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: DRILLING & CASING	PROGRESS: WATER	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
AS CASING					28.0	0.0			SILT (ML): Black, low plasticity, trace rootlets.			0.00: - 3.50m ALLUVIUM 3.50-7.00m RESIDUAL 7.00-TD XW ROCK
					27.5	0.5		ML		M to W		
				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% Atterberg Limits: LL = 44.2%; PL = 28.0%; PI = 16.2%; LS = 11.0%; MC = 73.8%
				1.45m	26.5	1.5						
								ML		W		
					26.0	2.0						
				2.50m U50	25.5	2.5			2.50m SILTY SAND (SM): Grey, fine to medium grained sand.			
				2.95m								
					25.0	3.0		SM			L	
									3.50m SILTY SAND (SM): Grey, fine to coarse grained sand, sub-rounded.			
	WB				24.5	3.5		SM		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

HA	Hand Auger	RR	Rock Rolling
AS	Auger Screw	HQ	HQ Coring
AD/T	Auger Drill TC-bit	NQ	NQ Coring
AD/V	Auger Drill V-bit	PQ	PQ Coring
WB	Washbore	NMLC	NMLC Coring

DRILLING PENETRATION

VE Very Easy F Firm VH Very Hard
E Easy H Hard

GROUNDWATER SYMBOLS

= Water level (static)
= Water level (during drilling)

SAMPLES & FIELD TESTS

D	Disturbed Sample	SPT	Standard Penetration Test
ES	Env Soil Sample	U	Undisturbed Tube Sample
EW	Env Water Sample	W	Water Sample

HP Hand Penetrometer
HV Hand Vane Shear
(P: Peak Su R: Residual Su)
N SPT blows per 300mm
HW SPT penetration by hammer weight
RW SPT penetration by rod weight

MOISTURE CONDITION
D = Dry M = Moist W = Wet

DENSITY (SPT N-value)

VL	Very Loose	0 - 4
L	Loose	4 - 10
MD	Medium Dense	10 - 30
D	Dense	30 - 50
VD	Very Dense	50 - 100
CO	Compact	>50/150mm

CONSISTENCY (Su) {N-value}

VS	Very Soft	< 12 kPa {0-2}
S	Soft	12 - 25 {2-4}
F	Firm	25 - 50 {4-8}
St	Stiff	50 - 100 {8-15}
VSt	Very Stiff	100 - 200 {15-30}
H	Hard	> 200 kPa {>30}

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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 : 2 OF 6

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DRILLING | MATERIAL

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					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				
									5.70m (SC): Pale grey, medium grained, with light orange staining.			
				5.95m	22.0	6.0				M	D	
					21.5	6.5		SC				
				7.00m SPT 12, 19, 24 N=43	21.0	7.0			7.00m 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]
WB				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			9.50m With sub-rounded, coarse grained sand, increasing clay content (low plasticity).			
				10.00m	18.0	10.0			10.00m			

DRILLING

HA	Hand Auger	RR	Rock Rolling
AS	Auger Screw	HQ	HQ Coring
AD/T	Auger Drill TC-bit	NQ	NQ Coring
AD/V	Auger Drill V-bit	PQ	PQ Coring
WB	Washbore	NMLC	NMLC Coring

DRILLING PENETRATION

VE Very Easy F Firm VH Very Hard
E Easy H Hard

GROUNDWATER SYMBOLS

= Water level (static)
= Water level (during drilling)

SAMPLES & FIELD TESTS

D	Disturbed Sample	SPT	Standard Penetration Test
ES	Env Soil Sample	U	Undisturbed Tube Sample
EW	Env Water Sample	W	Water Sample

HP Hand Penetrometer
HV Hand Vane Shear
(P: Peak Su R: Residual Su)
N SPT blows per 300mm
HW SPT penetration by hammer weight
RW SPT penetration by rod weight

MOISTURE CONDITION
D = Dry M = Moist W = Wet

DENSITY (SPT N-value)

VL	Very Loose	0 - 4
L	Loose	4 - 10
MD	Medium Dense	10 - 30
D	Dense	30 - 50
VD	Very Dense	50 - 100
CO	Compact	>50/150mm

CONSISTENCY (Su) {N-value}

VS	Very Soft	< 12 kPa {0-2}
S	Soft	12 - 25 {2-4}
F	Firm	25 - 50 {4-8}
St	Stiff	50 - 100 {8-15}
VSt	Very Stiff	100 - 200 {15-30}
H	Hard	> 200 kPa {>30}

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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 : 3 OF 6

PROJECT : GUSBUS | SURFACE ELEVATION : 28.0 (AHD) | DATE DRILLED : 31/8/12 to 31/8/12

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LOCATION : Eastern bank of Bulimba Creek | CONTRACTOR : Geodrill | CHECKED BY : DWL

DRILLING | MATERIAL

PROGRESS: DRILLING & CASING	PROGRESS: WATER	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
				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			11.50m CLAYSTONE: Grey, extremely weathered, low strength.	M	VSt	11.50: [Properties of CLAY, low plasticity]
				11.95m	16.0	12.0			11.80m SANDSTONE: Grey, fine grained sand in clay matrix, extremely weathered, extremely low strength.	M	D	11.80: [Properties of Clayey SAND]
WB					15.5	12.5			12.50m CLAYSTONE: Grey to dark grey, with fine grained sand, extremely weathered, low strength.	M	VSt	12.50: [Properties of CLAY]
				13.00m SPT 4, 7, 13 N=20	15.0	13.0						
				13.45m	14.5	13.5						
					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

HA Hand Auger | RR Rock Rolling
AS Auger Screw | HQ HQ Coring
AD/T Auger Drill TC-bit | NQ NQ Coring
AD/V Auger Drill V-bit | PQ PQ Coring
WB Washbore | NMLC NMLC Coring

DRILLING PENETRATION

VE Very Easy | F Firm | VH Very Hard
E Easy | H Hard

GROUNDWATER SYMBOLS

= Water level (static)
= Water level (during drilling)

SAMPLES & FIELD TESTS

D Disturbed Sample | SPT Standard Penetration Test
ES Env Soil Sample | U Undisturbed Tube Sample
EW Env Water Sample | W Water Sample

HP Hand Penetrometer
HV Hand Vane Shear
(P: Peak Su R: Residual Su)
N SPT blows per 300mm
HW SPT penetration by hammer weight
RW SPT penetration by rod weight

MOISTURE CONDITION
D = Dry M = Moist W = Wet

DENSITY (SPT N-value)

VL	Very Loose	0 - 4
L	Loose	4 - 10
MD	Medium Dense	10 - 30
D	Dense	30 - 50
VD	Very Dense	50 - 100
CO	Compact	>50/150mm

CONSISTENCY (Su) {N-value}

VS	Very Soft	< 12 kPa {0-2}
S	Soft	12 - 25 {2-4}
F	Firm	25 - 50 {4-8}
St	Stiff	50 - 100 {8-15}
VSt	Very Stiff	100 - 200 {15-30}
H	Hard	> 200 kPa {>30}

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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 : 4 OF 6

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DRILLING | MATERIAL

PROGRESS: DRILLING & CASING	PROGRESS: WATER	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
WB				16.00m SPT 10, 17, 24 N=41	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	
				16.45m	12.0	16.0			16.00m With fine grained sand.			
					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

HA	Hand Auger	RR	Rock Rolling
AS	Auger Screw	HQ	HQ Coring
AD/T	Auger Drill TC-bit	NQ	NQ Coring
AD/V	Auger Drill V-bit	PQ	PQ Coring
WB	Washbore	NMLC	NMLC Coring

DRILLING PENETRATION

VE	Very Easy	F	Firm	VH	Very Hard
E	Easy	H	Hard		

GROUNDWATER SYMBOLS

▼ = Water level (static)

▽ = Water level (during drilling)

SAMPLES & FIELD TESTS

D	Disturbed Sample	SPT	Standard Penetration Test
ES	Env Soil Sample	U	Undisturbed Tube Sample
EW	Env Water Sample	W	Water Sample

HP Hand Penetrometer
HV Hand Vane Shear
(P: Peak Su R: Residual Su)
N SPT blows per 300mm
HW SPT penetration by hammer weight
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MOISTURE CONDITION
D = Dry M = Moist W = Wet

DENSITY (SPT N-value)

VL	Very Loose	0 - 4
L	Loose	4 - 10
MD	Medium Dense	10 - 30
D	Dense	30 - 50
VD	Very Dense	50 - 100
CO	Compact	>50/150mm

CONSISTENCY (Su) {N-value}

VS	Very Soft	< 12 kPa {0-2}
S	Soft	12 - 25 {2-4}
F	Firm	25 - 50 {4-8}
St	Stiff	50 - 100 {8-15}
VSt	Very Stiff	100 - 200 {15-30}
H	Hard	> 200 kPa {>30}

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BOREHOLE ENGINEERING LOG

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CLIENT : TMR | POSITION : E: 10435, N: 152877 (56 South East Transit Horizontal Datum) | PAGE : 5 OF 6

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PROGRESS: DRILLING & CASING	PROGRESS: WATER	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
					8.0	20.0			CLAYSTONE: Dark grey and black, extremely weathered, low strength.			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]
WB					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

HA	Hand Auger	RR	Rock Rolling
AS	Auger Screw	HQ	HQ Coring
AD/T	Auger Drill TC-bit	NQ	NQ Coring
AD/V	Auger Drill V-bit	PQ	PQ Coring
WB	Washbore	NMLC	NMLC Coring

DRILLING PENETRATION

VE	Very Easy	F	Firm	VH	Very Hard
E	Easy	H	Hard		

GROUNDWATER SYMBOLS

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SAMPLES & FIELD TESTS

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WB				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						
				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

HA	Hand Auger	RR	Rock Rolling
AS	Auger Screw	HQ	HQ Coring
AD/T	Auger Drill TC-bit	NQ	NQ Coring
AD/V	Auger Drill V-bit	PQ	PQ Coring
WB	Washbore	NMLC	NMLC Coring

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E	Easy	H	Hard		

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