



## Division of Building, Construction and Engineering

Graham Road, Highett, Victoria, 3190, Australia  
PO Box 56, Highett, Victoria, 3190, Australia

Tel: (03) 9252 6000 Fax: (03) 9252 6253

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### CONSOLIDATED TILING SERVICES

8 September 1995  
Our Ref. EN13/ 84

### TEST REPORT No. 525

Requested by: Australian Natural Tile  
on (date): 22 August 1995  
Manufacturer: Australian Natural Tile  
Tile Desc.: Iron Bark  
315mm x 315mm

Sampling details:  
Where: Delivered  
Date: 22 August 1995  
By whom: Courier  
How (methods): N/A

The results reported relate only to the sample(s) tested.

No responsibility is taken for the accuracy of the sampling unless it is done under our own supervision

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This test report consists of 3 pages

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#### SUMMARY OF TESTS PERFORMED:

ISO/DIS 10545-12:1993	Determination of frost resistance		
	Tiles damaged after test:	NIL	PASS



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Tel: (03) 9252 6000 Fax: (03) 9252 6253

REPORT NO: 525  
ISSUE DATE: 8 September 1995  
MANUFACTURER: Australian Natural Tile  
TILE DESC: Iron Bark  
315mm x 315mm

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### DETERMINATION OF FROST RESISTANCE

TEST CARRIED OUT IN ACCORDANCE WITH  
ISO/DIS 10545-12:1993

Test Date: 5 September 1995

RESULTS Location: Ceramic Tile Laboratory  
Work size: Length: 315 mm Width: 315 mm Thickness: 16 mm

Number of specimens: 10

Water Absorption (%) by Vacuum Method

Tile	Before Frost Cycling	After Frost Cycling
1	8.0	9.8
2	8.7	9.4
3	8.7	9.6
4	7.5	8.0
5	7.3	8.1
6	7.0	8.0
7	7.3	8.3
8	8.1	9.3
9	7.6	8.1
10	7.3	7.9
<b>Mean:</b>	<b>7.7</b>	<b>8.7</b>

Defects before test: **NIL**

Defects after test: **NIL**

Number of tiles damaged after 100 cycles: **NIL**

No tile shall show any defects or damage after testing

#### INFORMATIVE ANNEX

This test is compulsory only for products that are intended to be specified for use where frost may apply.  
The test is not required for product groups that are generally unsuitable for use where frost may be present.



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Tel: (03) 9252 6000 Fax: (03) 9252 6253

REPORT NO: 641  
ISSUE DATE: 15 May 1996  
MANUFACTURER: Australian Natural Tile  
TILE DESC: Extruded Terracotta, floor tile  
Un glazed, 315mm x 315mm

Page 2 of 3

### DETERMINATION OF MOISTURE EXPANSION Using Boiling Water

TEST CARRIED OUT IN ACCORDANCE WITH  
ISO 10545-10:1995

Test Date: 15 May 1996

#### RESULTS

Location: Ceramic Tile Laboratory  
Number of specimens: 5

Tile	Moisture Expansion %
1	0.032
2	0.036
3	0.033
4	0.028
5	0.038
<b>Maximum value obtained :</b>	<b>0.038 %</b>
<b>Mean :</b>	<b>0.033 %</b>

There are no product requirements

#### INFORMATIVE ANNEX

The majority of glazed and unglazed tiles have negligible moisture expansion which does not contribute to tiling problems when tiles are correctly fixed.

With unsatisfactory fixing practices or in certain climatic conditions, moisture expansion in excess of 0.06 % (0.6 mm/m) may contribute to problems.



# Improving the Built Environment

Building Construction and Engineering, Graham Road (PO Box 56), Highett, Victoria 3190, Australia  
Telephone: 61 3 9252 6000 Facsimile: 61 3 9252 6244 Web: <http://www.dbce.csiro.au>

REPORT NO: 1840-1  
ISSUE DATE: 15 March 2001  
MANUFACTURER: Australian Natural Tile Co.  
PRODUCT DESC: Sandstone, extruded, unglazed, terracotta tile  
320mm x 320mm

Page 4 of 5

## Masonry units & segmental pavers - Method of test Method10: Determining resistance to salt attack. Method B - Materials other than dimension stone.

Test based on AS/NZS 4456.10: 1997

Samples received: 7 February 2001

Test Date: 15 March 2001

**Sample:** Sandstone extruded terracotta tile  
**Identification Mark:** 1840-1 numbered 1 to 5.  
**Duration of test:** 12 February to 14 March 2001  
**Test Solution:** Sodium Chloride solution  
**Mixing Ratio:** NaCl 140g : 1 litre water  
**Completed cycles:** 40 cycles  
**Test Conditions:** 19.5°C and 43% RH  
**Drying Conditions:** 115°C ±3°C  
**Drying Duration:** Short dry>2.5h, Long dry>12.0h.

Sample No.	Specimen size (mm)	Mass of particle loss (g)	Cycle number completed	Classification
1	50 x 25	0.01	40	Exposure
2	50 x 25	0.01	40	Exposure
3	50 x 25	0.01	40	Exposure
4	50 x 25	0.01	40	Exposure
5	50 x 25	0.01	40	Exposure

**Mode of Failure:** No Failure.

**Comments:**



# Improving the Built Environment

Building Construction and Engineering, Graham Road (PO Box 56), Highett, Victoria 3190, Australia  
Telephone: 61 3 9252 6000 Facsimile: 61 3 9252 6244 Web: <http://www.dbce.csiro.au>

REPORT NO: 1840-1 Addendum  
ISSUE DATE: 15 March 2001  
MANUFACTURER: Australian Natural Tile Co.  
PRODUCT DESC: Sandstone, extruded, unglazed, terracotta tile  
320mm x 320mm

## DETERMINATION OF REHEAT SHRINKAGE After 2 hours at 550 C

Based on:  
ISO 10545-10:1995

Test Date: 15 February 2001

### RESULTS

Location: Ceramic Tile Laboratory Number of specimens: 5

Tile	Reheat Shrinkage %
1	0.031
2	0.034
3	0.035
4	0.037
5	0.034

Maximum value obtained : 0.037 %

Mean : 0.034 %

There are no compliance criteria

### INFORMATIVE ANNEX

While this test method requires that specimens be heated to 550 C, it does not require that the reheat shrinkage be determined or reported. However, since such a reheat shrinkage may be highly indicative of the moisture expansion that has occurred since manufacture, it is reported here. In trying to assess the degree to which tile moisture expansion has contributed to any differential movement failure, one should note that a large amount of the expansion will probably have occurred prior to installation of the tiles. The rate of moisture expansion generally decreases significantly with time. Where the reheat shrinkage is greater than 0.06%, one should consider attempting to determine how much of the expansion has occurred before fixing of the tiles and after failure of the tiling system. This could then be considered in the context of other system variables that contribute to such failures (unsuitable substrate preparation, inappropriate choice of fixative, inadequate application of fixative, failure to provide for differential movement, structural movement, etc).

**WARNING:** Extreme caution should be exercised in the interpretation of this Informative Annexe. Should you believe that you have a case against the tile manufacturer or some other party, you should consider instigating a consultancy. However, you should note that there are generally a number of contributing factors in most differential movement failures, and that it is not always possible to identify the primary causal factor.

# Gold Coast City Council – Slip Resistance Test Report

Report No. : 2069

Client : The Australian Natural Tile Co. Pty. Ltd.  
79 Mica Street  
Carole Park, Qld. 4370  
Attn. Tony Kennedy

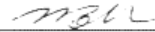
Site Details : N/A

Test Method: AS/NZS 3661.1:1993 Appendix A – Method for the measurement of the coefficient of friction of wet surfaces using a Stanley Portable Skid Resistance Tester.

**Results**

Sample Reference No.	TR 463
Description of Sample	315 mm. sq. (Nom.) Tile Terracotta (Dapple Gold)
No. of Specimens Submitted/Tested	Five (5)
Date of Test	14/06/94
Test Location (lab/in situ)	Laboratory
Surface Gradient	N/A
Test Type (fixed/unfixed)	Unfixed
Cleaning Performed	Water Only
Air Temperature at Time of Test (° C)	19
Weather Conditions at Time of Test	N/A
Coefficient of Friction of Specimen:	#1 0.63
	#2 0.64
	#3 0.64
	#4 0.63
	#5 0.63
Mean Coefficient of Friction of Sample	0.63
Required Coefficient of Friction – Sample <sup>(note 2)</sup>	0.40
Required Coefficient of Friction – Specimens <sup>(note 3)</sup>	0.35
Maximum Allowable Gradient <sup>(note 4)</sup>	18%

- Notes**
1. It is not intended for the test results contained in this report to account for any future wear or maintenance of the surface.
  2. Minimum required coefficient of friction, adjusted for slope, in accordance with clause 5.2 of AS3661.1
  3. No individual specimen shall have a coefficient of friction less than the value shown in the table.
  4. Maximum allowable gradient on which the sample can be laid.
  5. The samples, as tested, comply with the requirements of AS3661.1 for the slip resistance of pedestrian surfaces subject to wetting.
  6. Replacement for report no.2063

Signatory :   
 Date : 14/06/94

# Gold Coast City Council – Slip Resistance Test Report

Report No. : 2070

Client : The Australian Natural Tile Co. Pty. Ltd.  
79 Mica Street  
Carole Park, Qld. 4300  
Attn. Tony Kennedy

Site Details : N/A  
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Test Method: AS/NZS 3661.1:1993 Appendix A – Method for the measurement of the coefficient of friction of wet surfaces using a Stanley Portable Skid Resistance Tester.

**Results**

Sample Reference No.	TR 464
Description of Sample	315 mm sq. (Nom) Tile Terracotta (Kimberley Tap)
No. of Specimens Submitted/Tested	Five (5)
Date of Test	14/06/94
Test Location (lab/in situ)	Laboratory
Surface Gradient	N/A
Test Type (fixed/unfixed)	Unfixed
Cleaning Performed	Water Only
Air Temperature at Time of Test (° C)	20
Weather Conditions at Time of Test	N/A
Coefficient of Friction of Specimen:	
#1	0.61
#2	0.63
#3	0.64
#4	0.64
#5	0.65
Mean Coefficient of Friction of Sample	0.63
Required Coefficient of Friction – Sample <sup>(note 2)</sup>	0.40
Required Coefficient of Friction – Specimens <sup>(note 3)</sup>	0.35
Maximum Allowable Gradient <sup>(note 4)</sup>	18%

- Notes**
1. It is not intended for the test results contained in this report to account for any future wear or maintenance of the surface.
  2. Minimum required coefficient of friction, adjusted for slope, in accordance with clause 6.2 of AS3661.1
  3. No individual specimen shall have a coefficient of friction less than the value shown in the table
  4. Maximum allowable gradient on which the sample can be laid.
  5. The samples, as tested, comply with the requirements of AS3661.1 for the slip resistance of pedestrian surfaces subject to wetting.
  6. Replacement for report no. 2064

Signatory :   
 Date : 14/06/94

# Gold Coast City Council – Slip Resistance Test Report

Report No. : 2071


Client : The Australian Natural Tile Co. Pty. Ltd.  
79 Mica Street  
Carole Park, Qld. 4300  
Attn. Tony Kennedy

Site Details : N/A  
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Test Method: AS/NZS 3661.1:1993 Appendix A – Method for the measurement of the coefficient of friction of wet surfaces using a Stanley Portable Skid Resistance Tester.

Results	Sample Reference No.	TR 465
	Description of Sample	315 mm. sq. (Nom) Tile Terracotta (Tuscany Red)
	No. of Specimens Submitted/Tested	Five (5)
	Date of Test	14/06/94
	Test Location (lab/in situ)	Laboratory
	Surface Gradient	N/A
	Test Type (fixed/unfixed)	Unfixed
	Cleaning Performed	Water Only
	Air Temperature at Time of Test (° C)	20
	Weather Conditions at Time of Test	N/A
	Coefficient of Friction of Specimen:	#1 0.63
		#2 0.63
		#3 0.63
		#4 0.64
	#5 0.63	
Mean Coefficient of Friction of Sample	0.63	
Required Coefficient of Friction – Sample <sup>(note 2)</sup>	0.40	
Required Coefficient of Friction – Specimens <sup>(note 3)</sup>	0.35	
Maximum Allowable Gradient <sup>(note 4)</sup>	18%	

- Notes :
1. It is not intended for the test results contained in this report to account for any future wear or maintenance of the surface.
  2. Minimum required coefficient of friction, adjusted for slope, in accordance with clause 5.2 of AS3661.1
  3. No individual specimen shall have a coefficient of friction less than the value shown in the table.
  4. Maximum allowable gradient on which the sample can be laid.
  5. The samples, as tested, comply with the requirements of AS3661.1 for the slip resistance of pedestrian surfaces subject to wetting.
  6. Replacement for report no. 2065

Signatory :   
 Date : 14/06/94

# Gold Coast City Council – Slip Resistance Test Report

Report No. : 2072

Client : The Australian Natural Tile Co. Pty. Ltd.  
 79 Mica Street  
 Carole Park, Qld. 4300  
 Attn. Tony Kennedy

Site Details : N/A

Test Method: AS/NZS 3661.1:1993 Appendix A – Method for the measurement of the coefficient of friction of wet surfaces using a Stanley Portable Skid Resistance Tester.

Results

Sample Reference No.	TR 466
Description of Sample	315 mm. sq. (Nom) Tile Terracotta (Iron Park)
No. of Specimens Submitted/Tested	Five (5)
Date of Test	14/06/94
Test Location (lab/in situ)	Laboratory
Surface Gradient	N/A
Test Type (fixed/unfixed)	Unfixed
Cleaning Performed	Water Only
Air Temperature at Time of Test (° C)	20
Weather Conditions at Time of Test	N/A
Coefficient of Friction of Specimen:	
#1	0.65
#2	0.64
#3	0.67
#4	0.64
#5	0.67
Mean Coefficient of Friction of Sample	0.65
Required Coefficient of Friction – Sample (note 2)	0.40
Required Coefficient of Friction – Specimens (note 2)	0.35
Maximum Allowable Gradient (note 4)	20%

- Notes
1. It is not intended for the test results contained in this report to account for any future wear or maintenance of the surface.
  2. Minimum required coefficient of friction, adjusted for slope, in accordance with clause 5.2 of AS3661.1
  3. No individual specimen shall have a coefficient of friction less than the value shown in the table.
  4. Maximum allowable gradient on which the sample can be laid.
  5. The samples, as tested, comply with the requirements of AS3661.1 for the slip resistance of pedestrian surfaces subject to wetting.
  6. Replacement for report no. 2066

Signatory :   
 Date : 14/06/94

# Gold Coast City Council – Slip Resistance Test Report

Report No. : 2073

Client : The Australian Natural Tile Co. Pty. Ltd.  
79 Mica Street  
Carole Park, Qld. 4300  
Attn. Tony Kennedy

Site Details : N/A

Test Method: AS/NZS 3661.1:1993 Appendix A – Method for the measurement of the coefficient of friction of wet surfaces using a Stanley Portable Skid Resistance Tester.

**Results**

Sample Reference No.	TR 467
Description of Sample	315 mm. sq. (Nom) Tile Terracotta (Sunset Beige)
No. of Specimens Submitted/Tested	Five (5)
Date of Test	14/06/94
Test Location (lab/in situ)	Laboratory
Surface Gradient	N/A
Test Type (fixed/unfixed)	Unfixed
Cleaning Performed	Water Only
Air Temperature at Time of Test (° C)	20
Weather Conditions at Time of Test	N/A
Coefficient of Friction of Specimen:	
#1	0.64
#2	0.63
#3	0.63
#4	0.61
#5	0.63
Mean Coefficient of Friction of Sample	0.63
Required Coefficient of Friction – Sample <sup>(note 2)</sup>	0.40
Required Coefficient of Friction – Specimens <sup>(note 3)</sup>	0.35
Maximum Allowable Gradient <sup>(note 4)</sup>	18%

- Notes**
1. It is not intended for the test results contained in this report to account for any future wear or maintenance of the surface.
  2. Minimum required coefficient of friction, adjusted for slope, in accordance with clause 5.2 of AS3661.1
  3. No individual specimen shall have a coefficient of friction less than the value shown in the table.
  4. Maximum allowable gradient on which the sample can be laid.
  5. The samples, as tested, comply with the requirements of AS3661.1 for the slip resistance of pedestrian surfaces subject to wetting.
  6. Replacement for report no. 2067

Signatory :   
 Date : 14/06/94

## Slip Resistance Classification of New Pedestrian Surface Materials Report - Wet Pendulum Test Method

**MT  
 R023**

**Client:** The Australian Natural Tile Co.  
 79 Mica Street  
 CAROLE PARK QLD. 4300  
 Attention. Tony Kennedy

**Project:** Not Applicable

**Test Method** : AS/NZS 4586 - 1999  
**Test Method Description** : Slip Resistance Classification of New Pedestrian Surface Materials, Appendix A (Wet Pendulum Test Method)

<b>Sample Reference No.</b>		TR1856	
<b>Description of Test Sample (including any surface coatings, contamination and wear)</b>		320mm Square, Terracotta Tile, Rough/Sand Textured. Yellow/Pale Brown with Brown Speckles, Factory Pre-treated with Installation Pre-seal. Product Name: "Sand Stone"	
<b>No. of Specimens Submitted / Tested</b>		Five (5)	
<b>Sampled By (Laboratory / Client and Name)</b>		Client - Tony Kennedy	
<b>Date of Test</b>		19/03/2003	
<b>Test Location</b>		Laboratory	
<b>Test Type (Fixed / Unfixed)</b>		Unfixed	
<b>Type and Extent of Cleaning Performed</b>		Water & Scrubbing	
<b>Rubber Type Used</b>		Four S (4S)	
<b>Air Temperature at Time of Test (°C)</b>		23	
<b>Weather Conditions at Time of Test</b>		N/A	
<b>Specimen</b>	<b>Comments / Observations</b>	<b>Mean British Pendulum Number (Specimen)</b>	<b>Contribution of the floor surface to the risk of slipping when wet</b>
# 1		60	Very Low
# 2		59	Very Low
# 3		58	Very Low
# 4		61	Very Low
# 5		59	Very Low
<b>Mean British Pendulum Number (Sample) (Note 2)</b>		<b>59</b>	
<b>Classification</b>		<b>V</b>	
<b>Contribution of the Floor Surface to the Risk of Slipping when Wet</b>		<b>Very Low</b>	

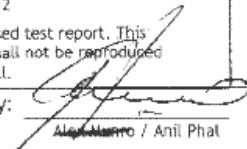
**Notes / Remarks / Variations** :

- 1) Results contained in this report do not account for any future wear or maintenance of the surface
- 2) Reported value has been corrected for temperature if TRRL rubber slider used for testing.
- 3) It is recommended that this report be read in conjunction with AS 4586 - 1999 and Handbook HB 197 - 1999..



NATA Accredited Laboratory  
 Number: 2912

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**Signatory:**   
 Anil Phal

**Report No.:** 12223      **Date:** 20/03/2003

Gold Coast City Council Materials Testing Laboratory, Olympic Circuit, Southport Q 4215

## Slip Resistance Classification of New Pedestrian Surface Materials Report - Wet Pendulum Test Method

MT  
R023

**Client:** The Australian Natural Tile Co.  
 79 Mica Street  
 CAROLE PARK QLD. 4300  
 Attention. Tony Kennedy

**Project:** Not Applicable


**Test Method** : AS/NZS 4586 - 1999

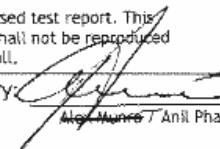
**Test Method Description** : Slip Resistance Classification of New Pedestrian Surface Materials, Appendix A (Wet Pendulum Test Method)

<b>Sample Reference No.</b>		TR1857	
<b>Description of Test Sample (including any surface coatings, contamination and wear)</b>		320mm Square, Terracotta Tile, Slightly Rough Textured, Red/Brown, Factory Pre-treated with installation Pre-seal. Product Name: "Tuscany Red"	
<b>No. of Specimens Submitted / Tested</b>		Five (5)	
<b>Sampled By (Laboratory / Client and Name)</b>		Client - Tony Kennedy	
<b>Date of Test</b>		19/03/2003	
<b>Test Location</b>		Laboratory	
<b>Test Type (Fixed / Unfixed)</b>		Unfixed	
<b>Type and Extent of Cleaning Performed</b>		Water & Scrubbing	
<b>Rubber Type Used</b>		Four S (4S)	
<b>Air Temperature at Time of Test (°C)</b>		23	
<b>Weather Conditions at Time of Test</b>		N/A	
<b>Specimen</b>	<b>Comments / Observations</b>	<b>Mean British Pendulum Number (Specimen)</b>	<b>Contribution of the floor surface to the risk of slipping when wet</b>
# 1		59	Very Low
# 2		58	Very Low
# 3		60	Very Low
# 4		58	Very Low
# 5		59	Very Low
<b>Mean British Pendulum Number (Sample) (Note 2)</b>		59	
<b>Classification</b>		V	
<b>Contribution of the Floor Surface to the Risk of Slipping when Wet</b>		Very Low	

**Notes / Remarks / Variations** :

- 1) Results contained in this report do not account for any future wear or maintenance of the surface
- 2) Reported value has been corrected for temperature if TRRL rubber slider used for testing.
- 3) It is recommended that this report be read in conjunction with AS 4586 - 1999 and Handbook HB 197 - 1999..

  
 NATA Accredited Laboratory  
 Number: 2912  
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Signatory:   
 Anil Phal

**Report No.:** 12224      **Date:** 20/03/2003

Gold Coast City Council Materials Testing Laboratory, Olympic Circuit, Southport Q 4215

## Slip Resistance Classification of New Pedestrian Surface Materials Report - Wet Pendulum Test Method

**MT  
 R023**

**Client:** The Australian Natural Tile Co.  
 79 Mica Street  
 CAROLE PARK QLD. 4300  
 Attention. Tony Kennedy

**Project:** Not Applicable

**Test Method** : AS/NZS 4586 - 1999

**Test Method Description** : Slip Resistance Classification of New Pedestrian Surface Materials, Appendix A (Wet Pendulum Test Method)

<b>Sample Reference No.</b>		TR1858	
<b>Description of Test Sample (including any surface coatings, contamination and wear)</b>		320mm Square, Terracotta Tile, Slightly Rough Textured. Red/Brown, Stamped Pebble Finish, Factory Pre-treated with Installation Pre-seal. Product Name: "Pebble Bluestone"	
<b>No. of Specimens Submitted / Tested</b>		Five (5)	
<b>Sampled By (Laboratory / Client and Name)</b>		Client - Tony Kennedy	
<b>Date of Test</b>		19/03/2003	
<b>Test Location</b>		Laboratory	
<b>Test Type (Fixed / Unfixed)</b>		Unfixed	
<b>Type and Extent of Cleaning Performed</b>		Water & Scrubbing	
<b>Rubber Type Used</b>		Four 5 (45)	
<b>Air Temperature at Time of Test (°C)</b>		24	
<b>Weather Conditions at Time of Test</b>		N/A	
<b>Specimen</b>	<b>Comments / Observations</b>	<b>Mean British Pendulum Number (Specimen)</b>	<b>Contribution of the floor surface to the risk of slipping when wet</b>
# 1		57	Very Low
# 2		54	Very Low
# 3		58	Very Low
# 4		56	Very Low
# 5		59	Very Low
<b>Mean British Pendulum Number (Sample) (Note 2)</b>		<b>57</b>	
<b>Classification</b>		<b>V</b>	
<b>Contribution of the Floor Surface to the Risk of Slipping when Wet</b>		<b>Very Low</b>	

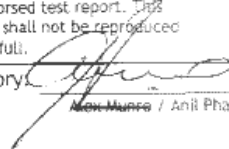
**Notes / Remarks / Variations** :

- 1) Results contained in this report do not account for any future wear or maintenance of the surface
- 2) Reported value has been corrected for temperature if TRRL rubber slider used for testing.
- 3) It is recommended that this report be read in conjunction with AS 4586 - 1999 and Handbook HB 197 - 1999..



NATA Accredited Laboratory  
 Number: 2912

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**Signatory:**   
 Anil Phal

**Report No.:** 12225

**Date:** 20/03/2003

Gold Coast City Council Materials Testing Laboratory, Olympic Circuit, Southport Q 4215