Much Asphalt (Pty), Ltd.
Central Laboratory

a SANAS Accredited Testing Laboratory, T0283

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Test Report Cover Page

Client's Name	*Much Asphalt Site Laboratory*	**Our Ref:**	*CL\09\M006*
Address	*Coedmore*	**Your Ref:**	
		Date	*30/09/2009*
Attention	*Timothy Gradwell*		

Particulars of Sample

Description of Samples	*Various aggregate samples and Bitumen for mix design*
Condition of Samples	*Good*
Date Received	*January/March 2009*
Sampling Procedure	*Sampled by Coedmore Staff*

SANAS Accredited Test Methods	*TMH1 : B3; TMH1 : B4; TMH1 : B14 & B15; TMH1 : C1; TMH1 : C2; TMH1 : C3; TMH1 : C4; TMH1 : C5; TMH1 : C7 (b); TMH1 : C12 T ASTM-D5; IP 49; ASTM-D36; ASTM D4402; SANS 838*

NON- Accredited Test Methods **	*Gyratory Test; ASTM: C1252-93; AASHTO: TP33* [1]

Deviations, Exclusions or Additions or Irregularities Observed:
None

1. **All measuring equipment used are traceable to National Standards where applicable .**
2. **This report is a true record of all measurements made and may not be reproduced other than in full except with the written approval of the Laboratory Manager.**
3. **Results reported in this Report, relate only to the samples tested.**

Remarks
*Please note that the Gyratory Test (marked with **) is not a SANAS Accredited test.*

Authorised Signatory	*HJ Appollis*	**Date:**	*30 March 2009*
Designation	*Reg Technical Manager*		

SANAS Disclaimer:
Tests marked "Not SANAS Accredited" in this Report are not included in the SANAS Schedule of Accreditation for this laboratory.
Opinions and interpretations expressed herein are outside the scope of SANAS accreditation.

Much Asphalt (Pty) Ltd., Coedmore

Asphalt Mix Design

Mix Type Type D

Ref Number CL/09/M006

Date 17/02/2009 **Report Ref Number:** CL/09/M006

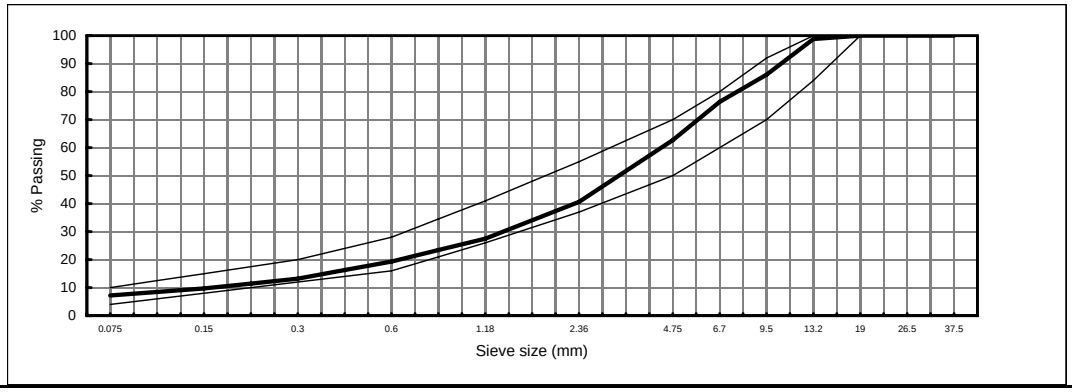
Aggregates

Number	Nominal size	Description and Source
1 (CL/0029)	13.2mm Stone	Crushed stone ex Afrisam Quarry
2 (CL/0030)	6.7mm Stone	Crushed stone ex Afrisam Quarry
3 (CL/0033)	Crusher dust	Crusher Dust ex Lafarge Quarry- Ridgeview
4 (CL/0073)	C/dust hotbin	Crusher Dust hotbin ex Plant
5 (CL/0034)	Sand	Sand ex Multi Sand

Fillers

Number	Type	Description and Source
6 (CL/0036)	Lime	Hydrated Lime

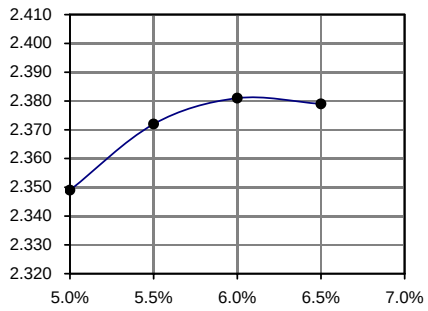
	Sieve Analysis and % Passing											
	Aggregates							Fillers			Combined Grading	Specification
Sample Number	1	2	3	4	5			6				
% In Mix	24%	20%	36%	14%	5%			1%			100.0%	
37.5												
26.5												
19.0	100										100	100 - 100
13.2	95										99	84 - 100
9.5	42	100	100								86	70 - 92
6.7	13	88	99	100	100						76	
4.75	9	34	95	97	99						63	50 - 70
2.36	6	2	69	60	91						41	37 - 55
1.18	5	1	48	32	67						28	26 - 41
0.600	5	1	36	17	32						19	16 - 28
0.300	4	1	26	9	8			100			13	12 - 20
0.150	3	1	20	4	1			98			10	8 - 15
0.075	2.5	0.7	14.7	2.2	0.4			86.5			7.2	4 - 10
BRD of Aggregate	2.670	2.569	2.656	2.667	2.619			2.312			2.638	
Flakiness Index %	24.5	39.5										
LUW	1435	1326	1672	1646	1541							
RUW	1586	1468	1862	1812	1686							
Sand Equivalent %			25	79	91							
Water Absorption %	0.7	1.2	1.0	0.8	0.3							



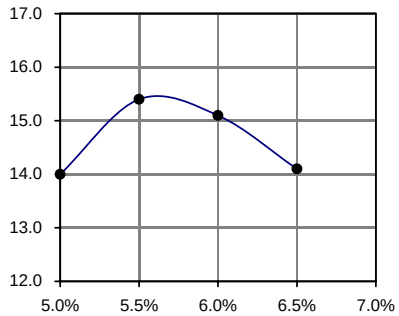
MIX TYPE Type D
REF NUMBER CL/09/M006

Binder		
Grade: 40/50 Pen	Bulk Relative Density	**1.025**
Source : Sapref	Mixing Temperature :	**165 °c**
Penetration: 44	Compaction Temperature:	**145 ° c**
Sample No. CL/0037	**Brookfield Viscosity @ 60º C = 326.5 Pa.s**	
Softening Point: 51.1 ºc	**Brookfield Viscosity @ 135º C = 0.462 Pa.s**	

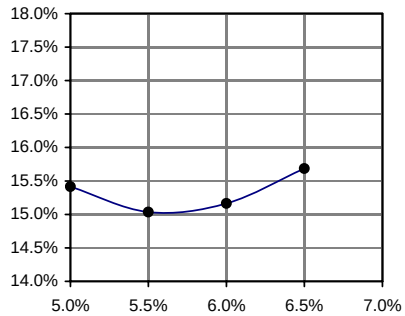
Bulk Relative Density



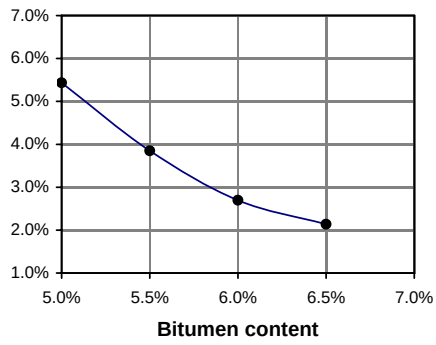
Stability



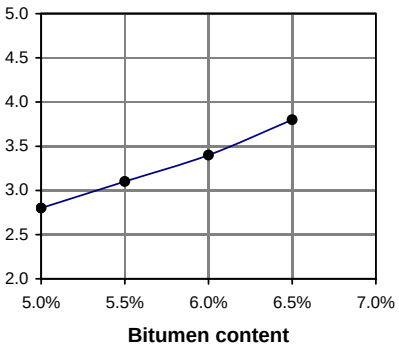
VMA



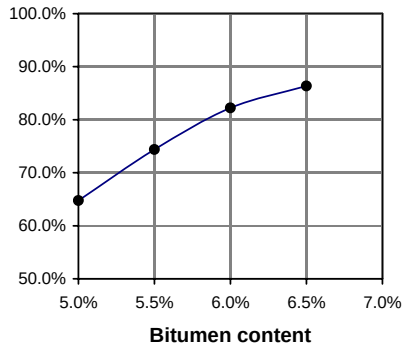
Voids in Mix



Flow



V.F.B



Binder Content	**%**	**5.0%**	**5.5%**	**6.0%**	**6.5%**			**5.1%**
Bulk Relative Density		2.349	2.372	2.381	2.379			**2.353**
Max. Theor. Density		2.484	2.467	2.447	2.431			**2.479**
Voids in Mix	**%**	5.4%	3.9%	2.7%	2.1%			**5.1%**
VMA	**%**	15.4%	15.0%	15.2%	15.7%			**15.4%**
V.F.B	**%**	64.7%	74.4%	82.2%	86.4%			**66.9%**
Stability	**kN**	14.0	15.4	15.1	14.1			**14.4**
Flow	**mm**	2.8	3.1	3.4	3.8			**3.0**
Stability/Flow Ratio		5.0	5.0	4.4	3.7			**4.8**
Film Thickness	**µ**	7.0	7.8	8.7	9.6			**7.2**
Binder Absorption	**%**	0.7%	0.7%	0.7%	0.7%			**0.7%**
Immersion Index	**%**							**92.4**
Dynamic Creep @ 40ºc	**mPa**							
Indirect Tensile Strength @ 25ºc	**kPa**							**1450**
Filler/Bitumen Ratio		1.4	1.3	1.2	1.1			**1.4**
Voids @ 300 Gyrations	**%**							**4.2**
Modified Lotman*TSR								