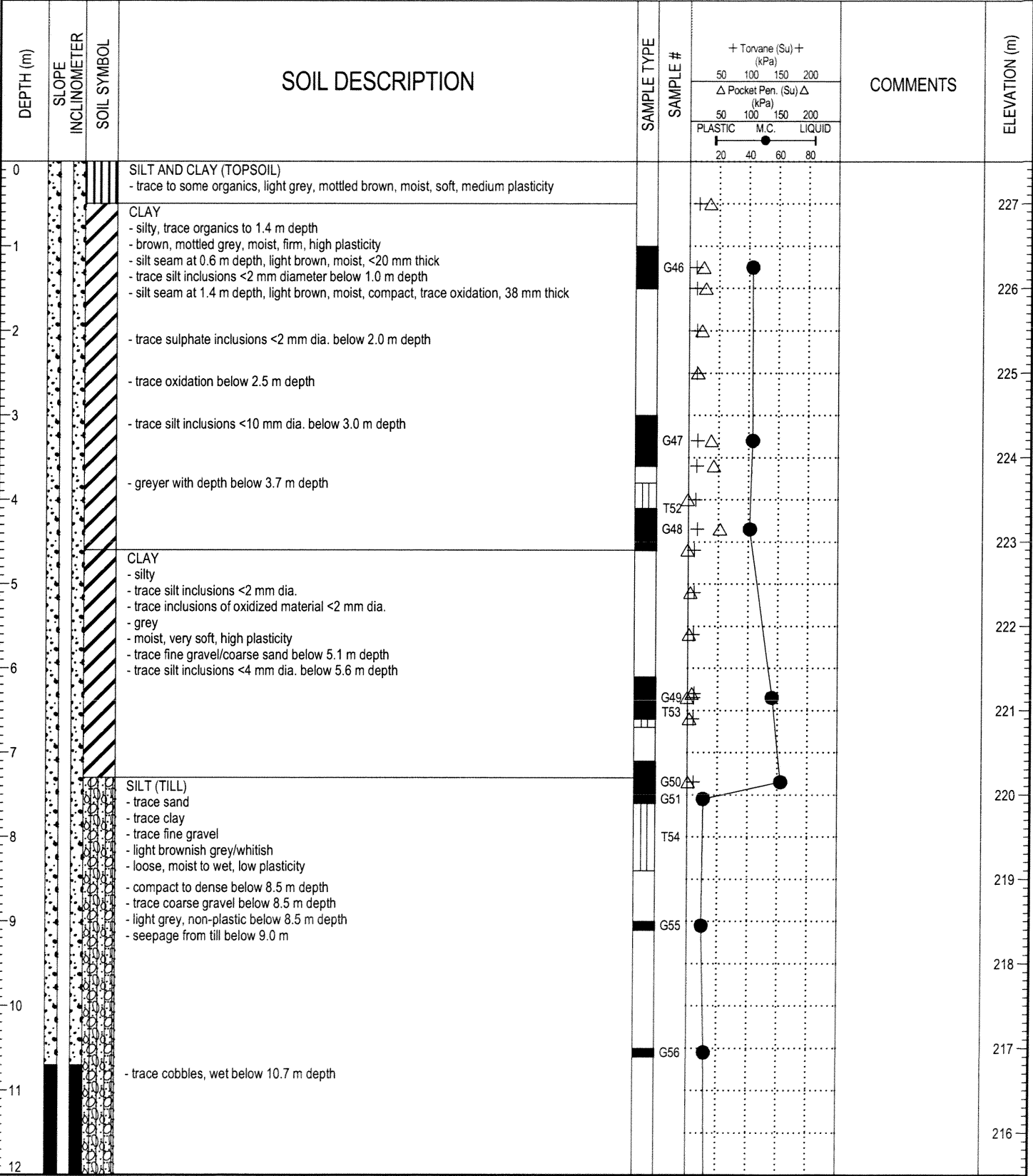


**APPENDIX A
TEST HOLE LOGS
AND
GROUNDWATER INFORMATION**

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SI-04-01		
LOCATION: On bench downslope of U-turn north of Grandmont				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: Acker, Hollow Stem		ELEVATION (m): 227.496		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



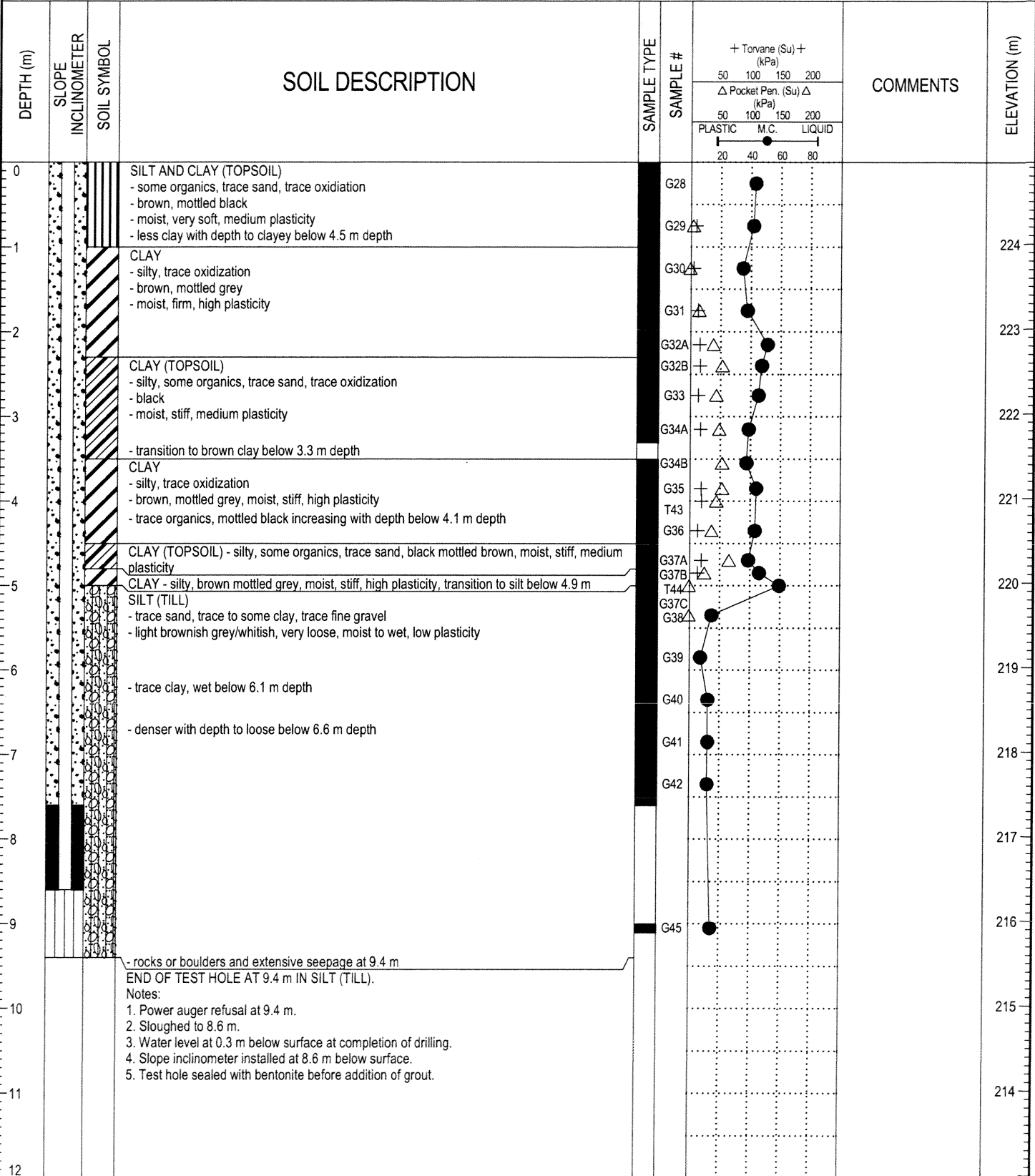
LOG OF TEST PIT PEMBINA AT GRANDMONT GPJ UMA GDT 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SI-04-01		
LOCATION: On bench downslope of U-turn north of Grandmont				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: Acker, Hollow Stem		ELEVATION (m): 227.496		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND

DEPTH (m)	SLOPE INCLINOMETER	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Penetration Test Results (kPa)			COMMENTS	ELEVATION (m)
						+ Torvane (Su) +	Δ Pocket Pen. (Su) Δ	PLASTIC M.C. LIQUID		
12						50	100	150	200	215
13						50	100	150	200	214
13.4			END OF TEST HOLE AT 13.4 m IN SILT (TILL). Notes: 1. Power auger refusal at 13.4 m. 2. Sloughed to 12.2 m. 3. Water level at 3.4 m below surface at completion of drilling. 4. Slope inclinometer installed at 12.5 m below surface. 5. Test hole sealed with bentonite before addition of grout.		G57					214
14										213
15										212
16										211
17										210
18										209
19										208
20										207
21										206
22										205
23										204
24										204

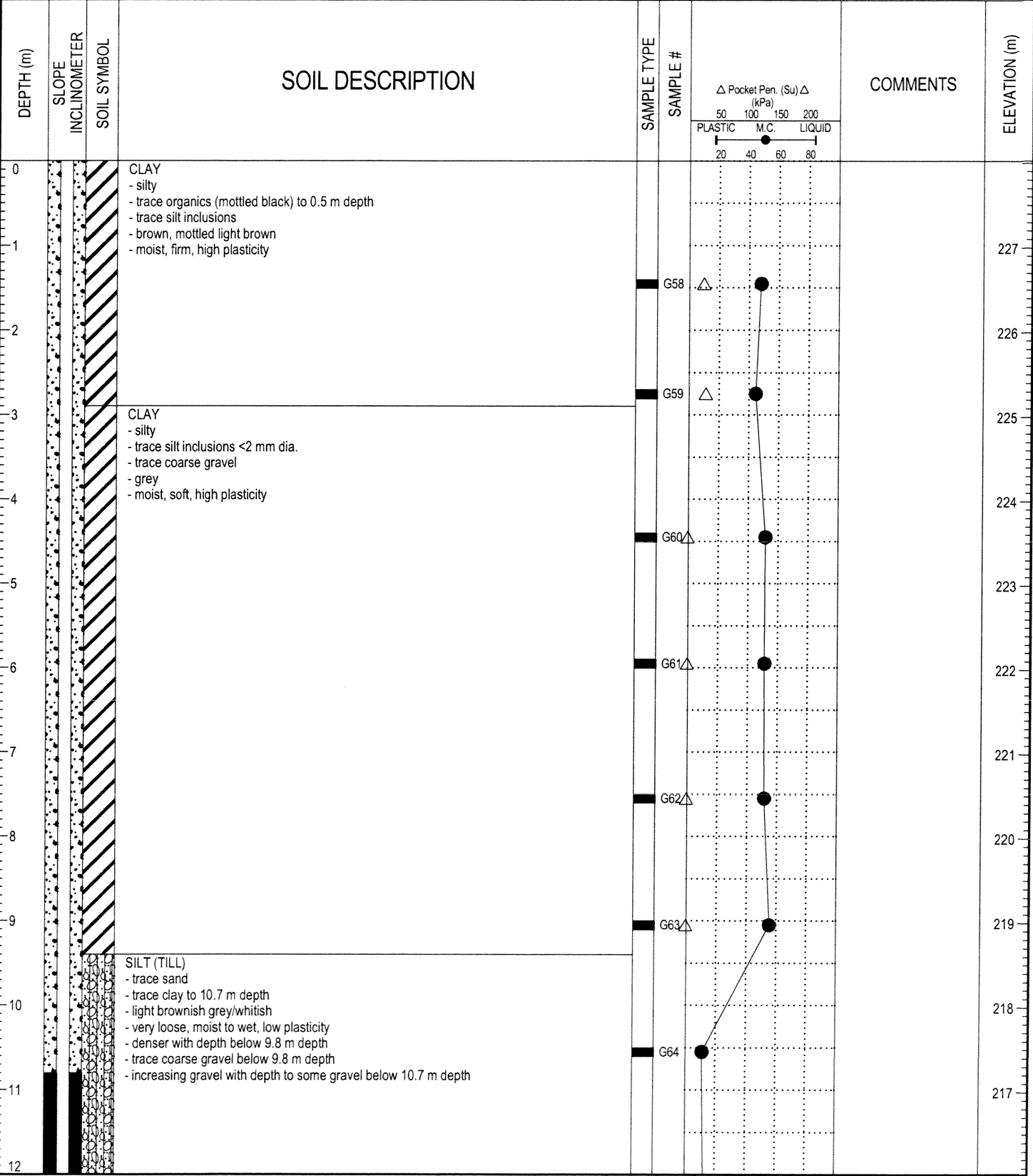
LOG OF TEST PIT PEMBINA AT GRANDMONT.GPJ UMA.GDT 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SI-04-02		
LOCATION: 5 m from river downslope of U-turn north of Grandmont				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: Acker, Hollow Stem		ELEVATION (m): 224.961		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



LOG OF TEST PIT PEMBINA AT GRANDMONT.GPJ, UMA.GDT, 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SI-04-03		
LOCATION: 10 m downslope and 10 m north of bushes at intersection				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.			METHOD: Acker, Solid Stem		ELEVATION (m): 228.025	
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



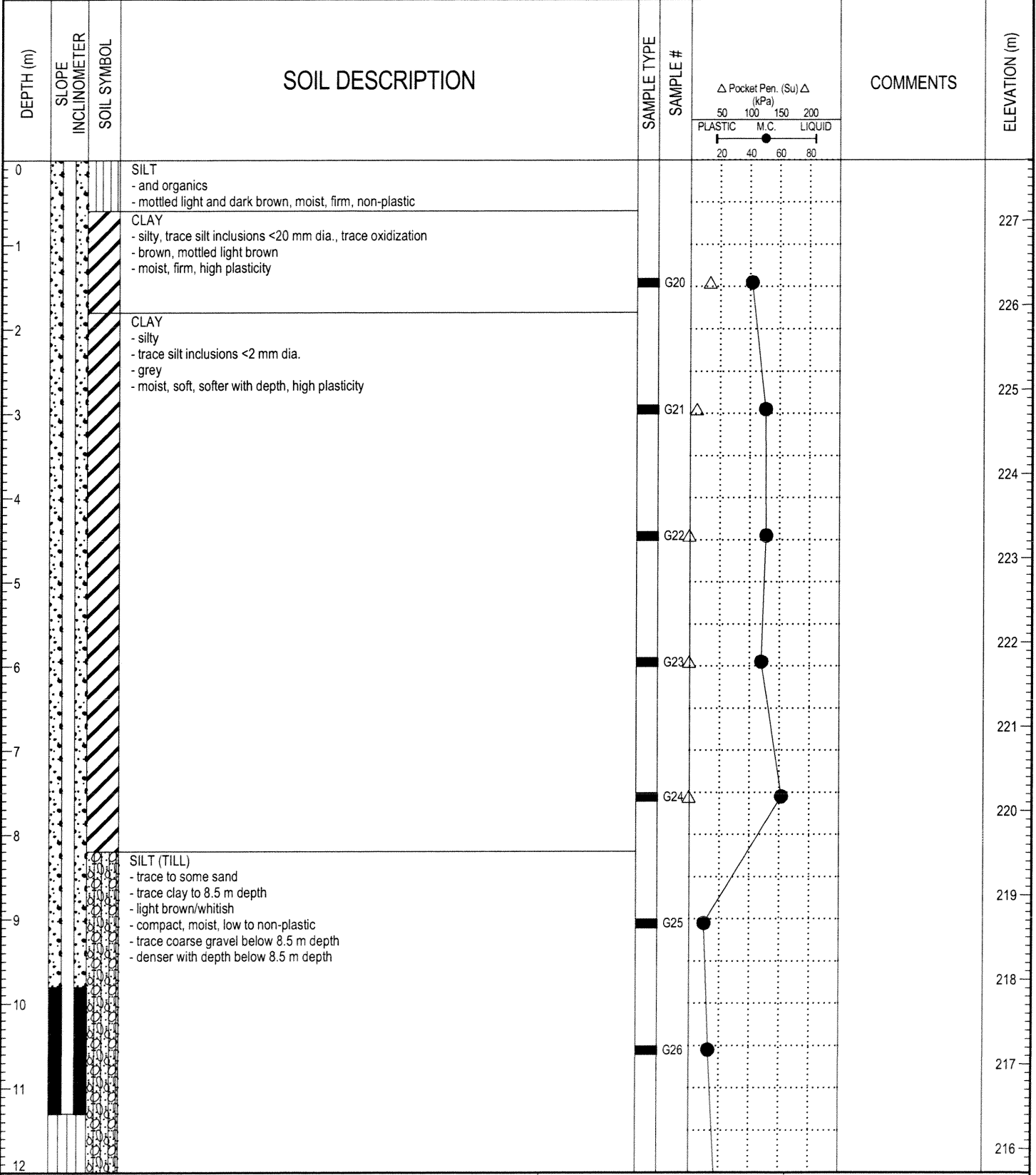
LOG OF TEST PIT PEMBINA AT GRANDMONT GPJ UMA.GDT 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SI-04-03	
LOCATION: 10 m downslope and 10 m north of bushes at intersection				PROJECT NO.: 0265 371 00	
CONTRACTOR: Paddock Drilling Ltd.		METHOD: Acker, Solid Stem		ELEVATION (m): 228.025	
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK
BACKFILL TYPE		<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT
		<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE	<input checked="" type="checkbox"/> CUTTINGS	<input type="checkbox"/> SAND

DEPTH (m)	SLOPE INCLINOMETER	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	Pocket Pen. (Su) Δ (kPa)			COMMENTS	ELEVATION (m)
						PLASTIC	M.C.	LIQUID		
12			- some to and gravel, wet and extensive seepage below 12.5 m depth		G65	20	40	60		
13					G66					215
14			END OF TEST HOLE AT 13.4 m IN SILT (TILL). Notes: 1. Power auger refusal at 13.4 m. 2. Sloughed to 12.5 m. 3. Water level at 3.5 m below surface at completion of drilling. 4. Slope inclinometer installed at 12.5 m below surface. 5. Test hole sealed with 0.6 m bentonite before addition of grout, but seal was not complete and 40 gallons of grout leaked out (determined by water level in hole). Test hole flushed and another 1.0 m of bentonite sealed the hole prior to the addition of remaining grout.							214
15										213
16										212
17										211
18										210
19										209
20										208
21										207
22										206
23										205
24										

LOG OF TEST PIT PEMBINAAT GRANDMONT.GPJ UMA.GDT 11/29/06

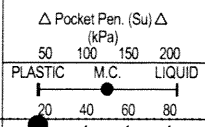
PROJECT: Riverbank Evaluation	CLIENT: City of Winnipeg	TESTPIT NO: SI-04-04
LOCATION: On bench north and downslope of Perimeter sign		PROJECT NO.: 0265 371 00
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Acker, Solid Stem	ELEVATION (m): 227.716
SAMPLE TYPE	<input type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE	
BACKFILL TYPE	<input type="checkbox"/> BENTONITE <input type="checkbox"/> GRAVEL <input type="checkbox"/> SLOUGH <input type="checkbox"/> GROUT <input type="checkbox"/> CUTTINGS <input type="checkbox"/> SAND	



LOG OF TEST PIT PEMBINA AT GRANDMONT GPJ UMA GDT 11/29/06

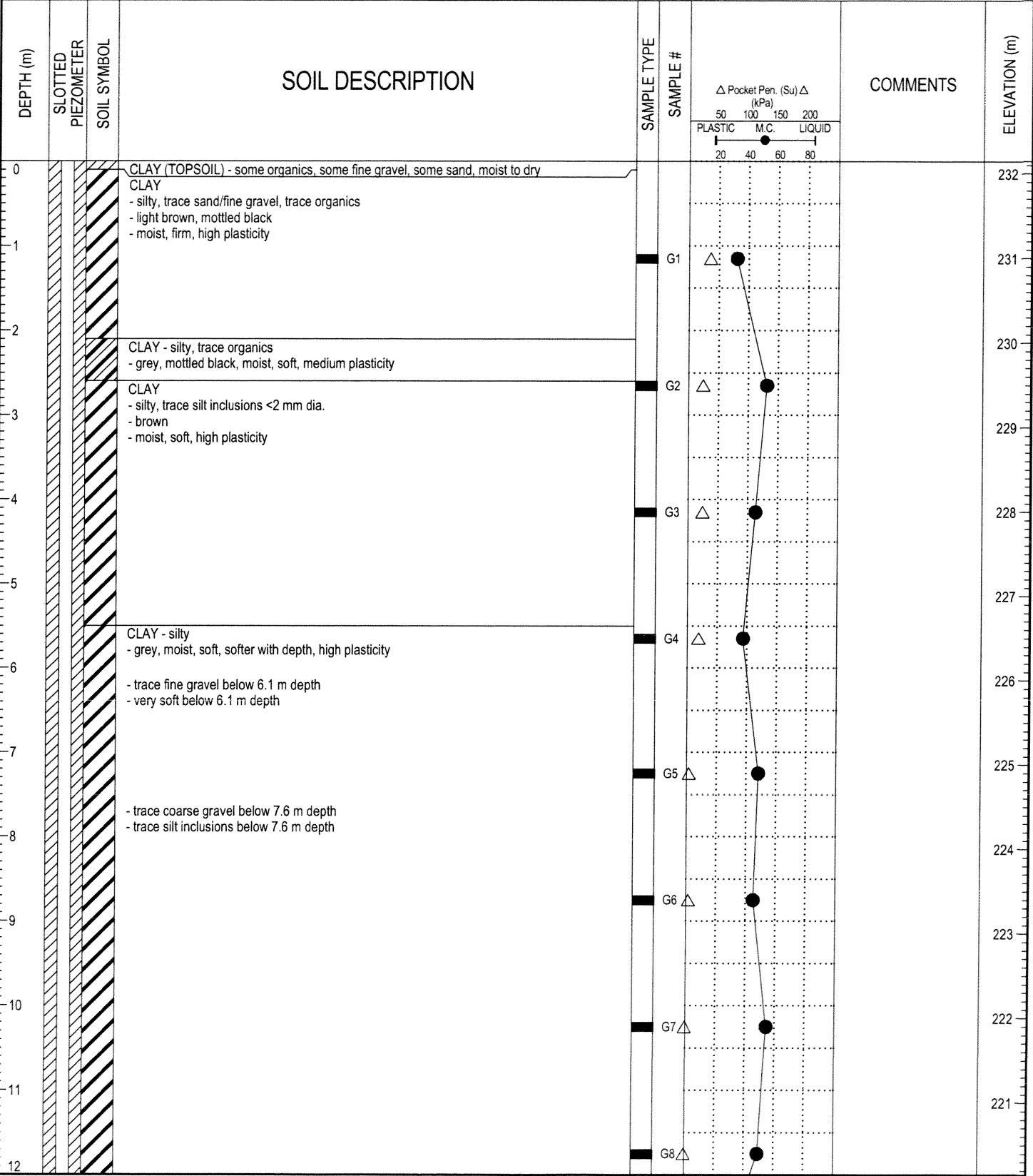
PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SI-04-04		
LOCATION: On bench north and downslope of Perimeter sign				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: Acker, Solid Stem		ELEVATION (m): 227.716		
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE
BACKFILL TYPE	<input checked="" type="checkbox"/> BENTONITE	<input type="checkbox"/> GRAVEL	<input type="checkbox"/> SLOUGH	<input type="checkbox"/> GROUT	<input type="checkbox"/> CUTTINGS	<input type="checkbox"/> SAND

DEPTH (m)	SLOPE INCLINOMETER	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
12							215
13							214
14			END OF TEST HOLE AT 13.7 m IN SILT (TILL). Notes: 1. Power auger refusal at 13.7 m. 2. Sloughed to 10.7 m. 3. Water level at 3.7 m below surface at completion of drilling. 4. Slope inclinometer installed at 11.3 m below surface. 5. Addition of 80 gallons of grout inserted in hole did not alter water level. Test hole was not sealed by grout as determined by the addition of water with no change in ground water level. Test hole sealed with 1.5 m bentonite, prior to addition of remaining grout.		G27		213
15							212
16							211
17							210
18							209
19							208
20							207
21							206
22							205
23							204
24							204



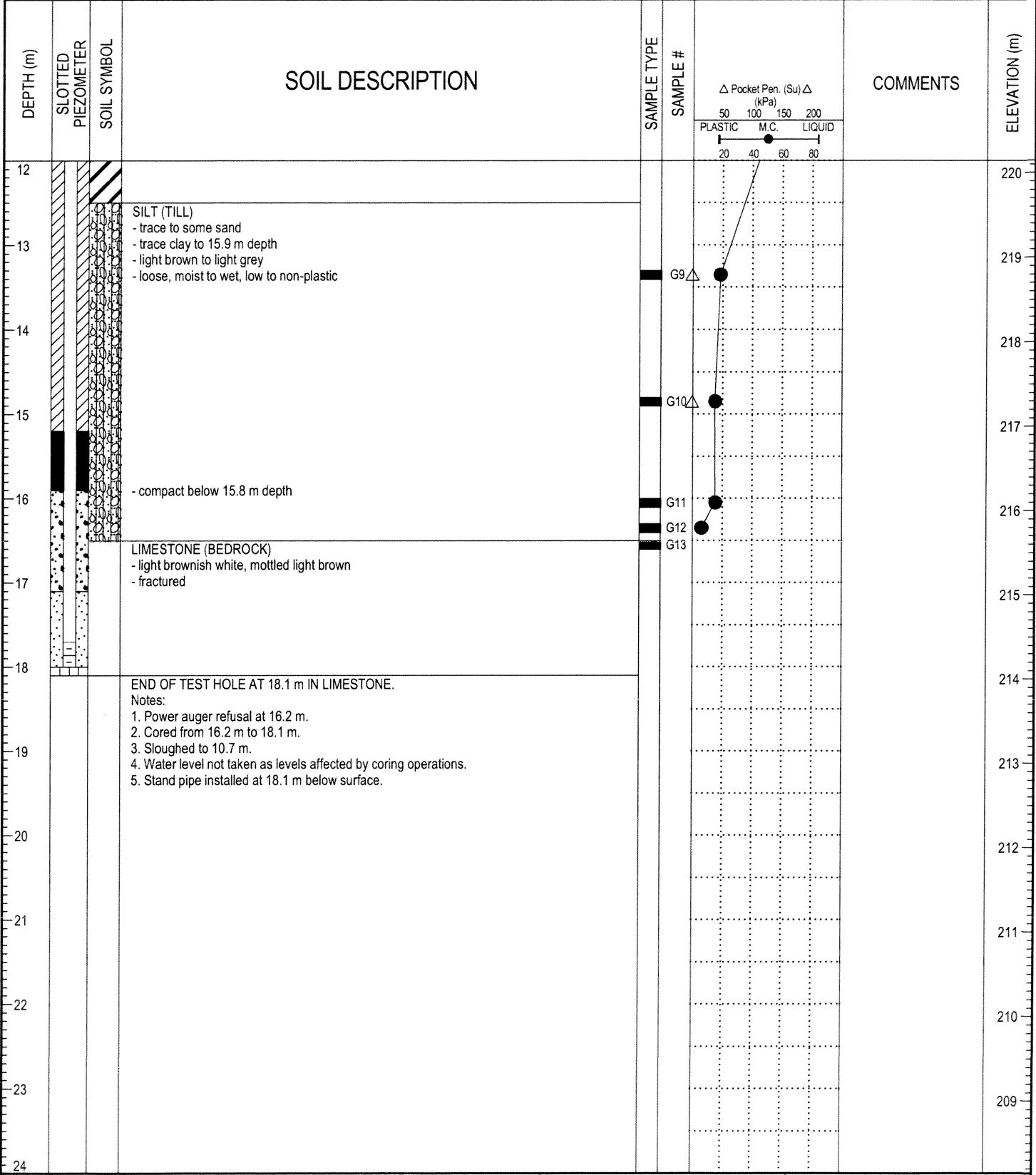
LOG OF TEST PIT PEMBINA AT GRANDMONT.GPJ UMA.GDT 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SP-04-05		
LOCATION: 10 m south of Perimeter sign and 10 m downslope of sidewalk				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.		METHOD: Acker, Solid Stem		ELEVATION (m): 232.146		
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



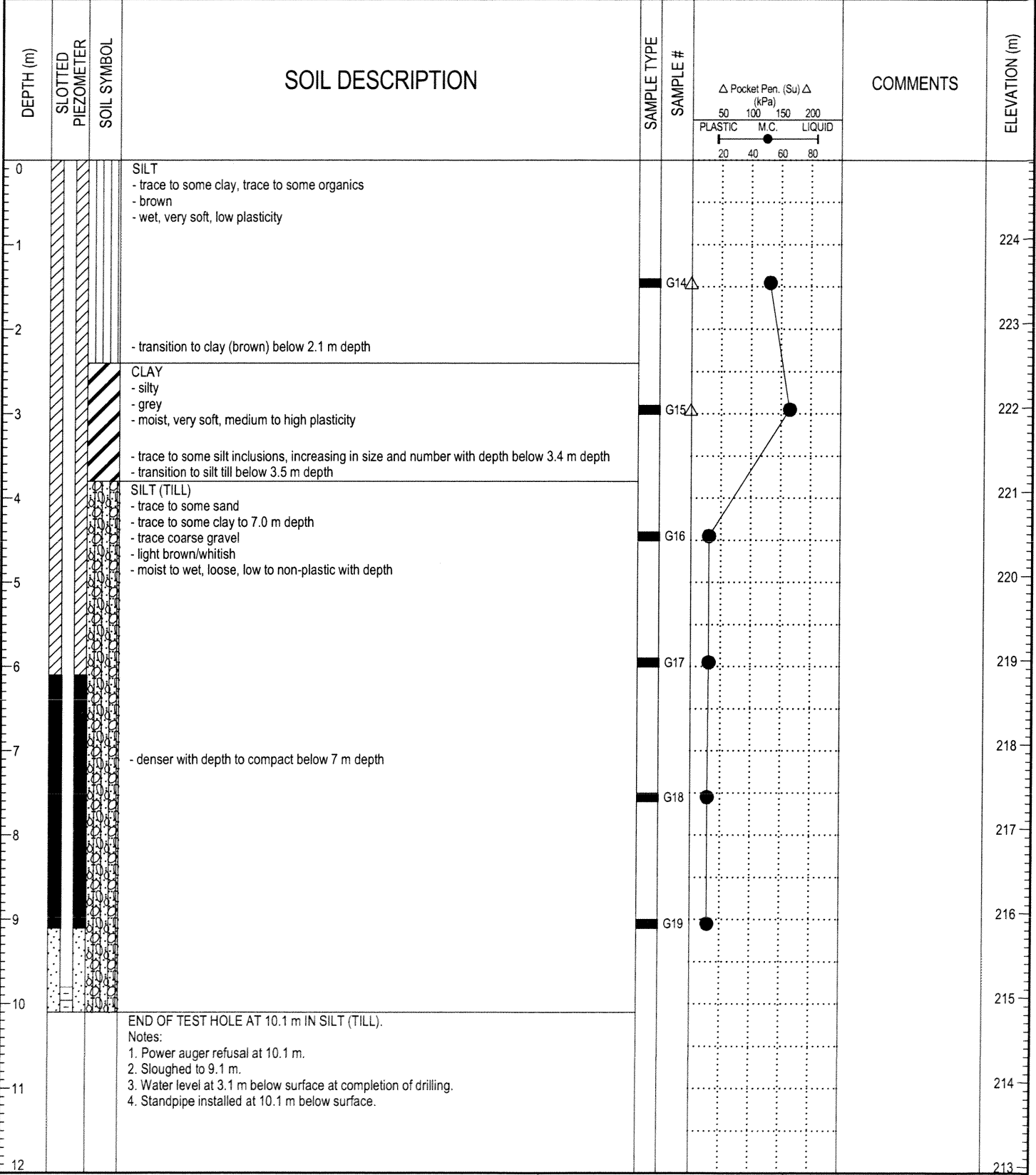
LOG OF TEST PIT PEMBINA AT GRANDMONT GPJ UMA.GDT 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SP-04-05		
LOCATION: 10 m south of Perimeter sign and 10 m downslope of sidewalk				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.			METHOD: Acker, Solid Stem		ELEVATION (m): 232.146	
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



LOG OF TEST PIT, PEMBINA AT GRANDMONT GPJ, UMA GDT, 11/29/06

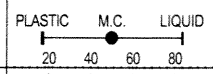
PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg		TESTPIT NO: SP-04-06		
LOCATION: 10 m from river downslope of Perimeter sign				PROJECT NO.: 0265 371 00		
CONTRACTOR: Paddock Drilling Ltd.			METHOD: Acker, Solid Stem		ELEVATION (m): 224.926	
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



LOG OF TEST PIT PEMBINA AT GRANDMONT.GPJ UMA.GDT 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg	TESTPIT NO: TH-05-07
LOCATION: Pembina at Grandmont		PROJECT NO.: 0265 371 00	
CONTRACTOR: AGRA Foundations Limited		METHOD: 1.5 m diameter flight auger	ELEVATION (m): 227.09
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> SPLIT SPOON
		<input checked="" type="checkbox"/> BULK	<input checked="" type="checkbox"/> NO RECOVERY
			<input type="checkbox"/> CORE

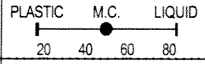
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0		CLAY (FILL) - brown, moist, stiff - high plastic, some silt, trace gypsum				227
0.5		CLAY - brown, moist, stiff - high plastic, some silt				226.5
2.4		- dark grey, firm, very moist below 2.4 m				225.4
7.6		- soft below 7.6 m				222.4
9.0		SILT (TILL) - light grey, moist, loose - low plastic, some clay, trace sand, trace gravel - occasional cobbles and boulders				218.0
10.4		Test hole terminated at 10.4 m. No seepage or sloughing observed during drilling. Slight squeezing of clay. Good drilling conditions. While backfilling, test hole blew in from base of silt till. Water level accumulation to 1.5 m from ground surface. Backfilled test hole with auger cuttings.	<input checked="" type="checkbox"/>	G1		216.6



LOG OF TEST PIT PEMBINA AT GRANDMONT.GPJ, UMA.GDT 11/29/06

PROJECT: Riverbank Evaluation		CLIENT: City of Winnipeg	TESTPIT NO: TH-05-08
LOCATION: Pembina at Grandmont		PROJECT NO.: 0265 371 00	
CONTRACTOR: AGRA Foundations Limited		METHOD: 1.5 m diameter flight auger	ELEVATION (m): 226.255
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE	<input checked="" type="checkbox"/> SPLIT SPOON
		<input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY
			<input type="checkbox"/> CORE

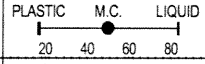
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0		CLAY (FILL) - brown, moist, stiff - high plastic, some silt, trace gypsum CLAY - brown, moist, stiff - high plastic, some silt, trace gypsum, friable				226
1						225
2						224
3						223
4		- massive below 4 m				222
5						221
6		- dark grey, very moist, firm below 5.5 m				220
7		- soft below 7 m				219
8		SILT (TILL) - light grey, damp, medium dense - low plastic, trace clay, trace gravel, trace sand - occasional cobbles - dense below 8.5 m	<input checked="" type="checkbox"/>	G2		218
9		Test hole terminated at 8.8 m below ground surface. No seepage or sloughing observed during drilling. Very slight squeezing of test hole. Hole left open for 1/2 hour with no observed accumulations of ground water. Backfilled test hole with auger cuttings.				217
10						216
11						215
12						215



LOG OF TEST PIT PEMBINA AT GRANDMONT.GPJ UMA.GDT 11/29/06

PROJECT: Riverbank Evaluation	CLIENT: City of Winnipeg	TESTPIT NO: TH-05-09
LOCATION: Pembina at Grandmont		PROJECT NO.: 0265 371 00
CONTRACTOR: AGRA Foundations Limited	METHOD: 1.5 m diameter flight auger	ELEVATION (m): 226.72
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB	<input type="checkbox"/> SHELBY TUBE
	<input checked="" type="checkbox"/> SPLIT SPOON	<input type="checkbox"/> BULK
	<input checked="" type="checkbox"/> NO RECOVERY	<input type="checkbox"/> CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0		CLAY - brown, moist, stiff - high plastic, some silt, trace gypsum				226
1						225
2						224
3						223
4						222
5		- dark grey, very moist, firm below 4.3 m				221
6						220
7		- soft below 6.7 m				219
8		SILT (TILL) - light grey, moist, loose - low plastic, some clay, trace sand, trace gravel - occasional cobbles				218
9		Test hole terminated at 8.8 m below ground surface. No seepage or sloughing observed during drilling. Good drilling conditions. Backfilled test hole with auger cuttings.		G3		217
10						216
11						215
12						215



LOG OF TEST PIT, PEMBINA AT GRANDMONT GP.J, UMA GDT, 11/29/06

Project: Pembina at Grandmont
UMA Job No.: 0265-371-00

I.D. SP-04-05
Inlet Type Casagrande 300 mm
Ground Elevation 232.146
Top of Piezo Elev (m) 233.066
Depth to Tip (m) 18.1
Bottom Tip Elevation 214.05
Sand Backfill
 Top (m)
 Bottom (m)

Date	Time	Standpipe (till)	
		Reading (m)	Ground Water Elev. (m)
July 15, 2004		8.45	224.62
August 6, 2004		8.87	224.20
September 16, 2004		8.84	224.23
October 13, 2004		8.51	224.56
October 20, 2004		8.31	224.76
October 28, 2004		8.24	224.83
November 3, 2004		8.65	224.42
November 9, 2004		7.68	225.39
November 17, 2004		7.65	225.42
November 26, 2004		8.32	224.75
January 12, 2005		9.80	223.27
July 14, 2005		6.61	226.46
August 26, 2005		7.95	225.12
November 29, 2005		7.90	225.17
May 5, 2006		5.68	227.39
October 6, 2006		8.01	225.06
October 12, 2006		7.90	225.17
October 20, 2006		8.04	225.03
October 27, 2006		8.26	224.81
November 3, 2006		8.64	224.43
November 9, 2006		8.78	224.29
November 17, 2006		8.88	224.19
November 28, 2006		8.82	224.25

Project: Pembina at Grandmont
UMA Job No.: 0265-371-00

Location:
I.D.: SP-04-06
Inlet Type: Casagrande 300 mm
Ground Elevation: 224.926
Top of Piezo Elev (m): 224.926
Depth to Tip (m): 10.1
Bottom Tip Elevation: 214.83
Sand Backfill
 Top (m)
 Bottom (m)

Date	Time	Standpipe (till)	
		Reading (m)	Ground Water Elev. (m)
July 15, 2004		4.50	220.43
September 23, 2004		0.71	224.22
October 13, 2004		0.40	224.53
October 20, 2004		0.35	224.58
October 28, 2004		0.28	224.65
November 3, 2004		0.14	224.79
November 26, 2004		0.31	224.62
November 29, 2005		0.00	224.93

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