



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH19**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 476850.00

Drilling Rig: Jacro 105

Northing: 6936450.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 2.50

Date: 06/10/2010

Drilling Information				Material Description						Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.1	Topsoil		SC	Clayey Sand: Loose, brown, fine to medium sand, high plasticity fines, moist to wet		M-W	L	1	0.4 –	PP	170kPa	
			0.1	Topsoil		SC	Clayey Sand: Loose, brown, fine to medium sand, high plasticity fines, moist to wet		W	L	1				
			0.3	Alluvial Soil		CH	Clayey Sand: Loose, dark grey brown, fine to medium sand, high plasticity fines, wet		M	St	1				
			0.3	Alluvial Soil		CH	Sandy Clay: Stiff, high plasticity, grey mottled orange brown, fine to coarse sand, moist				3				
			0.65			CH	Sandy Clay: Stiff, high plasticity, grey mottled orange brown, fine to coarse sand, moist				6				
			1.0			CH	Sandy Clay: As above, but with clayey sand layers		M	St	9				
			1.0			CH	Sandy Clay: As above, but with clayey sand layers				12				
			1.3	Residual Soil		CH	Silty Clay: Stiff, high plasticity, grey mottled orange brown, with sandy clay layers		M	St	12				
			1.8			CH	Silty Clay: As above, but very stiff		M	VSt	10				
			2.0			CH	Silty Clay: As above, but very stiff				16/85mm				
			2.25	Rock		SST	Sandstone: Very low strength, extremely weathered, orange brown	XW		VLS		1.4 –	PP	170kPa	
			2.5												
				3.0				2.50m: DRILLING REFUSAL							

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
▶ Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.		
◀ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa		
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH20

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477000.00

Drilling Rig: Jacro 105

Northing: 6936600.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 06/10/2010

Drilling Information				Material Description					Test Samples						
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.1	Topsoil		SC	Clayey Sand: Loose, moist Clayey Sand Topsoil		M	L	2	0.4 -	PP	180kPa	
			0.3		SC	Clayey Sand: Loose, dark grey mottled orange brown, fine to medium sand, high plasticity fines, moist		M	L	2					
					CH	Sandy Clay: Stiff, high plasticity, light grey mottled orange brown, fine to medium sand, moist		M	St	2					
			0.6												4
											3				
					SC	Clayey Sand: Medium dense, light grey mottled orange brown, fine to coarse sand, medium plasticity fines, moist		M	MD	6					
			1.0-1.95												7
											5				
											4				
					SM	Silty Sand: Loose, light grey mottled orange brown, fine to coarse sand, trace of fine gravel, moist to wet		M-W	L	3					
											3				
											3				
			1.6									2			
											3				
					SW	Sand: Medium dense, light grey mottled orange brown, fine to coarse sand, moist to wet		M-W	MD	4					
			2.0									5			
											5				
					SW	Sand: As above, but wet		W	MD	8					
											4				
											4				
			2.5									7			
								7							
								7							
CH	Sandy Clay: Stiff, high plasticity, dark grey mottled orange brown, fine to coarse sand, moist				M	St	6								
2.8									4						
								5							
3.0		SC	Clayey Sand: Medium dense, dark grey mottled orange brown, fine to coarse sand, wet		W	MD	6								
								8							
			3.00m: BOREHOLE TERMINATED							12					
											15				

Comments:										Authorised by:	
										Date:	
Water	Weathering		Consistency		Density		Rock Strength		Tests & Results		
▼ Water level on date shown	RS	Residual soil	VS	Very soft	VL	Very loose	ELS	Extremely low	U50	Undisturbed 50mm diam tube.	
			S	Soft	L	Loose			D	Disturbed sample.	
► Water inflow	XW	Extremely weathered	F	Firm	MD	Medium dense	VLS	Very low	SPT	Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.	
	DW	Distinctly weathered	St	Stiff			LS	Low			
◄ Water outflow			VSt	Very stiff	D	Dense	MS	Medium	PP	Hand penetrometer estimate of unconfined compressive strength, kPa.	
			H	Hard	VD	Verv dense	HS	High	S	Vane shear value kPa	
	SW	Slightly weathered	Moisture				VHS	Very high	DC	Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.	
	FR	Fresh	D Dry	M Moist	W Wet		EHS	Extremely high		From AS1289-1993 Methods of Testing Soils for Engineering Purposes	



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH21

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebling Creek Rd, Deebling Heights

Easting: 477000.00

Drilling Rig: Jacro 105

Northing: 6936750.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 06/10/2010

Drilling Information				Material Description					Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.05	Fill		FIL FIL	Silty Sand (SM): Medium dense, moist		M	MD	4			
							Silty Sand (SM): As above, but grey brown		M	MD	4			
											6			
											5			
											4			
											7			
			0.6	Alluvial Soil		SM	Silty Sand: Dense, grey brown, fine to medium sand, dry		M	D	17			
											17			
											17/70mm			
			1.0			CH	Sandy Clay: Hard, high plasticity, orange brown mottled grey, fine to coarse sand, dry		D	H				
			0.95											
			1.5			SC	Clayey Sand: Dense, orange brown, fine to medium sand, medium plasticity fines, moist		M	D				
			2.0											
			2.3			CH	Sandy Clay: Hard, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	H				
			2.8			CH	Silty Clay: Hard, high plasticity, grey with some orange brown mottling, with sandy clay layers, moist		M	H				
			3.0											
		3.0					3.00m: BOREHOLE TERMINATED							

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
Water inflow	XW Extremely weathered	S Soft	L Loose	low	D Disturbed sample.		
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	VLS Very low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.5kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	LS Low	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	VSt Very stiff	VD Very dense	MS Medium	S Vane shear value kPa		
		H Hard		HS High	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		Moisture		VHS Very high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		
		D Dry M Moist W Wet		EHS Extremely high			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH22**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebling Creek Rd, Deebling Heights

Easting: 477150.00
Northing: 6936600.00
RL:
Total Depth: 3.00

Drilling Rig: Jacro 105
Driller: Civiltech
Logged By: R. Howchin
Date: 06/10/2010

Drilling Information				Material Description					Test Samples						
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.1	Topsoil		SM	Silty Sand: Loose, light gray brown, fine to medium sand, dry		D	L	3	0.5	Emerson - Class 2		
		0.3	Alluvial Soil		SM	Silty Sand: Medium dense, light gray brown, fine to medium sand, dry		D	L	9					
					SC	Clayey Sand: Very dense, gray white mottled orange brown, fine to medium sand, medium plasticity fines, moist		M	VD	18					
						15/50mm									
		1.0													
		1.5			SC	Clayey Sand: Dense, gray, fine to medium sand, moist		M	D						
		2.0													
		2.2	Residual Soil		CH	Sandy Clay: Very stiff, high plasticity, gray, fine to medium sand, moist		M	VSt		2.3 -	PP	- 350kPa		
		2.8	Rock		SST	Sandstone: Extremely low strength, extremely weathered	XW		ELS						
		3.0													
							3.00m: BOREHOLE TERMINATED								

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
► Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH23**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477150.00

Drilling Rig: Jacro 105

Northing: 6936450.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 1.40

Date: 06/10/2010

Drilling Information				Material Description					Test Samples						
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.06	Topsoil		SM	Silty Sand: Loose, fine to medium sand, moist		M	L	1				
						SM	Silty Sand: Loose, grey, fine to medium sand, moist		M	L	2				
			0.3	Slopewash							2				
						CH	Sandy Clay: Very stiff, high plasticity, grey and yellow orange, fine to medium sand, moist		M	VSI	4				
											4				
			0.6	Residual Soil							7				
						SC	Clayey Sand: Dense, yellow orange and grey, fine to medium sand, medium plasticity clay fines, moist		M	D	13				
											16				
											15				
			1.0	1	Rock		SST	Sandstone: Extremely low strength, extremely weathered	XW		ELS				
		1.3													
		1.4				SST	Sandstone: As above, but very low strength	XW		VLS					
						1.40m: DRILLING REFUSAL									
			2.0												
			3.0												

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
▶ Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.		
◀ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa		
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		D Dry M Molst W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH24**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477000.00
Northing: 6936450.00
RL: 3.00
Total Depth: 3.00

Drilling Rig: Jacro 105
Driller: Civiltech
Logged By: R. Howchin
Date: 06/10/2010

Drilling Information				Material Description					Test Samples							
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result		
TC bit with 100mm Dia. Auger			0.08	Topsoil		SC	Clayey Sand: Loose, moist topsoil		M	L	1	0.1 -	PP	90kPa		
			CH				M		F	2						
				Alluvial Soil					Sandy Clay: Firm, high plasticity, dark grey, fine to medium sand, moist				2			
			0.35													

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	St Stiff	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	VSt Very stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH25

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebling Creek Rd, Deebling Heights

Easting: 477000.00
Northling: 6936300.00
RL:
Total Depth: 3.00
Drilling Rig: Jacro 105
Driller: Civiltech
Logged By: R. Howchin
Date: 07/10/2010

Drilling Information				Material Description					Test Samples							
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result		
TC bit with 100mm Dia. Auger			0.1	Topsoil		SC	Clayey Sand: Loose, moist topsoil		M	L	1	0.15 -	Emerson	Class 6		
			CH			Sandy Clay: Stiff, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	St	1	PP				150kPa	
			2				2									
			2				3									
			5				10									
			0.7				CH	Sandy Clay: As above, but hard		M						H
			16													
			0.9		SC	Clayey Sand: Medium dense, orange brown, fine to medium sand, medium plasticity fines, moist		M	MD		1.2	U50	PP>600kPa			
			1.1		CH	Sandy Clay: Hard, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	H							
			1.5	CH	Sandy Clay: As above, but trace of fine gravel, with thin layers of clayey sand		M	H								
			2.0													
			3.0													
			3.00m: BOREHOLE TERMINATED													

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Verv dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH26**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477150.00
Northing: 6936300.00
RL:
Total Depth: 3.00
Drilling Rig: Jacro 105
Driller: Civitech
Logged By: R. Howchin
Date: 07/10/2010

Drilling Information				Material Description							Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.06	Topsoil		SM	Silly Sand; Loose, moist topsoil		M	L	1	0.65	Emerson - Class 2	
						SM	Silly Sand: Loose, grey brown, fine to medium sand, wet		W	L	2			
			0.3			SM	Silly Sand: As above, but light grey		W	L	1			
											2			
			0.65	Residual Soil		SC	Clayey Sand: Very dense, grey mottled orange brown, fine to medium sand, medium plasticity fines, moist		M	VD	7			
			0.75			SST	Sandstone: Very low strength, extremely weathered, grey mottled orange brown	XW		VLS	20/90mm			
			1.0	Rock										
			1.7			SST	Sandstone: As above, but extremely low strength	XW		ELS				
			2.0	Residual Soil		SC	Clayey Sand: Very dense, grey mottled orange brown, fine to medium sand, medium plasticity fines, moist		M	VD				
			3.0											
			3.00m: BOREHOLE TERMINATED											

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
► Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VS Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH27

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 476550.00

Drilling Rig: Jacro 105

Northing: 6936150.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 07/10/2010

Drilling Information				Material Description						Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.1	Topsoil		SC	Clayey Sand: Loose to medium dense, moist		M	L-MD	3	0.2 -	PP	>600kPa	
				Alluvial Soil		CH	Sandy Clay: Hard, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	H	3				
											4				
											4				
											4				
											3				
											3				
											4				
											4				
											3				
											5				
											7				
			1.0												

Comments:										Authorised by:	
										Date:	
Water	Weathering		Consistency		Density		Rock Strength		Tests & Results		
▼ Water level on date shown	RS	Residual soil	VS	Very soft	VL	Very loose	ELS	Extremely low	U50	Undisturbed 50mm diam tube.	
▶ Water inflow	XW	Extremely weathered	S	Soft	L	Loose	VLS	Very low	D	Disturbed sample.	
◀ Water outflow	DW	Distinctly weathered	St	Stiff	MD	Medium dense	LS	Low	SPT	Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.	
	SW	Slightly weathered	VSt	Very stiff	D	Dense	MS	Medium	PP	Hand penetrometer estimate of unconfined compressive strength, kPa.	
	FR	Fresh	H	Hard	VD	Very dense	HS	High	S	Vane shear value kPa	
			Moisture				VHS	Very high	DC	Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.	
			D Dry	M Moist	W Wet		EHS	Extremely high		From AS1289-1993 Methods of Testing Soils for Engineering Purposes	



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

MORRISON
GEOTECHNIC

Engineering Log - Borehole

Borehole No.: **BH28**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 476700.00

Drilling Rig: Jacro 105

Northing: 6936150.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 07/10/2010

Drilling Information				Material Description							Test Samples			
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.1	Topsoil		SM	Silty Sand: Loose, grey brown, fine to medium sand, moist		M	L	2	0.3	PP	180kPa
			Alluvial Soil		SM	Silty Sand: Loose, grey, fine to medium sand, moist		M	L	2				
					CH	Sandy Clay: Stiff, high plasticity, yellow orange, fine to medium sand, moist		M	St	2				
			0.3			CH	Sandy Clay: As above, but hard		M	H	5	0.5	PP	400kPa
			0.45			CH	Sandy Clay: As above, but hard		M	H	8			
			0.6			SC	Clayey Sand: Dense, yellow orange and grey, fine to medium sand, medium plasticity clay fines, moist		M	D	13			
			1.0								19	1.3	PP	430kPa
			1.2			CH	Sandy Clay: Hard, high plasticity, dark grey and grey mottled yellow orange, fine to medium sand, moist		M	H				
			1.7			CH	Sandy Clay: As above, but with sand layers		M	H				
			2.0									2.4	PP	330kPa
			2.3			CH	Sandy Clay: As above, but very stiff		M	VSt				
			3.0											
			3.00m: BOREHOLE TERMINATED											

Comments:										Authorised by:	
										Date:	
Water	Weathering		Consistency		Density		Rock Strength		Tests & Results		
 Water level on date shown	RS	Residual soil	VS	Very soft	VL	Very loose	ELS	Extremely low	U50	Undisturbed 50mm diam tube.	
 Water inflow	XW	Extremely weathered	S	Soft	L	Loose	VLS	Very low	D	Disturbed sample.	
 Water outflow	DW	Distinctly weathered	F	Firm	MD	Medium dense	LS	Low	SPT	Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.	
	SW	Slightly weathered	St	Stiff	D	Dense	MS	Medium	PP	Hand penetrometer estimate of unconfined compressive strength, kPa.	
	FR	Fresh	H	Hard	VD	Verv dense	HS	High	S	Vane shear value kPa	
			Moisture				VHS	Very high	DC	Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.	
			D Dry	M Moist	W Wet		EHS	Extremely high		From AS1289-1993 Methods of Testing Soils for Engineering Purposes	



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH29

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 476850.00

Drilling Rig: Jacro 105

Northing: 6936150.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 07/10/2010

Drilling Information				Material Description						Test Samples						
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result		
TC bit with 100mm Dia. Auger				Topsoil		SM	Silty Sand: Loose, moist		M	L	2	0.25 -	PP	350kPa		
											2					
			0.2	Alluvial Soil		CH	Sandy Clay: Very stiff, high plasticity, red brown mottled grey, fine to medium sand, moist		M	VSt	1	0.4 -	PP	450kPa		
			0.35			CH	Sandy Clay: As above, but hard, light orange brown		M	H	3					
			0.5								7					
						CI	Sandy Clay: As above, but medium plasticity, with clayey sand layers		M	H	7					
													9	1.2	Emerson Class 2	
													9			
													13			
			1.0										13			
													13			
													18			
			1.2			SC	Clayey Sand: Very dense, with clay and sandstone layers, light orange brown, fine to medium sand, high plasticity fines, moist		M	VD	18					
			2.0													
			2.1			CI	Sandy Clay: Hard, medium plasticity, light orange brown, fine to medium sand, with clayey sand layers		M	H						
			2.8													
						SC	Clayey Sand: Very dense, with clay and sandstone layers, light orange brown, fine to medium sand, high plasticity fines, moist		M	VD						
			3.0													
3.00m: BOREHOLE TERMINATED																

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
▶ Water inflow	XW Extremely weathered	S Soft	L Loose	low	D Disturbed sample.		
◀ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	VLS Very low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	LS Low	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	MS Medium	S Vane shear value kPa		
				HS High	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
				VHS Very high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		
				EHS Extremely high			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH30

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477000.00
Northing: 6936150.00
RL:
Total Depth: 3.00

Drilling Rig: Jacro 105
Driller: Civiltech
Logged By: R. Howchin
Date: 07/10/2010

Drilling Information				Material Description						Test Samples				
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.05	Topsoil		SC	Clayey Sand: Loose, moist		M	L	1	0.1	U50	Iss=2.7%; PP=140kPa
						CH	Silty Clay: Stiff, high plasticity, dark gray brown, trace of fine to medium sand, moist		M	St	2			
											2			
			0.45			CH	Silty Clay: As above, but hard		M	H	3	0.5	PP	420kPa
			0.6			CH	Sandy Clay: Hard, high plasticity, dark gray mottled orange brown, fine to medium sand, moist		M	H	7			
											12			
											15			
											20			
			1.0			SC	Clayey Sand: Dense, gray mottled orange brown, fine to medium sand, high plasticity fines, moist to wet		M-W	D	19			
			1.2			SC	Clayey Sand: As above, but medium dense, dark gray mottled orange brown		M-W	MD				
			1.6			SC	Clayey Sand: As above, but gray mottled orange brown		M-W	MD				
			2.0											
		3.0												
							3.00m: BOREHOLE TERMINATED							

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
◄ Water outflow	DW Distinctly weathered	St Stiff	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	VSt Very stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH31

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Eastling: 476700.00
Northling: 6936000.00
RL:
Total Depth: 3.00

Drilling Rig: Jacro 105
Driller: Civiltch
Logged By: R. Howchin
Date: 07/10/2010

Drilling Information				Material Description					Test Samples						
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.1	Topsoil		SC	Clayey Gravelly Sand; Loose, moist		M	L	1	0.2 - 0.3	PP	180kPa	
				Alluvial Soil		CH	Sandy Clay; Stiff, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	St	2				
															2
															2
			0.4			CH	Sandy Clay; As above, but hard		M	H	3				
															5
			0.6			CH	Sandy Clay; As above, but light grey mottled orange brown		M	H	6				
															10
															8
			1.0												11
															13
															14
															13
			1.3			SC	Clayey Sand; Dense, light grey mottled orange brown, fine to coarse sand, high plasticity fines, trace of fine gravel, moist		M	D	12				
		1.5	SC	Clayey Sand; As above, but moist to wet		M-W	D								
		2.0													
		3.0	3.												
							3.00m: BOREHOLE TERMINATED								

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.		
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa		
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH32

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 476850.00
Northing: 6936000.00
RL:
Total Depth: 3.00
Drilling Rig: Jacro 105
Driller: Civiltech
Logged By: R. Howchin
Date: 07/10/2010

Drilling Information				Material Description					Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.15	Topsoil		SC	Clayey Sand: Loose, moist to wet		M-W	L	2	0.4 —	PP	280kPa
			0.3	Residual Soil		SC	Clayey Sand: Loose, light grey mottled orange brown, fine to medium sand, high plasticity fines, moist		M	L	1			
					CH	Sandy Clay: Very stiff, high plasticity, orange brown mottled grey fine to medium sand, moist		M	Vst	1				
										1				
										2				
										3				
										4				
										5				
			1.0	0.95		CH	Sandy Clay: As above, but hard		M	H	6	1 —	PP	420kPa
										6				
										6				
				1.2		CH	Sandy Clay: As above, but light grey mottled orange brown		M	H	11			
										10				
										10				
										10				
										15				
										16				
				1.8		CH	Sandy Clay: As above, but with sandstone and clayey sand layers		M	H	15/80mm	2.1	Emerson Class 2	
			2.0		Rock		SST	Sandstone: Extremely low strength, extremely weathered grey while with minor orange brown mottling	XW		ELS			
							SST	Sandstone: As above, but some clay layers	XW		ELS			
		2.6												
			3.0	3.0			3.00m: BOREHOLE TERMINATED							

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSI Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH33

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Eastings: 477000.00

Drilling Rig: Jacro 105

Northings: 6936000.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 1.45

Date: 07/10/2010

Drilling Information				Material Description					Test Samples						
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.12	Topsoil		SM	Silty Sand: Loose, grey brown, fine to medium sand, moist		M	L	1	0.15 –	PP	250kPa	
				Residual Soil		CH	Sandy Clay: Very stiff, high plasticity, orange brown, fine to medium sand, moist		M	VSt	2				
											1				
											2				
											2				
											3				
			0.7			CH	Sandy Clay: As above, but hard, light grey mottled brown and orange brown		M	H	11	0.8 –	PP	460kPa	
			1.0								16				
			1.4		Rock			Sandstone: Very low strength, extremely weathered, gray white mottled orange brown							
			1.45				SST		XW		VLS				
1.45m: DRILLING REFUSAL															
			2.0												
			3.0												

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.		
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa		
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		D Dry M Molst W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH34**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477150.00
Northing: 6936000.00
RL:
Total Depth: 3.00

Drilling Rig: Jacro 105
Driller: Civiltech
Logged By: R. Howchin
Date: 07/10/2010

Drilling Information				Material Description						Test Samples				
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger				Topsoil		SC	Clayey Sand: Loose, moist		M	L	2	0.2 –	PP	130kPa
			0.15	Alluvial Soil		CH	Sandy Clay: Stiff, high plasticity, dark grey brown, fine to medium sand, moist		M	St	1			
		0.3			CH	Sandy Clay: As above, but grey mottled orange brown		M	St	2				
										3				
										3				
		0.6			CH	Sandy Clay: As above, but very stiff		M	VSt	4				
										5				
										8				
		0.9			CH	Sandy Clay: As above, but hard, grey, trace of fine gravel		M	H	7				
		1.0								7				
										9				
										11				
									12					
									13					
	1.5		CH	Sandy Clay: As above, but grey with orange brown and black mottling		M	H	12						
	2.0													
	2.1		CH	Sandy Clay: As above, but orange brown		M	H							
	2.4		CH	Sandy Clay: As above, but orange brown mottled grey		M	H							
	2.6		SC	Clayey Sand: Medium dense, orange brown, fine to medium sand, high plasticity fines, moist		M	MD							
	3.0													
							3.00m: BOREHOLE TERMINATED							

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
► Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH35**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebling Creek Rd, Deebling Heights

Easting: 476550.00

Drilling Rig: Jacro 105

Northing: 6935850.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 08/10/2010

Drilling Information				Material Description					Test Samples									
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result				
TC bit with 100mm Dia. Auger			0.14	Topsoil		SC	Clayey Sand: Loose, moist		M	L	1	0.2 -	PP	80kPa				
			CH			Sandy Clay: Firm, high plasticity, grey mottled orange brown, fine to medium sand, moist	M		F	1								
			Alluvial Soil		CH	Sandy Clay: As above, but stiff	M		St	1	0.5 -				PP	130kPa		
										3								
										4								
			0.5			CH	Sandy Clay: As above, but stiff		M	St		7	0.5 -	PP			130kPa	
			1.0		SC	Clayey Sand: Medium dense, grey mottled orange brown, fine to medium sand, high plasticity fines, moist	M		MD	10								
										9								
										5								
										6								
			1.4			CH	Sandy Clay: Very stiff, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	VSt	7	1.45 -	PP	270kPa				
			1.7		CH	Sandy Clay: As above, but hard, with clayey sand layers	M		H	5								
										6								
										8								
			2.0			CH	Sandy Clay: As above, but hard, with clayey sand layers		M	H	10	1.8 -	PP	500kPa				
			2.1		SC	Clayey Sand: Medium dense, grey mottled orange brown, fine to medium sand, high plasticity fines, moist	M		MD	10								
										10								
										12								
			2.8			SC	Clayey Sand: As above, but with clay layers, moist to wet		M	MD								
			3.0			SC	Clayey Sand: As above, but with clay layers, moist to wet		M	MD								
			3.00m: BOREHOLE TERMINATED															

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	low	D Disturbed sample.
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	VLS Very low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	LS Low	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	MS Medium	S Vane shear value kPa
		Moisture		HS High	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		D Dry M Moist W Wet		VHS Very high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
				EHS Extremely high	



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH36**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebling Creek Rd, Deebling Heights

Easting: 476700.00

Drilling Rig: Jacro 105

Northing: 6935850.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 08/10/2010

Drilling Information				Material Description					Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.15	Topsoil		SC	Clayey Sand: Loose, moist		M	L	1	0.2 –	PP	280kPa
			0.65	Alluvial Soil		CH	Sandy Clay: Very stiff, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	VSt	1			
											1			
											3			
											5			
											6			
											10			
											9			
											17			
											15/80mm			
			1.6			SC	Clayey Sand: Medium dense, grey mottled orange brown, fine to medium sand, high plasticity fines, moist		M	MD		1.95 –	PP	430kPa
			1.9			CH	Sandy Clay: Hard, high plasticity, grey mottled orange brown and black, fine to medium sand, moist		M	H				
			2.0											
			3.0											
								3.00m: BOREHOLE TERMINATED						

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
Water outflow	DW Distinctly weathered	St Stiff	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	VSt Very stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899
PO Box 3063, Darra, QLD 4076
Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: **BH37**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 476850.00

Drilling Rig: Jacro 105

Northing: 6935850.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 08/10/2010

Drilling Information				Material Description					Test Samples						
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.05	Topsoil		SC	Clayey Sand: Loose, moist		M	L	1	0.4 –	PP	350kPa	
				Residual Soil		SC	Clayey Sand: Loose, gray white mottled orange brown, fine to medium sand, high plasticity fines, wet		W	L	1				
															1
															1
			0.35		CH	Sandy Clay: Very stiff, high plasticity, gray mottled red brown, fine to medium sand, moist		M	VSt	1					
			0.5		CH	Sandy Clay: As above, but with clayey sand layers		M	VSt	1					
											2				
											4				
											5				
			0.9		CH	Sandy Clay: As above, but orange brown mottled gray white		M	VSt	3					
			1.0								5				
											9				
											12				
											15				
											15/85mm				
		1.8	Rock		SST	Sandstone: Extremely low strength, extremely weathered, gray white mottled orange brown, with clayey sand and clay layers	XW		ELS						
		2.0													
		3.0	3.00m: BOREHOLE TERMINATED												

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
► Water inflow	XW Extremely weathered	S Soft	L Loose	LS Low	D Disturbed sample.		
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	VLS Very low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa		
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH38

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477000.00

Drilling Rig: Jacro 105

Northing: 6935850.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 08/10/2010

Drilling Information				Material Description						Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger				Topsoil		SM	Silty Sand: Loose, moist		M	L	3	0.5 –	PP	>600kPa	
			0.16	Alluvial Soil		CH	Sandy Clay: Hard, high plasticity, grey mottled red brown, fine to medium sand, moist		M	H	4				
															6
															8
			0.4			CH	Sandy Clay: As above, but orange brown mottled red brown, with fine to medium ironstone gravels		M	H	8				
			0.55			CH	Sandy Clay: As above, but trace of fine to medium gravels		M	H	9				
															8
															8
															8
			0.9			CH	Sandy Clay: As above, but light orange brown mottled grey, no gravels		M	H	7				
			1.0												5
											4				
											4				
											4				
											5				
											5				
											7				
											9				
											17				
			2.0								15/80mm				
		2.6			CH	Sandy Clay: As above, but medium plasticity, grey white mottled orange brown		M	H						
		3.0													
		3.0				3.00m: BOREHOLE TERMINATED									

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

MORRISON
GEOTECHNIC

Engineering Log - Borehole

Borehole No.: **BH39**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebling Creek Rd, Deebling Heights

Easting: 477150.00
Northing: 6935850.00
RL:
Total Depth: 3.00

Drilling Rig: Jacro 105
Driller: Civiltech
Logged By: R. Howchin
Date: 08/10/2010

Drilling Information				Material Description					Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.1	Topsoil		SM	Silty Sand: Loose, moist		M	L	6	0.3 -	PP	500kPa
			0.22	Residual Soil		SM	Silty Sand: Dense, light grey mottled orange brown, fine to medium sand, moist to dry		M	D	12			
					CH	Sandy Clay: Hard, high plasticity, grey mottled orange brown, fine to medium sand, moist		M	H	12				
										8				
										9				
										7				
			0.7			CH	Sandy Clay: As above, but orange brown		M	H	6			
			0.8								15			
					SC	Clayey Sand: Very dense, orange brown, fine to medium sand, medium plasticity fines, moist		M	VD	15/50mm				
			1.0	Rock		SST	Sandstone: Extremely low strength, extremely weathered, orange brown mottled grey white	XW		ELS				
			1.45			SST	Sandstone: As above, but very low strength	XW		VLS				
			2.0											
			2.1			SST	Sandstone: As above, but extremely low strength	XW		ELS				
			2.8			SST	Sandstone: As above, but very low strength	XW		VLS				
			3.0	3.0										
							3.00m: BOREHOLE TERMINATED							

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.		
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa		
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

MORRISON
GEOTECHNIC

Engineering Log - Borehole

Borehole No.: **BH40**

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477150.00

Drilling Rig: Jacro 105

Northing: 6935700.00

Driller: Civiltch

RL:

Logged By: R. Howchin

Total Depth: 2.20

Date: 15/10/2010

Drilling Information				Material Description						Test Samples				
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result
TC bit with 100mm Dia. Auger			0.15	Topsoil		SM	Silty Sand: Loose, moist		M	L	1	0.3 -	PP	220kPa
			0.25	Residual Soil		SM	Silty Sand: Loose, grey, fine to medium sand, high plasticity fines, wet		W	L	2			
						CH	Sandy Clay: Very stiff, high plasticity, orange brown mottled grey, fine to medium sand, moist		M	VSt	1			
											4			
											3			
			0.6			SC	Clayey Sand: Medium dense, orange brown mottled grey, fine to medium sand, high plasticity fines, dry		D	MD	6			
										11				
										15/50mm				
			0.9	Rock		SST	Sandstone: Extremely low strength, extremely weathered, grey mottled orange brown	XW		ELS				
			2.0											
		2.2			SST	Sandstone: As above, but very low strength	XW		VLS					
						2.20m: DRILLING REFUSAL								
			3.0											

Comments:

Authorised by:

Date:

Water	Weathering	Consistency	Density	Rock Strength	Tests & Results
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.
► Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.
◄ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.
	FR Fresh	VSt Very stiff	VD Very dense	HS High	S Vane shear value kPa
		H Hard		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.
		Moisture		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes
		D Dry M Moist W Wet			



Morrison Geotechnic Pty Ltd

A.B.N. 051 009 878 899

PO Box 3063, Darra, QLD 4076

Phone: (07) 3279 0900 Fax: (07) 3279 0955

Engineering Log - Borehole

Borehole No.: BH41

Page: 1 of 1

Job Number: DE10/162

Client: Stockland Development Pty Ltd

Project: Broad Geotechnical Appraisal

Location: Site B, South Deebing Creek Rd, Deebing Heights

Easting: 477000.00

Drilling Rig: Jacro 105

Northing: 6935700.00

Driller: Civiltech

RL:

Logged By: R. Howchin

Total Depth: 3.00

Date: 15/10/2010

Drilling Information				Material Description						Test Samples					
Drill Method	Water	RL	Hole Depth (m)	Soil Origin	Graphic Log	Classification Code	Description	Weathering	Moisture	Consistency - Density - Strength	DC Test Results	Test Depth	Tests	Sample/Result	
TC bit with 100mm Dia. Auger			0.15	Topsoil		SC	Clayey Sand: Loose, moist		M	L	1	0.2	U50	Iss=4.9%; PP>600kPa	
			0.3	Alluvial Soil		CH	Silty Clay: Hard, high plasticity, grey mottled orange brown, trace of fine to medium sand, moist		M	H	1				
					CH	Silty Clay: As above, but light grey		M	H	1					
										2					
										5					
			0.65		CH	Sandy Clay: Hard, high plasticity, grey mottled orange brown, fine to medium sand, dry		D	H	9					
										13					
										15/90mm					
			0.9			SC	Clayey Sand: Very dense, grey mottled orange brown, fine to medium sand, high plasticity fines, dry		D	VD					
			1.0												
			1.7			SC	Clayey Sand: As above, but with silty clay layers		D	VD					
			2.0												
			2.5				CH	Silty Clay: Hard, high plasticity, dark grey, with fine to medium sand layers, trace of fine gravel, moist		M	H				
			3.0												
				3.00m: BOREHOLE TERMINATED											

Comments:						Authorised by:	
						Date:	
Water	Weathering	Consistency	Density	Rock Strength	Tests & Results		
▼ Water level on date shown	RS Residual soil	VS Very soft	VL Very loose	ELS Extremely low	U50 Undisturbed 50mm diam tube.		
▶ Water inflow	XW Extremely weathered	S Soft	L Loose	VLS Very low	D Disturbed sample.		
◀ Water outflow	DW Distinctly weathered	F Firm	MD Medium dense	LS Low	SPT Standard Penetration Test, N = number of blows to drive 50mm sampler 300mm with a 63.6kg hammer falling 762mm.		
	SW Slightly weathered	St Stiff	D Dense	MS Medium	PP Hand penetrometer estimate of unconfined compressive strength, kPa.		
	FR Fresh	H Hard	VD Very dense	HS High	S Vane shear value kPa		
		Moisture		VHS Very high	DC Dynamic Cone test, 9.09kg hammer, fall 508mm, driving 20mm, 30 deg taper cone fitted to rods of smaller section.		
		D Dry M Moist W Wet		EHS Extremely high	From AS1289-1993 Methods of Testing Soils for Engineering Purposes		

APPENDIX 'C'

LABORATORY TEST RESULT SHEETS

MORRISON GEOTECHNIC PTY LTD

www.morrisongeo.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisongeo.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisongeo.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisongeo.com.au

■ SUNSHINE COAST

Unit 4 / 81 Wisers Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydoelab@
morrisongeo.com.au



Emerson Class Number Report

Client :	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 1
Client Address :	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	15/10/2010
Job Number :	DE10/162	Order Number:	
Project :	BROAD GEOTECHNICAL APPRAISAL	Test Method:	AS1289 3.8.1
Location :	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS		

Page 1 of 1

Lab No :	139900	139901	139902	139903
ID No :	-	-	-	-
Lot No :	-	-	-	-
Item No :	-	-	-	-
Sampling Method :	-	-	-	-
Date Sampled :	7/10/2010	7/10/2010	7/10/2010	7/10/2010
Date Tested :	13/10/2010	13/10/2010	13/10/2010	13/10/2010
Material Source :	Insitu	Insitu	Insitu	Insitu
For Use As :	-	-	-	-
Sample Location :	BH3 Depth 0.10m - 0.20m	BH13 Depth 0.00m - 0.10m	BH13 Depth 1.20m - 1.30m	BH15 Depth 0.40m - 0.50m
Soil Description :	-	-	-	-
Type of Water Used :	Distilled Water	Distilled Water	Distilled Water	Distilled Water
Temperature of Water (°C) :	24.000	24.000	24.000	24.000
Emerson Class Number :	Class 2	Class 6	Class 2	Class 4

Remarks :



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison

Mick Morrison (Brisbane)
NATA Accred No:1162 / 1169

FORM NUMBER

RP81-1

MORRISON GEOTECHNIC PTY LTD

www.morrisongeo.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisongeo.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisongeo.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisongeo.com.au

■ SUNSHINE COAST

Unit 4 / 81 Wises Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydoreslab@
morrisongeo.com.au



MORRISON
GEOTECHNIC
ABN 51 009 878 899
RPEUQ 2241

Emerson Class Number Report

Client :	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 2
Client Address :	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	15/10/2010
Job Number :	DE10/162	Order Number:	
Project :	BROAD GEOTECHNICAL APPRAISAL	Test Method:	AS1289 3.8.1
Location :	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS		

Page 1 of 1

Lab No :	139904	139905	139906	139907
ID No :	-	-	-	-
Lot No :	-	-	-	-
Run No :	-	-	-	-
Sampling Method :	-	-	-	-
Date Sampled :	7/10/2010	7/10/2010	7/10/2010	7/10/2010
Date Tested :	13/10/2010	13/10/2010	13/10/2010	13/10/2010
Material Source :	Insitu	Insitu	Insitu	Insitu
For Use As :	-	-	-	-
Sample Location :	BH22 Depth 0.50m - 0.60m	BH25 Depth 0.00m - 0.10m	BH26 Depth 0.65m - 0.75m	BH27 Depth 2.00m - 2.40m
Soil Description :	-	-	-	-
Type of Water Used :	Distilled Water	Distilled Water	Distilled Water	Distilled Water
Temperature of Water (°C) :	24.000	24.000	24.000	24.000
Emerson Class Number :	Class 2	Class 6	Class 2	Class 3
Remarks :				



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison

Mick Morrison (Brisbane)
NATA Accred No:1162 / 1169

FORM NUMBER

RP81-1

MORRISON GEOTECHNIC PTY LTD

www.morrisongeo.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisongeo.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisongeo.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisongeo.com.au

■ SUNSHINE COAST

Unit 4 / 81 Wises Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydelab@
morrisongeo.com.au



Emerson Class Number Report

Client :	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 3
Client Address :	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	15/10/2010
Job Number :	DE10/162	Order Number:	
Project :	BROAD GEOTECHNICAL APPRAISAL	Test Method:	AS1289 3.8.1
Location :	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS		

Page 1 of 1

Lab No :	139908	139909		
ID No :	-	-		
Lot No :	-	-		
Item No :	-	-		
Sampling Method :	-	-		
Date Sampled :	7/10/2010	7/10/2010		
Date Tested :	13/10/2010	13/10/2010		
Material Source :	Insitu	Insitu		
For Use As :	-	-		
Sample Location :	BH29 Depth 1.20m - 1.50m	BH32 Depth 2.10m - 2.50m		
Soil Description :	-	-		
Type of Water Used :	Distilled Water	Distilled Water		
Temperature of Water (°C) :	24.000	24.000		
Emerson Class Number :	Class 2	Class 2		
Remarks :				



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison (Brisbane)
NATA Accred No:1162 / 1169

FORM NUMBER

RP81-1

MORRISON GEOTECHNIC PTY LTD

www.morrisongeo.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisongeo.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisongeo.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisongeo.com.au

■ SUNSHINE COAST

Unit 4 / B1 Wises Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydorelab@
morrisongeo.com.au



Shrink Swell Index Report

Client:	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 4
Client Address:	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	20/10/2010
Job Number:	DE10/162	Order Number:	
Project:	BROAD GEOTECHNICAL APPRAISAL	Test Method :	AS1289.7.1.1
Location	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS	Sample Location	
Lab No:	139892	BH2	
Date Sampled:	07/10/2010	Depth 0.20m - 0.50m	
Date Tested:	11/10/2010		
Sampled By:	RJH	Lot Number:	-
Sample Method:	-	Item Number :	-
Material Source:	Insitu		
For Use As:	-		
Remarks:	-		

Page 1 of 1

Shrinkage Moisture Content (%) :	16.38	Swell MC Before(%) :	16.0
Shrinkage (%) :	2.2	Swell MC After(%) :	22.8
Unit Weight (t/m ³) :	2.04	PP Before (kPa):	600
Swell (%) :	0.6	PP After (kPa):	200
Shrink Swell Index (Iss %) :	1.4		
Visual Classification :	(CH) Silty Sandy CLAY, high plasticity, fine sand, moist, hard, brown mottled yellow.		
Inert Material Estimate(%):	-		
Cracking :	Yes		
Crumbling :	No		



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison

Mick Morrison (Brisbane)

FORM NUMBER

RP043-8

NATA Accred No:1162 / 1169



Trilab Pty Ltd ABN: 25 065 630 505 PO Box 3317 Newmarket QLD 4051
 test@trilab.com.au +61 7 3357 5535 www.trilab.com.au

SHRINK SWELL INDEX TEST REPORT			
Test Method: AS1289 7.1.1			
Client: Morrison Geotechnic Pty Ltd		Report No.	10100320-ISS
Project: DE10/162		Test Date:	13-20/10/2010
		Report Date:	20/10/2010
Client I.D: 139898 (D911) BH7		Depth (m): 0.20-0.37	
SWELL SPECIMEN		SHRINKAGE SPECIMEN	
Wet Density (t/m ³):	2.11	Extent of Crumbling:	Nil
Initial Moisture (%):	10.8	Extent of Cracking:	Nil
Final Moisture (%):	15.1	Moisture (%):	11.3
Swell (%):	1.0	Shrinkage (%):	1.6
SHRINK SWELL INDEX (Iss%): 1.2			
Description: Sandy Clay - brown			
Remarks: Shrinkage measured using steel pins inserted into the side of the specimen. Inert inclusions as estimated in the visual description.			
Swell Pressure: 200 kPa			
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated. Reference should be made to Trilab Pty Ltd "Standard Terms and Conditions of Business" for further details.			
Sample/s supplied by the client			Page 1 of 1



This Document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National standards

NATA Accredited Laboratory Number 9926
 Form Number: GT012-5

Authorised Signatory

James Russell
 J. Russell

Manager

MORRISON GEOTECHNIC PTY LTD

www.morrisongeo.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisongeo.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisongeo.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisongeo.com.au

■ SUNSHINE COAST

Unit 4 / 81 Wisers Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydelab@
morrisongeo.com.au



MORRISON
GEOTECHNIC
ABN 51 009 878 899
RPEUQ 2241

Shrink Swell Index Report

Client:	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 5
Client Address:	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	20/10/2010
Job Number:	DE10/162	Order Number:	
Project:	BROAD GEOTECHNICAL APPRAISAL	Test Method :	AS1289.7.1.1
Location	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS	Sample Location	BH11
Lab No:	139893	Depth 0.50m - 0.66m	
Date Sampled:	07/10/2010	Lot Number:	-
Date Tested:	11/10/2010	Item Number :	-
Sampled By:	RJH		
Sample Method:	-		
Material Source:	Insitu		
For Use As:	-		
Remarks:	-		

Page 1 of 1

Shrinkage Moisture Content (%) :	12.97	Swell MC Before(%) :	12.2
Shrinkage (%) :	2.1	Swell MC After(%) :	16.9
Unit Weight (t/m ³) :	2.1	PP Before (kPa):	600
Swell (%) :	2.8	PP After (kPa):	320
Shrink Swell Index (Iss %):	2.0		
Visual Classification :	(CH) Sandy CLAY, high plasticity, fine-medium sands, moist, hard, brown mottled grey.		
Inert Material Estimate(%):	-		
Cracking :	no		
Crumbling :	no		



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison

Mick Morrison (Brisbane)

NATA Accred No:1162 / 1169

FORM NUMBER

RP043-8

MORRISON GEOTECHNIC PTY LTD

www.morrisongeo.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisongeo.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisongeo.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisongeo.com.au

■ SUNSHINE COAST

Unit 4 / 81 Wises Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydelab@
morrisongeo.com.au



**MORRISON
GEOTECHNIC**
ABN 51 009 878 899
RPEUQ 2241

Shrink Swell Index Report

Client:	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 6
Client Address:	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	20/10/2010
Job Number:	DE10/162	Order Number:	
Project:	BROAD GEOTECHNICAL APPRAISAL	Test Method :	AS1289.7.1.1
Location	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS	Sample Location	
Lab No:	139894	BH13	
Date Sampled:	07/10/2010	Depth 0.35m - 0.61m	
Date Tested:	11/10/2010		
Sampled By:	RJH		
Sample Method:	-		
Material Source:	Insitu		
For Use As:	-	Lot Number:	-
Remarks:	-	Item Number :	-

Page 1 of 1

Shrinkage Moisture Content (%) :	17.34	Swell MC Before(%) :	13.4
Shrinkage (%) :	1.0	Swell MC After(%) :	16.0
Unit Weight (t/m ³) :	2	PP Before (kPa) :	+600
Swell (%) :	0.1	PP After (kPa) :	300
Shrink Swell Index (Iss %) :	0.6		
Visual Classification :	(CH) Sandy CLAY, high plasticity, fine-med grain sands, moist, hard, grey mottled orange brown.		
Inert Material Estimate(%) :	-		
Cracking :	yes		
Crumbling :	no		



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison

Mick Morrison (Brisbane)

NATA Accred No:1162 / 1169

FORM NUMBER

RP043-8

MORRISON GEOTECHNIC PTY LTD

www.morrisongeo.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisongeo.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisongeo.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisongeo.com.au

■ SUNSHINE COAST

Unit 4 / 81 Wises Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydoelab@
morrisongeo.com.au



Shrink Swell Index Report

Client:	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 7
Client Address:	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	20/10/2010
Job Number:	DE10/162	Order Number:	
Project:	BROAD GEOTECHNICAL APPRAISAL	Test Method :	AS1289.7.1.1
Location	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS	Sample Location	
Lab No:	139895	BH14	
Date Sampled:	07/10/2010	Depth 0.60m - 0.74m	
Date Tested:	11/10/2010		
Sampled By:	RJH		
Sample Method:	-		
Material Source:	Insitu		
For Use As:	-	Lot Number:	-
Remarks:	-	Item Number :	-

Page 1 of 1

Shrinkage Moisture Content (%) :	11.55	Swell MC Before(%) :	11.7
Shrinkage (%) :	1.6	Swell MC After(%) :	15.8
Unit Weight (t/m ³) :	2.02	PP Before (kPa):	600
Swell (%) :	0.9	PP After (kPa):	220
Shrink Swell Index (Iss %) :	1.2		
Visual Classification :	(CH) Sandy CLAY, high plasticity, fine-medium sand, moist, brown mottled red.		
Inert Material Estimate(%) :	-		
Cracking :	Yes		
Crumbling :	No		



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison

Mick Morrison (Brisbane)

FORM NUMBER

RP043-8

NATA Accred No:1162 / 1169



Trilab Pty Ltd ABN: 25 065 630 506 PO Box 3317 Newmarket QLD 4051
 test@trilab.com.au +61 7 3357 5535 www.trilab.com.au

SHRINK SWELL INDEX TEST REPORT			
Test Method: AS1289 7.1.1			
Client: Morrison Geotechnic Pty Ltd		Report No. 10100321-ISS	
Project: DE10/162		Test Date: 13/10/2010	
		Report Date: 20/10/2010	
Client I.D: 139899 (D912) BH16		Depth (m): 1.80-2.12	
SWELL SPECIMEN		SHRINKAGE SPECIMEN	
Wet Density (t/m ³):	2.11	Extent of Crumbling:	-
Initial Moisture (%):	20.5	Extent of Cracking:	-
Final Moisture (%):	24.9	Moisture (%):	19.6
Swell (%):	5.7	Shrinkage (%):	3.8
SHRINK SWELL INDEX (Iss%): 3.7			
Description: Clay - brown			
Remarks: Shrinkage measured using steel pins inserted into the side of the specimen. Inert inclusions as estimated in the visual description.			
Swell Pressure: 800 kPa			
The results of calibrations and tests performed apply only to the specific instrument or sample at the time of test unless otherwise clearly stated. Reference should be made to Trilab Pty Ltd "Standard Terms and Conditions of Business" for further details.			
Sample/s supplied by the client			Page 1 of 1



This Document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations, and/or measurements included in this document are traceable to Australian/National standards.

NATA Accredited Laboratory Number 9926
 Form Number: GT012-5

Authorised Signatory

James Russell
 J. Russell

Manager

MORRISON GEOTECHNIC PTY LTD

www.morrisonge.com.au

■ BRISBANE

Unit 1 / 35 Limestone Street
PO Box 3063
Darra Qld 4076
P: 07 3279 0900
F: 07 3279 0955
brisbanelab@
morrisonge.com.au

■ GOLD COAST

Unit 5 / 36 Lawrence Drive
PO Box 2011
Nerang Qld 4211
P: 07 5596 1599
F: 07 5527 2027
goldcoastlab@
morrisonge.com.au

■ CABOOLTURE

Unit 3 / 42 Aerodrome Road
Caboolture Qld 4510
P: 07 5499 0755
F: 07 5428 2498
caboolturelab@
morrisonge.com.au

■ SUNSHINE COAST

Unit 4 / 81 Wisers Road
Maroochydore Qld 4558
P: 07 5443 9522
F: 07 5479 1633
maroochydorelab@
morrisonge.com.au



MORRISON
GEOTECHNIC
ABN 51 009 878 899
RPEUQ 2241

Shrink Swell Index Report

Client:	STOCKLAND DEVELOPMENT PTY LTD	Report Number:	DE10/162 - 8
Client Address:	P O BOX 10160 ADELAIDE STREET BRISBANE QLD 4000	Report Date:	20/10/2010
Job Number:	DE10/162	Order Number:	
Project:	BROAD GEOTECHNICAL APPRAISAL	Test Method :	AS1289.7.1.1
Location	SITE B, SOUTH DEEBING CREEK ROAD , DEEBING HEIGHTS	Sample Location	
Lab No:	139896	BH30	
Date Sampled:	07/10/2010	Depth 0.10m - 0.30m	
Date Tested:	11/10/2010		
Sampled By:	RJH	Lot Number:	-
Sample Method:	-	Item Number :	-
Material Source:	Insitu		
For Use As:	-		
Remarks:	-		

Page 1 of 1

Shrinkage Moisture Content (%) :	31.94	Swell MC Before(%) :	34.9
Shrinkage (%) :	3.8	Swell MC After(%) :	34.5
Unit Weight (t/m ³) :	1.82	PP Before (kPa):	140
Swell (%) :	2.2	PP After (kPa):	120
Shrink Swell Index (Iss %) :	2.7		
Visual Classification :	(CH) Silty CLAY, high plasticity, fine sand, moist, stiff, dark brown/grey.		
Inert Material Estimate(%):	-		
Cracking :	Yes		
Crumbling :	No		



This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Corporate Site No: 1162 Darra.

APPROVED SIGNATORY

Mick Morrison

Mick Morrison (Brisbane)

FORM NUMBER

RP043-8

NATA Accred No:1162 / 1169