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BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-22

CLIENT : TMR	POSITION : E: 10435, N: 152877 (56 South East Transit Horizontal Datum)	PAGE : 1 OF 6
PROJECT : GUSBUS	SURFACE ELEVATION : 28.0 (AHD)	DATE DRILLED : 31/8/12 to 31/8/12
JOB NO : QB10312.540	DIP / AZIMUTH : 90°	LOGGED BY : NC
LOCATION : Eastern bank of Bulimba Creek	CONTRACTOR : Geodrill	CHECKED BY : DWL

DRILLING					MATERIAL							
PROGRESS		PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
DRILLING & CASING	WATER											
AS ↓ Casing ↑ WB ↑					28.0	0.0			SILT (ML): Black, low plasticity, trace rootlets.			0.00: - 3.50m ALLUVIUM
					27.5	0.5		ML		M to W		3.50-7.00m RESIDUAL
			1.00m SPT RW/450mm	27.0	1.0			1.20m	(ML): With fine grained sand.		VS	Sample - 1.00m to 1.45m Grading: Gravel = 0%; Sand = 25%; Fines = 75%
			1.45m	26.5	1.5							Atterberg Limits: LL = 44.2%; PL = 28.0%; PI = 16.2%; LS = 11.0%; MC = 73.8%
				26.0	2.0							
				25.5	2.5			2.50m	SILTY SAND (SM): Grey, fine to medium grained sand.			
			2.95m	25.0	3.0				SM			L
				24.5	3.5			3.50m	SILTY SAND (SM): Grey, fine to coarse grained sand, sub-rounded.		M	MD
			4.00m SPT 11, 16, 16 N=32	24.0	4.0			4.00m	(SM): Grey brown and pink.			
			4.45m	23.5	4.5				SM			D
			23.0	5.0				5.00m				

DRILLING				SAMPLES & FIELD TESTS				DENSITY (SPT N-value)		CONSISTENCY (Su) {N-value}	
HA Hand Auger	RR Rock Rolling	D Disturbed Sample	SPT Standard Penetration Test	VL Very Loose	0 - 4	VS Very Soft	< 12 kPa {0-2}				
AS Auger Screw	HQ HQ Coring	ES Env Soil Sample	U Undisturbed Tube Sample	L Loose	4 - 10	S Soft	12 - 25 {2-4}				
AD/T Auger Drill TC-bit	NQ NQ Coring	EW Env Water Sample	W Water Sample	MD Medium Dense	10 - 30	F Firm	25 - 50 {4-8}				
AD/V Auger Drill V-bit	PQ PQ Coring			D Dense	30 - 50	St Stiff	50 - 100 {8-15}				
WB Washbore	NMLC NMLC Coring			VD Very Dense	50 - 100	VSt Very Stiff	100 - 200 {15-30}				
				CO Compact	>50/150mm	H Hard	> 200 kPa {>30}				
DRILLING PENETRATION				MOISTURE CONDITION							
VE Very Easy	F Firm	VH Very Hard		HP Hand Penetrometer		D = Dry	M = Moist	W = Wet			
E Easy	H Hard			HV Hand Vane Shear							
GROUNDWATER SYMBOLS				N SPT blows per 300mm							
= Water level (static)				HW SPT penetration by hammer weight							
= Water level (during drilling)				RW SPT penetration by rod weight							



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-22

CLIENT : TMR	POSITION : E: 10435, N: 152877 (56 South East Transit Horizontal Datum)	PAGE : 2 OF 6
PROJECT : GUSBUS	SURFACE ELEVATION : 28.0 (AHD)	DATE DRILLED : 31/8/12 to 31/8/12
JOB NO : QB10312.540	DIP / AZIMUTH : 90°	LOGGED BY : NC
LOCATION : Eastern bank of Bulimba Creek	CONTRACTOR : Geodrill	CHECKED BY : DWL

DRILLING					MATERIAL							
PROGRESS		PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
DRILLING & CASING	WATER											
					23.0	5.0			CLAYEY SAND (SC): Orange brown, fine to coarse grained sand, medium plasticity clay, with red staining.			
				5.50m SPT 10, 20, 22 N=42	22.5	5.5		SC				
				5.95m	22.0	6.0			(SC): Pale grey, medium grained, with light orange staining.	M	D	
					21.5	6.5		SC				
				7.00m SPT 12, 19, 24 N=43	21.0	7.0			SANDSTONE: Pale grey, fine to medium, in weak clay matrix, extremely weathered, extremely low strength, with orange brown iron staining.			7.00: [Properties of Clayey SAND]
				7.45m	20.5	7.5					D	
					20.0	8.0						
				8.50m SPT 18, 30/150mm HB N=R	19.5	8.5				M		
				8.80m	19.0	9.0					VD	
					18.5	9.5			With sub-rounded, coarse grained sand, increasing clay content (low plasticity).			
				10.00m	18.0	10.0						




DRILLING				SAMPLES & FIELD TESTS				DENSITY (SPT N-value)			CONSISTENCY (Su) {N-value}										
HA	Hand Auger	RR	Rock Rolling	D	Disturbed Sample	SPT	Standard Penetration Test	VL	Very Loose	0 - 4	VS	Very Soft	< 12 kPa {0-2}								
AS	Auger Screw	HQ	HQ Coring	ES	Env Soil Sample	U	Undisturbed Tube Sample	L	Loose	4 - 10	S	Soft	12 - 25 {2-4}								
AD/T	Auger Drill TC-bit	NQ	NQ Coring	EW	Env Water Sample	W	Water Sample	MD	Medium Dense	10 - 30	F	Firm	25 - 50 {4-8}								
AD/V	Auger Drill V-bit	PQ	PQ Coring					D	Dense	30 - 50	St	Stiff	50 - 100 {8-15}								
WB	Washbore	NMLC	NMLC Coring	HP	Hand Penetrometer			VD	Very Dense	50 - 100	VSt	Very Stiff	100 - 200 {15-30}								
DRILLING PENETRATION				MOISTURE CONDITION				CO	Compact	>50/150mm	H	Hard	> 200 kPa {>30}								
VE	Very Easy	F	Firm	VH	Very Hard	D = Dry M = Moist W = Wet															
E	Easy	H	Hard																		
GROUNDWATER SYMBOLS																					
▼ = Water level (static)																					
▽ = Water level (during drilling)																					



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-22

CLIENT : TMR	POSITION : E: 10435, N: 152877 (56 South East Transit Horizontal Datum)	PAGE : 3 OF 6
PROJECT : GUSBUS	SURFACE ELEVATION : 28.0 (AHD)	DATE DRILLED : 31/8/12 to 31/8/12
JOB NO : QB10312.540	DIP / AZIMUTH : 90°	LOGGED BY : NC
LOCATION : Eastern bank of Bulimba Creek	CONTRACTOR : Geodrill	CHECKED BY : DWL

DRILLING					MATERIAL								
PROGRESS		PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations	
DRILLING & CASING	WATER												
				SPT 13, 20, 19 N=39	18.0	10.0			SANDSTONE: Grey, fine to coarse grained , with fine sized gravel, extremely weathered, extremely low strength, with pink and red staining.			Sample - 10.00m to 10.45m Grading: Gravel = 15%; Sand = 65%; Fines = 20% Atterberg Limits: LL = 28.4%; PL = 15.2%; PI = 13.2%; LS = 6.6%; MC = 15.0%	
				10.45m	17.5	10.5					M		D
					17.0	11.0			11.10m	Orange brown, coarse grained sand , with coarse grained sand fine sized gravel.			
				11.50m SPT 4, 9, 15 N=24	16.5	11.5			CLAYSTONE: Grey, extremely weathered, low strength.	M	VSt	11.50: [Properties of CLAY, low plasticity]	
				11.95m					SANDSTONE: Grey, fine grained sand in clay matrix, extremely weathered, extremely low strength.			11.80: [Properties of Clayey SAND]	
					16.0	12.0				M	D		
					15.5	12.5			12.50m	CLAYSTONE: Grey to dark grey, with fine grained sand, extremely weathered, low strength.			12.50: [Properties of CLAY]
				13.00m SPT 4, 7, 13 N=20	15.0	13.0							
				13.45m	14.5	13.5				M	VSt		
					14.0	14.0		14.00m	With coarse grained sandstone bands throughout.				
				14.50m SPT 5, 10, 16 N=26	13.5	14.5		14.50m	Blue grey, with scattered bands of coarse grained, sub-rounded sand, predominantly translucent quartz, very low strength, with brown staining.				
				14.95m									
					13.0	15.0		15.00m					

DRILLING				SAMPLES & FIELD TESTS				DENSITY (SPT N-value)		CONSISTENCY (Su) {N-value}	
HA Hand Auger	RR Rock Rolling	D Disturbed Sample	SPT Standard Penetration Test	VL Very Loose	0 - 4	VS Very Soft	< 12 kPa {0-2}				
AS Auger Screw	HQ HQ Coring	ES Env Soil Sample	U Undisturbed Tube Sample	L Loose	4 - 10	S Soft	12 - 25 {2-4}				
AD/T Auger Drill TC-bit	NQ NQ Coring	EW Env Water Sample	W Water Sample	MD Medium Dense	10 - 30	F Firm	25 - 50 {4-8}				
AD/V Auger Drill V-bit	PQ PQ Coring			D Dense	30 - 50	St Stiff	50 - 100 {8-15}				
WB Washbore	NMLC NMLC Coring			VD Very Dense	50 - 100	VSt Very Stiff	100 - 200 {15-30}				
				CO Compact	>50/150mm	H Hard	> 200 kPa {>30}				
DRILLING PENETRATION				MOISTURE CONDITION							
VE Very Easy	F Firm	VH Very Hard		HP Hand Penetrometer		D = Dry	M = Moist	W = Wet			
E Easy	H Hard			HV Hand Vane Shear							
GROUNDWATER SYMBOLS				N SPT blows per 300mm							
▼ = Water level (static)				HW SPT penetration by hammer weight							
▽ = Water level (during drilling)				RW SPT penetration by rod weight							



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-22

CLIENT : TMR

POSITION : E: 10435, N: 152877 (56 South East Transit Horizontal Datum)

PAGE : 4 OF 6

PROJECT : GUSBUS

SURFACE ELEVATION : 28.0 (AHD)

DATE DRILLED : 31/8/12 to 31/8/12

JOB NO : QB10312.540

DIP / AZIMUTH : 90°

LOGGED BY : NC

LOCATION : Eastern bank of Bulimba Creek

CONTRACTOR : Geodrill

CHECKED BY : DWL

DRILLING						MATERIAL						
PROGRESS		PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
DRILLING & CASING	WATER											
WB					13.0	15.0			CLAYSTONE: Blue grey, with scattered bands of coarse grained, sub-rounded sand, predominantly translucent quartz, extremely weathered, very low strength, with brown staining.			15.00: [Properties of CLAY with sand]
					12.5	15.5					VSt	
			16.00m SPT 10, 17, 24 N=41	12.0	16.0	16.00m With fine grained sand.						
			16.45m	11.5	16.5	16.50m With bands of coarse, sub-rounded sand and fine sized gravel.						
				11.0	17.0							
			17.50m SPT 8, 13, 21 N=34	10.5	17.5			M				
			17.95m	10.0	18.0			H				
				9.5	18.5							
			19.00m SPT 7, 15, 19 N=34	9.0	19.0	19.00m Stained pink red.						
			19.45m	8.5	19.5	19.40m Becoming dark grey and black.						
			8.0	20.0	20.00m							

DRILLING				SAMPLES & FIELD TESTS				DENSITY (SPT N-value)		CONSISTENCY (Su) {N-value}			
HA	Hand Auger	RR	Rock Rolling	D	Disturbed Sample	SPT	Standard Penetration Test	VL	Very Loose	0 - 4	VS	Very Soft	< 12 kPa {0-2}
AS	Auger Screw	HQ	HQ Coring	ES	Env Soil Sample	U	Undisturbed Tube Sample	L	Loose	4 - 10	S	Soft	12 - 25 {2-4}
AD/T	Auger Drill TC-bit	NQ	NQ Coring	EW	Env Water Sample	W	Water Sample	MD	Medium Dense	10 - 30	F	Firm	25 - 50 {4-8}
AD/V	Auger Drill V-bit	PQ	PQ Coring					D	Dense	30 - 50	St	Stiff	50 - 100 {8-15}
WB	Washbore	NMLC	NMLC Coring	HP	Hand Penetrometer	MOISTURE CONDITION		VD	Very Dense	50 - 100	VSt	Very Stiff	100 - 200 {15-30}
DRILLING PENETRATION				HV	Hand Vane Shear	D = Dry M = Moist W = Wet		CO	Compact	>50/150mm	H	Hard	> 200 kPa {>30}
VE	Very Easy	F	Firm	VH	Very Hard	(P: Peak Su R: Residual Su)							
E	Easy	H	Hard	N SPT blows per 300mm									
GROUNDWATER SYMBOLS				HW SPT penetration by hammer weight									
				RW SPT penetration by rod weight									



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-22

CLIENT : TMR	POSITION : E: 10435, N: 152877 (56 South East Transit Horizontal Datum)	PAGE : 5 OF 6
PROJECT : GUSBUS	SURFACE ELEVATION : 28.0 (AHD)	DATE DRILLED : 31/8/12 to 31/8/12
JOB NO : QB10312.540	DIP / AZIMUTH : 90°	LOGGED BY : NC
LOCATION : Eastern bank of Bulimba Creek	CONTRACTOR : Geodrill	CHECKED BY : DWL

DRILLING					MATERIAL								
PROGRESS		WATER	PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
DRILLING & CASING													
							8.0	20.0					20.00: [Properties of CLAY]
					20.50m SPT 4, 11, 15 N=26		7.5	20.5		20.50m Grey, trace black carbonaceous bands, with orange brown staining of defects.			
					20.95m		7.0	21.0			M	H	
							6.5	21.5					
					22.00m SPT 30/100mm HB N=R 22.10m		6.0	22.0		22.00m SANDSTONE: Pale grey, fine grained sand in clay matrix, extremely weathered, extremely low strength.			22.00: [Properties of Clayey SAND]
							5.5	22.5			M	VD	
							5.0	23.0					
					23.50m SPT 11, 14, 22 N=36		4.5	23.5		23.50m CLAYSTONE: Pale grey, with fine grained sand, extremeley weathered, very low strength, with dark brown iron staining.			23.50: [Properties of CLAY with sand]
					23.95m		4.0	24.0			M	H	
							3.5	24.5					
					25.00m		3.0	25.0		25.00m			

DRILLING				SAMPLES & FIELD TESTS				DENSITY (SPT N-value)			CONSISTENCY (Su) {N-value}		
HA	Hand Auger	RR	Rock Rolling	D	Disturbed Sample	SPT Standard Penetration Test		VL	Very Loose	0 - 4	VS	Very Soft	< 12 kPa {0-2}
AS	Auger Screw	HQ	HQ Coring	ES	Env Soil Sample	U Undisturbed Tube Sample		L	Loose	4 - 10	S	Soft	12 - 25 {2-4}
AD/T	Auger Drill TC-bit	NQ	NQ Coring	EW	Env Water Sample	W Water Sample		MD	Medium Dense	10 - 30	F	Firm	25 - 50 {4-8}
AD/V	Auger Drill V-bit	PQ	PQ Coring					D	Dense	30 - 50	St	Stiff	50 - 100 {8-15}
WB	Washbore	NMLC	NMLC Coring	HP	Hand Penetrometer	MOISTURE CONDITION		VD	Very Dense	50 - 100	VSt	Very Stiff	100 - 200 {15-30}
DRILLING PENETRATION				HV	Hand Vane Shear	D = Dry M = Moist W = Wet		CO	Compact	>50/150mm	H	Hard	> 200 kPa {>30}
VE	Very Easy	F	Firm	VH	Very Hard	(P: Peak Su R: Residual Su)							
E	Easy	H	Hard			N SPT blows per 300mm							
GROUNDWATER SYMBOLS				HW		SPT penetration by hammer weight							
▼ = Water level (static)				RW		SPT penetration by rod weight							
▽ = Water level (during drilling)													



BOREHOLE ENGINEERING LOG

BOREHOLE NO : BH-SKM-22

CLIENT : TMR

POSITION : E: 10435, N: 152877 (56 South East Transit Horizontal Datum)

PAGE : 6 OF 6

PROJECT : GUSBUS

SURFACE ELEVATION : 28.0 (AHD)

DATE DRILLED : 31/8/12 to 31/8/12

JOB NO : QB10312.540

DIP / AZIMUTH : 90°


LOGGED BY : NC

LOCATION : Eastern bank of Bulimba Creek

CONTRACTOR : Geodrill

CHECKED BY : DWL

DRILLING						MATERIAL						
PROGRESS		DRILLING PENETRATION	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	RL (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, Colour, Plasticity or Particle Characteristic Secondary and Minor Components	MOISTURE CONDITION	CONSISTENCY	STRUCTURE & Other Observations
DRILLING & CASING	WATER											
<div><div></div><div>WB</div><div></div></div>				SPT 19, 30/100mm HB N=R 25.25m	3.0	25.0			SANDSTONE: Grey to dark grey, fine to medium, in clay matrix, extremely weathered, very low strength.	M	VD	
				2.5	25.5							
				2.0	26.0							
				1.5	26.5							
				1.0	27.0							
				0.5	27.5							
				0.0	28.0							
				-0.5	28.5							
				-1.0	29.0							
				-1.5	29.5							
				26.50m SPT 30/100mm HB N=R 26.60m	1.5	26.5			26.50m 26.60m Grey to pale grey, with coarse grained quartz sand.			26.60: BH Terminated BH sealed with grout
				1.0	27.0							
				0.5	27.5							
				0.0	28.0							
				-0.5	28.5							
				-1.0	29.0							
				-1.5	29.5							
				-2.0	30.0							

DRILLING				SAMPLES & FIELD TESTS				DENSITY (SPT N-value)		CONSISTENCY (Su) {N-value}			
HA	Hand Auger	RR	Rock Rolling	D	Disturbed Sample	SPT	Standard Penetration Test	VL	Very Loose	0 - 4	VS	Very Soft	< 12 kPa {0-2}
AS	Auger Screw	HQ	HQ Coring	ES	Env Soil Sample	U	Undisturbed Tube Sample	L	Loose	4 - 10	S	Soft	12 - 25 {2-4}
AD/T	Auger Drill TC-bit	NQ	NQ Coring	EW	Env Water Sample	W	Water Sample	MD	Medium Dense	10 - 30	F	Firm	25 - 50 {4-8}
AD/V	Auger Drill V-bit	PQ	PQ Coring					D	Dense	30 - 50	St	Stiff	50 - 100 {8-15}
WB	Washbore	NMLC	NMLC Coring	HP	Hand Penetrometer	MOISTURE CONDITION		VD	Very Dense	50 - 100	VSt	Very Stiff	100 - 200 {15-30}
DRILLING PENETRATION				HV	Hand Vane Shear	D = Dry M = Moist W = Wet		CO	Compact	>50/150mm	H	Hard	> 200 kPa {>30}
VE	Very Easy	F	Firm	VH	Very Hard	(P: Peak Su R: Residual Su)							
E	Easy	H	Hard	N SPT blows per 300mm									
GROUNDWATER SYMBOLS				HW SPT penetration by hammer weight									
				RW SPT penetration by rod weight									
