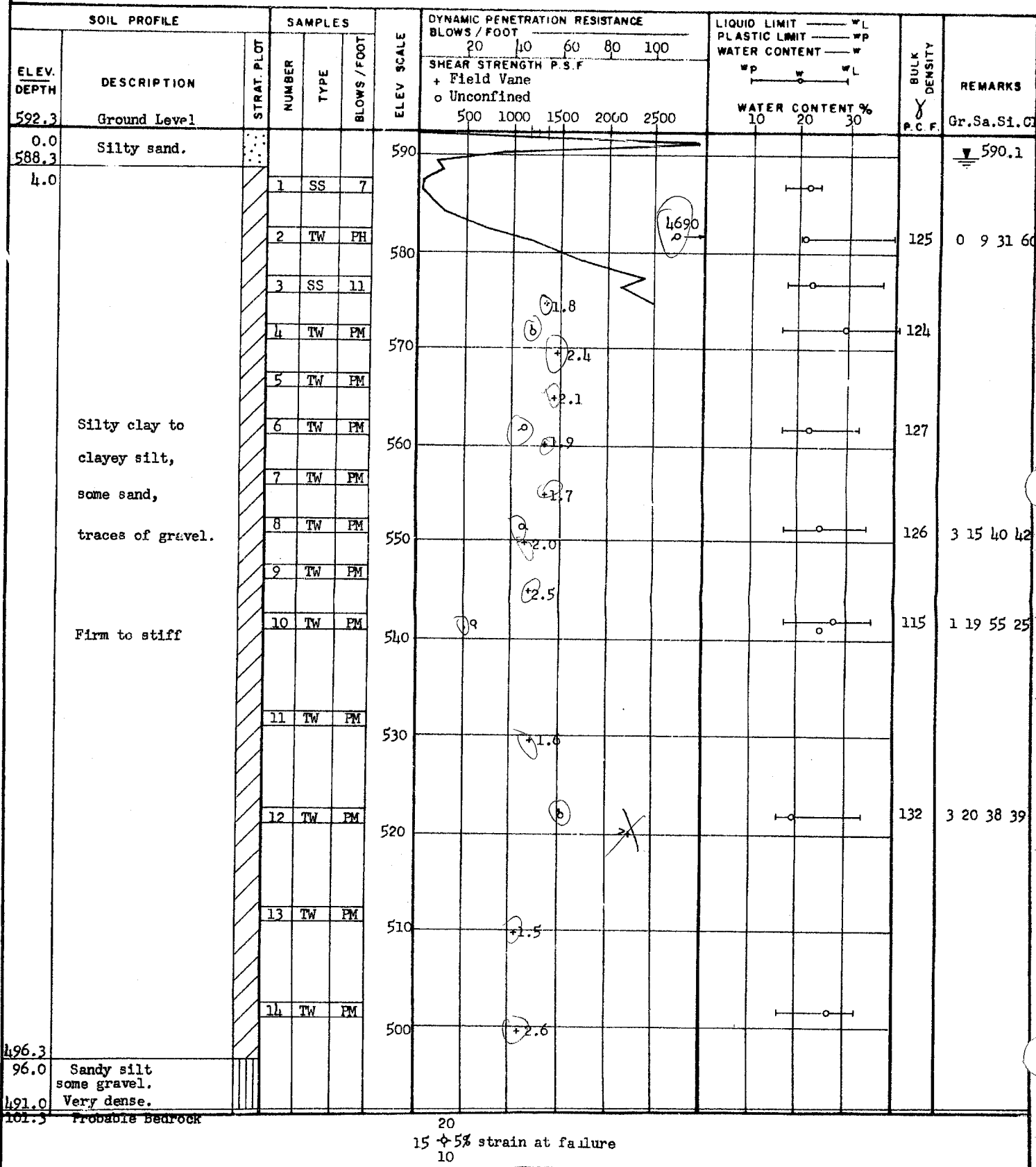


DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 7

FOUNDATION SECTION

JOB 68-F-15-1 LOCATION Co-ords. 101,090 N; 55,320 E. ORIGINATED BY AMS
W.P. 260-66-030 BORING DATE Feb. 26 & 27, 1968 COMPILED BY AMS
DATUM Geodetic BOREHOLE TYPE Cont. flight auger (bombardier) CHECKED BY SL



DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 8

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 68-F-15-1 LOCATION Co-ords. 100,964 N; 55,361 E. ORIGINATED BY AMS
W.P. 260-66-030 BORING DATE Feb. 27, 1968 COMPILED BY AMS
DATUM Geodetic BOREHOLE TYPE Cont. flight auger (bombardier) CHECKED BY 12

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. FLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	WP	WL	W		
593.6	Ground Level															
0.0																
589.6	Silty sand					590										
4.0			1	SS	4											
			2	TW	PH											
			3	TW	PH											
	Silty clay		4	TW	PH											
	Some sand		5	TW	PH											
	trace of gravel.		6	TW	PH											
	Firm		7	TW	PH											
			8	TW	PH											
550.6																
43.0	End of Borehole															

20
15 + 5 % strain at failure
10

0 13 41 46

127.5 1 16 44 39

FOUNDATION SECTION

ORIGINATED BY AMS

COMPILED BY _____ AMS

CHECKED BY

[illegible]

METRIC

PROJECT 04-1111-060

W.P.

LOCATION

N 4682323.0 ; E 328529.0

ORIGINATED BY C.C.

DIST

WEST

HWY 401 / 3

BOREHOLE TYPE

POWER AUGER, HOLLOW STEM

COMPILED BY T.M.

DATUM

Geodetic

DATE _____

November 24, 2006 - November 26, 2006

CHECKED BY **SJB**

[illegible]

+3, X3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 04-1111-060

RECORD OF DRILLHOLE: 23

SHEET 3 OF 3

LOCATION: N 4682323.0 ;E 328529.0

DRILLING DATE: November 24, 2006 - November 26, 2006

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: --

DRILL RIG:

DRILLING CONTRACTOR:

DEPTH SCALE METRES	DRILLING RECORD		DESCRIPTION	SYMBOLIC LOG	ELEV.		RUN No.	PENETRATION RATE (m/min)	COLOUR % RETURN	FLUSH	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols										NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
					DEPTH (m)	RECOVERY						R.Q.D. %	FRACT INDEX PER 0.3	DISCONTINUITY DATA				ROCK STRENGTH INDEX		WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
														TOTAL CORE %	SOLID CORE %	DIP w.r.t CORE AXIS	TYPE AND SURFACE DESCRIPTION	R1 R2 R3 R4	W1 W2 W3 W4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		ROCK SURFACE		156.36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

DEPTH SCALE

1 : 75



LOGGED: C.C.




CHECKED: SJB

PROJECT 07-1130-207-0		RECORD OF BOREHOLE No CPT-150		1 OF 1 METRIC	
W.P. _____		LOCATION N 4681733.4 :E 330757.6		ORIGINATED BY CC	
DIST WEST HWY 401/3		BOREHOLE TYPE POWER AUGER, SOLID STEM		COMPILED BY BRS	
DATUM GEODETIC		DATE August 6, 2008		CHECKED BY <i>SJS</i>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE						
180.85	GROUND SURFACE													
0.10	FILL, crushed gravel Grey													
180.24	FILL, sandy topsoil, some crushed gravel		1	SS	13									
0.61	Compact													
0.76	Black		2	SS	8									
179.63	FILL, clayey silt, some sand, trace gravel, trace asphalt													
1.22	Compact Brown		3	SS	4									
178.87	SILTY SAND, fine Loose Brown													
1.98	CLAYEY SILT, some sand, trace gravel Firm Mottled brown and grey END OF BOREHOLE													
Borehole dry during drilling on August 6, 2008.														

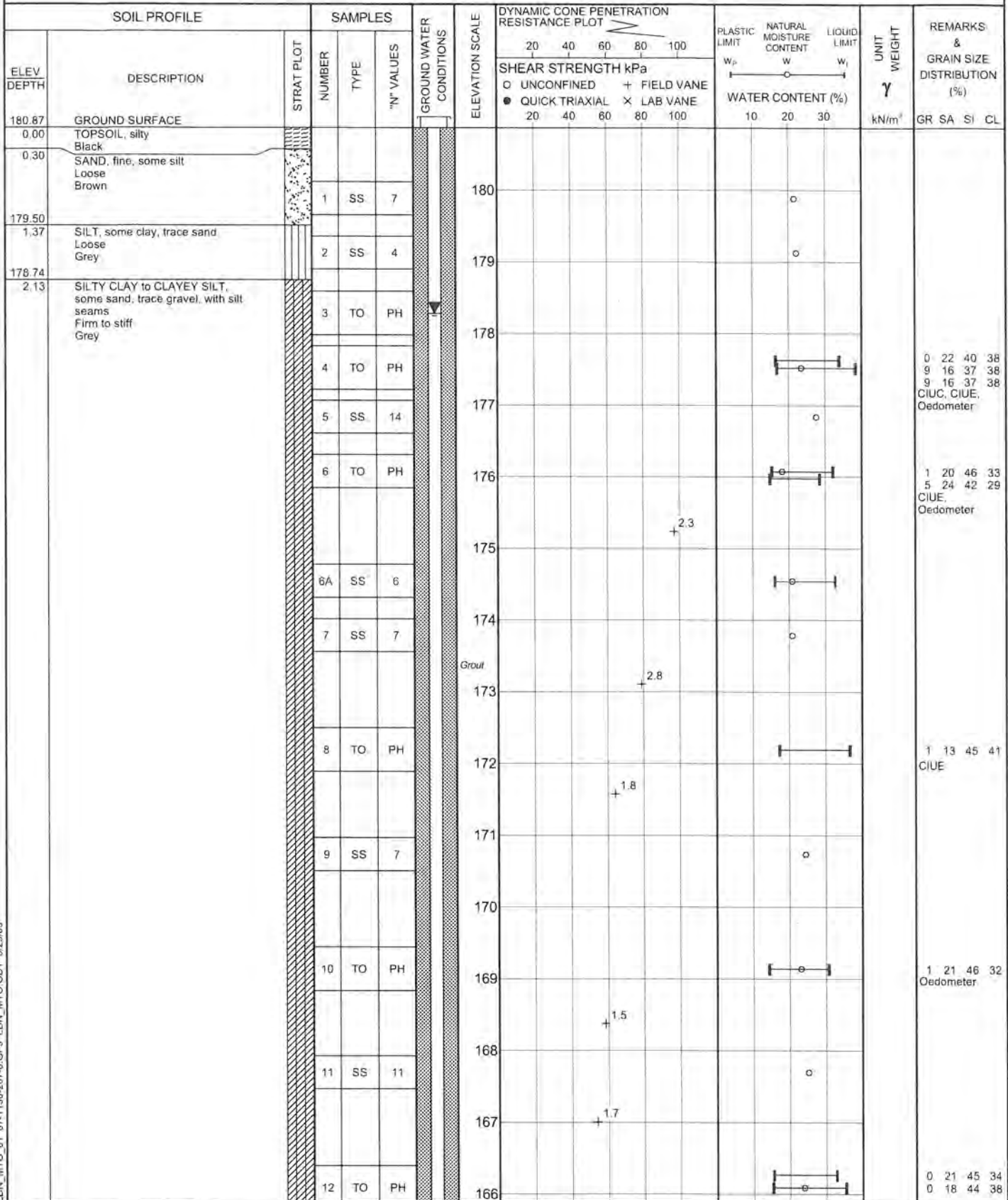
LDN MTO_01 07-1130-207-0.GPJ LDN MTO.GDT 6/29/09

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-153		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4681793.3 :E 330575.8</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 7, 2008</u>		CHECKED BY <u>SW3</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80			100	W _p	W	W _L
								SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE						WATER CONTENT (%)			
180.99	GROUND SURFACE																
0.00	TOPSOIL, silty, some sand Compact Black		1	SS	13												
180.30	CLAYEY SILT, trace sand, with silt partings Firm		2	SS	5												
179.47	Mottled brown and grey																
1.52	END OF BOREHOLE																
	Borehole dry during drilling on August 7, 2008.																

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 8/29/09

PROJECT 07-1130-207-0		RECORD OF BOREHOLE No 154		1 OF 4	METRIC
W.P. _____		LOCATION N 4681959 9 , E 330200 6		ORIGINATED BY SM	
DIST WEST HWY 401/3		BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC		COMPILED BY BRS	
DATUM GEODETIC		DATE July 22, 2008 - July 24, 2008		CHECKED BY SSS	



LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 8/29/09

Continued Next Page

+ 3 × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No 154

2 OF 4

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4681959.9 :E 330200.6

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

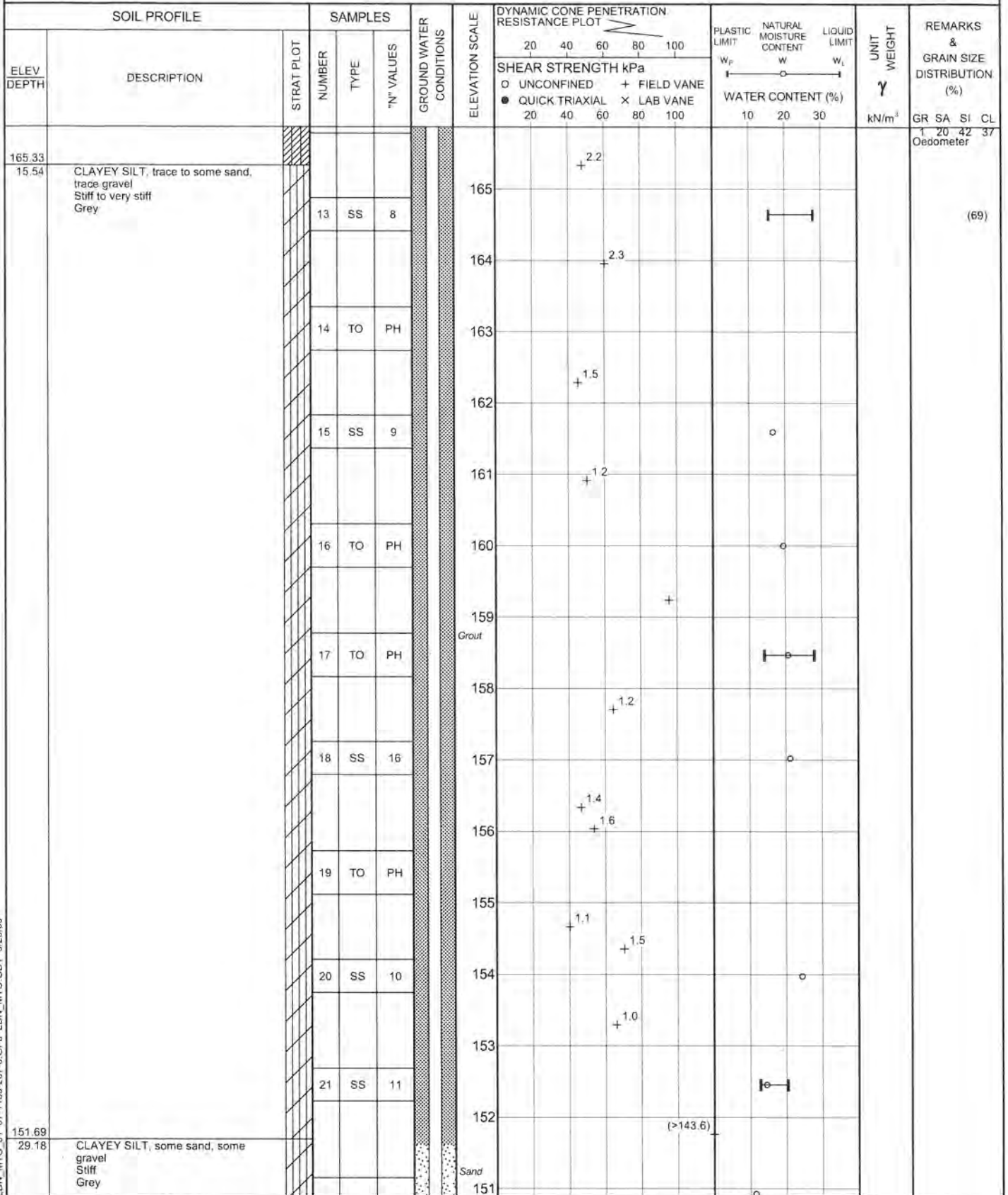
COMPILED BY BRS

DATUM GEODETIC

DATE

July 22, 2008 - July 24, 2008

CHECKED BY *SB*



Continued Next Page

+ 3 x 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

LDN MTO_01 07-1130-207-0.GPJ LDN MTO GDT 6/29/09

RECORD OF BOREHOLE No 154

3 OF 4

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4681959.9 ; E 330200.6

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY BRS

DATUM GEODETIC

DATE

July 22, 2008 - July 24, 2008

CHECKED BY *SS*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			20 40 60 80 100	20 40 60 80 100					
149.63	CLAYEY SILT, some sand, some gravel Stiff Grey		22	SS	11									
31.24	LIMESTONE, fresh, medium strong, weakly laminated to bedded, fine to coarse grained, faintly porous Light grey to tan to brown (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)		23	SS	60/ 125mm									
			24	NQ RC										
			25	NQ RC										
			26	NQ RC										
			27	NQ RC										
144.22	END OF BOREHOLE													
36.65	Borehole dry during drilling between July 22 and July 24, 2008. Water level measured in piezometer at elev. 178.97m on July 28, 2008. Water level measured in piezometer at elev. 180.42m on September 19, 2008. Water level measured in piezometer at elev. 177.23m on November 11, 2008. Water level measured in piezometer at elev. 178.27m on January 28, 2009.													

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 154

SHEET 4 OF 4

LOCATION: N 4681959.9 E 330200.6

DRILLING DATE: July 22, 2008 - July 24, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH % RETURN	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols										DIAMETRAL PORT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION	
									RECOVERY		R.Q.D. %	FRACT INDEX PER 0.3	DISCONTINUITY DATA			HYDRAULIC CONDUCTIVITY k, cm/sec					
									TOTAL CORE %	SOLID CORE %			DIP w.r.t. CORE AXIS								
									80 60 40 20	80 60 40 20			1 10 15 20	0 50 100	0 90	10 ⁶ 10 ⁵ 10 ⁴ 10 ³ 10 ²					
		ROCK SURFACE		149.63																	
	MUD ROTARY NO ROCK CORE	LIMESTONE, fresh, medium strong, very fine to coarse grained, faintly porous with occasional pits, stylolitic, fossiliferous (up to 5 cm diameter), mottled light grey to grey		31.24				149													
32				146.70	1																
		LIMESTONE, fresh, medium strong, weakly laminated, fine to medium grained, faintly porous, tan		32.17																	
33				147.59				148													
		LIMESTONE, fresh, medium strong, laminated, fine grained, faintly porous, tan to grey		33.28																	
				147.27																	
34			LIMESTONE, fresh, medium strong, coarse grained with up to 3 cm diameter inclusions in fine grained matrix, faintly porous, brown to grey with dark grey zone at 33.62m		33.60	2			147												
				33.74																	
				146.68																	
				34.19																	
				34.38																	
35			LIMESTONE, fresh, medium strong, very fine to fine grained, laminated, faintly porous, light brown to grey		146.10	3			146												
				34.77																	
				145.74																	
				35.13																	
36			LIMESTONE, fresh, medium strong, laminated very fine to fine grained, faintly porous stylolitic, mottled grey		145.31	4			145												
			35.56																		
		LIMESTONE, fresh, medium strong, very fine grained, very weakly laminated, faintly porous, light grey		144.56																	
37			36.40																		
		LIMESTONE, fresh, medium strong, fine grained, laminated, faintly porous, light brown and grey		36.65																	
38		LIMESTONE, fresh, medium strong, weakly laminated, very fine to fine grained, porous with occasional pits, weakly stylolitic, light grey to grey																			
		LIMESTONE, fresh, medium strong, bedded, fine grained, faintly porous, tan to brown																			
39		LIMESTONE, fresh, medium strong, up to 2 cm inclusions (angular) within fine grained matrix, faintly porous, brown, Breccia like texture																			
		LIMESTONE, fresh, medium strong, laminated, fine grained, faintly porous, tan to brown																			
40		END OF DRILLHOLE																			
41																					
42																					
43																					
44																					
45																					
46																					

DEPTH SCALE

1 : 75



LOGGED: SG

CHECKED: SJB

LDN ROCK 03 07-1130-207-0-ROCK.GPJ GLDR LDN.GDT 6/29/09 DATA INPUT: WDF

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-155		1 OF 1		METRIC	
W.P. _____		LOCATION <u>N 4682065.8 ; E 329981.7</u>		ORIGINATED BY <u>CC</u>			
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>			
DATUM <u>GEODETIC</u>		DATE <u>August 13, 2008</u>		CHECKED BY <u>SJB</u>			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE						
179.69	GROUND SURFACE													
0.00	FILL, sandy topsoil Black													
0.30	FILL, silty fine sand, trace topsoil, trace organics		1	SS	10									
0.46	Compact Brown													
0.61														
178.32	TOPSOIL, sandy Compact Black		2	SS	9									
1.37														
1.52	SILTY SAND, trace gravel Loose to compact Brown CLAYEY SILT, trace sand Stiff Grey END OF BOREHOLE													
Water level in borehole at about elev. 178.5m during drilling on August 13, 2008.														

Water level in borehole at about elev. 178.5m during drilling on August 13, 2008.

RECORD OF BOREHOLE No 158

1 OF 4

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682144.3 ; E 329769.9

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

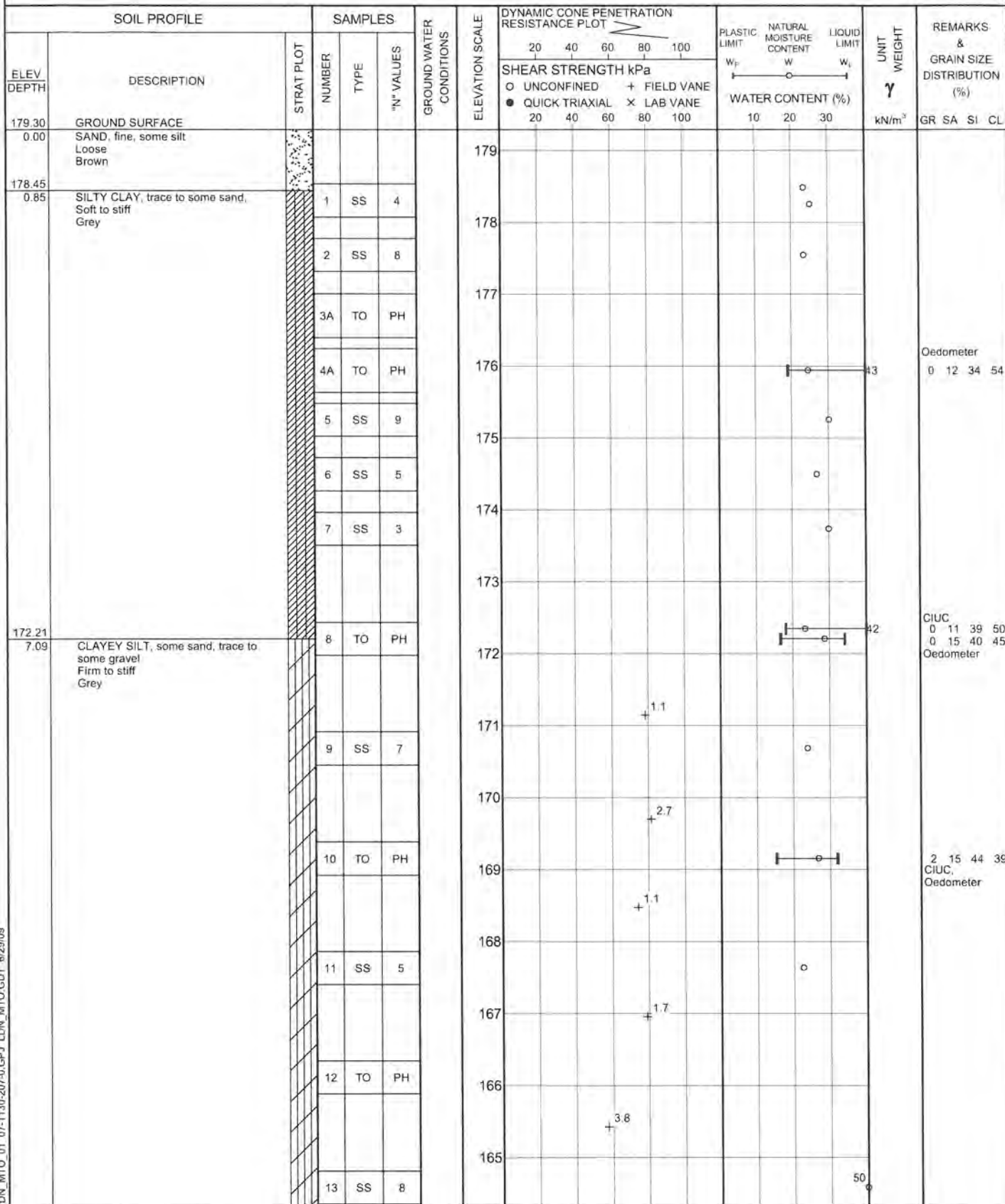
COMPILED BY BRS

DATUM GEODETIC

DATE

July 17, 2008 - July 18, 2008

CHECKED BY SJB



Continued Next Page

+ 3, X 3. Numbers refer to Sensitivity
O 3% STRAIN AT FAILURE

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 6/20/09

RECORD OF BOREHOLE No 158

2 OF 4

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682144.3 :E 329769.9

ORIGINATED BY SM

DIST WEST HWY 401/3

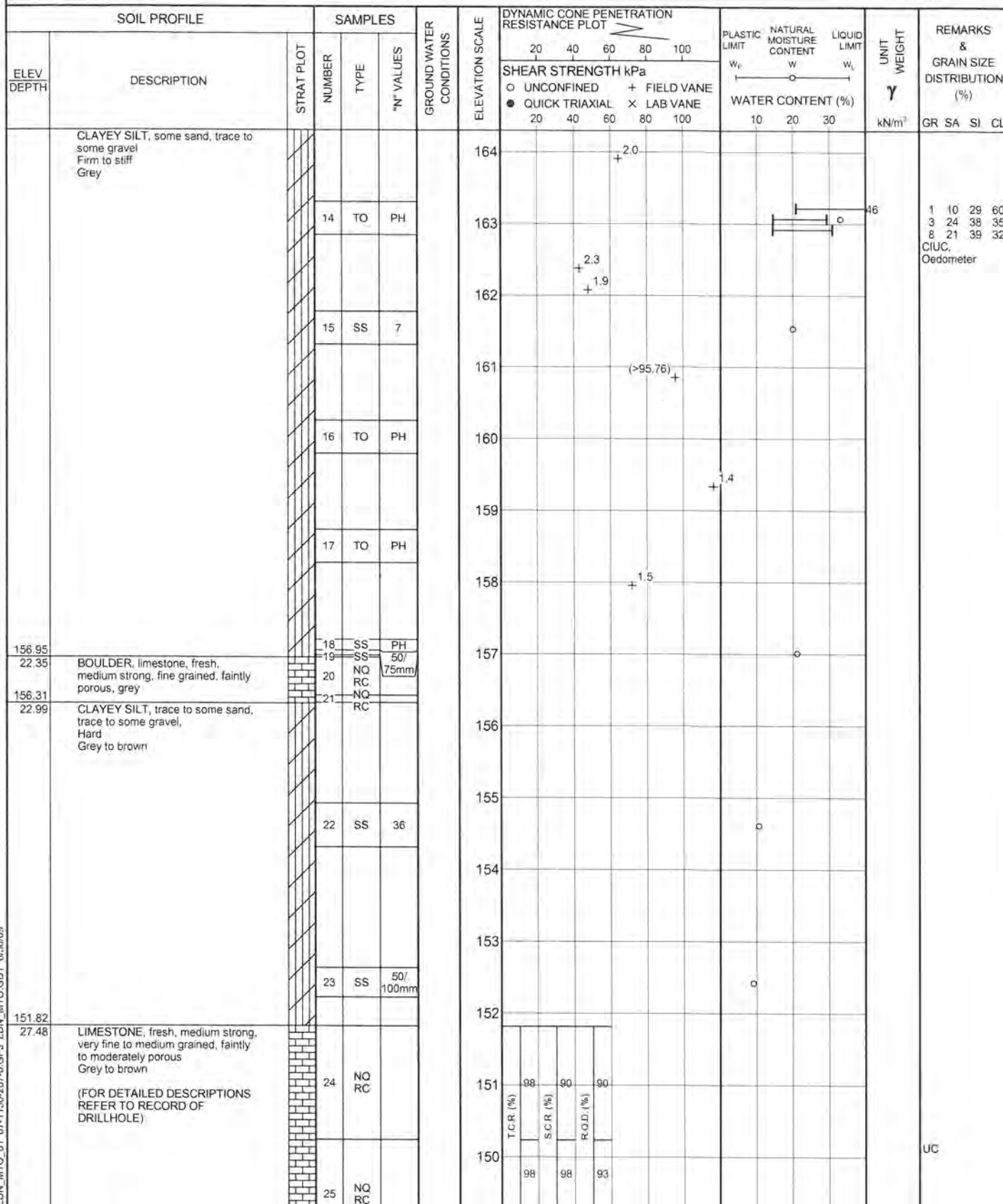
BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY BRS

DATUM GEODETIC

DATE July 17, 2008 - July 18, 2008

CHECKED BY **SJB**



Continued Next Page

+ 3 x 3

Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

LDN_MTO_01_07-1130-207-0.GPJ LDN_MTO.GDT 6/30/09

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-159		1 OF 1 METRIC	
W.P. _____		LOCATION <u>N 4682292.8 :E 329332.1</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 12, 2008</u>		CHECKED BY <u>SJS</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W _p — W — W _L WATER CONTENT (%)	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
178.77	GROUND SURFACE										
0.00	TOPSOIL, sandy silt, trace clay Loose Black										
177.86											
0.91	FILL, silt, some sand, some clay, trace topsoil, trace organics Loose		1	SS	4						
177.55											
1.22	Mottled brown and grey CLAYEY SILT, trace sand Firm		2	SS	5						
176.94											
1.83	Mottled brown and grey END OF BOREHOLE										
	Borehole dry during drilling on August 12, 2008.										

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 5/29/09

PROJECT 07-1130-207-0

RECORD OF BOREHOLE No 160

1 OF 3

METRIC

W.P.

LOCATION

N 4682216.8 : E 329156.2

ORIGINATED BY SM

DIST

WEST

HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY BRS

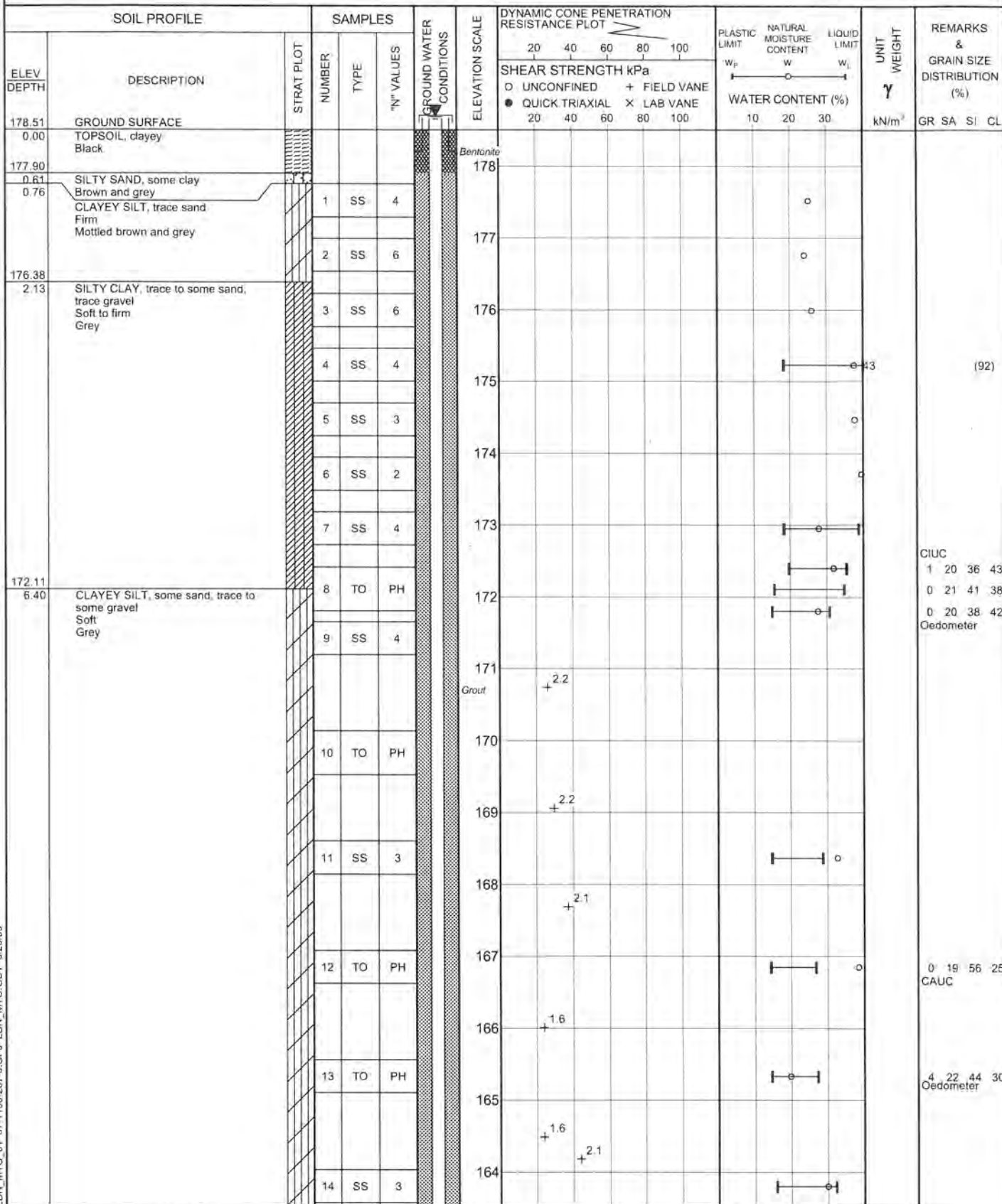
DATUM GEODETIC

DATE

July 14, 2008 - July 15, 2008

CHECKED BY

SSB



Continued Next Page

+ 3 × 3

Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No 160

2 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682216.8 ; E 329156.2

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

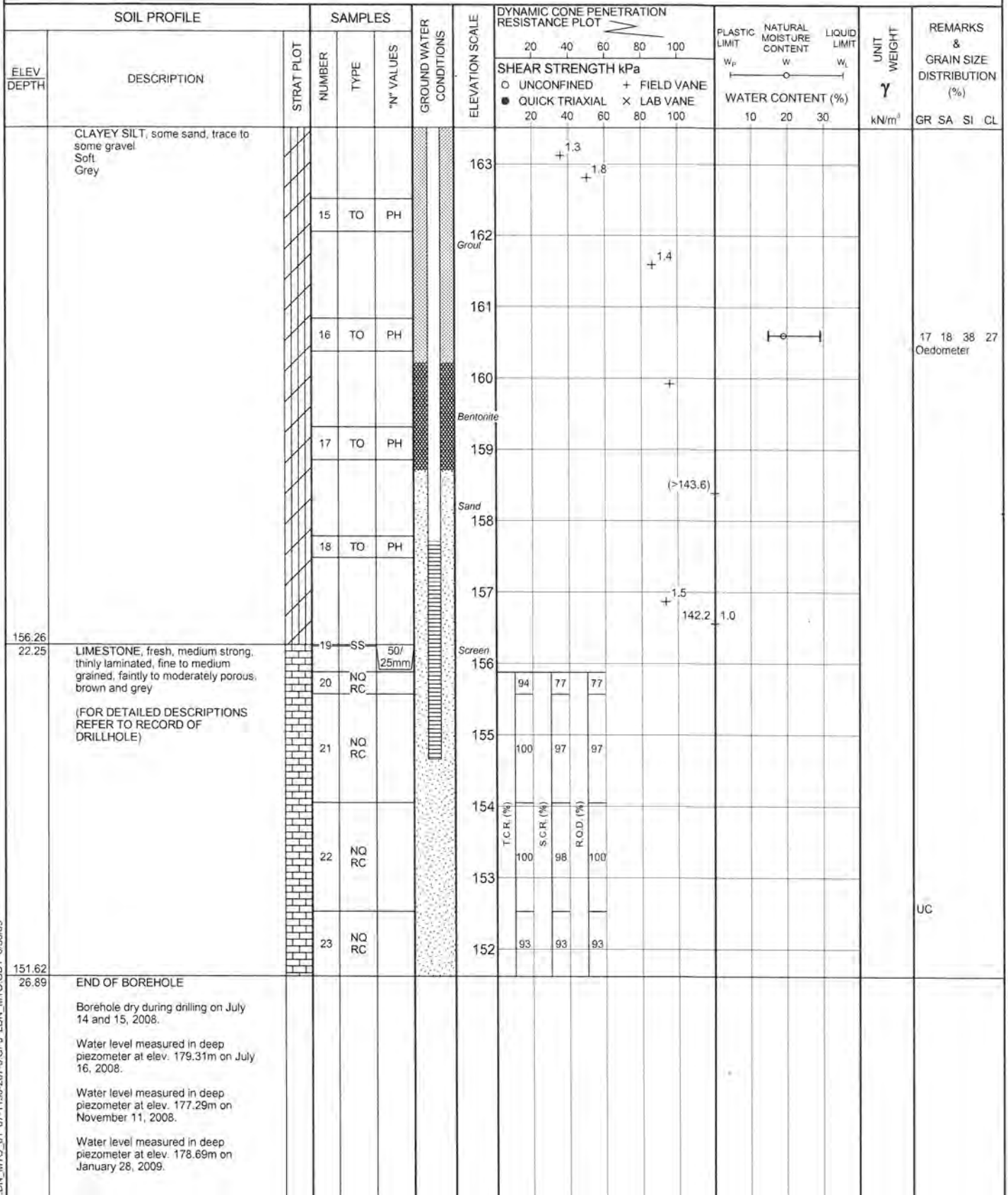
COMPILED BY BRS

DATUM GEODETIC

DATE

July 14, 2008 - July 15, 2008

CHECKED BY SB



+³ ×³ Numbers refer to Sensitivity ○³% STRAIN AT FAILURE

LDN_MTO_01_07-1130-207-0.GPJ LDN_MTO.GDT 8/30/09

LOCATION: N 4682216.8 E 329156.2

DRILLING DATE: July 14, 2008 - July 15, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE. NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

[illegible]

DN ROCK 03 07-1130-207-0-ROCK.GPJ GLDR LDN.GDT 5/29/09 DATA INPUT: WDF

DEPTH SCALE

1:75

LOGGED: SG

CHECKED: *SJH*

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-161		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4682177.6 :E 328793.9</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 14, 2008</u>		CHECKED BY <u>SJB</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)	
								20 40 60 80 100	20 40 60 80 100							
179.06	GROUND SURFACE															
0.08	FILL, crushed gravel Grey															
	SILTY SAND Compact Brown		1	SS	12											
177.99																
1.07	SILTY SAND AND GRAVEL															
1.22	Compact Brown		2	SS	24											
177.38																
1.68	SILT, trace fine sand Compact Mottled brown and grey															
176.77			3	SS	7											
2.29	SILT, some clay, trace sand Loose Grey															
	END OF BOREHOLE															
	Water level in borehole at about elev. 177.5m during drilling on August 14, 2008.															

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 5/29/09

PROJECT 07-1130-207-0		RECORD OF BOREHOLE No CPT-162		1 OF 1	METRIC
W.P. _____		LOCATION N 4682439.2 :E 328729.1		ORIGINATED BY CC	
DIST WEST HWY 401/3		BOREHOLE TYPE POWER AUGER, SOLID STEM		COMPILED BY SJL	
DATUM GEODETIC		DATE September 3, 2008		CHECKED BY <i>SJB</i>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
178.99	GROUND SURFACE												
0.00	TOPSOIL, sandy, some silt, trace gravel Compact Black		1	SS	22								
178.38	SAND, fine, some silt, trace gravel Compact Brown		2	SS	16		178						
177.54	SAND, fine to medium, some gravel, trace silt Compact Brown		3	SS	9		177						
1.52	SILT, some clay, some sand Loose Grey												
176.86	END OF BOREHOLE												
2.13	Borehole dry during drilling on September 3, 2008.												

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 5/29/09

RECORD OF BOREHOLE No 163

1 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682384.7 E 328586.3

ORIGINATED BY NG

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

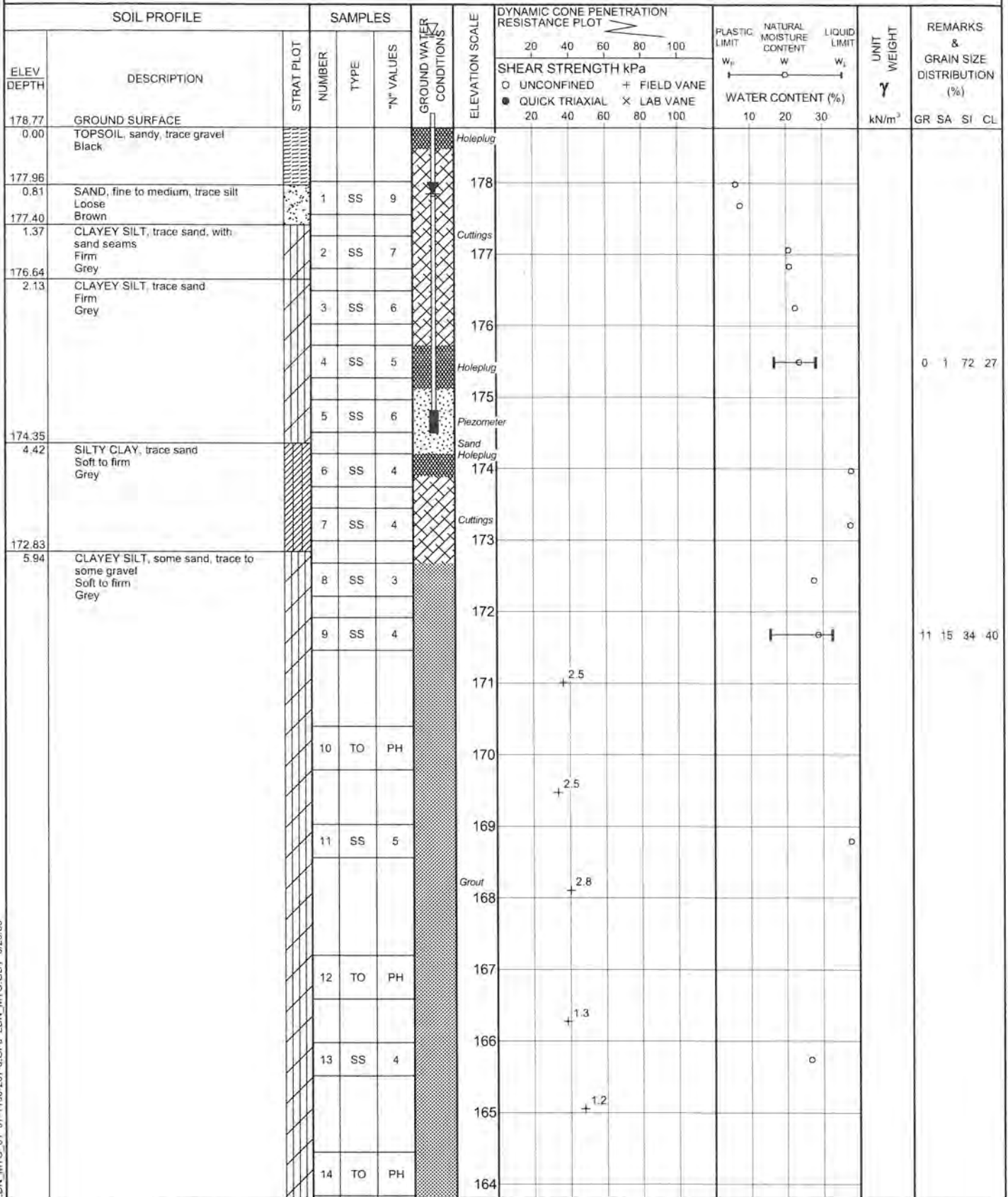
COMPILED BY LMK

DATUM GEODETIC

DATE

August 21, 2008 - August 26, 2008

CHECKED BY SJB



Continued Next Page

+ 3, x 3. Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 163

SHEET 3 OF 3

LOCATION: N 4682299.7 E 328445.6

DRILLING DATE: August 21, 2008 - August 26, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (mm/min)	FLUSH	COLOUR % RETURN	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.										HYDRAULIC CONDUCTIVITY k, cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)		NOTES WATER LEVELS INSTRUMENTATION
										RECOVERY		R.Q.D. %	FRACT INDEX PER 0.3	DISCONTINUITY DATA		TYPE AND SURFACE DESCRIPTION	10 ⁴ 10 ³ 10 ² 10 ¹						
										TOTAL CORE %	SOLID CORE %			DIP w.r.t CORE AXIS									
										50 60 70 80	80 90 100			0 30 60 90									
23	MUD ROTARY NO ROCK CORE	ROCK SURFACE		155.91 22.86																			
		LIMESTONE, fresh, medium strong, thinly laminated, very fine grained, faintly porous, hydrocarbon staining, mottled dark brown and grey																					
24			154.88 24.09	1																			
		LIMESTONE, fresh, medium strong, laminated, very fine grained, faintly porous with occasional pits, stylolitic, grey																					
25					2																		
26		LIMESTONE, fresh, medium strong, weakly laminated, very fine grained, faintly porous, fossiliferous, hydrocarbon, staining, mottled, dark brown to black and grey		152.91 25.86																			
					3																		
27		END OF DRILLHOLE		151.41 27.36																			
28																							
29																							
30																							
31																							
32																							
33																							
34																							
35																							
36																							
37																							

DEPTH SCALE

1:75



LOGGED: SG

CHECKED: SJB

RECORD OF BOREHOLE No 164

1 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682299.7 ; E 328445.6

ORIGINATED BY NG

DIST WEST HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY LMK

DATUM GEODETIC

DATE

August 27, 2008 - August 28, 2008

CHECKED BY *SJB*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100					
179.06	GROUND SURFACE													
0.00	TOPSOIL, sandy Black													
0.23	SAND, fine to medium, trace silt Compact Brown		1	SS	17		178							
177.46														
1.60	SAND, medium to coarse, trace silt Loose Brown		2	SS	9		177							
176.93														
2.13	CLAYEY SILT, trace sand Firm to stiff Grey		3	SS	9		176							
			4	SS	4									0 2 71 27
175.40														
3.66	SILTY CLAY, trace sand, trace gravel Soft to stiff Grey		5	SS	7		175							
			6	SS	5		174							
			7	SS	3		173							
			8	SS	4		172							
			9	SS	3									
							171	2.4						
			10	SS	6		170							1 9 32 58
			11	TO	PH		169	2.0						
							168	2.8						
			12	SS	4		167							
							166							
			13	TO	PH		165	1.4						
			14	SS	4									

Continued Next Page

+ 3, X 3: Numbers refer to Sensitivity
O 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No 164

2 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682299.7 ; E 328445.6

ORIGINATED BY NG

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY LMK

DATUM GEODETIC

DATE

August 27, 2008 - August 28, 2008

CHECKED BY *SJS*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100					
	SILTY CLAY, trace sand, trace gravel Soft to stiff Gray													
			15	TO	PH		163		+ 1.4					
							162		+ 1.0					
			16	SS	9		161							
							160		(+95.76) +					
			17	TO	PH		159							
							158							
			18	SS	WH		157		+ 1.5					
							156							
155.59			20	SS	118/75mm		155							
23.47	LIMESTONE, fresh, medium strong, weakly laminated to laminated, very fine to fine grained, faintly porous to porous Brown and grey (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)		21	NQ RC			154							
			22	NQ RC			153							
			23	NQ RC			152							
151.58	END OF BOREHOLE													
27.48	Borehole dry during drilling on August 27 and 28, 2008.													

+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 164

SHEET 3 OF 3

LOCATION: N 4682299.7 ,E 328445.6

DRILLING DATE: August 27, 2008 - August 28, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.		RUN No.	PENETRATION RATE (mm/min)	COLOUR % RETURN	FLUSH	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For occasional abbreviations refer to list of abbreviations & symbols										HYDRAULIC CONDUCTIVITY k, cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
				DEPTH (m)	CORRECTION						RECOVERY		R.Q.D. %	FRACT INDEX PER 0.3	DISCONTINUITY DATA		TYPE AND SURFACE DESCRIPTION	DIP w.r.t. CORE AXIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
											TOTAL CORE %	SOLID CORE %			DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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		ROCK SURFACE		155.59																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

DEPTH SCALE

1:75



LOGGED: SG

CHECKED: SSB

+3, X3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-165		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4682188.2 ; E 328457.7</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 13, 2008</u>		CHECKED BY <u>SJS</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _P	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40						60	80	100	20	40
178.98	GROUND SURFACE																		
0.00	FILL, crushed gravel Grey																		
0.30	TOPSOIL, sandy																		
0.46	Black		1	SS	8														
177.91	FILL, silty sand topsoil with silty sand layers, pockets of gravel and wood																		
1.07	Loose		2	SS	7														
177.30	Black																		
1.68	SILTY SAND AND GRAVEL																		
176.69	Loose		3	SS	20														
2.29	Brown																		
	SAND, trace gravel																		
	Compact																		
	Grey																		
	END OF BOREHOLE																		
	Water level in borehole at about elev. 177.31m during drilling on August 13, 2008																		

LDN MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 6/29/09

RECORD OF BOREHOLE No 166

1 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682168.3; E 328349.6

ORIGINATED BY CC

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

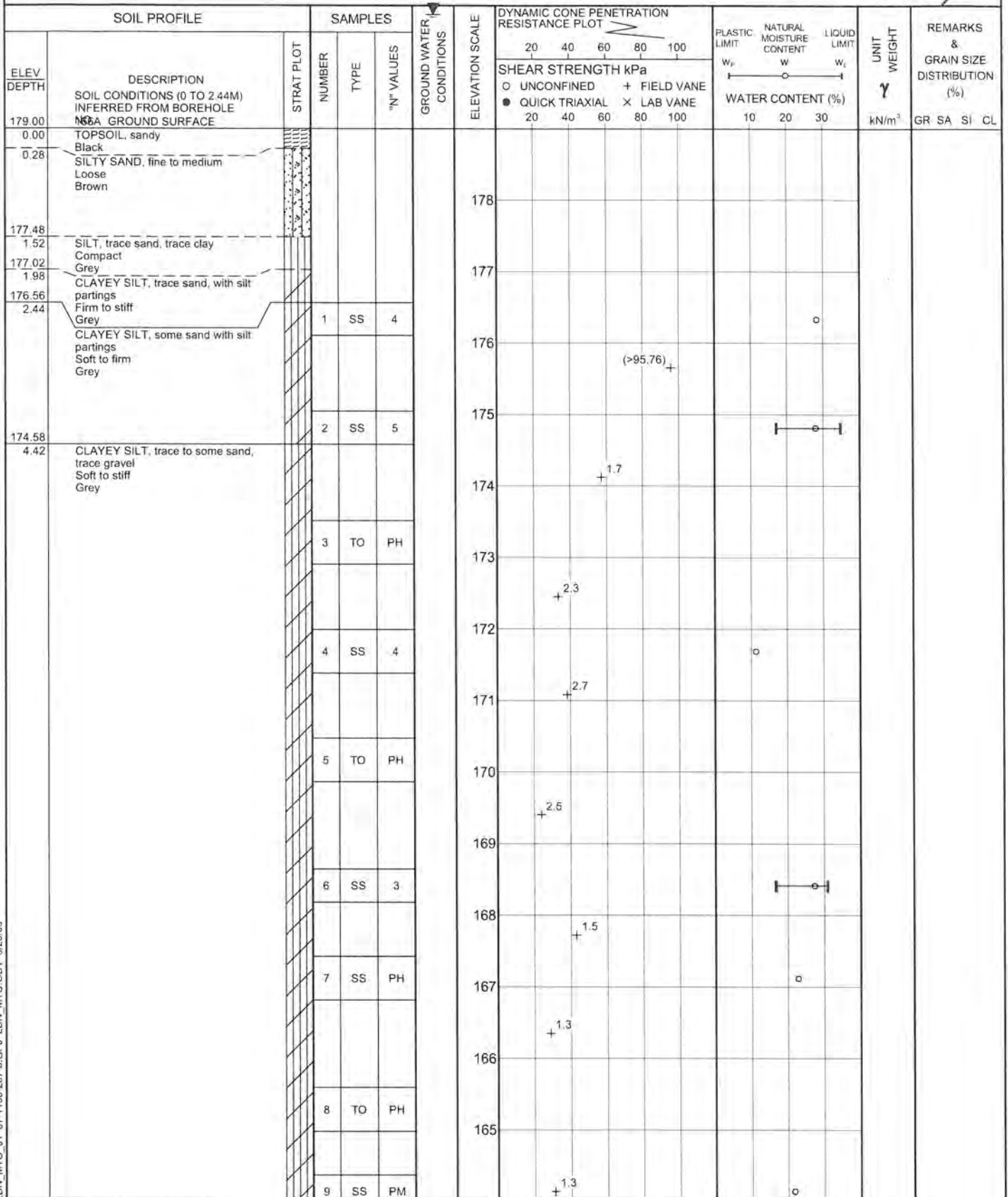
COMPILED BY LMK

DATUM GEODETIC

DATE

September 11, 2008 - September 17, 2008

CHECKED BY *SLB*



Continued Next Page

+ 3, X 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No 166

2 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682168.3 :E 328349.6

ORIGINATED BY CC

DIST WEST HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY LMK

DATUM GEODETIC

DATE

September 11, 2008 - September 17, 2008

CHECKED BY SJS

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100					
	CLAYEY SILT, trace to some sand, trace gravel Soft to stiff Grey														
			10	TO	PH		163								
			11	SS	15		162								
			12	TO	PH		161								
			13	SS	9		160								
			14	SS	9		159								
			15	NQ RC			158								
			16	NQ RC			157								
			17	NQ RC			156								
155.73	LIMESTONE, fresh, medium strong, weakly to thinly laminated, very fine to fine grained, faintly porous Mottled brown and grey (FOR DETAILED DESCRIPTION REFER TO RECORD OF DRILLHOLE)						155								
23.27							154								
							153								
152.08	END OF BOREHOLE														
26.92	Water level in borehole at about elev. 180.6m during drilling on September 17, 2008. Artesian water flow during rock coring measured at 1.60m above ground surface.														

+ 3 x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 166

SHEET 3 OF 3

LOCATION: N 4682168.3 ; E 328349.6

DRILLING DATE: September 11, 2008 - September 17, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH % RETURN	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols										DIAMETER POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION			
									RECOVERY		FRACT INDEX PER 0.3	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY k, cm/sec									
									TOTAL CORE %	SOLID CORE %		TYPE AND SURFACE DESCRIPTION											
									16 12 8 4 0	16 12 8 4 0		0 5 10 15 20	0 5 10 15 20		10 ⁻⁸	10 ⁻⁷	10 ⁻⁶	10 ⁻⁵			2	4	6
		ROCK SURFACE		155.73																			
	MUD ROTARY NO ROCK CORE	LIMESTONE, fresh, medium strong, weakly laminated, fine grained, porous to pitted with occasional vugs, fossiliferous, hydrocarbon staining, mottled brown and grey		23.27				155															
24					1																		
		LIMESTONE, fresh, medium strong, weakly laminated, fine grained, faintly porous, hydrocarbon staining, brown, mottled brown and grey zone at 25.3m		154.29																			
25				24.71	2				154														
		LIMESTONE, fresh, medium strong, thinly laminated, very fine grained to fine grained, faintly porous, stylolitic, occasional fossils, grey with light grey inclusions		153.63																			
26				25.37	3			153															
27		END OF DRILLHOLE		152.08																			
				26.92																			
28																							
29																							
30																							
31																							
32																							
33																							
34																							
35																							
36																							
37																							
38																							

DEPTH SCALE

1 : 75



LOGGED: SG

CHECKED: SSB

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-338		1 OF 1		METRIC	
W.P. _____		LOCATION <u>N 4681980.3 ; E 330141.6</u>		ORIGINATED BY <u>TA</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>December 15, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										WATER CONTENT (%)
181.22	GROUND SURFACE					▽												
0.00	TOPSOIL, sandy, trace clay Black																	
0.23	FILL, clayey silt, some sand, trace gravel Brown																	
180.61	SILTY FINE SAND, trace organics Loose to compact Dark brown		1	SS	8										○			
0.61																		
179.39	SANDY SILT, some clay Compact Grey		2	SS	10													
1.83	CLAYEY SILT, some sand, trace gravel, with occasional silt partings Stiff Grey		3	SS	10									○				
2.13																		
178.32	END OF BOREHOLE																	
2.90	Groundwater encountered at about elev. 179.6m during drilling on December 15, 2009.																	

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-340		1 OF 1		METRIC	
W.P. _____		LOCATION <u>N 4682203.2 ; E 329538.7</u>		ORIGINATED BY <u>TA</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>December 10, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	W _p W W _L	WATER CONTENT (%)				GR	SA	SI	CL
179.58	GROUND SURFACE																
0.00	TOPSOIL, sandy																
179.25	Black																
0.33	SANDY SILT, some clay, trace gravel, with silt partings Loose to compact Brown		1	SS	9												
			2	SS	10												
177.19																	
2.39	CLAYEY SILT, some sand, trace gravel, with occasional silt partings Very stiff Grey		3	SS	16												
176.68																	
2.90	END OF BOREHOLE																
	Borehole dry during drilling on December 10, 2009.																

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 341		1 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682255.5 ; E 329378.7</u>		ORIGINATED BY <u>DB/MR</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 24, 2009 - December 1, 2009</u>		CHECKED BY _____			





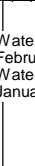
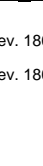


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT <div style="text-align: center;"> </div>	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
178.80	GROUND SURFACE						179						
0.00	TOPSOIL, sandy Black												
177.95	SANDY SILT, some clay Loose to compact Brown		1	SS	10		178						
177.43	CLAYEY SILT, some sand Firm to stiff Brown becoming grey below about elev. 175.9m		2	SS	9		177						
1.37			3	SS	13		176						
			4	SS	8		175						
174.99	SILTY CLAY, some sand, trace gravel Firm to stiff Grey		5	TO	PH		174						
3.81			6	SS	5		173						
			7	TO	PH		172						
			8	SS	4		171						
			9	TO	PH		170						
169.27	CLAYEY SILT, some sand, trace gravel Soft to very stiff Grey		10	TO	PH		169						
9.53			11	TO	PH		168						
			12	SS	3		167						
							166						
							165						

LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 11/03/10

Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 341		2 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682255.5 ; E 329378.7</u>		ORIGINATED BY <u>DB/MR</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 24, 2009 - December 1, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		WATER CONTENT (%)						
								○ UNCONFINED + FIELD VANE	w _p w w _L							
						● QUICK TRIAXIAL x LAB VANE										
						20 40 60 80 100										
						20 40 60 80 100										
157.06 21.74	CLAYEY SILT, some sand, trace gravel Soft to very stiff Grey						164	1.4								
			13	TO	PH											
			163	1.8												
			14	SS	5											
			162													
			161													
			15	TO	PH											
			160													
			16	TO	PH											
151.55 27.25	LIMESTONE, fresh, medium strong, weakly laminated, very fine to fine grained, faintly porous Light brown to grey (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)						159									
			16	TO	PH											
			158													
			17	SS	7											
			157													
			18	NQ RC	-											
							156	91	74	73						
			19	NQ RC	-											
			155													
			20	NQ RC	-											
							154	89	74	83						
			21	NQ RC	-											
							</									

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: LANTECH

DATUM: GEODETIC



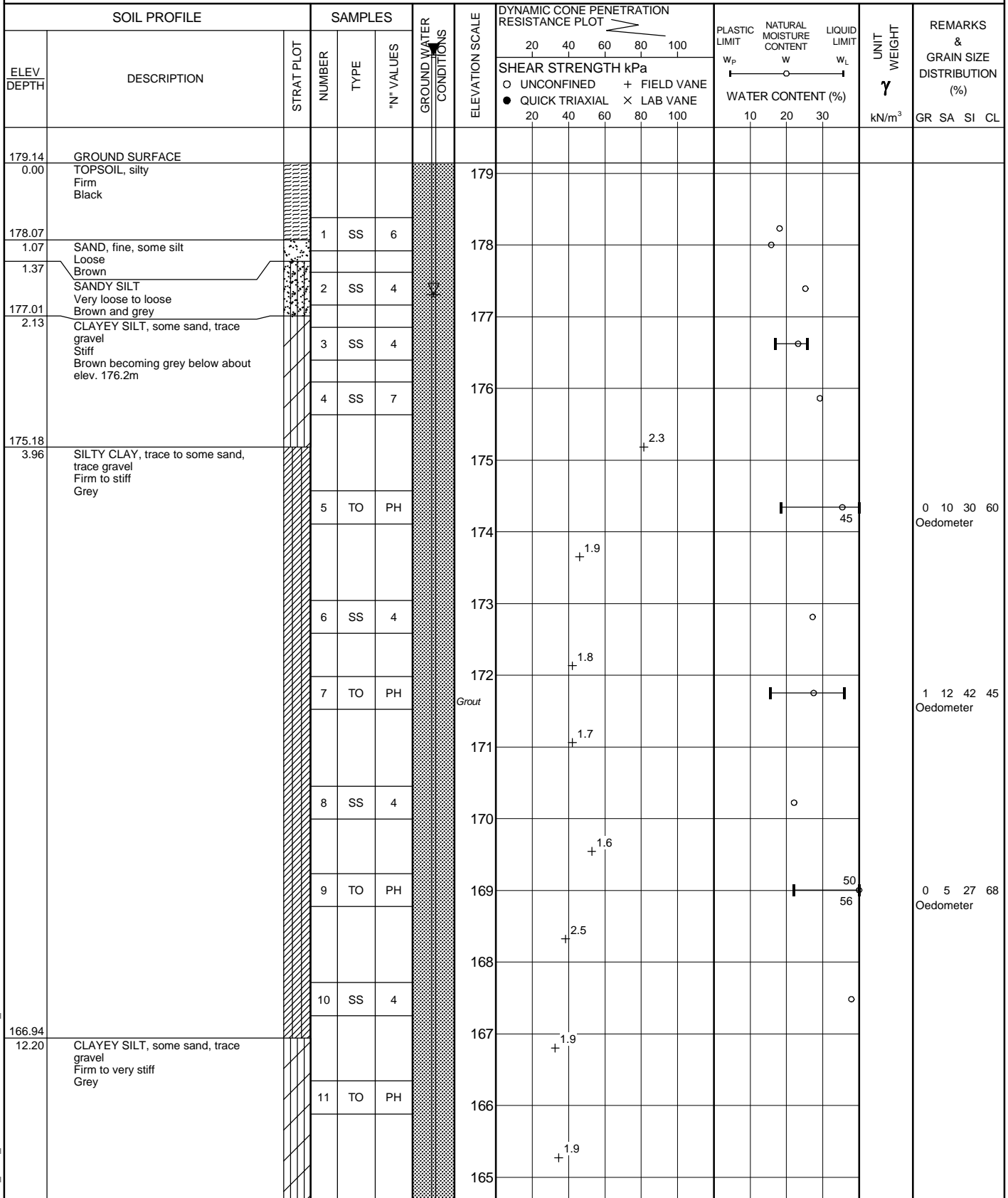
**Golder
Associates**

1 : 75

CHECKED:

_LDN_ROCK_03 09-1132-0080-ROCK.GPJ GLDR_LDN.GDT 12/03/10 DATA INPUT: LMK

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 343		1 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682231.8 ; E 329086.3</u>		ORIGINATED BY <u>MR/LK</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 18, 2009 - November 19, 2009</u>		CHECKED BY _____			



LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 12/03/10

Continued Next Page

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-342		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4682246.9 ; E 329168.7</u>		ORIGINATED BY <u>TA</u>	
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>	
DATUM <u>GEODETIC</u>		DATE <u>December 4, 2009</u>		CHECKED BY _____	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p w w _L				GR	SA	SI	CL
												20	40	60	80					
178.75	GROUND SURFACE																			
0.00	TOPSOIL, sandy, trace to some clay Black						178													
178.10																				
0.65	SILTY FINE SAND Compact Brown		1	SS	17															
177.38							177													
1.37	SANDY SILT, some clay, trace gravel, with silt partings Loose Grey		2	SS	7															
176.62																				
2.13	CLAYEY SILT, some sand, trace gravel, with occasional silt partings Stiff Grey						176													
175.85			3	SS	10															
2.90	END OF BOREHOLE																			
	Borehole dry during drilling on December 4, 2009.																			

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 343		2 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682231.8 ; E 329086.3</u>		ORIGINATED BY <u>MR/LK</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 18, 2009 - November 19, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		w _p	w	w _L		
								○ UNCONFINED + FIELD VANE	● QUICK TRIAXIAL × LAB VANE					
							20 40 60 80 100							
	CLAYEY SILT, some sand, trace gravel Firm to very stiff Grey		12	TO	PH									
								1.3						
			13	SS	PH									
			14	TO	PH									
								1.2						
			15	TO	PH									
								1.7						
			16	TO	PH									

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 09-1132-0080

RECORD OF DRILLHOLE: 343

SHEET 3 OF 3

LOCATION: N 4682231.8 ;E 329086.3

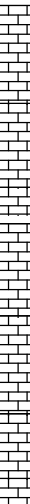
DRILLING DATE: November 18, 2009 - November 19, 2009

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: LANTECH

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.	RUN No.	PENETRATION RATE (m/min)	COLOUR FLUSH % RETURN	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.										DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION	
				DEPTH (m)					RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA		HYDRAULIC CONDUCTIVITY k, cm/sec						
									TOTAL CORE %	SOLID CORE %			DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION							
									80 60 40 20	80 60 40 20	80 60 40 20	5 10 15 20	0 30 60 90	10 ⁰ 10 ¹ 10 ² 10 ³							
		ROCK SURFACE		155.70																	
	MUD ROTARY NQ ROCK CORE	LIMESTONE, fresh, medium strong, laminated, very fine to fine grained, faintly porous with occasional pits, brown to dark brown, heavy hydrocarbon staining		23.44	1			155													
24																					
		LIMESTONE, fresh, medium strong, weakly laminated to laminated, fine grained, faintly porous with occasional pits, grey, zones of hydrocarbon staining, occasional fossils		154.73																	
				24.41	2																
25																					
		LIMESTONE, fresh, medium strong, weakly laminated, very fine to fine grained, faintly porous, grey, zones of hydrocarbon staining		153.90																	
				25.24																	
				153.63																	
26				LIMESTONE, fresh, medium strong, weakly laminated, very fine to fine grained, faintly porous, grey, zones of hydrocarbon staining		25.60															
		LIMESTONE, fresh, medium strong, weakly laminated, very fine to fine grained, faintly porous to pitted, dark brown, heavy hydrocarbon staining		152.62	3																
27				26.52																	
		LIMESTONE, fresh, medium strong, weakly laminated, very fine to fine grained, faintly porous, grey, zones of hydrocarbon staining		151.65	4																
28				27.49																	
				151.01																	
		LIMESTONE, fresh, medium strong, weakly laminated, very fine grained, faintly porous to pitted, dark brown, heavy hydrocarbon staining, fossiliferous		28.13																	
				150.74																	
				28.40																	
29		END OF DRILLHOLE																			
30																					
31																					
32																					
33																					
34																					
35																					
36																					
37																					
38																					

DEPTH SCALE

1 : 75



LOGGED: SG

CHECKED:

LDN_ROCK_03 09-1132-0080-ROCK.GPJ GLDR LDN.GDT 11/03/10 DATA INPUT: LMK

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 343A		1 OF 2		METRIC	
W.P. _____		LOCATION <u>N 4682230.6 ; E 329086.3</u>		ORIGINATED BY <u>MR</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, HOLLOW STEM</u>		COMPILED BY <u>LMK</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 23, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	W _P W W _L	20 40 60 80 100	10 20 30			
								SHEAR STRENGTH kPa		WATER CONTENT (%)				
							○ UNCONFINED + FIELD VANE							
							● QUICK TRIAXIAL × LAB VANE							
179.14	GROUND SURFACE													
0.00	TOPSOIL, silty Firm Black						179							
178.07							178							
1.07	SAND, fine, some silt Loose													
1.37	Brown													
	SANDY SILT													
177.01	Very loose to loose						177							
2.13	Brown and grey													
	CLAYEY SILT, some sand, trace gravel Stiff Brown becoming grey below about elev. 176.2m						176							
							175							
175.18							174							
3.96	SILTY CLAY, trace to some sand, trace gravel Firm to stiff Grey						173							
							172							
							171							
							170							
							169							
							168							
							167							
166.94							166							
12.20	CLAYEY SILT, some sand, trace gravel Firm to very stiff Grey						165							
			1	SS	PH									
			2	SS	PH									

LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 11/03/10

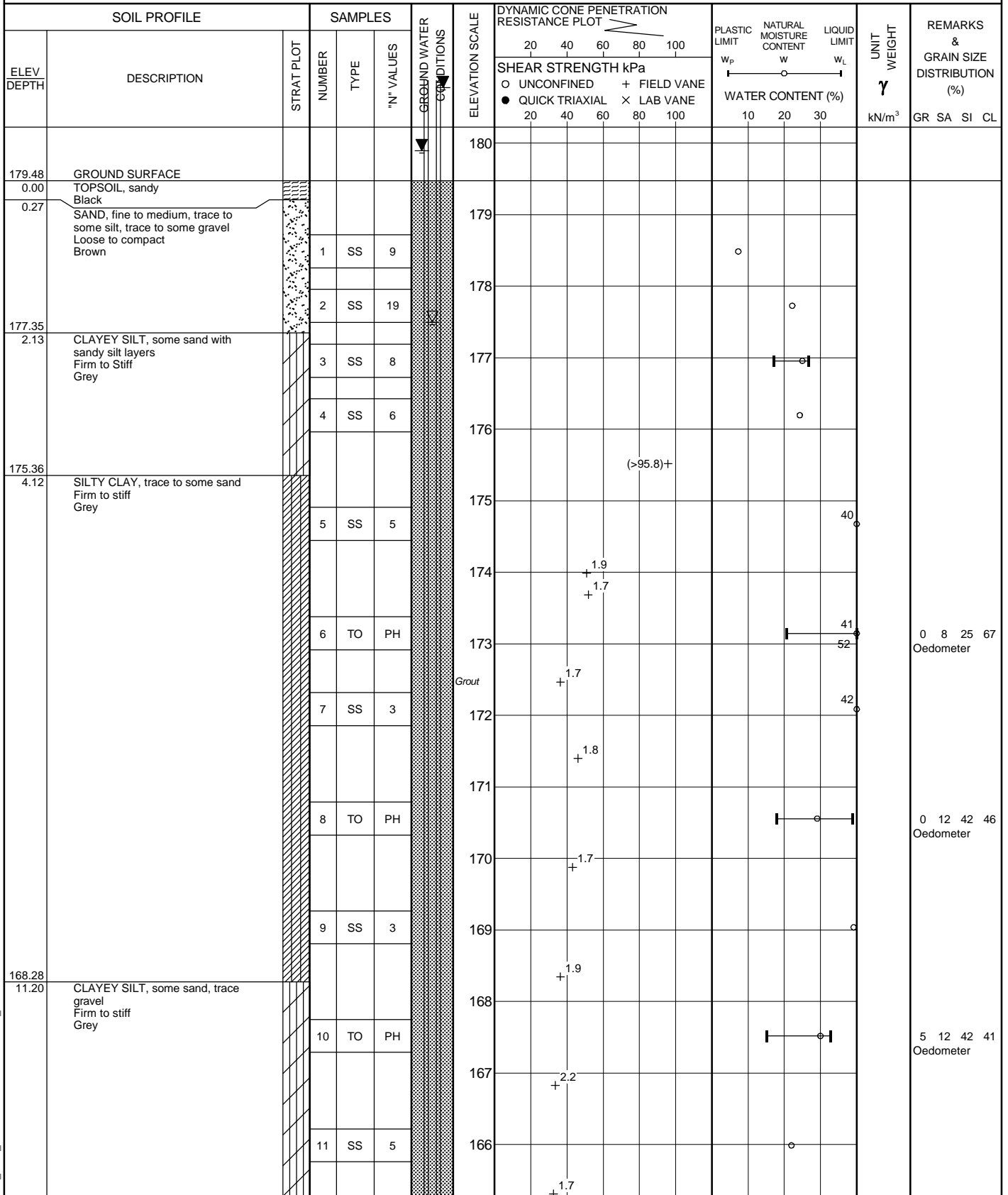
Continued Next Page

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-344		1 OF 1		METRIC	
W.P. _____		LOCATION <u>N 4682206.2 ; E 328974.6</u>		ORIGINATED BY <u>TA</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>December 2, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL	
								20	40	60	80	100									
179.56	GROUND SURFACE																				
0.00	TOPSOIL, sandy, trace to some rootlets																				
0.15	Black																				
	SAND, fine some silt		1	SS	10								o								
	Compact																				
	Brown																				
177.86	SAND AND GRAVEL, some silt		2	SS	10																
1.80	Compact																				
	Brown																				
	SILT, some clay, trace to some sand, trace gravel																				
	Compact		3	SS	16									o							
176.66	Brown becoming grey below about elev. 177.4m																				
2.90	END OF BOREHOLE																				
	Groundwater encountered at about elev. 177.9m during drilling on December 2, 2009.																				

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 345		1 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682149.0 ; E 328862.7</u>		ORIGINATED BY <u>MR</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 16, 2009 - November 17, 2009</u>		CHECKED BY _____			



LDN_MTO_06 09-1132-0080.GPJ LDN_MTO_GDT 11/03/10

Continued Next Page

+ 3, X 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 345		2 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682149.0 ; E 328862.7</u>		ORIGINATED BY <u>MR</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 16, 2009 - November 17, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE						
	CLAYEY SILT, some sand, trace gravel Firm to stiff Grey						165								
			12	TO	PH		164	1.7							
			13	TO	PH		163								
							162								
							161	(>95.8)+							
			14	SS	10		160								
							159								
			15	SS	22		158								
157.68			16	SS	50/ 75mm		157	83 64 69							
21.80	LIMESTONE, fresh, medium strong, weakly laminated to laminated, fine grained, faintly porous Light grey to brown (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)		17	NQ RC	-		156	68 44 44							
			18	NQ RC	-		155								
			19	NQ RC	-		154	98 56 9							
			20	NQ RC	-		153	100 72 42							
			21	NQ RC	-		152	99 99 99							
151.23	END OF BORHEOLE														
28.25	Groundwater encountered at about elev. 177.5m during drilling between November 16 and 17, 2009.	Upper Piezometer Water level measured at elev. 179.82 on February 24, 2010. Water level measured at elev. 179.90 on January 6, 2010.						Lower Piezometer Water level measured at elev. 180.68 on February 24, 2010. Water level measured at elev. 180.78 on January 6, 2010.							

LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 11/03/10

PROJECT: 09-1132-0080

RECORD OF DRILLHOLE: 345

SHEET 3 OF 3

LOCATION: N 4682149.0 ;E 328862.7

DRILLING DATE: November 16, 2009 - November 17, 2009

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: LANTECH

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.		PENETRATION RATE (mm/min)	FLUSH	COLOUR % RETURN	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.										HYDRAULIC CONDUCTIVITY k, cm/sec			DIAMETRAL POINT LOAD INDEX (MPa)		NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
				DEPTH (m)	RUN No.					RECOVERY		R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA		TYPE AND SURFACE DESCRIPTION	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴	2	4	6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
										TOTAL CORE %	SOLID CORE %			DIP w.r.t. CORE AXIS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		ROCK SURFACE		157.69																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

DEPTH SCALE

1 : 75



LOGGED: SG

CHECKED:

LDN_ROCK_03 09-1132-0080-ROCK.GPJ GLDR LDN.GDT 11/03/10 DATA INPUT: LMK

NILCON FIELD VANE SHEAR TEST RESULTS**Windsor-Essex Parkway**

Depth (m)	Elevation (m)	Undrained Shear Strength (kPa)			Sensitivity
		Natural	Post-Peak	Remoulded	
17.0	165.0	35	12	9	3.7
18.0	164.0	45	13	16	2.8
19.0	163.0	33	13	22	1.5
20.0	162.0	39	34	28	1.4

Field Vane Location 23 (Borehole BH-23)

5.0	173.9	47	21	15	3.1
6.0	172.9	38	16	9	4.4
7.0	171.9	29	15	10	2.8
8.0	170.9	29	15	10	2.8
9.0	169.9	26	14	9	2.7
10.0	168.9	27	15	8	3.6
11.0	167.9	27	18	6	4.8
12.0	166.9	34	9	5	7.2
13.0	165.9	22	19	7	3.3
14.0	164.9	22	19	4	5.8
15.0	163.9	22	12	14	1.5
16.0	162.9	31	22	17	1.8
17.0	161.9	46	27	26	1.8

Field Vane Location 105 (Borehole BH-105)

4.9	181.3	95	79	57	1.7
5.9	180.3	123	93	78	1.6
6.9	179.3	83	62	53	1.6
7.9	178.3	68	49	40	1.7
8.9	177.3	98	57	53	1.9
9.9	176.3	51	32	28	1.8
10.9	175.3	49	36	32	1.5
11.9	174.3	47	25	28	1.7
12.9	173.3	53	26	32	1.6
13.9	172.3	45	30	26	1.7
14.9	171.3	49	34	19	2.6
15.9	170.3	51	42	28	1.8
16.9	169.3	49	30	23	2.2
17.9	168.3	51	25	13	3.9
18.9	167.3	47	19	13	3.6
19.9	166.3	49	26	21	2.4
20.9	165.3	83	45	40	2.1
21.9	164.3	83	55	57	1.5

Field Vane Location 112 (Borehole BH-112)

6.8	177.8	81	43	40	2.0
7.8	176.8	79	32	42	1.9
8.8	175.8	45	43	26	1.7
9.8	174.8	59	40	32	1.8
10.8	173.8	51	30	28	1.8
11.8	172.8	47	26	28	1.7
12.8	171.8	53	42	32	1.6
13.8	170.8	43	26	21	2.1

NILCON FIELD VANE SHEAR TEST RESULTS**Windsor-Essex Parkway**

Depth (m)	Elevation (m)	Undrained Shear Strength (kPa)			Sensitivity
		Natural	Post-Peak	Remoulded	
7.6	174.7	99	82	78	1.3
8.6	173.7	70	59	61	1.1
9.6	172.7	62	53	57	1.1
10.6	171.7	59	45	49	1.2
11.6	170.7	60	49	57	1.1
12.6	169.7	53	53		
13.6	168.7	55	45	55	1.0
14.6	167.7	51	40	43	1.2
15.6	166.7	64	19	42	1.5
16.6	165.7	43	38		
17.6	164.7	30	13		
18.6	163.7	34	30		
19.6	162.7	30	30		

Field Vane Location 154 (Borehole BH-154)

5.6	175.3	91	57	57	1.6
6.6	174.3	66	40	47	1.4
7.6	173.3	76	68	64	1.2
8.6	172.3	57	26		
9.6	171.3	74	40	21	3.5
10.6	170.3	70	55	30	2.3
11.6	169.3	44	25	28	1.6
12.6	168.3	53	30		
13.6	167.3	57	40	40	1.4
14.6	166.3	51	45	28	1.8

Field Vane Location 158 (Borehole BH-158)

3.7	175.6	110	64	55	2.0
5.7	173.6	57	21	28	2.0
6.7	172.6	57	13	38	1.5
7.7	171.6	62	34	42	1.5
8.7	170.6	51	17	38	1.4
9.7	169.6	62	17	38	1.7
10.7	168.6	53	43	40	1.3
11.7	167.6	40	19		
12.7	166.6	32	11	26	1.2
13.7	165.6	26	15	23	1.2
14.7	164.6	45	13	25	1.8
15.7	163.6	55	28	34	1.6
16.7	162.6	26	8		
17.7	161.6	25	13	13	1.9

Field Vane Location 160 (Borehole BH-160)

3.7	175.0	54	23	15	3.5
5.7	173.0	32	13	11	2.8
6.7	172.0	19	2	11	1.7
7.7	171.0	34	13	13	2.6
8.7	170.0	23	6	17	1.3
9.7	169.0	38	15	20	1.9

NILCON FIELD VANE SHEAR TEST RESULTS
Windsor-Essex Parkway

Depth (m)	Elevation (m)	Undrained Shear Strength (kPa)			Sensitivity
		Natural	Post-Peak	Remoulded	
10.7	168.0	23	6	19	1.2
11.7	167.0	17	4	15	1.1
12.7	166.0	36	9	11	3.2
13.7	165.0	32	21	21	1.5
14.7	164.0	25	6	11	2.2
15.7	163.0	25	19	23	1.1
16.7	162.0	28	19	8	3.8
17.7	161.0	83	74	60	1.4

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-19

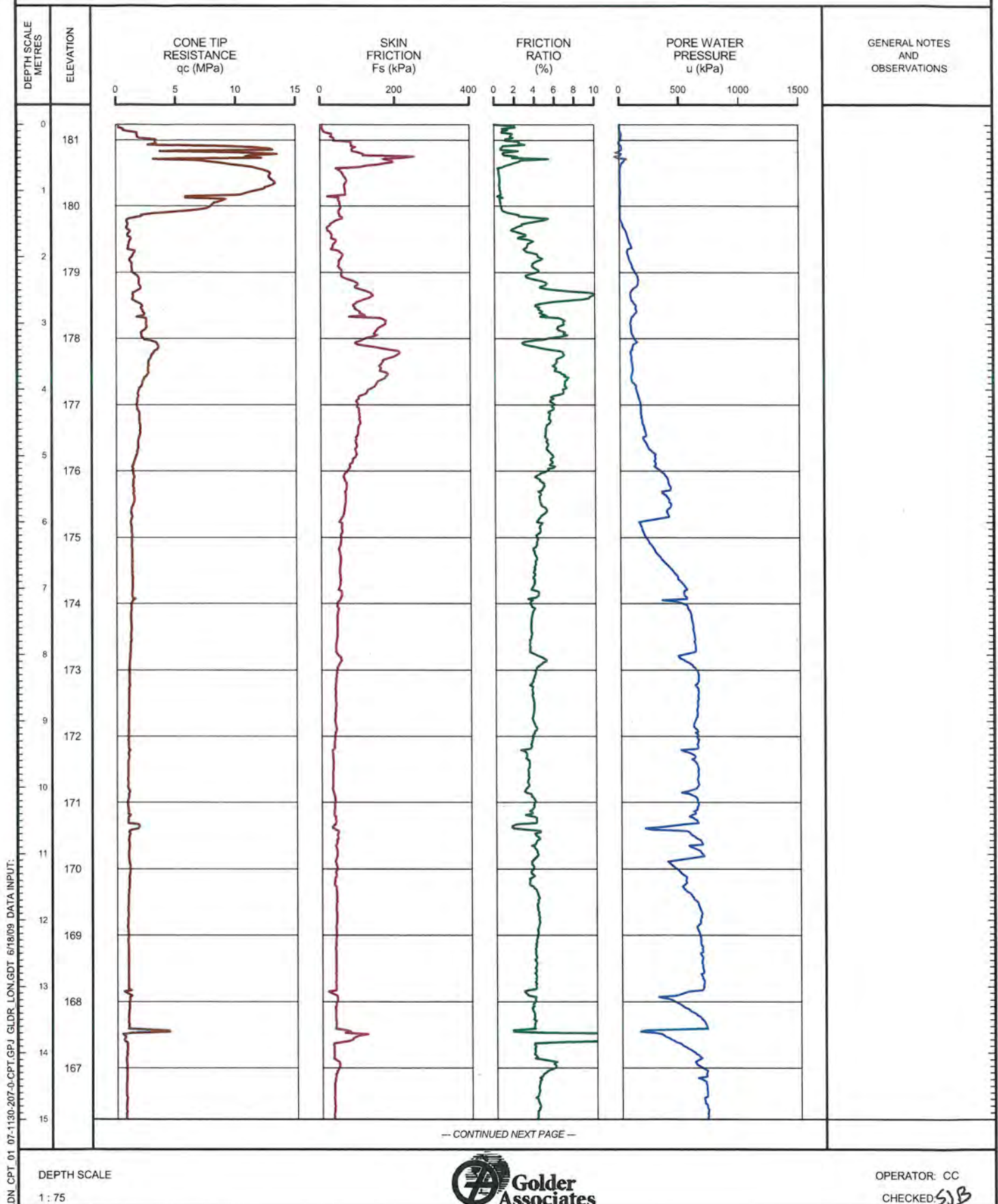
SHEET 1 OF 2

LOCATION: N 4681906.0 ; E 330413.0

TEST DATE: November 2, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-19

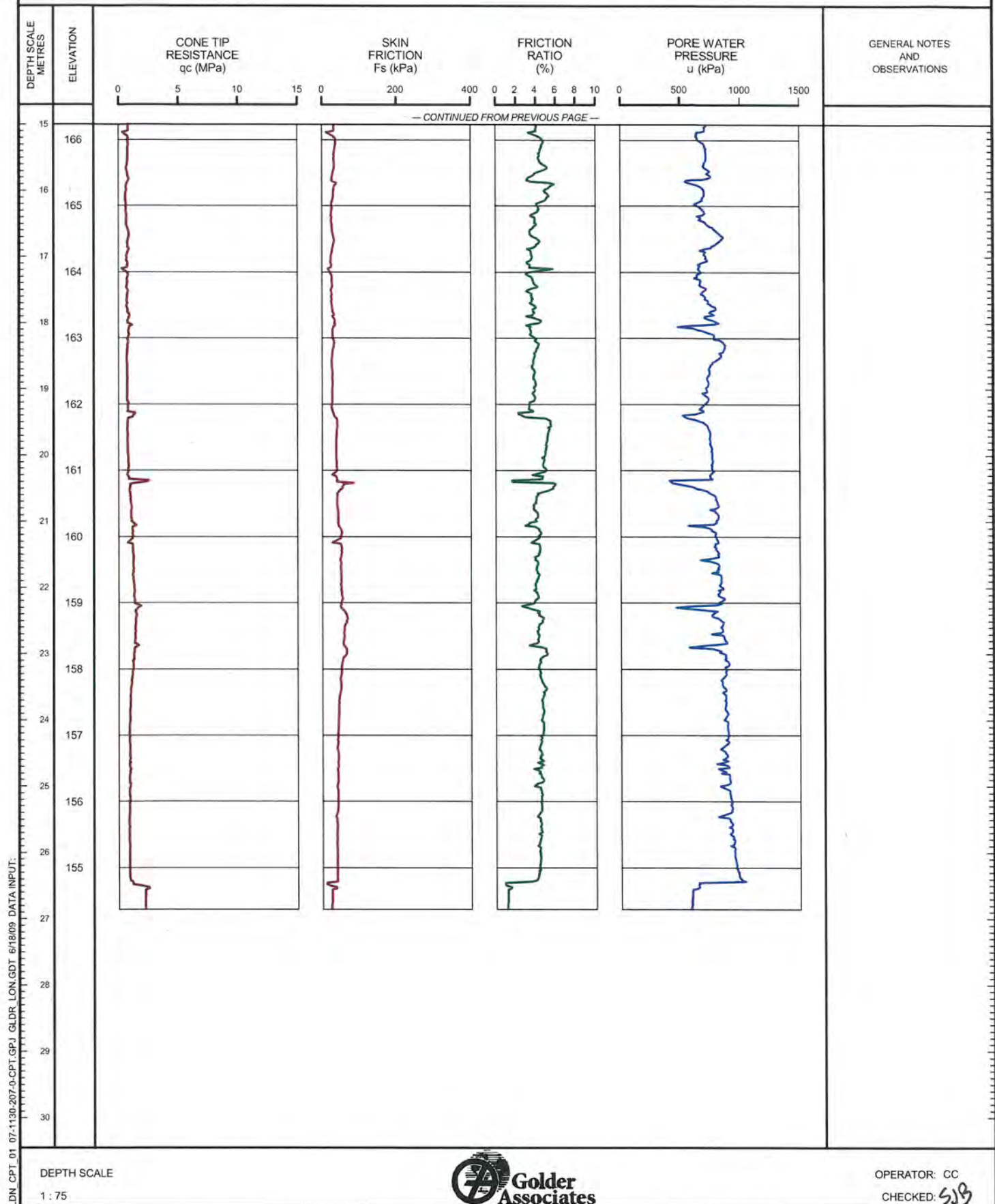
SHEET 2 OF 2

LOCATION: N 4681906.0 ; E 330413.0

TEST DATE: November 2, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-21

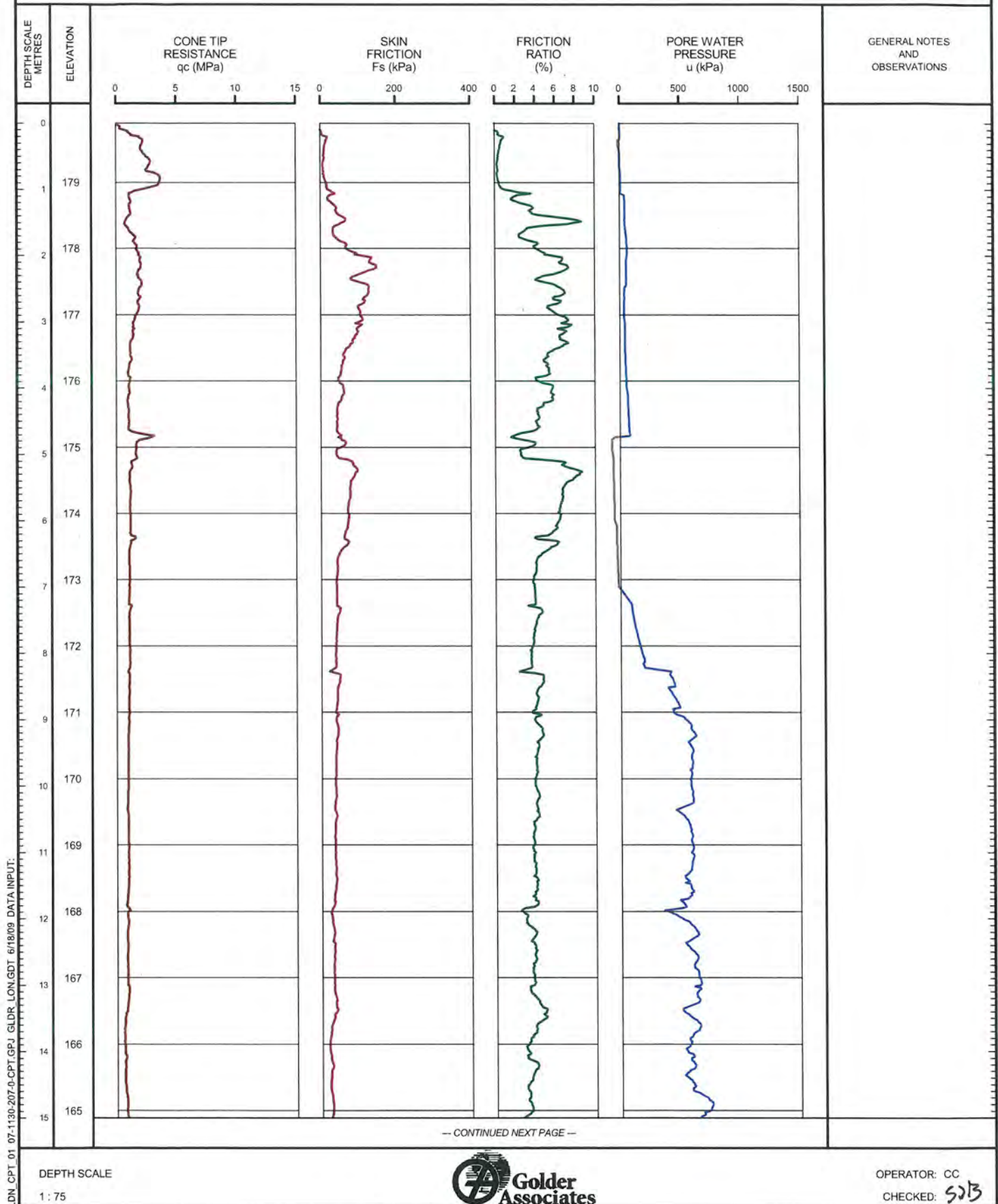
SHEET 1 OF 2

LOCATION: N 4682147.0 ; E 329759.0

TEST DATE: November 1, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-21

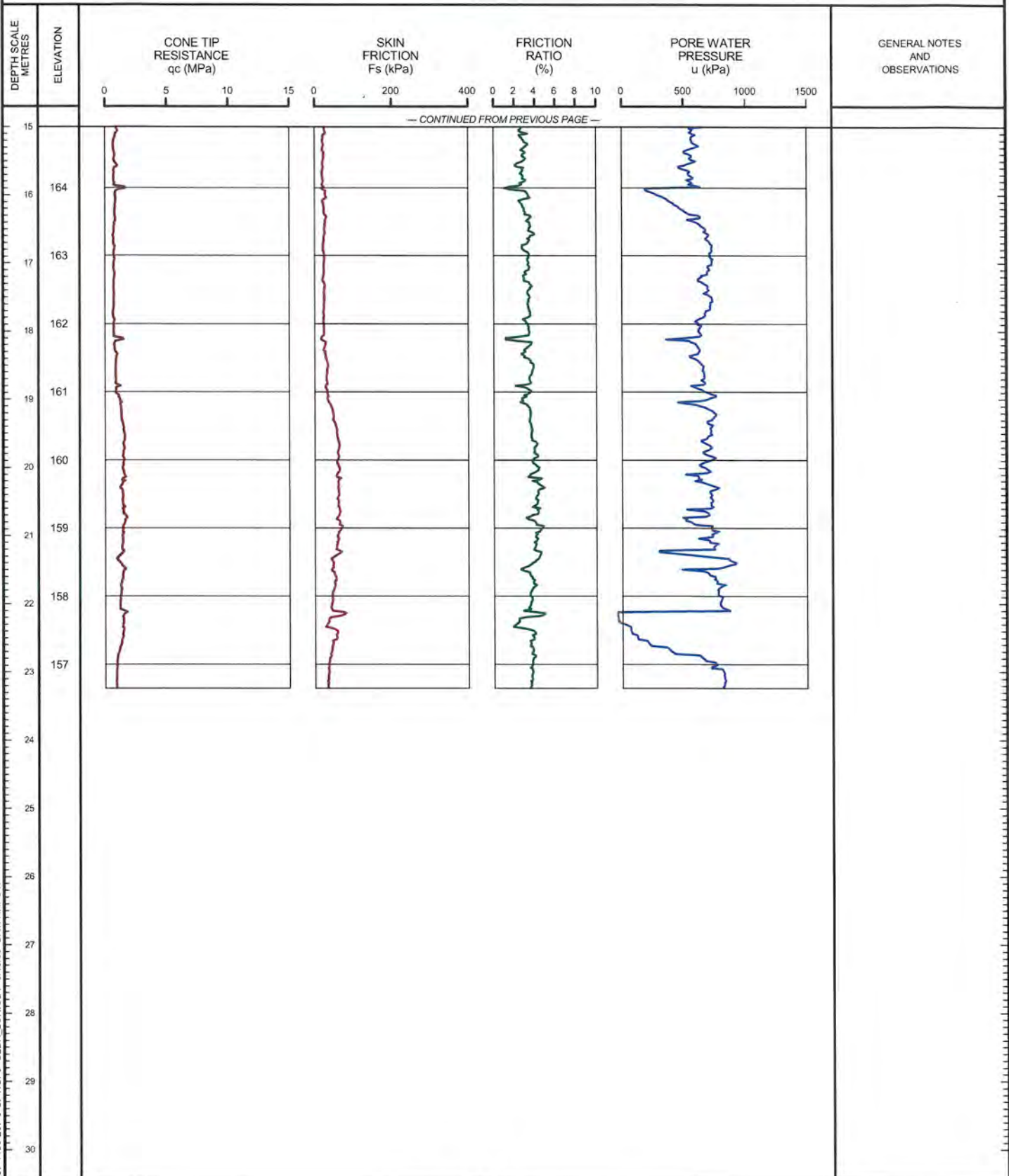
SHEET 2 OF 2

LOCATION: N 4682147.0 ; E 329759.0

TEST DATE: November 1, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SJB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-23

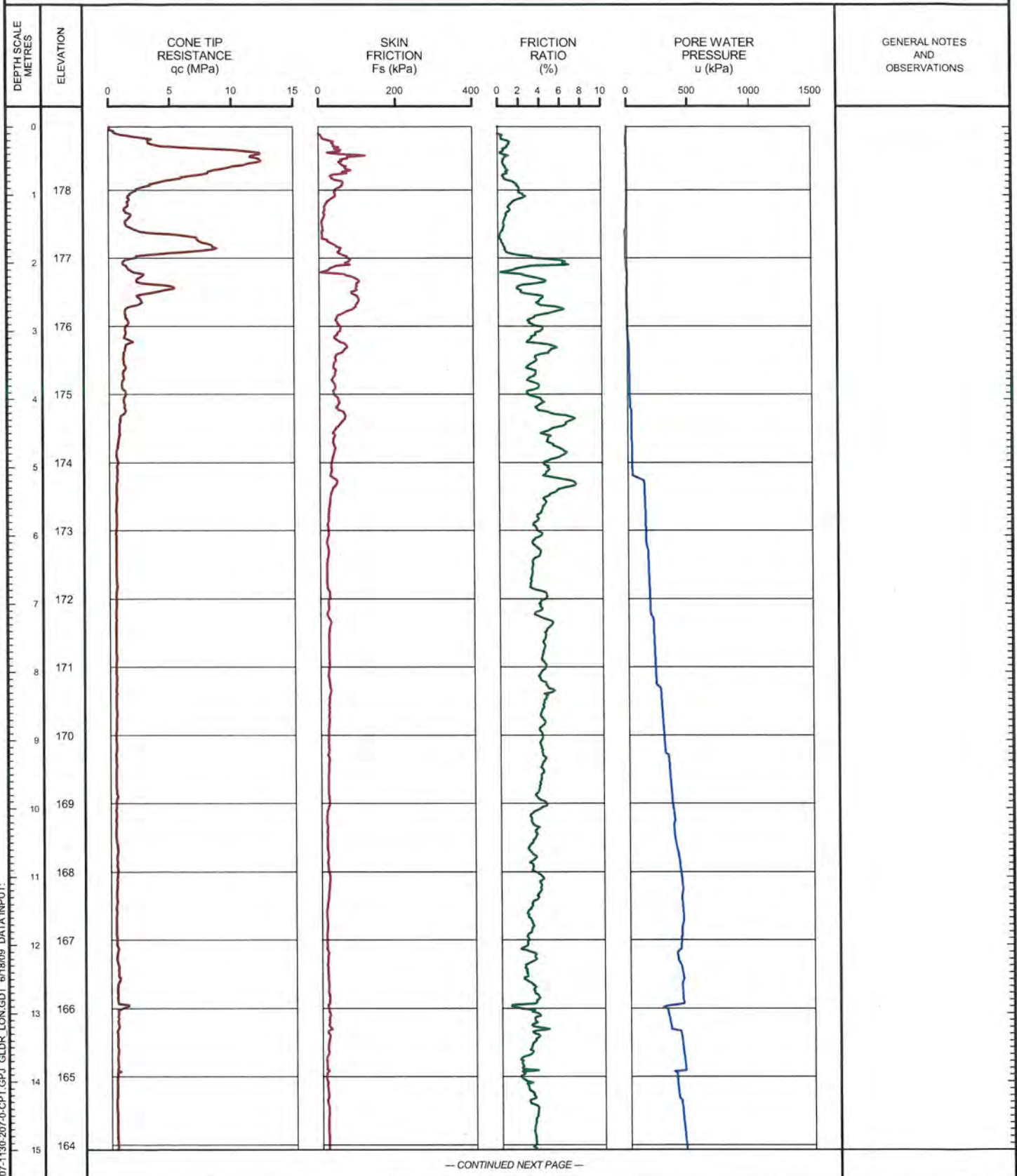
SHEET 1 OF 2

LOCATION: N 4682329.0 ; E 328523.0

TEST DATE: October 31, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-23

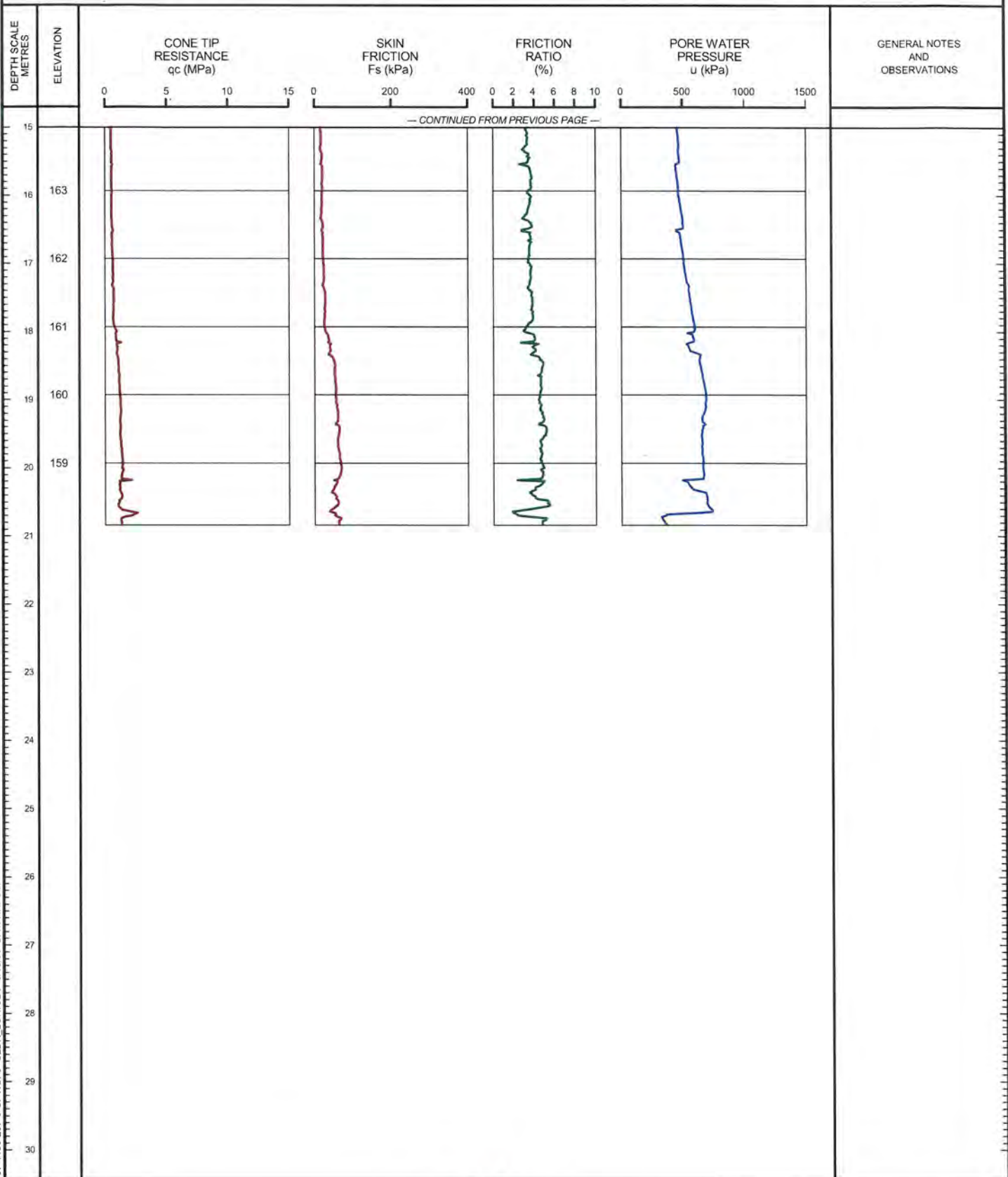
SHEET 2 OF 2

LOCATION: N 4682329.0 :E 328523.0

TEST DATE: October 31, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/19/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *CCB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-150

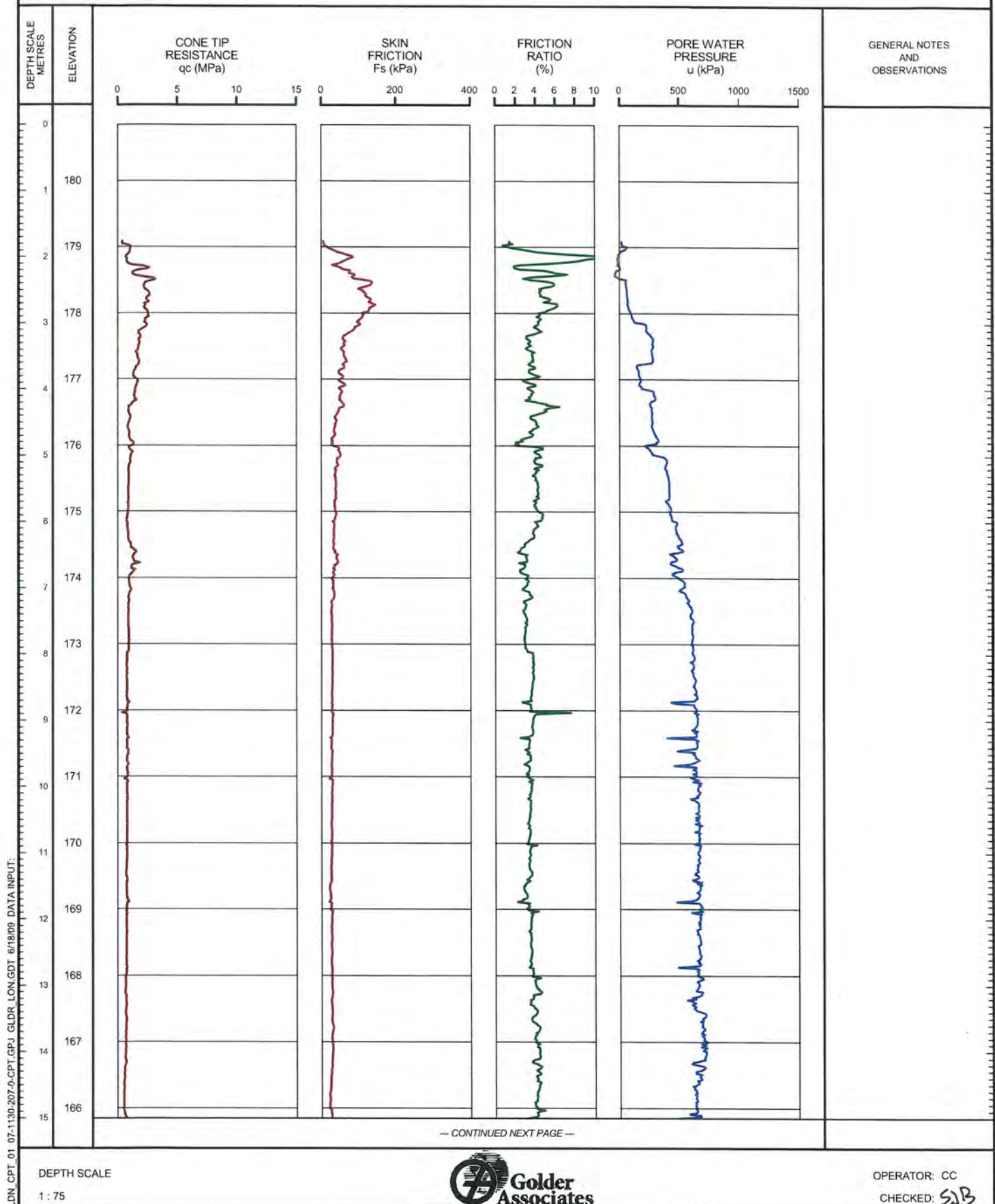
SHEET 1 OF 2

LOCATION: N 4681733.4 ; E 330757.6

TEST DATE: August 6, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.77m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-150

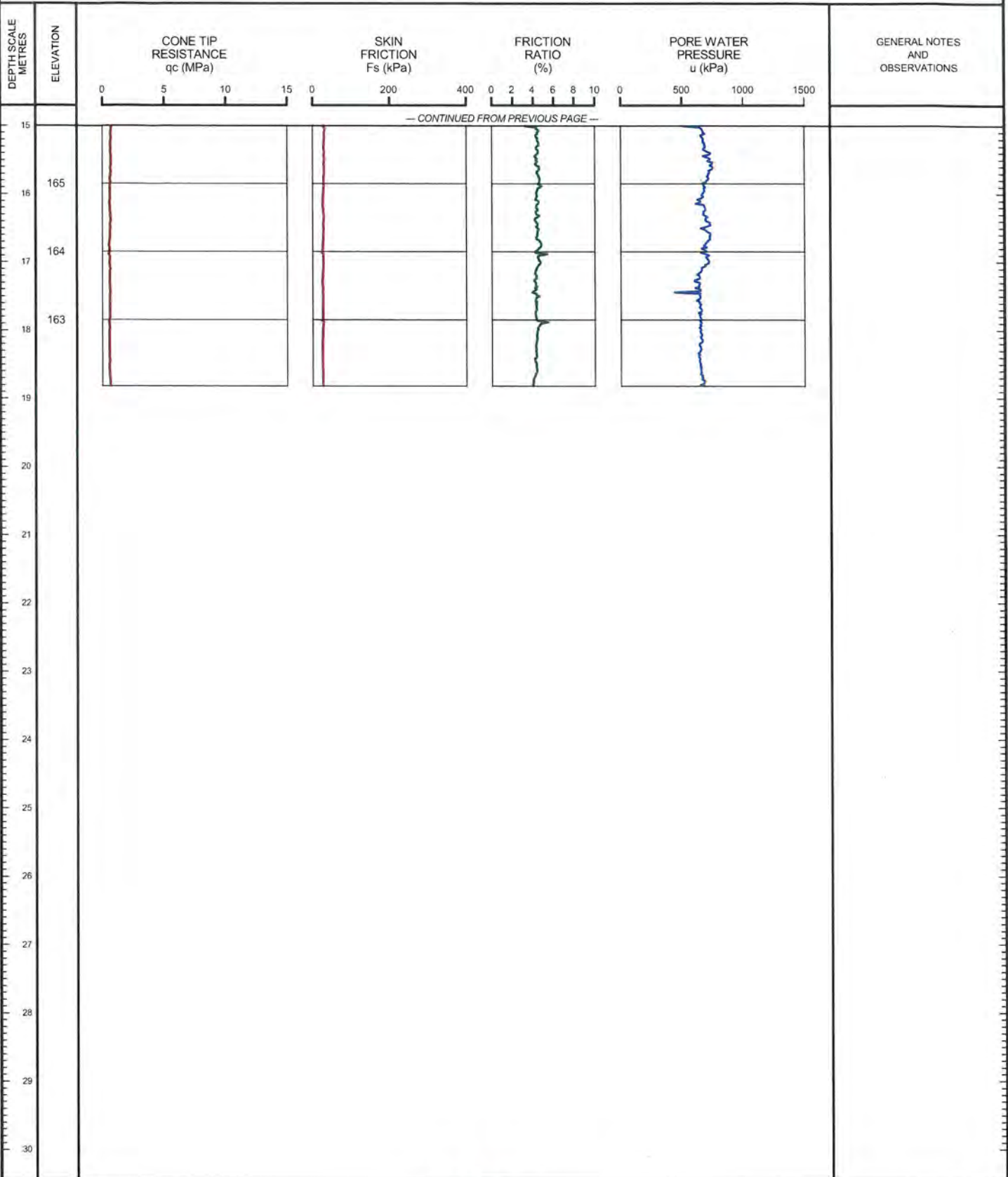
SHEET 2 OF 2

LOCATION: N 4681733.4 ;E 330757.6

TEST DATE: August 6, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.77m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-153

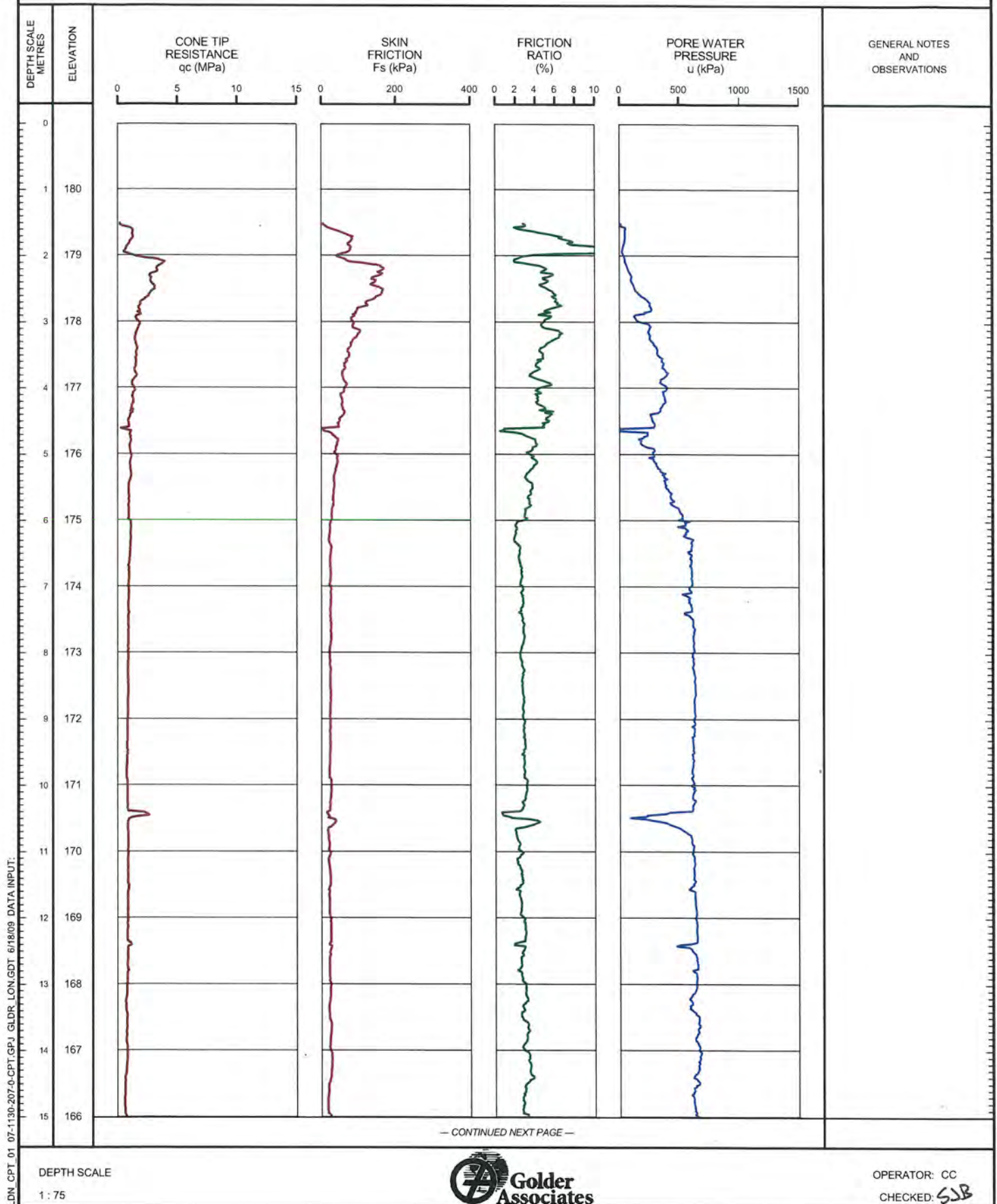
SHEET 1 OF 2

LOCATION: N 4681793.3 E 330575.8

TEST DATE: August 7, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.50m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT-GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-153

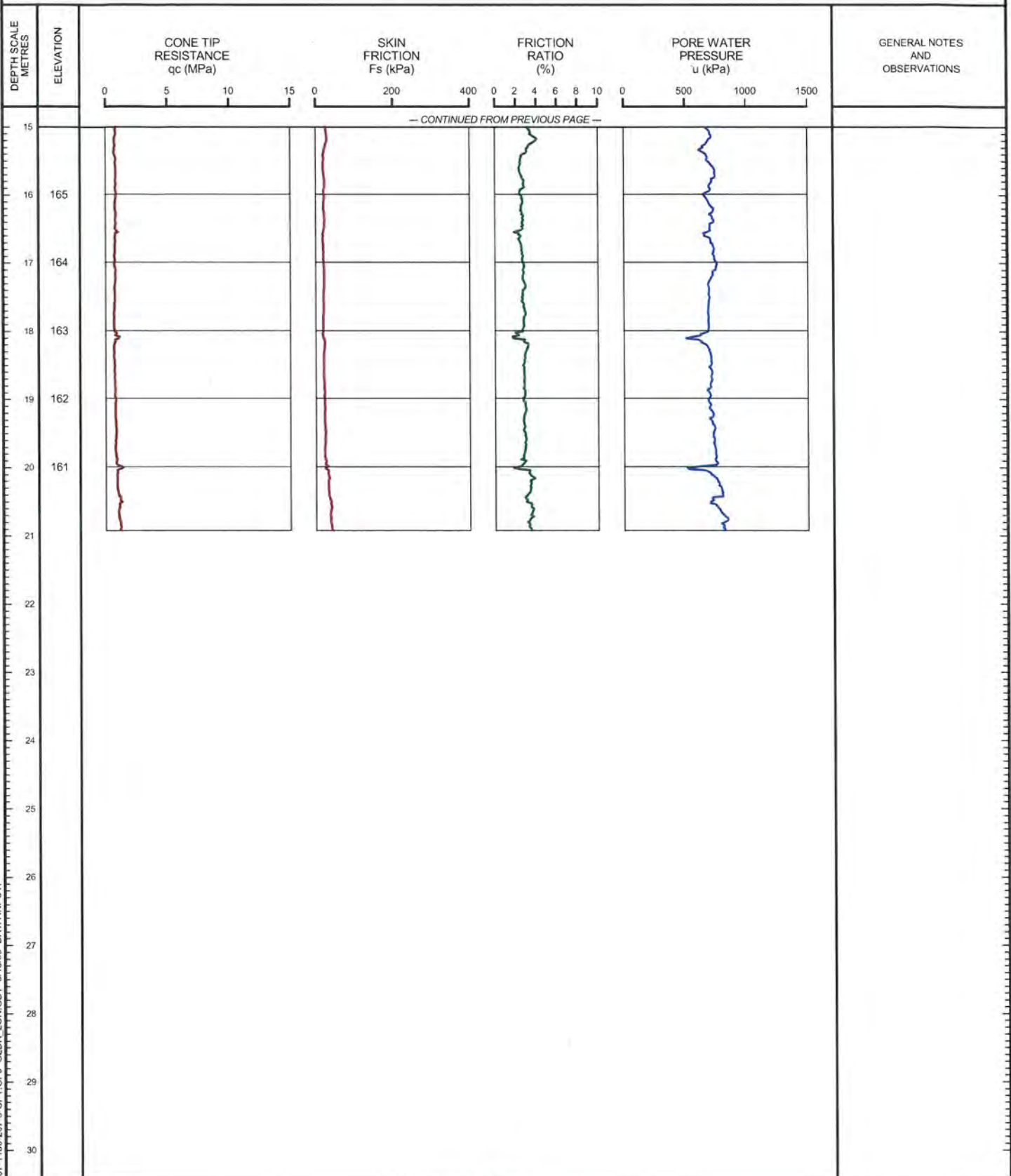
SHEET 2 OF 2

LOCATION: N 4681793.3 ; E 330575.8

TEST DATE: August 7, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.50m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT_01_07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-154

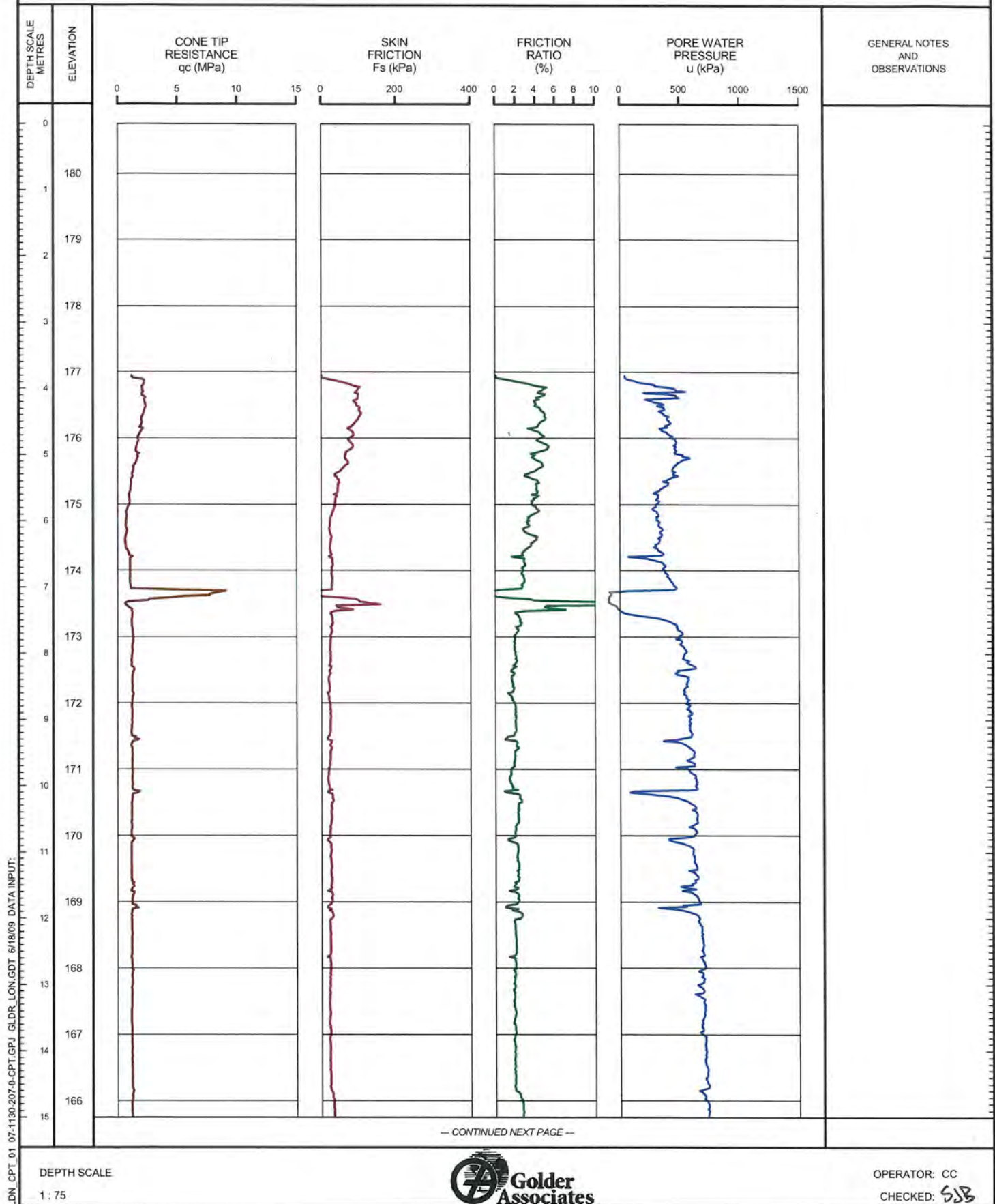
SHEET 1 OF 2

LOCATION: N 4681963.3 ; E 330191.0

TEST DATE:

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 4.58m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

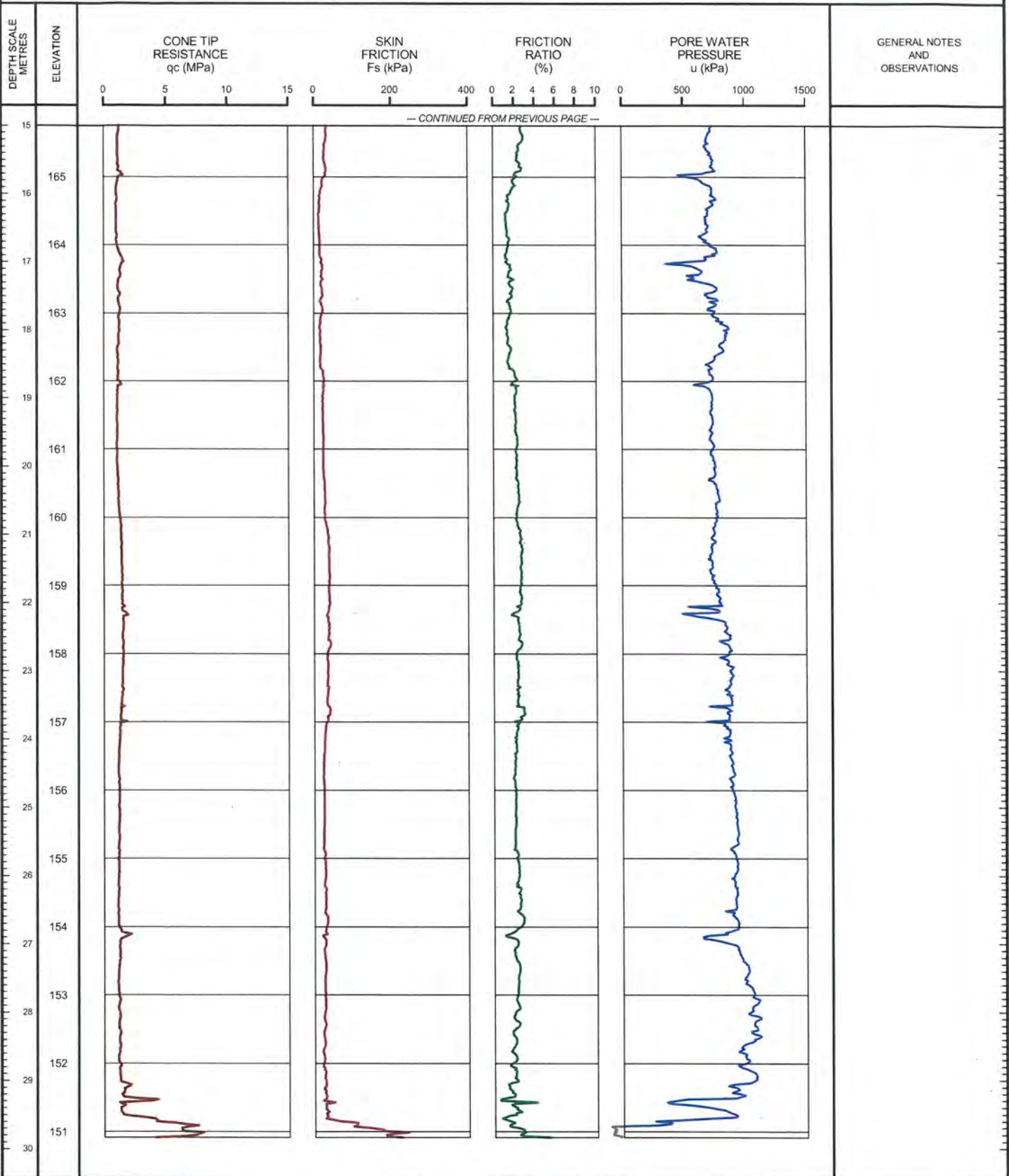
PROJECT: 07-1130-207-0
LOCATION: N 4681963.3 ; E 330191.0

RECORD OF CONE PENETRATION TEST CPT-154

SHEET 2 OF 2
DATUM: GEODETIC

TEST DATE:

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 4.58m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE
1 : 75



OPERATOR: CC
CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-155

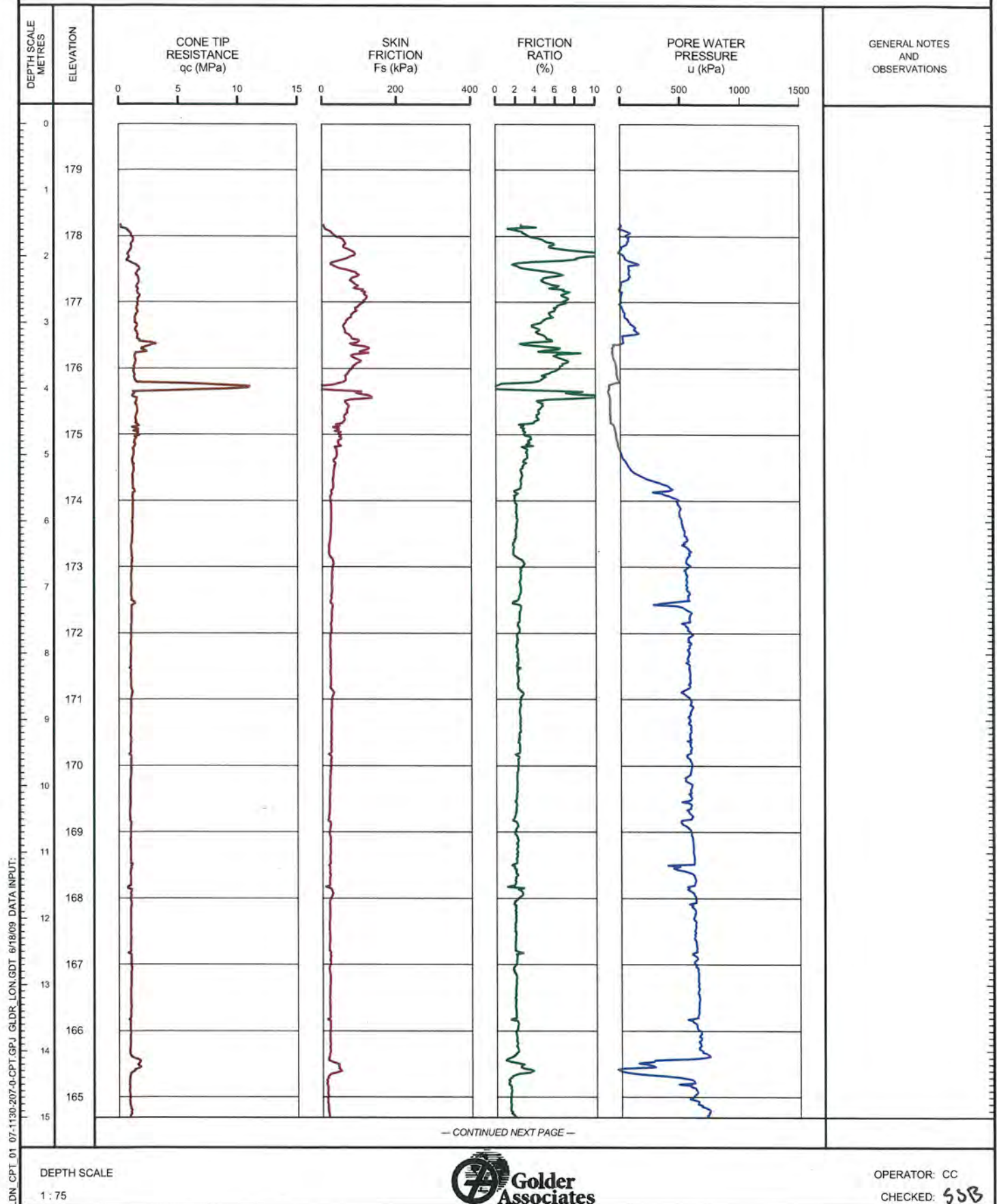
SHEET 1 OF 2

LOCATION: N 4682065.8 ; E 329981.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-155

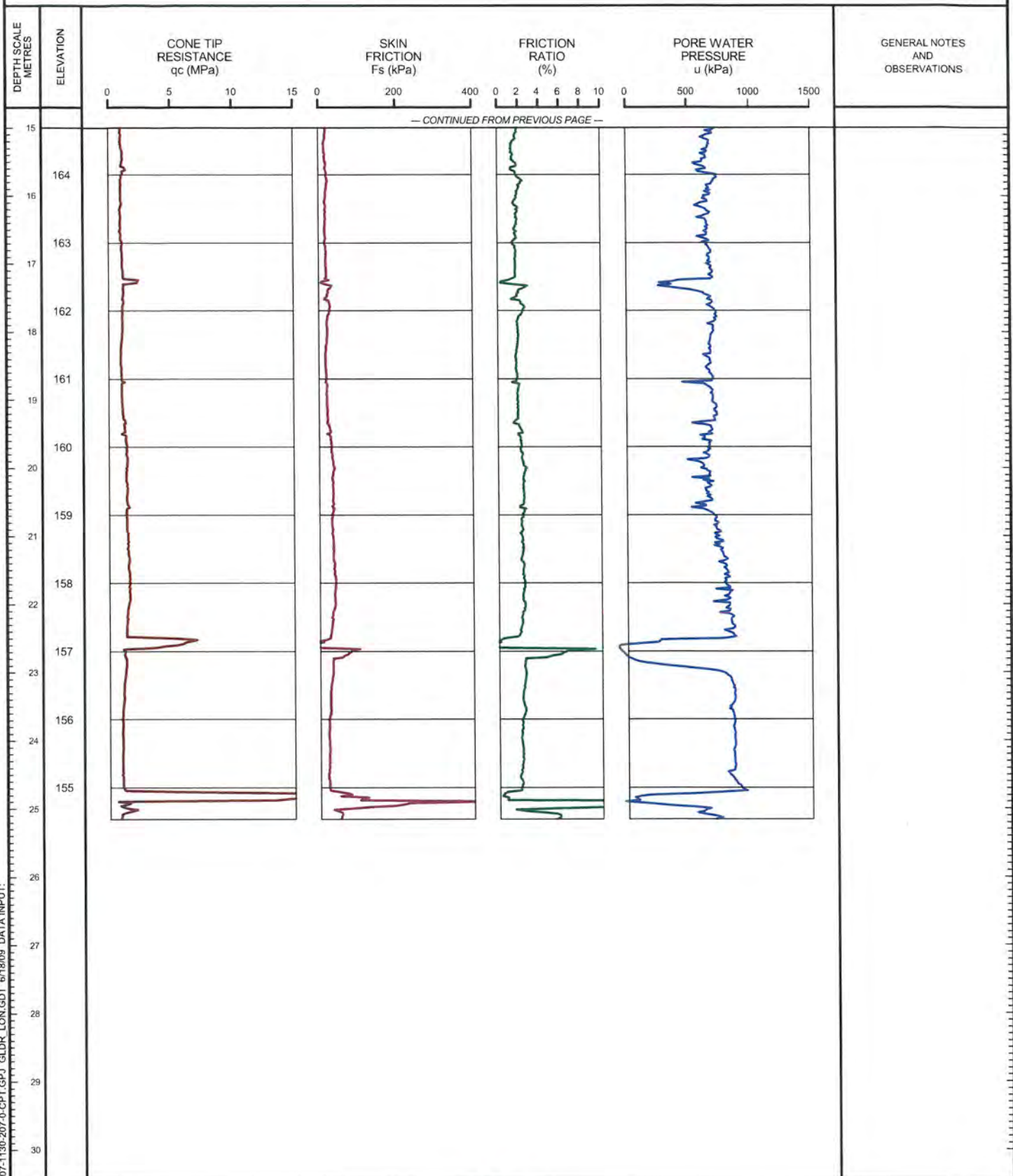
SHEET 2 OF 2

LOCATION: N 4682065.8 ; E 329981.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *JSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-159

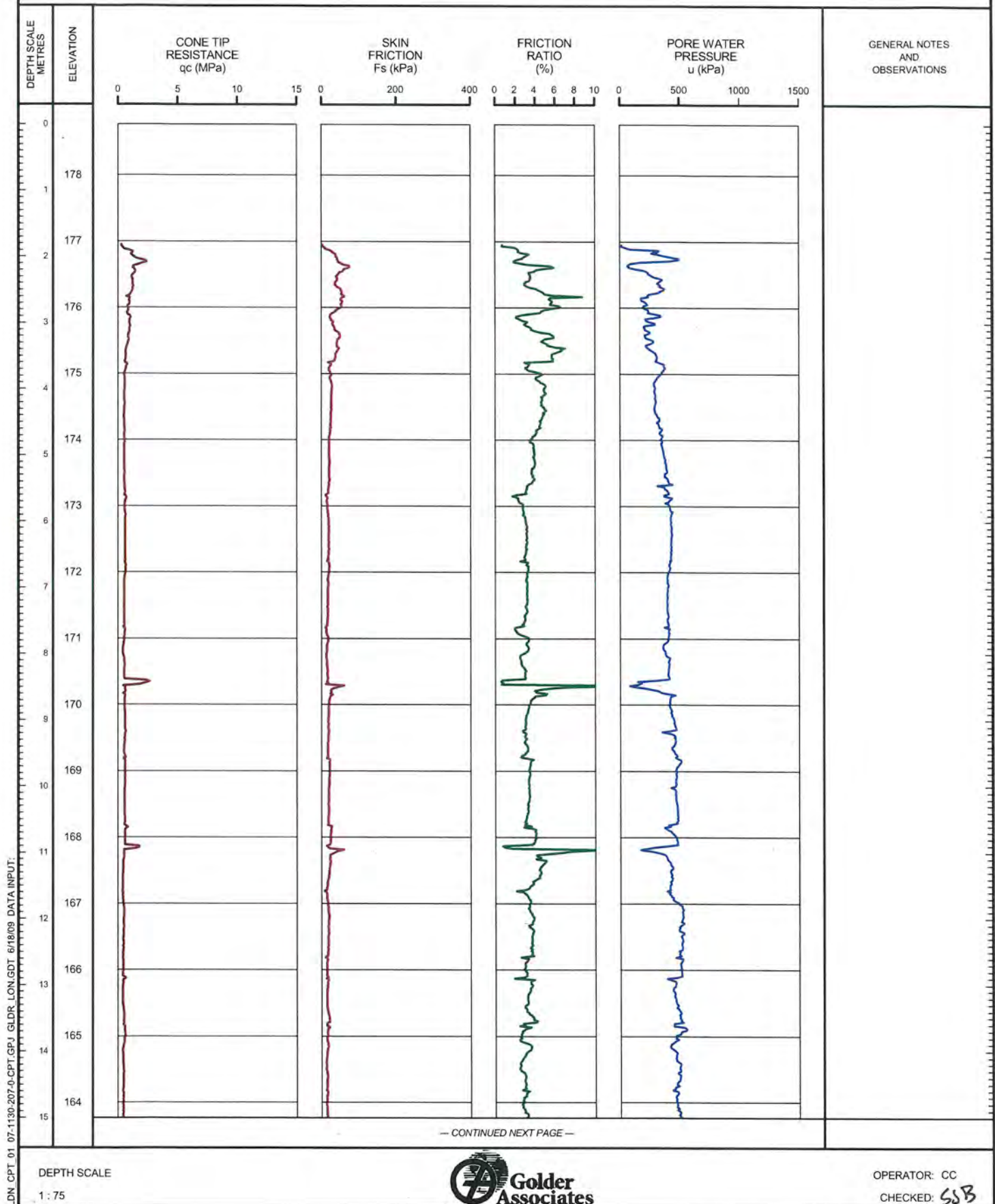
SHEET 1 OF 2

LOCATION: N 4682292.8 ; E 329332.1

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.83m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/19/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-159

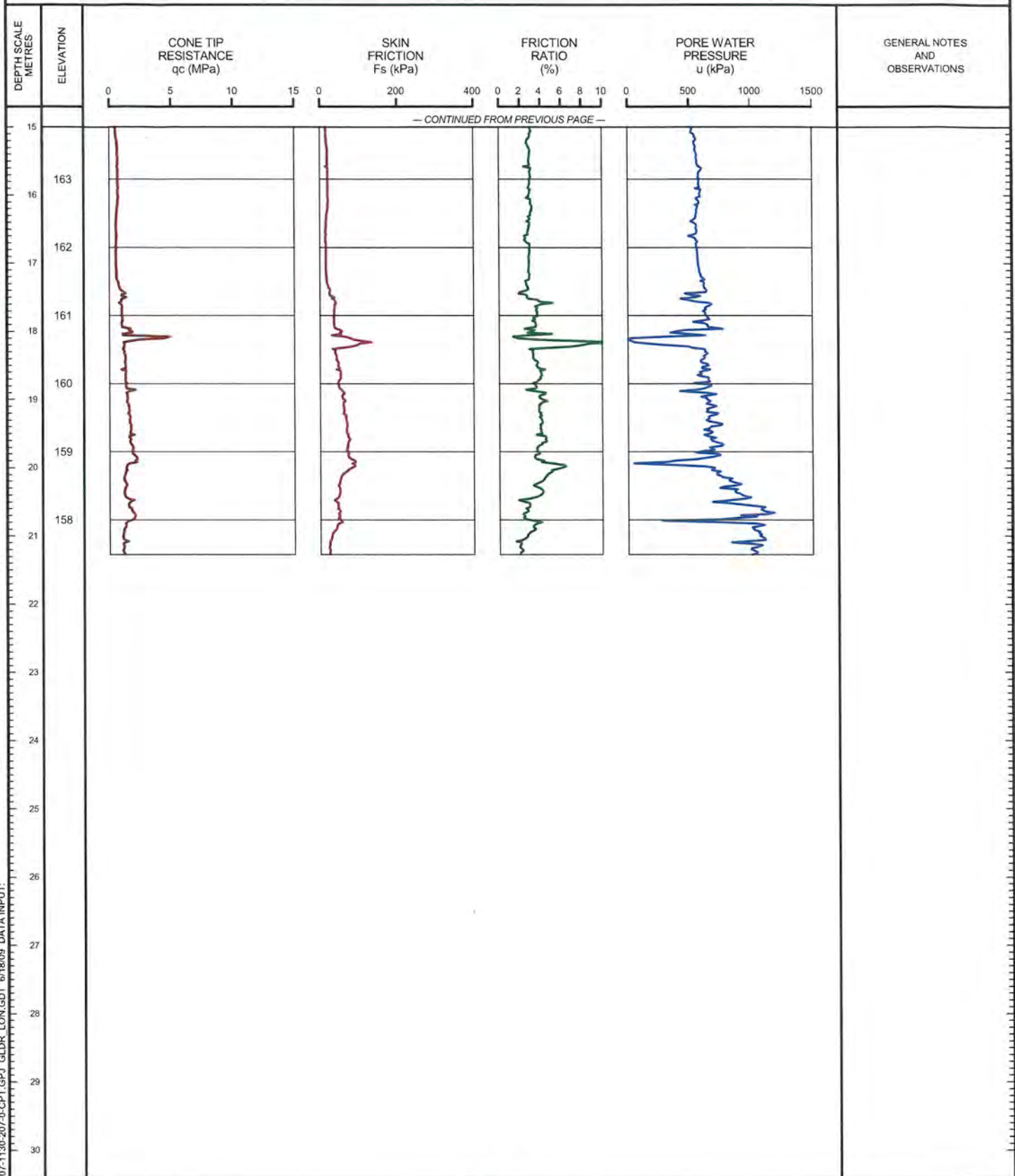
SHEET 2 OF 2

LOCATION: N 4682292.8 ; E 329332.1

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.83m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-160

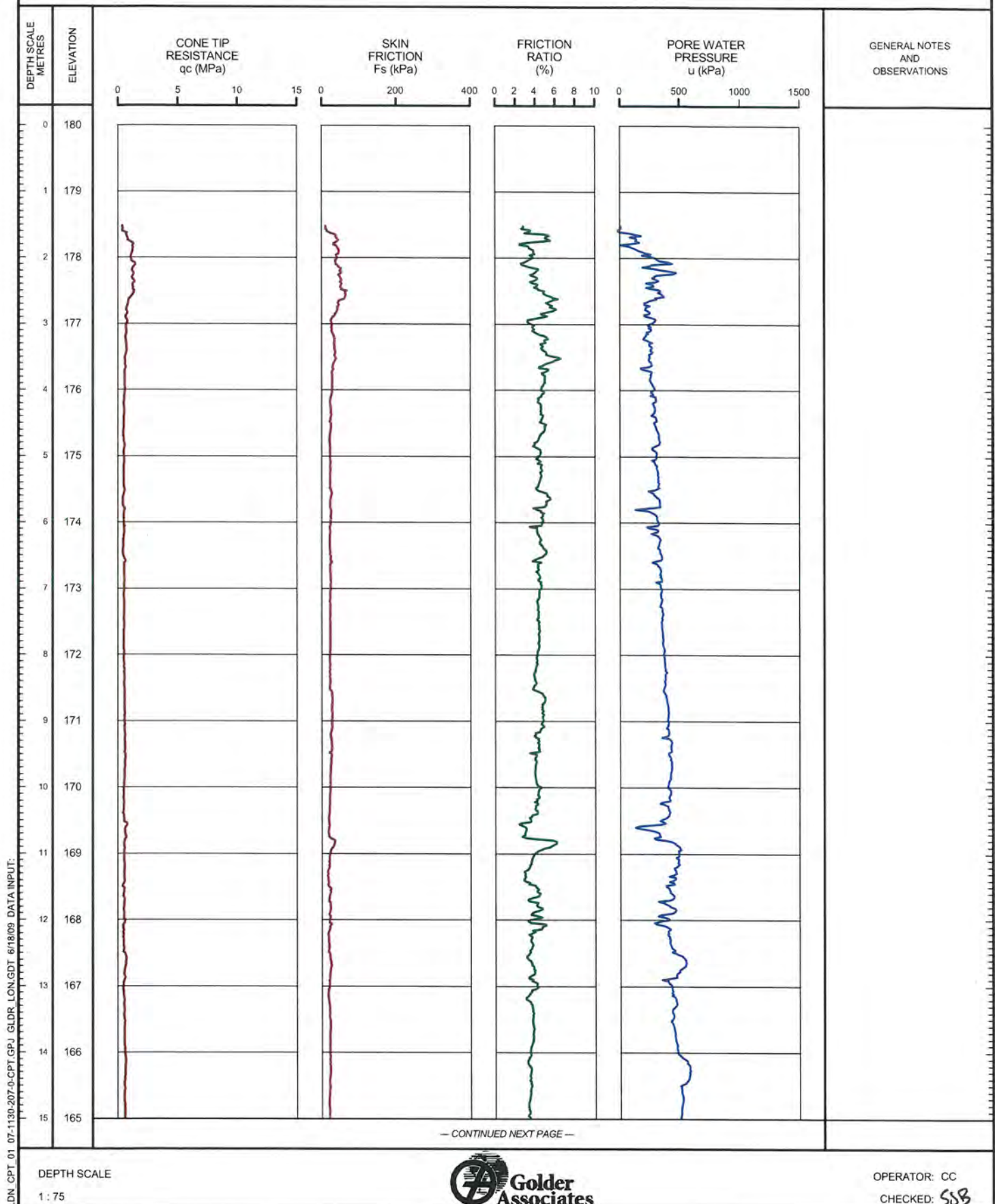
SHEET 1 OF 2

LOCATION: N 4682216.8 E 329156.2

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-160

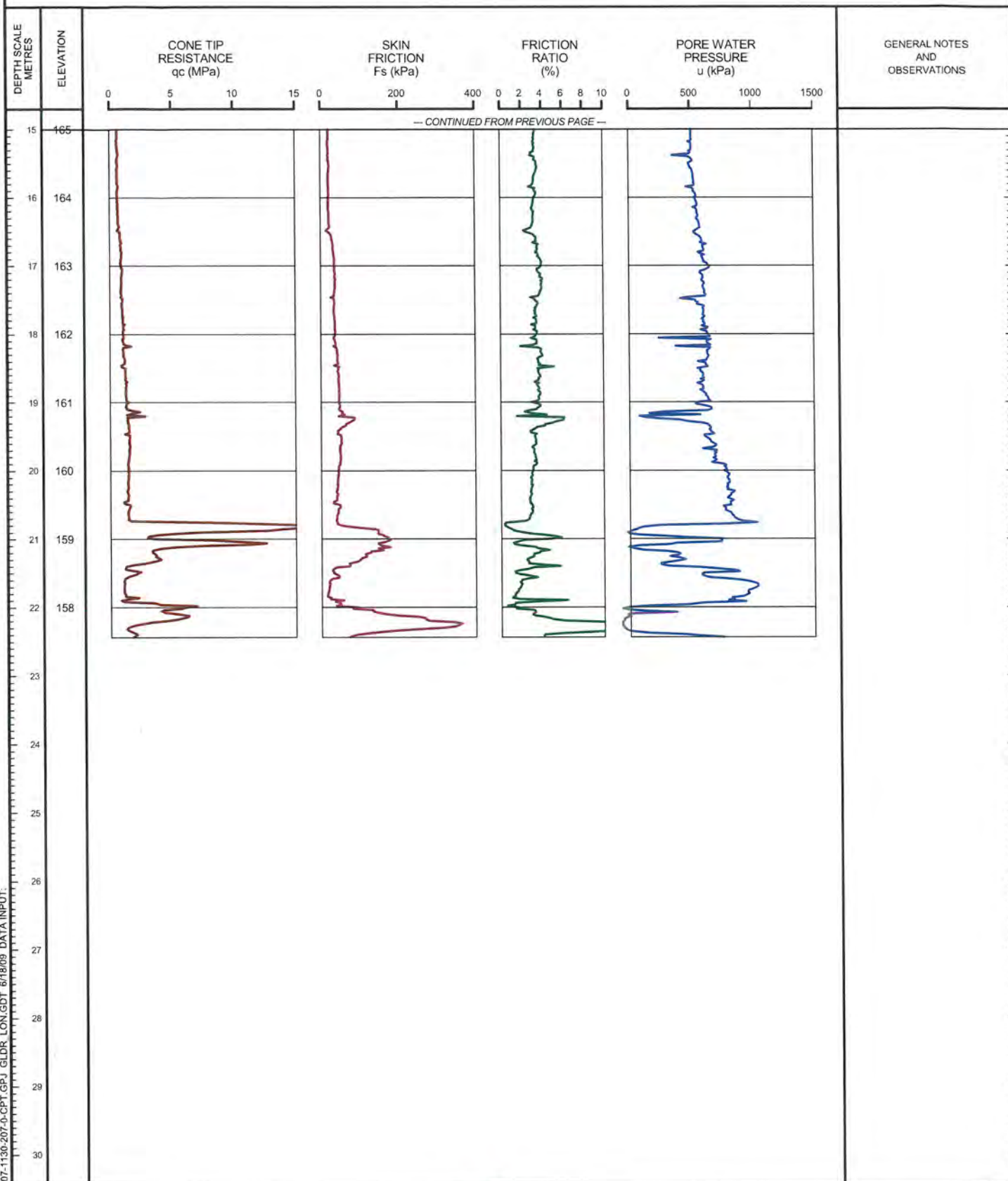
SHEET 2 OF 2

LOCATION: N 4682216 8 :E 329156.2

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-161

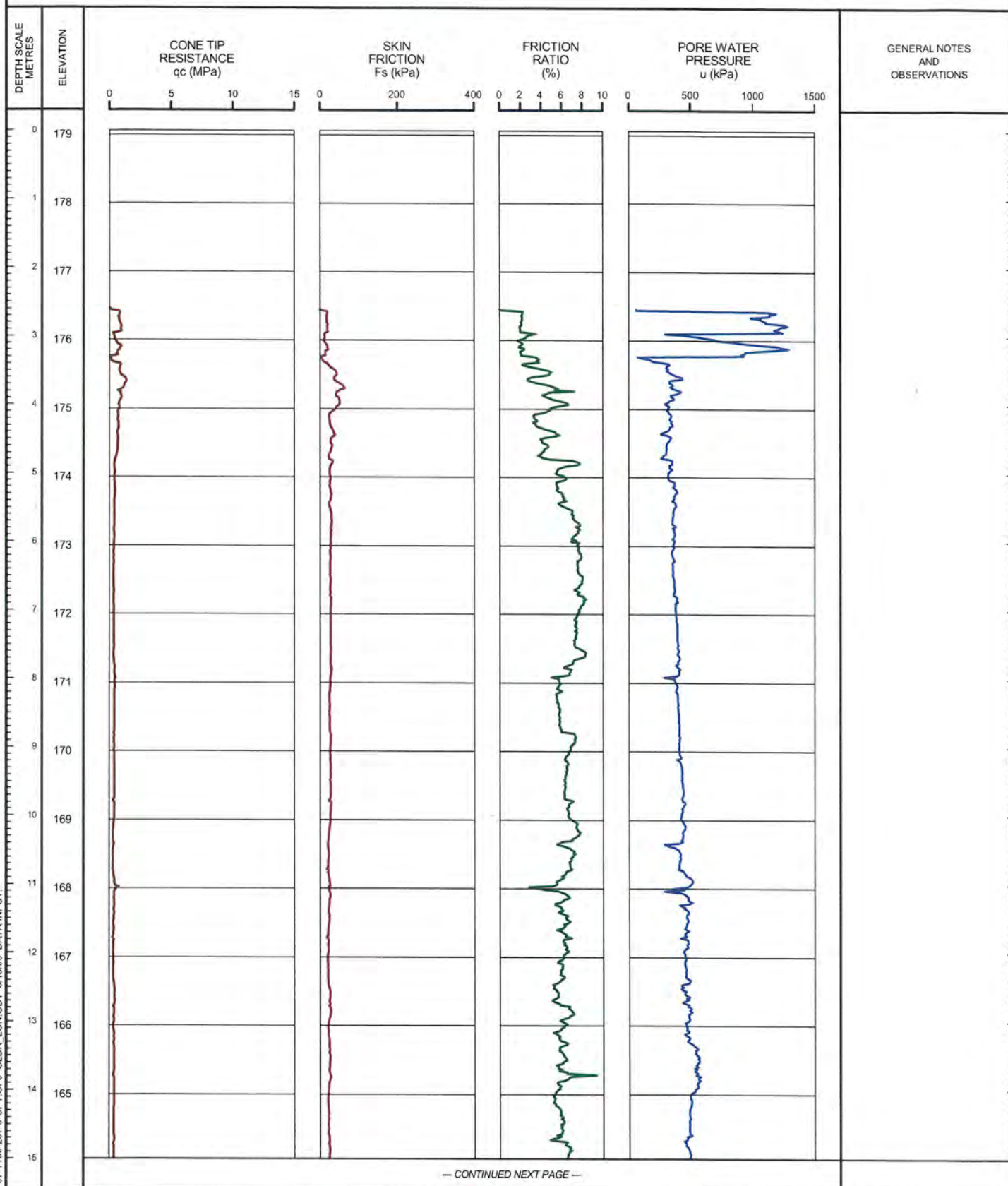
SHEET 1 OF 2

LOCATION: N 4682177.6 ; E 328793.9

TEST DATE: August 14, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.60m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE
1 : 75

OPERATOR: CC

CHECKED: *SSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-161

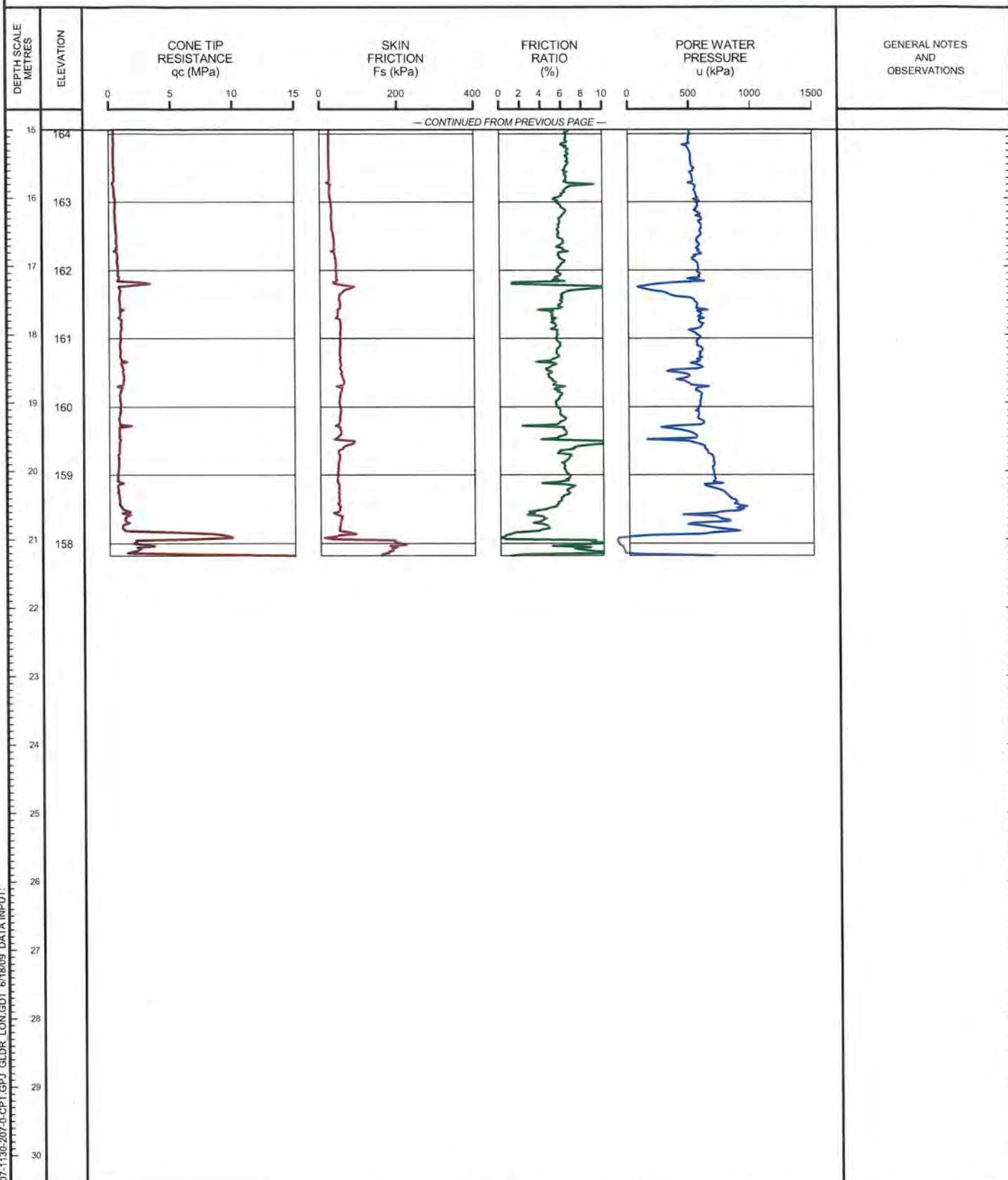
SHEET 2 OF 2

LOCATION: N 4682177.6 ; E 328793.9

TEST DATE: August 14, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.60m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

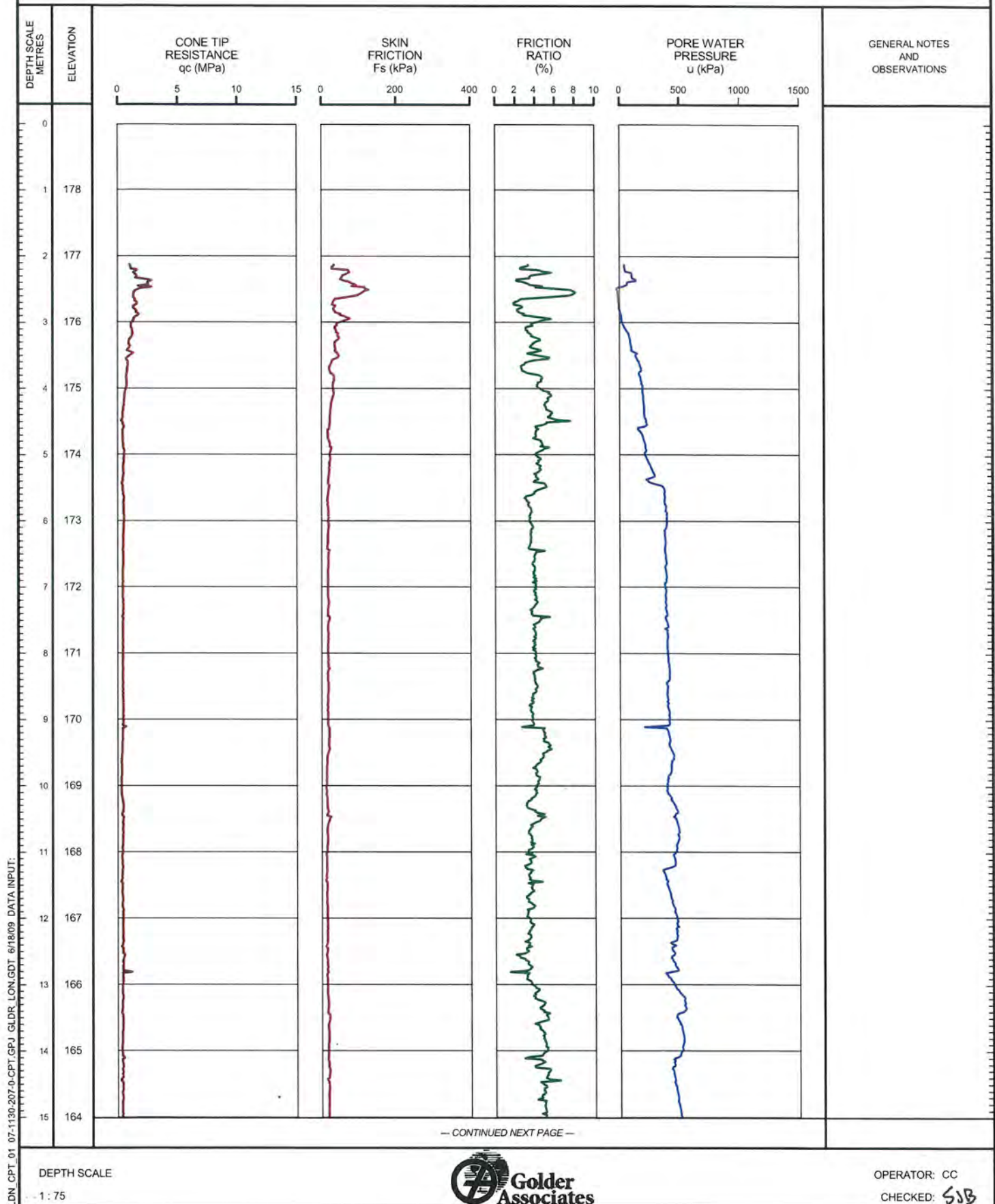
SHEET 1 OF 2

LOCATION: N 4682439.2 :E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

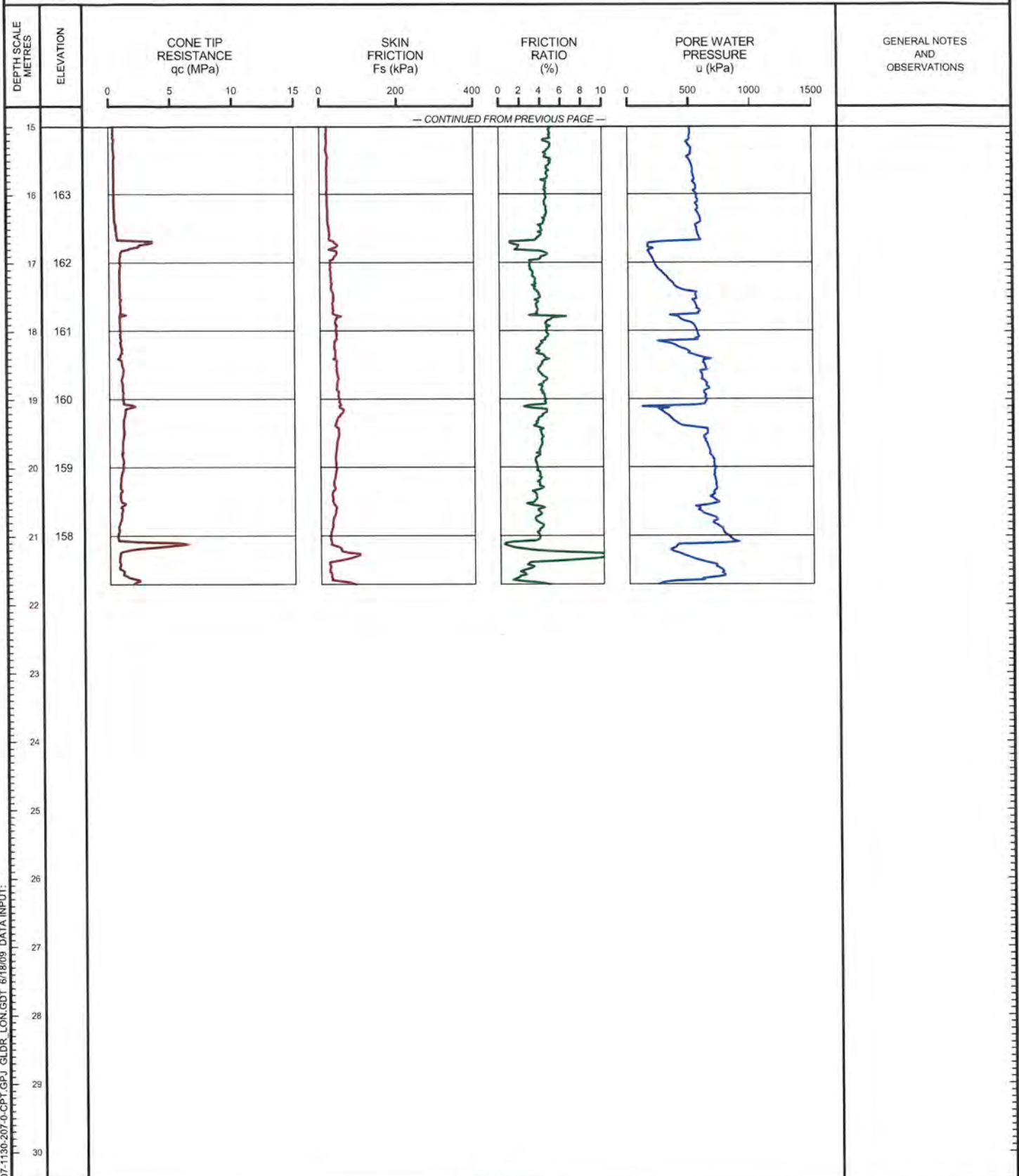
SHEET 2 OF 2

LOCATION: N 4682439.2; E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01_07-1130-207-0.CPT.GPJ GLDR LONGIT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *CC*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

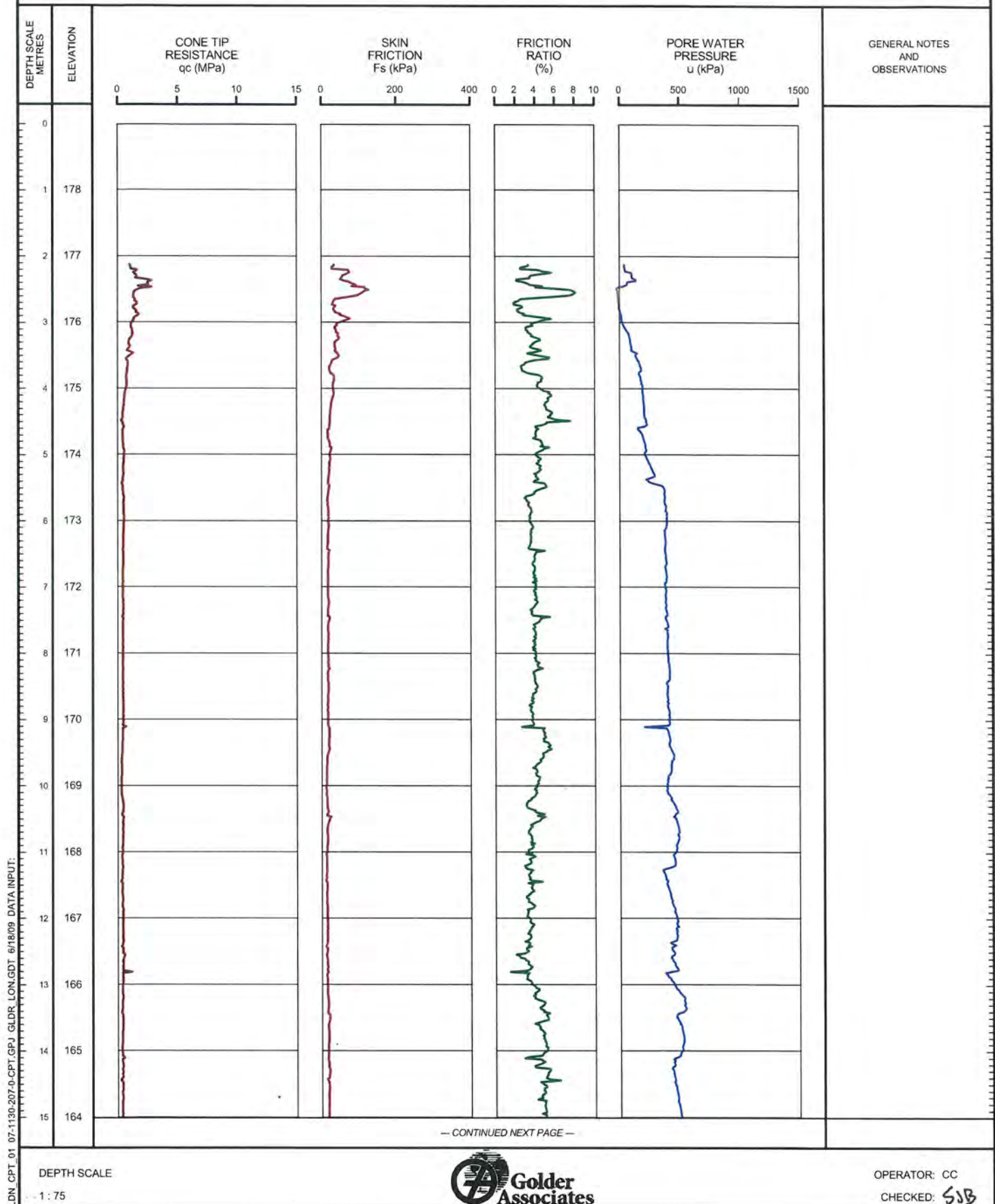
SHEET 1 OF 2

LOCATION: N 4682439.2 :E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

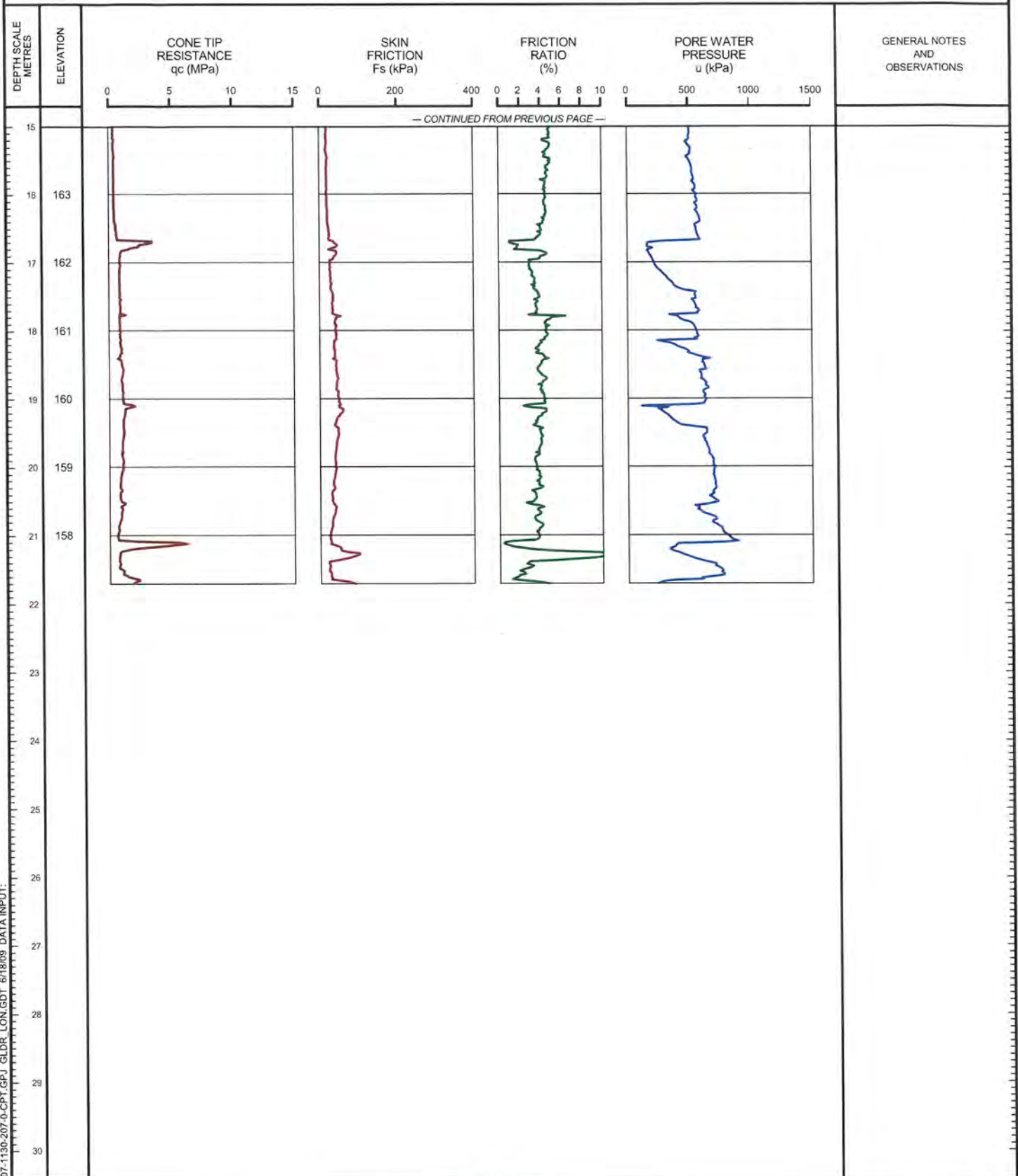
SHEET 2 OF 2

LOCATION: N 4682439.2; E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01_07-1130-207-0.CPT.GPJ GLDR LONGIT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-165

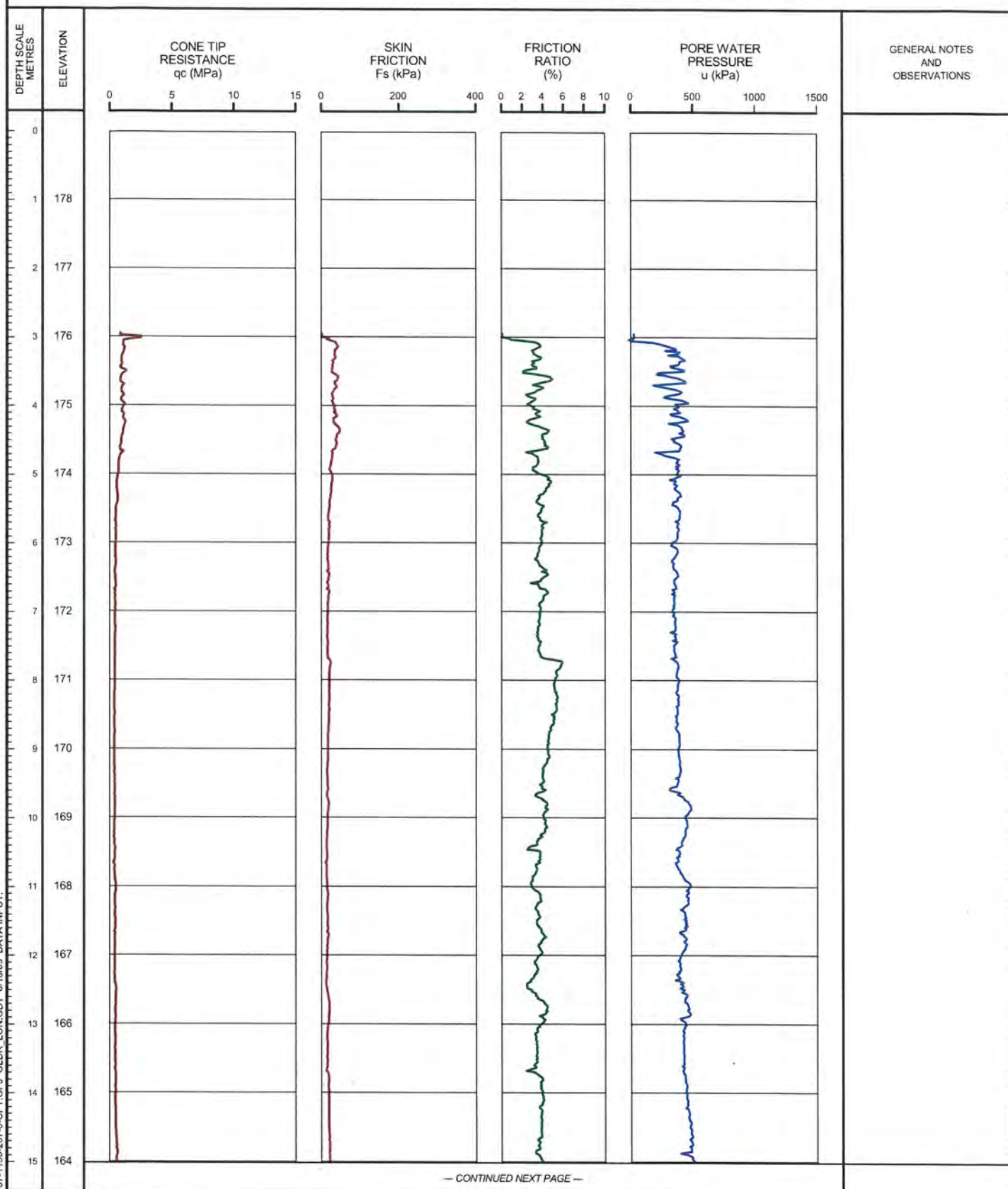
SHEET 1 OF 2

LOCATION: N 4682188.2 ; E 328457.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.95m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE
1 : 75

OPERATOR: CC

CHECKED: *SS*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-165

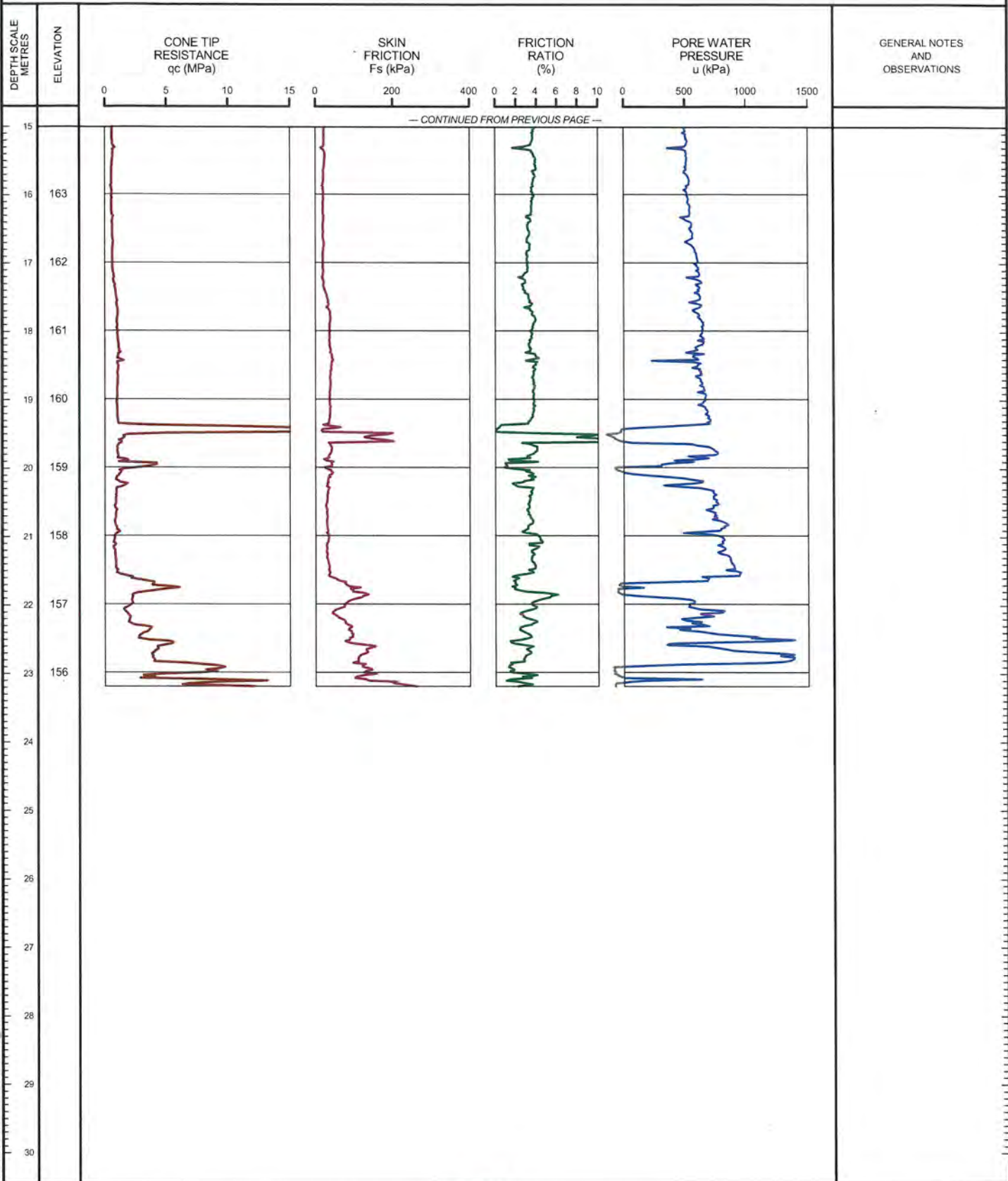
SHEET 2 OF 2

LOCATION: N 4682188.2 ; E 328457.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.95m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SVB*

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-338

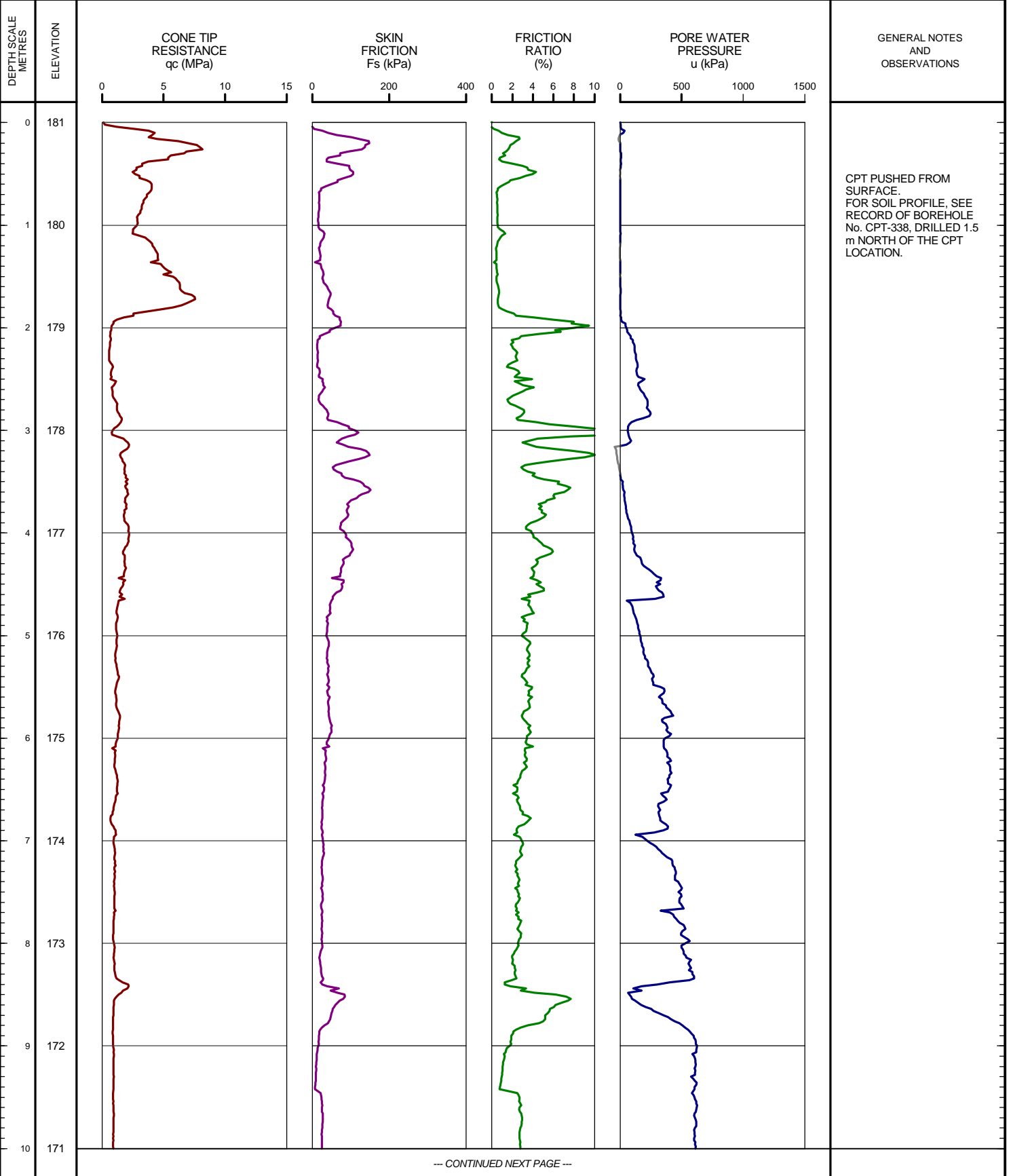
SHEET 1 OF 3

LOCATION: N 4681980.3 ;E 330141.6

TEST DATE: December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 181.22m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-338

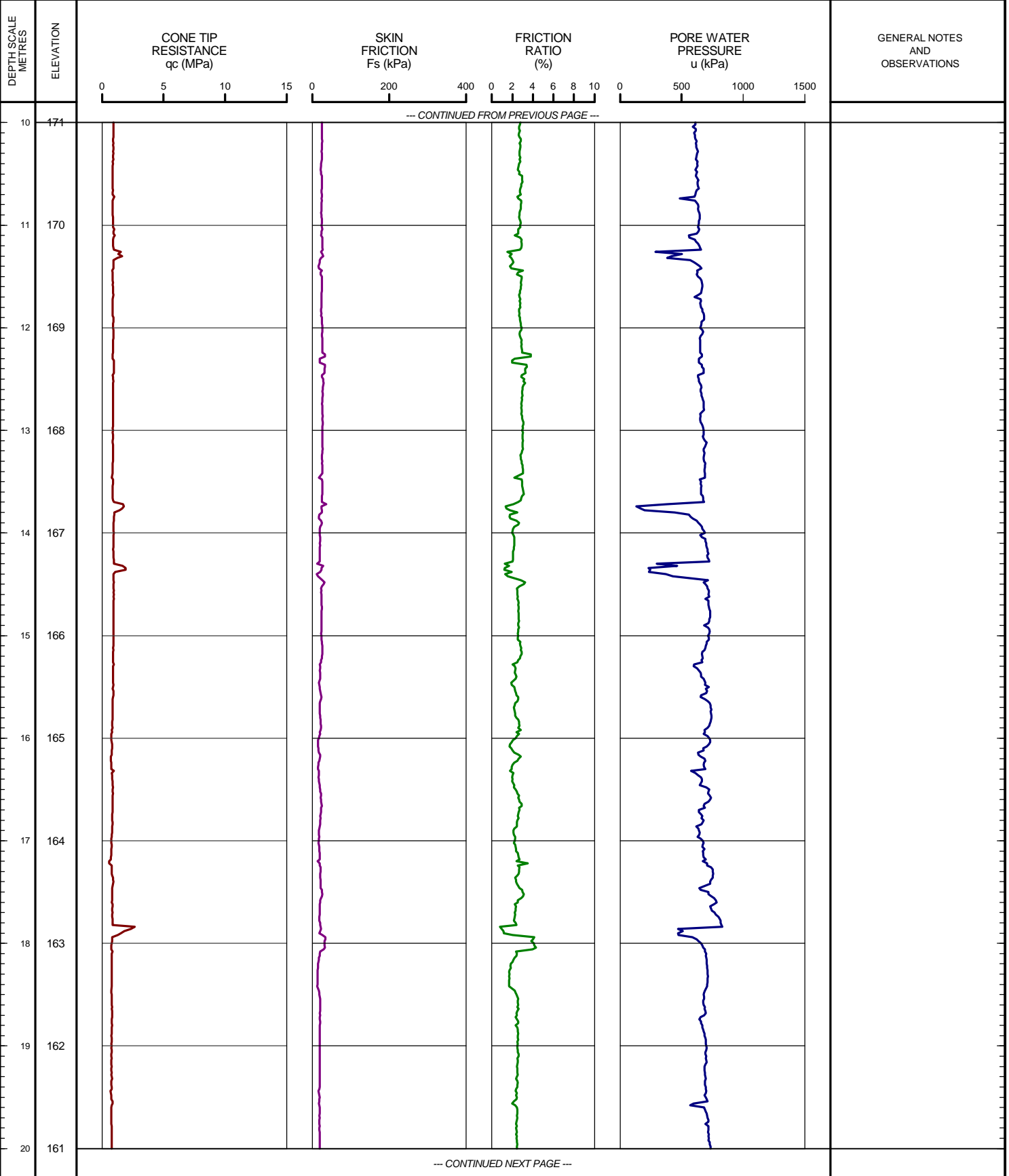
SHEET 2 OF 3

LOCATION: N 4681980.3 ;E 330141.6

TEST DATE: December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 181.22m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-338

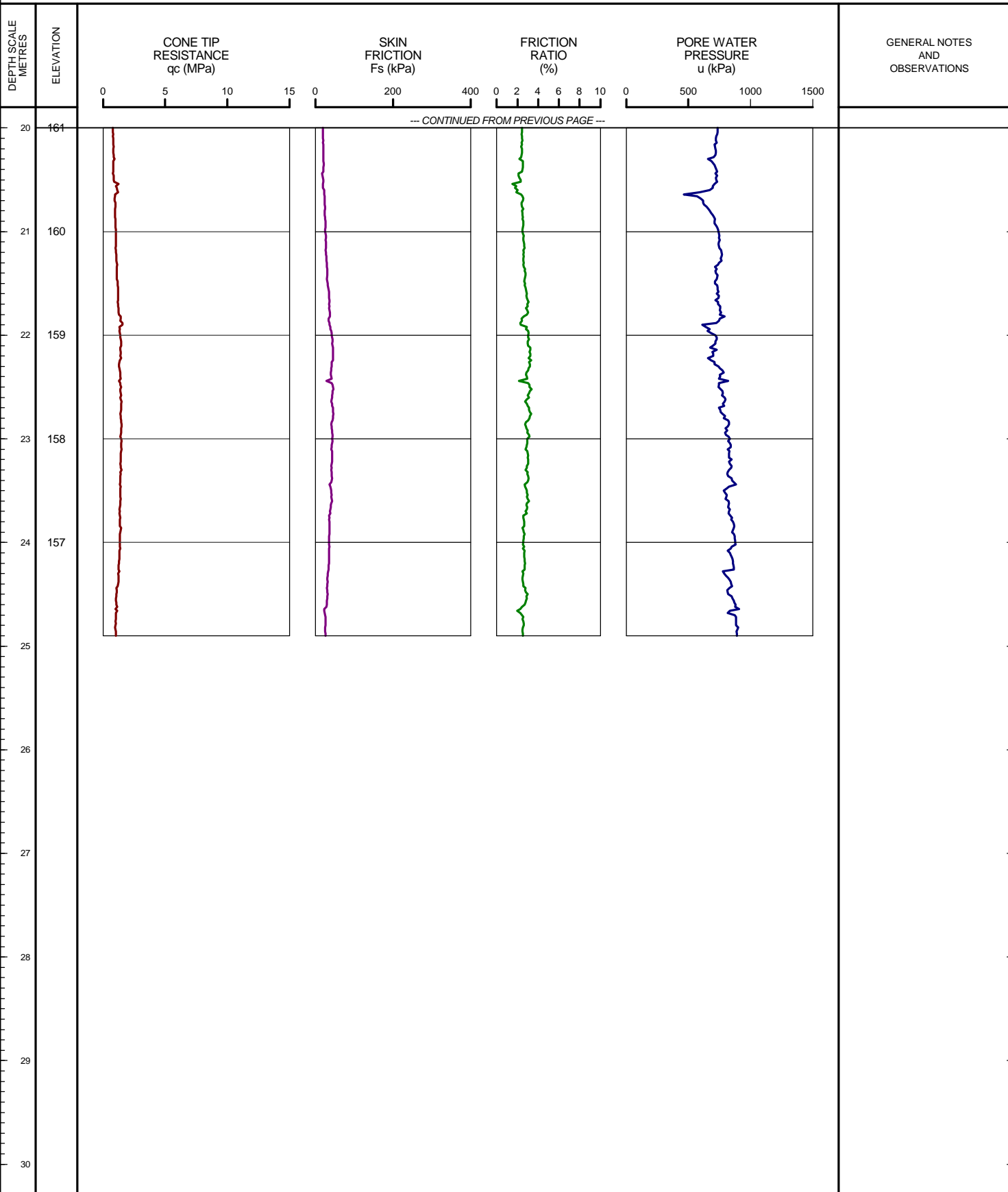
SHEET 3 OF 3

LOCATION: N 4681980.3 ;E 330141.6

TEST DATE: December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 181.22m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-340

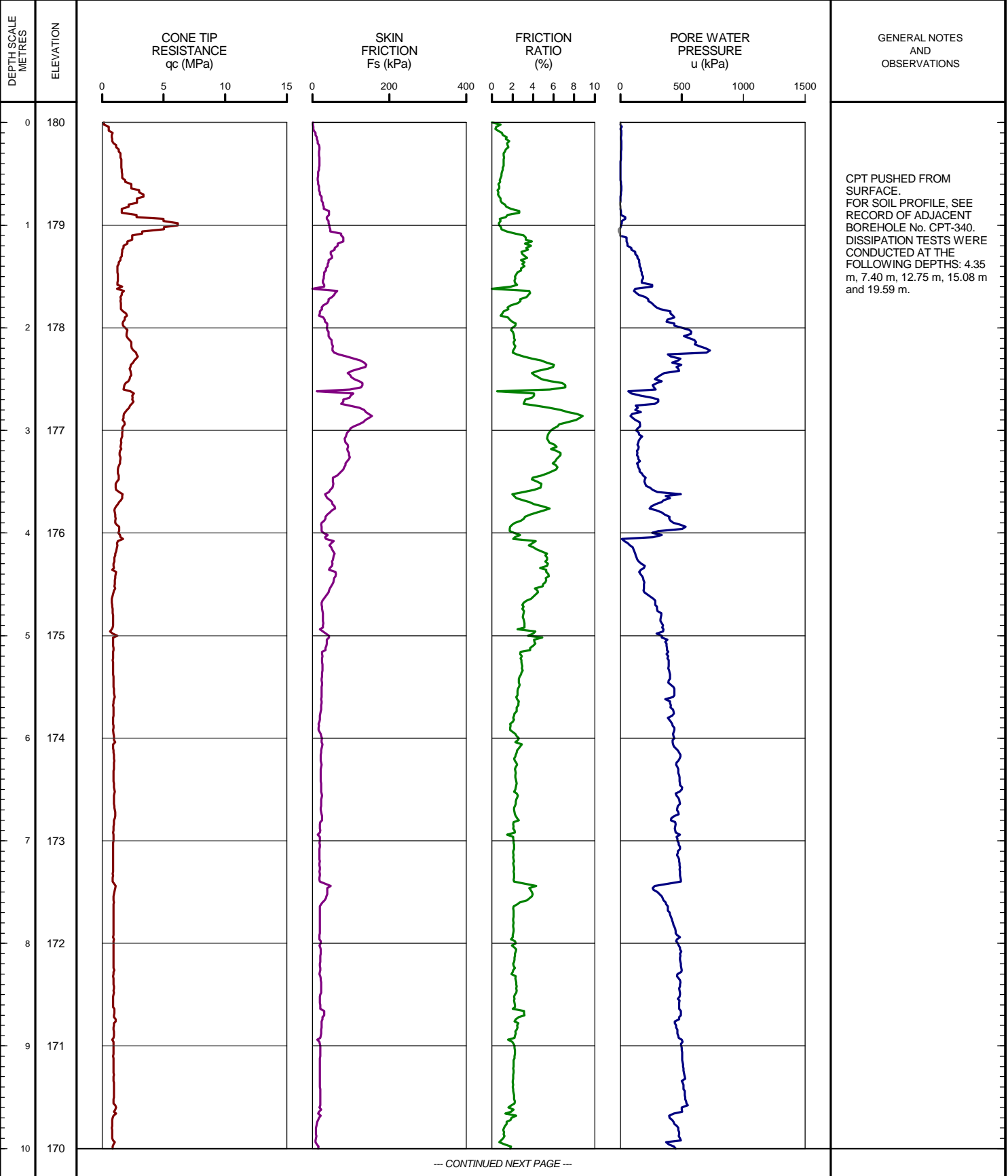
SHEET 1 OF 3

LOCATION: N 4682203.2 ;E 329538.7

TEST DATE: December 10, 2009 - December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.58m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-340

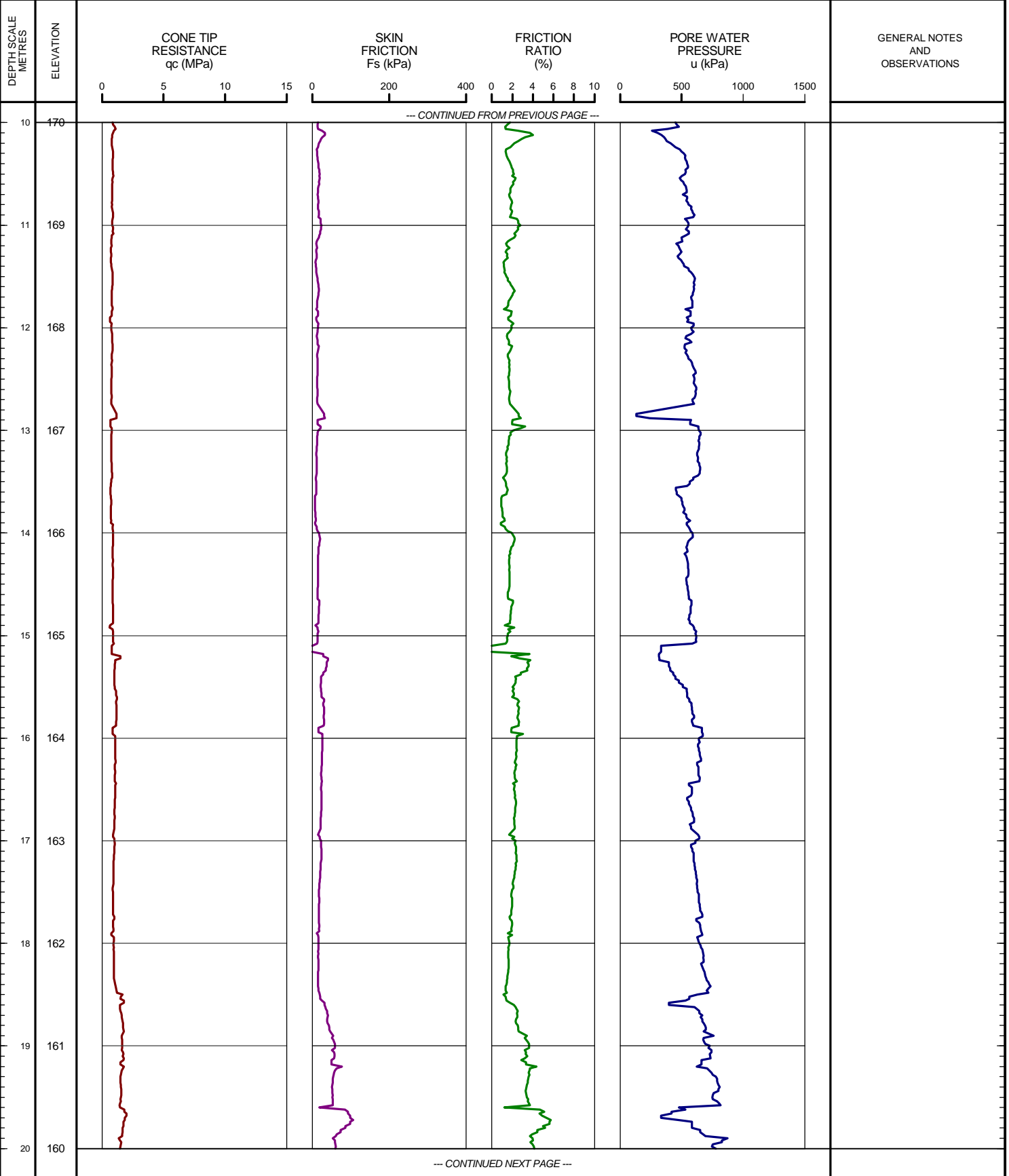
SHEET 2 OF 3

LOCATION: N 4682203.2 ;E 329538.7

TEST DATE: December 10, 2009 - December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.58m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-340

SHEET 3 OF 3

LOCATION: N 4682203.2 ;E 329538.7

TEST DATE: December 10, 2009 - December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.58m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-342

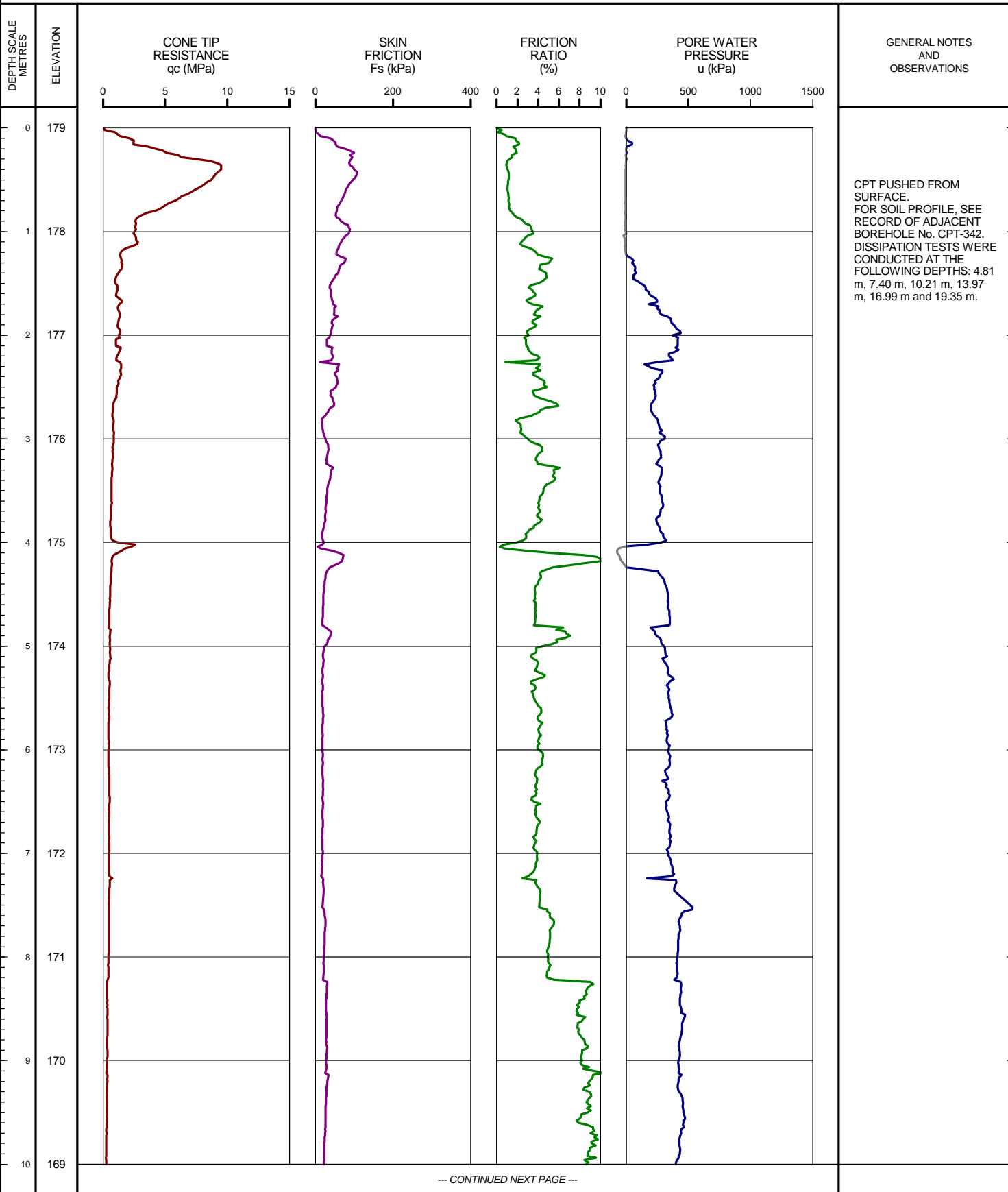
SHEET 1 OF 3

LOCATION: N 4682246.9 ;E 329168.7

TEST DATE: December 4, 2009 - December 8, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 178.75m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-342

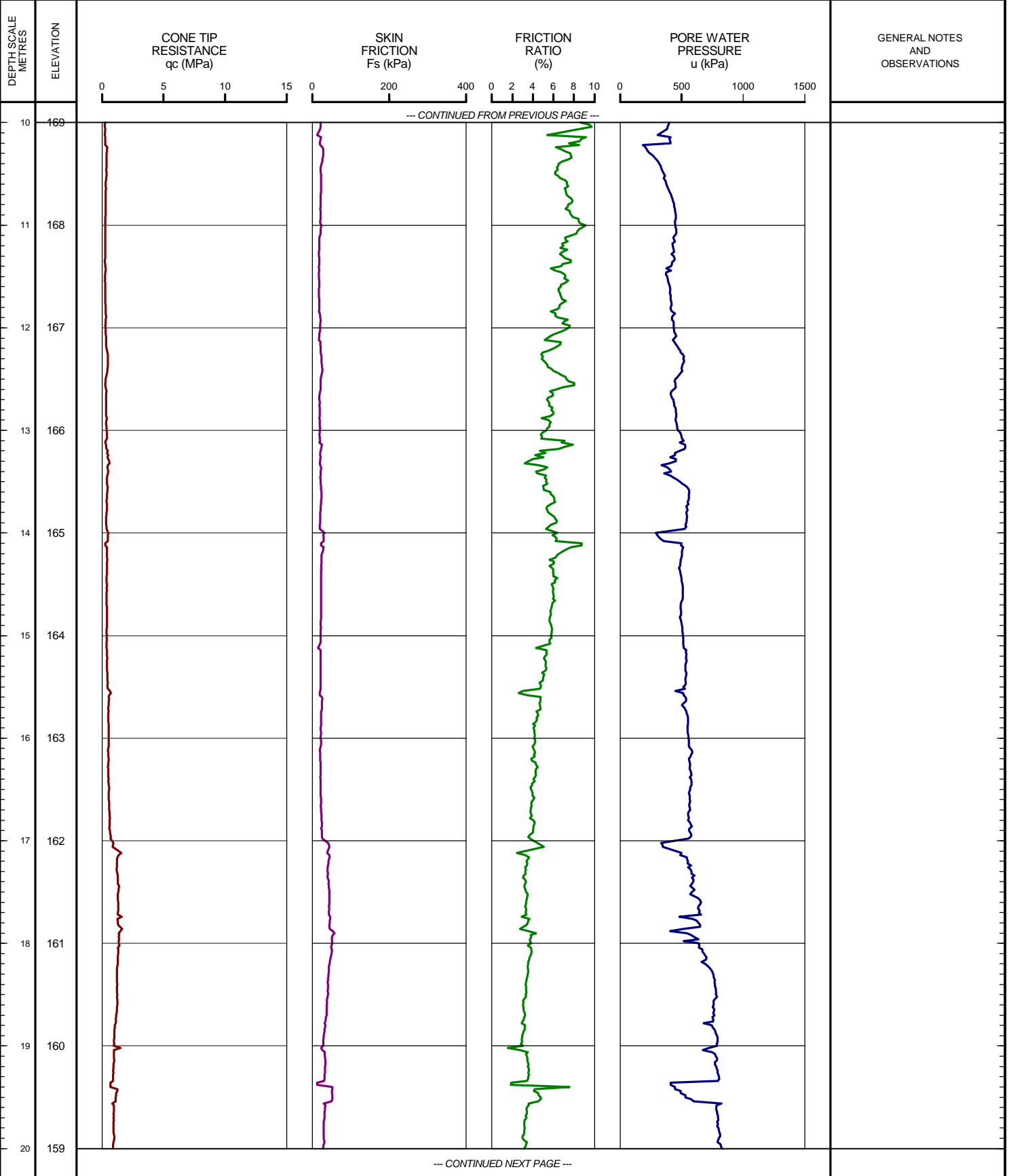
SHEET 2 OF 3

LOCATION: N 4682246.9 ;E 329168.7

TEST DATE: December 4, 2009 - December 8, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 178.75m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-342

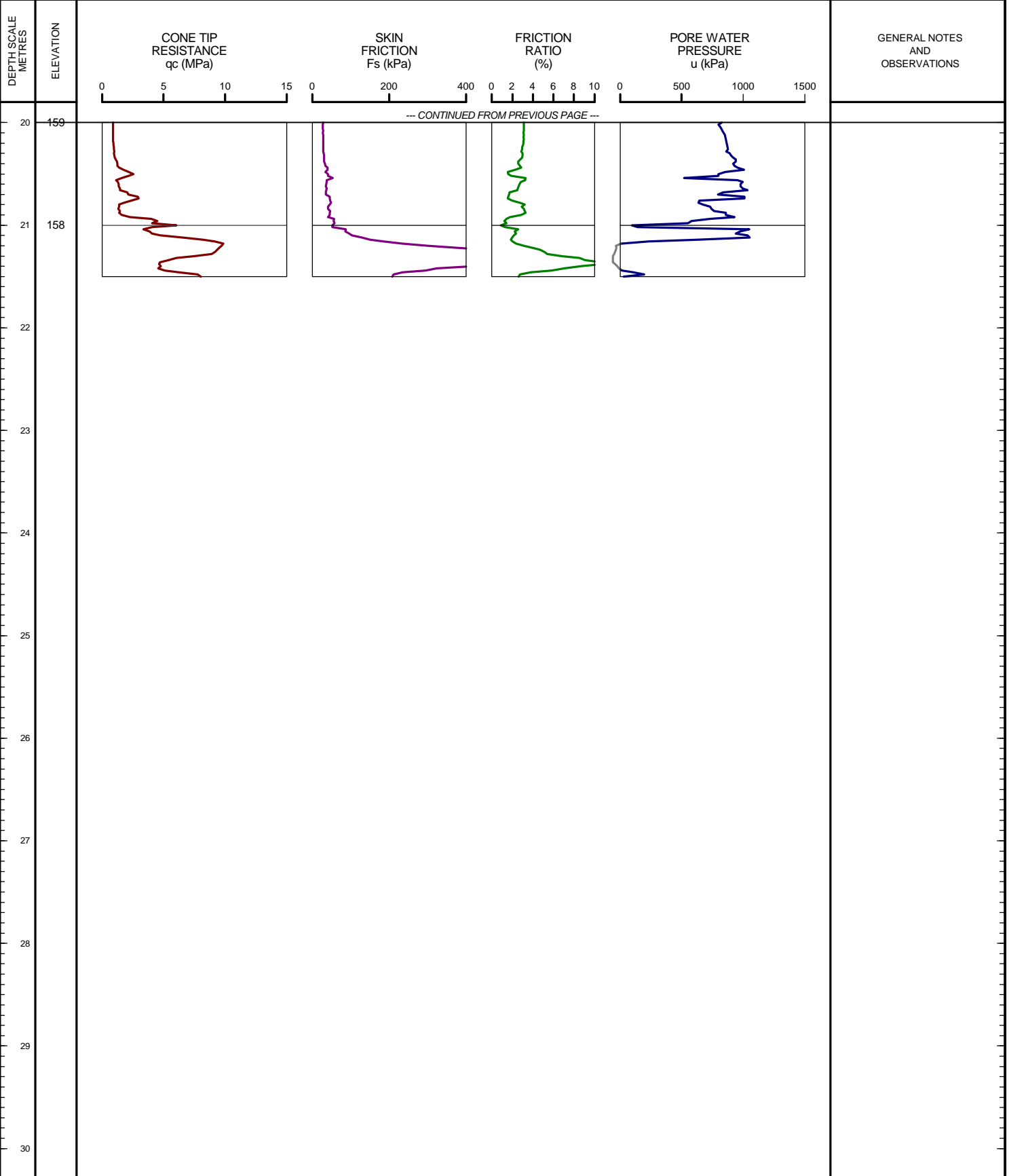
SHEET 3 OF 3

LOCATION: N 4682246.9 ;E 329168.7

TEST DATE: December 4, 2009 - December 8, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 178.75m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-344

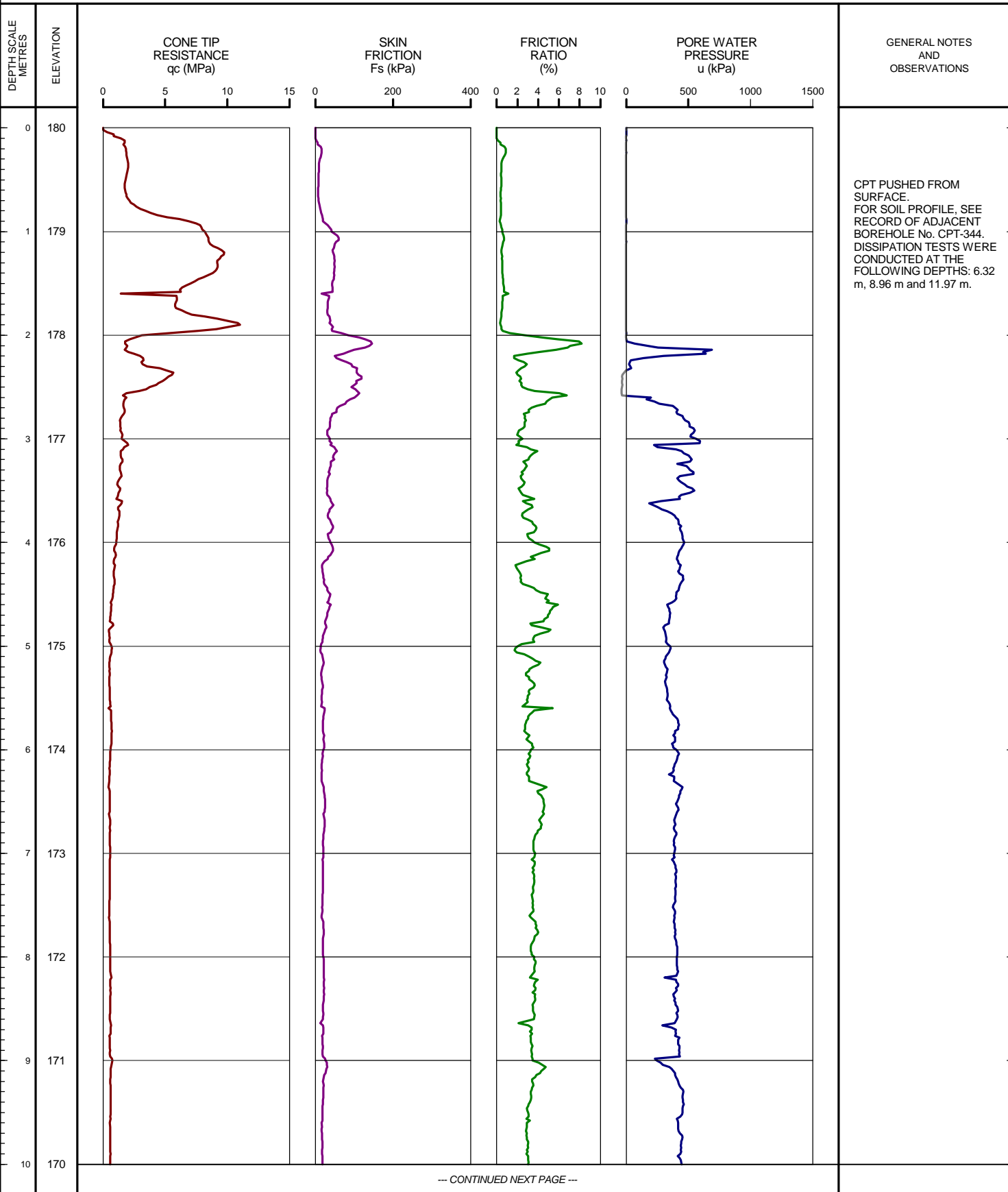
SHEET 1 OF 3

LOCATION: N 4682206.2 ;E 328974.6

TEST DATE: December 2, 2009 - December 3, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.56m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-344

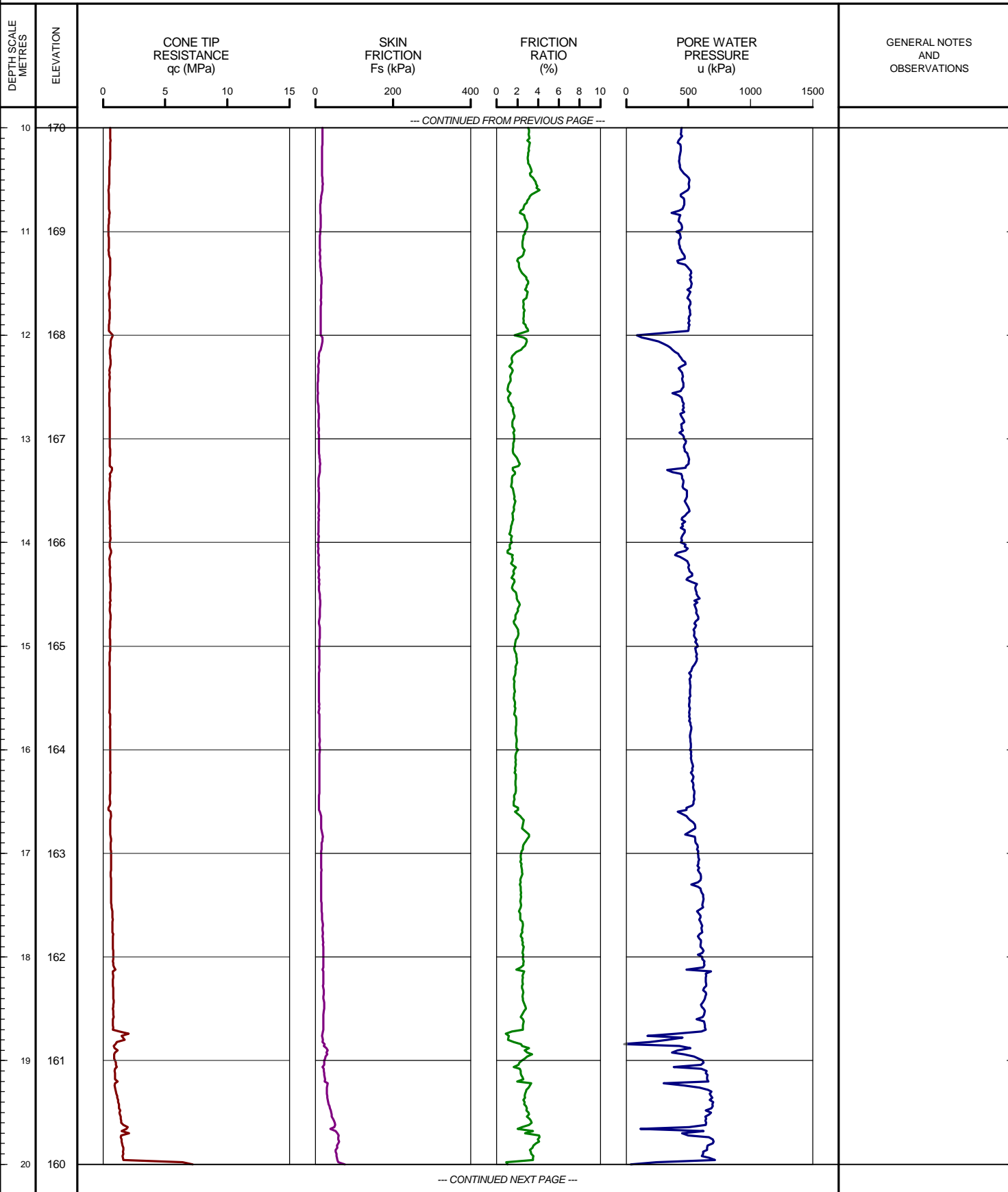
SHEET 2 OF 3

LOCATION: N 4682206.2 ;E 328974.6

TEST DATE: December 2, 2009 - December 3, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.56m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-344

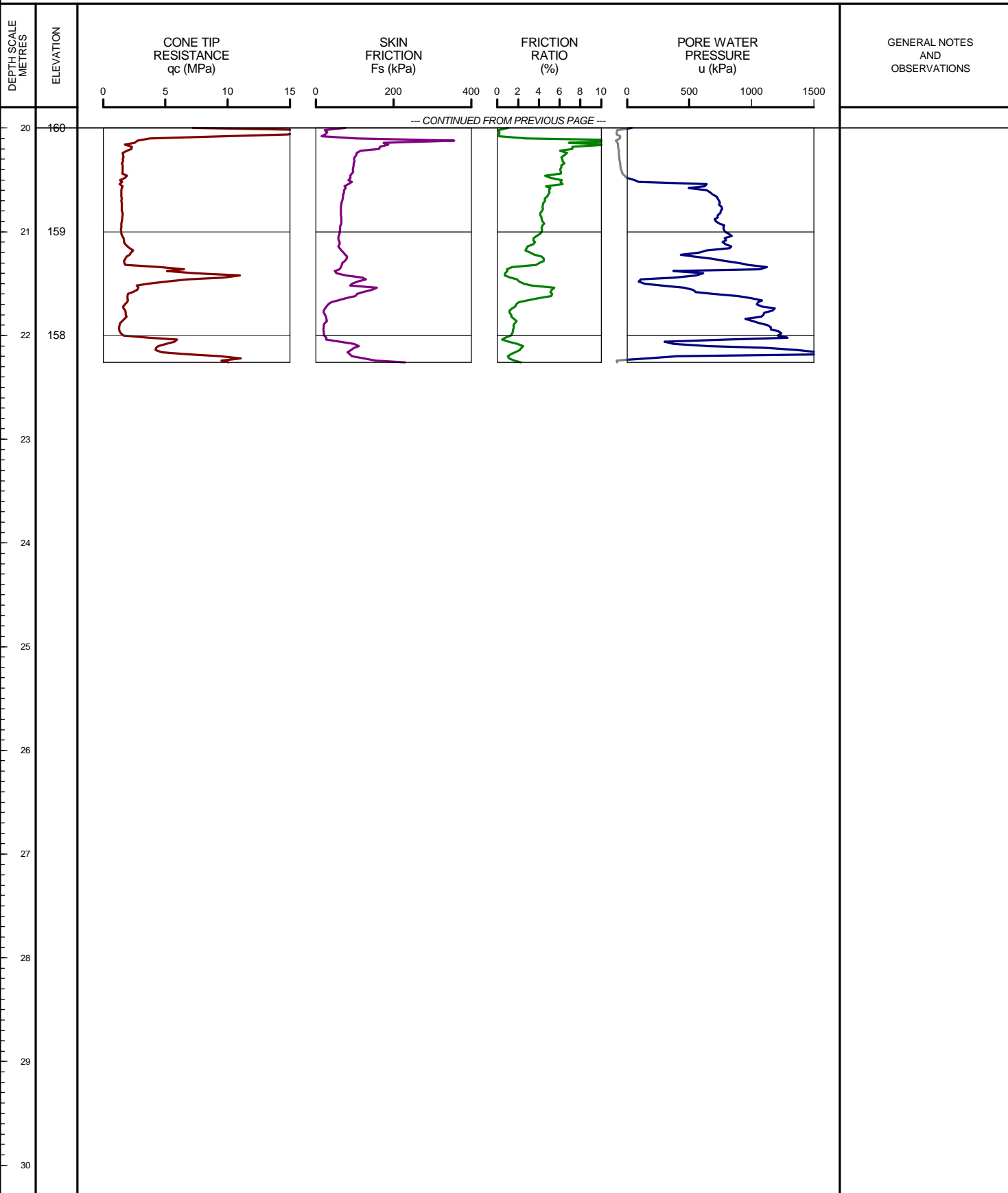
SHEET 3 OF 3

LOCATION: N 4682206.2 ;E 328974.6

TEST DATE: December 2, 2009 - December 3, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.56m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

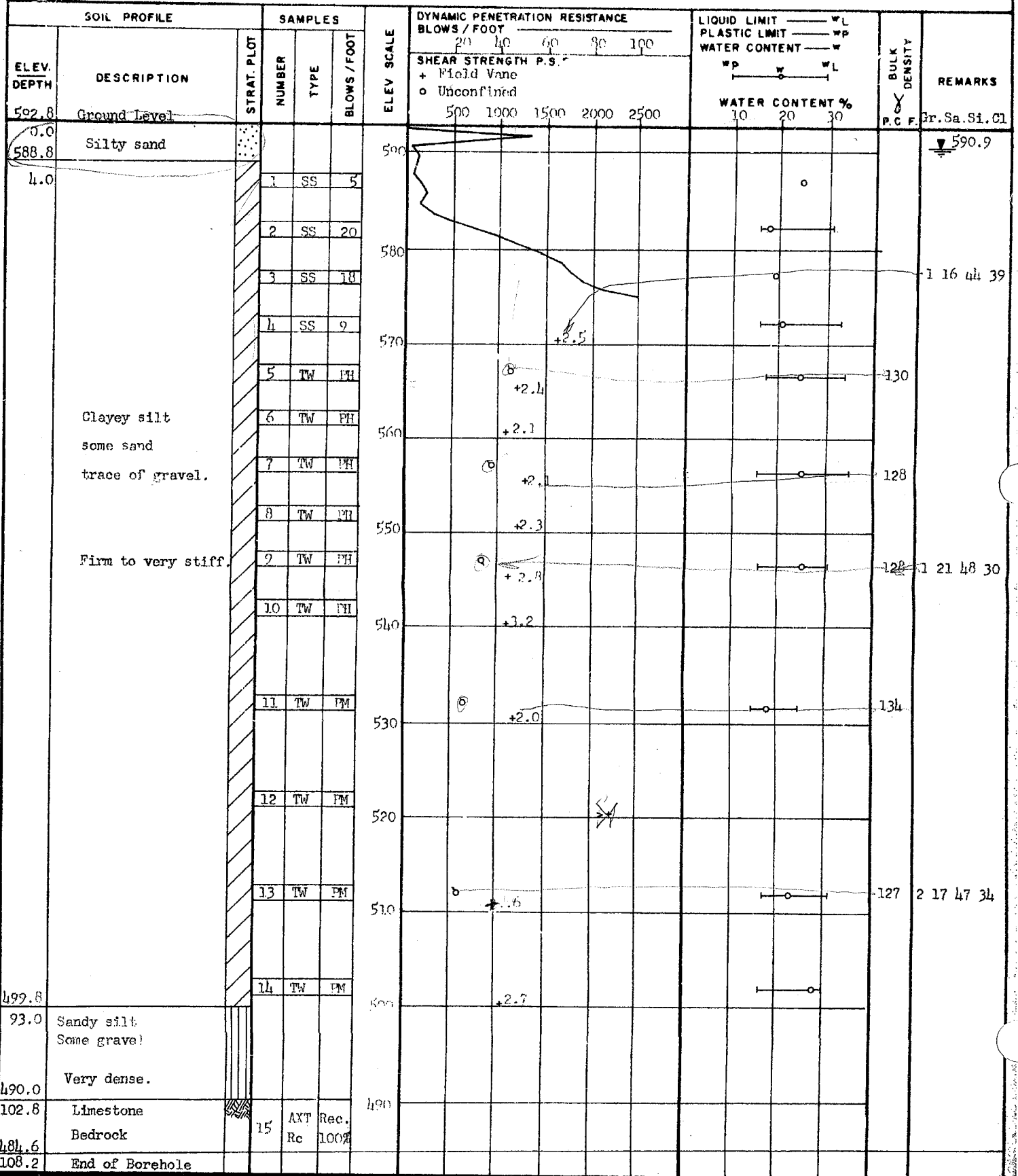
CHECKED:

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 5

FOUNDATION SECTION

JOB 68-F-15-1 LOCATION Co-ords. 100,901 N; 55,440 E. ORIGINATED BY AMS
W.P. 260-66-030 BORING DATE Feb. 21 & 22, 1968 COMPILED BY AMS
DATUM Geodetic BOREHOLE TYPE Cont. Flight auger (Bombardier) AXT Rock Core CHECKED BY [Signature]



DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 6

FOUNDATION SECTION

JOB 68-E-15 LOCATION Co-ords. 101,015 N; 55,440 E. ORIGINATED BY AMS
W.P. 260-66-6 BORING DATE Feb. 23, 1968 COMPILED BY AMS
DATUM Geodetic BOREHOLE TYPE Cont. flight auger (bombardier) CHECKED BY AMS

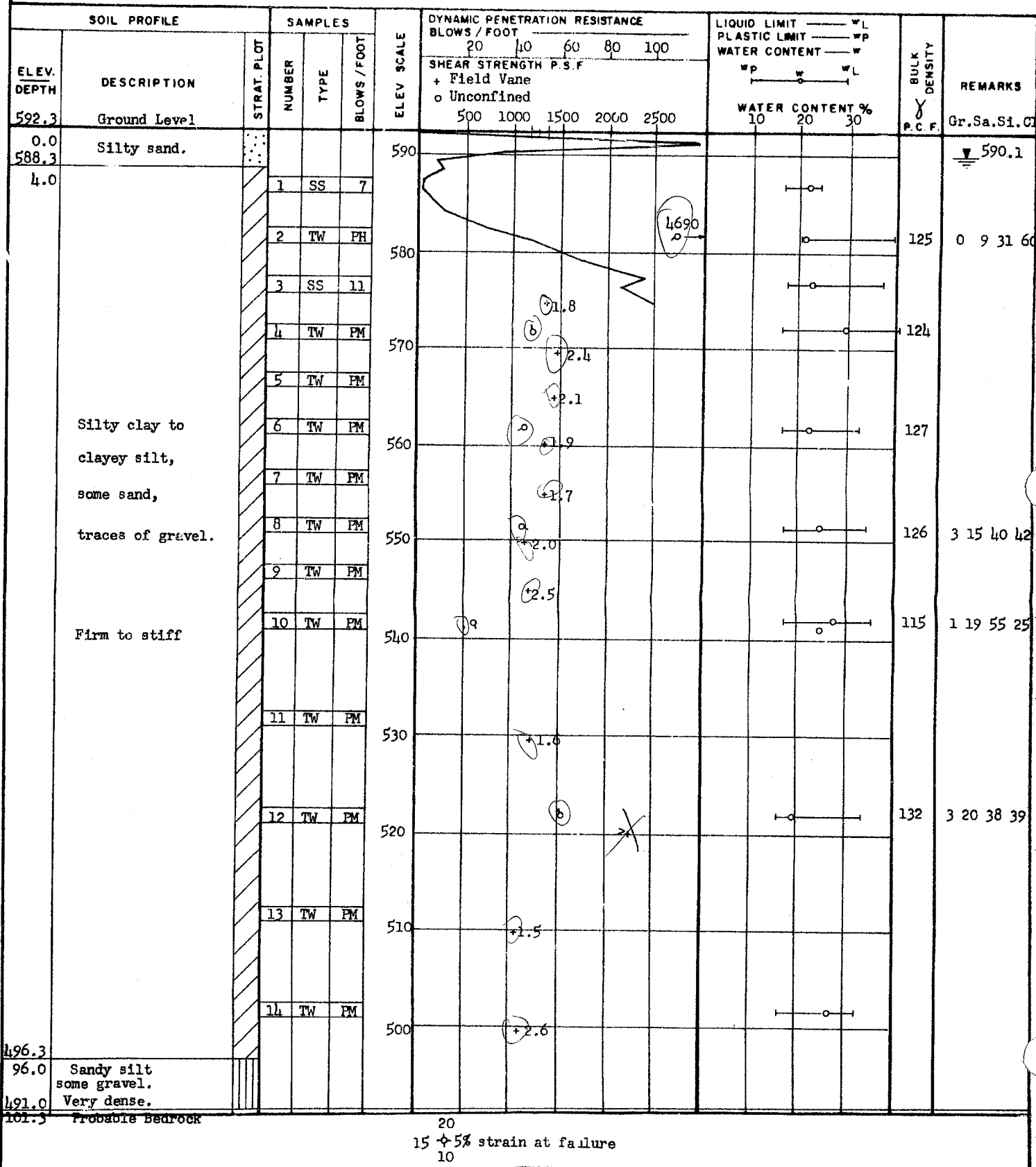
SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 SHEAR STRENGTH P.S.F. + Field Vane o Unconfined	LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W WATER CONTENT % 10 20 30	BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT					
593.0	Ground Level									
0.0	Silty sand.					590				590.5
4.0	Clayey silt some sand trace of gravel. Firm.		1	SS	6					
			2	TW	PH					
			3	TW	PH				124	1 11 38 50
			4	TW	PM					
			5	TW	PM				127	
			6	TW	PM					
			7	TW	PM					
			8	TW	PM					
551.5	End of Borehole									3 17 45 35
41.5							20 15 + 5 % strain at failure 10			

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 7

FOUNDATION SECTION

JOB 68-F-15-1 LOCATION Co-ords. 101,090 N; 55,320 E. ORIGINATED BY AMS
W.P. 260-66-030 BORING DATE Feb. 26 & 27, 1968 COMPILED BY AMS
DATUM Geodetic BOREHOLE TYPE Cont. flight auger (bombardier) CHECKED BY SL



DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 8

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 68-F-15-1 LOCATION Co-ords. 100,964 N; 55,361 E. ORIGINATED BY AMS
W.P. 260-66-030 BORING DATE Feb. 27, 1968 COMPILED BY AMS
DATUM Geodetic BOREHOLE TYPE Cont. flight auger (bombardier) CHECKED BY 12

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. FLOT	NUMBER	TYPE	BLOWS / FOOT		20	40	60	80	100	WP	WL	W		
593.6	Ground Level															
0.0																
589.6	Silty sand					590										
4.0			1	SS	4											
			2	TW	PH											
			3	TW	PH											
	Silty clay		4	TW	PH											
	Some sand		5	TW	PH											
	trace of gravel.		6	TW	PH											
	Firm		7	TW	PH											
			8	TW	PH											
550.6																
43.0	End of Borehole															

20
15 + 5 % strain at failure
10

0 13 41 46

127.5 1 16 44 39

FOUNDATION SECTION

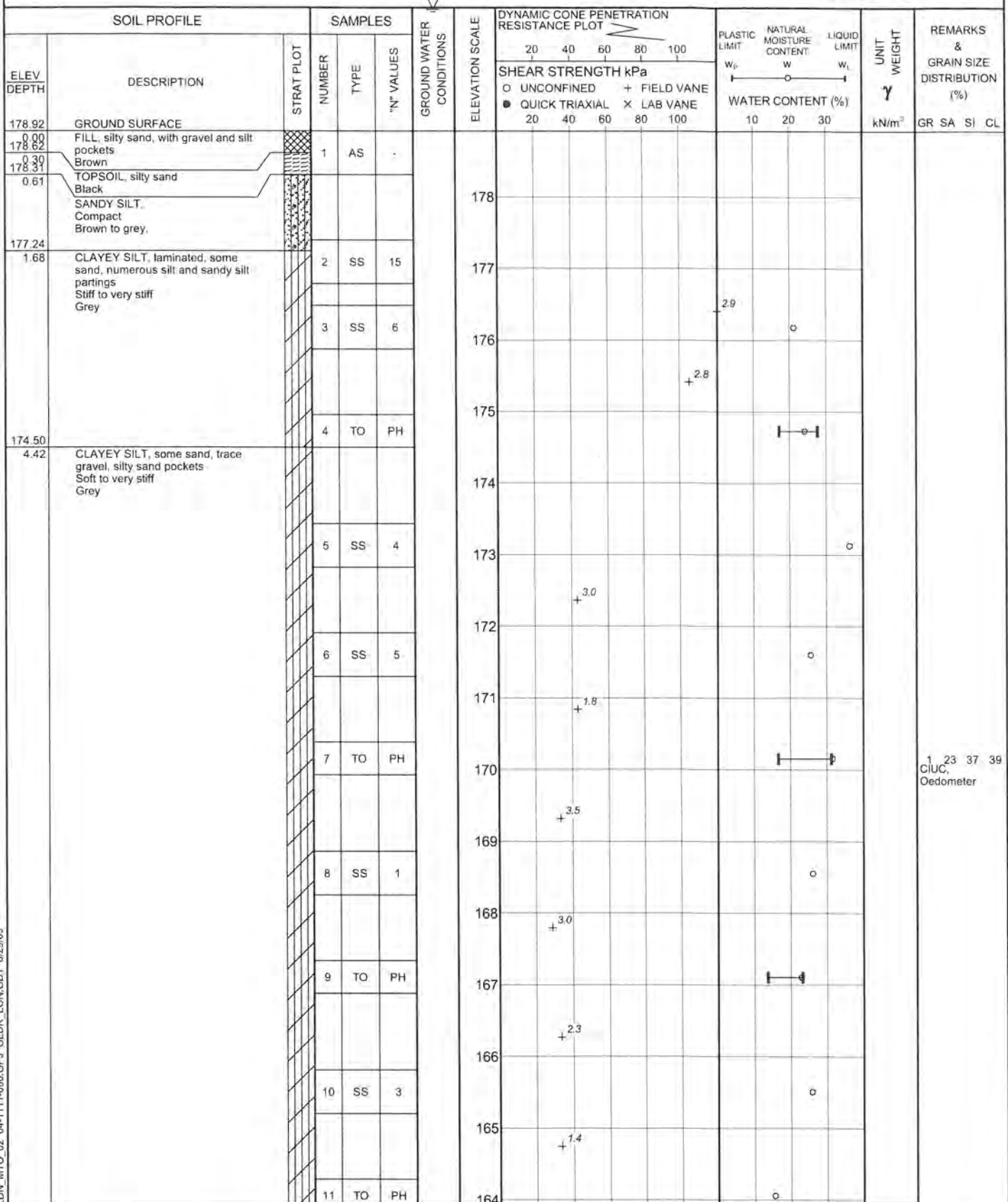
ORIGINATED BY AMS

COMPILED BY _____ AMS

CHECKED BY

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE			LIQUID LIMIT ———— PLASTIC LIMIT ———— WATER CONTENT ————			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	BLOWS / FOOT	SHEAR STRENGTH P.S.F. + Field Vane o Unconfined	WATER CONTENT % w p w w L				
585.4	Ground Level							500 1000 1500 2000 2500	10 20 30				Gr.Sa.Si.Cl
0.0													
581.4	Silty sand												583.4
4.0	Silty clay to clayey silt Some sand, traces of gravel. Stiff		1	SS	12	580							
			2	TW	PH			+3.0					
			3	TW	PH	570		+3.1				127	
			4	TW	PH			+2.1					
			5	TW	PH	560		+2.0				121.5	
			6	TW	PH			+3.5					
			7	TW	PH	550		+4.0				116	
			8	TW	PH			+2.3				134 123	3 27 43 27
			9	TW	PH	540		+1.6				132	4 22 48 26
			10	TW	PH			+1.9					
			11	TW	PH	530		+1.5				132	
517.4						520							
68.0	Sandy silt, some gravel & clay.		12	SS	23								14 33 40 13
511.4	Compact												
74.0	Limestone		13	AXT	Rec	510							
506.4	Bedrock			RC	100%								
79.0	End of Borehole												
							20 150 5% strain at failure 10						

PROJECT 04-1111-060		RECORD OF BOREHOLE No 23		1 OF 3	METRIC
W.P.	LOCATION	N 4682323.0 :E 328529.0		ORIGINATED BY C.C.	
DIST WEST HWY 401/3	BOREHOLE TYPE	POWER AUGER, HOLLOW STEM		COMPILED BY T.M.	
DATUM Geodetic	DATE	November 24, 2006 - November 26, 2006		CHECKED BY <i>SSS</i>	



LDN MTO 02 04-1111-060.GPJ GLDR LON.GDT 6/29/09

Continued Next Page

+3, x3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

METRIC.

PROJECT 04-1111-060

W.P.

LOCATION

N 4682323.0 ; E 328529.0

ORIGINATED BY C.C.

DIST WEST HWY 401 / 3

BOREHOLE TYPE POWER AUGER, HOLLOW STEM

COMPILED BY T.M.

DATUM Geodetic

DATE November 24, 2006 - November 26, 2006

CHECKED BY **SJB**

[illegible]

+ 3, X 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 04-1111-060

RECORD OF DRILLHOLE: 23

SHEET 3 OF 3

LOCATION: N 4682323.0 ;E 328529.0

DRILLING DATE: November 24, 2006 - November 26, 2006

DATUM: Geodetic

INCLINATION: -90° AZIMUTH: --

DRILL RIG:

DRILLING CONTRACTOR:

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.		RUN No.	PENETRATION RATE (m/min)	COLOUR % RETURN	FLUSH	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols										NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
				DEPTH (m)	RECOVERY						R.Q.D. %	FRACT INDEX PER 0.3	DISCONTINUITY DATA				ROCK STRENGTH INDEX		WEATH- ERING INDEX																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
					TOTAL CORE %								SOLID CORE %	DIP w.r.t CORE AXIS	TYPE AND SURFACE DESCRIPTION	R1 R2 R3 R4	W1 W2 W3 W4																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
		ROCK SURFACE		156.36																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

DEPTH SCALE

1 : 75



LOGGED: C.C.




CHECKED: SJB

PROJECT 07-1130-207-0		RECORD OF BOREHOLE No CPT-150		1 OF 1 METRIC	
W.P. _____		LOCATION N 4681733.4 :E 330757.6		ORIGINATED BY CC	
DIST WEST HWY 401/3		BOREHOLE TYPE POWER AUGER, SOLID STEM		COMPILED BY BRS	
DATUM GEODETIC		DATE August 6, 2008		CHECKED BY <i>SJS</i>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)	
								○ UNCONFINED	+ FIELD VANE							
180.85	GROUND SURFACE						20 40 60 80 100									
0.10	FILL, crushed gravel Grey															
180.24	FILL, sandy topsoil, some crushed gravel		1	SS	13						○					
0.61	Compact										○					
0.76	Black		2	SS	8						○					
179.63	FILL, clayey silt, some sand, trace gravel, trace asphalt															
1.22	Compact Brown		3	SS	4						○					
178.87	SILTY SAND, fine Loose Brown															
1.98	CLAYEY SILT, some sand, trace gravel Firm Mottled brown and grey END OF BOREHOLE															
Borehole dry during drilling on August 6, 2008.																

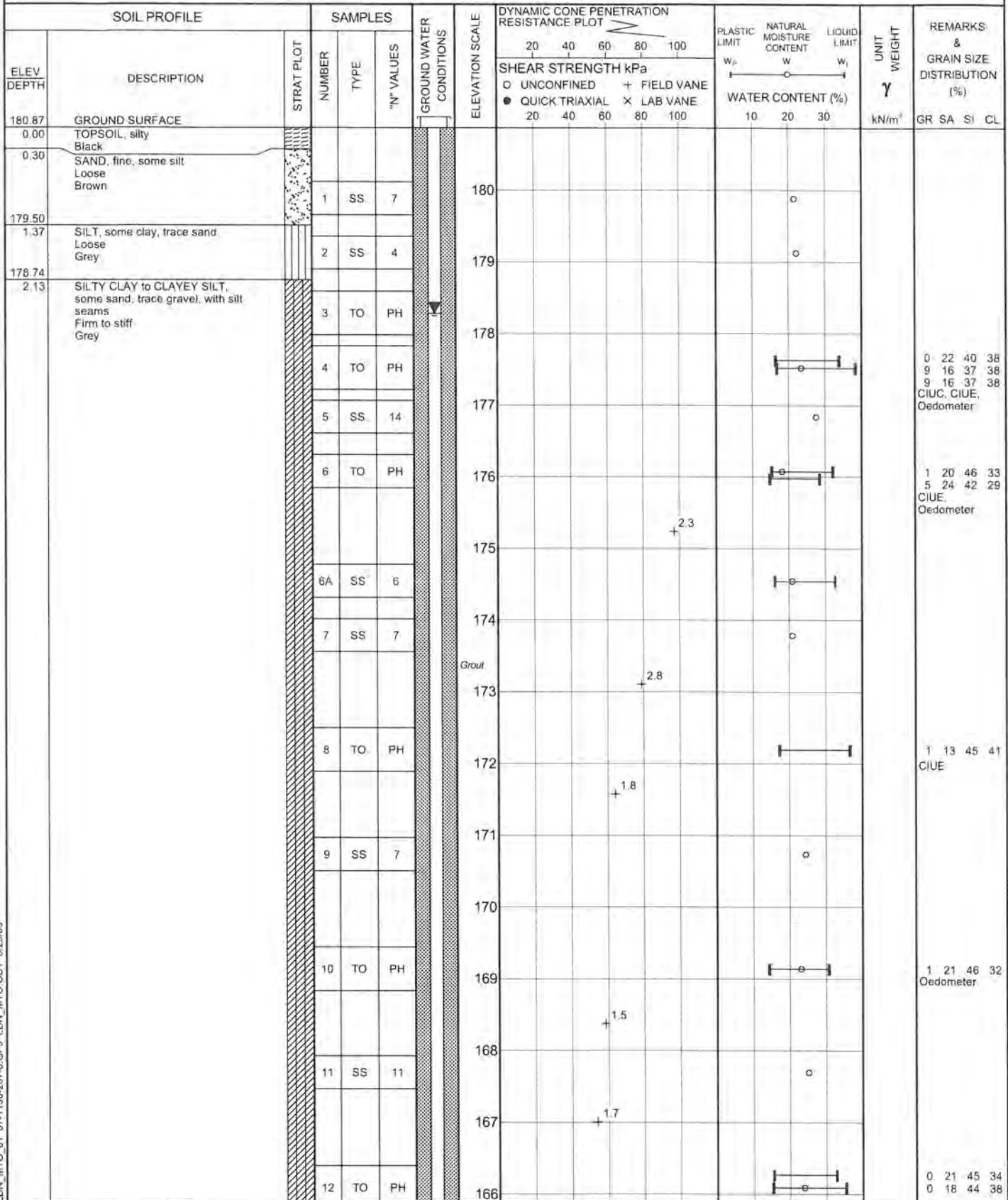
LDN MTO_01 07-1130-207-0.GPJ LDN MTO.GDT 6/29/09

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-153		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4681793.3 :E 330575.8</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 7, 2008</u>		CHECKED BY <u>SW3</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80			100	W _p	W	W _L
								SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE						WATER CONTENT (%)			
180.99	GROUND SURFACE																
0.00	TOPSOIL, silty, some sand Compact Black		1	SS	13												
180.30	CLAYEY SILT, trace sand, with silt partings Firm		2	SS	5												
179.47	Mottled brown and grey																
1.52	END OF BOREHOLE																
	Borehole dry during drilling on August 7, 2008.																

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 8/29/09

PROJECT 07-1130-207-0		RECORD OF BOREHOLE No 154		1 OF 4	METRIC
W.P. _____		LOCATION N 4681959 9 , E 330200 6		ORIGINATED BY SM	
DIST WEST HWY 401/3		BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC		COMPILED BY BRS	
DATUM GEODETIC		DATE July 22, 2008 - July 24, 2008		CHECKED BY SSS	



LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 8/29/09

Continued Next Page

+ 3 × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4681959.9 :E 330200.6

ORIGINATED BY SM

DIST WEST HWY 401/3

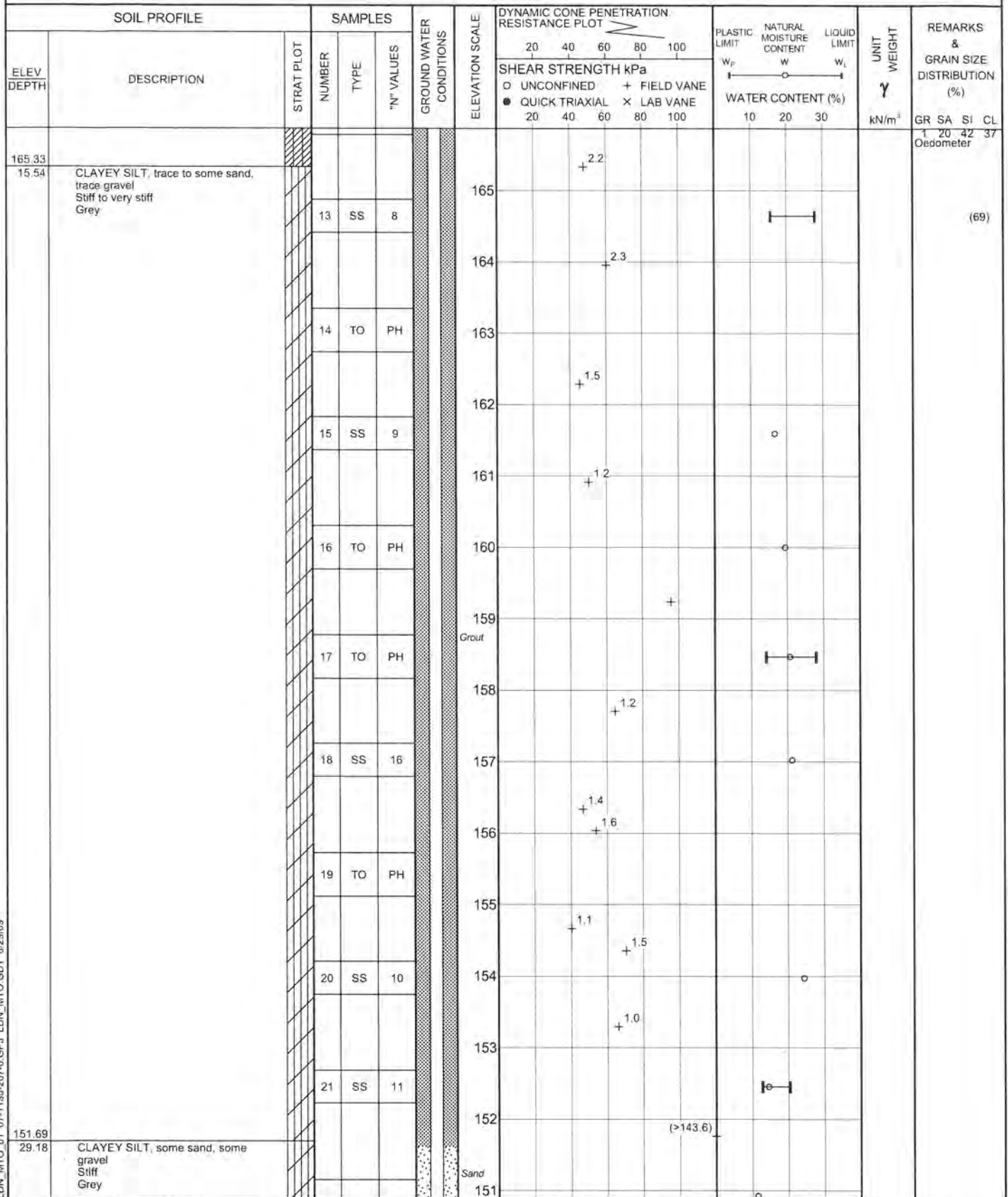
BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY BRS

DATUM GEODETIC

DATE July 22, 2008 - July 24, 2008

CHECKED BY SJB



Continued Next Page

+³, ×³: Numbers refer to Sensitivity ○^{3%} STRAIN AT FAILURE

RECORD OF BOREHOLE No 154

3 OF 4

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4681959.9 ; E 330200.6

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY BRS

DATUM GEODETIC

DATE

July 22, 2008 - July 24, 2008

CHECKED BY *SS*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100					
149.63	CLAYEY SILT, some sand, some gravel Stiff Grey		22	SS	11										
31.24	LIMESTONE, fresh, medium strong, weakly laminated to bedded, fine to coarse grained, faintly porous Light grey to tan to brown (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)		23	SS	60/ 125mm										
			24	NQ RC											
			25	NQ RC											
			26	NQ RC											
			27	NQ RC											
144.22	END OF BOREHOLE														
36.65	Borehole dry during drilling between July 22 and July 24, 2008. Water level measured in piezometer at elev. 178.97m on July 28, 2008. Water level measured in piezometer at elev. 180.42m on September 19, 2008. Water level measured in piezometer at elev. 177.23m on November 11, 2008. Water level measured in piezometer at elev. 178.27m on January 28, 2009.														

+ 3, X 3

Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 154

SHEET 4 OF 4

LOCATION: N 4681959.9 E 330200.6

DRILLING DATE: July 22, 2008 - July 24, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.		RUN No.	PENETRATION RATE (m/min)	COLOUR FLUSH % RETURN	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols										DIAMETRAL PORT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
				DEPTH (m)	R.Q.D. %					FRACT INDEX PER 0.3	DISCONTINUITY DATA			HYDRAULIC CONDUCTIVITY k, cm/sec																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
											TOTAL CORE %	SOLID CORE %	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION	10 ⁻⁸	10 ⁻⁶	10 ⁻⁴	10 ⁻²																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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DEPTH SCALE

1 : 75



LOGGED: SG

CHECKED: SJB

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-155		1 OF 1 METRIC	
W.P. _____		LOCATION <u>N 4682065.8 ; E 329981.7</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 13, 2008</u>		CHECKED BY <u>SJB</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE						
179.69	GROUND SURFACE													
0.00	FILL, sandy topsoil Black													
0.30	FILL, silty fine sand, trace topsoil, trace organics		1	SS	10									
0.46	Compact Brown													
0.61														
178.32	TOPSOIL, sandy Compact Black		2	SS	9									
1.37														
1.52	SILTY SAND, trace gravel Loose to compact Brown CLAYEY SILT, trace sand Stiff Grey END OF BOREHOLE													
Water level in borehole at about elev. 178.5m during drilling on August 13, 2008.														

Water level in borehole at about elev. 178.5m during drilling on August 13, 2008.

PROJECT 07-1130-207-0		RECORD OF BOREHOLE No 156		1 OF 1 METRIC	
W.P. _____		LOCATION N 4682106.6 E 329876.3		ORIGINATED BY NG	
DIST WEST HWY 401/3		BOREHOLE TYPE POWER AUGER, HOLLOW STEM		COMPILED BY LMK	
DATUM GEODETIC		DATE August 27, 2008		CHECKED BY <i>SJB</i>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)			
								○ UNCONFINED	+ FIELD VANE							● QUICK TRIAXIAL	× LAB VANE	
179.52	GROUND SURFACE							20	40	60	80	100						
0.00	TOPSOIL, sandy Black						Sand											
178.63							Holeplug											
0.89	SILTY FINE SAND Loose Brown		1	SS	8													
178.15																		
1.37	SILTY CLAY, trace sand, trace gravel Firm to stiff Grey		2	SS	5													
			3	SS	15													
			4	SS	12													
			5	SS	8		Cuttings											
			6	SS	7													
			7	SS	6													
			8	SS	6		Holeplug											
							173											
							Sand											

LDN_MTO_01 07-1130-207-0-GPJ LDN_MTO.GDT 6/29/09

RECORD OF BOREHOLE No 158

1 OF 4

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682144.3 ; E 329769.9

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

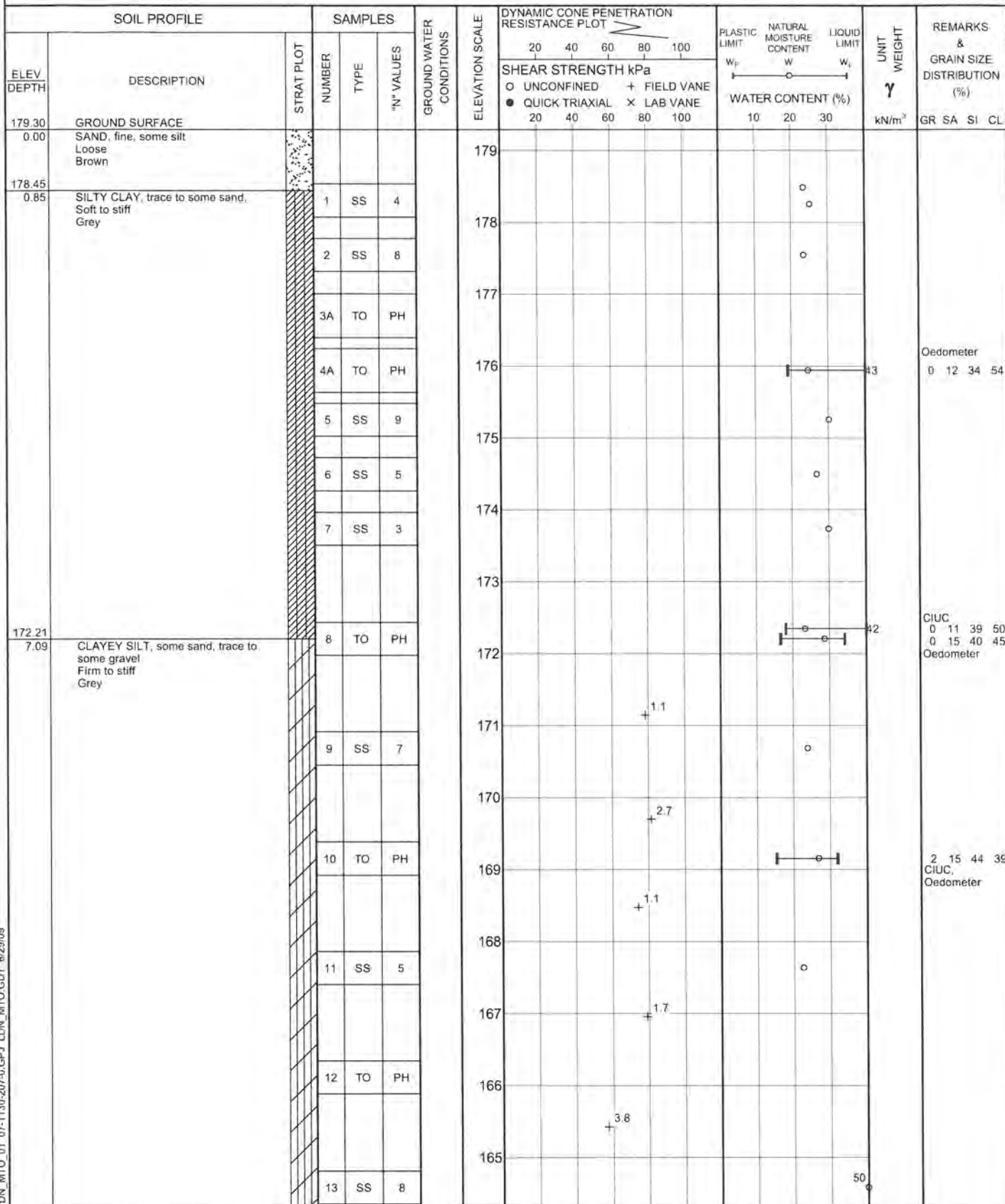
COMPILED BY BRS

DATUM GEODETIC

DATE

July 17, 2008 - July 18, 2008

CHECKED BY **SJB**



Continued Next Page

+ 3, X 3. Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 6/20/09

RECORD OF BOREHOLE No 158

2 OF 4

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682144.3 :E 329769.9

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

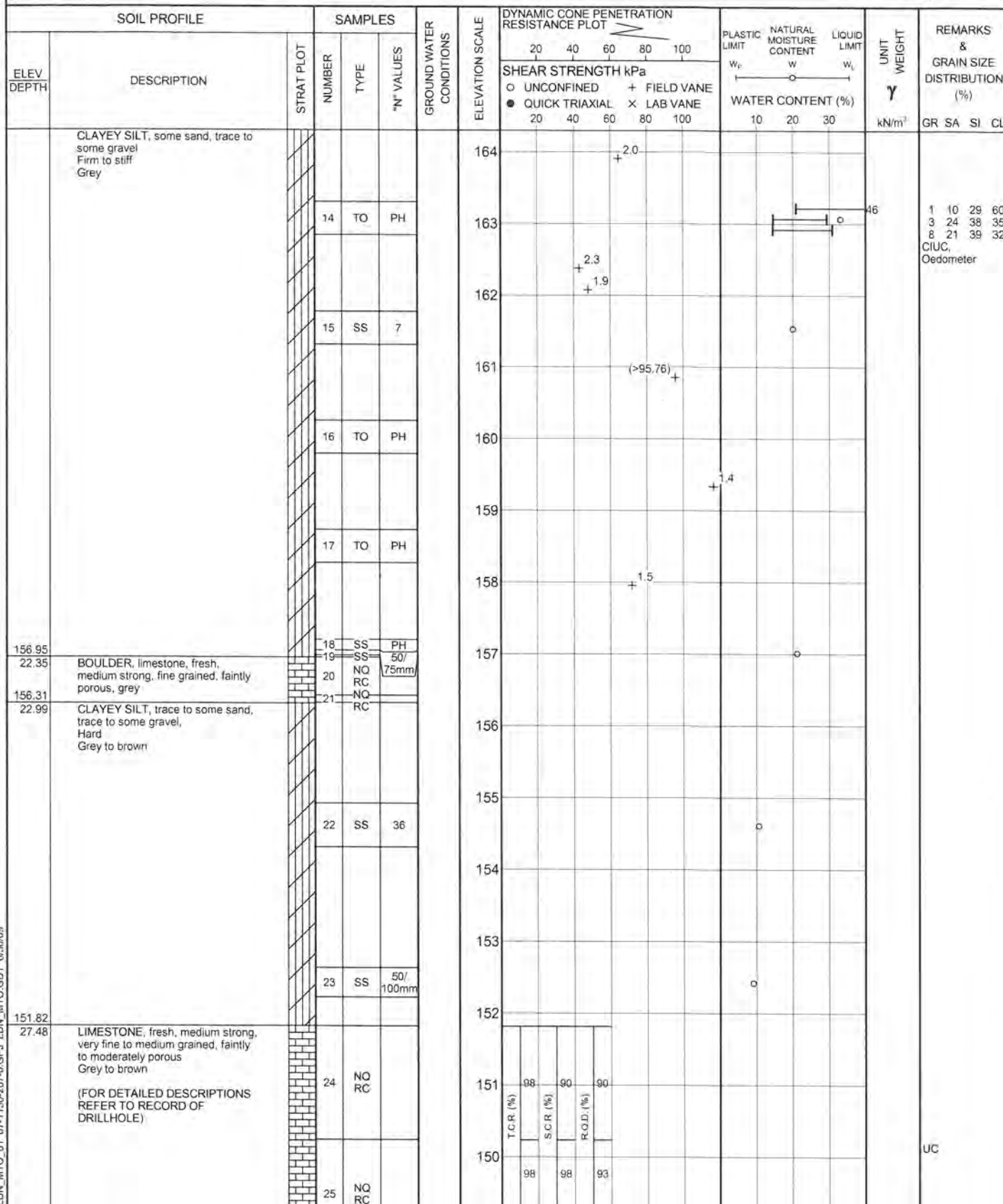
COMPILED BY BRS

DATUM GEODETIC

DATE

July 17, 2008 - July 18, 2008

CHECKED BY **SJB**



Continued Next Page

+ 3 x 3

Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

LDN_MTO_01_07-1130-207-0.GPJ LDN_MTO.GDT 6/30/09

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-159		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4682292.8 :E 329332.1</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 12, 2008</u>		CHECKED BY <u>SJS</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT WATER CONTENT (%)	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
178.77	GROUND SURFACE										
0.00	TOPSOIL, sandy silt, trace clay Loose Black										
177.86											
0.91	FILL, silt, some sand, some clay, trace topsoil, trace organics Loose		1	SS	4						
177.55											
1.22	Mottled brown and grey CLAYEY SILT, trace sand Firm		2	SS	5						
176.94											
1.83	Mottled brown and grey END OF BOREHOLE										
	Borehole dry during drilling on August 12, 2008.										

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 5/29/09

PROJECT 07-1130-207-0

RECORD OF BOREHOLE No 160

1 OF 3

METRIC

W.P.

LOCATION

N 4682216.8 : E 329156.2

ORIGINATED BY SM

DIST

WEST

HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY BRS

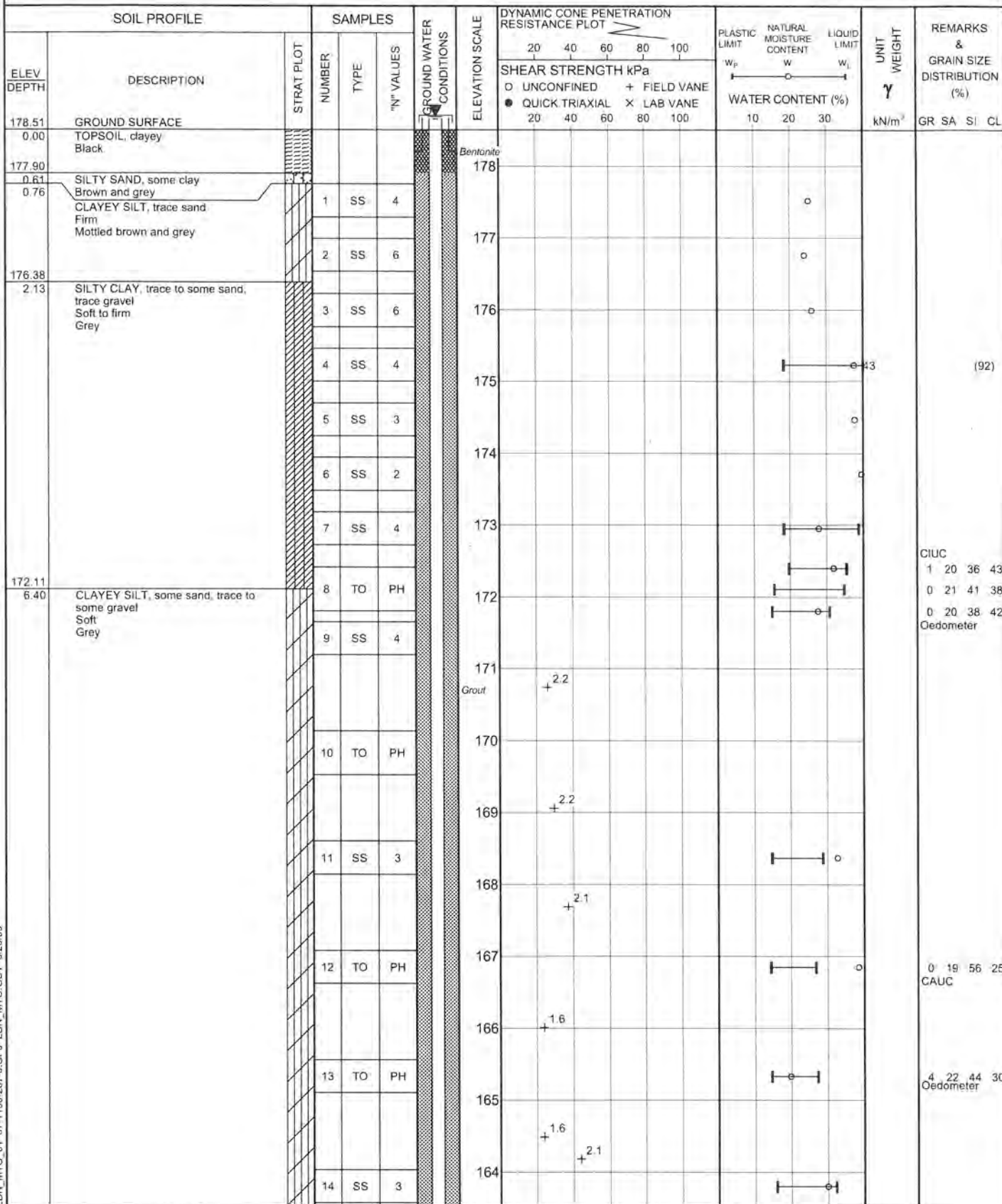
DATUM GEODETIC

DATE

July 14, 2008 - July 15, 2008

CHECKED BY

SSB



Continued Next Page

+ 3 × 3

Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No 160

2 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682216.8 ; E 329156.2

ORIGINATED BY SM

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

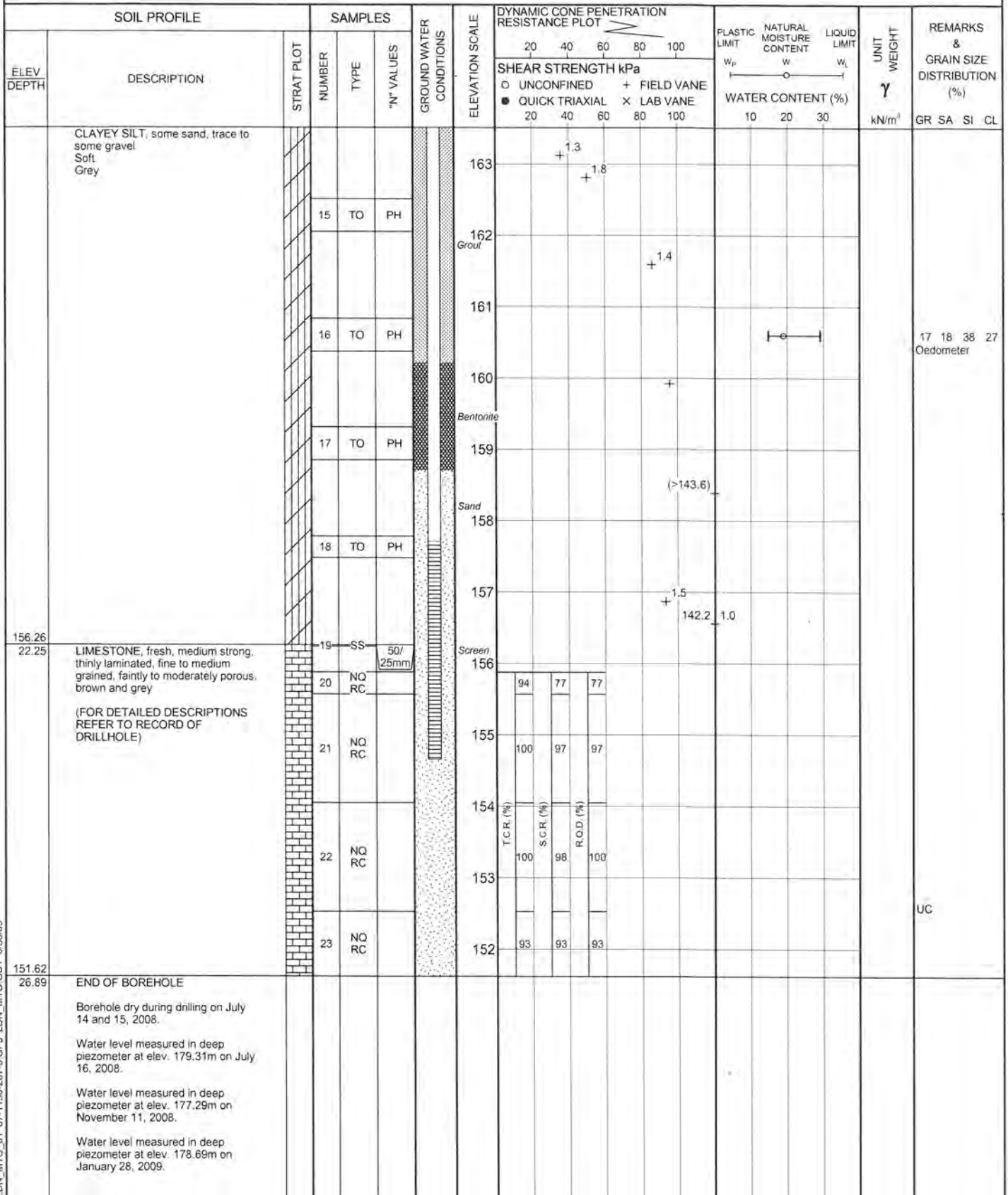
COMPILED BY BRS

DATUM GEODETIC

DATE

July 14, 2008 - July 15, 2008

CHECKED BY SB



+³ ×³ Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

LDN_MTO_01_07-1130-207-0.GPJ LDN_MTO.GDT 8/30/09

LOCATION: N 4682216.8 E 329156.2

DRILLING DATE: July 14, 2008 - July 15, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE. NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

[illegible]

DN ROCK 03 07-1130-207-0-ROCK.GPJ GLDR LDN.GDT 5/29/09 DATA INPUT: WDF

DEPTH SCALE

1:75

LOGGED: SG

CHECKED: SJA

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-161		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4682177.6 :E 328793.9</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 14, 2008</u>		CHECKED BY <u>SJB</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)				
								20	40						60	80	100	10	20
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
179.06	GROUND SURFACE																		
0.08	FILL, crushed gravel Grey																		
	SILTY SAND Compact Brown		1	SS	12														
177.99																			
1.07	SILTY SAND AND GRAVEL																		
1.22	Compact Brown		2	SS	24														
177.38																			
1.68	SILT, trace fine sand Compact Mottled brown and grey																		
176.77			3	SS	7														
2.29	SILT, some clay, trace sand Loose Grey																		
	END OF BOREHOLE																		
	Water level in borehole at about elev. 177.5m during drilling on August 14, 2008.																		

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 5/29/09

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-162		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4682439.2 :E 328729.1</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>SJL</u>	
DATUM <u>GEODETIC</u>		DATE <u>September 3, 2008</u>		CHECKED BY <u>SJB</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W _p — W — W _L WATER CONTENT (%)	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
178.99 0.00	GROUND SURFACE TOPSOIL, sandy, some silt, trace gravel Compact Black		1	SS	22		178				
178.38 0.61	SAND, fine, some silt, trace gravel Compact Brown		2	SS	16						
177.54 1.52	SAND, fine to medium, some gravel, trace silt Compact Brown		3	SS	9						
176.86 2.13	SILT, some clay, some sand Loose Grey END OF BOREHOLE Borehole dry during drilling on September 3, 2008.						177				

LDN_MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 5/29/09

RECORD OF BOREHOLE No 163

1 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682384.7 E 328586.3

ORIGINATED BY NG

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

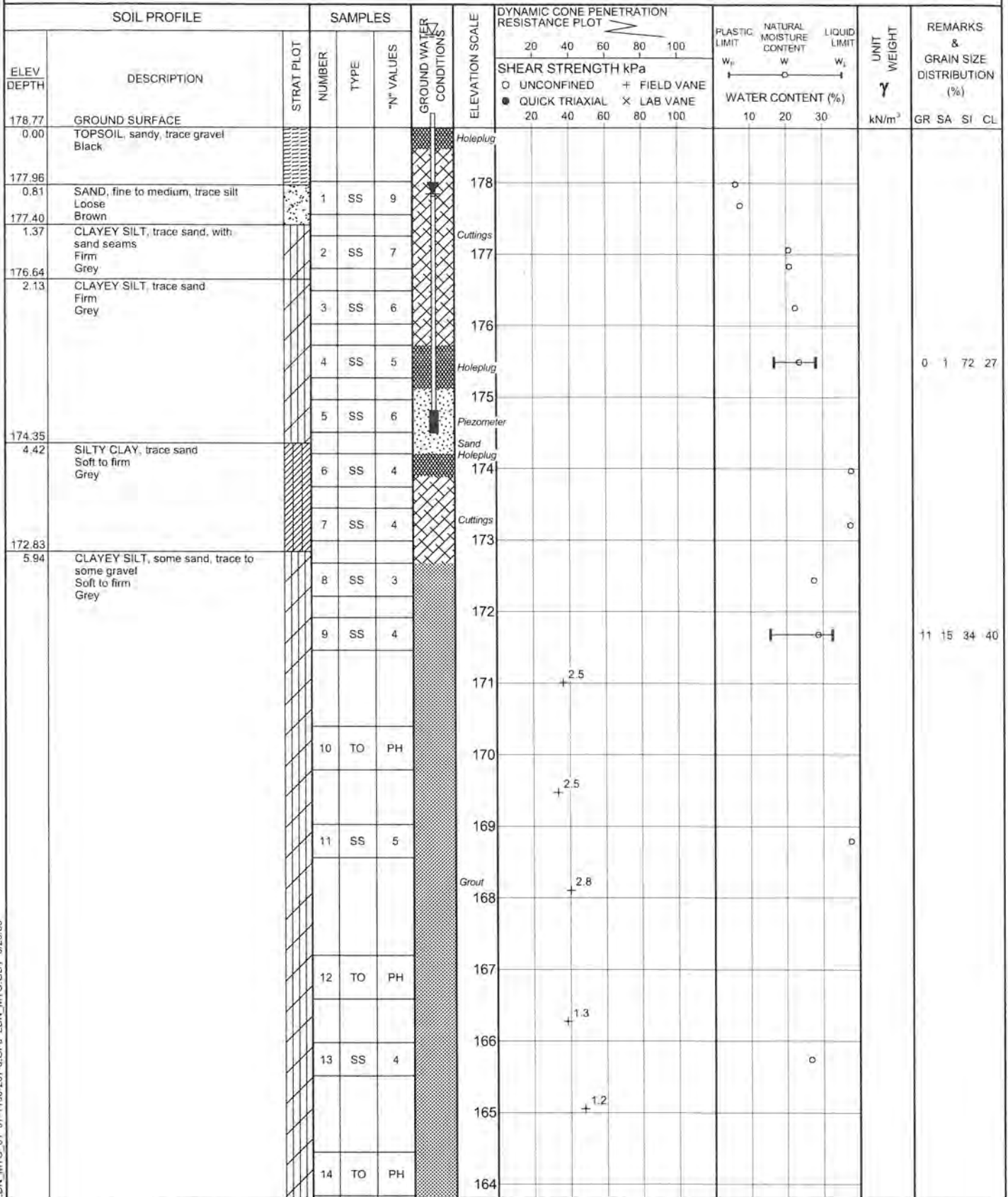
COMPILED BY LMK

DATUM GEODETIC

DATE

August 21, 2008 - August 26, 2008

CHECKED BY SJB



Continued Next Page

+ 3, x 3: Numbers refer to Sensitivity
○ 3% STRAIN AT FAILURE

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 163

SHEET 3 OF 3

LOCATION: N 4682299.7 E 328445.6

DRILLING DATE: August 21, 2008 - August 26, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (mm/min)	FLUSH	COLOUR % RETURN	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For additional abbreviations refer to list of abbreviations & symbols.										HYDRAULIC CONDUCTIVITY k, cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)		NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
										RECOVERY		R.Q.D. %	FRACT INDEX PER 0.3	DISCONTINUITY DATA		TYPE AND SURFACE DESCRIPTION	HYDRAULIC CONDUCTIVITY k, cm/sec																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
										TOTAL CORE %	SOLID CORE %			DIP w.r.t CORE AXIS			10 ⁻⁶	10 ⁻⁵	10 ⁻⁴																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
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23	MUD ROTARY NO ROCK CORE	ROCK SURFACE		155.91 22.86																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

DEPTH SCALE

1:75



LOGGED: SG

CHECKED: SJB

RECORD OF BOREHOLE No 164

1 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682299.7 ; E 328445.6

ORIGINATED BY NG

DIST WEST HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY LMK

DATUM GEODETIC

DATE

August 27, 2008 - August 28, 2008

CHECKED BY *SJB*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100					
179.06	GROUND SURFACE													
0.00	TOPSOIL, sandy Black													
0.23	SAND, fine to medium, trace silt Compact Brown		1	SS	17		178							
177.46														
1.60	SAND, medium to coarse, trace silt Loose Brown		2	SS	9		177							
176.93														
2.13	CLAYEY SILT, trace sand Firm to stiff Grey		3	SS	9		176							
			4	SS	4									0 2 71 27
175.40														
3.66	SILTY CLAY, trace sand, trace gravel Soft to stiff Grey		5	SS	7		175							
			6	SS	5		174							
			7	SS	3		173							
			8	SS	4		172							
			9	SS	3									
							171	2.4						
			10	SS	6		170							1 9 32 58
			11	TO	PH		169	2.0						
							168	2.8						
			12	SS	4		167							
							166							
			13	TO	PH		165	1.4						
			14	SS	4									

Continued Next Page

+ 3, X 3: Numbers refer to Sensitivity
O 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No 164

2 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682299.7 ; E 328445.6

ORIGINATED BY NG

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY LMK

DATUM GEODETIC

DATE

August 27, 2008 - August 28, 2008

CHECKED BY *SJS*

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100					
	SILTY CLAY, trace sand, trace gravel Soft to stiff Gray													
			15	TO	PH		163		+ 1.4					
							162		+ 1.0					
			16	SS	9		161							
							160		(+95.76) +					
			17	TO	PH		159							
							158							
			18	SS	WH		157		+ 1.5					
							156							
155.59			20	SS	118/75mm		155							
23.47	LIMESTONE, fresh, medium strong, weakly laminated to laminated, very fine to fine grained, faintly porous to porous Brown and grey (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)		21	NQ RC			154							
			22	NQ RC			153							
			23	NQ RC			152							
151.58	END OF BOREHOLE													
27.48	Borehole dry during drilling on August 27 and 28, 2008.													

+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 164

SHEET 3 OF 3

LOCATION: N 4682299.7 ,E 328445.6

DRILLING DATE: August 27, 2008 - August 28, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.		RUN No.	PENETRATION RATE (mm/min)	COLOUR % RETURN	FLUSH	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular PO - Polished K - Slickensided SM - Smooth Ro - Rough Br - Broken Rock NOTE: For occasional abbreviations refer to list of abbreviations & symbols										HYDRAULIC CONDUCTIVITY k, cm/sec	DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
				DEPTH (m)	FRACT INDEX PER 0.3						RECOVERY		R.Q.D. %	DIP w.r.t. CORE AXIS	TYPE AND SURFACE DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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		ROCK SURFACE		155.59																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</

DEPTH SCALE

1:75

LOGGED: SG

CHECKED: *SSB*

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682300.0 : E 328446.0

ORIGINATED BY NG

DIST

WEST

HWY 401/3

BOREHOLE TYPE

POWER AUGER, HOLLOW STEM

COMPILED BY LMK

DATUM

GEODETTIC

DATE _____

August 28, 2008

CHECKED BY SIR

[illegible]

+3, X3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>07-1130-207-0</u>		RECORD OF BOREHOLE No CPT-165		1 OF 1 METRIC	
W.P. _____		LOCATION <u>N 4682188.2 ; E 328457.7</u>		ORIGINATED BY <u>CC</u>	
DIST <u>WEST</u> HWY <u>401/3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>BRS</u>	
DATUM <u>GEODETIC</u>		DATE <u>August 13, 2008</u>		CHECKED BY <u>SJS</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _P	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE x LAB VANE						
178.98	GROUND SURFACE														
0.00	FILL, crushed gravel Grey														
0.30	TOPSOIL, sandy														
0.46	Black		1	SS	8										
177.91	FILL, silty sand topsoil with silty sand layers, pockets of gravel and wood														
1.07	Loose		2	SS	7										
177.30	Black														
1.68	SILTY SAND AND GRAVEL														
176.69	Loose		3	SS	20										
2.29	Brown														
	SAND, trace gravel														
	Compact														
	Grey														
	END OF BOREHOLE														
	Water level in borehole at about elev. 177.31m during drilling on August 13, 2008.														

LDN MTO_01 07-1130-207-0.GPJ LDN_MTO.GDT 6/29/09

RECORD OF BOREHOLE No 166

1 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682168.3; E 328349.6

ORIGINATED BY CC

DIST WEST HWY 401/3

BOREHOLE TYPE POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

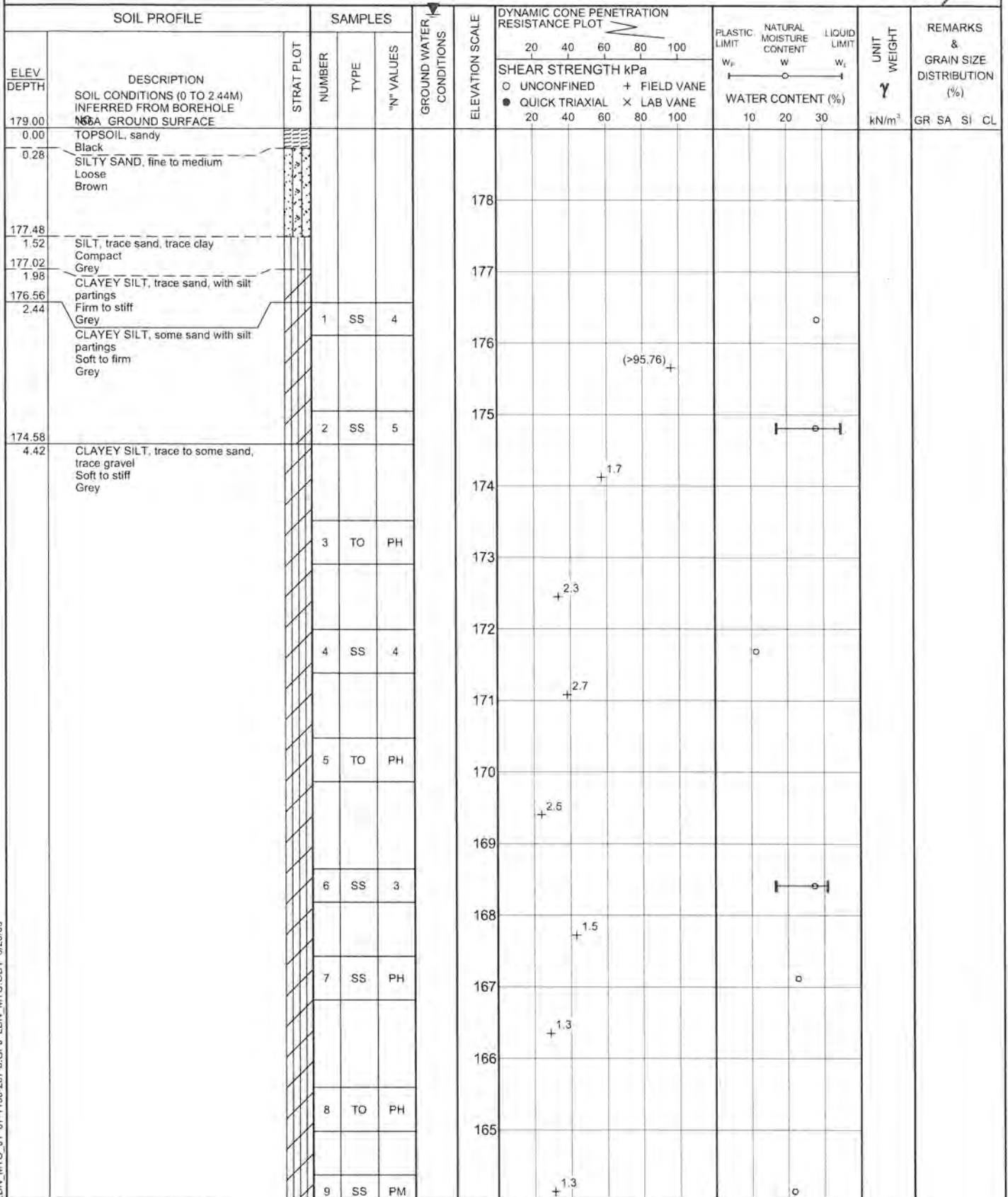
COMPILED BY LMK

DATUM GEODETIC

DATE

September 11, 2008 - September 17, 2008

CHECKED BY *SJB*



Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

RECORD OF BOREHOLE No 166

2 OF 3

METRIC

PROJECT 07-1130-207-0

W.P.

LOCATION

N 4682168.3 :E 328349.6

ORIGINATED BY CC

DIST WEST HWY 401/3

BOREHOLE TYPE

POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC

COMPILED BY LMK

DATUM GEODETIC

DATE

September 11, 2008 - September 17, 2008

CHECKED BY SJS

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100					
	CLAYEY SILT, trace to some sand, trace gravel Soft to stiff Grey														
			10	TO	PH		163								
			11	SS	15		162								
			12	TO	PH		161								
			13	SS	9		160								
			14	SS	9		159								
			15	NQ RC			158								
			16	NQ RC			157								
			17	NQ RC			156								
155.73	LIMESTONE, fresh, medium strong, weakly to thinly laminated, very fine to fine grained, faintly porous Mottled brown and grey (FOR DETAILED DESCRIPTION REFER TO RECORD OF DRILLHOLE)						155								
23.27							154								
							153								
152.08	END OF BOREHOLE														
26.92	Water level in borehole at about elev. 180.6m during drilling on September 17, 2008. Artesian water flow during rock coring measured at 1.60m above ground surface.														

+ 3 x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT: 07-1130-207-0

RECORD OF DRILLHOLE: 166

SHEET 3 OF 3

LOCATION: N 4682168.3 ; E 328349.6


DRILLING DATE: September 11, 2008 - September 17, 2008

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: —

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: AARDVARK DRILLING INC

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. DEPTH (m)	RUN No.	PENETRATION RATE (m/min)	FLUSH % RETURN	ELEVATION											HYDRAULIC CONDUCTIVITY k, cm/sec	DIAMETER POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION	
									RECOVERY		R.Q.D. %	FRACT INDEX PER 0.3	DISCONTINUITY DATA									
									TOTAL CORE %	SOLID CORE %			DIP w.r.t CORE AXIS	TYPE AND SURFACE DESCRIPTION								
									16 12 8 4 0	16 12 8 4 0					0 5 10 15 20	0 5 10 15 20						
		ROCK SURFACE		155.73																		
24	MUD ROTARY NO ROCK CORE	LIMESTONE, fresh, medium strong, weakly laminated, fine grained, porous to pitted with occasional vugs, fossiliferous, hydrocarbon staining, mottled brown and grey		23.27				155														
25		LIMESTONE, fresh, medium strong, weakly laminated, fine grained, faintly porous, hydrocarbon staining, brown, mottled brown and grey zone at 25.3m		154.29	2				154													
26		LIMESTONE, fresh, medium strong, thinly laminated, very fine grained to fine grained, faintly porous, stylolitic, occasional fossils, grey with light grey inclusions		153.63					153													
27		END OF DRILLHOLE		152.08	3																	
				26.92																		
28																						
29																						
30																						
31																						
32																						
33																						
34																						
35																						
36																						
37																						
38																						

DEPTH SCALE

1 : 75



LOGGED: SG

CHECKED: SSB

[illegible]

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-338		1 OF 1		METRIC	
W.P. _____		LOCATION <u>N 4681980.3 ; E 330141.6</u>		ORIGINATED BY <u>TA</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>December 15, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
181.22	GROUND SURFACE					▽														
0.00	TOPSOIL, sandy, trace clay Black																			
0.23	FILL, clayey silt, some sand, trace gravel																			
180.61	Brown																			
0.61	SILTY FINE SAND, trace organics Loose to compact Dark brown		1	SS	8										○					
179.39			2	SS	10															
1.83	SANDY SILT, some clay Compact Grey																			
2.13	CLAYEY SILT, some sand, trace gravel, with occasional silt partings Stiff Grey		3	SS	10									○						
178.32																				
2.90	END OF BOREHOLE																			
	Groundwater encountered at about elev. 179.6m during drilling on December 15, 2009.																			

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-340		1 OF 1		METRIC	
W.P. _____		LOCATION <u>N 4682203.2 ; E 329538.7</u>		ORIGINATED BY <u>TA</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>December 10, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE LIQUID CONTENT CONTENT LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					WATER CONTENT (%) w _p w w _L				GR	SA	SI	CL
								20	40	60	80	100	10	20	30					
179.58	GROUND SURFACE																			
0.00	TOPSOIL, sandy																			
179.25	Black																			
0.33	SANDY SILT, some clay, trace gravel, with silt partings Loose to compact Brown		1	SS	9															
			2	SS	10															
177.19	CLAYEY SILT, some sand, trace gravel, with occasional silt partings Very stiff Grey																			
2.39			3	SS	16															
176.68																				
2.90	END OF BOREHOLE																			
	Borehole dry during drilling on December 10, 2009.																			

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 341		1 OF 3 METRIC	
W.P. _____		LOCATION <u>N 4682255.5 ; E 329378.7</u>		ORIGINATED BY <u>DB/MR</u>	
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>	
DATUM <u>GEODETIC</u>		DATE <u>November 24, 2009 - December 1, 2009</u>		CHECKED BY _____	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT <div style="display: flex; justify-content: space-around; font-size: small;"> 20 40 60 80 100 </div>	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
178.80	GROUND SURFACE						179						
0.00	TOPSOIL, sandy Black												
177.95	SANDY SILT, some clay Loose to compact Brown		1	SS	10		178						
177.43	CLAYEY SILT, some sand Firm to stiff Brown becoming grey below about elev. 175.9m		2	SS	9		177						
1.37			3	SS	13		176						
			4	SS	8		175						
174.99	SILTY CLAY, some sand, trace gravel Firm to stiff Grey		5	TO	PH		174						
3.81			6	SS	5		173						
			7	TO	PH		172						
			8	SS	4		171						
169.27	CLAYEY SILT, some sand, trace gravel Soft to very stiff Grey		9	TO	PH		170						
9.53			10	TO	PH		169						
			11	TO	PH		168						
			12	SS	3		167						
							166						
							165						

LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 11/03/10

Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 341		2 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682255.5 ; E 329378.7</u>		ORIGINATED BY <u>DB/MR</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 24, 2009 - December 1, 2009</u>		CHECKED BY _____			

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE				WATER CONTENT (%) W _p W W _L				
	CLAYEY SILT, some sand, trace gravel Soft to very stiff Grey		13	TO	PH		164									
			14	SS	5		163									
			15	TO	PH		162									
			16	TO	PH		161									
			17	SS	7		160									
			18	NQ RC	-		159									
			19	NQ RC	-		158									
			20	NQ RC	-		157									
			21	NQ RC	-		156									
157.06	LIMESTONE, fresh, medium strong, weakly laminated, very fine to fine grained, faintly porous Light brown to grey (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)						155									
21.74							154									
							153									
							152									
151.55	END OF BOREHOLE						151									
27.25	Borehole dry during drilling between Nov. 24 and Dec. 1, 2009. Borehole sealed with cement-bentonite grout.						150									

INCLINATION: -90° AZIMUTH: ---

DRILLING CONTRACTOR: LANTECH

DATUM: GEODETIC



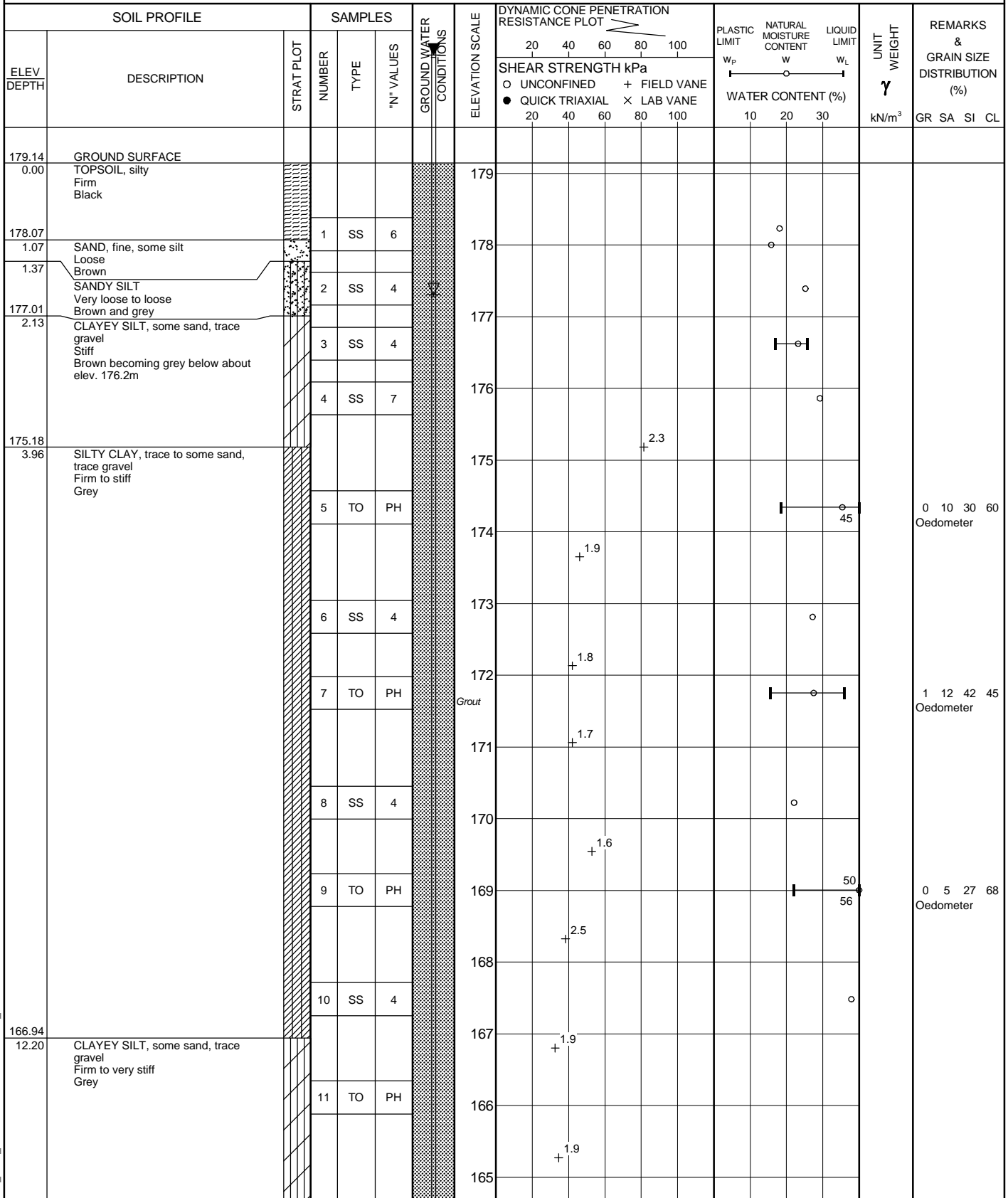
**Golder
Associates**

CHECKED:

1 : 75

_LDN_ROCK_03 09-1132-0080-ROCK.GPJ GLDR_LDN.GDT 12/03/10 DATA INPUT: LMK

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 343		1 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682231.8 ; E 329086.3</u>		ORIGINATED BY <u>MR/LK</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 18, 2009 - November 19, 2009</u>		CHECKED BY _____			



LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 12/03/10

Continued Next Page

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-342		1 OF 1	METRIC
W.P. _____		LOCATION <u>N 4682246.9 ; E 329168.7</u>		ORIGINATED BY <u>TA</u>	
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>	
DATUM <u>GEODETIC</u>		DATE <u>December 4, 2009</u>		CHECKED BY _____	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					WATER CONTENT (%) w _p w w _L				GR	SA	SI	CL
								20	40	60	80	100	10	20	30					
178.75	GROUND SURFACE																			
0.00	TOPSOIL, sandy, trace to some clay Black																			
178.10																				
0.65	SILTY FINE SAND Compact Brown		1	SS	17															
177.38																				
1.37	SANDY SILT, some clay, trace gravel, with silt partings Loose Grey		2	SS	7								○							
176.62																				
2.13	CLAYEY SILT, some sand, trace gravel, with occasional silt partings Stiff Grey		3	SS	10								○							
175.85																				
2.90	END OF BOREHOLE																			
	Borehole dry during drilling on December 4, 2009.																			

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 343		2 OF 3	METRIC
W.P. _____		LOCATION <u>N 4682231.8 ; E 329086.3</u>		ORIGINATED BY <u>MR/LK</u>	
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>	
DATUM <u>GEODETIC</u>		DATE <u>November 18, 2009 - November 19, 2009</u>		CHECKED BY _____	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE LIQUID LIMIT LIMIT CONTENT LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE	● QUICK TRIAXIAL × LAB VANE					
	CLAYEY SILT, some sand, trace gravel Firm to very stiff Grey		12	TO	PH			20 40 60 80 100						
			13	SS	PH									
			14	TO	PH									
			15	TO	PH									
			16	TO	PH									

LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 12/03/10

INCLINATION: -90° AZIMUTH: ---

SHEET 3 OF 3

DATUM: GEODETIC

RECORD OF BOREHOLE No 343A

1 OF 2

METRIC

PROJECT 09-1132-0080

W.P.

LOCATION

N 4682230.6 ; E 329086.3

ORIGINATED BY MR

DIST WEST HWY 401 / 3

BOREHOLE TYPE POWER AUGER, HOLLOW STEM

COMPILED BY LMK

DATUM GEODETIC

DATE

November 23, 2009

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa			WATER CONTENT (%)				
179.14	GROUND SURFACE							20 40 60 80 100							
0.00	TOPSOIL, silty Firm Black						179								
178.07							178								
1.07	SAND, fine, some silt Loose Brown														
1.37	SANDY SILT Very loose to loose Brown and grey														
177.01							177								
2.13	CLAYEY SILT, some sand, trace gravel Stiff Brown becoming grey below about elev. 176.2m						176								
							175								
175.18							174								
3.96	SILTY CLAY, trace to some sand, trace gravel Firm to stiff Grey						173								
							172								
							171								
							170								
							169								
							168								
							167								
166.94							166								
12.20	CLAYEY SILT, some sand, trace gravel Firm to very stiff Grey						165								
			1	SS	PH										
			2	SS	PH										

Continued Next Page

+³, ×³: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT 09-1132-0080 RECORD OF BOREHOLE NO. 018A 1 OF 1 METRIC

W.P. _____ LOCATION N 4682230.6 ; E 329086.3 ORIGINATED BY MR

DIST WEST HWY 401 / 3 BOREHOLE TYPE POWER AUGER, HOLLOW STEM COMPILED BY LMK

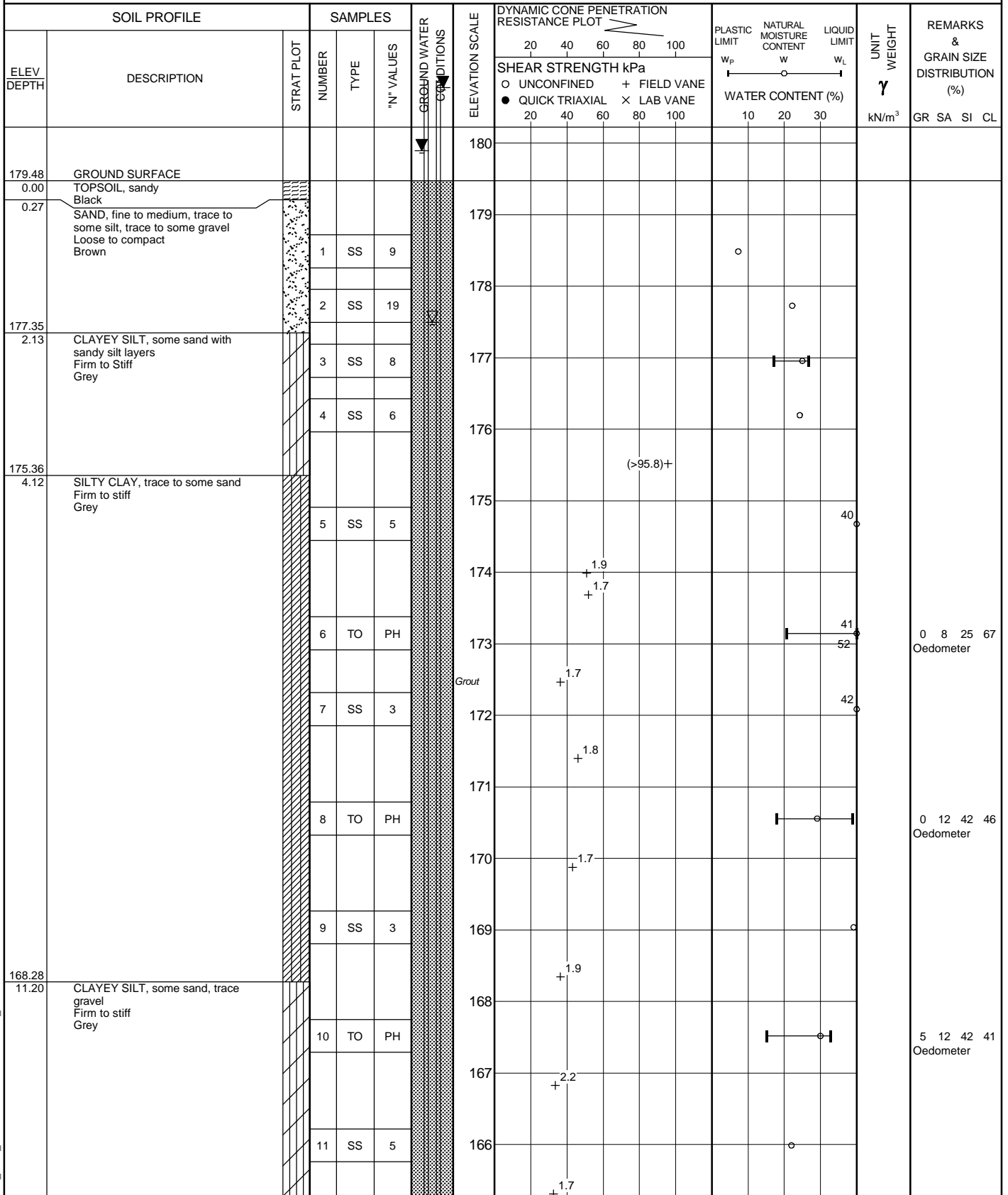
DATUM GEODETIC DATE November 23, 2009 CHECKED BY _____

[illegible]

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No CPT-344		1 OF 1		METRIC	
W.P. _____		LOCATION <u>N 4682206.2 ; E 328974.6</u>		ORIGINATED BY <u>TA</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, SOLID STEM</u>		COMPILED BY <u>DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>December 2, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			LIQUID LIMIT	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L			GR	SA	SI	CL	
								<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div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PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 345		1 OF 3 METRIC	
W.P. _____		LOCATION <u>N 4682149.0 ; E 328862.7</u>		ORIGINATED BY <u>MR</u>	
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>	
DATUM <u>GEODETIC</u>		DATE <u>November 16, 2009 - November 17, 2009</u>		CHECKED BY _____	



LDN_MTO_06 09-1132-0080.GPJ LDN_MTO_GDT 11/03/10

Continued Next Page

+ 3, X 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>09-1132-0080</u>		RECORD OF BOREHOLE No 345		2 OF 3		METRIC	
W.P. _____		LOCATION <u>N 4682149.0 ; E 328862.7</u>		ORIGINATED BY <u>MR</u>			
DIST <u>WEST</u> HWY <u>401 / 3</u>		BOREHOLE TYPE <u>POWER AUGER, MUD ROTARY WITH HQ TRICONE, NQRC</u>		COMPILED BY <u>LMK/DMB</u>			
DATUM <u>GEODETIC</u>		DATE <u>November 16, 2009 - November 17, 2009</u>		CHECKED BY _____			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)			
								○ UNCONFINED	+ FIELD VANE							● QUICK TRIAXIAL	× LAB VANE	
	CLAYEY SILT, some sand, trace gravel Firm to stiff Grey						165											
			12	TO	PH		164		1.7									
			13	TO	PH		163											
							162											
							161		(>95.8)+									
			14	SS	10		160											
			15	SS	22		159											
157.68			16	SS	50/ 75mm		158											
21.80	LIMESTONE, fresh, medium strong, weakly laminated to laminated, fine grained, faintly porous Light grey to brown (FOR DETAILED DESCRIPTIONS REFER TO RECORD OF DRILLHOLE)		17	NQ RC	-		157		83	64	69							
			18	NQ RC	-		156		68	44	44							
			19	NQ RC	-		155		T.C.R. (%) 98	S.C.R. (%) 56	R.Q.D. (%) 9							
			20	NQ RC	-		154											
			21	NQ RC	-		153		100	72	42							
151.23							152		99	99	99							
28.25	END OF BORHEOLE Groundwater encountered at about elev. 177.5m during drilling between November 16 and 17, 2009.	Upper Piezometer Water level measured at elev. 179.82 on February 24, 2010. Water level measured at elev. 179.90 on January 6, 2010.						Lower Piezometer Water level measured at elev. 180.68 on February 24, 2010. Water level measured at elev. 180.78 on January 6, 2010.										

LDN_MTO_06 09-1132-0080.GPJ LDN_MTO.GDT 11/03/10

PROJECT: 09-1132-0080

RECORD OF DRILLHOLE: 345

SHEET 3 OF 3

LOCATION: N 4682149.0 ;E 328862.7

DRILLING DATE: November 16, 2009 - November 17, 2009

DATUM: GEODETIC

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: MUD ROTARY WITH HQ TRICONE, NQRC

DRILLING CONTRACTOR: LANTECH

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV.		RUN No.	PENETRATION RATE (m/min)	COLOUR % RETURN	FLUSH	ELEVATION	JN - Joint FLT - Fault SHR - Shear VN - Vein CJ - Conjugate												BD - Bedding FO - Foliation CO - Contact OR - Orthogonal CL - Cleavage												PL - Planar CU - Curved UN - Undulating ST - Stepped IR - Irregular												PO - Polished K - Slickensided SM - Smooth Ro - Rough												Br - Broken Rock	NOTE: For additional abbreviations refer to list of abbreviations & symbols.	HYDRAULIC CONDUCTIVITY k, cm/sec			DIAMETRAL POINT LOAD INDEX (MPa)	NOTES WATER LEVELS INSTRUMENTATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
				DEPTH (m)	RECOVERY						R.Q.D. %	FRACT. INDEX PER 0.3	DISCONTINUITY DATA				DIP W.R.T. CORE AXIS	TYPE AND SURFACE DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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22	MUD ROTARY NO. ROCK CORE	ROCK SURFACE		157.69																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

DEPTH SCALE

1 : 75



LOGGED: SG

CHECKED:

LDN_ROCK_03 09-1132-0080-ROCK.GPJ GLDR LDN.GDT 11/03/10 DATA INPUT: LMK

NILCON FIELD VANE SHEAR TEST RESULTS**Windsor-Essex Parkway**

Depth (m)	Elevation (m)	Undrained Shear Strength (kPa)			Sensitivity
		Natural	Post-Peak	Remoulded	
17.0	165.0	35	12	9	3.7
18.0	164.0	45	13	16	2.8
19.0	163.0	33	13	22	1.5
20.0	162.0	39	34	28	1.4

Field Vane Location 23 (Borehole BH-23)

5.0	173.9	47	21	15	3.1
6.0	172.9	38	16	9	4.4
7.0	171.9	29	15	10	2.8
8.0	170.9	29	15	10	2.8
9.0	169.9	26	14	9	2.7
10.0	168.9	27	15	8	3.6
11.0	167.9	27	18	6	4.8
12.0	166.9	34	9	5	7.2
13.0	165.9	22	19	7	3.3
14.0	164.9	22	19	4	5.8
15.0	163.9	22	12	14	1.5
16.0	162.9	31	22	17	1.8
17.0	161.9	46	27	26	1.8

Field Vane Location 105 (Borehole BH-105)

4.9	181.3	95	79	57	1.7
5.9	180.3	123	93	78	1.6
6.9	179.3	83	62	53	1.6
7.9	178.3	68	49	40	1.7
8.9	177.3	98	57	53	1.9
9.9	176.3	51	32	28	1.8
10.9	175.3	49	36	32	1.5
11.9	174.3	47	25	28	1.7
12.9	173.3	53	26	32	1.6
13.9	172.3	45	30	26	1.7
14.9	171.3	49	34	19	2.6
15.9	170.3	51	42	28	1.8
16.9	169.3	49	30	23	2.2
17.9	168.3	51	25	13	3.9
18.9	167.3	47	19	13	3.6
19.9	166.3	49	26	21	2.4
20.9	165.3	83	45	40	2.1
21.9	164.3	83	55	57	1.5

Field Vane Location 112 (Borehole BH-112)

6.8	177.8	81	43	40	2.0
7.8	176.8	79	32	42	1.9
8.8	175.8	45	43	26	1.7
9.8	174.8	59	40	32	1.8
10.8	173.8	51	30	28	1.8
11.8	172.8	47	26	28	1.7
12.8	171.8	53	42	32	1.6
13.8	170.8	43	26	21	2.1

NILCON FIELD VANE SHEAR TEST RESULTS**Windsor-Essex Parkway**

Depth (m)	Elevation (m)	Undrained Shear Strength (kPa)			Sensitivity
		Natural	Post-Peak	Remoulded	
7.6	174.7	99	82	78	1.3
8.6	173.7	70	59	61	1.1
9.6	172.7	62	53	57	1.1
10.6	171.7	59	45	49	1.2
11.6	170.7	60	49	57	1.1
12.6	169.7	53	53		
13.6	168.7	55	45	55	1.0
14.6	167.7	51	40	43	1.2
15.6	166.7	64	19	42	1.5
16.6	165.7	43	38		
17.6	164.7	30	13		
18.6	163.7	34	30		
19.6	162.7	30	30		

Field Vane Location 154 (Borehole BH-154)

5.6	175.3	91	57	57	1.6
6.6	174.3	66	40	47	1.4
7.6	173.3	76	68	64	1.2
8.6	172.3	57	26		
9.6	171.3	74	40	21	3.5
10.6	170.3	70	55	30	2.3
11.6	169.3	44	25	28	1.6
12.6	168.3	53	30		
13.6	167.3	57	40	40	1.4
14.6	166.3	51	45	28	1.8

Field Vane Location 158 (Borehole BH-158)

3.7	175.6	110	64	55	2.0
5.7	173.6	57	21	28	2.0
6.7	172.6	57	13	38	1.5
7.7	171.6	62	34	42	1.5
8.7	170.6	51	17	38	1.4
9.7	169.6	62	17	38	1.7
10.7	168.6	53	43	40	1.3
11.7	167.6	40	19		
12.7	166.6	32	11	26	1.2
13.7	165.6	26	15	23	1.2
14.7	164.6	45	13	25	1.8
15.7	163.6	55	28	34	1.6
16.7	162.6	26	8		
17.7	161.6	25	13	13	1.9

Field Vane Location 160 (Borehole BH-160)

3.7	175.0	54	23	15	3.5
5.7	173.0	32	13	11	2.8
6.7	172.0	19	2	11	1.7
7.7	171.0	34	13	13	2.6
8.7	170.0	23	6	17	1.3
9.7	169.0	38	15	20	1.9

NILCON FIELD VANE SHEAR TEST RESULTS
Windsor-Essex Parkway

Depth (m)	Elevation (m)	Undrained Shear Strength (kPa)			Sensitivity
		Natural	Post-Peak	Remoulded	
10.7	168.0	23	6	19	1.2
11.7	167.0	17	4	15	1.1
12.7	166.0	36	9	11	3.2
13.7	165.0	32	21	21	1.5
14.7	164.0	25	6	11	2.2
15.7	163.0	25	19	23	1.1
16.7	162.0	28	19	8	3.8
17.7	161.0	83	74	60	1.4

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-19

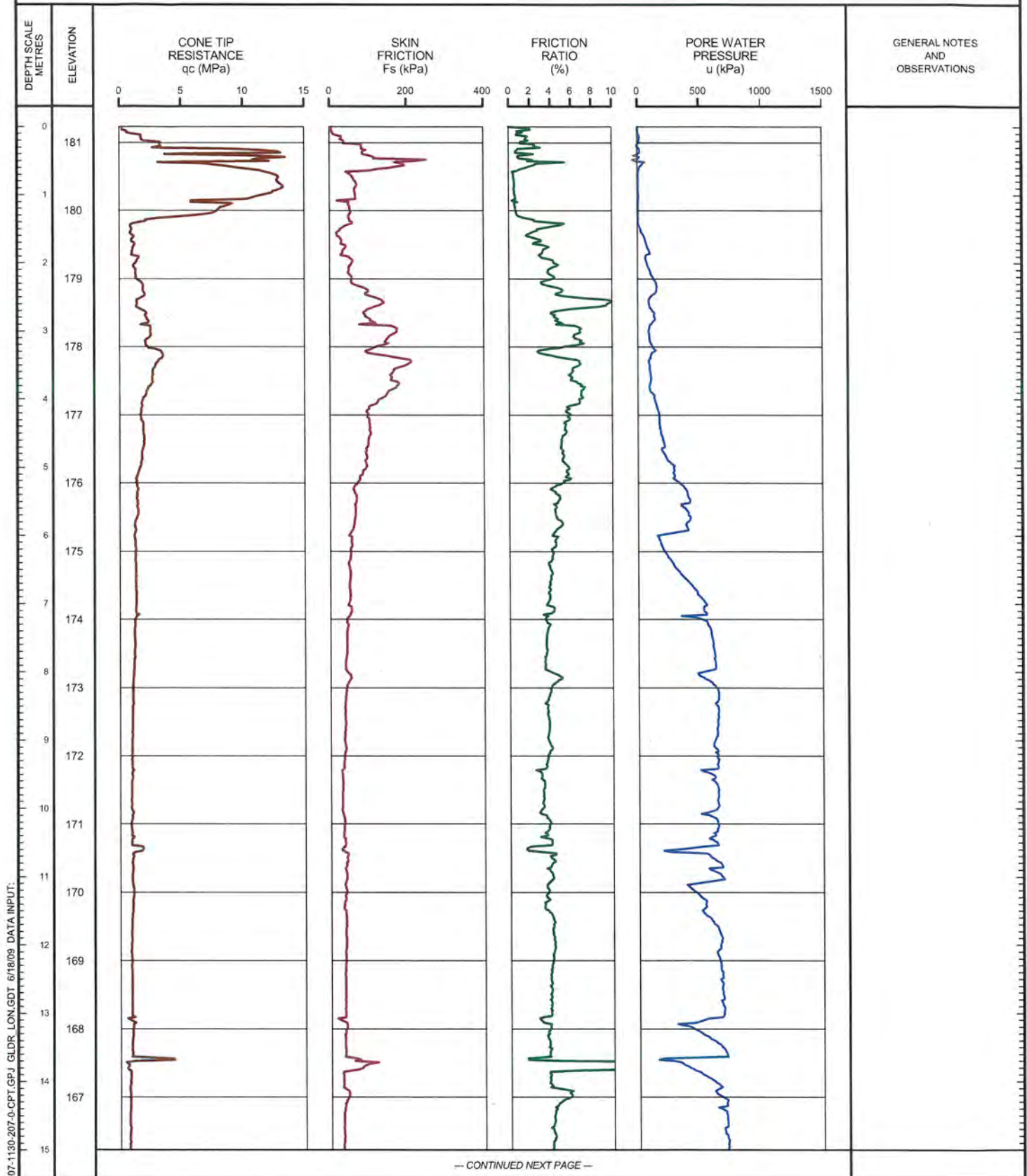
SHEET 1 OF 2

LOCATION: N 4681906.0 ,E 330413.0

TEST DATE: November 2, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SJB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-19

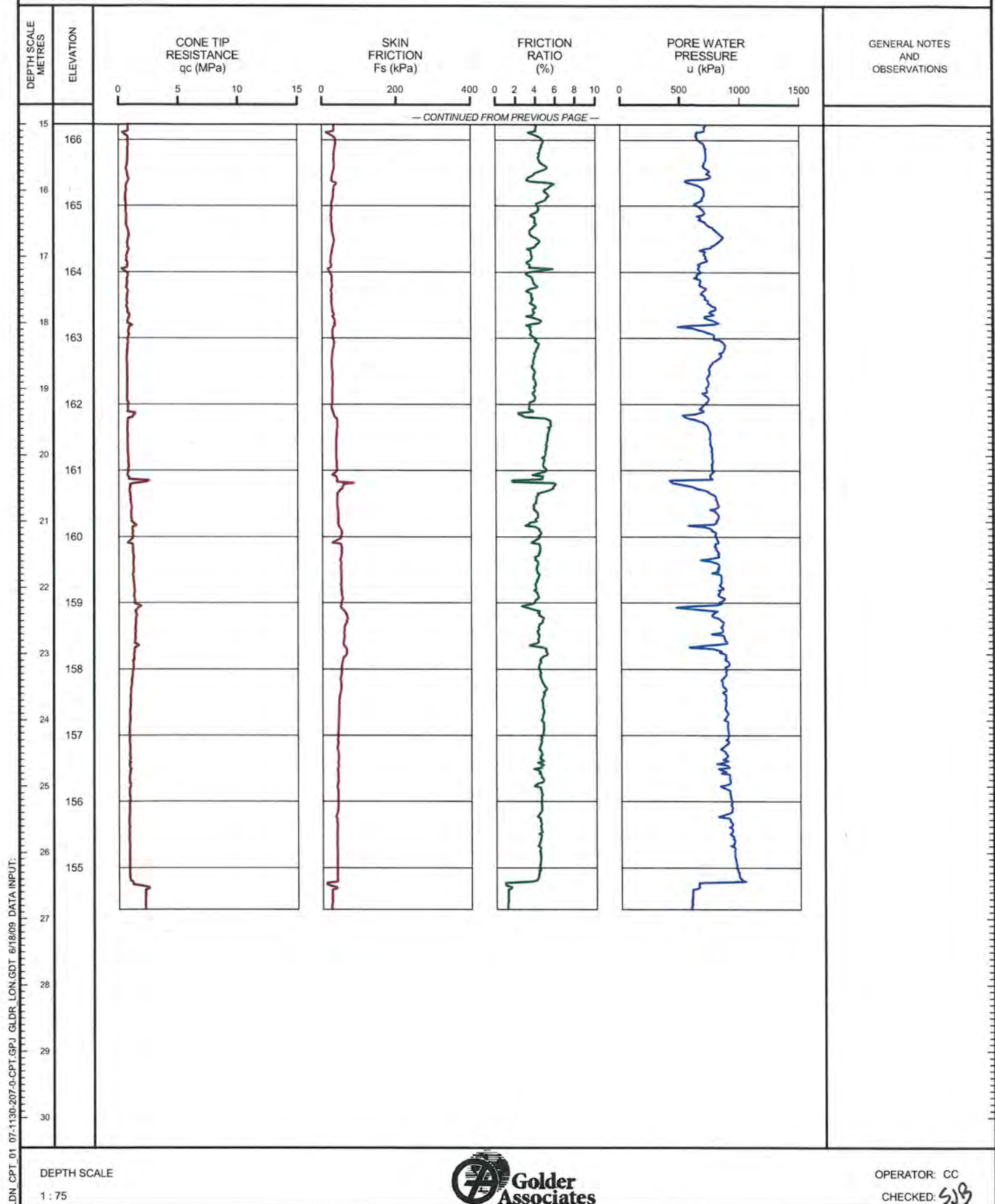
SHEET 2 OF 2

LOCATION: N 4681906.0 ; E 330413.0

TEST DATE: November 2, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-21

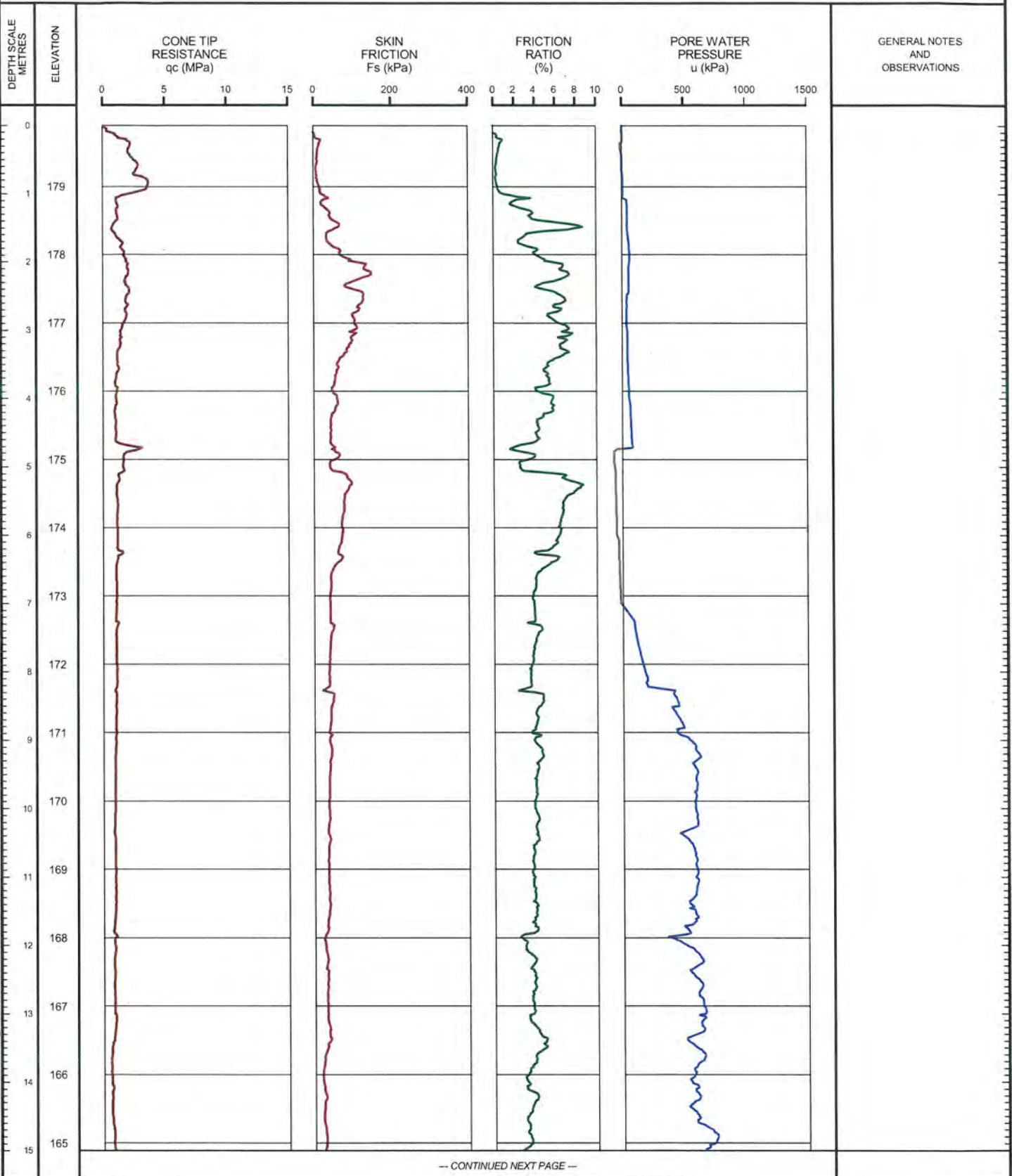
SHEET 1 OF 2

LOCATION: N 4682147.0 ; E 329759.0

TEST DATE: November 1, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *503*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-21

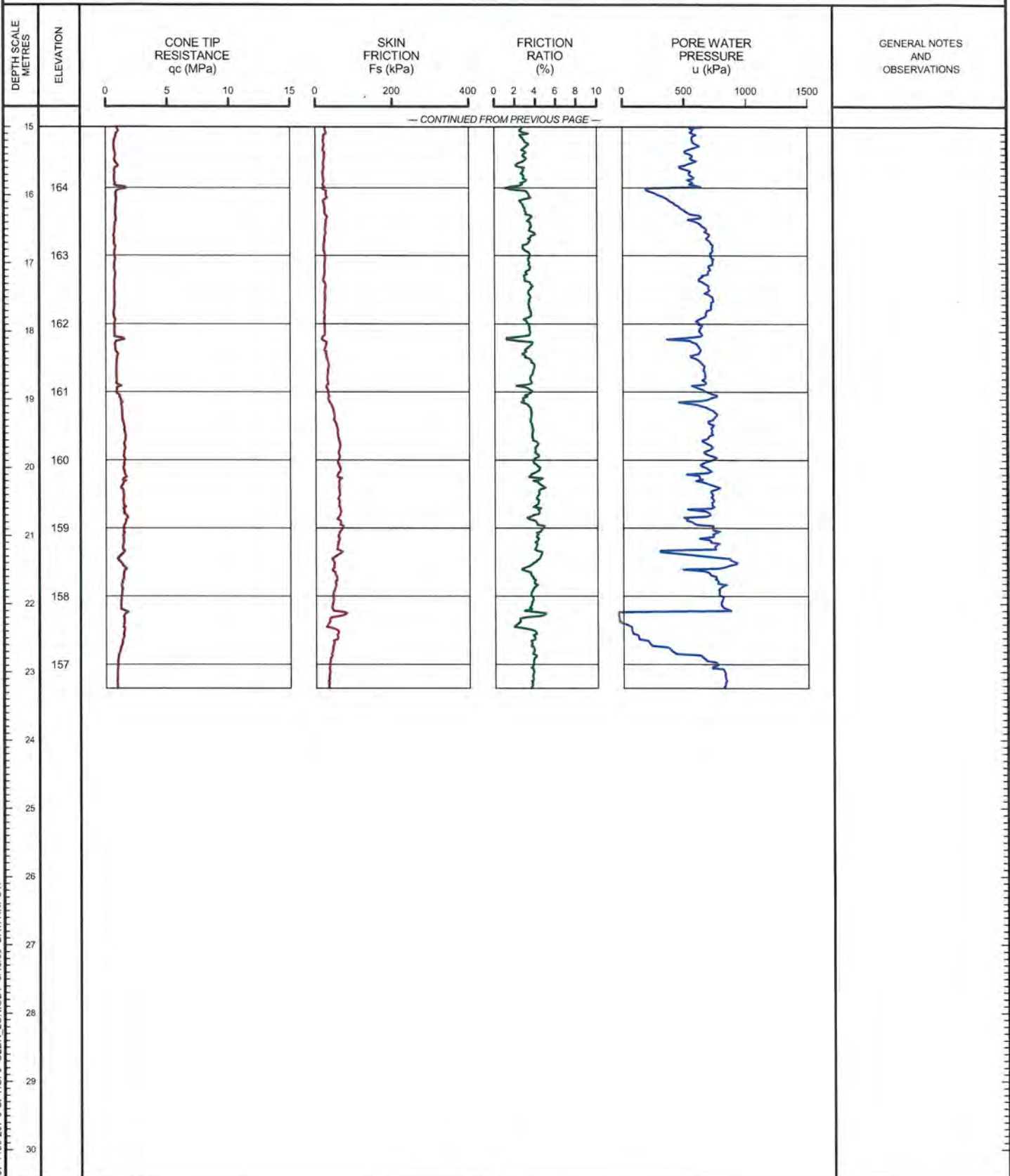
SHEET 2 OF 2

LOCATION: N 4682147.0 ; E 329759.0

TEST DATE: November 1, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-23

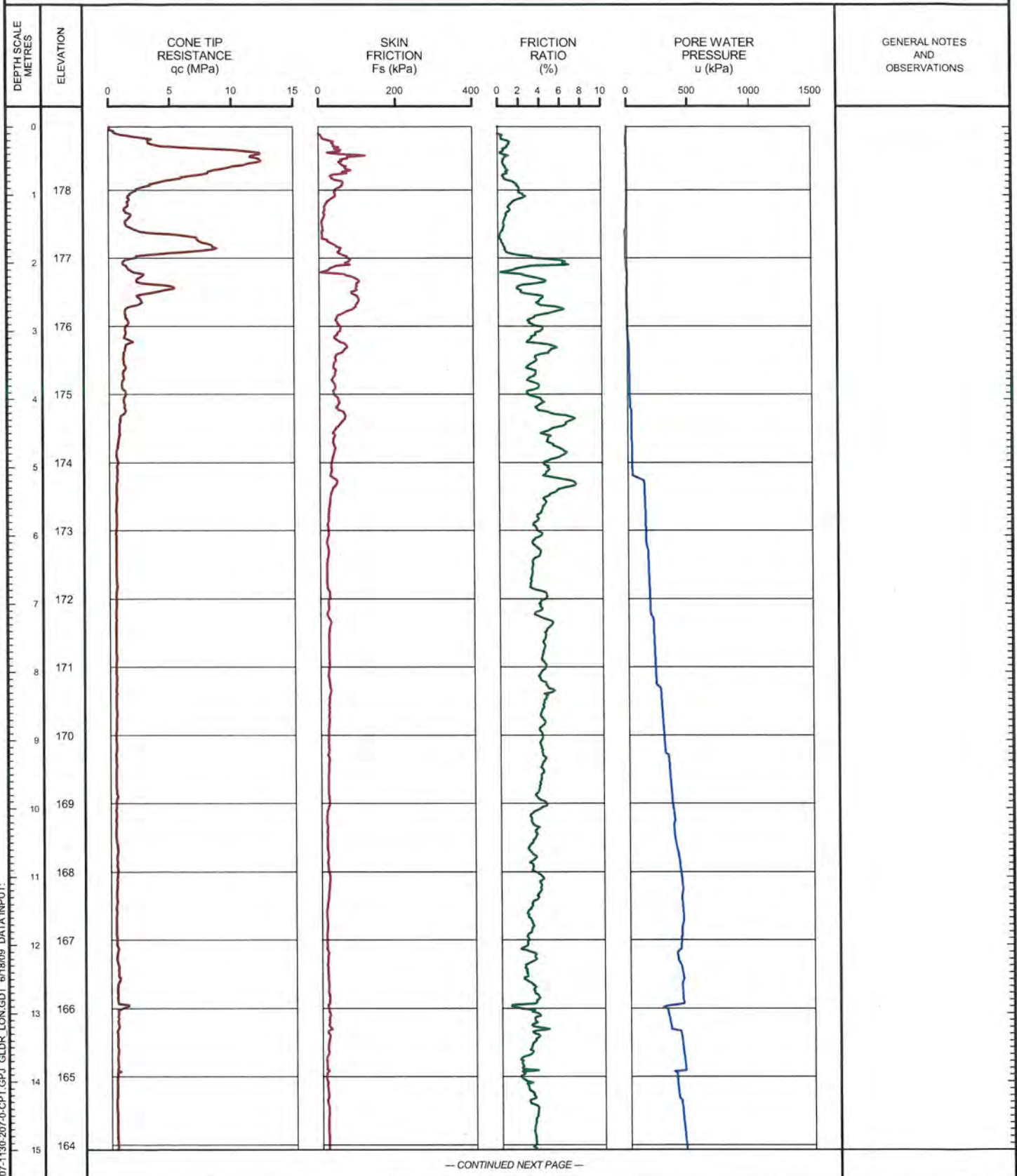
SHEET 1 OF 2

LOCATION: N 4682329.0 ; E 328523.0

TEST DATE: October 31, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-23

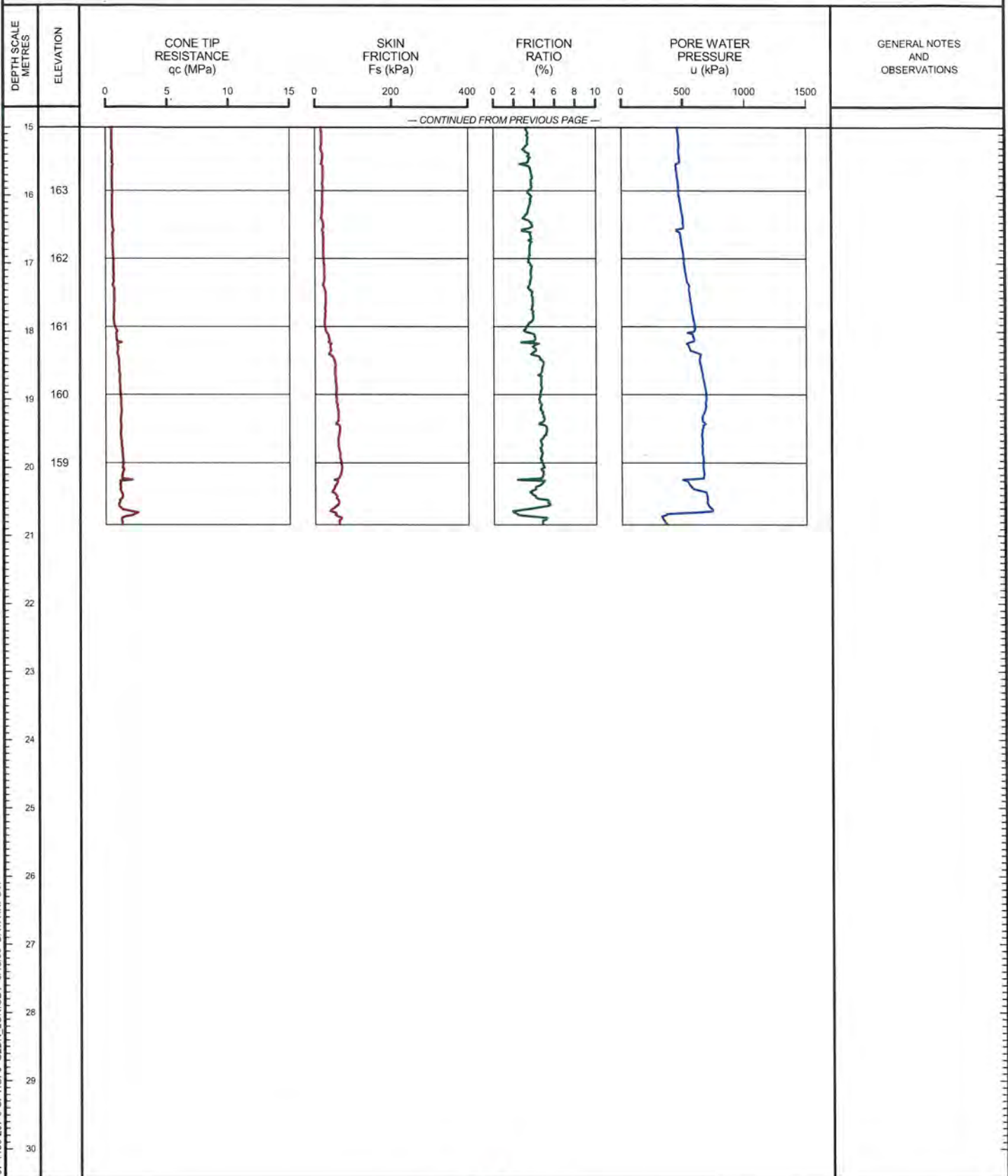
SHEET 2 OF 2

LOCATION: N 4682329.0 :E 328523.0

TEST DATE: October 31, 2006

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/19/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *CCB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-150

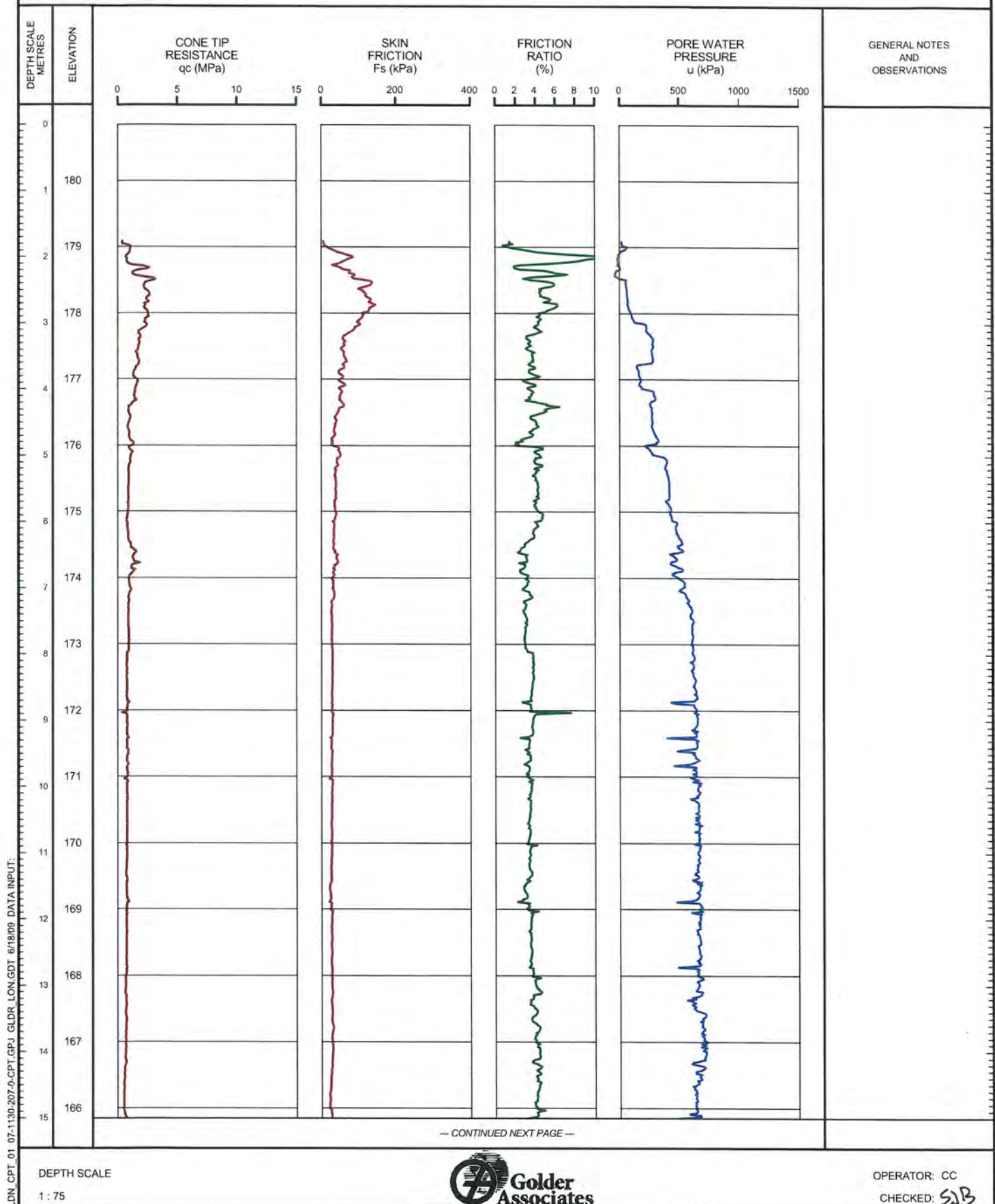
SHEET 1 OF 2

LOCATION: N 4681733.4 ; E 330757.6

TEST DATE: August 6, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.77m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-150

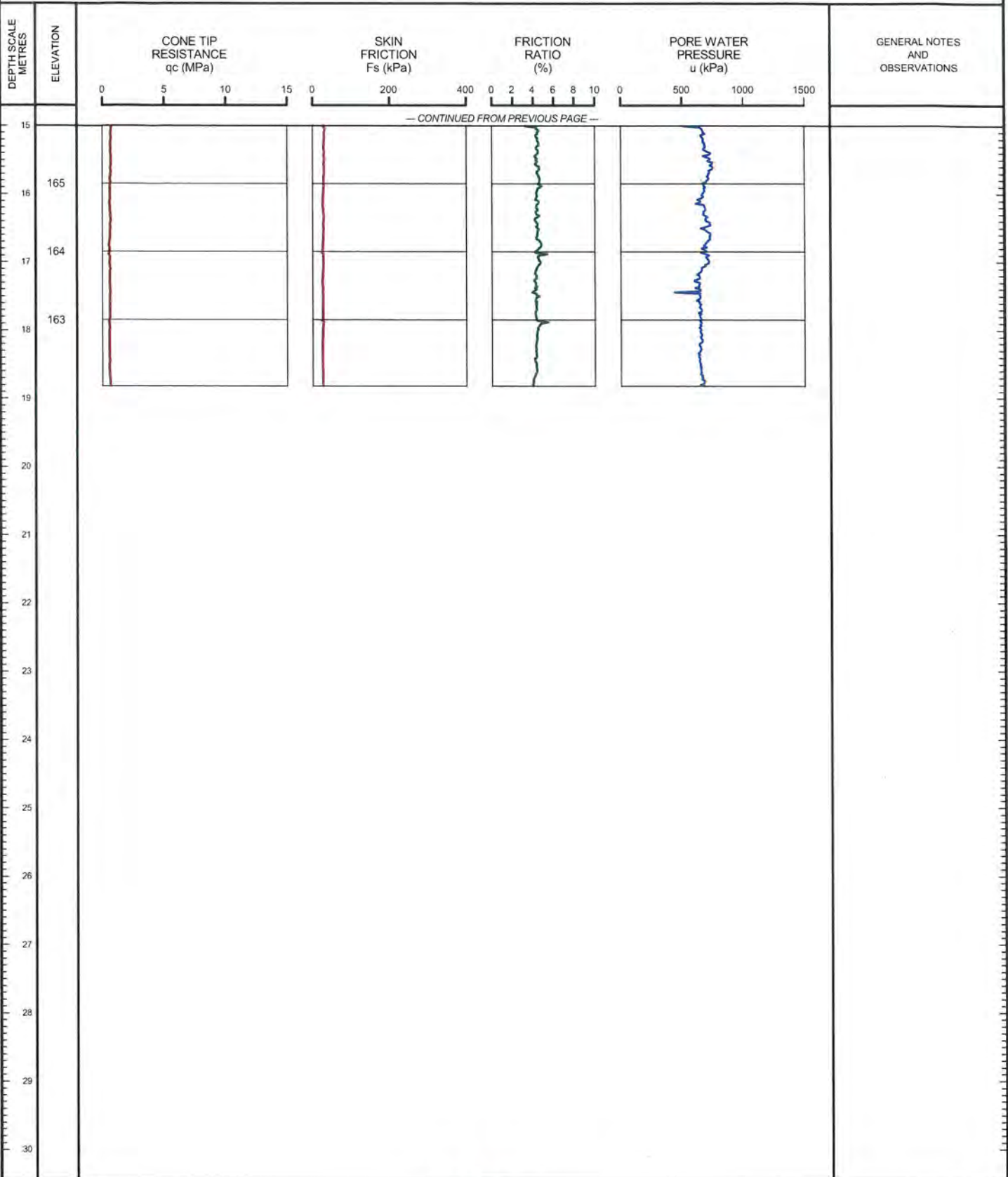
SHEET 2 OF 2

LOCATION: N 4681733.4 ;E 330757.6

TEST DATE: August 6, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.77m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-153

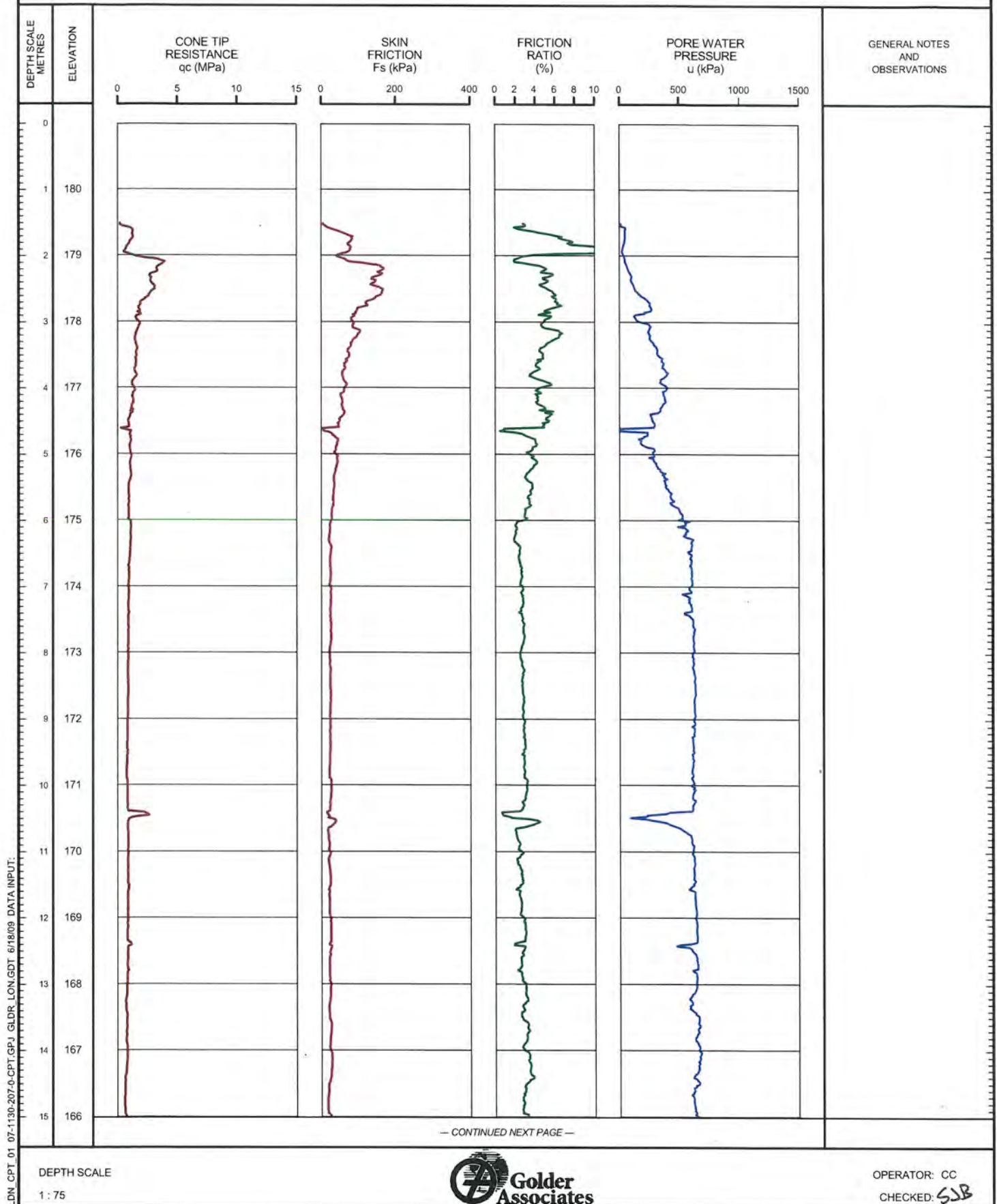
SHEET 1 OF 2

LOCATION: N 4681793.3 E 330575.8

TEST DATE: August 7, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.50m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT-GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-153

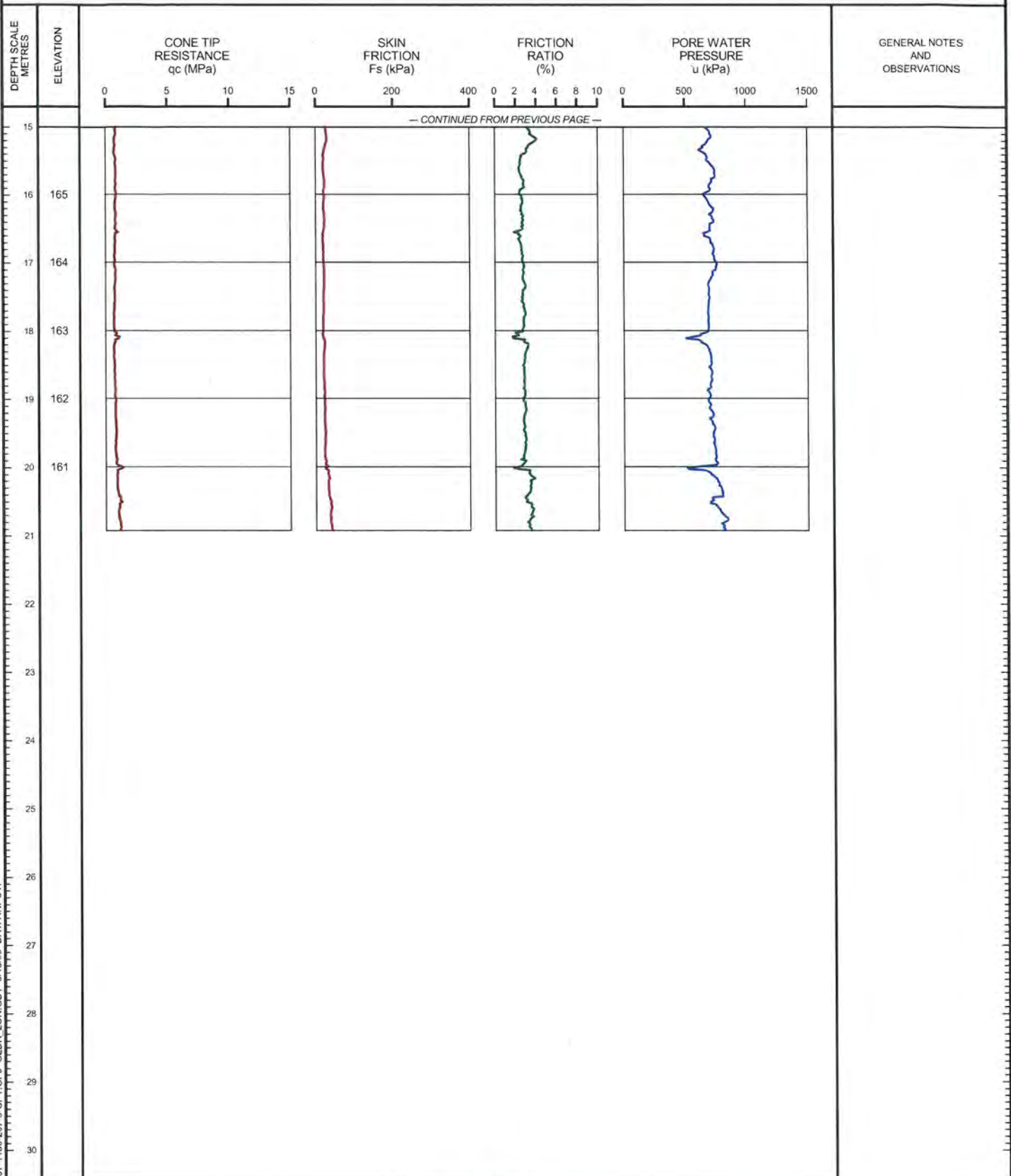
SHEET 2 OF 2

LOCATION: N 4681793.3 ; E 330575.8

TEST DATE: August 7, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.50m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT_01_07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-154

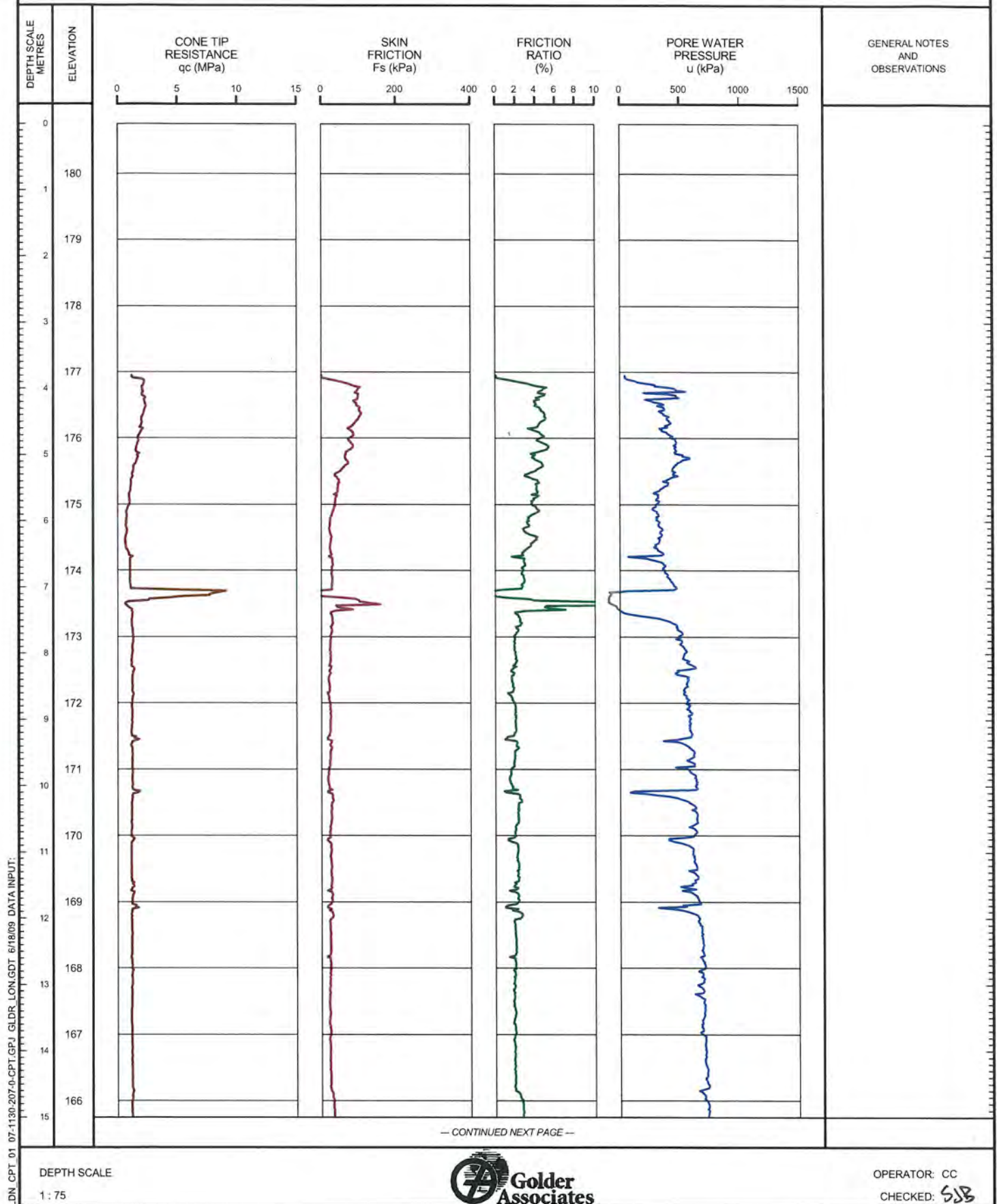
SHEET 1 OF 2

LOCATION: N 4681963.3 ; E 330191.0

TEST DATE:

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 4.58m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-154

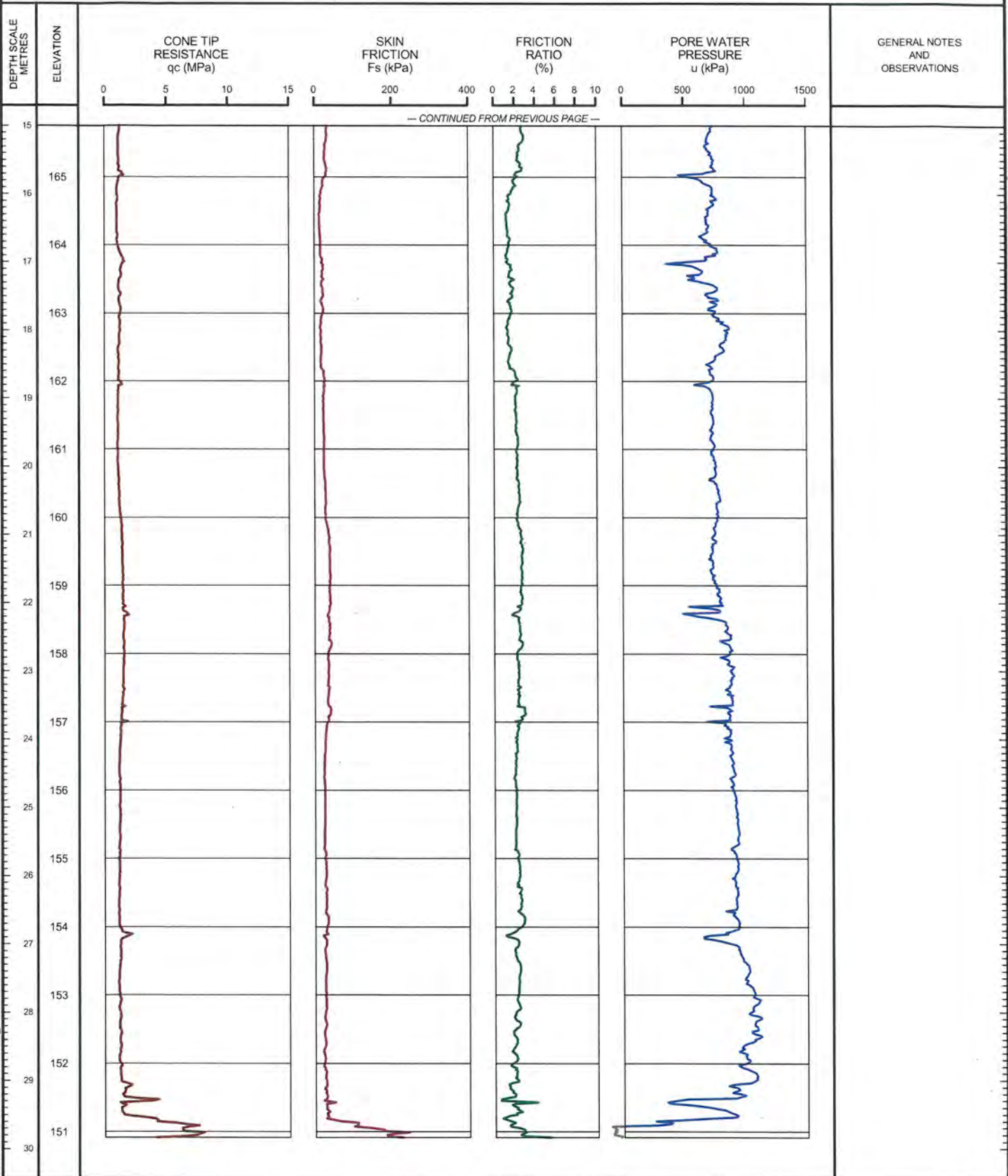
SHEET 2 OF 2

LOCATION: N 4681963.3 ; E 330191.0

TEST DATE:

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 4.58m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-155

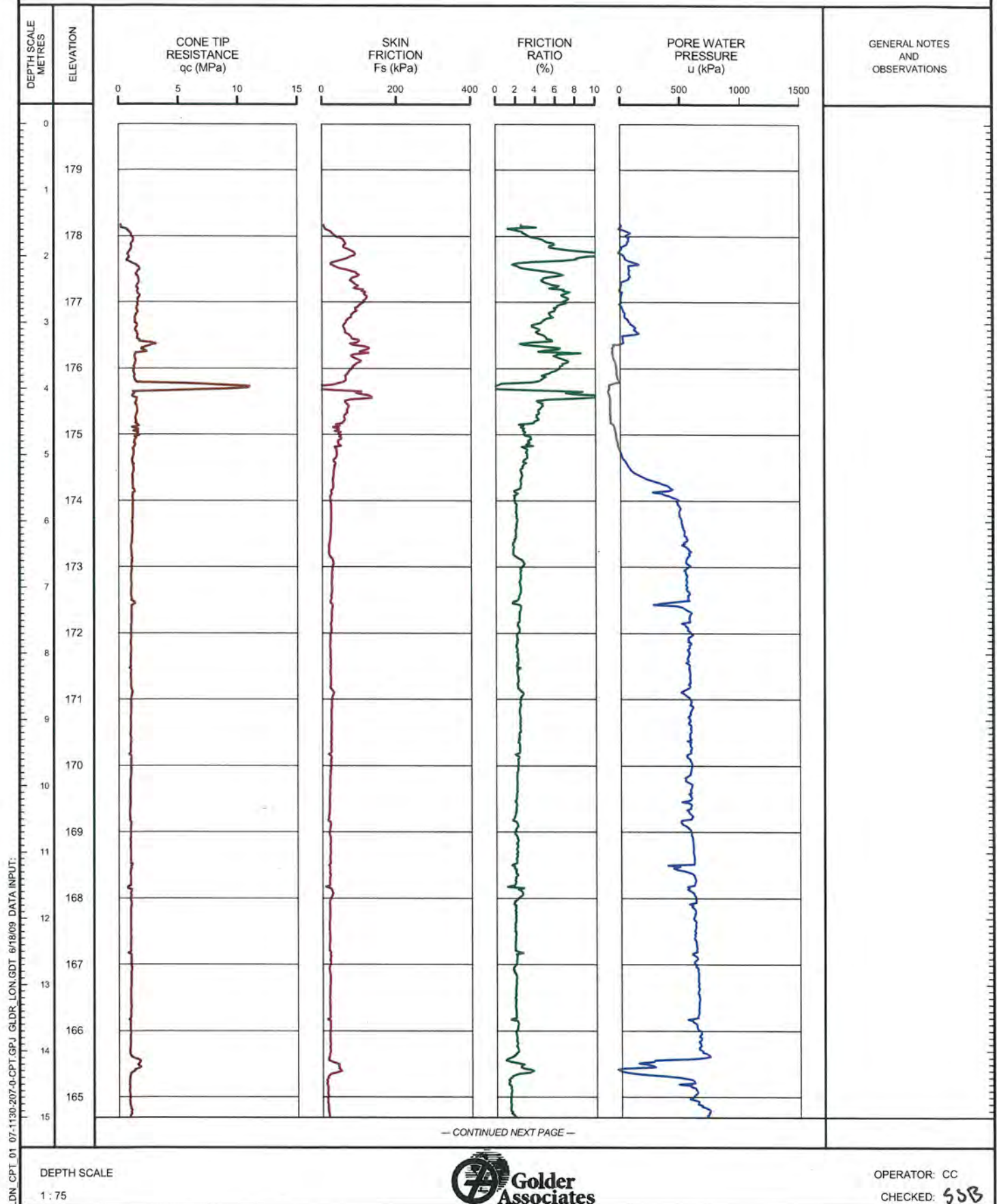
SHEET 1 OF 2

LOCATION: N 4682065.8 ; E 329981.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-155

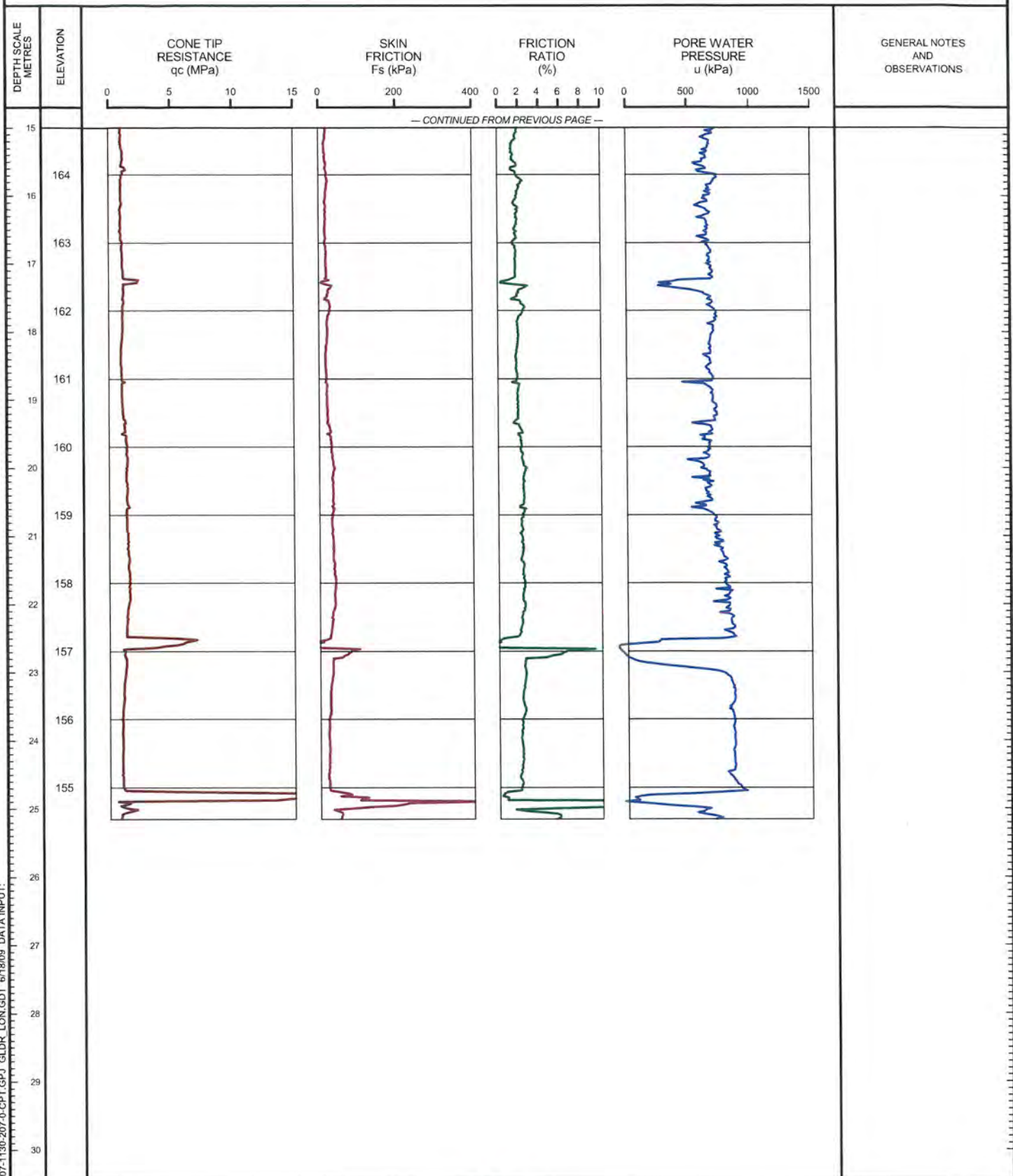
SHEET 2 OF 2

LOCATION: N 4682065.8 ; E 329981.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *JSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-159

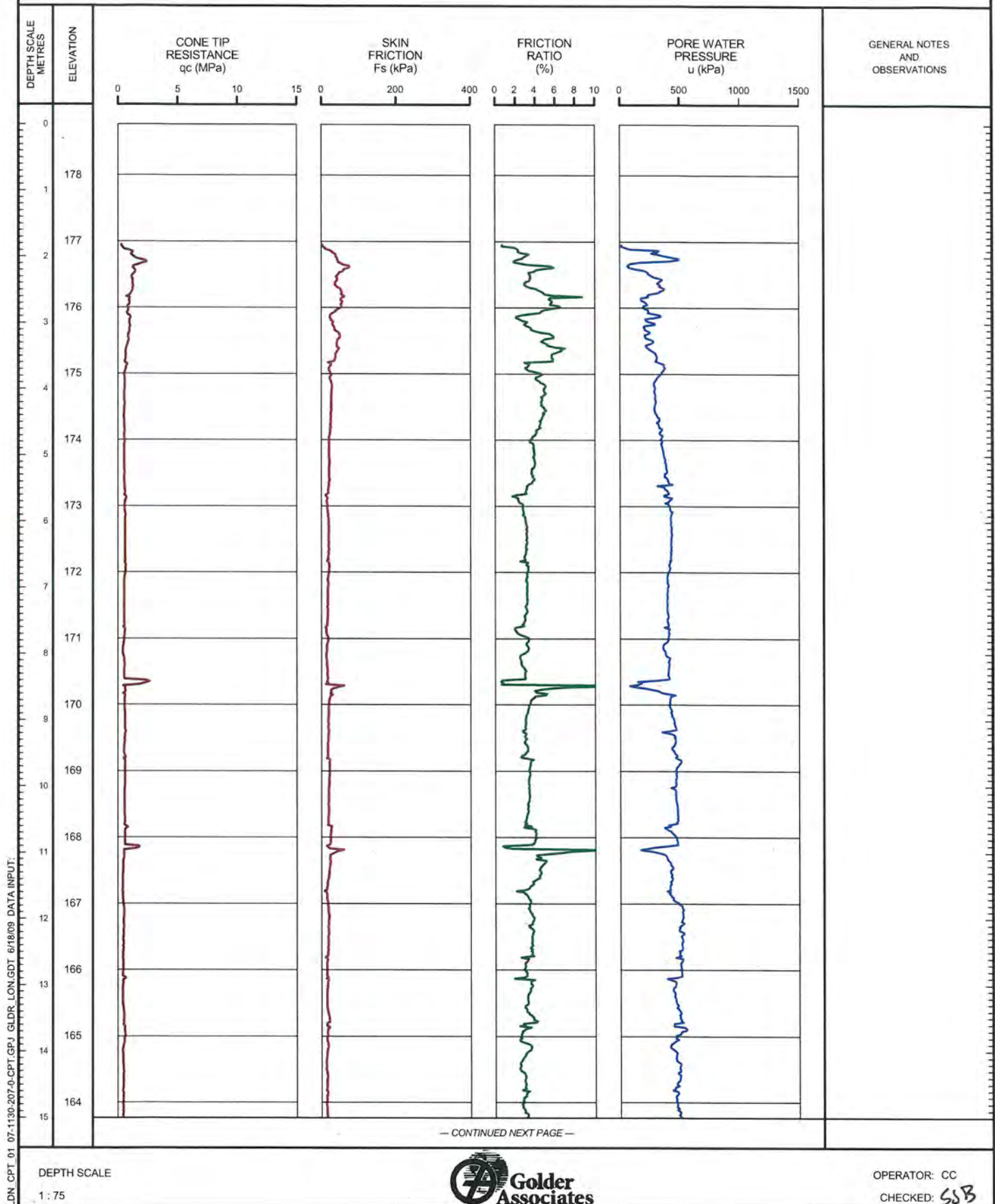
SHEET 1 OF 2

LOCATION: N 4682292.8 ; E 329332.1

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.83m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/19/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-159

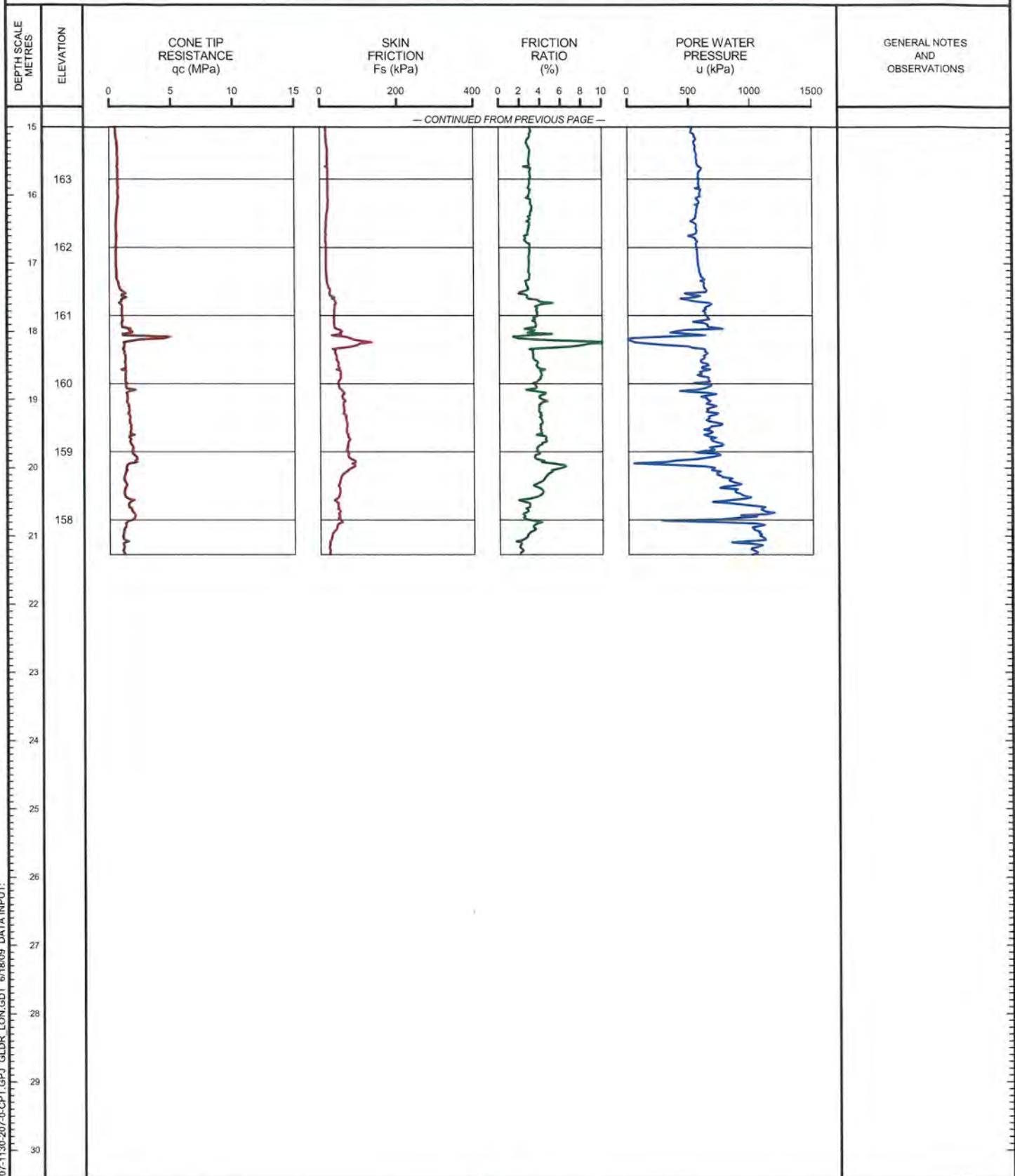
SHEET 2 OF 2

LOCATION: N 4682292.8 ; E 329332.1

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.83m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-160

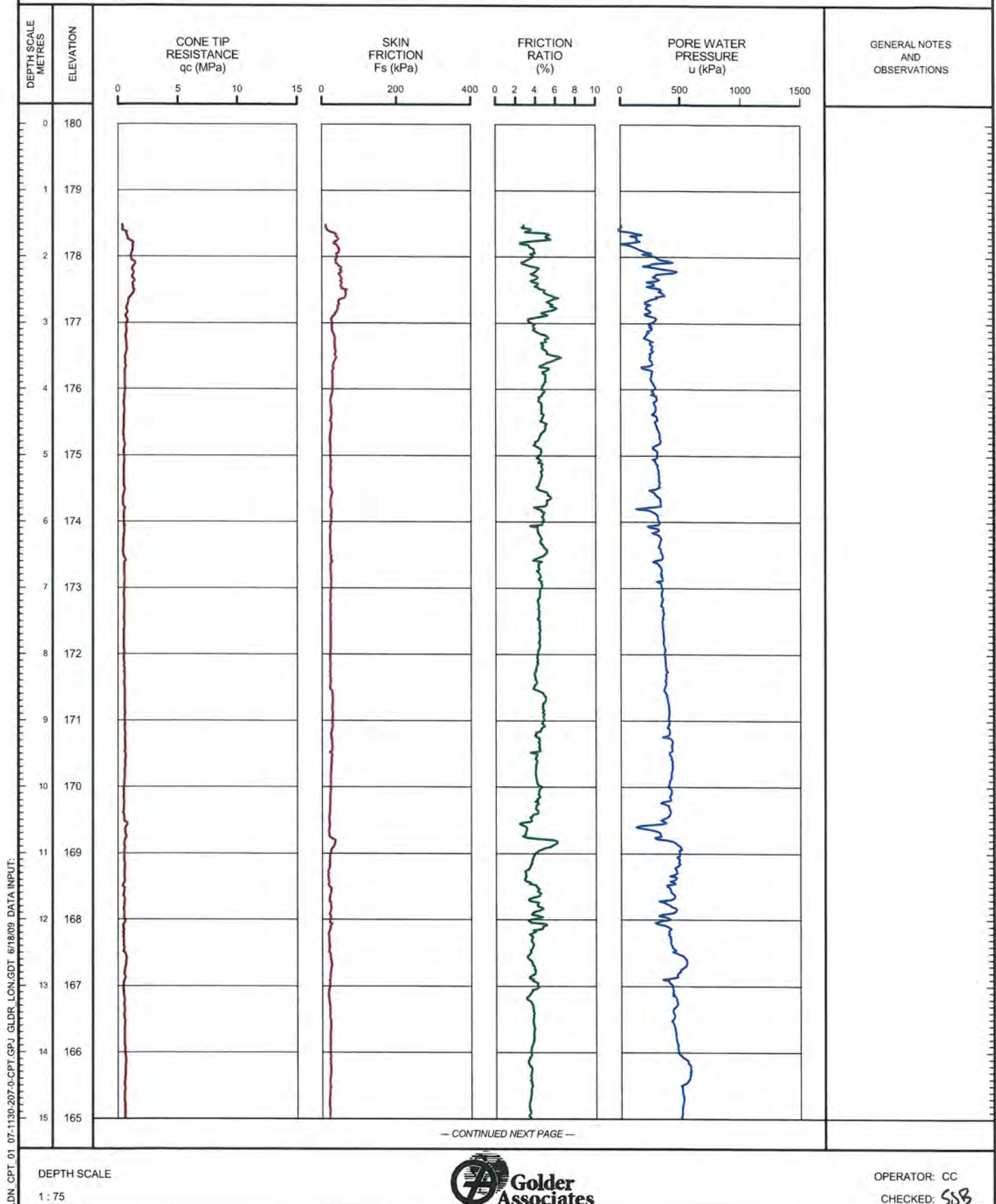
SHEET 1 OF 2

LOCATION: N 4682216.8 E 329156.2

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-160

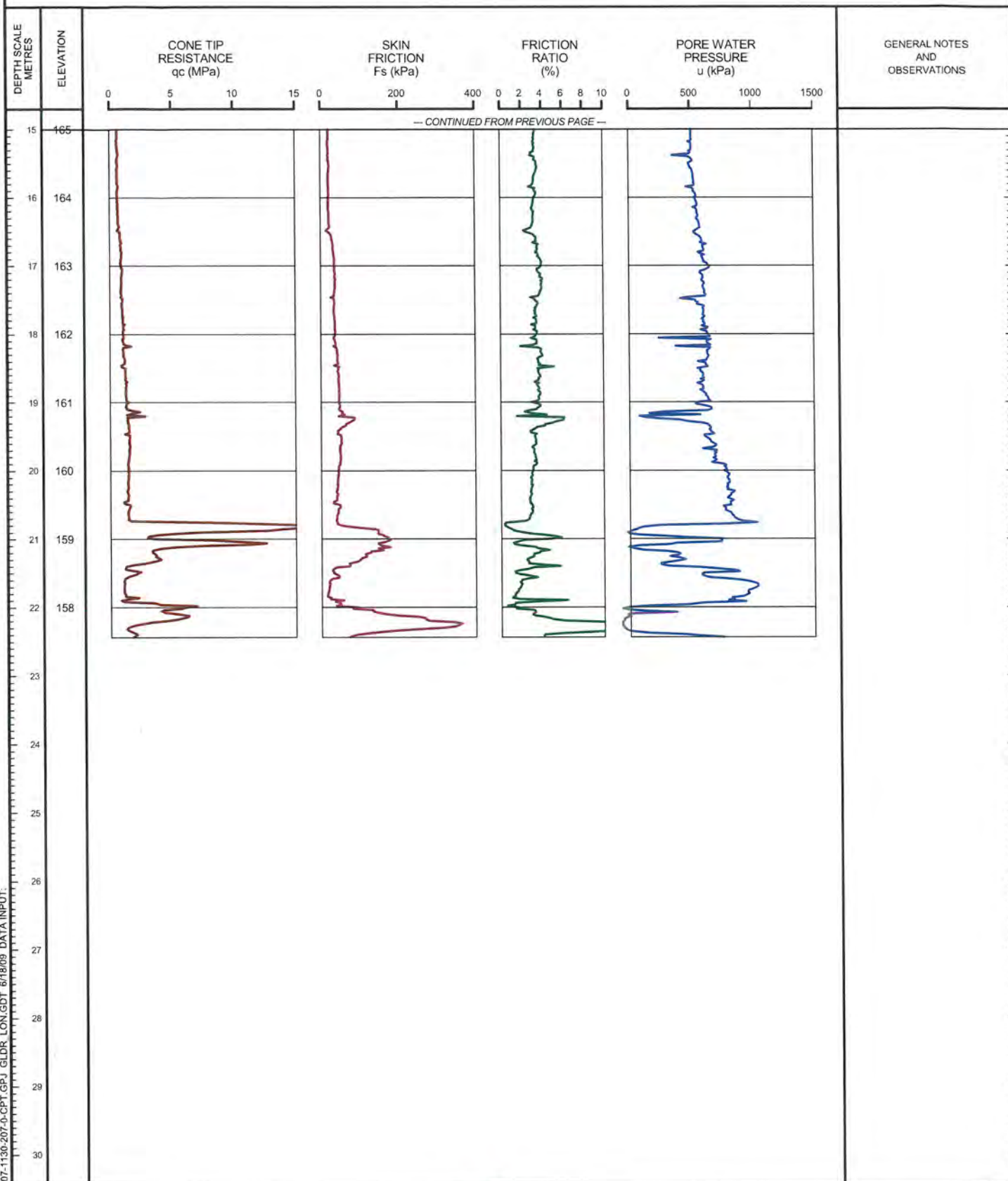
SHEET 2 OF 2

LOCATION: N 4682216 8 :E 329156.2

TEST DATE: August 12, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 1.53m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-161

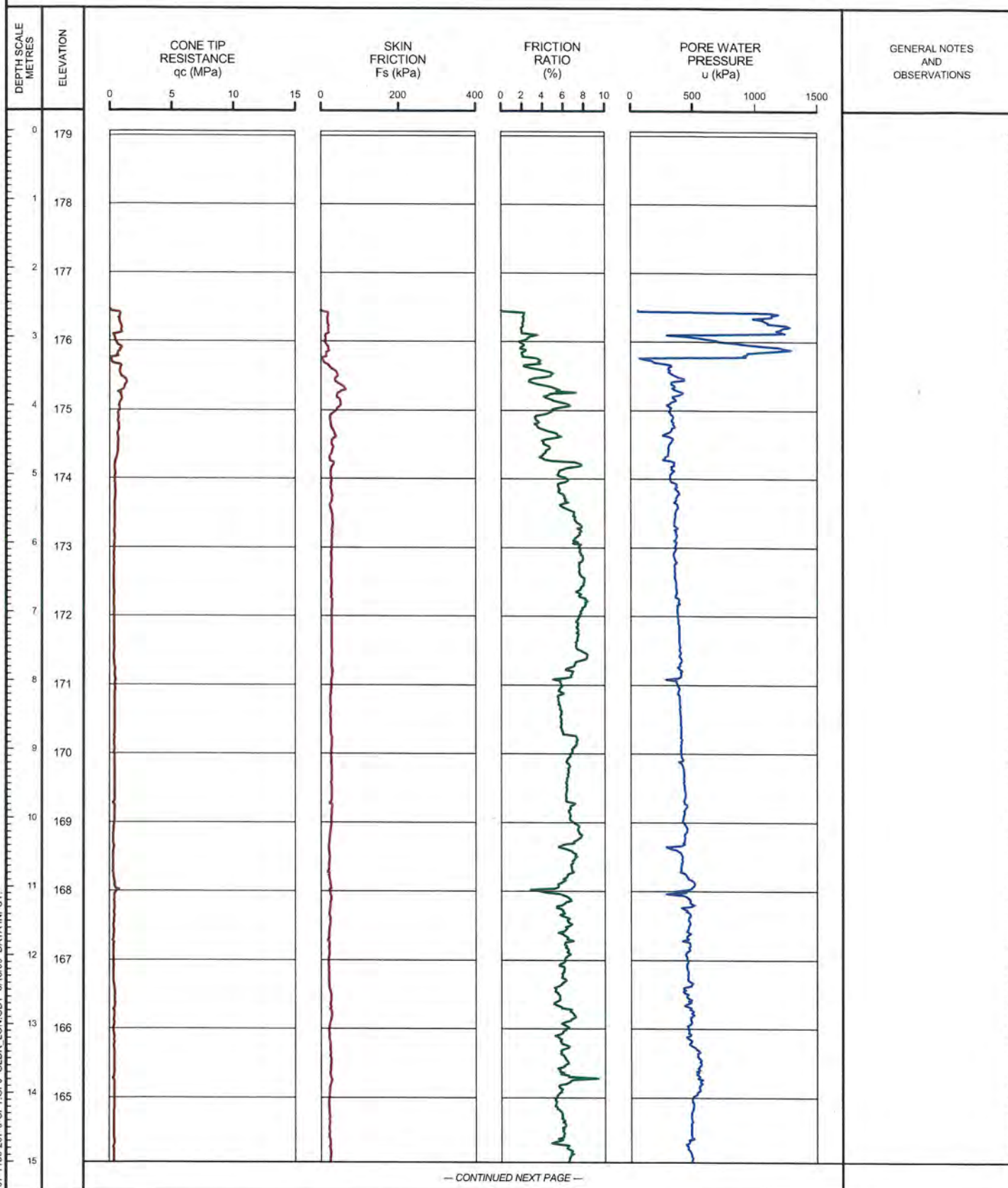
SHEET 1 OF 2

LOCATION: N 4682177.6 ; E 328793.9

TEST DATE: August 14, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.60m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE
1 : 75

OPERATOR: CC

CHECKED: *SSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-161

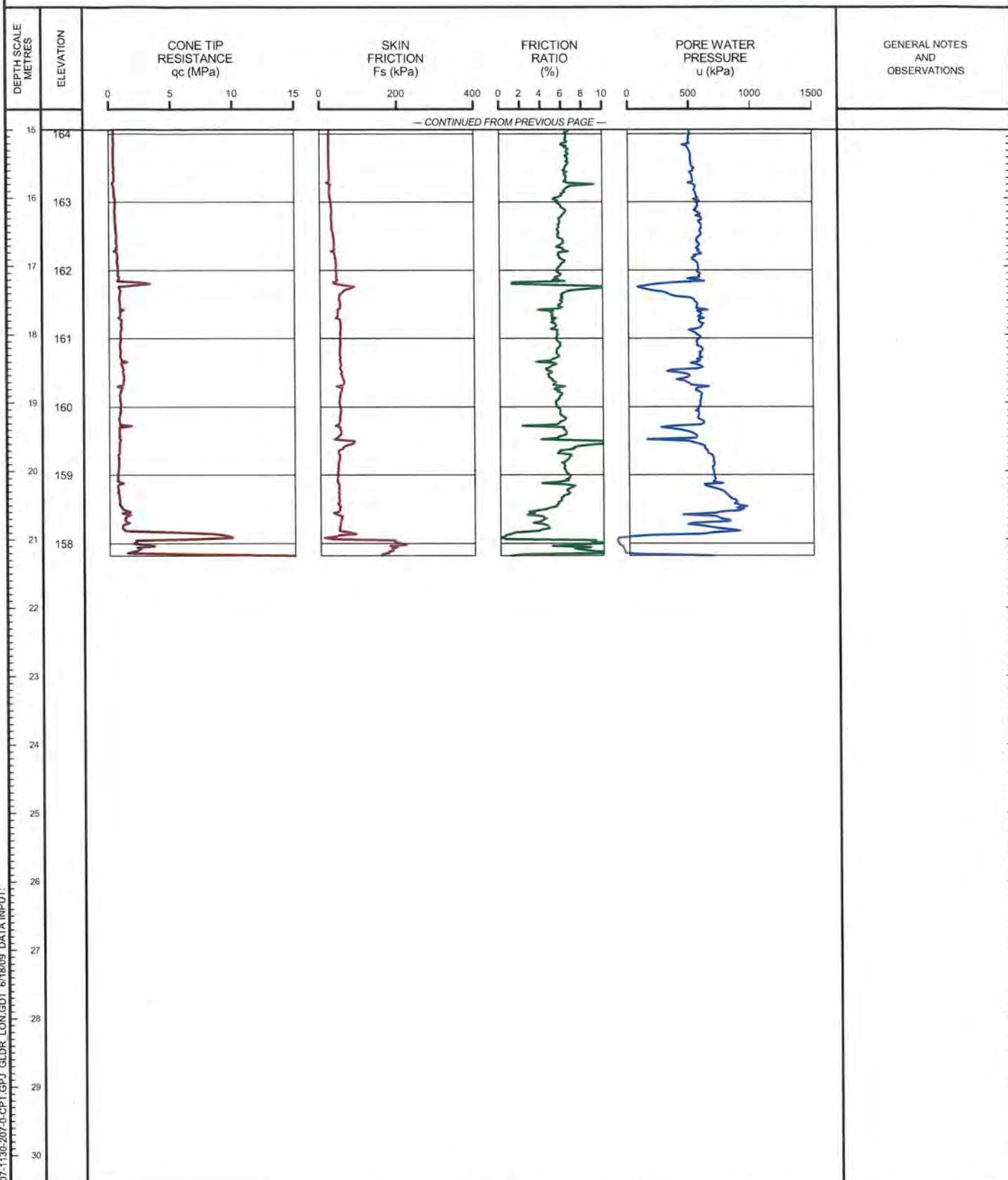
SHEET 2 OF 2

LOCATION: N 4682177.6 ; E 328793.9

TEST DATE: August 14, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.60m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: SJB

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

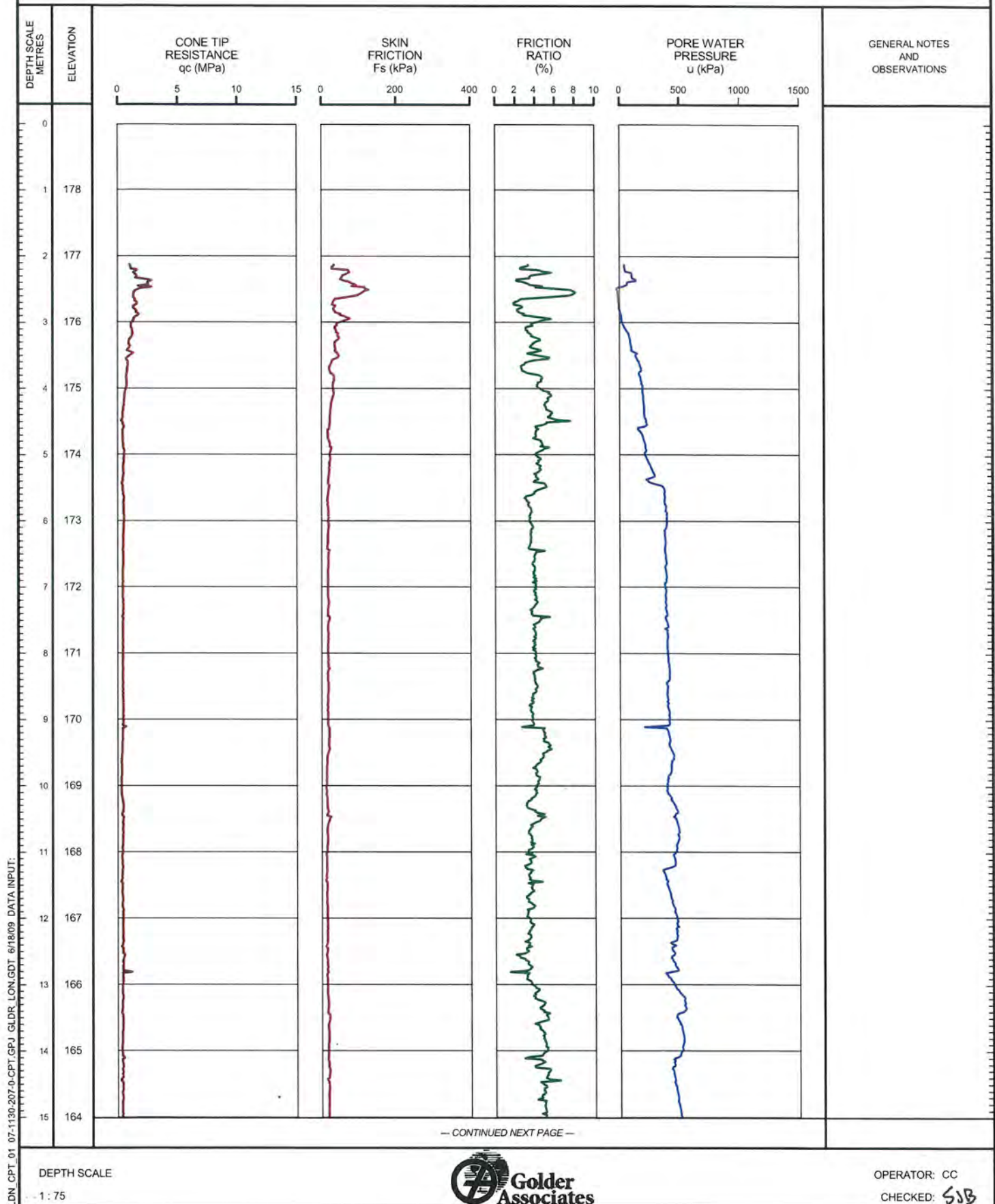
SHEET 1 OF 2

LOCATION: N 4682439.2 :E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

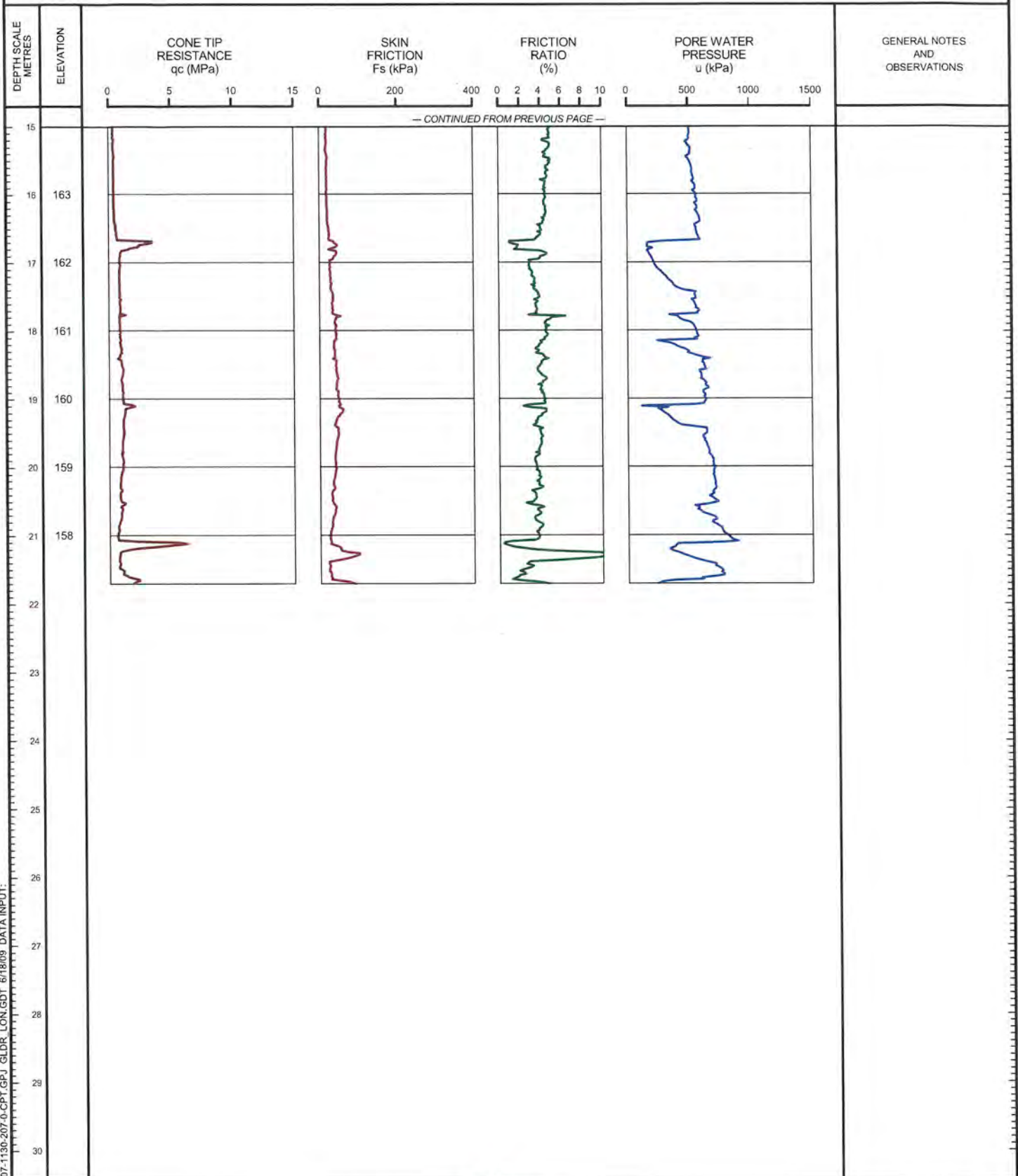
SHEET 2 OF 2

LOCATION: N 4682439.2; E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01_07-1130-207-0.CPT.GPJ GLDR LONGIT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

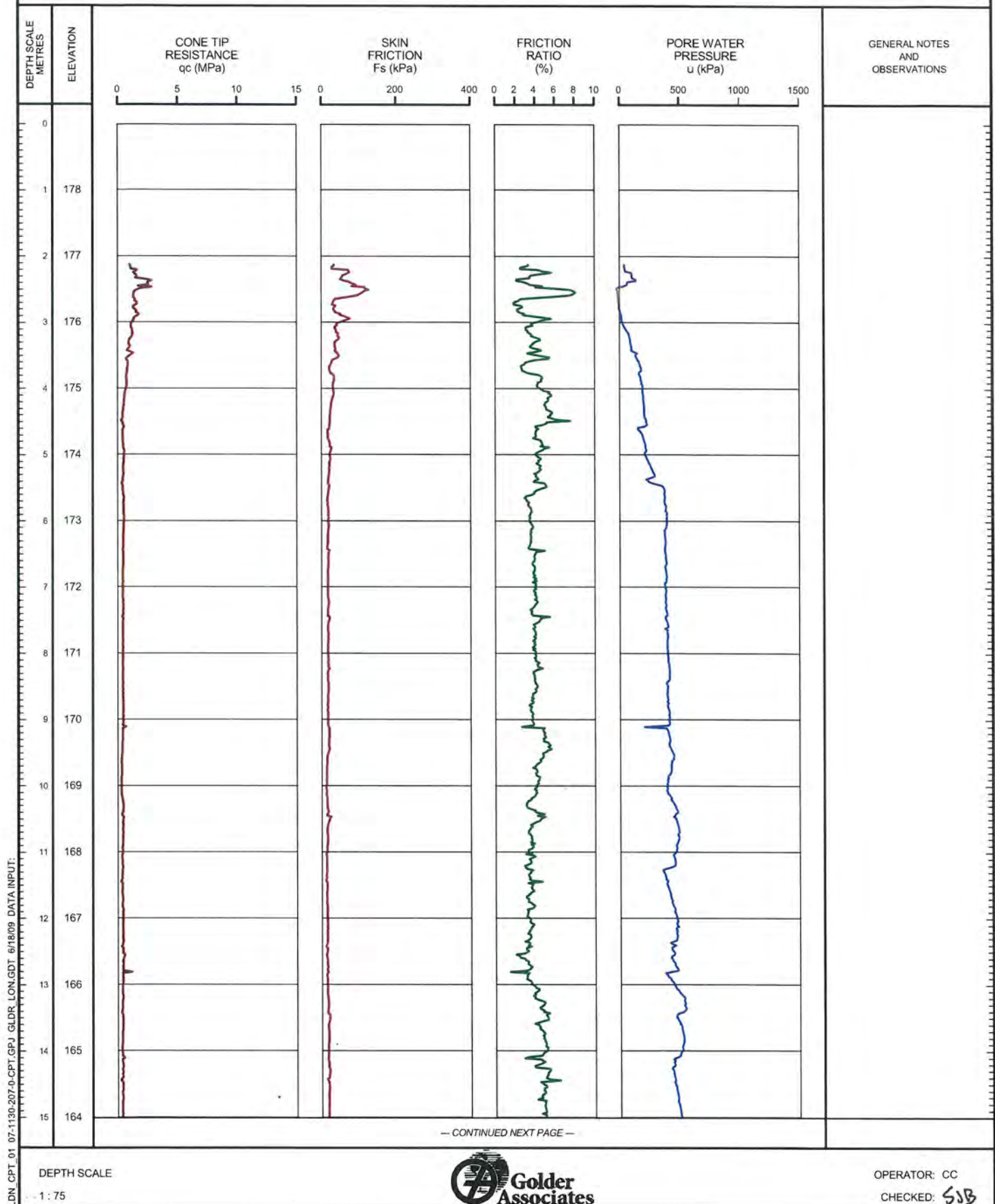
SHEET 1 OF 2

LOCATION: N 4682439.2 :E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-162

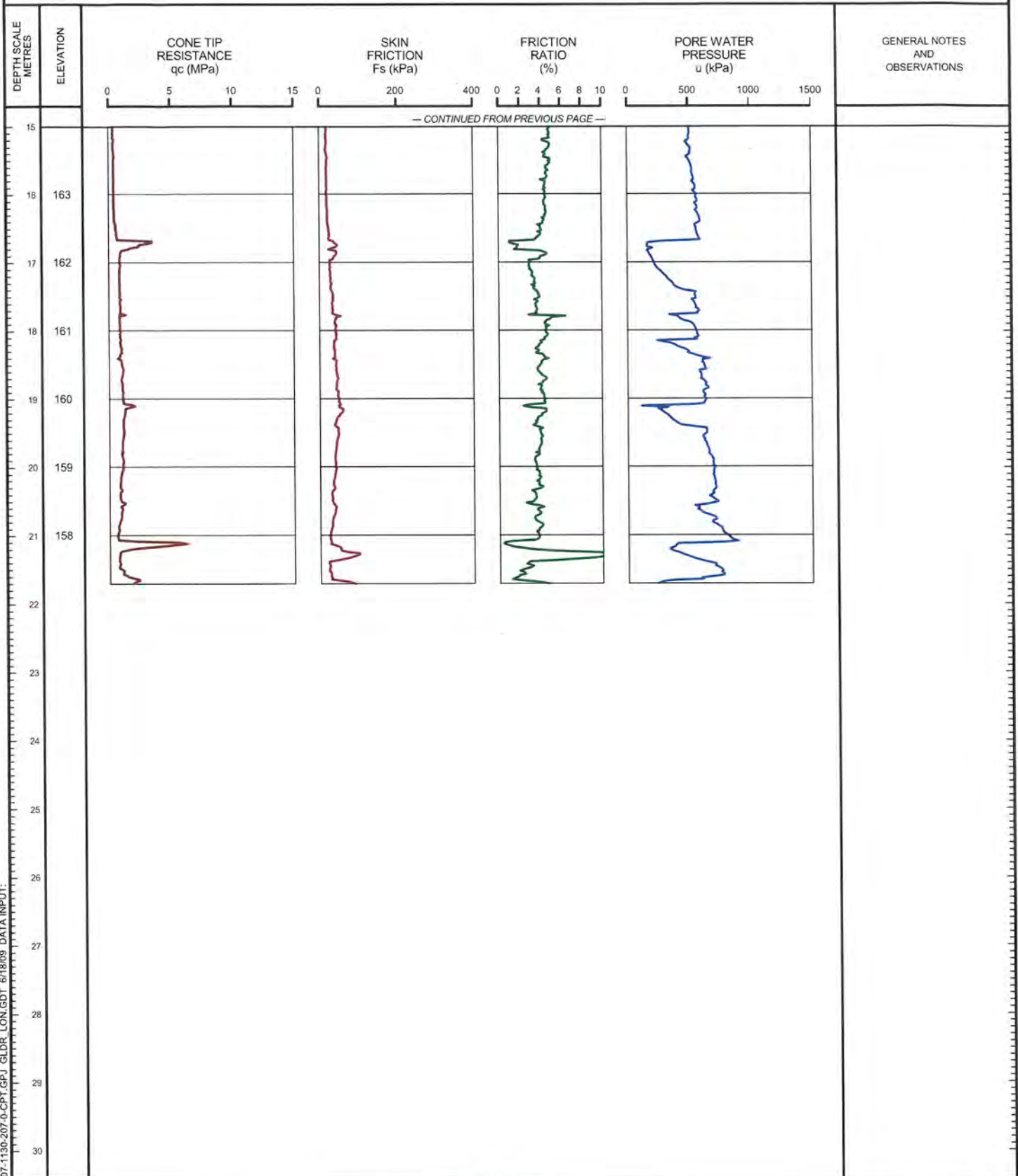
SHEET 2 OF 2

LOCATION: N 4682439.2; E 328729.1

TEST DATE: September 3, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.13m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT_01_07-1130-207-0.CPT.GPJ GLDR LONGIT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SSB*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-165

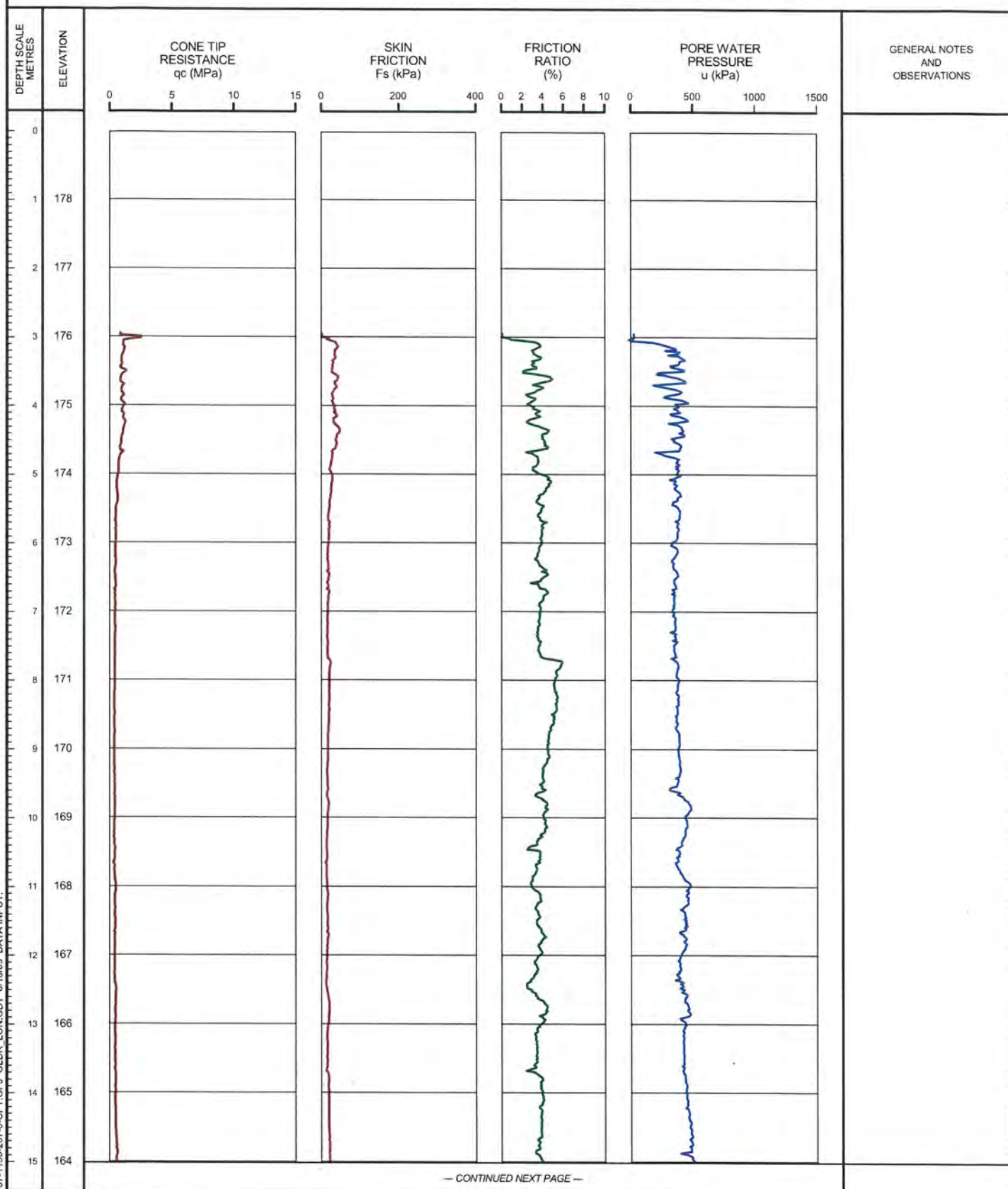
SHEET 1 OF 2

LOCATION: N 4682188.2 ; E 328457.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.95m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE
1 : 75

OPERATOR: CC

CHECKED: *SS*

PROJECT: 07-1130-207-0

RECORD OF CONE PENETRATION TEST CPT-165

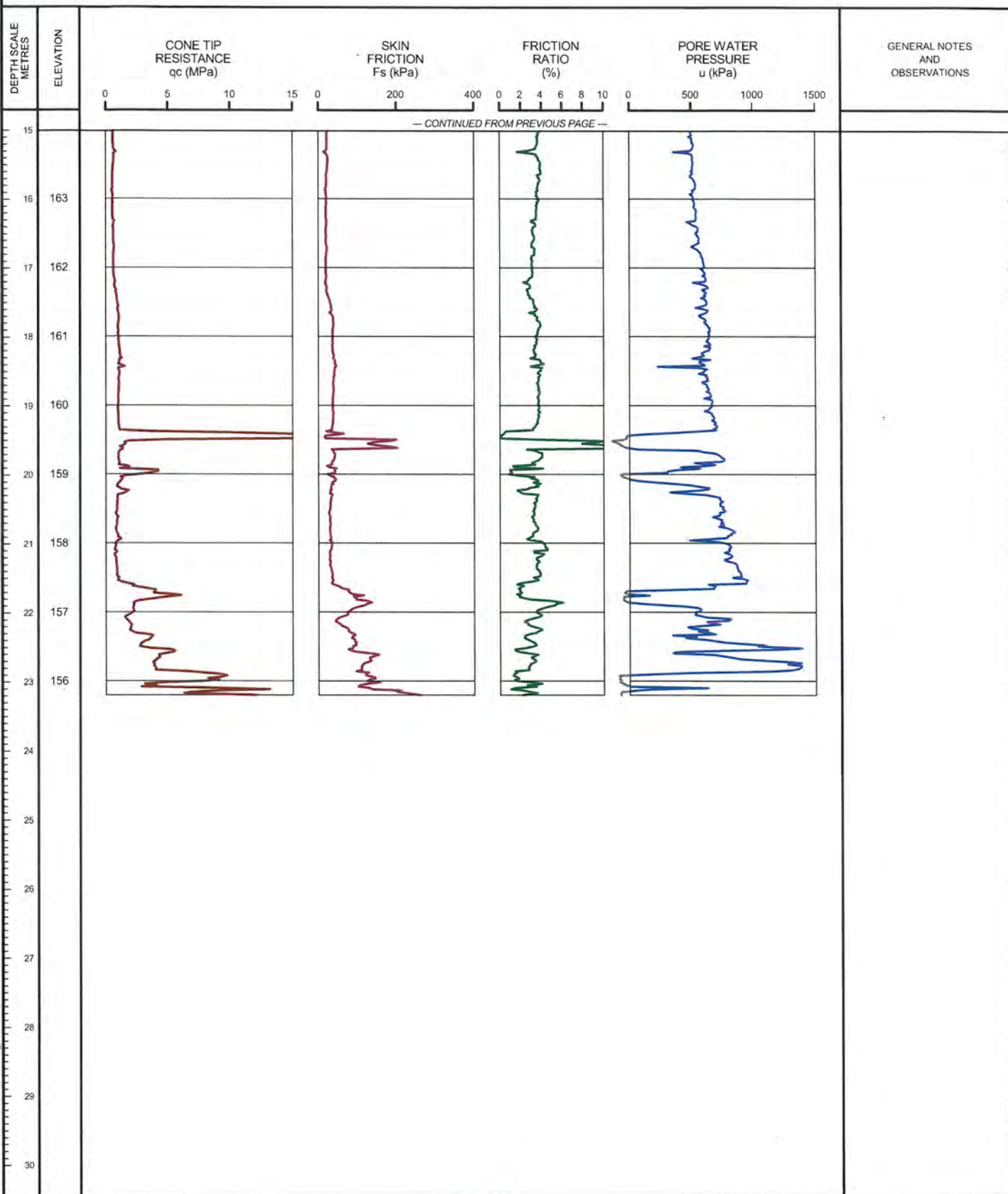
SHEET 2 OF 2

LOCATION: N 4682188.2 ; E 328457.7

TEST DATE: August 13, 2008

DATUM: GEODETIC

GROUND SURFACE ELEVATION: PREDRILL DEPTH: 2.95m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN CPT 01 07-1130-207-0-CPT.GPJ GLDR LON.GDT 6/18/09 DATA INPUT:

DEPTH SCALE

1 : 75



OPERATOR: CC

CHECKED: *SVB*

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-338

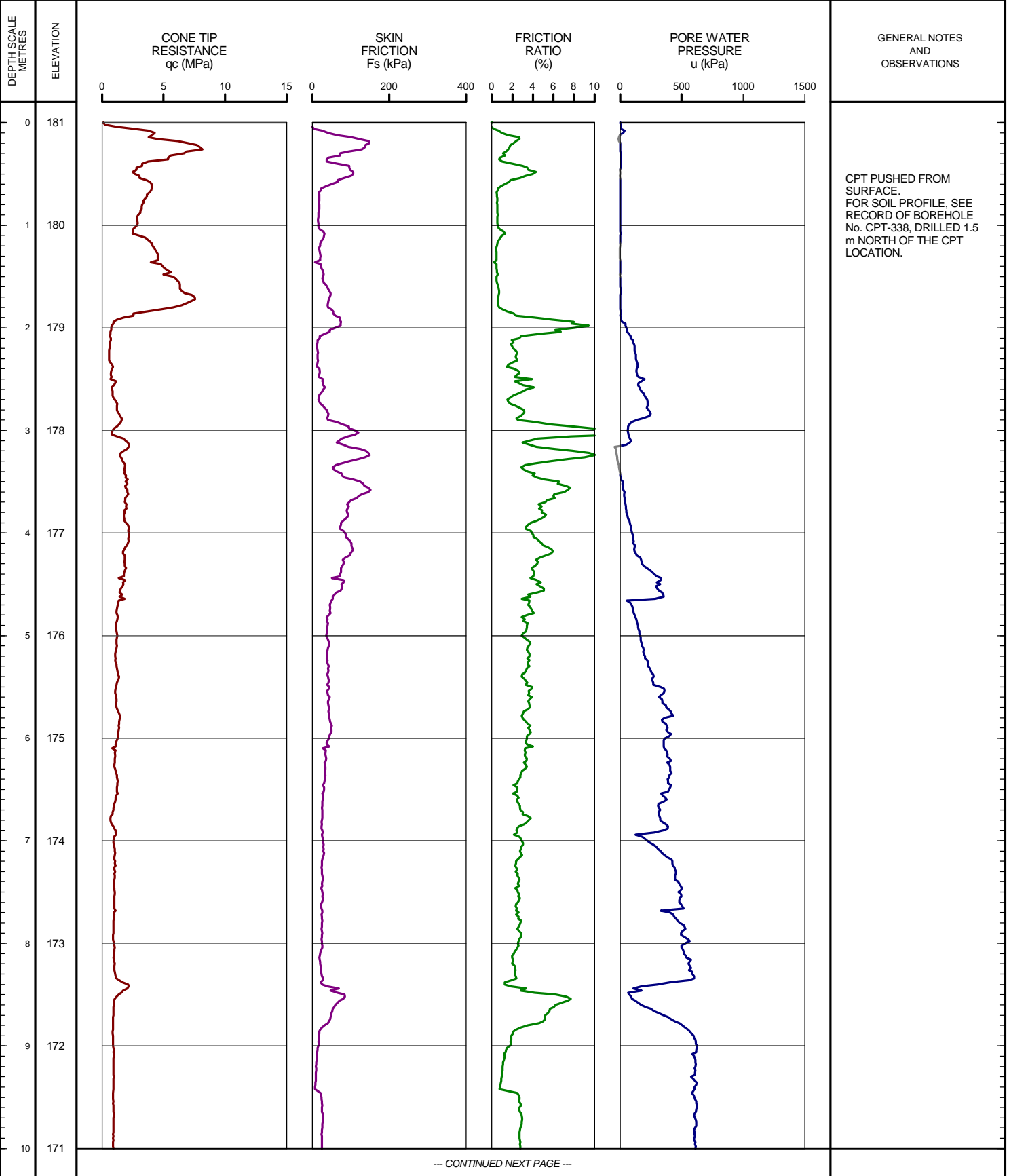
SHEET 1 OF 3

LOCATION: N 4681980.3 ;E 330141.6

TEST DATE: December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 181.22m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-338

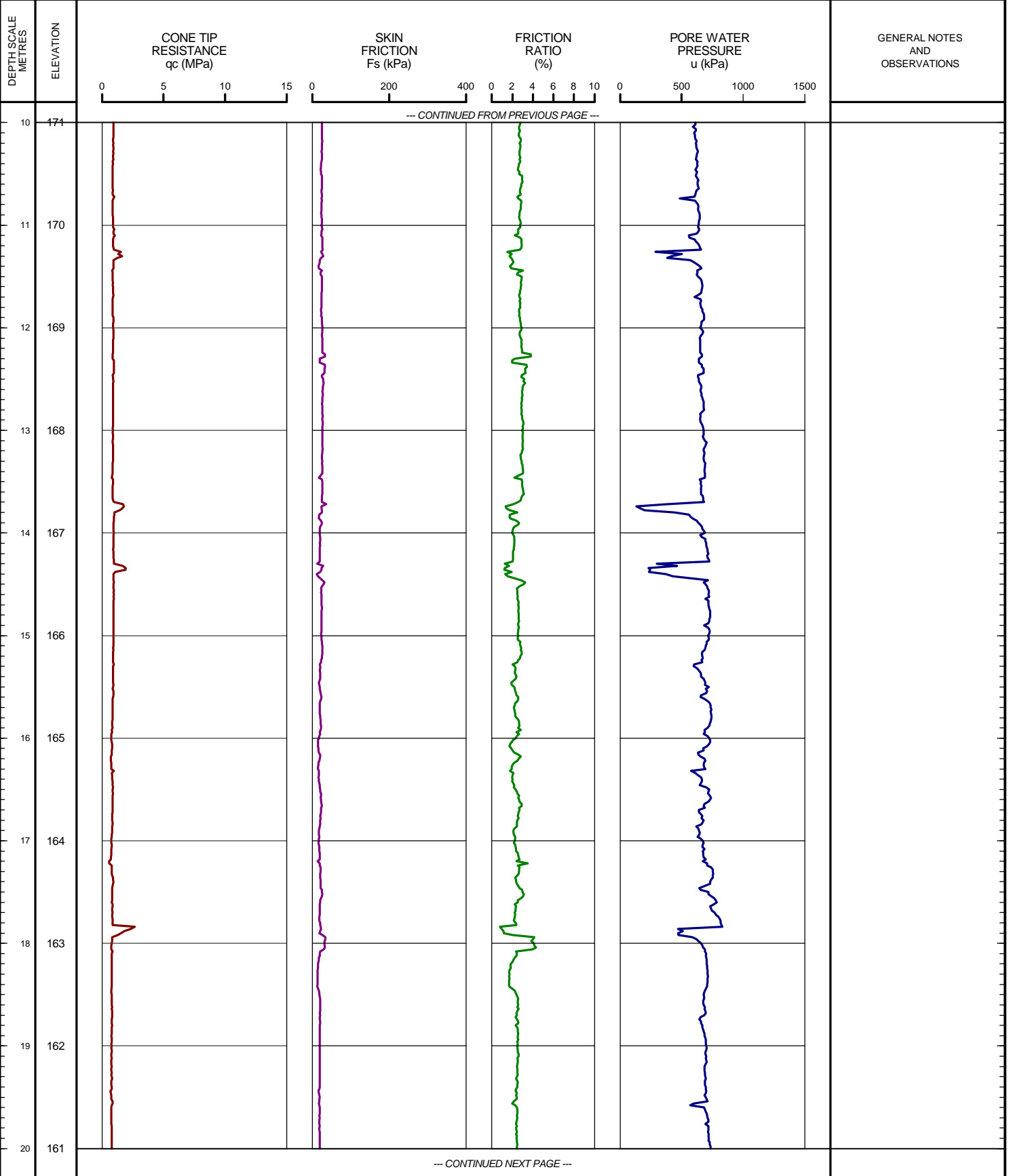
SHEET 2 OF 3

LOCATION: N 4681980.3 ;E 330141.6

TEST DATE: December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 181.22m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-338

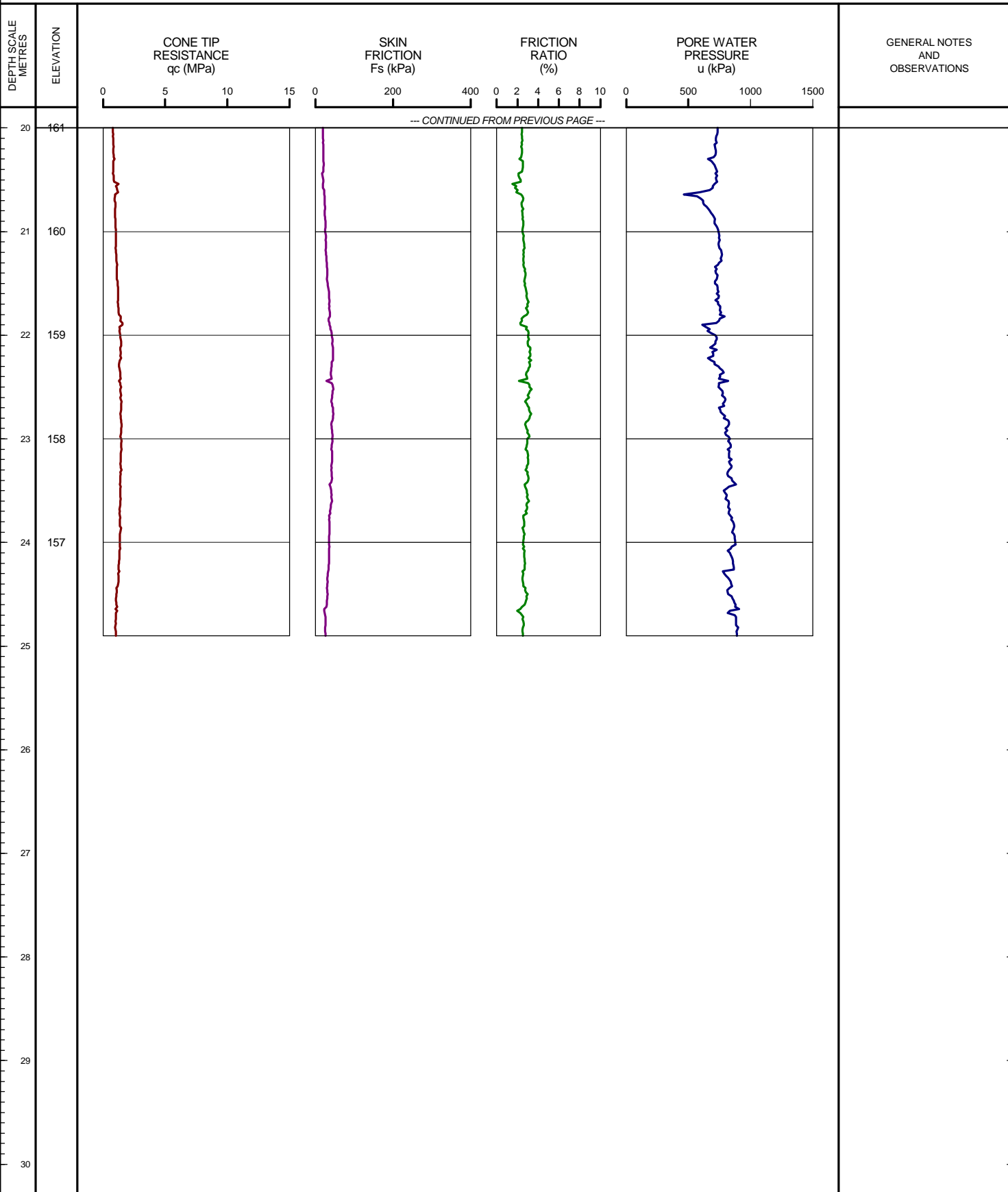
SHEET 3 OF 3

LOCATION: N 4681980.3 ;E 330141.6

TEST DATE: December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 181.22m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-340

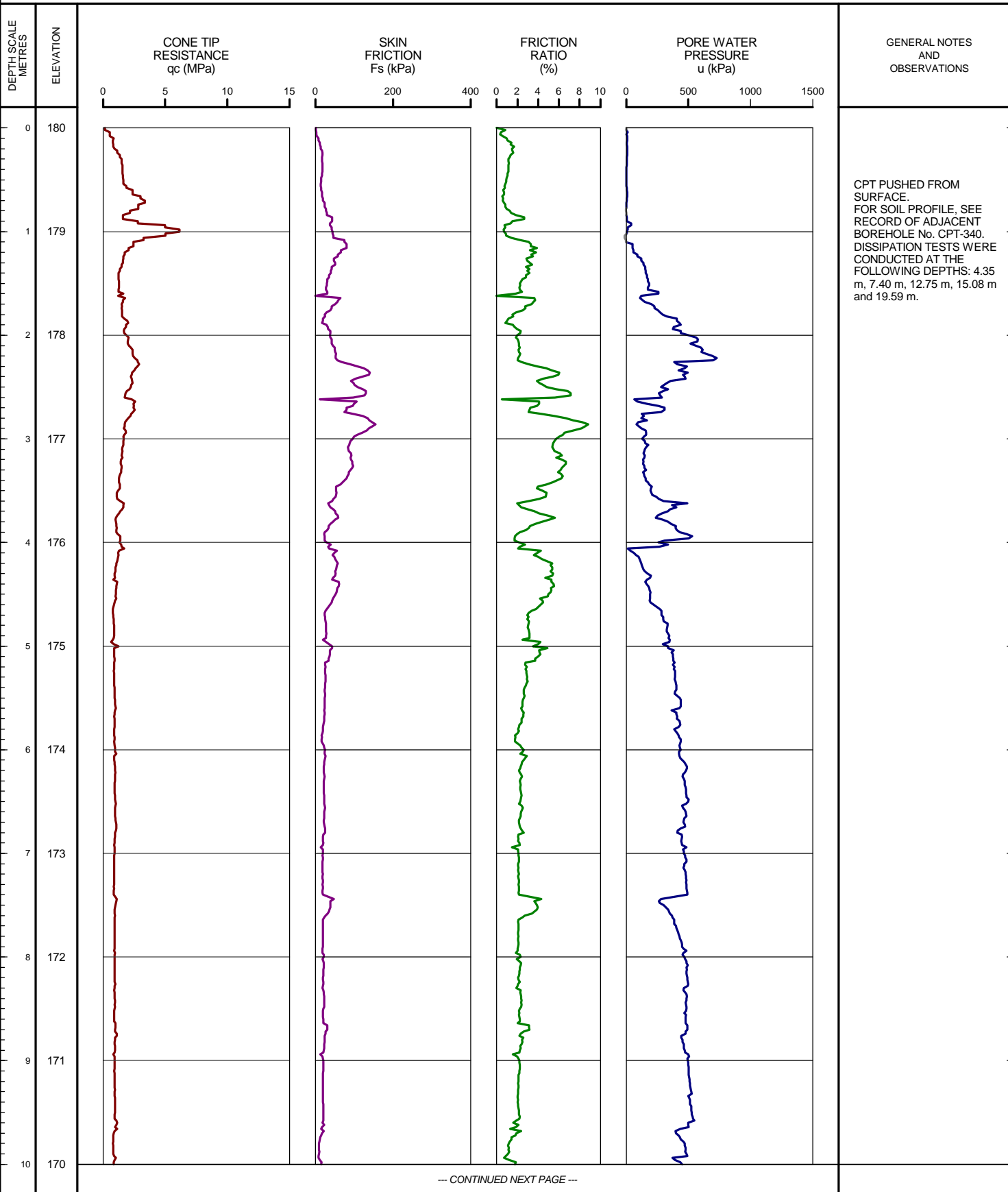
SHEET 1 OF 3

LOCATION: N 4682203.2 ;E 329538.7

TEST DATE: December 10, 2009 - December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.58m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-340

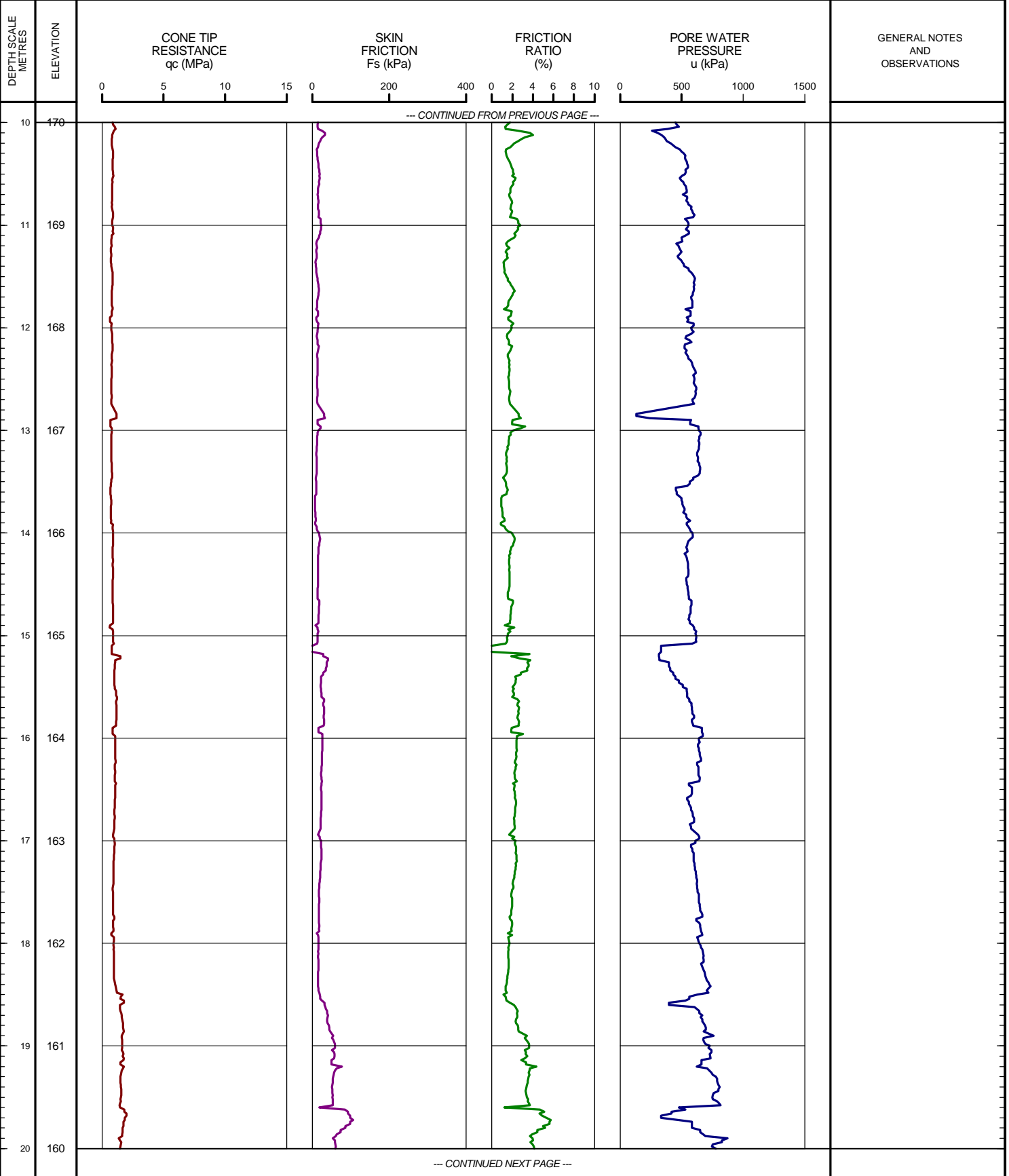
SHEET 2 OF 3

LOCATION: N 4682203.2 ;E 329538.7

TEST DATE: December 10, 2009 - December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.58m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-340

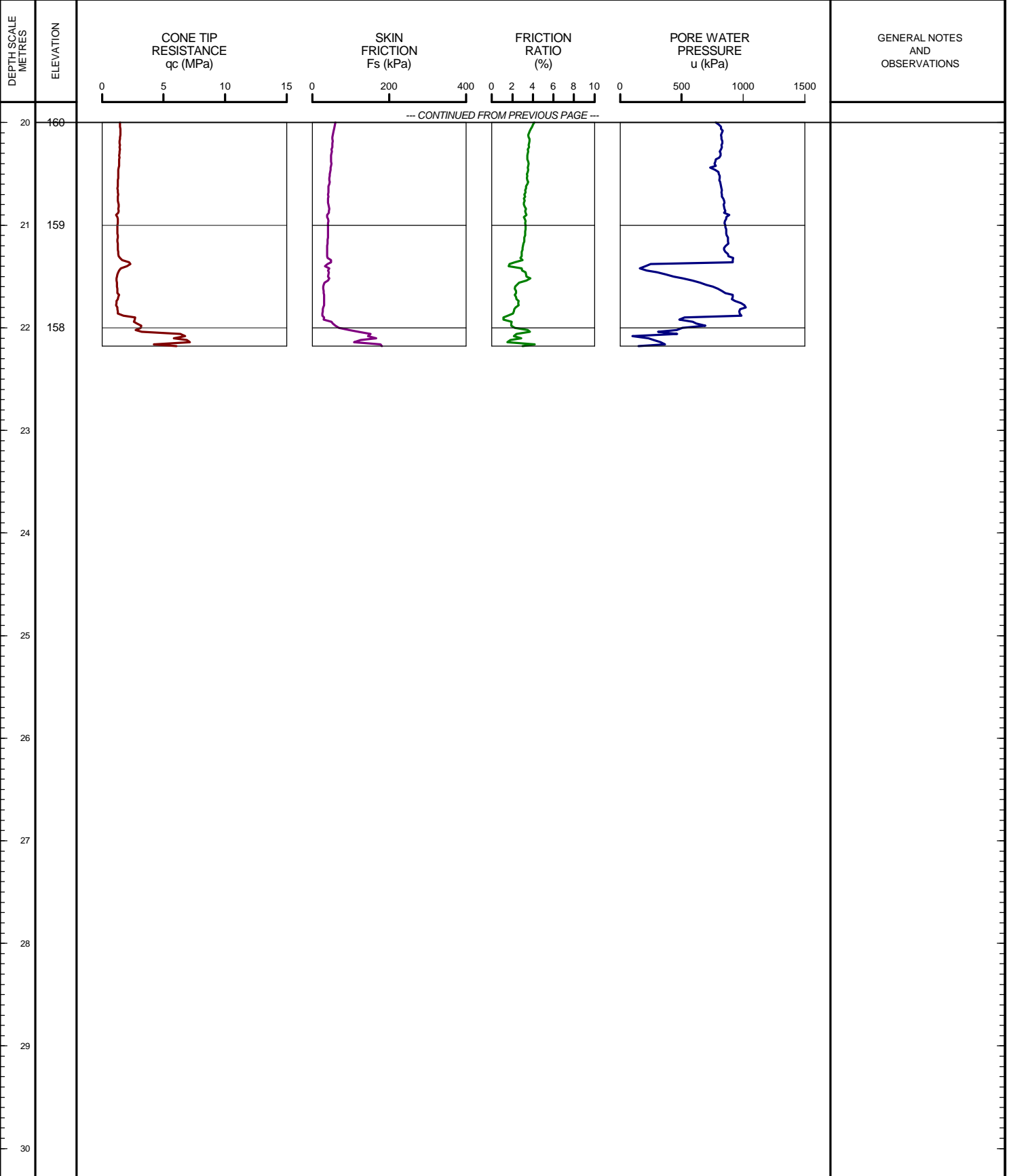
SHEET 3 OF 3

LOCATION: N 4682203.2 ;E 329538.7

TEST DATE: December 10, 2009 - December 15, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.58m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-342

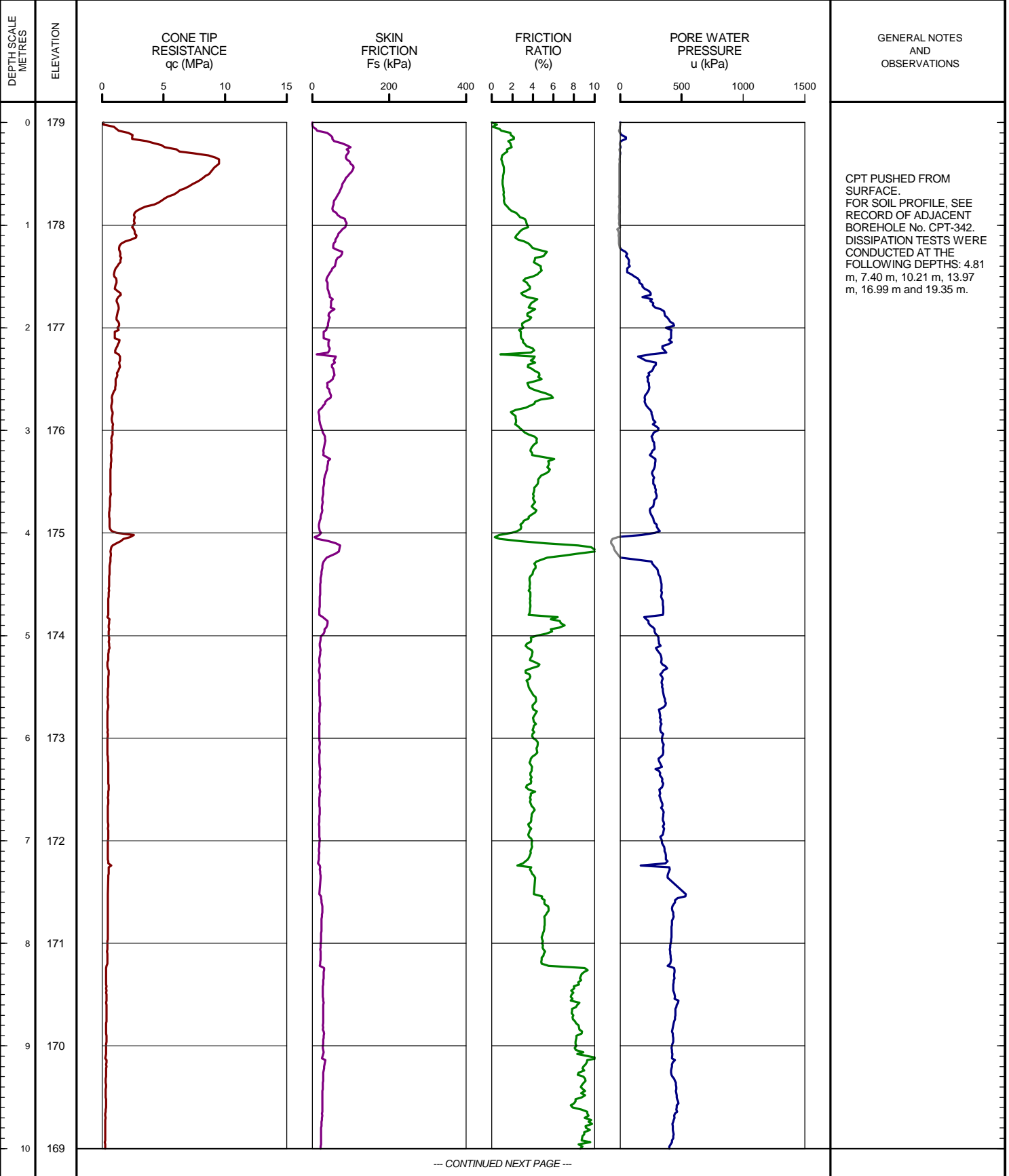
SHEET 1 OF 3

LOCATION: N 4682246.9 ;E 329168.7

TEST DATE: December 4, 2009 - December 8, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 178.75m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-342

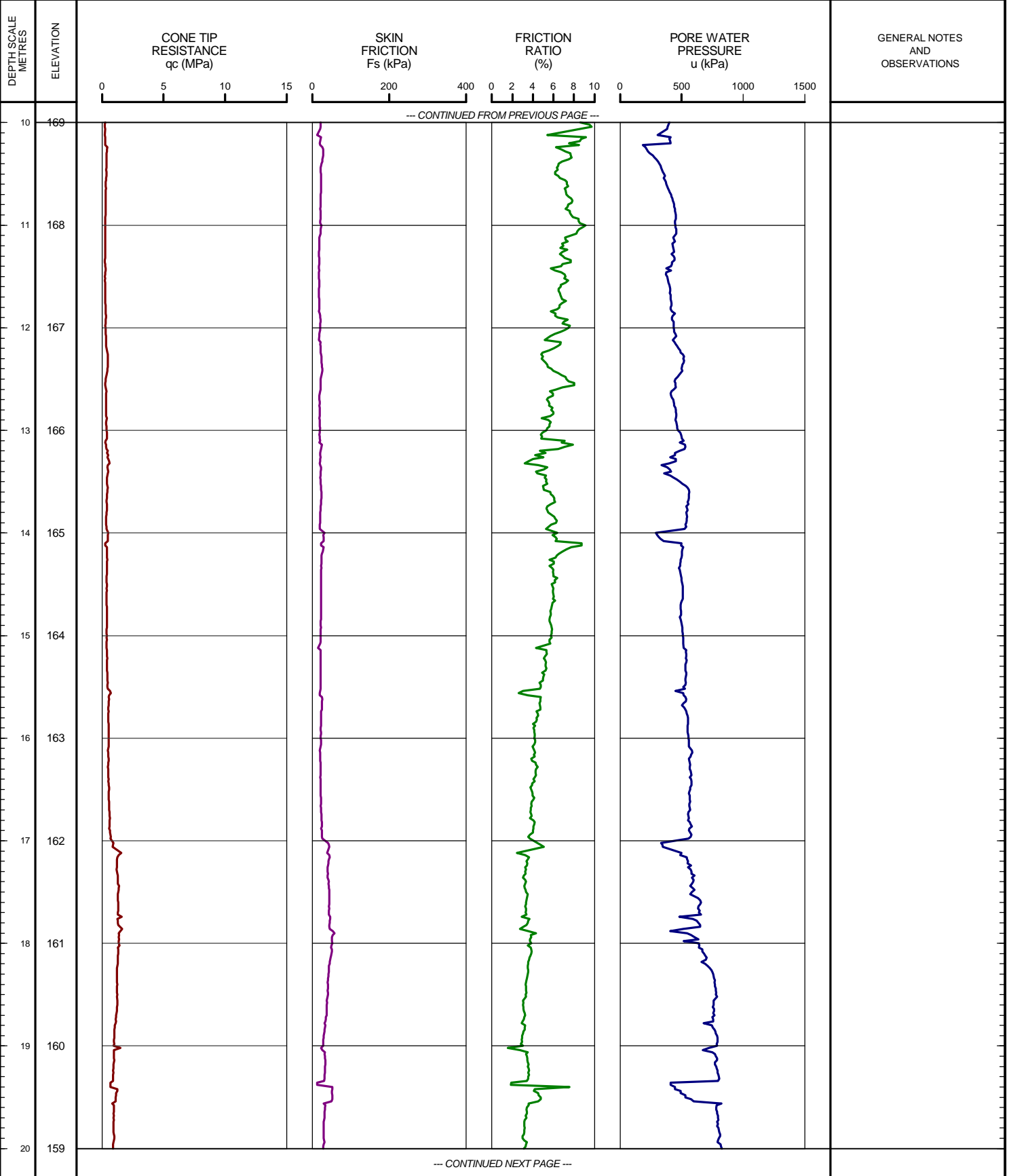
SHEET 2 OF 3

LOCATION: N 4682246.9 ;E 329168.7

TEST DATE: December 4, 2009 - December 8, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 178.75m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-342

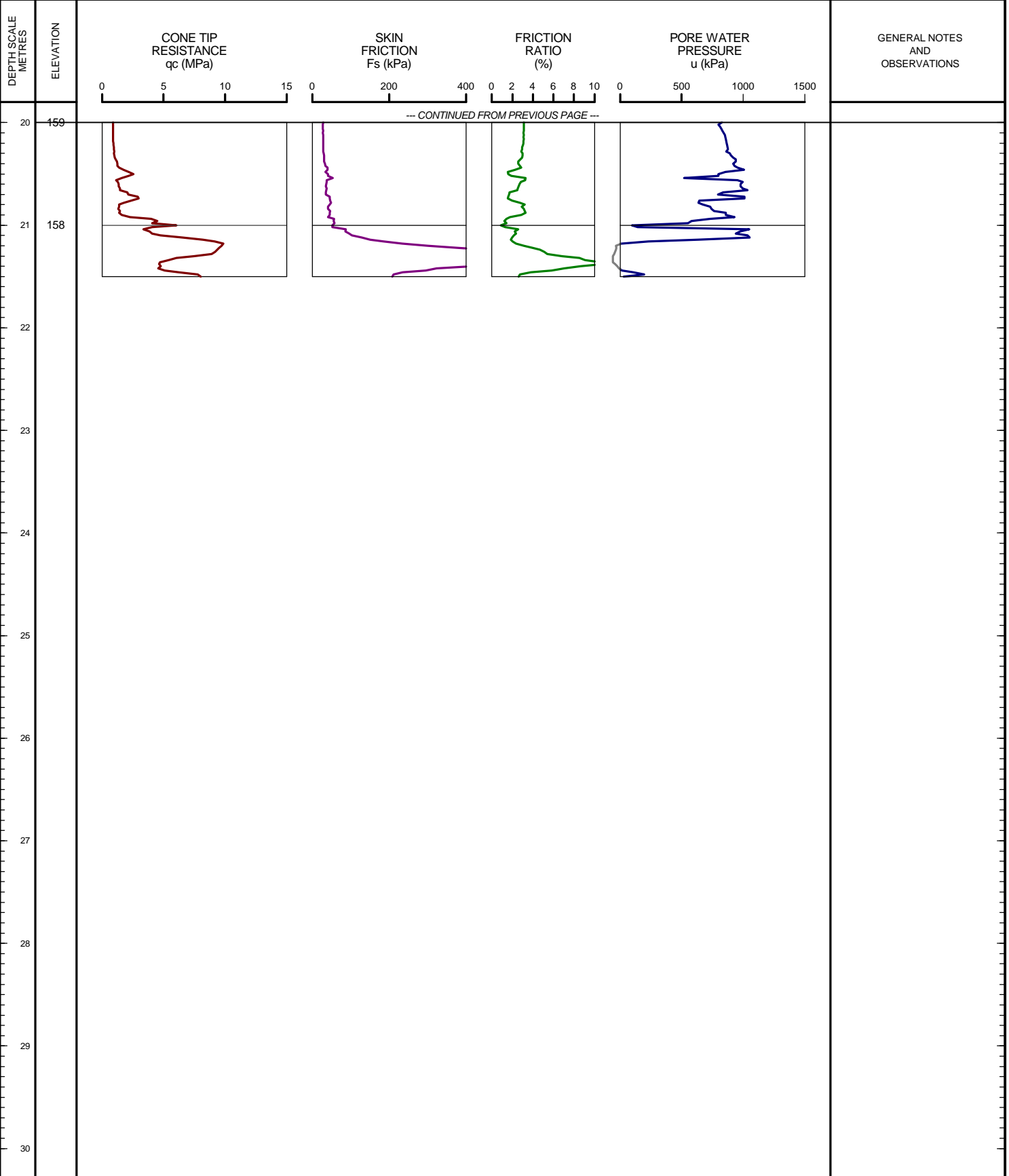
SHEET 3 OF 3

LOCATION: N 4682246.9 ;E 329168.7

TEST DATE: December 4, 2009 - December 8, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 178.75m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.6 CORRECTION FACTOR B: 0.013



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-344

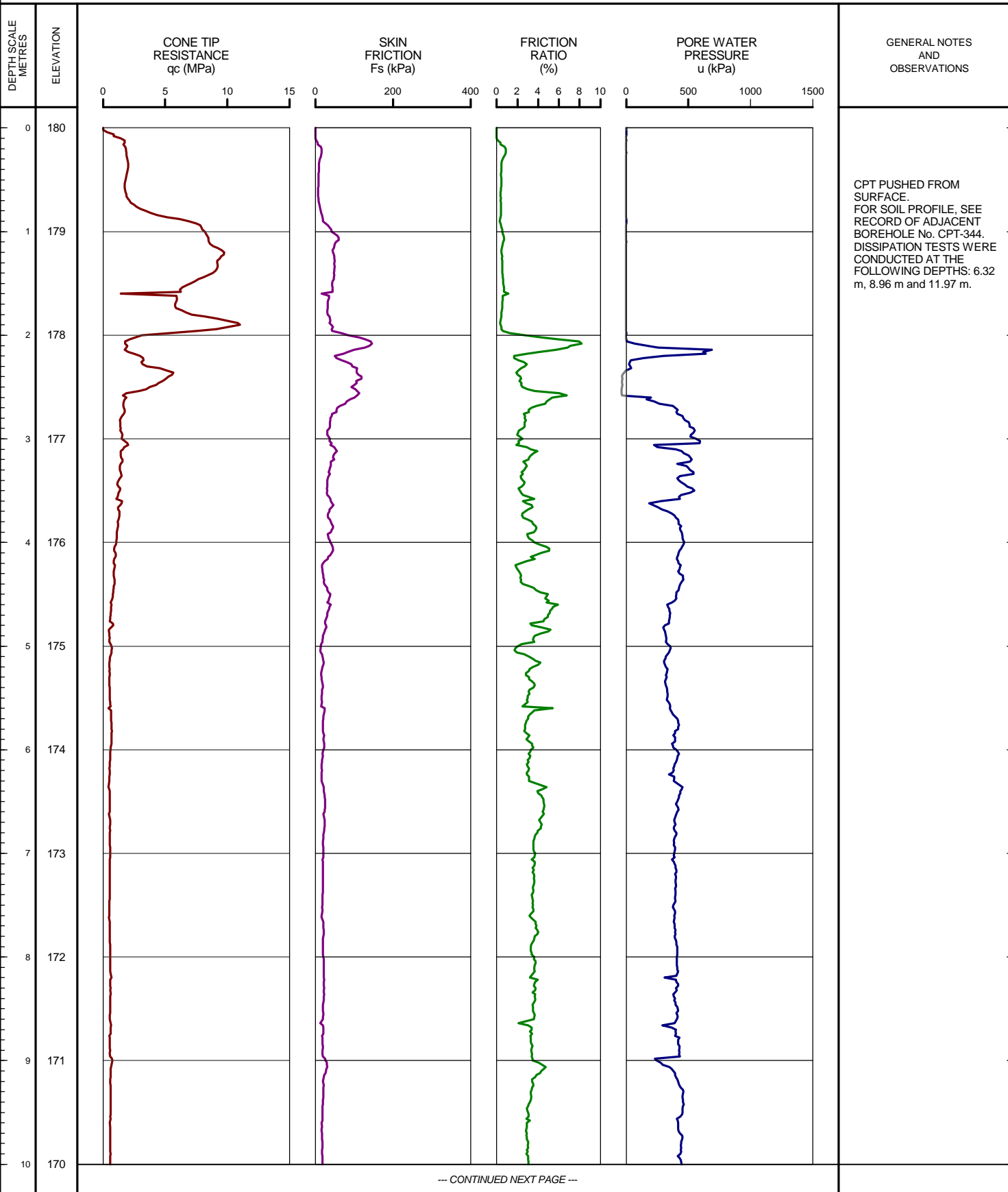
SHEET 1 OF 3

LOCATION: N 4682206.2 ;E 328974.6

TEST DATE: December 2, 2009 - December 3, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.56m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-344

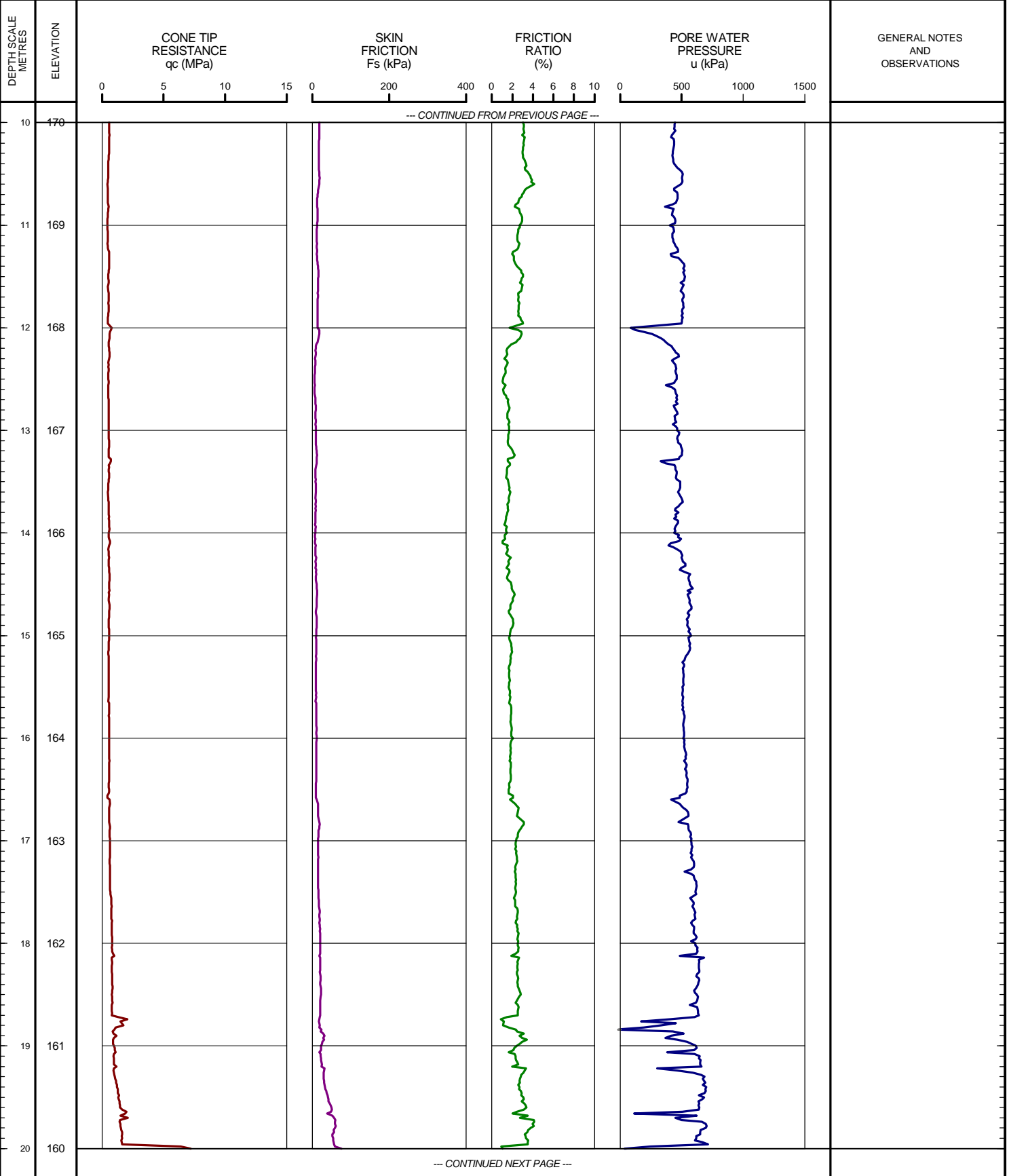
SHEET 2 OF 3

LOCATION: N 4682206.2 ;E 328974.6

TEST DATE: December 2, 2009 - December 3, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.56m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LDN_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

1 : 50



OPERATOR: TA

CHECKED:

PROJECT: 09-1132-0080

RECORD OF CONE PENETRATION TEST CPT-344

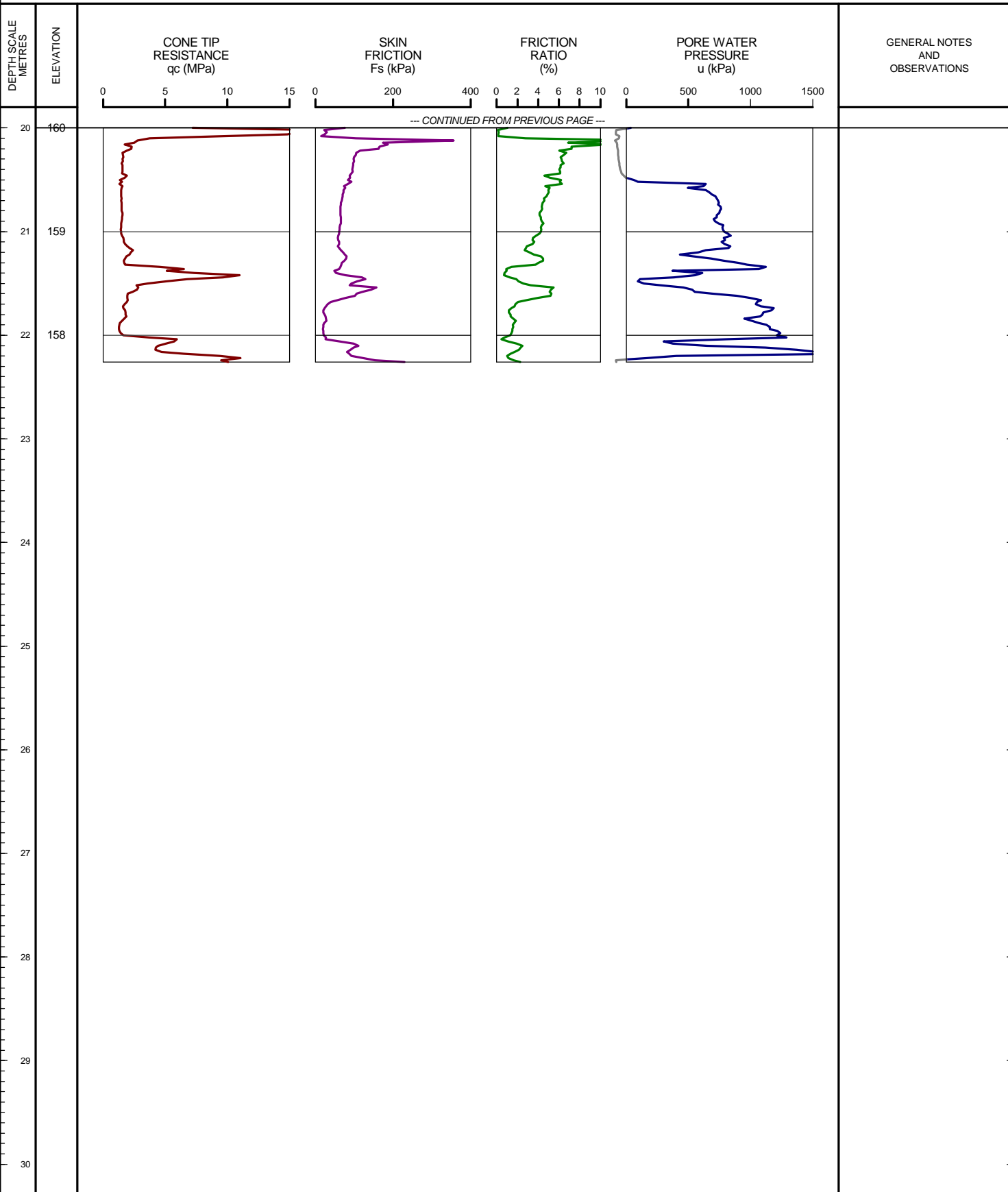
SHEET 3 OF 3

LOCATION: N 4682206.2 ;E 328974.6

TEST DATE: December 2, 2009 - December 3, 2009

DATUM: GEODETIC

GROUND SURFACE ELEVATION: 179.56m PREDRILL DEPTH: 0.00m CORRECTION FACTOR A: 0.584 CORRECTION FACTOR B: 0.012



LON_CPT_01 09-1132-0080-CPT.GPJ GLDR_LON.GDT 02/23/10 DATA INPUT:

DEPTH SCALE

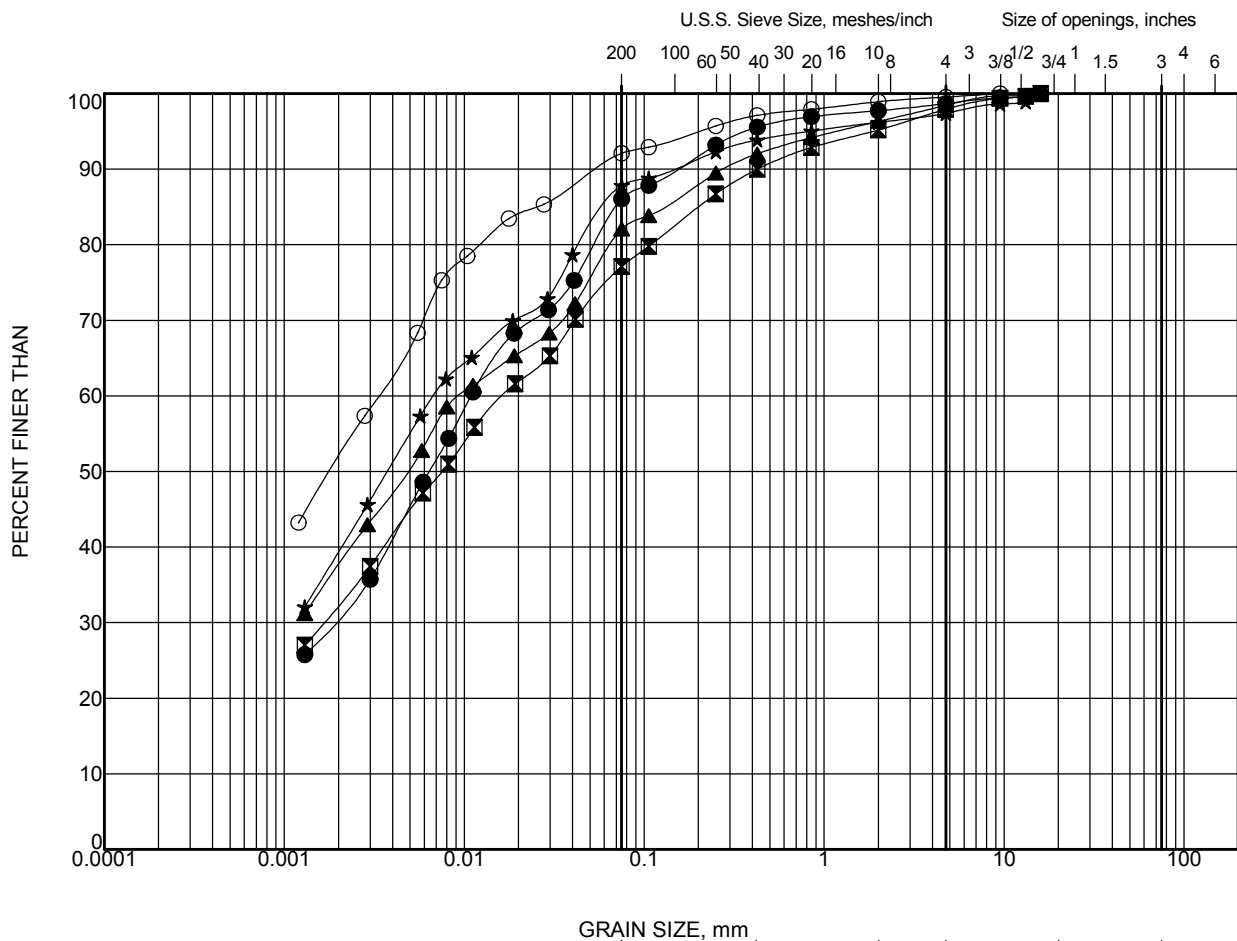
1 : 50



OPERATOR: TA

CHECKED:


Appendix C Geotechnical Laboratory Test Results

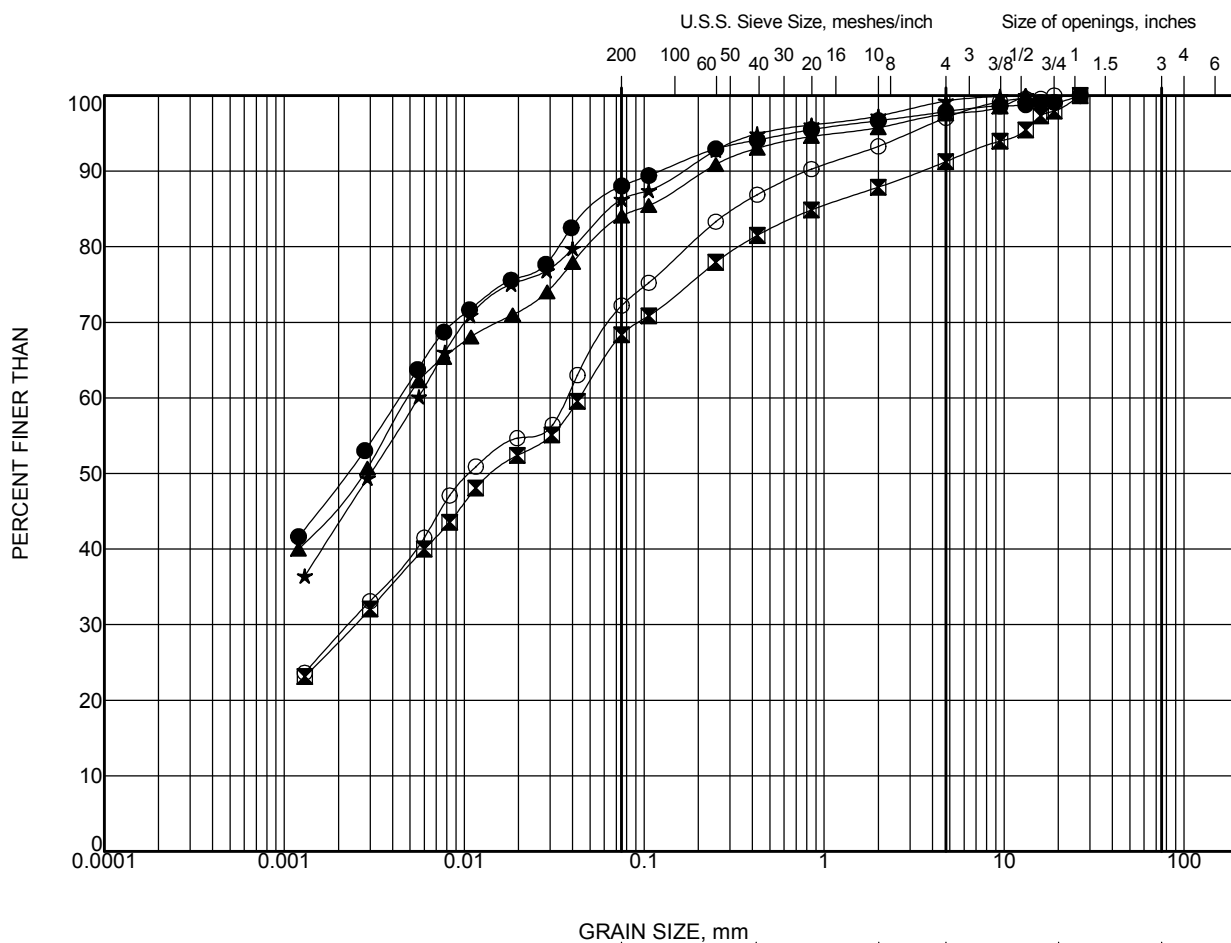


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	B2-1	12	12.2
■	B2-1	13	13.7
▲	B2-1	17	19.8
★	B2-1	18	21.3
○	B3-1	8	6.1




PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario				
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt				
		PROJECT No. SW8801.1004.101		FILE No.		
				SCALE	n/a	REV.
		DRAWN	mso	29 Nov. 2011	FIGURE 1-C	
		CHECK	mso	29 Nov. 2011		

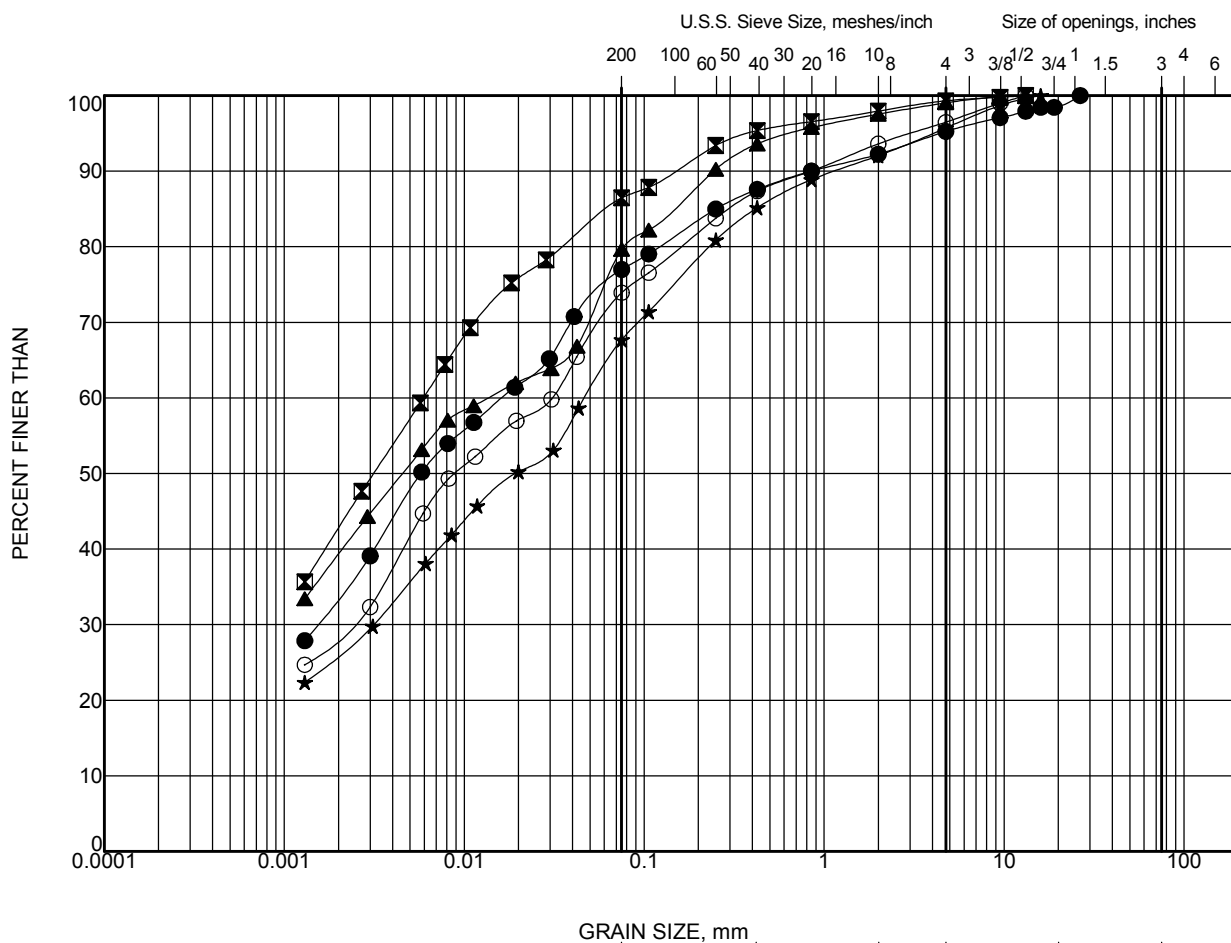


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	B3-1	12	12.2
⊠	B3-1	16	18.3
▲	B3-2	6	4.6
★	B3-2	10	9.1
○	B3-2	14	15.2




PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario			
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt			
  	PROJECT No. SW8801.1004.101		FILE No.		
			SCALE	n/a	
	DRAWN	mso	29 Nov. 2011	REV.	
	CHECK	mso	29 Nov. 2011		
		FIGURE 2-C			

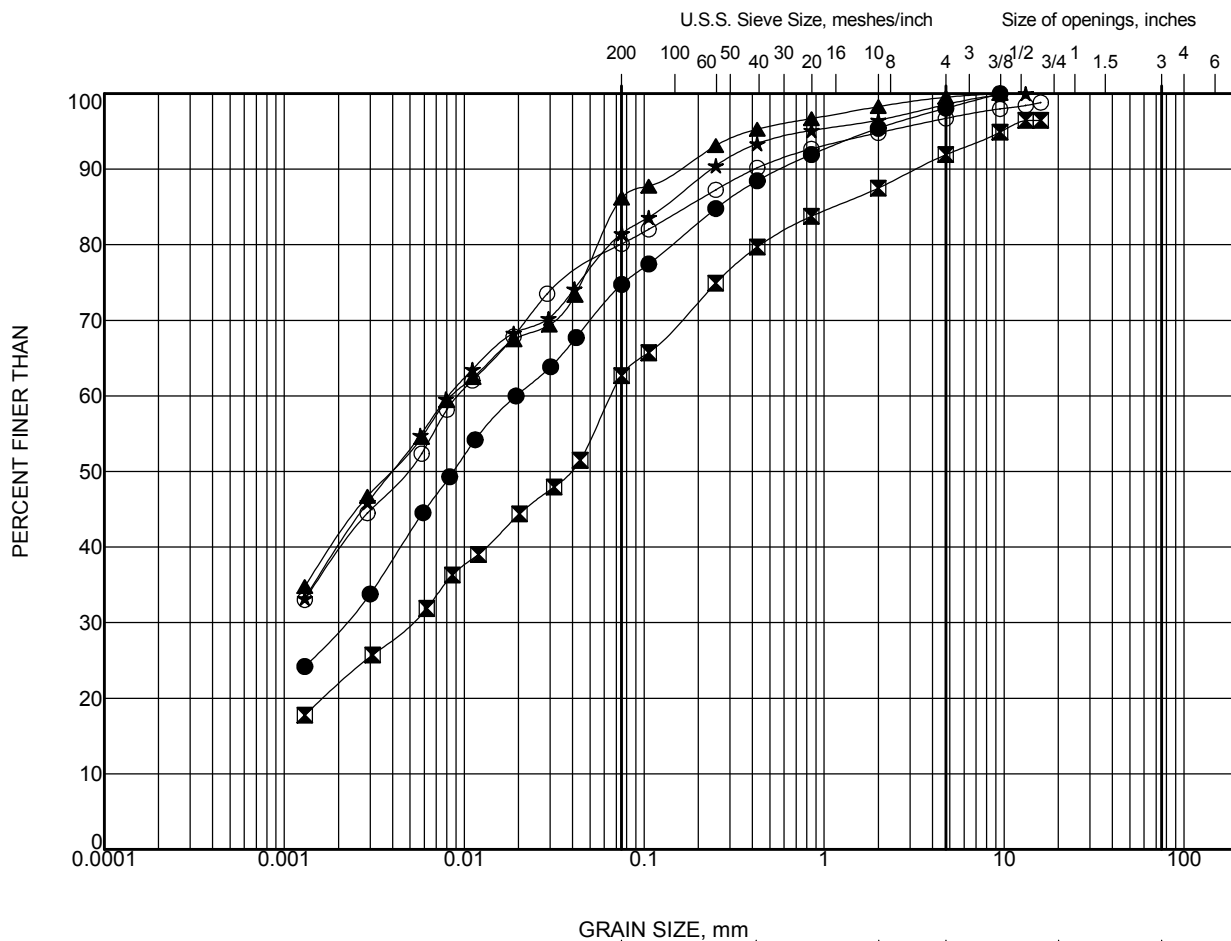


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	B3-2	16	18.3
■	B3-3	9	7.6
▲	B3-3	11	10.7
★	B3-3	13	13.7
○	B3-3	15	16.8




PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario				
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt				
  	PROJECT No. SW8801.1004.101			FILE No.		
				SCALE	n/a	REV.
	DRAWN	mso	29 Nov. 2011	FIGURE 3-C		
	CHECK	mso	29 Nov. 2011			

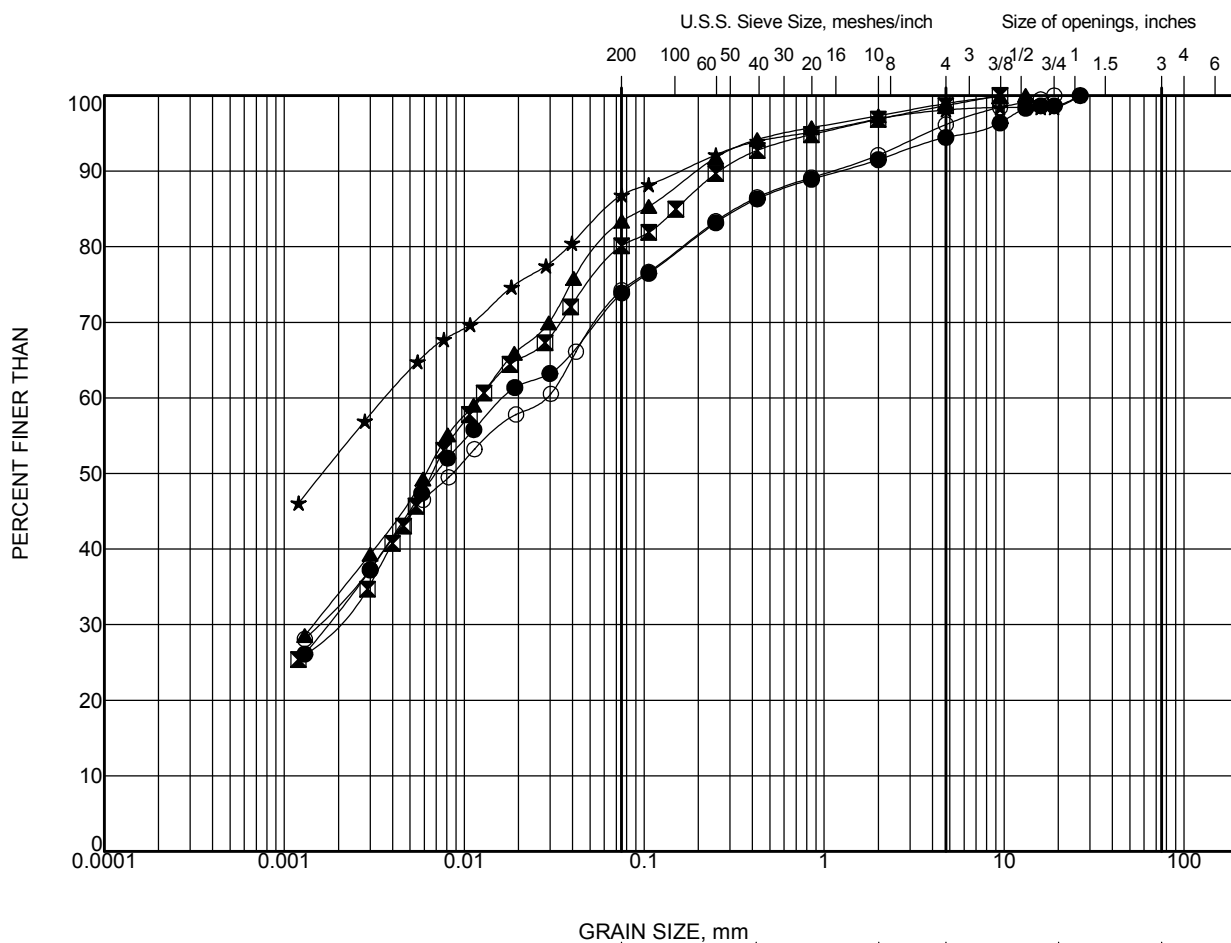


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	B3-3	17	19.8
■	B4-1	6	4.6
▲	B4-1	8	6.1
★	B4-1	13	13.7
○	B4-1	15	16.8


PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario				
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt				
  	PROJECT No. SW8801.1004.101			FILE No.		
				SCALE	n/a	REV.
	DRAWN	mso	29 Nov. 2011	FIGURE 4-C		
	CHECK	mso	29 Nov. 2011			

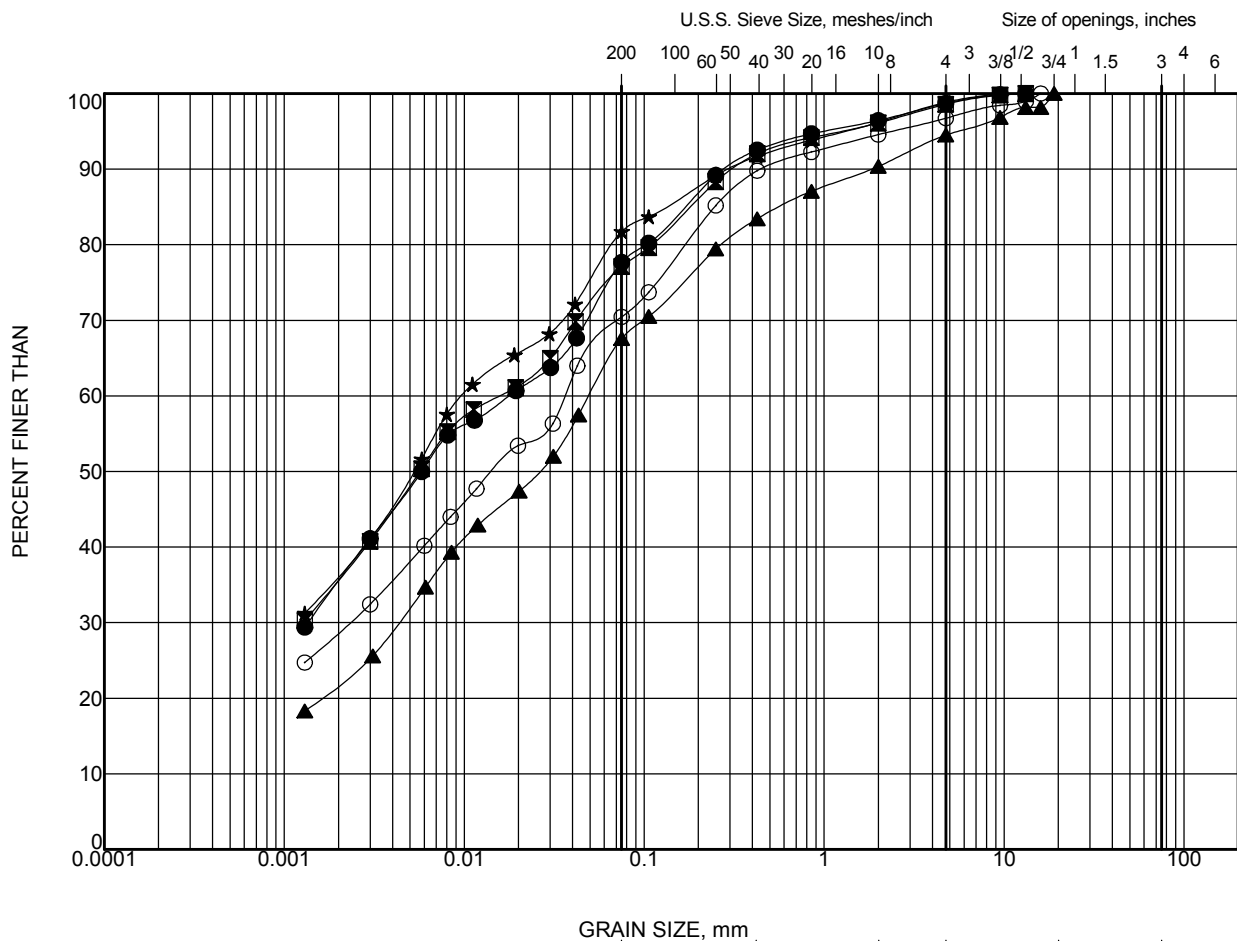


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	B4-1	19	22.9
■	B6-1	13	9.1
▲	B6-1	14	10.7
★	B6-1	15	12.2
○	B6-1	16	13.7

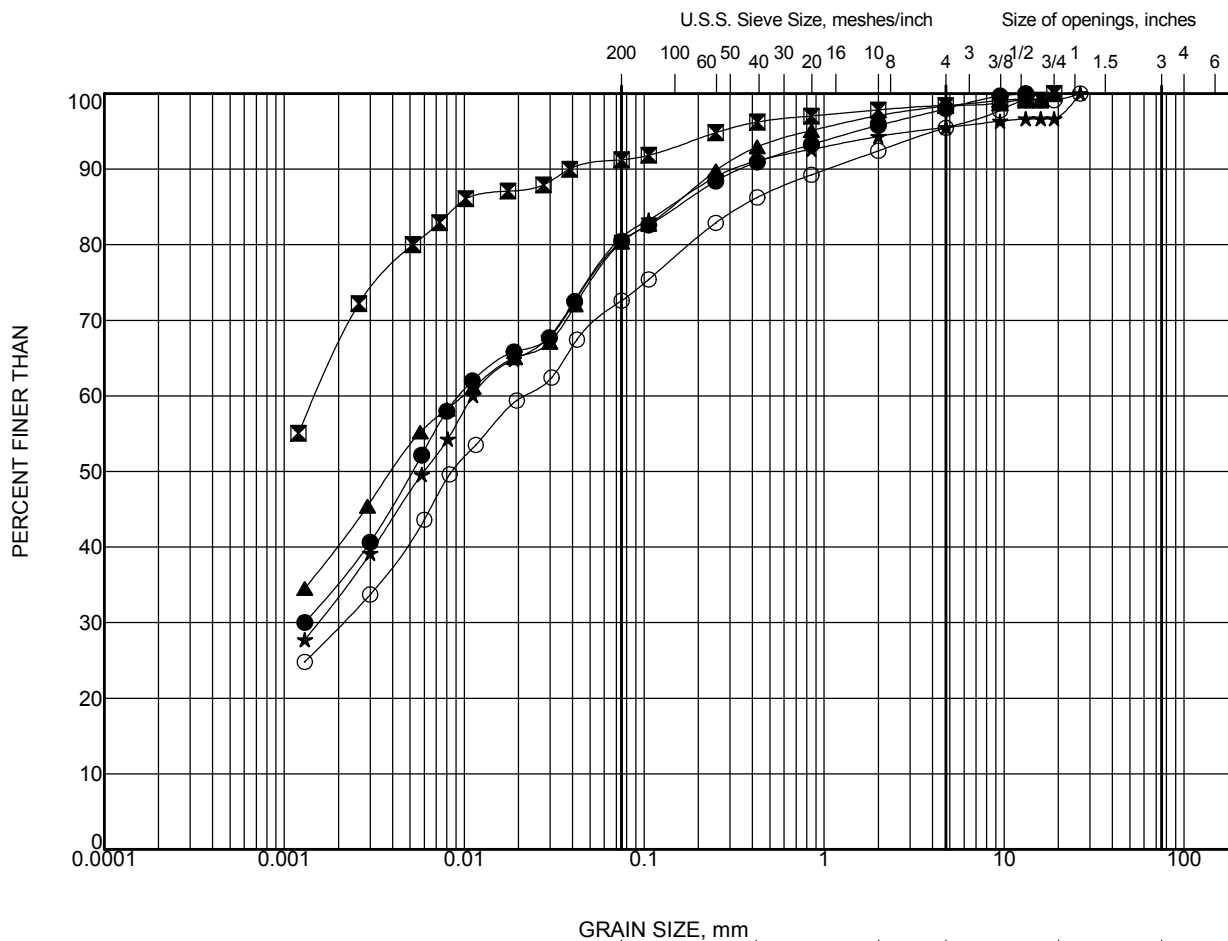
PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario			
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt			
  	PROJECT No. SW8801.1004.101		FILE No.		
			SCALE	n/a	
	DRAWN mso 29 Nov. 2011		REV.		
	CHECK mso 29 Nov. 2011				
				FIGURE 5-C	



LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	B6-2	8	6.1
■	B6-2	10	9.1
▲	B6-2	16	18.3
★	B6-2	20	24.4
○	B6-3	12	12.2

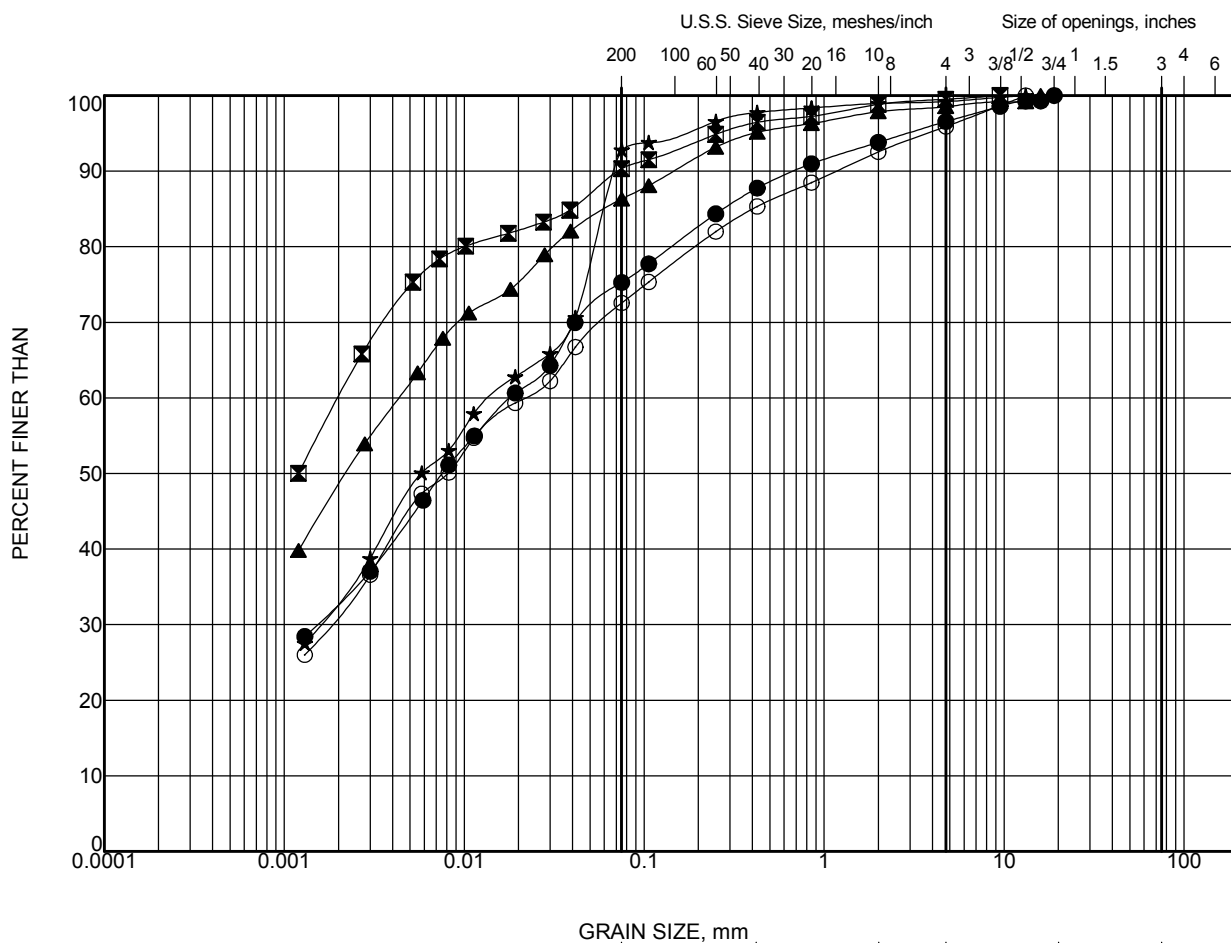
PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario		
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt		
PROJECT No. SW8801.1004.101		FILE No.		
DRAWN mso 29 Nov. 2011		SCALE n/a REV.		
CHECK mso 29 Nov. 2011		FIGURE 6-C		



LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	B6-3	20	24.4
■	BH02-RW	8	6.1
▲	BH02-RW	10	9.1
★	BH02-RW	12	12.2
○	BH02-RW	14	15.2


PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario	
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt	
		PROJECT No. SW8801.1004.101	FILE No.
DRAWN mso		30 Nov. 2011	SCALE n/a
CHECK mso		30 Nov. 2011	REV.
		FIGURE 7-C	

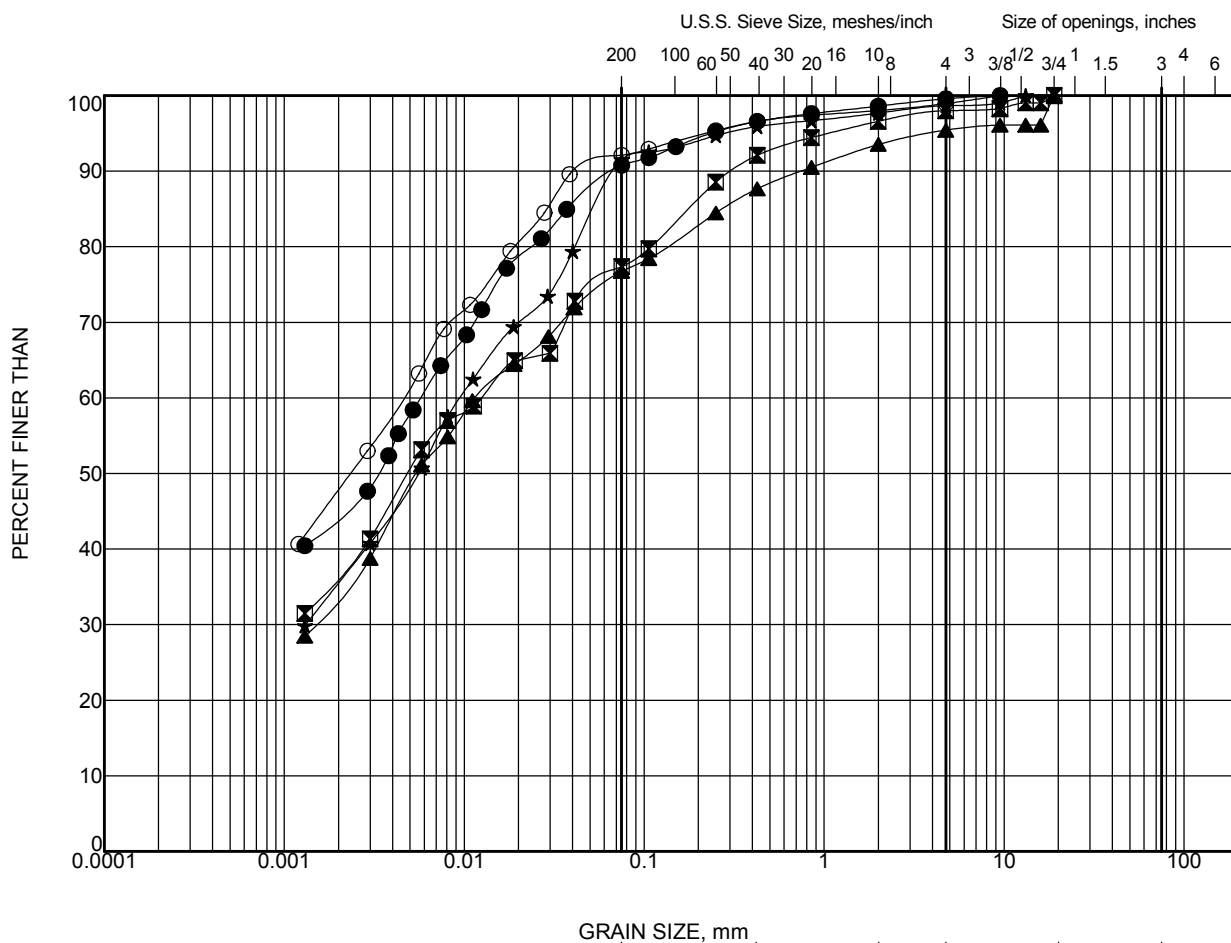


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	BH02-RW	16	18.3
■	BH03-RW	6	4.6
▲	BH03-RW	9	7.6
★	BH03-RW	11	10.7
○	BH03-RW	14	15.2




PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario			
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt			
  	PROJECT No. SW8801.1004.101		FILE No.		
			SCALE	n/a	
	DRAWN	mso	30 Nov. 2011	REV.	
	CHECK	mso	30 Nov. 2011		
		FIGURE 8-C			

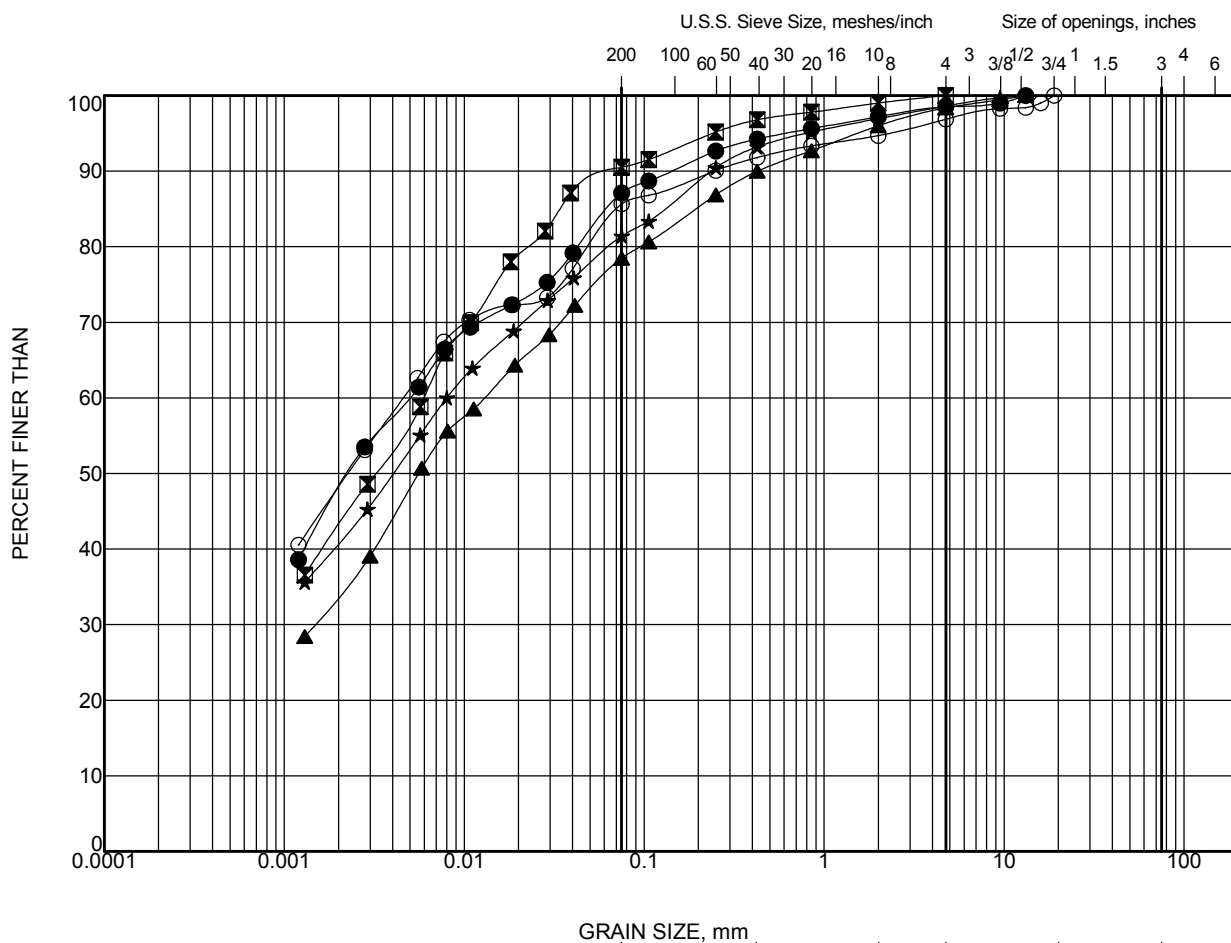


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	BH04-RW	8	7.6
■	BH04-RW	9	9.1
▲	BH04-RW	13	15.2
★	BH04-RW	17	21.3
○	BH05-RW	12	10.7




PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario				
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt				
  	PROJECT No. SW8801.1004.101			FILE No.		
				SCALE	n/a	REV.
	DRAWN	mso	30 Nov. 2011	FIGURE 9-C		
	CHECK	mso	30 Nov. 2011			

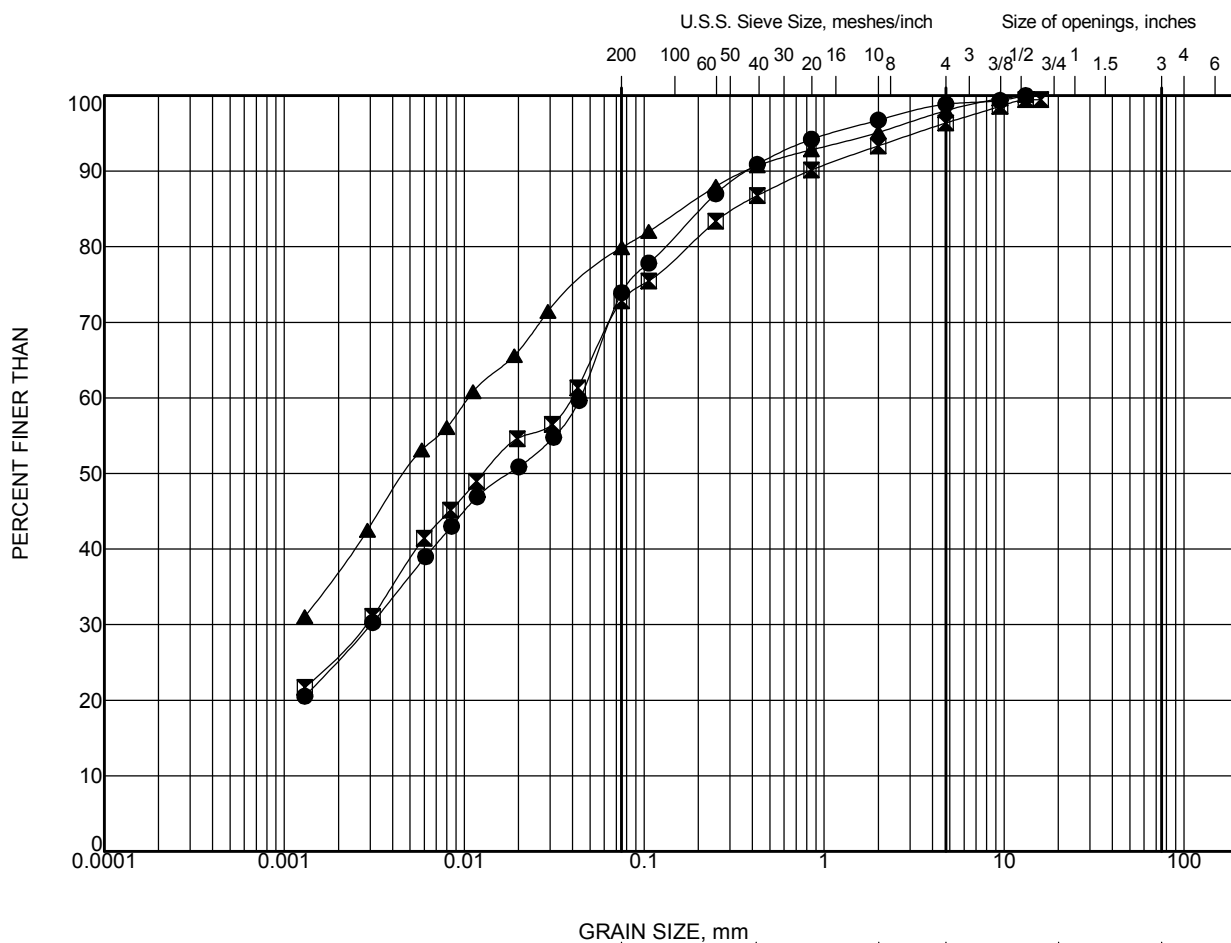


CLAY AND SILT	fine	medium	coarse	fine	coarse	Cobble Size
	SAND SIZE			GRAVEL SIZE		

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	BH05-RW	15	15.2
■	BH05-RW	16	16.8
▲	BH05-RW	19	21.3
★	BH06-RW	12	12.2
○	BH06-RW	14	15.2


PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario				
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt				
  	PROJECT No. SW8801.1004.101			FILE No.		
				SCALE	n/a	REV.
	DRAWN	mso	30 Nov. 2011	FIGURE 10-C		
	CHECK	mso	30 Nov. 2011			

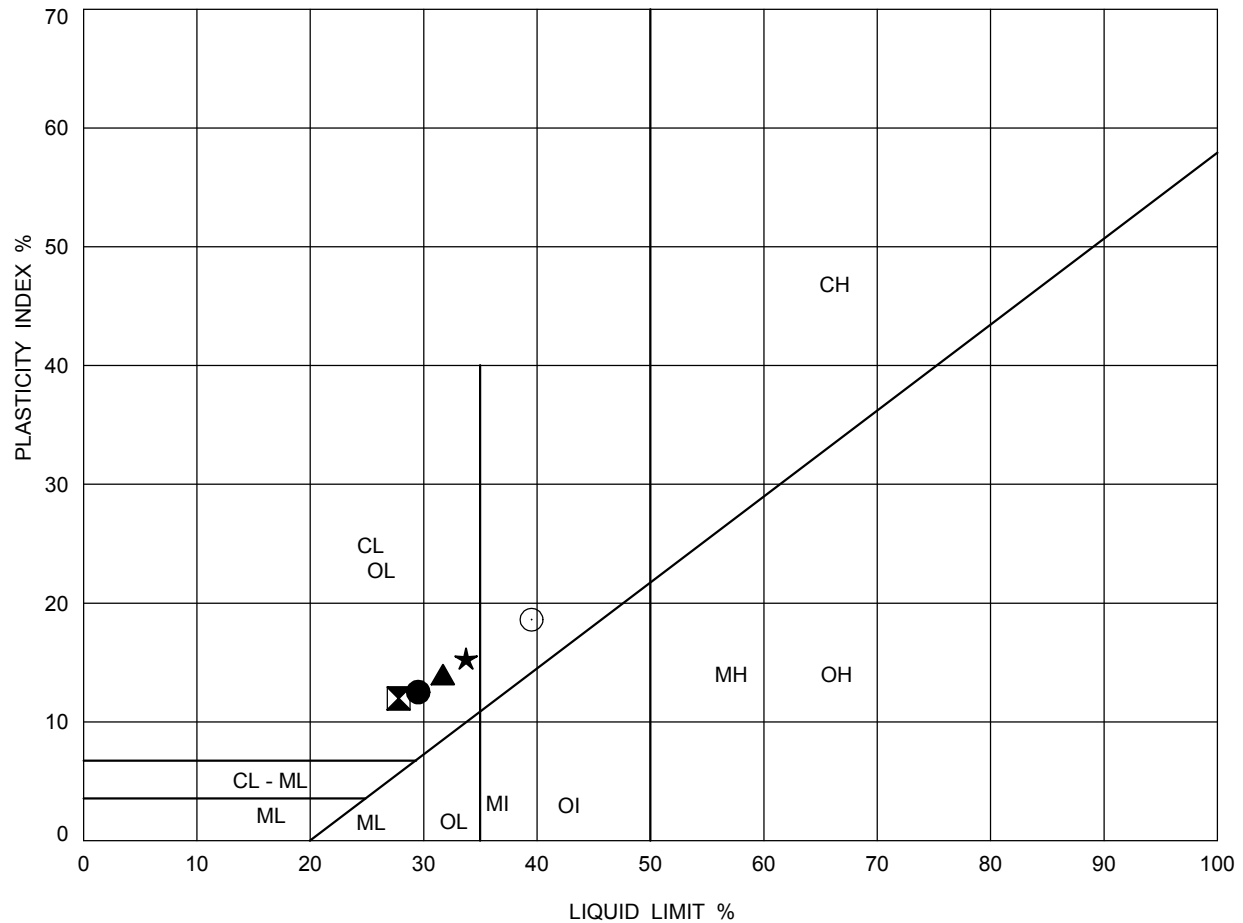


CLAY AND SILT	SAND SIZE			GRAVEL SIZE		Cobble Size
	fine	medium	coarse	fine	coarse	

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)
●	BH06-RW	15	16.8
■	BH06-RW	16	18.3
▲	BH06-RW	21	25.9

PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario			
TITLE		GRAIN SIZE DISTRIBUTION Silty Clay to Clayey Silt			
  	PROJECT No. SW8801.1004.101		FILE No.		
			SCALE	n/a	
	DRAWN mso 30 Nov. 2011		REV.		
	CHECK mso 30 Nov. 2011				
				FIGURE 11-C	






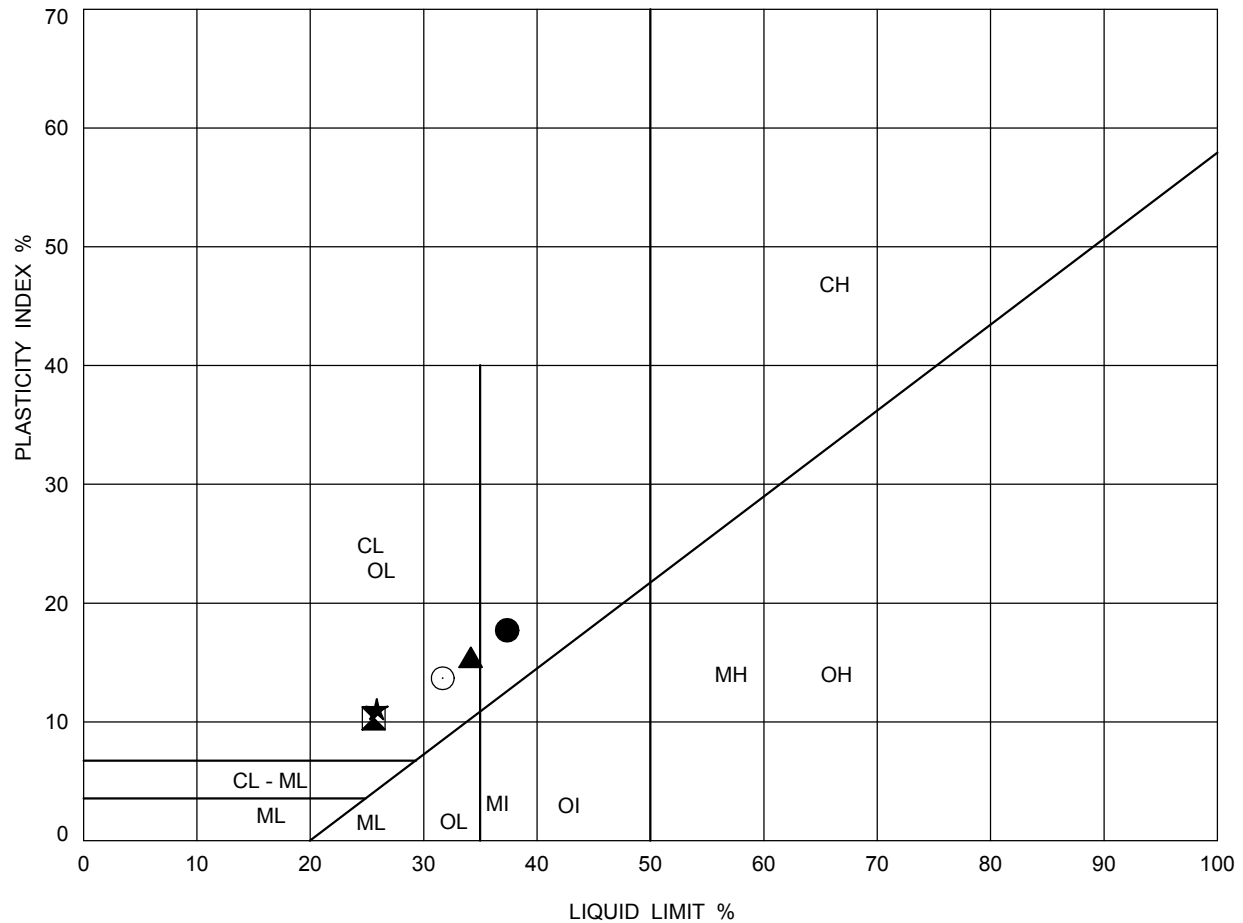
SOIL TYPE
 C = Clay
 M = Silt
 O = Organic

PLASTICITY
 L = Low
 I = Intermediate
 H = High

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	B2-1	12	12.2	30	17	13
⊠	B2-1	13	13.7	28	16	12
▲	B2-1	17	19.8	32	18	14
★	B2-1	18	21.3	34	18	16
○	B3-1	8	6.1	40	21	19

PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario	
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt	
PROJECT No. SW8801.1004.101		FILE No.	
DRAWN mso 30 Nov. 2011		SCALE n/a	
CHECK mso 30 Nov. 2011		REV.	
  		FIGURE 12-C	



SOIL TYPE

C = Clay
M = Silt
O = Organic

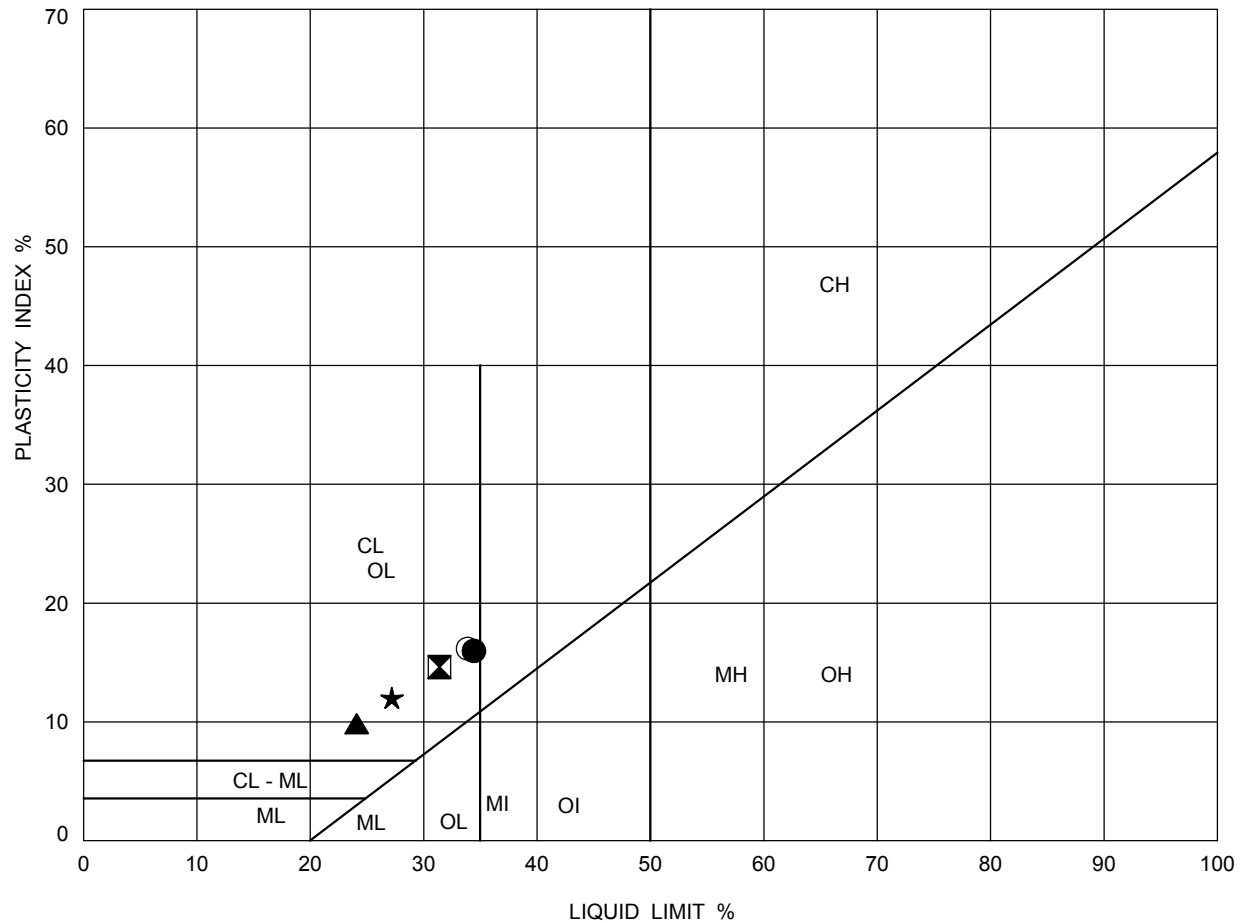
PLASTICITY

L = Low
I = Intermediate
H = High

LEGEND:




SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	B3-1	12	12.2	37	20	17
⊠	B3-1	16	18.3	26	15	11
▲	B3-2	10	9.1	34	19	15
★	B3-2	14	15.2	26	15	11
○	B3-2	16	18.3	32	18	14

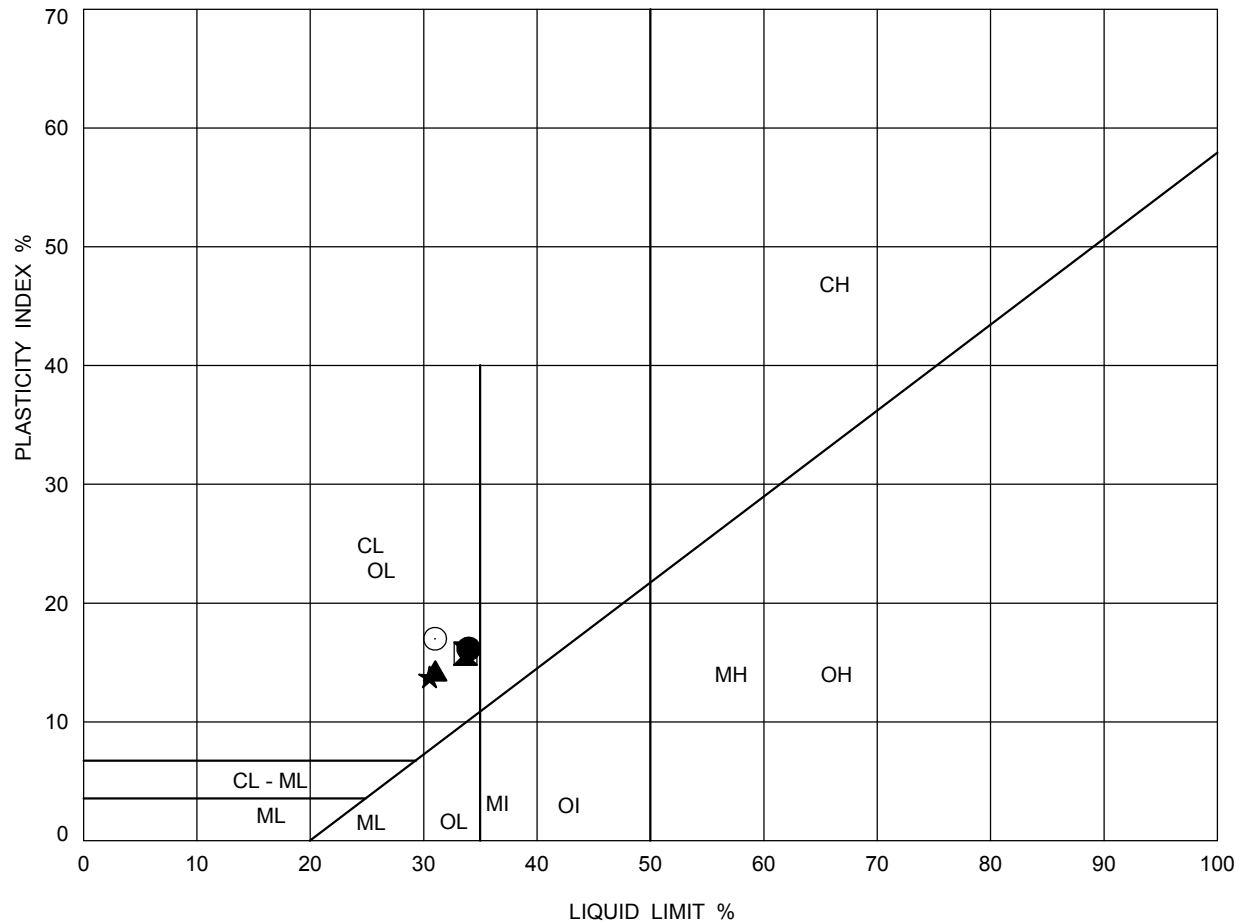
PROJECT				Windsor Essex Parkway (WEP) Windsor, Ontario			
TITLE				PLASTICITY CHART Silty Clay to Clayey Silt			
PROJECT No. SW8801.1004.101				FILE No.			
DRAWN mso 30 Nov. 2011				SCALE n/a REV.			
CHECK mso 30 Nov. 2011				FIGURE 13-C			



LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	B3-3	9	7.6	34	18	16
⊠	B3-3	11	10.7	31	17	14
▲	B3-3	13	13.7	24	14	10
★	B3-3	15	16.8	27	15	12
○	B3-3	17	19.8	34	18	16

PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario	
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt	
PROJECT No. SW8801.1004.101		FILE No.	
DRAWN mso 30 Nov. 2011		SCALE n/a	
CHECK mso 30 Nov. 2011		REV.	
  		FIGURE 14-C	



SOIL TYPE

C = Clay
M = Silt
O = Organic

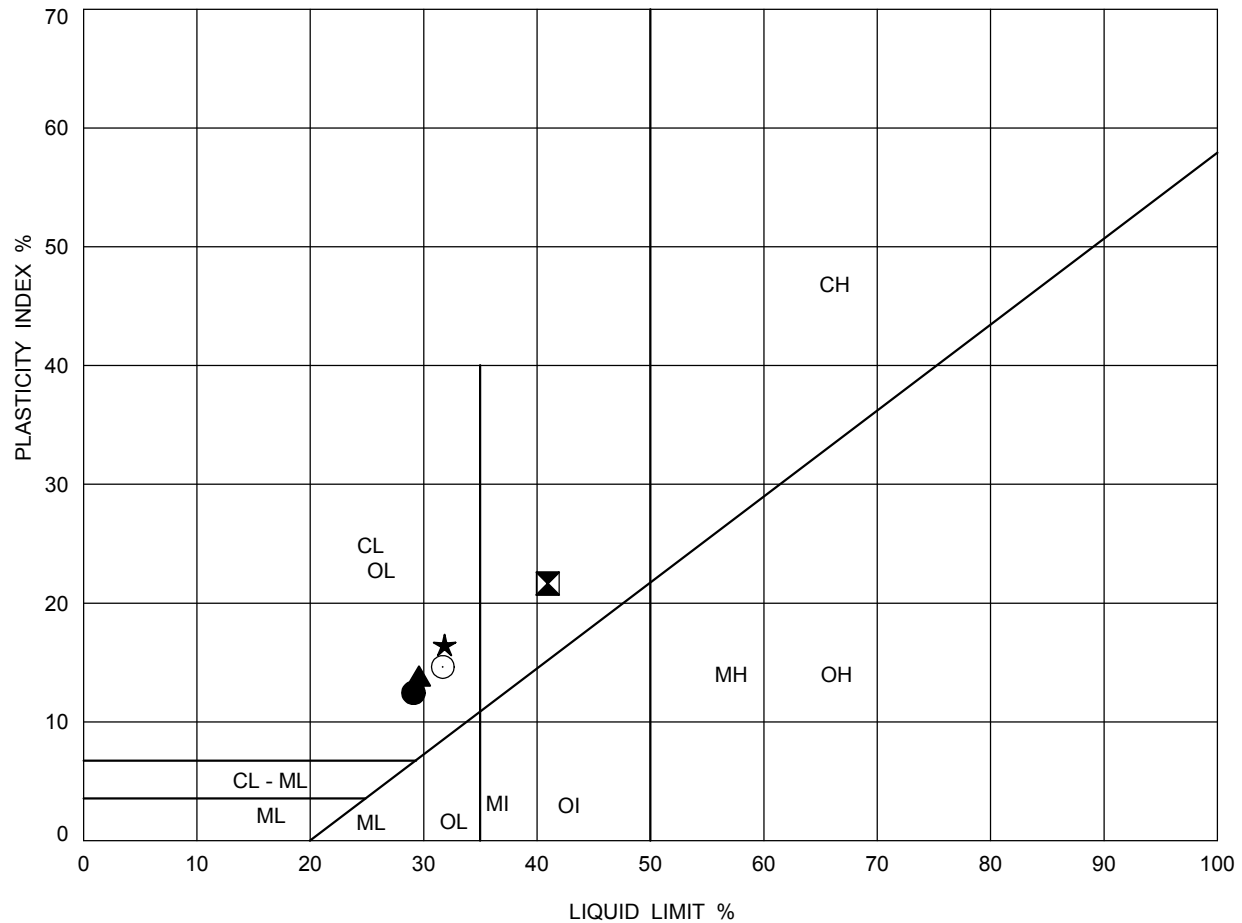
PLASTICITY

L = Low
I = Intermediate
H = High

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	B4-1	8	6.1	34	18	16
⊠	B4-1	13	13.7	34	18	16
▲	B4-1	15	16.8	31	17	14
★	B4-1	19	22.9	31	17	14
○	B6-1	13	9.1	31	14	17

PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario	
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt	
	PROJECT No. SW8801.1004.101		FILE No.
	DRAWN	mso	30 Nov. 2011
	CHECK	mso	30 Nov. 2011
SCALE n/a			REV.
FIGURE 15-C			






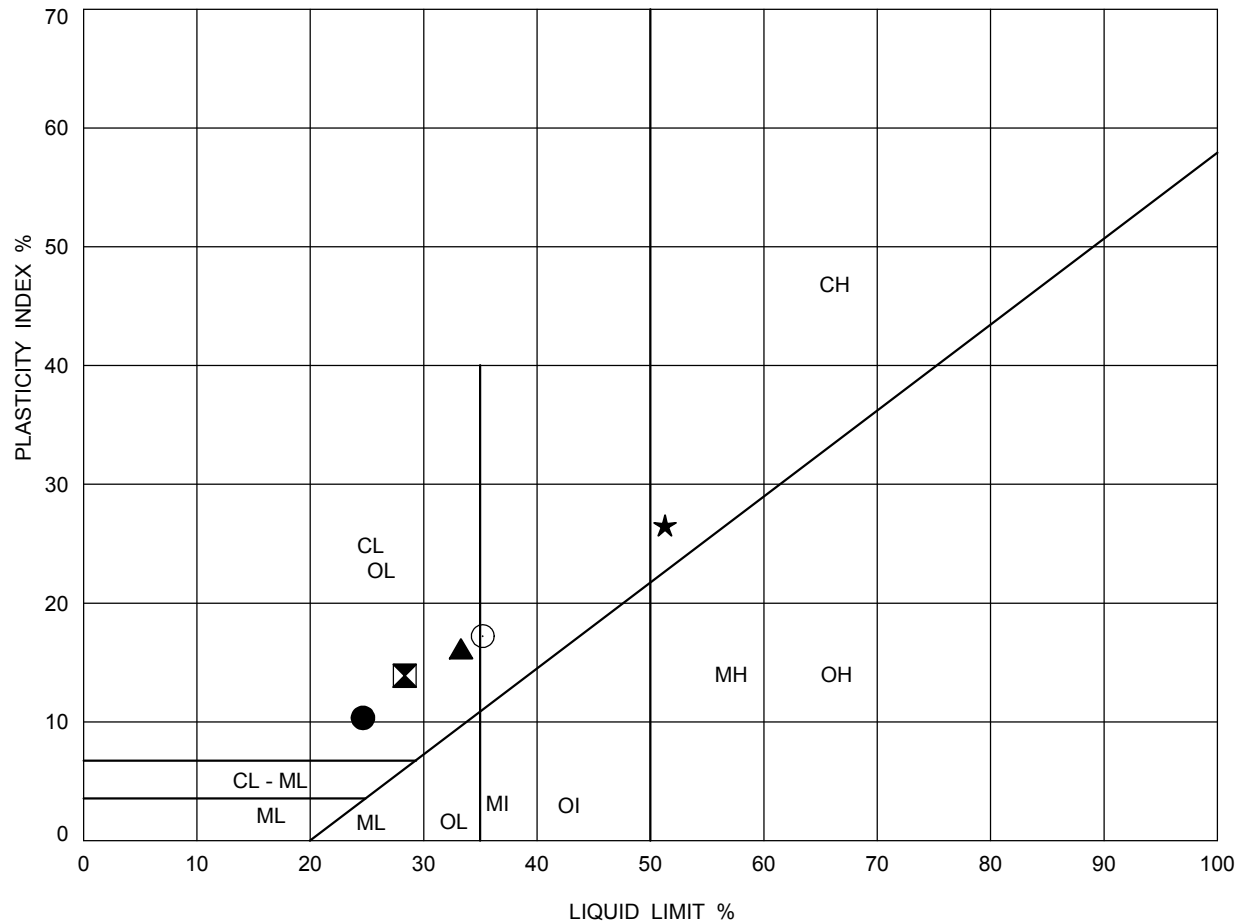
SOIL TYPE
 C = Clay
 M = Silt
 O = Organic

PLASTICITY
 L = Low
 I = Intermediate
 H = High

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	B6-1	14	10.7	29	17	12
⊠	B6-1	15	12.2	41	19	22
▲	B6-1	16	13.7	30	16	14
★	B6-2	8	6.1	32	15	17
○	B6-2	10	9.1	32	17	15

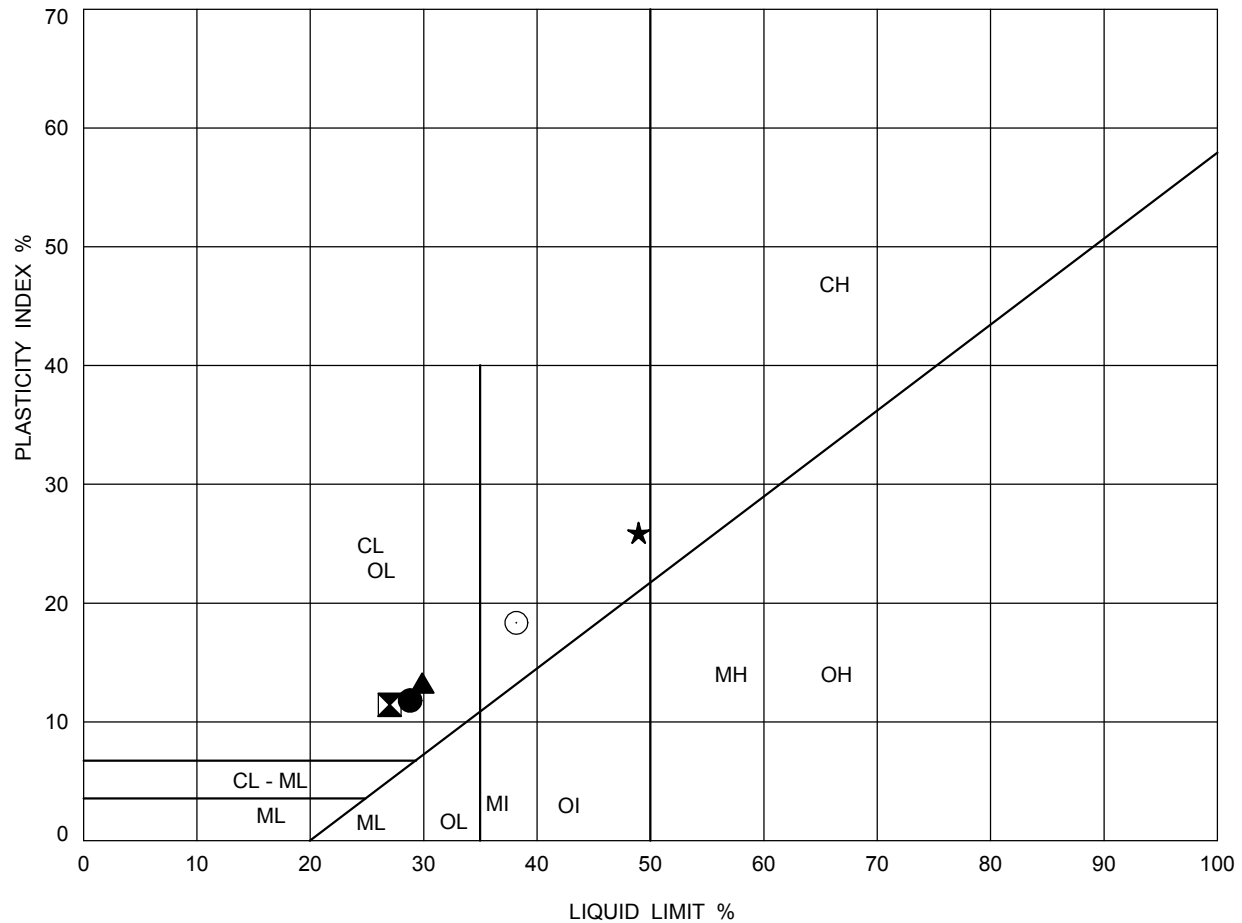
PROJECT				Windsor Essex Parkway (WEP) Windsor, Ontario			
TITLE				PLASTICITY CHART Silty Clay to Clayey Silt			
PROJECT No. SW8801.1004.101				FILE No.			
DRAWN mso 30 Nov. 2011				SCALE n/a			
CHECK mso 30 Nov. 2011				REV.			
  				FIGURE 16-C			



LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	B6-2	16	18.3	25	14	11
⊠	B6-3	12	12.2	28	14	14
▲	B6-3	20	24.4	33	17	16
★	BH02-RW	8	6.1	51	25	26
○	BH02-RW	10	9.1	35	18	17

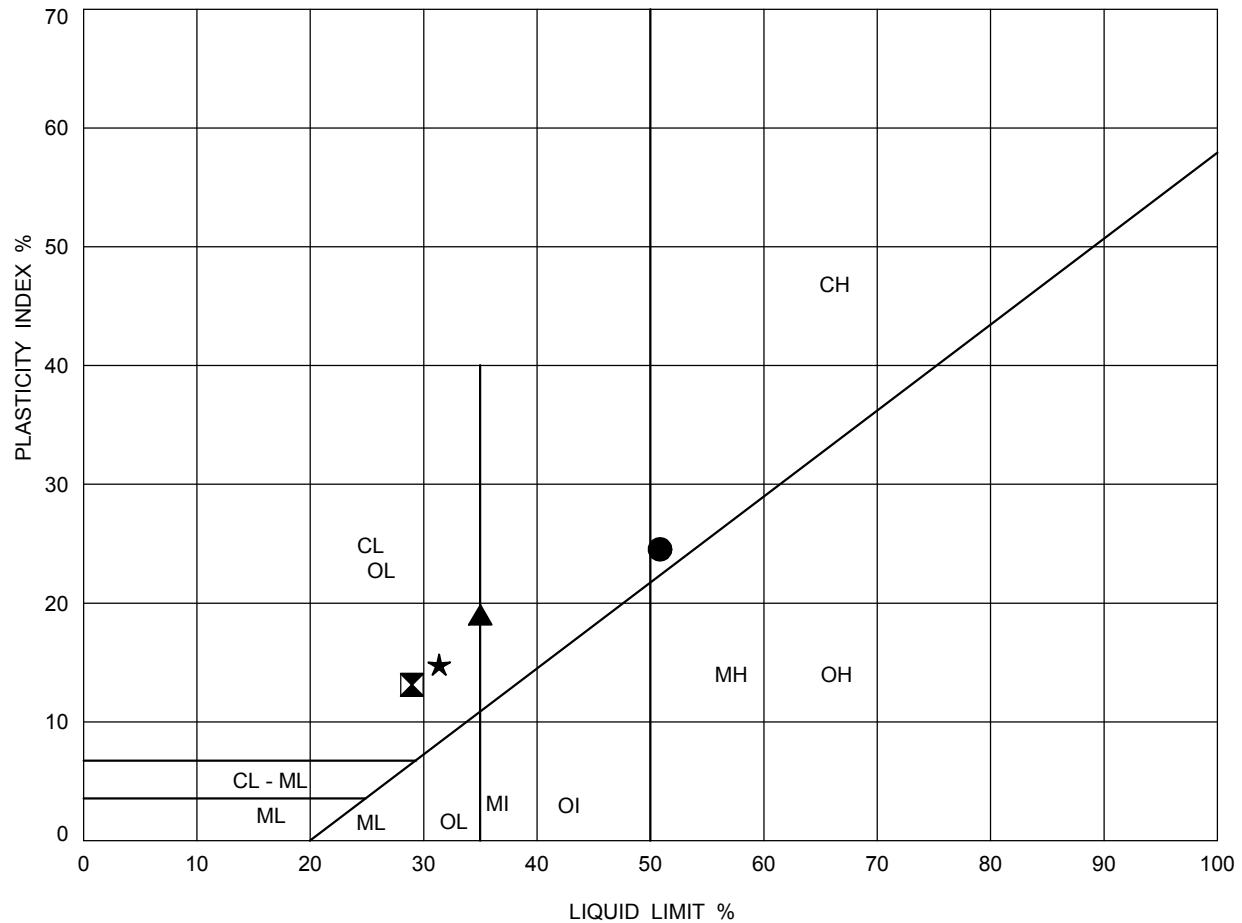
PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario		
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt		
PROJECT No. SW8801.1004.101		FILE No.		
DRAWN mso		30 Nov. 2011		
CHECK mso		30 Nov. 2011		
SCALE n/a		REV.		
FIGURE 17-C				



LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	BH02-RW	12	12.2	29	17	12
⊠	BH02-RW	14	15.2	27	16	11
▲	BH02-RW	16	18.3	30	17	13
★	BH03-RW	6	4.6	49	23	26
○	BH03-RW	9	7.6	38	20	18

PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario	
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt	
PROJECT No. SW8801.1004.101		FILE No.	
DRAWN mso		30 Nov. 2011	
CHECK mso		30 Nov. 2011	
SCALE n/a		REV.	
FIGURE 18-C			



SOIL TYPE



C = Clay
M = Silt
O = Organic

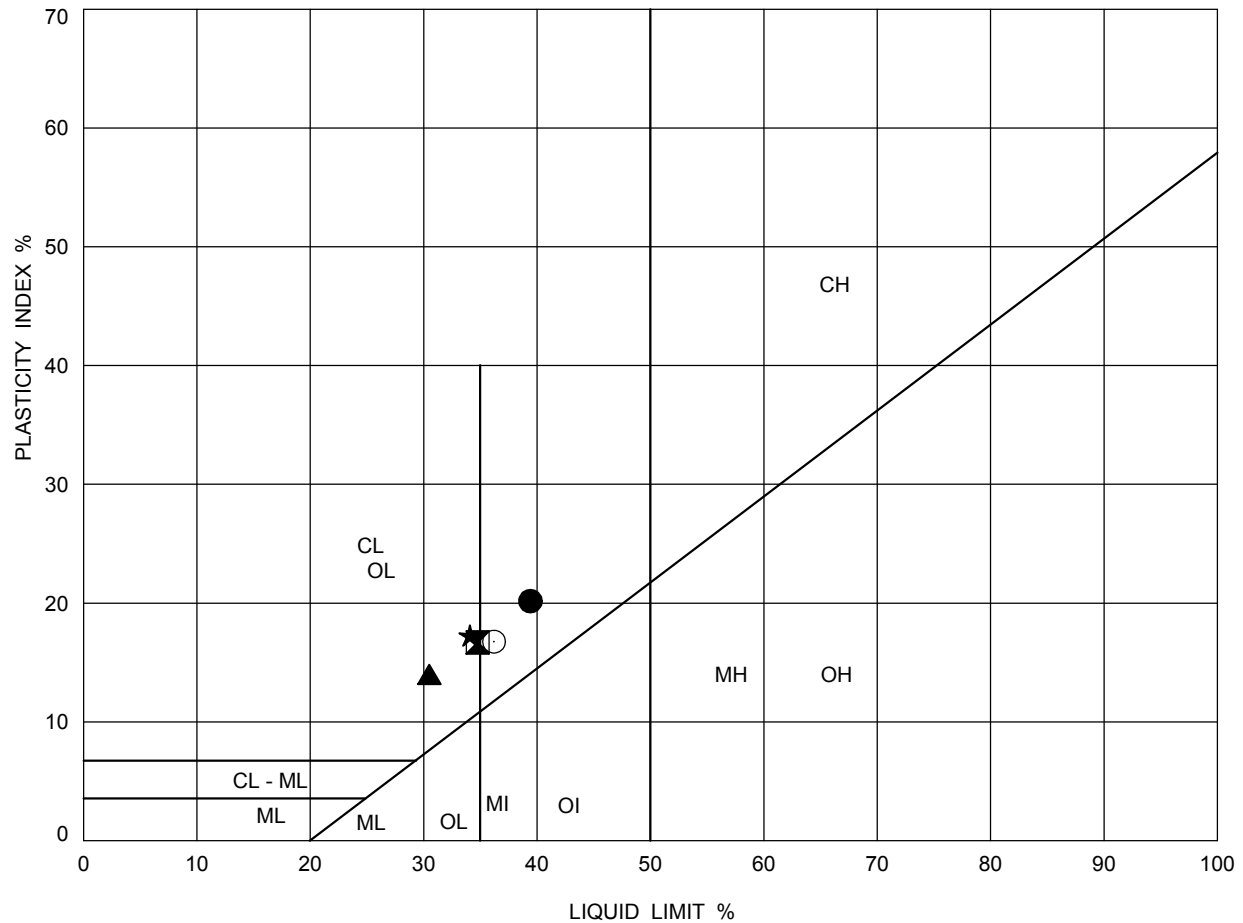
PLASTICITY

L = Low
I = Intermediate
H = High

LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	BH03-RW	11	10.7	51	26	25
⊠	BH03-RW	14	15.2	29	16	13
▲	BH04-RW	8	7.6	35	16	19
★	BH04-RW	9	9.1	31	17	14

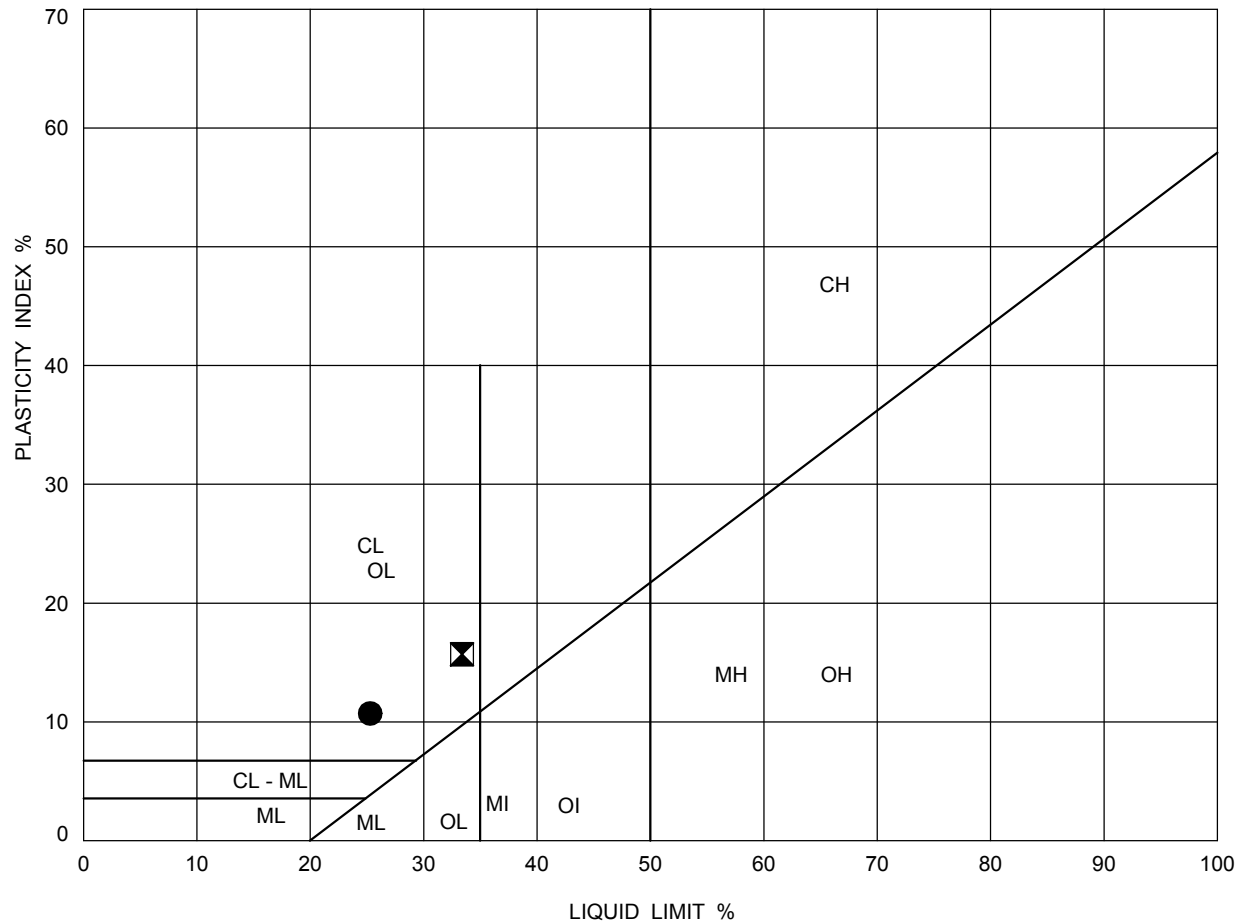
PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario		
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt		
 		PROJECT No. SW8801.1004.101	FILE No.	
DRAWN		mso	30 Nov. 2011	SCALE n/a
CHECK		mso	30 Nov. 2011	REV.
FIGURE 19-C				



LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	BH05-RW	15	15.2	39	19	20
⊠	BH05-RW	16	16.8	35	18	17
▲	BH05-RW	19	21.3	30	17	13
★	BH06-RW	12	12.2	34	17	17
○	BH06-RW	14	15.2	36	19	17

PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario	
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt	
	PROJECT No. SW8801.1004.101		FILE No.
	DRAWN	mso	30 Nov. 2011
CHECK	mso	30 Nov. 2011	SCALE n/a
			REV.
			FIGURE 20-C



LEGEND:

SYMBOL	BOREHOLE	SAMPLE	DEPTH (m)	LL(%)	PL(%)	PI
●	BH06-RW	16	18.3	25	15	10
⊠	BH06-RW	21	25.9	33	18	15

PROJECT		Windsor Essex Parkway (WEP) Windsor, Ontario		
TITLE		PLASTICITY CHART Silty Clay to Clayey Silt		
PROJECT No. SW8801.1004.101		FILE No.		
DRAWN mso		30 Nov. 2011		
CHECK mso		30 Nov. 2011		
SCALE n/a		REV.		
FIGURE 21-C				

ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **9-Sep-11**

Sample ID: **B2-4-RW_TW8**

Job No.: **SW8801.1004.101**

Depth(m): **7.6 to 8.2**

Test Data

Ring # :	A	Ring Height (in) =	0.760	Wt of dry filter paper (g)	0.69
Wet soil + Ring Wt (g)			196.14	Wt of ring (g)	76.59
Wet soil + Wet Paper + Ring (g)			192.60	Wet Paper (g)	2.10
Dry Soil + Dry Paper + Ring (g)			169.54	Ring Dia (in)	2.498
Initial moisture Content (%)			29.58	Final moisture Content (%)	23.47
Area of Ring (in ²)			4.90	Initial Volume (in ³)	3.7247
Initial Bulk Density (kg/m ³)			1959	Initial Dry Density (kg/m ³)	1512
Specific Gravity of Soil			2.73	Equiv. Thick. of solids (mm)	10.688
Final Bulk Density (kg/m ³)			2056	Final Dry Density (kg/m ³)	1587
Initial gauge reading for Load 1			0.2532	Gauge reading for last Loading	0.1831
Initial Voids Ratio			0.806	Final Void Ratio	0.639
Initial Degree of Saturation (%)			100	Final Degree of Saturation (%)	100

Trial #	1	2	3	4	5	6	7
Load (kPa)	4.0	6.0	9.0	13.0	20.0	30.0	45.0
Load (tsf)	0.0416	0.0624	0.094	0.135	0.208	0.312	0.468
Gauge Reading (in)	0.2531	0.2524	0.2502	0.2480	0.2447	0.24085	0.2356
(H-Hs) mm	8.613	8.594	8.541	8.484	8.400	8.302	8.169
Voids ratio	0.806	0.804	0.799	0.794	0.786	0.777	0.764
t ₉₀ (min)		10.24	6.76	18.92	15.60	11.56	9.30
C _v (m ² /day)		0.011	0.017	0.006	0.007	0.010	0.012
k' (MPa)		2.000	1.079	1.352	1.606	1.947	2.144
M _v (mm ² / N)		0.5001	0.9265	0.7397	0.6227	0.5136	0.4664

Trial #	8	9	10	11	12	13	14
Load (kPa)	65	100.0	65.0	45.0	30.0	20.0	13.0
Load (tsf)	0.676	1.040	0.676	0.468	0.312	0.208	0.135
Gauge Reading (in)	0.23015	0.2215	0.2228	0.2234	0.2251	0.2268	0.2290
(H-Hs) mm	8.030	7.811	7.843	7.859	7.901	7.945	8.001
Voids ratio	0.751	0.731	0.734	0.735	0.739	0.743	0.749
t ₉₀ (min)	9.00	12.25					
C _v (m ² /day)	0.012	0.009					
k' (MPa)	2.715	2.982					
M _v (mm ² / N)	0.3684	0.3354					

Trial #	15	16	17	18	19	20	21
Load (kPa)	9.0	13.0	20.0	30.0	45.0	65.0	100.0
Load (tsf)	0.0936	0.135	0.208	0.312	0.468	0.676	1.040
Gauge Reading (in)	0.23075	0.2304	0.2292	0.2276	0.2255	0.2235	0.2198
(H-Hs) mm	8.045	8.037	8.007	7.965	7.912	7.860	7.766
Voids ratio	0.753	0.752	0.749	0.745	0.740	0.735	0.727
t ₉₀ (min)							
C _v (m ² /day)							
k' (MPa)							
M _v (mm ² / N)							

ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP** Job No.: **SW8801.1004.101**
 Client: **Hatch Mott MacDonald Limited**
 Date: **9-Sep-11** Sample ID: **B2-4-RW_TW8** Depth(m): **7.6 to 8.2**

Trial #	22	23	24	25	26	27	28
Load (kPa)	150	225.0	335.0	505.0	760.0	1140.0	570.0
Load (tsf)	1.56	2.340	3.484	5.252	7.904	11.856	5.928
Gauge Reading (in)	0.21109	0.1992	0.1843	0.1679	0.1514	0.1351	0.1377
(H-Hs) mm	7.546	7.245	6.864	6.449	6.029	5.615	5.683
Voids ratio	0.706	0.678	0.642	0.603	0.564	0.525	0.532
t90 (min)	7.56	11.22	12.25	10.56	7.84	6.25	
Cv (m ² /day)	0.014	0.009	0.008	0.009	0.011	0.013	
k' (MPa)	4.195	4.536	5.188	7.176	10.408	15.343	
Mv (mm ² / N)	0.2384	0.2205	0.1928	0.1393	0.0961	0.0652	

Trial #	29	30	31	32	33	34	35
Load (kPa)	285	140.0	70.0	35.0	17.5	9.0	4.5
Load (tsf)	2.964	1.456	0.728	0.364	0.182	0.094	0.047
Gauge Reading (in)	0.14172	0.1475	0.1547	0.1626	0.1705	0.1785	0.1831
(H-Hs) mm	5.784	5.932	6.114	6.313	6.515	6.717	6.834
Voids ratio	0.541	0.555	0.572	0.591	0.610	0.628	0.639
t90 (min)							
Cv (m ² /day)							
k' (MPa)							
Mv (mm ² / N)							

ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

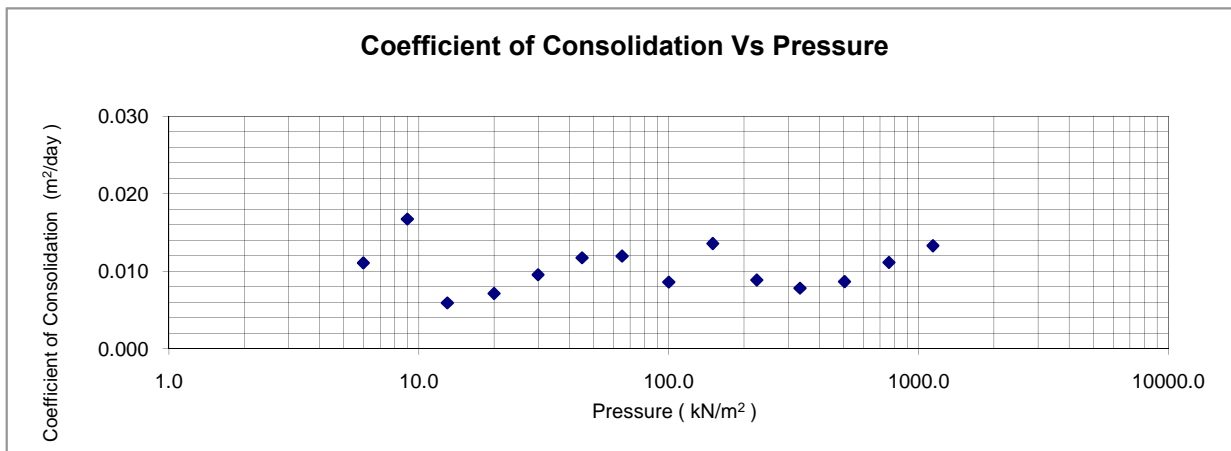
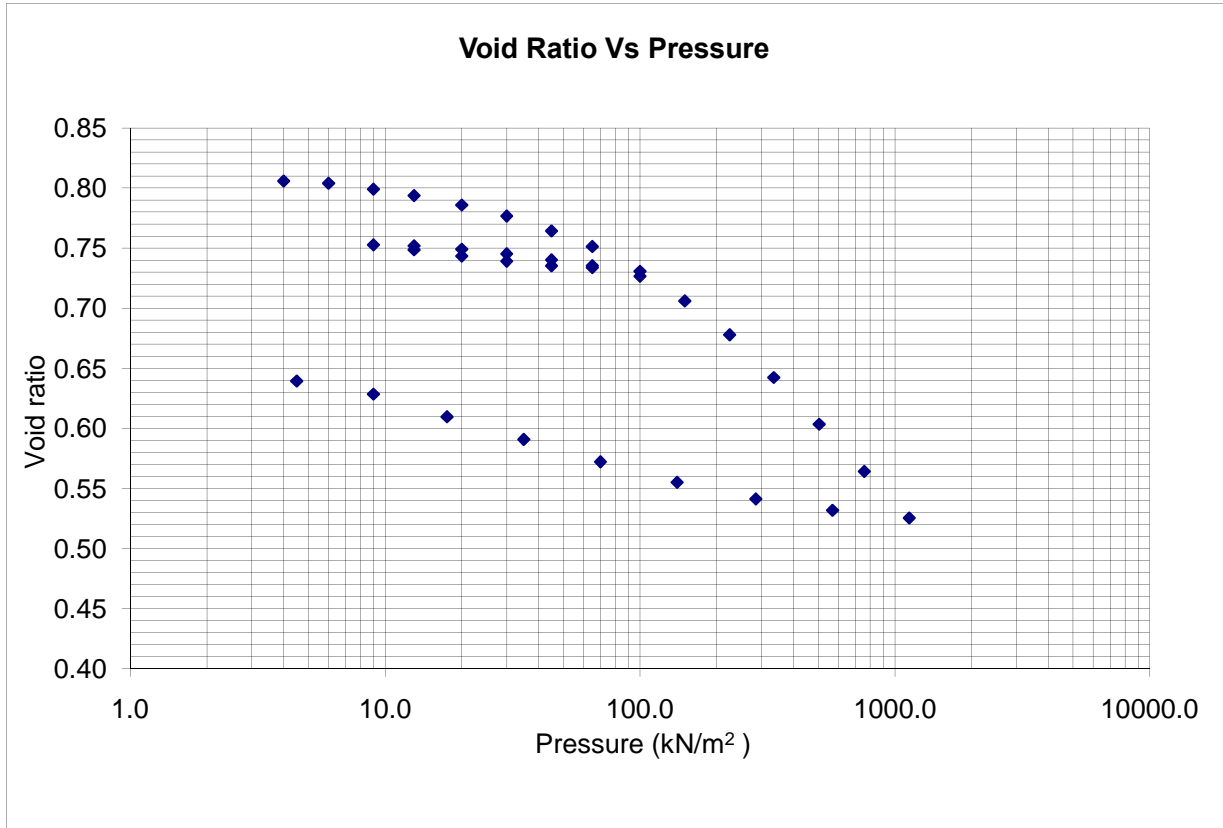
Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **9-Sep-11**

Sample ID: **B2-4-RW_TW8**

Job No.: **SW8801.1004.101**

Depth(m): **7.6 to 8.2**

σ'_v versus e and c_v



ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **9-Sep-11**

Sample ID: **B2-4-RW_TW8**

Job No.: **SW8801.1004.101**

Depth(m): **7.6 to 8.2**

Strain Energy Data

Presssure (kN/m ²)	c _v (m ² /day)	Void ratio
4.0		0.806
6.0	0.011	0.804
9.0	0.017	0.799
13.0	0.006	0.794
20.0	0.007	0.786
30.0	0.010	0.777
45.0	0.012	0.764
65.0	0.012	0.751
100.0	0.009	0.731
65.0		0.734
45.0		0.735
30.0		0.739
20.0		0.743
13.0		0.749
9.0		0.753
13.0		0.752
20.0		0.749
30.0		0.745
45.0		0.740
65.0		0.735
100.0		0.727
150.0	0.014	0.706
225.0	0.009	0.678
335.0	0.008	0.642
505.0	0.009	0.603
760.0	0.011	0.564
1140.0	0.013	0.525
570.0		0.532
285.0		0.541
140.0		0.555
70.0		0.572
35.0		0.591
17.5		0.610
9.0		0.628
4.5		0.639

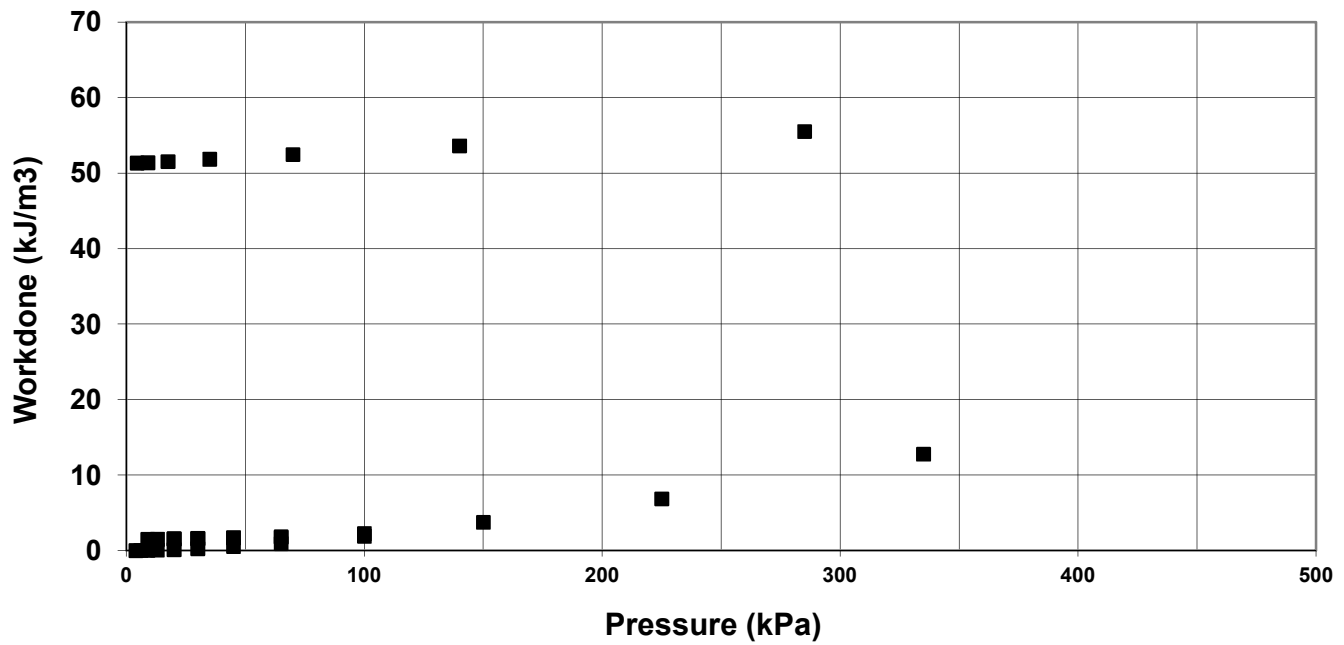
Presssure (KN/m ²)	Height mm	Total Work (KJ/m ³)
4.0	19.304	0.000
6.0	19.285	0.005
9.0	19.231	0.026
13.0	19.174	0.058
20.0	19.091	0.130
30.0	18.993	0.259
45.0	18.860	0.521
65.0	18.721	0.926
100.0	18.501	1.894
65.0	18.534	1.749
45.0	18.549	1.703
30.0	18.591	1.618
20.0	18.636	1.558
13.0	18.692	1.508
9.0	18.736	1.482
13.0	18.727	1.488
20.0	18.698	1.514
30.0	18.656	1.569
45.0	18.603	1.676
65.0	18.551	1.830
100.0	18.457	2.248
150.0	18.237	3.738
225.0	17.935	6.838
335.0	17.555	12.774
505.0	17.139	22.722
760.0	16.719	38.217
1140.0	16.305	61.741
570.0	16.373	58.172
285.0	16.475	55.526
140.0	16.622	53.622
70.0	16.804	52.472
35.0	17.004	51.849
17.5	17.206	51.537
9.0	17.408	51.382
4.5	17.524	51.336

ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **9-Sep-11** Sample ID: **B2-4-RW_TW8**

Job No.: **SW8801.1004.101**
 Depth(m): **7.6 to 8.2**

Strain Energy Method for Preconsolidation Pressure



ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **14-Sep-11**

Sample ID: **B2-4-RW_TW8**

Job No.: **SW8801**
 Depth(m): **7.6 to 8.2**

Test Data

Ring # :	B	Ring Height (in) =	0.760	Wt of dry filter paper (g)	0.69
Wet soil + Ring Wt (g)			196.11	Wt of ring (g)	76.53
Wet soil + Wet Paper + Ring (g)			195.35	Wet Paper (g)	2.16
Dry Soil + Dry Paper + Ring (g)			169.50	Ring Dia (in)	2.500
Initial moisture Content (%)			29.58	Final moisture Content (%)	26.42
Area of Ring (in ²)			4.91	Initial Volume (in ³)	3.7306
Initial Bulk Density (kg/m ³)			1956	Initial Dry Density (kg/m ³)	1509
Specific Gravity of Soil			2.73	Equiv. Thick. of solids (mm)	10.693
Final Bulk Density (kg/m ³)			2004	Final Dry Density (kg/m ³)	1546
Initial gauge reading for Load 1			0.2525	Gauge reading for last Loading	0.2163
Initial Voids Ratio			0.805	Final Void Ratio	0.719
Initial Degree of Saturation (%)			100	Final Degree of Saturation (%)	100

Trial #	1	2	3	4	5	6	7
Load (kPa)	5.0	7.5	11.5	17.5	26.5	40.0	60.0
Load (tsf)	0.052	0.078	0.120	0.182	0.276	0.416	0.624
Gauge Reading (in)	0.2525	0.2520	0.2502	0.2478	0.2445	0.24008	0.2344
(H-Hs) mm	8.611	8.599	8.551	8.492	8.406	8.295	8.151
Voids ratio	0.805	0.804	0.800	0.794	0.786	0.776	0.762
t ₉₀ (min)		1.69	7.84	14.44	16.40	12.25	11.56
C _v (m ² /day)		0.067	0.014	0.008	0.007	0.009	0.009
k' (MPa)		3.958	1.625	1.934	2.029	2.323	2.623
M _v (mm ² / N)		0.2526	0.6155	0.5169	0.4928	0.4305	0.3812

Trial #	8	9	10	11	12	13	14
Load (kPa)	90	135.0	200.0	300.0	150.0	75.0	37.5
Load (tsf)	0.936	1.404	2.080	3.120	1.560	0.780	0.390
Gauge Reading (in)	0.22635	0.2195	0.2081	0.1877	0.1896	0.1938	0.1990
(H-Hs) mm	7.947	7.773	7.482	6.964	7.012	7.119	7.251
Voids ratio	0.743	0.727	0.700	0.651	0.656	0.666	0.678
t ₉₀ (min)	12.25	11.56	10.24	10.89			
C _v (m ² /day)	0.009	0.009	0.010	0.009			
k' (MPa)	2.772	4.821	4.127	3.508			
M _v (mm ² / N)	0.3608	0.2074	0.2423	0.2851			

Trial #	15	16	17
Load (kPa)	19.0	9.5	4.75
Load (tsf)	0.1976	0.099	0.049
Gauge Reading (in)	0.2041	0.21115	0.2163
(H-Hs) mm	7.382	7.561	7.691
Voids ratio	0.690	0.707	0.719
t ₉₀ (min)			
C _v (m ² /day)			
k' (MPa)			
M _v (mm ² / N)			

ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

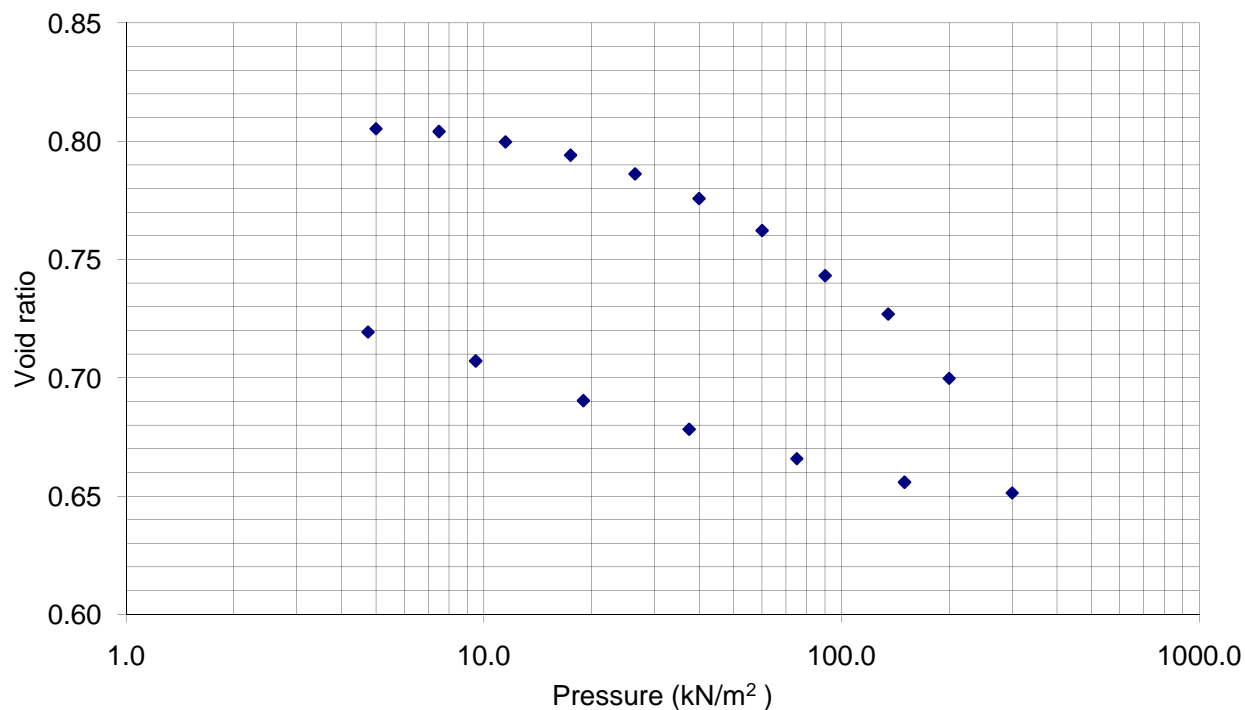
Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **14-Sep-11**

Sample ID: **B2-4-RW_TW8**

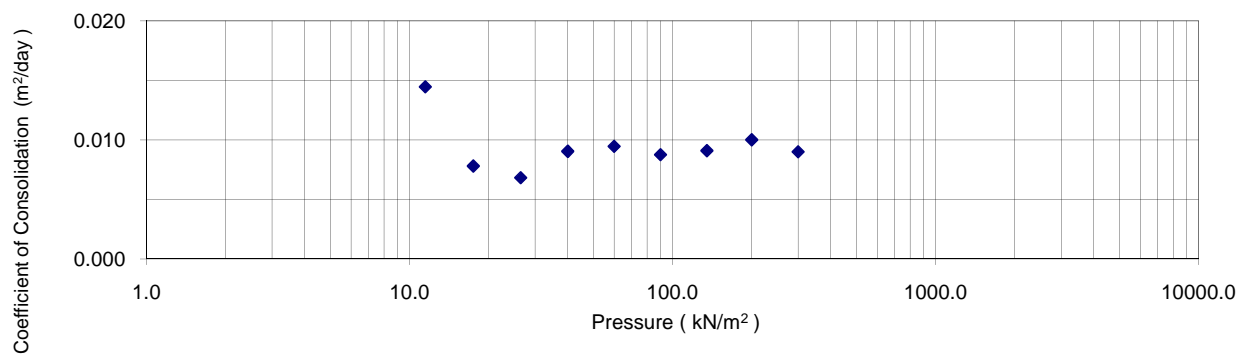
Job No.: **SW8801**
 Depth(m): **7.6 to 8.2**

σ'_v versus e and c_v

Void Ratio Vs Pressure



Coefficient of Consolidation Vs Pressure



ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **14-Sep-11**

Sample ID: **B2-4-RW_TW8**

Job No.: **SW8801**
 Depth(m): **7.6 to 8.2**

Strain Energy Data

Pressure (kN/m ²)	c _v (m ² /day)	Void ratio
5.0		0.805
7.5		0.804
11.5	0.014	0.800
17.5	0.008	0.794
26.5	0.007	0.786
40.0	0.009	0.776
60.0	0.009	0.762
90.0	0.009	0.743
135.0	0.009	0.727
200.0	0.010	0.700
300.0	0.009	0.651
150.0		0.656
75.0		0.666
37.5		0.678
19.0		0.690
9.5		0.707
4.75		0.719

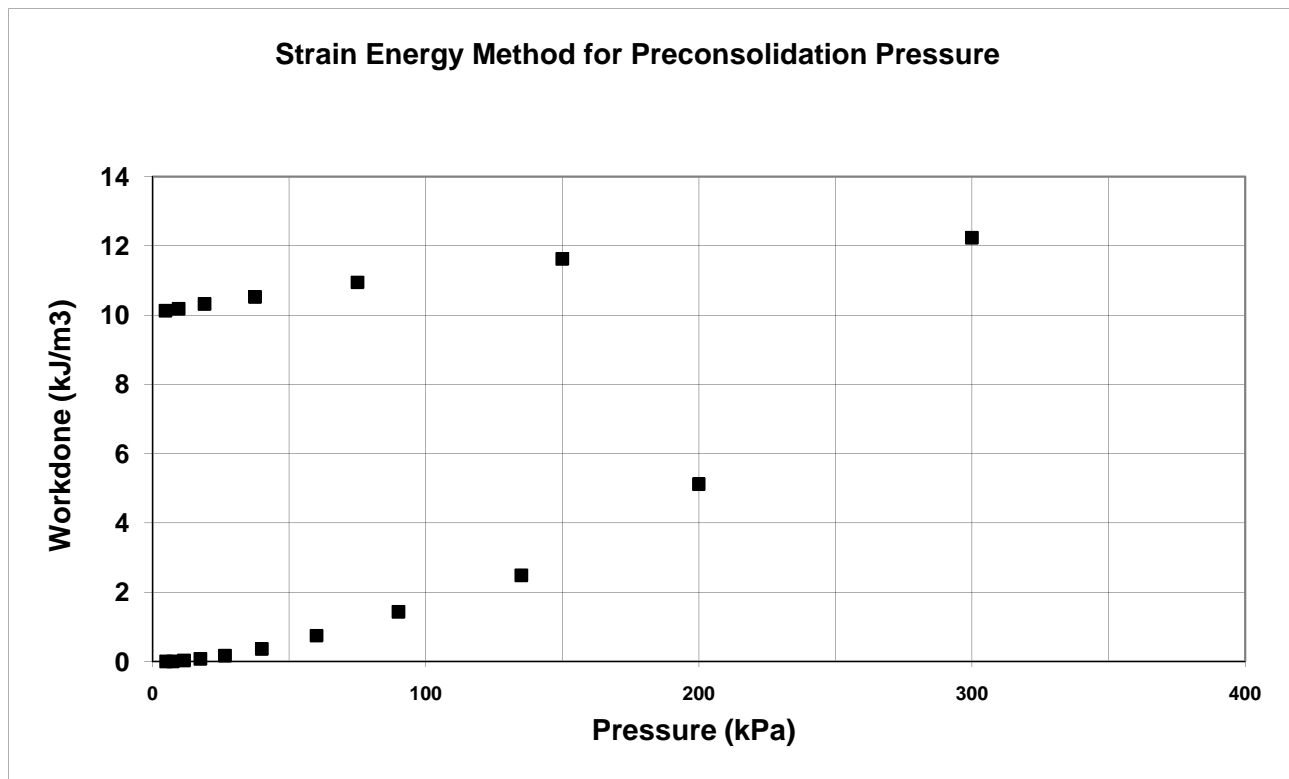
Pressure (kN/m ²)	Height mm	Total Work (KJ/m ³)
5.0	19.304	0.000
7.5	19.292	0.004
11.5	19.244	0.027
17.5	19.185	0.072
26.5	19.100	0.170
40.0	18.989	0.363
60.0	18.844	0.744
90.0	18.670	1.437
135.0	18.496	2.485
200.0	18.205	5.119
300.0	17.687	12.235
150.0	17.735	11.621
75.0	17.842	10.944
37.5	17.975	10.525
19.0	18.105	10.321
9.5	18.284	10.180
4.75	18.414	10.129

ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **14-Sep-11**

Sample ID: **B2-4-RW_TW8**

Job No.: **SW8801**
 Depth(m): **7.6 to 8.2**



ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **16-Sep-11**

Sample ID: **B6-1_TW13**

Job No.: **SW8801.1004.101**
 Depth(m): **13.7 to 14.3**

Test Data

Ring # :	A	Ring Height (in) =	0.757	Wt of dry filter paper (g)	0.70
Wet soil + Ring Wt (g)			207.35	Wt of ring (g)	76.59
Wet soil + Wet Paper + Ring (g)			207.23	Wet Paper (g)	2.04
Dry Soil + Dry Paper + Ring (g)			187.17	Ring Dia (in)	2.498
Initial moisture Content (%)			19.00	Final moisture Content (%)	17.04
Area of Ring (in ²)			4.90	Initial Volume (in ³)	3.7100
Initial Bulk Density (kg/m ³)			2151	Initial Dry Density (kg/m ³)	1807
Specific Gravity of Soil			2.75	Equiv. Thick. of solids (mm)	12.628
Final Bulk Density (kg/m ³)			2193	Final Dry Density (kg/m ³)	1843
Initial gauge reading for Load 1			0.2495	Gauge reading for last Loading	0.2226
Initial Voids Ratio			0.523	Final Void Ratio	0.469
Initial Degree of Saturation (%)			100	Final Degree of Saturation (%)	100

Trial #	1	2	3	4	5	6	7
Load (kPa)	5.0	7.5	11.5	17.5	26.5	40.0	60.0
Load (tsf)	0.052	0.078	0.120	0.182	0.276	0.416	0.624
Gauge Reading (in)	0.2478	0.2469	0.2451	0.2427	0.2399	0.2369	0.2331
(H-Hs) mm	6.556	6.535	6.488	6.427	6.355	6.280	6.184
Voids ratio	0.519	0.517	0.514	0.509	0.503	0.497	0.490
t90 (min)		7.84	6.76	8.70	6.76	6.50	5.76
Cv (m ² /day)		0.014	0.017	0.013	0.016	0.017	0.019
k' (MPa)		2.303	1.649	1.881	2.369	3.420	3.939
Mv (mm ² / N)		0.4343	0.6064	0.5315	0.4221	0.2924	0.2539

Trial #	8	9	10	11	12	13	14
Load (kPa)	90	135.0	200.0	300.0	150.0	75.0	37.5
Load (tsf)	0.936	1.404	2.080	3.120	1.560	0.780	0.390
Gauge Reading (in)	0.22801	0.2246	0.2187	0.2092	0.2096	0.2112	0.2133
(H-Hs) mm	6.054	5.967	5.816	5.577	5.585	5.626	5.681
Voids ratio	0.479	0.473	0.461	0.442	0.442	0.446	0.450
t90 (min)	5.52	5.76	5.76				
Cv (m ² /day)	0.019	0.018	0.018				
k' (MPa)	4.348	9.650	8.024				
Mv (mm ² / N)	0.2300	0.1036	0.1246				

Trial #	15	16	17
Load (kPa)	19.0	9.5	4.75
Load (tsf)	0.1976	0.099	0.049
Gauge Reading (in)	0.2168	0.219	0.2226
(H-Hs) mm	5.768	5.825	5.917
Voids ratio	0.457	0.461	0.469
t90 (min)			
Cv (m ² /day)			
k' (MPa)			
Mv (mm ² / N)			

ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

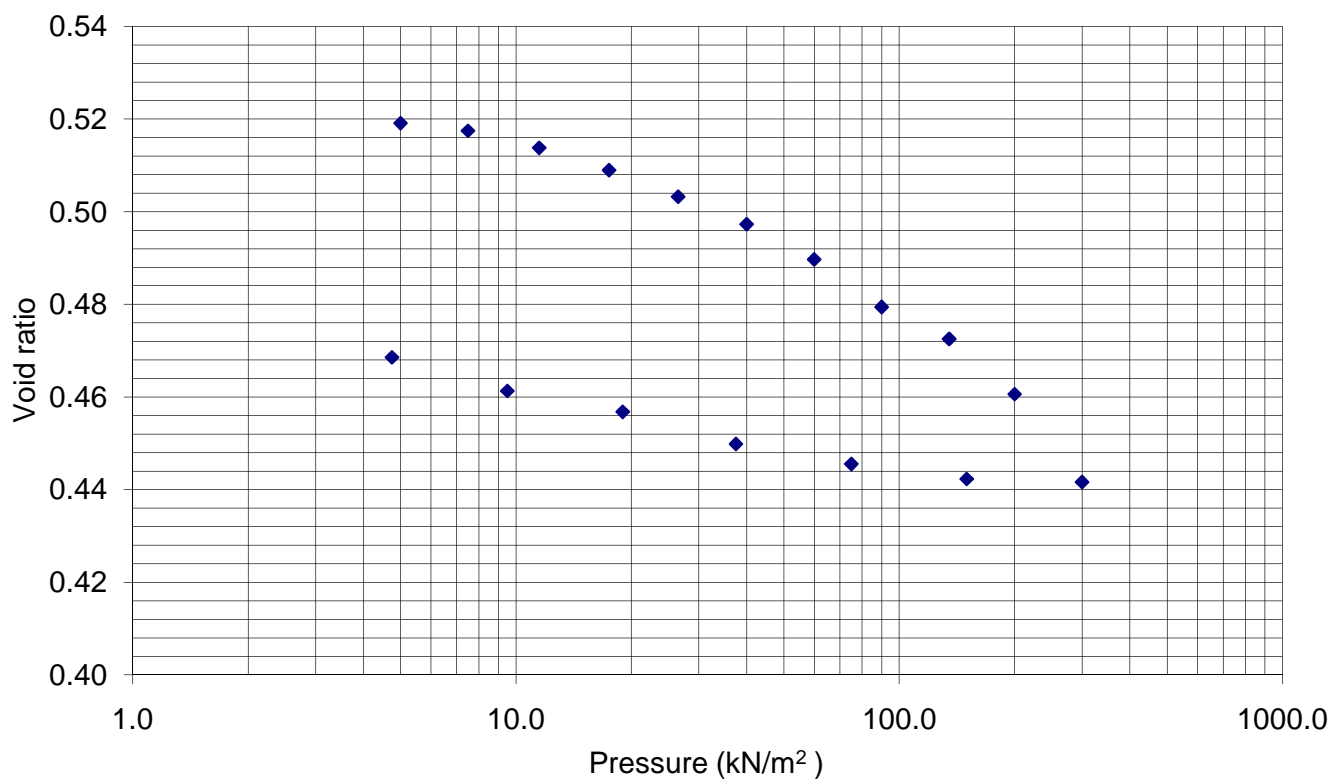
Project: **WEP**
 Client: **Hatch Mott MacDonald Limited**
 Date: **16-Sep-11**

Sample ID: **B6-1_TW13**

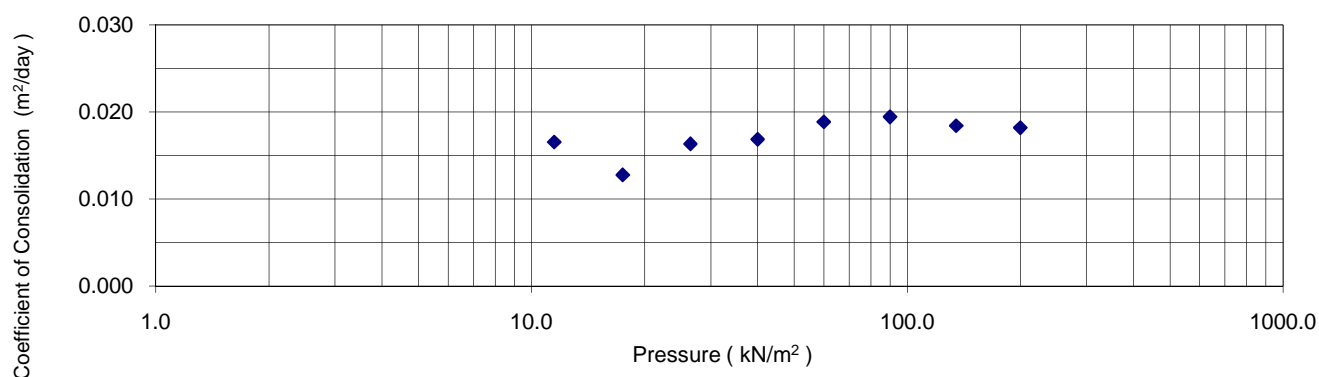
Job No.: **SW8801.1004.101**
 Depth(m): **13.7 to 14.3**

σ'_v versus e and c_v

Void Ratio Vs Pressure



Coefficient of Consolidation Vs Pressure



ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP** **Job No.:** **SW8801.1004.101**
Client: **Hatch Mott MacDonald Limited**
Date: **16-Sep-11** **Sample ID:** **B6-1_TW13** **Depth(m):** **13.7 to 14.3**

Strain Energy Data

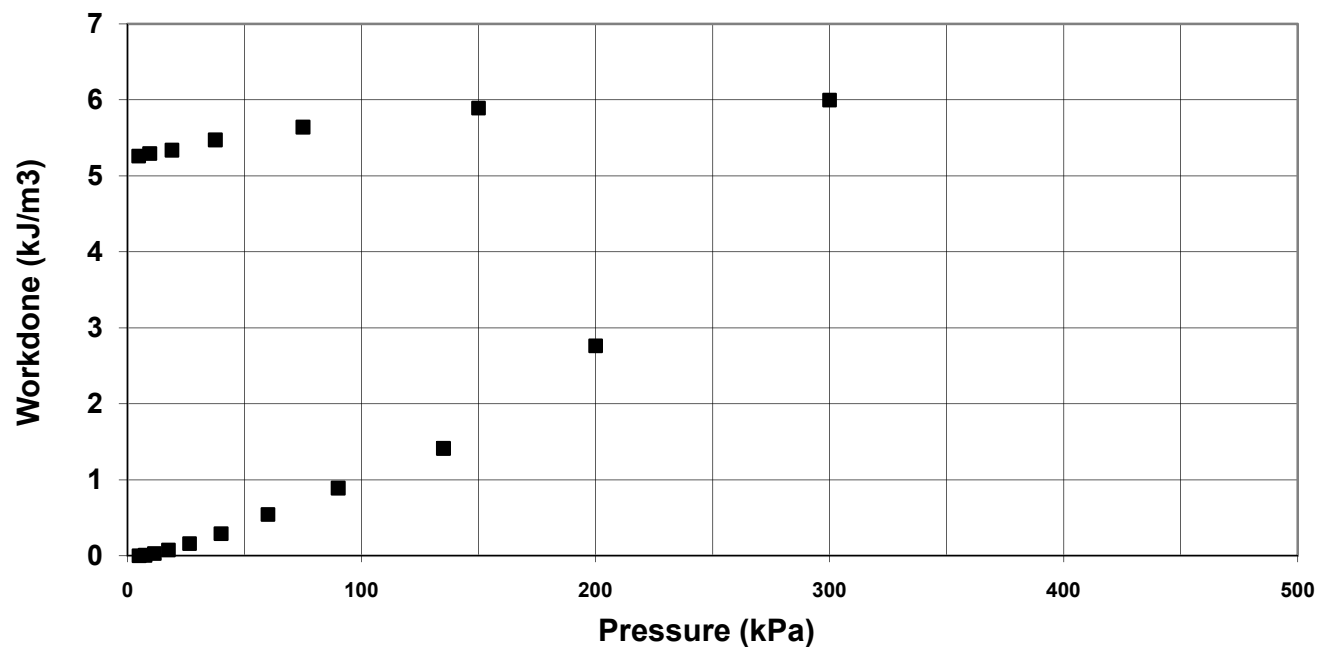
Presssure (kN/m ²)	c _v (m ² /day)	Void ratio
5.0		0.519
7.5		0.517
11.5	0.017	0.514
17.5	0.013	0.509
26.5	0.016	0.503
40.0	0.017	0.497
60.0	0.019	0.490
90.0	0.019	0.479
135.0	0.018	0.473
200.0	0.018	0.461
300.0		0.442
150.0		0.442
75.0		0.446
37.5		0.450
19.0		0.457
9.5		0.461
4.75		0.469

Presssure (KN/m ²)	Height mm	Total Work (KJ/m ³)
5.0	19.228	0.000
7.5	19.207	0.007
11.5	19.160	0.030
17.5	19.100	0.076
26.5	19.027	0.159
40.0	18.952	0.290
60.0	18.856	0.544
90.0	18.769	0.890
135.0	18.682	1.412
200.0	18.531	2.763
300.0	18.292	5.997
150.0	18.300	5.891
75.0	18.341	5.641
37.5	18.395	5.474
19.0	18.483	5.339
9.5	18.540	5.295
4.75	18.632	5.260

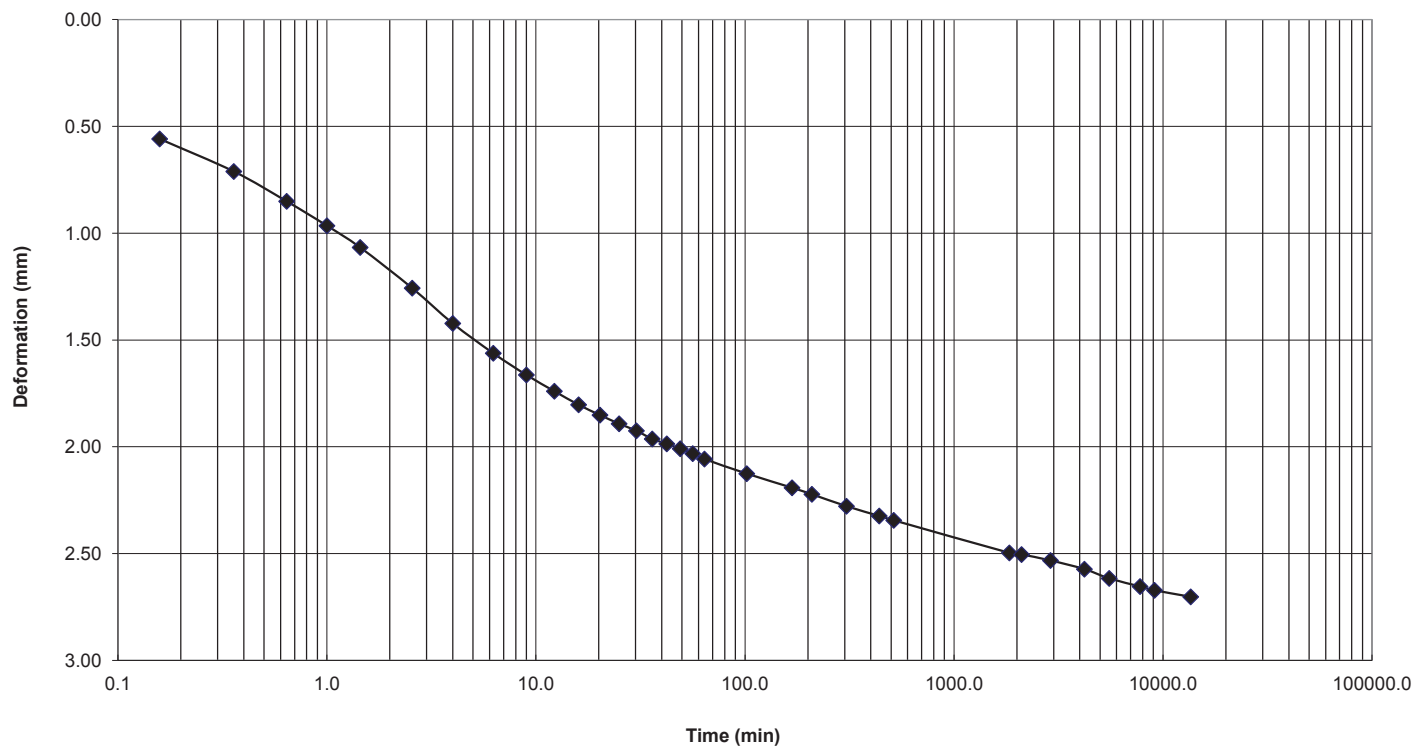
ONE DIMENSIONAL CONSOLIDATION TEST (ASTM D 2435)

Project: **WEP** Job No.: **SW8801.1004.101**
 Client: **Hatch Mott MacDonald Limited**
 Date: **16-Sep-11** Sample ID: **B6-1_TW13** Depth(m): **13.7 to 14.3**

Strain Energy Method for Preconsolidation Pressure



Time-Deformation Curve for Consolidation Test
"300 kPa"



Appendix D Slope Stability Analyses

Figure D-1: Slope Stability Result – Section 1 (Sta. 10+050W) – Stage 1 (El=185.0) – Short-term Loading

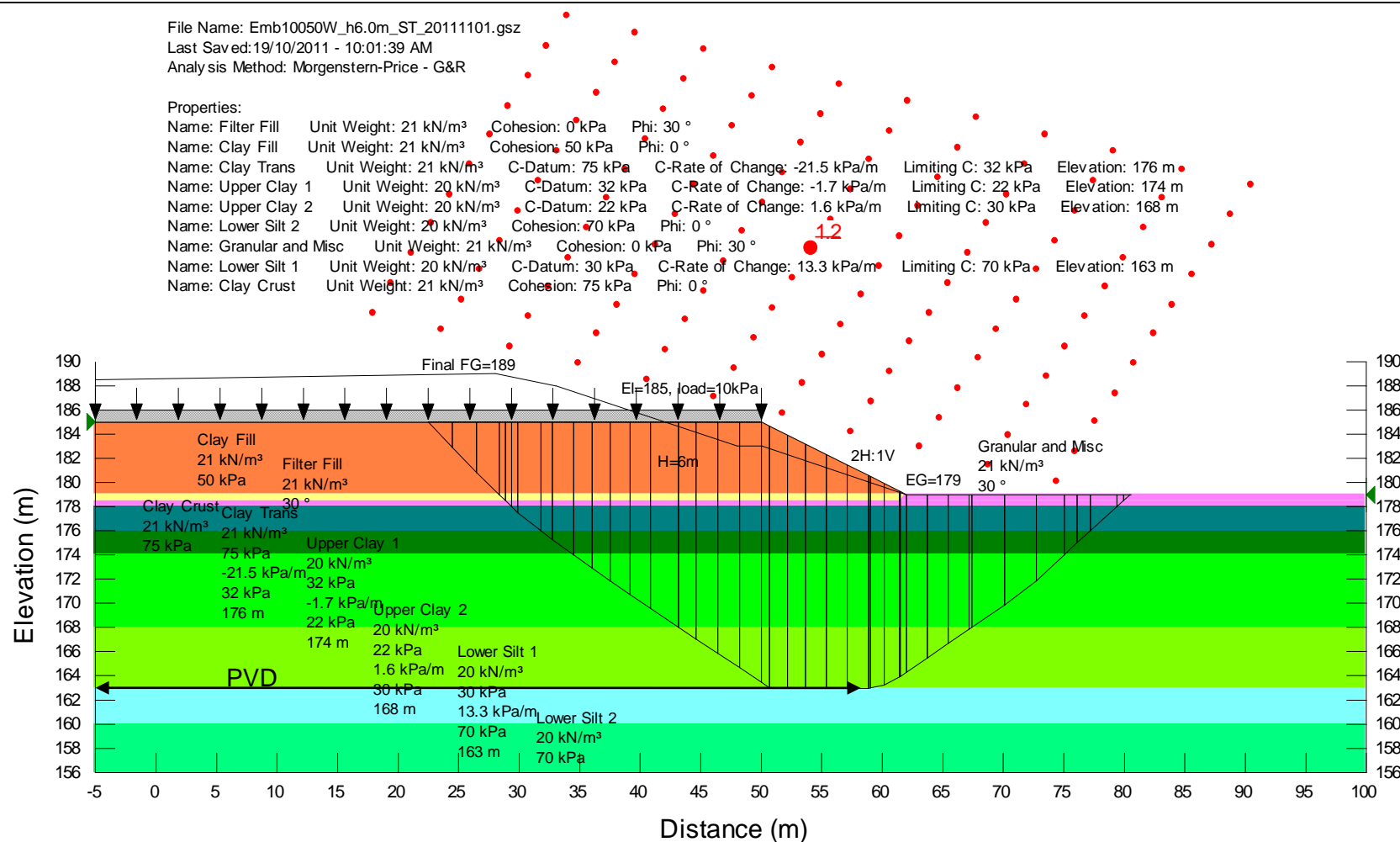


Figure D-2: Slope Stability Result – Section 1 (Sta. 10+050W) – Stage 2 (El=187.5) – Short-term Loading

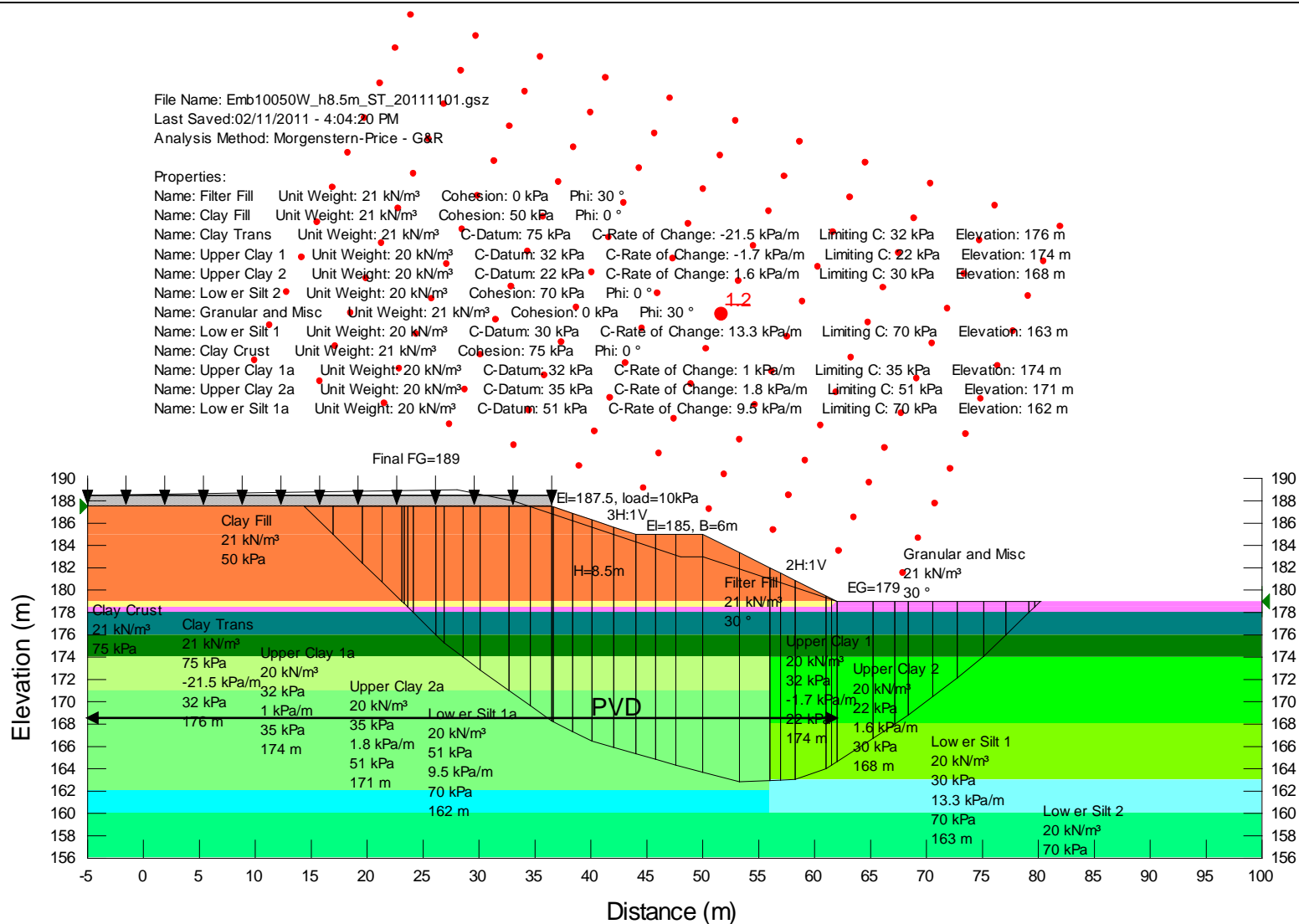


Figure D-3: Slope Stability Result – Section 1 (Sta. 10+050W) – Stage 3 (El=188.2) – Short-term Loading

File Name: Emb10050W_h9.2m_ST_20111101.gsz
Last Saved: 02/11/2011 - 4:07:08 PM
Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °
Name: Clay Trans	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -21.5 kPa/m
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 32 kPa	C-Rate of Change: -1.7 kPa/m
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 22 kPa	C-Rate of Change: 1.6 kPa/m
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 70 kPa	Phi: 0 °
Name: Granular and Msc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 30 kPa	C-Rate of Change: 13.3 kPa/m
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Upper Clay 1a	Unit Weight: 20 kN/m ³	C-Datum: 32 kPa	C-Rate of Change: 1 kPa/m
Name: Upper Clay 2a	Unit Weight: 20 kN/m ³	C-Datum: 35 kPa	C-Rate of Change: 1.8 kPa/m
Name: Lower Silt 1a	Unit Weight: 20 kN/m ³	C-Datum: 51 kPa	C-Rate of Change: 9.5 kPa/m
Name: Upper Clay 1b	Unit Weight: 20 kN/m ³	C-Datum: 40 kPa	C-Rate of Change: 1.7 kPa/m
Name: Upper Clay 2b	Unit Weight: 20 kN/m ³	C-Datum: 45 kPa	C-Rate of Change: 1.7 kPa/m
Name: Lower Silt 1b	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: 5 kPa/m
Name: Clay Trans b	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -17.5 kPa/m

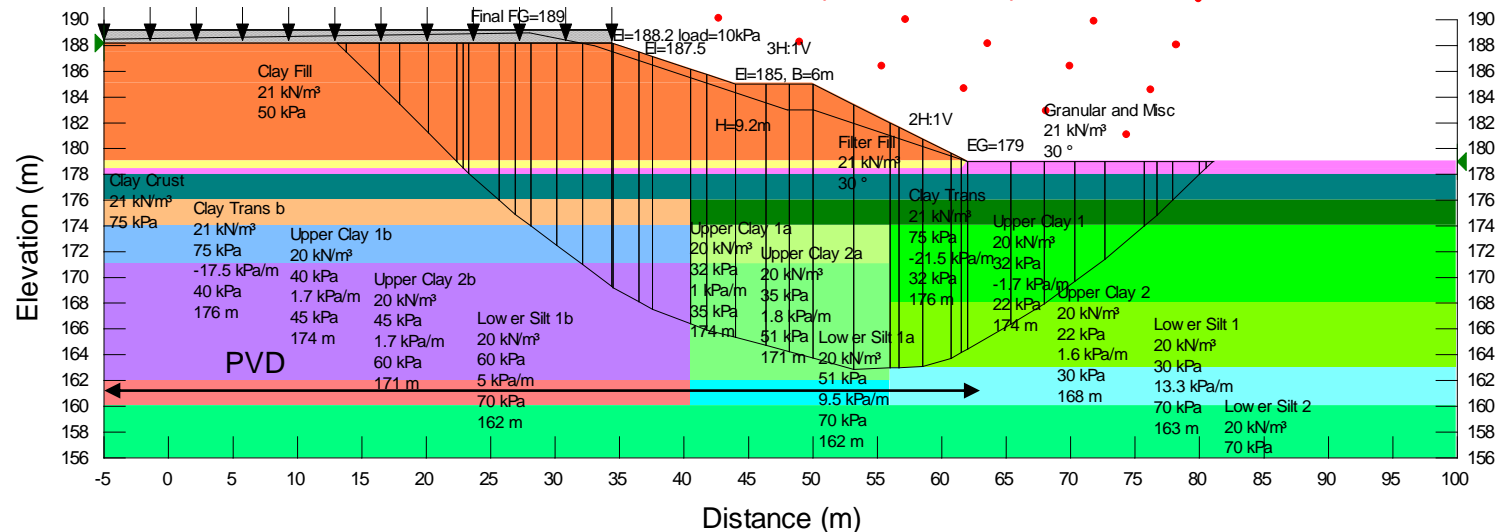


Figure D-4: Slope Stability Result – Section 1 (Sta. 10+050W) – Stage 4 (El=190.0) – Short-term Loading

File Name: Emb10050W_h11.0m_ST_20111101.gsz
Last Saved: 02/11/2011 - 4:46:50 PM
Analysis Method: Morgenstern-Price - G&R

Properties

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °
Name: Clay Trans	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -21.5 kPa/m
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 32 kPa	C-Rate of Change: -1.7 kPa/m
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 22 kPa	C-Rate of Change: 1.6 kPa/m
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 70 kPa	Phi: 0 °
Name: Granular and Misc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 30 kPa	C-Rate of Change: 13.3 kPa/m
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Upper Clay 1a	Unit Weight: 20 kN/m ³	C-Datum: 32 kPa	C-Rate of Change: 1 kPa/m
Name: Upper Clay 2a	Unit Weight: 20 kN/m ³	C-Datum: 36 kPa	C-Rate of Change: 1.8 kPa/m
Name: Lower Silt 1a	Unit Weight: 20 kN/m ³	C-Datum: 51 kPa	C-Rate of Change: 9.5 kPa/m
Name: Upper Clay 1b	Unit Weight: 20 kN/m ³	C-Datum: 40 kPa	C-Rate of Change: 1.7 kPa/m
Name: Upper Clay 2b	Unit Weight: 20 kN/m ³	C-Datum: 45 kPa	C-Rate of Change: 1.7 kPa/m
Name: Lower Silt 1b	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: 5 kPa/m
Name: Clay Trans b	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -17.5 kPa/m
Name: Clay Trans c	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -16 kPa/m
Name: Upper Clay 1c	Unit Weight: 20 kN/m ³	C-Datum: 43 kPa	C-Rate of Change: 2.3 kPa/m
Name: Upper Clay 2c	Unit Weight: 20 kN/m ³	C-Datum: 50 kPa	C-Rate of Change: 1.6 kPa/m
Name: Lower Silt 1c	Unit Weight: 20 kN/m ³	C-Datum: 64 kPa	C-Rate of Change: 3 kPa/m

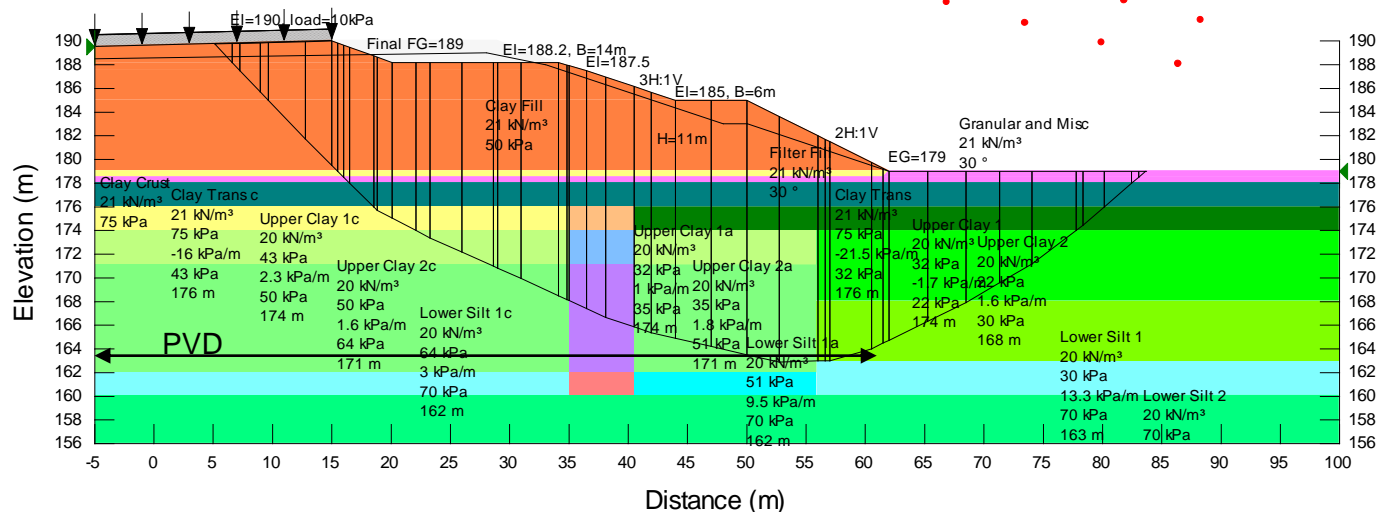


Figure D-5: Slope Stability Result – Section 1 (Sta. 10+050W) – Stage 5 (Final Config) – Short-term Loading

File Name: Emb10050W_h10.0m_EOC_ST_20111012.gsz
Last Saved: 20/12/2012 - 10:40:58 AM
Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m³	Cohesion: 0 kPa	Phi: 30 °
Name: Clay Fill	Unit Weight: 21 kN/m³	Cohesion: 50 kPa	Phi: 0 °
Name: Clay Trans	Unit Weight: 21 kN/m³	C-Datum: 75 kPa	C-Rate of Change: -21.5 kPa/m
Name: Upper Clay 1	Unit Weight: 20 kN/m³	C-Datum: 32 kPa	C-Rate of Change: 1.7 kPa/m
Name: Upper Clay 2	Unit Weight: 20 kN/m³	C-Datum: 22 kPa	C-Rate of Change: 1.6 kPa/m
Name: Lower Silt 2	Unit Weight: 20 kN/m³	Cohesion: 70 kPa	Phi: 0 °
Name: Granular and Msc	Unit Weight: 21 kN/m³	Cohesion: 0 kPa	Phi: 30 °
Name: Lower Silt 1	Unit Weight: 20 kN/m³	C-Datum: 30 kPa	C-Rate of Change: 13.3 kPa/m
Name: Clay Crust	Unit Weight: 21 kN/m³	Cohesion: 75 kPa	Phi: 0 °
Name: Upper Clay 1a	Unit Weight: 20 kN/m³	C-Datum: 32 kPa	C-Rate of Change: 1 kPa/m
Name: Upper Clay 2a	Unit Weight: 20 kN/m³	C-Datum: 35 kPa	C-Rate of Change: 1.8 kPa/m
Name: Lower Silt 1a	Unit Weight: 20 kN/m³	C-Datum: 51 kPa	C-Rate of Change: 9.5 kPa/m
Name: Upper Clay 1b	Unit Weight: 20 kN/m³	C-Datum: 40 kPa	C-Rate of Change: 1.7 kPa/m
Name: Upper Clay 2b	Unit Weight: 20 kN/m³	C-Datum: 45 kPa	C-Rate of Change: 1.7 kPa/m
Name: Lower Silt 1b	Unit Weight: 20 kN/m³	C-Datum: 60 kPa	C-Rate of Change: 5 kPa/m
Name: Clay Trans b	Unit Weight: 21 kN/m³	C-Datum: 75 kPa	C-Rate of Change: -17.5 kPa/m
Name: Clay Trans c	Unit Weight: 21 kN/m³	C-Datum: 75 kPa	C-Rate of Change: -16 kPa/m
Name: Upper Clay 1c	Unit Weight: 20 kN/m³	C-Datum: 43 kPa	C-Rate of Change: 2.3 kPa/m
Name: Upper Clay 2c	Unit Weight: 20 kN/m³	C-Datum: 50 kPa	C-Rate of Change: 1.6 kPa/m
Name: Lower Silt 1c	Unit Weight: 20 kN/m³	C-Datum: 64 kPa	C-Rate of Change: 3 kPa/m
Name: Clay Trans d	Unit Weight: 21 kN/m³	C-Datum: 75 kPa	C-Rate of Change: -13.5 kPa/m
Name: Upper Clay 1d	Unit Weight: 20 kN/m³	C-Datum: 48 kPa	C-Rate of Change: 2 kPa/m
Name: Upper Clay 2d	Unit Weight: 20 kN/m³	C-Datum: 54 kPa	C-Rate of Change: 1.3 kPa/m
Name: Lower Silt 1d	Unit Weight: 20 kN/m³	C-Datum: 66 kPa	C-Rate of Change: 2 kPa/m
Name: EPS	Unit Weight: 0.5 kN/m³	Cohesion: 10 kPa	Phi: 0 °

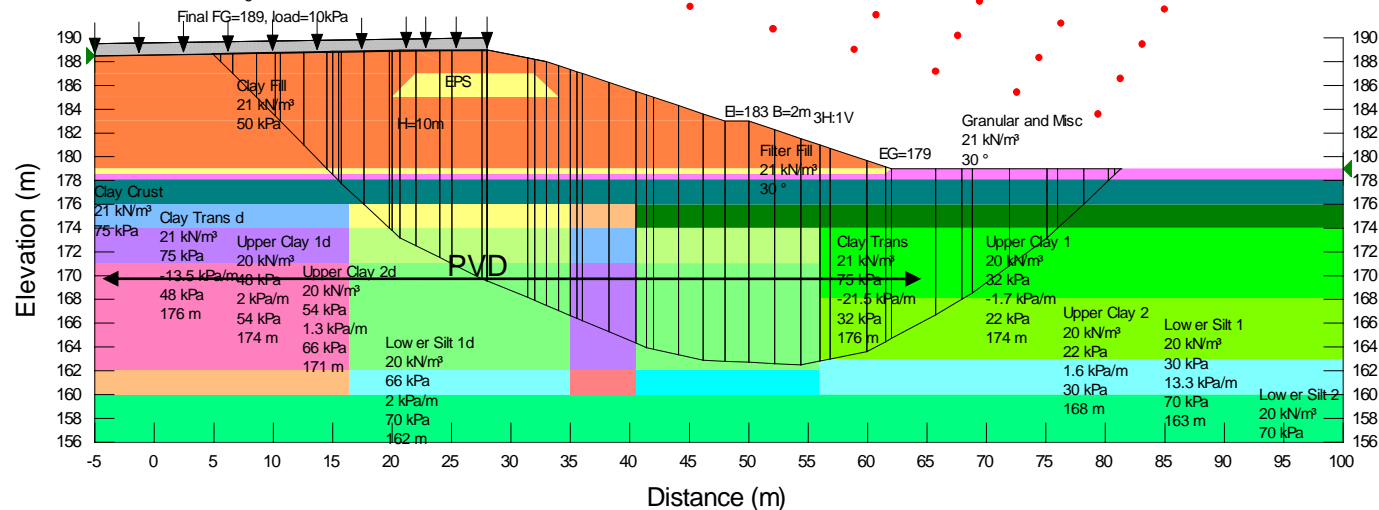


Figure D-6: Slope Stability Result – Section 1 (Sta. 10+050W) – Stage 5 (Final Config) – Long-term Loading

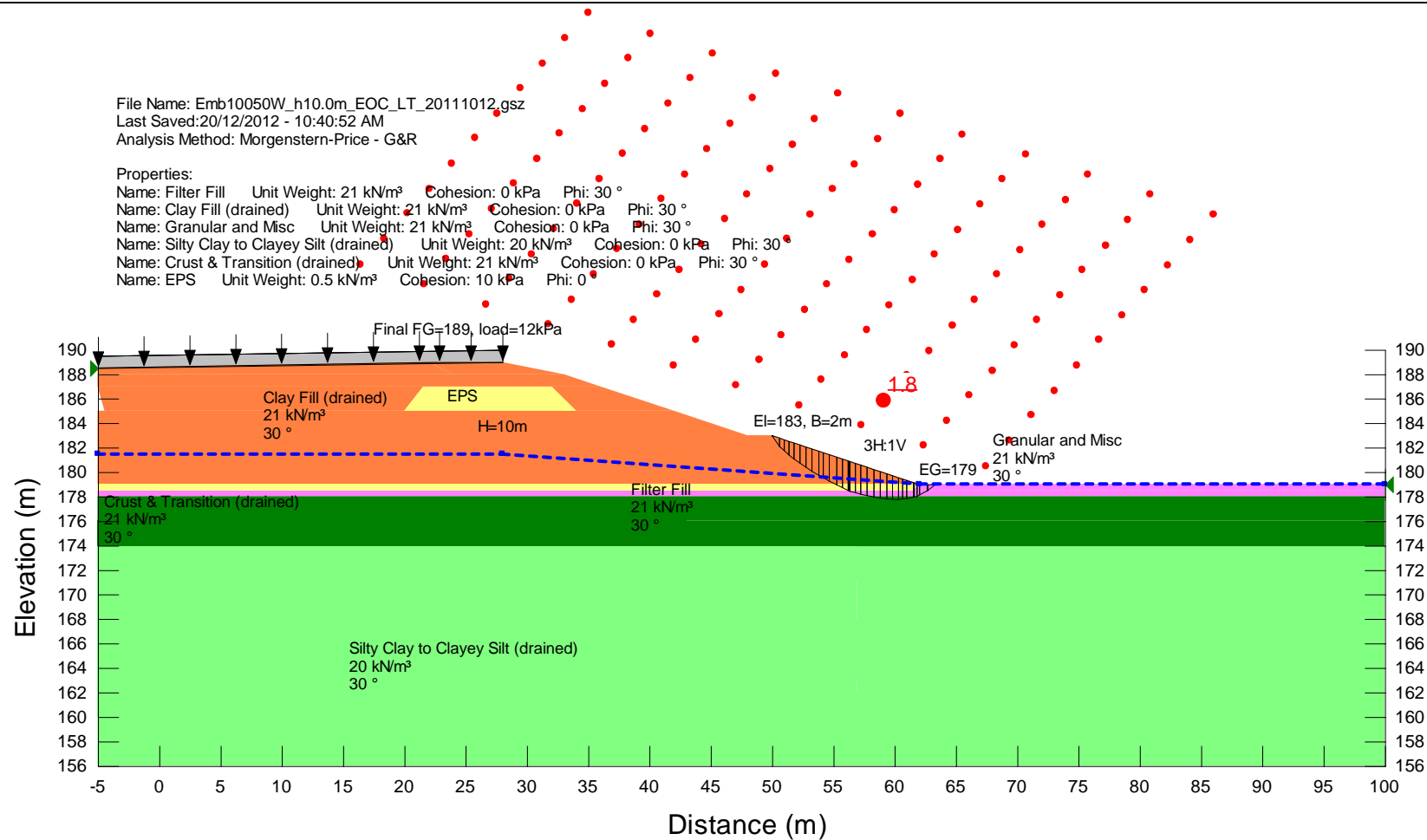


Figure D-7: Slope Stability Result – Section 2 (Sta. 10+600W) – Stage 1 (El=185.0) – Short-term Loading

File Name: Emb10600W_h6.0m_ST_20111101.gsz
Last Saved: 02/11/2011 - 4:13:29 PM
Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 35 kPa	C-Rate of Change: -1.5 kPa/m Limiting C: 23 kPa Elevation: 175 m
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 23 kPa	C-Rate of Change: 1.8 kPa/m Limiting C: 30 kPa Elevation: 167 m
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Granular and Msc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Transitional Clay	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -20 kPa/m Limiting C: 35 kPa Elevation: 177 m
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 30 kPa	C-Rate of Change: 15 kPa/m Limiting C: 75 kPa Elevation: 163 m

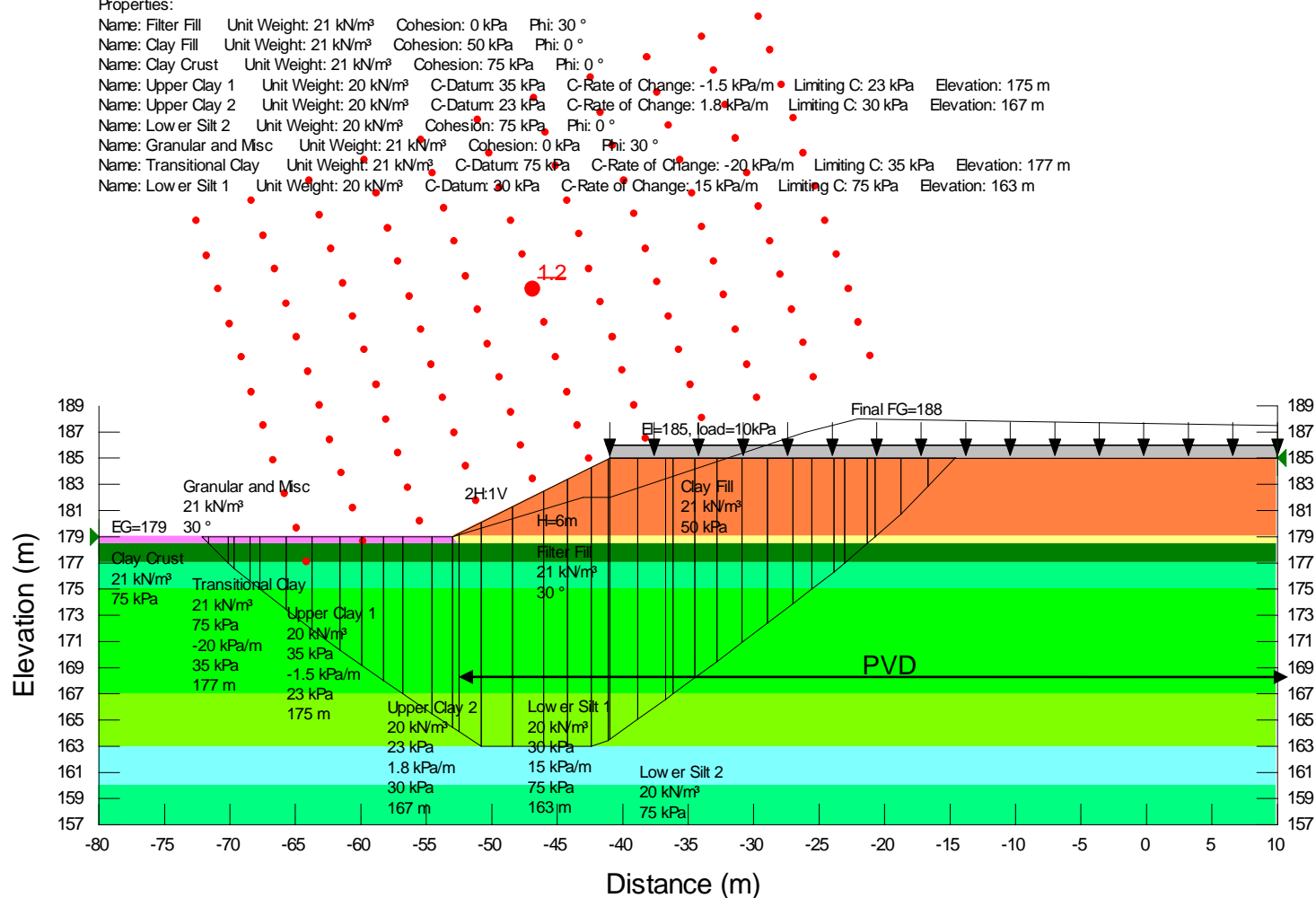


Figure D-8: Slope Stability Result – Section 2 (Sta. 10+600W) – Stage 2 (El=187.5) – Short-term Loading

File Name: Emb10600W_h8.5mgain_ST_20111101.gsz
Last Saved: 21/12/2012 - 9:44:44 AM
Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Filter Fill Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Clay Fill Unit Weight: 21 kN/m³ Cohesion: 50 kPa Phi: 0 °
Name: Clay Crust Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Upper Clay 1 Unit Weight: 20 kN/m³ C-Datum: 35 kPa C-Rate of Change: -1.5 kPa/m Limiting C: 23 kPa Elevation: 175 m
Name: Upper Clay 2 Unit Weight: 20 kN/m³ C-Datum: 23 kPa C-Rate of Change: 1.8 kPa/m Limiting C: 30 kPa Elevation: 167 m
Name: Lower Silt 2 Unit Weight: 20 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Granular and Misc Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Transitional Clay Unit Weight: 21 kN/m³ C-Datum: 75 kPa C-Rate of Change: -20 kPa/m Limiting C: 35 kPa Elevation: 177 m
Name: Lower Silt 1 Unit Weight: 20 kN/m³ C-Datum: 30 kPa C-Rate of Change: 15 kPa/m Limiting C: 75 kPa Elevation: 163 m
Name: Upper Clay 1a Unit Weight: 20 kN/m³ C-Datum: 75 kPa C-Rate of Change: -14 kPa/m Limiting C: 33 kPa Elevation: 175 m
Name: Upper Clay 2a Unit Weight: 20 kN/m³ C-Datum: 33 kPa C-Rate of Change: 1.9 kPa/m Limiting C: 52 kPa Elevation: 172 m
Name: Lower Silt 1a Unit Weight: 20 kN/m³ C-Datum: 52 kPa C-Rate of Change: 11.5 kPa/m Limiting C: 75 kPa Elevation: 162 m
Name: Transitional Clay a Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0 °

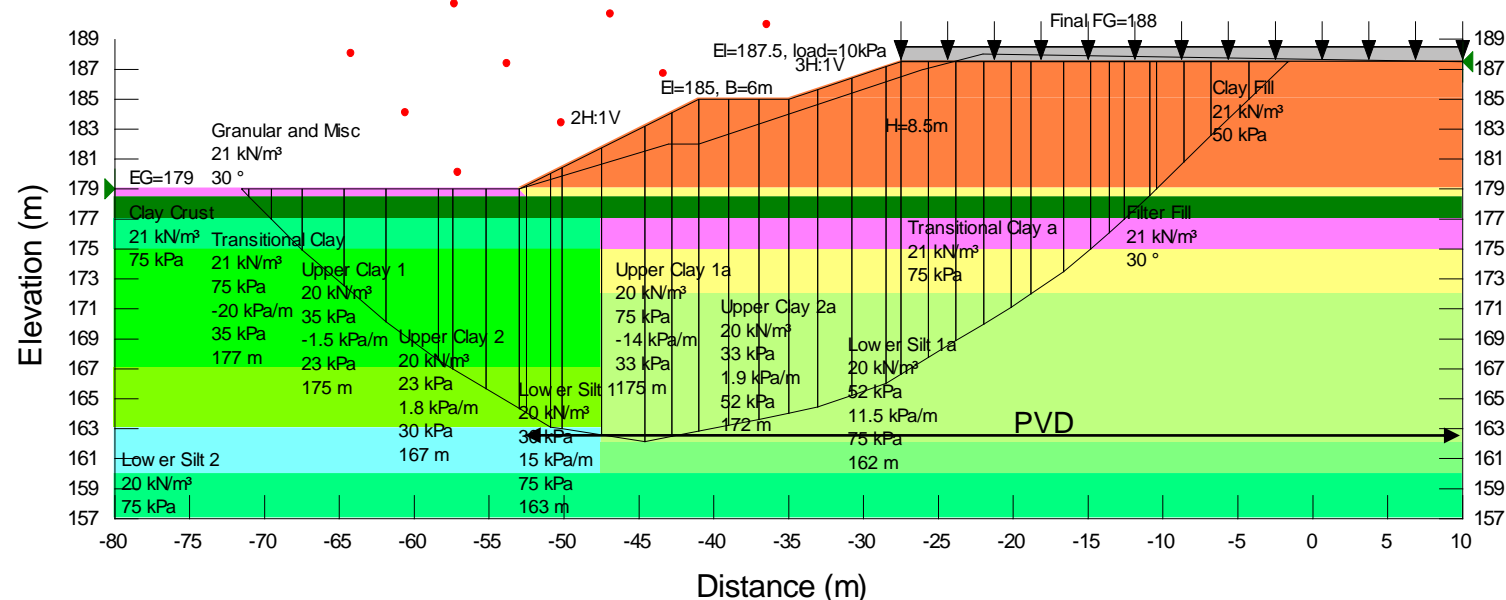


Figure D-9: Slope Stability Result – Section 2 (Sta. 10+600W) – Stage 3 (EI=189.0) – Short-term Loading

File Name: Emb10600W_h10.0mgain_ST_20111101.gsz
Last Saved: 21/12/2012 - 9:37:54 AM
Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Filter Fill Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Clay Fill Unit Weight: 21 kN/m³ Cohesion: 50 kPa Phi: 0 °
Name: Clay Crust Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Upper Clay 1 Unit Weight: 20 kN/m³ C-Datum: 35 kPa C-Rate of Change: -1.5 kPa/m Limiting C: 23 kPa Elevation: 175 m
Name: Upper Clay 2 Unit Weight: 20 kN/m³ C-Datum: 23 kPa C-Rate of Change: 1.8 kPa/m Limiting C: 30 kPa Elevation: 167 m
Name: Lower Silt 2 Unit Weight: 20 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Gravel and Misc Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Transitional Clay Unit Weight: 21 kN/m³ C-Datum: 75 kPa C-Rate of Change: -20 kPa/m Limiting C: 35 kPa Elevation: 177 m
Name: Lower Silt 1 Unit Weight: 20 kN/m³ C-Datum: 30 kPa C-Rate of Change: 15 kPa/m Limiting C: 75 kPa Elevation: 163 m
Name: Upper Clay 1a Unit Weight: 20 kN/m³ C-Datum: 35 kPa C-Rate of Change: -14 kPa/m Limiting C: 33 kPa Elevation: 175 m
Name: Upper Clay 2a Unit Weight: 20 kN/m³ C-Datum: 33 kPa C-Rate of Change: 1.9 kPa/m Limiting C: 52 kPa Elevation: 172 m
Name: Upper Clay 1b Unit Weight: 20 kN/m³ C-Datum: 75 kPa C-Rate of Change: -10.3 kPa/m Limiting C: 44 kPa Elevation: 175 m
Name: Upper Clay 2b Unit Weight: 20 kN/m³ C-Datum: 44 kPa C-Rate of Change: 1.7 kPa/m Limiting C: 61 kPa Elevation: 172 m
Name: Lower Silt 1b Unit Weight: 20 kN/m³ C-Datum: 61 kPa C-Rate of Change: 7 kPa/m Limiting C: 75 kPa Elevation: 162 m
Name: Lower Silt 1a Unit Weight: 20 kN/m³ C-Datum: 52 kPa C-Rate of Change: 11.5 kPa/m Limiting C: 75 kPa Elevation: 162 m
Name: Transitional Clay a Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0 °

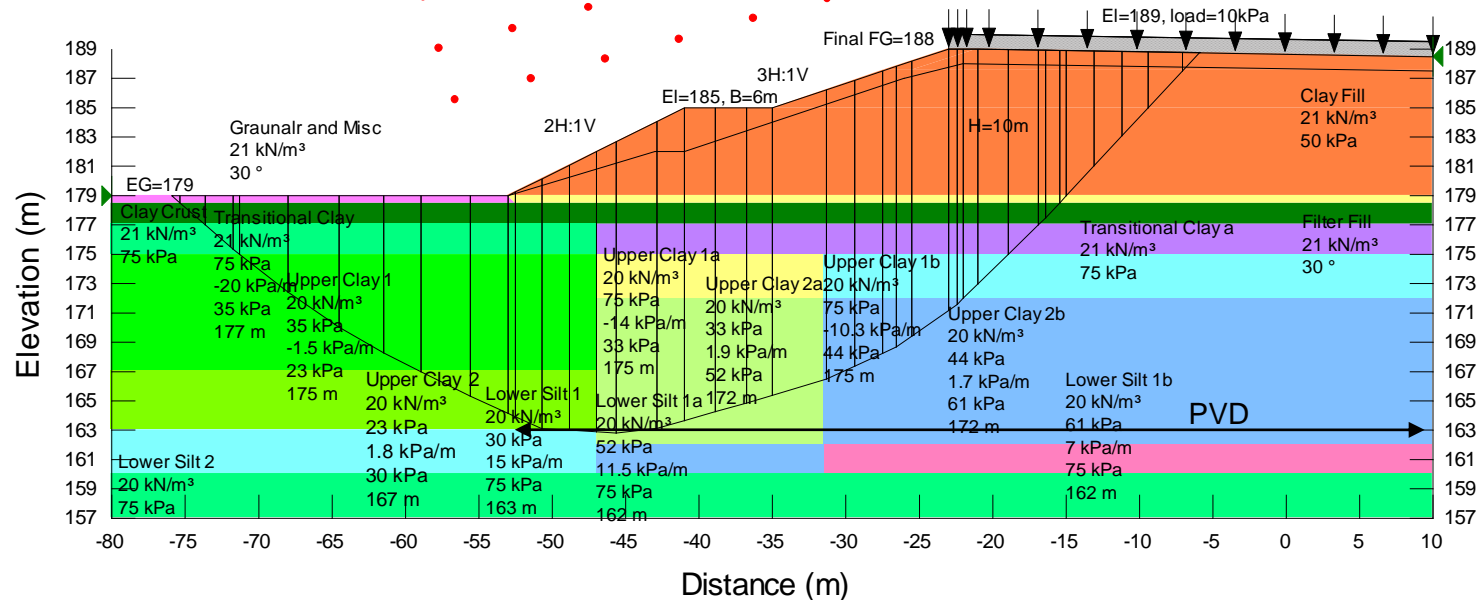


Figure D-10: Slope Stability Result – Section 2 (Sta. 10+600W) – Stage 4 (Final Config) – Short-term Loading

File Name: Emb10710W_h9.0mgain_EOC_ST_20111102.gsz
Last Saved: 21/12/2012 - 9:50:24 AM
Analysis Method: Morgenstern-Price - G&R (noEPS)

Properties:

Name: Filter Fill Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Clay Fill Unit Weight: 21 kN/m³ Cohesion: 50 kPa Phi: 0 °
Name: Clay Crust Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Upper Clay 1 Unit Weight: 20 kN/m³ C-Datum: 35 kPa C-Rate of Change: -1.5 kPa/m Limiting C: 23 kPa Elevation: 175 m
Name: Upper Clay 2 Unit Weight: 20 kN/m³ C-Datum: 23 kPa C-Rate of Change: 1.8 kPa/m Limiting C: 30 kPa Elevation: 167 m
Name: Lower Silt 2 Unit Weight: 20 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Granular and Misc Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Transitional Clay Unit Weight: 21 kN/m³ C-Datum: 75 kPa C-Rate of Change: -20 kPa/m Limiting C: 35 kPa Elevation: 177 m
Name: Lower Silt 1 Unit Weight: 20 kN/m³ C-Datum: 30 kPa C-Rate of Change: 15 kPa/m Limiting C: 75 kPa Elevation: 163 m
Name: Upper Clay 1a Unit Weight: 20 kN/m³ C-Datum: 75 kPa C-Rate of Change: -14 kPa/m Limiting C: 33 kPa Elevation: 175 m
Name: Upper Clay 2a Unit Weight: 20 kN/m³ C-Datum: 33 kPa C-Rate of Change: 1.9 kPa/m Limiting C: 52 kPa Elevation: 172 m
Name: Upper Clay 1b Unit Weight: 20 kN/m³ C-Datum: 75 kPa C-Rate of Change: -10.2 kPa/m Limiting C: 44 kPa Elevation: 175 m
Name: Upper Clay 2b Unit Weight: 20 kN/m³ C-Datum: 44 kPa C-Rate of Change: 1.7 kPa/m Limiting C: 61 kPa Elevation: 172 m
Name: Lower Silt 1b Unit Weight: 20 kN/m³ C-Datum: 61 kPa C-Rate of Change: 7 kPa/m Limiting C: 75 kPa Elevation: 162 m
Name: Upper Clay 1c Unit Weight: 20 kN/m³ C-Datum: 75 kPa C-Rate of Change: 8.3 kPa/m Limiting C: 50 kPa Elevation: 175 m
Name: Upper Clay 2c Unit Weight: 20 kN/m³ C-Datum: 50 kPa C-Rate of Change: 1.5 kPa/m Limiting C: 65 kPa Elevation: 172 m
Name: Lower Silt 1c Unit Weight: 20 kN/m³ C-Datum: 65 kPa C-Rate of Change: 5 kPa/m Limiting C: 75 kPa Elevation: 162 m
Name: Transitional Clay a Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Lower Silt 1a Unit Weight: 20 kN/m³ C-Datum: 52 kPa C-Rate of Change: 11.5 kPa/m Limiting C: 75 kPa Elevation: 162 m

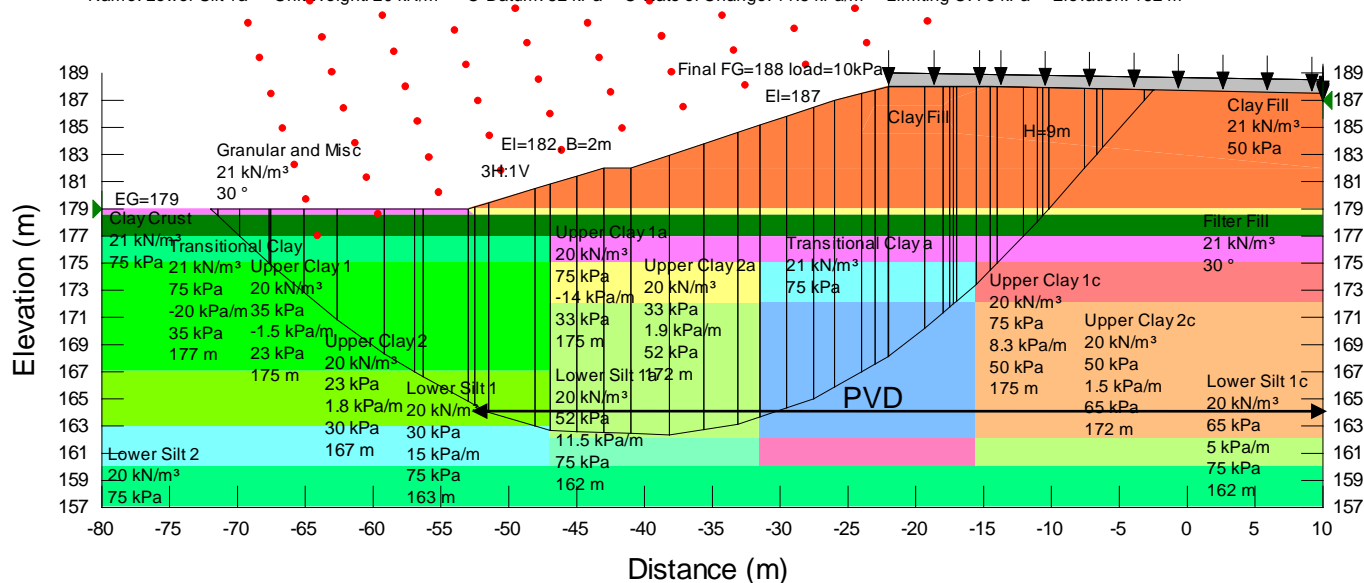


Figure D-11: Slope Stability Result - Section 2 (Sta. 10+600W) - Stage 4 (Final Config) - Long-term Loading

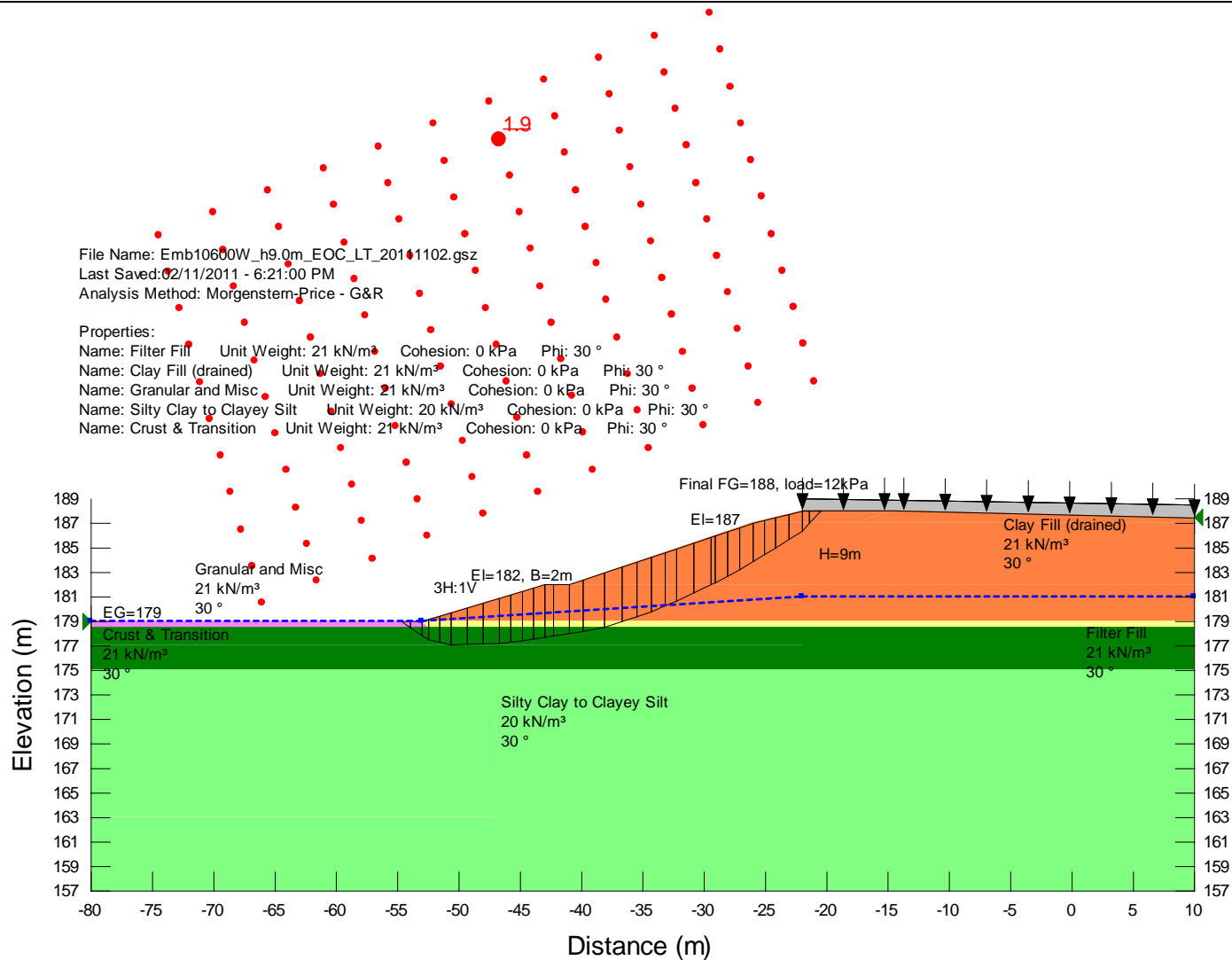
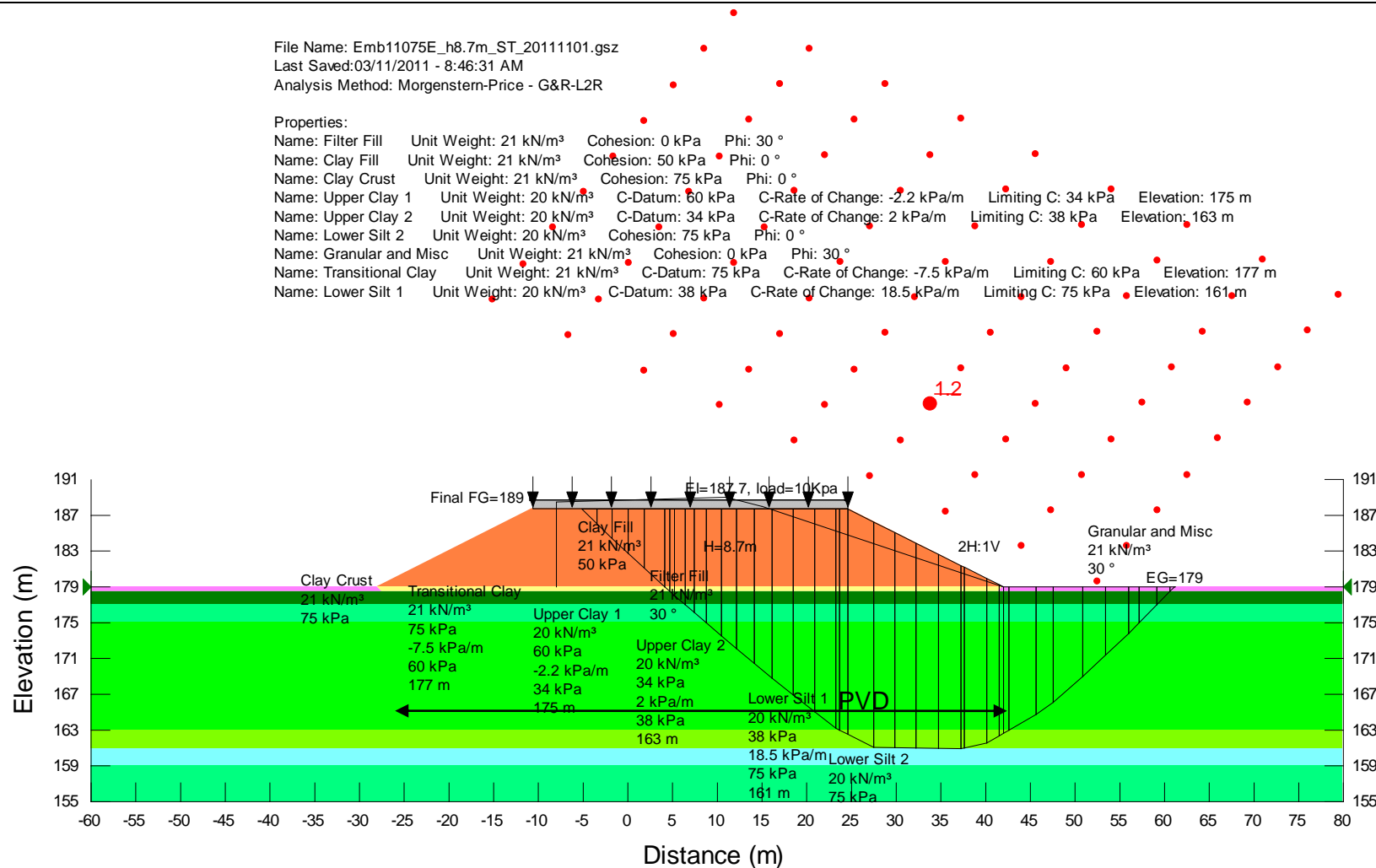


Figure D-12: Slope Stability Result – Section 3 (Sta. 11+075E) – Stage 1 (El=187.7) – Short-term Loading



File Name: Emb11075E_h11.0m_ST_20111101.gsz
Last Saved: 03/11/2011 - 8:56:30 AM
Analysis Method: Morgenstern-Price - G&R-R2L

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °				
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °				
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0 °				
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: -2.2 kPa/m	Limiting C: 34 kPa	Elevation: 175 m		
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 34 kPa	C-Rate of Change: 2 kPa/m	Limiting C: 38 kPa	Elevation: 163 m		
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 75 kPa	Phi: 0 °				
Name: Granular and Misc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °				
Name: Transitional Clay	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -7.5 kPa/m	Limiting C: 60 kPa	Elevation: 177 m		
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 38 kPa	C-Rate of Change: 18.5 kPa/m	Limiting C: 75 kPa	Elevation: 161 m		
Name: Upper Clay 1a	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: -2.3 kPa/m	Limiting C: 53 kPa	Elevation: 175 m		
Name: Upper Clay 2a	Unit Weight: 20 kN/m ³	C-Datum: 53 kPa	C-Rate of Change: 0.6 kPa/m	Limiting C: 60 kPa	Elevation: 172 m		
Name: Lower Silt 1a	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: 7.5 kPa/m	Limiting C: 75 kPa	Elevation: 161 m		

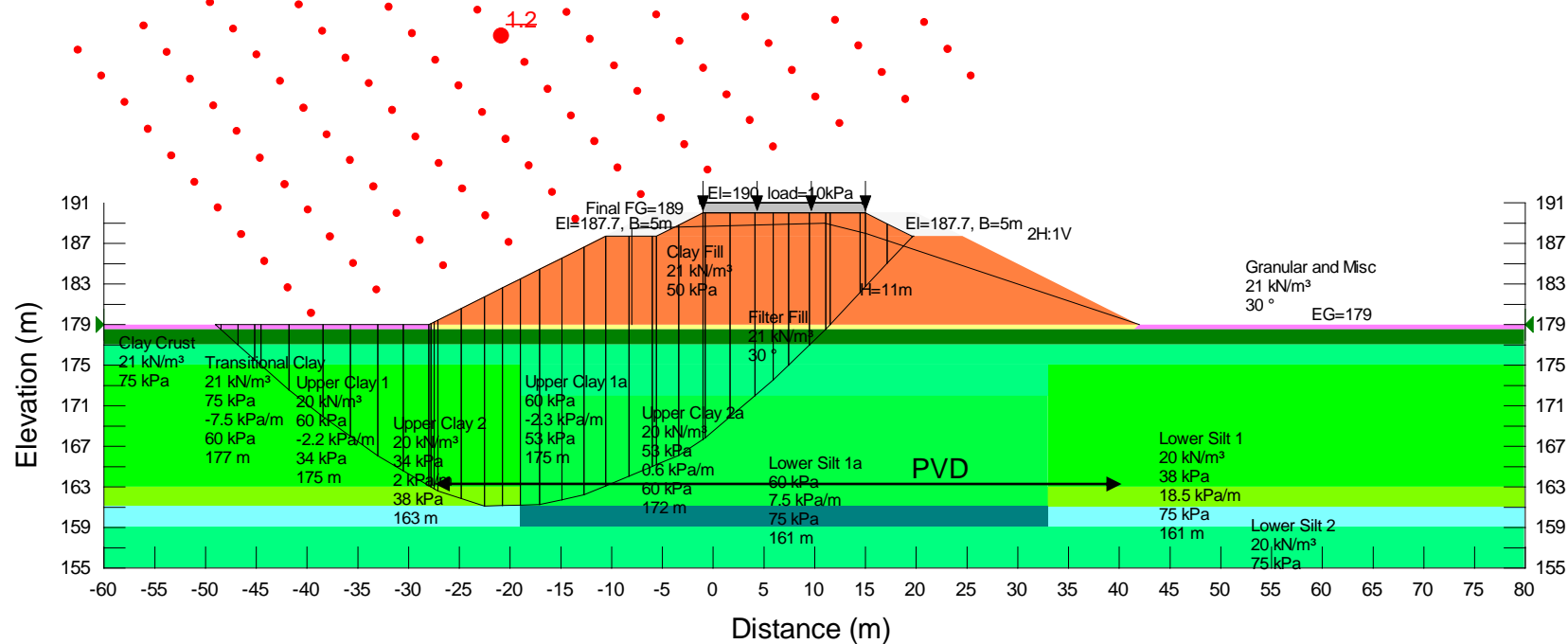


Figure D-14: Slope Stability Result - Section 3 (Sta. 11+075E) - Stage 3 (Final Config) - Short-term Loading

File Name: Emb11075E_h10.0m_EOC_ST_20111103.gsz
Last Saved: 03/11/2011 - 9:40:33 AM
Analysis Method: Morgenstern-Price - G&R-L2R

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: -2.2 kPa/m
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 34 kPa	C-Rate of Change: 2 kPa/m
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Granular and Misc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Transitional Clay	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -7.5 kPa/m
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 38 kPa	C-Rate of Change: 18.5 kPa/m
Name: Upper Clay 1b	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: -1.7 kPa/m
Name: Upper Clay 2b	Unit Weight: 20 kN/m ³	C-Datum: 55 kPa	C-Rate of Change: 0.9 kPa/m
Name: Lower Silt 1b	Unit Weight: 20 kN/m ³	C-Datum: 65 kPa	C-Rate of Change: 5 kPa/m
Name: Upper Clay 1a	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: -2.3 kPa/m
Name: Upper Clay 2a	Unit Weight: 20 kN/m ³	C-Datum: 53 kPa	C-Rate of Change: 0.6 kPa/m
Name: Lower Silt 1a	Unit Weight: 20 kN/m ³	C-Datum: 60 kPa	C-Rate of Change: 7.5 kPa/m

Type: Pile, Shear Capacity: 400 kN

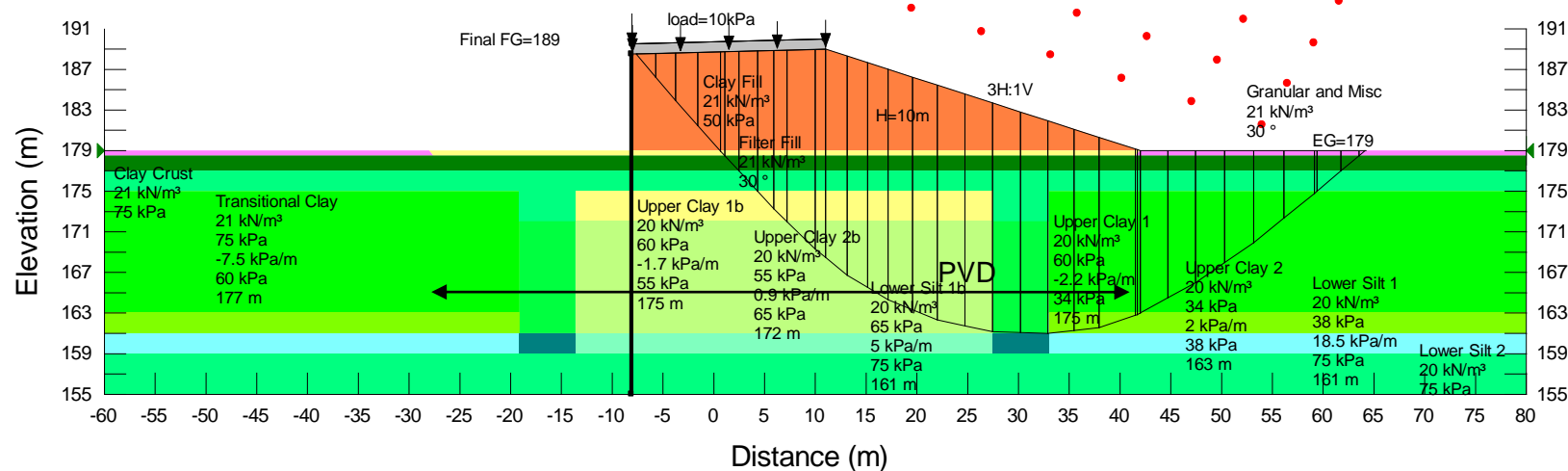


Figure D-15: Slope Stability Result – Section 3 (Sta. 11+075E) – Stage 3 (Final Config) – Long-term Loading

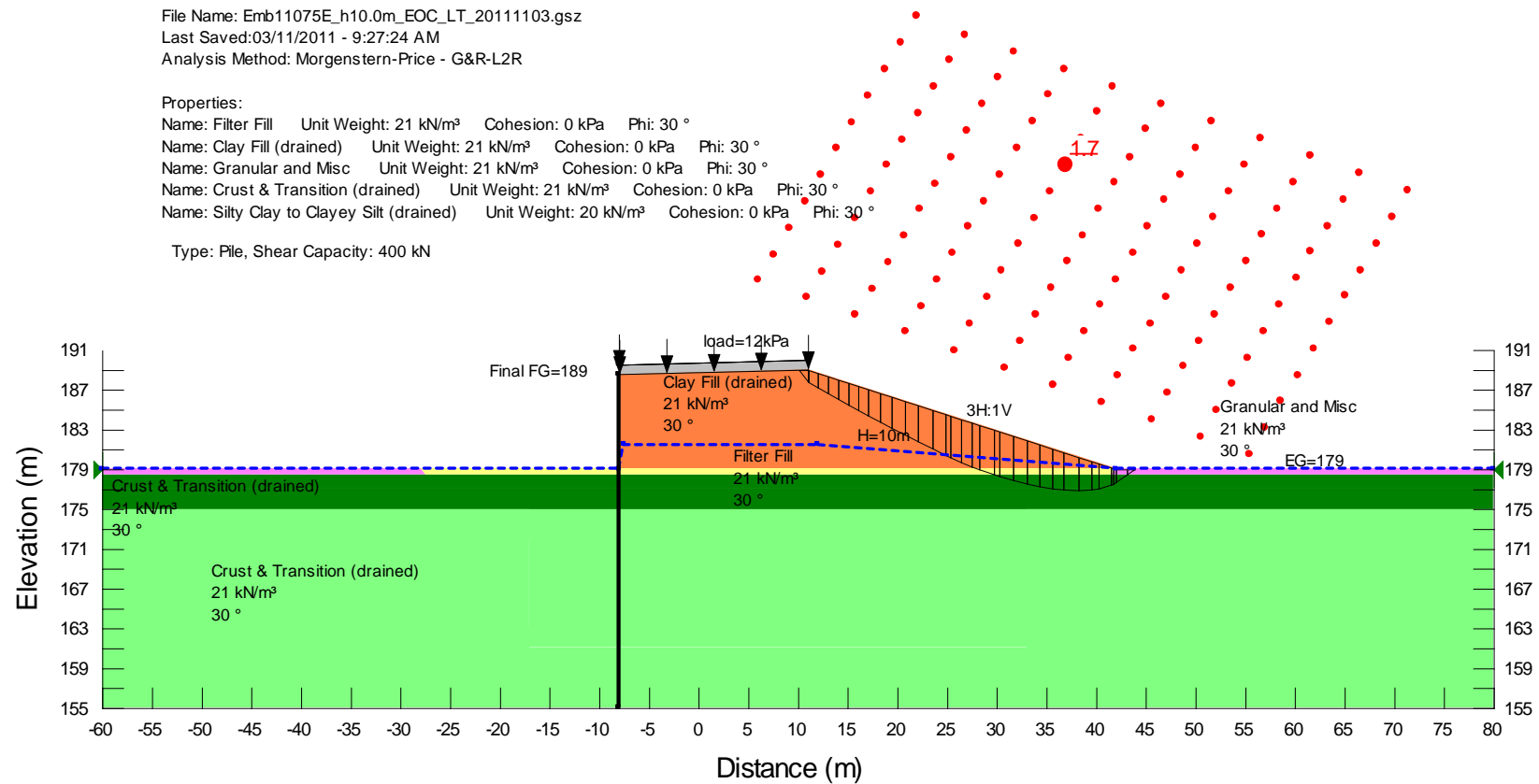


Figure D-16: Slope Stability Result - Section 4 (Sta. 11+775W) - Stage 1 (El=189.0) - Short-term Loading

File Name: Emb11775W_h8.0m_ST_20111110.gsz
 Last Saved: 10/11/2011 - 12:27:50 PM
 Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30°
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0°
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0°
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 67 kPa	C-Rate of Change: -2.1 kPa/m
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 42 kPa	C-Rate of Change: 2.3 kPa/m
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 75 kPa	Phi: 0°
Name: Upper Granular and Misc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30°
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 49 kPa	C-Rate of Change: 26 kPa/m
Name: Clay Fill (Existing)	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0°
Name: Clay Transition	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -4 kPa/m

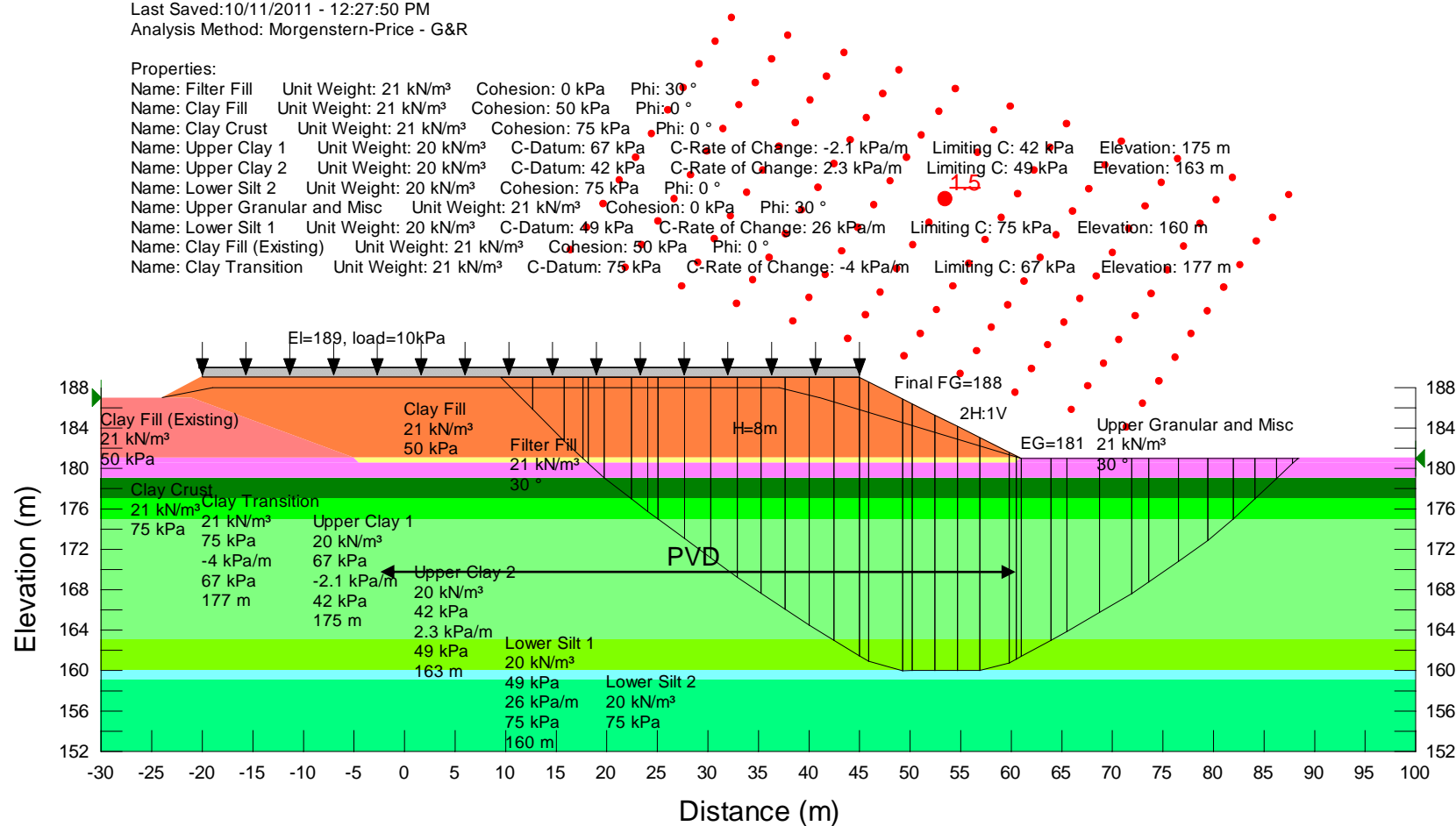


Figure D-17: Slope Stability Result – Section 4 (Sta. 11+775W) – Stage 2 (Final Config) – Short-term Loading

File Name: Emb11775W_h7.0m_EOC_ST_20111110.gsz

Last Saved: 10/11/2011 - 12:55:31 PM

Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °	
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °	
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0 °	
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 67 kPa	C-Rate of Change: -2.1 kPa/m	Limiting C: 42 kPa Elevation: 175 m
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 42 kPa	C-Rate of Change: 2.3 kPa/m	Limiting C: 49 kPa Elevation: 163 m
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 75 kPa	Phi: 0 °	
Name: Upper Granular and Misc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °	
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 49 kPa	C-Rate of Change: 26 kPa/m	Limiting C: 75 kPa Elevation: 160 m
Name: Clay Fill (Existing)	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °	
Name: Clay Transition	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -4 kPa/m	Limiting C: 67 kPa Elevation: 177 m

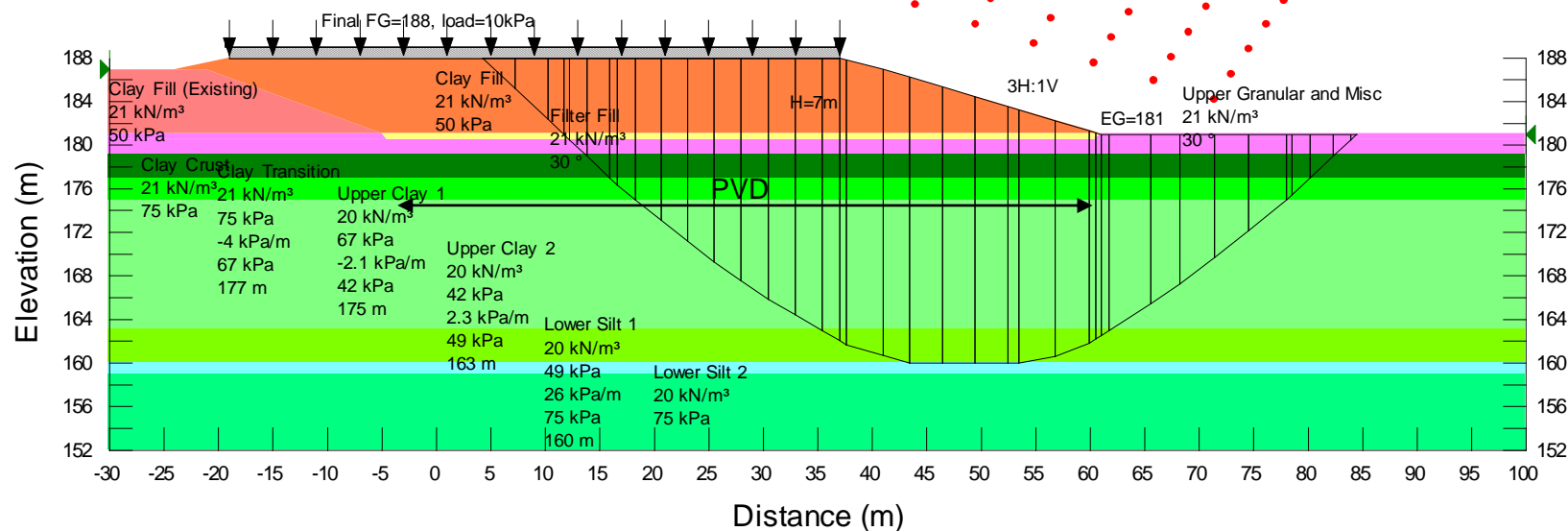


Figure D-18: Slope Stability Result - Section 4 (Sta. 11+775W) - Stage 2 (Final Config) - Long-term Loading

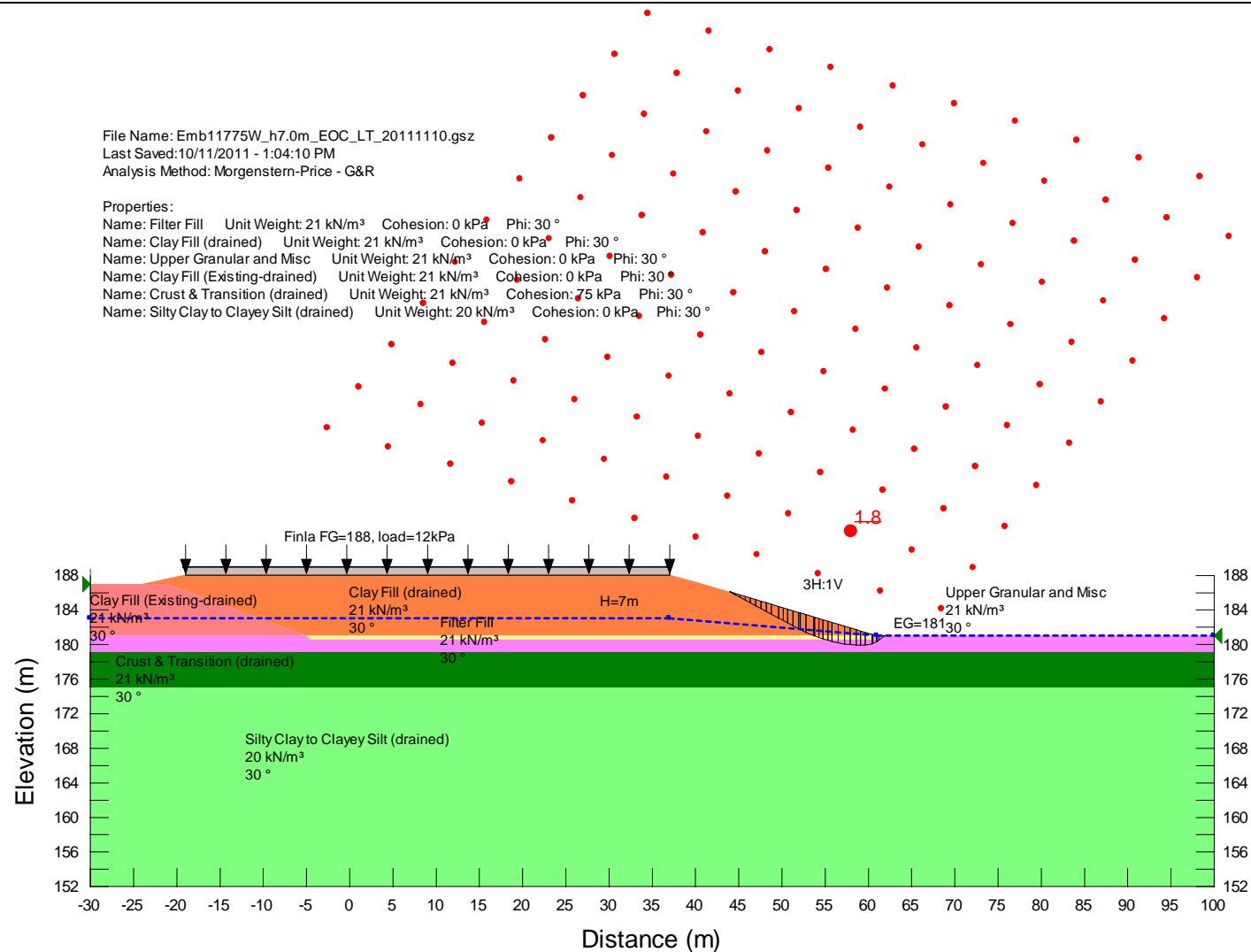


Figure D-19: Slope Stability Result – Section 5 (Sta. 12+225E) – Stage 1 (El=189.0) – Short-term Loading

File Name: Emb12225E_h9.0m_ST_20111110.gsz
Last Saved: 10/11/2011 - 2:32:34 PM
Analysis Method: Morgenstern-Price - G&R-L2R

Properties:

Name: Filter Fill Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Clay Fill Unit Weight: 21 kN/m³ Cohesion: 50 kPa Phi: 0 °
Name: Clay Crust Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Upper Clay 1 Unit Weight: 20 kN/m³ C-Datum: 68 kPa C-Rate of Change: -2.8 kPa/m Limiting C: 37 kPa Elevation: 175 m
Name: Upper Clay 2 Unit Weight: 20 kN/m³ C-Datum: 37 kPa C-Rate of Change: 2 kPa/m Limiting C: 45 kPa Elevation: 164 m
Name: Lower Clay 2 Unit Weight: 20 kN/m³ Cohesion: 75 kPa Phi: 0 °
Name: Top Soil and Misc Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °
Name: Transitional Clay Unit Weight: 21 kN/m³ C-Datum: 75 kPa C-Rate of Change: 3.5 kPa/m Limiting C: 68 kPa Elevation: 177 m
Name: Lower Silt 1 Unit Weight: 20 kN/m³ C-Datum: 45 kPa C-Rate of Change: 30 kPa/m Limiting C: 75 kPa Elevation: 160 m

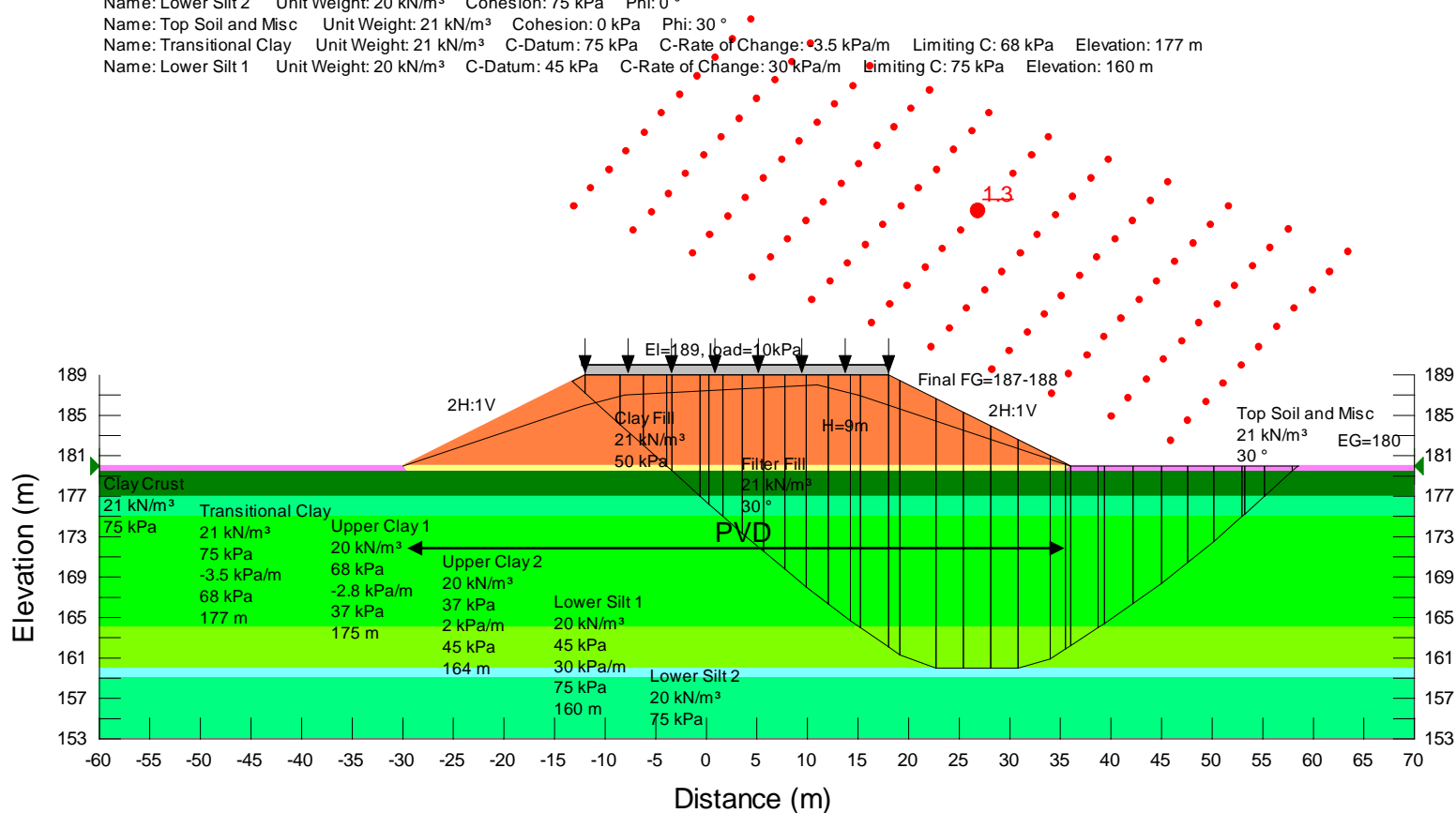


Figure D-20: Slope Stability Result – Section 5 (Sta. 12+225E) – Stage 2 (Final Config) – Short-term Loading

File Name: Emb12225E_h8.0m_EOC_ST_20111110.gsz
Last Saved: 10/11/2011 - 2:44:09 PM
Analysis Method: Morgenstern-Price - G&R-L2R

Properties:

Name: Filter Fill	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Clay Fill	Unit Weight: 21 kN/m ³	Cohesion: 50 kPa	Phi: 0 °
Name: Clay Crust	Unit Weight: 21 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Upper Clay 1	Unit Weight: 20 kN/m ³	C-Datum: 68 kPa	C-Rate of Change: -2.8 kPa/m Limiting C: 37 kPa Elevation: 175 m
Name: Upper Clay 2	Unit Weight: 20 kN/m ³	C-Datum: 37 kPa	C-Rate of Change: 2 kPa/m Limiting C: 45 kPa Elevation: 164 m
Name: Lower Silt 2	Unit Weight: 20 kN/m ³	Cohesion: 75 kPa	Phi: 0 °
Name: Top Soil and Misc	Unit Weight: 21 kN/m ³	Cohesion: 0 kPa	Phi: 30 °
Name: Transitional Clay	Unit Weight: 21 kN/m ³	C-Datum: 75 kPa	C-Rate of Change: -3.5 kPa/m Limiting C: 68 kPa Elevation: 177 m
Name: Lower Silt 1	Unit Weight: 20 kN/m ³	C-Datum: 45 kPa	C-Rate of Change: 30 kPa/m Limiting C: 75 kPa Elevation: 160 m

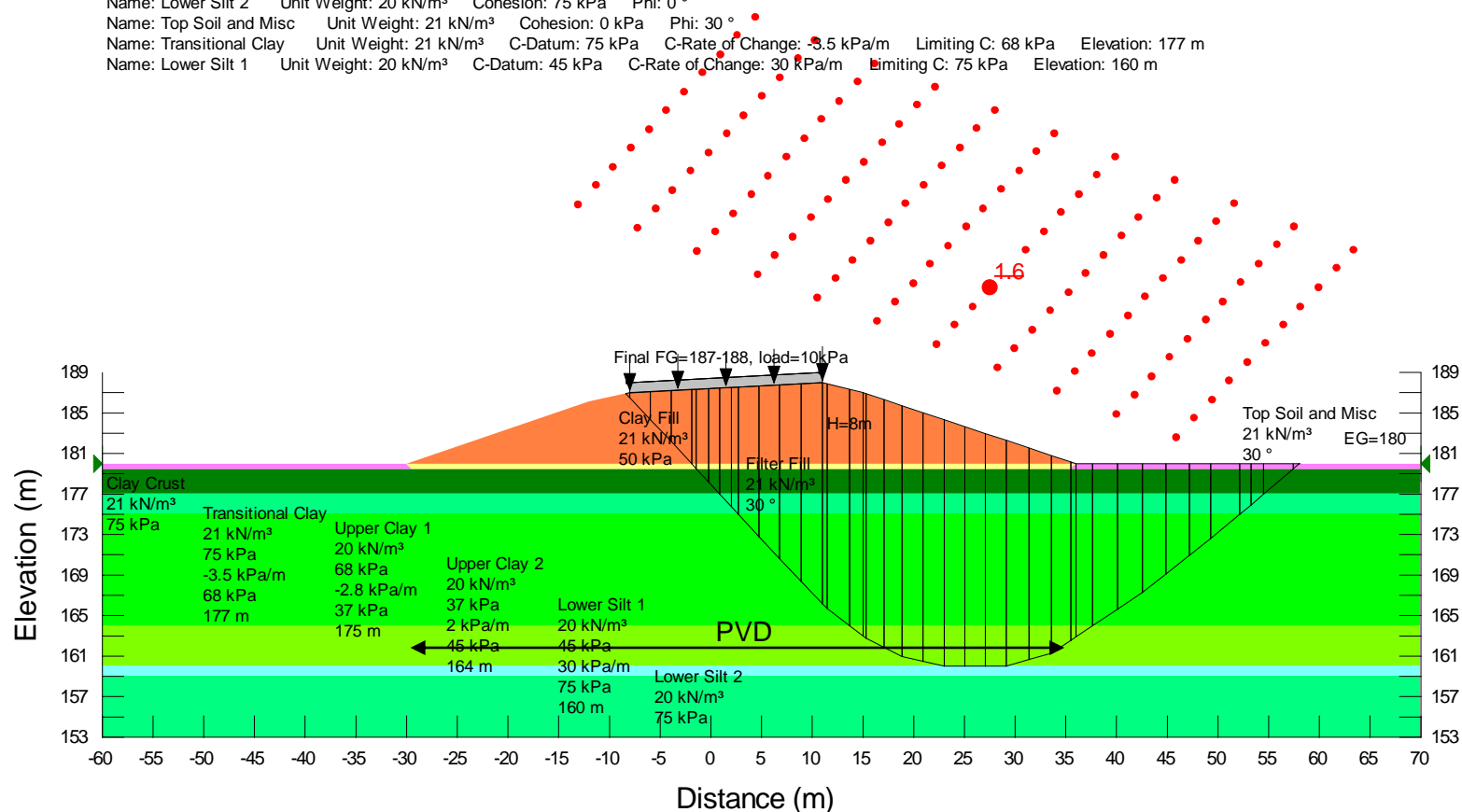


Figure D-21: Slope Stability Result – Section 5 (Sta. 12+225E) – Stage 2 (Final Config) – Long-term Loading

File Name: Emb12225E_h8.0m_EOC_LT_20111111.gsz

Last Saved: 11/11/2011 - 11:54:02 AM

Analysis Method: Morgenstern-Price - G&R-L2R

Properties:

Name: Filter Fill Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °

Name: Clay Fill (drained) Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °

Name: Top Soil and Misc Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °

Name: Crust & Transition (drained) Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30 °

Name: Silty Clay to Clayey Silt (drained) Unit Weight: 20 kN/m³ Cohesion: 0 kPa Phi: 30 °

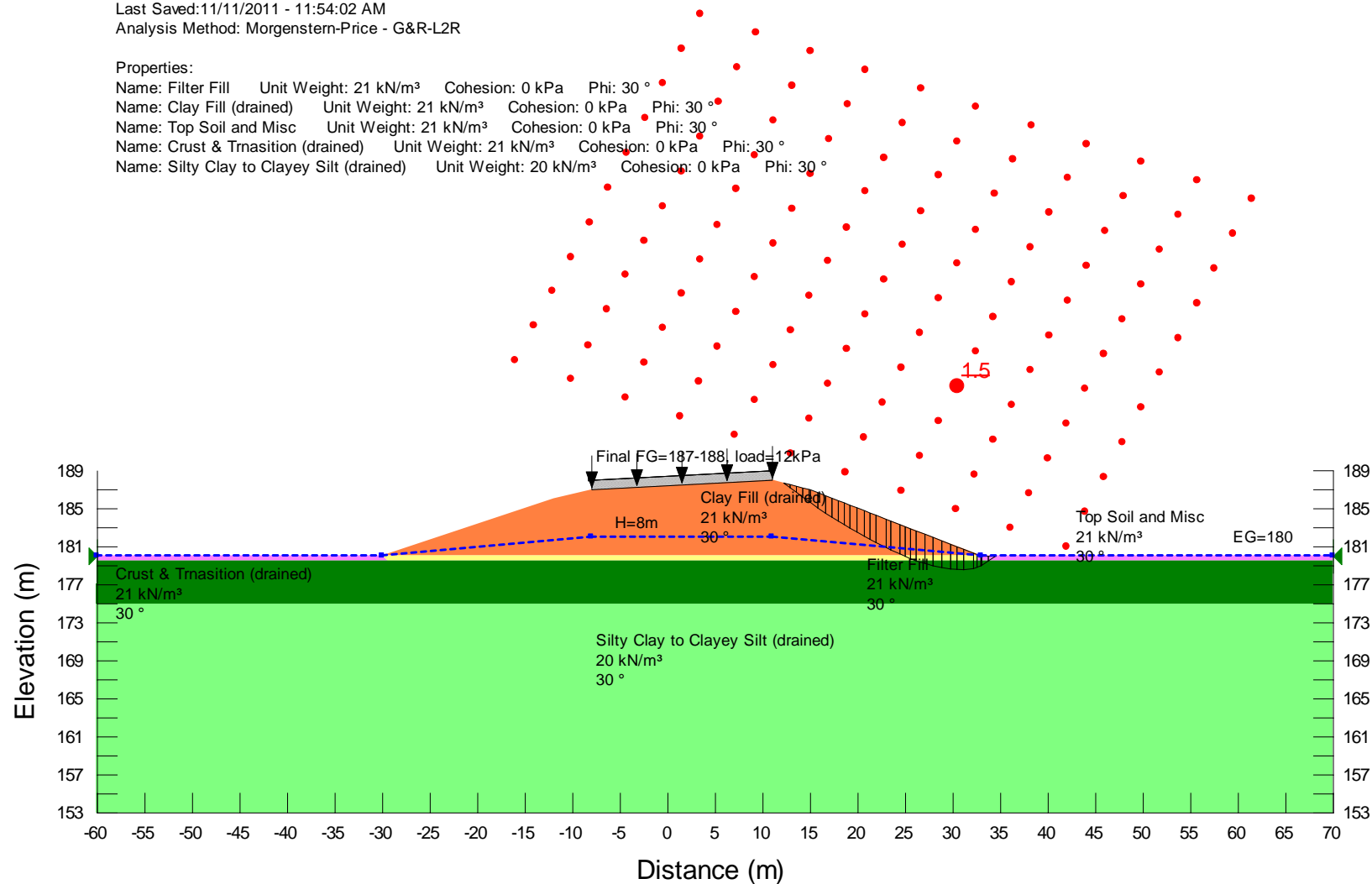


Figure D-22: Slope Stability Result – LBS1 (Sta. 10+750W) – Stage 4 (Final Config) – Short-term Loading

File Name: LBS1_10750W_h7.5m_EOC_20121219.gsz
Last Saved: 19/12/2012 - 5:08:20 PM
Analysis Method: Morgenstern-Price - G&R

Properties:

Name: Clay Fill Unit Weight: 21 kN/m³ Cohesion: 50 kPa Phi: 0°
Name: Clay Crust Unit Weight: 21 kN/m³ Cohesion: 75 kPa Phi: 0°
Name: Upper Clay 1 Unit Weight: 20 kN/m³ C-Datum: 35 kPa C-Rate of Change: -1.5 kPa/m Limiting C: 23 kPa Elevation: 175 m
Name: Upper Clay 2 Unit Weight: 20 kN/m³ C-Datum: 23 kPa C-Rate of Change: 1.8 kPa/m Limiting C: 30 kPa Elevation: 167 m
Name: Lower Silt 2 Unit Weight: 20 kN/m³ Cohesion: 75 kPa Phi: 0°
Name: Granular and Misc Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30°
Name: Transitional Clay Unit Weight: 21 kN/m³ C-Datum: 75 kPa C-Rate of Change: -20 kPa/m Limiting C: 35 kPa Elevation: 177 m
Name: Lower Silt 1 Unit Weight: 20 kN/m³ C-Datum: 30 kPa C-Rate of Change: 30 kPa/m Limiting C: 75 kPa Elevation: 163 m
Name: Upper Clay 1a Unit Weight: 20 kN/m³ C-Datum: 35 kPa C-Rate of Change: -0.7 kPa/m Limiting C: 33 kPa Elevation: 175 m
Name: Upper Clay 2a Unit Weight: 20 kN/m³ C-Datum: 33 kPa C-Rate of Change: 1.9 kPa/m Limiting C: 52 kPa Elevation: 172 m
Name: Lower Silt 1a Unit Weight: 20 kN/m³ C-Datum: 52 kPa C-Rate of Change: 11.5 kPa/m Limiting C: 75 kPa Elevation: 162 m
Name: Upper Clay 1b Unit Weight: 20 kN/m³ C-Datum: 35 kPa C-Rate of Change: 3 kPa/m Limiting C: 44 kPa Elevation: 175 m
Name: Upper Clay 2b Unit Weight: 20 kN/m³ C-Datum: 44 kPa C-Rate of Change: 1.7 kPa/m Limiting C: 61 kPa Elevation: 172 m
Name: Lower Silt 1b Unit Weight: 20 kN/m³ C-Datum: 61 kPa C-Rate of Change: 7 kPa/m Limiting C: 75 kPa Elevation: 162 m
Name: Filter Fill Unit Weight: 21 kN/m³ Cohesion: 0 kPa Phi: 30°

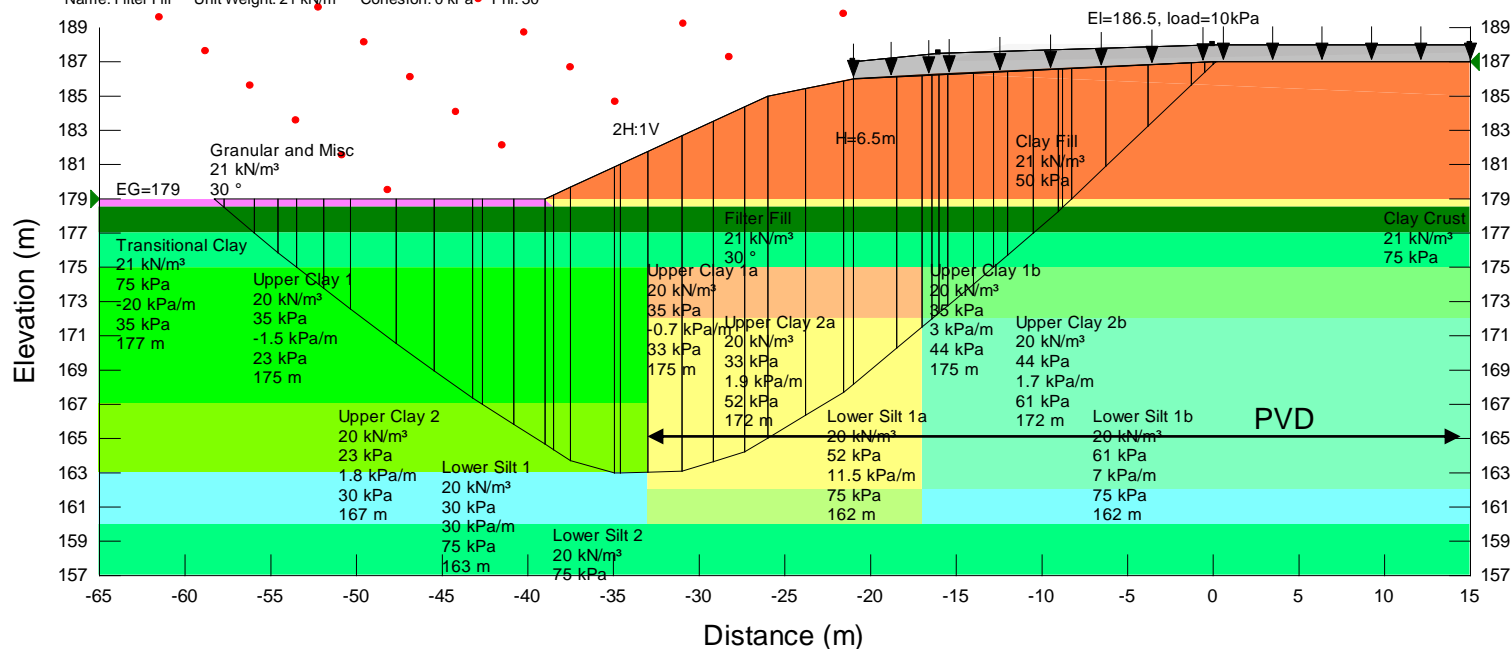
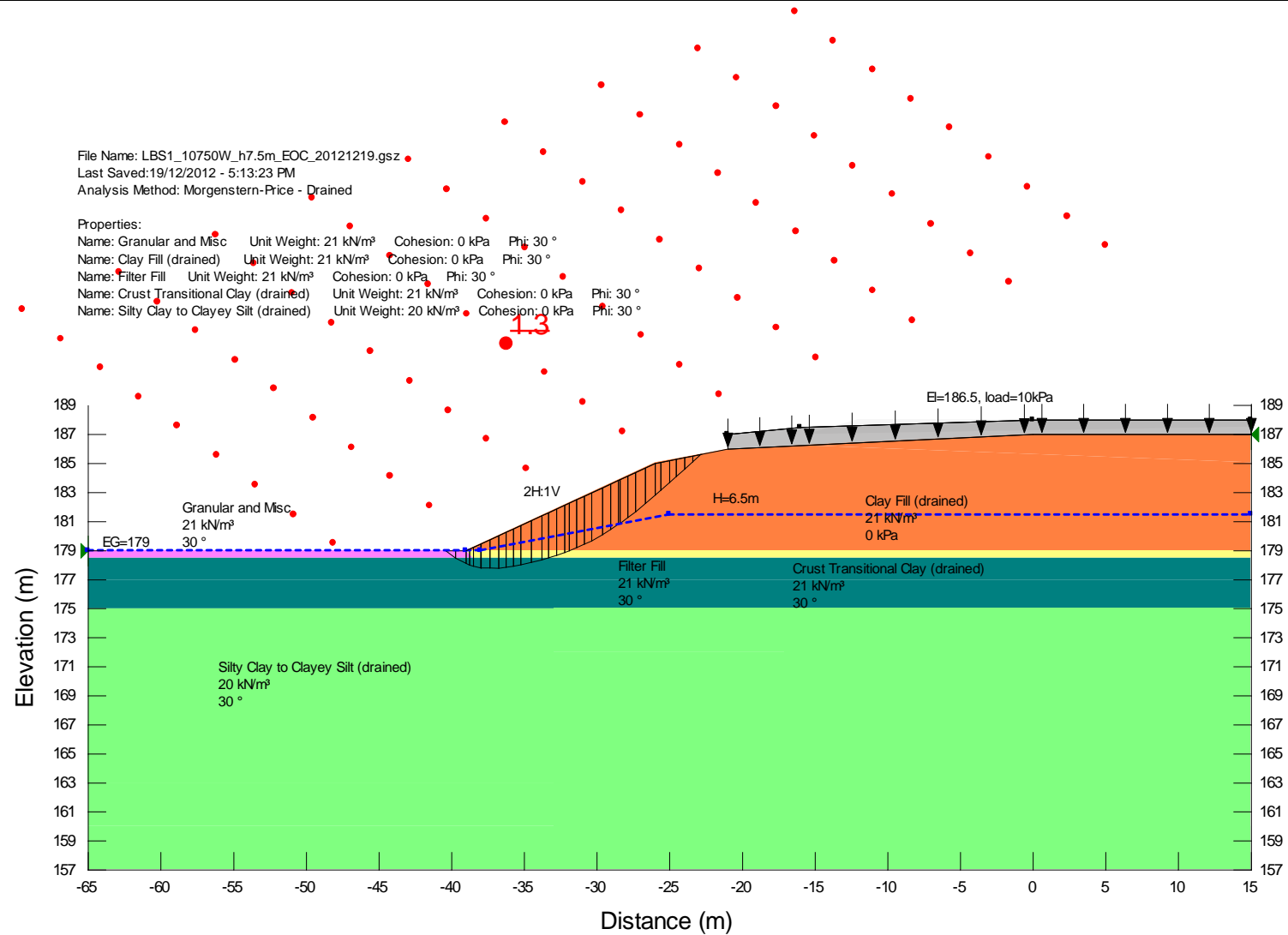


Figure D-23: Slope Stability Result - LBS1 (Sta. 10+750W) - Stage 4 (Final Config) - Long-term Loading



Appendix E Settlement Analyses

Figure E-1: Long-term Settlement Profile across Embankment – Section 1 (Sta. 10+050W, height = 10m)

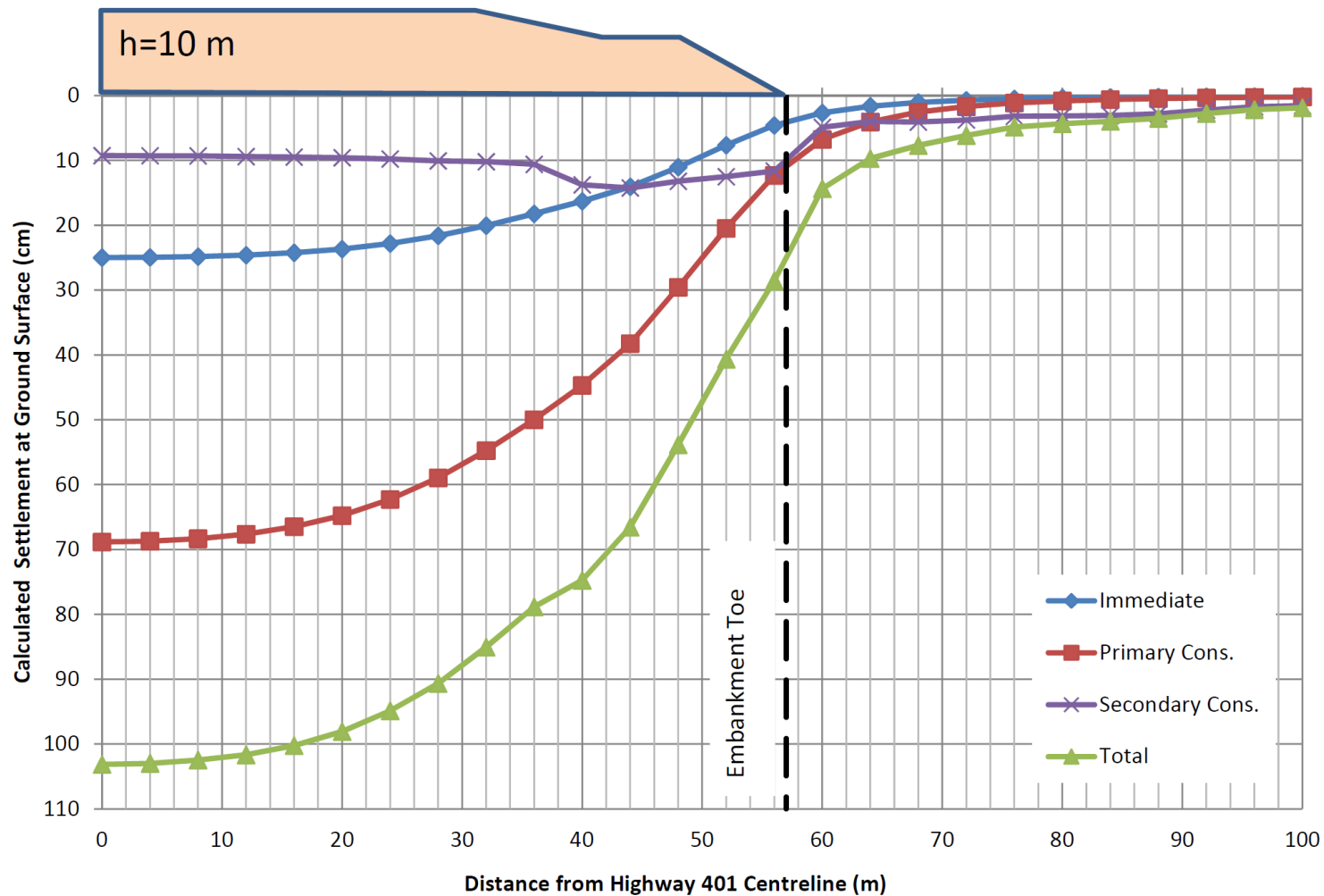


Figure E-2: Long-term Settlement Profile across Embankment – Section 2 (Sta. 10+600W, height = 9m)

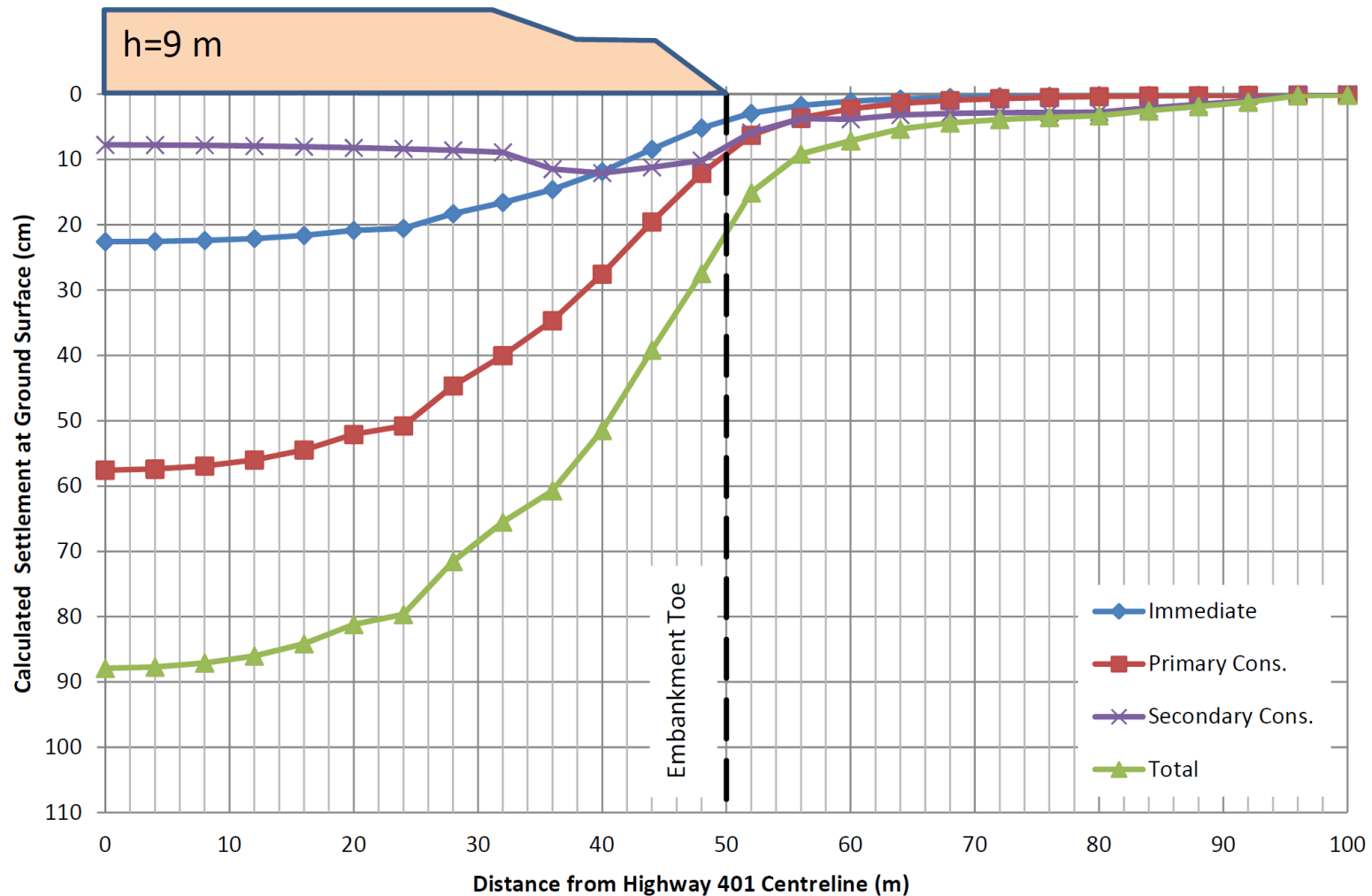


Figure E-3: Long-term Settlement Profile across Embankment – Section 3 (Sta. 11+075E, height = 10 m)

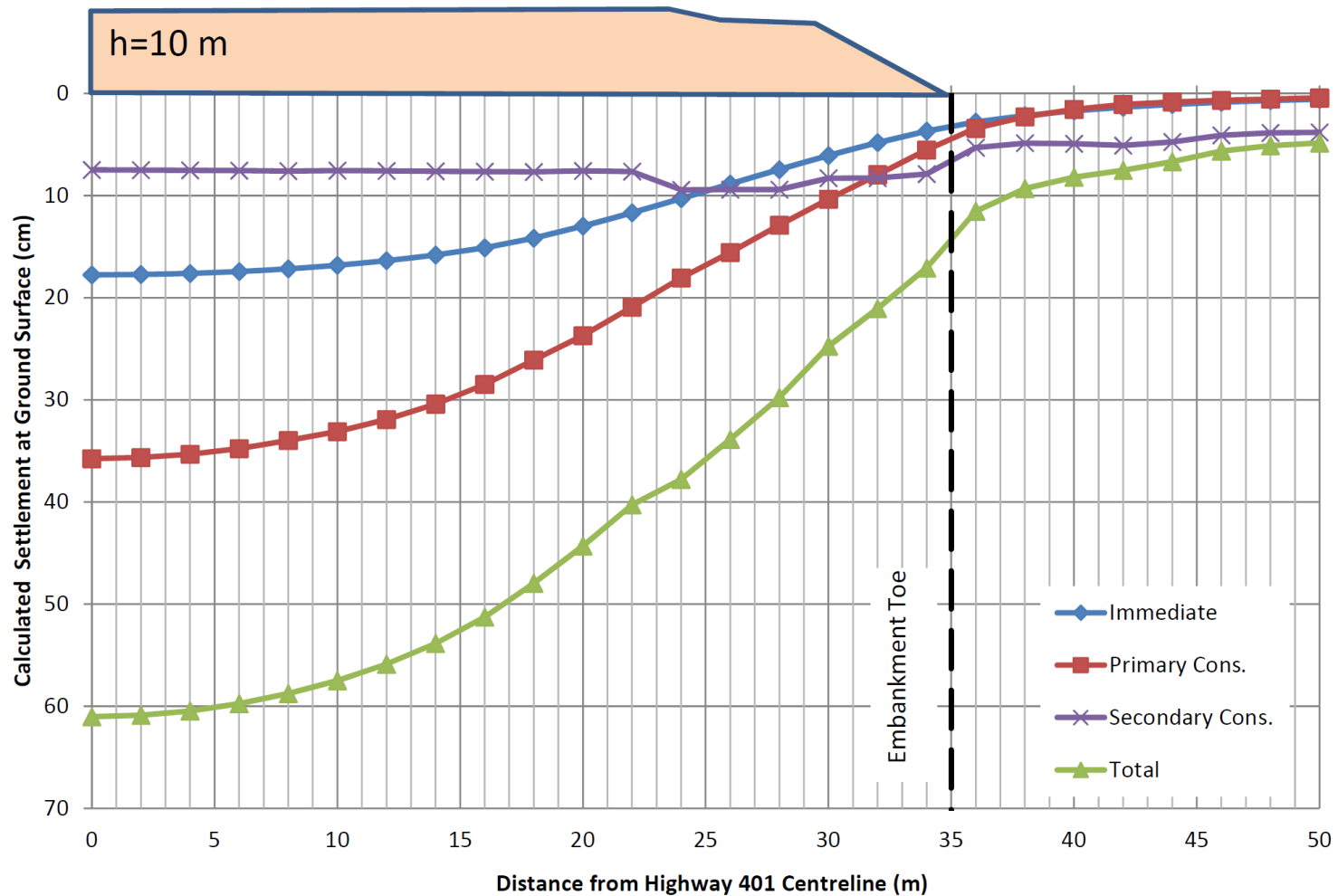


Figure E-4: Long-term Settlement Profile across Embankment - Section 4 (Sta. 11+775W, height = 7 m)

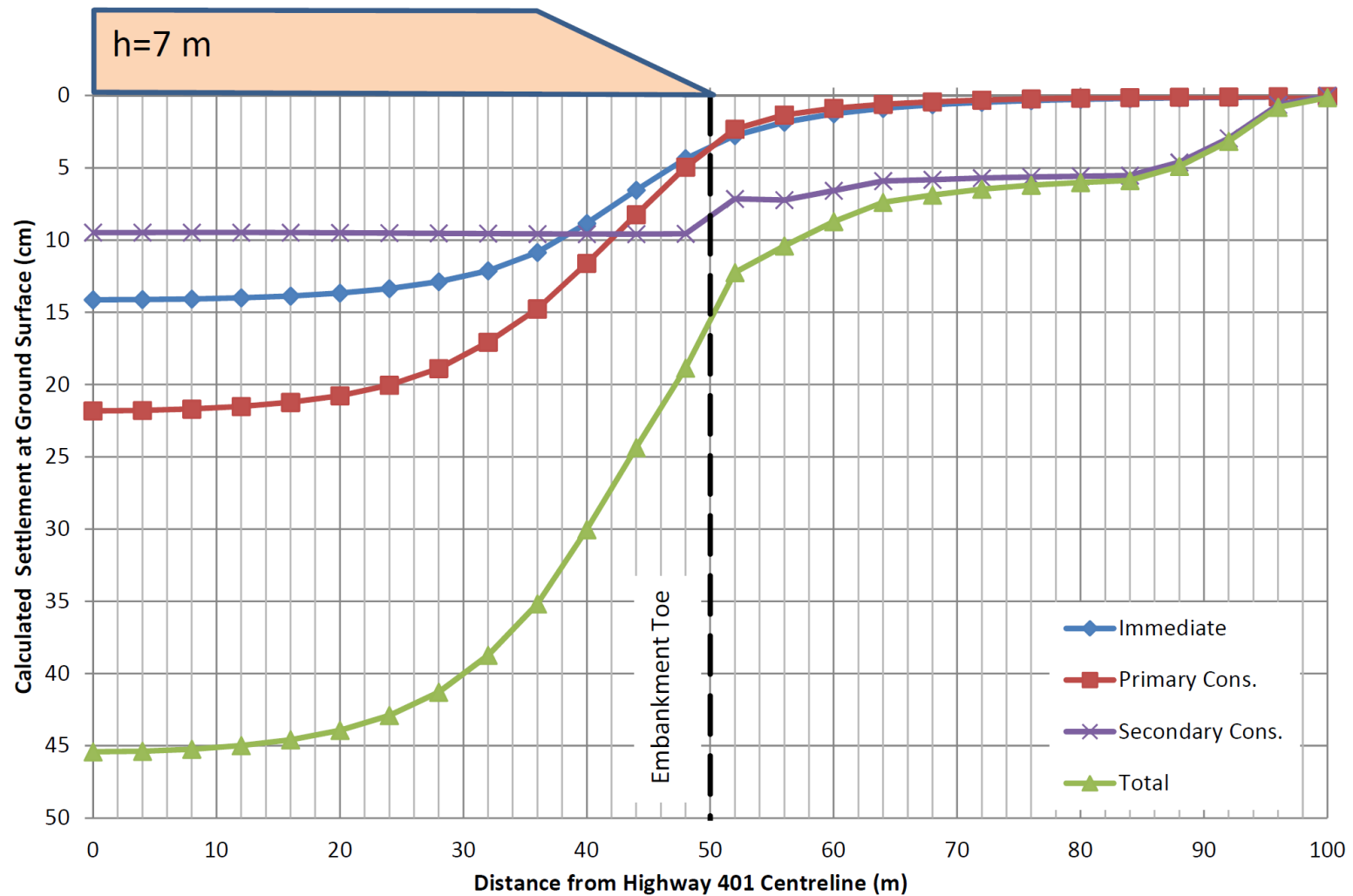


Figure E-5: Long-term Settlement Profile across Embankment – Section 5 (Sta. 12+225E, height = 8 m)

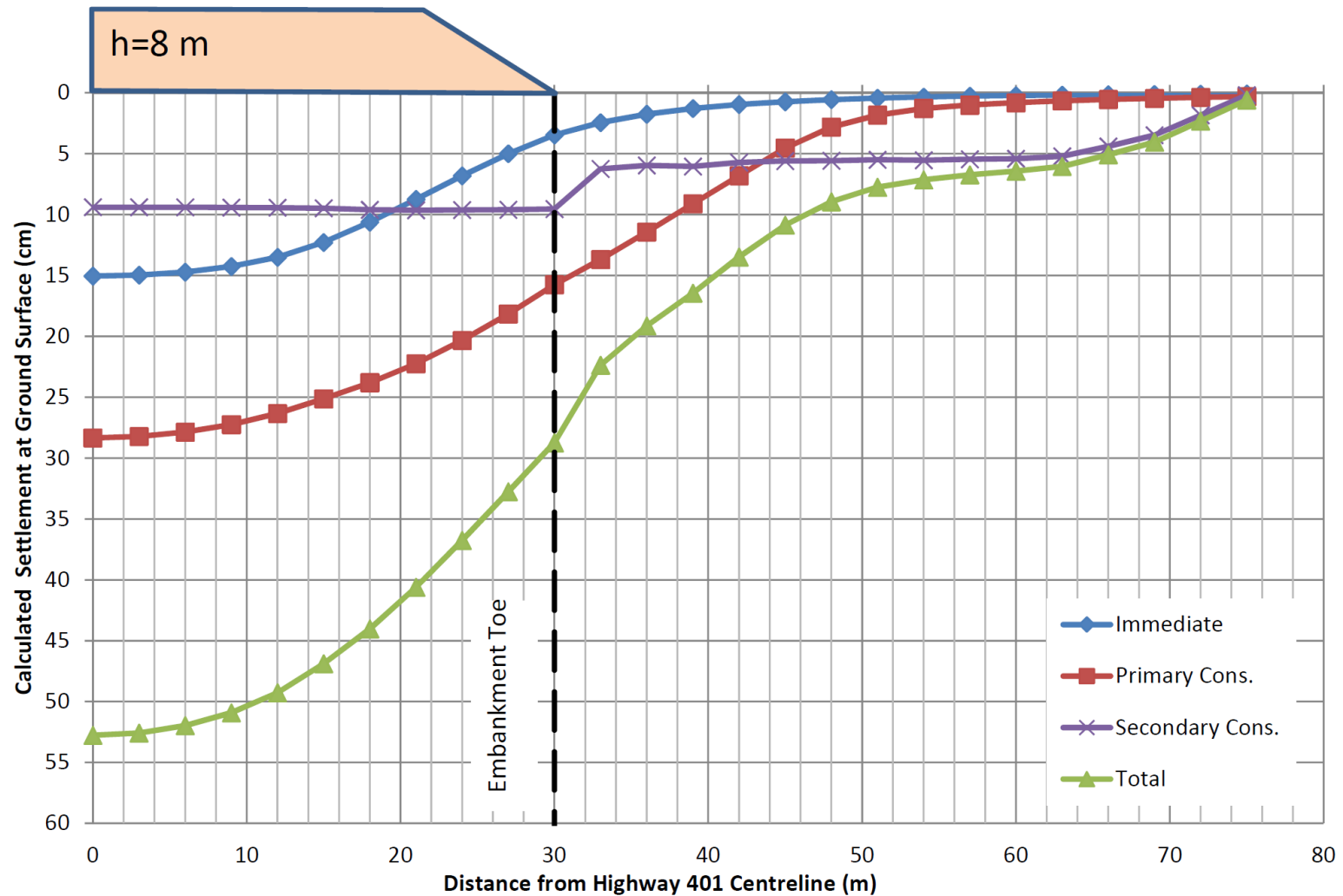
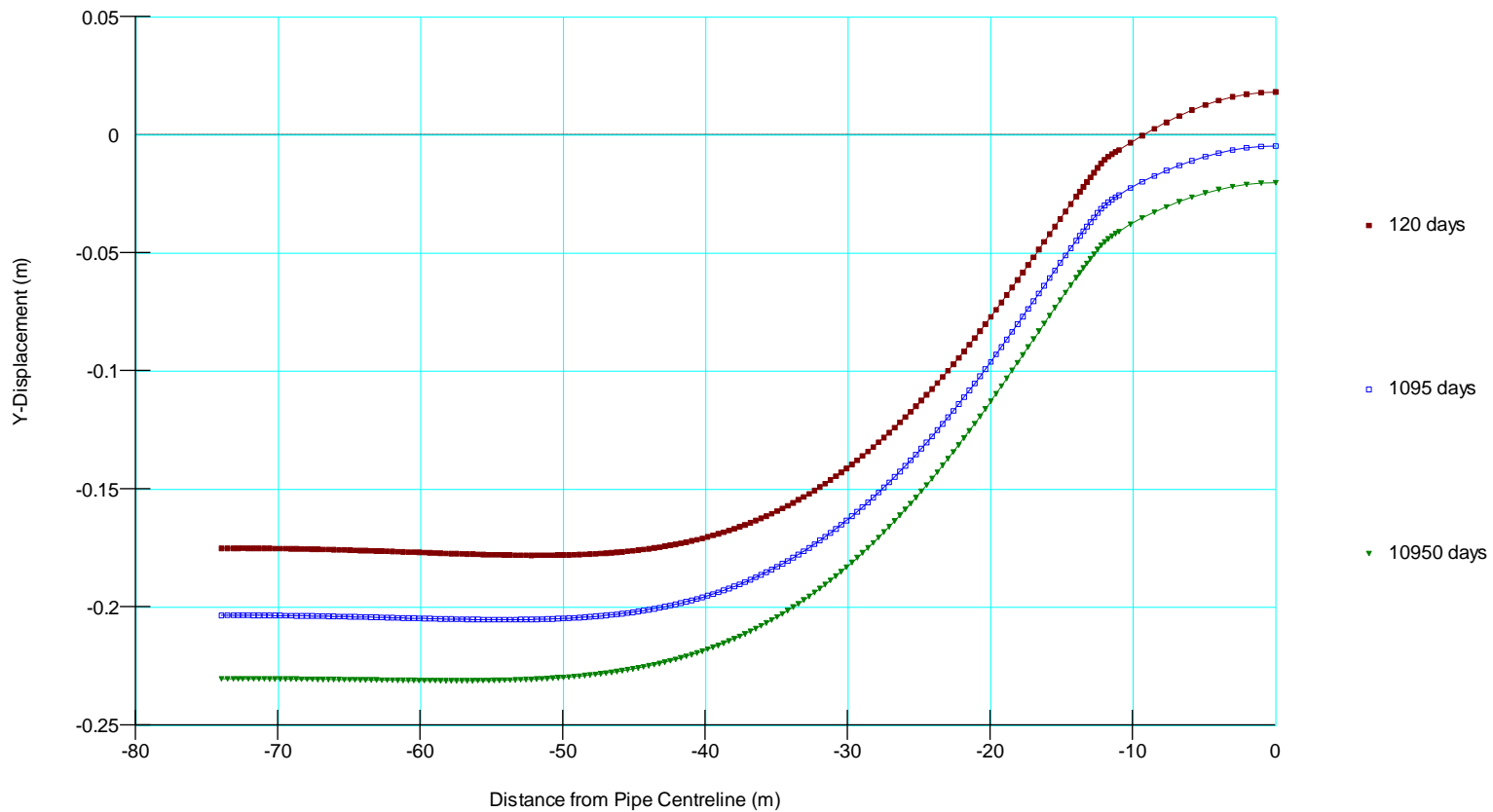


Figure E-6: Ground Settlement Profile at Pipe Level – Second Street (Sta. 12+200W)



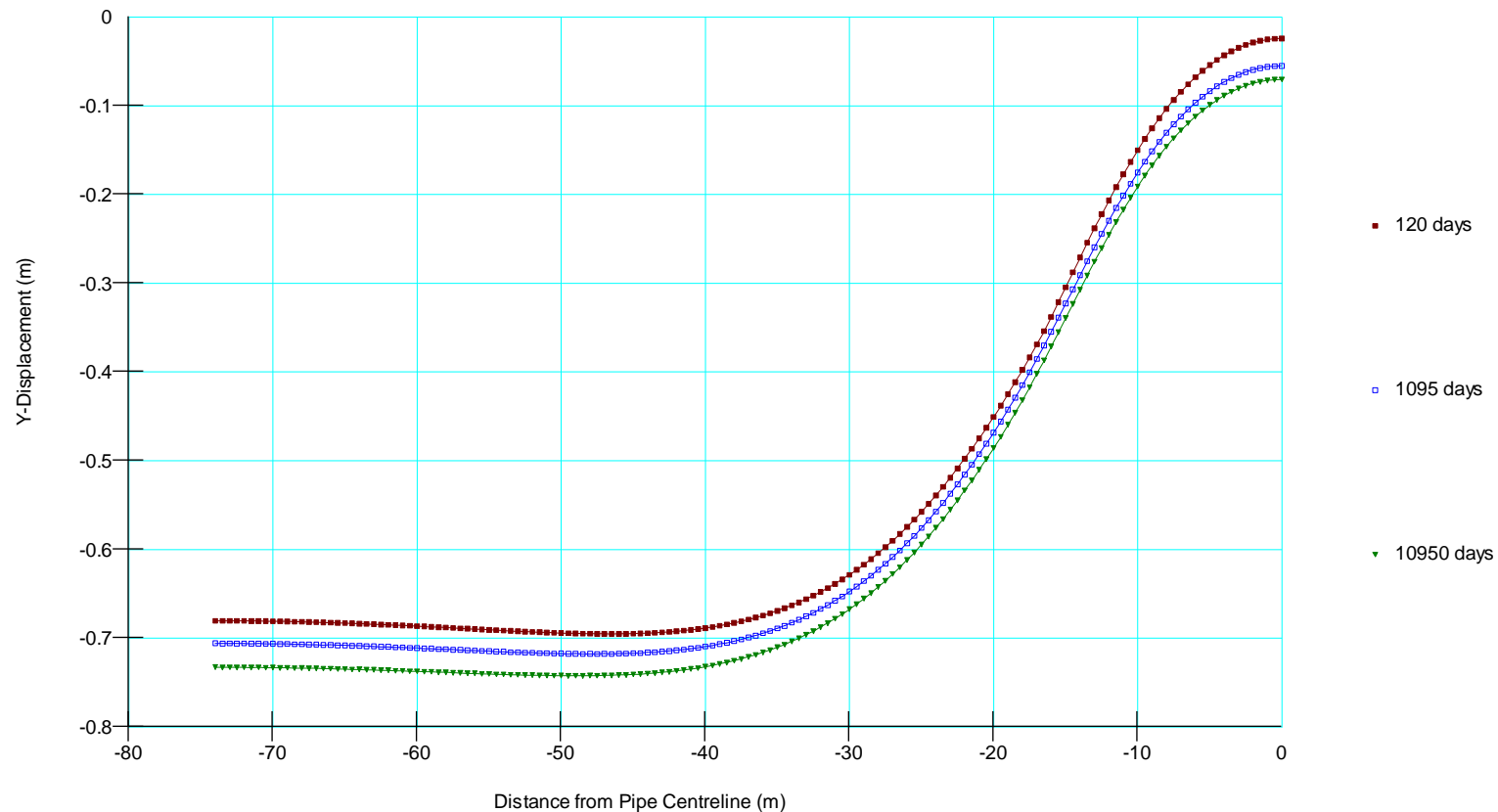
Legend:

End of Construction (EOC): 120 days

3 yr: 1095 days

30yr: 10950 days

Figure E-7: Ground Settlement Profile at Final Embankment Surface– Second Street (Sta. 12+200W)



Legend:

End of Construction (EOC): 120 days

3 yr: 1095 days

30yr: 10950 days

Appendix F Selected Rock Core Photos

Photograph F-1: Borehole B02-RW – Rock Core Elevation 156.8 to 155.3 m



Photograph F-2: Borehole B03-RW – Rock Core Elevation 156.5 to 151.2 m



Photograph F-3: Borehole B04-RW – Rock Core Elevation 155.6 to 152.5 m



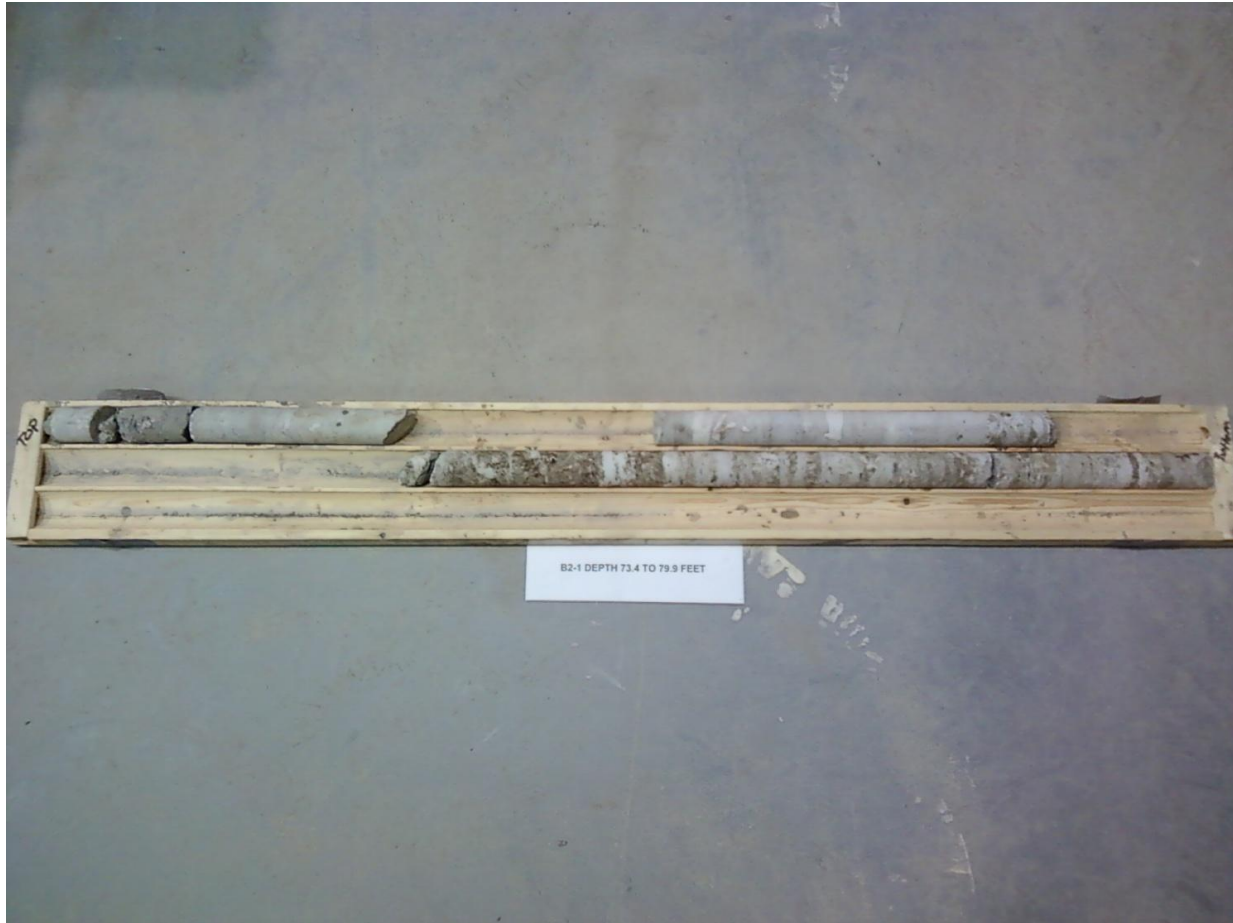
Photograph F-4: Borehole B05-RW – Rock Core Elevation 154.8 to 153.3 m



Photograph F-5: Borehole B06-RW – Rock Core Elevation 148.8 to 147.3 m



Photograph F-6: Borehole B2-1 – Rock Core Elevation 156.2 to 154.4 m



Photograph F-7: Borehole B3-1 – Rock Core Elevation 157.6 to 154.7 m



Photograph F-8: Borehole B3-2 – Rock Core Elevation 156.0 to 153.7 m



Photograph F-9: Borehole B3-3 – Rock Core Elevation 153.7 to 152.2 m



Photograph F-10: Borehole B4-1 – Rock Core Elevation 150.5 to 149.0 m



Photograph F-11: Borehole B6-1 – Rock Core Elevation 149.7 to 145.5 m



Photograph F-12: Borehole B6-2 – Rock Core Elevation 149.7 to 146.6 m



Photograph F-13: Borehole B6-3 – Rock Core Elevation 149.9 to 146.9 m

