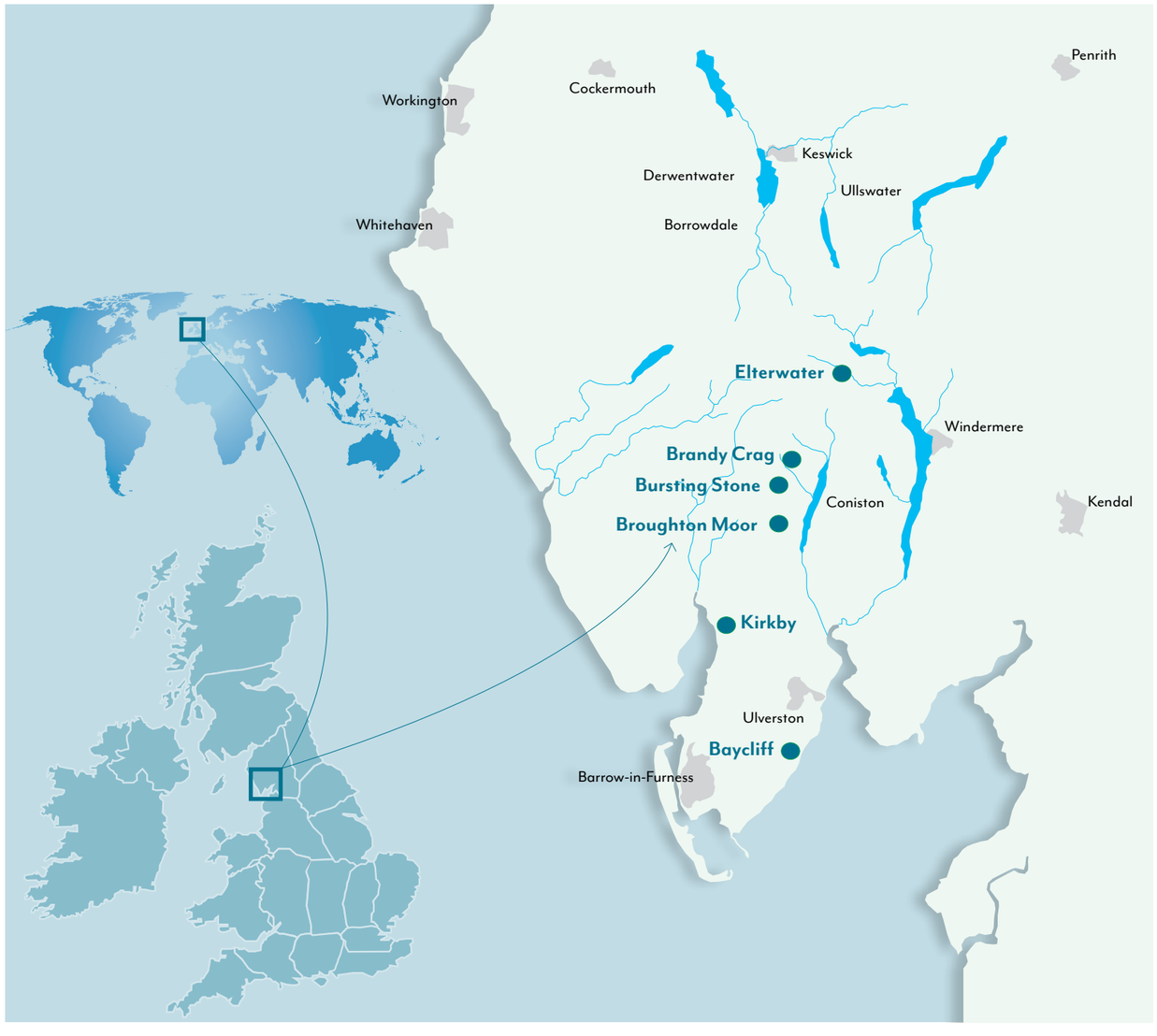
BURLINGTON
STONE

STONE: Broughton Moor

Broughton Moor

As its name suggests the quarry is situated on Broughton Moor, mid-way between Broughton-in-Furness and Coniston and has been worked since the middle of the 19th Century. Broughton Moor is a mid green stone, often highlighted by contrasting white veins and beautiful tone

Broughton Moor can be extracted in a variety of green tones to add a dark and light green contrast to surfaces yet purvey the beauty of its natural markings. Broughton Moor has been used for generations to provide walling, flooring, cladding, cills, worktops, and stairs. The richness of Broughton Moor makes it ideal for use in interior furniture and fittings, whether in traditional or modern design schemes.



The benefits of Burlington Natural Stone

Burlington Stone is one of the finest most durable stones in the world. Due to the outstanding technical properties of the natural stone, it is a material that is extremely practical, hard wearing and easy to clean and maintain. The character and natural beauty inherent within Burlington's stone allows it to be used for both internal and external applications, for example, flooring, external and decorative wall cladding and swimming pools.

Dense and durable
Colour-fast
Chemically inert
Stain resistant
Non combustible

Reasons to use Burlington Stone

- Low maintenance costs
- Low water absorption
- Tried and Tested - Established 1843
- A British family owned business with long traditions and values
- Certified to ISO14001 and aiming to utilise 100% of the rock extracted
- Harvested rain water used in the production
- Aesthetic beauty of the stone
- Work closely with the BRE and The National Parks Authority
- International pedigree of landmark bespoke projects
- High performance characteristics, suitable for both internal and external use in construction projects.

Broughton Moor

Cover Image: Broughton Moor cladding in a honed finish.

1. Four Seasons - Hong Kong
2. Dubai Festival Centre - Dubai
3. Four Seasons - Baltimore - USA
4. Four Seasons Resort - Hawaii
5. In line shower tray
6: Foundry Square - San Francisco - USA

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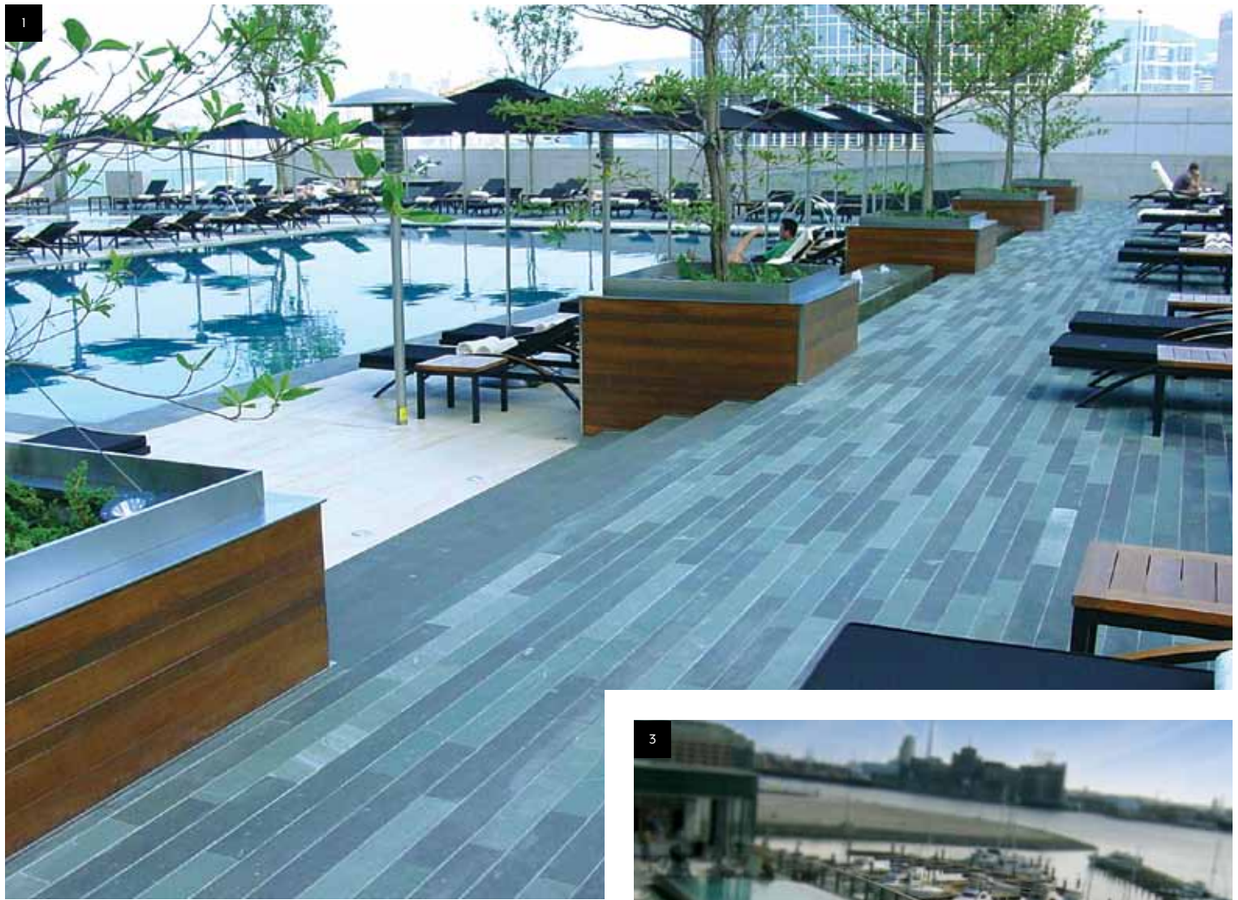

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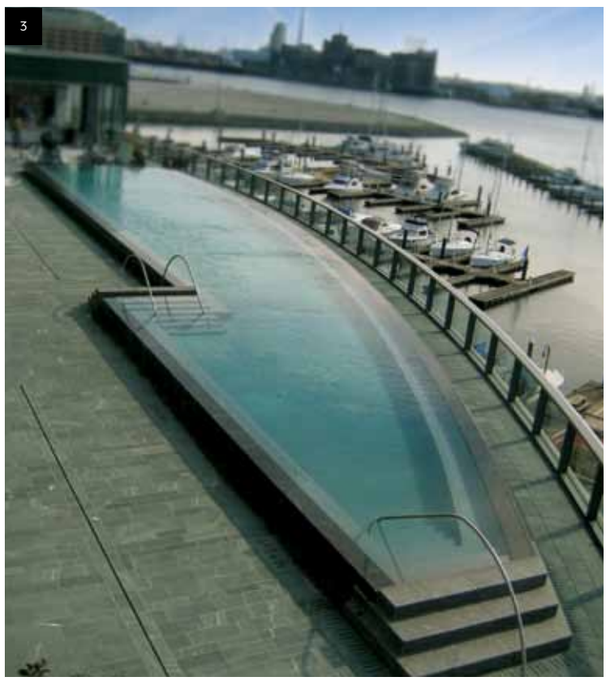

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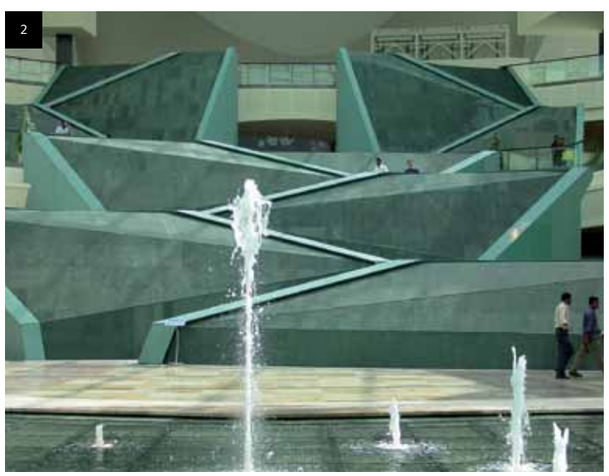

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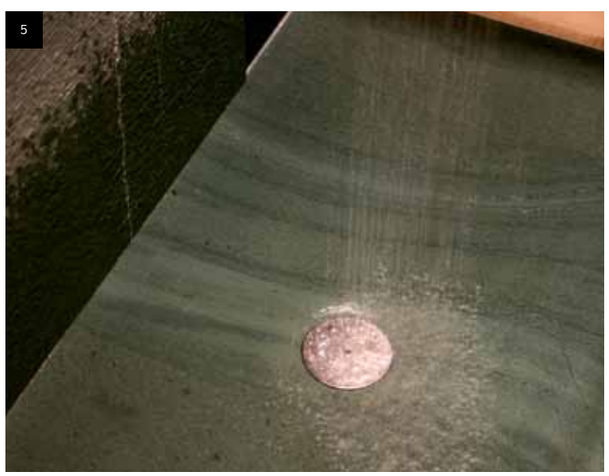

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7. State University - USA
8. Yale University - USA
9. Durham Court House - USA
10. St. Dunstans Church - UK
11. OPCW - The Hague - Netherlands

Inside Back Cover: Temple Quay House - Bristol - UK

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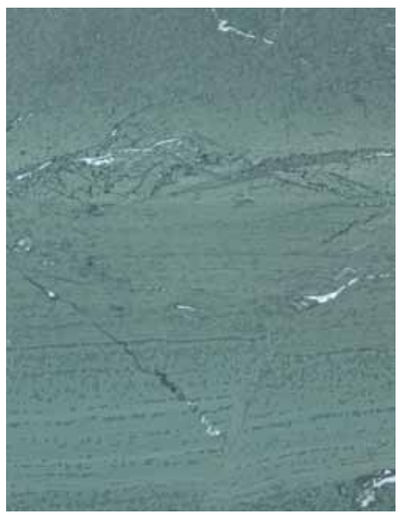
BM 03

BM 04

BM 07



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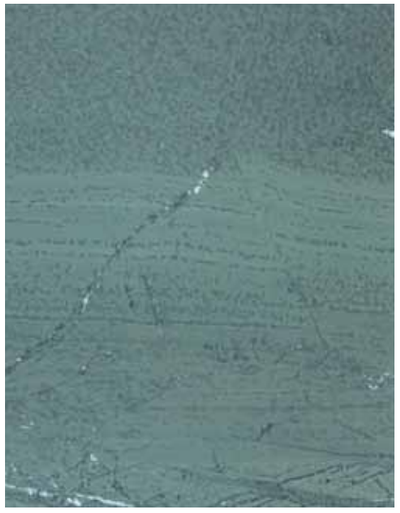
BM 09



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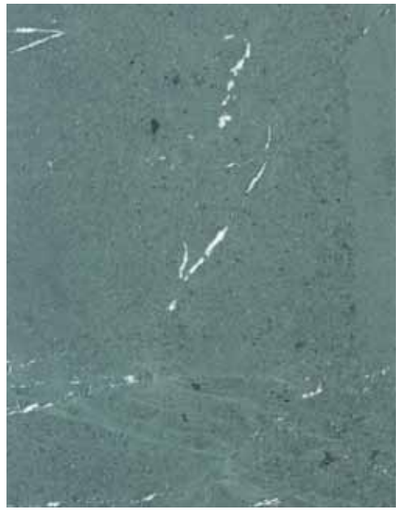

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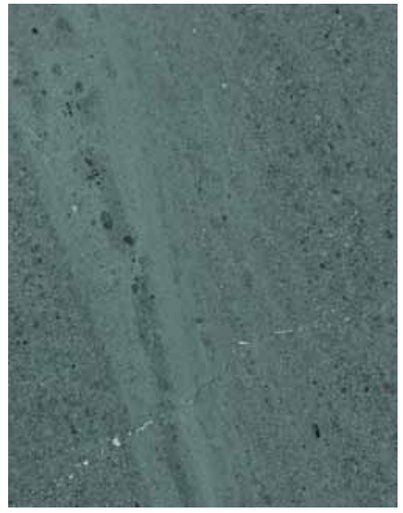

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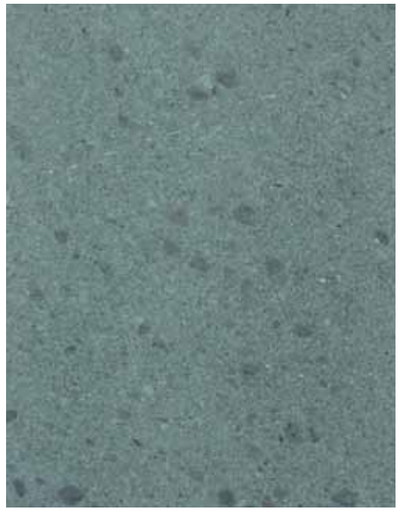

BM 18

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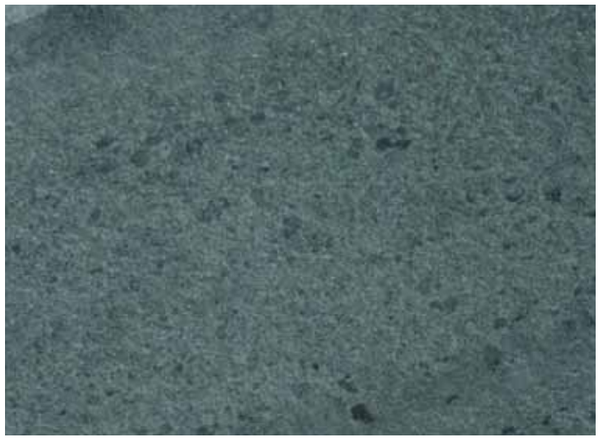
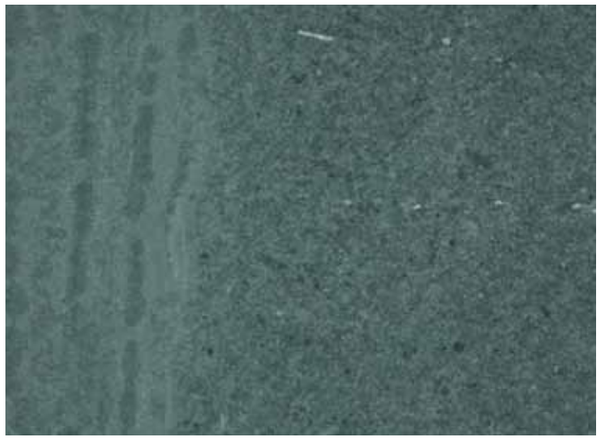
NOTE: The colours shown are indicative only and would encompass the colour variations available from our stocked range of products. For any bespoke requirements, the customer can determine their specific needs for the project and product choices can be made after reference to detailed samples. The uniqueness of Burlington natural stone means colour tone and markings can change as a consequence of its extraction from different stone seams and the finish carried out to its surface.



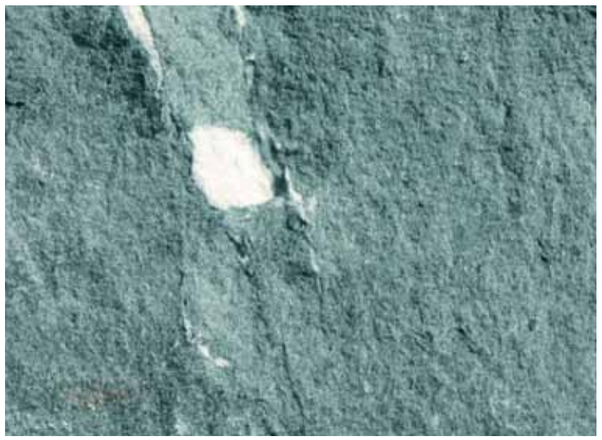
FLAME TEXTURED: Heat and water combine to achieve a regular textured finish.

GRITBLASTED: A high-pressure airline projects coarse-grained abrasives, giving a regular non slip finish.

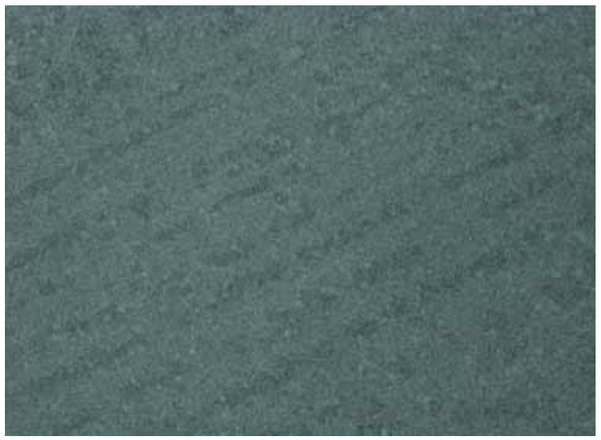


HONED: A smooth finish with a slight sheen, produced by using a polishing head.

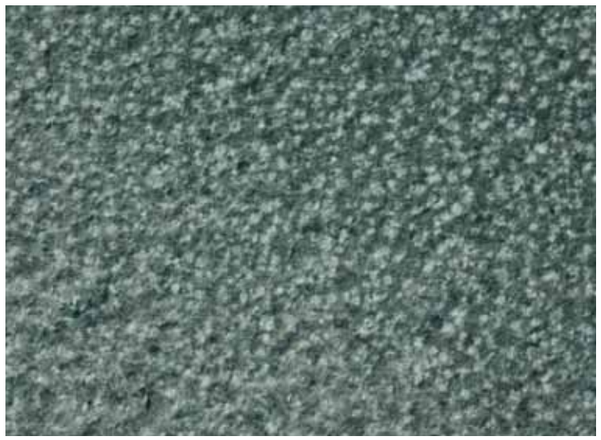
LINE TEXTURED: The top surfaces of sawn slabs are pneumatically tooled to produce a grooved surface.



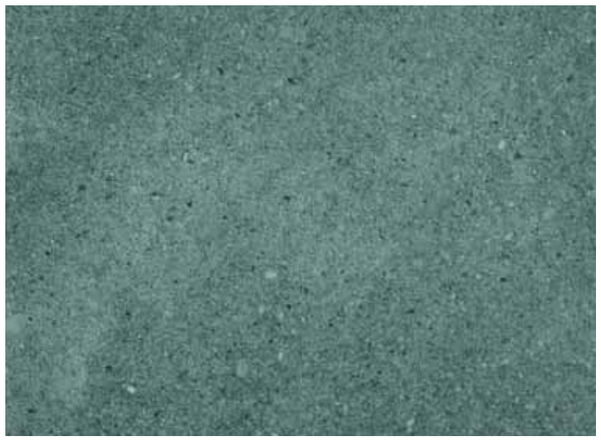
RIVEN CLEFT: A finish in which the stone is split along its natural cleavage plane.



SANDED: The top surfaces of sawn slabs are coarsely diamond sanded to produce a non slip finish.



SPOT TEXTURED: The top surfaces of sawn slabs are pneumatically tooled to produce a pitted surface.



WATERJET: A similar finish to honed but with greater slip-resistance.

Echoing the depth and diversity of Burlington's natural stone colour palette and product offering is the range of smooth and textured finishes that can be specified. Indeed it is the combination of such USPs that makes Burlington a unique proposition on the global stage. With each finish having its own place subject to its applied environment, specifiers and homeowners can choose from:

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Delivering Environmental Sustainability

Burlington is certified to
ISO 14001 Management Systems

BS EN 12326-1
KM 10333

ISO 14001
EMS 573812

003

Burlington Stone seeks to encourage and implement a range of practises that actively minimise the impact on the surrounding environment from its quarrying operations, and endeavours to extend its waste management techniques to maintain a sustainable industry for the future.

Certificate of Registration

ENVIRONMENTAL MANAGEMENT SYSTEM - ISO 14001:2004

This is to certify that:

Burlington Slate Ltd
Cavendish House
Kirkby-in-Furness
LA17 7UN
United Kingdom

Holds Certificate No: **EMS 573812**
and operates an Environmental Management System which complies with the requirements of ISO 14001:2004 for the following scope:

The quarrying, manufacture and distribution of roofing slate, architectural and landscape products.

For and on behalf of BSI:

Chair, Certification Body Management Committee.

Originally registered: **22/12/2011** Latest Issue: **22/12/2011** Expiry Date: **22/12/2014**

Page: 1 of 1

This certificate was issued electronically and remains the property of BSI and is bound by the conditions of contract.
An electronic certificate can be authenticated online.
Printed copies can be validated at www.bsigroup.com/ClientDirectory

The British Standards Institution is incorporated by Royal Charter.
BSI (UK) Headquarters: Kitemark Court, Davy Avenue, Knowlhill, Milton Keynes MK5 8PP. Tel: 0845 080 9000

- Do not pollute environment
- No harmful chemicals
- Simple processes
- Recycle
- Friendly extraction techniques
- Active by-products from the production process itself
- Quarry restoration
- Low impact on nature

breeam

Delivering Environmental Sustainability

BURLINGTON STONE

SUSTAINABILITY

In recent years more and more of the waste slate has been used to produce Burlington's secondary products. These include slate mulch for paths and gardens, water features, paving, lintels etc. and even the material from years ago is recycled to produce 'weathered' walling stone - a product which is very popular when repairing or matching of old walls is required. These initiatives have led to all the waste from one particular quarry being used.

The production processes use water from private reservoirs; this water is then recycled using a filter press and the clean water returned to the machines.

Two quarries have Waste Exemption licences enabling the importation of soils and sub-soils for landscaping work. This also involves the use of leaves obtained from the local authorities that sweep the Lakeland roads each year between October and January. This material is allowed to compost for two to three years before being used for landscaping.

LANDSCAPE IMPACT & RESTORATION

At Broughton Moor quarry an 80 hectare tree planting scheme has been carried out under the Woodland Challenge Fund. This incorporates several species of native woodland including alder, juniper, sessile oak, rowan and birch. A new footpath linked to a small car park by wooden walkways is open to the public and not only will this scheme mature with time, it will also serve as a screen for the quarrying operations.

Two of Burlington's quarries are bounded by Sites of Special Scientific Interest; the one at Kirkby because of the heather moorland and at Elterwater for the oak woodland and its associated lichens and mosses. In the case of Elterwater quarry a program of rhododendron eradication is under way to prevent this invasive plant from spreading into the SSSI. Other potential problems identified by Natural England such as Himalayan Balsam and Japanese Knotweed are regularly treated each year wherever they occur.

CARBON REDUCTION

Producing any kind of dimensional stone has high energy requirements. At Burlington's main production plant the large stone-working machinery is regulated by modern control-gear designed to reduce start-up loads and consequently cut down the overall electrical usage.

Quarry and road-going vehicles are replaced on a regular basis (wherever possible to Tier III standard) to ensure that emission levels are kept to a minimum. Because personnel are drawn from a wide area (mainly within the National Park), transport is provided for the majority of the workforce. This, in turn, reduces the number of vehicles visiting the site each day. By providing a source of aggregate material in the central area of the Park, the 'mineral miles' and therefore carbon emissions associated with importing other stone are reduced.

ROCK EXTRACTION

All of Burlington's quarries use the same method of extraction which involves the use of diamond wire saws. This technique was originally pioneered in the Italian marble industry and ensures that the rock is 'released' from the face in as gentle a way as possible by undercutting the entire section of rock prior to splitting it into manageable sizes. Gunpowder is used for this because of its low velocity of detonation and therefore minimal effect on the rock.

If you require any further detailed information, please contact us on:
+44 (0)1229 889 665 in the UK or (972) 985 9182 in the USA.

UK & Europe Product Data

BURLINGTON STONE

This data describes Burlington's Broughton Moor stone which is quarried in the English Lake District. Broughton Moor stone has been used for generations to provide flooring, external and decorative cladding to walls, cills and copings. Architects and designers around the world have long taken advantage of its natural beauty, durability and adaptability to create classic weather resistant details and surface finishes. The richness of Broughton Moor stone makes it ideal for use in interior furniture and fittings, whether in traditional or modern design schemes and in external projects.

SUMMARY OF KEY TECHNICAL DATA:

PETROGRAFIC ANALYSIS	Slate feldspar, chlorite.
FLEXURAL STRENGTH*	38.67 mPa
HONED SLIP RESISTANCE	49 SRV
ABSORPTION	0.13%
ABRASION RESISTANCE	18 MAV

* NOTE: Flexural strength is dependant on a suitable bed.

DESCRIPTION

SHAPE AND SIZE: Broughton Moor stone is extracted using modern diamond wire cutting technology, then cut to the specified size and shape using a combination of computer controlled machinery and traditional craftsmanship.

DENSITY: 2765 kg/m^3.

Performance characteristics

STRUCTURAL AND MECHANICAL: Burlington Broughton Moor stone has high abrasion resistance, compressive strength, flexural strength and modulus of elasticity (see Table 1). Broughton Moor stone also has good slip resistance (see Table 2), making it suitable for flooring and exterior paving.

FIRE: Broughton Moor stone is non-combustible.

GASES AND LIQUIDS (see Table 3) Broughton Moor stone has good weather resistance with low water absorption properties.

It is non-porous and will not delaminate in use; it is also resistant to atmospheric pollution, acid and sea spray and is unaffected by common chemicals.

BIOLOGICAL: Broughton Moor stone will not rot, does not encourage growth of mosses or lichens and is not liable to insect or vermin attack; it is compatible with most other building materials.

THERMAL: The thermal conductivity of the material is approximately 2.0 W/mK; it is dimensionally stable, with a thermal coefficient of expansion of 10.4 x 10-6.

HANDLING & STORAGE

Burlington stone is a dense, heavy material; vehicular access should be provided to a storage area close to the point of installation.

Take care on site to prevent damage to the material: when not crated it should be stacked on edge on timber bearers and protected with building paper or plastic sheeting.

Burlington stone is an inert material and inherently safe if handled with due caution:

- Safe lifting techniques should always be used.
- Protective clothing should be worn to avoid cuts from sharp edges.
- Wear eye protection when machining, drilling or cutting.
- Dust arising from dry machining contains silica, which can be a long-term health hazard if inhaled in significant quantities for extended periods: use a suitable dust mask.

MAINTENANCE

When correctly detailed and fixed, Burlington stone is naturally durable material which requires very little maintenance. Guidance on the maintenance of natural stone is given in BS 8221-1:2000: 'Code of practice for cleaning and surface repair of buildings. Cleaning of natural stones, brick, terracotta and concrete'.

Remove marks and spills with a damp cloth; use white spirit for stubborn residues. Smooth finishes can be buffed with a nylon scrubbing pad to restore shine. Textured surfaces tend to retain more dust: vacuum clean if necessary; remove all traces of dirty water after cleaning and buff with a medium-stiff brush.

Burlington stone can be treated with surface impregnation to repel grease: contact Burlington for advice if this technique is being considered.

SUPPLY & DELIVERY

At current rate of extraction the quarry has reserves in excess of 70 years. Standard honed floor tiles (300mm x 300mm x 12mm) are available ex-stock; other items are made to order.

Burlington stone is normally crated and palleted: delivery in the UK is by our own road haulage vehicles; overseas deliveries will be by the most efficient and cost-effective means available.

Samples, prices and conditions of sale will be supplied on request. We will gladly provide you with current details of availability and lead times and will be happy to provide firm quotations for individual projects on the basis of drawings and/or Bills of Quantities.

TECHNICAL SUPPORT

We are always happy to provide technical advice on the specification of Burlington stone for new build or refurbishment projects.

We offer in-depth project consultation and a wide range of support services including:

- a technical advice line: call (01229) 889 665 in the UK
- estimating;
- computer-aided detailing;
- copies of relevant test results;
- a range of printed technical support material;
- product samples;
- help and advice on meeting national building regulations.

REFERENCES

Visitors are welcome to view completed applications of Burlington stone at our Cumbria offices.

For up-to-date news and information on the worldwide use of Burlington stone and Burlington slate for commercial, domestic and landscaping applications, visit our web site: www.burlingtonstone.com

Table 1 Structural properties

Property	Test method	Mean value
Abrasion resistance (mm)	BS EN 14157:2004* C241-85**	18.5 18.11
Compressive strength (MPa)	BS EN 1926:1999	87
Modulus of elasticity (MPa)	C120-85	46194.89
Flexural strength (MPa) 3-point (wet) 4-point (dry)	 BS EN 12372:1999 BS EN 13161:1999	 37.94 51.01
Breaking load at dowels (N)	BS EN 13364:2002	6500

*BRE 1P10/00 proposes guidance on the interpretation of wide wheel abrasion results. The guidance values presented are as follows:

Abrasion resistance value	Suggested usage
< 23	Intensive (e.g. shopping malls)
23 - 30	Moderate (e.g. office buildings)
> 30	Individual (e.g. houses)

**calculated as the reciprocal of the volume abraded multiplied by ten

Table 2 Potential for slip

Stone finish		Slip resistance value† (Potential for slip)	
		(dry)	(wet)
Riven	unsealed : sealed	64 : 63	52 : 52
Flamed	unsealed : sealed	64 : 63	58 : 57
Gritblasted	unsealed : sealed	64 : 61	59 : 55
Sanded	unsealed : sealed	66 : 66	59 : 52
Water Jet	unsealed : sealed	67 : 65	63 : 53
Honed	unsealed : sealed	61 : 49	36 : 21

†test carried out by Sandberg Ltd in accordance with UK Slip Resistance Group Guidelines Issue 2 June 2000. Type Four S 'Simulated Standard Shoe Sole' developed by RAPRA Technology Ltd for use in testing pedestrian slip resistance. Sealer used: RR Stone Seal.

Potential for slip	Pendulum value
high	≤ 25
moderate	25 - 35
low	35 - 65
extremely low	> 65

Table 3 Gases and liquids

Property	Test method	Mean value
Water absorption (%)	BS EN 13755:2002	0.13
Density (kg/m^3)	BS EN 1936:1999	2765
Open porosity (%)	BS EN 1936:1999	0.10
Acid resistance (mm)	C217-85	0.24

USA
Product Data

BURLINGTON
STONE

Geology - Should be a good quality stone of the Ordovician Borrowdale Volcanic Series (metamorphosed volcanic ash) Era.

GENERAL REQUIREMENTS:
The stone should have characteristics equal to or better than the following:

Compressive Strength (C170)	157MPa (22,771psi)
Absorption (C121)	0.12%
Modulus of Rupture (C120)	30MPa (4,351psi)
Abrasion Resistance (C241)	38.49
Acid Resistance (C217)	0.04mm (0.0016ins)

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TECHNICAL SUPPORT
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INFORMATION
The information on this sheet is for guide purposes only: please contact your local representative for current information.

The sizes shown are preferred maximum sizes and are not available in large quantities. Thicker section material is available.

These stones are suitable for interior and exterior uses in all climatic conditions. Other applications include sills, copings, benches, treads, risers, thresholds, columns and roofing.

RIVEN CLEFT

	3/8"	1/2"	3/4"	1"	1 1/4"
Paving/Flooring	12" x 12"	12" x 12"	12" x 12"	12" x 12"	12" x 12"
Cladding etc	12" x 12"	12" x 12"	24" x 12"	24" x 12"	24" x 18"

HONED / SANDED Suitable for exterior paving as an accent only.

	3/8"	1/2"	3/4"	1"	1 1/4"
Paving/Flooring	18" x 12"	36" x 24"	48" x 24" 30" x 30"	48" x 24" 30" x 30"	60" x 24" 30" x 30"
Cladding etc	18" x 12"	36" x 24"	48" x 30"	60" x 30"	72" x 30"
Counters			72" x 30"	72" x 30"	72" x 30"

GRITBLASTED

	3/8"	1/2"	3/4"	1"	1 1/4"
Paving/Flooring	18" x 12"	36" x 24"	48" x 24" 30" x 30"	48" x 24" 30" x 30"	60" x 24" 30" x 30"
Cladding etc	18" x 12"	36" x 24"	48" x 30"	60" x 30"	72" x 30"

LINE TEXTURED / SPOT TEXTURED

	3/8"	1/2"	3/4"	1"	1 1/4"
Paving/Flooring	NA	NA	48" x 24"	48" x 24"	60" x 24"
Cladding etc	NA	NA	48" x 24"	48" x 24"	60" x 24"

FLAME TEXTURED

	3/8"	1/2"	3/4"	1"	1 1/4"
Paving/Flooring	NA	12" x 12" 16" x 16"	24" x 24"	36" x 24"	60" x 24" 30" x 30"
Cladding etc	NA NA	12" x 12" 16" x 16"	24" x 24"	36" x 24"	60" x 30"

NB: 12" x 12" is the maximum size offered in Elterwater at 1/2" thickness.

WATERJET

	3/8"	1/2"	3/4"	1"	1 1/4"
Paving/Flooring	NA	24" x 24"	36" x 24"	54" x 24"	54" x 24"
Cladding etc	NA	24" x 24"	36" x 24"	54" x 24"	54" x 24"

NB: One dimension cannot exceed 24".

Broughton Moor

The following pages show the colour variations available from our stocked range of products. For any bespoke requirements, the customer can determine their specific needs for the project and product choices can be made after reference to detailed samples. The uniqueness of Burlington natural stone means colour tone and markings can change as a consequence of its extraction from different stone seams and the finish carried out to its surface.

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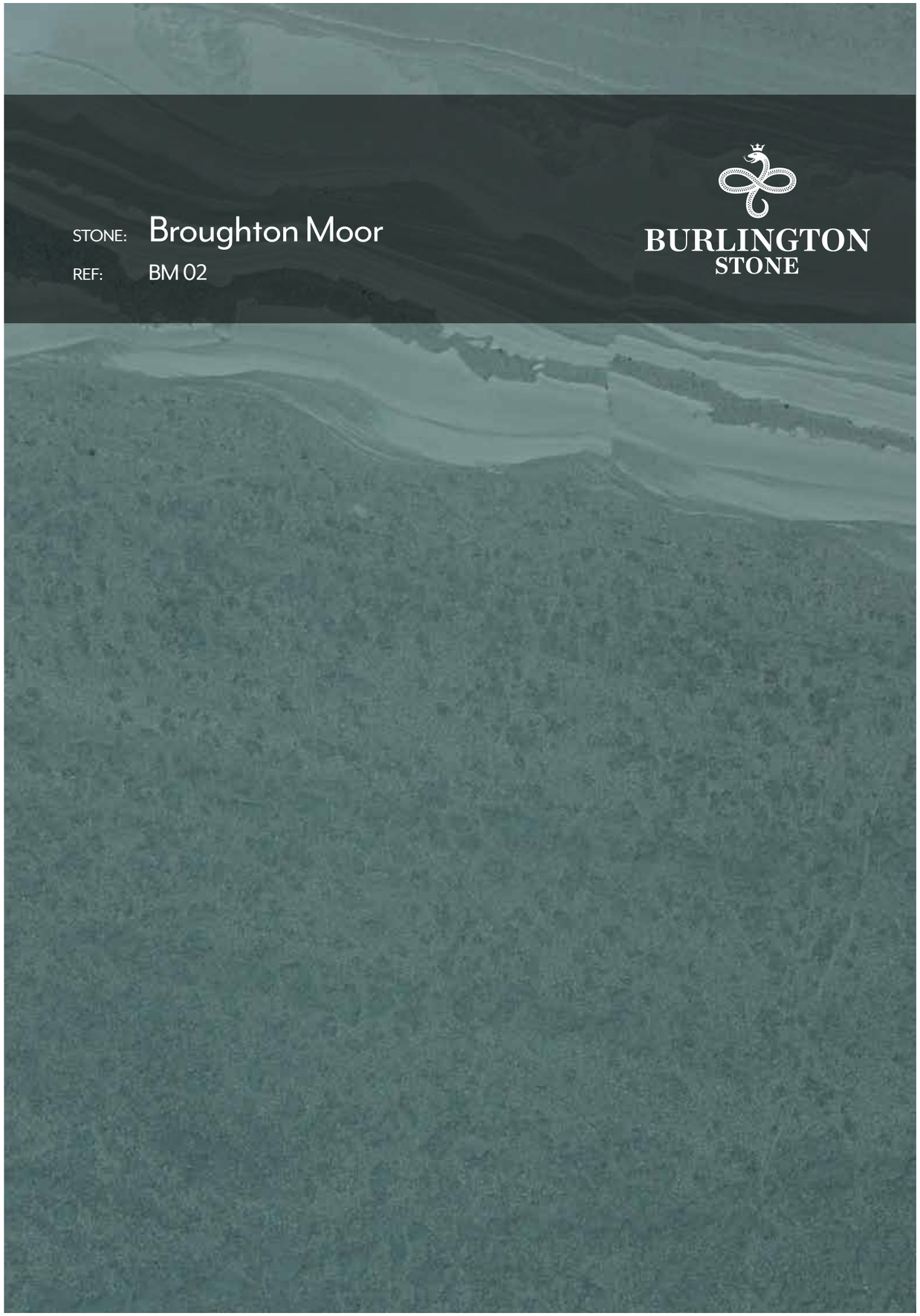
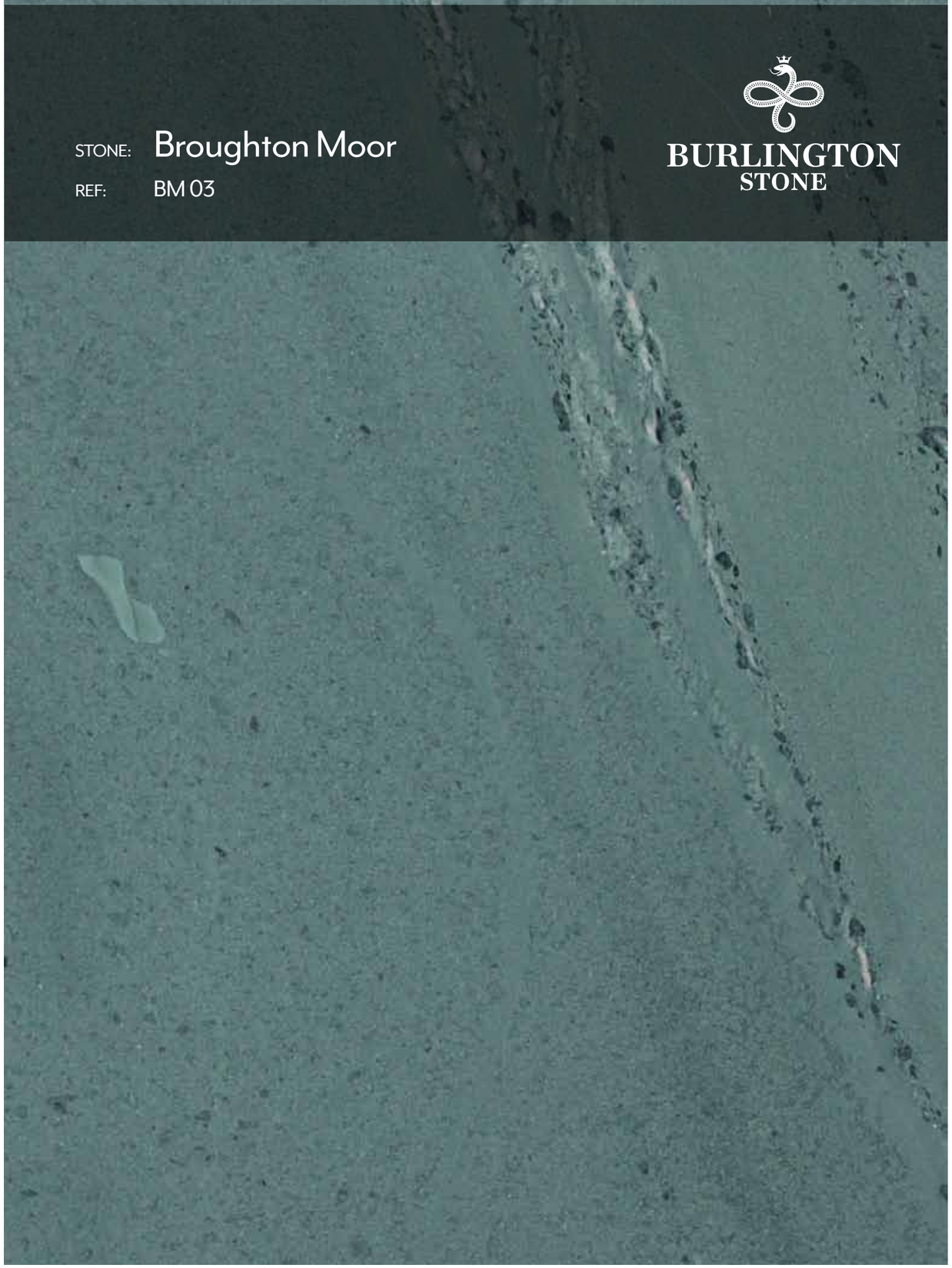


STONE: Broughton Moor

REF: BM 03

BURLINGTON STONE



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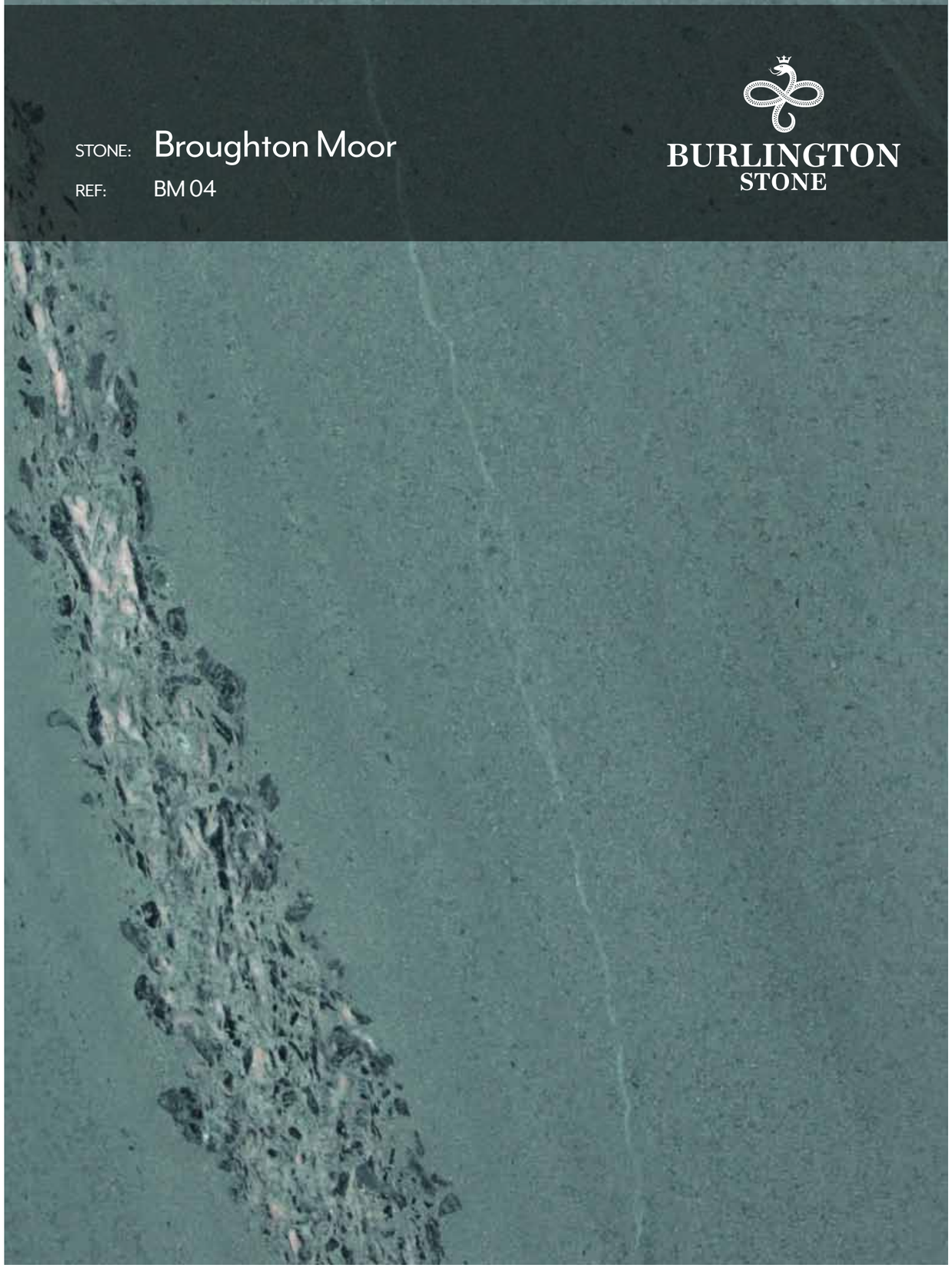

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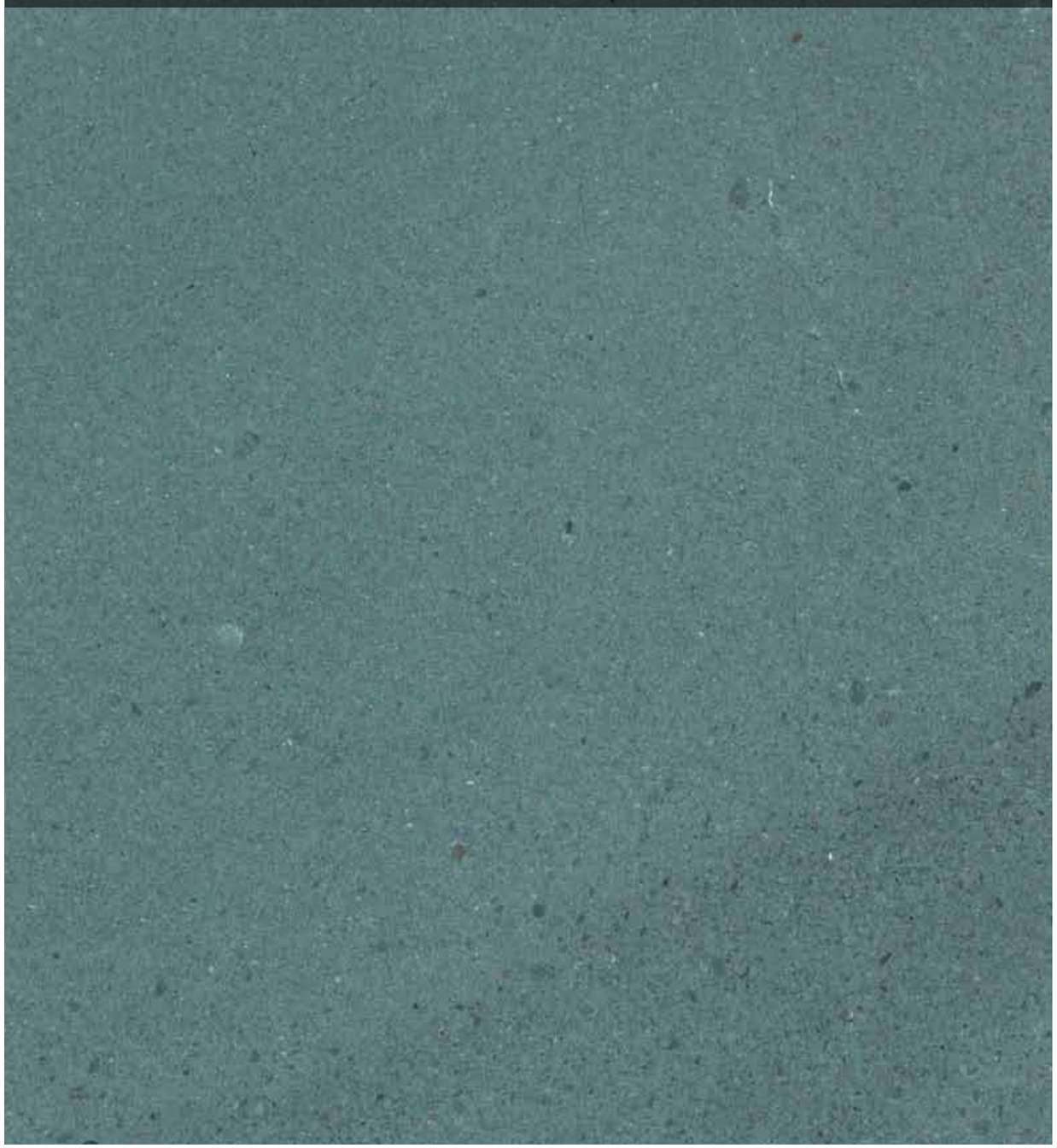

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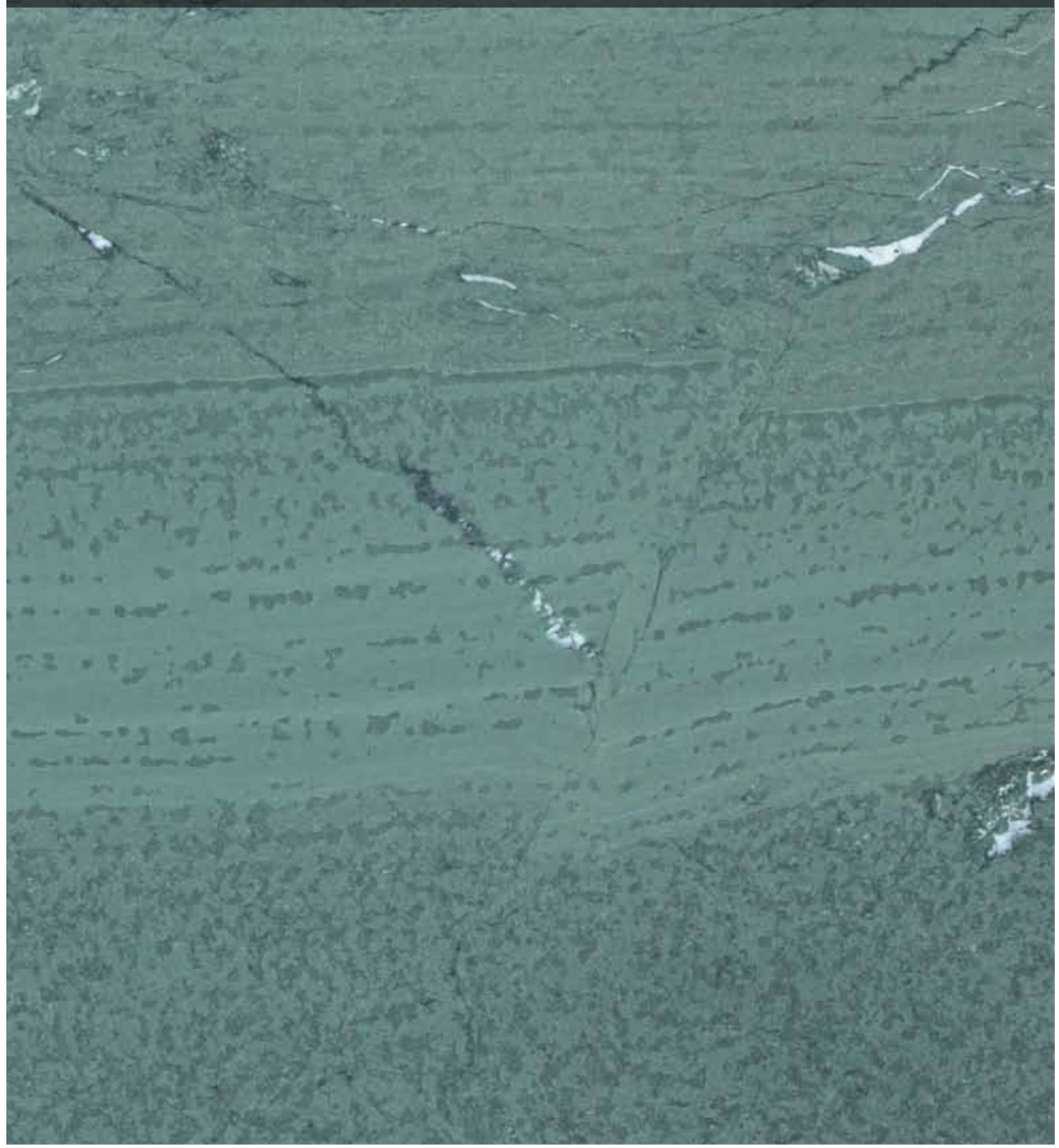
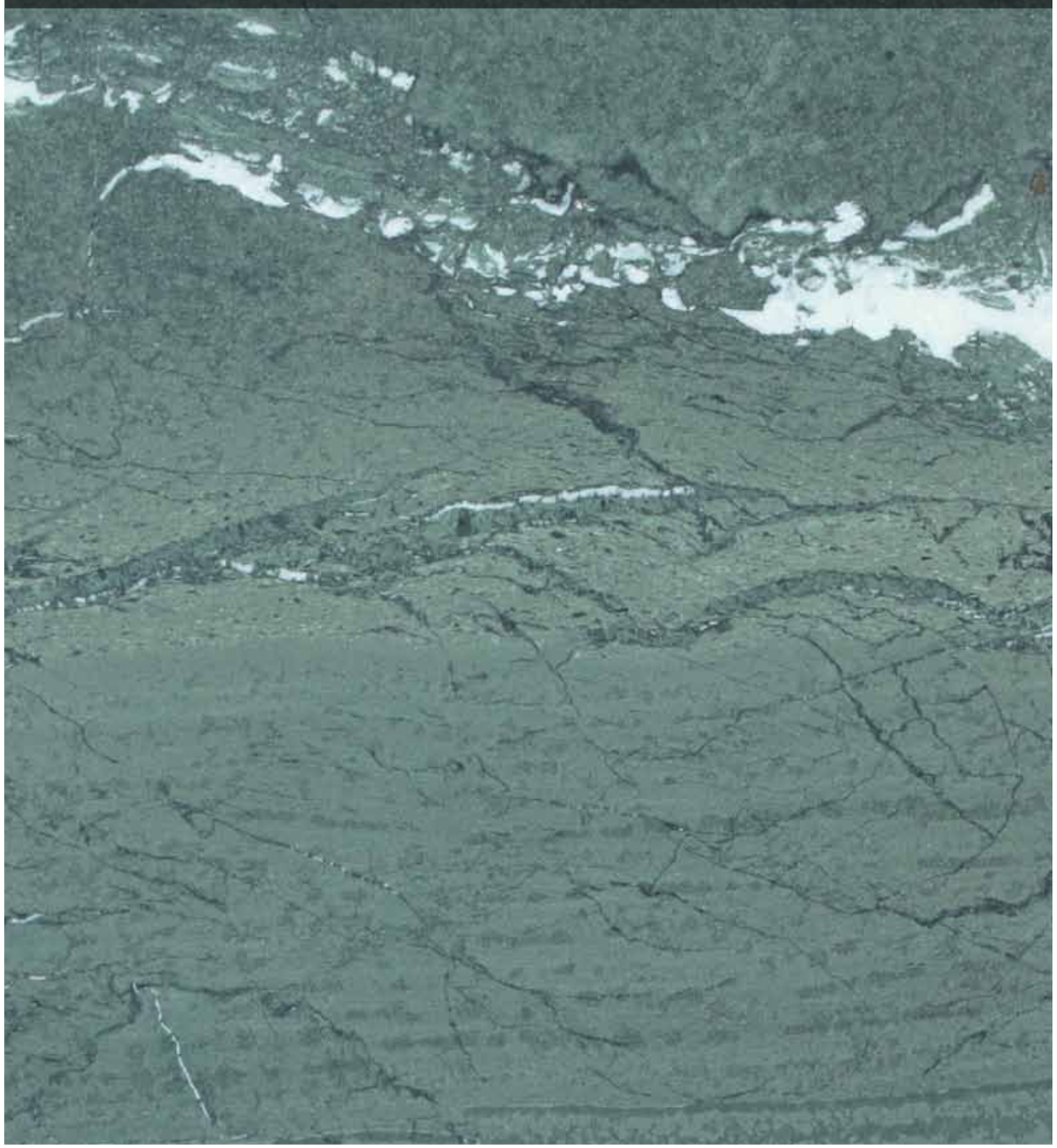


STONE: Broughton Moor

REF: BM 09

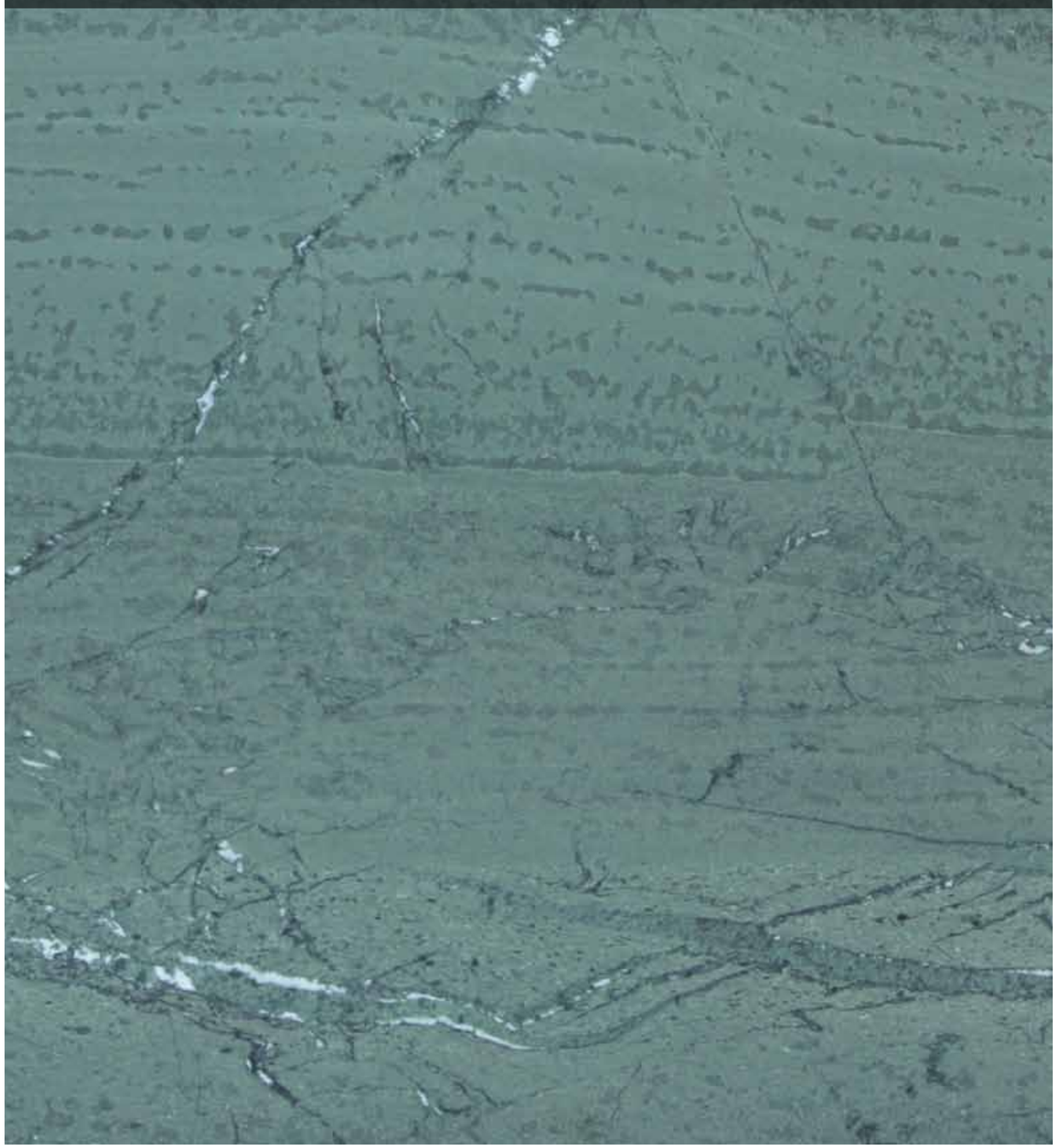
BURLINGTON STONE

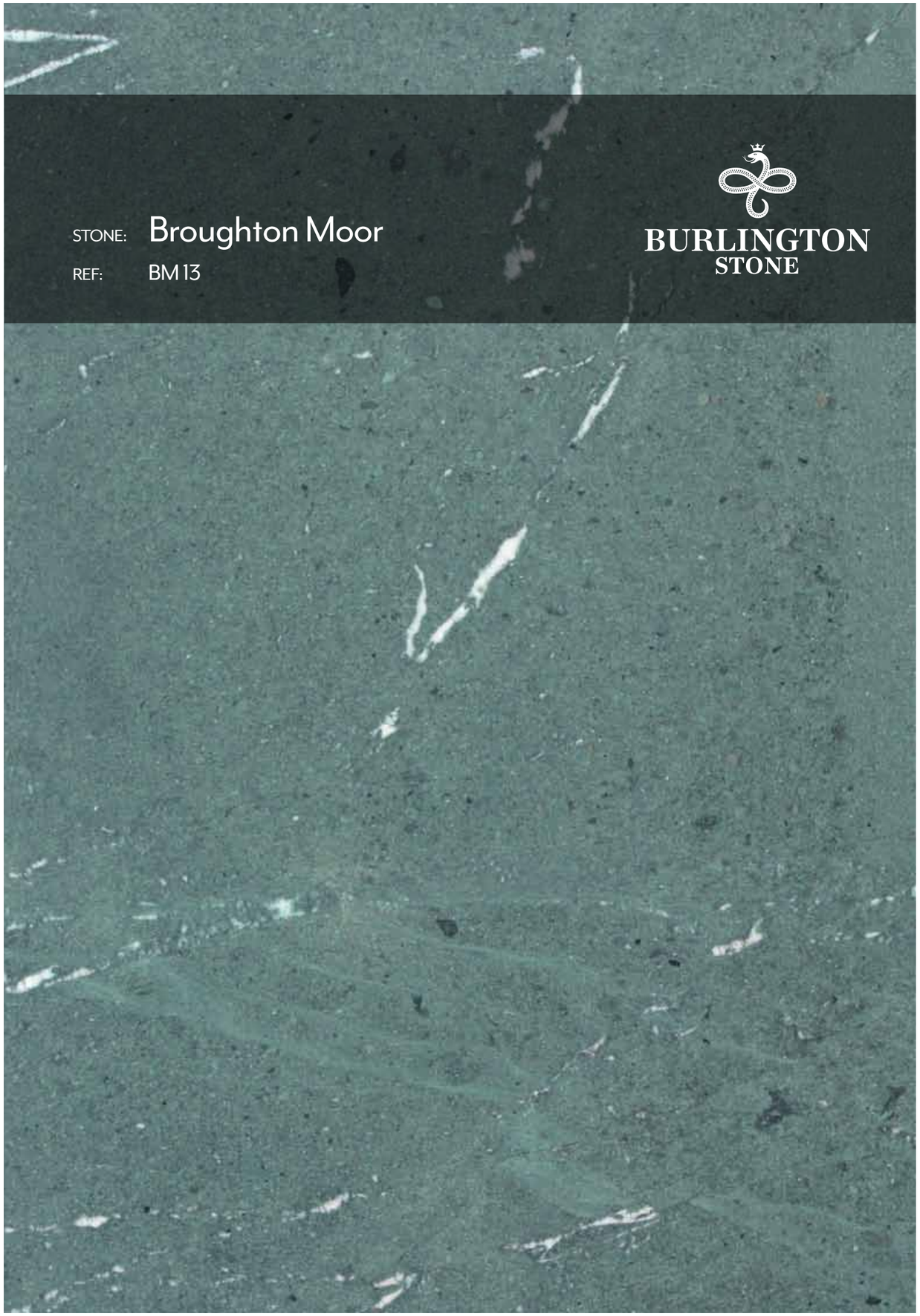


STONE: Broughton Moor

REF: BM 12

BURLINGTON STONE

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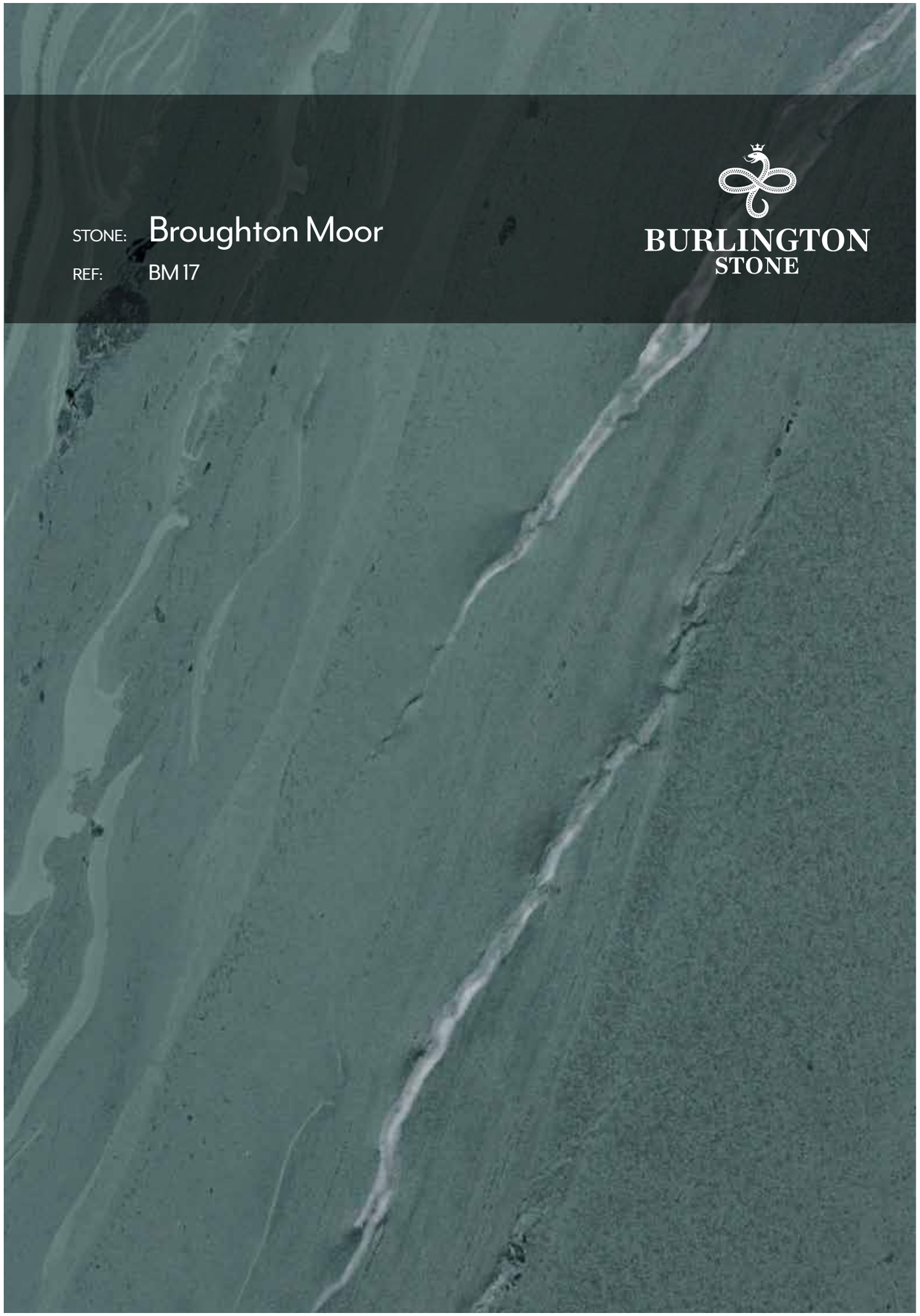
REF: BM13
BURLINGTON
STONE


STONE: Broughton Moor
REF: BM14
BURLINGTON
STONE

STONE: Broughton Moor

REF: BM17

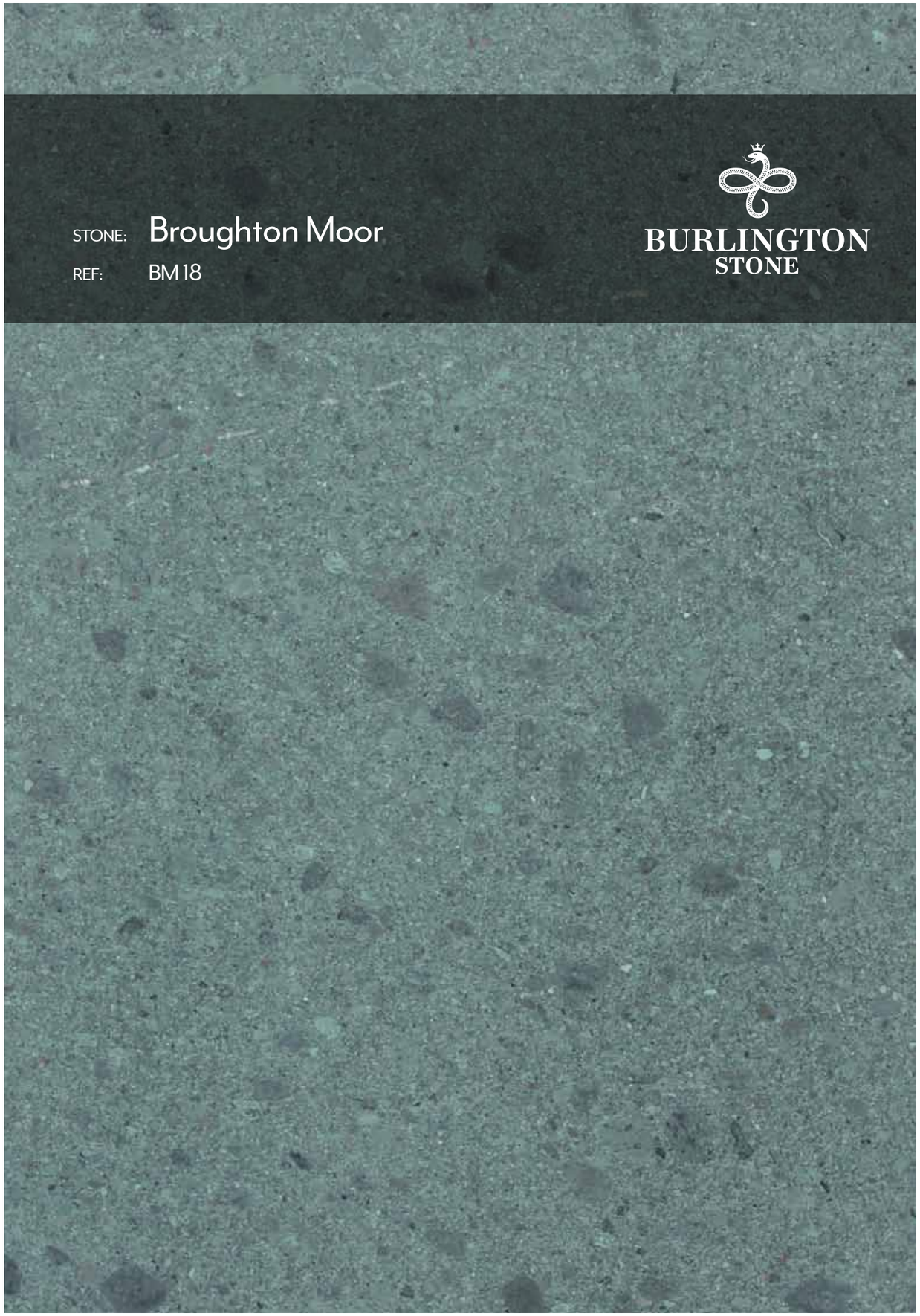
BURLINGTON STONE



STONE: Broughton Moor

REF: BM18

BURLINGTON STONE



STONE: Broughton Moor

REF: BM19

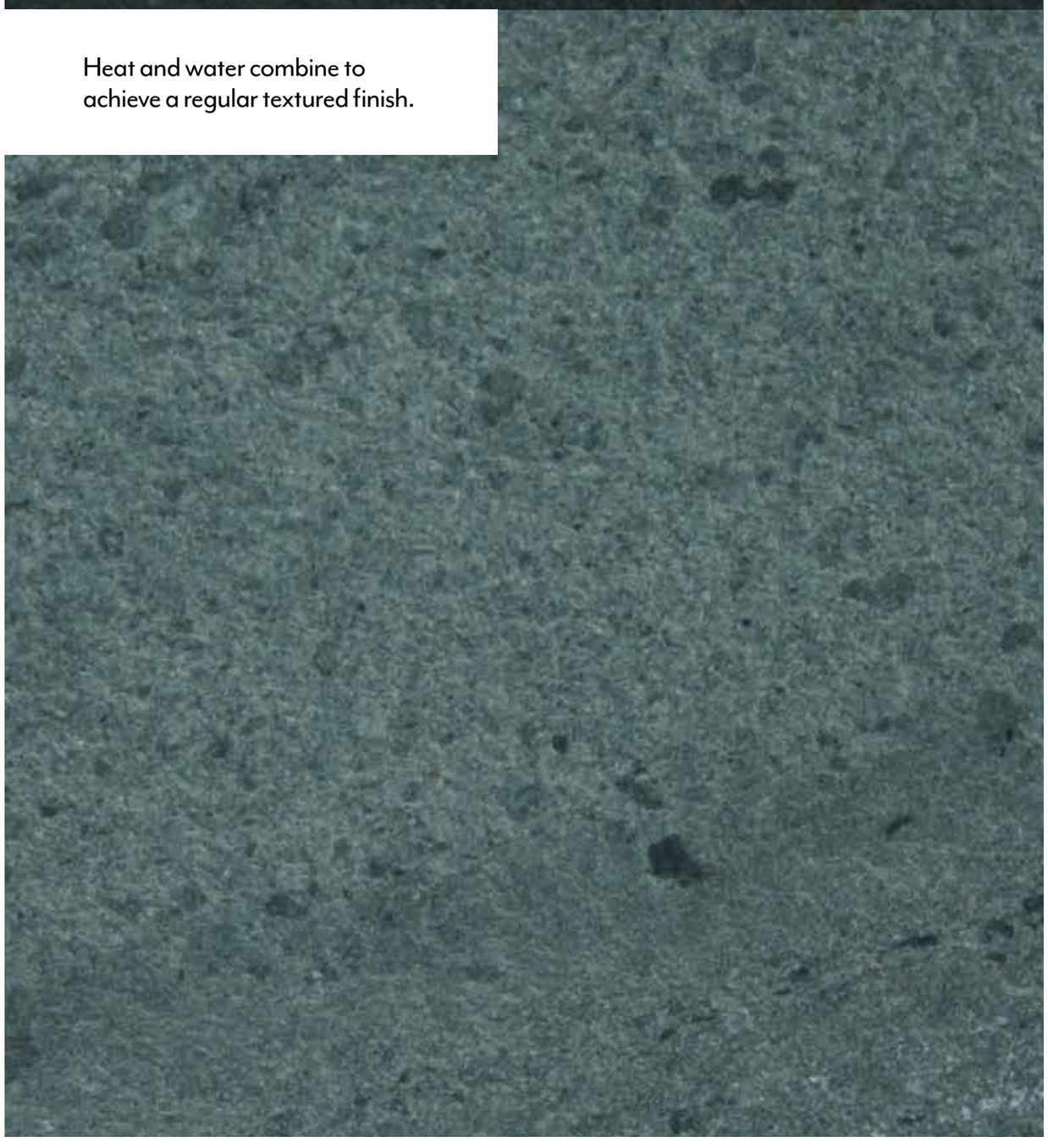
BURLINGTON STONE

STONE: Broughton Moor

FINISH: Flamed Textured

BURLINGTON STONE

Heat and water combine to achieve a regular textured finish.



STONE: Broughton Moor
FINISH: Gritblasted

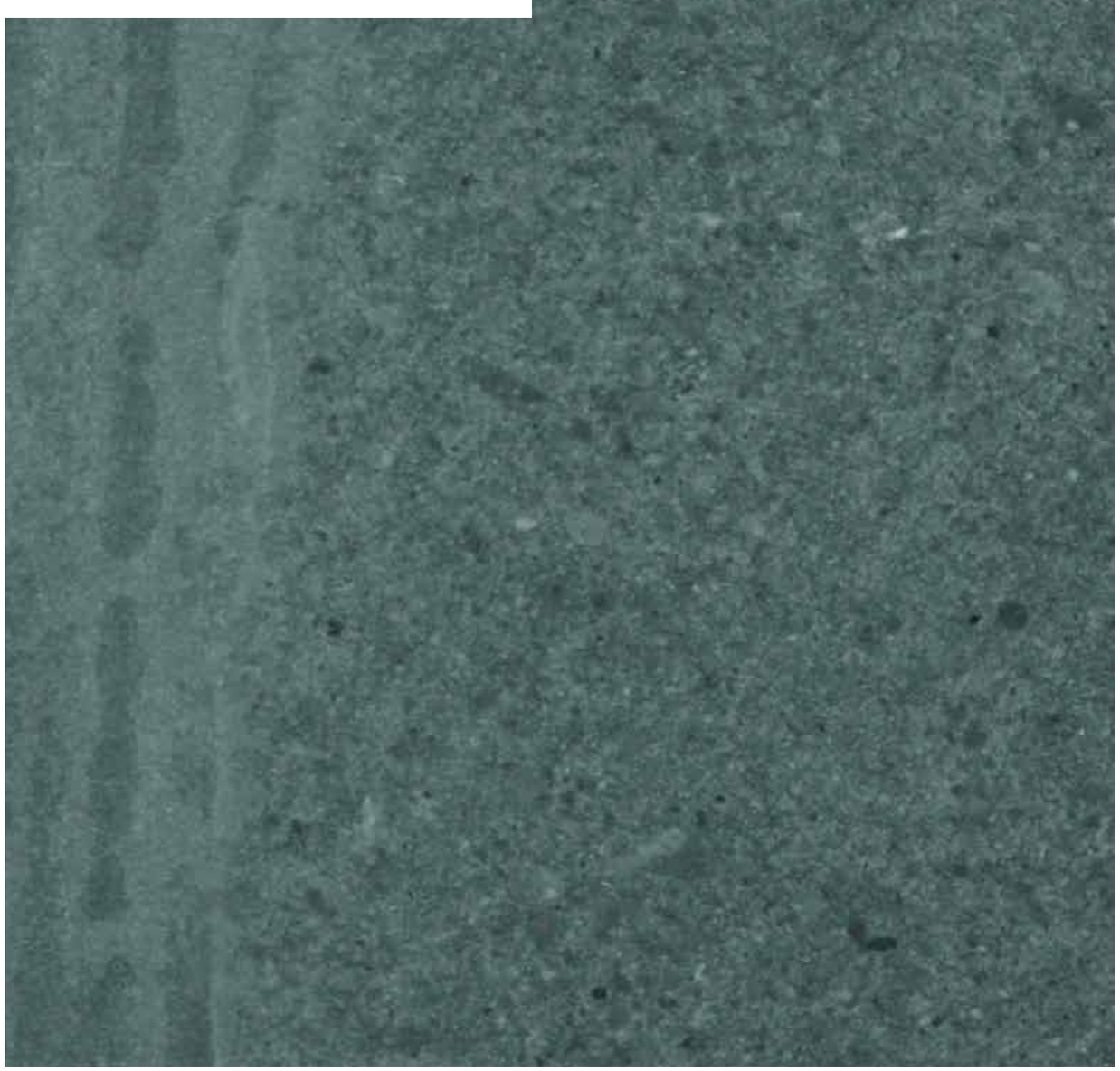
BURLINGTON STONE

A high-pressure airline projects coarse-grained abrasives, giving a regular non slip finish.

STONE: Broughton Moor
FINISH: Honed

BURLINGTON STONE

A smooth finish with a slight sheen, produced by using a polishing head.



STONE: Broughton Moor
FINISH: Line Textured

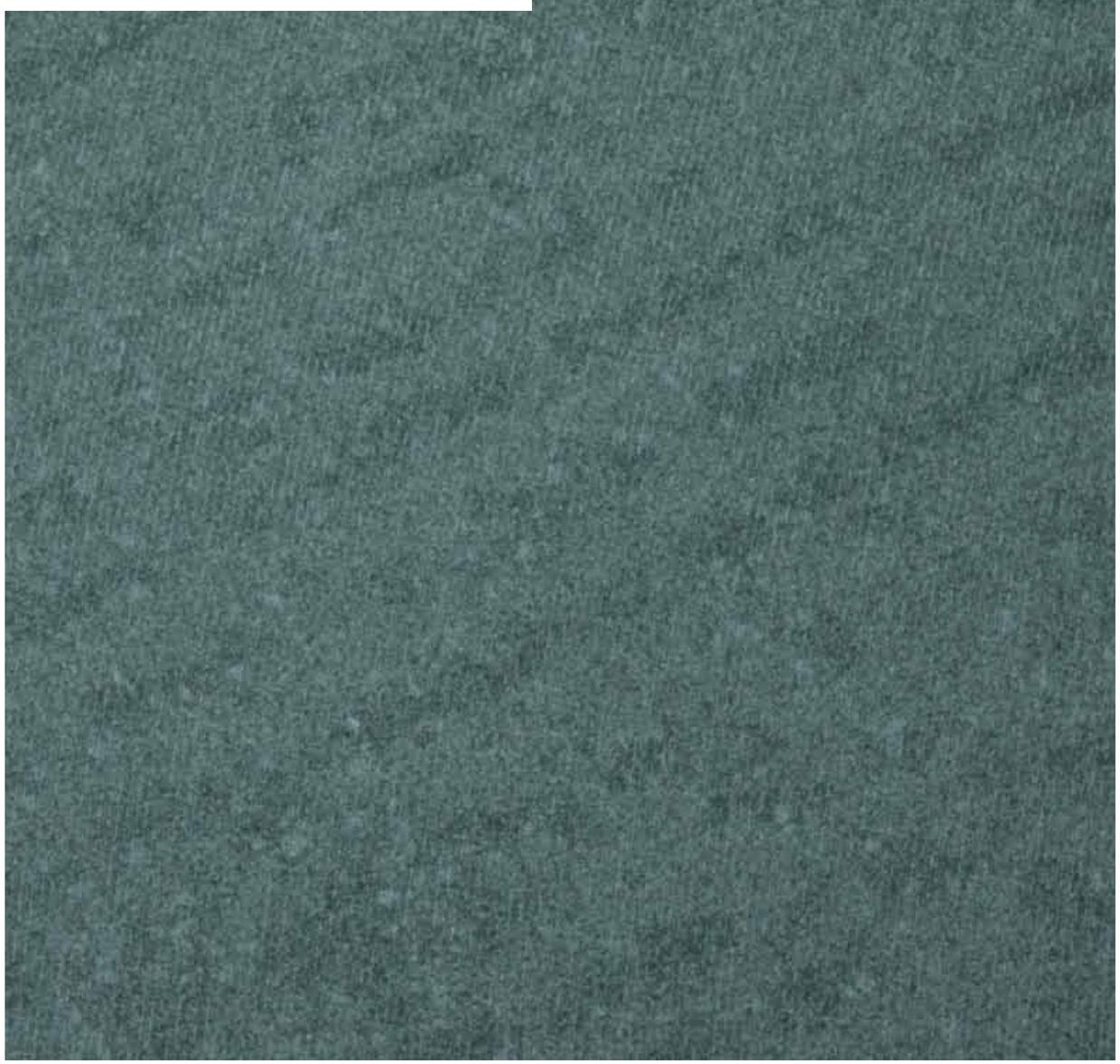
BURLINGTON STONE

The top surfaces of sawn slabs are pneumatically tooled to produce a grooved surface.

STONE: Broughton Moor
FINISH: Sanded

BURLINGTON STONE

The top surfaces of sawn slabs are coarsely diamond sanded to produce a non slip finish.



STONE: Broughton Moor
FINISH: Spot Textured

BURLINGTON STONE

The top surfaces of sawn slabs are pneumatically tooled to produce a pitted surface.

STONE: Broughton Moor
FINISH: Waterjet

BURLINGTON STONE

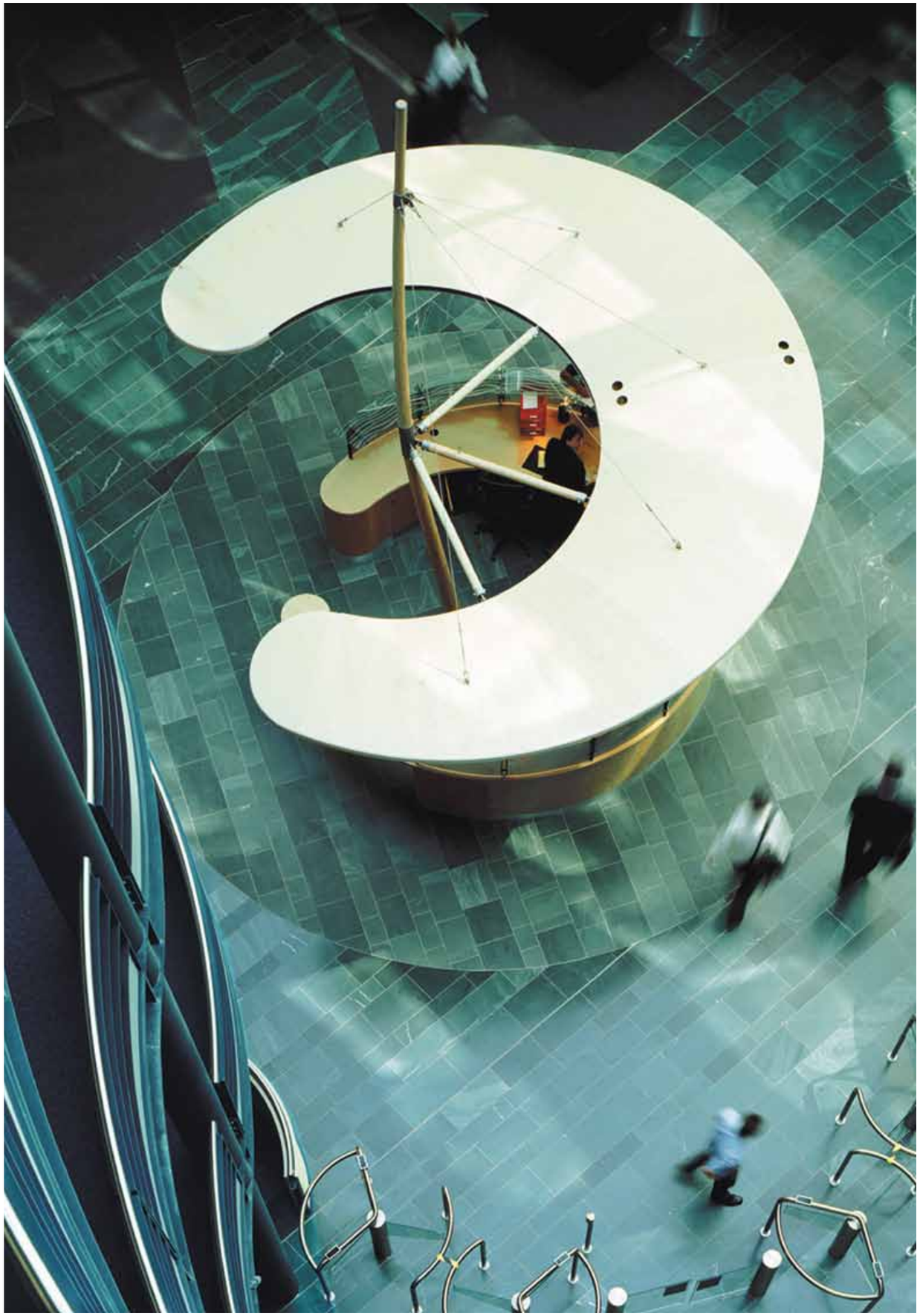
A similar finish to honed but with greater slip-resistance.

STONE: Broughton Moor

FINISH: Riven Cleft

BURLINGTON STONE

A finish in which the stone is split along its natural cleavage plane.



BURLINGTON STONE

EST 1843

BS EN 12326-1
KM 10333

ISO 14001
EMS 573812

003

1969
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1984
THE QUEEN'S AWARD FOR EXPORT ACHIEVEMENT

1991
THE QUEEN'S AWARD FOR EXPORT ACHIEVEMENT

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