25 November 2016

BAM Stone
PO Box 156
Port Fairy VIC 3284

Attention: Mr. Tony Rowe

Bamstone Bluestone
- Determination of Slip Resistance

Client reference: Request T. Rowe

Our reference: BAM1116-1

Investigating officer: James P Mann & Mark Milevski

Report prepared by: James P Mann & Mark Milevski

James P Mann
Laboratory Manager

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1. INTRODUCTION

A request was received from the client to determine the slip resistance of two surface finishes on samples of bluestone. The tiles supplied were identified as follows:

- Bamstone Bluestone – Bush Hammered (our reference: B135)
- Bamstone Bluestone – Grit Blasted (our reference: B136)

2. TEST PROGRAM

Slip resistance was determined in accordance with Appendix A of AS 4586:2013 "Slip resistance classification of new pedestrian surface materials". Testing was carried out at five sites in a wet condition using a British Pendulum fitted with a Slider 96 (4S) rubber slider[1].

3. RESULTS

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

Property	Bluestone – Bush Hammered	Bluestone – Grit Blasted
Slip Resistance AS 4586:2013 – Classification – Slip Resistance Value (SRV)	 P5 83 (BPN 81 - 86)	 P5 66 (BPN 61 - 71)

4. DISCUSSION

The Bamstone Bluestone sample with a bush hammered finish and grit blasted finish achieved an SRV of 83 and 66 respectively, attaining a P5 classification (SRV >54). According to Table 3B of the Standards Australia handbook HB198-2014[2] the surface finish is suitable for the following locations[3]:

- External walkways including ramps, sloping driveways, footpaths etc., including those steeper than 1 in 14
- Loading docks undercover and commercial kitchens
- Swimming pool ramps and stairs leading to water

[1] Slider expiry date: 1 September 2017
[2] Guide to the specification and testing of slip resistance of pedestrian surfaces
[3] 5.2 of HB198 states: "The use of these values should be in the context of design, which also considers abnormal wear, maintenance, abnormal contamination, the presence (or otherwise) of water or other lubricants, the nature of the pedestrian traffic (including age, gait and crowding), the footwear (or lack thereof), slope lighting and handrails."

Appendix A
Test Certificates

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WET SLIP RESISTANCE (AS 4586:2013 APP A)

Test Certificate

TEST METHOD	AS 4586:2013 Appendix A (Wet Pendulum)		
TEST DATE	25-Nov-16		
CLIENT	BAM Stone		
OUR REFERENCE	BAM1116-1		
SAMPLE	Bamstone Bluestone - Bush Hammered		
SURFACE FINISH	Bush Hammered		
SAMPLE ORIGIN	Port Fairy - Victoria		
SAMPLING DATE	1/11/2016	**SAMPLE LOCATION**	Not Known
SHAPE and NOMINAL SIZE	Prism: 300mm x 300mm		
AIR TEMPERATURE	19.0 ^{O} C	**TEST SITE**	SI Laboratory
WEATHER	Not Applicable		
TEST TYPE	Unfixed		
ANGLE OF TEST	Horizontal		
SLIDER TYPE	Slider 96	**SLIDER EXPIRY**	01-Sep-17
SLIDER PREPARATION	Slider passed 3x over 400 grit paper, 10x over 3mic lapping film.		
SURFACE PREPARATION	Washed with potable water and cloth		
SURFACE CONDITION	As supplied		

Test Number	Orientation	BPN Readings	Mean
S12402	B135/1 Random	95, 87, 87, 86, 85	86
S12403	B135/2 Random	84, 87, 85, 85, 85	85
S12404	B135/3 Random	84, 83, 83, 84, 84	84
S12405	B135/4 Random	80, 80, 82, 81, 80	81
S12406	B135/5 Random	80, 90, 82, 80, 81	81

MEAN Wet SLIP RESISTANCE VALUE (SRV): **83** ±2 (u_{95})

SLIP RESISTANCE CLASSIFICATION: **P5**

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: Mark Milevski

APPROVED SIGNATORY:

NAME: James P Mann

ISSUE DATE: 25-Nov-16

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WET SLIP RESISTANCE (AS 4586:2013 APP A)

Test Certificate

TEST METHOD	AS 4586:2013 Appendix A (Wet Pendulum)		
TEST DATE	25-Nov-16		
CLIENT	BAM Stone		
OUR REFERENCE	BAM1116-1		
SAMPLE	Bamstone Bluestone - Grit Blasted		
SURFACE FINISH	Grit Blasted		
SAMPLE ORIGIN	Port Fairy - Victoria		
SAMPLING DATE	1/11/2016	**SAMPLE LOCATION**	Not Known
SHAPE and NOMINAL SIZE	Prism: 300mm x 300mm		
AIR TEMPERATURE	19.1 ^{O} C	**TEST SITE**	SI Laboratory
WEATHER	Not Applicable		
TEST TYPE	Unfixed		
ANGLE OF TEST	Horizontal		
SLIDER TYPE	Slider 96	**SLIDER EXPIRY**	01-Sep-17
SLIDER PREPARATION	Slider passed 3x over 400 grit paper, 10x over 3mic lapping film.		
SURFACE PREPARATION	Washed with potable water and cloth		
SURFACE CONDITION	As supplied		

Test Number	Orientation	BPN Readings	Mean
S12407	B136/1 Random	67, 67, 67, 67, 67	67
S12408	B136/2 Random	64, 64, 64, 64, 64	64
S12409	B136/3 Random	61, 61, 61, 61, 61	61
S12410	B136/4 Random	70, 69, 69, 69, 69	69
S12411	B136/5 Random	72, 71, 71, 71, 71	71

MEAN Wet SLIP RESISTANCE VALUE (SRV): **66** ±2 (u_{95})

SLIP RESISTANCE CLASSIFICATION: **P5**

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: Mark Milevski

APPROVED SIGNATORY:

NAME: James P Mann

ISSUE DATE: 25-Nov-16

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