

# Walling & Masonry

v1.12







## Product Range

Lansdowne	4
Kingston	8
Specials	12
Advantages of Tobermore Facing Bricks	16
Country Stone	18
<b>Technical Information</b>	24
<b>Instructions &amp; Warnings</b>	32

# Walling & Masonry

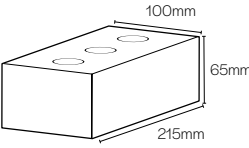




# Lansdowne

## Rustic effect facing brick.

Lansdowne facing brick is manufactured with a warm and aged feel. Lansdowne bricks are known for their hard-wearing capabilities and exceptional long-lasting colours.



Size

- Tumbled to give an aged, rustic appearance
- Evokes timeless warmth and elegance
- Vibrant long-lasting colours
- Suitable for both modern or period properties

 **Ef-Stop®**





# Lansdowne Facing Brick



## Specification

Product type	Concrete facing brick
Manufactured to	BS EN 771-3:2011
Manufacturing process	Processed to give aged appearance
Brick type	Perforated (3 holes per brick)
Efflorescence	Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence
Mean compressive strength	22N / mm²
Dimensional stability (Moisture movement / shrinkage)	<0.6mm / m
Weight	2.7kg per brick (average)
Durability	(Freeze/thaw) F2 (severe exposure)
Tolerances	Category D2
Reaction to fire	A1
Water vapour permeability	5/15 µ
Water absorption	2.9g/(m² x s)
Soluble salts	S2
Direct Airborne Sound Insulation- Gross density	1900 kg/m³
Shear bond strength	0.15N/mm²
Flexural Bond Strength	NPD
Thermal Resistance (Conductivity)	Protected 1.59W/m K, Exposed 1.70 W/m K
Mortars & Expansion Joints	Refer to BS 5628-3:2005
Bed Reinforcement	Refer to BS 5628-3:2005
Specials	Range of complementary brick specials are available
Installed to	Refer to BS 5628-3:2005
BS	Plus F10 215 Create 45-80-50/302
Applications	Please refer to Table 15 of PD 6697: 2010. For further details please refer to www.tobermore.co.uk
Energy used	100% renewable energy
Water used	100% from our rainwater harvesting system and groundwater bore hole
Recycled content	Not less than 10%
Carbon footprint	0.31kg Co²e/unit
Recyclable	100% of this product can be recycled
Manufacturing & Delivery	From one location within the UK
breeam rating	A+, according to the Green Guide to Specification, 4th Edition 2009.

Tobermore products are manufactured in accordance with an accredited ISO 9001:2015 quality management. Manufacturing facilities are accredited to ISO 14001:2015 environmental management. The company publish environmental labels and declarations in accordance with BES 6001.

## A

Aged

Finish

## Stock

product	size (mm)	colours available	in stock	no. per pack	no. per slice	weight kg per pack GB	weight kg per pack NI/ROI
Lansdowne	215 x 100 x 65	Autumn Gold, Burren, Charcoal, Cottage Red, Heather, Meadow Gold, Slate	Yes	480	96	1369	1360

### Autumn Gold



### Burren



### Cottage Red



### Charcoal



### Heather



### Meadow Gold



### Slate







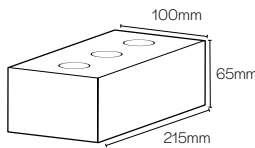
# Kingston

Versatile, smooth facing brick.

The sophisticated Kingston Facing Bricks, are manufactured with a smooth vibrant finish. With five colour options, ranging from vivid red and gold tones to understated grey and stone shades, Kingston is suitable for any type of application.

- Manufactured with a smooth, sophisticated surface
- Vibrant long-lasting colours
- Suitable for both modern or period properties

 **Ef-Stop®**



Size





Kingston

S  
Smooth  
Finish

BIM  
Level 2



Specification



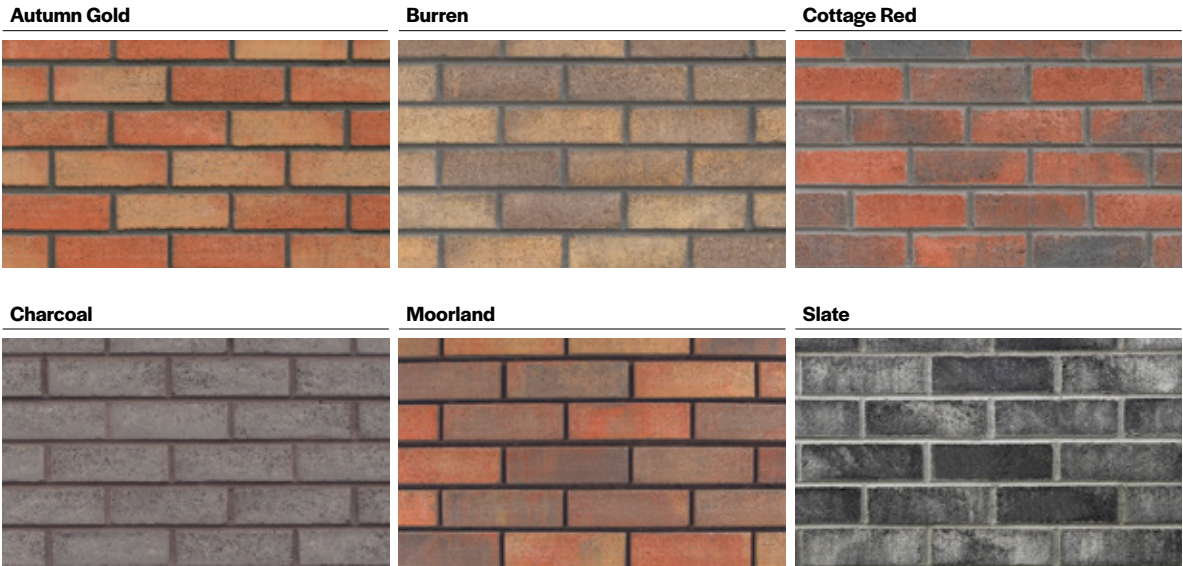
Product type	Concrete facing brick
Manufactured to	BS EN 771-3:2011
Brick type	Perforated (3 holes per brick)
Efflorescence	Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence
Mean compressive strength	22N / mm²
Dimensional stability (Moisture movement / shrinkage)	<0.6mm / m
Weight	2.7kg per brick (average)
Durability	(Freeze/thaw) F2 (severe exposure)
Tolerances	Category D2
Reaction to fire	A1
Water vapour permeability	5 /15 µ
Water absorption	3.7g /(m² x s)
Soluble salts	S2
Direct Airborne Sound Insulation- Gross density	1900 kg/m³
Shear bond strength	0.15N /mm²
Flexural Bond Strength	NPD
Thermal Resistance (Conductivity)	Protected 1.59W/m K, Exposed 1.70 W/m K
Mortars & Expansion Joints	Refer to BS 5628-3:2005
Bed Reinforcement	Refer to BS 5628-3:2005
Specials	Range of complementary brick specials are available
Installed to	Refer to BS 5628-3:2005
NSI	Plus F10 215 Create 45-80-50/302
Applications	Please refer to Table 15 of PD 6697: 2010. For further details please refer to www.tobermore.co.uk
Energy used	100% renewable energy
Water used	100% from our rainwater harvesting system and groundwater bore hole
Recycled content	Not less than 8%
Carbon footprint	0.31kg Co²e /unit
Recyclable	100% of this product can be recycled
Manufacturing & Delivery	From one location within the UK
Breeam rating	A+, according to the Green Guide to Specification, 4th Edition 2009.

Tobermore products are manufactured in accordance with an accredited ISO 9001:2015 quality management. Manufacturing facilities are accredited to ISO 14001:2015 environmental management. The company publish environmental labels and declarations in accordance with BES 6001.

Stock

product	size (mm)	colours available	in stock	no. per pack	no. per slice	weight kg per pack GB	weight kg per pack NI/ROI
Kingston BIM	215 x 100 x 65	Autumn Gold, Burren, Charcoal, Cottage Red, Moorland, Slate	YES	440	44	1220	1220

BIM - This product is available to download from our website in BIM Level 2 format.





# Specials

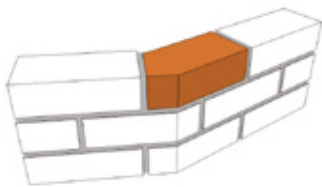
## Lansdowne & Kingston

Tobermore have produced a range of specially shaped concrete bricks to complement the standard products. These have similar names and shapes to those for clay bricks which are included in BS4729. Consequently, these bricks should be familiar as those enabling well known architectural features to be specified and achieved.

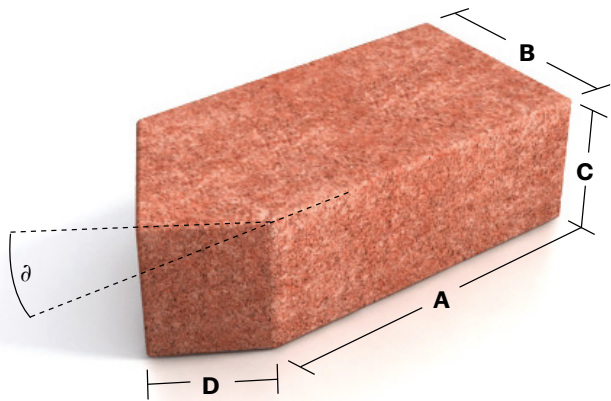
- Specials comply with the same physical tests as Tobermore’s standard bricks
- Designed to co-ordinate with metric format bricks (215x100x65mm)
- Vibrant long lasting colours



### Squint Left or Right Handed



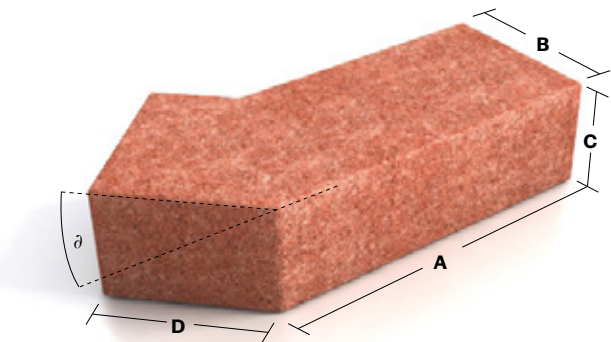
Type	A	B	C	D	$\theta$
AN 1.1	164	102	65	51	30°
AN 1.2	164	102	65	51	45°
AN 1.3	164	102	65	51	60°



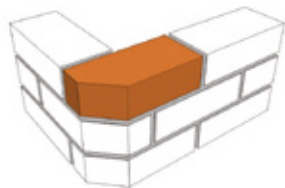
### Dog leg Left or Right Handed



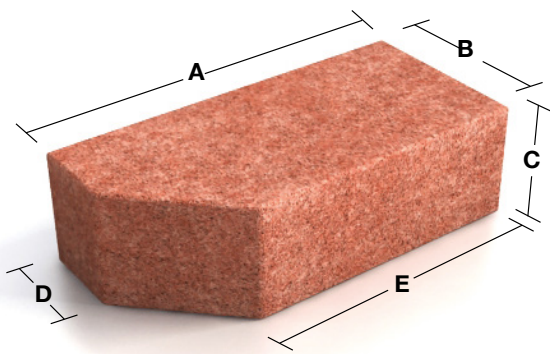
Type	A	B	C	D	$\theta$
AN 2.2	159	102	65	102	45°
AN 2.3	159	102	65	102	60°
AN 2.4	215	102	65	102	30°
AN 2.5	215	102	65	102	45°
AN 2.6	215	102	65	102	60°



### Single cant Left or Right Handed



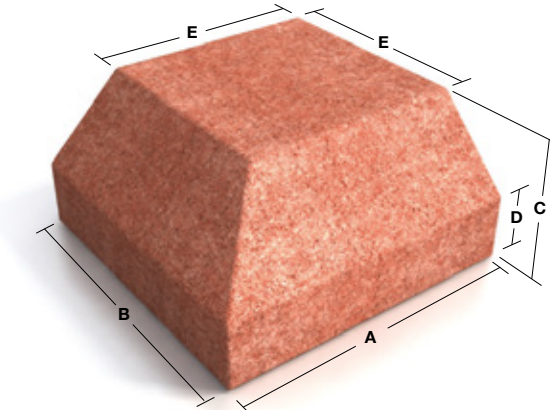
Type	A	B	C	D	E
AN 3.1	215	102	65	46	159
AN 3.2	215	102	65	60	172



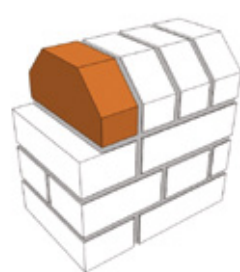
### Single cant external return Left or Right Handed



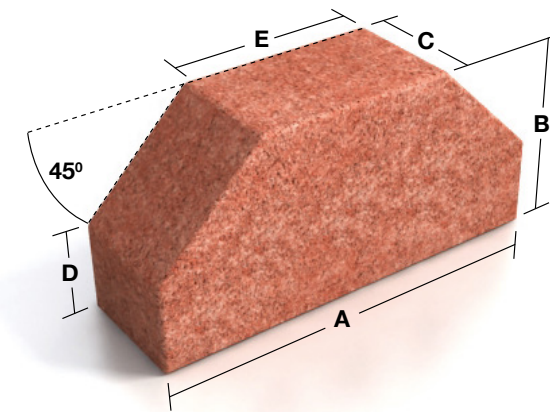
Type	A	B	C	D	E
AN 7.1	215	215	102	46	159
AN 7.2	215	215	102	60	173



### Double cant

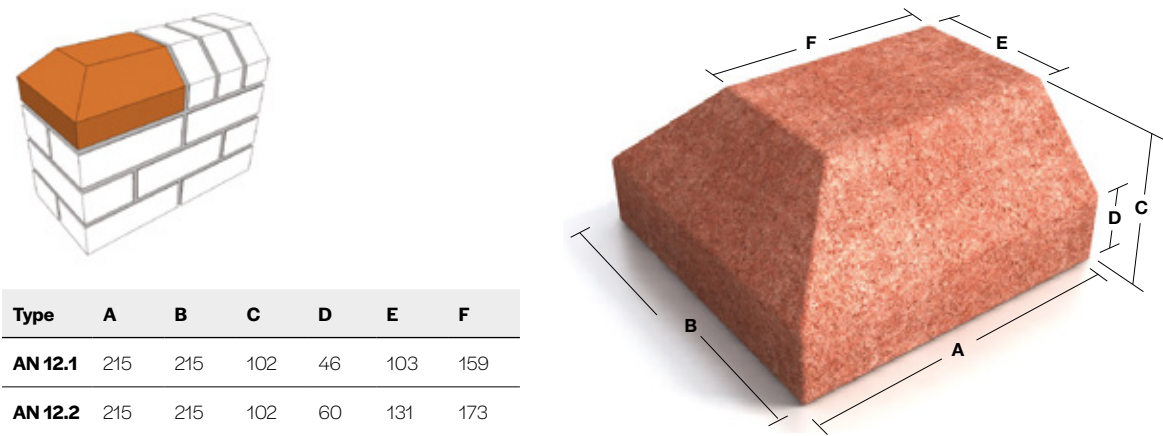


Type	A	B	C	D	E
AN 6.1	215	102	65	46	103
AN 6.2	215	102	65	60	131

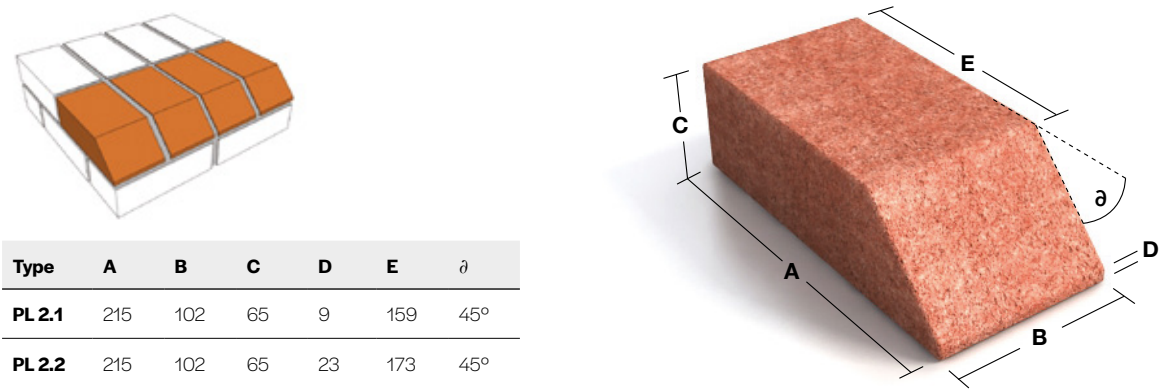


Specials

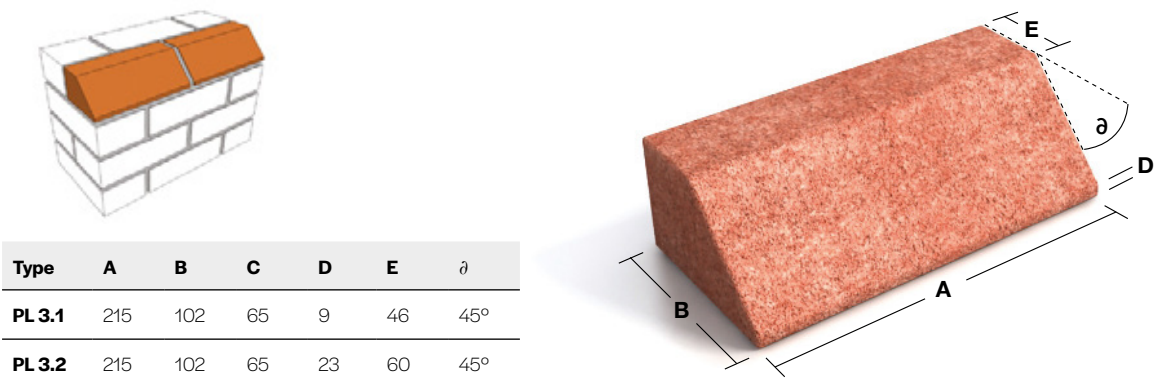
Double cant stop end



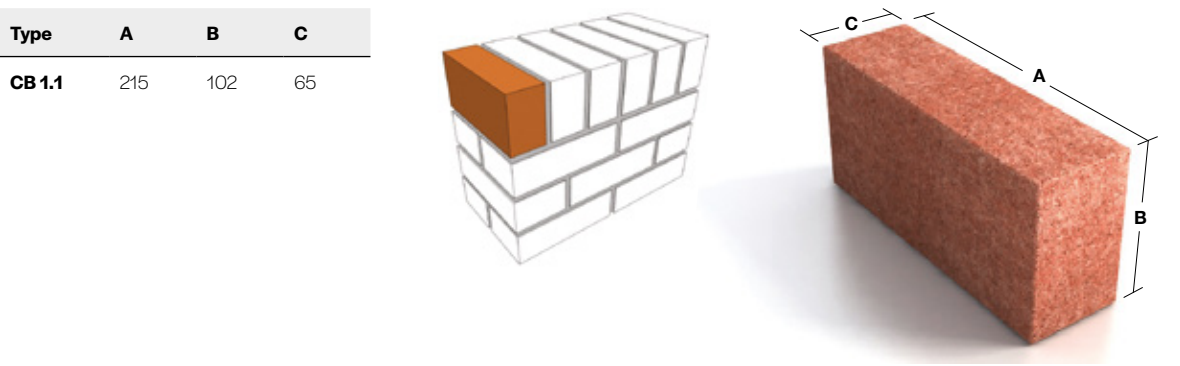
Plinth header



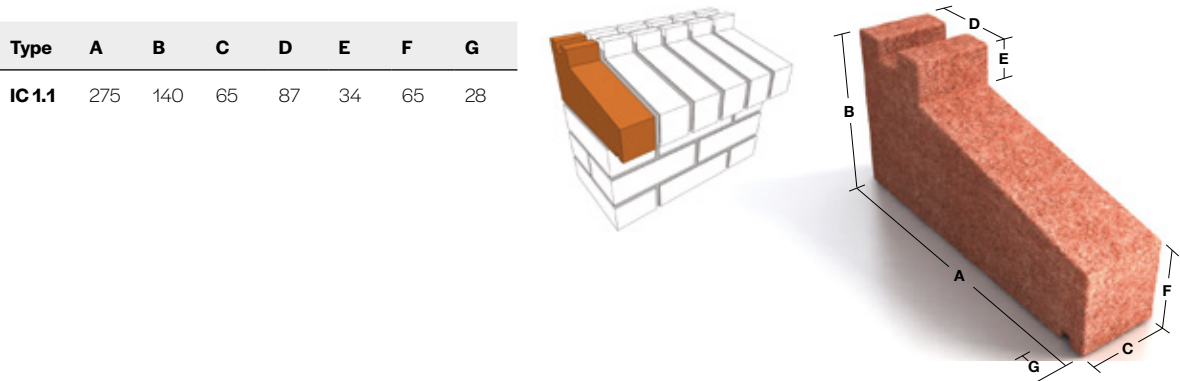
Plinth stretcher



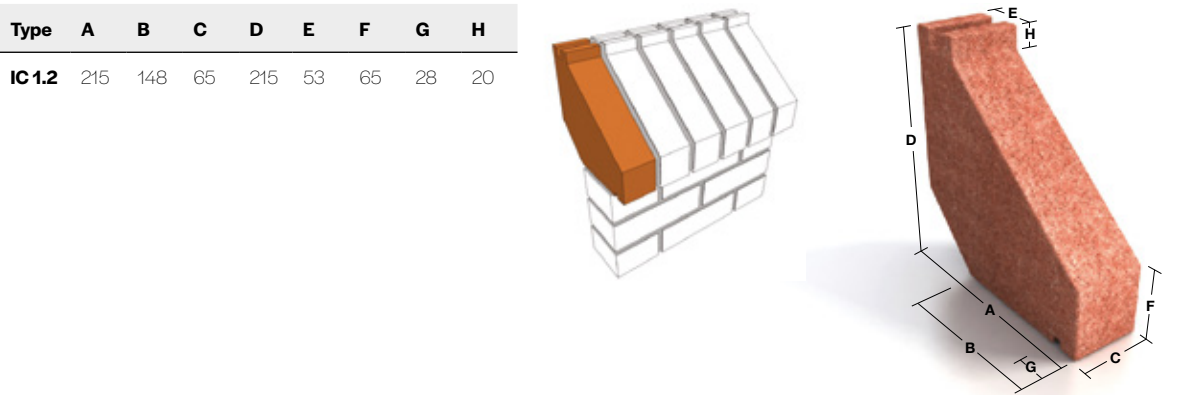
Brick closer/end block



Cill brick



Cill brick





# Advantages

## of Tobermore Facing Bricks

Tobermore are a **World Class** manufacturer and therefore our products provide a number of **significant advantages**.

### Manufacturing standards

Tobermore products are manufactured in accordance to an accredited ISO9001:2008 quality system. The facing brick products are manufactured to BS EN 771-3:2011

### Environmental Standards & Credentials

Manufacturing facilities are accredited to ISO14001:2004 Environmental Management. The company publish Environmental labels and declarations in accordance to ISO14021:2001. Facing brick have a Carbon Footprint of 22kgCo2/m2. All facing bricks are manufactured with 100% renewable energy and 100% water used from rainwater harvesting systems.

### Availability & Delivery

Tobermore have one of the largest factories in the UK and Ireland which spans over a 50 acre site. Product is available from stock or made to order within a very short time frame (2-3 weeks). Over 98% of GB deliveries arrive on the day of request which provides customers confidence in supplying material on time.

### Colour

Tobermore only use the best Iron Oxide pigments available on the market to produce the distinctive colour range available within facing brick. These pigments are manufactured to BS EN 12878. The colour is throughout the product. Tobermore can demonstrate the excellent colour retention properties through completed projects.

### Durability

All Tobermore facing bricks are categorised as frost resistant (F2) as proven by independent laboratory tests.

### Voids

Tobermore facing brick are manufactured with three perforated voids in each brick. This provides significant benefits to the brick layer as the product will bond to the mortar on both sides. This will help to reduce the issue of floating.

### Strength

Tobermore facing bricks exceed a minimum crushing strength in excess of 22N/ mm2 and comfortably exceed the performance requirements of the standard. Tobermore facing brick will gain strength with age.

### Efflorescence

Tobermore use market leading vapour curing technology in the manufacture of all facing bricks. Facing bricks are vapour cured for a minimum 12 hour period which significantly reduces the possibility of efflorescence.

### Choice

Tobermore produce facing bricks in colours which fully complement and blend with the wide range of block paving and paving flag products also on offer.

### Tolerances

Tobermore manufacture products on the best manufacturing machines and moulds available on the market. This ensures tolerances are accurate and consistent.

### Aggregates

Tobermore own and produce the sand and aggregate which is used to manufacture the product. This ensures we are in complete control of the main raw materials and guarantees consistency of quality.

### Packs

Tobermore facing brick packs are palletised, shrink wrapped, and weigh approximately 1.2 tonne. Blended coloured bricks are contained within each pack. It is desirable to mix from three or four different pallets.

### Specials

Tobermore have an extensive range of specials available.



### Vibrant long-lasting colours\*

Tobermore only use high quality Iron Oxide pigments, (which are made to BS EN 12878), to produce our strong, vibrant and deep colours. Our state-of-the-art equipment makes our products extremely dense thus ensuring that our colours remain intact for very long periods. For example when we examine products which are 10 years old we can see that the colour retention is excellent. Tobermore would recommend that to maintain the colour and quality of product a regular maintenance programme is carried out on all projects.

# Superb Colour Retention

## Lansdowne projects revisited

Tobermore's quality facing bricks have proven colour retention. We recently revisited a few of the prestigious developments that were built in 2004. The development below was built by private developer Gerry Mathews whose company S.K.G. earned a reputation for building quality homes. 10 years on and the Lansdowne Heather facing bricks at Lisroland View have the same rich, vibrant colours that impressed Gerry Mathews when he was selecting the bricks back in 2004.



Ten years on and Tobermore's Lansdowne Brick still look fantastic. Quality is at the forefront of our business and we are very impressed with the performance of this product."

**Gerry Mathews**  
Building Developer

**2004**



**2014**



We were also impressed with this housing development in Glengormley which was built by Hagan Homes in 2004. The Lansdowne Warm Red looks great and has certainly retained its rich colour.

**2004**



**2014**





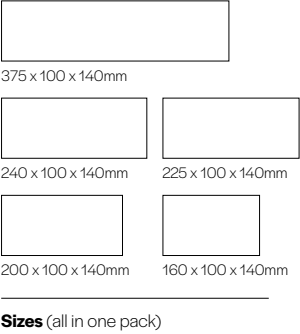


# Country Stone

Rugged stone effect.

Country Stone has a nostalgic appearance, with a rugged finish emulating the distinct aesthetics of natural stone.

- Emulates natural stone
- Vibrant long-lasting colours
- Creates a classic, vintage look





# Country Stone



SF  
Split  
Face  
  
Finish

BIM  
Level 2



## Specification



Product type	Concrete facing brick
Manufactured to	BS EN 771-3:2011
Efflorescence	Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence
Mean compressive strength	20N / mm <sup>2</sup>
Installed to	Refer to BS 5628-3:2005
Dimensional stability (Moisture movement / shrinkage)	0.9mm / m
Durability	(Freeze/thaw) F2 (severe exposure)
Tolerances	Category D2
Reaction to fire	A1
Water absorption	16.53g / (m <sup>2</sup> x s)
Water vapour permeability	30/100 μ
Direct Airborne Sound Insulation - Gross density	2020kg / m <sup>3</sup>
Shear bond strength	0.15N / mm <sup>2</sup>
Flexural Bond Strength	NPD
Thermal Resistance (Conductivity)	Protected 1.25W/m K, Exposed 1.43W/m K
Mortars & Expansion Joints	Refer to BS 5628-3:2005
Bed Reinforcement	Refer to BS 5628-3:2005
NS	Plus F10 295 Create 45-80-50/322
Applications	Please refer to Table 15 of PD 6697: 2010. For further details please refer to <a href="http://www.tobermore.co.uk">www.tobermore.co.uk</a>
Energy used	100% renewable energy
Water used	100% from our rainwater harvesting system and groundwater bore hole
Recycled content	Not less than 5%
EPD Carbon footprint	29.17kgs Co <sub>2</sub> e / m <sup>2</sup>
Recyclable	100% of this product can be recycled
Manufacturing & Delivery	From one location within the UK
Breeam rating <a href="http://www.bre.co.uk">www.bre.co.uk</a>	A+, according to the Green Guide to Specification, 4th Edition 2009.

Tobermore products are manufactured in accordance with an accredited ISO 9001:2015 quality management. Manufacturing facilities are accredited to ISO 14001:2015 environmental management. The company publish environmental labels and declarations in accordance with BES 6001.

## Stock

product	size (mm)	colours available	in stock	m <sup>2</sup> per pack	m <sup>2</sup> per slice	no. per pack	weight kg per pack GB	weight kg per pack NI/ROI
Country Stone (single course mixed length) (all sizes in one pack)	375 x 100 x 140 225 x 100 x 140 160 x 100 x 140 240 x 100 x 140 200 x 100 x 140	Bracken, Heather, Slate	YES	6.72	1.34	40 40 40 40 40	1560	1560
Country Stone Coping	208 x 300 x 80	Bracken, Heather, Slate	YES	-	-	128	1416	1416

Heather	Bracken	Slate
		



# Laying Guidelines

**Pillars**  
The Country Stone range is commonly used to construct pillars, entrances, and boundary walls.

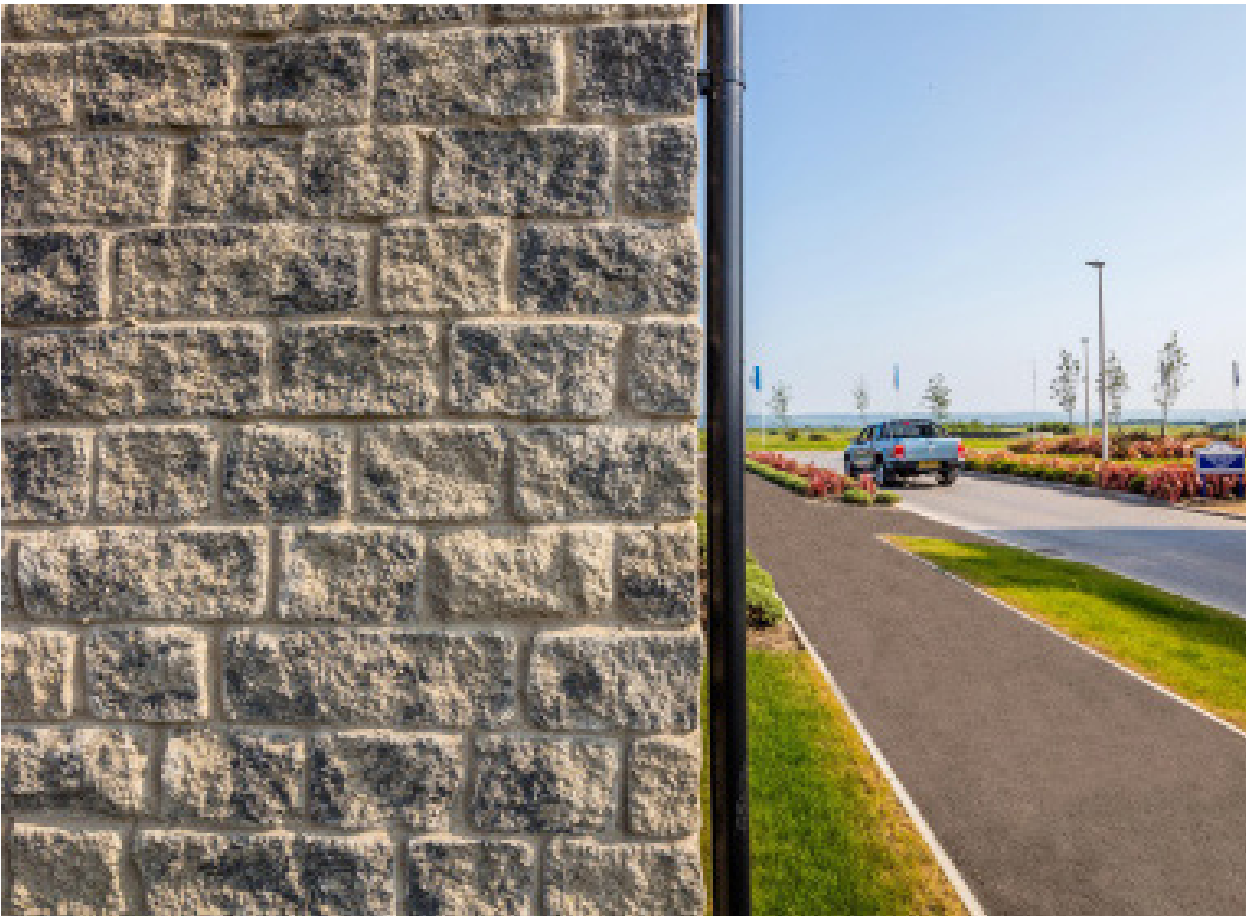
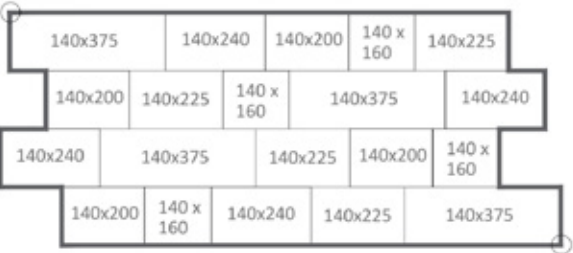
**Copings & caps**  
Tobermore supply a specific coping that is suitable for Country Stone. The Country Stone coping is textured on both ends and ensures the wall is capped with an appropriately finished product.

**Example Bonding Pattern**  
Country Stone Walling mixed pack  
5 various block lengths X 140mm course height

Product	Sizes Per Pack
<b>Country Stone</b> (single course mixed length, all sizes in one pack)	375×100×140
	225×100×140
	160×100×140
	240×100×140
	200×100×140

A mixed pack of Country Stone walling contains 5 different block lengths which are all 140mm course height. They are built randomly by mixing all five sizes ensuring that perpendicular joints do not directly line up.

Below is one example of how this can be achieved.



# Superb Colour Retention

Country Stone Walling Project Revisited

2005



2015





# Technical Information

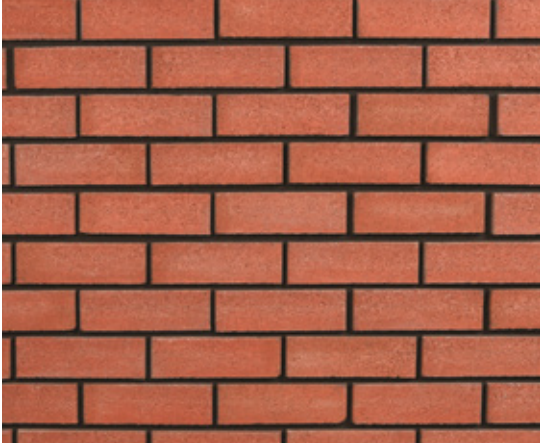
## Walling & Masonry

<b>Important Information</b> Any technical information provided by Tobermore in relation to any product (whether before or after order) is provided by way of GUIDANCE ONLY and, to the fullest extent permitted by law, without liability on the part of Tobermore for any loss or damage suffered as a result of relying upon it.  Such technical information should not be relied upon in substitution for obtaining independent expert advice prior to using any product from both a suitably qualified engineer and building contractor, in particular, as to the suitability of the product for use at the intended site for the intended scheme.	<b>PD 6697:2019</b>  Recommendations for the design of masonry structures to BSEN 1996-1-1 and BSEN 1996-2.  This publication includes the information that was incorporated in BS 5628, which is now withdrawn and which does not contradict that given in EN 1996.
	<b>Note</b>  BS guidelines are subject to change and therefore you should refer to <a href="http://www.bsigroup.com">www.bsigroup.com</a> for the latest version.

Walling and masonry are well established forms of construction in the UK. The products incorporated are comprehensively covered by British Standards. Guidance is available from BSI to ensure that the products are professionally installed. One issue which is repeatedly raised is the suitability of Tobermore concrete bricks and Country Stone Walling for use below the damp-proof course. Tobermore products have a long history of successful installation below the dpc and provided the guidance for design, installation and maintenance is followed their use in this location is recommended (see Table1). Refer to the references below for the detail. Tobermore recommend a maximum spacing of 6m for movement joints when used with the correct mortar and design principles in accordance with PD6697.

### Vibrant Long Lasting Colours

Tobermore only use high quality Iron Oxide pigments, (which are made to BS EN 12878), to produce our strong, vibrant and deep colours. Our state-of-the-art equipment makes our products extremely dense thus ensuring that our colours remain intact for very long periods. For example, when we examine products which are 10 years old we can see that the colour retention is excellent. Tobermore recommend that to maintain the colour and quality of product a regular maintenance programme is carried out on all projects.



## Installation

Concrete walling products are manufactured from a mixture of CEM II Cement and aggregate which is vibrated into moulds and subsequently cured in a warm vapour atmosphere for 12 hours which ensures efflorescence is dramatically reduced. Moreover the vapour curing also enhances the colour, improves the strength and cures the products much faster.

### British Standard

Concrete walling products are manufactured to comply with are made to comply with BS EN 771-3: 2011+A1: 2015 which is the Specification for Masonry Units Part 3 Aggregate Concrete Masonry Units (Dense and Lightweight Aggregates). The Specification applies to all aggregate concrete masonry units, i.e. bricks and blocks in UK terminology. Tobermore concrete bricks are nominally 215mm long, 100mm wide (thick) and 65mm high, and comply with the traditional UK definition.

### Declaration of Performance

Compliance with the Specification BS EN 771-3:2011 + A1: 2015 is demonstrated by Tobermore producing a Declaration of Performance (DoP) for each brick type. These documents which are available on the Tobermore website [www.tobermore.co.uk](http://www.tobermore.co.uk) lists the properties of the product as required by the Specification, e.g. compressive strength, dimensions and density are all given by Tobermore in a legal declaration. The CE mark, which gives the same information, accompanies the product and signifies that the declaration has been made and consequently the products meet the legal requirements for sale in all of the countries in the European Single Market.

### Design Guidance

The way in which the designer uses the declared information and the way the builder constructs the brickwork are covered by guidance in other relevant documents. Key to this is the European Code of Practice, Eurocode 6 - Design of Masonry Structures. This comes in the following parts:

- 1.2 General Rules for Reinforced and Unreinforced Masonry (BS EN 1996-1-1)
- 2.1 General Rules - Structural Fire Design (BS EN 1996-1-2)
- 3.1 Design Considerations, Selection of Materials and Execution of Masonry (BS EN 1996-2)

A further part, Part 3: Simplified Calculation Methods for Unreinforced Masonry Structures exists, but gives very conservative designs and its use is not encouraged in the UK. The Eurocode covers all masonry construction throughout Europe but because of the widely varying traditions, it cannot do that in detail. Consequently, a lot of the detail which is relevant to the UK is given in Published Document; Recommendations for the Design of Masonry Structures to BS EN 1996-1-1 and BS EN 1996-2, PD 6697: 2019.

Whilst there is much that is helpful in the official guidance, manufacturers' recommendations should be followed in order to achieve successful results.

Tobermore walling products are used to provide the appearance of the building, this is generally not the case with concrete blocks

and there are important differences between concrete and clay bricks. All masonry units expand or contract to some extent due to temperature and moisture effects. Clay masonry units respond to changes in temperature, they demonstrate a small reversible movement due to wetting and drying but importantly demonstrate a long term irreversible expansion as they adsorb water from the atmosphere. On the other hand, concrete walling products shrink as they dry out. The way to deal with this in concrete brickwork is to subdivide walls into smaller panels by introducing movement joints which should be provided at intervals between 6m and 9m. The length to height ratio of panels should not exceed 3:1. It is also important to not allow concrete bricks to become excessively wet before they are laid, or for new brickwork to do so before it is adequately protected by good architectural details.

There are other differences between concrete and clay units, e.g. Tobermore walling products are very consistent in size and hence the brickwork has a regular, precise appearance which, although possible with some clay bricks, is not with others due to natural variability in size due to the making, drying and firing processes. The Tobermore Lansdowne are consistent in size, however they are tumbled which gives softer edges and less precise arises.



## Design for Movement

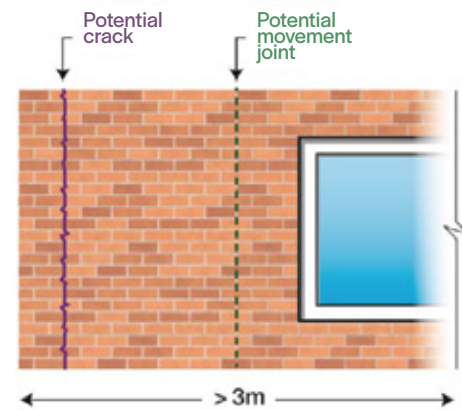
The provisions of the Eurocode for masonry are written as a principle followed by a series of application rules to achieve the principle. In the case of movement, the principle is:

“The possibility of masonry movement shall be allowed for in the design such that the performance of the masonry in use is not adversely affected by such movement.”

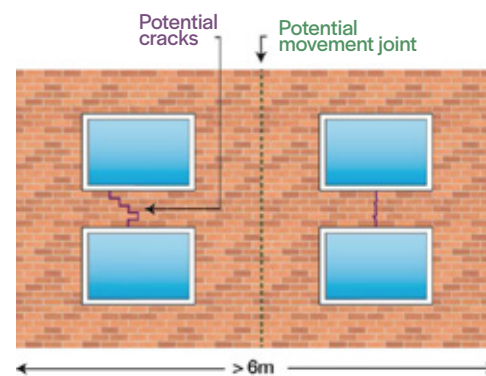
The way of achieving this situation is by the use of movement joints as described earlier to subdivide large areas of brickwork into smaller panels such that in particular, shrinkage of the brickwork does not allow sufficient tension to build up

in the wall that it cracks. Consequently, long low panels are to be avoided. The maximum spacing of movement joints is a national matter and the National Annex to BS EN 1996-2 recommends a value of 9m for concrete brickwork with the provision that it may be less if the length: height of the sub-panel created exceeds 3:1. In practice, movement joints are often spaced at 6m - 9m as recommended in PD6697. Tobermore recommend a maximum spacing of 6m.

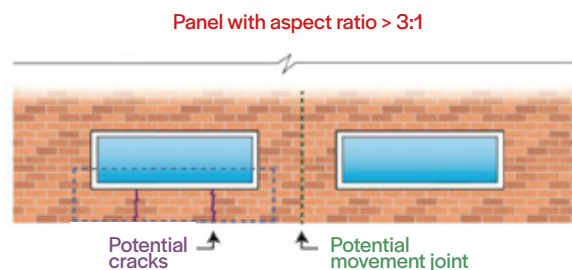
The following illustrations show some situations where cracking can occur and how it can be alleviated by the introduction of movement joints.



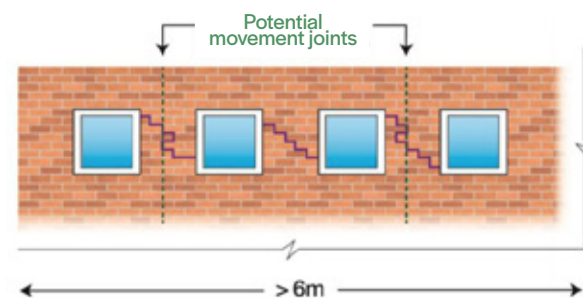
**Fig.1:** Corners are very stiff joints. A run of brickwork more than half the minimum allowance can lead to cracking near to the corners.



**Fig.2:** A long uninterrupted run of brickwork between upper and lower windows can lead to cracking at the smallest height, i.e. between the windows either as shown or from the corners of the windows. Cracks may be vertical or stepped – they follow the line of least resistance.



**Fig.3:** Long, low panels (> 3:1 ratio) should be avoided. These panels shrink between the more heavily loaded brickwork between the windows.



**Fig.4:** Long runs of uninterrupted brickwork, especially when vertical loading is low, can lead to diagonal cracking of narrow brickwork panels between window openings.

Current guidance focuses on ensuring movement joints are located where they are needed in relation to interaction with other structural elements, restraints, corners, etc. and is based upon experience rather than calculation. Movement joints in concrete brickwork should not be less than 10mm thickness. They must, of course, be free from mortar.

In concrete masonry the principal effect is shrinkage and relatively incompressible materials such as hemp, fiberboard and cork can be used. The joints must be sealed with a sealant that will resist rain penetration and a guide to the selection of sealants is given in BS 6213.

## Durability

Although durability is covered in the Specification for Concrete Bricks (BS EN 771-3: 2011 + A1: 2015) it is rather unsatisfactory from the user point of view. The manufacturer is required to declare the freeze thaw resistance by reference to the provisions valid in the place of use until an appropriate European Standard is available. There were no requirements in the previous Standard, BS 6073-1: 1981 and durability is dealt with by Code of Practice guidance. At the European level, this is limited. Where masonry is exposed to moisture, wetting, or extreme wetting and freeze thaw cycling, but excluding exposure to external sources of significant levels of sulfates or aggressive chemicals, the bricks are required to be freeze thaw resistant. In more aggressive situations, the guidance is to consult the manufacturer. PD 6697 is more helpful and contains a table describing the various locations in buildings. For each location, the minimum compressive strength of a concrete brick that is suitable for that location, together with a minimum mortar classification is required. The only exception to this is that concrete walling products are not considered to be suitable to act as masonry DPC's.

Table 15 in PD 6697 is useful; however there are several different minimum brick compressive strengths for the various locations. Tobermore walling products are declared as frost resistant. In this context, this means that Tobermore facing bricks are suitable for all locations except cappings, copings, sills, earth retaining walls without waterproofing on the retaining face, or in foul drainage. Although not covered in BS EN 771-3, concrete bricks do not contain soluble sulfates and hence the reference in the Eurocode is to sulfates from external sources. In these circumstances, the manufacturer's advice should be sought.

### Resistance to Rain Penetration

The principal guidance on the design and detailing of walls is given in PD 6697. This covers the thickness of single leaf walls and cavity walling, including reference to a minimum air space and the introduction of cavity insulation.

The guidance is comprehensive and authoritative. There are no specific provisions that one would make for concrete brickwork. Concrete and clay brickwork are dealt with in the same way.

## Selection of Mortars

In general, the common guidance for the selection of mortars in most situations is to use a mortar that is no stronger than is required for structural or durability reasons. This is relevant to concrete brickwork as these are susceptible to drying shrinkage and if this were to cause cracking, it is far preferable that it is contained within the joints. It may then be viewed as negligible or relatively easy to repair by raking out and repointing.

The selection of mortars for durability is covered in table 15 of PD 6697 and for most situations in facing masonry a mortar with compressive strength class M4 is suitable. This is a mortar which would be expected to achieve a compressive strength of 4N/mm<sup>2</sup> after 28 days. A mortar prescribed by its mix of constituents by volume traditionally considered to be equivalent to an M4 mortar would be a 1:1:5-6, Ordinary Portland Cement:lime:sand mortar, the range of proportions of the sand content reflecting its grading. The designer should be aware that if the cement used is a CEM II the OPC content may be 65% only and the volume proportions may need to be reconsidered. Exceptions to the use of strength class M4 are work near to ground level or in earth retaining structures. Where concrete brickwork is being used in structural situations, the engineer will select a mortar such that the strength when used with the facing will achieve the compressive, flexural and shear strength in the brickwork that is required according to the provisions of Eurocode 6, BS EN 1996 1-1.

Tobermore concrete walling products meet the minimum strength requirements for all dwellings constructed using Approved Document A of the Building Regulations and BS 8103-2: 2013 Structural Design of Low Rise Buildings, Part 2: Code of Practice for Masonry Walls for Housing. The mortars should be selected using table 15 of PD 6697 but will generally be an M4 strength class (lower classes are not permitted).



## Good Practice on site

### Workmanship

Good site practice for the use of Tobermore concrete walling products is no different to that for clay walling products. The only issue worthy of comment is that of adjusting the suction of concrete bricks which is better solved by using a water retentive additive in the mortar. However, the suction of Tobermore concrete walling products is low and this is unlikely to be an issue. The appearance of facing brickwork can be ruined by lack of care on site. In particular care is needed to avoid mortar adhering to the walling products face.

### Prior to commencement of work (Construction Drawings and Movement Control)

When movement control measures have not been included in the design drawings, or when design drawings have been produced based on the use of clay facing bricks, we strongly recommend that the designers are made aware of the change to masonry units and drawings are updated to reflect this change in materials prior to any work commencing.

### Storage and Handling on site

Masonry units should be stored in dry conditions. Tobermore products are supplied in shrink wrapped packs which should remain sealed until they are required. The shrink wrapping provides protection from the weather. If this is removed, it should be replaced, or alternative protection provided. Bricks should be stored on sound, level ground and raised so that they are clear of any wet / muddy areas. This prevents the possibility of contamination and staining. Masonry units should be kept in storage areas which are close to where they will be required. This helps to reduce unnecessary handling which will minimise any damage or waste. Best practice is to ensure units are protected from the weather during storage on site and during construction.

### Protection During Construction

Newly constructed work should be protected from rain, snow, frost and excessive drying out using waterproof coverings which allow air to circulate. Best practice precautions will help to reduce the likelihood of subsequent efflorescence, shrinkage, patchy mortar colour, staining, and movement. Any materials which are used in conjunction with masonry units should also be stored under protection.

Material stacked out on scaffolding should also be fully protected whenever rain causes an interruption to work and overnight.

### Distribution of Units on Site

Distributing the units to the area of work is best carried out using mechanical methods to reduce the possibility of damage and wastage. Best practice is to lift and place the units. They should always be kept as dry as possible. Opened packs and units that have been stacked out ready for use should be protected from the weather.

### Other Important Practices

- Tobermore concrete walling products should be laid on a full bed of mortar with all joints filled.
- No lift should exceed 1.5m in height in a single day. The joint profile should be finished to the specified profile. The specified joint profile should be formed after leaving the mortar to harden slightly. Tooling is recommended to

compact the joints, improve weather resistance and to reduce shrinkage in the mortar. Joints should be finished depending on the overall effect required. It is vital that all horizontal and vertical joints must be compacted and free from voids. Shell bedding should not be used. Recessed or flush pointing is not recommended in high exposure areas.

- Tobermore concrete brickwork should not be built in temperatures below 3°C and frozen materials should not be used. Masonry units should be constructed in areas that are greater than 10m away from de-icing salts.

### Selecting Bricks on Site for Use

To achieve the best possible finish, we recommend the following advice is followed to evenly distribute any slight variations in shade, colour and texture over a large area. When the circumstances allow complete one house / building by using masonry units taken from the same batch. This is achieved by checking the batch code label displayed on the packs. Always, thoroughly mix products from a minimum of three packs. Where products are supplied in packs with vertical slices always take them “vertically slice by slice” this ensures that colours are distributed evenly. When the circumstances do not allow the use of products from the same batch then it is extremely important to minimise possible colour banding /shading by always, thoroughly mixing products from a minimum of three packs concurrently with some overlap between deliveries / batches. If a noticeable variance in colour / shade or texture is visible, do not proceed with the installation and contact your supplier for further guidance. Best practice is to make regular visual checks to ensure the blending of colours is consistent.

### Bed Joint Reinforcement

To control stresses within the brickwork Bed joint reinforcement (BJR) may be used in certain instances. We would recommend taking project specific advice from a qualified engineer.

### Wall Ties

Wall ties in accordance with PD 6697: 2019 should be used. Please refer to the tables regarding exposure zone, cavity width and type of structure. As work progresses wall ties should be built into both leaves simultaneously. They should be placed so that they fall towards the outer leaf and the drip is central, facing downwards. The number of wall ties per m2 should be in accordance with BS EN 1996-1-1:2012 +A1 2005.

### Completed Work

The finished appearance should be agreed between all relevant parties which may include the specifier, client, house builder or end user. Best practice is to construct sample panels between 1 to 1.5 square metres in size. These panels should be viewed from a distance of at least 3 metres. The brickwork should be viewed as a whole rather than viewing individual bricks. Inevitably some individual units may have small chips caused by transporting to site or movement and handling on site. However, the generally accepted industry standard is that no individual chip should be greater than 15mm. Tobermore masonry units are coloured all the way through which provides an added benefit meaning any small chips are less visible.

# Technical Information

## References

1. British Standards Institution
  - a. BS EN 771-3: 2011 + A1: 2015
  - b. Specification for Masonry Units Part 3: Aggregate Concrete Masonry Units (Dense and Lightweight Aggregates)
2. BS EN 1996: Eurocode 6: Design of Masonry Structures
  - a. BS EN 1996-1-1: 2005 + A1 2012
  - b. Part 1.2: General Rules for Reinforced and Unreinforced Masonry Structures
  - c. BS EN 1996-1.2: 2005
  - d. Part 1.2: General Rules - Structural Fine Design
  - e. BS EN 1996-2: 2006
  - f. Part 2: Design Considerations, Selection of Materials and Execution of Masonry
  - g. BS EN 1996-3: 2006
  - h. Part 3: Simplified Calculation Methods for Unreinforced Masonry Structure
3. PD 6697: 2019 Published Document Recommendations for the Design of Masonry Structures to BS EN 1996-1-1 and BS EN 1996-2
4. BS EN 845-3: 2013 + A1: 2016 Specification for Ancillary Components - Part 3: Bed Joint Reinforcement of Steel Meshwork
5. BS 6213: 2000 + A1: 2010 Selection of Constitution Sealants - Guide
6. BS 8103-2: 2013 Structural Design of Low Rise Buildings - Part 2: Code of Practice for Masonry Walls for Housing
7. BS EN 772-14: 2002 Methods of Test for Masonry Units
  - a. Part 14: Determination of Moisture Movement of Aggregate Concrete and Manufactured Stone Masonry Units
8. HM Government The Building Regulations 2010 Approved Document A Structure
9. HMSO National Building Studies: Bulletin No 4 1948 Sand Lime and Concrete Bricks
10. Building Research Station Digest No 6 1957 The Avoidance of Cracking in Masonry Construction of Concrete or Sand-Lime Bricks
11. Roberts, J.J, Tovey; A.K, Cranston; W.B and Beeby, A.W



Table 1

Specification for Concrete Bricks for Durability

Masonry Condition or Situation	Tobermore Masonry	Mortar Type
(A) Work below or near external ground level		
A1 Low Risk of Saturation with or without Freezing	Kingston, Lansdowne, Country Stone	Mortar M4
A2 Low Risk of Saturation with or without Freezing		
(B) Masonry DPC's		
B1 in Buildings	Not Suitable	N/A
B2 in External Works		
(C) Unrendered External Walls (other than chimneys, cappings, copings, parapets and sills)		
C1 Low Risk of Saturation	Kingston, Lansdowne, Country Stone	Mortar M4
C2 High Risk of Saturation		
(D) Rendered External Walls (other than chimneys, cappings, copings, parapets and sills)		
Rendered External Walls	Kingston, Lansdowne, Country Stone	Mortar M4
(E) Internal Walls and the Inner Leaves of Cavity Walls		
Internal Walls and Inner Leaves of Cavity Walls	Kingston, Lansdowne, Country Stone	Mortar M4
(F) Unrendered Parapets (other than cappings or copings)		
F1 Low Risk of Saturation e.g. low parapets in some single story buildings	Kingston, Lansdowne, Country Stone	Mortar M4
F2 High Risk of Saturation e.g. where a capping only is provided		Mortar M6 for Country Stone in F2
(G) Rendered Parapets (other than cappings or copings)		
Rendered Parapets	Kingston, Lansdowne, Country Stone	Mortar M4
(H) Chimneys		
H1 Unrendered with Low Risk of Saturation	Kingston, Lansdowne, Country Stone	Mortar M4
H2 Unrendered with High Risk of Saturation		Mortar M6 for Country Stone in H2
H3 Rendered		
(I) Cappings, Copings and Sills		
VCappings, copings and sills	Country Stone	Mortar M6
(J) Freestanding Boundary Walls and Screen Walls (other than cappings and copings)		
J1 With Coping	Kingston, Lansdowne, Country Stone	Mortar M4
J2 With Capping		Mortar M6 for Country Stone in J2
(K) Earth Retaining Walls and Screen Walls (other than cappings and coping)		
K1 With Waterproofing on Retaining Face and Coping	Kingston, Lansdowne, Country Stone	Mortar M6
(L) Drainage and Sewerage e.g. Inspection Chambers and Manholes		
L1 Surface Water	Kingston, Lansdowne, Country Stone	Mortar M4

Table 1 indicates the conditions of exposure for which Tobermore Concrete Bricks and Country Stone are suitable for use, together with the minimum Mortar Classification. This guidance is consistent with that given in PD 6697:2019, Table 15.





# Instructions & Warnings

## As referred to in Tobermore's Conditions of Sale

### CORE TERMS (PAVING & WALLING)

#### Product

All products should be carefully inspected for defects or damage upon delivery and prior to being laid or fitted.

#### Product Information

Within Tobermore, design and development of products is a continuing process, and product information is subject to change without notice. Accordingly, please check with Tobermore to ensure that the product information you have represents the most up-to-date product information.

#### Prior to Installation

Prior to opening the packs check that all the batch code labels match. The batch code labels can be found on the outer packaging. For example, 04D22N.

It is good practice to sort products to ensure consistency of colour, texture and dimensional tolerance. Any defects must be reported without delay. If products are installed with any form of defect which was clearly apparent prior to installation the installer will be responsible for all costs incurred to rectify the issue.

#### Installation

All products should be installed in accordance with the latest British Standard.

#### Colour/Shade & Texture

Tobermore produces paving and walling products with excellent density and durability. All products are manufactured in batches using naturally extracted raw materials including aggregates, pigments and cement etc. Products such as Braemar, Sienna, Fusion, Mayfair Flags, Manhattan, City Pave and Fusion Kerbs are manufactured using premium naturally occurring granite aggregates. To achieve their final appearance some products undergo secondary processes, this involves shot blasting or grinding the surface of the product.

Whilst we have several factory procedures in place to help control shade, colour and texture within and between batches we cannot guarantee consistency. This is due to the natural materials and secondary processes. Therefore, slight variations in the finished products is normal between and within batches. These variations actually enhance the character and natural beauty of the products.

To achieve the best possible finish we recommend the following advice is followed to evenly distribute any slight variations in shade, colour and texture over a large area.

When the circumstances allow complete one area of paving, one retaining wall or one house / building by using products taken from the same batch. This is achieved by checking the batch code label displayed on the packs.

Always, thoroughly mix products from a minimum of three packs.

Where products are supplied in packs with vertical slices always take them "vertically slice by slice" this ensures that colours are distributed evenly.

When the circumstances do not allow the use of products from the same batch then it is extremely important to minimise possible colour banding / shading by always, thoroughly mixing products from a minimum of three packs concurrently with some overlap between deliveries / batches.

Where products from different batches are being installed in the same area of paving, wall or building it is the installers responsibility to carry out a colour match check by comparing colours from each batch. If a noticeable variance in colour / shade or texture is visible, do not proceed with the installation and contact your supplier for further guidance.

Mixing thoroughly from a minimum of three packs is of particular importance when installing single colours such as Golden, Buff, Natural, Charcoal, Graphite, Silver, Mid-Grey, Sandstone, Alto Silver, Aaron Stone, Jura Grey and Innis Black.

During installation the installer must make regular visual checks to ensure the blending of colours is consistent.

We would always recommend that when purchasing products, especially in larger quantities, that they are all ordered at the same time.

Please note that the colour of new products will inevitably vary compared to those that have been installed for a period of time as weathering does take place.

All colour illustrations are as accurate as the printing process will allow. For a more accurate colour match please refer to actual product samples, which can be provided. Colours and textures illustrated are representations and therefore should not be expected to be an exact match.

The overall visual appearance of a completed installation should only be assessed from the normal viewing distance. Variations in colour/shade and texture are technically harmless, do not affect the products performance and are not deemed to be a product defect.

We will not be held liable for any discolouration or staining caused to product which has been stored incorrectly.

Note: Whilst we strive to ensure consistency, complimentary products such as Kerb Specials, Step Flags, Facing Brick Specials, Historic Circles etc. may not be an exact colour / texture or shade match to the standard version of the product as they will have been manufactured at varying times using different processes.

#### Tegula

Tegula is manufactured using a secondary process that distresses the edges and corners of the blocks to give the desired aged antique appearance. The process randomly distresses the blocks, therefore some blocks will be more distressed than others will, this is completely normal and does not affect the product performance.

#### Staining

Some chemicals that are commonly used in gardens such as lawn feed containing Ferrous Sulphate can stain concrete products. Any chemicals that are spilt must be removed immediately by rinsing away with clean water. Please check the information on the instruction label of the container holding the chemical.

#### Moisture

Occasionally, after installation, some units may show variations in shade and have a patchy appearance. This is due to the varying amounts of moisture within the concrete and the ground. The drying out process of concrete continues in-situ after installation. Some units may also retain more moisture than neighbouring units and take longer to dry out. This is caused by the variations in density of the naturally extracted aggregates used in the manufacturing process. Given time and natural weathering, the capillaries within the surface of the concrete will gradually close and any patches or moisture retention will dissipate as the product matures. This does not affect long-term performance.

#### Efflorescence

Efflorescence is a crystalline deposit that occurs naturally on the surface of concrete materials. It usually appears as a white deposit but can also be brown or yellow in appearance. Tobermore use market-leading technology to significantly suppress the occurrence of efflorescence, however, if it occurs, it may mask the colour of the product for a period of time, but tends to be washed away gradually by rain. Tobermore do not replace products with efflorescence. Packs of products which have had packaging removed should always be re-covered with appropriate packaging to prevent the occurrence of secondary efflorescence.

#### Surface Scratches

Minor scuffs or bruises may occur during delivery, movement onsite, and installation (for example, during any plate vibrating process). In Tobermore's experience, these marks usually weather off through time.

To reduce the risk of surface scratches we strongly recommend the use of a vibrating plate with a rubber protective mat.

#### Ordering

To avoid waste, please ensure that your contractor accurately measures the area on site before ordering products. In Tobermore's experience, dimensions taken from a project plan can vary significantly from the final layout.

Depending on the layout of the project, we recommend ordering an additional 2 - 5% of material to allow for cutting, detailing and wastage.

#### Manufacturing & Quality Systems

Tobermore is a BS EN ISO 9001, BS EN ISO 14001 and BES 6001 registered company. Tobermore uses an integrated management system to manage all health & safety and environmental issues.

#### Product Maintenance

Routine cleaning and maintenance is required to keep the overall appearance of products in pristine condition.

All concrete products can develop algae, lichen, and moss growths due to environmental conditions and may require cleaning. Areas adjacent to plant borders and trees may discolour from transfer of plant-life. Tobermore cannot accept responsibility for any of these conditions.

#### Queries & Complaints

Please contact one of Tobermore's Paving & Walling Centres or offices (contact details at [www.tobermore.co.uk](http://www.tobermore.co.uk)) with any queries or complaints. Any complaints must be notified to Tobermore without delay.

### CORE TERMS (PAVING ONLY)

Paving installed unbound should have a close joint width of 2-5mm to allow for the dimensional tolerances of products and to create a gap to allow the brushing in of kiln dried jointing sand. The straightness of lines will be dependent on workmanship and product tolerances. String lines must be used to help achieve straight lines. Tobermore do not recommend Butt jointing as this will make achieving straight lines more difficult.

#### Product Maintenance

Light coloured paving blocks and flags emphasise tyre marks and oil spills on the driveway. Please note that these products will need more maintenance if overall appearance is to be maintained.

#### Initial Cleaning

When an area has just been paved, allow it to settle for a few days. After this, you may wish to lightly hose down the paving to remove any excess sand or dirt. The area should then be treated with a weed killer suppressant 2-3 times per year as required.

#### General Cleaning

Paving requires regular maintenance, including regular sweeping to prevent the build up of detritus. Tobermore recommends that paving is cleaned 2-3 times per year.

For general cleaning of dirt and algae, vigorous brushing with a stiff yard brush with plenty of hot detergent solution (washing up liquid or non-bio washing powder), thoroughly rinsed with clean water, should suffice. Repeated treatment may be required for paved areas sited beneath trees or in permanent/near permanent shade.

A light power hose at medium pressure is generally all that is required to clean general dirt and grime. Any jointing material which is removed must be replaced. Do not use high pressure powerwashers as aggressive power-washing can damage the product surface. A trial area should be tested before large scale powerwashing takes place.

#### Moss, Lichen and Algae

Thick growths of moss or lichen must be removed first by scraping out the joints and then treating the area with a moss killer such as anti-moss paving cleaner. Anti-moss is designed to remove moss, lichens and algae. It is best applied in dry weather. After being applied it will take a few days to be fully effective. Once the moss and lichens have been killed, they can easily be brushed off. Anti-moss also leaves a residue in the sand joint which will help reduce the likelihood of re-growth. The manufacturer's instructions should always be followed when using any cleaning agent.

#### Weeds

Large weeds should be removed by hand and then the area treated with a weed killer (available from any good garden centre). Smaller weeds can then be treated directly with weed killer and these weeds should start to die within days. The manufacturer's instructions should always be followed when using any weed killing agent.

#### Block Paving Sealer

It is possible to seal block paving with a resin material which combats staining and weed growth and which also enhances colour and appearance. The acrylic sealer is sprayed onto the block paving and forms a 'skin' on top of the paving and the jointing material giving an easily maintained finish. The manufacturer's instructions should always be followed when using any sealing agent.

### FOR HYDROPAVE PRODUCTS

#### Installation - Hydropave

Tobermore recommends that its Hydropave products be installed in conjunction with a BS EN 7533-13:2009 designed permeable paving system.

**Note:** A permeable paving design relies heavily on using the correct aggregates. Prior to installation, we would ask you to test both the 4/20mm coarse graded aggregate and also the 6.3-2mm bedding and jointing grit as per the relevant British Standard specification (BS EN 13242:2002). In particular, the material should be categorised as LA20 according to Table 9, SZ18 according to Table 10 and MDE15 according to Table 11 within this standard. The grit should be insoluble in dilute hydrochloric acid and should be naturally occurring material. In our experience, incorrect use of aggregates is one of the most common reasons for failure of a permeable paving system.

#### Joint Filling

All joints must be filled to the top with 6.3 – 2mm grit to prevent movement and spalling of the blocks. We recommend that after a few weeks use, any joints which have settled and are not full, are topped up with grit. Joints should be kept filled at all times. You will need approximately one tonne of grit for every 100m<sup>2</sup> of 80mm paving.

**Note:** Care should be taken that the permeable joints do not become contaminated as work on the scheme is completed. Special care needs to be taken when soft landscaping is carried out so that soil does not enter the joints. When this type of work is being carried out, the surface of the permeable paving should be protected by an appropriate cover to protect the joints from being contaminated.

#### Hydropave Maintenance

Please refer to Tobermore's detailed 'Permeable Paving Maintenance Guidelines' available on our website: [www.tobermore.co.uk](http://www.tobermore.co.uk)

### FOR EASYCLEAN PRODUCTS

#### Handling & Installation

During installation, the surface should be protected at all times from scratching and abrasion.

Once the protective glue dot has been removed do not stack flags directly on top of each other.

Use a plate vibrator with a rubber mat.

Do not scratch the surface with tools. (Spade, trowel etc.)

#### User advice

Do not drag garden furniture across the surface of the flags.

Do not pressure wash.

Do not use chemical cleaning products (e.g. solvents/acids).

### FOR FACING BRICK & COUNTRY STONE PRODUCTS

#### Important Note:

Where the circumstances allow, it is beneficial to complete one building / structure using bricks taken from one batch and mixed on site from a minimum of 3 packs to avoid colour banding / shading. If the circumstances do not allow for this then it is important to minimise the possibility of banding / shading by always mixing bricks from 3 packs concurrently with some overlap between deliveries.

Where the site conditions allow, it will also be beneficial to take receipt of as many bricks as possible at an early stage to maximise colour consistency throughout the site.

#### Installation – Facing Bricks

Please refer to Tobermore's detailed 'Guide to the use of Tobermore Concrete Bricks' available on our website: [www.tobermore.co.uk](http://www.tobermore.co.uk)

#### Installation – Country Stone

Tobermore's Country Stone products are designed to recreate traditional stone sizes and to co-ordinate with standard cavity wall construction. When used in housing projects, a clear cavity must be retained.

All work must be protected during construction and must be designed and built in accordance with accepted industry standards and practice. Builders familiar with conventional brickwork will find that similar installation principles apply.

Joints can be finished flush or tooled depending on the overall effect required. Raked joints

are not recommended. It is vital that all horizontal and vertical joints between Country Stone blocks must be compacted and free from voids. Shell bedding should not be used.

#### Good Practice during Construction - Facing Bricks & Country Stone

- If mortar dry's on the surface of the bricks it will stain the product and may not be removed.
- Mortar extruding from joints should be removed when the mortar is wet and during the process of laying.
- Any mortar smears on the brick surface should be removed by dry or wet brushing.
- Scaffolding should be installed as per regulatory instructions. Please note that mortar can drop and hit the scaffolding and then also go onto the wall. You should inspect the work area at all times to ensure the brick surface remains mortar free.
- When it rains be careful that any wet mortar on the scaffolding does not get 'splashed' onto the wall.
- When work stops or is interrupted by inclement weather conditions, brickwork should be protected immediately with polythene sheeting that is held in place with a suitable fixing. If new brickwork is not protected efflorescence, patchy mortar colour, patchy brickwork and staining can occur.
- Bricks should always be covered with polythene sheets to avoid getting damp or dirty when not being used.

#### General Cleaning Advice - Facing Bricks & Country Stone

- It is always important to keep bricks as clean as possible while laying and tooling. See Good Practice above.
- If mortar has been allowed to dry on the surface of the bricks the options you have to clean it off are as follows; Each process should be tested first and should ensure the facing bricks are not damaged - Dry brushing b. Wet brushing c. Using a 'like coloured' brick to rub the stained brick d. Pressure washing - should only be used as a last resort as it will damage the surface and the mortar joint if not completed correctly (this method cannot be attempted until the area has been allowed to set for a minimum of 7 days).
- Acid cleaning should be avoided.

#### Movement Joints and Mortar Guidance - Facing Bricks & Country Stone

1. NHC recommends that walls constructed of concrete masonry units should have vertical movement joints included every 6m to allow for drying/shrinkage, see PD6697:2019, maximum ratio for brickwork panels is to be 3:1 length : height. PD6697:2019 gives advice on joint positions, the benefit of brickwork reinforcement at window openings is also covered in the same document. Movement joints should be planned prior to commencing any construction to enable them to be concealed behind down pipes etc. and ensure the aesthetics of buildings are maintained.
2. It is important to ensure that the mortar specified for the construction is suitable for the contract, see table 15 of PD6697:2019 - class M4 is the maximum recommended for normal external masonry walls. This should not be exceeded when using Tobermore Concrete facing bricks and Country Stone Walling.
3. We would recommend that you discuss this guidance with all parties involved in the design, construction and installation of the scheme. We also recommend that you refer to BS EN 1996-1-1 and PD6697:2019.
4. Specific professional advice should be obtained at all times before commencing building work.

#### Important Guidance Information: Tobermore Concrete Facing and Country Stone Walling

1. Professional advice, specific to the project, should be sought before commencement of the building work.
2. Tobermore Facing Bricks have different properties to clay bricks especially in relation to moisture movement. Please refer to 'Guide to the Use of Tobermore Concrete Facing Bricks', which is available on request or at [www.tobermore.co.uk](http://www.tobermore.co.uk)
3. Tobermore recommends that vertical movement joints be spaced at no more than 6m apart. Panels of brickwork where the length: height ratio exceeds 3 are particularly vulnerable to cracking; if they cannot be avoided, they should include movement joints at closer centres.
4. Movement joints should be planned prior to any construction so that they can be concealed behind drainpipes etc. Further guidance on moisture movement is available in the 'Guide to the Use of Tobermore Concrete Facing Bricks' and BSI documents BSEN 1996 (Eurocode 6) and PD 6697 (Recommendations for Design).
5. It is important to ensure that the mortar specified is suitable for the construction, see Table 15 of PD 6697. Mortar of strength class M4 will generally be suitable. Please refer to 'Guide to the use of Tobermore concrete facing bricks', which is available on request.
6. When building with dissimilar materials allowances should be made for differential movement. Design guidance from a structural engineer should be sought when combining dissimilar materials such as clay and concrete facing bricks. Examples of using dissimilar materials would be where a clay brick is used to build up to the dpc level and then Tobermore concrete facing bricks are used above the dpc. In some circumstances the dpc acts as a slip plane to separate the two materials which helps to dissipate tensile stress. However expert guidance should always be sought as to ensure structural stability as further slip planes or bed reinforcement may need to be incorporated into the design.
7. It is recommended that this guidance is discussed with all persons involved in the design and construction of the building work.

### FOR SECURA PRODUCTS

#### Installation - Secura

All Secura products should be installed in accordance with British Standard BS8002. When constructing a retaining wall, ensure that you follow the design provided by the scheme engineer.





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Paving



Walling & Retaining Walls



Facing Brick

