

CLIENT CITY OF WINNIPEG
PROJECT FLOOD PUMPING STATIONS - CONDITION ASSESSMENT STUDY
SITE Hawthorne Pump Station
LOCATION 14 m East of Station
DRILLING METHOD Solid Stem Auger

JOB NO. 04-107-12.400
GROUND ELEV. 225.11 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 6-Oct-04

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	INSTALLATION LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT blows/0.15 m ▲	Cu from Uncon. Comp. Test (kPa) ◇
	(m)	(ft)							CONE blows/0.15 m △	Cu TORVANE (kPa) ◆
									20 40 60	20 40 60 80
225.4				TOPSOIL						
				CLAY FILL - Black, mottled black and brown, moist, stiff, intermediate plasticity, trace gravel, trace silt, trace rootlets, trace oxidation.						
224	1									
		5		- Trace coarse grained sand, trace wood at 1.52 m.						
223	2									
222.6				SILTY CLAY - Dark grey, moist, stiff, intermediate plasticity, trace cinders, trace wood, trace organics.						
222.3				SILT - Dark grey, moist, soft, low to no plasticity, trace fine grained sand.						
222	3	10		- Black organic lens (2.5 cm thick) at 3.05 m.						
221.6				LACUSTRINE SILTY CLAY (CH) - Dark grey, moist, firm, high plasticity, trace fine grained sand, trace rootlets, trace organics.						
221	4									
		15		- Mottled grey-black, stiff, trace oxidation at 4.57 m.						
220	5			- Brown, mottled brown to light brown, high plasticity below 5.08 m.						
				- Trace silt seams (<1 mm thick) at 5.59 m.						
219	6	20		- Silt layer (light brown, moist, soft, 0.15 m thick) at 6.10 m						
				- Grey, firm, high plasticity, trace gravel, trace silt nodules below 6.25 m.						
218	7			- Firm at 7.11 m.						
				- Firm at 7.62 m.						
217	8			- Firm at 8.13 m.						
216	9	30		- Firm at 9.65 m.						

SAMPLE TYPE

CONTRACTOR **Paddock Drilling Ltd.**

INSPECTOR **D. ANDERSON**

APPROVED _____

DATE **20-09-05**

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ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	INSTALLATION LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT blows/0.15 m ▲	Cu from Uncon. Comp. Test (kPa) ◇
	(m)	(ft)							CONE blows/0.15 m △	Cu TORVANE (kPa) ◆
									20 40 60	20 40 60 80
									20 40 60	PL MC LL % 20 40 60 80
215						10.1				
214.4		35		END OF HOLE AT 10.67 m		10.7				
214		11		Notes: 1. Stratigraphy based on SI-06 located approximately 4.5 m east. 2. Installed Standpipe Pneumatics PN-5 at 7.32 m, (Serial No. 29639) and PN-6 at 10.67 m (Serial No. 29634) with above ground casings.						
213		12								
212		13								
211		14								
210		15								
209		16								
208		17								
207		18								
206		19								
205		20								
204		21								

SAMPLE TYPE

CONTRACTOR
Paddock Drilling Ltd.

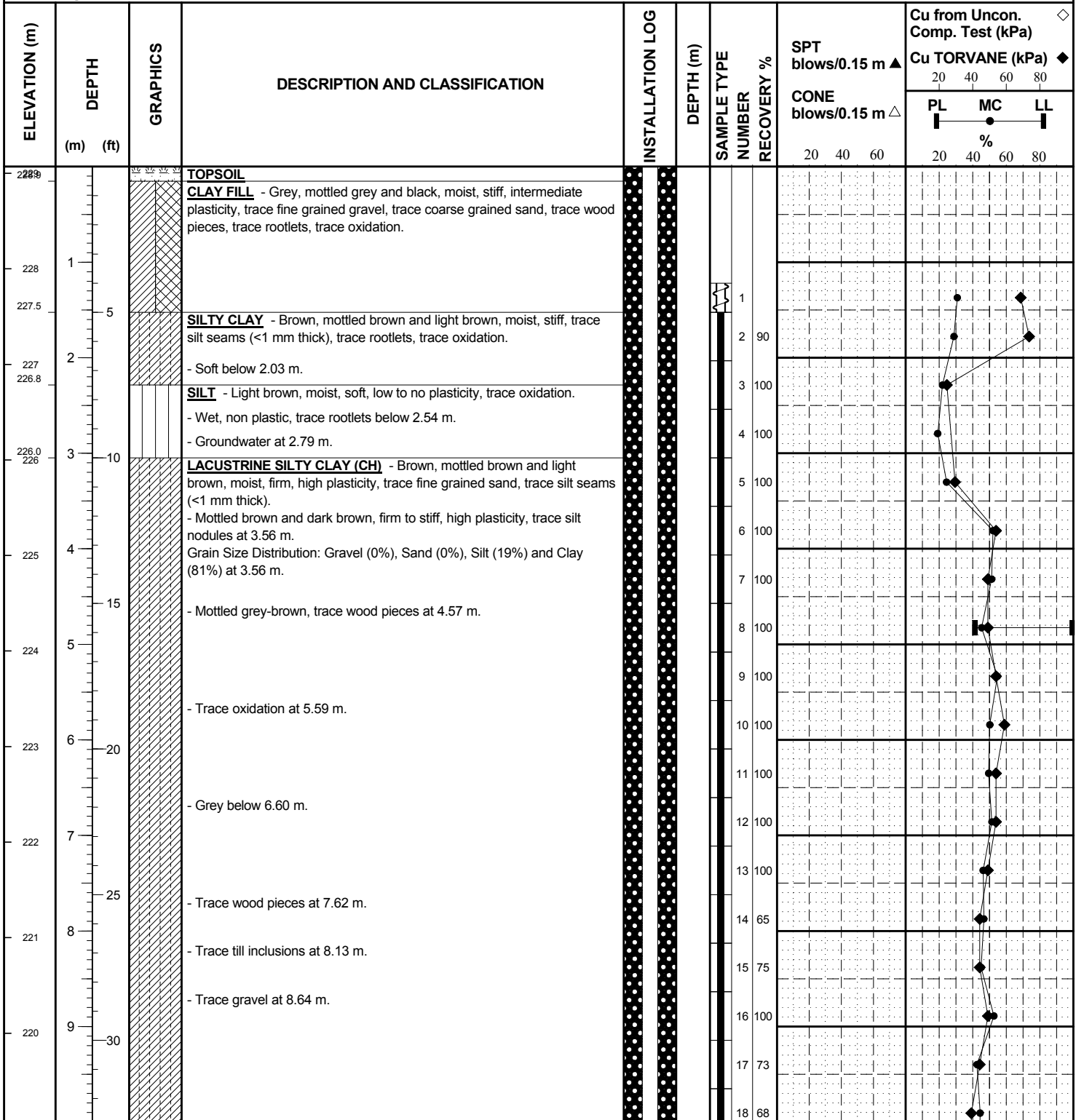
INSPECTOR
D. ANDERSON

APPROVED _____ DATE 20-09-05

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CLIENT CITY OF WINNIPEG
PROJECT FLOOD PUMPING STATIONS - CONDITION ASSESSMENT STUDY
SITE Hawthorne Pump Station
LOCATION 35 m West of Station
DRILLING METHOD 200 mm ø Hollow Stem Auger, ACKER SS Drill Rig

JOB NO. 04-107-12.400
GROUND ELEV. 229.07 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 5-Oct-04

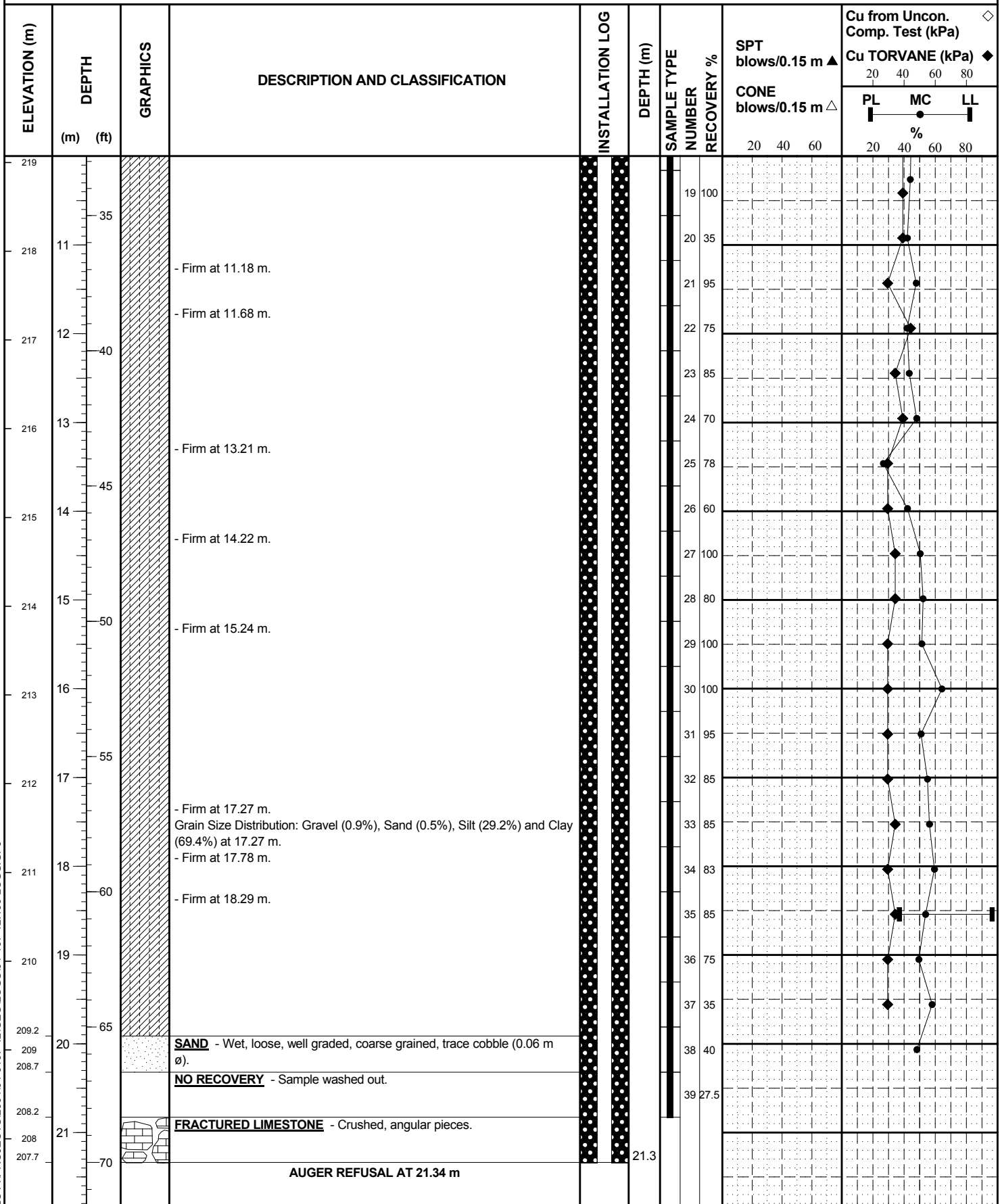


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SAMPLE TYPE  Auger Grab  Split Barrel

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. ANDERSON**

APPROVED _____ DATE 20-09-05



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SAMPLE TYPE Auger Grab Split Barrel

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. ANDERSON**

APPROVED _____ DATE **20-09-05**

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	INSTALLATION LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT blows/0.15 m ▲	Cu from Uncon. Comp. Test (kPa) ◇
								CONE blows/0.15 m △	Cu TORVANE (kPa) ◆
								20 40 60	20 40 60 80
									PL MC LL %
207	22		Notes: 1. Slope Inclinometer SI-05 grouted to ground level and installed with an above ground casing. Stick up height is 1.05 m.						
	75								
206	23								
	80								
205	24								
	85								
204	25								
	90								
203	26								
	95								
202	27								
	100								
201	28								
	105								
200	29								
	110								

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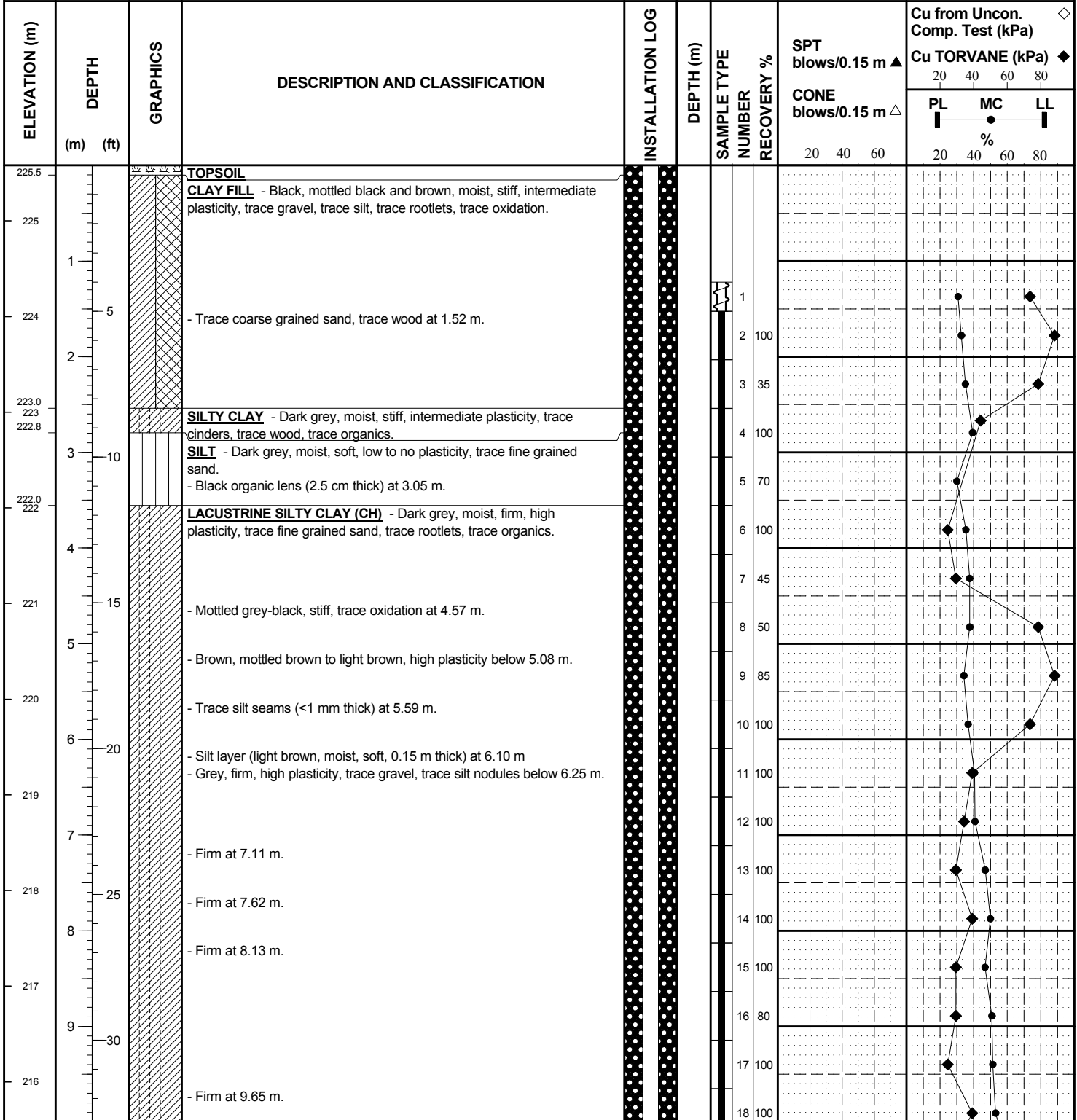
SAMPLE TYPE Auger Grab Split Barrel

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. ANDERSON**

APPROVED _____ DATE 20-09-05

CLIENT CITY OF WINNIPEG
PROJECT FLOOD PUMPING STATIONS - CONDITION ASSESSMENT STUDY
SITE Hawthorne Pump Station
LOCATION 14 m East of Shoreline
DRILLING METHOD 200 mm ø Hollow Stem Auger, ACKER SS Drill Rig

JOB NO. 04-107-12.400
GROUND ELEV. 225.58 m
TOP OF PVC ELEV.
WATER ELEV.
DATE DRILLED 6-Oct-04

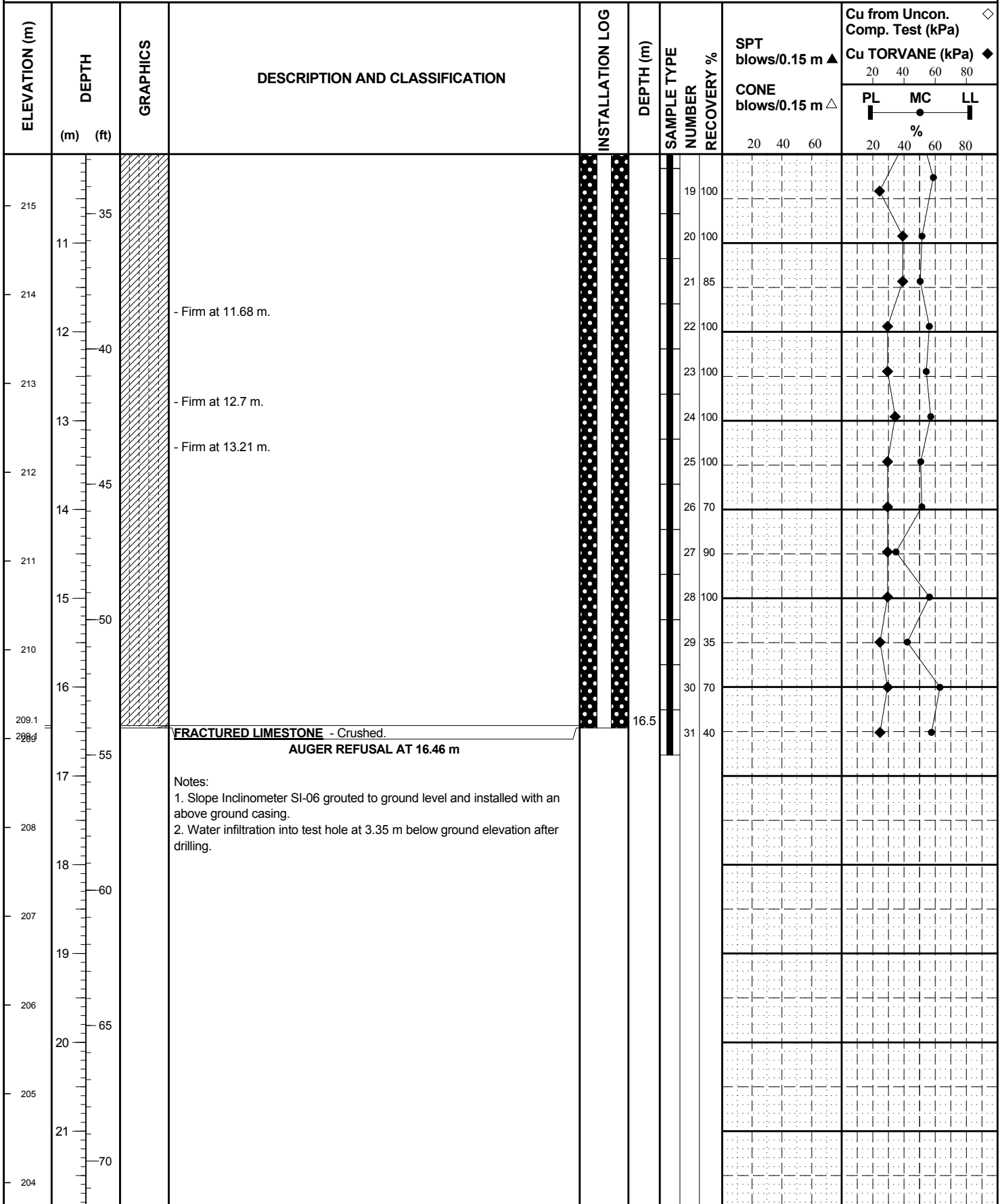


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SAMPLE TYPE  Auger Grab  Split Barrel

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. ANDERSON**

APPROVED _____ DATE 20-09-05



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SAMPLE TYPE  Auger Grab  Split Barrel

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. ANDERSON**

APPROVED _____ DATE **20-09-05**

CLIENT CITY OF WINNIPEG
PROJECT FLOOD PUMPING STATIONS - CONDITION ASSESSMENT STUDY
SITE Hawthorne Pump Station
LOCATION 14 m East of Station
DRILLING METHOD Solid Stem Auger

JOB NO. 04-107-12.400
GROUND ELEV. 225.42 m
TOP OF PVC ELEV. 226.42 m
WATER ELEV.
DATE DRILLED 6-Oct-04

ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	INSTALLATION LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT blows/0.15 m ▲	Cu from Uncon. Comp. Test (kPa) ◇
	(m)	(ft)							CONE blows/0.15 m △	Cu TORVANE (kPa) ◆
									20 40 60	20 40 60 80
										PL MC LL %
225.3				TOPSOIL						
225				CLAY FILL - Black, mottled black and brown, moist, stiff, intermediate plasticity, trace gravel, trace silt, trace rootlets, trace oxidation.						
224	1	5		- Trace coarse grained sand, trace wood at 1.52 m.		1.5				
223.9				SILTY CLAY - Dark grey, moist, stiff, intermediate plasticity, trace cinders, trace wood, trace organics.						
222.6				SILT - Dark grey, moist, soft, low to no plasticity, trace fine grained sand.						
222.9				- Black organic lens (2.5 cm thick) at 3.05 m.						
221.9				LACUSTRINE SILTY CLAY (CH) - Dark grey, moist, firm, high plasticity, trace fine grained sand, trace rootlets, trace organics.						
221				- Mottled grey-black, stiff, trace oxidation at 4.57 m.		4.6				
220				- Brown, mottled brown to light brown, high plasticity below 5.08 m.						
				- Trace silt seams (<1 mm thick) at 5.59 m.						
219				- Silt layer (light brown, moist, soft, 0.15 m thick) at 6.10 m						
				- Grey, firm, high plasticity, trace gravel, trace silt nodules below 6.25 m.						
				- Firm at 7.11 m.						
218				- Firm at 7.62 m.						
				- Firm at 8.13 m.						
217										
216				- Firm at 9.65 m.						

SAMPLE TYPE

CONTRACTOR
Paddock Drilling Ltd.

INSPECTOR
D. ANDERSON

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ELEVATION (m)	DEPTH		GRAPHICS	DESCRIPTION AND CLASSIFICATION	INSTALLATION LOG	DEPTH (m)	SAMPLE TYPE NUMBER	RECOVERY %	SPT blows/0.15 m ▲	CONE blows/0.15 m △	Cu from Uncon. Comp. Test (kPa) ◇	Cu TORVANE (kPa) ◆
	(m)	(ft)							20	40	60	20
215		35										
214		40		- Firm at 11.68 m.								
213		45		- Firm at 12.7 m.		12.5						
212		50		- Firm at 13.21 m.								
211		55										
210		60										
209.0		65										
209		70										
208.0		75		FRACTURED LIMESTONE - Crushed.								
208		80										
208.0		85		AUGER REFUSAL AT 17.37 m								
208		90										
207		95										
206		100										
205		105										
204		110										

Notes:
 1. Stratigraphy based on SI-06 located approximately 3 m south.
 2. Installed Casagrande Standpipe SP-3 at 17.37 m. Stick up height is 1.0 m. Water level measured at 9.83 m on October 6, 2004.
 3. When backfilling around standpipe, bentonite bridged at 4.6 m, leaving an air void between 4.6 to 12.5 m.

SAMPLE TYPE _____

CONTRACTOR **Paddock Drilling Ltd.** INSPECTOR **D. ANDERSON** APPROVED _____ DATE **20-09-05**

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**TABLE 1
SUMMARY OF PIEZOMETER MONITORING
HAWTHORNE PUMP STATION**

Standpipe	SP-3	Piezometer	PN-5 29639	PN-6 29634	River Level ⁽¹⁾ (m)
Ground Elev. (m)	225.42	Ground Elev. (m)	225.11	225.11	
Stick Up Elev. (m)	226.42	Tip Elev. (m)	217.79	214.44	
Strata	Limestone Bedrock	Strata	Lacustrine Silty Clay	Lacustrine Silty Clay	
Date	Elevation (m)	Date	Elevation (m)	Elevation (m)	
21-Oct-04	223.02	21-Oct-04	223.77	223.44	222.86
01-Feb-05	223.34	01-Feb-05	223.21	222.81	222.19
03-Jun-05	224.03	03-Jun-05	224.86	224.89	223.96
19-Sep-05	223.06	19-Sep-05	NM	NM	223.56

Note:

NM = Not Monitored

1. River levels are from the Kildonan Bridge location (provided by the City of Winnipeg).