

6 June 2013



Littlehampton Brick Company  
PO Box 479  
Littlehampton SA 5250

Attention: Mr. Mark Boding

# Brick Paver Testing

## - Old Red and Mahogany 50mm

**Client reference:** Request M. Boding

**Our reference:** LBC0513-1

**Investigating officer:** Kate Tonkin & Graham Baggs

**Report prepared by:** Kate Tonkin & Graham Baggs

James P Mann  
Laboratory Manager



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### 1. INTRODUCTION

A request was received from the client to determine the breaking load and slip resistance of two samples of Brick Pavers, Old Red 50mm and Mahogany 50mm.

### 2. TEST PROGRAM

Characteristic breaking load of segmental pavers was carried out in accordance with AS4456.5:2003. The specimens were air dried at 20±2°C for a minimum of 48 hours prior to testing. Testing was carried out with the wearing face in tension.

Slip resistance was determined on five specimens of each paver sample in accordance with Appendix A of AS/NZS 4586:2004 “Slip resistance classification of new pedestrian surface materials”, (Wet Pendulum Test Method). Testing was carried out using a British Pendulum fitted with a 4S (96) rubber slider.

### 3. RESULTS

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

Property	Old Red Brick Paver 50mm	Mahogany Brick Paver 50mm
<b>Breaking Load (kN)</b>	6.2 (4.1 – 8.2)	8.9 (6.1 – 11.8)
<b>Strength (MPa)</b>	5.8 (3.7 – 7.5)	8.7 (6.0 – 12.0)
<b>Slip Resistance (Wet Pendulum)</b>		
– British Pendulum Number	66 (61 - 71)	64 (61 - 69)
– Classification	V	V
– Contribution to Risk of Slipping	Very Low	Very Low

## 4. DISCUSSION

### 4.1. Breaking load

According to Table 2.8 of AS/NZS 4455.2:2010<sup>1</sup> the minimum breaking load for a paver (<0.08 m<sup>2</sup>) in residential and public spaces should be as follows:

- Pedestrians only: 2kN
- Pedestrians and vehicles: 5kN

The table below demonstrates that the tested samples of both the Old Red 50mm paver and the Mahogany 50mm paver satisfy these requirements.

	Minimum breaking load (kN) According to AS/NZ 4455.2:2010	Old Red 50 mm	Mahogany 50mm
<b>RESIDENTIAL</b>			
Pedestrians only	2	✓	✓
Pedestrian and light vehicles only	3	✓	✓
Pedestrian and Commercial vehicles	5	✓	✓
<b>PUBLIC SPACE</b>			
Pedestrians only	2	✓	✓
Pedestrian and light vehicles only	3	✓	✓
Pedestrian and Commercial vehicles	5	✓	✓

### 4.2. Slip Resistance

The Old Red paver samples tested have a mean BPN of 66 and the Mahogany paver samples tested have a mean BPN of 64. Therefore both pavers achieve a V classification. Table 2 of the Australian Standards HB197:1999 states the contribution of the stone surface to the risk of slipping when wet is considered VERY LOW.

According to Table 3 of the HB 197:99 both the pavers surfaces are suitable for selection for locations that include:

- External ramps
- Swimming pool ramps
- Entry foyers hotel, office, public buildings – wet or dry
- Shopping centres including food court
- Lift lobbies
- External colonnade, walkways and pedestrian crossings
- Swimming pool surrounds and communal shower rooms
- External stair nosings

<sup>1</sup> Masonry units, pavers, flags and segmental retaining wall units - Pavers and flags

# Test Certificates



## BREAKING LOAD OF SEGMENTAL PAVERS Test Certificate

<b>TEST METHOD</b>	AS/NZS 4456.5:2003
<b>TEST DATE</b>	28-May-13
<b>CLIENT</b>	Littlehampton Brick Company
<b>OUR REFERENCE</b>	LBC0513-1
<b>SAMPLE</b>	Old Red 50mm Paver
<b>SURFACE FINISH</b>	As fired
<b>SAMPLE ORIGIN</b>	Littlehampton SA
<b>MANUFACTURE DATE</b>	27/05/2013
<b>SAMPLE LOCATION</b>	Not Known
<b>WORK SIZE</b>	114 x 230 x 50
<b>LOADING ORIENTATION</b>	Perpendicular to Wearing Face

**Conditioning:**

Test Number	Specimen Identification	Span (mm)	Test Condition	Width (mm)	Thickness (mm)	Max. Load (Newtons)	Strength (MPa)
M3077	C207/1	180	Dried	112.7	50.9	6820	6.3
M3078	C207/2	180	Dried	113.2	50.5	6930	6.5
M3079	C207/3	180	Dried	113.3	51.5	5500	5.0
M3080	C207/4	180	Dried	112.6	51.3	8190	7.5
M3081	C207/5	180	Dried	112.9	51.7	4130	3.7
M3082	C207/6	180	Dried	114.4	50.4	4430	4.1
M3083	C207/7	180	Dried	112.9	51.8	6660	5.9
M3084	C207/8	180	Dried	113.2	49.6	7180	7.0
M3085	C207/9	180	Dried	113.1	49.8	6120	5.9
M3086	C207/10	180	Dried	112.6	50.5	6220	5.8

**DRY BREAKING LOAD (Mean - kN):** 6.2 ± 0.08 (*U<sub>95</sub>*)

**Standard Deviation:** 1.2

**MODULUS of RUPTURE DRY (Mean - MPa):** 5.8

**Standard Deviation:** 1.2

**COMMENTS/VARIATIONS**

**TESTED BY:** J Mann & G Baggs

**APPROVED SIGNATORY:**

**NAME:** James P Mann



**ISSUE DATE:** 28-May-13

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## BREAKING LOAD OF SEGMENTAL PAVERS Test Certificate

<b>TEST METHOD</b>	AS/NZS 4456.5:2003
<b>TEST DATE</b>	28-May-13
<b>CLIENT</b>	Littlehampton Brick Company
<b>OUR REFERENCE</b>	LBC0513-1
<b>SAMPLE</b>	Mahogany 50mm Paver
<b>SURFACE FINISH</b>	As fired
<b>SAMPLE ORIGIN</b>	Littlehampton SA
<b>MANUFACTURE DATE</b>	27/05/2013
<b>SAMPLE LOCATION</b>	Not Known
<b>WORK SIZE</b>	114 x 230 x 50mm
<b>LOADING ORIENTATION</b>	Perpendicular to Wearing Face

**Conditioning:**

Test Number	Specimen Identification	Span (mm)	Test Condition	Width (mm)	Thickness (mm)	Max. Load (Newtons)	Strength (MPa)
M3067	C208/1	180	Dried	111.7	50.3	8560	8.2
M3068	C208/2	180	Dried	112.3	51.4	9940	9.0
M3069	C208/3	180	Dried	110.9	50.5	9010	8.6
M3070	C208/4	180	Dried	112.0	48.7	11810	12.0
M3071	C208/5	180	Dried	112.2	49.9	8430	8.1
M3072	C208/6	180	Dried	111.3	49.4	6050	6.0
M3073	C208/7	180	Dried	112.3	49.2	8060	8.0
M3074	C208/8	180	Dried	111.3	50.2	9740	9.4
M3075	C208/9	180	Dried	110.1	50.9	7200	6.8
M3076	C208/10	180	Dried	111.8	49.2	10660	10.6

**DRY BREAKING LOAD (Mean - kN): 8.9 ± 0.1 (U<sub>95</sub>)**

**Standard Deviation: 1.7**

**MODULUS of RUPTURE DRY (Mean - MPa): 8.7**

**Standard Deviation: 1.7**

**COMMENTS/VARIATIONS**

**TESTED BY:** J Mann & G Baggs

**APPROVED SIGNATORY:**

**NAME:** James P Mann



**ISSUE DATE:** 28-May-13



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## SLIP RESISTANCE CLASSIFICATION - NEW Test Certificate

<b>TEST METHOD</b>	AS/NZS 4586:2004 Appendix A		
<b>TEST DATE</b>	04-Jun-13		
<b>CLIENT</b>	Littlehampton Brick Company		
<b>OUR REFERENCE</b>	LBC0513-1		
<b>SAMPLE</b>	Old Red 50mm Paver		
<b>SURFACE FINISH</b>	As fired		
<b>SAMPLE ORIGIN</b>	Littlehampton SA		
<b>SAMPLING DATE</b>	27/05/2013	<b>SAMPLE LOCATION</b>	Not Known
<b>NOMINAL SIZE</b>	110x225x50 mm		
<b>AIR TEMPERATURE</b>	18.2 °C	<b>TEST SITE</b>	SI Laboratory
<b>WEATHER</b>	Not Applicable		
<b>TEST TYPE</b>	Unfixed		
<b>ANGLE OF TEST</b>	Horizontal		
<b>SLIDER TYPE</b>	4S/96	<b>SLIDER EXPIRY</b>	22-Aug-13
<b>SURFACE PREPARATION</b>	Washed with potable water and cloth		

Test Number	Orientation	BPN Readings	Mean
S4287	C207/11 Random	70, 67, 67, 67, 66	67
S4288	C207/12 Random	80, 73, 73, 70, 70	71
S4289	C207/13 Random	62, 61, 62, 61, 61	61
S4290	C207/14 Random	67, 67, 67, 67, 67	67
S4291	C207/15 Random	66, 64, 66, 65, 66	66

**MEAN BRITISH PENDULUM NUMBER (Wet):** **66** ±2 (*U<sub>95</sub>*)  
**SLIP RESISTANCE CLASSIFICATION:** **V**

*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:** Kate Tonkin

**APPROVED SIGNATORY:**

**NAME:** James P Mann



**ISSUE DATE:** 04-Jun-13



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## SLIP RESISTANCE CLASSIFICATION - NEW Test Certificate

<b>TEST METHOD</b>	AS/NZS 4586:2004 Appendix A		
<b>TEST DATE</b>	04-Jun-13		
<b>CLIENT</b>	Littlehampton Brick Company		
<b>OUR REFERENCE</b>	LBC0513-1		
<b>SAMPLE</b>	Mahogany 50mm Paver		
<b>SURFACE FINISH</b>	As fired		
<b>SAMPLE ORIGIN</b>	Littlehampton SA		
<b>SAMPLING DATE</b>	27/05/2013	<b>SAMPLE LOCATION</b>	Not Known
<b>NOMINAL SIZE</b>	110x225x50 mm		
<b>AIR TEMPERATURE</b>	17.8 °C	<b>TEST SITE</b>	SI Laboratory
<b>WEATHER</b>	Not Applicable		
<b>TEST TYPE</b>	Unfixed		
<b>ANGLE OF TEST</b>	Horizontal		
<b>SLIDER TYPE</b>	4S/96	<b>SLIDER EXPIRY</b>	22-Aug-13
<b>SURFACE PREPARATION</b>	Washed with potable water and cloth		

Test Number	Orientation	BPN Readings	Mean
S4282	C208/11 Random	64, 64, 62, 62, 63	62
S4283	C208/12 Random	74, 70, 70, 69, 69	69
S4284	C208/13 Random	65, 63, 62, 61, 60	61
S4285	C208/14 Random	70, 64, 64, 64, 64	64
S4286	C208/15 Random	67, 62, 61, 62, 62	62

**MEAN BRITISH PENDULUM NUMBER (Wet):** **64** ±2 (U<sub>95</sub>)  
**SLIP RESISTANCE CLASSIFICATION:** **V**

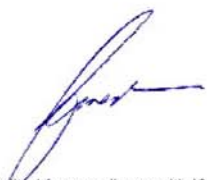
*NOTE: The expanded measurement uncertainty values (u95) quoted in this report are at a confidence level of 95 % with a nominal coverage factor of 2. These values do not include any estimate of the effects associated with sampling.*

**COMMENTS/VARIATIONS**

**TESTED BY:** Kate Tonkin

**APPROVED SIGNATORY:**

**NAME:** James P Mann



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