



 EARTHINVLAB	EARTH INVESTIGATION LABORATORIES Plot 209 Tienie Street, Andeon AH, Zandfontein, 0183 P.O. Box 2856, Rosslyn, 0200 Tel: +27 (0)12 372 3023 Fax: +27 (0)86 241 3304 e-mail: admin@earthinv.co.za	
	TEST REPORT	
	REPORT #	EIL_324.3

CLIENT INFORMATION			
Client Name:	MMK	Client Number:	398
Address:	Suite 11, Hillcrest Park 2 Old Main Hillcrest	Project Name:	The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road
Primary Contact Person:	Sachin Kistasamy	Telephone Number:	031 765 7752
Primary Contact email:	sachin.kistasamy@mmkengineers.co.za	Fax Number:	0

SAMPLES/JOB INFORMATION			
Date Sampled:	03-Nov-23	Date Received:	03-Nov-23
Sampler:	EIL	Date Tested:	03-Nov-23
Sample Location:	Durban Heights to Wycombe Road	Date Reported:	28-Nov-23
Sample Method:		Tests Conducted At:	On Site
Sample Condition:		Report Status:	Final

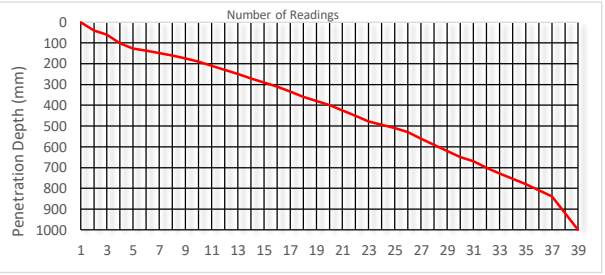
TEST RESULTS SUMMARY			
Test (s) Methods References	Test Method(s) Description (s)	Qty	Test Conducted by.
TMH 6 ST6#	Measurement of the insitu strength of soils by dynamic cone penetrometer(DCP)	7	Earthinv Main Lab
-			-
-			-
-			-
-			-
-			-
-			-
-			-

TEST RESULTS NOTES
<p>Tests Deviations and Subcontracting - Test deviations indicated if any on the report and clearly communicated to Client.</p> <p>Documents Reproduction - If a report is published or reproduced by the client, it will be done in full, without any omittance.</p> <p>Report Status - Only final status results are to be good for publication.</p> <p>Samples Received and Results Relation - Test results relate to sample received and to conditions thereof on receipt</p> <p>Samples Retainment - If not specified by the Client, samples will be disposed off as per the Laboratories discretion</p> <p>Opinions & Recommendations: Opinions & recommendations do not form part of the Labs accreditation schedule</p>

Page 1 of 8

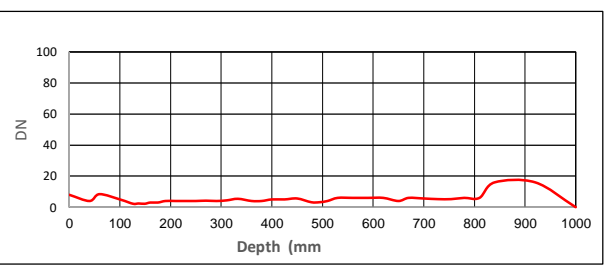
 EARTHINVLAB	Earth Inv Lab FINAL REPORT DYNAMIC CONE PENETROMETER
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Project Name:	The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road	DCP No.	DCP1 0.0 Km
Client Ref No:	398	Area:	Durban Heights to High Wycombe Road
Client Name:	MMK	Position:	DCP1 0.0 Km
Report No:	EIL_324.3	Start Depth	0
Report Date:	03-Nov-23	Blow/ Reading	5

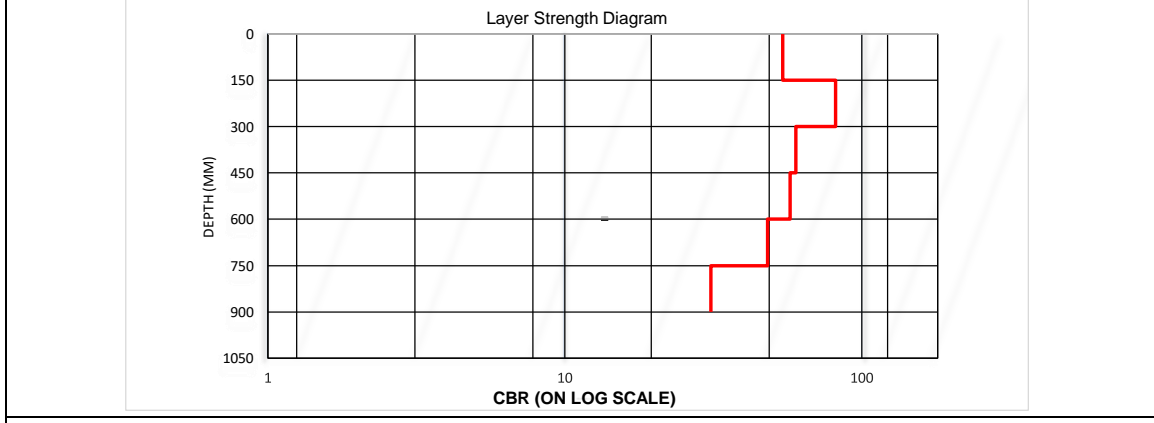
DCP Readings		Blows per reading:					5		
no.	mm	no.	mm	no.	mm	no.	mm	no.	mm
1	0	11	210	21	425	31	670	41	
2	40	12	230	22	450	32	700	42	
3	60	13	250	23	478	33	728	43	
4	102	14	270	24	494	34	754	44	
5	126	15	291	25	510	35	780	45	
6	137	16	311	26	530	36	810	46	
7	149	17	333	27	560	37	840	47	
8	160	18	360	28	590	38	920	48	
9	175	19	380	29	620	39	1000	49	
10	190	20	400	30	650	40		50	



DCP number (mm/Blow) DN							
DN	mm	DN	mm	DN	mm	DN	mm
8,0	0	4,0	210	5,0	425	6,0	670
4,0	40	4,0	230	5,6	450	5,6	700
8,4	60	4,0	250	3,2	478	5,2	728
4,8	102	4,2	270	3,2	494	5,2	754
2,2	126	4,0	291	4,0	510	6,0	780
2,4	137	4,4	311	6,0	530	6,0	810
2,2	149	5,4	333	6,0	560	16,0	840
3,0	160	4,0	360	6,0	590	16,0	920
3,0	175	4,0	380	6,0	620		1000
4,0	190	5,0	400	4,0	650		




Layer	Depth (mm)		Thickness (mm)	Penetration Rate DN (mm/blow)	CBR (%)	Blows/mm		UCS (kPa)	Bearing Capacity
	from	to				150mm	300mm		
1	0	150	150	4,9	54,1	30,5	72,3	510	685
2	151	300	149	3,6	81,6	41,8		726	949
3	301	450	149	4,5	59,9	32,8	64,4	556	742
4	451	600	149	4,7	57,4	31,7		536	717
5	601	750	149	5,4	48,1	27,6	47,1	461	623
6	751	900	149	7,6	31,0	19,5		316	440



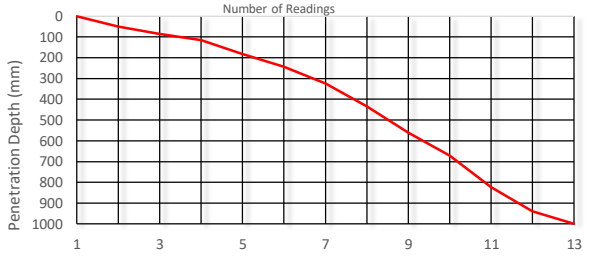
Note:
 No DCP refusal

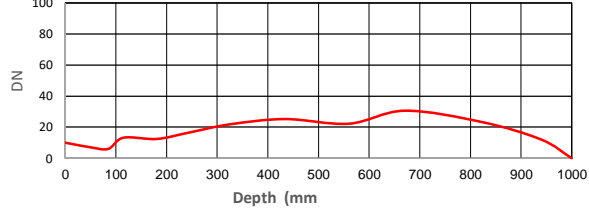


 EARTHINVLAB	Earth Inv Lab FINAL REPORT DYNAMIC CONE PENETROMETER		
Project Name:	The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road	DCP No.	DCP2 0.2 Km
Client Ref No:	398	Area:	Durban Heights to High Wycombe Road
Client Name:	MMK	Position:	DCP2 0.2 Km
Report No:	EIL_324.3	Start Depth	0
Report Date:	03-Nov-23	Blow/ Reading	5

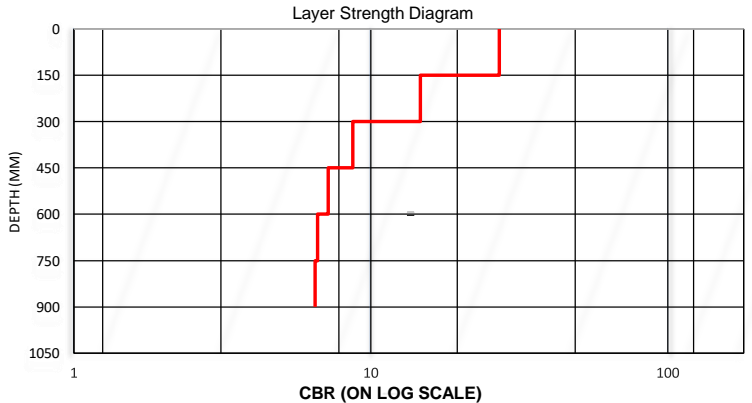
DCP Readings		Blows per reading:					5				
no.	mm	no.	mm	no.	mm	no.	mm	no.	mm	no.	mm
1	0	11	824	21		31		41			
2	50	12	940	22		32		42			
3	85	13	1000	23		33		43			
4	115	14		24		34		44			
5	181	15		25		35		45			
6	243	16		26		36		46			
7	325	17		27		37		47			
8	434	18		28		38		48			
9	560	19		29		39		49			
10	671	20		30		40		50			

DCP number (mm/Blow) DN									
DN	mm	DN	mm	DN	mm	DN	mm	DN	mm
10,0	0	23,2	824						
7,0	50	12,0	940						
6,0	85		1000						
13,2	115								
12,4	181								
16,4	243								
21,8	325								
25,2	434								
22,2	560								
30,6	671								







Layer	Depth (mm)		Thickness (mm)	Penetration Rate DN (mm/blow)	CBR (%)	Blows/mm		UCS (kPa)	Bearing Capacity
	from	to				150mm	300mm		
1	0	150	150	8,5	27,1	17,7	28,5	281	395
2	151	300	149	13,8	14,7	10,8		166	242
3	301	450	149	20,8	8,7	7,2	13,3	106	160
4	451	600	149	24,2	7,2	6,2		90	137
5	601	750	149	25,8	6,6	5,8	11,5	84	129
6	751	900	149	26,2	6,5	5,7		83	127



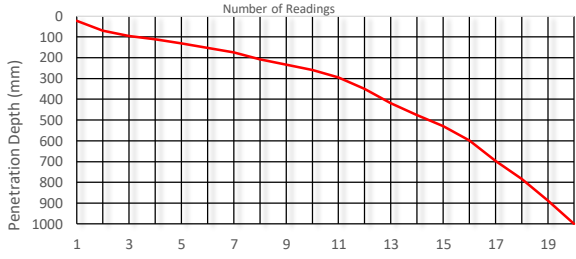
Note:
No DCP refusal

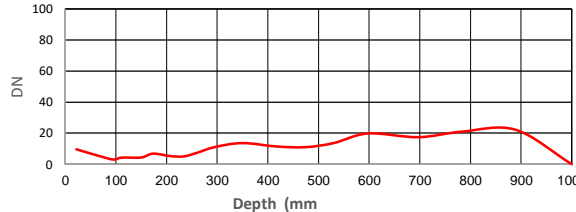

Page 3 of 8

 EARTHINVLAB	Earth Inv Lab FINAL REPORT DYNAMIC CONE PENETROMETER			
Project Name:	The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road		DCP No.	DCP3 0.5 Km
Client Ref No:	398		Area:	Durban Heights to High Wycombe Road
Client Name:	MMK		Position:	DCP3 0.5 Km
Report No:	EIL_324.3		Start Depth	-22
Report Date:	03-Nov-23		Blow/ Reading	5

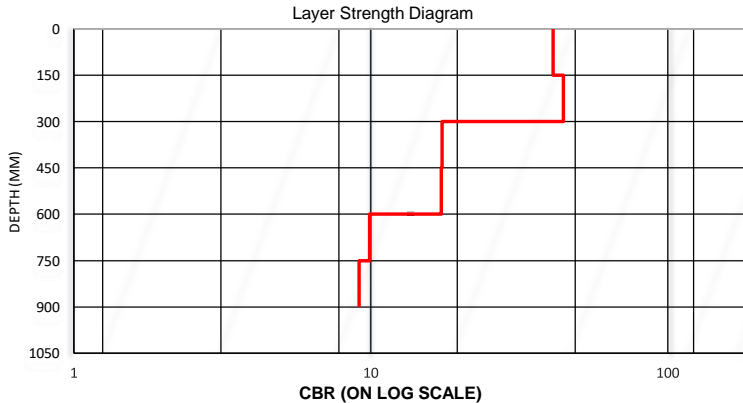
DCP Readings		Blows per reading:					5				
no.	mm	no.	mm	no.	mm	no.	mm	no.	mm	no.	mm
1	22	11	295	21		31		41			
2	70	12	350	22		32		42			
3	95	13	418	23		33		43			
4	110	14	475	24		34		44			
5	131	15	530	25		35		45			
6	152	16	598	26		36		46			
7	174	17	697	27		37		47			
8	208	18	784	28		38		48			
9	234	19	889	29		39		49			
10	259	20	1000	30		40		50			

DCP number (mm/Blow) DN									
DN	mm	DN	mm	DN	mm	DN	mm	DN	mm
9,6	22	11,0	295						
5,0	70	13,6	350						
3,0	95	11,4	418						
4,2	110	11,0	475						
4,2	131	13,6	530						
4,4	152	19,8	598						
6,8	174	17,4	697						
5,2	208	21,0	784						
5,0	234	22,2	889						
7,2	259		1000						







Layer	Depth (mm)		Thickness (mm)	Penetration Rate DN (mm/blow)	CBR (%)	Blows/mm		UCS (kPa)	Bearing Capacity
	from	to				150mm	300mm		
1	0	150	150	6,1	41,1	24,5	50,5	403	550
2	151	300	149	5,7	44,5	25,9		431	586
3	301	450	149	12,1	17,4	12,4	24,6	192	277
4	451	600	149	12,1	17,2	12,3		191	276
5	601	750	149	18,8	9,9	7,9	15,4	119	177
6	751	900	149	20,0	9,1	7,4		111	166



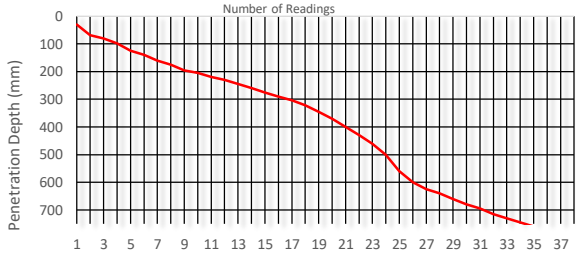
Note:
 No DCP refusal

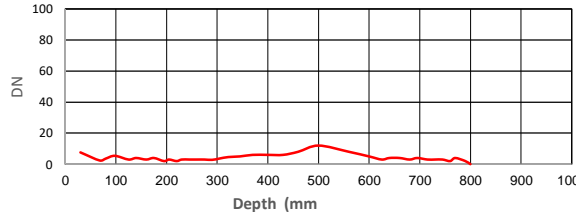

Page 4 of 8

 EARTHINVLAB	Earth Inv Lab FINAL REPORT DYNAMIC CONE PENETROMETER
Project Name: The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road	DCP No.: DCP4 0.8 Km
Client Ref No.: 398	Area: Durban Heights to High Wycombe Road
Client Name: MMK	Position: DCP4 0.8 Km
Report No.: EIL_324.3	Start Depth: -30
Report Date: 03-Nov-23	Blow/ Reading: 5

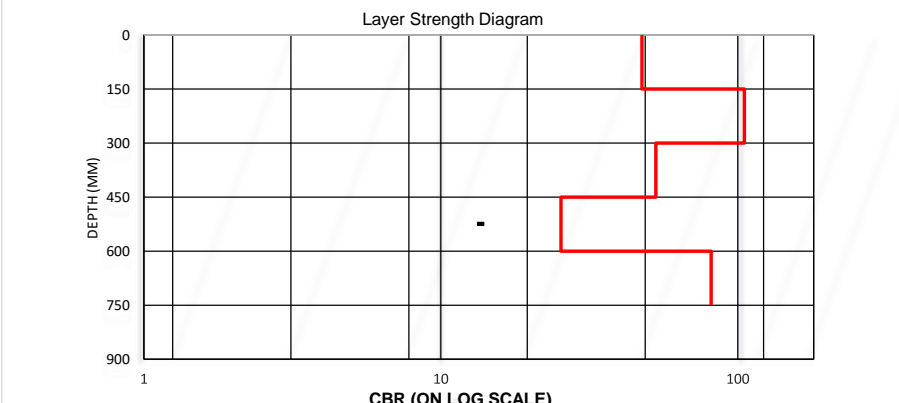
DCP Readings		Blows per reading:					5				
no.	mm	no.	mm	no.	mm	no.	mm	no.	mm	no.	mm
1	30	11	220	21	400	31	695	41			
2	68	12	230	22	430	32	715	42			
3	80	13	245	23	460	33	730	43			
4	98	14	260	24	500	34	745	44			
5	125	15	275	25	560	35	760	45			
6	140	16	290	26	600	36	770	46			
7	160	17	304	27	625	37	790	47			
8	175	18	322	28	640	38	800	48			
9	195	19	345	29	660	39		49			
10	205	20	370	30	680	40		50			

DCP number (mm/Blow) DN							
DN	mm	DN	mm	DN	mm	DN	mm
7,6	30	2,0	220	6,0	400	4,0	695
2,4	68	3,0	230	6,0	430	3,0	715
3,6	80	3,0	245	8,0	460	3,0	730
5,4	98	3,0	260	12,0	500	3,0	745
3,0	125	3,0	275	8,0	560	2,0	760
4,0	140	2,8	290	5,0	600	4,0	770
3,0	160	3,6	304	3,0	625	2,0	790
4,0	175	4,6	322	4,0	640		800
2,0	195	5,0	345	4,0	660		
3,0	205	6,0	370	3,0	680		







Layer	Depth (mm)		Thickness (mm)	Penetration Rate DN (mm/blow)	CBR (%)	Blows/mm		UCS (kPa)	Bearing Capacity
	from	to				150mm	300mm		
1	0	150	150	5,5	47,5	27,5	78,6	456	618
2	151	300	149	2,9	105,3	51,1		903	1162
3	301	450	149	5,0	53,0	29,8	46,4	501	673
4	451	600	149	8,9	25,4	16,7		266	375
5	601	750	149	3,6	81,3	41,7	41,7	723	946



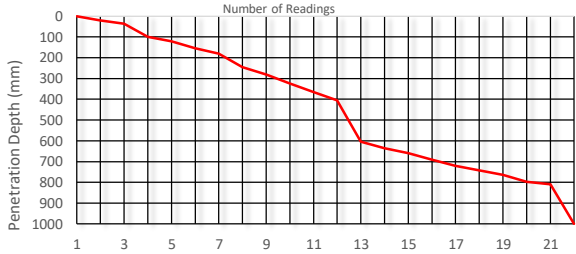
Note:
 DCP refusal @ 800 mm

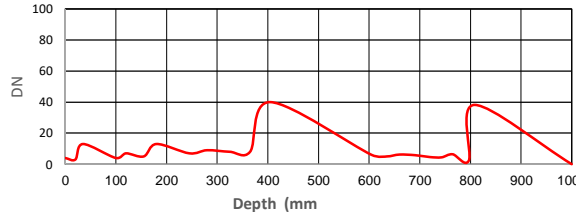


 EARTHINVLAB	Earth Inv Lab FINAL REPORT DYNAMIC CONE PENETROMETER		
Project Name:	The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road	DCP No.	DCP5 1.1 Km
Client Ref No:	398	Area:	Durban Heights to High Wycombe Road
Client Name:	MMK	Position:	DCP5 1.1 Km
Report No:	EIL_324.3	Start Depth	0
Report Date:	03-Nov-23	Blow/ Reading	5

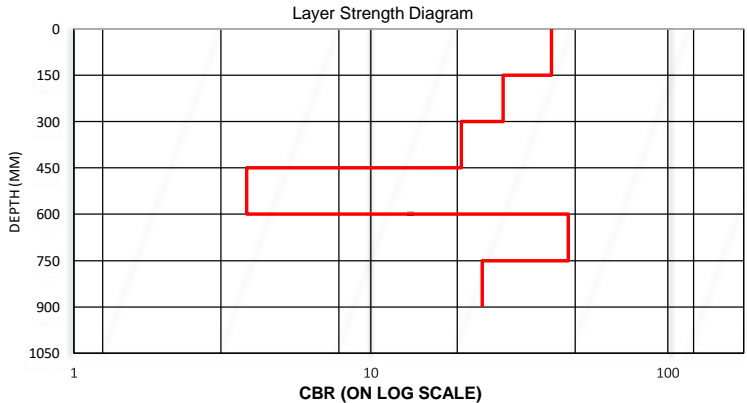
DCP Readings		Blows per reading:					5
no.	mm	no.	mm	no.	mm	no.	mm
1	0	11	365	21	809	31	41
2	20	12	405	22	1000	32	42
3	35	13	605	23		33	43
4	100	14	635	24		34	44
5	120	15	660	25		35	45
6	155	16	691	26		36	46
7	180	17	720	27		37	47
8	245	18	743	28		38	48
9	280	19	765	29		39	49
10	325	20	797	30		40	50

DCP number (mm/Blow) DN							
DN	mm	DN	mm	DN	mm	DN	mm
4,0	0	8,0	365	38,2	809		
3,0	20	40,0	405		1000		
13,0	35	6,0	605				
4,0	100	5,0	635				
7,0	120	6,2	660				
5,0	155	5,8	691				
13,0	180	4,6	720				
7,0	245	4,4	743				
9,0	280	6,4	765				
8,0	325	2,4	797				







Layer	Depth (mm)		Thickness (mm)	Penetration Rate DN (mm/blow)	CBR (%)	Blows/mm		UCS (kPa)	Bearing Capacity
	from	to				150mm	300mm		
1	0	150	150	6,2	40,6	24,3	42,2	399	545
2	151	300	149	8,3	27,9	17,9		289	404
3	301	450	149	10,7	20,2	13,9	17,7	219	312
4	451	600	149	39,7	3,8	3,8		52	83
5	601	750	149	5,6	46,2	26,7	42,5	445	604
6	751	900	149	9,4	23,7	15,8		251	355



Note:
No DCP refusal

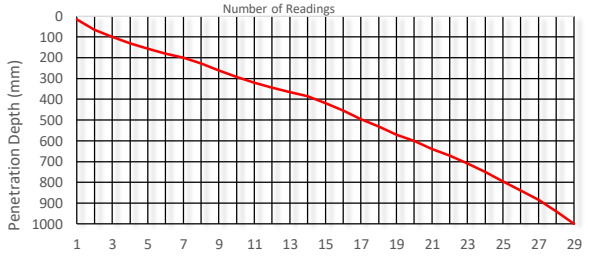


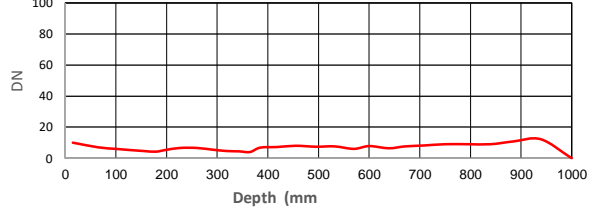
Page 6 of 8

 EARTHINVLAB	Earth Inv Lab FINAL REPORT DYNAMIC CONE PENETROMETER
Project Name: The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road	DCP No.: DCP6 1.4 Km
Client Ref No.: 398	Area: Durban Heights to High Wycombe Road
Client Name: MMK	Position: DCP6 1.4 Km
Report No.: EIL_324.3	Start Depth: -15
Report Date: 03-Nov-23	Blow/ Reading: 5

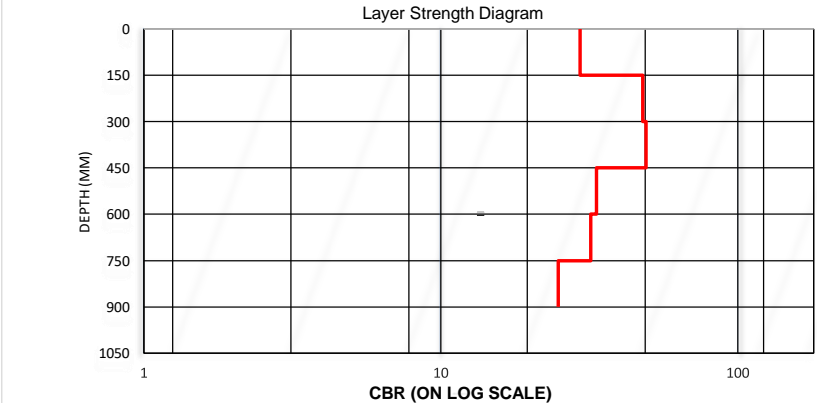
DCP Readings		Blows per reading:					5
no.	mm	no.	mm	no.	mm	no.	mm
1	15	11	320	21	639	31	41
2	65	12	343	22	671	32	42
3	100	13	365	23	709	33	43
4	130	14	385	24	750	34	44
5	156	15	419	25	795	35	45
6	179	16	455	26	840	36	46
7	200	17	495	27	885	37	47
8	227	18	532	28	939	38	48
9	260	19	570	29	1000	39	49
10	293	20	600	30		40	50

DCP number (mm/Blow) DN							
DN	mm	DN	mm	DN	mm	DN	mm
10,0	15	4,6	320	6,4	639		
7,0	65	4,4	343	7,6	671		
6,0	100	4,0	365	8,2	709		
5,2	130	6,8	385	9,0	750		
4,6	156	7,2	419	9,0	795		
4,2	179	8,0	455	9,0	840		
5,4	200	7,4	495	10,8	885		
6,6	227	7,6	532	12,2	939		
6,6	260	6,0	570		1000		
5,4	293	7,8	600				







Layer	Depth (mm)		Thickness (mm)	Penetration Rate DN (mm/blow)	CBR (%)	Blows/mm		UCS (kPa)	Bearing Capacity
	from	to				150mm	300mm		
1	0	150	150	8,0	29,4	18,8	46,3	302	422
2	151	300	149	5,4	47,8	27,5		459	621
3	301	450	149	5,3	49,1	28,0	48,7	469	633
4	451	600	149	7,2	33,4	20,7		337	467
5	601	750	149	7,5	32,0	20,0	36,4	325	451
6	751	900	149	9,1	24,8	16,4		262	369



Note:
 No DCP refusal

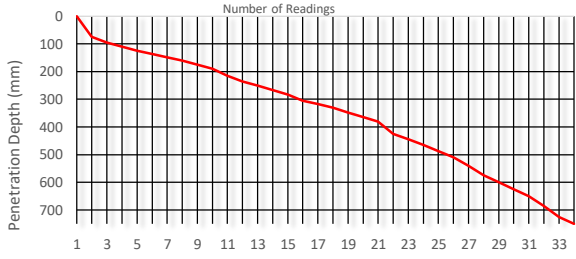


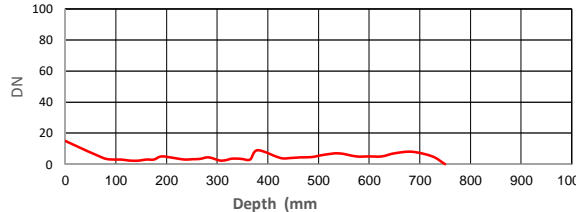
Page 7 of 8

 EARTHINVLAB		Earth Inv Lab FINAL REPORT DYNAMIC CONE PENETROMETER			
Project Name:	The Geological Investigation for Southern Aqueduct Work Package 6 Durban Heights to High Wycombe Road			DCP No.	DCP7 1.6 Km
Client Ref No:	398			Area:	Durban Heights to High Wycombe Road
Client Name:	MMK			Position:	DCP7 1.6 Km
Report No:	EIL_324.3			Start Depth	0
Report Date:	03-Nov-23			Blow/ Reading	5

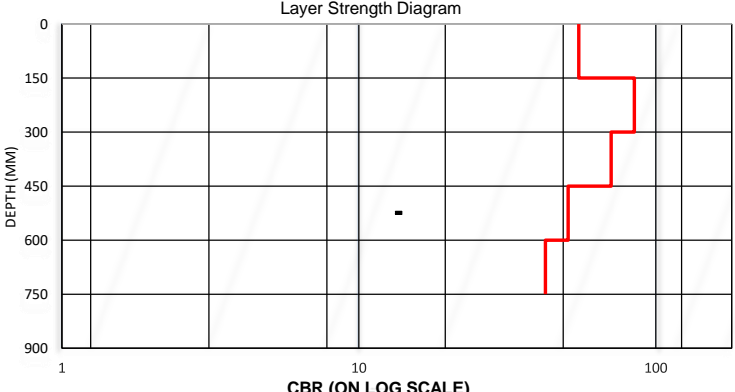
DCP Readings		Blows per reading:					5				
no.	mm	no.	mm	no.	mm	no.	mm	no.	mm	no.	mm
1	0	11	215	21	380	31	650	41			
2	75	12	235	22	425	32	685	42			
3	95	13	250	23	445	33	725	43			
4	110	14	266	24	465	34	750	44			
5	125	15	283	25	487	35		45			
6	137	16	305	26	510	36		46			
7	148	17	317	27	540	37		47			
8	160	18	330	28	575	38		48			
9	175	19	348	29	600	39		49			
10	190	20	365	30	625	40		50			

DCP number (mm/Blow) DN							
DN	mm	DN	mm	DN	mm	DN	mm
15,0	0	4,0	215	9,0	380	7,0	650
4,0	75	3,0	235	4,0	425	8,0	685
3,0	95	3,2	250	4,0	445	5,0	725
3,0	110	3,4	266	4,4	465		750
2,4	125	4,4	283	4,6	487		
2,2	137	2,4	305	6,0	510		
2,4	148	2,6	317	7,0	540		
3,0	160	3,6	330	5,0	575		
3,0	175	3,4	348	5,0	600		
5,0	190	3,0	365	5,0	625		





Layer	Depth (mm)		Thickness (mm)	Penetration Rate DN (mm/blow)	CBR (%)	Blows/mm		UCS (kPa)	Bearing Capacity
	from	to				150mm	300mm		
1	0	150	150	4,9	55,0	30,8	73,9	517	693
2	151	300	149	3,5	84,7	43,0		749	977
3	301	450	149	4,0	70,8	37,4	66,1	643	848
4	451	600	149	5,2	50,7	28,8		483	650
5	601	750	149	6,0	42,5	25,0	25,0	414	565



Note:
DCP refusal @ 750 mm