

Borehole log

R.L. (m)	Depth (m)	Drilling Method Flush Return (%)	TCR (RQD) (%)	Spacing of Natural Defects (mm)	In-Situ Testing	Sampling	Rock Strength	Weathering Grade	Geology Legend	Groundwater	Description of Strata	Defect Description	Geological Unit
		25 50 75	25 50 75	500 100 100 50			EW NW SE SW MS VS	RS CS HS MS VS					
62	1	HA	80								Silty CLAY with some rootlets; brown. Firm, moist, high plasticity (TOPSOIL).		Topsoil
61	2	SPT	100		SPT ₁ =3.9, 10 N=19	SPT1					Silty CLAY; light brown mottled orange. Firm, moist, high plasticity.		
60	3	PQ3	100								Sandy SILT with some carbonaceous intrusions; light grey streaked orange. Stiff to very stiff, moist, low plasticity; sand, fine to coarse (Completely degraded NORTHLAND ALLOCHTHON GRADE 5).		
59	4	SPT	100(0)		SPT ₁ =50/90mm						Highly degraded, light grey streaked orange, massive LIMESTONE; extremely weak, recovered as Sandy SILT; Very stiff, moist, low plasticity (NORTHLAND ALLOCHTHON GRADE 4).		
58	5	PQ3	100(0)		SPT ₁ =50/140mm						Moderately degraded, light bluish grey, massive LIMESTONE; extremely weak to very weak. Highly micro-fractured, sheared and slickensided. (NORTHLAND ALLOCHTHON GRADE 3).		Motatau Complex
57	6	SPT	0		SPT ₁ =50/90mm						Highly degraded, light bluish grey, massive LIMESTONE; extremely weak, recovered as Sandy SILT; Very stiff, moist, low plasticity (NORTHLAND ALLOCHTHON GRADE 4).		
56	7	PQ3	55(0)								Moderately degraded, light bluish grey, massive LIMESTONE; extremely weak to very weak. Highly micro-fractured, sheared and slickensided. (NORTHLAND ALLOCHTHON GRADE 3).		
55	8	PQ3	55(0)								Highly degraded, light bluish grey, massive LIMESTONE; extremely weak, recovered as Silty fine to coarse SAND with some minor fine gravel; Medium Dense to Dense, wet, poorly graded (NORTHLAND ALLOCHTHON GRADE 4).		
											Highly degraded, light grey, massive LIMESTONE; extremely weak, recovered as Sandy SILT; Very stiff, moist, low plasticity (NORTHLAND ALLOCHTHON GRADE 4).		
											Moderately degraded, grey, thinly bedded MUDSTONE; extremely weak to very weak.		
Driller: McMillan Drilling Pty Ltd. Easting: 1739221.1 Elevation: 62.58 Started: 18/04/2017 Plant: D&B-10D Northing: 5980987.9 Datum: Finished: 21/04/2017 Logged by: SW Grid: NZTM2000 Inclination: -90 Standard: NZS 4402:1986 Checked by: SKA Accuracy: Orientation: Status: Final													
Remarks:													

Borehole log

Project: Warkworth to Wellsford
Client: NZTA
Location: Martin Property

Hole ID: WW-BH1026
Project No: IZ083000
Page: 2 of 4

R.L. (m)	Depth (m)	Drilling Method Flush Return (%)	TCR (RQD) (%)	Spacing of Natural Defects (mm)	In-Situ Testing	Sampling	Rock Strength	Weathering Grade	Geology Legend	Groundwater	Description of Strata	Defect Description	Geological Unit					
		25 50 75	25 50 75	500 100 10			EW NW SE SW MS VS	RS CS HW SW MW SW										
54	9	PQ3	80(0)								bedding is moderately inclined. Highly micro-fractured, sheared and slickensided. (NORTHLAND ALLOCHTHON GRADE 3).	8.7 - 9m CZ	Motatau Complex					
53	10	PQ3	67(0)							9.70	Slightly degraded, bluish grey, massive LIMESTONE; extremely weak to very weak. Highly micro-fractured, sheared and slickensided. (NORTHLAND ALLOCHTHON GRADE 2).							
52	11	PQ3	93(16)										Motatau Complex					
51	12									11.70	Slightly weathered, grey, moderately thickly bedded, fine SANDSTONE; weak with thinly interbedded dark grey SILTSTONE; very weak. Bedding is steeply inclined.	11.76 - 11.76m JT, 5°, clean, PR 11.89 - 11.89m JT, 30°, clean, UN, RF 12.09 - 12.09m JT, 44°, clean, UN, RF 12.1 - 12.34m CZ 12.34 - 12.4m JTx5, 5 - 75°, clean, PR, S 12.47 - 12.56m CZ 12.6 - 12.74m CZ 12.74 - 12.91m JTx5, 15 - 80°, clean, PR, S 13.01 - 13.01m JT, 60°, clean, ST, RF 13.1 - 13.1m JT, 75°, clean, PR 13.24 - 13.24m JT, 70°, clean, PR, S						
50	13	PQ3	100(33)															
49	14	PQ3	76(68)															
48	15											14.33 - 14.33m JT, 80°, clean, PR, S 14.6 - 14.7m CZ 14.78 - 14.78m JT, 45°, clean, PR, S 15.2 - 15.35m JT, 20 - 80°, clean, UN, RF						
47	16	PQ3	100(43)							15.80	Slightly degraded, bluish grey, massive LIMESTONE; extremely weak. Highly							
Driller:		McMillan Drilling Pty Ltd.					Easting:		1739221.1		Elevation:		62.58		Started:		18/04/2017	
Plant:		D&B-10D					Northing:		5980987.9		Datum:				Finished:		21/04/2017	
Logged by:		SW					Grid:		NZTM2000		Inclination:		-90		Standard:		NZS 4402:1986	
Checked by:		SKA					Accuracy:				Orientation:				Status:		Final	
Remarks:																		

Borehole log

R.L. (m)	Depth (m)	Drilling Method Flush Return (%)	TCR (RQD) (%)	Spacing of Natural Defects (mm)	In-Situ Testing	Sampling	Rock Strength	Weathering Grade	Geology Legend	Groundwater	Description of Strata	Defect Description	Geological Unit	
		25 50 75	25 50 75	50 100 150 200 250 300 350 400 450 500			EW NW SE SW MS VS	RS CS HS MS VS						
46	17		PQ3 100(0)								microfractured and slickensided (NORTHLAND ALLOCHTHON GRADE 2).		Motatau Complex	
45	18										17.40 Slightly degraded, dark grey, massive MUDSTONE; weak with some fine to coarse gravel sized, subrounded limestone clasts. Highly microfractured and slickensided (NORTHLAND ALLOCHTHON GRADE 2).			
44	19		PQ3 100(0)								18.00 Slightly degraded, interbedded, dark grey MUDSTONE and bluish grey LIMESTONE; extremely weak. Highly microfractured and slickensided (NORTHLAND ALLOCHTHON GRADE 2).			
43	20		PQ3 100(0)											
42	21													
41	22		PQ3 100(0)								21.30 Slightly degraded, light grey MUDSTONE; extremely weak to very weak. Highly micro-fractured, sheared and slickensided (NORTHLAND ALLOCHTHON GRADE 2).			
40	23		PQ3 100(0)								22.75 Slightly degraded, bluish grey, massive LIMESTONE; extremely weak. Highly microfractured and slickensided (NORTHLAND ALLOCHTHON GRADE 2).			
39											23.40 Slightly degraded, light grey MUDSTONE; extremely weak to very weak. Highly micro-fractured, sheared and slickensided (NORTHLAND ALLOCHTHON GRADE 2).			
24											23.70 Slightly degraded, bluish grey, massive			
Driller: McMillan Drilling Pty Ltd. Easting: 1739221.1 Elevation: 62.58 Started: 18/04/2017 Plant: D&B-10D Northing: 5980987.9 Datum: Finished: 21/04/2017 Logged by: SW Grid: NZTM2000 Inclination: -90 Standard: NZS 4402:1986 Checked by: SKA Accuracy: Orientation: Status: Final Remarks:														

Borehole log

Project: Warkworth to Wellsford
Client: NZTA
Location: Martin Property

Hole ID: WW-BH1026
Project No: IZ083000
Page: 4 of 4

R.L. (m)	Depth (m)	Drilling Method Flush Return (%)	TCR (RQD) (%)	Spacing of Natural Defects (mm)	In-Situ Testing	Sampling	Rock Strength	Weathering Grade	Geology Legend	Groundwater	Description of Strata	Defect Description	Geological Unit
38	25	PQ3	100(0)								LIMESTONE; extremely weak. Highly microfractured and slickensided (NORTHLAND ALLOCHTHON GRADE 2).		Motatau Complex
37	26	PQ3	100(0)								Slightly degraded, light grey MUDSTONE; extremely weak to very weak. Highly micro-fractured, sheared and slickensided (NORTHLAND ALLOCHTHON GRADE 2).	25 - 25m JT, 45°, clean, PR, SL	
36	27												
35	28	PQ3	100(0)									28.2 - 28.2m JT, 60°, soil infilling, PR	
34	29	PQ3	100(0)									29 - 29m JT, 35°, soil infilling, PR	
33	30												
Hole Terminated at 30.00 m Target depth													