Sulfur dioxide exposure	**S1**
Non-carbonate carbon content	Complies: ≤ 2%
Release of dangerous substances: None in conditions of use as roofing or external cladding	
External fire performance: Deemed to satisfy	

Material Safety Data Sheet 31.12.11

Product Name: Example:	**Roofing and Architectural Slate Products** 
1. Product and company identification Product name: Product type and use: Address and telephone number:	 Roofing and Architectural Slate Products All types used for a wide range of construction and civil engineering applications. Welsh Slate Ltd Penrhyn Quarry Bethesda Bangor Gwynedd LL57 4YG Tel: +44 (0) 1248 600 656 Email: enquiries@welshslate.com
2. Composition/Information on Ingredients	Slate is a metamorphic rock. The composition consists of various combinations of minerals including quartz (typical concentration < 25% crystalline silica).
3. Hazard Identification Main risks: Inhalation: Skin contact: Contact with eyes: Ingestion: Environmental risks:	 May cause a long term health hazard if resirable dust produced from working with slate is inhaled in excessive quantities over a long period of time (years). If any respirable dust – produced whilst working with slate is inhaled in excessive quantities over a long period (years), it may create a long-term health hazard. May cause skin irritation e.g. redness, eczema. Can cause cuts and abrasions. May cause eye irritation. May cause irritation if swallowed. May cause contamination if slate fines are allowed to enter the local water course.

4. First Aid Measures	
Inhalation:	Not applicable.
Skin contact:	Wash skin with water. For cuts and abrasions; clean with water and apply sterile dressing if required.
Contact with eyes:	Wash out with clean water and seek medical attention if required.
Ingestion:	Wash out mouth with clean water and seek medical attention if required.
5. Fire-Fighting Measures	
Extinguishing media:	Not applicable.
Protective equipment:	Not applicable.
Special hazards:	Not applicable.
Note:	Slate is non combustible/flammable.
6. Accidental Release Measures	
Personal precautions:	Use appropriate protective clothing (See section 8).
Environmental precautions:	Do not let slate fines enter the local water course, any run off should be contained.
Method of cleaning up on ground:	Dowse with water to reduce respirable dust and ensure environmental precautions are implemented.
Method of cleaning up in water:	Inform the appropriate local authority.
7. Handling and Storage	
Storage conditions:	Not applicable.
Storage stability:	Not applicable.
Note:	There are no special measures/conditions.
8. Exposure Controls/Personal Protection	
Engineering measures to reduce exposure:	When working slate eg dry drilling, cutting etc the working area and methods should be designed to incorporate a Local Exhaust Ventilation (LEV) system.
Personal protective equipment:	
Inhalation:	Respiratory protection should be suitable for hazardous dusts in accordance with HSE publication HSG 53.
Skin:	Protective gloves to BS EN 420 should be worn.
Eye protection:	Eye protection should be dust tight type to BS EN 166.

8. Exposure Controls/Personal Protection Cont. Work exposure limit (WEL):	Respirable crystalline silica (RCS) has a maximum exposure limit of 0.1mg/ m^3 per 8-hour Time Weighted Average. All dusts have a Respirable Occupational Exposure Standard of 4mg/m^3 and an Inhalable Occupational Exposure Standard of 10mg/ m^3 8 hour Time Weighted Average.
9. Physical and Chemical Properties State: Colour: Odour: Ph: Boiling temperature (°C): Melting / decomposition temp (°C): Density (kg/m^3): Solubility in water (weight-%): Solubility in organic solvents:	 Solid. Heather / Blue Grey. None. Not applicable. Not applicable. 2.8kg/m^3 (Heather) and 2.7kg/m^3 (Blue Grey) Non-soluble. Non-soluble.
10. Stability and Reactivity Conditions to avoid: Material to avoid: Hazardous decomposition products:	 None. None. None.
11. Toxicological Information General information : Note:	 Prolonged exposure to Respirable Crystalline Silica (RCS) slate dust may cause silicosis. Long-term exposure to high levels of RCS dust can also lead to an increased risk of developing lung cancer. If the dust given off from working with slate is fine enough to breathe into the lungs through the nose and mouth this is termed “respirable”. Once it is breathed in, RCS dust can be retained in the lungs for many years.
12. Ecological Information Mobility: Persistence and degradability: Bio accumulative potential	 Non-volatile. Non-biodegradable. No bio accumulative potential.
13. Disposal Information Disposal of product: Disposal of packaging:	 Slate is an inert material and any waste produced should be disposed of in accordance with local legal regulations. Must be disposed of in accordance with regional or national regulations.

14. Transport Information Transport warning label	
Packaging group:	Roofing and Architectural slate products do not require labeling and is not subject to hazardous substance conveyance regulations.
ADR/RID: IMO-IMDG code: IATA: UN No:	Not applicable. Not applicable. Not applicable. Not applicable.
15. Regulatory Information Labeling according to EU directives	
DANGER symbol(s):	None.
Risk phrases:	R36 – Irritating to eyes; R66 – Repeated exposure may cause dry skin or cracking; R68/20 – Harmful: Possible risk of irreversible effects through inhalation.
Safety phrases:	S22 – Do not breath dust; S25 – Avoid contact with eyes; S37/39 – Wear suitable gloves and eye / face protection; S38 – In case of insufficient ventilation wear suitable respiratory equipment; S51 – Use only in well-ventilated areas; S57 – Use appropriate containment to avoid environmental contamination.
CAS No:	None.
16. Other Information Other information:	Dry dust from natural slate is a substance hazardous to heath and requires employers to carry out an assessment of risk in accordance with the COSHH Regulations 2002.
Legal disclaimer:	The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any harm or damage resulting from handling or from contact with the above product.

Appendix D

Cast Iron Air Brick Product Information

CAST IRON AIR BRICK COMPANY

Building Architectural Enhancements

riba product selector

Specification Sheet – CiabMTM-2018

www.castironairbricks.co.uk

CAST IRON SQUARE HOLE

MADE TO MEASURE GRILLES

Items MTM4 – MTM5 – MTM6 - MTM7 – MTM8 – MTM9 MTM10 – MTM12 – MTM15

Cast iron made to measure grilles are cut to order from 3ft long grey iron grilles we have in stock. These grilles were cast at the foundry in sand moulds bonded with resin to a fine cast finish and then delivered to us and stored primed black to prevent them rusting. Using these grilles (nine different widths) we then cut them to create over 250 different sized grilles. We can supply them drilled or undrilled in the corners, with or without copper fly screen and paint them before delivery. The made to measure grilles are normally ready for dispatch the following week after the customer has placed the order.

HISTORY

Cast iron grilles installed in old buildings come in all shapes and sizes. That's because at the turn of the 20th century there were thousands of iron foundries in Great Britain and each one supplied local building companies with their own grilles. There was some standardisation, as the majority of clay bricks were 9x3 inch this meant a cast iron air brick had to be the same size, but apart from that it was a free for all with grilles, vents and gratings. Grilles cast in foundries in one town were rarely the same size as those in foundries in other towns.

Now for any property developer, to get a grille cast, in Victorian times, wasn't too difficult. After all, there would have been a few foundries to choose from and with dozens of properties being built all at the same time, foundries must have gladly accepted the commission to create a pattern for a bespoke grille. The pattern would be used to cast dozens and dozens or maybe hundreds of grilles for the street of houses or a factory building so the time to make the pattern was worthwhile. The foundry would be paid to make the pattern, but to really make a profit, the foundry made its money on the castings. The more castings made, the more profit made. Making patterns is time consuming and is really only worthwhile when it's to create products in demand and not one offs. That was in Victorian times but the economics of production for foundries is still the same even today.

Since the 1950s the number of iron foundries in Britain has been in a rapid decline and this decline has continued throughout the 20th century and into the 21st. Competition from abroad, especially China has forced many foundries to close as they've been unable to compete on price. It's not all been bad news though as those that are left have survived for a reason. They've specialised on castings that they're good at producing and they've become more efficient, turning down "one offs" in favour of more profitable "production jobs" that repeat year after year. And now in 2018 British foundries are thriving, there's a queue of work, every British foundry has a full order book and a waiting list. Companies who'd switched production to China have found prices rising and quality falling and are returning production back to the UK.

Problem Solver

Our Victorian buildings are fitted with an array of different sized grilles, some original, some Edwardian and others post war and all in varying degrees of decay. No longer are there foundries in every town and the remaining British foundries are not interested in making a single grille and those that are need a hefty price for the pattern and several months to produce one. It might be possible to find a replica in the reclamation yards or on ebay but in the unlikely event of finding one just the right size there's also the problem that a second hand grille could be as old as the grille being replaced and have a limited lifespan. So it has been almost impossible to find a bespoke cast iron grille made to a specific size which is why we created the "made to measure" cast iron square hole grille range.

We're able to cut a cast iron grille for you in square hole pattern, which is a traditional Georgian and Victorian style, and have it delivered to you or to site a week later. We've 250 different sizes to choose from and the sizes are all predetermined so instead of emailing or waiting on the phone while we get the tape measure out, you can check for yourself and know immediately what we can do. You can therefore have a brand new cast iron grille that looks like an original but will last another 100 years or so and will finish off your restoration to perfection.

Examples

We've supplied made to measure gratings to numerous properties around the UK and abroad and have been making and cutting square hole grilles for around ten years. In 2013 we supplied some 8" cast iron square hole grilles to Kier Construction for their delicate restoration of the 13th century college of Peterhouse at Cambridge university and more recently, 2018, to Sherlock Interiors for an equally delicate restoration of Islington Londons iconic Grade 2 listed, Lowndes House.

Photo – Jerry, British Listed Buildings.co.uk

Finish

The material we use to cut made to measure grilles is not stored bare metal but lightly primed in black matt to prevent it from rusting in storage. We are therefore only able to offer the finish as painted. We supply grilles as standard, finished painted in black gloss two part epoxy paint and this normally takes a week. We can however release grilles earlier in the primed black paint but please note the ends where the grilles have been cut will be a ground finish and the ends, and the grille will rust much faster than gloss finish. We can also supply bespoke RAL painted grilles to match customers' existing brickwork or requirements. Please note that for items painted in such a way there is an additional charge for this and it will add 1-2 weeks onto the delivery time. All made to measure grilles are cut to order therefore we do not accept returns on them regardless of the paint finish.

Environmental Benefits and Longevity

The cast iron made to measure square hole grilles are cut and finished in Devon, England and are expected to last a lifetime. They are made in a traditional green sand method in the foundry in Scotland where they have been traditionally made since before Victorian times.

Cast iron is not affected by UV and is fire resistant and fully recyclable. The cast iron used in the manufacture of this product is sourced from scrap iron with the addition of a small amount of pig iron. On average, 95% of the casting is recycled material. The moulds used to create the castings are generated using sand that is packed in a box with one of our patterns and this sand is used again and again to create further castings.

Casting in the UK has ensured all our products are made to strict emission and pollution levels in accordance with the latest legislation and that the workers creating these products are fairly paid and have a safe working environment in which to earn a living.

Melting iron requires a substantial amount of energy from either gas or electricity and to offset the CO2 emissions from this process we have planted over 300 trees in our own 3 acre wood. The annual absorption of CO2 from our wood is enough to ensure the production of our castings is carbon neutral.

As we don't import any of our products, the mileage from foundry to our finishing workshop and distribution bay in North Devon is very low keeping our carbon footprint small and once installed we expect this air brick to last a life time.

Maintenance

The made to measure grilles are supplied painted in black. We use a three part epoxy primer followed by two part epoxy black gloss top coat which is extremely hard wearing. If the grilles are used as part of pavement or walkway they are going to get scratched and or exposed to salt they will need repainting at some point. The gloss paint will dull over time and is likely to dull to a satin sheen in a year or two. We can supply the grilles in a light black matt primer which is the storage primer and prevents them rusting in in the workshop before they are used. If you would like this finish your grilles will be ready much quicker but please note that the grilles will rust much quicker than the fully painted ones and the ends were they are cut will be an unpainted bare ground finish. Should the grilles start to rust this will form a protective layer to prevent further corrosion and requires no further maintenance.

If using mesh with the grilles to keep out insects and flies, regular inspection of the mesh is advised and cleaning were necessary by vacuuming the surface of the mesh to clear away dust and debris.

Notes for architects

The made to measure grilles offer property developers the opportunity to fit an authentic, cast iron grille into almost any size hole within a week or so of ordering. They can be used either as a vent grille or as a drainage grille. They have the option of being drilled in the corners for securing to a wall and also to have flyscreen mesh supplied. It is important that mesh is not used if the grilles are being using as drainage gratings as the mesh will block very quickly.

The square hole pattern is ideal for cutting to size. The original full size 3ft grilles have thick borders top and bottom and at each end. When cut, the thick borders remain top and bottom and the ends are ground to leave a 5-6mm border so the new grille has a border all the way round. The square hole pattern is the only pattern that is suitable for cutting to size and retain a strength border on all four sides after being cut. No other design of grille we have is suitable for this process.

Grilles we have in stock, are cut using a Japanese, diamond encrusted stainless steel cutting blade and then hand ground at the ends and painted. This means we can supply cast iron made to measure grilles several months quicker than having them cast to order in bespoke moulds. This takes a week to ten days to get them to you but if that is still too long and you need them in 2-3 days, consider asking for the without the gloss finish as described in maintenance above.

We have measured every grille we have to work out the exact sizes we can cut them to. These sizes are listed in our made to measure size guide. Although we say “made to measure” this does of course mean the grilles still have to be cut across a rib where the hole size ends so it is not finite. On average this means we can cut to around any size + or – 15mm. For example, looking at the size guide for a 6” (150mm) made to measure grille, if a customer wanted the grille cut to 12” long (305mm) we would be able to cut undersize at 295mm or oversize at 316mm. If we cut the grille at 305mm it would leave one side with jagged “fingers” of iron which not only are sharp but also brittle leaving the grille weak and likely to crack. An example is shown below, we wouldn’t be prepared to supply a grille in this condition.

The size guide with each size we can cut to is available as a PDF on our website in the made to measure grilles section as a PDF here…

https://www.castironairbricks.co.uk/product/made-to-measure-square-hole-grilles/

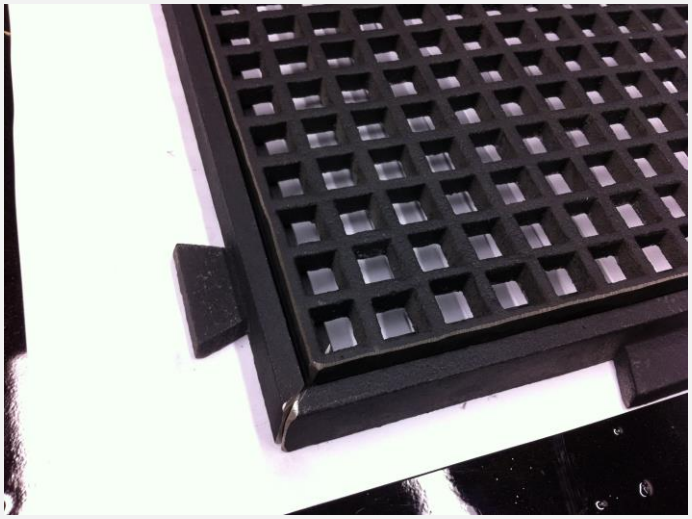
or can be downloaded direct from here…

https://www.castironairbricks.co.uk/shop/wp-content/uploads/2014/08/Made-to-Measure.pdf

The guide shows the free area of each grille that we can create and is indispensable for working out sizes of grilles were amount of ventilation is important. Please note that adding mesh will reduce the free area by 33% so ensure a big enough grille is specified to compensate for the mesh if applicable. The guide lists the 3ft (910mm) long grilles we can cut in order from smallest width to largest width and shows the materials, thickness, square hole size, the thickness of the ribs between the holes and also the width of the borders top and bottom. Once cut the end borders are the same thickness as the ribs illustrated in the photo showing the 3 examples below. We are not able to show you or your client exactly what your grille will look like because it hasn't been made yet but you can get an idea of all the dimensions from the guide as it also shows the number of rows and columns of holes and therefore the total number of holes (so we can work out the free area in mm2)

We can possibly cut squares to allow for drain pipes to pass through or to avoid abutting an obstacle so please forward any sketches or ideas you have and we'll advise if we can do it and give you a price. We have done something similar for the Manchester Whitworth Art Gallery were we created grilles for the entrance and cut out a square to allow for the down pipes. It might be that cutting a piece out of the grille will create a weakness and if that's the case we will advise as we wouldn't be prepared to dispatch a product that won't arrive at the destination in one piece.

We can also provide made to measure bearers cut to size to sit the grilles in and possibly build a cast iron frame for the bearers which is something we have done for North Ealing Primary School in London. There are numerous scenarios in framing any cast iron grilles with cast iron bearers so it is best to contact us with your ideas and we will try to accommodate and get a price to you. Mitred corners using cast iron bearers looks wonderful when done properly but it's tricky to cut them perfectly to size and therefore expensive. Cast iron can't be welded so the frame is supplied as four loose pieces so requires some degree of skill on site to lay them correctly.



For more details please see our website…

https://www.castironairbricks.co.uk/product/made-to-measure-square-hole-grilles/

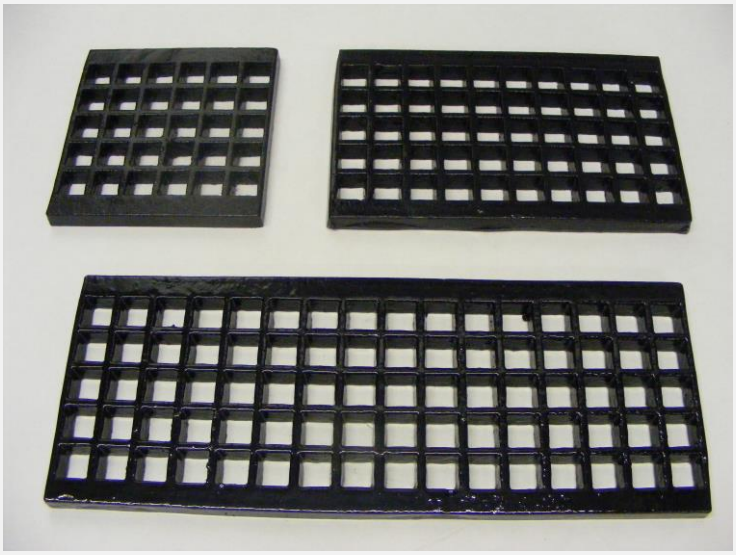
Alternatively email or call us

Sales@castironairbricks.co.uk

01598 711999

Delivery for this product painted black is normally 7-10 days or 14-21 days painted to customer supplied RAL.

Cast Iron Air Brick Company, Down Farm, Brayford, EX32 7QQ



CAST IRON AIR BRICK COMPANY

Building Architectural Enhancements

riba product selector

Specification Sheet – ciabMTM-2018

www.castironairbricks.co.uk

Appendix E

Analysis of Mortar Samples by Sandberg LLP

SANDBERG

REPORT 66101/C

33 FITZROY SQUARE

ANALYSIS OF MORTAR SAMPLES

Sandberg LLP
5 Carpenters Place
Clapham High Street
London SW4 7TD

Tel: 020 7565 7000
Fax: 020 7565 7101
email: mail@sandberg.co.uk
web: www.sandberg.co.uk

SANDBERG
CONSULTING ENGINEERS
INVESTIGATION INSPECTION
MATERIALS TESTING

Sandberg LLP
5 Carpenters Place
London SW4 7TD

Tel: 020 7565 7000
Fax: 020 7565 7101
email: clapham@sandberg.co.uk
web: www.sandberg.co.uk

REPORT 66101/C

33 FITZROY SQUARE

ANALYSIS OF MORTAR SAMPLES

Sizebreed Construction Limited
Unit G.29, The Lightbox
111 Power Road
London
W4 5PY

This report comprises
2 pages of text
Table 1 of 1 sheet

For the attention of Mr Brian Fyfe

2 October 2019

SANDBERG
CONSULTING ENGINEERS
INVESTIGATION INSPECTION
TESTING MATERIALS

Sandberg LLP
5 Carpenters Place
London SW4 7TD

Tel: 020 7565 7000
Fax: 020 7565 7101
email: clapham@sandberg.co.uk
web: www.sandberg.co.uk

REPORT 66101/C

33 FITZROY SQUARE

ANALYSIS OF MORTAR SAMPLES

References: Written instruction from Mr Brian Fyfe of Sizebreed Construction Limited.

1. INTRODUCTION

Two mortar samples, taken by yourselves , were received in our laboratories on 20 September 2019. We were asked to carry out analysis to determine the material type of the samples.

2. SAMPLE DETAILS

Sandberg Reference	Client Reference	Sample Details	Weight of sample received, g
C2762	Mineral sample	Brown mortar, moderately hard, compact, moderate density	9
C2763	Mineral sample	Brown mortar, moderately hard, compact, moderate density	50

3. ANALYSIS METHOD AND RESULTS

3.1 Determination of Mix Proportions

The samples were prepared and analysed using documented in-house methods based on BS 4551:2005 + A2:2013 “Methods of test for mortar”.

The samples were also analysed for organic matter content in accordance with BS 1377: Part 3: 2018.

Details of the analysis are given in Table 1 of this report.

The mix compositions are summarized as follows:

Sandberg Reference	Client reference	Mix constituents
C2762	Mineral sample	Organic binder : non-hydraulic lime : sand
C2763	Mineral sample	Organic binder : non-hydraulic lime : sand

4. **REMARKS**

It is not always possible by chemical analysis alone to distinguish with certainty between Portland cement and lime binders or between hydraulic and non-hydraulic limes.

Microscopical examination can usually ascertain the presence or otherwise of Portland cement in the mortar and of calcareous material in the aggregate. In the absence of such confirmatory work, interpretation of the analytical results is made on the basis of consideration of the analysis in conjunction with the appearance and any available background information for the mortar.

The samples were found to comprise organic binder, non-hydraulic lime and sand mixes.

The organic binder contents of the samples were found to be 6.5% and 5.0% by weight of sample. Without reference materials it is not possible to say whether the results represent the full organic binder content. Any decisions based upon the results should be taken with a degree of caution.

The lime contents were found to be 6.5% and 3.5% by weight of sample. Without petrographic confirmation of a lime binder it is possible that the acid soluble calcium contents are from limestone rather than a lime binder.

In the absence of reference materials it is not possible to give mix proportions by volume.

Sizebreed Construction Limited
Unit G.29, The Lightbox
111 Power Road
London
W4 5PY

for Sandberg LLP

D Kinnersley
Senior Associate
2 October 2019

For the attention of Mr Brian Fyfe

Materials, samples and test specimens are retained for a period of 2 months from the issue of the final report.

Tests reported on sheets not bearing the UKAS mark in this report/certificate are not included in the UKAS accreditation schedule for this laboratory.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The results in this report relate to the samples as received and only those tested.

END OF TEST

SANDBERG

66101/C

Table/Sheet
1/1 of 1

Date of Test
30/9-1/10/19

MORTAR- CHEMICAL ANALYSIS
DETERMINATION OF MIX PROPORTIONS

Documented In-house Methods 34.1(*) and BS 4551:2005+A2:2013
BS1377: part 3 : 2018

Sandberg Reference	**C2762**	**C2763**		
Client Reference	**Mineral sample**	**Mineral sample**		
Details	**Mortar**	**Mortar**		
CHEMICAL ANALYSIS		**% by mass**		
Insoluble Residue	**83.75**	**89.27**		
Soluble Silica, SiO_2*	**0.14**	**0.13**		
Acid soluble Alumina, Al_2O_3*	**0.35**	**0.26**		
Acid soluble Iron, Fe_2O_3*	**0.13**	**0.11**		
Acid soluble Calcium, CaO	**4.52**	**2.67**		
Acid soluble Magnesium, MgO	**0.75**	**0.80**		
Acid soluble Sulphate, SO_3	**0.60**	**0.37**		
Loss on Ignition	**9.75**	**6.38**		
Organic matter	**(6.65)**	**(4.88)**		
Total	**99.99**	**99.99**		

Calculated Mix Proportions				
Composition to nearest 0.5%	**% by mass of dry mass**			
Organic Binder : Non-hydraulic lime : sand				
Organic Binder	**6.5**	**5.0**		
Lime	**6.5**	**3.5**		
Sand	**87.0**	**91.5**		
Remarks	**-**	**-**		