ENGINEERING BOREHOLE LOG

Queensland Government

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/8-2014

BOREHOLE No BH4
SHEET 1 of 5
REFERENCE No H12011

PROJECT Mt Whitestone: Slope Instability Investigation - Preliminary Inclinometer Boreholes
LOCATION Below the road COORDINATES 416161.3 E; 6937854.7 N
PROJECT No FG6128 SURFACE R.L. 212.52m PLUNGE DATE STARTED 4/11/14 GRID DATUM MGA94
JOB No HEIGHT DATUM AHD BEARING DATE COMPLETED 7/11/14 DRILLER Hinterland

DEPTH (m)	R.L. (m)	AUGER / CASING / WASH BORING / CORE DRILLING	RQD ( )% CORE REC %	SAMPLE	MATERIAL DESCRIPTION	LITHOLOGY	USC	WEATHERING	INTACT STRENGTH (AS1726) EH VH H M L VL EL	DEFECT SPACING (AS1726) EC VC C M W VW EW	GRAPHIC LOG	ADDITIONAL DATA AND TEST RESULTS	SAMPLES	TESTS
0	212.52				**Gravelly SILT (COLLUVIUM)** Brown, dry, firm. Angular gravel fragments up to 20mm in size.		(GM)						A	SPT
												4,16,24		
1	211.02				**Gravelly, sandy SILT (COLLUVIUM)** Pale brown, dry to moist, hard. Angular gravel fragments up to 20mm in size.		(GM)						B	SPT
												28,26,30/130		
2														
3	209.52				**Sandy CLAY with Cobbles and Boulders (COLLUVIUM)** Orange brown, moist. Generally comprises a hard Sandy Clay of intermediate plasticity which contains a mix of high strength cobbles and boulders up to 300mm in size.								C	SPT
												18,26,30/110		
4											Sandstone cobble			
5			58 100								Broken zone			
6				D			(CI)					30/50		SPT
7														
8				E							Sandstone cobble	11,17,20		SPT
											8.5m some water loss			
9			64								9.0m total circulation loss Soft clay seam	LL = 53; PI = 34; LS = 13.4; MC = 16.5%; Emerson Class 1		
10														

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REMARKS

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BOREHOLE No BH4
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10	202.52		100 100		**Sandy CLAY with Cobbles and Boulders (COLLUVIUM) as before**							Sandstone cobble		
												Sandstone cobble		
												Sandstone boulder		
11			67 60									Sandstone cobble Soft clay seam		
												Sandstone boulder		
12			79											
13			100									Soft clay seam Soft clay seam Soft clay seam		
14												Soft clay seam with rock fragments		
			96									Sandstone boulder Soft clay seam with rock fragments		
												Soft clay seam		
15							(CI)					Sandstone cobble Soft clay seam with rock fragments Soft clay seam Soft clay seam with rock fragments Permeability test: 1.5 x 10^{-8}m/s Fracture at 0° planar polished - drilling induced?		
			88											
			48											
16			0									Soft clay seam		
17			100									Fracture at 0° planar polished - drilling induced?		
18												Soft clay seam Total circulation loss		
												Fractured sandstone boulder Broken zone		
19			64									Broken zone with basalt fragment		
			37 0									Broken zone		
20												LL = 55; LS = 15.8; DD = 1.55t/m^3; WD = 1.92t/m^3; MC = 26.3%;		

REMARKS

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20	192.52		100		**Sandy CLAY with Cobbles and Boulders (COLLUVIUM) as before**							Emerson Class 1 Shrink Swell Index 1.1%pF		
			100											
21												Circulation loss		
												Broken zone		
			95											
					21.7m increased sand content in matrix, water loss slowing							Brecciated Zone Fracture at 0° planar polished - drilling induced?		
22														
23														
			100											
24														
			100									Sandstone cobble		
					24.6m Permeability test: (invalid test result)							Sandstone boulder		
25							(CI)					Soft clay seam with rock fragments		
			85											
												Sandstone cobble		
												Soft clay seam with rock fragments		
			46									VWP installed		
26												Soft clay seam with rock fragments		
												Broken zone with quartzite fragments		
27														
			52											
			100									Broken zone		
28												Soft clay seam		
												Sandstone cobble		
			100									Soft clay seam with rock fragments		
												Soft clay seam with rock fragments		
29												Soft clay seam with rock fragments		
												Soft clay seam with rock fragments		
			60									Sandstone boulder		
												Sandstone boulder		
30												Sandstone cobble		

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30	182.52		100		**Sandy CLAY with Cobbles and Boulders (COLLUVIUM) as before**							Broken zone		
31			100									Sandstone boulder Broken zone Broken zone Soft clay seam, carbonaceous material Carbonaceous layer Sandstone cobble Soft clay seam Sandstone boulder		
			100											
32												Sandstone cobble		
			85				(CI)							
33												Soft clay seam		
			100									Sandstone cobble		
34			100									Soft clay seam %Pass 2.360mm = 46 %Pass 0.075mm = 24 %Pass 0.002mm = 5 Broken zone		
			100		34.87m Some polished surfaces. Organic material.							Sandstone boulder		
	177.62											Soft clay seam		
35	177.38				**Interbedded SILTSTONE and SANDSTONE HW:**		HW					Colluvium / bebrock interface, some polished surfaces Is(50) = 0.29MPa		x
	177.12				**Interbedded SILTSTONE and SANDSTONE MW:**		MW					Is(50) = 0.61MPa Clay layer		o
			100		**Interbedded SILTSTONE and SANDSTONE SW:** Dark to light grey, fine grained, medium to high strength. Laminations at 0-5°							UCS (rock) = 5.38 MPa Is(50) = 0.44MPa Is(50) = 0.68MPa		x o
36												Sandstone bedding @ 0-10° Laminations @ 0-5°		
					Defects: LP: 0-5° (1/m); Pl-Un/Ro, OP. Js: 0-10° (1/m); Pl-St/Ro, OP-CD. Js: 20-30° (1/m); Pl/Ro, CD. Js: 20-30° (<1/m); Pl/Ro, TI.									
37			100		Some minor carbonaceous material throughout (rootlets?)									
							SW					Relict disturbed zone		
38														
			100											
39												Is(50) = 0.30MPa Is(50) = 0.49MPa		x o
40														

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40	172.52				**Interbedded SILTSTONE and SANDSTONE as before**							Inclinometer installed		
41							SW					Carbonaceous material		
	170.92		100									Is(50) = 1.00MPa		x
												Is(50) = 1.70MPa		o
												UCS (rock) = 1.12 MPa		
												Is(50) = 0.39MPa		x
					Borehole terminated at 41.6m							Is(50) = 0.46MPa		o
42														
43														
44														
45														
46														
47														
48														
49														
50														

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REMARKS

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CORE PHOTO LOG

DEPARTMENT OF TRANSPORT AND MAIN ROADS
Geotechnical Section
35 Butterfield Street, Herston Qld 4006
Phone 07 3066 3336

Queensland Government

Project Name	**Mt Whitestone (Detailed Investigation)**		
Project No.	FG6196	Start Date	4/11/14
Borehole No.	BH 4	Finish Date	7/11/14
Location		Start Depth (m)	4.50
Detail	Gatton Clifton Rd -313	Finish Depth (m)	41.60
Chainage	15.04-15.40km	Submitted By	TH
Remarks			

0 100 200 300 400 500 600 700

SCALE 1:5

GEOT043/2

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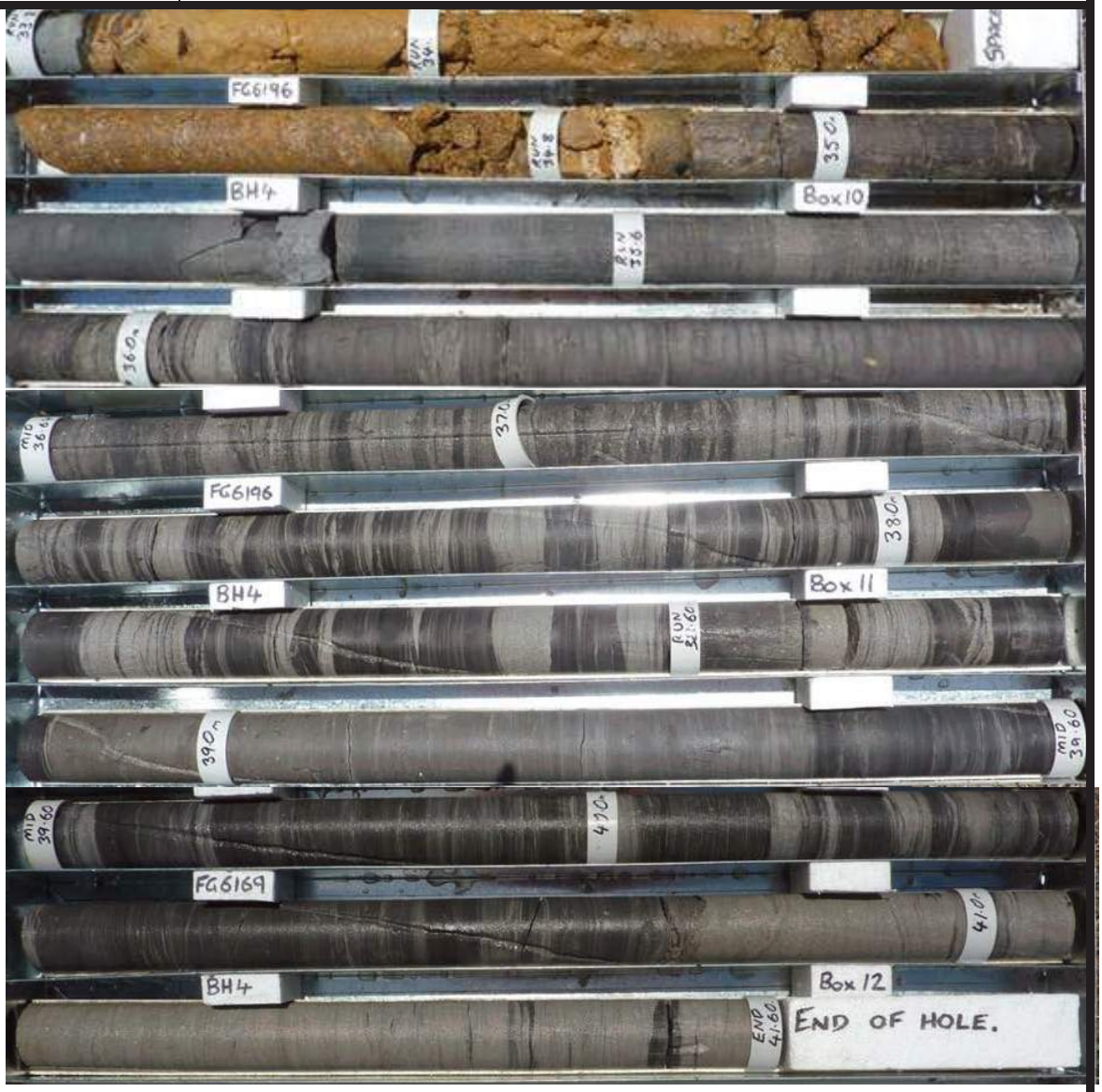

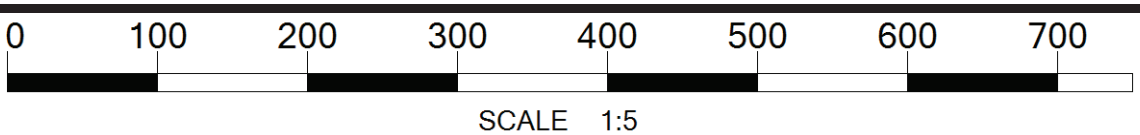

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Stand Pipe Details - SP4