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Ref No.: DQG 170625 – AA

24 June 2025

Re: ***Haerses Road Quarry***
45 Haerses Road
Maroota NSW
BANDED SANDSTONE COMPLIANCE REPORT

This report presents a summary and assessment of laboratory test results carried out on material sampled from the Haerses Road Quarry. The works were requested by Dixon Quarry Group (the client). Core Geotechnical Pty Ltd has reviewed and assessed the laboratory test results that have been carried out on the banded sandstone materal. It is understood that the sandstone is to be quarried for use as a dimension stone product to be used in various conditions and applications.

Australian and Internationally accepted laboratory test methods specific to dimension stone were chosen where applicable, all tests have been carried out by NATA accredited facilities. The laboratory tests carried out are as follows:

Laboratory Test	Test Method	Reference
Resistance to Salt Attack	AS 4456.10 – 2003 – Method A	Boral File No: 911/25 Request No: 118385 Lab Sample No: 321025
Water Absorption	AS 4046.4	Boral File No: 911/25 Request No: 118385 Lab Sample No: 321025
Water Absorption and Bulk Specific Gravity	ASTM C97M-18	Stone Initiatives FST0425-01
Modulus of Rupture	ASTM C99M-24	Stone Initiatives FST0425-01
Compressive Strength	ASTM C170M-24a	Stone Initiatives FST0425-01

Detailed laboratory test results are attached to this report.

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Assessment of Results

Based on the laboratory test results, the samples meet the ASTM C616M-22 requirements for density, compressive strength, modulus of rupture and water absorption. Therefore, the sample banded sandstone is considered to be **suitable for use as quartz-based dimension stone for general building and construction purposes.**

Based on the laboratory test results, the samples are considered to be **"Exposure Grade (EXP)"** in accordance with AS/NZS 4455.1 – 2008 in regards to resistance to salt attack. Therefore, the sample banded sandstone is considered to be **suitable for (but not limited to) use in aggressive, high salt environments** such as:

- Masonry in contact with saline or contaminated water or subject to saline wetting and drying
- Within 1 km of a surf coast (coastline with breaking surf)
- Within 100 m of a non-surf coast (bays and rivers)
- Applications where the product is subjected to salts in the soils, adjacent material or groundwater
- Below the damp proof course of a wall
- Retaining walls

All samples assessed as part of this report are considered to be Exposure Grade. The hierarchy of resistance to salt attack grades are noted in the table below:

Grade	Usage
Exposure Grade (EXP)	The highest grade of resistance to salt attack. Suitable for (but not limited to) use in aggressive, high salt and severe marine environments including being in contact with saline or contaminated water. May also be used in environments where GP or PRO grades are acceptable.
General Purpose Grade (GP)	Suitable for use in an external wall, in some mild non-saline marine environments, interior applications subject to non-saline wetting and drying and when in contact with non-aggressive soils. May also be used in environments where PRO grades are acceptable.
Protected Grade (PRO)	The lowest grade of resistance to salt attack. Suitable for use above damp-proof course in non-marine environments. May be used in other environments provided it is protected with a waterproof coating, properly flashed junctions with other elements and a covering such as a roof protecting the masonry.

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The samples are considered to be **suitable for use on council jobs**, specific requirements can be tested upon request. The banded sandstone samples achieve a range of common council specifications such as:

- Wet crushing strength of at least 25 MPa
- Minimum point load strength of 1 MPa
- Minimum relative density of 2.2
- Mean wet/dry strength variation of less than 45%
- Demonstrate durability against a saline environment as per AS 4456.10

In accordance with AS 1726 – 2017, the banded sandstone sample material is considered to be slightly weathered to fresh and high strength. Based on the Pells classification system for sandstone in Sydney, the sample material is considered to be Class I Sandstone which is the highest quality Sydney Sandstone Class. Although this classification system is typically used for foundation design purposes, it is a sound indication of the high strength, quality and consistency of the sandstone sample. See below table:

Class	Unconfined compressive strength q_u (MPa)	Defect spacing	Allowable seams
I	>24	>600mm	<1.5%
II	>12	>600mm	<3%
III	>7	>200mm	<5%
IV	>2	>60mm	<10%
V	>1	N.A.	N.A

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Limitations

This report is based on the information provided by the client and/or other contractors. This report has been prepared for the exclusive use of the client for the purpose stated herein and is based on the scope of work agreed. The interpretations, recommendations and conclusions presented are based on information obtained from laboratory test results and they reflect the quality of sample material only.

No warranty or guarantee is expressed or implied as to the subsurface conditions across the entire site. The findings should not be applied to any other site or project without written approval from Core Geotechnical Pty Ltd.

This report should be read in full, including all appendices, to ensure proper understanding of the findings. Third parties reviewing or relying on this report do so at their own risk and Core Geotechnical Pty Ltd disclaims all responsibility for any such unauthorised use or reliance.

For and on behalf
of Core Geotechnical Pty Ltd

James Tricker
Director – Geotechnical Engineer

Reviewed by

Shanan McManus
Director – Geotechnical Consultant

PROPERTY OF DIXON QUARRY GROUP

Boral Construction Materials
Materials Technical Services

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TEST REPORT

CLIENT: ELITE SAND & SOIL PTY LTD
ADDRESS: 4 Harford Street, Jamisontown, NSW 2750

FILE No: 911/25

PROJECT: Testing of Sandstone samples for Salt Attack

REQUEST No: 118385

TEST PROCEDURE:
AS 4456.10 – 2003 – Method A - Determining Resistance to Salt Attack

Laboratory Sample No.:	321025
Date Sampled:	05/05/2025
Date Received:	07/05/2025
Date Tested:	From 15/05/2025 to 05/06/2025
Sample Description:	Dixon Firestone Banded
Date of Manufacture:	Not Supplied
Field No.:	1

TEST RESULTS:

Solution Used	Specimen No.	Percentage Mass Loss (C15) (%)	Average Percentage Mass Loss (C15) (%)	Description of any Damage to Sample	Cycle No. at which testing stopped	Salt Attack Resistance Grade AS/NZS 4455.1-2008
Sodium Chloride (NaCl)	5	0.10	0.09	Crumbling	15	Exposure
	6	0.08		Crumbling		
	7	0.09		Crumbling		
	8	0.10		Crumbling		
	9	0.08		Crumbling		
Sodium Sulfate (Na_2SO_4)	1	0.62	0.89	Crumbling	15	Exposure
	2	0.58		Crumbling		
	3	1.07		Crumbling		
	4	0.63		Crumbling		
	12	1.54		Crumbling		

Sample was provided by the Client.
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Test results in this Test Report relate only to the samples tested.

Nanthini.S
5th June 2025
Jason Roberts, Tom Parker, Mat.File, File.

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TEST REPORT

CLIENT: ELITE SAND & SOIL PTY LTD

PROJECT: Testing of Sandstone Samples.

SAMPLE DESCRIPTION: Dixon Firestone Banded

TEST METHOD: AS4046 – Water Absorption

DATE OF TEST: 10.5.25

FILE NO: 911/25

LAB SAMPLE NO: 321025

REQUEST NO: 118385

DATE SAMPLED: 5.5.25

DATE REC'D: 7.5.25

AS4046.4 – DETERMINATION OF WATER ABSORPTION

DATE IN WATER: 8.5.25 **DATE OUT OF OVEN: 10.5.25**

CLIENT SAMPLE NO:	WET WEIGHT (grams) A	DRY WEIGHT (grams) B	DECREASE IN MASS (grams) A-B	WATER ABSORPTION FOR EACH SPECIMEN (TO 0.1%)
1	294.9	283.7	11.2	3.9
2	294.7	283.6	11.1	3.9
3	293.5	282.3	11.2	4.0
4	296.2	284.9	11.3	4.0
5	292.5	281.5	11.0	3.9
6	288.5	277.4	11.1	4.0
Average Water Absorption (%)				4.0

Sample submitted by client.

J. Roberts, T. Parker, File,

Kamal Ali
SECTION HEAD – AGGREGATES
10th June 2025

PROPERTY OF DIXON QUARRY GROUP

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TEST REPORT

CLIENT: ELITE SAND & SOIL PTY LTD

PROJECT: Testing of Sandstone Samples.

SAMPLE DESCRIPTION: Dixon Firestone Banded

TEST METHOD: AS4046 – Water Absorption

DATE OF TEST: 10.5.25

FILE NO: 911/25

LAB SAMPLE NO: 321025

REQUEST NO: 118385

DATE SAMPLED: 5.5.25

DATE REC'D: 7.5.25

AS4046.4 – DETERMINATION OF WATER ABSORPTION

DATE IN WATER: 8.5.25 **DATE OUT OF OVEN: 10.5.25**

CLIENT SAMPLE NO:	WET WEIGHT (grams) A	DRY WEIGHT (grams) B	DECREASE IN MASS (grams) A-B	WATER ABSORPTION FOR EACH SPECIMEN (TO 0.1%)
7	288.3	277.3	11.0	4.0
8	297.8	286.8	11.0	3.8
9	295.9	284.8	11.1	3.9
10	285.9	274.9	11.0	4.0
11	290.6	279.6	11.0	3.9
12	293.3	282.5	10.8	3.8
Average Water Absorption (%)				3.9

Sample submitted by client.

J. Roberts, T. Parker, File,

Kamal Ali
SECTION HEAD – AGGREGATES
10th June 2025

PROPERTY OF DIXON QUARRY GROUP

WATER ABSORPTION, BULK SPECIFIC GRAVITY
Test Certificate

TEST METHOD	ASTM C97 Absorption and Bulk Specific Gravity
TEST DATE	17-04-25 **TO** 05-05-25
CLIENT	Dixon Sand/ MRB Resources
OUR REFERENCE	FST0425-01
SAMPLE	Banded Sandstone
SURFACE FINISH	Sawn
SAMPLE ORIGIN	Unknown
SAMPLING DATE	15-04-25
SHAPE and NOMINAL SIZE	Cube: 50mm x 50mm x 50mm

Conditioning: Dried min 48 hrs @ 60 deg C / Soaked for 48 hours @ 22 deg C

Specimen Identification	Dried Mass (g)	Soaked Mass (g)	Suspended Mass (g)	Bulk SG ($kg.m^{-3}$)	% Absorption by Volume	% Absorption by Weight
Q3023/001	288.27	299.48	171.33	2249	8.75	3.89
Q3023/002	280.65	291.97	166.70	2240	9.04	4.03
Q3023/003	283.24	294.65	168.71	2249	9.06	4.03
Q3023/004	279.70	291.40	165.82	2227	9.32	4.18
Q3023/005	285.36	296.93	169.61	2241	9.09	4.05

MEAN BULK SPECIFIC GRAVITY ($kg.m^{-3}$): **2241 ± 2** (***U95***)

Standard Deviation: 9

MEAN ABSORPTION by VOLUME(%): **9.05 ± 0.09 (*U95*)**

Standard Deviation: 0.20

MEAN ABSORPTION by WEIGHT (%): **4.04 ± 0.04 (*U95*)**

Standard Deviation: 0.10

TESTED BY: Emily Tonkin

APPROVED SIGNATORY:

NAME: Kate Tonkin

NOTE: The expanded measurement uncertainty values (u95) quoted in this report are at a confidence level of 95% with a nominal coverage factor of 2.

ISSUE DATE: 05-May-25

Accreditation No. 15695

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MODULUS OF RUPTURE
Test Certificate

TEST METHOD	ASTM C99M Modulus of Rupture of Dimension Stone
TEST DATE	22-04-2025 TO 01-05-2025
CLIENT	Dixon Sand/ MRB Resources
OUR REFERENCE	FST0425-01
SAMPLE	Banded Sandstone
SAMPLE ORIGIN	Unknown
SAMPLING DATE	15-04-25
NOMINAL SIZE	200mm x 100mm x 60mm
LOAD ORIENTATION TO FINISH	Perpendicular FINISH IN TENSION Sawn
TEST EQUIPMENT	Electronic Universal Force Testing Machine, Assett ID: S01114

Conditioning: Dried for minimum 48 hours @ 60 deg C

Test Number	Specimen Identification	Span (mm)	Test Condition	Load Orientation (w.r.t. Rift)	Width (mm)	Thickness (mm)	Max. Load (Newtons)	Strength (MPa)
F12071	Q3023/006	180	Dried	Perpendicular	100.10	61.2	10953	7.9
F12072	Q3023/007	180	Dried	Perpendicular	101.31	61.1	9836	7.0
F12073	Q3023/008	180	Dried	Perpendicular	100.70	61.1	10897	7.8
F12074	Q3023/009	180	Dried	Perpendicular	100.49	60.9	10531	7.6
F12075	Q3023/010	180	Dried	Perpendicular	101.27	60.3	10442	7.7

MEAN DRIED MODULUS of RUPTURE (MPa): **7.6 ± 0.14 (u95)**

Standard Deviation: **0.3**

Conditioning: Soaked for 48 hours @ 22 deg C

Test Number	Specimen Identification	Span (mm)	Test Condition	Load Orientation (w.r.t. Rift)	Width (mm)	Thickness (mm)	Max. Load (Newtons)	Strength (MPa)
F12076	Q3023/011	180	Soaked	Perpendicular	101.72	61.1	6455	4.6
F12077	Q3023/012	180	Soaked	Perpendicular	101.30	61.1	5950	4.3
F12078	Q3023/013	180	Soaked	Perpendicular	100.54	61.2	5982	4.3
F12079	Q3023/014	180	Soaked	Perpendicular	100.81	61.1	5882	4.2
F12080	Q3023/015	180	Soaked	Perpendicular	100.89	61.0	5589	4.0

MEAN SOAKED MODULUS of RUPTURE (MPa): **4.3 ± 0.09 (u95)**

Standard Deviation: **0.2**

TESTED BY: Arslan Khan

NOTE: The expanded measurement uncertainty values (u95) quoted in this report are at a confidence level of 95% with a nominal coverage factor of 2.

APPROVED SIGNATORY:

NAME: Mark Milevski

ISSUE DATE: 09-May-25

Accreditation No. 15695

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COMPRESSIVE STRENGTH OF DIMENSION STONE
Test Certificate

TEST METHOD	ASTM C170M
TEST DATE	22-04-25 To 01-05-25
CLIENT	Dixon Sand/ MRB Resources
OUR REFERENCE	FST0425-01
SAMPLE	Banded Sandstone
SAMPLE ORIGIN	Unknown
SAMPLING DATE	15-04-25
SHAPE and NOMINAL SIZE	Prism: 60mm x 60mm x 60mm
DIRECTION OF LOAD TO RIFT	Perpendicular to bedding or rift
TEST EQUIPMENT	2000kN Matest Compression Force frame, Assett ID: S11039

Conditioning: Dried for minimum 48 hours @ 60 deg C

Specimen Identification	Test Condition	Load Orientation	Length (mm)	Width 1 (mm)	Width 2 (mm)	Max. Load (Newtons)	Compressive Strength (MPa)
Q3023/016	Dried	Perpendicular	61.4	61.0	60.9	285252	77
Q3023/017	Dried	Perpendicular	60.3	60.6	60.9	219580	59
Q3023/018	Dried	Perpendicular	60.9	60.7	60.9	252562	68
Q3023/019	Dried	Perpendicular	60.9	61.0	60.8	316136	85
Q3023/020	Dried	Perpendicular	61.4	60.5	60.3	282649	77

MEAN DRIED COMPRESSIVE STRENGTH (MPa): **73 ± 0.9** ***(U95)***

Standard Deviation: **10.0**

Conditioning: Soaked for 48 hours @ 22 deg C

Specimen Identification	Test Condition	Load Orientation	Length (mm)	Width 1 (mm)	Width 2 (mm)	Max. Load (Newtons)	Compressive Strength (MPa)
Q3023/021	Soaked	Perpendicular	60.8	60.8	60.9	167892	45
Q3023/022	Soaked	Perpendicular	60.5	60.7	60.7	161135	44
Q3023/023	Soaked	Perpendicular	60.5	61.2	61.2	126863	34
Q3023/024	Soaked	Perpendicular	60.5	60.7	60.0	181397	50
Q3023/025	Soaked	Perpendicular	60.4	60.2	60.7	142608	39

MEAN SOAKED COMPRESSIVE STRENGTH (MPa): **42 ± 0.5** ***(U95)***

Standard Deviation: **6.1**

TESTED BY: Arslan Khan

APPROVED SIGNATORY:

NAME: Mark Milevski

NOTE: The expanded measurement uncertainty values (u95) quoted in this report are at a confidence level of 95% with a nominal coverage factor of 2.

ISSUE DATE: 01-May-25

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