AMB GEOTECH (SQS) REPORT FOR:

HARSANTS ROAD - THANGOOL

CLIENT: BANANA SHIRE COUNCIL



DATE: 11th July 2023

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(INCLUDING SUMMARY OF TEST RESULTS AND TEST REPORTS)

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BORE HOLE #1 – E: 271509 N: 7270341 BORE HOLE #2 – E: 271469 N: 7270248 BORE HOLE #3 – E: 271427 N: 7270100

1.0 INTRODUCTION

AMB Geotech (SQS) was requested by Banana Shire Council to provide a pavement investigation located at the Harsants Road Floodway and Approaches - Thangool.

2.0 FIELDWORK

Using sampling locations nominated by Banana Shire Council, three locations were excavated using a truck mounted drill rig with a 300mm auger.

- Each site was logged and classified for every layer encountered (Refer Appendix 3).
- 3 test sites were sampled for laboratory testing.

Material logging & field sampling was carried out by a technician from SQS on the date 7th June 2023.

3.0 LABORATORY TESTING

5 Samples were selected for material CBR, PSD & ATT

testing. The sites selected for testing were from the

following Test Pits:

- BORE HOLE #1 PAVEMENT & SUBGRADE (CBR, PSD, ATT)
- BORE HOLE #2 SUBGRADE (CBR, PSD, ATT)
- BORE HOLE #3 PAVEMENT & SUBGRADE (CBR, PSD, ATT)

Each sample from the above selected sites was tested for California Bearing Ratio, Particle Size Distribution, Atterberg Limits & Subgrade DCP'S (Refer Appendix 1).

Yours Faithfully,

AMB Geotech SQS Pty Ltd

Ray Hicks RPEQ Engineer Cert No.1149



APPENDIX 1 LABORATORY TESTING (Including Summary of Test Results and Test Reports)

	T-11181A	T-11182A	T-11182B	T-11181B	T-11182C
Sieve	Passed %				
53.0mm	100			100	
37.5mm	98			98	
26.5mm	97			97	100
19.0mm	95			94	99
13.2mm	90	100		89	99
9.5mm	83	99		84	98
6.7mm	77	99	100	78	97
4.75mm	68	98	99	72	97
2.36mm	58	95	98	59	95
0.425mm	31	84	88	34	81
0.075mm	21	72	41	22	65
LL (%)	30.8	72.0	32.0	32.0	53.0
PL (%)	18.4	20.0	12.0	18.6	14.0
PI (%)	12.4	52.0	20.0	13.4	39.0
LS (%)	8.4	21.0	12.5	9.6	16.0
CBR (%)	12	2.0	10.0	8	2.5
Location	BH #1	BH #1	BH #2	BH #3	BH #3
Depth (m)	0.00-0.35	0.35-1.00	0.00-0.50	0.00-0.20	0.20 - 1.00
Material	Pavement	Subgrade	Subgrade	Pavement	Subgrade



T-23-784-1
1
10/07/2023
Banana Shire Council
P.O Box 412, Biloela Qld 4715
T-23-784
Harsants Road, Thangool
11182
T-11182A
07/06/2023
23/06/2023 - 03/07/2023
AS 1289.1.2.1 6.5.3 - Power auger drilling
AS 1289.1.1 - Sampling and preparation of soils
Selected by Client
Harsants Road, Thangool - Bore Hole 1 E: 271509, 7270341, Depth: 350mm - 1000mm
Refer to Bore Log
Onsite Existing / Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2	.1.1)	Min	Max
CBR taken at	2.5 mm		
CBR %	2.0		
Method of Compactive Effort	Star	dard	
Method used to Determine MDD	AS 1289 5	.1.1 & 2	.1.1
Method used to Determine Plasticity	Vis	ual	
Maximum Dry Density (t/m ³)	1.42		
Optimum Moisture Content (%)	29.5		
Laboratory Density Ratio (%)	97.0		
Laboratory Moisture Ratio (%)	100.0		
Dry Density after Soaking (t/m ³)	1.32		
Field Moisture Content (%)	26.6		
Moisture Content at Placement (%)	29.4		
Moisture Content Top 30mm (%)	43.8		
Moisture Content Rest of Sample (%)	34.7		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	44.1		
Swell (%)	4.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)			



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T-11182A
07/06/2023
23/06/2023 - 04/07/2023
AS 1289.1.2.1 6.5.3 - Power auger drilling
AS 1289.1.1 - Sampling and preparation of soils
Selected by Client
Harsants Road, Thangool - Bore Hole 1 E: 271509, 7270341, Depth: 350mm - 1000mm
Refer to Bore Log
Onsite Existing / Insitu

Particle Size Distributio	n (AS1289 3.6.1 &	2.1.1 &	Q253)		
Sieve	Passed %	Pa	assing	Limits	
19 mm	100				
13.2 mm	100				
9.5 mm	99				
6.7 mm	99				
4.75 mm	98				
2.36 mm	95				
1.18 mm	90				
0.6 mm	86				
0.425 mm	84				
0.3 mm	82				
0.15 mm	77				
0.075 mm	72				
Particle size and shape	properties of a soi	(Q253)		Min	Max
Particle size and shape Coefficient of Uniformit	properties of a soi y (D ₆₀ /D ₁₀)	(Q253) 775	5.0	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio	properties of a soi y (D ₆₀ /D ₁₀)	(Q253) 775 0.8	5.0 35	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature	properties of a soi y (D ₆₀ /D ₁₀)	(Q253) 775 0.8	5.0 35 22	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient	y (D ₆₀ /D ₁₀)	(Q253) 775 0.8 0.2	5.0 35 22	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient Atterberg Limit (AS128	 properties of a soi y (D₆₀/D₁₀) 9 9 3.1.2 & 3.2.1 & 3. 	(Q253) 775 0.8 0.2 3.1 & Q2	5.0 35 22 252)	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient Atterberg Limit (AS128 Sample History	9 3.1.2 & 3.2.1 & 3.	(Q253) 775 0.8 0.2 3.1 & Q2 ven Drie	5.0 35 22 252) ed	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient Atterberg Limit (AS128) Sample History Preparation Method	9 3.1.2 & 3.2.1 & 3.	(Q253) 775 0.8 0.2 3.1 & Q ven Drie	5.0 35 22 252) ed	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient Atterberg Limit (AS128 Sample History Preparation Method Passing 0.425 (%)	9 3.1.2 & 3.2.1 & 3.	(Q253) 775 0.8 0.2 3.1 & Q2 ven Drie Dry Sieve 84	5.0 35 22 252) ed e	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient Atterberg Limit (AS128 Sample History Preparation Method Passing 0.425 (%) Liquid Limit (%)	9 3.1.2 & 3.2.1 & 3.	(Q253) 775 0.8 0.2 0.2 3.1 & Q ven Drie Dry Sieve 84 72	5.0 35 22 252) ed e	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient Atterberg Limit (AS128 Sample History Preparation Method Passing 0.425 (%) Liquid Limit (%)	9 3.1.2 & 3.2.1 & 3.	(Q253) 775 0.8 0.2 3.1 & Q2 ven Drie Dry Sieve 84 72 20	5.0 35 22 252) 252) 26d	Min	Max
Particle size and shape Coefficient of Uniformit Fines Ratio Coefficient of Curvature Grading Coefficient Atterberg Limit (AS128 Sample History Preparation Method Passing 0.425 (%) Liquid Limit (%) Plastic Limit (%) Plasticity Index (%)	9 3.1.2 & 3.2.1 & 3.	(Q253) 775 0.8 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2	5.0 35 22 252) ed e	Min	Max

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	21.0		
Cracking Crumbling Curling	Cracking & C	Curling	



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10/07/2023
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P.O Box 412, Biloela Qld 4715
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Harsants Road, Thangool
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T-11182A
07/06/2023
07/06/2023 - 07/06/2023
AS 1289.1.2.1 6.5.3 - Power auger drilling
AS 1289.1.1 - Sampling and preparation of soils
Selected by Client
Harsants Road, Thangool - Bore Hole 1 E: 271509, I 7270341, Depth: 350mm - 1000mm
Refer to Bore Log
Onsite Existing / Insitu

Insitu California Bearing Ratio - dynamic cone penetrometer (Q114B)				
Moisture Cond	lition	Moist		
Starting Reference Point		Subgrade		
Layer Layer Thickness (mm)		Depth (mm)	Equivalent California Bearing Ratio	
Subgrade	30	50 - 80	14	
Change 1	120	80 - 200	8	
Change 2	70	200 - 270	8	
Change 3	150	270 - 420	9	
Change 4	25	420 - 445	8	
Change 5	120	445 - 565	20	
Change 56	14	565 - 579	> 60	



Report Number:	T-23-784-1
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11182
Sample Number:	T-11182B
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 03/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	AS 1289.1.1 - Sampling and preparation of soils
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 2 E: 271469, 7270248, Depth: 0mm - 500mm
Material:	Refer to Bore Log
Material Source:	Onsite Existing / Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.	.1.1)	Min	Max
CBR taken at	2.5 mm		
CBR %	3.0		
Method of Compactive Effort	Star	dard	
Method used to Determine MDD AS 1289 5.1.		.1.1 & 2	2.1.1
Method used to Determine Plasticity	Vis	ual	
Maximum Dry Density (t/m ³)	1.73		
Optimum Moisture Content (%)	17.0		
Laboratory Density Ratio (%)	97.5		
Laboratory Moisture Ratio (%)	97.5		
Dry Density after Soaking (t/m ³)	1.65		
Field Moisture Content (%)	12.9		
Moisture Content at Placement (%)	16.4		
Moisture Content Top 30mm (%)	24.5		
Moisture Content Rest of Sample (%)	20.9		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	45.0		
Swell (%)	2.0		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)			



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Report Number:	T-23-784-1
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11182
Sample Number:	T-11182B
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 04/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	AS 1289.1.1 - Sampling and preparation of soils
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 2 E: 271469, 7270248, Depth: 0mm - 500mm
Material:	Refer to Bore Log
Material Source:	Onsite Existing / Insitu

Particle Size Distributio	11 (AS1269 3.6. 1 & .	2.1.1 <u>& Q253</u>	Particle Size Distribution (AS1289 3.6.1 & 2.1.1 & Q253)			
Sieve	Passed %	Passing	Passing Limits			
19 mm	100					
13.2 mm	100					
9.5 mm	100					
6.7 mm	100					
4.75 mm	99					
2.36 mm	98					
1.18 mm	96					
0.6 mm	93					
0.425 mm	88					
0.3 mm	79					
0.15 mm	53					
0.075 mm	41					
Particle size and shape	properties of a soil	(Q253)	Min	Max		
Coefficient of Uniformity	y (D ₆₀ /D ₁₀)	14.7				
Fines Ratio		0.46				
Coefficient of Curvature	9	0.70				
Grading Coefficient						
Atterberg Limit (AS128	9 3.1.2 & 3.2.1 & 3.3	3.1 & Q252)	Min	Max		
Atterberg Limit (AS1288 Sample History	9 3.1.2 & 3.2.1 & 3.3 O	3.1 & Q252) ven Dried	Min	Max		
Atterberg Limit (AS1289 Sample History Preparation Method	9 3.1.2 & 3.2.1 & 3.3 O D	3.1 & Q252) ven Dried vry Sieve	Min	Max		
Atterberg Limit (AS1285 Sample History Preparation Method Passing 0.425 (%)	9 3.1.2 & 3.2.1 & 3. O D	3.1 & Q252) ven Dried vry Sieve 88	Min	Max		
Atterberg Limit (AS128) Sample History Preparation Method Passing 0.425 (%) Liquid Limit (%)	9 3.1.2 & 3.2.1 & 3. O D	3.1 & Q252) ven Dried Dry Sieve 88 32	Min	Max		
Atterberg Limit (AS1285 Sample History Preparation Method Passing 0.425 (%) Liquid Limit (%) Plastic Limit (%)	9 3.1.2 & 3.2.1 & 3. O D	3.1 & Q252) ven Dried lry Sieve 88 32 12	Min	Max		
Atterberg Limit (AS1285 Sample History Preparation Method Passing 0.425 (%) Liquid Limit (%) Plastic Limit (%) Plasticity Index (%)	9 3.1.2 & 3.2.1 & 3. O D	3.1 & Q252) ven Dried bry Sieve 88 32 12 20	Min	Max		
Atterberg Limit (AS1285 Sample History Preparation Method Passing 0.425 (%) Liquid Limit (%) Plastic Limit (%) Plasticity Index (%) Weighted Plasticity Inde	9 3.1.2 & 3.2.1 & 3. Or D D D D D D D D D D D D D D D D D D	3.1 & Q252) ven Dried vry Sieve 88 32 12 20 1768	Min Min	Max		

Linear Shinkaye (AS1209 3.4.1)		IVIIII	IVIAX
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	10.0		
Cracking Crumbling Curling	None		



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SOIL QUALITY SERVICES

Report Number:	T-23-784-1
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11182
Sample Number:	T-11182B
Date Sampled:	07/06/2023
Dates Tested:	07/06/2023 - 07/06/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	AS 1289.1.1 - Sampling and preparation of soils
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 2 E: 271469, I 7270248, Depth: 0mm - 500mm
Material:	Refer to Bore Log
Material Source:	Onsite Existing / Insitu

Insitu California Bearing Ratio - dynamic cone penetrometer (Q114B)			
Moisture Condition Moist			
Starting Reference Point Subgrade		Subgrade	
Layer	Layer Thickness (mm)	Depth (mm)	Equivalent California Bearing Ratio
Subgrade	50	50 - 100	20
Change 1	30	100 - 130	30
Change 2	265	130 - 395	13
Change 3	190	395 - 585	14
Change 4	150	585 - 735	14
Change 5	75	735 - 810	14
Change 6	105	810 - 915	20
Change 7	70	915 - 985	20
Change 8	34	985 - 1019	60



Report Number:	T-23-784-1
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11182
Sample Number:	T-11182C
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 03/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	AS 1289.1.1 - Sampling and preparation of soils
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 3 E: 271427, 7270100, Depth: 350mm - 1000mm
Material:	Refer to Bore Log
Material Source:	Onsite Existing / Insitu

California Bearing Ratio (AS 1289 6.1.1 & 2.	.1.1)	Min	Max
CBR taken at	2.5 mm		
CBR %	2.5		
Method of Compactive Effort	Star	dard	
Method used to Determine MDD	AS 1289 5	.1.1 & 2	2.1.1
Method used to Determine Plasticity	Vis	ual	
Maximum Dry Density (t/m ³)	1.53		
Optimum Moisture Content (%)	24.0		
Laboratory Density Ratio (%)	97.5		
Laboratory Moisture Ratio (%)	98.0		
Dry Density after Soaking (t/m ³)	1.44		
Field Moisture Content (%)	19.5		
Moisture Content at Placement (%)	23.5		
Moisture Content Top 30mm (%)	31.5		
Moisture Content Rest of Sample (%)	29.0		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4		
Curing Hours	45.6		
Swell (%)	3.5		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)			

SOIL QUALITY SERVICES AMB Geotech SQS Pty Ltd ABN 36 631 788 620 SQS Toowoomba Laboratory 15 Rocla Court Toowoomba QLD 4350 Phone: (07) 4633 4875 Email: Toowoomba@sqs.net.au Accredited for compliance with ISO/IEC 17025 - Testing NATA ۰. d Approved Signatory: Kevin Kivinen WORLD RECOGNISED Laboratory Manager NATA Accredited Laboratory Number: 2911 N: California Bearing Ratio 0.6 0.5 Applied Load (kN) 8.0 0.2 0.1 0 0 1 2 3 4 5 6 7 8 9 10 11 12 13 Penetration (mm) ---- Results + 2.5 + 5

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Report Number:	T-23-784-1
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11182
Sample Number:	T-11182C
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 04/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	AS 1289.1.1 - Sampling and preparation of soils
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 3 E: 271427, 7270100, Depth: 350mm - 1000mm
Material:	Refer to Bore Log
Material Source:	Onsite Existing / Insitu

Particle Size Distribution (AS1289 3.6.1 & 2.1.1 & Q253)		
Sieve	Passed %	Passing Limits
26.5 mm	100	
19 mm	99	
13.2 mm	99	
9.5 mm	98	
6.7 mm	97	
4.75 mm	97	
2.36 mm	95	
1.18 mm	91	
0.6 mm	85	
0.425 mm	81	
0.3 mm	78	
0.15 mm	70	
0.075 mm	65	
Particle size and shape properties of a soil (Q253) Min Max		

Coefficient of Uniformity (D ₆₀ /D ₁₀)	1689.0	
Fines Ratio	0.80	
Coefficient of Curvature	0.26	
Grading Coefficient	5.3	

Atterberg Limit (AS1289 3.1.2 & 3.2	2.1 & 3.3.1 & Q252)	Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Passing 0.425 (%)	81		
Liquid Limit (%)	53		
Plastic Limit (%)	14		
Plasticity Index (%)	39		
Weighted Plasticity Index (%)	3171		
Linear Christopa (AC1280.2.4.1)		Min	Max

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	16.0		
Cracking Crumbling Curling	Cracking	g	



Report Number:	T-23-784-1
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11182
Sample Number:	T-11182C
Date Sampled:	07/06/2023
Dates Tested:	07/06/2023 - 07/06/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	AS 1289.1.1 - Sampling and preparation of soils
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 3 E: 271427, I 7270100, Depth: 350mm - 1000mm
Material:	Refer to Bore Log
Material Source:	Onsite Existing / Insitu

Insitu California Bearing Ratio - dynamic cone penetrometer (Q114B)					
Moisture Cond	lition	Moist			
Starting Refere	ence Point		Subgrade		
Layer	Layer Thickness (mm)	Depth (mm)	Equivalent California Bearing Ratio		
Subgrade	10	50 - 60	50		
Change 1	75	60 - 135	25		
Change 2	45	135 - 180	19		
Change 3	220	180 - 400	20		
Change 4	23	400 - 423	50		
Change 5	7	423 - 430	> 60		



Report Number:	T-23-784-1
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11182
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 27/06/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	AS 1289.1.1 - Sampling and preparation of soils
Site Selection:	Selected by Client
Location:	Harsants Road, Thangool - Subgrade Investigation
Material:	Refer to Bore Log
Material Source:	Onsite Existing / Insitu



Toowoomba Laboratory 15 Rocla Court Toowoomba QLD 4350 Phone: (07) 4633 4875 Email: Toowoomba@sqs.net.au



Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Kevin Kivinen Laboratory Manager NATA Accredited Laboratory Number: 2911

Moisture Content AS	1289 2.1.1				
Sample Number	Sample Location	Moisture Content (%)	Min	Max	Material
T-11182A	Harsants Road, Thangool - Bore Hole 1 E: 271509, N: 7270341, Depth: 350mm - 1000mm	26.6 %	**	**	Refer to Bore Log
T-11182B	Harsants Road, Thangool - Bore Hole 2 E: 271469, N: 7270248, Depth: 0mm - 500mm	12.9 %	**	**	Refer to Bore Log
T-11182C	Harsants Road, Thangool - Bore Hole 3 E: 271427, N: 7270100, Depth: 350mm - 1000mm	19.5 %	**	**	Refer to Bore Log

Report Number:	T-23-784-2
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11181
Sample Number:	T-11181A
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 03/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	Q101A - Sample combination and splitting
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 1 E: 271509 7270341, Depth: 0mm - 350mm
Material:	Refer to Bore Log
Material Source:	Existing Pavement Material

Colifornia Doction Datia (01120 8 AC 1200	0 4 4)	N 41	14
California Bearing Ratio (QT13C & AS 1289	.2.1.1)	IVIIN	wax
CBR % (at 2.5 mm)	11	-	
CBR % (at 5 mm)	12		
CBR %	12		
Method of Compactive Effort	Stan	dard	
Method used to Determine MDD	Q142A & AS Q1	1289.2 43	.1.1 &
Method used to Determine Plasticity	Vis	ual	
Maximum Dry Density (t/m ³)	1.97		
Optimum Moisture Content (%)	11.5		
Target Dry Density (t/m ³)	1.97		
Achieved Dry Density (t/m ³)	1.97		
Target Laboratory Density Ratio (%)	100		
Laboratory Density Ratio (%)	100.0		
Target Moisture Content (%)	11.4		
Achieved Moisture Content (%)	11.4		
Target Laboratory Moisture Ratio (%)	100		
Laboratory Moisture Ratio (%)	100.5		
Dry Density after Soaking (t/m ³)	1.96		
Field Moisture Content (%)			
Moisture Content at Placement (%)	11.4		
Moisture Content Top 30mm (%)	15.2		
Moisture Content Rest of Sample (%)	13.3		
Mass Surcharge (kg)	4.5		
Soaking Period (days)	4	1	
Test Condition	Soaked		
Curing Hours	23.0		
Swell (%)	0.3		
Oversize Material (mm)	19		
Oversize Material Included	Excluded		
Oversize Material (%)		1	



Report Number:	T-23-784-2
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11181
Sample Number:	T-11181A
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 09/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	Q101A - Sample combination and splitting
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 1 E: 271509, 7270341, Depth: 0mm - 350mm
Material:	Refer to Bore Log
Material Source:	Existing Pavement Material

Particle Size Distributio	n (Q103A &	AS 128	39.2. ⁻	1.1 & Q2	53)	
Sieve	Passed %			Passing	Limits	
53 mm	10	00				
37.5 mm	9	8				
26.5 mm	9	7				
19 mm	9	5				
13.2 mm	9	0				
9.5 mm	8	3				
6.7 mm	7	7				
4.75 mm	6	8				
2.36 mm	5	8				
0.425 mm	3	1				
0.075 mm	2	1				
Particle size and shape	properties c	of a soil	(Q2	53)	Min	Max
Coefficient of Uniformity (D ₆₀ /D ₁₀)				212.8		
Fines Ratio				0.66		
Coefficient of Curvature)			3.2		
Grading Coefficient				26.4		
Atterberg Limit (Q104D	& Q105 & A	S 1289	.2.1.	1)	Min	Max
Liquid Limit (%)			30.	8		
Plastic Limit (%)		18.4				
Plasticity Index (%)		12.4				
Weighted Plasticity Index (%)			390	0		
Linear Shrinkage (Q106	6)		_		Min	Max
Linear Shrinkage (%)			8.4	ŀ		
Weighted Linear Shrink		26	3			

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0.1 0.2 1 2 3 4 5 10 20 30 Particle Size (mm)

10

100

Report Number:	T-23-784-2
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11181
Sample Number:	T-11181B
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 03/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	Q101A - Sample combination and splitting
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 3 E: 271427 7270100, Depth: 0mm - 200mm
Material:	Refer to Bore Log
Material Source:	Existing Pavement Material

California Bearing Ratio (Q113C & AS 1289	.2.1.1)	Min	Max	
CBR % (at 2.5 mm)	8			
CBR % (at 5 mm)	7			
CBR %	8			
Method of Compactive Effort	Star	ndard		
Method used to Determine MDD	Q142A & AS 1289.2.1.1 Q143			
Method used to Determine Plasticity	Vis	sual		
Maximum Dry Density (t/m ³)	1.99			
Optimum Moisture Content (%)	12.0			
Target Dry Density (t/m ³)	1.99			
Achieved Dry Density (t/m ³)	1.99			
Target Laboratory Density Ratio (%)	100			
Laboratory Density Ratio (%)	100.0			
Target Moisture Content (%)	11.8			
Achieved Moisture Content (%)	11.6			
Target Laboratory Moisture Ratio (%)	100			
Laboratory Moisture Ratio (%)	98.5			
Dry Density after Soaking (t/m ³)	1.99			
Field Moisture Content (%)				
Moisture Content at Placement (%)	11.6			
Moisture Content Top 30mm (%)	14.1			
Moisture Content Rest of Sample (%)	13.2			
Mass Surcharge (kg)	4.5			
Soaking Period (days)	4			
Test Condition	Soaked			
Curing Hours	2.5			
Swell (%)	0.2			
Oversize Material (mm)	19			
Oversize Material Included	Excluded			
Oversize Material (%)]		



Report Number:	T-23-784-2
Issue Number:	1
Date Issued:	10/07/2023
Client:	Banana Shire Council
	P.O Box 412, Biloela Qld 4715
Project Number:	T-23-784
Project Name:	Harsants Road, Thangool
Work Request:	11181
Sample Number:	T-11181B
Date Sampled:	07/06/2023
Dates Tested:	23/06/2023 - 10/07/2023
Sampling Method:	AS 1289.1.2.1 6.5.3 - Power auger drilling
Preparation Method:	Q101A - Sample combination and splitting
Site Selection:	Selected by Client
Sample Location:	Harsants Road, Thangool - Bore Hole 3 E: 271427, 7270100, Depth: 0mm - 200mm
Material:	Refer to Bore Log
Material Source:	Existing Pavement Material

Particle Size Distributio	n (Q103A &	AS 128	39.2. ⁻	1.1 & Q2	53)	
Sieve	Passed %			Passing	Limits	
53 mm	10	00				
37.5 mm	9	8				
26.5 mm	9	7				
19 mm	9	4				
13.2 mm	8	9				
9.5 mm	8	4				
6.7 mm	7	8				
4.75 mm	7	2				
2.36 mm	5	9				
0.425 mm	3	4				
0.075 mm	2	2				
Particle size and shape	properties c	of a soil	(Q2	53)	Min	Max
Coefficient of Uniformity	Coefficient of Uniformity (D ₆₀ /D ₁₀)			205.4		
Fines Ratio				0.66		
Coefficient of Curvature	;			1.9		
Grading Coefficient				27.0		
Atterberg Limit (Q104D	& Q105 & A	S 1289).2.1.	1)	Min	Max
Liquid Limit (%)			32.	0		
Plastic Limit (%)		18.6				
Plasticity Index (%)		13.4				
Weighted Plasticity Index (%)			454	1		
Linear Shrinkage (Q106	6)		_		Min	Max
Linear Shrinkage (%)		9.6	5			
Weighted Linear Shrink		32	7			

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2 3 4 5

1 Particle Size (mm) 10

2030

100

0.1 0.2

APPENDIX 2 SITE LOCATIONS (INCLUDING TEST PIT LOCATIONS BORE LOGS AND SITE PHOTOGRAPHS



CLIENT:	BANANA SHIRE COUNCIL	E: 271509	BH No.
PROJECT:	CROWSDALE CAMBOON	N: 7270341	1
LOCATION:	HARSANTS ROAD FLOODWAY - THANGOOL	Date: 07/06/2023	

(m			SOIL DESCRIPTION (AS 1726)	1	FIELD TEST / SAMPLES		DCP	
Hole Depth (Soil Origin	Soil Code		Consistency Density	Test Type & Depth Range (m)	RESULT (%)	Test Depth (m)	Blows
0.0		GC	Clayey GRAVEL, brown, dry, medium grained gravel, Medium plastic fines	Hard	CBR	12	0.00 – 0.10	-
0.1			"				0.10 – 0.20	-
0.2		"	"				0.23 – 0.30	
0.35		СН	Silty CLAY, brown, high plasticity, fine grained, moist	Stiff	CBR M/C	2.0 26.6	0.30 - 0.40	5
0.4		63	<i>a</i>				0.40 - 0.50	4
0.5		67	()				0.50 - 0.60	5
0.6		"	**				0.60 - 0.70	5
0.7		67	()				0.70 – 0.80	10
0.8		67	()				0.80 - 0.90	6+
0.9		"	63				0.90 - 1.00	Refusal
1.0		"	"				1.00 – 1.10	
Rig Type		уре	ADDITIONAL NOTES (seepages, delays etc.)				Termination	Depth (m)
Truck Auger Type 300mm Diameter		ck Type nm eter	PROJECT NO. T-23-784			1.	0	





Harsants Road - Thangool FOR: BANANA SHIRE COUNCIL



Logged By JR

CLIENT: BANANA SHIRE COUNCIL E: 271469						BH No.		
PROJECT: CROWSDALE CAMBOON N: 7270248							2	
LOCATION: HARSANTS ROAD FLOODWAY - THANGOOL Date: 07/06/				6/2023	2			
					FIELD TEST /		DCP	
Hole Depth (m)	Soil Origin	Soil Code	SOIL DESCRIPTION (AS 1726)	Consistency / Density	Test Type & Depth S Ranne (m)	RESULT (%)	Test Depth (m)	Blows
0.0		CL	Sandy Silty CLAY, brown, low plasticity, fine grained, moist	Firm	CBR M/C	3.0 12.9	0.00 – 0.10	10
0.1		"	"				0.10 – 0.20	6
0.2		"	"				0.23 - 0.30	7
0.3		"	"				0.30 - 0.40	6
0.4		63	(7				0.40 - 0.50	7
0.5		67	Terminated				0.50 - 0.60	7
Rię	Rig Type		ADDITIONAL NOTES (seepages, delays etc.)				Termination	Depth (m)
Truck Auger Type 300mm Diameter		ck Type nm eter	PROJECT NO. T-23-784				0.50	
LEGEND: D= Disturbed Bag, SPT = Standard Penetration Test, U50=Undisturbed 50mm Tube, PP= Pocket Penetrometer, DCP=Dynamic Cone Penetrometer								

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JR



CLIENT:	BANANA SHIRE COUNCIL	E: 271427	BH No.
PROJECT:	CROWSDALE CAMBOON	N: 7270100	0
LOCATION	HARSANTS ROAD FLOODWAY - THANGOOL	Date: 07/06/2023	3

(L				Consistency / Density	FIELD TEST / SAMPLES		DCP	
Hole Depth (r	Soil Origin	Soil Code	SOIL DESCRIPTION (AS 1726)		Test Type & Depth Rance (m)	RESULT (%)	Test Depth (m)	Blows
0.0		GC	Clayey GRAVEL, brown, dry, medium grained gravel, Medium plastic fines	Hard	CBR	8	0.00 – 0.10	-
0.1			"				0.10 – 0.20	-
0.2		СН	Silty CLAY, red, high plasticity, fine grained, moist	Stiff	CBR M/C	2.5 19.5	0.23 - 0.30	12
0.3		"	"				0.30 - 0.40	9
0.4		67	0				0.40 - 0.50	10
0.5		67	67	1			0.50 - 0.60	13+
0.6		"	"				0.60 - 0.70	Refusal
0.7		67	()	1			0.70 - 0.80	
0.8		67	()	 			0.80 - 0.90	
0.9		67	63				0.90 - 1.00	
1.0		"	"				1.00 – 1.10	
Riç	Rig Type		ADDITIONAL NOTES (seepages, delays etc.)				Termination Depth (m)	
T Aug 30 Dia	Truck Auger Type 300mm Diameter		PROJECT NO. T-23-784				1.0	
LEGEND: D= Disturbed Bag, SPT = Standard Penetration Test, U50=Undisturbed 50mm Tube, PP= Pocket Penetrometer, DCP=Dynamic Cone Penetrometer								
Logged By								

Logged By JR



HARSANTS ROAD – THANGOOL

