

Project:	MOUNT SYLVIA DIATOMITE
Date:	15/2/2007
Author:	js
Office:	
Drawing:	
Scale:	1:750000
Projection:	MGA Zone 56 (GDA 94)



7 REFERENCES

Coffey Mining 2006. Mt. Sylvania Operations Site Based Management Plan, November 2006

APPENDIX A
Petrological Report

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Petrologist
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Our ref: M18/06/1463
Your ref: Letter of 13th November, 2006 (Guy Lewington)

Petrological examination of one basaltic sample
from Mt Sylvania, Southern Queensland.

Report No: M18/06/1463

9 December 2006.

For: Mr. Sylvia Diatomite Pty Ltd

Dr B.J. Barron
Consulting Petrologist

Sample No. Mt Sylvania

Rock Type Partly selectively altered (weathered), plagioclase- and olivine- microporphyritic alkali olivine basalt. It contains some patches of strongly poikilitic nepheline. Rare hairline brittle fractures are coated with limonitic oxides. Similar oxides stain fine grained secondary layer silicates in the vicinity of the fractures.

Hand Specimen A massive, fine grained, dark grey sample that contains sparse, medium grained, black patches some of which could represent xenocrysts/xenoliths. The sample is cut by a narrow branching discontinuous fractures marked by yellow-brown limonitic oxides. The sample is very weakly magnetic, and K-feldspar staining gave weak patchy positive results.

Thin Section This sample is a basaltic igneous rock with a distinct microporphyritic and intergranular texture. It has a variable grain size from less than 0.05 mm, but with sparse plagioclase prisms reaching about 3 mm long. Average length of plagioclase prisms is about 0.4 mm for the microphenocrystic fraction and about 0.2 mm for the groundmass fraction.

A microphenocryst fraction accounts for about 25% of the present section area. It comprises dominant plagioclase and subordinate olivine. The plagioclase occurs as unoriented prisms and glomeroporphyritic aggregates, some of which are intergrown with olivine. The plagioclase is calcic, and some crystals are distinctly compositionally zoned. Most show little alteration except for wispy brown birefringent smectite clay along some fractures and cleavage surfaces. Olivine also occurs as subhedral crystals, some of which are doubly terminated. Olivine crystals rarely reach 1.3 mm grain size, and are somewhat skeletal enclosing aggregates of fine grained plagioclase and clinopyroxene. At least some olivine grains that have anhedral shapes could represent xenocrysts from a lherzolitic mantle source. Olivine shows substantial alteration to fine grained yellow-brown and olive green bowlingite containing relict 'islands' of unaltered olivine.

Microphenocrystic plagioclase and olivine are set throughout an intergranular groundmass fraction in which plagioclase forms a framework of unoriented prisms that are weakly compositionally zoned, but are mainly calcic. Groundmass plagioclase prisms also show patchy alteration to fine grained olive green ?bowlingite and minor smectite clay, possibly due to near surface weathering. Plagioclase also commonly contains clusters of wispy apatite needles. Clinopyroxene mainly occurs as interstitial anhedral to subhedral small prismatic crystals. The clinopyroxene is pale to mid- purple-brown titanian ?augite. Some clinopyroxene crystals poikilitically enclose clusters of much smaller plagioclase prisms. Sparse small olivine granules also occur in the groundmass fraction where they are intergrown in mafic aggregates with clinopyroxene and oxides. Opaque oxides mainly are prismatic and skeletal ?ilmenite.

In some domains are patchy local aggregates of coarse grained, strongly poikilitic ?nepheline. The ?nepheline reaches about 3 mm grain size and encloses ubiquitous unoriented plagioclase prisms, clinopyroxene and olivine, as well as oxides. The latter minerals account for about 50% of these strongly poikilitic grains.

The sample contains rare dense aggregates of weakly titanian clinopyroxene granules that could represent altered xenocrysts. Also present are shadowy outlines of xenoliths (mainly less than 0.6 mm across), marked by clusters of dusty oxides.

The sample contains about 15% to 20% of patchy fine grained olive green to yellow-brown smectite clay and 'bowlingite'. The latter mainly partly replaces olivine. The rock also is cut by several narrow irregular discontinuous brittle fractures, partly filled with translucent to nearly opaque yellow-brown limonitic oxides. Similar oxides stain the secondary layer silicates, particularly adjacent to these hairline fractures. The yellow-brown limonitic oxides are the result of near surface weathering.

This sample has the following approximate overall primary modal mineralogy: plagioclase 55%; clinopyroxene 15%; altered olivine 15%; K-feldspar 10%; opaque oxides 10%; ?nepheline 10%; and accessory apatite.

This sample may be identified as a partly selectively altered (weathered), plagioclase- and olivine- microporphyritic alkali olivine basalt. It contains some patches of strongly poikilitic ?nepheline. Rare hairline brittle fractures coated with limonitic oxides. Similar oxides stain fine grained secondary layer silicates in the vicinity of the fractures.

APPENDIX B
Test Data

SUMMARY OF TEST DATA

	Tests							Test Value	# of Tests	Std. Dev.	Comments
	Type 1 Paving Material	Type 2 Paving Material	Type 3 Paving Material	Cover Aggregate	Asphalt Aggregate	Concrete Aggregate					
Aggregate Property	Specification Number	11.05	11.05	11.05	11.22	11.30, 11.33, 11.34, 11.36	11.70				Refer Test Data from Coffey and SQS
10% Fines Wet	Q205B	C	C	C	C	C	C	195	1		OK for type 3.1-3.5
10% Fines Dry								265			
Wet/Dry Strength Variation	Q205C	C	C		C	C	C	29			
Degradation Factor	Q208B	C	C			C					
Crushed Particles	Q215	C			C	C					
Weak Particles	Q217				C	C					AS test can be performed by Coffey
Flakiness	Q201A	C	C	C	C	C	C	26	1		OK for type 3.1-3.5 (25Jan07)
Grading Fineness Ratio	Q103A	C, F & f	C, F & f	C, F & f				0.56			OK for Grading B & C (Type 1, 2, 3)
Grading	Q103B				C	C & F		not done			
LL [%]	Q104A	f	f	f				27.6, 24.8	2	1.40	OK for type 3.2-3.5
PL [%]	Q105	f	f	f				20.4	1	N/A	
PI	Q105							4.2, 4.4	2	0.10	OK for type 3.1-3.5
LS [%]	Q106	f	f	f				4.8, 2.4	2	1.20	OK for type 3.3-3.5
Density/APD	Q109	C & F	C & F	C & F	C			2.869, 2.880	2		Coffey Geotechnics (25Jan07)
Density/GPD	Q214A						C	2.1, 3.0	4		Coffey Geotechnics (27Jan07)
Mean Water Absorption	Q214B					C & F	C & F	1.00	2		OK Coffey Geotechnics (25Jan07)
PAFV	Q203					C					
Alkali Silica	Q458						C & F	*			
CBR	Q113A	C, F & f	C, F & f					100			
Petrographic Description#		C & F	C & F	C & F	C	C & F	C & F				

NOTES:

#Current Petrographic Applies to Cover Rock Only

*Alkali Silica Test no longer required by MRD

Round 2 Tests incl GST

1	Tests Completed
2	To be done as required

Notes:

For UNBOUND PAVING MATERIALS:-

'C' Refers to the coarse aggregate fraction which is taken as >2.36mm

'F' Refers to the fine aggregate fraction which is <2.36mm and >0.425mm

'f' Refers to fines which is <0.425mm

For COVER AGGREGATE:-

'C' Refers to the coarse aggregate fraction which is taken the the nominal size of the aggregate

For ASPHALT MATERIALS:-

'C' Refers to the coarse aggregate fraction which is taken as >4.75mm

'F' Refers to the fine aggregate fraction which is <4.75mm & >0.425mm

Filler is nominated as material <0.075mm

For CONCRETE MATERIALS:-

'C' Refers to the coarse aggregate fraction which is taken as >4.75mm

'F' Refers to the fine aggregate or sand fraction which is <4.75mm & >0.425mm

List of Abbreviations

GPD - Gross Particle Density

APD - Apparent Particle Density

LL - Liquid Limit

PL - Plastic Limit

PI - Plasticity Index

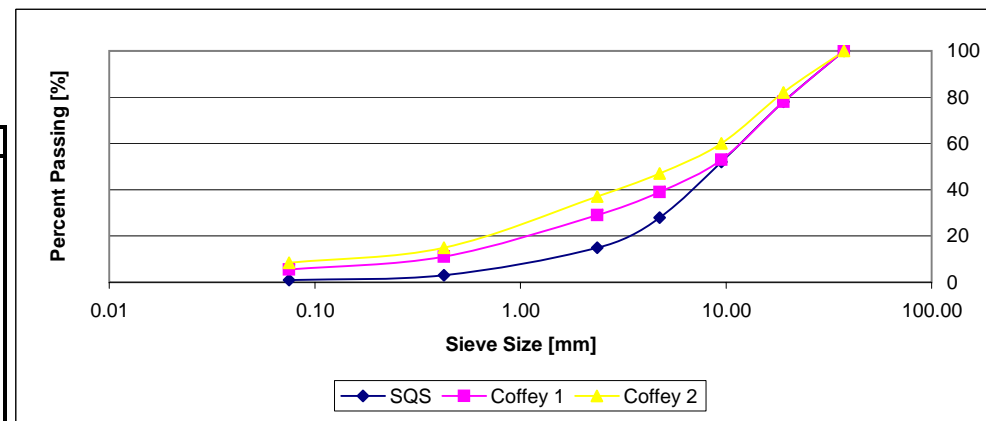
LS - Linear Shrinkage

PAFV - Polished Aggregate Friction Value

CBR - California Bearing Ratio

PSD - Particle Size Distribution

A.S. Sieve Sizes [mm]	Percent Passing	
	Test 2	Test 3
Test Method: Q103A		
75.00		
53.00		
37.50	100	100
19.00	78	82
9.50	53	60
4.75	39	47
2.36	29	37
0.425	11	15
0.075	5.5	8.5



Description of Test Methods and Results

Test method	Specification No.	Data	Acceptable Range	Description	Comments
10% Fines Wet [kN]	Q205B	195	60 - 175		
10% Fines Dry [kN]		275			
Wet/Dry Variation [%]	Q205C	29	30 - 40		
Degradation Factor	Q208B		30 - 50		
Crushed Particles [%]	Q215		70 - 80		
Weak Particles	Q217		1.00		
Flakiness [%]	Q201A	26	30 - 40		
Grading	Q103A			Fine fraction washed from coarser material	Grading specific to each desired product
Grading	Q103B				Grading specific to each desired product
LL [%]	Q104A	27.6, 24.8		The boundary between liquid and plastic states. It is give as the water content at which the sample has such a small shear strength that it flows to close a groove when it is jarred. A high liquid limit indicates a high compressibility and shrink and swell tendencies	
PL [%]	Q105	20.4		The boundary between plastic and semi-solid states. Expressed as the water content at which the sample begins to crumble when it is rolled into fine threads.	
PI	Q105	4.2, 4.4	6% - 14% max	The plasticity index is calculated by subtracting the plastic limit from the liquid limit. A high plasticity index indicates low shear strength.	
LS [%]	Q106	4.8, 2.4	3.5%-7.5% max	The boundary between semi-solid and solid states. Measured by the water content that will fill the pores when the sample is at the minimum volume attained by drying.	
Density/APD	Q109	2.869, 2.880		The mass of a sample divided by its apparent volume. The apparent volume is the volume of the sample excluding the open pores but including internal pores (within individual particles).	To be recorded for control purposes
Density/GPD	Q214A	2.1, 3.0			To be recorded for control purposes
Water Absorption	Q214B	1.00	2.00		
PAFV	Q203				
Alkali Silica	Q458				
CBR Unsoaked	Q113A	100		Measures the pressure required to penetrate a road subgrade sample with a plunger of standard area. It is a ratio of the required pressure to penetrate a soil sample divided by the pressure required for equal penetration in the desired crushed rock sample	
Petrographic Description		Yes			

Note:

Ranges given are for all types of pavement material (unbound, coarse aggregates, concrete and asphalt)
 Specific ranges are available for each material type



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Aggregate/Soil Test Report

Client: Coffey Mining Pty Ltd
Unit 6, 29 McDougall Street
Milton QLD 4064

Principal: Mt Sylvia Diatomite Mine

Job No: LABTNATH00009AAA

Project: MINEMILT00035AAA - Mt Sylvia

Lot No: TRN:

Sample Details

Sample ID: NATH07S-00744

Field Sample: 0003

Date Sampled: 24/02/2006

Source: Supplied

Material: In Situ

Specification: AS Grading

Sampling Method: Submitted by client

Location: Sample Supplied, Mt Sylvia

Other Test Results

Description	Method	Result	Limits
Wet Strength (kN)	Q206C	195	
Dry Strength (kN)		275	
Wet/Dry Strength Variation (%)		29	
Nature of Sample		Crushed Rock	
Nominal Sample Size (mm)		10	
Fraction Size		-13.2 +9.5 mm	

Report No: MAT:NATH07S-00744

Issue No: 1

This report replaces all previous issues of report no 'MAT:NATH07S-00744'.

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WORLD RECOGNISED ACCREDITATION

Approved Signatory: Chris Park (Laboratory Manager)
NATA Accredited Laboratory Number: 431
Date of Issue: 31/03/2007

Particle Size Distribution

Method:
Drying by:
Date Tested:

Sieve Size	% Passing	Limits
Chart		

Comments
N/A



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Aggregate/Soil Test Report

Client: Coffey Mining Pty Ltd
Unit 6, 29 McDougall Street
Milton QLD 4064

Principal: Mt Sylvia Diatomite Mine

Job No: LABTNATH00009AA

Project: MINEMILT00035AA - Mt Sylvia

Lot No: TRN:

Report No: MAT:NATH07S-00076

Issue No: 1

This report replaces all previous issues of report no MAT:NATH07S-00076.

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WORLD RECOGNISED
ACCREDITATION

Approved Signatory: Chris Park (Laboratory Manager)
NATA Accredited Laboratory Number: 431
Date of Issue: 29/01/2007

Sample Details

Sample ID: NATH07S-00076

Field Sample: 0001

Date Sampled:

Source: Supplied

Material:

Specification: AS Grading

Sampling Method: Submitted by client

Location: Mt Sylvia, Submitted, 10/1/07

Particle Size Distribution

Method: Q103A

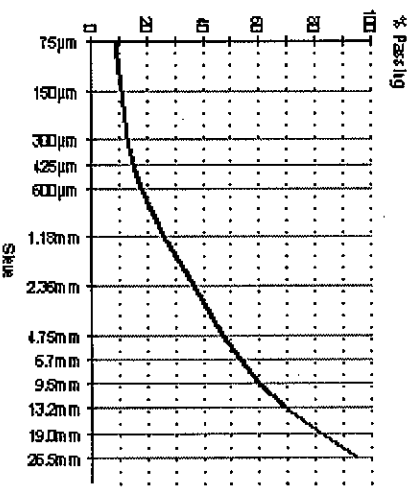
Drying by: Oven

Sieve Size	% Passing	Limits
26.5mm	95	
19.0mm	82	
13.2mm	69	
9.5mm	60	
6.7mm	53	
4.75mm	47	
2.36mm	37	
1.18mm	26	
600µm	18	
425µm	15	
300µm	13	
150µm	11	
75µm	8.5	

Other Test Results

Description	Method	Result	Limits
Fineness Ratio	Q103A	0.56	
Flakiness Index (%)	Q201A	26	

Chart



Comments
N/A

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Bulk Particle Density Report

Client : Coffey Mining Pty Ltd	Report Number: NATH07W000037.1
Job Number : LABTNATH00009AA	Report Date: 27/01/2007
Project : Laboratory Testing	Order Number:
Location : Samples Supplied,	Test Method: Q214B

Lab No :	NATH07S-00076		
ID No :	-		
Lot No :	-		
Item No :	-		
Date Tested :	08/01/2007		
Material Source :	Supplied		
For Use As :	-		
Sample Location :	Mt Sylvia Submitted 10/1/07		
Mean Water Absorption (%):	1.00		
Mean Apparent Particle Density (t/m ³):	2.869		
Mean Particle Dry Density (t/m ³):	2.795		
Mean Particle Density (SSD) (t/m ³):	2.821		
Remarks :	Sample supplied by Client		

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Bulk Particle Density Report

Client :	Coffey Mining Pty Ltd	Report Number:	NATH07W00037.2
Job Number :	LABNATH00009AA	Report Date:	27/01/2007
Project :	Laboratory Testing	Order Number:	
Location :	Samples Supplied,	Test Method:	Q214A

Lab No :	NATH07S-00076		
ID No :	-		
Lot No :	-		
Item No :	-		
Date Tested :	15/01/2007		
Material Source :	Supplied		
For Use As :	-		
Sample Location :	MT SYLVIA Submitted 10/1/07		
Mean Water Absorption (%):	3.00		
Mean Apparent Particle Density (t/m^3):	2.880		
Mean Particle Dry Density (t/m^3):	2.620		
Mean Particle Density (SSD) (t/m^3):	2.710		
Remarks :	Sample supplied by Client		

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Old Soils P/L
 ombs Laboratory
 Court, Toowoomba

South Queensland Soils
 15 Rocla Court
 Toowoomba 4350

REPORT ON
 TYPE 3
 PAVEMENT MATERIAL

Number : 061-0478 Lot number : -
 b Number : 061-017 Chainage :
 tem number : 51500 Sample Loc.: Unknown
 Submitted by : CLIENT
 Senders No : Depth : Layer :
 Sampled By : CLIENT Mat Source : Unknown
 Samp. Method : UNKNOWN
 Date sampled : 08/03/06 Item Desc. : Base, Unbound
 Date tested : 10/03/06 pavement, Type 3

A.S. Sieve Size	Specification Requirements (11.05)				Percentage Passing by mass (Q103A)
	Grading Limits				
	B	C	D	E	
75.0 mm				100	
53.0 mm	100			-	
37.5 mm	85-100	100		85-100	100
26.5 mm					
19.0 mm	55-90	80-100	100	-	78
9.5 mm	40-70	55-90	80-100	40-100	53
4.75 mm	28-55	40-70	55-90	-	39
2.36 mm	20-45	30-55	40-70	20-100	29
.425 mm	10-25	12-30	20-40	10-80	11
.075 mm	4-15	5-20	8-25	4-30	5.5

Tests	SUBTYPE					Results
	3.1	3.2	3.3	3.4	3.5	
L.L. (%) (Q104A/D)	25 max	28 max	35 max	35 max	40 max	27.6
P.I. (%) (Q105)	6 "	8 "	12 "	12 "	14 "	4.2
L.S. (%) (Q106)	3.5 "	4.5 "	6.5 "	6.5 "	7.5 "	4.8
M.A.L. (%) (Q107)						
P.I. x % < 0.425mm	150 "	200 "	360 "	-	-	48
L.S. x % < 0.425mm	85 "	110 "	195 "	-	-	55
Ratio 0.075/0.425	.35-.55	0.35-0.65		-	-	0.48
F.I. (%) (Q201A)		35 Max.		40 "	-	
Total Spec. Defects						

Remarks : Submitted sample for testing.

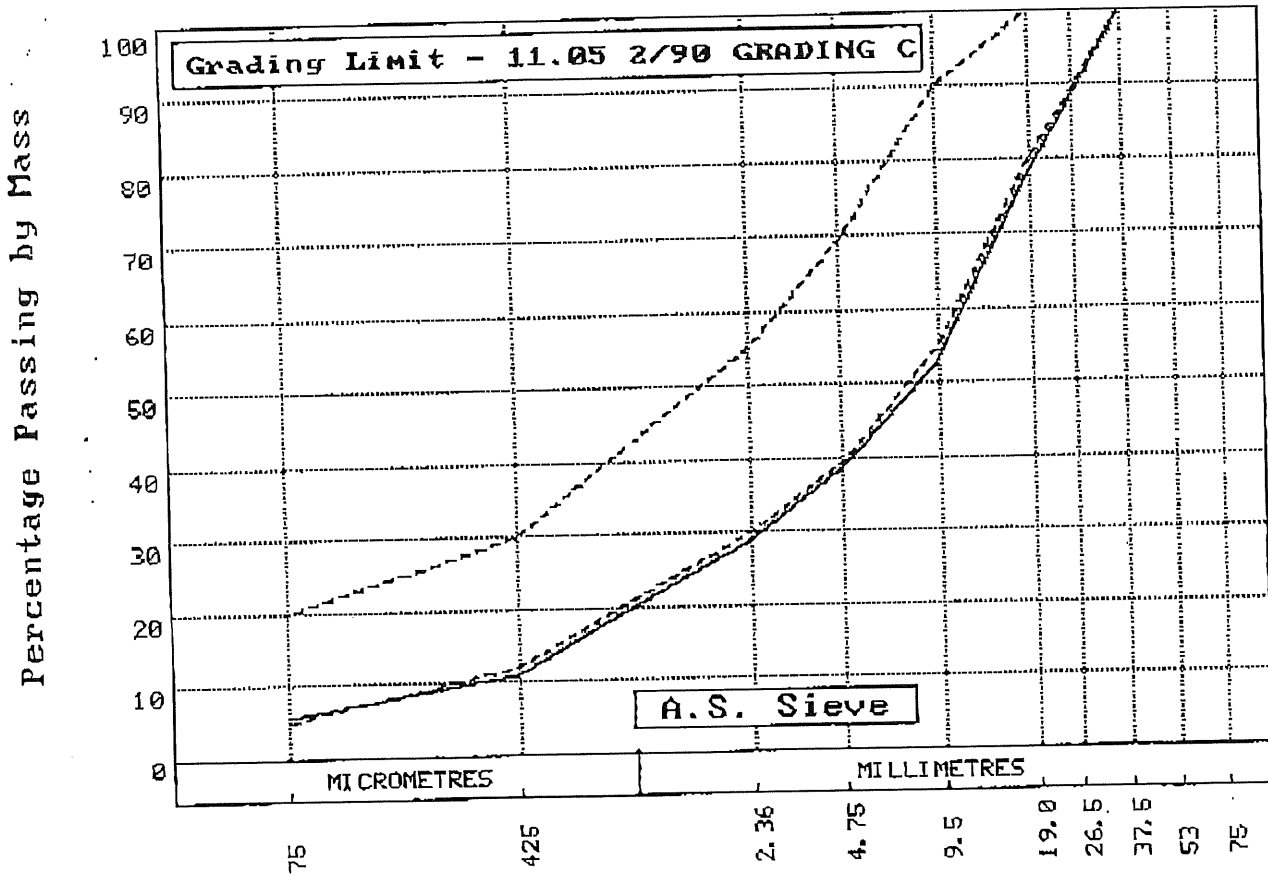
Signatory : *Mark Madden*
 Mark Madden

Page : 1 of 2 Report No : 2005 Date : 13/03/06 CF/0191/535



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Lab number : 061-0478



Checked By : *Mark Madden* Signatory : *Mark Madden*
 Mark Madden Mark Madden

Page : 2 of 2 Report No : 2005 Date : 13/03/06 CF/0191/S35

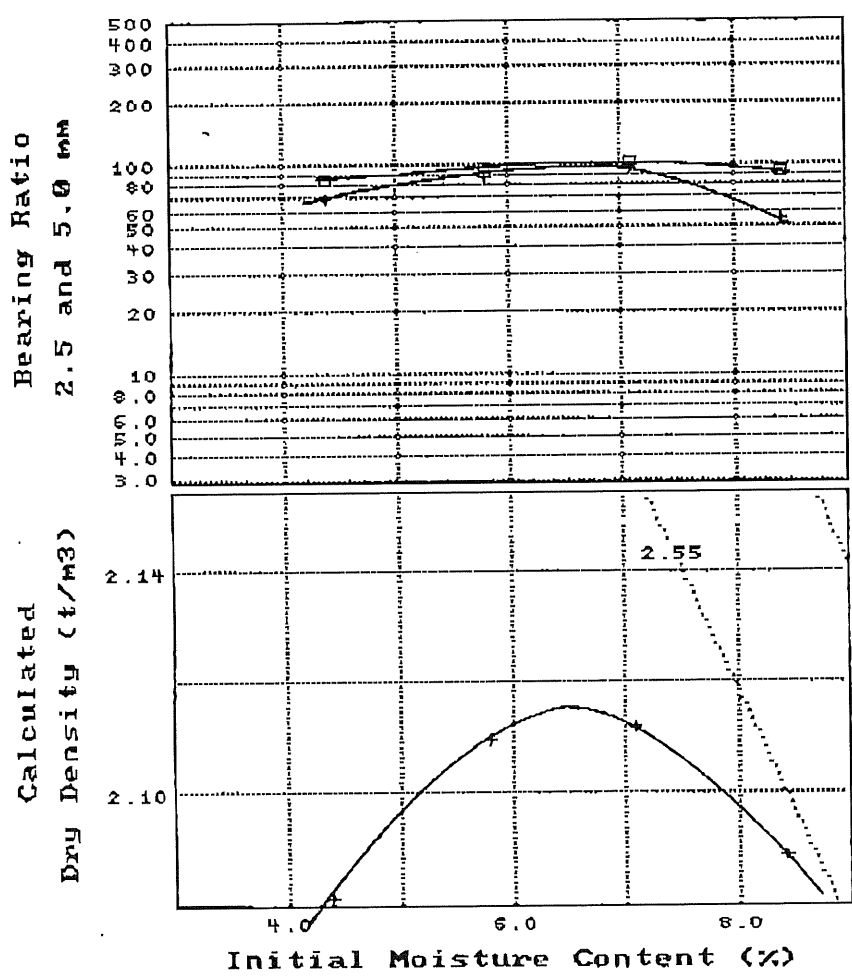


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Old Soils P/L Toowoomba Laboratory Toowoomba	South Queensland Soils 15 Rocla Court Toowoomba 4350	REPORT ON CALIFORNIA BEARING RATIO
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Job Number : 061-0478	Lot Number : -	Rqst No: _____
Job Number : 061-017	Chainage : _____	
Item number : 51500	Sample Loc. : Unknown	
Submitted by : CLIENT		
Senders No : _____	Depth : _____	Layer : _____
Sampled By : CLIENT	Mat Source : Unknown	
Samp. Method : UNKNOWN		
Date sampled : 08/03/06	Item Desc. : Base, Unbound	
Date tested : 13/03/06	pavement, Type 3	

Initial Moisture Content (%)	Calculated Dry Density (t/m ³)	Bearing Ratio 2.5 mm	Bearing Ratio 5.0 mm	Swell (%)	MC After Pene. (%)
5.8	2.110	87.0	96.0		
8.4	2.089	54.0	93.0		
4.4	2.081	69.0	85.0		
7.1	2.112	96.0	102		



Test Condition
Unsoaked

Compactive Effort
100% STD

+ — CBR 2.5mm
□ — CBR 5.0mm

Test Method	Q113A
CBR OMC (%)	6.6
CBR MDD (t/m ³)	2.12
CBR 2.5mm	94
CBR 5.0mm	100
Material CBR Value	100

Remarks : Submitted sample for testing.			
Checked By : <i>Mark Madden</i> Mark Madden	Signatory : <i>Mark Madden</i> Mark Madden	Page : 1 of 1	Report No : 2010 Date : 15/03/06 CF/0892/S36



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