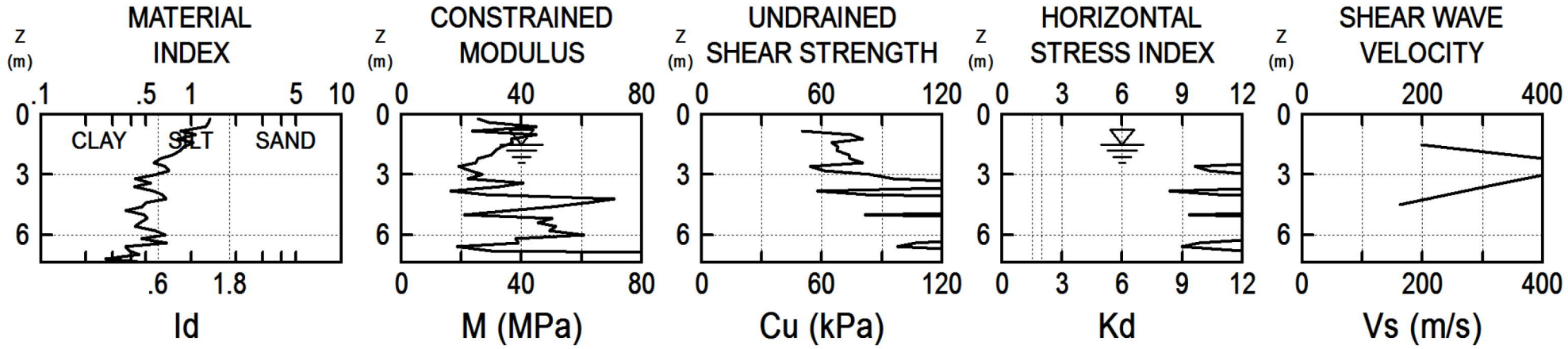
APPENDIX 3.7

DILATOMETER TEST RESULTS

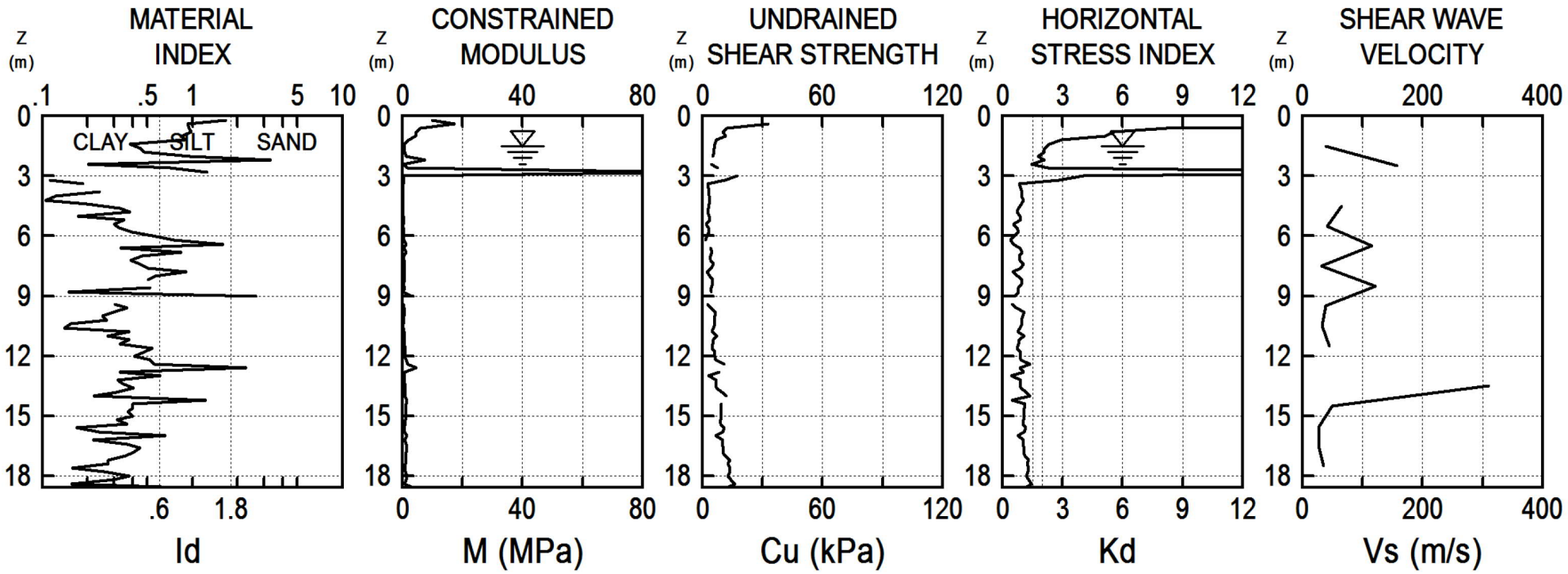
SEISMIC DILATOMETER TEST (S D M T)

Drill Force NZ	Lander Geotechnical	TEST
DF21GE034	Hamlin Rd, Ardmore	DMT_01
		15 APR 2021

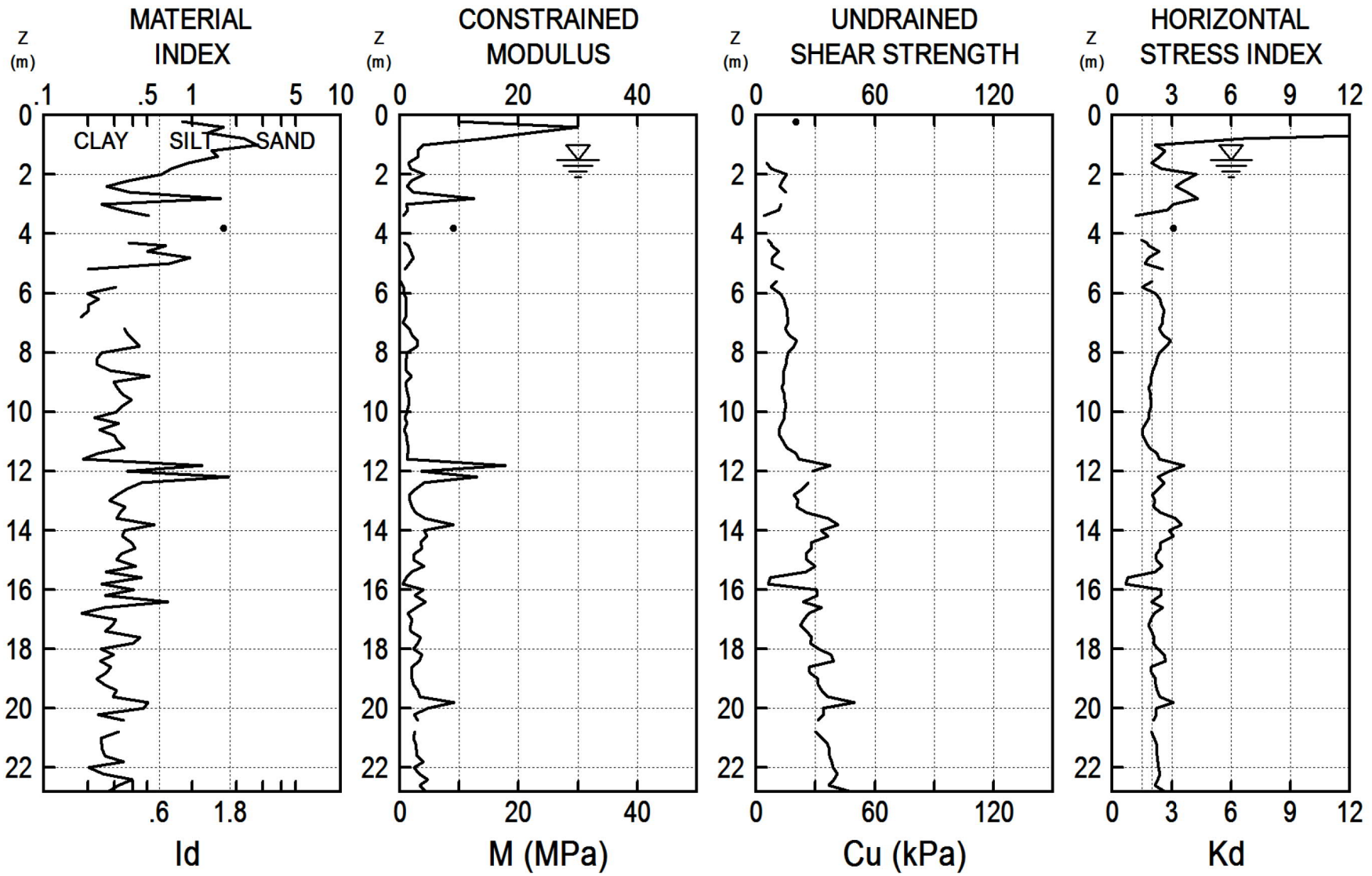


SEISMIC DILATOMETER TEST (S D M T)

Drill Force NZ DF21GE034	Lander Geotechnical Hamlin Rd, Ardmore	TEST **DMT_02** 15 APR 2021



DILATOMETER TEST (D M T)



Drill Force NZ

DF21GE034

Lander Geotechnical

Hamlin Rd, Ardmore

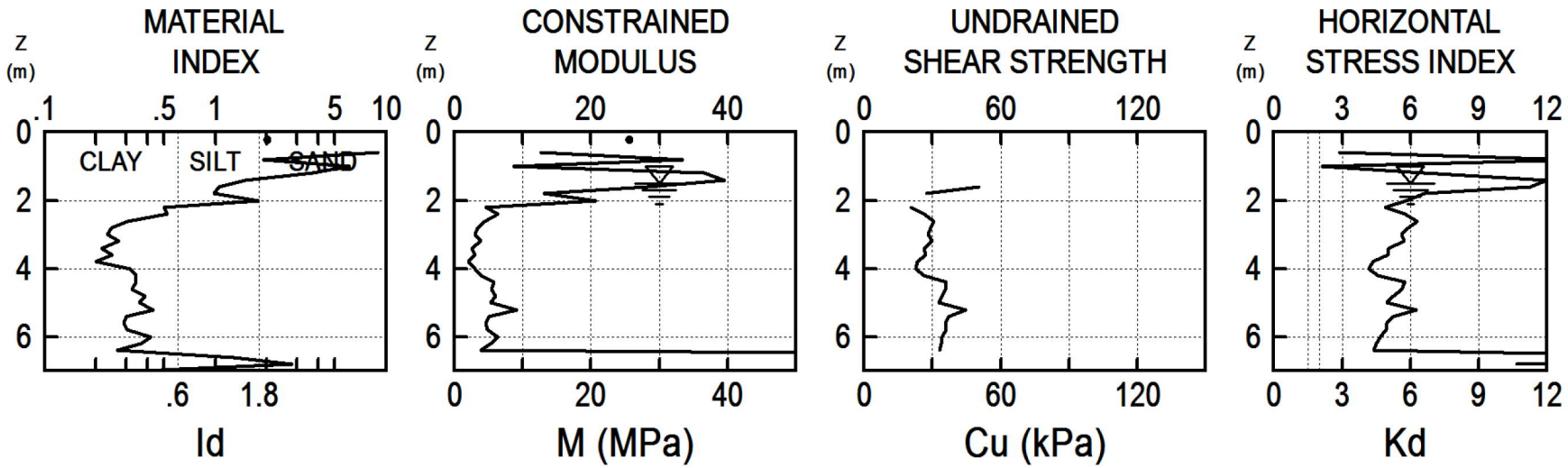
INTERPRETED GEOTECHNICAL PARAMETERS

TEST

DMT_03

16 APR 2021

DILATOMETER TEST (D M T)



Drill Force NZ

DF21GE034

Lander Geotechnical

Hamlin Rd, Ardmore

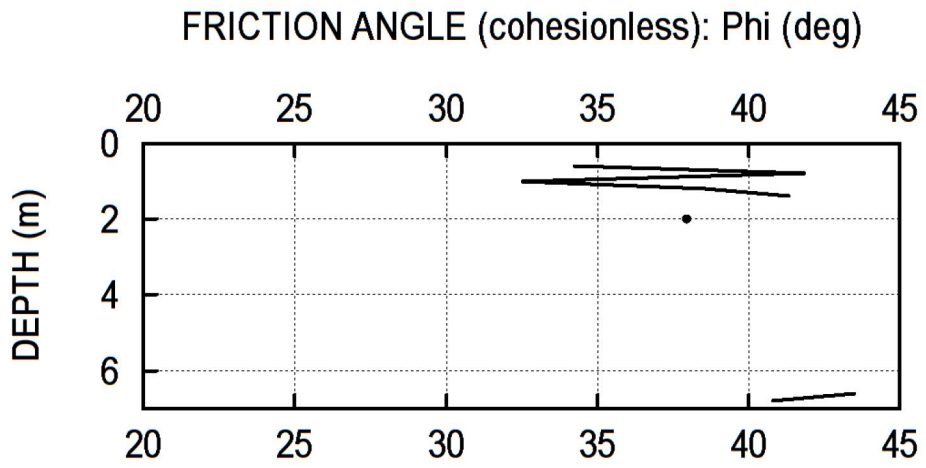
INTERPRETED GEOTECHNICAL PARAMETERS

TEST **DMT_04**

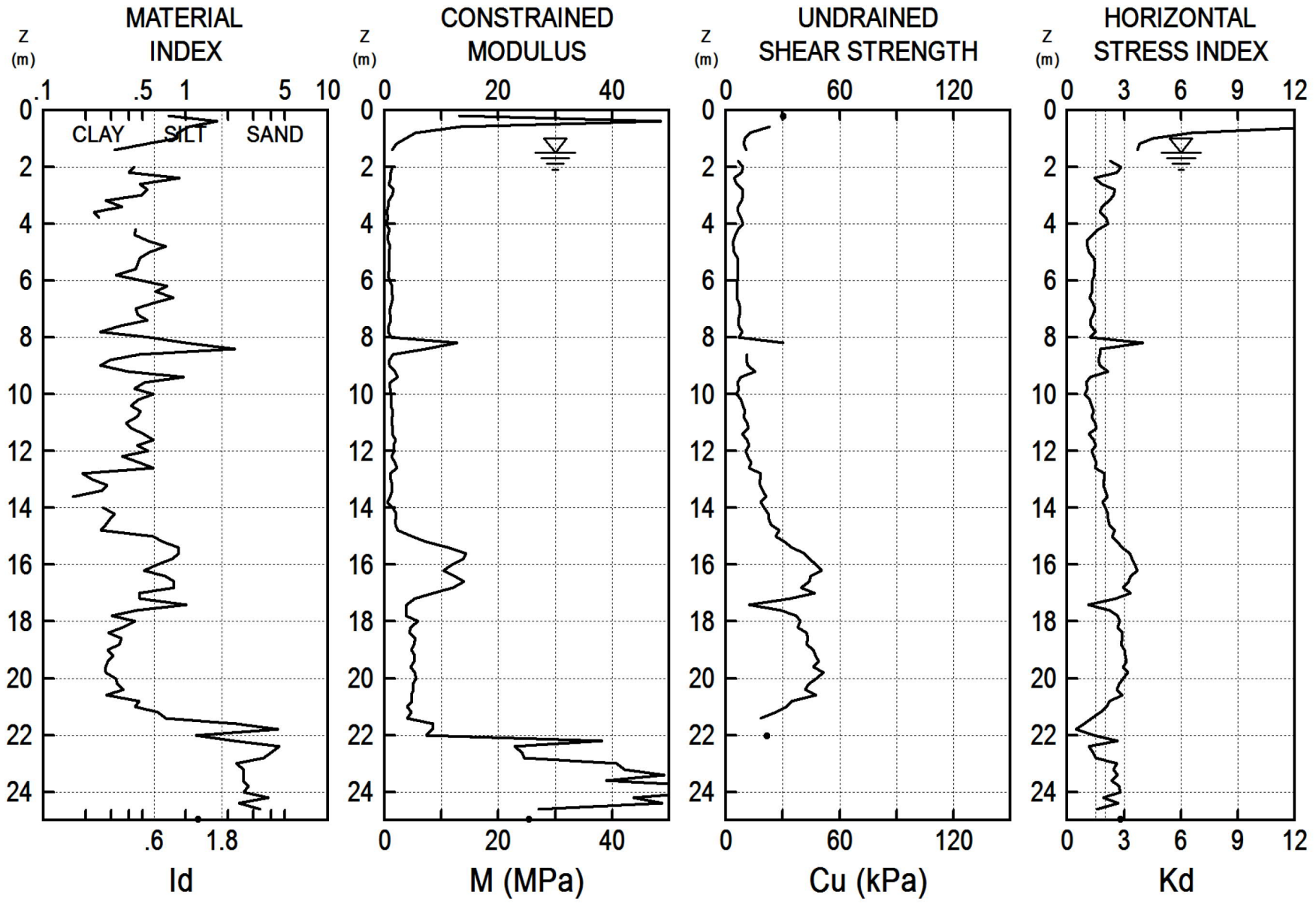
20 APR 2021

DILATOMETER TEST (D M T)

Drill Force NZ	Lander Geotechnical	TEST
DF21GE034	Hamlin Rd, Ardmore	**DMT_04**
INTERPRETED GEOTECHNICAL PARAMETERS		20 APR 2021



DILATOMETER TEST (D M T)



Drill Force NZ

Lander Geotechnical

DF21GE034

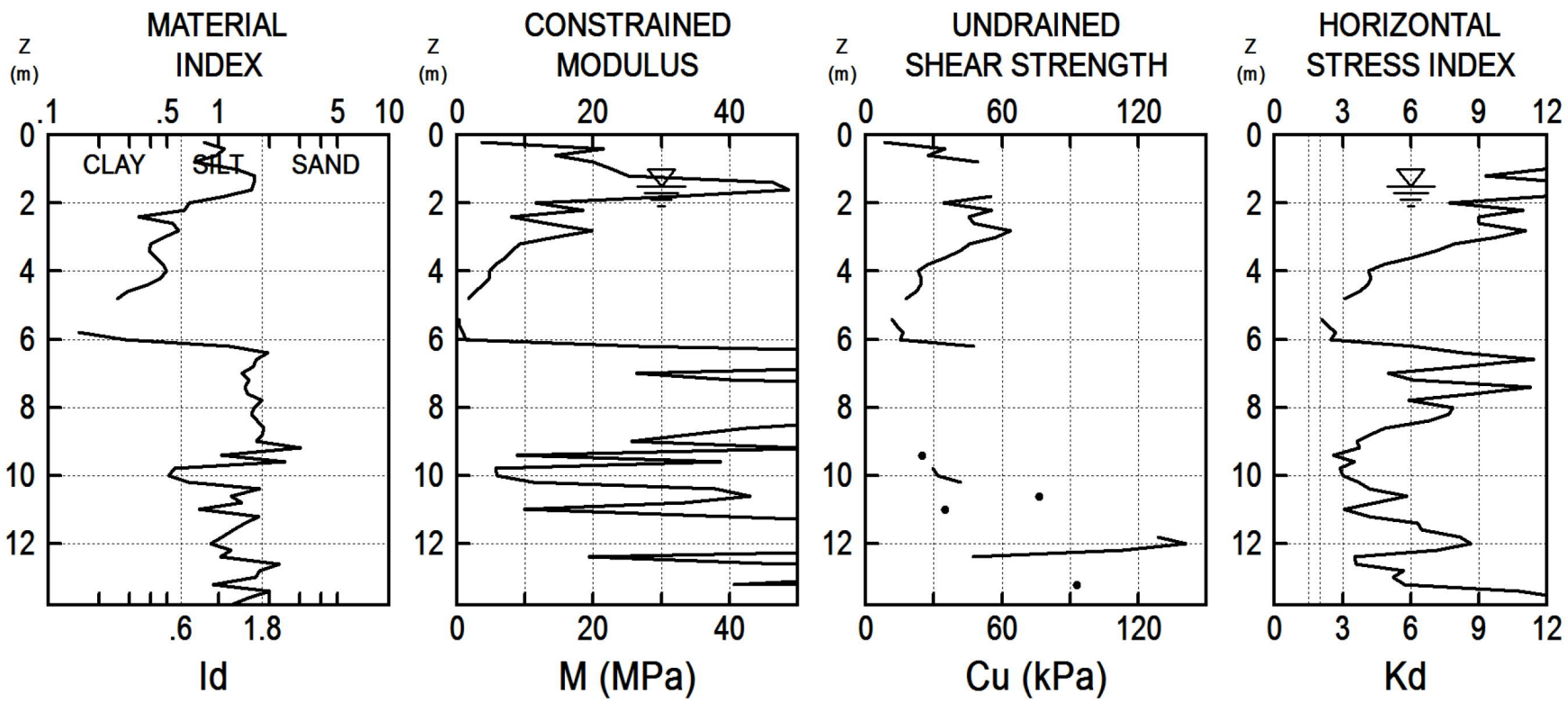
Hamlin Rd, Ardmore

INTERPRETED GEOTECHNICAL PARAMETERS

TEST **DMT_05**

20 APR 2021

DILATOMETER TEST (D M T)



Drill Force NZ

DF21GE034

Lander Geotechnical

Hamlin Rd, Ardmore

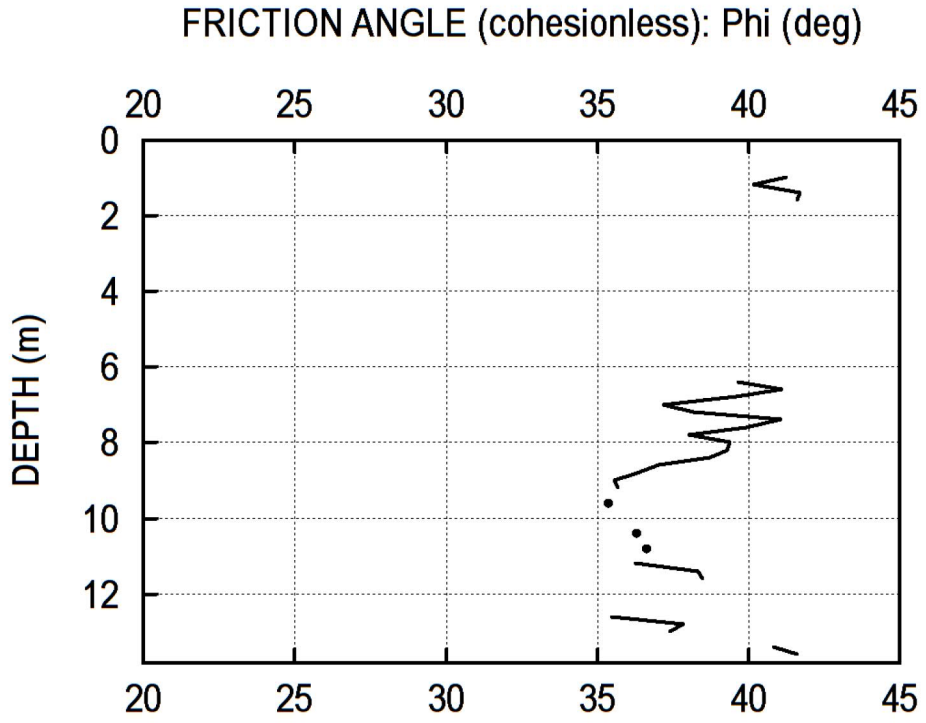
INTERPRETED GEOTECHNICAL PARAMETERS

TEST **DMT_06**

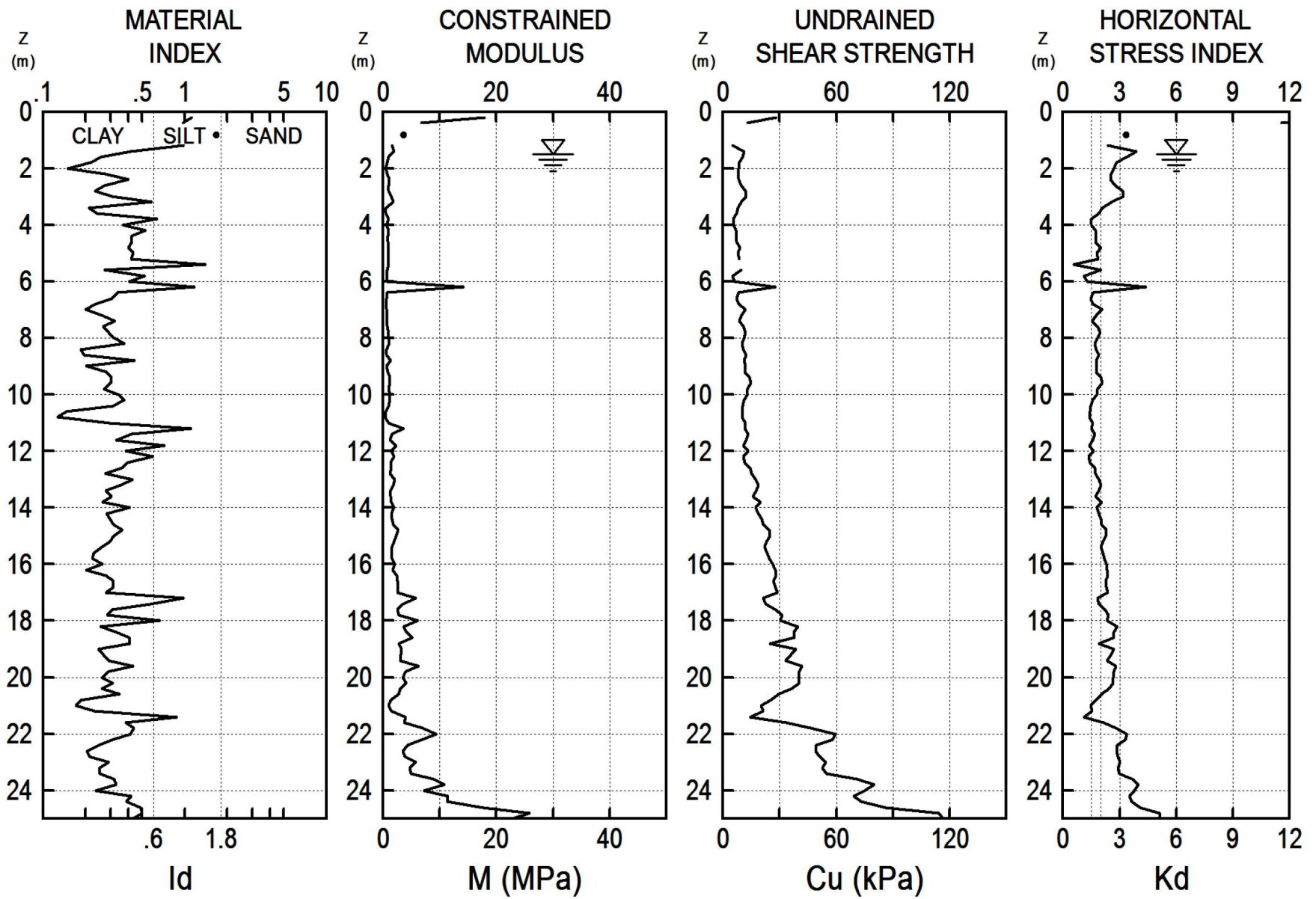
23 APR 2021

DILATOMETER TEST (D M T)

Drill Force NZ	Lander Geotechnical	TEST
DF21GE034	Hamlin Rd, Ardmore	**DMT_06**
INTERPRETED GEOTECHNICAL PARAMETERS		23 APR 2021



DILATOMETER TEST (D M T)



Drill Force NZ

Lander Geotechnical

DF21GE034

Hamlin Rd, Ardmore

INTERPRETED GEOTECHNICAL PARAMETERS

TEST **DMT_07**

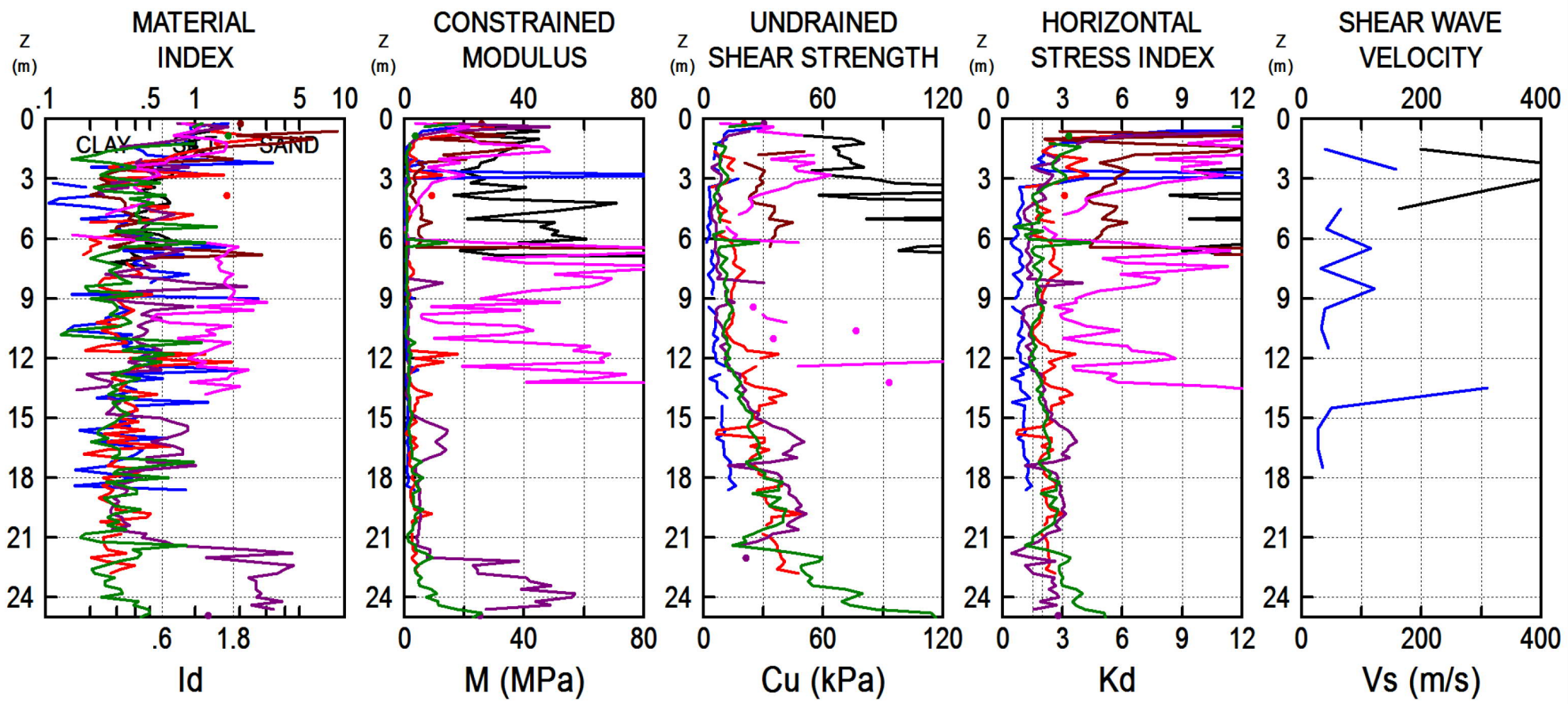
22 APR 2021

Drill Force NZ

DF21GE034

Lander Geotechnical

Hamlin Rd, Ardmore



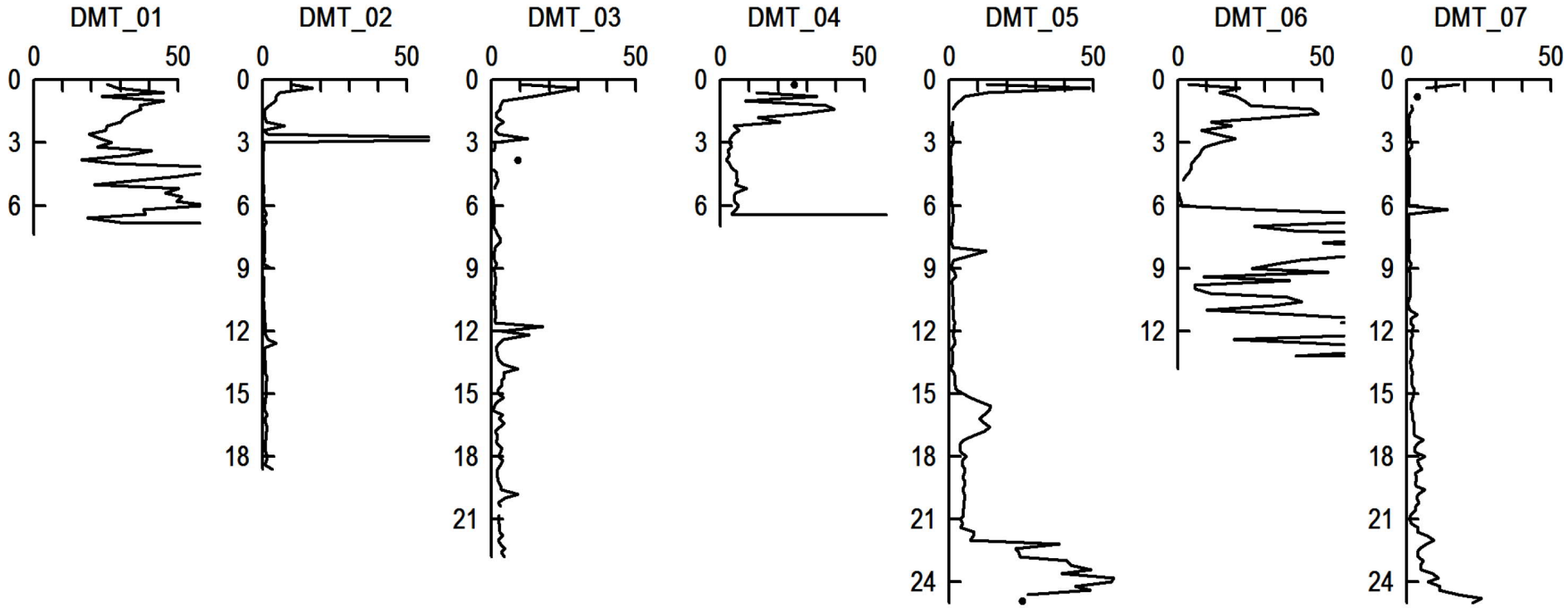
Drill Force NZ

DF21GE034

Lander Geotechnical

Hamlin Rd, Ardmore

CROSS SECTION OF CONSTRAINED MODULUS M (MPa)



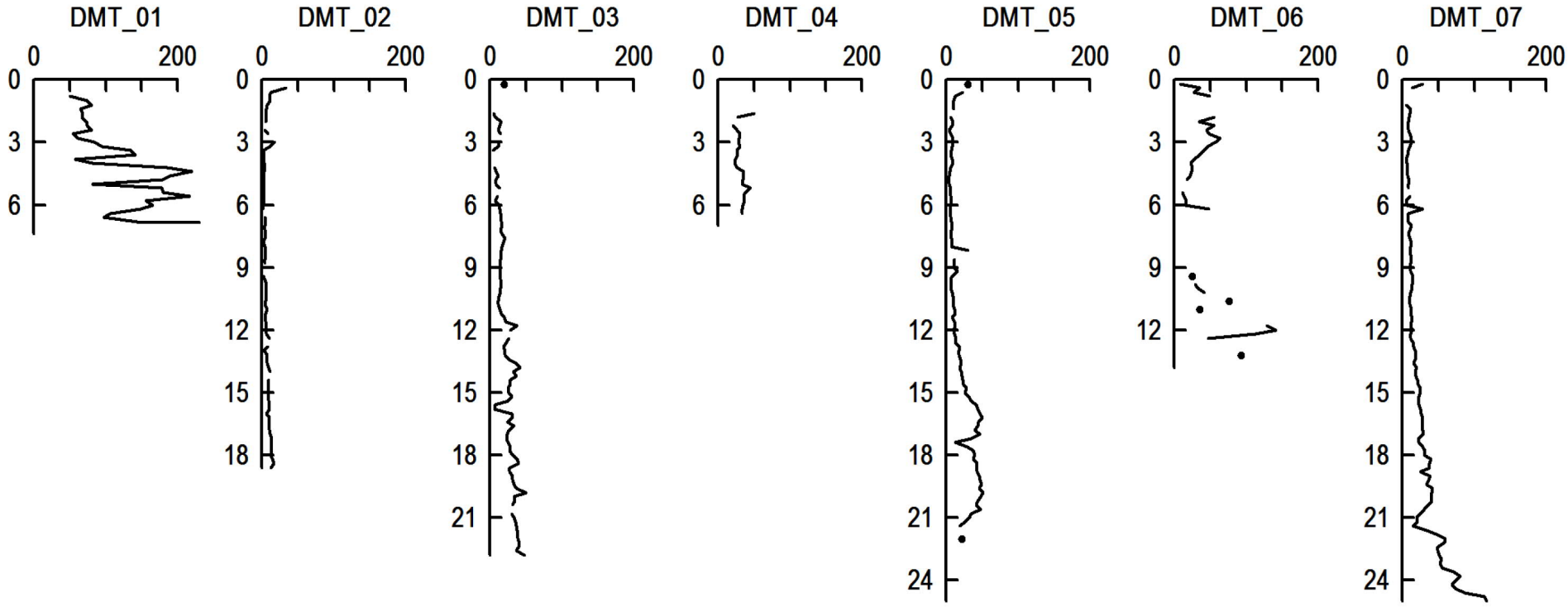
Drill Force NZ

DF21GE034

Lander Geotechnical

Hamlin Rd, Ardmore

CROSS SECTION OF UNDRAINED SHEAR STRENGTH Cu (kPa)



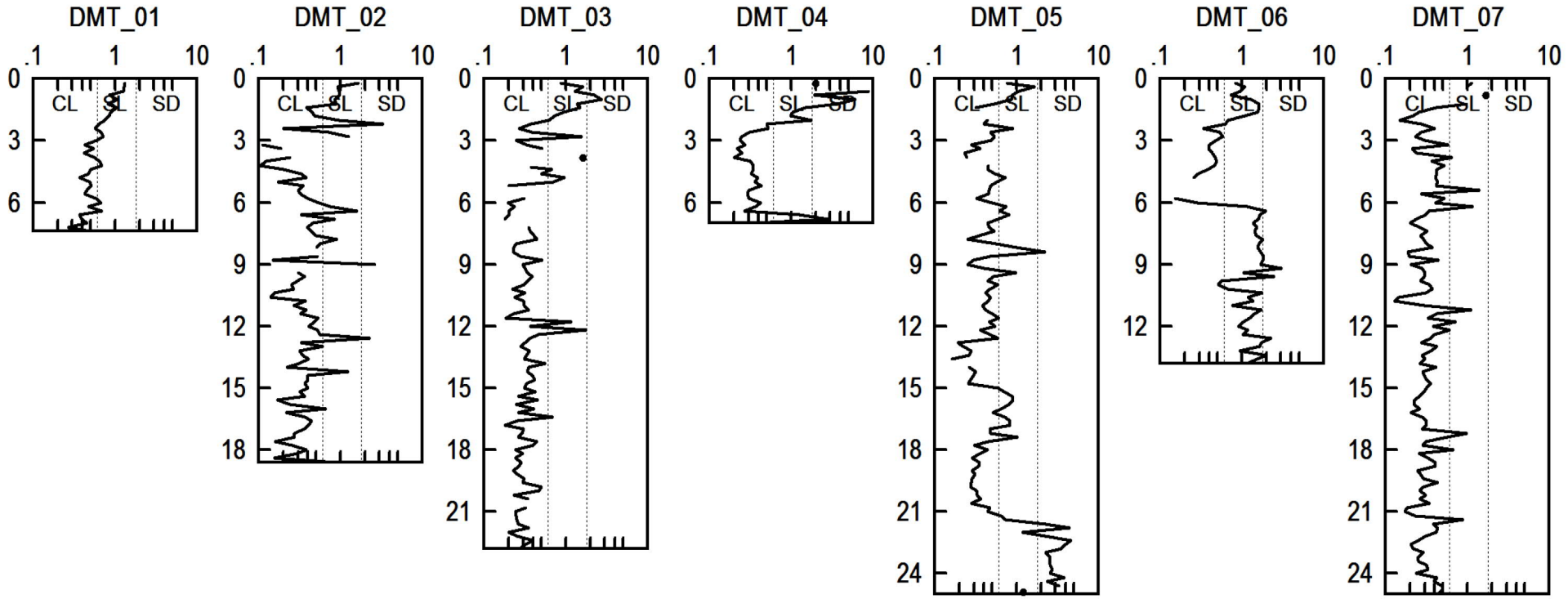
Drill Force NZ

DF21GE034

Lander Geotechnical

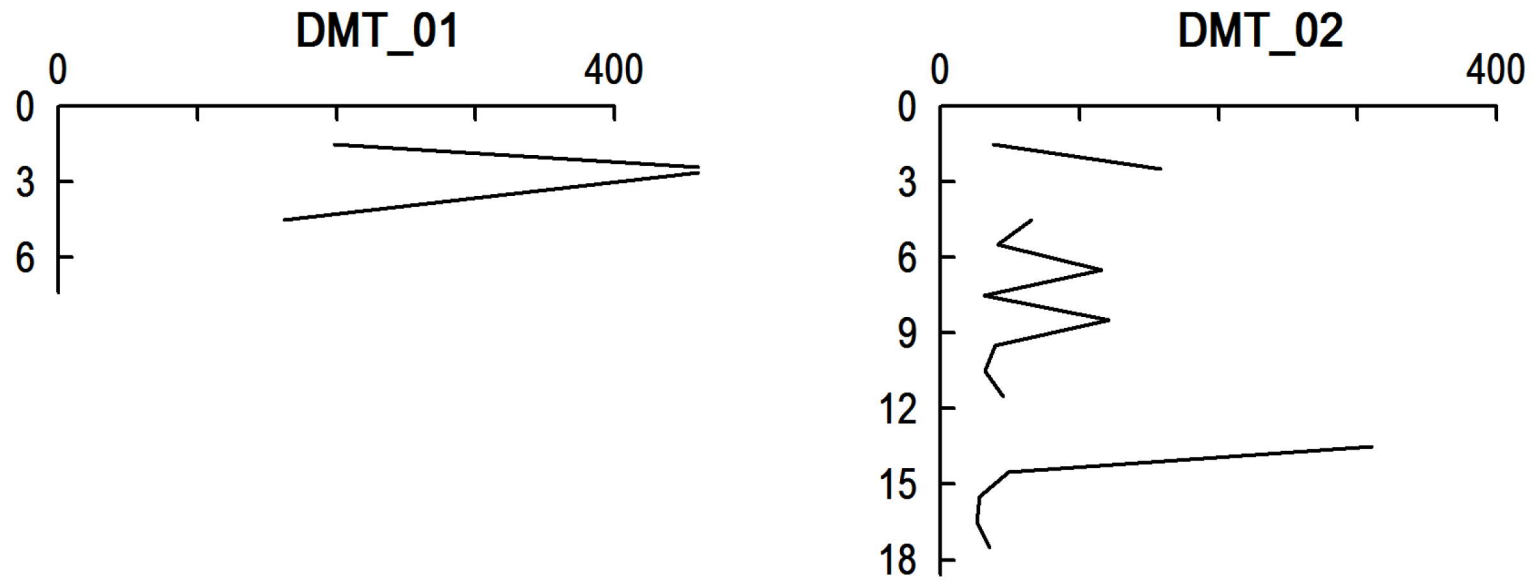
Hamlin Rd, Ardmore

CROSS SECTION OF MATERIAL INDEX Id



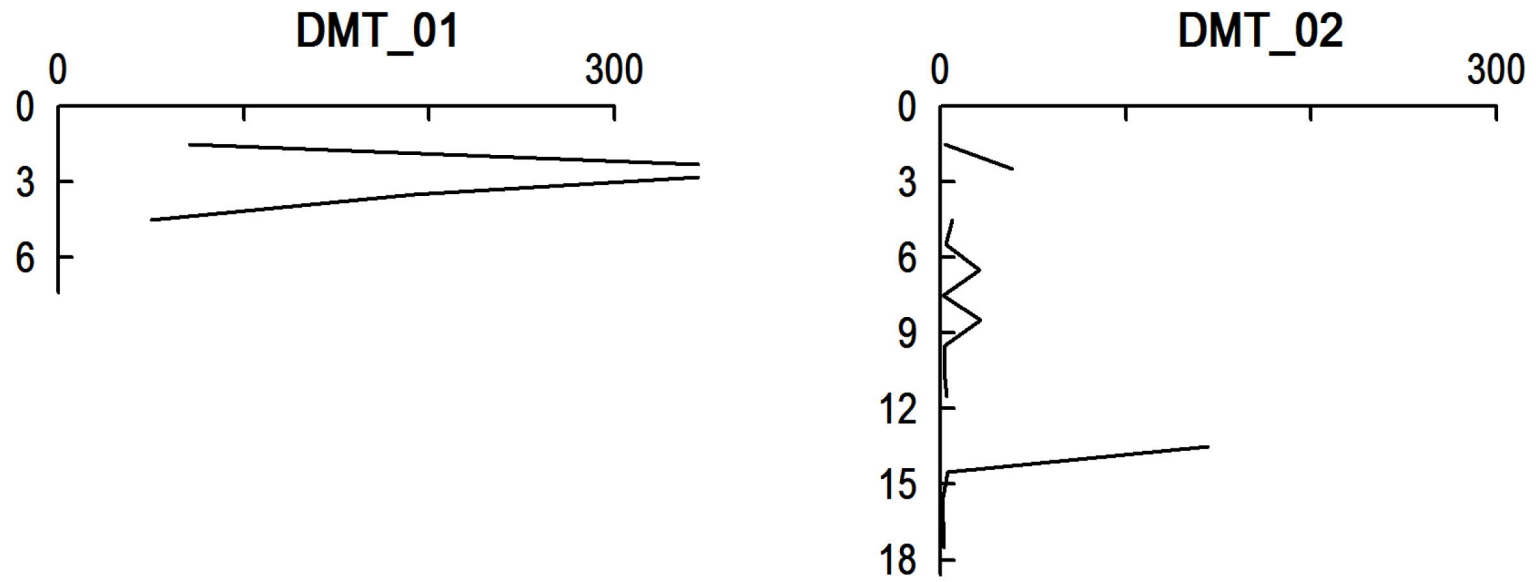
Drill Force NZ	Lander Geotechnical
DF21GE034	Hamlin Rd, Ardmore

CROSS SECTION OF SHEAR WAVE VELOCITY Vs (m/s)

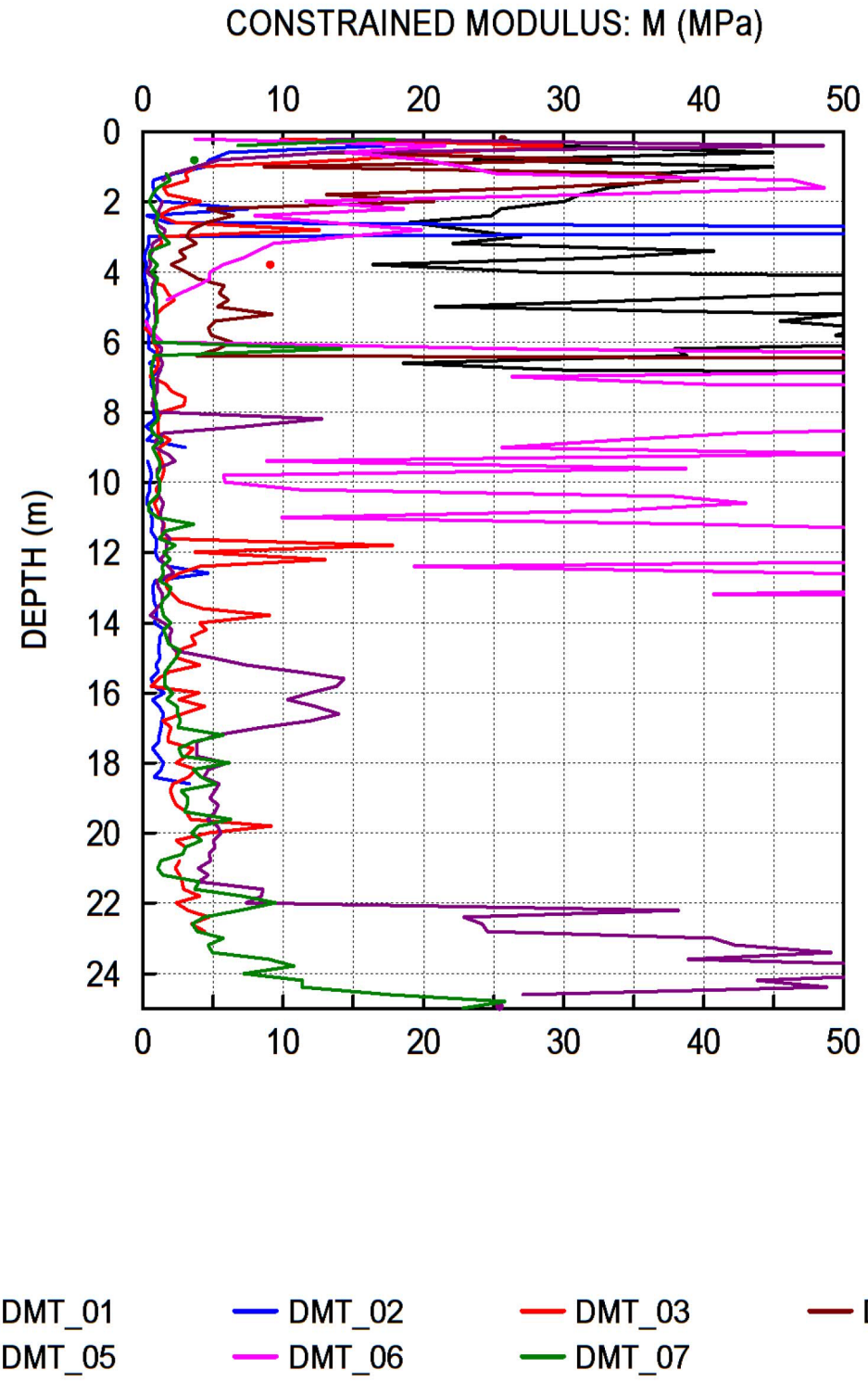


Drill Force NZ	Lander Geotechnical
DF21GE034	Hamlin Rd, Ardmore

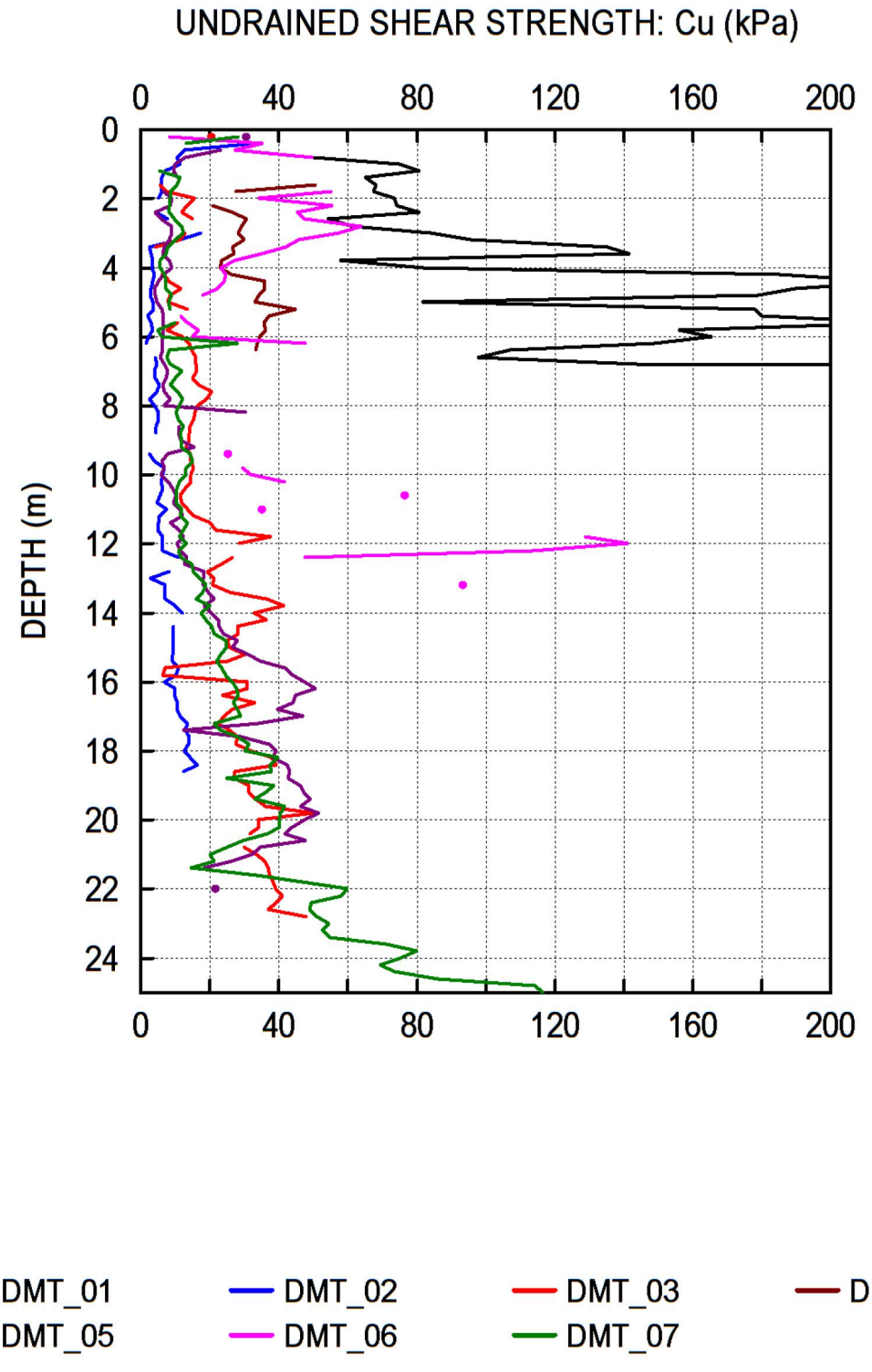
CROSS SECTION OF MAX SHEAR MODULUS Go (MPa)



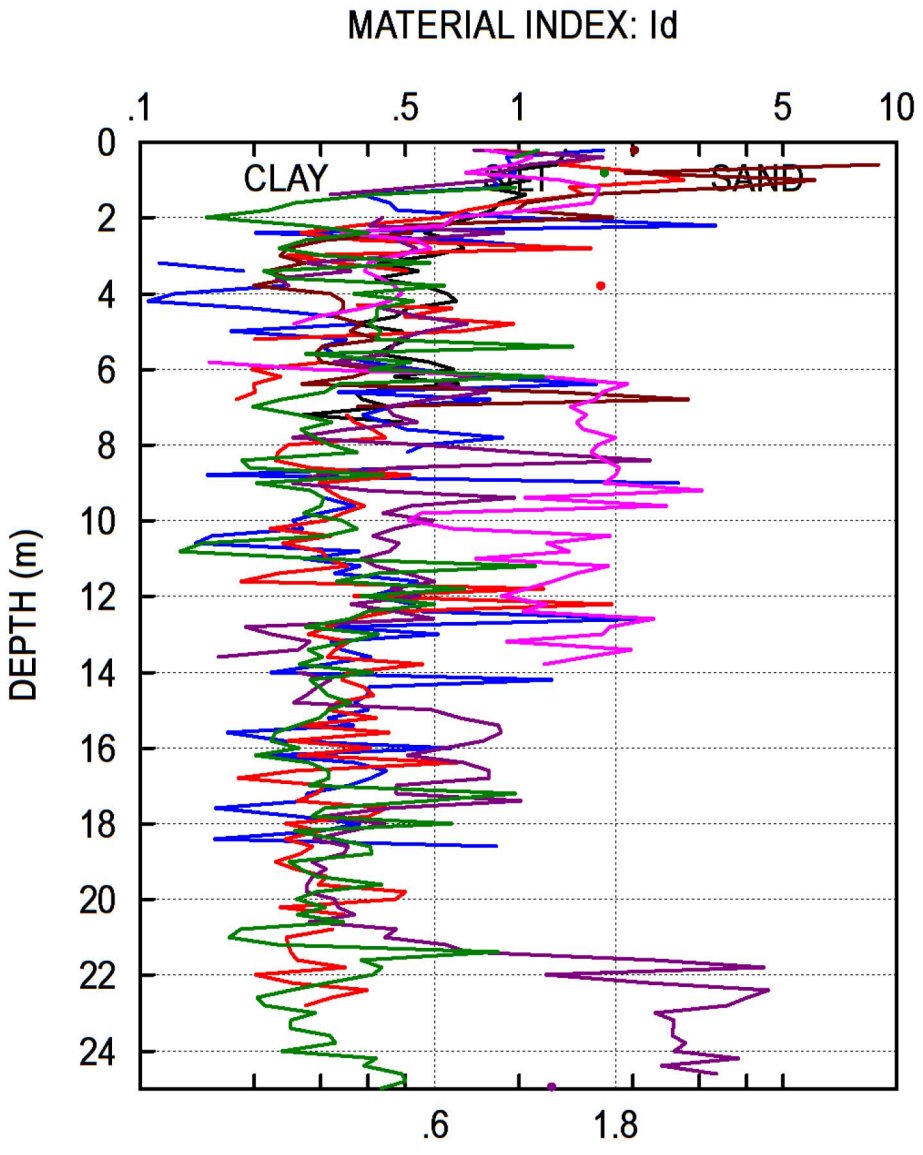
Drill Force NZ	Lander Geotechnical	
DF21GE034	Hamlin Rd, Ardmore	
SUPERIMPOSED TEST RESULTS		



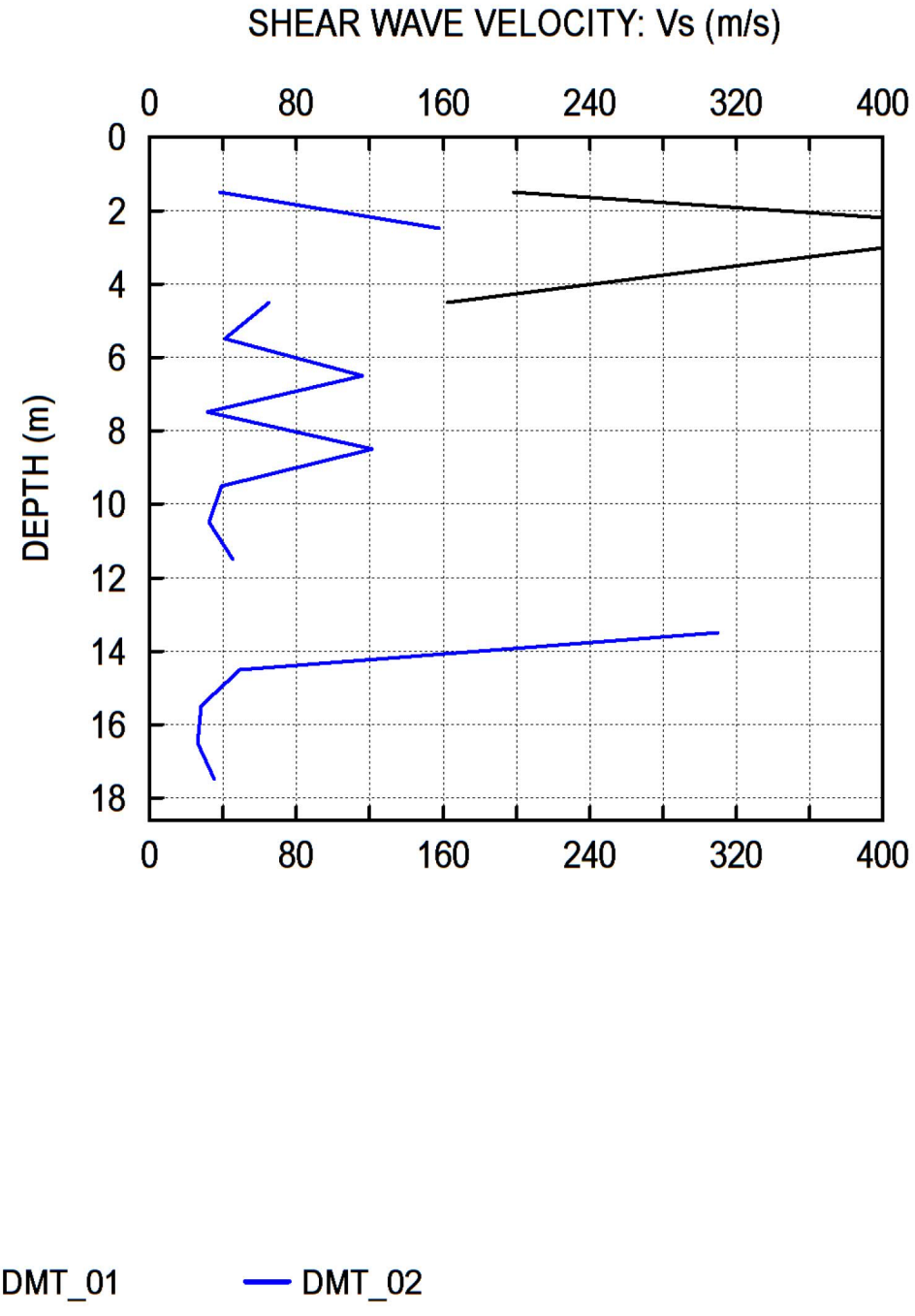
Drill Force NZ	Lander Geotechnical	
DF21GE034	Hamlin Rd, Ardmore	
SUPERIMPOSED TEST RESULTS		



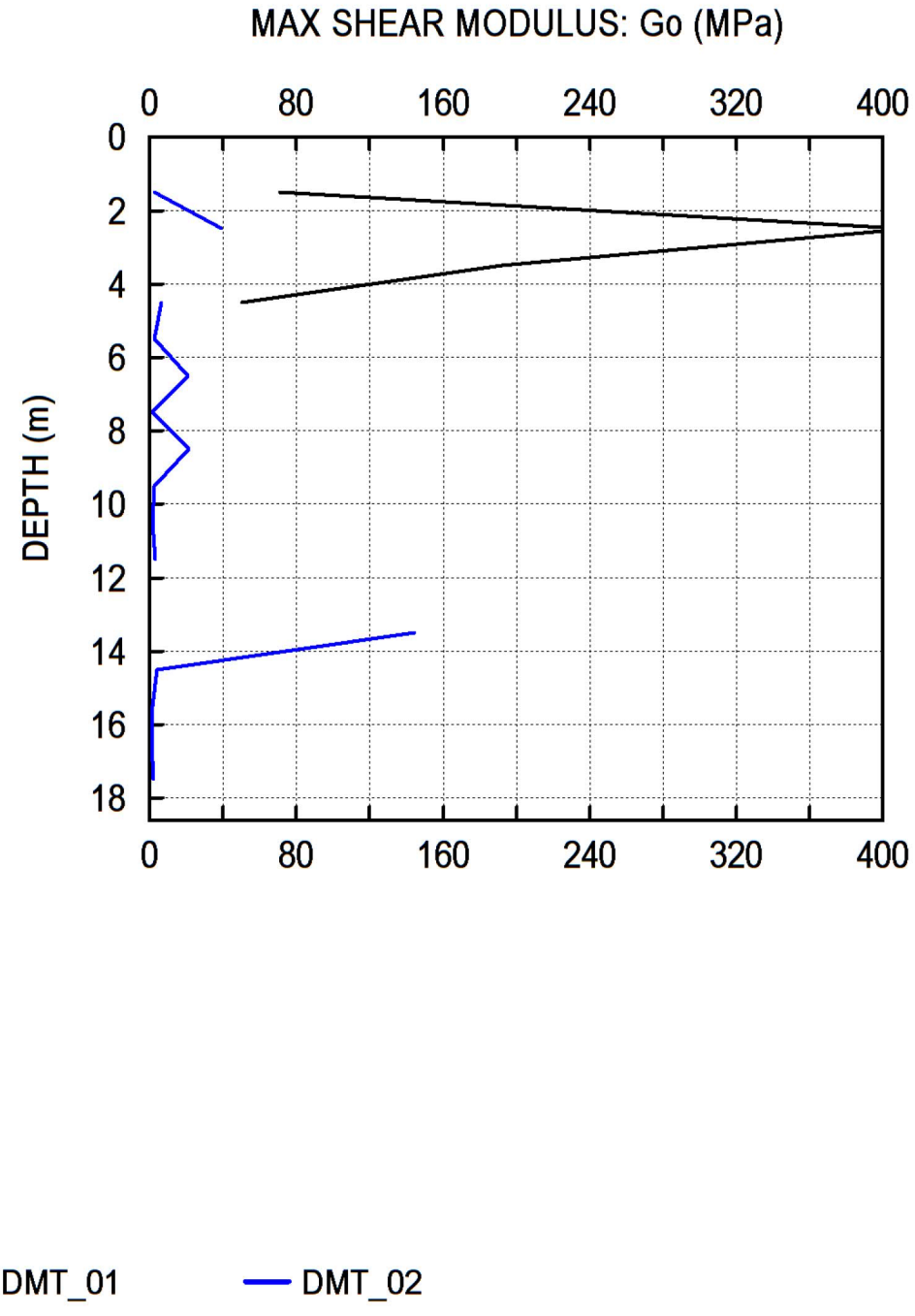
Drill Force NZ	Lander Geotechnical	
DF21GE034	Hamlin Rd, Ardmore	
SUPERIMPOSED TEST RESULTS		



Drill Force NZ	Lander Geotechnical	
DF21GE034	Hamlin Rd, Ardmore	
SUPERIMPOSED TEST RESULTS		



Drill Force NZ	Lander Geotechnical	
DF21GE034	Hamlin Rd, Ardmore	
SUPERIMPOSED TEST RESULTS		



DMT_01

15 APR 2021

Drill Force NZ
Lander Geotechnical
DF21GE034
Hamlin Rd, Ardmore

LEGEND
Z = Depth Below Ground Level
Po,P1,P2 = Corrected A,B,C readings
Id = Material Index
Ed = Dilatometer Modulus
Ud = Pore Press. Index = (P2-Uo)/(Po-Uo)
Gamma = Bulk unit weight
Sigma' = Effective overb. stress
Uo = Pore pressure

INTERPRETED PARAMETERS
Phi = Safe floor value of Friction Angle
Ko = In situ earth press. coeff.
M = Constrained modulus (at Sigma')
Cu = Undrained shear strength
Ocr = Overconsolidation ratio
(OCR = 'relative OCR'- generally realistic. If accurate independent OCR available, apply suitable factor)

GENERAL PARAMETERS
DeltaA = 11 kPa
DeltaB = 12 kPa
GammaTop = 17.0 kN/m^3
FactorEd = 34.7
Zm = 0.0 kPa
Zabs = 0.0 m
Zw = 1.5 m

WaterTable at 1.50 m
Reduction formulae according to Marchetti, ASCE Geot.Jnl.Mar. 1980, Vol.109, 299-321; Phi according to TC16 ISSMGE, 2001

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_01 DESCRIPTION
0.2	141	345		143	333		16.7	3	0	1.33	42.0	6.6				46	25.5		SANDY SILT
0.4	187	441		186	429		16.7	7	0	1.30	27.7	8.4				45	29.2		SANDY SILT
0.6	300	674		293	662		17.7	10	0	1.26	29.1	12.8				45	44.9		SANDY SILT
0.8	258	489		259	477		16.7	14	0	0.84	19.0	7.6		2.7	33.6		23.6	50	SILT
1.0	381	784		373	772		17.7	17	0	1.07	22.0	13.8		2.9	42.3		45.0	75	SILT
1.2	416	757		411	745		17.7	20	0	0.81	20.1	11.6		2.8	36.6		36.6	81	SILT
1.4	364	741		357	729		17.7	24	0	1.04	14.9	12.9		2.3	23.0		37.1	65	SILT
1.6	385	729		380	717		17.7	27	1	0.89	14.3	11.7		2.3	21.5		33.2	68	SILT
1.8	387	717		383	705		17.7	28	3	0.85	13.5	11.2		2.2	19.7		31.1	67	SILT
2.0	420	737		416	725		17.7	30	5	0.75	13.9	10.7		2.2	20.5		30.1	73	CLAYEY SILT
2.2	427	702		425	690		17.7	31	7	0.63	13.4	9.2		2.2	19.5		25.5	74	CLAYEY SILT
2.4	462	728		461	716		17.7	33	9	0.56	13.8	8.9		2.2	20.3		24.8	81	SILTY CLAY
2.6	342	577		342	565		16.7	34	11	0.67	9.6	7.7		1.8	11.7		19.0	54	CLAYEY SILT
2.8	384	658		382	646		17.7	36	13	0.71	10.3	9.1		1.9	13.0		23.1	61	CLAYEY SILT
3.0	497	790		495	778		17.7	37	15	0.59	12.8	9.8		2.1	18.3		26.9	84	SILTY CLAY
3.2	552	791		552	779		17.7	39	17	0.42	13.8	7.9		2.2	20.3		22.1	95	SILTY CLAY
3.4	739	1130		732	1118		18.6	40	19	0.54	17.6	13.4		2.6	29.8		40.7	135	SILTY CLAY
3.6	770	1089		766	1077		17.7	42	21	0.42	17.6	10.8		2.6	29.9		32.8	141	SILTY CLAY
3.8	388	605		389	593		16.7	44	23	0.56	8.4	7.1		1.6	9.4		16.4	58	SILTY CLAY
4.0	516	839		512	827		17.7	45	25	0.65	10.8	10.9		1.9	13.9		28.1	82	CLAYEY SILT
4.2	990	1627		970	1615		19.1	47	26	0.68	20.2	22.4		2.8	36.9		70.8	185	CLAYEY SILT
4.4	1135	1684		1120	1672		18.6	49	28	0.51	22.4	19.2		3.0	43.6		62.6	220	SILTY CLAY
4.6	1018	1479		1007	1467		18.6	50	30	0.47	19.4	16.0		2.7	34.7		49.9	190	SILTY CLAY
4.8	976	1325		971	1313		18.6	52	32	0.36	18.0	11.9		2.6	30.9		36.3	179	SILTY CLAY
5.0	539	797		538	785		17.7	54	34	0.49	9.3	8.6		1.8	11.1		20.8	81	SILTY CLAY
5.2	994	1475		982	1463		18.6	55	36	0.51	17.0	16.7		2.5	28.4		50.1	178	SILTY CLAY
5.4	1009	1449		999	1437		18.6	57	38	0.46	16.8	15.2		2.5	27.7		45.4	180	SILTY CLAY
5.6	1176	1652		1164	1640		18.6	59	40	0.42	19.0	16.5		2.7	33.7		51.3	217	SILTY CLAY
5.8	922	1423		909	1411		18.6	61	42	0.58	14.3	17.4		2.3	21.5		49.4	156	SILTY CLAY
6.0	976	1583		958	1571		19.1	63	44	0.67	14.6	21.3		2.3	22.3		60.8	165	CLAYEY SILT
6.2	899	1299		891	1287		18.6	64	46	0.47	13.1	13.7		2.2	18.9		37.9	149	SILTY CLAY
6.4	710	1162		700	1150		19.1	66	48	0.69	9.8	15.6		1.8	12.0		38.8	107	CLAYEY SILT
6.6	660	896		660	884		17.7	68	50	0.37	9.0	7.8		1.7	10.4		18.5	98	SILTY CLAY
6.8	891	1221		887	1209		18.6	70	52	0.39	12.0	11.2		2.1	16.4		29.9	144	SILTY CLAY
7.0	2446	3486		2406	3474		20.1	71	54	0.45	33.0	37.1		3.7	79.3		134.5	521	SILTY CLAY
7.2	3057	3840		3030	3828		20.1	73	56	0.27	40.5	27.7		4.1	>99.9		105.9	694	CLAY
7.4	2566	3742		2519	3730		20.1	76	58	0.49	32.6	42.0		3.6	78.0		152.0	544	SILTY CLAY

DMT_02	LEGEND	INTERPRETED PARAMETERS	GENERAL PARAMETERS
15 APR 2021	Z = Depth Below Ground Level	Phi = Safe floor value of Friction Angle	DeltaA = 14 kPa
Drill Force NZ	Po,P1,P2 = Corrected A,B,C readings	Ko = In situ earth press. coeff.	DeltaB = 20 kPa
Lander Geotechnical	Id = Material Index	M = Constrained modulus (at Sigma')	GammaTop = 17.0 kN/m^3
DF21GE034	Ed = Dilatometer Modulus	Cu = Undrained shear strength	FactorEd = 34.7
Hamlin Rd, Ardmore	Ud = Pore Press. Index = (P2-Uo)/(Po-Uo)	Ocr = Overconsolidation ratio	Zm = 0.0 kPa
	Gamma = Bulk unit weight	(OCR = 'relative OCR'- generally	Zabs = 0.0 m
	Sigma' = Effective overb. stress	realistic. If accurate independent OCR	Zw = 1.5 m
	Uo = Pore pressure	available, apply suitable factor)	

WaterTable at 1.50 m
Reduction formulae according to Marchetti, ASCE Geot.Jnl.Mar. 1980, Vol.109, 299-321; Phi according to TC16 ISSMGE, 2001

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_02 DESCRIPTION
0.2	47	171		57	151		15.7	3	0	1.67	16.6	3.3				43	9.8		SANDY SILT
0.4	153	328		160	308		15.7	7	0	0.93	24.5	5.1		3.1	49.8		17.2	33	SILT
0.6	69	175		79	155		15.7	10	0	0.95	8.2	2.6		1.6	9.1		6.0	12	SILT
0.8	61	162		72	142		15.7	13	0	0.98	5.6	2.4		1.3	5.0		4.7	10	SILT
1.0	71	171		82	151		15.7	16	0	0.85	5.1	2.4		1.2	4.3		4.4	11	SILT
1.2	45	127		57	107		15.7	19	0	0.89	3.0	1.7		0.78	1.9		2.2	7	SILT
1.4	39	92		52	72		14.7	22	0	0.38	2.3	0.7		0.63	1.3		0.7	6	MUD
1.6	39	95		52	75		14.7	24	1	0.45	2.1	0.8		0.57	1.1		0.7	6	MUD
1.8	43	101		56	81		14.7	25	3	0.48	2.1	0.9		0.57	1.1		0.8	6	MUD
2.0	39	115		51	95		15.7	26	5	0.96	1.8	1.5		0.48	0.82		1.3	5	SILT
2.2	59	273		64	253		16.7	27	7	3.31	2.1	6.6				32	7.5		SAND
2.4	37	79		51	59		14.7	29	9	0.20	1.5	0.3		0.39	<0.8		0.2	4	MUD
2.6	67	147		79	127		15.7	30	11	0.71	2.3	1.7		0.62	1.2		1.7	8	CLAYEY SILT
2.8	714	1552		688	1532		19.1	31	13	1.25	21.9	29.3				44	94.9		SANDY SILT
3.0	133	173		147	153		13.7	33	15	0.05	4.0	0.2		0.99	3.0		0.3	17	MUD AND/OR PEAT
3.2	97	141		111	121		14.7	34	17	0.11	2.8	0.4		0.74	1.7		0.4	11	MUD
3.4	33	72		47	52		14.7	34	19	0.19	0.8	0.2		< 0.3	<0.8		0.2	2	MUD
3.6	39	75		53	55		13.7	35	21	0.07	0.9	0.1		< 0.3	<0.8		0.1	3	MUD AND/OR PEAT
3.8	44	86		58	66		14.7	36	23	0.24	1.0	0.3		< 0.3	<0.8		0.2	3	MUD
4.0	45	83		59	63		14.7	37	25	0.12	0.9	0.1		< 0.3	<0.8		0.1	3	MUD
4.2	53	91		67	71		14.7	38	26	0.10	1.1	0.1		< 0.3	<0.8		0.1	4	MUD
4.4	52	93		66	73		14.7	39	28	0.20	0.9	0.3		< 0.3	<0.8		0.2	3	MUD
4.6	49	93		62	73		14.7	40	30	0.33	0.8	0.4		< 0.3	<0.8		0.3	3	MUD
4.8	49	94		62	74		14.7	41	32	0.38	0.7	0.4		< 0.3	<0.8		0.3	3	MUD
5.0	57	97		71	77		14.7	42	34	0.17	0.9	0.2		< 0.3	<0.8		0.2	3	MUD
5.2	62	109		75	89		14.7	43	36	0.35	0.9	0.5		< 0.3	<0.8		0.4	4	MUD
5.4	49	90		63	70		14.7	44	38	0.30	0.6	0.3		< 0.3	<0.8		0.2	2	MUD
5.6	59	103		72	83		14.7	45	40	0.33	0.7	0.4		< 0.3	<0.8		0.3	3	MUD
5.8	66	114		79	94		14.7	46	42	0.40	0.8	0.5		< 0.3	<0.8		0.4	3	MUD
6.0	58	106		71	86		14.7	47	44	0.54	0.6	0.5		< 0.3	<0.8		0.4	2	MUD
6.2	51	98		64	78		14.7	48	46	0.75	0.4	0.5		< 0.3	<0.8		0.4	1	MUD
6.4	63	138		75	118		15.7	49	48	1.60	0.5	1.5				24	1.3		SANDY SILT
6.6	81	129		94	109		14.7	50	50	0.33	0.9	0.5		< 0.3	<0.8		0.4	4	MUD
6.8	90	164		102	144		15.7	51	52	0.84	1.0	1.5		< 0.3	<0.8		1.2	5	SILT
7.0	84	137		97	117		14.7	52	54	0.46	0.8	0.7		< 0.3	<0.8		0.6	4	MUD
7.2	89	140		102	120		14.7	53	56	0.39	0.9	0.6		< 0.3	<0.8		0.5	4	MUD
7.4	102	160		115	140		14.7	54	58	0.44	1.0	0.9		< 0.3	<0.8		0.7	5	MUD
7.6	97	155		110	135		14.7	55	60	0.50	0.9	0.9		< 0.3	<0.8		0.7	5	MUD
7.8	78	137		91	117		14.7	56	62	0.91	0.5	0.9		< 0.3	<0.8		0.8	2	MUD
8.0	94	151		107	131		14.7	57	64	0.56	0.8	0.8		< 0.3	<0.8		0.7	4	MUD
8.2	109	170		122	150		14.7	58	66	0.51	1.0	1.0		< 0.3	<0.8		0.8	5	MUD
8.4	110	149		124	129		13.7	59	68	0.09	0.9	0.2		< 0.3	<0.8		0.2	5	MUD AND/OR PEAT
8.6	105	163		118	143		14.7	60	70	0.52	0.8	0.9		< 0.3	<0.8		0.7	4	MUD

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_02 DESCRIPTION
8.8	107	148		121	128		14.7	61	72	0.15	0.8	0.3		< 0.3	<0.8		0.2	4	MUD
9.0	103	234		112	214		16.7	62	74	2.64	0.6	3.5				25	3.0		SILTY SAND
9.2	6	14		76			13.7	63	76										
9.4	95	138		109	118		14.7	64	77	0.30	0.5	0.3		< 0.3	<0.8		0.3	2	MUD
9.6	112	162		125	142		14.7	65	79	0.37	0.7	0.6		< 0.3	<0.8		0.5	4	MUD
9.8	139	193		152	173		14.7	66	81	0.30	1.1	0.7		< 0.3	<0.8		0.6	7	MUD
10.0	137	187		150	167		14.7	67	83	0.25	1.0	0.6		< 0.3	<0.8		0.5	6	MUD
10.2	135	185		148	165		14.7	68	85	0.27	0.9	0.6		< 0.3	<0.8		0.5	6	MUD
10.4	142	186		156	166		14.7	69	87	0.15	1.0	0.4		< 0.3	<0.8		0.3	6	MUD
10.6	136	178		150	158		14.7	70	89	0.14	0.9	0.3		< 0.3	<0.8		0.2	5	MUD
10.8	131	184		144	164		14.7	71	91	0.38	0.7	0.7		< 0.3	<0.8		0.6	5	MUD
11.0	158	212		171	192		14.7	72	93	0.27	1.1	0.7		< 0.3	<0.8		0.6	7	MUD
11.2	143	199		156	179		14.7	73	95	0.38	0.8	0.8		< 0.3	<0.8		0.7	5	MUD
11.4	142	194		155	174		14.7	74	97	0.33	0.8	0.7		< 0.3	<0.8		0.6	5	MUD
11.6	141	203		154	183		14.7	75	99	0.54	0.7	1.0		< 0.3	<0.8		0.9	5	MUD
11.8	157	222		169	202		14.7	76	101	0.48	0.9	1.1		< 0.3	<0.8		1.0	6	MUD
12.0	160	221		173	201		14.7	77	103	0.41	0.9	1.0		< 0.3	<0.8		0.8	6	MUD
12.2	163	232		175	212		15.7	78	105	0.52	0.9	1.3		< 0.3	<0.8		1.1	6	SILTY CLAY
12.4	203	294		214	274		15.7	79	107	0.56	1.4	2.1		0.35	<0.8		1.8	11	SILTY CLAY
12.6	172	356		179	336		16.7	80	109	2.26	0.9	5.5				27	4.6		SILTY SAND
12.8	185	246		198	226		14.7	82	111	0.33	1.1	1.0		< 0.3	<0.8		0.8	8	MUD
13.0	136	191		149	171		14.7	83	113	0.61	0.4	0.8		< 0.3	<0.8		0.7	3	MUD
13.2	178	235		191	215		14.7	84	115	0.32	0.9	0.8		< 0.3	<0.8		0.7	7	MUD
13.4	181	240		194	220		14.7	85	117	0.34	0.9	0.9		< 0.3	<0.8		0.8	7	MUD
13.6	184	248		197	228		14.7	86	119	0.40	0.9	1.1		< 0.3	<0.8		0.9	7	MUD
13.8	210	274		223	254		14.7	86	121	0.31	1.2	1.1		< 0.3	<0.8		0.9	10	MUD
14.0	229	288		242	268		14.7	87	123	0.22	1.4	0.9		0.36	<0.8		0.8	12	MUD
14.2	155	238		167	218		15.7	88	125	1.23	0.5	1.8					1.5		SANDY SILT
14.4	214	286		226	266		15.7	90	127	0.40	1.1	1.4		< 0.3	<0.8		1.2	9	SILTY CLAY
14.6	214	285		226	265		15.7	91	129	0.40	1.1	1.3		< 0.3	<0.8		1.1	9	SILTY CLAY
14.8	218	287		230	267		15.7	92	130	0.37	1.1	1.3		< 0.3	<0.8		1.1	9	SILTY CLAY
15.0	220	292		232	272		15.7	93	132	0.40	1.1	1.4		< 0.3	<0.8		1.2	9	SILTY CLAY
15.2	219	282		232	262		14.7	94	134	0.31	1.0	1.1		< 0.3	<0.8		0.9	9	MUD
15.4	222	290		234	270		15.7	95	136	0.36	1.0	1.2		< 0.3	<0.8		1.1	9	SILTY CLAY
15.6	237	289		250	269		14.7	96	138	0.17	1.2	0.7		< 0.3	<0.8		0.6	11	MUD
15.8	233	291		246	271		14.7	97	140	0.24	1.1	0.9		< 0.3	<0.8		0.7	10	MUD
16.0	207	289		219	269		15.7	98	142	0.66	0.8	1.7		< 0.3	<0.8		1.5	7	CLAYEY SILT
16.2	237	293		250	273		14.7	100	144	0.22	1.1	0.8		< 0.3	<0.8		0.7	10	MUD
16.4	237	307		249	287		15.7	101	146	0.37	1.0	1.3		< 0.3	<0.8		1.1	10	SILTY CLAY
16.6	247	328		259	308		15.7	102	148	0.45	1.1	1.7		< 0.3	<0.8		1.5	10	SILTY CLAY
16.8	247	323		259	303		15.7	103	150	0.41	1.1	1.5		< 0.3	<0.8		1.3	10	SILTY CLAY
17.0	258	332		270	312		15.7	104	152	0.36	1.1	1.5		< 0.3	<0.8		1.2	11	SILTY CLAY
17.2	279	349		291	329		15.7	105	154	0.28	1.3	1.3		0.34	<0.8		1.1	14	CLAY
17.4	274	342		286	322		15.7	107	156	0.27	1.2	1.2		0.31	<0.8		1.1	13	CLAY
17.6	285	340		298	320		14.7	108	158	0.16	1.3	0.8		0.33	<0.8		0.7	14	MUD
17.8	286	354		298	334		15.7	109	160	0.26	1.3	1.2		0.33	<0.8		1.1	14	CLAY
18.0	280	361		292	341		15.7	110	162	0.38	1.2	1.7		< 0.3	<0.8		1.5	13	SILTY CLAY
18.2	296	371		308	351		15.7	111	164	0.30	1.3	1.5		0.33	<0.8		1.3	14	CLAY
18.4	314	372		327	352		14.7	112	166	0.16	1.4	0.9		0.38	<0.8		0.7	16	MUD
18.6	288	429		297	409		15.7	113	168	0.87	1.1	3.9		< 0.3	<0.8		3.3	12	SILT

DMT_03	LEGEND	INTERPRETED PARAMETERS	GENERAL PARAMETERS
16 APR 2021	Z = Depth Below Ground Level	Phi = Safe floor value of Friction Angle	DeltaA = 10 kPa
Drill Force NZ	Po,P1,P2 = Corrected A,B,C readings	Ko = In situ earth press. coeff.	DeltaB = 24 kPa
Lander Geotechnical	Id = Material Index	M = Constrained modulus (at Sigma')	GammaTop = 17.0 kN/m^3
DF21GE034	Ed = Dilatometer Modulus	Cu = Undrained shear strength	FactorEd = 34.7
Hamlin Rd, Ardmore	Ud = Pore Press. Index = (P2-Uo)/(Po-Uo)	Ocr = Overconsolidation ratio	Zm = 0.0 kPa
	Gamma = Bulk unit weight	(OCR = 'relative OCR'- generally	Zabs = 0.0 m
	Sigma' = Effective overb. stress	realistic. If accurate independent OCR	Zw = 1.5 m
	Uo = Pore pressure	available, apply suitable factor)	

WaterTable at 1.50 m
Reduction formulae according to Marchetti, ASCE Geot.Jnl.Mar. 1980, Vol.109, 299-321; Phi according to TC16 ISSMGE, 2001

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_03 DESCRIPTION
0.2	89	201		95	177		15.7	3	0	0.86	28.0	2.8		3.4	61.4		9.9	20	SILT
0.4	160	440		158	416		16.7	7	0	1.64	24.1	9.0				44	29.9		SANDY SILT
0.6	166	402		166	378		16.7	10	0	1.28	16.8	7.4				43	22.0		SANDY SILT
0.8	87	308		88	284		16.7	13	0	2.24	6.6	6.8				39	14.5		SILTY SAND
1.0	30	156		35	132		16.7	17	0	2.73	2.1	3.4				33	3.8		SILTY SAND
1.2	46	148		53	124		15.7	20	0	1.36	2.6	2.5				34	3.0		SANDY SILT
1.4	49	161		55	137		15.7	23	0	1.49	2.4	2.8				33	3.2		SANDY SILT
1.6	43	122		51	98		15.7	25	1	0.95	2.0	1.6		0.54	0.98		1.4	5	SILT
1.8	60	139		68	115		15.7	26	3	0.73	2.5	1.6		0.66	1.4		1.8	8	CLAYEY SILT
2.0	115	218		122	194		15.7	28	5	0.62	4.2	2.5		1.0	3.2		4.1	15	CLAYEY SILT
2.2	103	174		111	150		15.7	29	7	0.37	3.6	1.3		0.91	2.5		2.0	13	SILTY CLAY
2.4	95	153		104	129		14.7	30	9	0.27	3.2	0.9		0.82	2.1		1.2	12	MUD
2.6	119	195		127	171		15.7	31	11	0.38	3.8	1.5		0.94	2.7		2.3	15	SILTY CLAY
2.8	151	389		151	365		16.7	32	13	1.55	4.3	7.4				36	12.6		SANDY SILT
3.0	109	167		118	143		14.7	33	15	0.24	3.1	0.9		0.80	2.0		1.1	13	MUD
3.2	103	167		112	143		14.7	34	17	0.33	2.8	1.1		0.73	1.7		1.3	11	MUD
3.4	51	105		60	81		14.7	35	19	0.51	1.2	0.7		< 0.3	<0.8		0.6	4	MUD
3.8	137	351		138	327		15.7	37	23	1.64	3.1	6.6				35	9.0		SANDY SILT
4.2	75	109		85	85		13.7	40	26		1.5	0.0		0.39	<0.8			6	MUD AND/OR PEAT
4.3	89	148		98	124		14.7	40	27	0.37	1.8	0.9		0.48	0.82		0.8	7	MUD
4.4	95	176		103	152		15.7	41	28	0.67	1.8	1.7		0.50	0.87		1.5	8	CLAYEY SILT
4.6	122	203		130	179		15.7	42	30	0.50	2.4	1.7		0.64	1.3		1.8	11	SILTY CLAY
4.8	104	210		110	186		15.7	43	32	0.97	1.8	2.6		0.49	0.86		2.2	8	SILT
5.0	100	183		108	159		15.7	44	34	0.70	1.7	1.8		0.45	<0.8		1.5	8	CLAYEY SILT
5.2	143	199		152	175		14.7	45	36	0.20	2.6	0.8		0.68	1.5		0.9	14	MUD
5.6	126	164		136	140		13.7	47	40	0.04	2.0	0.1		0.55	1.0		0.1	11	MUD AND/OR PEAT
5.8	105	160		114	136		14.7	48	42	0.31	1.5	0.8		0.40	<0.8		0.7	7	MUD
6.0	142	196		151	172		14.7	49	44	0.20	2.2	0.7		0.59	1.1		0.7	12	MUD
6.2	158	219		167	195		14.7	50	46	0.24	2.4	1.0		0.65	1.3		1.0	14	MUD
6.4	166	224		175	200		14.7	51	48	0.20	2.5	0.9		0.67	1.4		0.9	15	MUD
6.6	177	237		186	213		14.7	52	50	0.20	2.6	0.9		0.70	1.5		1.1	16	MUD
6.8	178	235		187	211		14.7	53	52	0.18	2.5	0.8		0.68	1.5		0.9	16	MUD
7.0	182	228		191	204		13.7	54	54	0.09	2.5	0.4		0.68	1.5		0.5	16	MUD AND/OR PEAT
7.2	177	254		185	230		15.7	55	56	0.35	2.4	1.6		0.64	1.3		1.6	15	SILTY CLAY
7.4	193	277		201	253		15.7	56	58	0.37	2.6	1.8		0.68	1.5		2.0	17	SILTY CLAY
7.6	222	322		229	298		15.7	57	60	0.41	3.0	2.4		0.78	1.8		3.0	20	SILTY CLAY
7.8	214	315		221	291		15.7	58	62	0.44	2.7	2.4		0.72	1.6		2.9	19	SILTY CLAY
8.0	197	264		205	240		15.7	59	64	0.24	2.4	1.2		0.64	1.3		1.2	16	CLAY
8.2	194	258		203	234		14.7	61	66	0.23	2.3	1.1		0.61	1.2		1.1	16	MUD
8.4	193	256		202	232		14.7	62	68	0.23	2.2	1.1		0.59	1.1		1.0	15	MUD
8.6	189	257		197	233		15.7	63	70	0.28	2.0	1.2		0.55	1.0		1.1	14	CLAY
8.8	191	287		198	263		15.7	64	72	0.52	2.0	2.3		0.54	0.99		1.9	14	SILTY CLAY
9.0	193	263		201	239		15.7	65	74	0.30	2.0	1.3		0.53	0.98		1.1	14	CLAY

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_03 DESCRIPTION
9.2	188	258		196	234		15.7	66	76	0.31	1.8	1.3		0.50	0.87		1.1	13	CLAY
9.4	200	276		208	252		15.7	67	77	0.34	1.9	1.5		0.53	0.95		1.3	14	SILTY CLAY
9.6	204	287		212	263		15.7	68	79	0.39	1.9	1.8		0.53	0.95		1.5	14	SILTY CLAY
9.8	212	291		220	267		15.7	70	81	0.34	2.0	1.6		0.54	0.99		1.4	15	SILTY CLAY
10.0	208	281		216	257		15.7	71	83	0.31	1.9	1.4		0.51	0.91		1.2	14	CLAY
10.2	211	273		220	249		14.7	72	85	0.22	1.9	1.0		0.51	0.90		0.9	15	MUD
10.4	201	272		209	248		15.7	73	87	0.32	1.7	1.3		0.45	<0.8		1.1	13	CLAY
10.6	191	250		200	226		14.7	74	89	0.24	1.5	0.9		0.40	<0.8		0.8	11	MUD
10.8	198	265		206	241		15.7	75	91	0.30	1.5	1.2		0.41	<0.8		1.0	12	CLAY
11.0	213	285		221	261		15.7	76	93	0.31	1.7	1.4		0.45	<0.8		1.2	13	CLAY
11.2	231	313		239	289		15.7	77	95	0.35	1.9	1.7		0.50	0.89		1.5	15	SILTY CLAY
11.4	266	339		274	315		15.7	79	97	0.23	2.2	1.4		0.61	1.2		1.4	20	CLAY
11.6	279	346		287	322		15.7	80	99	0.18	2.4	1.2		0.64	1.3		1.2	22	CLAY
11.8	401	761		395	737		17.7	81	101	1.17	3.6	11.9		0.91	2.5		17.8	37	SILT
12.0	333	449		339	425		15.7	83	103	0.36	2.9	3.0		0.75	1.7		3.6	28	SILTY CLAY
12.2	304	661		298	637		16.7	84	105	1.76	2.3	11.8				33	13.0		SANDY SILT
12.4	326	458		331	434		16.7	85	107	0.46	2.6	3.6		0.70	1.5		4.0	26	SILTY CLAY
12.6	305	409		312	385		15.7	86	109	0.36	2.3	2.6		0.63	1.3		2.6	23	SILTY CLAY
12.8	278	364		285	340		15.7	88	111	0.31	2.0	1.9		0.54	1.0		1.6	19	CLAY
13.0	295	379		303	355		15.7	89	113	0.28	2.1	1.8		0.58	1.1		1.7	21	CLAY
13.2	294	391		301	367		15.7	90	115	0.36	2.1	2.3		0.56	1.1		2.0	21	SILTY CLAY
13.4	332	435		339	411		15.7	91	117	0.33	2.4	2.5		0.65	1.4		2.6	26	CLAY
13.6	407	528		413	504		16.7	92	119	0.31	3.2	3.2		0.82	2.1		4.2	36	CLAY
13.8	447	655		448	631		16.7	94	121	0.56	3.5	6.3		0.89	2.4		9.0	41	SILTY CLAY
14.0	389	514		394	490		16.7	95	123	0.35	2.9	3.3		0.75	1.7		4.0	33	SILTY CLAY
14.2	416	546		421	522		16.7	96	125	0.34	3.1	3.5		0.80	2.0		4.5	36	SILTY CLAY
14.4	361	484		367	460		16.7	98	127	0.39	2.5	3.2		0.66	1.4		3.4	28	SILTY CLAY
14.6	367	497		372	473		16.7	99	129	0.41	2.5	3.5		0.66	1.4		3.7	28	SILTY CLAY
14.8	346	450		353	426		15.7	101	130	0.33	2.2	2.6		0.60	1.2		2.4	25	SILTY CLAY
15.0	352	453		359	429		15.7	102	132	0.31	2.2	2.4		0.60	1.2		2.3	26	CLAY
15.2	387	524		392	500		16.7	103	134	0.42	2.5	3.8		0.67	1.4		4.1	30	SILTY CLAY
15.4	353	443		360	419		15.7	104	136	0.26	2.1	2.0		0.58	1.1		1.9	25	CLAY
15.6	211	280		219	256		15.7	106	138	0.45	0.8	1.3		< 0.3	<0.8		1.1	7	SILTY CLAY
15.8	204	255		213	231		14.7	107	140	0.24	0.7	0.6		< 0.3	<0.8		0.5	6	MUD
16.0	402	538		407	514		16.7	108	142	0.40	2.5	3.7		0.66	1.4		3.9	31	SILTY CLAY
16.2	404	504		411	480		15.7	109	144	0.26	2.4	2.4		0.66	1.4		2.5	31	CLAY
16.4	359	534		362	510		16.7	110	146	0.69	2.0	5.1		0.53	0.97		4.4	24	CLAYEY SILT
16.6	424	527		431	503		16.7	112	148	0.26	2.5	2.5		0.68	1.4		2.7	33	CLAY
16.8	380	455		388	431		15.7	113	150	0.18	2.1	1.5		0.57	1.1		1.3	27	CLAY
17.0	365	463		372	439		15.7	114	152	0.31	1.9	2.3		0.52	0.94		2.0	24	CLAY
17.2	356	448		363	424		15.7	115	154	0.29	1.8	2.1		0.49	0.86		1.8	22	CLAY
17.4	380	471		387	447		15.7	117	156	0.26	2.0	2.1		0.54	0.99		1.8	25	CLAY
17.6	403	543		408	519		16.7	118	158	0.45	2.1	3.9		0.58	1.1		3.5	28	SILTY CLAY
17.8	401	529		406	505		16.7	119	160	0.40	2.1	3.4		0.56	1.1		3.0	27	SILTY CLAY
18.0	433	531		440	507		15.7	120	162	0.24	2.3	2.3		0.62	1.3		2.3	32	CLAY
18.2	479	604		484	580		16.7	122	164	0.30	2.6	3.3		0.70	1.5		3.8	38	CLAY
18.4	491	601		497	577		16.7	123	166	0.24	2.7	2.8		0.72	1.6		3.2	39	CLAY
18.6	408	509		415	485		15.7	124	168	0.28	2.0	2.4		0.54	0.99		2.1	27	CLAY
18.8	409	505		416	481		15.7	126	170	0.26	2.0	2.3		0.53	0.97		1.9	27	CLAY
19.0	443	537		450	513		15.7	127	172	0.23	2.2	2.2		0.60	1.2		2.1	31	CLAY
19.2	446	548		453	524		16.7	128	174	0.26	2.2	2.5		0.59	1.1		2.3	31	CLAY
19.4	462	582		468	558		16.7	129	176	0.31	2.3	3.1		0.61	1.2		3.1	33	CLAY
19.6	486	608		492	584		16.7	131	178	0.29	2.4	3.2		0.65	1.3		3.3	36	CLAY
19.8	585	813		585	789		17.7	132	180	0.50	3.1	7.1		0.80	2.0		9.1	50	SILTY CLAY
20.0	477	645		480	621		16.7	134	181	0.47	2.2	4.9		0.61	1.2		4.7	34	SILTY CLAY
20.2	479	580		486	556		16.7	135	183	0.23	2.2	2.4		0.61	1.2		2.4	34	CLAY
20.4	463	590		468	566		16.7	136	185	0.35	2.1	3.4		0.56	1.1		3.0	31	SILTY CLAY
20.8	455	572		461	548		16.7	139	189	0.32	2.0	3.0		0.53	0.97		2.6	30	CLAY
21.0	484	587		491	563		16.7	140	191	0.24	2.1	2.5		0.58	1.1		2.3	33	CLAY

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_03 DESCRIPTION
21.2	504	612		510	588		16.7	142	193	0.25	2.2	2.7		0.61	1.2		2.6	36	CLAY
21.4	514	625		520	601		16.7	143	195	0.25	2.3	2.8		0.61	1.2		2.7	37	CLAY
21.6	519	634		525	610		16.7	145	197	0.26	2.3	3.0		0.61	1.2		2.9	37	CLAY
21.8	530	675		534	651		16.7	146	199	0.35	2.3	4.0		0.62	1.2		4.0	38	SILTY CLAY
22.0	535	634		542	610		16.7	147	201	0.20	2.3	2.4		0.62	1.3		2.4	39	CLAY
22.2	553	672		559	648		16.7	149	203	0.25	2.4	3.1		0.64	1.3		3.2	41	CLAY
22.4	546	710		550	686		16.7	150	205	0.40	2.3	4.7		0.62	1.2		4.7	39	SILTY CLAY
22.6	530	664		535	640		16.7	151	207	0.32	2.2	3.6		0.59	1.1		3.4	37	CLAY
22.8	609	748		614	724		16.7	153	209	0.27	2.6	3.8		0.71	1.6		4.4	48	CLAY

DMT_04

20 APR 2021

Drill Force NZ
Lander Geotechnical
DF21GE034
Hamlin Rd, Ardmore

LEGEND
Z = Depth Below Ground Level
Po,P1,P2 = Corrected A,B,C readings
Id = Material Index
Ed = Dilatometer Modulus
Ud = Pore Press. Index = (P2-Uo)/(Po-Uo)
Gamma = Bulk unit weight
Sigma' = Effective overb. stress
Uo = Pore pressure

INTERPRETED PARAMETERS
Phi = Safe floor value of Friction Angle
Ko = In situ earth press. coeff.
M = Constrained modulus (at Sigma')
Cu = Undrained shear strength
Ocr = Overconsolidation ratio
(OCR = 'relative OCR'- generally realistic. If accurate independent OCR available, apply suitable factor)

GENERAL PARAMETERS
DeltaA = 16 kPa
DeltaB = 37 kPa
GammaTop = 17.0 kN/m^3
FactorEd = 34.7
Zm = 0.0 kPa
Zabs = 0.0 m
Zw = 1.5 m

WaterTable at 1.50 m
Reduction formulae according to Marchetti, ASCE Geot.Jnl.Mar. 1980, Vol.109, 299-321; Phi according to TC16 ISSMGE, 2001

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_04 DESCRIPTION
0.2	97	348		103	311		16.7	3	0	2.02	30.3	7.2				45	25.6		SILTY SAND
0.6	25	323		29	286		16.7	10	0	8.95	2.9	8.9				34	12.6		SAND
0.8	182	564		182	527		17.7	13	0	1.90	13.5	12.0				42	33.4		SILTY SAND
1.0	30	289		36	252		16.7	17	0	6.06	2.1	7.5				33	8.6		SAND
1.2	141	664		134	627		17.7	20	0	3.70	6.6	17.1				39	36.6		SAND
1.4	291	750		287	713		17.7	24	0	1.49	12.0	14.8				41	39.6		SANDY SILT
1.6	297	646		298	609		17.7	26	1	1.05	11.3	10.8		2.0	14.9		28.2	50	SILT
1.8	180	405		187	368		16.7	28	3	0.98	6.6	6.3		1.4	6.5		13.1	27	SILT
2.0	173	513		175	476		16.7	29	5	1.78	5.8	10.5				38	20.7		SANDY SILT
2.2	144	268		156	231		15.7	31	7	0.50	4.9	2.6		1.1	4.0		4.6	21	SILTY CLAY
2.4	181	325		192	288		15.7	32	9	0.52	5.8	3.3		1.3	5.2		6.4	26	SILTY CLAY
2.6	206	320		219	283		15.7	33	11	0.31	6.3	2.2		1.4	6.0		4.5	31	CLAY
2.8	201	301		215	264		15.7	34	13	0.24	5.9	1.7		1.3	5.4		3.4	29	CLAY
3.0	199	296		213	259		15.7	35	15	0.23	5.6	1.6		1.3	5.0		3.1	28	CLAY
3.2	212	319		225	282		15.7	37	17	0.27	5.7	2.0		1.3	5.1		3.8	30	CLAY
3.4	195	287		209	250		15.7	38	19	0.22	5.0	1.4		1.2	4.2		2.6	26	CLAY
3.6	201	300		215	263		15.7	39	21	0.25	5.0	1.7		1.2	4.2		3.0	27	CLAY
3.8	183	269		197	232		15.7	40	23	0.20	4.4	1.2		1.1	3.4		2.0	23	CLAY
4.0	183	288		196	251		15.7	41	25	0.32	4.2	1.9		1.0	3.1		3.0	23	CLAY
4.2	207	323		220	286		15.7	42	26	0.34	4.6	2.3		1.1	3.6		3.9	26	SILTY CLAY
4.4	267	402		279	365		16.7	44	28	0.34	5.7	3.0		1.3	5.2		5.8	36	SILTY CLAY
4.6	270	401		282	364		16.7	45	30	0.33	5.6	2.8		1.3	5.0		5.4	36	CLAY
4.8	265	408		277	371		16.7	46	32	0.39	5.3	3.3		1.2	4.5		6.0	34	SILTY CLAY
5.0	260	394		272	357		15.7	48	34	0.36	5.0	3.0		1.2	4.2		5.3	33	SILTY CLAY
5.2	332	510		342	473		16.7	49	36	0.43	6.2	4.6		1.4	5.9		9.2	45	SILTY CLAY
5.4	291	420		303	383		16.7	50	38	0.30	5.3	2.8		1.2	4.5		5.1	37	CLAY
5.6	285	409		297	372		15.7	52	40	0.29	5.0	2.6		1.2	4.2		4.6	36	CLAY
5.8	291	419		303	382		16.7	53	42	0.30	4.9	2.7		1.2	4.1		4.9	36	CLAY
6.0	286	440		297	403		16.7	54	44	0.42	4.7	3.7		1.1	3.8		6.3	34	SILTY CLAY
6.2	285	425		297	388		16.7	56	46	0.36	4.5	3.2		1.1	3.6		5.3	34	SILTY CLAY
6.4	284	400		297	363		15.7	57	48	0.27	4.4	2.3		1.1	3.4		3.8	33	CLAY
6.6	1285	2767		1230	2730		20.6	58	50	1.27	20.3	52.1				43	165.0		SANDY SILT
6.8	764	2537		694	2500		19.6	60	52	2.81	10.6	62.7				41	160.4		SILTY SAND
7.0	2532	3458		2504	3421		20.1	62	54	0.37	39.4	31.8		4.0	>99.9		120.8	568	SILTY CLAY

DMT_05	LEGEND	INTERPRETED PARAMETERS	GENERAL PARAMETERS
20 APR 2021	Z = Depth Below Ground Level	Phi = Safe floor value of Friction Angle	DeltaA = 15 kPa
Drill Force NZ	Po,P1,P2 = Corrected A,B,C readings	Ko = In situ earth press. coeff.	DeltaB = 40 kPa
Lander Geotechnical	Id = Material Index	M = Constrained modulus (at Sigma')	GammaTop = 17.0 kN/m^3
DF21GE034	Ed = Dilatometer Modulus	Cu = Undrained shear strength	FactorEd = 34.7
Hamlin Rd, Ardmore	Ud = Pore Press. Index = (P2-Uo)/(Po-Uo)	Ocr = Overconsolidation ratio	Zm = 0.0 kPa
	Gamma = Bulk unit weight	(OCR = 'relative OCR'- generally	Zabs = 0.0 m
	Sigma' = Effective overb. stress	realistic. If accurate independent OCR	Zw = 1.5 m
	Uo = Pore pressure	available, apply suitable factor)	

WaterTable at 1.50 m
Reduction formulae according to Marchetti, ASCE Geot.Jnl.Mar. 1980, Vol.109, 299-321; Phi according to TC16 ISSMGE, 2001

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_05 DESCRIPTION
0.2	121	271		131	231		15.7	3	0	0.76	38.6	3.5		4.0	>99.9		13.1	30	CLAYEY SILT
0.4	231	648		228	608		16.7	7	0	1.67	34.9	13.2				46	48.6		SANDY SILT
0.6	122	309		130	269		15.7	10	0	1.06	13.2	4.8		2.2	19.0		13.3	23	SILT
0.8	74	200		85	160		15.7	13	0	0.87	6.6	2.6		1.4	6.4		5.4	13	SILT
1.0	61	176		73	136		15.7	16	0	0.86	4.5	2.2		1.1	3.6		3.7	10	SILT
1.2	60	152		73	112		15.7	19	0	0.53	3.8	1.3		0.95	2.7		2.0	9	SILTY CLAY
1.4	69	149		83	109		14.7	22	0	0.32	3.7	0.9		0.93	2.6		1.3	11	MUD
1.8	45	100		60	60		13.7	25	3		2.2	0.0		0.61	1.2			6	MUD AND/OR PEAT
2.0	66	152		79	112		14.7	26	5	0.44	2.8	1.1		0.75	1.7		1.4	9	MUD
2.2	64	146		78	106		14.7	27	7	0.40	2.6	1.0		0.70	1.5		1.1	8	MUD
2.4	36	126		49	86		15.7	28	9	0.91	1.4	1.3		0.38	<0.8		1.1	4	SILT
2.6	50	129		64	89		14.7	29	11	0.48	1.8	0.9		0.49	0.86		0.7	6	MUD
2.8	76	170		89	130		15.7	30	13	0.54	2.5	1.4		0.68	1.4		1.5	9	SILTY CLAY
3.0	78	169		91	129		15.7	31	15	0.49	2.4	1.3		0.65	1.4		1.4	9	SILTY CLAY
3.2	75	149		89	109		14.7	33	17	0.28	2.2	0.7		0.60	1.2		0.7	8	MUD
3.4	66	142		80	102		14.7	34	19	0.36	1.8	0.8		0.50	0.87		0.7	7	MUD
3.6	66	134		80	94		14.7	35	21	0.23	1.7	0.5		0.47	<0.8		0.4	6	MUD
3.8	81	153		95	113		14.7	36	23	0.25	2.0	0.6		0.55	1.0		0.5	8	MUD
4.0	89	151		104	111		13.7	37	25	0.09	2.2	0.3		0.59	1.1		0.2	9	MUD AND/OR PEAT
4.2	74	155		88	115		14.7	37	26	0.45	1.6	0.9		0.44	<0.8		0.8	6	MUD
4.4	65	141		79	101		14.7	38	28	0.44	1.3	0.8		0.34	<0.8		0.7	5	MUD
4.6	57	133		71	93		14.7	39	30	0.54	1.0	0.8		< 0.3	<0.8		0.7	4	MUD
4.8	62	147		76	107		14.7	40	32	0.73	1.1	1.1		< 0.3	<0.8		0.9	4	MUD
5.0	67	147		81	107		14.7	41	34	0.57	1.1	0.9		< 0.3	<0.8		0.8	4	MUD
5.2	82	164		96	124		14.7	42	36	0.48	1.4	1.0		0.37	<0.8		0.8	6	MUD
5.4	88	171		102	131		14.7	43	38	0.46	1.5	1.0		0.39	<0.8		0.9	6	MUD
5.6	90	172		104	132		14.7	44	40	0.45	1.4	1.0		0.38	<0.8		0.8	6	MUD
5.8	93	168		107	128		14.7	45	42	0.32	1.4	0.7		0.38	<0.8		0.6	7	MUD
6.0	92	176		106	136		14.7	46	44	0.50	1.3	1.1		0.34	<0.8		0.9	6	MUD
6.2	94	192		107	152		15.7	47	46	0.74	1.3	1.6		0.33	<0.8		1.3	6	CLAYEY SILT
6.4	98	190		111	150		15.7	48	48	0.62	1.3	1.3		0.34	<0.8		1.1	6	CLAYEY SILT
6.6	95	195		108	155		15.7	50	50	0.82	1.2	1.6		< 0.3	<0.8		1.4	6	SILT
6.8	107	200		120	160		15.7	51	52	0.59	1.3	1.4		0.35	<0.8		1.2	7	SILTY CLAY
7.0	116	203		129	163		14.7	52	54	0.45	1.5	1.2		0.39	<0.8		1.0	8	MUD
7.2	115	202		128	162		14.7	53	56	0.46	1.4	1.2		0.36	<0.8		1.0	7	MUD
7.4	109	197		122	157		15.7	54	58	0.54	1.2	1.2		< 0.3	<0.8		1.0	6	SILTY CLAY
7.6	115	193		129	153		14.7	55	60	0.35	1.3	0.8		0.32	<0.8		0.7	7	MUD
7.8	131	206		145	166		14.7	56	62	0.25	1.5	0.7		0.40	<0.8		0.6	8	MUD
8.0	120	212		133	172		15.7	57	64	0.56	1.2	1.3		0.31	<0.8		1.1	7	SILTY CLAY
8.2	294	570		298	530		16.7	58	66	1.00	4.0	8.1		0.98	2.9		12.7	30	SILT
8.4	168	444		172	404		16.7	60	68	2.23	1.8	8.1				31	7.2		SILTY SAND
8.6	161	263		174	223		15.7	61	70	0.47	1.7	1.7		0.46	<0.8		1.5	11	SILTY CLAY
8.8	161	245		175	205		14.7	62	72	0.30	1.7	1.1		0.45	<0.8		0.9	11	MUD

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_05 DESCRIPTION
9.0	168	249		182	209		14.7	63	74	0.25	1.7	0.9		0.46	<0.8		0.8	11	MUD
9.2	201	308		213	268		15.7	64	76	0.40	2.2	1.9		0.58	1.1		1.8	15	SILTY CLAY
9.4	146	275		157	235		15.7	65	77	0.97	1.2	2.7		0.31	<0.8		2.3	8	SILT
9.6	131	218		144	178		14.7	66	79	0.52	1.0	1.2		< 0.3	<0.8		1.0	6	MUD
9.8	140	225		154	185		14.7	67	81	0.44	1.1	1.1		< 0.3	<0.8		0.9	7	MUD
10.0	134	225		147	185		15.7	68	83	0.59	0.9	1.3		< 0.3	<0.8		1.1	6	SILTY CLAY
10.2	155	247		168	207		15.7	70	85	0.47	1.2	1.3		< 0.3	<0.8		1.1	8	SILTY CLAY
10.4	166	257		179	217		15.7	71	87	0.41	1.3	1.3		0.33	<0.8		1.1	9	SILTY CLAY
10.6	177	278		190	238		15.7	72	89	0.48	1.4	1.7		0.37	<0.8		1.4	10	SILTY CLAY
10.8	173	269		186	229		15.7	73	91	0.45	1.3	1.5		0.33	<0.8		1.3	9	SILTY CLAY
11.0	190	285		203	245		15.7	74	93	0.38	1.5	1.5		0.39	<0.8		1.2	11	SILTY CLAY
11.2	198	299		211	259		15.7	75	95	0.42	1.5	1.7		0.41	<0.8		1.4	12	SILTY CLAY
11.4	172	269		185	229		15.7	77	97	0.50	1.1	1.5		< 0.3	<0.8		1.3	8	SILTY CLAY
11.6	196	313		208	273		15.7	78	99	0.60	1.4	2.3		0.37	<0.8		1.9	11	SILTY CLAY
11.8	208	315		220	275		15.7	79	101	0.46	1.5	1.9		0.40	<0.8		1.6	12	SILTY CLAY
12.0	195	304		207	264		15.7	80	103	0.54	1.3	2.0		0.34	<0.8		1.7	10	SILTY CLAY
12.2	206	300		219	260		15.7	81	105	0.36	1.4	1.4		0.37	<0.8		1.2	11	SILTY CLAY
12.4	222	334		234	294		15.7	82	107	0.47	1.5	2.1		0.41	<0.8		1.8	13	SILTY CLAY
12.6	219	343		231	303		15.7	84	109	0.60	1.5	2.5		0.39	<0.8		2.1	12	SILTY CLAY
12.8	264	349		278	309		14.7	85	111	0.19	2.0	1.1		0.53	0.97		0.9	18	MUD
13.0	265	355		278	315		15.7	86	113	0.22	1.9	1.3		0.52	0.95		1.1	18	CLAY
13.2	267	366		280	326		15.7	87	115	0.28	1.9	1.6		0.52	0.92		1.4	18	CLAY
13.4	281	380		294	340		15.7	88	117	0.26	2.0	1.6		0.55	1.0		1.4	19	CLAY
13.6	295	379		309	339		14.7	89	119	0.16	2.1	1.1		0.58	1.1		1.0	21	MUD
13.8	275	346		289	306		13.7	90	121	0.10	1.9	0.6		0.51	0.90		0.5	18	MUD AND/OR PEAT
14.0	294	395		307	355		15.7	91	123	0.26	2.0	1.7		0.55	1.0		1.4	20	CLAY
14.2	311	426		323	386		15.7	92	125	0.32	2.2	2.2		0.58	1.1		2.0	22	CLAY
14.4	315	426		327	386		15.7	93	127	0.29	2.1	2.0		0.58	1.1		1.9	22	CLAY
14.6	327	437		339	397		15.7	95	129	0.27	2.2	2.0		0.60	1.2		1.9	24	CLAY
14.8	358	471		370	431		15.7	96	130	0.25	2.5	2.1		0.67	1.4		2.3	28	CLAY
15.0	354	538		363	498		16.7	97	132	0.59	2.4	4.7		0.64	1.3		4.8	26	SILTY CLAY
15.2	390	619		396	579		16.7	98	134	0.70	2.7	6.3		0.71	1.6		7.3	31	CLAYEY SILT
15.4	421	718		424	678		16.7	100	136	0.88	2.9	8.8		0.76	1.8		11.0	35	SILT
15.6	471	810		472	770		17.7	101	138	0.89	3.3	10.3		0.85	2.2		14.3	42	SILT
15.8	489	813		491	773		17.7	103	140	0.81	3.4	9.8		0.87	2.3		13.8	44	SILT
16.0	511	792		515	752		17.7	104	142	0.64	3.6	8.2		0.90	2.5		11.9	47	CLAYEY SILT
16.2	532	777		538	737		17.7	106	144	0.51	3.7	6.9		0.93	2.6		10.3	51	SILTY CLAY
16.4	501	800		504	760		17.7	107	146	0.72	3.3	8.9		0.85	2.2		12.3	45	CLAYEY SILT
16.6	501	837		502	797		17.7	109	148	0.83	3.2	10.2		0.84	2.1		14.0	44	SILT
16.8	474	788		476	748		17.7	111	150	0.83	2.9	9.4		0.77	1.8		12.0	40	SILT
17.0	520	744		527	704		16.7	112	152	0.47	3.3	6.2		0.86	2.2		8.5	47	SILTY CLAY
17.2	435	621		443	581		16.7	113	154	0.48	2.6	4.8		0.68	1.5		5.2	34	SILTY CLAY
17.4	276	455		285	415		15.7	115	156	1.01	1.1	4.5		< 0.3	<0.8		3.8	12	SILT
17.6	405	571		414	531		16.7	116	158	0.45	2.2	4.0		0.60	1.2		3.9	29	SILTY CLAY
17.8	462	607		473	567		16.7	117	160	0.30	2.7	3.3		0.71	1.6		3.8	37	CLAY
18.0	482	675		490	635		16.7	119	162	0.44	2.8	5.0		0.73	1.7		5.9	39	SILTY CLAY
18.2	475	640		485	600		16.7	120	164	0.36	2.7	4.0		0.71	1.6		4.6	38	SILTY CLAY
18.4	507	658		517	618		16.7	122	166	0.29	2.9	3.5		0.76	1.8		4.3	42	CLAY
18.6	516	691		525	651		16.7	123	168	0.35	2.9	4.4		0.76	1.8		5.4	43	SILTY CLAY
18.8	515	686		524	646		16.7	124	170	0.34	2.9	4.2		0.75	1.7		5.1	43	SILTY CLAY
19.0	540	697		550	657		16.7	126	172	0.28	3.0	3.7		0.79	1.9		4.7	46	CLAY
19.2	551	720		560	680		16.7	127	174	0.31	3.0	4.2		0.79	1.9		5.3	47	CLAY
19.4	565	728		575	688		16.7	128	176	0.28	3.1	3.9		0.81	2.0		5.1	49	CLAY
19.6	549	704		559	664		16.7	130	178	0.28	2.9	3.6		0.77	1.8		4.5	46	CLAY
19.8	587	751		597	711		16.7	131	180	0.27	3.2	4.0		0.82	2.1		5.3	52	CLAY
20.0	564	740		573	700		16.7	132	181	0.32	3.0	4.4		0.77	1.8		5.5	47	CLAY
20.2	541	712		550	672		16.7	134	183	0.33	2.7	4.2		0.73	1.6		5.0	44	SILTY CLAY
20.4	531	710		540	670		16.7	135	185	0.37	2.6	4.5		0.70	1.5		5.1	42	SILTY CLAY
20.6	573	733		583	693		16.7	137	187	0.28	2.9	3.8		0.76	1.8		4.7	48	CLAY

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_05 DESCRIPTION
20.8	487	680		495	640		16.7	138	189	0.47	2.2	5.0		0.60	1.2		4.8	35	SILTY CLAY
21.0	471	647		480	607		16.7	139	191	0.44	2.1	4.4		0.56	1.1		3.9	32	SILTY CLAY
21.2	432	637		440	597		16.7	141	193	0.64	1.7	5.5		0.47	0.81		4.6	26	CLAYEY SILT
21.4	371	554		380	514		16.7	142	195	0.73	1.3	4.7		0.33	<0.8		4.0	18	CLAYEY SILT
21.6	323	654		324	614		17.7	143	197	2.28	0.9	10.1				27	8.5		SILTY SAND
21.8	262	589		263	549		16.7	145	199	4.44	0.4	9.9					8.4		SAND
22.0	409	701		412	661		16.7	146	201	1.18	1.4	8.6		0.38	<0.8		7.3	21	SILT
22.2	620	1496		594	1456		18.6	148	203	2.21	2.6	29.9				34	38.2		SILTY SAND
22.4	396	1189		374	1149		18.6	150	205	4.58	1.1	26.9				29	22.9		SAND
22.6	435	1270		411	1230		18.6	151	207	4.01	1.3	28.4				30	24.2		SAND
22.8	465	1303		441	1263		18.6	153	209	3.55	1.5	28.5				31	24.6		SAND
23.0	644	1578		615	1538		18.6	155	211	2.28	2.6	32.0				34	40.7		SILTY SAND
23.2	627	1618		595	1578		18.6	157	213	2.57	2.4	34.1				33	42.1		SILTY SAND
23.4	673	1755		637	1715		19.6	158	215	2.56	2.7	37.4				34	49.1		SILTY SAND
23.6	618	1573		588	1533		18.6	160	217	2.55	2.3	32.8				33	38.9		SILTY SAND
23.8	703	1918		660	1878		19.6	162	219	2.76	2.7	42.3				34	57.0		SILTY SAND
24.0	724	1909		682	1869		19.6	164	221	2.57	2.8	41.2				34	56.1		SILTY SAND
24.2	579	1774		537	1734		18.6	166	223	3.81	1.9	41.5				32	43.8		SAND
24.4	713	1792		677	1752		19.6	168	225	2.38	2.7	37.3				34	48.8		SILTY SAND
24.6	518	1413		491	1373		18.6	170	227	3.34	1.6	30.6				31	27.1		SAND
25.0	727	1342		714	1302		17.7	173	231	1.22	2.8	20.4				34	25.4		SANDY SILT

DMT_06

23 APR 2021

Drill Force NZ
Lander Geotechnical
DF21GE034
Hamlin Rd, Ardmore

LEGEND
Z = Depth Below Ground Level
Po,P1,P2 = Corrected A,B,C readings
Id = Material Index
Ed = Dilatometer Modulus
Ud = Pore Press. Index = (P2-Uo)/(Po-Uo)
Gamma = Bulk unit weight
Sigma' = Effective overb. stress
Uo = Pore pressure

INTERPRETED PARAMETERS
Phi = Safe floor value of Friction Angle
Ko = In situ earth press. coeff.
M = Constrained modulus (at Sigma')
Cu = Undrained shear strength
Ocr = Overconsolidation ratio
(OCR = 'relative OCR'- generally realistic. If accurate independent OCR available, apply suitable factor)

GENERAL PARAMETERS
DeltaA = 16 kPa
DeltaB = 31 kPa
GammaTop = 17.0 kN/m^3
FactorEd = 34.7
Zm = 0.0 kPa
Zabs = 0.0 m
Zw = 1.5 m

WaterTable at 1.50 m
Reduction formulae according to Marchetti, ASCE Geot.Jnl.Mar. 1980, Vol.109, 299-321; Phi according to TC16 ISSMGE, 2001

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_06 DESCRIPTION
0.2	32	115		46	84		15.7	3	0	0.82	13.6	1.3		2.2	19.9		3.7	8	SILT
0.4	161	382		168	351		16.7	7	0	1.09	25.7	6.3		3.2	53.9		21.5	35	SILT
0.6	140	324		149	293		15.7	10	0	0.96	15.1	5.0		2.4	23.5		14.4	27	SILT
0.8	247	469		254	438		16.7	13	0	0.72	19.5	6.4		2.7	35.1		20.0	49	CLAYEY SILT
1.0	189	472		193	441		16.7	16	0	1.28	11.8	8.6				41	22.9		SANDY SILT
1.2	181	512		183	481		16.7	20	0	1.63	9.3	10.3				40	25.1		SANDY SILT
1.4	309	818		302	787		17.7	23	0	1.61	13.1	16.8				42	46.4		SANDY SILT
1.6	337	872		329	841		17.7	26	1	1.56	12.8	17.8				42	48.6		SANDY SILT
1.8	325	704		324	673		17.7	27	3	1.08	11.8	12.1		2.0	16.1		32.2	55	SILT
2.0	217	406		226	375		16.7	29	5	0.67	7.7	5.2		1.6	8.2		11.6	34	CLAYEY SILT
2.2	330	574		336	543		16.7	30	7	0.63	10.9	7.2		1.9	14.2		18.6	55	CLAYEY SILT
2.4	280	418		291	387		16.7	31	9	0.34	9.0	3.3		1.7	10.4		7.9	45	SILTY CLAY
2.6	298	496		306	465		16.7	33	11	0.54	9.0	5.5		1.7	10.5		13.2	47	SILTY CLAY
2.8	385	642		391	611		17.7	34	13	0.58	11.0	7.7		2.0	14.4		19.8	64	SILTY CLAY
3.0	356	561		364	530		16.7	36	15	0.47	9.8	5.8		1.8	11.9		14.3	57	SILTY CLAY
3.2	301	460		311	429		16.7	37	17	0.40	7.9	4.1		1.6	8.6		9.2	46	SILTY CLAY
3.4	284	434		295	403		16.7	39	19	0.39	7.2	3.8		1.5	7.3		8.1	42	SILTY CLAY
3.6	250	396		261	365		16.7	40	21	0.43	6.0	3.6		1.3	5.6		7.1	35	SILTY CLAY
3.8	210	346		222	315		15.7	41	23	0.47	4.8	3.2		1.1	4.0		5.7	27	SILTY CLAY
4.0	188	317		200	286		15.7	42	25	0.49	4.1	3.0		1.0	3.1		4.8	23	SILTY CLAY
4.2	199	326		211	295		15.7	44	26	0.46	4.2	2.9		1.0	3.2		4.7	24	SILTY CLAY
4.4	199	313		212	282		15.7	45	28	0.38	4.1	2.4		1.0	3.1		3.9	24	SILTY CLAY
4.6	189	284		203	253		15.7	46	30	0.29	3.7	1.7		0.94	2.7		2.6	22	CLAY
4.8	163	245		177	214		15.7	47	32	0.25	3.1	1.3		0.80	2.0		1.6	18	CLAY
5.0	175	218		191			13.7	48	34										
5.2	138	184		154			13.7	49	36										
5.4	126	179		142	148		13.7	50	38	0.06	2.1	0.2		0.56	1.1		0.2	11	MUD AND/OR PEAT
5.6	143	201		158	170		13.7	51	40	0.10	2.3	0.4		0.63	1.3		0.4	14	MUD AND/OR PEAT
5.8	166	233		181	202		14.7	51	42	0.15	2.7	0.7		0.72	1.6		0.8	16	MUD
6.0	159	241		173	210		15.7	52	44	0.28	2.5	1.3		0.66	1.4		1.4	15	CLAY
6.2	376	786		374	755		17.7	54	46	1.16	6.1	13.2		1.3	5.7		26.6	48	SILT
6.4	532	1425		506	1394		19.6	55	48	1.94	8.3	30.8				40	71.6		SILTY SAND
6.6	738	1818		702	1787		19.1	57	50	1.66	11.4	37.6				41	98.8		SANDY SILT
6.8	557	1338		536	1307		19.1	59	52	1.59	8.2	26.7				40	61.8		SANDY SILT
7.0	362	805		358	774		17.7	61	54	1.37	5.0	14.4				37	26.3		SANDY SILT
7.2	447	1039		436	1008		17.7	62	56	1.51	6.1	19.9				38	40.1		SANDY SILT
7.4	813	1837		780	1806		19.1	64	58	1.42	11.3	35.6				41	93.1		SANDY SILT
7.6	664	1529		639	1498		19.1	66	60	1.48	8.8	29.8				40	70.8		SANDY SILT
7.8	481	1217		463	1186		18.6	68	62	1.81	5.9	25.1				38	50.3		SILTY SAND
8.0	635	1520		609	1489		19.1	70	64	1.61	7.8	30.5				39	69.2		SANDY SILT
8.2	638	1495		613	1464		19.1	71	66	1.55	7.7	29.5				39	66.3		SANDY SILT
8.4	589	1434		565	1403		19.1	73	68	1.68	6.8	29.1				39	62.0		SANDY SILT
8.6	450	1137		434	1106		18.6	75	70	1.84	4.9	23.3				37	42.4		SILTY SAND

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_06 DESCRIPTION
8.8	407	1010		395	979		18.6	77	72	1.80	4.2	20.3				36	34.1		SILTY SAND
9.0	367	871		360	840		17.7	79	74	1.67	3.6	16.7				36	25.6		SANDY SILT
9.2	402	1317		375	1286		18.6	80	76	3.05	3.7	31.6				36	52.0		SILTY SAND
9.4	284	540		290	509		16.7	82	77	1.03	2.6	7.6		0.69	1.5		8.8	25	SILT
9.6	390	1122		372	1091		18.6	83	79	2.46	3.5	25.0				35	38.8		SILTY SAND
9.8	316	491		326	460		16.7	85	81	0.55	2.9	4.7		0.76	1.8		5.7	29	SILTY CLAY
10.0	334	507		344	476		16.7	86	83	0.51	3.0	4.6		0.79	1.9		5.8	32	SILTY CLAY
10.2	404	657		410	626		16.7	88	85	0.67	3.7	7.5		0.93	2.6		11.1	42	CLAYEY SILT
10.4	476	1145		461	1114		17.7	89	87	1.75	4.2	22.7				36	37.9		SANDY SILT
10.6	634	1280		620	1249		19.1	91	89	1.18	5.8	21.8		1.3	5.3		43.0	76	SILT
10.8	516	1099		505	1068		17.7	93	91	1.36	4.5	19.5				37	33.5		SANDY SILT
11.0	374	630		380	599		16.7	94	93	0.77	3.0	7.6		0.79	1.9		9.8	35	CLAYEY SILT
11.2	511	1215		494	1184		17.7	96	95	1.73	4.2	23.9				36	39.9		SANDY SILT
11.4	734	1610		709	1579		19.1	97	97	1.42	6.3	30.2				38	61.9		SANDY SILT
11.6	761	1555		740	1524		19.1	99	99	1.22	6.5	27.2				38	56.4		SANDY SILT
11.8	949	1817		924	1786		19.1	101	101	1.05	8.2	29.9		1.6	9.0		68.7	129	SILT
12.0	1014	1822		992	1791		19.1	103	103	0.90	8.6	27.7		1.7	9.8		65.3	141	SILT
12.2	880	1769		854	1738		19.1	105	105	1.18	7.2	30.7		1.5	7.3		66.6	113	SILT
12.4	483	894		481	863		17.7	107	107	1.02	3.5	13.3		0.89	2.4		19.3	47	SILT
12.6	523	1410		497	1379		18.6	108	109	2.27	3.6	30.6				35	47.8		SILTY SAND
12.8	772	1853		736	1822		19.1	110	111	1.74	5.7	37.7				38	74.0		SANDY SILT
13.0	726	1693		696	1662		19.1	112	113	1.66	5.2	33.5				37	63.0		SANDY SILT
13.2	778	1400		765	1369		19.1	114	115	0.93	5.7	21.0		1.3	5.2		40.7	93	SILT
13.4	1459	3849		1358	3818		21.1	115	117	1.98	10.8	85.4				41	219.3		SILTY SAND
13.6	1715	3919		1623	3888		20.6	118	119	1.51	12.8	78.6				42	214.8		SANDY SILT
13.8	2679	5430		2560	5399		20.6	120	121	1.16	20.4	98.5		2.8	37.4		312.6	479	SILT

DMT_07	LEGEND	INTERPRETED PARAMETERS	GENERAL PARAMETERS
22 APR 2021	Z = Depth Below Ground Level	Phi = Safe floor value of Friction Angle	DeltaA = 16 kPa
Drill Force NZ	Po,P1,P2 = Corrected A,B,C readings	Ko = In situ earth press. coeff.	DeltaB = 32 kPa
Lander Geotechnical	Id = Material Index	M = Constrained modulus (at Sigma')	GammaTop = 17.0 kN/m^3
DF21GE034	Ed = Dilatometer Modulus	Cu = Undrained shear strength	FactorEd = 34.7
Hamlin Rd, Ardmore	Ud = Pore Press. Index = (P2-Uo)/(Po-Uo)	Ocr = Overconsolidation ratio	Zm = 0.0 kPa
	Gamma = Bulk unit weight	(OCR = 'relative OCR'- generally	Zabs = 0.0 m
	Sigma' = Effective overb. stress	realistic. If accurate independent OCR	Zw = 1.5 m
	Uo = Pore pressure	available, apply suitable factor)	

WaterTable at 1.50 m
Reduction formulae according to Marchetti, ASCE Geot.Jnl.Mar. 1980, Vol.109, 299-321; Phi according to TC16 ISSMGE, 2001

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_07 DESCRIPTION
0.2	114	294		123	262		15.7	3	0	1.12	36.3	4.8		3.9	92.2		17.9	28	SILT
0.4	63	181		76	149		15.7	7	0	0.97	11.5	2.6		2.0	15.4		6.7	13	SILT
0.8	30	146		43	114		15.7	13	0	1.68	3.3	2.5				35	3.6		SANDY SILT
1.2	31	121		45	89		15.7	19	0	0.98	2.4	1.5		0.63	1.3		1.6	5	SILT
1.4	72	154		86	122		15.7	22	0	0.41	3.9	1.2		0.96	2.8		1.9	11	SILTY CLAY
1.6	68	136		83	104		14.7	24	1	0.26	3.4	0.7		0.86	2.3		1.0	10	MUD
1.8	60	123		75	91		14.7	25	3	0.22	2.8	0.5		0.75	1.7		0.7	9	MUD
2.0	60	118		75	86		14.7	26	5	0.15	2.7	0.4		0.71	1.6		0.4	8	MUD
2.2	61	127		76	95		14.7	27	7	0.27	2.5	0.7		0.68	1.4		0.7	8	MUD
2.4	65	140		80	108		14.7	28	9	0.40	2.5	1.0		0.67	1.4		1.1	8	MUD
2.6	77	146		92	114		14.7	29	11	0.27	2.8	0.8		0.73	1.7		0.9	10	MUD
2.8	93	162		108	130		14.7	30	13	0.23	3.1	0.8		0.82	2.0		1.0	12	MUD
3.0	100	177		115	145		14.7	31	15	0.31	3.2	1.1		0.83	2.1		1.4	12	MUD
3.2	86	180		100	148		15.7	32	17	0.58	2.6	1.7		0.69	1.5		1.9	10	SILTY CLAY
3.4	73	135		88	103		14.7	33	19	0.21	2.1	0.5		0.57	1.1		0.5	8	MUD
3.6	71	134		86	102		14.7	34	21	0.24	1.9	0.5		0.52	0.93		0.5	7	MUD
3.8	61	141		75	109		14.7	35	23	0.64	1.5	1.2		0.40	<0.8		1.0	5	MUD
4.0	64	131		79	99		14.7	36	25	0.37	1.5	0.7		0.40	<0.8		0.6	6	MUD
4.2	76	156		90	124		14.7	37	26	0.53	1.7	1.2		0.46	<0.8		1.0	7	MUD
4.4	81	156		96	124		14.7	38	28	0.42	1.8	1.0		0.48	0.82		0.8	7	MUD
4.6	83	158		98	126		14.7	39	30	0.42	1.7	1.0		0.46	<0.8		0.8	7	MUD
4.8	99	178		113	146		14.7	40	32	0.40	2.0	1.1		0.55	1.0		1.0	9	MUD
5.0	93	171		108	139		14.7	41	34	0.43	1.8	1.1		0.48	0.83		0.9	8	MUD
5.2	100	179		114	147		14.7	42	36	0.42	1.8	1.1		0.50	0.89		1.0	8	MUD
5.4	48	128		62	96		14.7	43	38	1.39	0.6	1.2				24	1.0		MUD
5.6	114	185		129	153		14.7	44	40	0.27	2.0	0.8		0.55	1.0		0.7	10	MUD
5.8	78	151		93	119		14.7	45	42	0.52	1.1	0.9		< 0.3	<0.8		0.8	5	MUD
6.0	89	160		104	128		14.7	46	44	0.40	1.3	0.8		0.33	<0.8		0.7	6	MUD
6.2	249	527		254	495		16.7	47	46	1.16	4.4	8.4		1.1	3.4		14.1	28	SILT
6.4	112	185		127	153		14.7	49	48	0.33	1.6	0.9		0.44	<0.8		0.8	8	MUD
6.6	107	176		122	144		14.7	50	50	0.31	1.5	0.8		0.38	<0.8		0.7	7	MUD
6.8	117	183		132	151		14.7	50	52	0.24	1.6	0.7		0.43	<0.8		0.6	8	MUD
7.0	145	213		160	181		14.7	51	54	0.20	2.1	0.7		0.56	1.1		0.6	12	MUD
7.2	133	204		148	172		14.7	52	56	0.26	1.8	0.8		0.48	0.82		0.7	10	MUD
7.4	125	198		140	166		14.7	53	58	0.32	1.5	0.9		0.41	<0.8		0.8	8	MUD
7.6	144	217		159	185		14.7	54	60	0.27	1.8	0.9		0.49	0.86		0.8	11	MUD
7.8	156	234		171	202		14.7	55	62	0.29	2.0	1.1		0.53	0.97		0.9	12	MUD
8.0	152	231		166	199		14.7	56	64	0.32	1.8	1.1		0.49	0.87		1.0	11	MUD
8.2	147	229		161	197		15.7	57	66	0.37	1.7	1.2		0.45	<0.8		1.1	10	SILTY CLAY
8.4	155	221		170	189		14.7	59	68	0.18	1.7	0.7		0.47	0.81		0.6	11	MUD
8.6	168	237		183	205		14.7	60	70	0.19	1.9	0.8		0.52	0.93		0.7	12	MUD
8.8	163	255		177	223		15.7	60	72	0.44	1.7	1.6		0.47	0.81		1.4	11	SILTY CLAY
9.0	168	237		183	205		14.7	62	74	0.20	1.8	0.8		0.48	0.83		0.7	12	MUD

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_07 DESCRIPTION
9.2	170	247		185	215		14.7	63	76	0.28	1.7	1.1		0.47	0.81		0.9	12	MUD
9.4	191	276		205	244		15.7	64	77	0.30	2.0	1.3		0.55	1.0		1.2	14	CLAY
9.6	199	285		213	253		15.7	65	79	0.30	2.1	1.4		0.56	1.1		1.2	15	CLAY
9.8	188	267		202	235		14.7	66	81	0.27	1.8	1.1		0.50	0.88		1.0	13	MUD
10.0	190	277		204	245		15.7	67	83	0.34	1.8	1.4		0.49	0.85		1.2	13	SILTY CLAY
10.2	178	264		192	232		15.7	68	85	0.37	1.6	1.4		0.42	<0.8		1.2	11	SILTY CLAY
10.4	175	253		190	221		14.7	69	87	0.31	1.5	1.1		0.39	<0.8		0.9	10	MUD
10.6	175	237		190	205		14.7	70	89	0.15	1.4	0.5		0.38	<0.8		0.4	10	MUD
10.8	175	235		190	203		14.7	71	91	0.13	1.4	0.4		0.36	<0.8		0.4	10	MUD
11.0	193	273		207	241		14.7	72	93	0.29	1.6	1.2		0.42	<0.8		1.0	12	MUD
11.2	196	361		206	329		15.7	73	95	1.11	1.5	4.3		0.40	<0.8		3.6	11	SILT
11.4	210	309		223	277		15.7	74	97	0.42	1.7	1.9		0.46	<0.8		1.6	13	SILTY CLAY
11.6	203	288		217	256		15.7	76	99	0.33	1.6	1.3		0.42	<0.8		1.1	12	CLAY
11.8	197	319		209	287		15.7	77	101	0.72	1.4	2.7		0.37	<0.8		2.3	11	CLAYEY SILT
12.0	216	310		230	278		15.7	78	103	0.38	1.6	1.7		0.44	<0.8		1.4	13	SILTY CLAY
12.2	199	308		212	276		15.7	79	105	0.60	1.4	2.2		0.35	<0.8		1.9	11	SILTY CLAY
12.4	207	298		221	266		15.7	80	107	0.40	1.4	1.6		0.37	<0.8		1.3	12	SILTY CLAY
12.6	233	328		247	296		15.7	81	109	0.36	1.7	1.7		0.46	<0.8		1.5	15	SILTY CLAY
12.8	239	324		253	292		15.7	83	111	0.27	1.7	1.3		0.47	<0.8		1.1	15	CLAY
13.0	258	370		271	338		15.7	84	113	0.43	1.9	2.3		0.51	0.91		2.0	17	SILTY CLAY
13.2	271	376		284	344		15.7	85	115	0.35	2.0	2.1		0.54	1.0		1.8	19	SILTY CLAY
13.4	266	357		280	325		15.7	86	117	0.28	1.9	1.6		0.51	0.92		1.3	18	CLAY
13.6	254	345		268	313		15.7	87	119	0.30	1.7	1.6		0.46	<0.8		1.3	16	CLAY
13.8	287	380		301	348		15.7	89	121	0.26	2.0	1.6		0.55	1.0		1.4	20	CLAY
14.0	271	382		284	350		15.7	90	123	0.41	1.8	2.3		0.49	0.85		2.0	17	SILTY CLAY
14.2	283	377		297	345		15.7	91	125	0.28	1.9	1.7		0.52	0.92		1.4	19	CLAY
14.4	298	398		311	366		15.7	92	127	0.30	2.0	1.9		0.55	1.0		1.6	20	CLAY
14.6	307	412		320	380		15.7	93	129	0.31	2.1	2.1		0.56	1.0		1.8	21	CLAY
14.8	334	456		346	424		15.7	94	130	0.36	2.3	2.7		0.62	1.2		2.7	25	SILTY CLAY
15.0	337	450		350	418		15.7	96	132	0.31	2.3	2.4		0.61	1.2		2.3	25	CLAY
15.2	327	433		340	401		15.7	97	134	0.30	2.1	2.1		0.58	1.1		1.9	23	CLAY
15.4	321	418		335	386		15.7	98	136	0.26	2.0	1.8		0.55	1.0		1.5	22	CLAY
15.6	333	426		347	394		15.7	99	138	0.23	2.1	1.6		0.57	1.1		1.5	23	CLAY
15.8	345	439		359	407		15.7	100	140	0.22	2.2	1.7		0.59	1.1		1.6	25	CLAY
16.0	361	467		374	435		15.7	101	142	0.26	2.3	2.1		0.62	1.2		2.1	26	CLAY
16.2	371	465		385	433		15.7	103	144	0.20	2.3	1.7		0.63	1.3		1.7	28	CLAY
16.4	379	492		392	460		15.7	104	146	0.28	2.4	2.4		0.64	1.3		2.4	28	CLAY
16.6	371	489		384	457		15.7	105	148	0.31	2.2	2.6		0.61	1.2		2.5	27	CLAY
16.8	382	503		394	471		15.7	106	150	0.31	2.3	2.7		0.62	1.2		2.6	28	CLAY
17.0	392	507		405	475		15.7	107	152	0.28	2.4	2.4		0.63	1.3		2.5	29	CLAY
17.2	345	578		352	546		16.7	109	154	0.98	1.8	6.7		0.49	0.87		5.7	21	SILT
17.4	355	517		365	485		16.7	110	156	0.57	1.9	4.2		0.52	0.93		3.5	23	SILTY CLAY
17.6	392	512		404	480		15.7	111	158	0.31	2.2	2.6		0.60	1.2		2.5	28	CLAY
17.8	418	539		430	507		16.7	112	160	0.28	2.4	2.7		0.65	1.3		2.8	31	CLAY
18.0	418	633		426	601		16.7	114	162	0.66	2.3	6.1		0.63	1.3		6.1	30	CLAYEY SILT
18.2	481	609		493	577		16.7	115	164	0.26	2.9	2.9		0.75	1.7		3.5	40	CLAY
18.4	469	615		480	583		16.7	117	166	0.33	2.7	3.6		0.72	1.6		4.1	37	CLAY
18.6	476	646		486	614		16.7	118	168	0.40	2.7	4.4		0.72	1.6		5.1	38	SILTY CLAY
18.8	385	521		397	489		15.7	119	170	0.41	1.9	3.2		0.52	0.93		2.7	25	SILTY CLAY
19.0	484	608		496	576		16.7	121	172	0.25	2.7	2.8		0.72	1.6		3.2	38	CLAY
19.2	471	597		483	565		16.7	122	174	0.26	2.5	2.8		0.68	1.5		3.1	36	CLAY
19.4	452	580		464	548		16.7	123	176	0.29	2.3	2.9		0.63	1.3		2.9	33	CLAY
19.6	517	709		526	677		16.7	125	178	0.43	2.8	5.2		0.74	1.7		6.3	42	SILTY CLAY
19.8	508	650		519	618		16.7	126	180	0.29	2.7	3.4		0.72	1.6		4.0	40	CLAY
20.0	507	638		519	606		16.7	127	181	0.26	2.6	3.0		0.71	1.6		3.4	40	CLAY
20.2	513	661		524	629		16.7	129	183	0.31	2.6	3.6		0.70	1.6		4.1	40	CLAY
20.4	489	615		501	583		16.7	130	185	0.26	2.4	2.8		0.65	1.4		3.0	36	CLAY
20.6	444	580		456	548		16.7	132	187	0.34	2.0	3.2		0.55	1.0		2.8	30	SILTY CLAY
20.8	410	499		424	467		15.7	133	189	0.18	1.8	1.5		0.48	0.83		1.3	25	CLAY

Z (m)	A (kPa)	B (kPa)	C (kPa)	Po (kPa)	P1 (kPa)	P2 (kPa)	Gamma (kN/m^3)	Sigma' (kPa)	Uo (kPa)	Id	Kd	Ed (MPa)	Ud	Ko	Ocr	Phi (Deg)	M (MPa)	Cu (kPa)	DMT_07 DESCRIPTION
21.0	373	453		387	421		14.7	134	191	0.17	1.5	1.2		0.39	<0.8		1.0	20	MUD
21.2	385	478		399	446		15.7	135	193	0.23	1.5	1.6		0.41	<0.8		1.4	21	CLAY
21.4	337	512		347	480		15.7	136	195	0.88	1.1	4.6		< 0.3	<0.8		3.9	14	SILT
21.6	484	640		495	608		16.7	137	197	0.38	2.2	3.9		0.59	1.1		3.7	33	SILTY CLAY
21.8	580	789		588	757		16.7	139	199	0.43	2.8	5.9		0.74	1.7		7.0	47	SILTY CLAY
22.0	669	903		676	871		17.7	140	201	0.41	3.4	6.8		0.87	2.3		9.4	60	SILTY CLAY
22.2	660	846		669	814		17.7	142	203	0.31	3.3	5.0		0.85	2.2		6.8	58	CLAY
22.4	603	748		614	716		16.7	143	205	0.25	2.9	3.5		0.75	1.7		4.3	49	CLAY
22.6	603	730		615	698		16.7	145	207	0.20	2.8	2.9		0.74	1.7		3.5	49	CLAY
22.8	620	754		632	722		16.7	146	209	0.21	2.9	3.1		0.76	1.8		3.9	51	CLAY
23.0	647	818		657	786		16.7	147	211	0.29	3.0	4.5		0.79	1.9		5.7	54	CLAY
23.2	636	787		647	755		16.7	149	213	0.25	2.9	3.8		0.77	1.8		4.6	52	CLAY
23.4	654	809		665	777		16.7	150	215	0.25	3.0	3.9		0.78	1.9		4.9	55	CLAY
23.6	764	979		772	947		17.7	152	217	0.32	3.7	6.1		0.92	2.6		8.9	71	CLAY
23.8	823	1061		829	1029		17.7	153	219	0.33	4.0	6.9		0.98	2.9		10.8	80	CLAY
24.0	794	973		803	941		17.7	155	221	0.24	3.8	4.8		0.94	2.7		7.2	75	CLAY
24.2	765	1032		770	1000		17.7	156	223	0.42	3.5	8.0		0.89	2.4		11.4	69	SILTY CLAY
24.4	793	1053		798	1021		17.7	158	225	0.39	3.6	7.7		0.92	2.5		11.3	73	SILTY CLAY
24.6	880	1233		881	1201		17.7	159	227	0.49	4.1	11.1		1.0	3.1		17.6	86	SILTY CLAY
24.8	1053	1492		1049	1460		18.6	161	229	0.50	5.1	14.2		1.2	4.3		25.8	114	SILTY CLAY
25.0	1068	1460		1067	1428		18.6	163	231	0.43	5.1	12.5		1.2	4.4		22.8	116	SILTY CLAY

DMT_01 - Tabular data: Vs, Go, Vs Repeatability

Each Vs value in the 'Vs Repeatability' column corresponds to a distinct energization.

Z	Vs	Go	Rho	Vs Repeatability	Var Coeff.
[m]	[m/s]	[MPa]	[kg/m^3]	[m/s]	[%]
1.50	198	70.6	1800	198	0.00
2.50	485	412	1750	485	0.00
3.50	322	192	1850	322	0.00
4.50	162	49.9	1900	162	0.00

DMT_02 - Tabular data: Vs, Go, Vs Repeatability

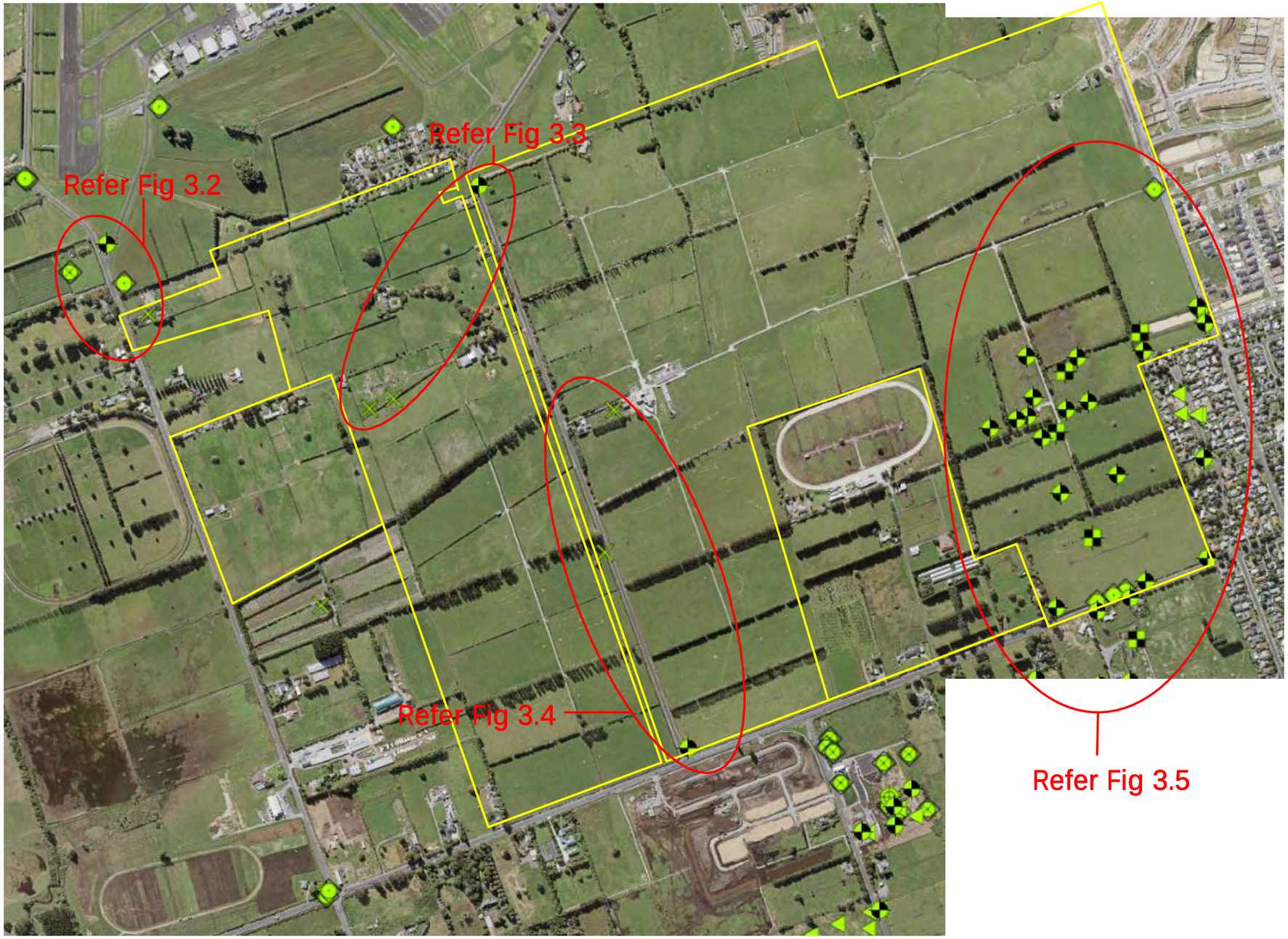
Each Vs value in the 'Vs Repeatability' column corresponds to a distinct energization.

Z	Vs	Go	Rho	Vs Repeatability	Var Coeff.
[m]	[m/s]	[MPa]	[kg/m^3]	[m/s]	[%]
1.50	38	2.2	1500	38	0.00
2.50	158	38.7	1550	158	0.00
3.50	0	0.0	1450	0	
4.50	65	6.3	1500	65	0.00
5.50	41	2.5	1500	41	0.00
6.50	116	20.9	1550	116	0.00
7.50	31	1.4	1500	31	0.00
8.50	121	21.2	1450	121	0.00
9.50	39	2.3	1500	39	0.00
10.50	32	1.5	1500	32	0.00
11.50	45	3.0	1500	45	0.00
12.50	0	0.0	1650	0	
13.50	310	144	1500	310	0.00
14.50	49	3.8	1600	49	0.00
15.50	28	1.2	1550	28	0.00
16.50	26	1.1	1600	26	0.00
17.50	35	1.9	1550	35	0.00

APPENDIX 3.8

EXISTING GEOTECHNICAL DATA (NZGD RECORDS)

Legend and/or Notes:



SOURCE: NZGS Database,; refer Figs. 3.2-3.5 insets for test labels

revision	description	drawn	approved	date

drawn	KM
approved	SGL
date	28.11.23
scale	nts
original size	A3

LDE LAND DEVELOPMENT & ENGINEERING

client: **SUNFIELD DEVELOPMENTS LIMITED**

project: **SUNFIELDS, ARDMORE**

title: **NZGS DATABASE OF EXISTING INFORMATION**

project no: **J01627** figure no: **3.1**

Template revision: 1:1000 (10/12/14)

FIGURE 3.2

FIGURE 3.4

FIGURE 3.3

FIGURE 3.5

revision	description	drawn	approved	date

drawn	KM
approved	SGL
date	28.11.23
scale	nts
original size	A3

LDE LAND DEVELOPMENT & ENGINEERING

client: SUNFIELD DEVELOPMENTS LIMITED

project: SUNFIELDS, ARDMORE

title: NZGS DATABASE TEST LABELS

project no: J01627 | figure no: 3.2 - 3.5

Template revision: 1:1000 (10/12/14)

PATTLE DELAMORE PARTNERS LTD

LOG OF BOREHOLE
Papakura Groundwater Monitoring

HOLE NO. **MB16**
JOB NO: A02331700

CLIENT: Papakura District Council

LOCATION: Corner Hamlin Road and Cosgrave Road

START DATE: 31/08/2010
END DATE: 31/08/2010

COORDINATES: 1773564E 5898849N

TOTAL DEPTH: 6.0m

LOGGED BY: GJS

SHEET 1 OF 1

GROUND LEVEL: 24.28m
TOP OF CASING: 24.57m

INTERPRETATION	DESCRIPTION OF SOIL / ROCK (based on cuttings etc.)	GRAPHIC LOG	DEPTH (m)	RL (m)	DRILLING DEPTH / DATE	WATER LEVEL GAIN / LOSS	SAMPLES / TESTS	INSTALLATION
FILL	Silty fine to coarse GRAVEL; brown. Tightly packed; moist; silt is non plastic.		0.0	24				Raised Toby Box
			1.0	23				
TAURANGA GROUP	Organic SILT with fibrous and amorphous organics; dark brown to black. Soft; non plastic [PEAT].		2.0	22				Bentonite Casing 50mm uPVC
			3.0	21				
			4.0	20				Sand
			5.0	19				Walton Park Sand (7/14) Screen 50mm uPVC
			6.0					

END OF BOREHOLE AT 6.0m

Notes: Hand Augered to 1.2m.

KEY
- Groundwater Level
- Water Gain
- Water Loss
- Grab sample

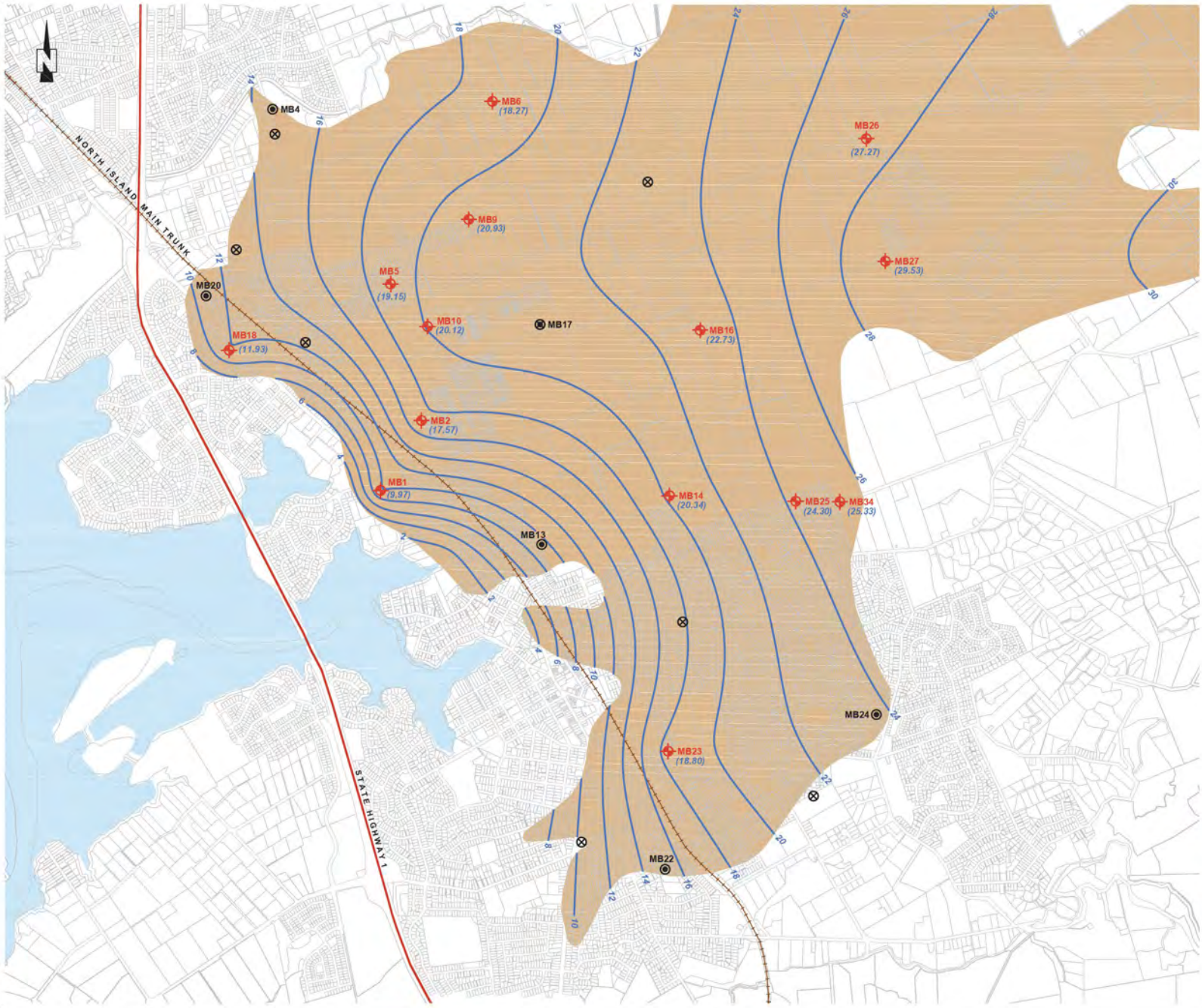
Drilled By:
Diameter: 100mm
Method: Wash rotary
Datum:

Filename: PDP ID No: 546

Logs based on New Zealand Geomechanics Society Field Description Guidelines (2005)

NZGD ID: BH_70544

NZGD ID: BH_70544



PATTLE DELAMORE PARTNERS LTD

LOG OF BOREHOLE
Papakura Groundwater Monitoring

HOLE NO. **MB27**
JOB NO: A02331700

CLIENT: Papakura Distric Council
LOCATION: 81 Hamlin Road

START DATE: 31/08/2010
END DATE: 31/08/2010
COORDINATES: 1774783E 5899303N
TOTAL DEPTH: 6.0m
LOGGED BY: GJS
SHEET 1 OF 1

GROUND LEVEL: 30.54m
TOP OF CASING: 30.70m

INTERPRETATION	DESCRIPTION OF SOIL / ROCK (based on cuttings etc.)	GRAPHIC LOG	DEPTH (m)	RL (m)	DRILLING DEPTH / DATE	WATER LEVEL GAIN / LOSS	SAMPLES / TESTS	INSTALLATION
TAURANGA GROUP	SILT; brown. Soft; moist; non plastic.		0.0	30				Raised Toby Box
	Organic SILT with fibrous and amorphous organics; black. Soft; wet; non plastic [PEAT].		1.0	29				Bentonite
			2.0	28				Casing 50mm uPVC
			3.0	27				Sand
			4.0	26				Walton Park Sand (7/14)
			5.0	25				Screen 50mm uPVC
			6.0					

END OF BOREHOLE AT 6.0m

Notes: Hand Augered to 1.2m.

KEY
- Groundwater Level
- Water Gain
- Water Loss
- Grab sample

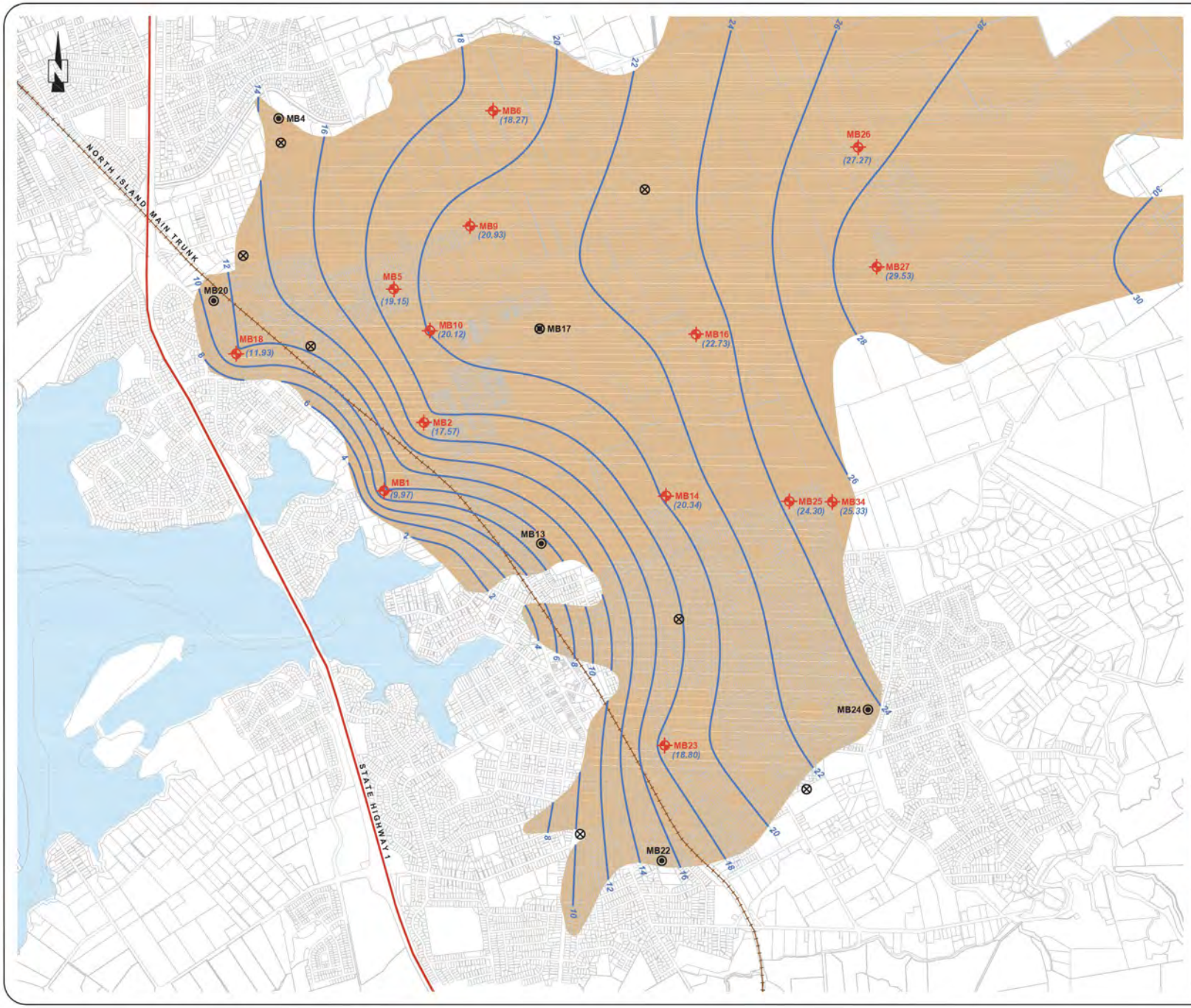
Drilled By:
Diameter: 100mm
Method: Wash rotary
Datum:

Filename: PDP ID No: 555

Logs based on New Zealand Geomechanics Society Field Description Guidelines (2005)

NZGD ID: BH_70553

NZGD ID: BH_70553



KEY :

- MONITORING BOREHOLE (PIEZOMETER INSTALLED)
- BOREHOLE (NO PIEZOMETER)
- PROPOSED MONITORING BOREHOLE (WITH PIEZOMETER)
- (9.97) GROUNDWATER LEVEL (01/04/2011)
- 20 GROUNDWATER CONTOUR (01/04/2011)
- AUCKLAND COUNCIL PEAT AREA

SOURCE:
1. CADASTRAL/TOPOGRAPHICAL INFORMATION DERIVED FROM LINZ DATA
2. PEAT AREA SUPPLIED BY AUCKLAND COUNCIL.

NO.	REVISION	DATE	APP.
A	ISSUED FOR REVIEW	APR 11	

CLIENT : Auckland Council

PROJECT :

PAPAKURA GROUNDWATER LEVEL MONITORING PROGRAMME

TITLE :

LOCATION MAP

pdp solutions for your environment
PATTLE DELAMORE PARTNERS LTD
Auckland Wellington Christchurch

SCALE 1:25,000 (A3)

0 500m 1km

PROJECT NO.	FIGURE NO.	REVISION
A02331700	01	A

FILE: A02331700D001.dwg IMAGE:

NZGD ID: BH_70553

PATTLE DELAMORE PARTNERS LTD

LOG OF BOREHOLE
Papakura Groundwater Monitoring

HOLE NO. **MB34**
JOB NO: A02331700

CLIENT: Papakura District Council
LOCATION: 508 Old Wairoa Road

START DATE: 31/08/2010
END DATE: 31/08/2010
COORDINATES: 1774484E 5897720N
TOTAL DEPTH: 6.0m
LOGGED BY: GJS
SHEET 1 OF 1

GROUND LEVEL: 26.18m
TOP OF CASING: 26.27m

INTERPRETATION	DESCRIPTION OF SOIL / ROCK (based on cuttings etc.)	GRAPHIC LOG	DEPTH (m)	RL (m)	DRILLING DEPTH / DATE	WATER LEVEL GAIN / LOSS	SAMPLES / TESTS	INSTALLATION
TAURANGA GROUP	Organic SILT with fibrous and amorphous organics; black to dark brown. Soft; non plastic; wet; bands of more silty or more sibrous material encountered [PEAT].		0.0 1.0 2.0 3.0 4.0 5.0 6.0	26 25 24 23 22 21		31 Aug		Raised Toby Box Bentonite Casing 50mm uPVC Sand Walton Park Sand (7/14) Screen 50mm uPVC

END OF BOREHOLE AT 6.0m

Notes: Hand Augered to 1.2m.

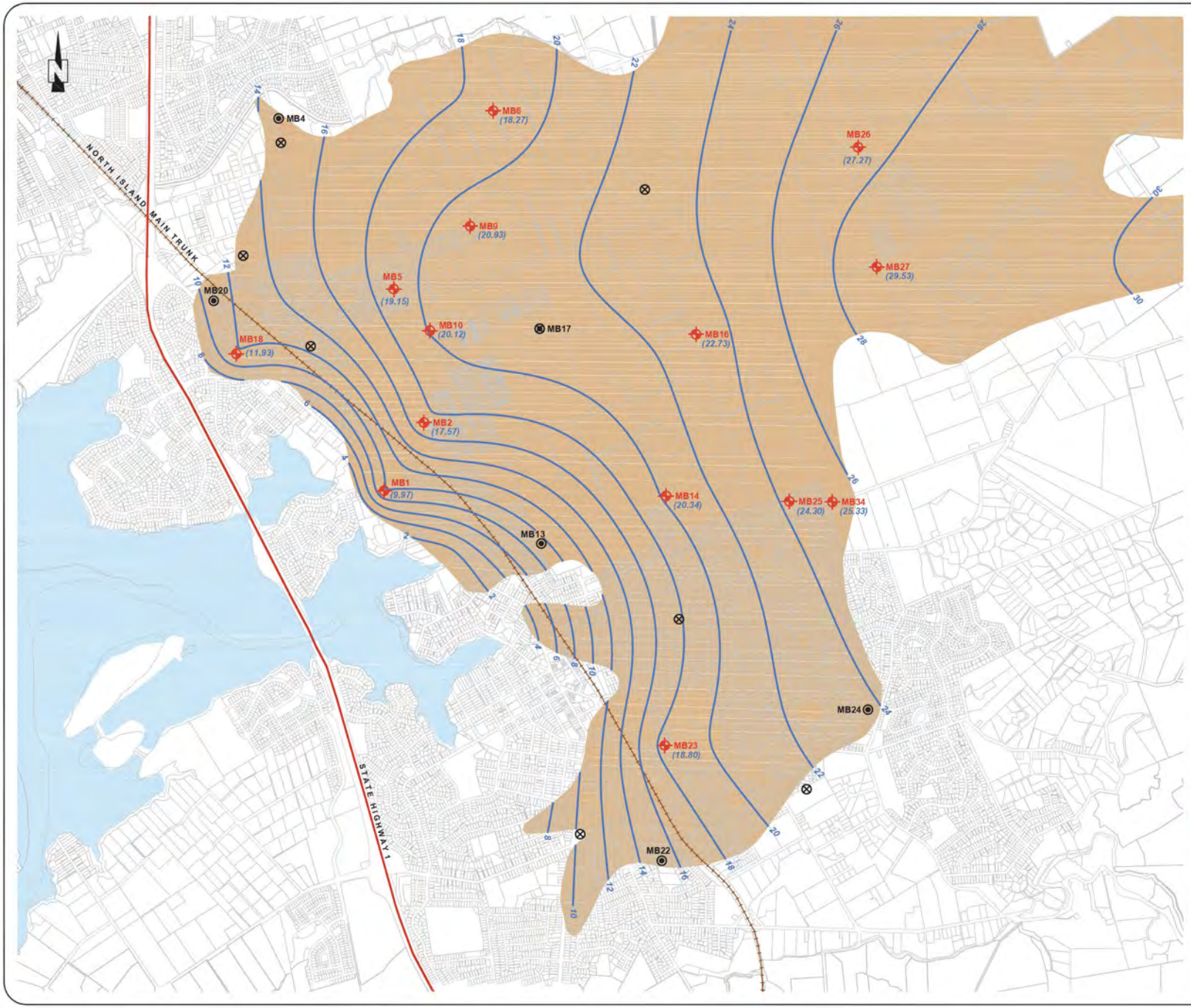
KEY
- Groundwater Level
- Water Gain
- Water Loss
- Grab sample

Drilled By:
Diameter: 100mm
Method: Wash rotary
Datum:
Filename: PDP ID No: 556

Logs based on New Zealand Geomechanics Society Field Description Guidelines (2005)

NZGD ID: BH_70554

NZGD ID: BH_70554



KEY :

- MONITORING BOREHOLE (PIEZOMETER INSTALLED)
- BOREHOLE (NO PIEZOMETER)
- PROPOSED MONITORING BOREHOLE (WITH PIEZOMETER)
- (9.97) GROUNDWATER LEVEL (01/04/2011)
- 20 GROUNDWATER CONTOUR (01/04/2011)
- AUCKLAND COUNCIL PEAT AREA

SOURCE:
1. CADASTRAL/TOPOGRAPHICAL INFORMATION DERIVED FROM LINZ DATA
2. PEAT AREA SUPPLIED BY AUCKLAND COUNCIL

NO.	REVISION	DATE	APP.
A	ISSUED FOR REVIEW	APR 11	

CLIENT : Auckland Council

PROJECT : PAPAKURA GROUNDWATER LEVEL MONITORING PROGRAMME

TITLE : LOCATION MAP

pdp solutions for your environment
PATTLE DELAMORE PARTNERS LTD
Auckland Wellington Christchurch

SCALE 1:25,000 (A3)

0 500m 1km

PROJECT NO.	FIGURE NO.	REVISION
A02331700	01	A

FILE: A02331700D001.dwg IMAGE:

NZGD ID: BH_70554

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-20B**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm, Cosgrave Road
Job No.: 51/32174/04

Coordinates: E 1773924.4, N 5897848.9
Surface RL (m): +25.3m
Commenced: 14-Nov-14
Completed: 14-Nov-14

Datum: NZTM
Total Depth: 6.5m
Contractor: Pro-Drill
Driller: Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	JFK
Processed:	JFK
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.0 [+25.3]	OB	50			Topsoil	ML		SILT with trace clay; dark brown. Firm, moist, non plastic. Some rootlets. [Topsoil].	M	F						
0.5 [+24.7]	OB	74		▼	Peat (Amorphous)	OL		Organic SILT with minor clay and medium sand; dark brown. Soft to firm, moist to wet, non plastic. Some rootlets.	M-W	S-F					SV 22/16	
1.0 [+24.3]						SP		Fine SAND; light brown. 'Loose', wet to saturated, poorly graded. Slightly dilatant. Some rootlets and plant remains. [Ash].	W-S	'L'					SV 34+	
1.1 [+24.2]						OL			M-	S-F						
1.2 [+24.1]	OB	100				OH		Organic SILT with minor clay and medium sand; dark brown. Soft to firm, moist to wet, non plastic. Some rootlets.	W W	S-F						
1.5	SPT	100						CLAY; dark brown to black. Soft to firm, wet, moderate to high plasticity. Minor rootlets (Amorphous Peat). ...from 1.50m, becomes saturated.							SV 34+ SPT	0,0, 0,0, 0,0, [N=0]
2.0	OB	71						...from 2.16m, wood fragments and tree gum inclusions. ...at 2.26m, 80mm wood inclusion.								
2.4 [+22.8]						OH		...from 2.34m, wood fragment inclusions. Organic CLAY; dark brown, very soft to soft, saturated, high plasticity (Amorphous Clay).	S	VS-S						
3.0	SPT	0						...3.00m to 3.45m, SPT coreloss but cored over and recovered (disturbed).							SV 40/16 SPT	0,0, 0,0, 0,0, [N=0]
3.8 [+21.4]	OB	55				OH		Organic CLAY; dark brown, black. Soft, wet, high plasticity. Minor organic material and rootlets (Amorphous Peat). ...4.00m 60mm, 70% wood fragments	W	S					SV 13/0	
4.4 [+20.9]		100			Peat (Fibrous)	OL		CLAY with some silt; dark brown to black, soft, wet, low plasticity, 30% organic material, wood and rootlets (Semi-fibrous Peat). ...4.60m, low plasticity, minor silt	W	S						
5.0 [+20.3]	SPT	49						CORE LOSS 4.95 to 5.50m							SV 27/16 SPT	0,0, 0,0, 0,0, [N=0]
5.5 [+19.8]	OB	0				OL		CLAY with some silt; dark brown to black, very soft to soft, wet, low plasticity, some organic material, wood and rootlets (Semi-fibrous Peat).	W	VS-S						
6.0		76														
6.1 [+19.2]	SPT	89				SM		Silty fine SAND; orange brown, loose, saturated, poorly graded, moderately to highly dilatant (Ash).	S	L					SV 27/13 SPT	0,0, 0,0, 0,0, [N=0]
6.2 [+19.2]						OL		CLAY with some silt; dark brown to black, very soft to soft, wet, low plasticity, some organic material, wood and rootlets (Semi-fibrous Peat).	W	VS-S						
6.5 [+18.8]								Termination Depth = 6.45m, Target depth								
7.0																

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-20B

Project	Takanini 2a/2b Conveyance	**Commenced**	14/11/14	**Completed**	14/11/14
Site	Kennys' Farm, Cosgrave Road	**Logged By**	JFK		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 3.0 m

3.0 m to 6.45 m

NZGD ID: BH_70572

BOREHOLE with Piezo LOG

GHD Limited

PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-21**

Sheet 1 of 6

Project:	SHA Takanini 2a/2b	**Coordinates:** E 1773889.31, N 5897883.28	**Datum:** NZTM
Client:	Auckland Council	**Surface RL (m):** +25.4m	**Total Depth:** 40.6m
Site:	Cosgrave Road shoulder	**Commenced:** 01-Dec-14	**Contractor:** Pro-Drill
Job No.:	51/32174/04	**Completed:** 03-Dec-14	**Driller:** Rodney Campbell

Equipment:	Tractor TX5	**Inclination:** -90	**Logged:** RV
Shear Vane:	Geo 1060	**Comments:**	**Processed:** RV
Bore Diameter (mm):	86		**Checked:** BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0	Vacuum	0			No recovery			Vacuum excavated first 1.5 m to clear services, with down hole shear vanes at 0.5 m centres.							SV 128/45 SV 13/3	
1.5 [+23.9]	Wash drill	0						No recovery in SPT or open barrel @ 1.5 m; cased to 1.5 m and wash-drilled to 2.0 m.							SV 13/3 SPT 1,0, 0,0, 0,0, [N=0]	
2.0 [+23.4]	Open Barrel	82	HW	▼	Peat (Fibrous)	Pt		CLAY with trace sand and minor organics; black. Soft; saturated; sand, fine. (Semi-fibrous Peat)	S	S					SV 17/4	
								@ 2.7 m becomes wet.	W						SV 21/4	
3								@ 3.0 m becomes saturated and amorphous.	S							
	SPT	58			Peat (Amorphous)			@ 3.45 m becomes wet.	W						SV 16/4 SPT 0,0, 0,0, 0,0, [N=0]	
4.1 [+21.3]	Open Barrel	55														
	Push Tube	0						Coreloss from 4.1 to 5.1 m bgl.								
5	Push Tube	92														
5.1 [+20.3]	Open Barrel	100			Peat (Fibrous)	Pt		CLAY with trace sand and minor organics; black. Soft; saturated; low plasticity; sand, fine. (Amorphous Peat) @ 5.1 m becomes semi-fibrous.	S	S						
								@ 5.86 m with some wood.								
6.0 [+19.4]	SPT	0						Coreloss from 6.0 to 6.45 m bgl.							SPT 0,0, 0,0, 0,0, [N=0]	
6.5 [+18.9]	Open Barrel	70				Pt		CLAY with some wood and carbonaceous organics; black. Very soft; saturated; low plasticity. (Semi-fibrous Peat)	S	VS						
7																

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-21**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Cosgrave Road shoulder
Job No.: 51/32174/04

Coordinates: E 1773889.31, N 5897883.28 **Datum:** NZTM
Surface RL (m): +25.4m **Total Depth:** 40.6m
Commenced: 01-Dec-14 **Contractor:** Pro-Drill
Completed: 03-Dec-14 **Driller:** Rodney Campbell

Equipment: Tractor TX5
Shear Vane: Geo 1060
Bore Diameter (mm): 86

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
7.6 [+17.8]	Open Barrel	70	HW		Peat (Semi-fibrous)	Pt		CLAY with some wood and carbonaceous organics; black. Very soft; saturated; low plasticity. (Semi-fibrous Peat)	S	VS					SV 8/0	
7.6 [+17.8]								@ 7.53 m wood.	S	VS						
	SPT	89				SM Pt		SILT with some sand and minor carbonaceous organics; light brown with black flecks. Very soft; saturated; sand, fine; dilatant. (Ash)	S	VS					SV UTP (wood) SPT	0,0, 0,0, 0,0, [N=0]
8.1 [+17.3]								CLAY with some carbonaceous organics; black. Very soft; saturated. (Semi-fibrous Peat)	S	VL						
8.1 [+17.3]	Open Barrel	100				SM Pt		Fine SAND with some silt and minor carbonaceous organics; yellow with black flecks. Very loose; saturated; dilatant. (Ash)	W	VS						
8.5 [+16.9]						SM		CLAY with some silt, minor wood fragments and carbonaceous organics; black. Very soft; wet; low plasticity. (Semi-fibrous Peat)	W	VS						
8.5 [+16.8]						Pt		Sandy SILT with minor carbonaceous organics; light brown with black flecks. Very soft; wet; sand, fine; dilatant. (Ash)	W	VS					SV 8/0	
	SPT	96						CLAY with some silt and minor carbonaceous organics; black. Very soft; wet; low plasticity. (Semi-fibrous Peat)		S					SV 13/0 SPT	0,0, 0,0, 0,0, [N=0]
10	Open Barrel	93						@ 8.92 m with very thin (8-19 mm) ash layer mixed in with peat. @ 8.94 m has medium plasticity. @ 9.0 m becomes soft with low plasticity. @ 9.45 m with trace fine sand.								
								@ 9.94 m to 10.07 m becomes woody (20-50% wood).								
								@ 10.21 m has high plasticity.								
								@ 10.38 m has low plasticity.								
	SPT	100						@ 10.6 m becomes saturated.	S						SV 13/0 SPT	0,0, 0,0, 0,0, [N=0]
11								@ 10.92 m becomes wet.	W							
	Open Barrel	100						@ 11.05 m becomes saturated.	S						SV 11/0	
11.3 [+14.0]						Pt		CLAY with minor wood and carbonaceous organics; black. Very soft; wet; low plasticity. (Semi-fibrous Peat)	W	VS						
								@ 11.56 m with some wood.								
								@ 11.68 m becomes saturated.	S							
12								@ 11.73 m becomes wet.	W							
12.6 [+13.4]	SPT	64				Pt		CLAY with trace sand and minor carbonaceous organics; black. Soft; saturated; low plasticity; sand, fine, (Semi-fibrous Peat)	S	S					SV 13/0 SPT	0,0, 0,0, 0,0, [N=0]
								@ 12.45 m becomes wet.	W							
13	Open Barrel	100						@ 13.1 m becomes saturated.	S							
								@ 13.33 m becomes wet.	W							
								@ 13.5 m becomes saturated.	S						SPT	0,0, 0,0, 1,1, [N=2]
	SPT	73						@ 13.65 m becomes wet.	W							
14																

NZGD ID: BH_70573

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-21**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Cosgrave Road shoulder
Job No.: 51/32174/04

Coordinates: E 1773889.31, N 5897883.28 **Datum:** NZTM
Surface RL (m): +25.4m **Total Depth:** 40.6m
Commenced: 01-Dec-14 **Contractor:** Pro-Drill
Completed: 03-Dec-14 **Driller:** Rodney Campbell

Equipment: Tractor TX5
Shear Vane: Geo 1060
Bore Diameter (mm): 86

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
15	Open Barrel	95			Peat (Semi-fibrous)	Pt		CLAY with trace sand and minor carbonaceous organics; black. Soft; saturated; low plasticity; sand, fine, (Semi-fibrous Peat)	S	S					SV UTP (wood)	
								@ 14.37 to 14.67 m becomes woody (20-50% wood).								
	SPT	100						@ 15.0 m becomes saturated.	S						SV 17/0 SPT 0,0, 0,0, 0,0, [N=0]	
15.6 [+9.9]								@ 15.23 m becomes wet.	W							
16	Open Barrel	100				Pt		CLAY with minor carbonaceous organics; black. Soft; saturated; low plasticity. (Semi-fibrous Peat)	S	S						
								@ 16.0 m becomes very soft.		VS					SV 4/0	
16.3 [+9.0]					Peat (Amorphous)	Pt		CLAY; dark brown. Very soft; wet; low plasticity. (Amorphous Peat)	W	VS						
16.5 [+8.9]						Pt		CLAY with minor wood fragments; black. Very soft; saturated; low plasticity. (Semi-fibrous Peat)	S	VS						
16.7 [+8.7]	SPT	100				Pt		@ 16.63 m core comprises 90% wood fragments to 16.86 m.	W	VS					SV UTP (wood) SPT 1,0, 0,0, 0,0, [N=0]	
17	Open Barrel	69	HW					CLAY with minor carbonaceous organics; dark brown with black flecks. Very soft; wet; medium plasticity. (Amorphous Peat) @ 16.95 m core comprises 90% wood fragments to 17.44 m.								
								@ 17.44 m has low plasticity.							SV 3/0	
17.7 [+7.7]						SP		Fine to medium SAND with trace silt; brown with black spots. Very loose; wet. (Alluvium)	W	VL						
18.0 [+7.4]	SPT	0						Coreloss from 18.0 to 18.5 m bgl.							SPT 6,3, 1,1, 1,1, [N=4]	
18.5 [+6.9]						Pt		CLAY; dark brown. Soft; wet; moderate plasticity. (Amorphous Peat)	W	S						
								@ 18.8 m becomes and dark brown with black flecks.								
18.9 [+6.4]	Open Barrel	92			Alluvium (Puketoka)	CH		CLAY; brown with black flecks. Soft (disturbed); wet; high plasticity. (Alluvium)	W	S					SV 21/1	
19.1 [+6.3]						CL		@ 19.02 m becomes light brown with black smears. CLAY with minor silt; light greenish grey. Soft (disturbed); wet; low plasticity. (Alluvium)	W	S						
20	SPT	100						@ 20.0 m becomes firm.		F					SV 28/4 SPT 0,1, 2,1, 2,1, [N=6]	
	Open Barrel	62														
21																

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-21**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Cosgrave Road shoulder
Job No.: 51/32174/04

Coordinates: E 1773889.31, N 5897883.28 **Datum:** NZTM
Surface RL (m): +25.4m **Total Depth:** 40.6m
Commenced: 01-Dec-14 **Contractor:** Pro-Drill
Completed: 03-Dec-14 **Driller:** Rodney Campbell

Equipment: Tractor TX5
Shear Vane: Geo 1060
Bore Diameter (mm): 86

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
22	SPT	89	None		Alluvium (Puketoka)	CL		CLAY with minor silt; light greenish grey. Soft (disturbed); wet; low plasticity. (Alluvium)	W	S					SV 37/13 SPT 0,0, 0,0, 0,0, [N=0]	
	Open Barrel	97						@ 20.45 m has medium plasticity.								
22.1 [+3.3]								@ 22.0 m has low plasticity.							SV 40/13	22
						SM		SILT with some sand; light greenish grey. Firm; wet; sand, fine; non-plastic. (Alluvium)	W	F						
22.9 [+2.5]	SPT	100													SV 29/5 SPT 0,0, 2,1, 1,2, [N=6]	
23						CL		CLAY with some silt; light greenish grey. Firm; wet; medium plasticity. (Alluvium)	W	F						23
	Open Barrel	85													SV 43/11	
24																24
	SPT	100													SPT 1,1, 2,3, 3,3, [N=11]	
	Open Barrel	50						@ 24.55 m has low plasticity.								
25.6 [-0.2]						SM		SILT with minor sand and clay; light greenish grey. Stiff; wet; low plasticity; sand, fine. (Alluvium)	W	St					SV 60/13 SPT 0,0, 0,2, 2,2, [N=6]	
26	SPT	100														25
	Open Barrel	100				SM		SILT with some sand; light greenish grey. Stiff; wet; low plasticity; sand, fine. (Alluvium)	W	St						26
26.7 [-1.4]						SM		Fine to medium SAND with trace silt; light greenish grey. Loose; wet. (Alluvium)	W	L						
26.9 [-1.5] 26.9 [-1.6]						SM SM		Silty CLAY; light greenish grey. 'Soft'; wet. (Alluvium) Fine to medium SAND; light greenish grey. Medium dense; wet. (Alluvium) @ 27.1 to 27.2 m contains some fine gravel that breaks down to a silt.	W	MD						
27	SPT	89													SPT 2,2, 3,2, 3,3, [N=11]	27
27.4 [-2.1]						ML		SILT; light greenish grey. Stiff; wet; non-plastic. (Alluvium)	W	St						
27.6 [-2.2]						SP		@ 27.6 m contains CLAY lens 45 mm long and 5 mm wide; black. 'Soft'; wet.	W W	'S' MD						
27.8 [-2.4]		100				ML			W	St						
28																28

NZGD ID: BH_70573

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-21**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Cosgrave Road shoulder
Job No.: 51/32174/04

Coordinates: E 1773889.31, N 5897883.28
Surface RL (m): +25.4m
Commenced: 01-Dec-14
Completed: 03-Dec-14

Datum: NZTM
Total Depth: 40.6m
Contractor: Pro-Drill
Driller: Rodney Campbell

Equipment: Tractor TX5
Shear Vane: Geo 1060
Bore Diameter (mm): 86

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
[2.6]	Open Barrel	100			Alluvium (Puketoka)	CL		Fine to medium SAND with trace gravel; light greenish grey. Medium dense; wet; gravel, fine, angular. (Alluvium)	W	St					SV 69/9	
								SILT with minor sand and trace fine gravel; light greenish grey with dark green flecks. Stiff; wet; sand, fine; gravel, fine, angular. (Alluvium)								
	SPT	100						CLAY with some sand lenses; grey. Stiff; wet; medium plasticity; sand lenses, fine, very thin to thinly laminated, extremely closely spaced to closely spaced. (Alluvium)							SV 97/17 SPT 2,2, 4,5, 6,6, [N=21]	
29																29
	Open Barrel	87														
30																30
[30.4 -5.0]	SPT	100													SPT 2,3, 3,3, 3,3, [N=12]	
	Open Barrel	91				CL		CLAY; dark grey. Stiff; wet; medium plasticity. (Alluvium) @ 30.61 m becomes light greenish grey with low plasticity.	W	St						
31								@ 31.0 m becomes hard.		H					SV 187+	31
[31.5 -6.1]	SPT	93	None			SM		SILT with some sand; light greenish grey. Hard; wet; low plasticity; sand, fine. (Alluvium)	W	H					SV 187+ SPT 5,5, 5,7, 8,11, [N=31]	
[32.0 -6.6]	HQ Coring	82			Kaawa Formation	SM		Fine SAND with minor silt; greenish grey. Dense; wet. (Completely Weathered Sandstone) @ 32.15 m becomes dark grey.	W	D	CW					32
[32.8 -7.4]						SM		Fine SAND that breaks down to a SILT with some sand; greenish grey. Very stiff; wet; non-plastic. (Completely Weathered Sandstone)	W	VSt						
33	SPT	84													SPT 2,3, 3,5, 5,5, [N=18]	33
[33.6 -8.1]	HQ Coring	57	None			SM		Fine SAND with some silt; greenish grey. Medium dense; wet. (Completely Weathered Sandstone)	W	MD						
34																34
[34.1 -8.6]						SM		Fine SAND that breaks down to a silty SAND; greenish grey. Medium dense; wet. (Completely Weathered Sandstone)	W	MD						
[34.5 -9.1]	SPT	100				SM		Fine SAND that breaks down to a SAND with some silt; greenish grey. Dense; wet. (Completely Weathered Sandstone)	W	D					SPT 3,5, 7,10, 11,16, [N=44]	
35 [35.0]																35

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3.GDT 1/9/15

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-21**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Cosgrave Road shoulder
Job No.: 51/32174/04

Coordinates: E 1773889.31, N 5897883.28
Surface RL (m): +25.4m
Commenced: 01-Dec-14
Completed: 03-Dec-14

Datum: NZTM
Total Depth: 40.6m
Contractor: Pro-Drill
Driller: Rodney Campbell

Equipment: Tractor TX5
Shear Vane: Geo 1060
Bore Diameter (mm): 86

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
36.1 [-9.7]	HQ Coring	100	None		Kaawa Formation	SM		Silty fine to coarse SAND; greenish grey. Wet. (Completely Weathered Sandstone)	W	H						
						SM		Fine to medium SAND that breaks down to a SILT with minor sand; greenish grey. Hard; wet; non-plastic. (Completely Weathered Sandstone)	W	H						
36		100														
36.6 [-10.6]	SPT	100				SM		Fine SAND that breaks down to a SILT with trace fine sand; greenish grey. Hard; wet; non-plastic. (Completely Weathered Sandstone)	W	H					SPT 3,5, 7,8, 11,16, [N=42]	
36.3 [-11.0]	HQ Coring	78				SM		Fine SAND that breaks down to a SILT with some sand; greenish grey. Hard; wet; non-plastic. (Completely Weathered Sandstone)	W	H						
37																37
37.3 [-11.7]						SM		Fine SAND that breaks down to a SILT with minor sand; greenish grey. Hard; wet; non-plastic. (Completely Weathered Sandstone)	W	H						
37.6 [-12.1]	SPT	100				SM		Fine to coarse SAND; greenish grey. Very dense; wet. (Completely Weathered Sandstone)	W	VD					SPT 3,5, 6,8, 16,20, [N=50+]	
37.7 [-12.3]			None			SM		Fine SAND that breaks down to a SILT with minor sand; greenish grey. Hard; wet; non-plastic. (Completely Weathered Sandstone)	W	H						
38	HQ Coring	81				SM		Silty fine to coarse SAND; greenish grey. Very dense; wet. (Completely Weathered Sandstone)	W	VD						38
39.0 [-13.6]	SPT	71				SM		Coarse SAND with some silt; greenish green. Very dense; wet. (Completely Weathered Sandstone)	W	VD					SPT 6,10, 13,20, 17,*, [N=50+]	
39.4 [-14.0]	HQ Coring	93			East Coast Bays Fm			Slightly weathered, greenish grey, homogeneous, fine to coarse grained SANDSTONE. Very weak.			SW					
40																40
40.5 [-15.1]	SPT							Termination Depth = 40.555m, Target depth							SPT 50,*, [N=50+]	
41																41
42																42

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-21

Project	Takanini 2a2b Conveyance	**Commenced**	01/12/14	**Completed**	03/12/14
Site	Cosgrave Road shoulder	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 40.5 m bgl		

0.0 m to 5.86 m

5.86 m to 8.89 m

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Report of Photographs

Site Identification: GHD-MBH-21

Project	Takanini 2a2b Conveyance	**Commenced**	01/12/14	**Completed**	03/12/14
Site	Cosgrave Road shoulder	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 40.5 m bgl		

8.89 m to 11.34 m

11.34 m to 13.95 m

NZGD ID: BH_70573

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Report of Photographs

Site Identification: GHD-MBH-21

Project	Takanini 2a2b Conveyance	**Commenced**	01/12/14	**Completed**	03/12/14
Site	Cosgrave Road shoulder	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 40.5 m bgl		

13.95 m to 16.36 m

16.36 m to 19.67 m

NZGD ID: BH_70573

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Report of Photographs

Site Identification: GHD-MBH-21

Project	Takanini 2a2b Conveyance	**Commenced**	01/12/14	**Completed**	03/12/14
Site	Cosgrave Road shoulder	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 40.5 m bgl		

19.67 m to 22.26 m

22.26 m to 24.8 m

NZGD ID: BH_70573

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-21

Project	Takanini 2a2b Conveyance	**Commenced**	01/12/14	**Completed**	03/12/14
Site	Cosgrave Road shoulder	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 40.5 m bgl		

24.8 m to 27.7 m

27.7 m to 30.36 m

NZGD ID: BH_70573

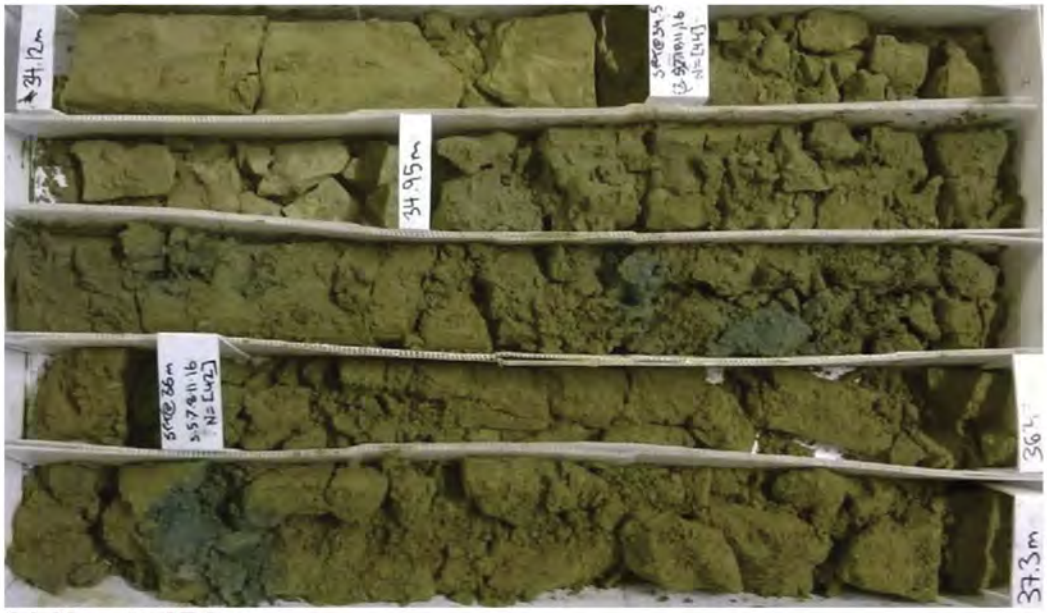
CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-21

Project	Takanini 2a2b Conveyance	**Commenced**	01/12/14	**Completed**	03/12/14
Site	Cosgrave Road shoulder	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 40.5 m bgl		

30.36 m to 34.12 m



34.12 m to 37.3 m

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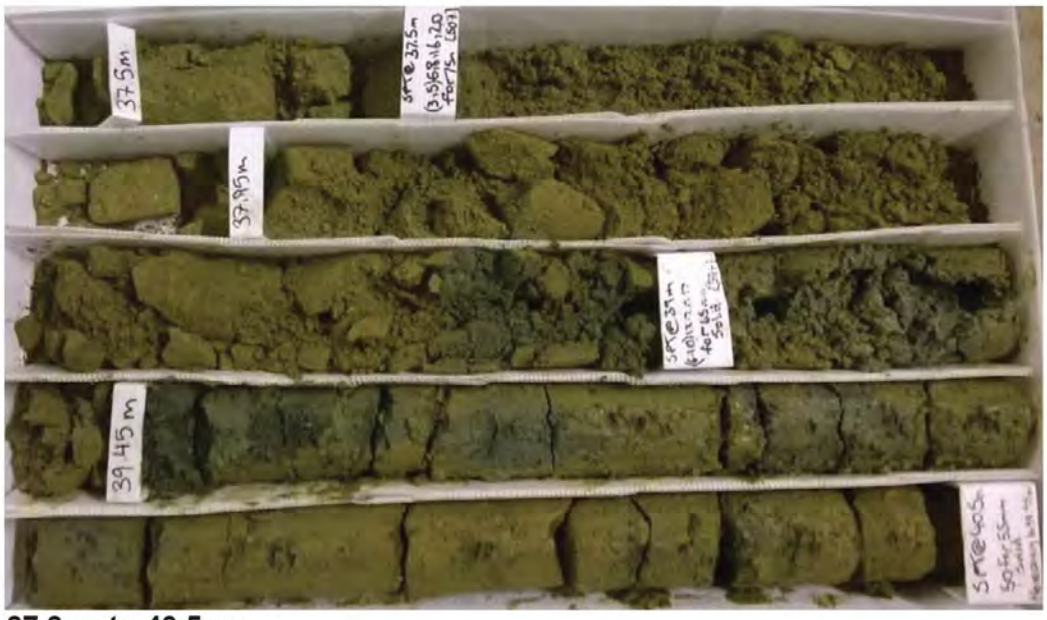
Report of Photographs

Site Identification: GHD-MBH-21

Project	Takanini 2a2b Conveyance	**Commenced**	01/12/14	**Completed**	03/12/14
Site	Cosgrave Road shoulder	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 40.5 m bgl		



37.3 m to 40.5 m

NZGD ID: BH_70573

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-23**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm, Cosgrave Road
Job No.: 51/32174/04

Coordinates: E 1773866.9, N 5898042.39
Surface RL (m): +25.3m
Commenced: 14-Nov-14
Completed: 14-Nov-14

Datum: NZTM
Total Depth: 6.7m
Contractor: Pro-Drill
Driller: Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	JFK
Processed:	JFK
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.3 [25.1]	OB	100			Topsoil	ML		SILT with minor clay; dark brown. Firm, moist, non plastic. Some rootlets. (Topsoil)	M	F						
		100			Peat (Amorphous)	Pt		WOOD; varying states of decomposition with poor recovery. 0.27m to 0.50m, can be cut with core knife. 0.50m to 2.00m, hard and intact.							SV UTP (wood) SV UTP (wood)	
1		50		▼												1
	SPT	33													SV UTP (wood) SPT 4,2, 1,1, 0,1, [N=3]	
2.0 [23.3]						OL		CLAY with some silt and trace fine sand; dark brownish black. Soft, wet, low plasticity (Amorphous Peat)	W	S						2
2.2 [23.1]	OB	100				SP		Fine to medium SAND (10mm); light brown. 'Loose', wet, poorly graded. (Ash)	W	'L' S						
2.5 [22.8]						OL			W	S						
		76				OL		CLAY; dark brown to black. Soft, wet, low plasticity. (Amorphous Peat) CLAY; dark brown. Very soft to soft, wet, low to moderate plasticity. (Amorphous Peat)	W	VS-S					SV 20/5	
3.0 [22.3]	SPT	0				OL		Highly disturbed. CLAY; dark brown to black. Very soft to soft, saturated, low plasticity. 60% to 70% fibrous material. [Fibrous peat]. 3.00m to 3.45m, coreless; 3.45m to 4.00m, coreless; 4.00m to 4.60m, coreless; 4.60m to 5.00m, recovered.	S	VS-S					SV UTP (wood) SPT 0,0, 0,0, 0,0, [N=0]	3
	OB	58														4
4.6 [20.7]		75				OL		CLAY; dark brown to black. Soft, wet to saturated, low plasticity. Minor organic material inclusions. (Amorphous Peat)	W-S	S						
	SPT	100													SV 8/0 SPT 0,0, 0,0, 0,0, [N=0]	5
	OB	53														6
	SPT	100													SV 0/0 SPT 0,1, 0,0, 0,0, [N=0]	
6.7 [18.7]								Termination Depth = 6.65m, Target depth								7

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

NZGD ID: BH_70575

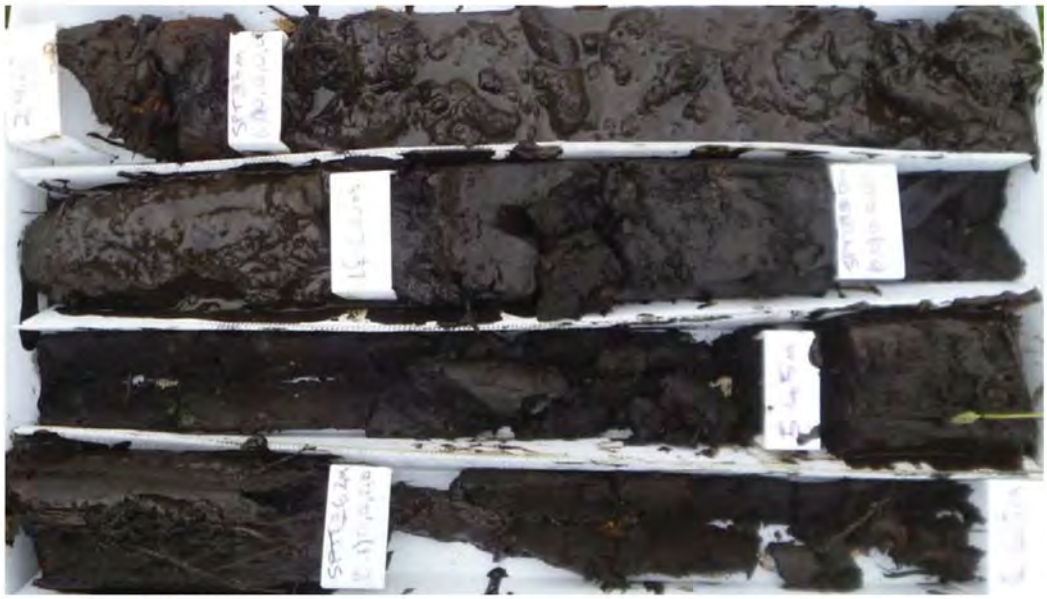
CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-23

Project	Takanini 2a/2b Conveyance	**Commenced**	14/11/14	**Completed**	14/11/14
Site	Kennys' Farm, Cosgrave Road	**Logged By**	JFK		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.65 m bgl		

0.0 m to 2.9 m



2.9 m to 6.65 m

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-24**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774115.41, N 5898035.09 **Datum:** NZTM
Surface RL (m): +25.4m **Total Depth:** 6.5m
Commenced: 11-Nov-14 **Contractor:** Pro-Drill
Completed: 11-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96
Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.3 [+25.1]	Open Barrel	52	None		Peat (Amorphous)	OL		SILT with some rootlets; dark brown. Moist; non-plastic. (Topsoil)	M							
						Pt		SILT with some sand; black. Soft; saturated; non-plastic; sand, fine to coarse. (Semi-fibrous Peat)	S	S						
0.6 [+24.8]		80		▼		Pt		Clayey SILT with minor sand; dark brown with light brown flecks. Soft; moist; non-plastic. (Amorphous Peat)	M	S					SV 18/3	
0.7 [+24.7]						Pt			M	S						
0.8 [+24.6]						Pt			M	S						
1								CLAY with minor silt; dark brown. Soft; moist; medium plasticity; amorphous, plastic; ash pockets.	M							
1.1 [+24.3]						SM		(Amorphous Peat)	S	T					SV 34+	
1.2 [+24.2]		100				Pt		CLAY with minor organics; dark brown with black flecks. Soft; moist; medium plasticity. (Amorphous Peat) @ 1.0 m becomes firm and saturated.	W	F						
	SPT	100						Sandy SILT with some carbonaceous organics; light brown with dark brown streaks and black flecks. Firm; wet; non-plastic; sand, fine. (Ash)	W	VS					SV UTP (wood) SPT 1,0, 0,0, 0,0, [N=0]	
2	Open Barrel	95	None		Peat (Fibrous)			CLAY with some organics and trace sand; black. Firm; wet; medium plasticity; sand, fine to coarse; plastic. (Semi-fibrous Peat) @ 1.4 to 1.42 m with some wood fragments. @ 1.5 m becomes very soft. @ 1.95 mto 2.25 m with piece of wood, 300 mm long. @ 2.35 m becomes dark brown and saturated with 50% wood.							
3	SPT	33						@ 3.0 m no wood.							SV UTP (wood) SPT 1,2, 1,0, 1,1, [N=3]	
3.5 [+22.0]	Open Barrel	100				Pt		Wood with wood fragments; black. Saturated.	S							
4		48						@ 3.85 to 4.0 m solid piece of wood, 300 mm long.							SV UTP (wood)	
4.4 [+21.0]						Pt		CLAY with 50% wood and trace sand; black. Very soft; saturated; low plasticity. (Amorphous Peat)	S	VS						
4.6 [+20.8]	SPT	100				Pt		CLAY with minor carbonaceous organics and trace wood fragments; dark brown with black flecks. Very soft; saturated. (Amorphous Peat)	S	VS					SV 1/0 SPT 0,0, 0,0, 0,0, [N=0]	
5	Open Barrel	64	None		Peat (Amorphous)	SM		SILT with minor sand and clay; light brown smeared dark brown with black flecks. Very soft; saturated. (Ash)	S	VS						
5.2 [+20.2]						Pt			W	VS						
5.3 [+20.2]		100						CLAY with minor carbonaceous organics; dark brown with black flecks. Very soft; wet; medium plasticity. (Amorphous Peat) @ 5.5 m becomes saturated with minor wood branches.							SV 4/0	
5.9 [+19.5]								Two 50 mm pieces of wood.								
6	SPT	100				Pt		CLAY with some silt and organics; black. Very soft; wet; low plasticity. (Semi-fibrous Peat)	W	VS					SV UTP (wood) SPT 0,0, 0,0, 0,0, [N=0]	
6.5 [+19.0]								Termination Depth = 6.45m, Target depth								
7																

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3.GDT 1/9/15

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Report of Photographs

Site Identification: GHD-MBH-24

Project	Takanini 2a/2b Conveyance	**Commenced**	11/11/14	**Completed**	11/11/14
Site	Kennys' Farm, 55 Cosgrave Road	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 3.0 m

3.0 m to 6.45 m

NZGD ID: BH_70576

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-25**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774155.82, N 5897911.88 **Datum:** NZTM
Surface RL (m): +25.6m **Total Depth:** 6.5m
Commenced: 11-Nov-14 **Contractor:** Pro-Drill
Completed: 12-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96
Inclination: -90
Comments:

Logged:	MB/RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.3 [+25.4]	Open Barrel	54	None		Peat (Amorphous)	OL		SILT with some rootlets and minor clay; brown. Moist; non-plastic; friable. (Topsoil)	M							
		58				OL		SILT with some sand and trace organics; brown. Firm; saturated; low plasticity. (Organic Silt)	S	F					SV 34+	
0.9 [+24.7]		100				OL		Silty CLAY with trace wood; black. Soft; moist; medium plasticity; slightly spongy. (Organic Clay). @ 1.1 m becomes more organic rich.	M	S					SV 19/5	
1.2 [+24.4]						ML		SILT with trace sand; light brown. Soft; moist to wet; sand, fine; slightly dilatant. (Ash)	M	S						
1.3 [+24.3]	SPT	33				OL		Silty CLAY with trace wood; black. Soft; moist; medium plasticity; slightly spongy. (Organic Clay).	M	S					SV UTP (wood) SPT 2,1, 1,0, 0,1, [N=2]	
2.1 [+23.5]								No recovery.								
	Open Barrel	71				Pt		Silty CLAY with some wood; black. Stiff; moist to wet; medium plasticity. (Amorphous Peat)	M	St					SV 64/27	
2.8 [+23.1]	SPT	0						@ 3.0 m become soft.		S					SV 23/7 SPT 0,1, 1,0, 0,0, [N=1]	
3.5 [+22.1]						OL		CLAY with some wood; dark brown. Soft; wet; medium plasticity. (Organic Clay)	W	S					SV UTP (wood)	
	Open Barrel	46														
4.6 [+21.0]	SPT	100				Pt		Silty CLAY; dark brown. Very soft; wet; medium plasticity; slightly spongy. (Amorphous Peat)	W	VS					SPT 1,0, 0,0, 0,0, [N=0]	
5.0 [+20.6]	Open Barrel	71				OL		CLAY with some wood; dark brown. Very soft; wet; medium plasticity. (Organic Clay)	W	VS						
5.4 [+20.2]		100				Pt		Silty CLAY; dark brown. Very soft; wet; medium plasticity; slightly spongy. (Amorphous Peat)	W	VS						
6.2 [+19.4]	SPT	100				ML		SILT with trace sand; light brown. Very soft; moist to wet; sand, fine; slightly dilatant. (Ash)	M	VS					SPT 1,1, 1,0, 0,0, [N=1]	
6.3 [+19.3]						Pt		Silty CLAY; dark brown. Very soft; wet; medium plasticity; slightly spongy. (Amorphous Peat)	W	VS						
6.5 [+19.2]								Termination Depth = 6.45m, Target depth								

NZGD ID: BH_70577

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Report of Photographs

Site Identification: GHD-MBH-25

Project	Takanini 2a/2b Conveyance	**Commenced**	11/11/14	**Completed**	12/11/14
Site	Kennys' Farm, 55 Cosgrave Road	**Logged By**	RV / MB		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 3.0 m

3.0 m to 6.0 m

No recovery in SPT @ 6.0 m bgl to 6.45 m bgl.

NZGD ID: BH_70577

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-26**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774315.58, N 5897974.18
Surface RL (m): +25.1m
Commenced: 12-Nov-14
Completed: 12-Nov-14

Datum: NZTM
Total Depth: 6.5m
Contractor: Pro-Drill
Driller: Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	MB
Processed:	JK/RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating
0.1 [+25.0]	Open Barrel	50	None		Peat (Fibrous)	OL		TOPSOIL			
						Pt		Clayey SILT with some organics; dark brown. Very soft; moist; low plasticity. (Amorphous Peat)	M	VS	
0.6 [+24.5]						SM		Sandy SILT; cream brown. Very soft; moist; non-plastic; sand, fine; slightly dilatant; pumiceous. (Rhyolitic Ash)	M	VS	SV 7/1
0.7 [+24.5]		80		▼		Pt			M	VS	
1								Silty CLAY with some wood; black. Very soft; moist; medium plasticity; slightly spongy. (Semi-fibrous Peat)	W		SV UTP (wood)
		70						@ 1.0 m becomes wet.			
2								@ 1.8 m becomes 70-80% wood.			
2.1 [+23.0]	SPT	11				OH		CLAY with some wood and organics; dark brown. Soft; wet; medium to high plasticity. (Fibrous Peat)	W	S	SV 15/9 SPT 1,0, 0,0, 0,0, [N=0]
	Open Barrel	88						@ 2.3 m becomes 80% wood.			
3								@ 3.3 m with minor wood and trace dilatant ash within matrix.			SPT 0,0, 0,0, 0,0, [N=0]
3.8 [+21.3]	SPT	67				Pt		Solid piece of wood.			
4.0 [+21.1]	Open Barrel	100				OH		Silty CLAY with some wood inclusions; dark brown. Very soft; wet; medium to high plasticity. (Fibrous Peat)	W	VS	
5	SPT	100									SPT 0,0, 0,0, 0,0, [N=0]
	Open Barrel	90									
5.8 [+19.3]						Pt		Silty CLAY with some wood and organics; black. Very soft; moist; medium plasticity. (Amorphous Peat)	M	VS	
6	SPT	0						No recovery.			SPT 0,0, 0,0, 0,0, [N=0]
6.5 [+18.7]								Termination Depth = 6.45m, Target Depth			
7											

Weathering: EW, VW, W, MS, S, VS, ES
Estimated Rock Strength
RQD (%)
Defect Spacing (mm): 20, 60, 200, 600, 2000
Piezometer

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Report of Photographs

Site Identification: GHD-MBH-26

Project	Takanini 2a/2b Conveyance	**Commenced**	12/11/14	**Completed**	12/11/14
Site	Kennys' Farm	**Logged By**	MB		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 3.3 m

3.3 m to 6.0 m

No recovery in SPT @ 6.0 m bgl to 6.45 m bgl.

NZGD ID: BH_70578

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-27**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774297.75, N 5898021.57
Surface RL (m): +25.1m
Commenced: 12-Nov-14
Completed: 13-Nov-14
Datum: NZTM
Total Depth: 6.5m
Contractor: Pro-Drill
Driller: Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.0 [+25.1]	Open Barrel	50	None		Peat (Fibrous)	OL		SILT with some rootlets and trace sand; dark brown. Moist; non-plastic; sand, fine. (Topsoil)	M							
								@ 0.23 to 0.53 m with minor charcoal and ash comprising silty fine SAND; brownish orange.								
0.8 [+24.5]						SM		Silty fine SAND with some carbonaceous organics; light brown with black flecks. Very soft; moist; non-plastic. (Ash)	M	VS						
0.7 [+24.4]		90		▼		Pt			M	VS					SV 10/3	
1.0 [+24.1]						Pt		CLAY with minor rootlets; black. Very soft; moist; medium plasticity. (Amorphous Peat) @ 0.77 m piece of wood.	S	VS					SV 4/1	1
1.5 [+23.7]		70				Pt		CLAY with some rootlets, minor silt and trace sand; black. Very soft; saturated; sand, fine; plastic. (Semi-fibrous Peat)	W	VS						
								CLAY with trace sand; black. Very soft; wet; low plasticity; sand fine to medium; medium plasticity. (Amorphous Peat)								
2.1 [+23.0]		100				Pt		@ 1.81 m becomes dark brown and saturated with some organics.	S							2
						Pt		CLAY with some organics and trace sand; brown. Very soft; saturated; sand fine; medium plasticity. (Semi-fibrous Peat)	S	VS						
2.5 [+22.6]		0						No recovery.								
3.0 [+22.1]	SPT	86				Pt		Solid pieces of wood and wood fragments (tree trunk).							SPT SV UTP (wood) 5,12, 15,22, 13,*, [N=>50]	3
	OB	60														
		100														
	WD	0														
	HQ Coring	72														4
	SPT	13													SPT SV UTP (wood) 0,1, 0,0, 0,0, [N=0]	
5.1 [+20.1]						Pt		CLAY with trace sand; dark brown. Very soft; saturated; sand, fine to coarse. (Semi-fibrous Peat)	S	VS						5
5.5 [+19.7]	Open Barrel	79				Pt		CLAY; black. Very soft; wet; medium to high plasticity. (Amorphous Peat)	W	VS						
5.6 [+19.6]						Pt		CLAY with minor wood fragments and carbonaceous organics; black. Very soft; wet; (Semi-fibrous Peat)	W	VS						
								@ 5.95 m with some wood fragments. @ 6.0 m becomes soft.		S						
	SPT	100													SPT SV 13/0 0,1, 1,0, 1,0, [N=2]	6
6.3 [+18.8]						Pt		Wood pieces.								
6.5 [+18.7]								Termination Depth = 6.45m, Target Depth								
7																7

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Report of Photographs

Site Identification: GHD-MBH-27

Project	Takanini 2a/2b Conveyance	**Commenced**	12/11/14	**Completed**	13/11/14
Site	Kennys' Farm	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 3.3 m

3.3 m to 6.0 m

NZGD ID: BH_70579

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-28**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774323.72, N 5898094.54
Surface RL (m): +25.2m
Commenced: 06-Nov-14
Completed: 06-Nov-14

Datum: NZTM
Total Depth: 6.5m
Contractor: Pro-Drill
Driller: Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	RV/JFK
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.5 [+24.7]	Open Barrel	66	None		Peat (Amorphous)	OL		SILT with some clay and rootlets and minor sand; dark brown. Moist; low plasticity; sand, fine. (Topsoil)	M							
								@ 0.25 to 0.29 m with some ash mixed in, comprising SILT with some fine sand; dark brown to light brown.								
0.6 [+24.6]						Pt		CLAY with some silt and trace sand; drak brown. Soft; wet; low plasticity; sand fine. (Amorphous Peat)	W	S					SV 22/1	
0.7 [+24.5]		76		▼		SM		100 mm piece of wood.	W							
0.8 [+24.4]						Pt		Fine to medium SAND with some silt; light brown. Wet; slightly dilatant. (Ash)	W	S						
1.0 [+24.2]						Pt		CLAY with some silt; black. Soft; wet; low plasticity. (Amorphous Peat)	S	S					SV 16/3	
1.1 [+24.2]		85						50 mm piece of wood.								
								CLAY with some silt, trace sand and 30% organic rootlets; black. Soft; saturated; low plasticity. (Amorphous Peat)	W							
								@ 1.4 m becomes wet.								
2.0 [+23.2]								@ 1.7 m becomes saturated with 80% wood (no rootlets).	S							
		0				Pt		Wood fragments. Push tube @ 2.0m, no revocery.							SV 7/3	
								Open barrel to 3.0m, no recovery.								
		81						Open barrel to 3.2m, no recovery.							SV UTP (wood)	
		72						@ 4.0m, 500mm fragment of wood.							SV UTP (wood)	
		40						@ 4.5m to 5.0m, 200mm fragment of wood.								
		72														
5.5 [+19.7]		96				Pt		CLAY with minor rootlets; dark brown. Very soft; saturated; low to medium plasticity. (Amorphous Peat)	S	VS					SV 8/0	
6.0 [+19.2]	SPT	0						No recovery.							SV 5/0 SPT 0,0, 0,0, 0,0, [N=0]	
6.5 [+18.8]								Termination Depth = 6.45m, Target Depth								

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Report of Photographs

Site Identification: GHD-MBH-28

Project	Takanini 2a/2b Conveyance	**Commenced**	06/11/14	**Completed**	06/11/14
Site	Kennys' Farm	**Logged By**	RV / JFK		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 4.0 m

4.0 m to 6.0 m

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-29A**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774283.72, N 5898105.46 **Datum:** NZTM
Surface RL (m): +25.2m **Total Depth:** 6.6m
Commenced: 05-Nov-14 **Contractor:** Pro-Drill
Completed: 05-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96
Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.4 [+24.8]	Open Barrel	72	None		Peat (Fibrous)	SM		SILT with some rootlets and minor sand; dark brown. Moist; non-plastic; sand, fine. (Topsoil)	M							
0.5 [+24.7]						SM		Fine to medium SAND with some silt; light brownish yellow with black bands. Wet; non-dilatant. (Ash)	W							
0.8 [+24.5]		72				Pt		SILT with some clay and wood and trace sand; dark brown. Firm; moist; sand, fine. (Semi-fibrous Peat)	M	F					SV 34+	
0.9 [+24.3]						SM		Fine SAND with some silt and minor carbonaceous organics; light brown. wet; dilatant. (Ash)	W							
1.0 [+24.2]				▼		Pt		CLAY with some silt and wood fragments. Firm; wet; low plasticity. (Amorphous Peat)	W	F						
		66				Pt		SILT with some clay, wood and roots; black. Firm; saturated; low plasticity. (Semi-fibrous Peat)	S	F					SV 40/8	1
1.8 [+23.4]						Pt		CLAY; black. Firm; saturated; medium plasticity. (Amorphous Peat)	S	F						
1.9 [+23.3]						Pt		70 mm piece of wood.	S	VS						
2.0 [+23.2]		60				Pt		SILT with some wood and minor clay; dark brown. Very soft; saturated; low plasticity. (Semi-fibrous Peat)	S	VS					SV 8/5	2
3.0 [+22.2]	SPT	0			Peat (Amorphous)	Pt		CLAY with some wood; black. Firm; saturated. (Amorphous Peat)	S	F					SV 29/20 SPT 0,0, 0,0, 0,0, [N=0]	3
	Open Barrel	55														
		40													SV UTP (wood)	4
5.2 [+20.0]						Pt		300 mm piece of wood.								5
5.5 [+19.7]		58				Pt		CLAY with some silt and 80% wood; black. Very soft; saturated. (Amorphous Peat)	S	VS						
6.0 [+19.3]	SPT	58				Pt Pt		60 mm piece of wood. SILT with minor wood; black. Very soft; wet; medium plasticity; seni-spongy. (Semi-fibrous Peat)	W	VS					SV 7/0 SPT 0,0, 0,0, 0,0, [N=0]	6
6.6 [+18.7]								Termination Depth = 6.55m, Target Depth								7

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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Auckland, New Zealand
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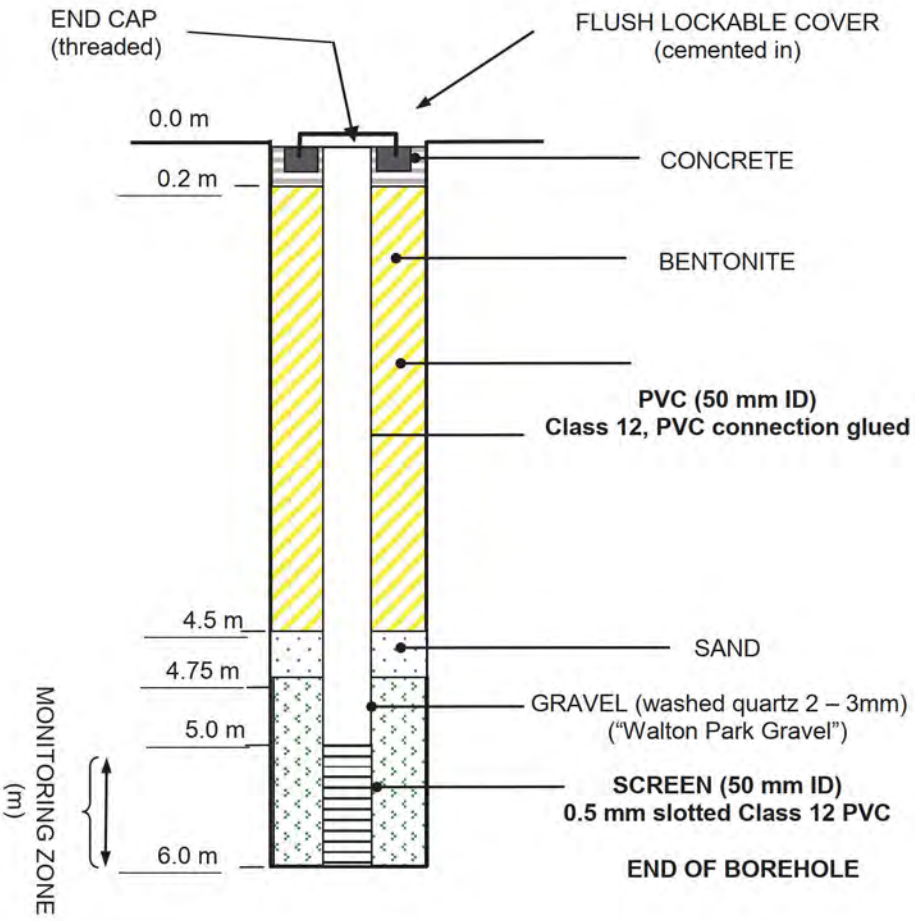
PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA Takanini 2a/2b**
Location:
Project Reference: **51-3341103**

BH29B

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 26/11/2014
Drilling Method: Wash Bore Diameter Core: 86mm Contractor: Prodrill	Easting: 1774277.966 Northing: 5898103.613 Ground Level: 25.263	**VERIFIED BY**: BH



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: BH_70581

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Report of Photographs

Site Identification: GHD-MBH-29A

Project	Takanini 2a/2b Conveyance	**Commenced**	05/11/14	**Completed**	05/11/14
Site	Kennys' Farm	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.55 m bgl		

0.0 m to 3.0 m

3.0 m to 6.55 m

NZGD ID: BH_70581

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-30**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774276.78, N 5898129.89 **Datum:** NZTM
Surface RL (m): +25.2m **Total Depth:** 6.5m
Commenced: 05-Nov-14 **Contractor:** Pro-Drill
Completed: 05-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96
Inclination: -90
Comments:

Logged:	JFK/RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.2 [+25.0]	Open Barrel	54	None		Peat (Amorphous)	OL		SILT with minor clay and trace sand; dark brown. Moist; non-plastic. (Topsoil)	M							
0.3 [+24.9]						SM		Fine to medium SAND with some silt and rootlets; greyish brown. Wet; poorly graded. (Ash)	W							
						Pt		CLAY with some silt and minor organics; brownish black. Soft; saturated; low plasticity. (Amorphous Peat)	S	S					SV 17/1	
0.7 [+24.5]		100				SM		Fine SAND with minor silt and some organics; light brown. Wet; poorly graded. (Ash)	W							
0.8 [+24.4]						Pt		CLAY with minor silt and organics; dark brownish black. Soft; wet; low plasticity. (Amorphous Peat)	W	S					SV 13/4	
1		68													SV UTP (obstruction)	1
1.7 [+23.5]		100				Pt		Wood pieces and fragments.								
2.0 [+23.2]		15						No recovery.							SV UTP (obstruction)	2
3																
3.0 [+22.2]						Pt		40 mm of wood fragments.							SV UTP (obstruction) 1,1, SPT 1,0, 0,0, [N=1]	3
3.0 [+22.1]	SPT	9						No recovery.								
3.5 [+21.7]	Open Barrel	45				Pt		40 mm piece of wood then wood fragments.								
4																4
4.0 [+21.2]		64				Pt		320 mm piece of wood with wood fragments.								
4.6 [+20.6]		66				Pt		CLAY with trace carbonaceous rootlets; black. saturated. (Amorphous Peat)	S							
5																5
5.3 [+19.9]						SM		Fine SAND with some silt; brown with white mottling. wet; dilatant. (Ash)	W	VS						
5.5 [+19.8]		90				Pt		CLAY with trace sand; black. Very soft; saturated; sand, fine. (Amorphous Peat) @ 5.5 to 5.72 m with some wood and rootlets.	S						SV 7/0	
6.0 [+19.2]	SPT	18				Pt		Silty CLAY with some wood; black. Very soft; saturated. (Semi-fibrous Peat)	S	VS					SPT 0,1, 0,0, 0,0, [N=0]	6
6																
6.5 [+18.7]								Termination Depth = 6.45m, Target Depth								
7																7

NZGD ID: BH_70582

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-30

Project	Takanini 2a/2b Conveyance	**Commenced**	05/11/14	**Completed**	05/11/14
Site	Kennys' Farm	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 4.5 m

4.5 m to 6.45 m

NZGD ID: BH_70582

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-31A**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774258.11, N 5898187.07 **Datum:** NZTM
Surface RL (m): +25.3m **Total Depth:** 6.5m
Commenced: 10-Nov-14 **Contractor:** Pro-Drill
Completed: 10-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96
Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.0 [+25.3]	Open Barrel	48	None	▼	Peat (Amorphous)	OL		SILT with some rootlets and trace sand; dark brown. Moist; non-plastic; sand, fine. (Topsoil)	M							
0.5 [+24.8]						SM		SILT with some sand and minor rootlets; brownish	M	F				SV 31/4	
0.6 [+24.7]		100				Pt		orange. Firm; moist to wet; non-plastic. (Ash)	M	F					
0.8 [+24.5]								CLAY with trace sand, wood and rootlets; dark brown. Firm; moist to wet; medium plasticity; sand, fine. (Amorphous Peat)							
1.0 [+24.3]						SM		@ 8.0 m with wood fragments.	M						
1.5 [+23.8]	Push Tube	72				Pt		Silty fine SAND; light brown with brown mottling. Moist; dilatant. (Ash)	W	S				SV 22/4	
						Pt		SILT with some sand; dark brown. Soft; wet; low plasticity; sand, fine to coarse. (Amorphous Peat)							
		72						Push tube from 1.0 to 1.5 m.							
2.0 [+23.3]						Pt		Push tube from 1.5 to 2.0 m.							
2.0 [+23.3]	Open Barrel	52				SM		Silty fine SAND; light brown. Wet; dilatant. (Ash)	W	S					
						Pt		CLAY with minor silt and wood fragments and trace sand; black. Soft; saturated; low plasticity. (Fibrous Peat)	S						
2.3 [+23.0]								@ 2.3 m becomes wet and amorphous with high plasticity.							
2.5 [+22.8]								@ 2.5 m becomes saturated with low plasticity.						SV UTP (wood)	
2.7 [+22.7]		100				Pt		Silty CLAY with some sand and 50% wood; brown. Soft; saturated; sand, fine. (Semi-fibrous Peat)	S	S					
3.0 [+22.3]	SPT	0						No recovery.						SV 10/4 SPT	0,0, 0,0, 0,0, [N=0]
3.5 [+21.8]	Open Barrel	91				Pt		CLAY with some wood; black. Very soft; saturated; medium plasticity. (Amorphous Peat)	S	VS					
								@ 3.9 to 4.25 m with 50% wood.						SV UTP (wood)	
4.5 [+20.8]		100						@ 4.3 to 4.5 m with 40-90% wood.							
	SPT	73				Pt		CLAY with minor wood; black. Very soft; saturated; medium plasticity. (Amorphous Peat)	S	VS				SV 0/0 SPT	0,0, 0,0, 0,0, [N=0]
5.3 [+20.0]	Open Barrel	100						@ 5.3 m becomes wet.	W						
								@ 5.68 m becomes saturated.	S						
5.9 [+19.4]								@ 5.9 m with large peice of wood, 40% of core.							
6.0 [+19.3]	SPT	0						No recovery.						SV 0/0 SPT	0,0, 0,0, 0,0, [N=0]
6.5 [+18.9]								Termination Depth = 6.45m, Target Depth							

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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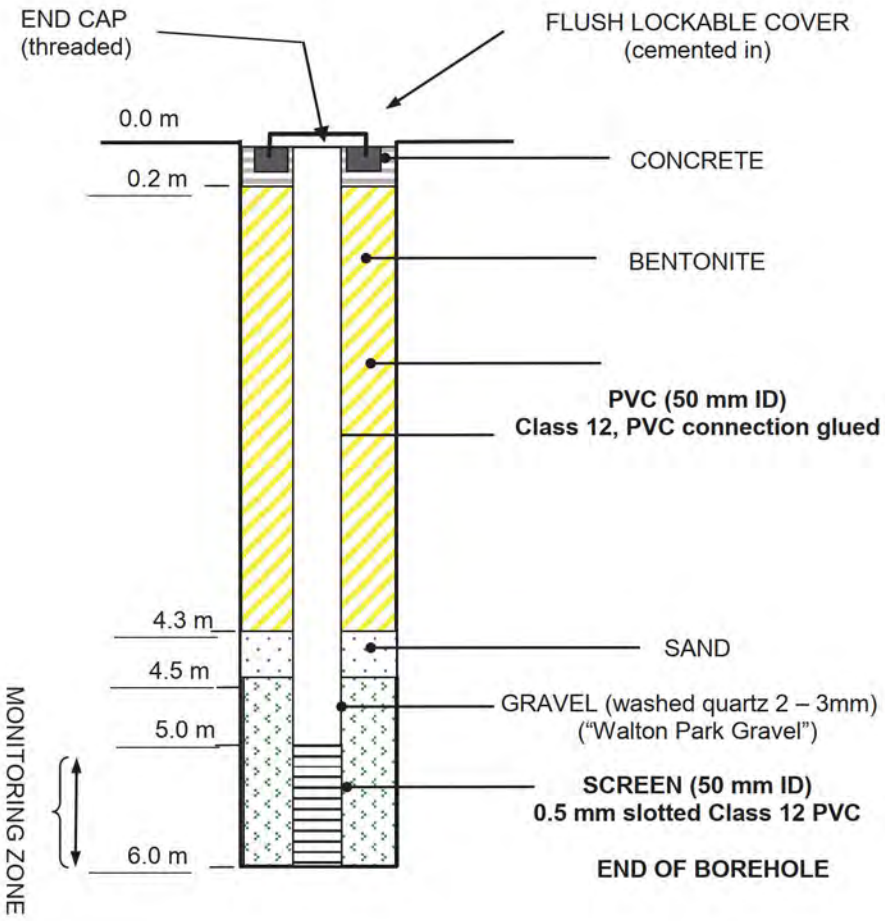
PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA Takanini 2a/2b**
Location:
Project Reference: **51-3341103**

BH31B

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 10/11/2014
Drilling Method: Wash Bore Diameter Core: 96mm Contractor: Prodrill	Easting: 1774251.436 Northing: 5898185.010 Ground Level: 25.284	**VERIFIED BY**: BH



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: BH_70583

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Report of Photographs

Site Identification: GHD-MBH-31A

Project	Takanini 2a/2b Conveyance	**Commenced**	10/11/14	**Completed**	10/11/14
Site	Kennys' Farm	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 4.0 m

4.0 m to 6.45 m

NZGD ID: BH_70583

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-32**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774409.65, N 5897998.41
Surface RL (m): +25.1m
Commenced: 13-Nov-14
Completed: 13-Nov-14

Datum: NZTM
Total Depth: 6.5m
Contractor: Pro-Drill
Driller: Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.0 [+25.1]	Open Barrel	45	None		Peat (Fibrous)	OL		SILT with some rootlets and trace sand; dark brown. Moist; sand, fine. (Topsoil)	M							
0.19 [+24.9]								@ 0.19 to 0.21 m with minor flecks of ash comprising silty fine SAND; light brown.								
0.6 [+24.6]		74				Pt		SILT with some sand and organics; black. Stiff; saturated; sand, fine. (Semi-fibrous Peat)	S	St					SV 65/48	
1.0 [+24.2]				▼				@ 0.8 m becomes moist.								
1.1 [+24.1]		56				SM		@ 0.85 m with minor rootlets, charcoal and flecks of ash comprising SILT; light brown.	W	S					SV 21/4	1
	SPT	93				Pt		Fine SAND with some silt; light brown with dark brown streaks. Wet; dilatant. (Ash)	S						SV UTP (wood) SPT 0,0, 0,0, 0,0, [N=0]	
	Open Barrel	91						CLAY with minor organics; black. Soft; saturated; low plasticity. (Semi-fibrous Peat)								
2.1 [+22.8]						Pt		Wood fragments.								
2.3 [+22.6]		94				Pt		CLAY with minor organics; black. Soft; saturated; low plasticity. (Semi-fibrous Peat)	S	S					SV UTP (wood)	2
2.7 [+22.5]						Pt		Wood fragments.								
3.0 [+22.1]	SPT	38			Alluvial Clay	OL		CLAY with minor rootlets; grey. Soft; saturated. (Alluvial Clay)	S	S					SV 25/14 SPT 0,0, 0,0, 0,0, [N=0]	
								@ 3.45 m becomes grey with black smears.								3
	Open Barrel	78						@ 3.67 to 3.89 m branches of wood.								
4.0 [+21.1]		0						No recovery.							SV 0/0	
4.5 [+20.6]						OL		CLAY with minor rootlets; grey. Very soft; saturated. (Alluvial Clay)	S	VS						4
4.7 [+20.5]		74			Peat (Fibrous)	Pt		CLAY with trace sand and 80% wood; black. Very soft; saturated; sand, fine; medium plasticity. (Semi-fibrous Peat)	S	VS						
	SPT	56						@ 4.86 m with minor wood.							SV 7/0 SPT 0,0, 0,0, 0,0, [N=0]	
	Open Barrel	84														5
6.0 [+19.1]	SPT	0						No recovery.							SV 3/0 SPT 0,0, 0,0, 0,0, [N=0]	
6.5 [+18.7]								Termination Depth = 6.45m, Target Depth								6
7																7

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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Report of Photographs

Site Identification: GHD-MBH-32

Project	Takanini 2a/2b Conveyance	**Commenced**	13/11/14	**Completed**	13/11/14
Site	Kennys' Farm	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 3.45 m

3.45 m to 6.0 m

No recovery in SPT at 6.0 to 6.45 m bgl.

NZGD ID: BH_70584

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-33A**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774411.72, N 5898107.47 **Datum:** NZTM
Surface RL (m): +25.1m **Total Depth:** 6.6m
Commenced: 07-Nov-14 **Contractor:** Pro-Drill
Completed: 07-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.4 [+24.8]	Open Barrel	82	None	▼	Peat (Fibrous)	OL		SILT with trace sand and some rootlets; dark brown. Moist; non-plastic; sand, fine. (Topsoil) @ 0.13 to 0.38 m with some ash flecks mixed in, comprising SILT with some fine sand; light brownish grey with yellow mottling.	M							
0.5 [+24.6]						SM			M							
	Push Tube	80				Pt		SILT with some sand and rootlets; light brownish grey with orange flecks. Moist; sand, fine. (Ash) Push tube from 0.5 to 1.0 m.							SV 53/21	
1 [+24.1]	Open Barrel	54				Pt		CLAY with minor silt and some rootlets; black. Stiff; wet; low plasticity. (Semi-fibrous Peat)	W	St						1
1.2 [+23.9]						Pt		@ 1.09 m with ash "dyke" down side of core (~30-40% of core), comprising silty SAND; light brown mottled black.								
1.5 [+23.6]	Push Tube	0						80 mm piece of wood. No recovery.							SV 6/1	
2.0 [+23.1]	Open Barrel	79			Peat (Amorphous)	Pt		CLAY with some organics and trace sand; black. Very soft; saturated; medium plasiticy; sand, fine to medium; medium. (Amorphous Peat)	S	VS						2
3								@ 2.66 to 2.73 m with minor ash "dyke" down side of core, comprising silty SAND with carbonaceous organics; light brown. Slightly dilatant.								
3.5 [+22.1]						Pt		@ 2.83 m with 20-50% wood. CLAY with 80% wood; dark brown. Very soft; saturated. (Amorphous Peat)	S	VS						3
		40														
		83						@ 3.95 m with 30% wood @ 4.2 m with some wood.								4
4.3 [+20.8]						Pt		@ 4.3 m 40 mm piece of wood.	S	VS						
4.5 [+20.6]						Pt		CLAY with minor wood and rootlets; dark brown. Very soft; saturated; low plasticity. (Amorphous Peat)	W	VS					SV 8/0	
		100						CLAY with some wood and minor flecks of ash; black. Very soft; wet; amorphous, plastic; ash comprises silty fine to medium SAND, light brown. (Amorphous Peat)								5
5.0 [+20.1]					Peat (Fibrous)	Pt		CLAY with minor sand and 30% wood; dark brown. Very soft; saturated; sand, fine. (Fibrous Peat)	S	VS					SV 0/0	
		42														
5.8 [+19.3]						Pt		CLAY; dark brown. Very soft; wet. (Amorphous Peat)	W	VS						6
6.1 [+19.0]	SPT	51				Pt		CLAY with trace branches; black. Very soft; wet; high plasticity. (Semi-fibrous Peat)	W	VS					SV 0/0 SPT 0,0, 0,0, 0,0, [N=0]	
6.6 [+18.6]								Termination Depth = 6.55m, Target Depth								7

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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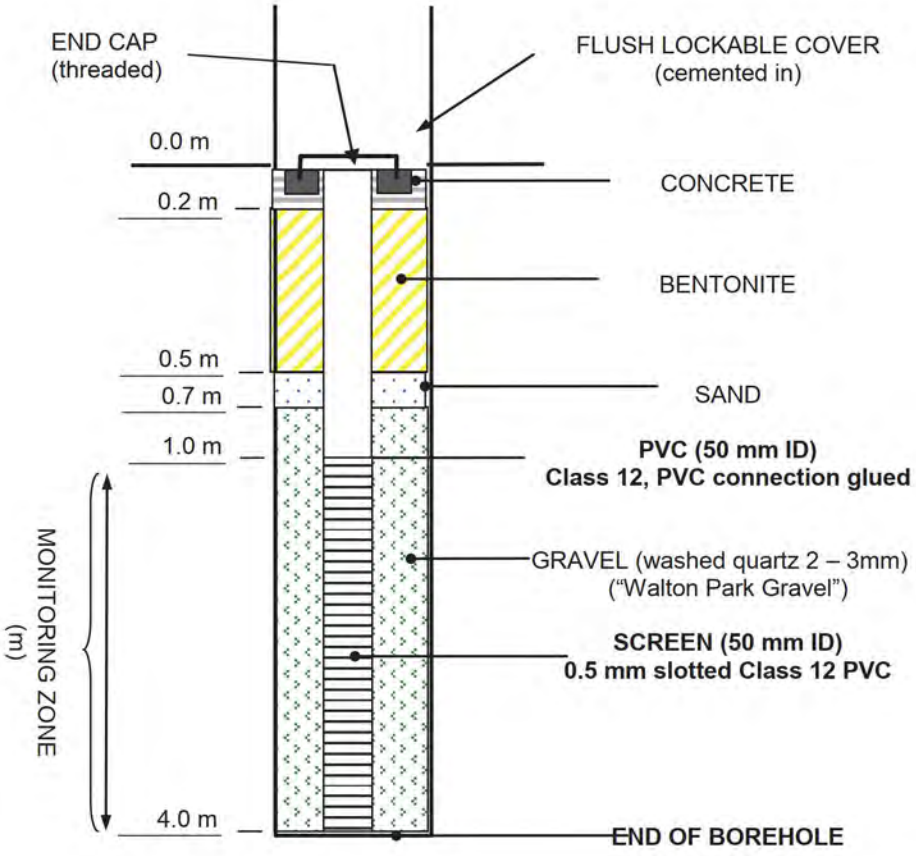
PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA – Takanini 2a/2b**
Location: **Takanini – Kenny's Farm**
Project Reference: **51-3341103**

BH33B

BOREHOLE INFORMATION	**CO-ORDINATES:**	**DATE INSTALLED: 7/11/2014**
Drilling Method: Wash Bore	Easting: 1774411.576	**VERIFIED BY**: BH
Diameter Core: 96mm	Northing: 5898114.324	
Contractor: Prodrill	Ground Level: 25.059	



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: BH_70585

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-33A

Project	Takanini 2a/2b Conveyance	**Commenced**	07/11/14	**Completed**	07/11/14
Site	Kennys' Farm	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 4.5 m

4.5 m to 6.45 m

NZGD ID: BH_70585

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-34A**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm
Job No.: 51/32174/04

Coordinates: E 1774236.71, N 5898073.82 **Datum:** NZTM
Surface RL (m): +25.4m **Total Depth:** 6.5m
Commenced: 10-Nov-14 **Contractor:** Pro-Drill
Completed: 11-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.3 [+25.2]	Open Barrel	50	None	▼	Peat (Semi -fibrous)	OL		SILT with some rootlets; black. Moist; non-plastic. (Topsoil)	M							
								@ 0.18 m with trace blotches of ash, comprising SILT; light brown. Non-plastic.								
		10						No recovery.							SV 37/24	
1.0 [+24.5]						Pt		Silty CLAY with minor wood; black. Soft; moist; low plasticity. (Amorphous Peat)	M	S					SV 15/4	
1.3 [+24.2]		90				Pt		CLAY with some wood and minor sand; black. Soft;	W	S						
1.4 [+24.1]						Pt		wet; low plasticity; sand, fine; semi-spongy. (Semi-fibrous Peat)	W	S						
								CLAY with trace sand and some wood; black. Soft; wet; low plasticity; sand, fine to coarse. (Semi-fibrous Peat) @ 1.47 to 1.52 m with 50 mm piiece of wood.								
2.0 [+23.4]		100			Peat (Amorphous)	Pt		CLAY with minor wood; dark brown. Very soft; saturated; low plasticity. (Amorphous Peat)	S	VS					SV 10/8	
2.4 [+23.0]						Pt		100 mm piece of wood.								
2.5 [+22.9]		0						No recovery.							SV 13/8	
		63														
3.5 [+21.9]						Pt		CLAY with trace wood (twigs); dark brown. Soft; saturated; low plasticity. (Amorphous Peat)	S	S					SV 20/5	
3.8 [+21.6]		86				Pt		CLAY with trace sand and 80% wood; dark brown. Soft; saturated; sand, fine. (Semi-fibrous Peat)	S	S						
4.0 [+21.4]						Pt		@ 3.85 m with 100 mm piece of wood.	S	S						
		96						CLAY with minor wood; dark brown. Soft; saturated; low plasticity. (Amorphous Peat)								
4.5 [+20.9]	SPT	100				Pt		CLAY with trace carbonaceous rootlets; dark brown. Soft; wet; medium plasticity. (Amorphous Peat)	W	S					SPT 0,0, 0,0, 0,0, [N=0]	
								@ 4.75 to 4.8 m with light brown smears. (Ash)								
	Open Barrel	58						@ 4.95 m becomes black.								
								@ 5.4 m with 20 mm piece of wood, 20% of core.								
5.6 [+19.9]		96			Peat (Semi -fibrous)	Pt		CLAY with minor organiccs; dark brown. Very soft; saturated; low plasticity. (Semi-fibrous Peat)	S	VS					SV 3/0	
6.0 [+19.5]						Pt		Wood with wood fragments.								
6.0 [+19.4]	SPT	78				Pt		CLAY with some organics; dark brown. Very soft; saturated; low plasticity. (Semi-fibrous Peat) @ 6.25 m becomes black.	S	VS					SPT 0,0, 0,0, 0,0, [N=0]	
6.5 [+19.0]								Termination Depth = 6.45m, Target Depth								

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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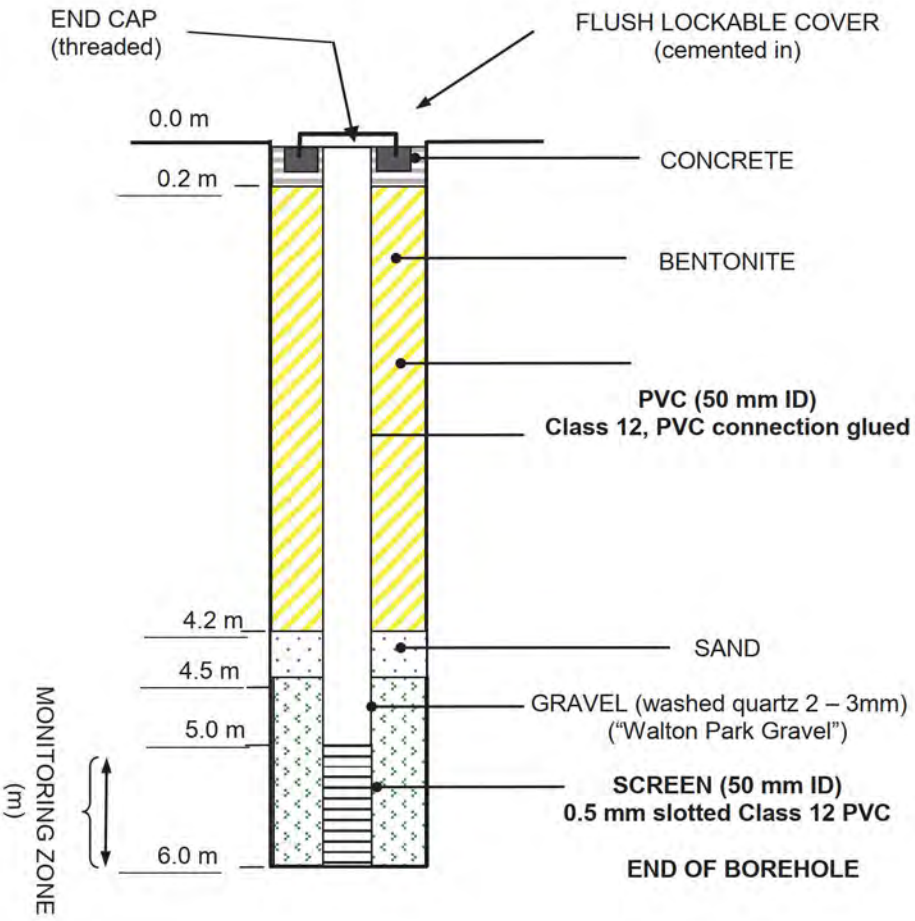
PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA Takanini 2a/2b**
Location:
Project Reference: **51-3341103**

BH34B

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 10/11/2014
Drilling Method: Wash Bore Diameter Core: 96mm Contractor: Prodrill	Easting: 1774238.176 Northing: 5898067.908 Ground Level: 25.369	**VERIFIED BY**: BH



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: BH_70586

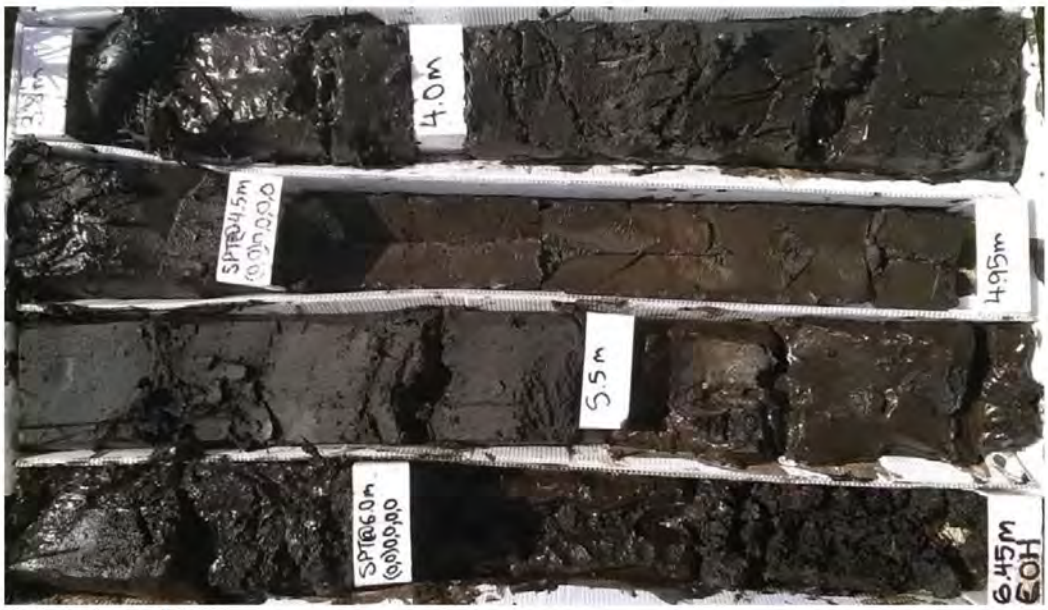
CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-34A

Project	Takanini 2a/2b Conveyance	**Commenced**	10/11/14	**Completed**	11/11/14
Site	Kennys' Farm	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 6.45 m bgl		

0.0 m to 4.5 m



4.5 m to 6.45 m

NZGD ID: BH_70586

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-37**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm, Old Wairoa Road
Job No.: 51/32174/04

Coordinates: E 1774425.33, N 5897853.93 **Datum:** NZTM
Surface RL (m): +25.9m **Total Depth:** 21.5m
Commenced: 03-Nov-14 **Contractor:** Pro-Drill
Completed: 05-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
0.0 [+25.9]	OB	60			Topsoil	ML		SILT with trace rootlets; dark brown. Moist; low plasticity. (Topsoil)	M	F						
0.5 [+25.4]	OB	68		▼	Peat (Amorphous)	OL		SILT with some clay; dark brown. Firm; moist; medium plasticity. (Amorphous Peat)	M	F					SV 30/5	
1	OB	78						@ 0.9 to 1.1 m with some wood. @ 1.0 m becomes soft. @ 1.1 to 1.4 m peat contains ash lenses comprising SILT with minor sand; light brown. Soft; wet; sand fine.	W	S					SV 18/6	1
1.4								@ 1.4 m becomes black.								
1.5 [+24.4]	SPT	76						@ 1.5 m with minor sand; dark brown. Firm; saturated; sand, fine.	S	F					SV 34+ (wood) SPT 1,0, 0,0, 0,0, [N=0]	
2.0 [+23.9]	OB	0						No recovery due to piece of wood being pushed down hole by open barrel and SPT. Recovered a large amount of wood at 3.0 m, suspected from 1.95 m.								2
2	OB	40													SV 34+ (wood)	
3.0 [+22.9]	SPT	33	None		Alluvial clay	CL		CLAY with some wood; light grey. Very soft; saturated; medium plasticity. (Alluvium)	S	VS					SPT 0,0, 1,0, 1,0, [N=2]	3
3	OB	91						@ 3.67 m becomes dark grey.								
4.0 [+21.9]	Push Tube	100			Peat (Amorphous)	Pt		SILT with some wood and rootlets and minor sand; dark brown. Very soft; saturated; sand, fine. (Amorphous Peat)	S	VS					SV 2/0	4
5	Push Tube		None													5
5.3 [+20.6]	OB	100				SM		SILT with some sand; light brownish yellow. Very soft; wet; sand, fine to medium. (Ash)	W	VS						
5.4 [+20.5]						OL			W	VS						
5.5 [+20.4]	PT	100						CLAY; dark brown. Very soft; wet; medium plasticity. (Amorphous Peat) Push tube from 5.5 to 6.0 m.								
6.0 [+19.9]	SPT	100				ML		SILT with trace sand; brown. Very soft; saturated; dilatant; sand, fine. (Ash)	S	VS					SPT 1,0, 0,0, 0,0, [N=0]	6
6.1 [+19.8]						OL			S	VS						
6.3 [+19.6]						Pt		CLAY with trace sand; dark brown. Very soft; saturated; medium plasticity; sand, fine. (Amorphous Peat)	S	VS						
6.5 [+19.4]	Open Barrel	52				OL Pt		Silty CLAY with 80% wood; dark brown. Very soft; saturated. (Fibrous Peat)	S	VS						
6.6 [+19.3]								CLAY; dark brown. Very soft; saturated; medium plasticity. (Amorphous Peat)	S	VS						7

NZGD ID: BH_70589

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-37**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm, Old Wairoa Road
Job No.: 51/32174/04

Coordinates: E 1774425.33, N 5897853.93 **Datum:** NZTM
Surface RL (m): +25.9m **Total Depth:** 21.5m
Commenced: 03-Nov-14 **Contractor:** Pro-Drill
Completed: 05-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96
Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
7.2 [18.6]	Open Barrel	52	None		Peat (Amorphous)	Pt		CLAY with minor wood; black. Very soft; saturated; medium plasticity. (Semi-fibrous Peat)	S	VS						
						ML		SILT with trace sand; light brownish yellow. Very soft; saturated. (Ash)	S	VS						
								@ 7.5 m becomes soft.		S						
7.7 [18.2]	SPT	100				OL		CLAY with minor silt and wood and trace sand; black. Soft; saturated; medium plasticity. (Amorphous Peat)	S	S					SV 16/0 SPT 0,0, 0,0, 0,0, [N=0]	
7.9 [18.0]						SM			S	S						
8.0 [17.9]	OB	91				OL		SILT with minor sand; light brownish yellow. Soft; saturated; low plasticity; dilatant. (Ash)	S	S						8
								CLAY with some wood and carbonaceous material; black. Soft; satruated; medium plasticity. (Amorphous Peat)								
8.5 [17.4]	OB	100				SM OL		Silty fine SAND; light brown. Very loose; saturated. (Ash)	S S	VL S					SV 16/0	
8.7 [17.1]						SM		CLAY with some wood; black. Soft; saturated; medium plasticity. (Amorphous Peat)	W	VL						
8.8 [17.1]						Pt		Silty fine SAND; yellowish brown. Very loose; wet. (Ash)	S	S						
9.2 [16.7]	SPT	100				SM		Silty CLAY with some wood; black. Soft; saturated; medium plasticity. (Semi-fibrous Peat)	W	VL					SV UTP (wood) 0,0, SPT 0,0, 0,0, [N=0]	9
9.3 [16.6]						OL		20 mm piece of amber (Kauri gum) @ 9.08 m.		VL						
9.5 [16.4]								Silty fine SAND; light brown. Very loose; wet. (Ash)	S	VS						
	OB	100				OL		CLAY; black. Very soft; saturated; low plasticity. (Semi-fibrous Peat)	S	VS						
10								CLAY with some silt and minor wood and rootlets; dark brown. Very soft; saturated; medium plasticity. (Amorphous Peat)							SV 8/0	10
	OB	100														
10.5 [15.4]	SPT	78				OL		CLAY with minor wood; black. Very soft; saturated; medium plasticity. (Amorphous Peat)	S	VS					SV UTP (wood) 1,0, SPT 0,0, 0,0, [N=0]	
10.9 [15.0]						SM		Sandy SILT; yellow. Very soft; wet; low plasticity; dilatant; sand, fine. (Ash)	W	VS						11
11.1 [14.8]	OB	100				OL		CLAY; black. Very soft; saturated; medium plasticity. (Amorphous Peat)	S	VS						
11.4 [14.5]						SM		Sandy SILT; yellow. Very soft; wet; dilatant. (Ash)	W	VS						
11.5 [14.4]								Carbonaceous wood	W	VS						
11.6 [14.3]	OB	100				ML Pt		SILT with trace sand; brownish yellow. Very soft; wet; sand, fine; dilatant. (Ash)	W	VS						
12								CLAY; black. Very soft; wet; medium plasticity; semi-fibrous, slightly spongy, plastic. (Semi-fibrous Peat)							SV 8/0 SPT 1,1, 2,2, 3,3, [N=10]	12
12.2 [13.7]	SPT	100			Peat (Fibrous)	SP		Fine SAND with some carbonaceous material; light brownish yellow. Loose; wet. (Ash)	W	L						
12.5 [13.4]						SM		Silty SAND; light brownish yellow. Loose; saturated; dilatant. (Ash)	S	L						
13	Open Barrel	57				Pt		CLAY with minor carbonaceous rootlets; black. Very soft; wet; medium plasticity. (Semi-fibrous Peat)	W	VS						13
								@ 13.5 m with wood fragments; dark brown. Soft; saturated; semi-spongy.	S	S					SV 21/0 SPT 0,0, 0,0, 0,0, [N=0]	
13.7 [12.2]	SPT	78				OL Pt		@ 13.6 m becomes black and amorphous.	S	S						
13.9 [12.0]						ML		CLAY with minor silt and carbonaceous material; black. Soft; saturated. (Amorphous Peat)	W	S						14

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-37**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm, Old Wairoa Road
Job No.: 51/32174/04

Coordinates: E 1774425.33, N 5897853.93 **Datum:** NZTM
Surface RL (m): +25.9m **Total Depth:** 21.5m
Commenced: 03-Nov-14 **Contractor:** Pro-Drill
Completed: 05-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96

Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
[+11.9]	Open Barrel	32			Peat (Amorphous)	Pt		SILT; yellow. Soft; wet; low plasticity. (Ash)	W	S						
								CLAY with some wood; black. Soft; wet; low plasticity; semi-fibrous, semi-spongy. (Amorphous Peat)								
15		32														15
15.2 [+10.7]						SM Pt		SILT with some sand; yellowish brown. Soft; wet. (Ash)	W S	S S						
15.2 [+10.7]	SPT	100						CLAY with some wood fragments; black. Soft; saturated; low plasticity; semi-fibrous, slightly spongy. (Semi-fibrous Peat)							SV 13/0 SPT 0,0, 0,0, 0,0, [N=0]	
								@ 15.65 to 16.7 m re-drilled and recovered disturbed core.	S						Re-drilled and recovered disturbed sample from 15.65 to 16.7 m	
15.9 [+10.0] 16 15.9 [+10.0]						SM		@ 15.75 m becomes dark brown. Saturated; medium plasticity.	W	S						16
	Open Barrel	21				OL		SILT with some sand; yellowish, brownish orange. Soft; wet; dilatant. (Ash)	S	S						
								CLAY with some wood; black. Soft; saturated; medium plasticity. (Amorphous Peat) @ 16.0 m becomes semi-fibrous and semi-spongy. @ 16.37 m with trace plant fragments.								
								@ 16.7 m becomes very soft.		VS					SPT 0,0, 0,0, 0,0, [N=0]	
16.8 [+9.1] 17	SPT	100				OL		CLAY with minor wood; black. Very soft; saturated; medium plasticity. (Amorphous Peat)	S	VS						17
	Open Barrel	100	None					@ 17.44 m becomes dark, greyish brown.								
17.6 [+9.3]						OH		CLAY with trace organic material; dark brownish grey, spotted black. Very soft; moist; high plasticity. (Alluvium)	M	VS						
18								@ 17.86 m becomes firm and light greyish brown.		F						18
	SPT	33						@ 18.0 m becomes light grey.							SV 35/8 SPT 0,0, 0,2, 2,1, [N=5]	
18.8 [+7.1]	Open Barrel	100			Alluvium (Puketoka)	OL		CLAY with minor silt; light greenish grey. Firm; moist; medium plasticity. (Alluvium)	M	F						
19																19
	SPT	100						@ 19.5 m becomes very stiff.		VSt					SV 131/32 SPT 2,2, 2,2, 3,3, [N=10]	
20 20.6 [+5.3]	Open Barrel	100				OL		CLAY with some silt and a piece of wood; greenish grey. Very stiff; moist; low plasticity. (Alluvium)	M	VSt						20
20.5 [+5.4]						OL		Silty CLAY; greenish grey. Very stiff; moist; low plasticity. (Alluvium)	M	VSt						
21																21

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

BOREHOLE with Piezo LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-MBH-37**

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Kennys' Farm, Old Wairoa Road
Job No.: 51/32174/04

Coordinates: E 1774425.33, N 5897853.93 **Datum:** NZTM
Surface RL (m): +25.9m **Total Depth:** 21.5m
Commenced: 03-Nov-14 **Contractor:** Pro-Drill
Completed: 05-Nov-14 **Driller:** Lee Sherwin

Equipment: Excavator Ex60
Shear Vane: Geo 1060
Bore Diameter (mm): 96
Inclination: -90
Comments:

Logged:	RV
Processed:	RV
Checked:	BH

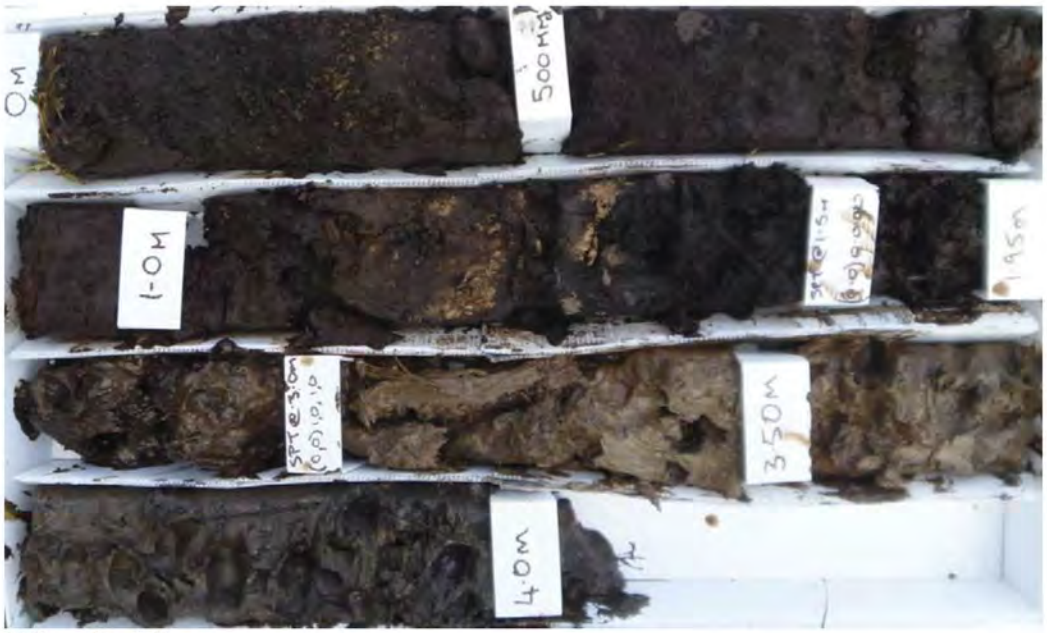
Depth (m)/ [Elev.]	Drilling Method	Core Run / Recovery (%)	Support / Casing (m)	Water	Geological Fm	Classification	Graphic Log	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Weathering	Estimated Rock Strength (EW VW W MS S VS ES)	RQD (%)	Defect Spacing (mm) (20 60 200 600 2000)	TESTS & SAMPLES / ROCK MASS DEFECTS: Depth, Type, Inclinations, Roughness, Texture, Aperture, Coating	Piezometer
	SPT	100	None			OL		Silty CLAY; greenish grey. Very stiff; moist; low plasticity. (Alluvium) Piece of wood @ 21.1 m.	M	VSt					SV 187+ SPT 2,1, 3,2, 3,4, [N=12]	
21.5 [+4.4]								Termination Depth = 21.45m, Target depth								

CLIENTS | PEOPLE | PERFORMANCE

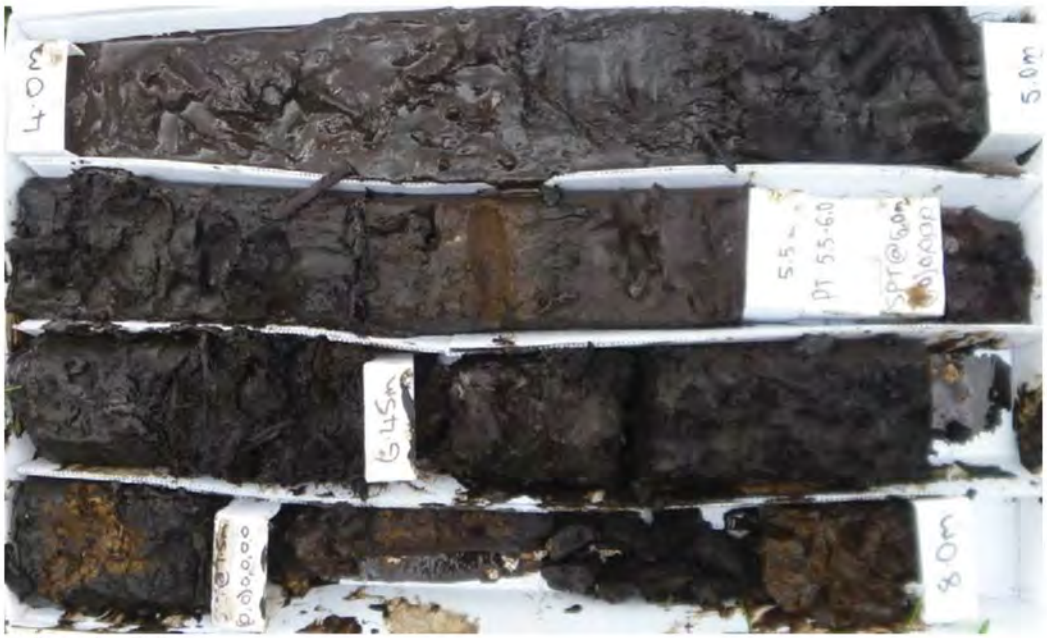
Report of Photographs

Site Identification: GHD-MBH-37

Project	Takanini 2a/2b Conveyance	**Commenced**	03/11/14	**Completed**	05/11/14
Site	Kennys' Farm, Old Wairoa Road	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 21.5 m bgl		



0.0 m to 4.0 m



4.0 m to 8.0 m

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-37

Project	Takanini 2a/2b Conveyance	**Commenced**	03/11/14	**Completed**	05/11/14
Site	Kennys' Farm, Old Wairoa Road	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 21.5 m bgl		

8.0 m to 10.28 m

10.28 m to 13.04 m

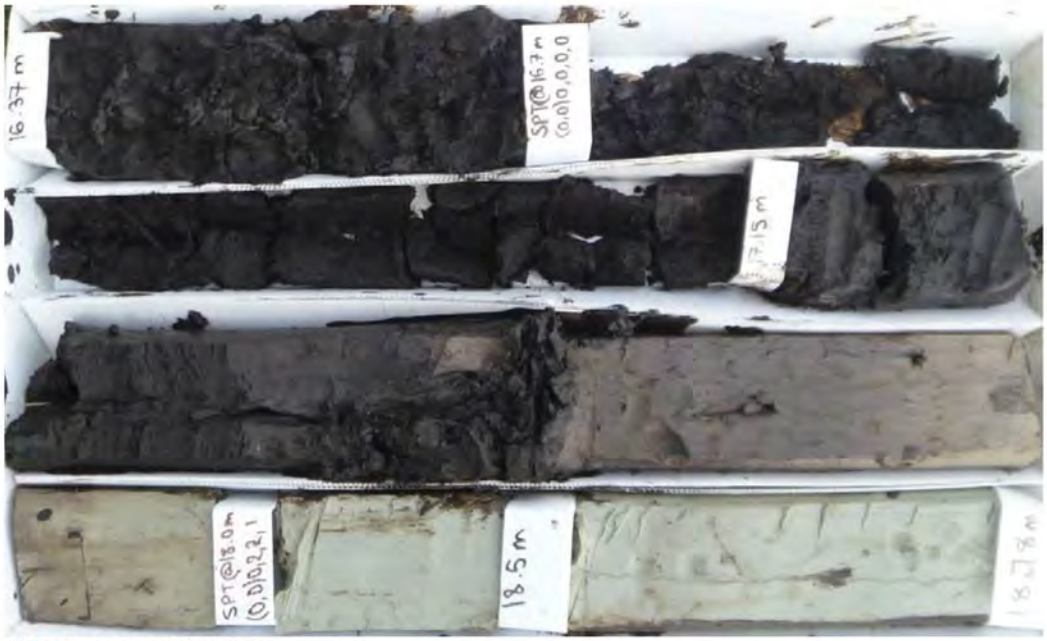
CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-37

Project	Takanini 2a/2b Conveyance	**Commenced**	03/11/14	**Completed**	05/11/14
Site	Kennys' Farm, Old Wairoa Road	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 21.5 m bgl		

13.04 m to 16.37 m



16.37 m to 18.78 m

NZGD ID: BH_70589

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: GHD-MBH-37

Project	Takanini 2a/2b Conveyance	**Commenced**	03/11/14	**Completed**	05/11/14
Site	Kennys' Farm, Old Wairoa Road	**Logged By**	RV		
Job #	51-32174-04	**Checked By**	BH		
Client	Auckland Council	**Hole Depth**	0.0 m to 21.5 m bgl		

18.78 m to 21.45 m

NZGD ID: BH_70589

HAND AUGER LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-HA1**
Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Refer to Site Plan
Job No.: 51/32174/04

Coordinates: E 1773903.4, N 5897892.7 **Datum:** NZTM
Surface RL (m): +22.3m **Total Depth:** 5.0m
Commenced: 06-Jan-14 **Contractor:**
Completed: 06-Jan-14

Equipment: 50 mm hand auger
Shear Vane: Geo946
Hole Diameter (mm): 50

Logged:	SKA
Processed:	BF
Checked:	SKA

Depth (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments
					ML	SILT; dark brown. Non plastic [TOPSOIL]	D	St			
		0.30 [+22.0]				... from 0.2 m, becomes moist	M				
					OL	SILT with minor clay; dark brown to black. Low plasticity. [ORGANIC SILT]	M				
		0.50 [+21.8]			Pt	PEAT, fibrous to amorphous; black.	W	S	0.50		10/3
						... from 0.6 m, becomes saturated	S	S			
		1.00 [+21.3]			SP	Silty SAND; light brown white, brown streaks.	S	L			
	▽	[+21.2]	Puketoka Fm		Pt	Poorly graded [PUMICEOUS SAND]	S	S			
						PEAT, amorphous, some fibrous inclusions; black. No recovery.					
						... at 1.2 m, rootlet.			1.50		10/0
									2.00		11/2
						... at 2.5 m, rootlet.			2.70		13/2
						... at 3.0 m, becomes fibrous tree remnant and rootlets.			3.20		82/16 (rootlets)
						... from 3.2 m, becomes fibrous PEAT with some amorphous, minor clay.			3.50		48/33
		4.00 [+18.3]			Pt	PEAT, spongy to fibrous; black. No recovery. Saturated, amorphous organic material.	S	F	4.00		48/16
						... at 4.5 m, tree remnant, rootlets.					
						... at 4.8 m, tree remnant.					
		5.00 [+17.3]				Termination Depth = 5m (Target depth)					

Depth Scale (m): 0, 1, 2, 3, 4, 5, 6, 7

NZGD ID: HA_70597

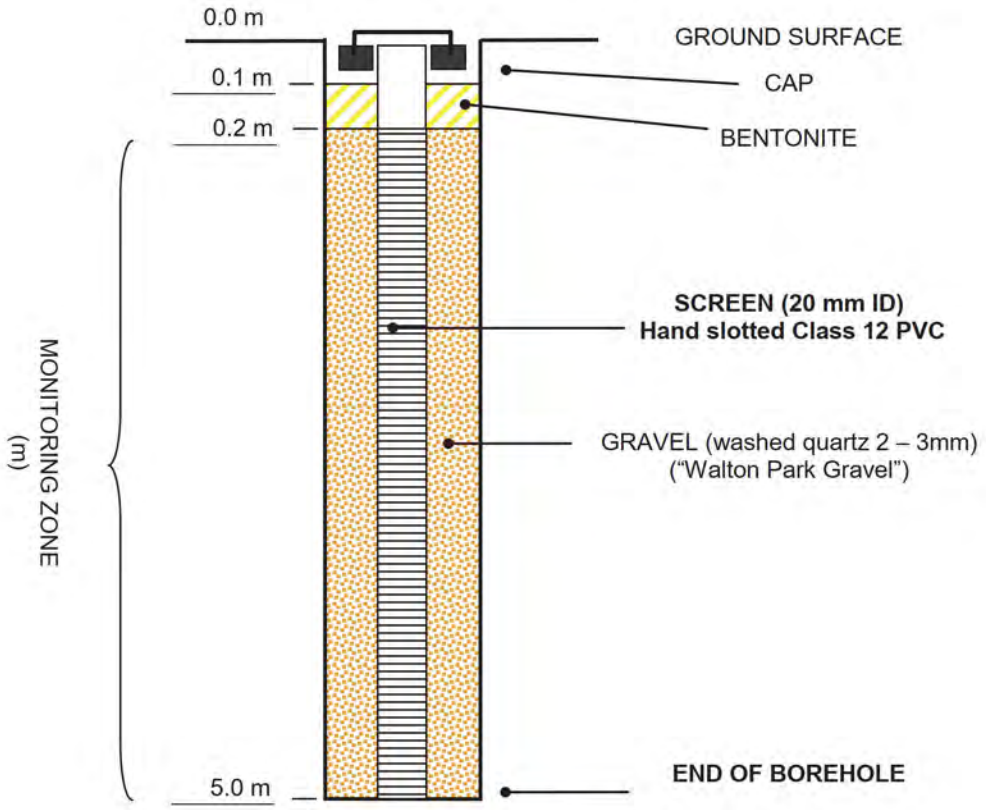
GHD Centre, Level 3
27 Napier Street, Freemans Bay
PO Box 6543
Auckland, New Zealand
Tel: +64 9 370 8000
www.ghd.com

PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA – Takanini 2a/2b**
Location: **Takanini**
Project Reference: **51-32174**

HA1

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 06/01/14
Drilling Method: Hand Auger	Easting: 1773398	VERIFIED BY: TS
Diameter Core: 50	Northing: 5897698	
Contractor: NA	Ground Level:	



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: HA_70597

HAND AUGER LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-HA2**

Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Refer to Site Plan
Job No.: 51/32174/04

Coordinates: E 1773894, N 5897919.3
Surface RL (m): +22.3m
Commenced: 10-Jan-14
Completed: 10-Jan-14
Contractor:

Datum: NZTM
Total Depth: 5.0m

Equipment: 50 mm hand auger
Hole Diameter (mm): 50
Shear Vane: Geo946

Logged:	SKA
Processed:	BF
Checked:	SKA

Depth (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments
		0.30 [+22.0]			ML	SILT; dark brown. Non plastic. [TOPSOIL]	M	St			
	▽	0.50 [+21.8]			OL	SILT; dark brown, spotted reddish brown. Non plastic; some amorphous organic inclusion. [ORGANIC SILT]	M	St	0.50		13/5
		0.90 [+21.4]			Pt	PEAT, amorphous to firm; dark brown, black	W	S			
1		[+21.3]			SP	Silty SAND; light brownish white, brown streaks. Poorly graded. SAND; fine. [DILATENT SAND]	S	'L'			
					Pt	PEAT, amorphous, spongy; black. ... from 1.1 m, low recovery < 10 %.	S	S	1.10		20/3
									1.50		23/5
2			Puketoka Fm			... at 2.0 m, fibrous inclusions, tree rootlets.			2.00		10/5
									2.50		26/5
3						... from 2.9 m, becomes fibrous PEAT with amorphous inclusions. ... at 3.1 m, tree rootlet.			3.10		13/7
									3.50		20/10
		3.80 [+18.5]			Pt	PEAT; amorphous to spongy; black. Some fibrous (rootlets) inclusions.	S	S			
4									4.00		10/7
									4.50		92/0 (rootlets)
5		5.00 [+17.3]				Termination Depth = 5m (Target depth)			5.00		33/20
6											
7											

NZGD ID: HA_70598

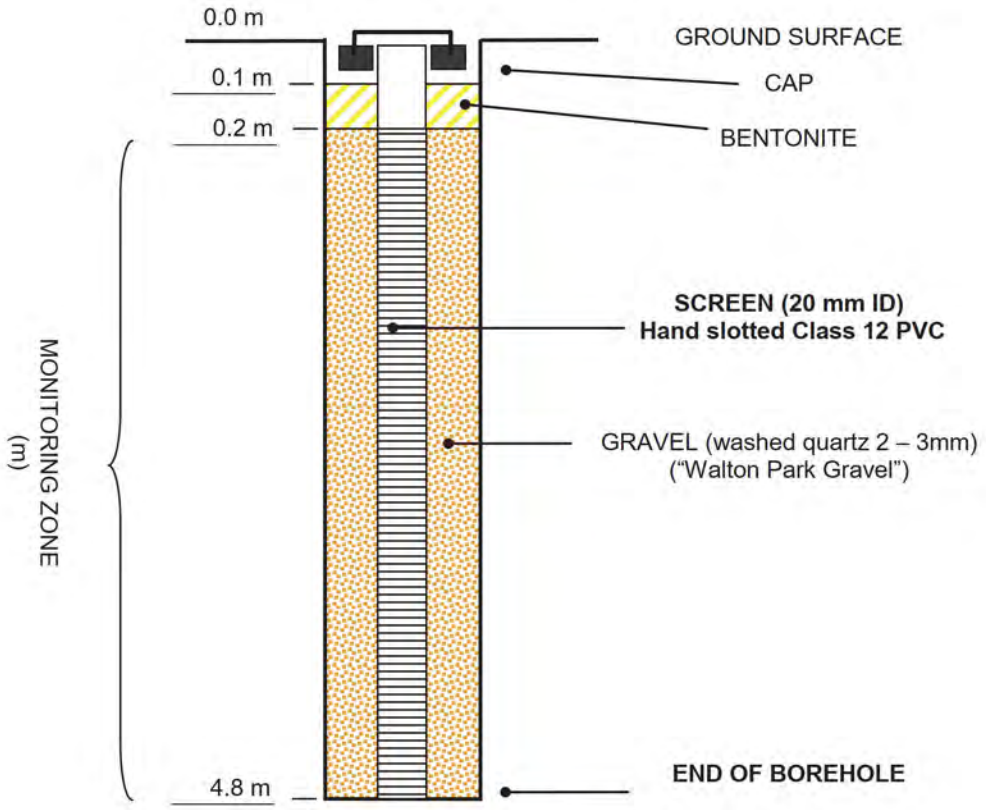
GHD Centre, Level 3
27 Napier Street, Freemans Bay
PO Box 6543
Auckland, New Zealand
Tel: +64 9 370 8000
www.ghd.com

PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA – Takanini 2a/2b**
Location: **Takanini**
Project Reference: **51-32174**

HA2

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 06/01/14
Drilling Method: Hand Auger	Easting: 1773571	VERIFIED BY: TS
Diameter Core: 50	Northing: 5897753	
Contractor: NA	Ground Level:	



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: HA_70598

HAND AUGER LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-HA3**
Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Refer to Site Plan
Job No.: 51/32174/04

Coordinates: E 1773880.4, N 5897954.6 **Datum:** NZTM
Surface RL (m): +22.3m **Total Depth:** 5.0m
Commenced: 09-Jan-14 **Contractor:**
Completed: 09-Jan-14

Equipment: 50 mm hand auger
Shear Vane: Geo946
Hole Diameter (mm): 50

Logged:	SKA
Processed:	BF
Checked:	SKA

Depth (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments
0		0.40 [+21.9]			ML	SILT; dark brown, reddish brown. Non plastic. [TOPSOIL]	M	St			
	▽	0.70 [+21.6]			Pt	PEAT, amorphous, minor fibrous; black.	W	S	0.50		23/3
1		1.00 [+21.3]			OH	CLAY; dark brown, black streaks. High plasticity. Minor fibrous organic inclusion. [ORGANIC CLAY]	S	F	1.00		28/3
		1.20 [+21.1]			ML	Sandy SILT; light brown white, dark brwon streaks Non plastic. [SENSITIVE SILT]	S	F			
			Puketoka Fm		Pt	PEAT, amorphous; black.	S	S			
						... at 1.4 m, fibrous organic inclusion, tree remnant.			1.60		3/2
2						... from 1.6 m, no recovery < 10 %, amorphous PEAT with trace fibrous.			2.00		10/3
						... from 2.3 m, fibrous organic inclusion, becomes fibrous PEAT with amorphous inclusion.			2.50		79/25 (fibrous)
3						... at 3.1 m, fibrous inclusion, tree remnant. Too difficult to Auger. 3.1 m - 3.7 m, tree remnant.			3.00		62/16 (fibrous)
		3.70 [+18.6]			Pt	PEAT, amorphous, some fibrous inclusion; dark brown.	S	S			
4									4.00		56/16 (fibrous)
									4.50		39/16
5		5.00 [+17.3]				Termination Depth = 5m (Target depth)			5.00		33/13
6											
7											

Depth Scale (m)

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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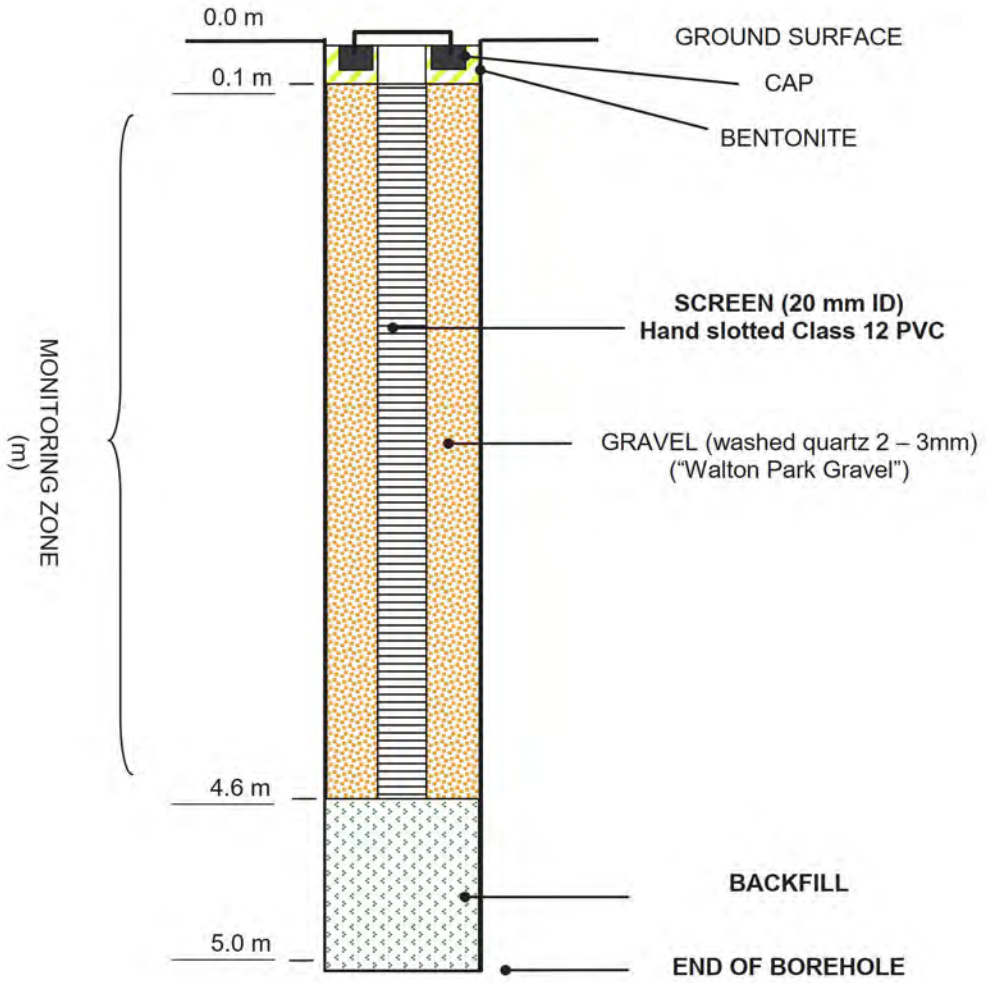
PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA – Takanini 2a/2b**
Location: **Takanini**
Project Reference: **51-32174**

HA3

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 06/01/14
Drilling Method: Hand Auger	Easting: 1773571	VERIFIED BY: TS
Diameter Core: 50	Northing: 5897753	
Contractor: NA	Ground Level:	



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: HA_70599

HAND AUGER LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-HA4**
Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Refer to Site Plan
Job No.: 51/32174/04

Coordinates: E 1774512.5, N 5897730.9
Surface RL (m): +26.0m
Commenced: 07-Jan-14
Completed: 07-Jan-14
Datum: NZTM
Total Depth: 4.4m
Contractor:

Equipment: 50 mm hand auger
Hole Diameter (mm): 50
Shear Vane: Geo946

Logged:	SKA
Processed:	BF
Checked:	SKA

Depth (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments
		0.20 [+25.8]			ML	SILT; brown, spotted black. Non plastic [TOPSOIL]; minor organic inclusion.	M	St			
					OL	SILT, dark brown to black. Non plastic. Amorphous organic inclusion. [ORGANIC SILT] ... from 0.4 m, fibrous to amorphous organic inclusion.	W	F	0.50		18/2
		0.60 [+25.4]			Pt	PEAT, fibrous, spongy; black, spotted dark brown.	W	S			
1						... from 1.1 m, becomes amorphous.			1.10		21/3
	▽					... at 1.3 m, sandy SILT; light yellow white. Firm, wet, non plastic. [PUMICEOUS SILT] ... at 1.5 m, tree remnant. ... from 1.6 m, thinly interbedded organic SILT.			1.60		13/10
2		2.10 [+23.8]	Puketoka Fm						2.00		21/10
		2.20 [+23.8]			OL	SILT; dark grey to dark brown. Non plastic.	S	S			
					Pt	Amorphous organic inclusion [ORGANIC SILT] PEAT, amorphous; black to dark brown.	S	S	2.50		0/0
3		3.00 [+23.0]				... at 2.9 m, tree rootlet.			3.00		16/10
					OH	CLAY; light brownish white, dark brown streaks. High plasticity. [ORGANIC CLAY]	S	S			
		3.30 [+22.7]			CH	CLAY; light yellow grey, dark brown streaks. High plasticity. Hole swelling at 3.3 m, becomes difficult to auger.	S	S	3.50		25/13
4		4.00 [+22.0]			OH	CLAY; light brownish white, dark brown streaks. High plasticity. [ORGANIC CLAY]	S	S	4.00		18/10
		4.40 [+21.6]				Termination Depth = 4.4m (Too Difficult to Auger (Tree Root))			4.40		229 +
5											
6											
7											

Depth Scale (m)

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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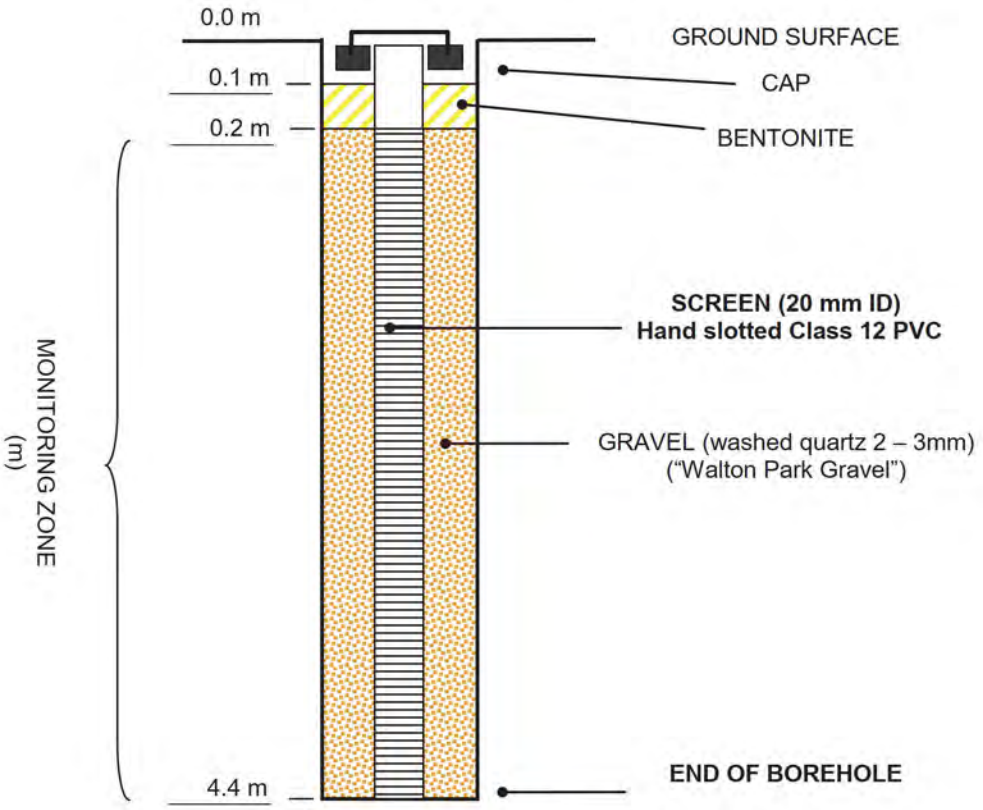
PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA – Takanini 2a/2b**
Location: **Takanini**
Project Reference: **51-32174**

HA4

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 06/01/14
Drilling Method: Hand Auger	Easting: 1773465	VERIFIED BY: TS
Diameter Core: 50	Northing: 5897535	
Contractor: NA	Ground Level:	



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: HA_70600

HAND AUGER LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-HA5**
Sheet 1 of 1

Project: SHA Takanini 2a/2b
Client: Auckland Council
Site: Refer to Site Plan
Job No.: 51/32174/04

Coordinates: E 1774773.1, N 5897829.8
Surface RL (m): +26.8m
Commenced: 07-Jan-14
Completed: 07-Jan-14
Datum: NZTM
Total Depth: 2.5m
Contractor:

Equipment: 50 mm hand auger
Hole Diameter (mm): 50
Shear Vane: Geo946

Logged:	SKA
Processed:	BF
Checked:	SKA

Depth (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation)	Moisture Condition	Consistency/ Relative Density	Sample Type & Depth	Sample No.	Sample/ Test Records & Comments
		0.10 [+26.7]	Fill			SILT with minor fine gravel; brown. Angular roading aggregate.	D	VSt			
		0.30 [+26.5]					D	VSt			
		0.40 [+26.4]				Gravelly SILT; brown mottled light yellow brown. Non plastic. Fine to medium gravel, angular roading aggregate.	D	VSt			
		0.50 [+26.3]			ML		M	St	0.50		120/23
					ML	SILT with minor clay; grey, orange streaks, spotted black. Non plastic. Trace gravel.	M	St			
		0.80 [+26.0]			OH	SILT with some clay and minor fine sand; light white grey, mottled light grey. Non plastic.	Wt	F - St	1.00		57/10
1	▽	1.20 [+25.6]	Puketoka Fm		Pt	Silty CLAY; light grey, black streaks. Stiff, medium low plasticity.. ... from 0.6 m, spotted black, orange bands, becomes light grey brown.	S	S	1.50		18/7
						CLAY; brownish black, black streaks. High plasticity, amorphous organic inclusion. [ORGANIC CLAY] ... from 1.1 m, becomes saturated.					
2		2.00 [+24.8]			OH	PEAT, amorphous; black, saturated. ... from 1.3 m, low recovery < 10 %. ... from 1.6 m, interbedded organic CLAY; dark brown. High plasticity.	W	F - St	2.00		49/13
		2.30 [+24.5]	ECBF		ML		M	St			
		2.50 [+24.3]				... at 1.8 m, interlaminated sandy clayey SILT; light yellow white. Firm, wet. Low plasticity.			2.50		229 +
3						Silty CLAY; light brown grey to grey black streaks. Low plasticity. [ORGANIC CLAY] **Note:***Hole squeezing*					
						Sandy SILT; light yellow brown. Non plastic.					
						Termination Depth = 2.5m (Too Stiff to Auger)					
4											
5											
6											
7											

Depth Scale (m)

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

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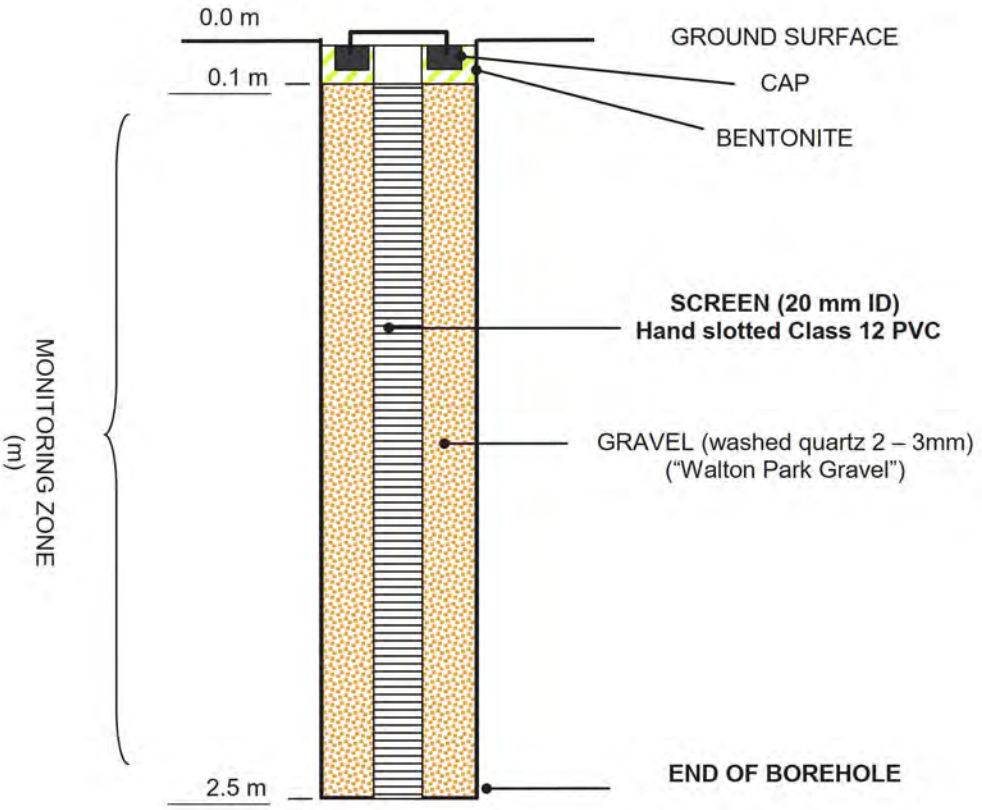
PIEZO INSTALLATION SUMMARY

Client: **Auckland Council**
Project: **SHA – Takanini 2a/2b**
Location: **Takanini**
Project Reference: **51-32174**

HA5

BOREHOLE INFORMATION	CO-ORDINATES:	DATE INSTALLED: 06/01/14
Drilling Method: Hand Auger	Easting: 1773551	VERIFIED BY: TS
Diameter Core: 50	Northing: 5897644	
Contractor: NA	Ground Level:	



NOTE: Geology summarized in borehole logs

NOT TO SCALE

NZGD ID: HA_70601

CLIENT: Ardmore Airport Limited		LOGGED: MF CHECKED : PM	SHEET: 1 OF 4	JOB No.: 3919PA
LOCATION: Ardmore Airport Ardmore		DIAMETER: 50 mm	DATE: 4/6/08	HAND AUGER No.: 1

Stratigraphy	SOIL DESCRIPTION	Legend	GL(m) Depth (m)	Water Level	Peak Strength (kPa) Dial DRS395	Remoulded Strength (kPa)	Sensitivity	Comments Samples Other Tests
Tauranga Group Materials	Topsoil							
	NATURAL: Firm, slightly plastic, dark brownish grey silty CLAY (with organic odour): moist		0.5	4/6/08 ▽	61	13	4.7	
	-becoming soft, highly plastic, brownish grey with rare dark orange streaks: wet -with rare black (organic??) spots		1.0		36	7	5.1	
	Soft, slightly plastic, dark brown, silty clay PEAT with fine fibrous material: saturated -poor retrieval		1.5		34	7	4.9	
			2.0		40	10	4.0	
			2.5		34	13	2.6	
			3.0		39	10	3.9	
	End of borehole @ 3.0 metres (Target Depth) Groundwater during drilling encountered @ 1.0 metres. Standing groundwater on completion measured @ 0.7 metres.		3.5		35	18	1.9	
			4.0		29	18	1.6	
			4.5					
			5.0					

GEOTEK SERVICES LIMITED

PAPAKURA BRANCH: 37 Elliott Street, PO Box 272-1217, Papakura, Manukau 2244, Auckland
Phone (64-9) 296-7241 Facsimile (64-9) 296-7243

HEAD OFFICE: Cnr Moore & Vincent Streets, PO Box 39-015, Howick, Manukau 2145, Auckland
Phone (64-9) 535-9814 Facsimile (64-9) 535-7243 E-mail enquiries@geotek.co.nz

NZGD ID: HA_142856

LEGEND

HA3 — Hand auger borehole locations

303 — Reviewed sites

GEOTEK SERVICES LIMITED

PAPAKURA BRANCH: 37 Elliott Street, PO Box 272-1217, Papakura, Manukau 2244, Auckland
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HEAD OFFICE: Cnr Moore & Vincent Streets, PO Box 39-015, Howick, Manukau 2145, Auckland
Phone (64-9) 535-9814 Facsimile (64-9) 535-7243 E-mail enquiries@geotek.co.nz

TITLE: Geotechnical Review and Borehole Location Plan
CLIENT: Ardmore Airport Limited
LOCATION : Ardmore Airport, Ardmore

SCALE	1:6000 (approx.) @ A3
DRAWING No.	3919PA-2
DRAWN BY	MF
DATE	11/9/08
SHEET	2 OF 2

NZGD ID: HA_142856

CS12-12-2465
Bore ID 21027
Consent No 23121
SWL - 3.6
Bot - 157
1774319.8
5899485.8

Drillhole Log

Prospect	Hole No 3	Co-ordinates mE 2684714.2	mN 6461149.0
Drill Rig	Date Jan 2000	Logged by Des Oxnam	

Interval (m)		Geological Log			
From	To	Rock/Soil Type	Symbol	Colour	Description
0	4.0	Clay		Brown	clays
4.0	4.5	Clay		Green/grey	Clays
4.5	9.0				Mudstone with bands of sandstone
9.0	10.5				mudstone
10.5	67.0				Lithic sandstone with interbedded mudstone (?Kaihu)
67.0	157.0				Hard sandstone with mudstone layers (Amokura?)
157.0	175.0				Muddy sanstone with hard bands
175.0	213.0				Sandstone
213.0	220.0				Firm sandstone
220.0	230.0				Sandstone with fireclay bands
230.0	241.0				Hard fractured sandstone
241.0	249.0				Hard greywacke
249.0	258.0				Extremely hard greywacke
255.0	258.0				

BH2
ID. 21027
2684691.7
6461201.3
=> 1774297
5899538
Production Bore

FAULKNER DRILLWELL N.Z. LTD.

DRILLING CONTRACTORS

DAILY LOG SHEET

№ 462

P.O. BOX 576, MANUREWA

Client: Mr Campbell

Date: 20th July 1982

Day: Tuesday

Engineers:

Location: Airfield rd Ardmore.

Rig No.: 1

Tender Truck No.: 2

Size and Purpose of Bore: 100mm Water Well

R12 : 849617

Work Details and Bore Hole No.: Arrived onsite with all equipment Set up rig Commenced drilling 150mm hole Went into a log at 3m and hole went slightly off Reamed hole to 200mm to 5m depth Continued drilling 150mm hole from 5m to 38.8m Withdrew rods, collar from hole. Ceased work. Carted 2 loads of water during day.

GROUNDWATER A.R.W.B.
W.R. No Ag 3129
NAME Crentine Ent Ltd
TECHNICAL FILES DKS
10/12/84
ACTIONED
BORELOG DKS
PUMP TEST
COMPUTER DKS
WATER QUAL

Bore Log :

0m - 0.15m Topsoil
0.15m - 3m Timber + Peat
3m - 5m Timber
5m - 10m Peat + timber
10m - 16m Pumice + Sand.
16m - 24m Mudstone.
24m - 30m Coarse Sandstone with shell
30m - 42m Lime Intruded Sandstone
42m - 95.48m Sandstone + Mudstone.

Materials Used:

Start 8.30am Finish 4.15pm :

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours : 1hour.

Contract Rates :

Rig Truck Km : 4Km

Water Tender Truck Km : 8Km

Fire Equipment :

Utility or Van Service Km : 8Km.

6 x 6 Winch Truck Km :

Client's Representative:

Crew:

Driller: JJ Faulkner. JG Faulkner.

FAULKNER DRILLWELL N.Z. LTD.

DRILLING CONTRACTORS

DAILY LOG SHEET

№ 463

P.O. BOX 576, MANUREWA

Client: Mr J Campbell

Date: 21st July 1982

Day: Wednesday

Engineers:

Rig No.: 1

Location: Ardmore.

Tender Truck No.: 2

Size and Purpose of Bore: 100mm Water Well

Work Details and Bore Hole No.: Arrived on site with casing prepared + lowered 39m of 100mm to bottom of hole Lowered rods + collar to bottom with 100mm drag bit attached Commenced drilling 100mm hole from 38.8m to 95.48m. Pulled back to 62m. Went + got compressor. Blew bore at 1500gph from 3pm to 5pm. Ceased work. Carted 3 loads of water during day.

Bore Log :

Materials Used:

39m x 100mm Casing

1 x 3 tooth casing shoe

Start 7.45am Finish 5.00pm :

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours : 3hours.

Contract Rates :

Rig Truck Km :

Water Tender Truck Km : 6Km.

Hire Equipment :

Utility or Van Service Km : 12Km

6 x 6 Winch Truck Km :

Client's Representative:

Crew:

Driller: JJ Faulkner JG Faulkner

FAULKNER DRILLWELL N.Z. LTD.

DRILLING CONTRACTORS

DAILY LOG SHEET

№ 464

P.O. BOX 576, MANUREWA

Client: Mr John Campbell

Date: 22nd July 1982

Day: Thursday

Engineers:

Rig No.: 1

Location: Airfield rd Ardmore.

Tender Truck No.: 2

Size and Purpose of Bore: 100mm water Well

Work Details and Bore Hole No.: Continued
blowing bore from 9.00am to 11.00am Packed up rig + gear left site at 12.00pm With all equipment.

Bore Log:

Materials Used: Compressor hire.

Start 9.00am Finish 12.00pm :

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours : 3 hours.

Contract Rates :

Rig Truck Km : 2km

Water Tender Truck Km : 2Km

Hire Equipment :

Utility or Van Service Km : 8Km.

6 x 6 Winch Truck Km :

Client's Representative:

Crew:

Driller: [signature] J G Faulkner.

FAULKNER DRILLWELL N.Z. LTD.

DRILLING CONTRACTORS

DAILY LOG SHEET

№ 573

P.O. BOX 576, MANUREW

Client: I John Cambell

Date: 14th December 1982

Day: ~~Wednesday~~ Tuesday

Engineers:

Rig No.: 1

Location: Ardmore Airfield rd RD.2 Papakura

Tender Truck No.: 2

Size and Purpose of Bore: 100mm water Well

Work Details and Bore Hole No.: Arrived with all gear. Set up rig over bore. Pulled pump from hole. Ran rods to 67m. Reamed hole from 67m to 95.48m. Found there to be a clay ball up in hole. Cleaned hole & right out. Pulled back to 65m. Blew bore at 2,500gph for 1½hours. Pulled drill rods from hole. Ceased work.

Bore Log :

Materials Used:

Start 9.30am Finish 4.45pm :

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours :

Contract Rates :

Rig Truck Km :

Water Tender Truck Km :

Hire Equipment :

Utility or Van Service Km :

6 x 6 Winch Truck Km :

Client's Representative:

Crew:

Driller: SJ Faulkner. JG Faulkner.

FAULKNER DRILLWELL N.Z. LTD.

DRILLING CONTRACTORS

DAILY LOG SHEET

№ 574

P.O. BOX 576, MANUREWA

Client: Mr John Cambell.

Date: 15th December 1982

Day: Wednesday.

Engineers:

Rig No.: 1

Location: Ardmore.

Tender Truck No.: 2

Size and Purpose of Bore: 100mm Water Well

Work Details and Bore Hole No.: Lowered pump back into hole. Packed up gear + rig left site with all gear.

Bore Log: Maximum recommended pumping rate 1,800 gph.

Materials Used:

Start 7.15am Finish 9.30am :

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours :

Contract Rates :

Rig Truck Km :

Water Tender Truck Km :

Hire Equipment :

Utility or Van Service Km :

6 x 6 Winch Truck Km :

Client's Representative:

Crew:

Driller: S.J. Faulkner J.C. Faulkner

21027_23121

CSD-12-2465

Drillhole Log

cased 157 m swl 5.0 m

Prospect	Hole No 2	Co-ordinates mE 2684691.7	mN 6461201.3
Drill Rig	Date Sep 1999	Logged by I. Van Houtte	

Interval (m)		Geological Log			
From	To	Rock/Soil Type	Symbol	Colour	Description
0	5.0	Clay			Clay
5.0	78.0				Waitemata sandstone/mudstone
78.0	90.8				Waitemata sandstone/mudstone
96.0	140.0				Sandstones (20% circulation loss)
140.0	149.0				Mudstone
149.0	223.7				Fractured sandstones (30% circulation loss)
223.7	224.3				Lignite coal
224.3	226.8				Fireclay
226.8	228.4				Fire clays with hard bars (Siderite)
228.4	229.85				Coal
229.85	232.0				Fireclay
232.0	243.0				Very hard sandstone
243.0	250.0 / 270				Greywacke

20951 _ 22960

C512-12- 2446

Drillhole Log

Cased 157 m Sud 3.2 m

Prospect	**Hole No** 1	**Co-ordinates** mE 2684735.3	mN 6460636.1
Drill Rig	**Date** Aug 1999	**Logged by** I. Van Houtte	

Interval (m)		Geological Log			
From	**To**	**Rock/Soil Type**	**Symbol**	**Colour**	**Description**
0	1.0	Clay			Clays
1.0	15.0	Peat			Peat/timber
15.0	43.0	Silt	Tg		Clays and Silts
43.0	50.0				Green glauconitic sandstone (Kaihu Group)
50.0	68.0				Interbedded sandstone and mudstones
68.0	80.0				Hard fractured sandstones
80.0	90.0				Mudstone
90.0	96.0				Interbedded sandstone and mudstones
96.0	107.0				Mudstone
107.0	112.0				Very hard sandstone
112.0	153.0				Interbedded sandstone and mudstones
153.0	166.0				Very hard sandstone (20% circulation loss)
166.0	208.0				Mudstone
208.0	238.5				Fractured sandstone (15% circulation loss)
238.5	246.0				Fractured greywacke (15% circulation loss)
246.0	260.6				Fractured greywacke (40% circulation loss)

265

DRILLWELL EXPLORATION N.Z. LIMITED

9 Rawson Way
Takanini
AUCKLAND

DRILLING CONTRACTORS

12592

DAILY LOG SHEET

LOG No. 27609

P.O. BOX 360 MANUREW/

Day: THURSDAY Date: 30-4-98

Client: A.R.C. Rig No:

Consultant/Engineer: Tender Truck No:

Location: Hamlins road. Compressor No:

Purpose of Bore: Monitering BORE REPAIR Bore Hole No:

Bore Size: Map Reference No: Permit No:

Work Details: On Site 9.30 Lay out ROAD Signs Cones etc. Check with CABLE Locator. On Position of CABLE's (LOCATOR STAYED while. Digging AS CABLE very close TO BORE) Dig With Digger TO 1.2m AROUND Bent PIPE. Cut off - Clean AND WELD. On TURNED out Socket ADD 1m 4" CASING Short - ADD .400 LOCKABLE CAP. Back fill HOLE AND Compact - PICK UP Signs etc. LEAVE Site 11.30

Bore Log: C512-12-1240

for Repair details See G064-C01-07.

Materials Used: 1 TUNDCO 4" Socket
1m 4" CASING Short.
.400 LOCKABLE CAP
Digger Hire
WELDER - GENERATOR HIRE.

Start Time: 9.30 Finish Time: 11.30 Total Time: Meals and Other Breaks:

Drill Rig Km		Rig Working Hours		Client's Representative:	
Water Tender Truck Km		Stand-By Hours			
6 x 6 Crane Truck Km		Compressor Hours		Drill Crew: Gerry	
Lt. Rig Towing Truck Km		DH Hammer Hours			
Utility or Van Service Km	2 km	Contract Rates		Driller: Mp Robson	
Other		Travel Hours			
		Other			

DRILLWELL EXPLORATION N.Z. LIMITED

9 Rawson Way
Takanini
AUCKLAND

DRILLING CONTRACTORS
DAILY LOG SHEET

LOG No. 27257

P.O. BOX 360 MANUREWA

Day: Tuesday Date: 5 · 5 · 96

Client: A.R.C Rig No: 3

Consultant/Engineer: Tender Truck No: 27

Location: Hamlins Rd. Auckland. Compressor No: Hire

Purpose of Bore: Cleanout & Repair. Bore Hole No: 1

Bore Size: 100mm Map Reference No: — Permit No: —

Work Details:

Arrived on site 7.30
Positioned rig over existing bore & set up mast & chill-pit. Ran rods to 138.55m
Flushed hole clean.
Pulled back rods to 77.1m
Set up headworks & air hoses. Began to develope bore for 1hr. Dismantled Airworks.
Pulled out remaining rods & collar.
Packed up rig & site.
NB: Bore producing 164 Gph at 77.1m.
Ceased work 1.00

Bore Log:

Materials Used: Compressor Hire.

Start Time: 7.30 Finish Time: 1.00 Total Time: 5½ Meals and Other Breaks: —

Drill Rig Km	6	Rig Working Hours	5½	Client's Representative:	
Water Tender Truck Km	6	Stand-By Hours			
6 x 6 Crane Truck Km		Compressor Hours		Drill Crew:	S O'Brien
Lt. Rig Towing Truck Km		DH Hammer Hours			
Utility or Van Service Km		Contract Rates		Driller:	C Brown
		Travel Hours			

DRILLWELL EXPLORATION N.Z. LIMITED

9 Rawson Way
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DAILY LOG SHEET

LOG No. 27258

P.O. BOX 360 MANUREWA

Day: MONDAY Date: 11-5-98

Client: ARC Rig No:

Consultant/Engineer: Tender Truck No: 9

Location: HAMLINES RD ARDMORE. Compressor No:

Purpose of Bore: REPAIR Bore Hole No:

Bore Size: Map Reference No: Permit No:

Work Details: On Site 8.30
After Poking up Posts & Timber. And loading Trailer with Builders mix
Dig Holes for 3 Posts & Cement In. Install 2 Rails Around Bore. Dig out Rd And Mix Concrete.
Ardmore. Clear Gear.
Site 10.45

Bore Log:

Materials Used: 2 BAGS cement.
3 W02 Round Post.
12m 150 x 4m H3 Rails
4 BAGS Dricon
1/4 Meter Builders Mix

Start Time: 8.00 Finish Time: 11.00 Total Time: Meals and Other Breaks:

Drill Rig Km	:	Rig Working Hours	:	Client's Representative:	
Water Tender Truck Km	:	Stand-By Hours	:		
6 x 6 Crane Truck Km	:	Compressor Hours	:	Drill Crew:	
U.I. Rig Towing Truck Km	:	DH Hammer Hours	:	GARY M.	
Utility or Van Service Km	: SIR	Contract Rates	:	Driller:	
		Travel Hours	:		

DRILLWELL EXPLORATION N.Z. LTD.

DRILLING CONTRACTORS

DAILY LOG SHEET

19883

P.O. BOX 360 MANUREWA

Client: AUCKLAND REGIONAL COUNCIL

Date: 11-5-94

Day: WEDNESDAY

Engineers:

Rig No.: 3

Location: HAMLINS ROAD PAPAKURA.

Tender Truck No.: 27

Permit No C512-12-1240

Size and Purpose of Bore: 100mm MONITOR BORE

Order No

Work Details and Bore Hole No.: (1)

On site at 7.00am. Set up and leveled rig. Proceeded wash drilling 150mm hole to a depth of 45.00 metres. Installed 100mm casing. Ran rods and 100mm drag bit. Drilled to 83.69 metres. Pulled out rods and 100mm casing. Ran rods to 45.00 metres and reamed out to a depth of 84.59 metres. Pulled out rods and ran 84.89 metres of 100mm casing. Grouted hole using 21 bags of cement. Flushed pump, cleaned gear, ceased work.

Bore Log :

0 – 1.00m BROWN CLAY
1.00 – 2.00m BROWN ORGANICS
2.00 – 20.00m ORGANICS & TIMBER
20.00 – 43.00m SANDY SILTS
43.00 – 59.00m PEAT.
59.00 – 66.00m GREY SILTS
66.00 – 72.00m SANDY SILTS
72.00 – 84.00m MUDSTONE.

N.B. – 3½ HOURS SPENT INSTALLING 100mm CASING, DRILLING 100mm PROBE HOLE PULLING OUT CASING & RUNNING RODS BACK TO 45.00 METRES

Materials Used:

21 x 40Kg BAGS OF CEMENT.
84.89m x 100mm CASING
1 x 100mm CASING SHOE (PLAIN)
3 x 50Kg BAGS OF BRAN.

Start 7.00 Finish 6.30 : 11½

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours : 3½ hours running and pulling casing and drilling 100mm proceeded

Contract Rates

Rig Truck Km : 7

Water Tender Truck Km : 7

6 x 6 Winch Truck Km :

Utility or Van Service Km : 7

Client's Representative:

Crew: S.P. O'BRIEN

DRILLWELL EXPLORATION N.Z. LTD.

DRILLING CONTRACTORS

19884

DAILY LOG SHEET

P.O. BOX 360 MANUREWA

Client: AUCKLAND REGIONAL COUNCIL Date: 12-5-94

Day: THURSDAY

Engineers:

Rig No.: 3

Location: HAMLINS ROAD PAPAKURA

Tender Truck No.: 27

Size and Purpose of Bore: 100mm MONITOR BORE

Work Details and Bore Hole No.: (1)

On site at 7.30 A.m. Ran rods and 100mm drag-bit. Drilled out cement in casing mouth and wash drilled to a depth of 138.55 metres. Pulled out rods and installed airline to 85.00m Proceeded development of bore. Loaded loose gear onto tender. Cleaned up site and ceased work

Bore Log :

84.00 – 138.55m MUDSTONE & SANDSTONE.

AIRLINE DEPTH ÷ 85.00M.

FLOW RATE ÷ 164 GPH.

STATIC WATER LEVEL ÷ 16.00m

START PRESSURE ÷ 120 P.S.I

RUNNING PRESSURE ÷ 30 P.S.I

Materials Used:

COMPRESSOR HIRE ÷ 4½ HOURS

Start 7.30 Finish 5.00 : 9½

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours :

Contract Rates :

Rig Truck Km :

Water Tender Truck Km :

6 x 6 Winch Truck Km :

Utility or Van Service Km : 14

Client's Representative:

Crew: S. P. O'BRIEN

DRILLWELL EXPLORATION N.Z. LTD.

DRILLING CONTRACTORS

19885

DAILY LOG SHEET

P.O. BOX 360 MANUREWA

Client: AUCKLAND REGIONAL COUNCIL

Date: 13-5-94

Day: FRIDAY

Engineers:

Rig No.: 3

Location: HAMLINS ROAD. PAPAKURA.

Tender Truck No.: 27

Size and Purpose of Bore: 100mm MONITOR BORE.

Work Details and Bore Hole No.: (1) & (2).

On site at 8.15a.m. Continued development of bore for ½ hour. Pulled out airline and packed up rig. Cleaned up site, constructed cement pad and left site with all gear.

BORE NO 2.

Set up and leveled rig. Dug drain to pit and proceeded wash drilling 100mm hole to a depth of 70.00 metres. Pulled out rods and ceased work.

Bore Log : (2)

0 – 1.00m	BROWN CLAYS
1.00 – 2.00m	WHITE CLAYS
2.00 – 3.00m	BROWN CLAYS
3.00 – 6.00m	GREY CLAYS
6.00 – 7.00m	GRAVELS
7.00 – 8.00m	GREY SILTS
8.00 – 9.40m	ORGANICS.
9.40 – 10.00m	GREY SILTS
10.00 – 12.00m	ORGANICS
12.00 – 52.00m	GREY & GREEN STICKY SILTS
52.00 – 70.00m	MUDSTONE SANDSTONE.

Materials Used:

DIGGER HIRE

COMPRESSOR HOURS ÷ ½

3 x 40Kg BAGS OF CEMENT.

3 x 40Kg BAGS OF RHEOGEL

4 Kg OF PAC R

Start 8.15am Finish 4:45 : 8½

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours :

Contract Rates :

Rig Truck Km : 8

Water Tender Truck Km : 8

6 x 6 Winch Truck Km :

Utility or Van Service Km : 16

Client's Representative:

Crew: S.P. O'BRIEN

DRILLWELL EXPLORATION N.Z. LTD.

DRILLING CONTRACTORS

19886

DAILY LOG SHEET

P.O. BOX 360 MANUREWA

Client: AUCKLAND REGIONAL COUNCIL Date: 16-5-94

Day: MONDAY

Engineers: PAPAKURA Rig No.: 3

Location: TAKANINI ROAD Tender Truck No.: 27

Permit No C512-12-1241

Size and Purpose of Bore: 100mm MONITOR BORE.

Work Details and Bore Hole No.: (2)

On site at 8.00 A.M.
Drilled (reamed) 150mm hole
to a depth of 84.49 metres.
Pulled out rods and
installed 84.89 metres
of 100mm casing.
Grouted hole using
22 bags of cement
Flushed pump clean.
washed cementing gear
and carted water.
Ceased work.

Bore Log :

Materials Used:

84.89m OF 100mm CASING
1x 100mm CASING SHOE (PLAIN)
22 x 40KG BAGS OF CEMENT.

Start 8.00 Finish 3.00 : 7

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours :

Contract Rates :

Rig Truck Km :

Water Tender Truck Km :

6 x 6 Winch Truck Km :

Client's Representative:

Crew: S O'BRIEN

DRILLWELL EXPLORATION N.Z. LTD.

DRILLING CONTRACTORS

19887

DAILY LOG SHEET

P.O. BOX 360 MANUREWA

Client: AUCKLAND REGIONIAL COUNCIL

Date: 17-5-94

Day: TUESDAY

Engineers:

Rig No.: 3

Location: PARAKURA - CLEVEDON ROAD.

Tender Truck No.: 27

Size and Purpose of Bore: 100mm WATER BORE

Work Details and Bore Hole No.:

On site at 7.30am. Ran rods and 100mm drag-bit. Wash drilled from 85.00 metres to a depth of 149.00 metres. Pulled out rods and installed airline to 71.00 metres. Developed bore for ½ hour. Pulled out airline and ran rods to 149.00 metres. Continued wash drilling to a depth of 173.00 metres. Pulled back rods and ceased work.

Bore Log :

N.B. - 3½ HOURS EXTRA TIME FOR RUNNING RODS, DRILLING & PULLING RODS BACK.

Materials Used:

COMPRESSOR HIRE - ½ HOUR.

Start 7.30 Finish 6.45 : 11¼

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours :

Contract Rates :

Rig Truck Km :

Water Tender Truck Km :

6 x 6 Winch Truck Km :

Utility or Van Service Km : 22

Client's Representative:

Crew: S.P. O'BRIEN

DRILLWELL EXPLORATION N.Z. LTD.

DRILLING CONTRACTORS

19888

DAILY LOG SHEET

P.O. BOX 360 MANUREWA

Client: AUCKLAND REGIONAL COUNCIL Date: 18-5-94

Day: WEDNESDAY

Engineers: Rig No.: 3

Location: PAPAKURA - CLEVEDON ROAD Tender Truck No.: 27

Size and Purpose of Bore: 100mm MONITOR BORE.

Work Details and Bore Hole No.: (2)

On site at 7.15am. Ran rods and continued wash drilling from 173.00 metres to a total depth of 180.00 metres. Pulled out rods and ran airline to 71.00 metres developed bore, grouted hole using 8 bags of cement. Washed up gear, loaded loose gear onto tender. Pulled out airline and packed up rig. Constructed cement pad, tidied site and left with all gear.

Bore Log :

N.B. ÷ 2½ HOURS SPENT RUNNING RODS, DRILLING & PULLING OUT.

Materials Used:

10 x 40 KG BAGS OF CEMENT
COMPRESSOR HIRE ÷ 5 HOURS
1 x LOCKING BORE CAP.
1x LOCKING PRESSURE CAP.

Start 7.15 Finish 4.30 : 9¼

Meals and Other Breaks :

Stand-by Hours :

Rig Working Hours :

Contract Rates :

Rig Truck Km : 11

Water Tender Truck Km : 11

6 x 6 Winch Truck Km :

Utility or Van Service Km : 11

Client's Representative:

Crew: S. P. O'BRIEN

TEST EXCAVATION LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-TP-07**
Sheet 1 of 1

Project:	SHA Takanini 2a/2b	**Coordinates:** E 1774019.09, N 5897963.89	**Datum:** NZTM
Client:	Auckland Council	**Surface RL (m):** +25.6m	**Total Depth:** 4.0m
Site:	Kennys' Farm, 55 Cosgrave Road	**Commenced:** 11-Nov-14	**Contractor:** Abernathy Projects
Job No.:	51/32174/04	**Completed:** 11-Nov-14	

Equipment:	Hyundai 5t		**Excavation Width (m):** 0.8	**Logged:**	JFK
Bucket Size (m):	0.6	**Shear Vane:** Geo 308	**Excavation Length (m):** 2.4	**Processed:**	RV
Bucket Type:	Rock		**Orientation/ Bearing:** ENE-WSW	**Checked:**	BH

Depth Scale (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Sample Depth	Sample Type	Sample/Test Number / Records & Comments
0		0.4 [+25.2]			OL	SILT with some rootlets; brown. Firm; moist; non-plastic. (Topsoil)	M	F			
					Pt	Organic CLAY with some silt and trace sand; dark brownish black. Firm; wet; non-plastic; sand, fine. (Amorphous Peat)	W	F	0.46	SV	33/7
	▽					@ 0.75 m becomes soft.		S	0.75	SV	20/7
1									1.00		Push Tube
		1.1 [+24.5]			SM	Sandy SILT with some roots; light brown. Soft; wet; non-plastic; sand, fine. (Ash)	W	S		U(50)	
		[+24.4]			Pt	Organic CLAY with some silt and trace sand; dark brownish black. Soft; wet; non-plastic; sand, fine. (Amorphous Peat)	W	S	1.50		
		1.7 [+24.0]	Peat (Amorphous)		Pt	CLAY with 60% wood and fibres; black. Soft; saturated; low plasticity. (Semi-fibrous Peat)	S	S	1.70	SV	12/4
2									1.90	SV	17/3
		2.1 [+23.6]			Pt	Organic CLAY with some wood and fibrous inclusions; dark brown. Soft; saturated; low to medium plasticity. (Amorphous Peat)	S	S			
									2.50	SV	20/4
						@ 2.66 m becomes firm.		F	2.66	SV	26/3
3						@ 3.05 m becomes black with low plasticity.					
						@ 3.2 m becomes soft.		S	3.20	SV	19/5
4		4.0 [+21.7]				Termination Depth = 3.95m (Extent of reach)					
5											
6											
7											

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: TP07

Project	SHA – Takanini 2a/2b	**Depth**	0.00 m	**To**	3.95 m
Job #	51-32714-04	**Pit Length**	Not recorded	**Pit Width**	Not recorded
Client	Auckland Council	**Comment**			
Date	11/11/2014				

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: TP07

Project	SHA – Takanini 2a/2b	**Depth**	0.00 m	**To**	3.95 m
Job #	51-32714-04	**Pit Length**	Not recorded	**Pit Width**	Not recorded
Client	Auckland Council	**Comment**			
Date	11/11/2014				

NZGD ID: TP_70593

TEST EXCAVATION LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-TP-08**
Sheet 1 of 1

Project:	SHA Takanini 2a/2b	**Coordinates:** E 1774247.75, N 5898044.34	**Datum:** NZTM
Client:	Auckland Council	**Surface RL (m):** +25.6m	**Total Depth:** 3.7m
Site:	Kennys' Farm	**Commenced:** 10-Nov-14	**Contractor:** Abernathy Projects
Job No.:	51/32174/04	**Completed:** 12-Nov-14	

Equipment:	5T Hyundai	**Excavation Width (m):**	1.6	**Logged:**	JFK/MB
Bucket Size (m):	1.5 **Shear Vane:** Geo 308	**Excavation Length (m):**	2.4	**Processed:**	RV
Bucket Type:	Weed bucket, blade bucket	**Orientation/ Bearing:**	ENE-WSW	**Checked:**	BH

Depth Scale (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Sample Depth	Sample Type	Sample/Test Number / Records & Comments
0		0.3 [+25.3]			OL	Organic SILT; black. Very Stiff; dry; slightly plastic; non-fibrous, friable. (Topsoil)	M	VSt	0.10	SV	126/54
					Pt	Organic silty CLAY; black. Stiff; moist; medium plasticity. (Semi-fibrous Peat)	M	St	0.30	SV	90/36
									0.50	SV	78/33
						@ 0.6 m with frequent wood fragments.					
	▽					@ 0.8 m becomes soft.		S	0.80	SV	Push tube
1	0.80m					@ 0.9 m becomes very soft.			0.80	SV	25/7
									0.90	U(50)	11/2
		1.2 [+24.4]			SM	Sandy SILT; light brown. Firm; moist; non-plastic; sand, fine; slightly dilatant. (Ash)	M	F	1.20	D	
		1.4 [+24.2]							1.30	SV	35/5
			Peat (Semi -fibrous)		Pt	Organic silty CLAY; black. Soft; moist; medium plasticity. (Semi-fibrous Peat)	M	S	1.40	SV	20/2
									1.60	SV	16/3
									1.90	SV	13/3
2		2.1 [+23.5]				@ 2.0 m becomes very soft.		VS	2.00	SV	8/3
					Pt	Organic CLAY with minor wood fragments and rootlets; dark brown. Very soft; saturated; low plasticity. (Amorphous Peat)	S	VS			
						@ 2.4 m with large pieces of wood.			2.40	SV	10/3
		2.8 [+22.8]			Pt	CLAY with minor silt and sand and 70% wood and fibrous organics; dark brownish black. Very soft; saturated; non-plasticity. (Semi-fibrous Peat)	S	VS	2.90	SV	10/8
3						@ 3.4 m becomes soft.		S	3.40	SV	13/8
		3.7							3.50	SV	16/8 Organic / hydrogen sulfide odour
		[+21.9]				Termination Depth = 3.7m (Extent of reach)			3.80	SV	13/9
4											
5											
6											
7											

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

NZGD ID: TP_70594

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Report of Photographs

Site Identification: TP08

Project	SHA – Takanini 2a/2b	**Depth**	0.00 m	**To**	3.70 m
Job #	51-32714-04	**Pit Length**	Not recorded	**Pit Width**	Not recorded
Client	Auckland Council	**Comment**			
Date	12/11/2014				

NZGD ID: TP_70594

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: TP08

Project	SHA – Takanini 2a/2b	**Depth**	0.00 m	**To**	3.70 m
Job #	51-32714-04	**Pit Length**	Not recorded	**Pit Width**	Not recorded
Client	Auckland Council	**Comment**			
Date	12/11/2014				

NZGD ID: TP_70594

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: TP08

Project	SHA – Takanini 2a/2b	**Depth**	0.00 m	**To**	3.70 m
Job #	51-32714-04	**Pit Length**	Not recorded	**Pit Width**	Not recorded
Client	Auckland Council	**Comment**			
Date	12/11/2014				

TEST EXCAVATION LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-TP-09**
Sheet 1 of 1

Project:	SHA Takanini 2a/2b	**Coordinates:** E 1774377.95, N 5898023.51	**Datum:** NZTM
Client:	Auckland Council	**Surface RL (m):** +25.1m	**Total Depth:** 3.8m
Site:	Kennys' Farm	**Commenced:** 10-Nov-14	**Contractor:** Abernathy Projects
Job No.:	51/32174/04	**Completed:** 11-Nov-14	

Equipment:	5T Hyundai		**Excavation Width (m):**	2.0	**Logged:** JFK
Bucket Size (m):	1.6	**Shear Vane:** Geo 308	**Excavation Length (m):**	2.7	**Processed:** RV
Bucket Type:	Blade		**Orientation/ Bearing:**	NNW-SSE	**Checked:** BH

Depth Scale (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Sample Depth	Sample Type	Sample/Test Number / Records & Comments
0		0.3 [+24.8]	Peat (Amorphous)		OL	SILT with some clay and rootlets; dark brownish black. Moist; non-plastic. (Topsoil)	M	F			
					Pt	Silty organic CLAY with pockets of ash and charcoal; dark brownish black. Firm; wet; non-plastic. (Amorphous Peat). Ash comprises slightly dilatant, silty fine SAND; light brown.	W	F	0.25	SV	39+
	▽	0.5 [+24.6]			Pt		W	F	0.40	SV	33/7
		0.7			SM	@ 0.4 m trace wood fragments.	M	S	0.54	SV	29/7
		[+24.3]			Pt	Organic CLAY with minor silt and some wood and charcoal fragments; brown to dark brown. Firm; wet; low plasticity. (Peat)	W	F	0.65	SV	24/6
1						Sandy SILT; light brown. Soft; moist; non-plastic. (Ash)		S	0.80	SV	30/9
						Organic CLAY with some fibrous organics; dark brownish black. Firm; wet; low plasticity. (Amorphous Peat)			1.00	SV	Push tube
						@ 1.1 m becomes soft.			1.00	SV	33/4
						@ 1.55 m becomes very soft.			1.10	U(50)	14/3
						@ 1.6 m with trace large pieces of wood.		VS	1.50		
2		2.1 [+23.0]				@ 1.9 m becomes dark brown.			1.55	SV	8/3
			Peat (Fibrous)		Pt	Wood and fibrous organic material (80%) in a matrix of organic clayesy SILT; dark brownish black. Matrix Soft; saturated; low plasticity. (Fibrous Peat)	S	S	2.00	SV	8/4
3									2.50	SV	14/4
		3.8 [+21.3]									Organic / hydrogen sulfide odour.
4						Termination Depth = 3.8m (Extent of reach)					
5											
6											
7											

BOREHOLE LOG NZ ALT 5132174 - LOGS.GPJ NZ GINT DATA TEMPLATE VER 1.3 GDT 1/9/15

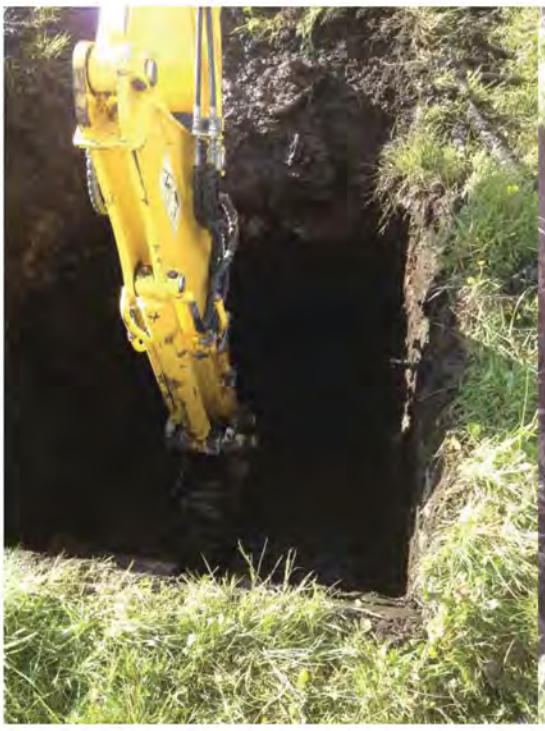
NZGD ID: TP_70595

CLIENTS | PEOPLE | PERFORMANCE

Report of Photographs

Site Identification: TP09

Project	SHA – Takanini 2a/2b	**Depth**	0.0 m	**To**	3.80 m
Job #	51-32714-04	**Pit Length**	Not recorded	**Pit Width**	1.60 m
Client	Auckland Council	**Comment**			
Date	11/11/2014				



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Report of Photographs

Site Identification: TP09

Project	SHA – Takanini 2a/2b	**Depth**	0.0 m	**To**	3.80 m
Job #	51-32714-04	**Pit Length**	Not recorded	**Pit Width**	1.60 m
Client	Auckland Council	**Comment**			
Date	11/11/2014				

TEST EXCAVATION LOG

GHD Limited
PO Box 6543
Auckland 1141

Site Identification: **GHD-TP-10**
Sheet 1 of 1

Project:	SHA Takanini 2a/2b	**Coordinates:** E 1774463.55, N 5897861.88	**Datum:** NZTM
Client:	Auckland Council	**Surface RL (m):** +26.0m	**Total Depth:** 4.0m
Site:	Kennys' Farm, Old Wairoa Road	**Commenced:** 12-Nov-14	**Contractor:** Abernathy Projects
Job No.:	51/32174/04	**Completed:** 12-Nov-14	

Equipment:	Havarda GT		**Excavation Width (m):**	0.8	**Logged:** MB
Bucket Size (m):	0.7	**Shear Vane:** Geo 308	**Excavation Length (m):**	2.0	**Processed:** RV
Bucket Type:	Rock		**Orientation/ Bearing:**	Not Recorded	**Checked:** BH

Depth Scale (m)	Water	Depth (m)/ [Elev.]	Geological Unit	Graphic Log	Classification	SOIL DESCRIPTION: (Soil Code), Soil Name [minor MAJOR], colour, structure [zoning, defects, cementing], plasticity or grain size, secondary components, structure. (Geological Formation) / ROCK DESCRIPTION: Weathering, colour, fabric, ROCK NAME (Formation Name)	Moisture Condition	Consistency/ Relative Density	Sample Depth	Sample Type	Sample/Test Number / Records & Comments
0		0.2 [+25.8]	Peat (Amorphous)		OL	Topsoil. Dry; friable.	D				
					CL	Clayey SILT; dark orange brown with organic staining. Firm; dry to moist; slightly plastic; friable.	D	F	0.40	SV	37/7
		0.5 [+25.5]			Pt	Organic clayey SILT with frequent wood inclusions; dark brown. Firm; moist; slightly plastic. (Amorphous Peat)	M	F	0.60	SV	35/6
1		1.2 [+24.8]			SM	Sandy SILT; light brown. Soft; moist; non-plastic; slightly dilatant; pumiceous. (Rhyolic Ash)	M	S	1.30	SV	20/6
	▽	1.4 [+24.6]			Pt	Silty CLAY with trace wood inclusions; black. Soft; wet; medium plasticity; slightly spongy. (Amorphous Peat)	W	S	1.70	SV	14/4
									1.80	SV	16/3
2						@ 2.0 m with larger wood logs.			2.20	SV	12/3
		2.4 [+23.6]	Alluvium		CL	Silty CLAY; light brown. Soft; wet; medium to high plasticity. (Alluvial Clay)	W	S	2.40	SV	24/7
									2.60	SV	28/5
3						@ 3.0 m becomes tan.			3.00	SV	15/4
									3.30	D	
									3.40	SV	19/6
											Organic / hydrogen sulfide odour.
4		4.0 [+22.0]				Termination Depth = 4m (Extent of reach)			4.00	SV	21/4
5											
6											
7											

NZGD ID: TP_70596

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Report of Photographs

Site Identification: TP10

Project	SHA – Takanini 2a/2b	**Depth**	0.00 m	**To**	4.00 m
Job #	51-32714-04	**Pit Length**	2.00 m	**Pit Width**	0.80 m
Client	Auckland Council	**Comment**			
Date	12/11/2014				

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Report of Photographs

Site Identification: TP10

Project	SHA – Takanini 2a/2b	**Depth**	0.00 m	**To**	4.00 m
Job #	51-32714-04	**Pit Length**	2.00 m	**Pit Width**	0.80 m
Client	Auckland Council	**Comment**			
Date	12/11/2014				

NZGD ID: TP_70596