

9 August 2018



Bruhn Limestone
PO BOX 412
Mount Gambier SA 5290

Attention: Mr. Andrew Carmody

Mount Gambier Limestone

- Determination of physical properties

Client reference: Req: A. Carmody

Our reference: BRU0718-1

Investigating officers: Graham Baggs & Mark Milevski

Report prepared by: Graham Baggs

James P Mann
Laboratory Manager



	Draft	Reviewed	Released
Name	GB	MM	GB
Date	9/8/18	9/8/18	9/8/18

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1. INTRODUCTION

Stone Initiatives received a request from the client’s representative to perform testing on samples of Mount Gambier Limestone prepared as building blocks with nominal dimensions of 660 mm long x 120 mm wide x 240 mm high. (Our reference: L533)

2. EVALUATION

The aim of the investigation was an evaluation of the basic physical properties. The tests carried out were:

- Water Absorption / Bulk Specific Gravity
- Unconfined Compressive Strength

Water absorption and bulk specific gravity were determined in accordance with ASTM C97-15 "Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone". The specimens had been dried at $60 \pm 2^\circ\text{C}$ for 48 hours followed by soaking at $22 \pm 2^\circ\text{C}$ for a further 48 hours.

The compressive strength of each specimen was determined in accordance with AS/NZS 4456.4:2003 "Masonry units and segmental pavers and flags – Methods of test – Determining compressive strength of masonry units".

Testing was carried out with the load applied perpendicular to bedding with each block tested in two halves over a nominal load area of 330 mm x 120 mm.

3. RESULTS

Results are summarized in the table below. Full test data are detailed in Appendix A of this report.

Property	Mt Gambier Limestone Mean (range)
Bulk Specific Gravity • (kg.m ⁻³)	1300 (1273 – 1318)
Water Absorption • (% by weight)	28.0 (26.8 – 29.4)
Compressive Strength • Dried (MPa)	3.9 (3.8 – 4.0)

Appendix A

Test Certificates



WATER ABSORPTION, BULK SPECIFIC GRAVITY Test Certificate

TEST METHOD	ASTM C97M-15
TEST DATE	11-Jul-18
CLIENT	Bruhn Limestone
OUR REFERENCE	BRU0718-1
SAMPLE	Mt Gambier Limestone
SURFACE FINISH	Sawn
SAMPLE ORIGIN	Not Known
SAMPLING DATE	11/07/2018
SAMPLE LOCATION	Not Known
SHAPE and NOMINAL SIZE	Prism: 50mm x 50mm x 50mm

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

Test Number	Specimen Identification	Dried Mass (g)	Soaked mass (g)	Suspended mass (g)	Bulk SG (kg.m ⁻³)	% Absorption by Volume	% Absorption by Weight
W8848	L533/1	164.59	210.15	83.99	1,305	36.11	27.68
W8849	L533/2	159.60	206.54	81.20	1,273	37.45	29.41
W8850	L533/3	174.12	220.71	88.62	1,318	35.27	26.76
W8851	L533/4	179.48	231.09	91.83	1,289	37.06	28.76
W8852	L533/5	167.04	212.57	85.55	1,315	35.84	27.26

MEAN BULK SPECIFIC GRAVI (kg.m⁻³) **1,300 ± 1 (U₉₅)**
 STANDARD DEVIATION 19

MEAN ABSORPTION BY Volume (%) **36.35% ± 0.11 (U₉₅)**
 STANDARD DEVIATION 0.89%

MEAN ABSORPTION BY Weight (%) **27.97% ± 0.08 (U₉₅)**
 STANDARD DEVIATION 1.09%

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. These values do not include any estimate of the effects associated with sampling.

COMMENTS/VARIATIONS

TESTED BY: J. Mann & M. Milevski

APPROVED SIGNATORY:

NAME: James P Mann

ISSUE DATE: 01-Aug-18



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Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

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Compressive Strength

TEST: Method 4: Determining compressive strength of masonry units
CLIENT: Bruhn Limestone
DATE TESTED: 8/08/2018
SAMPLE: Mt Gambier Limestone masonry units
SAMPLING DATE: 3/07/2018
TEST CONDITION: Air dried
LOAD RATE: 6-35 kN/min
TEST METHOD: AS NZS 4456.4:2003
OUR REF : BRU0718-1
SAMPLE SIZE (Nom): 660x240x120mm
ASPECT RATIO: 2
ASPECT RATIO FACTOR (K_a): 0.775
WIDTH (Nom): 120 mm

Test Number	Specimen Identification	Work size length (mm) 1st half	Work size length (mm) 2nd half	Load 1st half (N)	Load 2nd half (N)	Total Specimen Load (N)	Compressive Strength (MPa)
C6266	L533/6	329	329	190820	195360	386180	3.8
C6267	L533/7	333	324	216890	183290	400180	3.9
C6268	L533/8	328	329	194700	201580	396280	3.9
C6269	L533/9	334	326	188080	220170	408250	4.0
C6270	L533/10	325	333	212480	196460	408940	4.0
Mean Tested Compressive Strength (Mpa):							3.9
Standard Deviation:							0.1
Mean Tested Load Capacity kN (kg):							400 (40760)

COMMENTS (Including variations to procedure):

TESTED BY: G. Baggs
Approved Signatory:

Date: 9-Aug-17

