

Appendix A

Test Holes Location Plan
Test Holes Logs

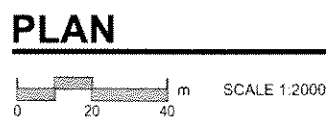
B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 07/05/04 3:27:29 PM

Saved By: stevensc

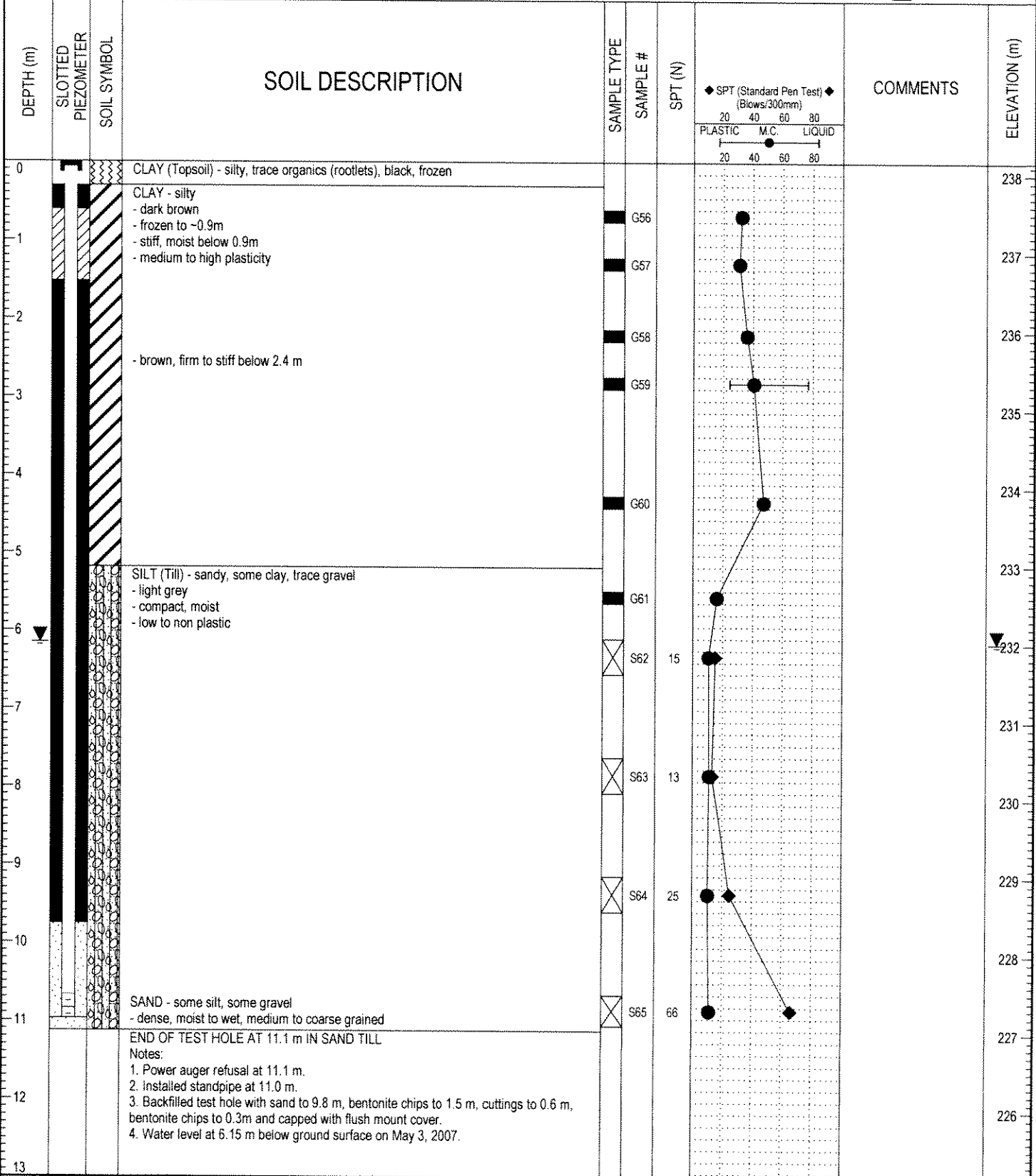
UMA FILE NAME: D265-202-01_01-B-F001_RX.dwg

ISS/REV: A



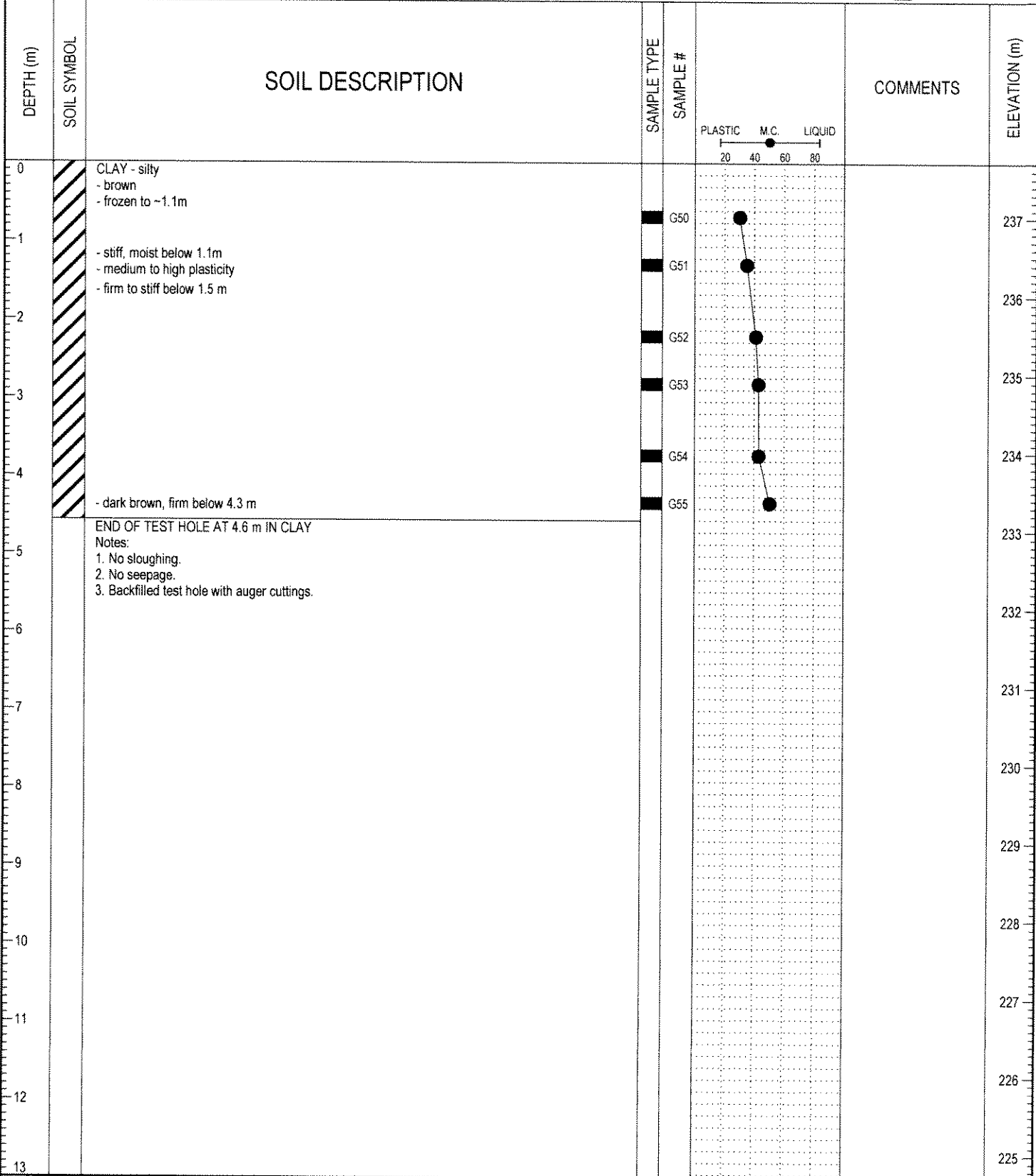
City of Winnipeg
 Perimeter Road Sewage Pumping Station Reliability
 Forcemain Twinning
Test Holes Location Plan

PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-01				
LOCATION: Outside fenced compound around retention pond N 5,521,344.3 E 620,277.6		PROJECT NO.: D265 202 01				
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 238.16				
SAMPLE TYPE	GRAB	SHELBY TUBE	SPLIT SPOON	BULK	NO RECOVERY	CORE
BACKFILL TYPE	BENTONITE	GRAVEL	SLOUGH	GROUT	CUTTINGS	SAND



LOG OF TESTHOLE 2007 03 29 WILKES AVE AND PERIMETER TH LOGS GPJ UMA GBT 5/4/07

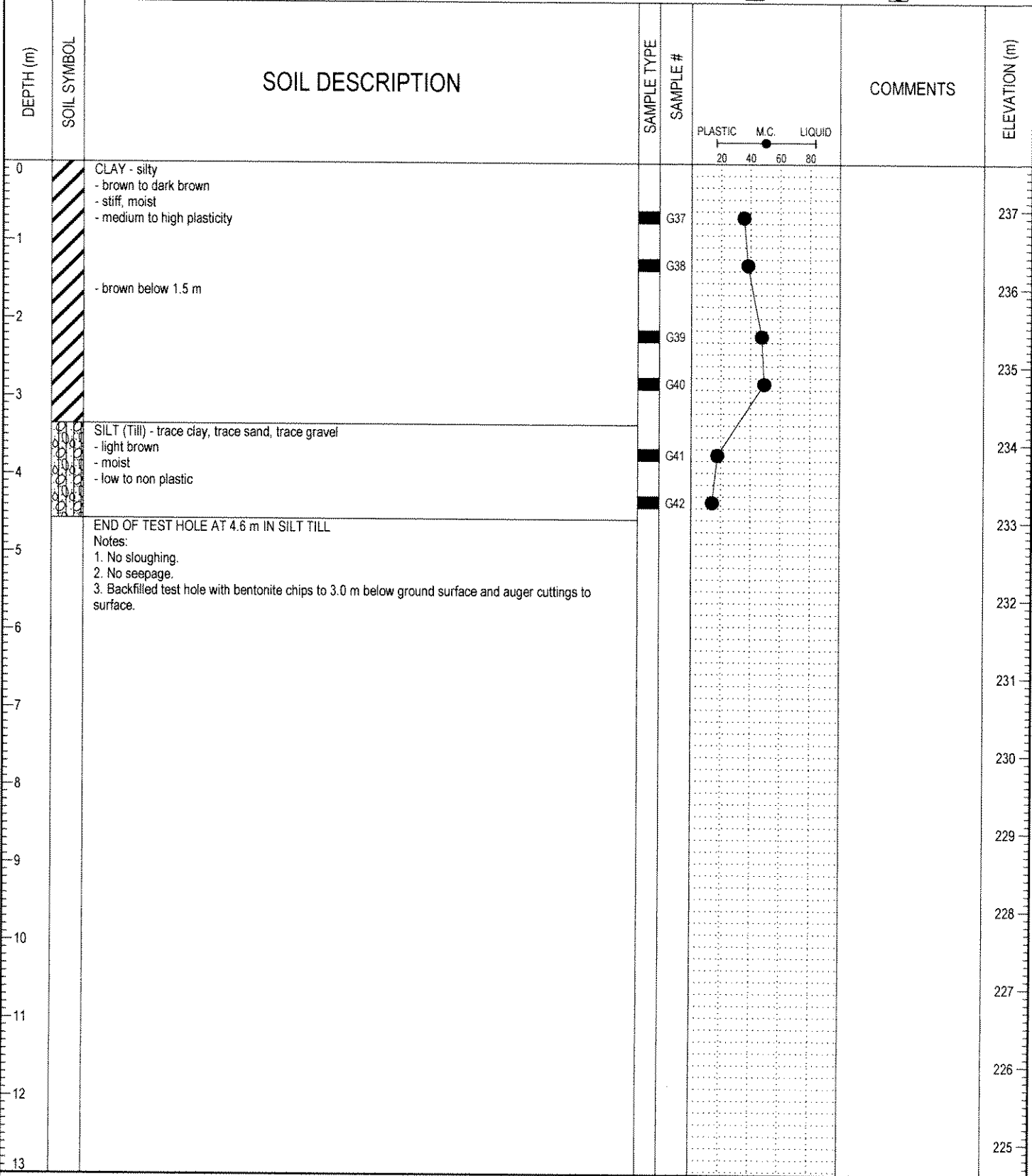
PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-02
LOCATION: Invert of ditch on West side of Perimeter Hwy. N 5,521,428.9 E 620,426.9		PROJECT NO.: D265 202 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 237.707
SAMPLE TYPE	<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



LOG OF TESTHOLE 2007.03.29 WILKES AVE. AND PERIMETER TH LOGS GPJ UMA GOT 5/4/07

	LOGGED BY: S. Peters	COMPLETION DEPTH: 4.57 m
	REVIEWED BY:	COMPLETION DATE: 3/27/07
	PROJECT ENGINEER: Faris Khalil	Page 1 of 1

PROJECT: PRPS Reliability - Forcemain Twinning		CLIENT: City of Winnipeg	TESTHOLE NO: TH07-03
LOCATION: Invert of ditch on East side of Perimeter Hwy. N 5,521,427.4 E 620,473.4		PROJECT NO.: D265 202 01	
CONTRACTOR: Paddock Drilling Ltd.		METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 237.598
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



LOG OF TESTHOLE - 2007 03 29 WILKES AVE AND PERIMETER TH LOGS.GPJ UMA.GDT 5/4/07

UMA AECOM	LOGGED BY: S. Peters	COMPLETION DEPTH: 4.57 m
	REVIEWED BY:	COMPLETION DATE: 3/27/07
	PROJECT ENGINEER: Faris Khalil	Page 1 of 1

PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-04
LOCATION: West of service road on East side of Perimeter Hwy. N 5,521,526.0 E 620,522.9		PROJECT NO.: D265 202 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 238.523
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 #	PLASTIC	M.C.	LIQUID	COMMENTS	ELEVATION (m)
0		CLAY (Topsoil) - silty, trace organics (rootlets), black, frozen							
0.5		CLAY - silty - dark brown - stiff, dry to moist - medium to high plasticity		G31					238
1.5		- brown, moist below 1.5 m		G32					237
2.0				G33					236
2.5				G34					235
3.0		SILT (Till) - trace clay, trace sand, trace gravel - brown - moist - low to non plastic		G35					234
4.5		END OF TEST HOLE T 4.6 m IN SILT TILL		G36					233
5.0		Notes: 1. No sloughing. 2. No seepage. 3. Backfilled test hole with bentonite chips to 2.7 m below ground surface and auger cuttings to surface.							232
6.0									231
7.0									230
8.0									229
9.0									228
10.0									227
11.0									226
12.0									
13.0									

LOG OF TESTHOLE 2007.03.29 WILKES AVE AND PERIMETER TH LOGS GPJ UMA GDT 5/4/07

	LOGGED BY: S. Peters	COMPLETION DEPTH: 4.57 m
	REVIEWED BY:	COMPLETION DATE: 3/27/07
	PROJECT ENGINEER: Faris Khalil	Page 1 of 1

PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-05
LOCATION: West of service road on East side of Perimeter Hwy. N 5,521,626.0 E 620,526.2		PROJECT NO.: D265 202 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 238.644
SAMPLE TYPE	<input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK	<input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE

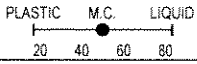
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	PLASTIC	M.C.	LIQUID	COMMENTS	ELEVATION (m)
0		CLAY (Topsoil) - silty, trace organics (rootlets), black, frozen							
0-1		CLAY - silty - grey, brown below 1.5 m - stiff, moist - medium to high plasticity		G25					238
1-2				G26					237
2-3				G27					236
3-4		SILT (Till) - trace clay, trace sand, trace gravel - brown - moist - low to non-plastic		G28					235
4-5				G29					234
5-6		END OF TEST HOLE T 4.6 m IN SILT TILL Notes: 1. No sloughing. 2. No seepage. 3. Backfilled test hole with bentonite chips to 2.7 m below ground surface and auger cuttings to surface.		G30					233
6-7									232
7-8									231
8-9									230
9-10									229
10-11									228
11-12									227
12-13									226

LOG OF TESTHOLE 2007.03 29 WILKES AVE AND PERIMETER TH LOGS GPJ UMA GDJ 5/4/07

UMA AECOM	LOGGED BY: S. Peters	COMPLETION DEPTH: 4.57 m
	REVIEWED BY:	COMPLETION DATE: 3/27/07
	PROJECT ENGINEER: Faris Khalil	Page 1 of 1

PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-06
LOCATION: West of service road on East side of Perimeter Hwy. N 5,521,721.3 E 620,556.4		PROJECT NO.: D265 202 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 238.784
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 (Topsoil) - silty, black to dark grey, frozen		G19		238
1		CLAY - silty - brown - stiff, moist - medium to high plasticity		G20		237
2				G21		236
3				G22		235
4		SILT (Till) - trace clay, trace sand, trace gravel - brown - moist - low to non plastic		G23		234
5		END OF TEST HOLE T 4.6 m IN SILT TILL Notes: 1. No sloughing. 2. No seepage. 3. Backfilled test hole with bentonite chips to 3.0 m below ground surface and auger cuttings to surface.		G24		233
6						232
7						231
8						230
9						229
10						228
11						227
12						226
13						226



LOG OF TESTHOLE 2007 03 29 WILKES AVE AND PERIMETER TH LOGS GPFJ UMA GDT 5/4/07

PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-07
LOCATION: West of service road on East side of Perimeter Hwy. N 5,521,780.4 E 620,637.5		PROJECT NO.: D265 202 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 238.531
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

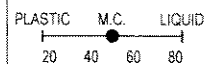
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	COMMENTS	ELEVATION (m)
0		CLAY - silty - brown - frozen to ~1.2 m		G13		238
1		- stiff, moist, medium to high plasticity below 1.2 m - dark brown below 1.5 m		G14		237
2				G15		236
3		- trace gravel below 2.4 m		G16		235
4				G17		234
4.6				G18		234
5		SILT (Till) - trace clay, trace sand, trace gravel, brown, moist, low to non plastic				234
5		END OF TEST HOLE T 4.6 m IN SILT TILL Notes: 1. No sloughing. 2. No seepage. 3. Backfilled test hole with bentonite chips to 4.0 m below ground surface and auger cuttings to surface.				233
6						232
7						231
8						230
9						229
10						228
11						227
12						226
13						226

LOG OF TESTHOLE 2007 03 29 WILKES AVE AND PERIMETER TH LOGS GPFJ UMA GDT 5/4/07

UMA AECOM	LOGGED BY: S. Peters	COMPLETION DEPTH: 4.57 m
	REVIEWED BY:	COMPLETION DATE: 3/27/07
	PROJECT ENGINEER: Faris Khalil	Page 1 of 1

PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-08
LOCATION: West of service road on East side of Perimeter Hwy. N 5,521,880.4 E 620,640.8		PROJECT NO.: D265 202 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 238.351
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 - silty - brown - frozen to ~1.5 m				238
1		- stiff, moist, medium to high plasticity below 1.5 m		G7		237
2				G8		236
3		- dark brown below 2.7 m		G9		235
4		SILT (Till) - trace clay, trace sand, trace gravel - brown - dry to moist - low to non plastic		G10		234
5		END OF TEST HOLE T 4.6 m IN SILT TILL Notes: 1. No sloughing. 2. No seepage. 3. Backfilled test hole with bentonite chips to 3.0 m below ground surface and auger cuttings to surface.		G11		233
6				G12		232
7						231
8						230
9						229
10						228
11						227
12						226
13						



LOG OF TESTHOLE 2007.03.29 WILKES AVE AND PERIMETER TH LOGS GPJ UMA GDT 5/4/07

PROJECT: PRPS Reliability - Forcemain Twinning	CLIENT: City of Winnipeg	TESTHOLE NO: TH07-09
LOCATION: West of service road on East side of Perimeter Hwy. N 5,521,980.3 E 620,644.1		PROJECT NO.: D265 202 01
CONTRACTOR: Paddock Drilling Ltd.	METHOD: RM30, 125mm dia. SSA	ELEVATION (m): 238.211
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 #	PLASTIC M.C. LIQUID			COMMENTS	ELEVATION (m)
					20	40	60		
0		CLAY - silty - dark brown - frozen to -1.5 m		G1					238
1		- brown below 1.2 m - stiff, moist, medium to high plasticity below 1.5m		G2					237
2		CLAY and SILT - brown, firm, moist, low to medium plasticity		G3					236
3		CLAY - silty - brown - stiff, moist - medium to high plasticity		G4					235
4		- trace gravel, firm below 3.7 m		G5					234
4.6		SILT (Till) - trace clay, trace sand, trace gravel, brown, dry to moist, low to non plastic		G6					234
5		END OF TEST HOLE T 4.6 m IN SILT TILL Notes: 1. No sloughing. 2. No seepage. 3. Backfilled test hole with auger cuttings to surface.							233
6									232
7									231
8									230
9									229
10									228
11									227
12									226
13									226

LOG OF TESTHOLE 2007.03.29 WILKES AVE AND PERIMETER TH LOGS GPJ UMA GDT 5/4/07

	LOGGED BY: S. Peters	COMPLETION DEPTH: 4.57 m
	REVIEWED BY:	COMPLETION DATE: 3/27/07
	PROJECT ENGINEER: Faris Khalil	Page 1 of 1

ATTERBERG
(ASTM D4318-98)

UMA | AECOM

MATERIALS LABORATORY

UMA | AECOM

1479 Buffalo Place, Winnipeg, MB R3T 1L7
tel (204) 284-0580 fax (204) 475-3646

JOB No.: D265-202-01
CLIENT: City of Winnipeg
PROJECT: PRPS Upgrade
LOCATION:

DATE: Apr.26 2007
TEST HOLE: 07-01
SAMPLE: G59
DEPTH: 9-9.5'

Liquid Limit

WATER CONTENT

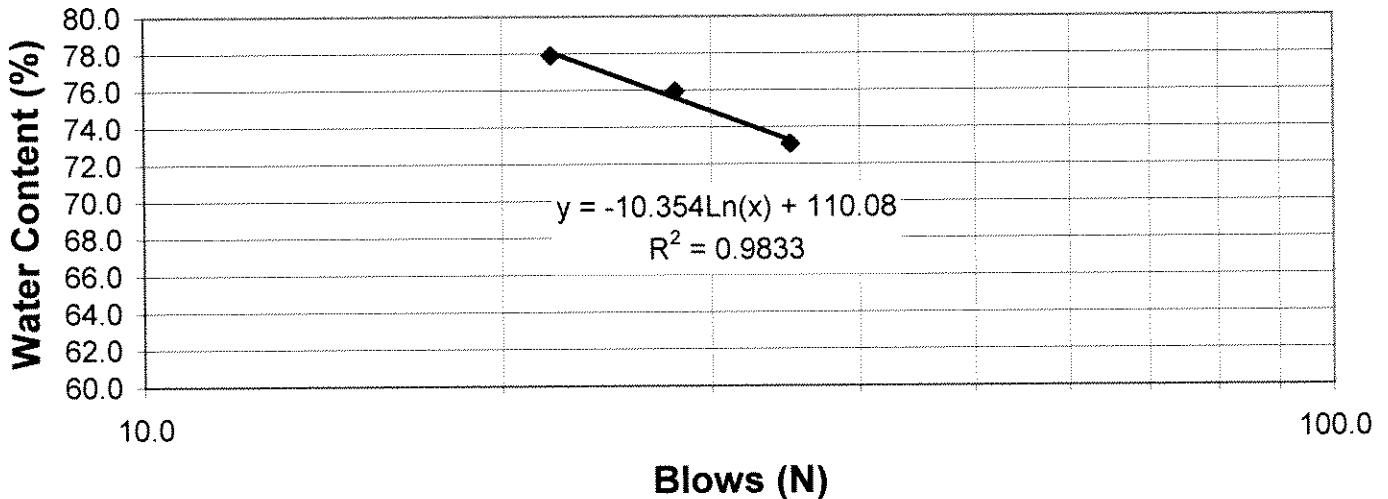
Blows	22	28	35		
WT. SAMPLE WET + TARE (gr)	129.352	128.142	123.689		
WT. SAMPLE DRY + TARE (gr)	123.836	121.717	118.654		
WT. TARE (gr)	116.755	113.256	111.764		
WT. WATER (gr)	5.516	6.425	5.035		
WT. DRY SOIL (gr)	7.081	8.461	6.890		
MOISTURE CONTENT (%)	77.899	75.937	73.077		

Plastic Limit

WATER CONTENT

WT. SAMPLE WET + TARE (gr)	121.530	116.365		
WT. SAMPLE DRY + TARE (gr)	120.318	115.181		
WT. TARE (gr)	115.378	110.220		
WT. WATER (gr)	1.212	1.184		
WT. DRY SOIL (gr)	4.940	4.961		
MOISTURE CONTENT (%)	24.534	23.866		

LIQUID LIMIT



Liquid Limit = 76.8

Plastic Limit = 24.2

Plasticity Index = 52.6

GRAIN SIZE DISTRIBUTION



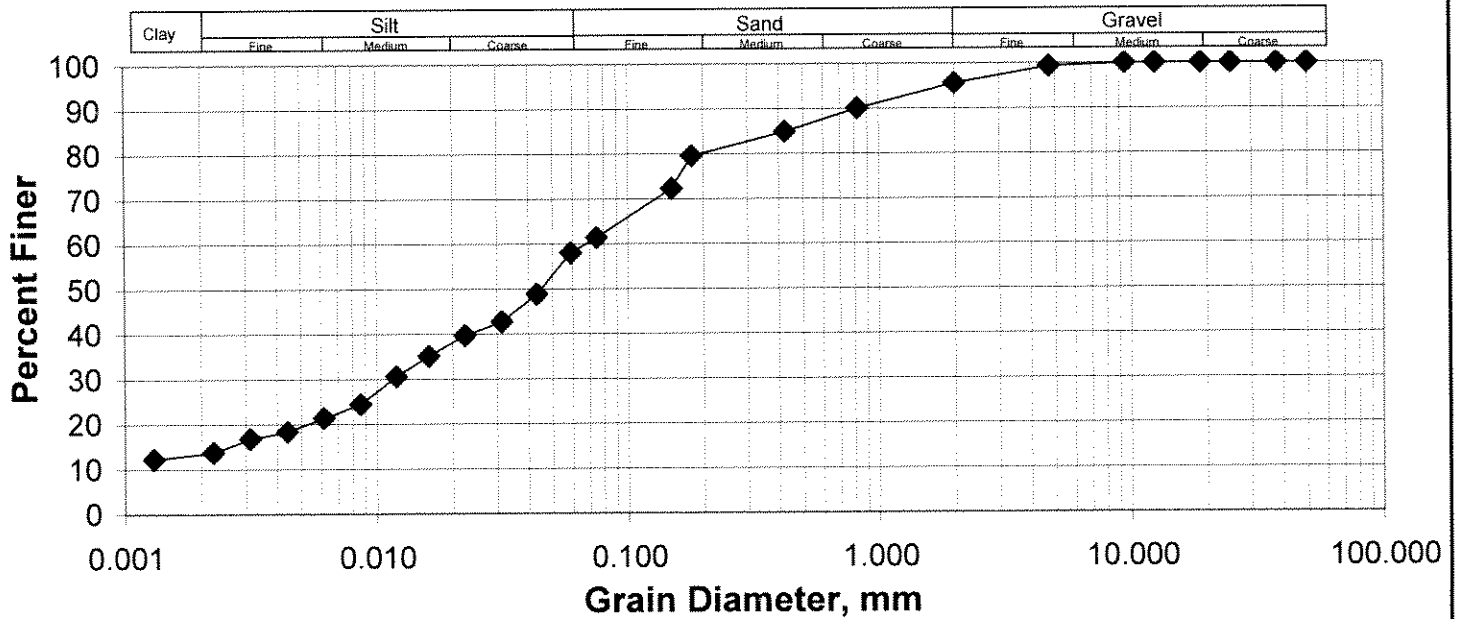
MATERIALS LABORATORY
 UMA | AECOM
 1479 Buffalo Place, Winnipeg, MB R3T 1L7
 tel (204) 284-0580 fax (204) 475-3646

Job No.: D265-202-01
 Client: City of Winnipeg
 Project: PRPS Upgrades
 Date Tested: April 24, 2007
 Tested By: ML

Sample No. G 62
 Hole No. TH 07-1
 Depth: 20-21.5'
 Date Sampled: _____
 Sampled By: _____

GRAVEL SIZES		SAND SIZES		FINES	
Grain Size (mm.)	Total Percent Passing	Grain Size (mm.)	Total Percent Passing	Grain Size (mm.)	Total Percent Passing
50.0	100.0	2.00	95.6	0.0750	61.4
38.0	100.0	0.83	90.0	0.0591	57.9
25.0	100.0	0.43	84.9	0.0434	48.8
19.0	100.0	0.18	79.5	0.0314	42.7
12.5	100.0	0.15	72.3	0.0225	39.6
9.5	100.0	0.075	61.4	0.0162	35.1
4.75	99.3			0.0120	30.5
2.00	95.6			0.0087	24.4
				0.0062	21.3
				0.0044	18.3
				0.0031	16.8
				0.0022	13.7
				0.0013	12.2

GRAIN SIZE DISTRIBUTION CURVE



Gravel 4.4% Silt 44.8%
 Sand 37.5% Clay 13.3%

** Note: Soil Classification based on Grain Size from Canadian Foundation Engineering Manual, 3rd edition (1992).

GRAIN SIZE DISTRIBUTION

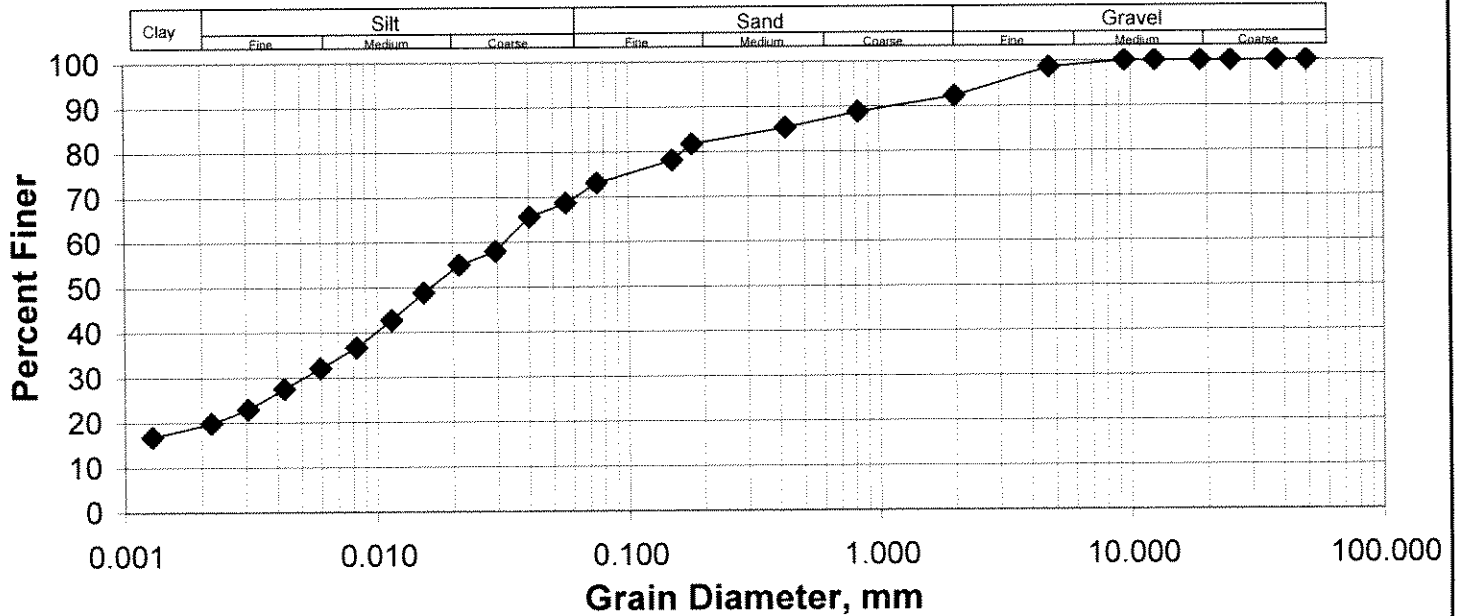
	MATERIALS LABORATORY
	UMA AECOM
	1479 Buffalo Place, Winnipeg, MB R3T 1L7
	tel (204) 284-0580 fax (204) 475-3646

Job No.: D265-202-01
 Client: City of Winnipeg
 Project: PRPS Upgrades
 Date Tested: April 24, 2007
 Tested By: ML

Sample No. G 64
 Hole No. TH 07-01
 Depth: 30-31.5'
 Date Sampled: _____
 Sampled By: _____

GRAVEL SIZES		SAND SIZES		FINES	
Grain Size (mm.)	Total Percent Passing	Grain Size (mm.)	Total Percent Passing	Grain Size (mm.)	Total Percent Passing
50.0	100.0	2.00	92.2	0.0750	73.1
38.0	100.0	0.83	88.8	0.0564	68.6
25.0	100.0	0.43	85.3	0.0404	65.6
19.0	100.0	0.18	81.7	0.0296	57.9
12.5	100.0	0.15	78.1	0.0212	54.9
9.5	100.0	0.075	73.1	0.0153	48.8
4.75	98.6			0.0115	42.7
2.00	92.2			0.0083	36.6
				0.0060	32.0
				0.0043	27.4
				0.0031	22.9
				0.0022	19.8
				0.0013	16.8

GRAIN SIZE DISTRIBUTION CURVE



Gravel	7.8%	Silt	50.3%
Sand	22.7%	Clay	19.2%

** Note: Soil Classification based on Grain Size from Canadian Foundation Engineering Manual, 3rd edition (1992).