

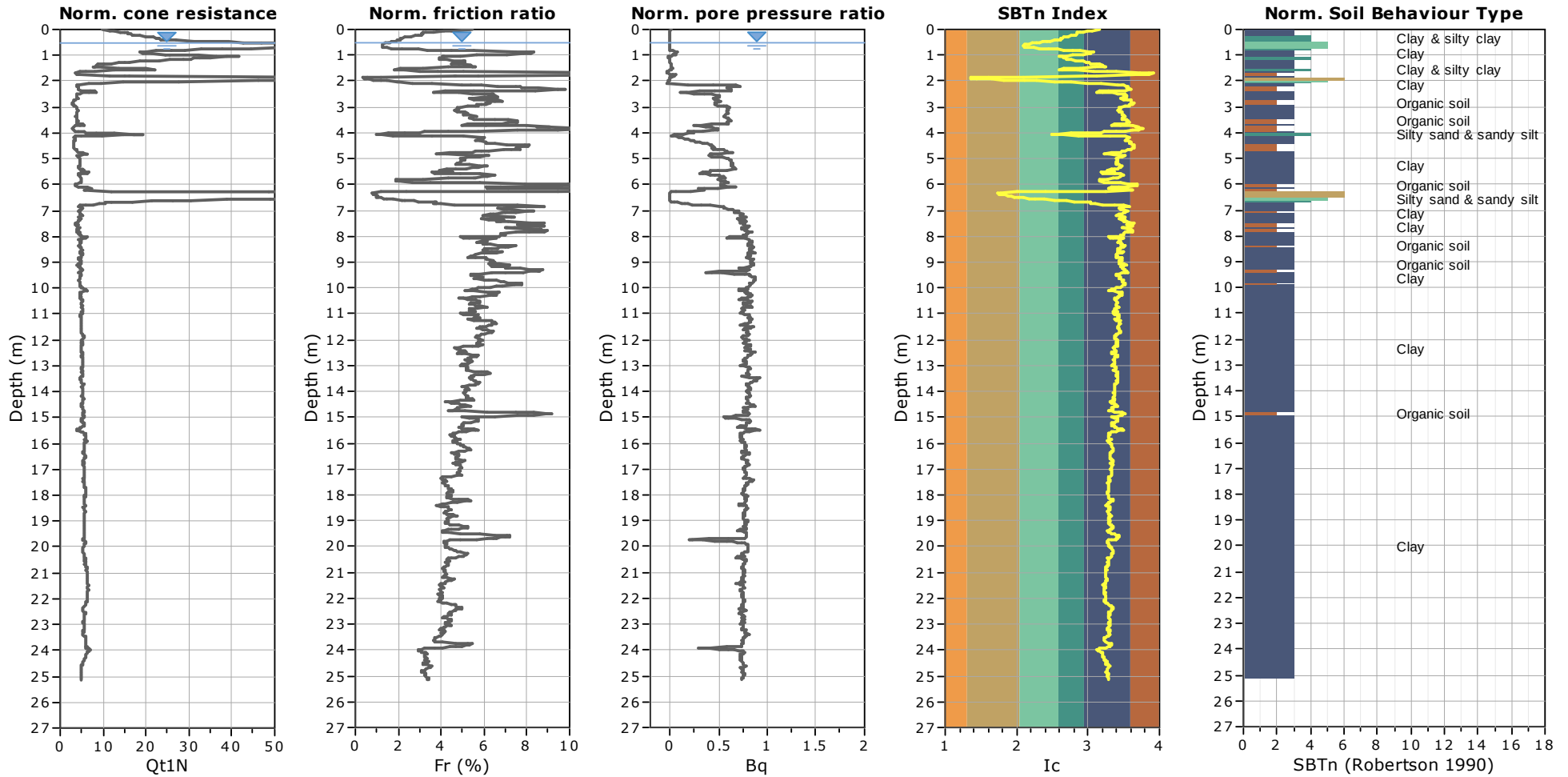


Golder Associates
Ottawa, ON
www.golder.com

Project: 12-1125-0045 - CRRRC EA Eastern Ontario
Location: Boundary Road Site

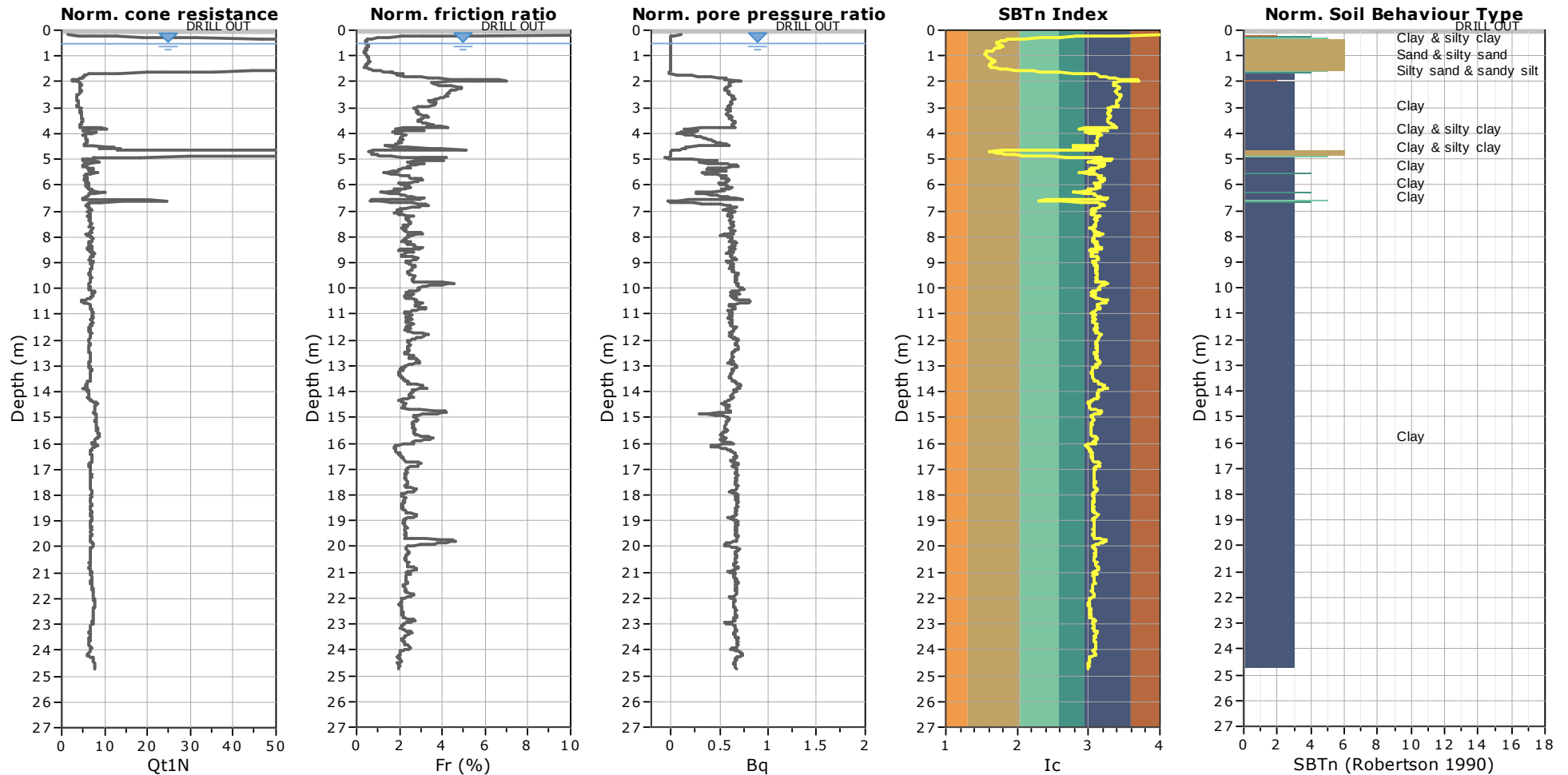
CPT: 12-2-1 Rev 1

Total depth: 25.14 m, Date: 12/20/2012
Surface Elevation: 77.02 m
Coords: X:466155.63, Y:5019599.37
Cone Type: 10 cm2, u2, (4039)
Cone Operator: Golder (D. Grylls)



SBTn legend

- | | | |
|---------------------------|------------------------------|-----------------------------------|
| 1. Sensitive fine grained | 4. Clayey silt to silty clay | 7. Gravely sand to sand |
| 2. Organic material | 5. Silty sand to sandy silt | 8. Very stiff sand to clayey sand |
| 3. Clay to silty clay | 6. Clean sand to silty sand | 9. Very stiff fine grained |



PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-2

SHEET 1 OF 2

LOCATION: N 5020298.57 ; E 467132.84

BORING DATE: November 13-14, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20		40		60		80			
								SHEAR STRENGTH Cu, kPa		nat V. + rem V. ⊕		Q - ● U - ○		WATER CONTENT PERCENT			
								20	40	60	80			20	40	60	80
0	Power Auger 200 mm Diam. (Hollow Stem)	GROUND SURFACE		75.95													
		TOPSOIL		0.00													
		Very loose brown SILTY SAND to SAND, some silt and clay		0.25 75.40	1	50 DO	3							○			MH
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		0.55 74.88	2	50 DO	4										
1		Grey brown SAND, some silt, trace clay															
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22	3	50 DO	1										
		Soft grey to red grey SILTY CLAY															
2				73.89													
		Grey CLAYEY SILT, some sand		2.15				+									
		Soft grey to red grey CLAY to SILTY CLAY, with silt seams															
3																	
4		- Grey silt layer from 3.72 m to 3.76 m					⊕	+									
5				71.20 4.75													
		Grey SANDY SILT, with black staining		4.99 5.13													
		Grey SILT, some clay															
		Soft to firm red grey CLAY to SILTY CLAY, with black staining and sandy silt and sand seams															
6		- Grey sandy silt layer from 5.28 m to 5.32 m					+										
7							⊕	+									
		- Grey silt layer from 7.16 m to 7.24 m															
8									+								
9		- Grey clayey silt layer from 8.94 m to 9.07 m							+								
10							⊕	+									
11									+								
12									+								
	Electric Nilcon	Stiff grey and red CLAY to SILTY CLAY, with black staining		63.76 12.19													
13								⊕	+								
14									+								
15									>39								
		CONTINUED NEXT PAGE															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14_JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-2

SHEET 2 OF 2

LOCATION: N 5020298.57 ;E 467132.84

BORING DATE: November 13-14, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m										
								SHEAR STRENGTH Cu, kPa		nat V. + Q - ● rem V. ⊕ U - ○		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²		
15	Electric Nilcon	--- CONTINUED FROM PREVIOUS PAGE --- Stiff grey and red CLAY to SILTY CLAY, with black staining															
16																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	
24																	
25																	
26																	
27		End of Borehole		48.95 27.00													
28	Note: 1. Soil stratigraphy inferred from various soil sampling methods and CPT. 2. Vane pushed to 27 m depth. Rod friction too high to carry out test.																
29																	
30																	

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

SHEET 1 OF 3

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m												
								SHEAR STRENGTH				WATER CONTENT PERCENT							
								Cu, kPa	nat V. rem V.	+ ⊕	- ○	Wp	W	I			WI		
								20	40	60	80								
								20	40	60	80								
0	Wash Boring HW Casing	GROUND SURFACE		76.01															
		TOPSOIL		0.00															Protective Casing
		Very loose brown SILTY SAND to SAND, some silt and clay		0.25 75.48															
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		0.55 74.94															
1		Grey brown SAND, some silt, trace clay																	
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22															
		Soft grey to red grey SILTY CLAY																	
2		Grey CLAYEY SILT, some sand		73.95															
		Soft grey to red grey CLAY to SILTY CLAY, with silt seams		2.15	1	73 TP	PH												
3																			
4			- Grey silt layer from 3.72 m to 3.76 m																
5			Grey SANDY SILT, with black staining		71.26 4.75														
			Grey SILT, some clay		4.99														
			Soft to firm red grey CLAY to SILTY CLAY, with black staining and sandy silt and sand seams		5.13														
6			- Grey sandy silt layer from 5.28 m to 5.32 m																
7			- Grey silt layer from 7.16 m to 7.24 m																
8																			
9			- Grey clayey silt layer from 8.94 m to 9.07 m																
10																			
11																			
12																			
		Stiff grey and red CLAY to SILTY CLAY, with black staining		63.82 12.19															
13																			
14																			
15																			

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CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-3

SHEET 2 OF 3

LOCATION: N 5020302.44 ;E 467125.21

BORING DATE: November 15-19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	RESISTANCE, BLOWS/0.3m				k, cm/s					
								SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ⊙		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²		
15	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE --- Stiff grey and red CLAY to SILTY CLAY, with black staining															
16																	
17																	
18																	
19					5	73 TP	PH										
20																	
21																	
22					6	73 TP	PH										
23					53.15 22.86												
24				Stiff to very stiff grey CLAY to SILTY CLAY, with black staining													
25					7	50 DO	WH										
26					8	50 DO	WR										
27					9	50 DO	WR										
28					10	50 DO	WR										
29					11	50 DO	WR										
30			12	50 DO	WR												
			13	50 DO	WR												
			14	50 DO	WR												
		CONTINUED NEXT PAGE															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-3

SHEET 3 OF 3

LOCATION: N 5020302.44 ;E 467125.21

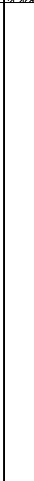
BORING DATE: November 15-19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION								
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60		80				10 ⁻⁸		10 ⁻⁶		10 ⁻⁴		10 ⁻²	
								SHEAR STRENGTH Cu, kPa		nat V. rem V.		+ ⊕		Q - U				● - ○		Wp		W		Wi	
								20	40	60	80														
30	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE --- Stiff to very stiff grey CLAY to SILTY CLAY, with black staining			14	50 DO	WR																		
					15	50 DO	WR																		
31						16	50 DO	WR																	
						17	50 DO	WR																	
32							18	50 DO	WR																
						19	50 DO	WR																	
33							20	50 DO	WR																
						21	50 DO	WR																	
34							22	50 DO	52																
						23	50 DO	67																	
35							24	50 DO	36																
						25	50 DO	33																	
36				Dense to very dense grey SILTY SAND, some gravel, trace clay, with cobbles and boulders (GLACIAL TILL)		40.20																			
						35.81																			
37																									
38																									
39																									
40																									
41	Borehole continued on RECORD OF DRILLHOLE 12-1-3 Note: 1. Soil stratigraphy inferred from various soil sampling methods and CPT. 2. Different stratigraphy relative to borehole 12-1-7.		35.40																						
42																									
43																									
44																									
45																									

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF DRILLHOLE: 12-1-3

SHEET 1 OF 3

LOCATION: N 5020302.44 ;E 467125.21

DRILLING DATE: November 15-19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN										DISCONTINUITY DATA				HYDRAULIC CONDUCTIVITY K, cm/sec						WEATH- ERING INDEX						NOTES	
						RECOVERY		R.Q.D. %		FRACT. INDEX PER 0.25m		DIP W/L CORE AXIS		TYPE AND SURFACE DESCRIPTION		Jcont Jr Ja		10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³		W1 W2 W3 W4 W5 W6		JN - Joint FLT - Fault SH - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Clean PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth RO - Rough MB - Mechanical Break BR - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.											
						TOTAL CORE %	SOLID CORE %																										
41	Rotary Drill HQ Core	BEDROCK SURFACE		35.40	1																												
		CARLSBAD FORMATION, 40.61 m to 46.47 m Fresh, very thinly to thinly interbedded sequence of dark grey to black slate susceptible SHALE, CALCAREOUS SHALE, SHALEY LIMESTONE and LIMESTONE with occasional bioclastic limestone beds.		40.61																													
				35.26										JN _h																			
				40.75										JN _h																			
														JN _h																			
														JN _h																			
42				34.27	2																												
				41.74																													
				41.76										JN _h																			
				34.10																													
				41.91																													
				41.94																													
														JN _h																			
				33.91																													
				42.10										JN _h																			
				33.83																													
				42.18																													
				33.58																													
				42.43																													
				33.54																													
				42.47										VN _h																			
				33.50										JN _h																			
				42.51										JN _h																			
				33.44																													
				42.57										JN _h																			

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76 mm Diam. PVC
Casing
Bentonite-Cement
Grout

DEPTH SCALE

1 : 10



LOGGED: DG

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

SHEET 2 OF 3

DATUM: Geodetic

DRILLING CONTRACTOR: Marathon Drilling

CHECKED: SAT

PROJECT: 12-1125-0045

RECORD OF DRILLHOLE: 12-1-3

SHEET 3 OF 3

LOCATION: N 5020302.44 ;E 467125.21

DRILLING DATE: November 15-19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.	RUN No.	FLUSH RETURN	JN - Joint FLT - Fault SH - Shear VN - Vein CJ - Conjugate				BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Clean				PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular				PO - Polished K - Slickensided SM - Smooth RO - Rough MB - Mechanical Break				BR - Broken Rock				NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
				DEPTH (m)			RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.25m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA			HYDRAULIC CONDUCTIVITY K, cm/sec				WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
							TOTAL CORE %	SOLID CORE %				TYPE AND SURFACE DESCRIPTION	Joon	Jr	Ja	K ₁₀	K ₂₀	K ₃₀	K ₄₀	W1	W2	W3	W4	W5	W6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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DEPTH SCALE

1 : 10



LOGGED: DG

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-3-1

SHEET 1 OF 3

LOCATION: N 5020300.53 ;E 467124.43

BORING DATE: November 23, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION				
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m												
								SHEAR STRENGTH Cu, kPa		nat V. + rem V. ⊕		Q - ● U - ○				WATER CONTENT PERCENT			
								20	40	60	80	10 ⁻⁸	10 ⁻⁶			10 ⁻⁴	10 ⁻²	Wp	W
0		GROUND SURFACE		76.10											MON. WELL				
	Rotary Drill HQ Core	TOPSOIL		0.00											Protective Casing				
		Very loose brown SILTY SAND to SAND, some silt and clay		0.25 75.55															
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		0.55															
1		Grey brown SAND, some silt, trace clay																	
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22															
		Soft grey to red grey SILTY CLAY																	
2		Grey CLAYEY SILT, some sand		74.04															
		Soft grey to red grey CLAY to SILTY CLAY, with silt seams		2.15															
3																			
4		- Grey silt layer from 3.72 m to 3.76 m																	
				71.35															
5		Grey SANDY SILT, with black staining		4.75															
		Grey SILT, some clay		4.99															
		Soft to firm red grey CLAY to SILTY CLAY, with black staining and sandy silt and sand seams		5.13															
6		- Grey sandy silt layer from 5.28 m to 5.32 m																	
7																			
8		- Grey silt layer from 7.16 m to 7.24 m																	
9																			
10		- Grey clayey silt layer from 8.94 m to 9.07 m																	
11																			
12																			
13		Stiff grey and red CLAY to SILTY CLAY, with black staining		63.91 12.19															
14																			
15																			
		CONTINUED NEXT PAGE																	

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14_JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-3-1

SHEET 2 OF 3

LOCATION: N 5020300.53 ;E 467124.43

BORING DATE: November 23, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ○		WATER CONTENT PERCENT Wp I — ○ W — I WI					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶			10 ⁻⁴	10 ⁻²
15	Rotary Drill HQ Core	--- CONTINUED FROM PREVIOUS PAGE ---													MON. WELL		
16		Stiff grey and red CLAY to SILTY CLAY, with black staining															
17																	
18																	
19																	
20																	
21																	
22																	
23			Stiff to very stiff grey CLAY to SILTY CLAY, with black staining	53.24 22.86													
24																	
25																	
26																	
27																	
28																	
29																	
30																	
		CONTINUED NEXT PAGE															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-3-1

SHEET 3 OF 3

LOCATION: N 5020300.53 ;E 467124.43

BORING DATE: November 23, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH		WATER CONTENT PERCENT					
								Cu, kPa	nat V. + rem V. ⊕	Q - U -	Wp	W	WI		
30	Rotary Drill HQ Core	--- CONTINUED FROM PREVIOUS PAGE ---													
31		Stiff to very stiff grey CLAY to SILTY CLAY, with black staining													
32															
33															
34															
35															
36		Dense to very dense grey SILTY SAND, some gravel, trace clay, with cobbles and boulders (GLACIAL TILL)		40.29 35.81											
37															
38															
39															
40		Borehole continued on RECORD OF DRILLHOLE 12-1-3.1													
41		Note: 1. Soil stratigraphy inferred from various soil sampling methods and CPT. 2. Different stratigraphy relative to borehole 12-1-7.													
42															
43															
44															
45															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

SHEET 1 OF 3

DATUM: Geodetic

DRILLING CONTRACTOR: Marathon Drilling

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF DRILLHOLE: 12-1-3-1

SHEET 2 OF 3

LOCATION: N 5020300.53 ;E 467124.43

DRILLING DATE: November 23, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.										RUN No.	FLUSH RETURN	JN - Joint FLT - Fault SH - Shear VN - Vein CJ - Conjugate										BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Clean										PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular										PO - Polished K - Slicksided SM - Smooth RO - Rough MB - Mechanical Break										BR - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.	NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
				DEPTH (m)	RECOVERY		R.Q.D. %	FRACT INDEX PER 0.25m	DIP W/L CORE AXIS	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, cm/sec				WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
					TOTAL CORE %	SOLID CORE %				TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja			10 ⁰	10 ¹	10 ²	10 ³	W1	W2	W3	W4	W5	W6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
42	Rotary Drill HQ Core	--- CONTINUED FROM PREVIOUS PAGE --- CARLSBAD FORMATION, 39.78 m to 45.37 m Fresh, very thinly to thinly interbedded sequence of dark grey to black slate susceptible SHALE, CALCAREOUS SHALE, SHALEY LIMESTONE and LIMESTONE with occasional bioclastic limestone beds.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											

DEPTH SCALE

1 : 10



LOGGED: DG

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF DRILLHOLE: 12-1-3-1

SHEET 3 OF 3

LOCATION: N 5020300.53 ;E 467124.43

DRILLING DATE: November 23, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 850

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.		RUN No.	FLUSH RETURN	JN - Joint FLT - Fault SH - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Clean PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth RO - Rough MB - Mechanical Break BR - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.										NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
				DEPTH (m)	RECOVERY			SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA				HYDRAULIC CONDUCTIVITY K, cm/sec			WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
												TYPE AND SURFACE DESCRIPTION	Joon	Jr	Ja	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴	W1	W2	W3	W4	W5	W6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
44	Rotary Drill HQ Core	--- CONTINUED FROM PREVIOUS PAGE --- CARLSBAD FORMATION, 39.78 m to 45.37 m Fresh, very thinly to thinly interbedded sequence of dark grey to black slake susceptible SHALE, CALCAREOUS SHALE, SHALEY LIMESTONE and LIMESTONE with occasional bioclastic limestone beds.		32.23 43.87 43.90 32.15 43.95 32.08 44.02 32.03 44.07	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</

DEPTH SCALE

1 : 10



LOGGED: DG

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-4

SHEET 1 OF 3

LOCATION: N 5020299.81 ; E 467126.00

BORING DATE: November 26, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m										
								SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ●		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴			10 ⁻²
0		GROUND SURFACE		76.08													
	Wash Boring HW Casing	TOPSOIL		0.00											Protective Casing Bentonite Seal		
		Very loose brown SILTY SAND to SAND, some silt and clay		0.25 75.53													
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		0.55 75.01													
1		Grey brown SAND, some silt, trace clay		1.22													
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22													
		Soft grey to red grey SILTY CLAY		74.02													
2		Grey CLAYEY SILT, some sand		2.15													
		Soft grey to red grey CLAY to SILTY CLAY, with silt seams															
3																	
4		- Grey silt layer from 3.72 m to 3.76 m															
				71.33 4.75													
5		Grey SANDY SILT, with black staining		4.99 5.13													
		Grey SILT, some clay															
		Soft to firm red grey CLAY to SILTY CLAY, with black staining and sandy silt and sand seams															
6		- Grey sandy silt layer from 5.28 m to 5.32 m															
7																	
		- Grey silt layer from 7.16 m to 7.24 m															
8																	
9			- Grey clayey silt layer from 8.94 m to 9.07 m														
10																	
11																	
12																	
		Stiff grey and red CLAY to SILTY CLAY, with black staining		63.89 12.19													
13																	
14																	
15																	
		CONTINUED NEXT PAGE															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14_JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-4

SHEET 2 OF 3

LOCATION: N 5020299.81 ; E 467126.00

BORING DATE: November 26, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ○		WATER CONTENT PERCENT Wp ——— W ——— WI					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶			10 ⁻⁴	10 ⁻²
15	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---															
16		Stiff grey and red CLAY to SILTY CLAY, with black staining															
17																	
18																	
19																	
20																	
21																	
22																	
23		Stiff to very stiff grey CLAY to SILTY CLAY, with black staining		53.22 22.86													
24																	
25																	
26																	
27																	
28																	
29																	
30																	
		CONTINUED NEXT PAGE															

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-4

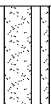
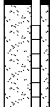
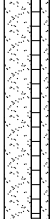
SHEET 3 OF 3

LOCATION: N 5020299.81 ;E 467126.00

BORING DATE: November 26, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m											
								SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ○		WATER CONTENT PERCENT						
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²			
30	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---														'B' 'A'		
31		Stiff to very stiff grey CLAY to SILTY CLAY, with black staining														Silica Sand		
32																		
33																		
34																		
35																		
36		Dense to very dense grey SILTY SAND, some gravel, trace clay, with cobbles and boulders (GLACIAL TILL)		40.27 35.81												Silica Sand		
37																		
38																32 mm Diam. PVC #10 Slot Screen 'A'		
39																		
40	End of Borehole Note: 1. Soil stratigraphy inferred from various soil sampling methods and CPT. 2. Different stratigraphy relative to borehole 12-1-7.		36.18 39.90													Silica Sand Peltonite		
41																		
42																		
43																		
44																		
45																		

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-5

SHEET 1 OF 2

LOCATION: N 5020301.64 ; E 467122.27

BORING DATE: November 19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION										
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60				80		10 ⁻⁸		10 ⁻⁶		10 ⁻⁴		10 ⁻²	
								Cu, kPa		nat V. + rem V. ⊕		Q - U - ○				Wp		W		Wi					
								20	40	60	80														
0		GROUND SURFACE		76.06																					
	Power Auger 200 mm Diam. (Hollow Stem)	TOPSOIL		0.00																					
		Very loose brown SILTY SAND to SAND, some silt and clay		0.25 75.51																					
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		0.55																					
1		Grey brown SAND, some silt, trace clay		74.99																					
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22																					
		Soft grey to red grey SILTY CLAY																							
2		Grey CLAYEY SILT, some sand		74.00																					
		Soft grey to red grey CLAY to SILTY CLAY, with silt seams		2.15																					
3																									
4			- Grey silt layer from 3.72 m to 3.76 m																						
					71.31																				
5		Grey SANDY SILT, with black staining		4.75																					
		Grey SILT, some clay		4.99																					
		Soft to firm red grey CLAY to SILTY CLAY, with black staining and sandy silt and sand seams		5.13																					
6			- Grey sandy silt layer from 5.28 m to 5.32 m																						
7			- Grey silt layer from 7.16 m to 7.24 m																						
8																									
9			- Grey clayey silt layer from 8.94 m to 9.07 m																						
10																									
11																									
12				63.87																					
		Stiff grey and red CLAY to SILTY CLAY, with black staining		12.19																					
13																									
14																									
15																									
		CONTINUED NEXT PAGE																							

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-5

SHEET 2 OF 2

LOCATION: N 5020301.64 ;E 467122.27

BORING DATE: November 19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa		nat V. + Q - ● rem V. ⊕ U - ○		WATER CONTENT PERCENT Wp — W — WI			
								20	40	60	80	10 ⁻⁸	10 ⁻⁶		
15		--- CONTINUED FROM PREVIOUS PAGE ---													
				60.81											
				15.25											
16		End of Borehole													
		Note: Soil stratigraphy inferred from various soil sampling methods and CPT.													
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															
28															
29															
30															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-1-6

SHEET 1 OF 1

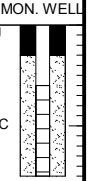
LOCATION: N 5020298.76 ;E 467123.21

BORING DATE: November 19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m										
								SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ●		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶			10 ⁻⁴	10 ⁻²
0	Power Auger 200 mm Diam. (HS)	GROUND SURFACE		76.06											MON. WELL		
		TOPSOIL		0.00													
		Very loose brown SILTY SAND to SAND, some silt and clay		0.25													
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		0.55													
1				74.99													
		Grey brown SAND, some silt, trace clay															
		Stiff red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22													
		Soft grey to red grey SILTY CLAY		74.56													
				1.50													
2			End of Borehole														
		Note: Soil stratigraphy inferred from various soil sampling methods and CPT.															
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	



CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

SHEET 1 OF 2

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

[illegible]

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-2

SHEET 2 OF 2

LOCATION: N 5019601.24 ;E 466150.44

BORING DATE: December 19, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m												
								SHEAR STRENGTH Cu, kPa		nat V. + rem V. ⊕		Q - ● U - ○		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²			Wp	W
								20	40	60	80	20	40	60	80				
15		--- CONTINUED FROM PREVIOUS PAGE ---							40										
	Electric Nilcon	Soft to firm red grey to grey CLAY to SILTY CLAY, with black staining and silt seams																	
16									+										
			60.51																
17		Firm to stiff grey CLAY to SILTY CLAY, with black staining		16.61				⊕	+										
18										+									
19										+									
20											+								
21											>67	+							
22												+							
23													+						
24														+					
25													+						
26		Very stiff dark grey CLAY to SILTY CLAY, with black staining		51.36 25.76											115				
27		End of Borehole		50.37 26.75															
28		Note: 1. Soil stratigraphy inferred from various soil sampling methods and CPT. 2. Vane pushed to 26.75 m depth.																	
29																			
30																			

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-3

SHEET 1 OF 3

LOCATION: N 5019604.15 ; E 466157.12

BORING DATE: January 7-14, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa		nat V. + Q - ● rem V. ⊕ U - ○		WATER CONTENT PERCENT Wp — W — Wi					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶			10 ⁻⁴	10 ⁻²
								20	40	60	80	20	40			60	80
0		GROUND SURFACE		76.94											MON. WELL		
	Wash Boring HW Casing	TOPSOIL/PEAT		0.00											Protective Casing		
		Very loose to loose grey brown SILTY SAND		0.23													
1				75.72													
		Red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22													
		CLAY to SILTY CLAY		1.37													
2				74.83													
		Grey brown SANDY SILT, trace to some clay		2.11													
				2.29													
		Firm red grey SILTY CLAY, with sand seams		74.14													
3			- Sand layer from 2.41 m to 2.46 m		2.80												
		Grey SAND, some silt, trace clay, with black staining		3.02													
		Soft to firm red grey CLAY to SILTY CLAY, with silt seams															
4						1	73 TP	PH									
			- Grey silt layer from 4.47 m to 4.50 m														
5																	
6																	
7			- Silt layer from 6.53 m to 6.61 m		70.01												
			- Silt layer from 6.65 m to 6.68 m														
			SILTY SAND, trace clay, with black staining		7.03												
			Grey CLAYEY SILT		69.55												
			Soft to firm red grey to grey CLAY to SILTY CLAY, with black staining and silt seams		7.39												
8																	
						2	73 TP	PH									
9																	
10																	
11																	
12					3	73 TP	PH										
13																	
14					4	73 TP	PH										
15																	
		CONTINUED NEXT PAGE															

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-3

SHEET 2 OF 3

LOCATION: N 5019604.15 ;E 466157.12

BORING DATE: January 7-14, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION						
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20		40		60		80									
								SHEAR STRENGTH Cu, kPa		nat V. + rem V. ⊕		Q - ● U - ○		10 ⁻⁵				10 ⁻⁶		10 ⁻⁴		10 ⁻²	
								WATER CONTENT PERCENT Wp ———— W ———— WI		20		40		60				80					
15	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---						20	40	60	80						MON. WELL						
16		Soft to firm red grey to grey CLAY to SILTY CLAY, with black staining and silt seams																					
17		Firm to stiff grey CLAY to SILTY CLAY, with black staining		60.33 16.61																			
18																							
19																							
20					5	73 TP	PH																
21																							
22																							
23																							
24						6	73 TP	PH															
25																							
26		Very stiff dark grey CLAY to SILTY CLAY, with black staining		51.18 25.76																			
27																							
28																							
29					7	50 DO	4																
30		CONTINUED NEXT PAGE																					

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-3

SHEET 3 OF 3

LOCATION: N 5019604.15 ;E 466157.12

BORING DATE: January 7-14, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION			
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m												
								SHEAR STRENGTH Cu, kPa		nat V.	+ rem V.	Q - U -	● ○	WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴			10 ⁻²	Wp	W
								20	40	60	80								
30	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---													MON. WELL				
		Very stiff dark grey CLAY to SILTY CLAY, with black staining																	
31																			
32					8	73 TP	PH												
33																			
					9	50 DO	2												
		Grey brown SILTY SAND			43.16														
		Grey SANDY SILT			33.78														
					33.91														
		Dark grey and brown SILTY CLAY			42.65														
					34.29														
					42.35														
35		Compact to very dense grey SAND and SILT, some gravel, trace clay (GLACIAL TILL)			34.59	10	50 DO	71											
36						11	50 DO	16											
						12	50 DO	73											

MON. WELL

Bentonite-Cement
Grout

Peltonite

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

SHEET 1 OF 3

DATUM: Geodetic

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.	RUN No.	FLUSH RETURN	RECOVERY		R.Q.D. %	FRACT INDEX PER 0.25m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA				HYDRAULIC CONDUCTIVITY K, cm/sec				WEATH- ERING INDEX				NOTES			
				DEPTH (m)			TOTAL CORE %	SOLID CORE %				TYPE AND SURFACE DESCRIPTION	Joon	Jr	Ja	10 ⁹	10 ⁸	10 ⁷	10 ⁶	W1	W2	W3	W4		W5	W6	
JN - Joint FLT - Fault SH - Shear VN - Vein CJ - Conjugate		BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Clean		PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular				PO - Polished K - Slickensided SM - Smooth RO - Rough MB - Mechanical Break				BR - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.															
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		38		39		40		41		42		43		44		45		46		47		48		49		50	
37		3																									

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF DRILLHOLE: 12-2-3

SHEET 2 OF 3

LOCATION: N 5019604.15 ;E 466157.12

DRILLING DATE: January 7-14, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.	RUN No.	FLUSH RETURN	JN - Joint FLT - Fault SH - Shear VN - Vein CJ - Conjugate				BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Clean				PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular				PO - Polished K - Slickensided SM - Smooth RO - Rough MB - Mechanical Break				BR - Broken Rock				NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
				DEPTH (m)			RECOVERY		R.Q.D. %	FRACT INDEX PER 0.25m	DIP w/L CORE AXIS	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY K, cm/sec		WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
							TOTAL CORE %	SOLID CORE %				TYPE AND SURFACE DESCRIPTION	Joon	Jr	Ja	10 ⁰	10 ¹	10 ²	10 ³	W1	W2	W3	W4	W5	W6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
39		--- CONTINUED FROM PREVIOUS PAGE --- CARLSBAD FORMATION, 36.74 m to 41.95 m Fresh, medium grey, fine to medium grained crystalline, non-porous, thinly to medium bedded LIMESTONE with fine argillaceous partings, occasional bioclastic and lithoclastic beds and black shale susceptible shale partings 0.5-5.0 cm thick. Shale and calcareous shale comprises approximately 10% of section.		38.04 38.90 37.96 38.98 37.87 39.07	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

DEPTH SCALE

1 : 10



LOGGED: DG

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

SHEET 3 OF 3

DATUM: Geodetic

DRILLING CONTRACTOR: Marathon Drilling

LOGGED: DG
CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

SHEET 1 OF 3

DATUM: Geodetic

BORING DATE: January 15-17, 2013

[illegible]

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-4

SHEET 2 OF 3

LOCATION: N 5019605.34 ;E 466154.28

BORING DATE: January 15-17, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH		WATER CONTENT PERCENT					
								Cu, kPa	nat V. + rem V. ⊕	Q - U -	Wp	W	WI		
15	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---													MON. WELL
16		Soft to firm red grey to grey CLAY to SILTY CLAY, with black staining and silt seams													
17		Firm to stiff grey CLAY to SILTY CLAY, with black staining		60.48 16.61											
18															
19															
20															
21															
22															
23															
24															
25															
26	Very stiff dark grey CLAY to SILTY CLAY, with black staining		51.33 25.76												
27															
28															
29															
30															
		CONTINUED NEXT PAGE													

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-4

SHEET 3 OF 3

LOCATION: N 5019605.34 ; E 466154.28

BORING DATE: January 15-17, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m										
								SHEAR STRENGTH				WATER CONTENT PERCENT					
								Cu, kPa		nat V. + rem V. ⊕		Q - ● U - ○		Wp			
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²		

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-5

SHEET 1 OF 2

LOCATION: N 5019606.89 ;E 466157.75

BORING DATE: January 17-18, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION										
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60				80		10 ⁻⁸		10 ⁻⁶		10 ⁻⁴		10 ⁻²	
								SHEAR STRENGTH Cu, kPa		nat V. + rem V. ⊕		Q - ● U - ○				Wp		W		Wi					
0		GROUND SURFACE		76.99																					
	Wash Boring HW Casing	TOPSOIL/PEAT		0.00											Protective Casing										
		Very loose to loose grey brown SILTY SAND		0.23																					
1				75.77																					
		Red brown SILTY CLAY, with sand seams (Weathered Crust)		1.22																					
		CLAY to SILTY CLAY		1.37																					
2				74.88											Bentonite Seal										
		Grey brown SANDY SILT, trace to some clay		2.11																					
		Firm red grey SILTY CLAY, with sand seams		2.29																					
3			- Sand layer from 2.41 m to 2.46 m		74.19																				
		Grey SAND, some silt, trace clay, with black staining		2.80																					
		Soft to firm red grey CLAY to SILTY CLAY, with silt seams		3.02																					
4															Silica Sand										
		- Grey silt layer from 4.47 m to 4.50 m																							
5																									
6															32 mm Diam. PVC #10 Slot Screen 'B'										
7			- Silt layer from 6.53 m to 6.61 m		70.06																				
		- Silt layer from 6.65 m to 6.68 m																							
		SILTY SAND, trace clay, with black staining		7.03																					
		Grey CLAYEY SILT		69.60											Silica Sand										
		Soft to firm red grey to grey CLAY to SILTY CLAY, with black staining and silt seams		7.39																					
8																									
9														Bentonite Seal											
10																									
11																									
12																									
13																									
14																									
15																									
		CONTINUED NEXT PAGE																							

CONTINUED NEXT PAGE

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14_JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-5

SHEET 2 OF 2

LOCATION: N 5019606.89 ;E 466157.75

BORING DATE: January 17-18, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH		WATER CONTENT PERCENT					
								Cu, kPa	nat V. + rem V. ⊕	Q - U -	Wp	W	WI		
15	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---													
16		Soft to firm red grey to grey CLAY to SILTY CLAY, with black staining and silt seams													
17		Firm to stiff grey CLAY to SILTY CLAY, with black staining		60.38 16.61											
18															
19															
20															
21		End of Borehole		56.26 20.73											
22		Note: Soil stratigraphy inferred from various soil sampling methods and CPT.													
23															
24															
25															
26															
27															
28															
29															
30															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-2-6

SHEET 1 OF 1

LOCATION: N 5019607.98 ;E 466154.98

BORING DATE: January 19, 2013

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	RESISTANCE				CONDUCTIVITY					
								SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ●		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶			10 ⁻⁴	10 ⁻²
0	Power Auger 200 mm Diam. (Hollow Stem)	GROUND SURFACE		77.13													
		TOPSOIL/PEAT		0.00													
		Very loose to loose grey brown SILTY SAND		0.23													
1		Red brown SILTY CLAY, with sand seams (Weathered Crust) CLAY to SILTY CLAY		75.91 1.22 1.37													
2		Grey brown SANDY SILT, trace to some clay		75.02 2.11 2.29													
		End of Borehole															
3		Note: Soil stratigraphy inferred from various soil sampling methods and CPT.															
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	

MON. WELL

Protective Casing
Bentonite Seal

Silica Sand

50 mm Diam. PVC
#10 Slot Screen

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-3-2

SHEET 1 OF 3

LOCATION: N 5021570.68 ;E 466665.61

BORING DATE: November 27-28, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION								
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa				WATER CONTENT PERCENT													
								20		40		60		80				10 ⁻⁸		10 ⁻⁶		10 ⁻⁴		10 ⁻²	
								20		40		60		80				Wp		W		Wi			
0	Power Auger 200 mm Diam. (Hollow Stem)	GROUND SURFACE		76.24																					
		TOPSOIL		0.00																					
		Loose to compact grey brown to grey SILTY SAND, trace clay		0.20	1	50 DO	9																		
1																									
		Grey SANDY SILT, trace clay		75.10	2	50 DO	10																		
				1.14																					
				74.72																					
2		Soft grey and red brown CLAY to SILTY CLAY, with silt seams		1.52	3	50 DO	WH																		
3																									
4																									
5		Grey SILT, trace clay		71.36																					
		Grey SILTY SAND		4.88																					
		Soft grey and red brown CLAY to SILTY CLAY, with black staining and silt seams		5.03																					
6				5.15																					
7		Grey SILT		69.84																					
		Soft grey and red brown CLAY to SILTY CLAY, with black staining		6.46																					
		Grey SILT		69.35																					
		Soft grey and red brown CLAY to SILTY CLAY, with black staining and clayey silt seams		6.95																					
8																									
9	Electric Nicon	Soft to stiff grey and grey brown CLAY to SILTY CLAY, with black staining		67.65																					
				8.59																					
10																									
11																									
12																									
13																									
14																									
15																									
		CONTINUED NEXT PAGE																							

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

[illegible]

DEPTH SCALE

1 : 75

LOGGED: DG

CHECKED: SAT

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-3-2

SHEET 3 OF 3

LOCATION: N 5021570.68 ;E 466665.61

BORING DATE: November 27-28, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m												
								SHEAR STRENGTH Cu, kPa		nat V. + rem V. ⊕		Q - ● U - ○		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²			Wp	W
								20	40	60	80	20	40	60	80				
30	Electric Nilcon	--- CONTINUED FROM PREVIOUS PAGE ---																	
		Brown SILTY SAND		45.94															
		Very stiff grey CLAY to SILTY CLAY, with black staining		30.33															
31				45.11															
		End of Borehole		31.13															
		Note: Soil stratigraphy inferred from various soil sampling methods and CPT.																	
32																			
33																			
34																			
35																			
36																			
37																			
38																			
39																			
40																			
41																			
42																			
43																			
44																			
45																			

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14_JM

SHEET 1 OF 3

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

1 : 75



CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-3-3

SHEET 2 OF 3

LOCATION: N 5021578.47 ;E 466670.90

BORING DATE: December 3-5, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa				WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²		
								nat V. rem V.	+ ⊕	Q - U -	● ○	Wp	W	Wi			
								20	40	60	80	20	40	60	80		
15	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---															
		Soft to stiff grey and grey brown CLAY to SILTY CLAY, with black staining															
16					4	73 TP	PH										
17																	
18																	
19																	
20																	
21																	
22																	
23			Stiff grey and red brown CLAY to SILTY CLAY, with black staining	53.61 22.61													Bentonite-Cement Grout
24																	
25																	
26			Grey CLAYEY SILT, some sand	50.56 25.66 50.22													
			Very stiff grey CLAY to SILTY CLAY, with black staining	26.00													
27																	
		Grey SILTY fine SAND	49.03														
		Grey SANDY SILT, some clay	27.30														
28		Very stiff grey CLAY to SILTY CLAY, with black staining															
29					6	73 TP	PH										
30																	
		CONTINUED NEXT PAGE															

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14_JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-3-3

SHEET 3 OF 3

LOCATION: N 5021578.47 ;E 466670.90

BORING DATE: December 3-5, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m										
								SHEAR STRENGTH Cu, kPa		nat V. + Q - rem V. ⊕ U - ●		WATER CONTENT PERCENT					
								20	40	60	80	10 ⁻⁸	10 ⁻⁶			10 ⁻⁴	10 ⁻²
30	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---															
		Brown SILTY SAND		45.92													
		Very stiff grey CLAY to SILTY CLAY, with black staining		30.33													
31																	
32	Wash Boring HW Casing	Very stiff grey SILTY CLAY, some sand		44.37													
		Very stiff grey and red CLAY to SILTY CLAY		31.85													
				32.10													
33																	
		Compact to very dense grey SILTY SAND to SANDY SILT, some gravel, trace to some clay, with cobbles and boulders (GLACIAL TILL)		43.15													
				33.07													
34	Rotary Drill HQ Core				7	50 DO	6										
					8	50 DO	20										
					9	50 DO	21										
					10	50 DO	44										
					11	50 DO	55										
					12	50 DO	97										
					13	50 DO	88										
					14	50 DO	>50										
					15	50 DO	90										
39					16	50 DO	90										
40		Borehole continued on RECORD OF DRILLHOLE 12-3-3				36.38											
		Note: Soil stratigraphy inferred from various soil sampling methods and CPT.															
41																	
42																	
43																	
44																	
45																	

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14_JM

SHEET 1 OF 3

DATUM: Geodetic

DRILLING CONTRACTOR: Marathon Drilling

[illegible]

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF DRILLHOLE: 12-3-3

SHEET 2 OF 3

LOCATION: N 5021578.47 ;E 466670.90

DRILLING DATE: December 3-5, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	FLUSH RETURN										DISCONTINUITY DATA										HYDRAULIC CONDUCTIVITY						WEATH- ERING INDEX						NOTES
						RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.25m	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	Joon	Jr	Ja	K, cm/sec	W1	W2	W3	W4	W5	W6																	
						TOTAL CORE %	SOLID CORE %																															
						000000	000000															000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000		
42	Rotary Drill HQ Core	--- CONTINUED FROM PREVIOUS PAGE --- CARLSBAD FORMATION, 39.84 m to 45.42 m Fresh, very thinly to thinly interbedded sequence of dark grey to black slake susceptible SHALE, CALCAREOUS SHALE, SHALEY LIMESTONE and LIMESTONE with occasional bioclastic limestone beds.		34.28	2																																	
				41.94																																		
				34.10																																		
				42.12																																		
				34.02																																		
				42.20																																		
43	Rotary Drill HQ Core			33.63		3																																
				42.59																																		
				42.62																																		
CONTINUED NEXT PAGE																																						

63 mm Diam. PVC
#10 Slot Screen

DEPTH SCALE

1 : 10



LOGGED: DG

CHECKED: SAT

PROJECT: 12-1125-0045

RECORD OF DRILLHOLE: 12-3-3

SHEET 3 OF 3

LOCATION: N 5021578.47 ;E 466670.90

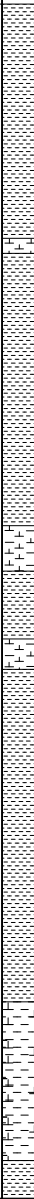
DRILLING DATE: December 3-5, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 55

DRILLING CONTRACTOR: Marathon Drilling

DEPTH SCALE METRES	DRILLING RECORD		DESCRIPTION	SYMBOLIC LOG	ELEV.	RUN No.	FLUSH RETURN	JN - Joint FLT - Fault SH - Shear VN - Vein CJ - Conjugate				BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Clean				PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular				PO - Polished K - Slickensided SM - Smooth RO - Rough MB - Mechanical Break				BR - Broken Rock				NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
					DEPTH (m)			RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.25m	DIP w.r.t. CORE AXIS	DISCONTINUITY DATA				HYDRAULIC CONDUCTIVITY K, cm/sec				WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
								TOTAL CORE %	SOLID CORE %				TYPE AND SURFACE DESCRIPTION	Joon	Jr	Ja	10 ⁹	10 ⁸	10 ⁷	10 ⁶	W1	W2	W3	W4	W5	W6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
44	Rotary Drill HQ Core		--- CONTINUED FROM PREVIOUS PAGE --- CARLSBAD FORMATION, 39.84 m to 45.42 m Fresh, very thinly to thinly interbedded sequence of dark grey to black slake susceptible SHALE, CALCAREOUS SHALE, SHALEY LIMESTONE and LIMESTONE with occasional bioclastic limestone beds.		32.07 44.15 44.17	3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

63 mm Diam. PVC
#10 Slot Screen

Silica Sand

DEPTH SCALE

1 : 10



LOGGED: DG

CHECKED: SAT

CRRRC-ROCK 1211250045.GPJ GAL-MISS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-3-4

SHEET 2 OF 3

LOCATION: N 5021576.05 ;E 466672.49

BORING DATE: December 11-14, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m											
								SHEAR STRENGTH Cu, kPa				WATER CONTENT PERCENT						
								20	40	60	80	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²			
15		--- CONTINUED FROM PREVIOUS PAGE --- Soft to stiff grey and grey brown CLAY to SILTY CLAY, with black staining														'B' 'A'		
16																		
17																		
18																		
19																		
20																		
21																		
22																		
23	Wash Boring HW Casing	Stiff grey and red brown CLAY to SILTY CLAY, with black staining		53.62 22.61														
24																		
25																		
26		Grey CLAYEY SILT, some sand		50.57 25.66 50.23 26.00														
27		Very stiff grey CLAY to SILTY CLAY, with black staining																
28		Grey SILTY fine SAND		49.04														
		Grey SANDY SILT, some clay		27.30														
28		Very stiff grey CLAY to SILTY CLAY, with black staining														Peltonite Silica Sand		
29																		
30																25 mm Diam. PVC #10 Slot Screen 'B'		
		CONTINUED NEXT PAGE																

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM

PROJECT: 12-1125-0045

RECORD OF BOREHOLE: 12-3-4

SHEET 3 OF 3

LOCATION: N 5021576.05 ;E 466672.49

BORING DATE: December 11-14, 2012

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: ---

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION								
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT													
								20		40		60		80				10 ⁻⁸		10 ⁻⁶		10 ⁻⁴		10 ⁻²	
								Cu, kPa		nat V. rem V.		+ ⊕		Q - U				● - ○		Wp		W		WI	
								20	40	60	80					20	40	60	80						
30	Wash Boring HW Casing	--- CONTINUED FROM PREVIOUS PAGE ---																							
		Brown SILTY SAND		45.93																					
		Very stiff grey CLAY to SILTY CLAY, with black staining		30.33																					
31																									
		Very stiff grey SILTY CLAY, some sand		44.38																					
		Very stiff grey and red CLAY to SILTY CLAY		31.85																					
				32.10																					
32																									
33																									

DEPTH SCALE

1 : 75



LOGGED: DG

CHECKED: SAT

CRRRC-SOIL_1211250045.GPJ GAL-MIS.GDT_09/04/14 JM

SHEET 1 OF 2

DATUM: Geodetic

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

[illegible]

CHECKED: SAT

CRRRC-SOIL 1211250045.GPJ GAL-MIS.GDT 09/04/14 JM