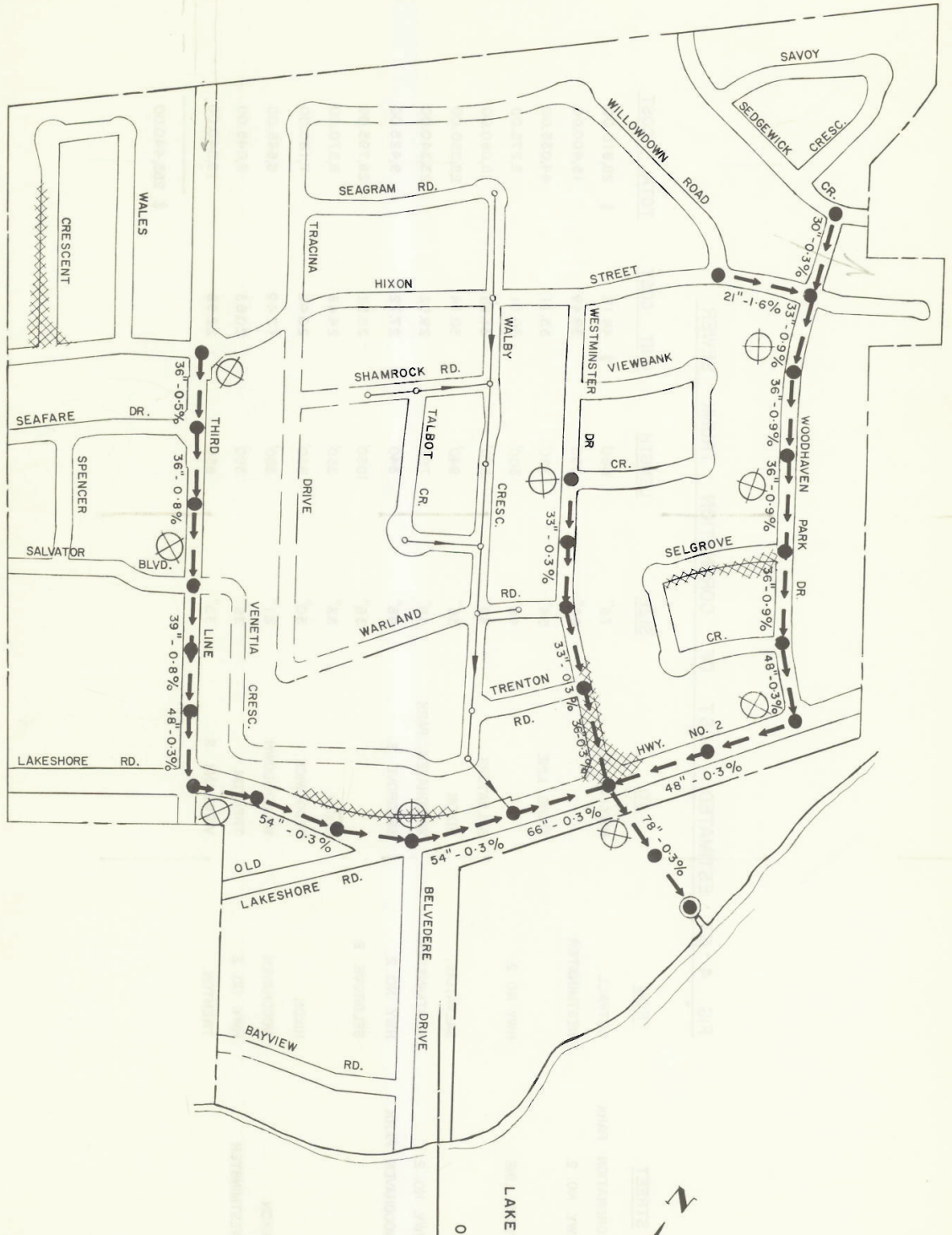




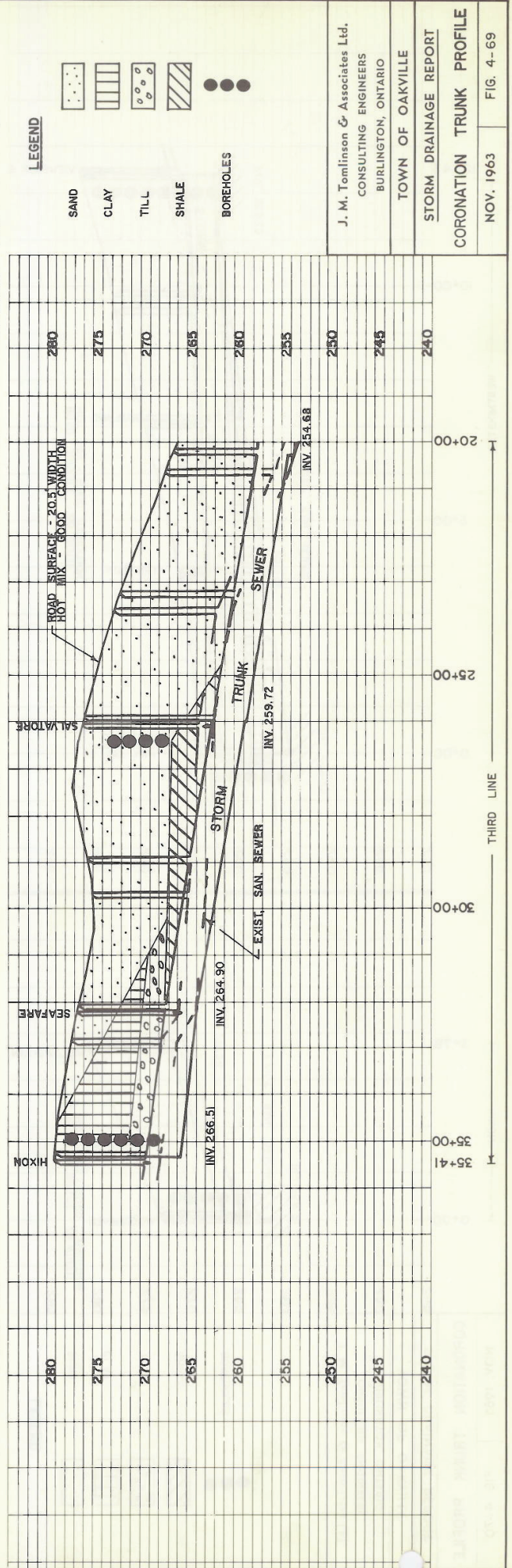
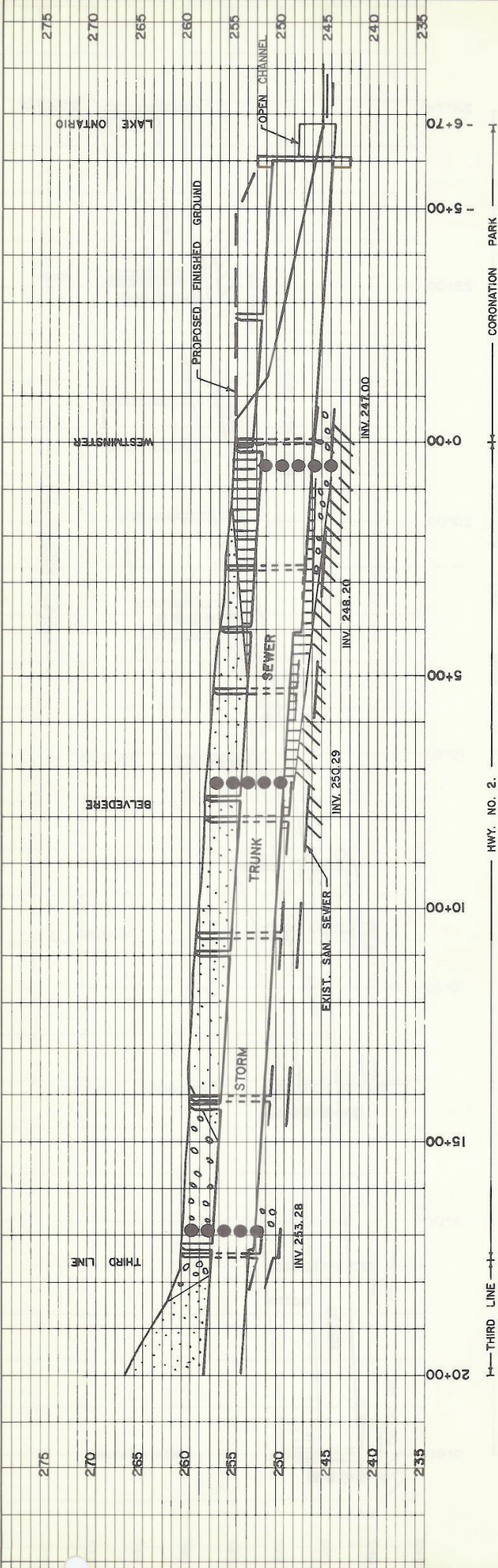


APPENDIX A

BACKGROUND DATA



PONDING 
 BOREHOLES 
 J. M. Tomlinson & Associates Ltd.
 CONSULTING ENGINEERS
 BURLINGTON, ONTARIO
 TOWN OF OAKVILLE
 STORM DRAINAGE REPORT
 CORONATION TRUNK SEWER
 NOV. 1963 FIG. 4-68



LEGEND

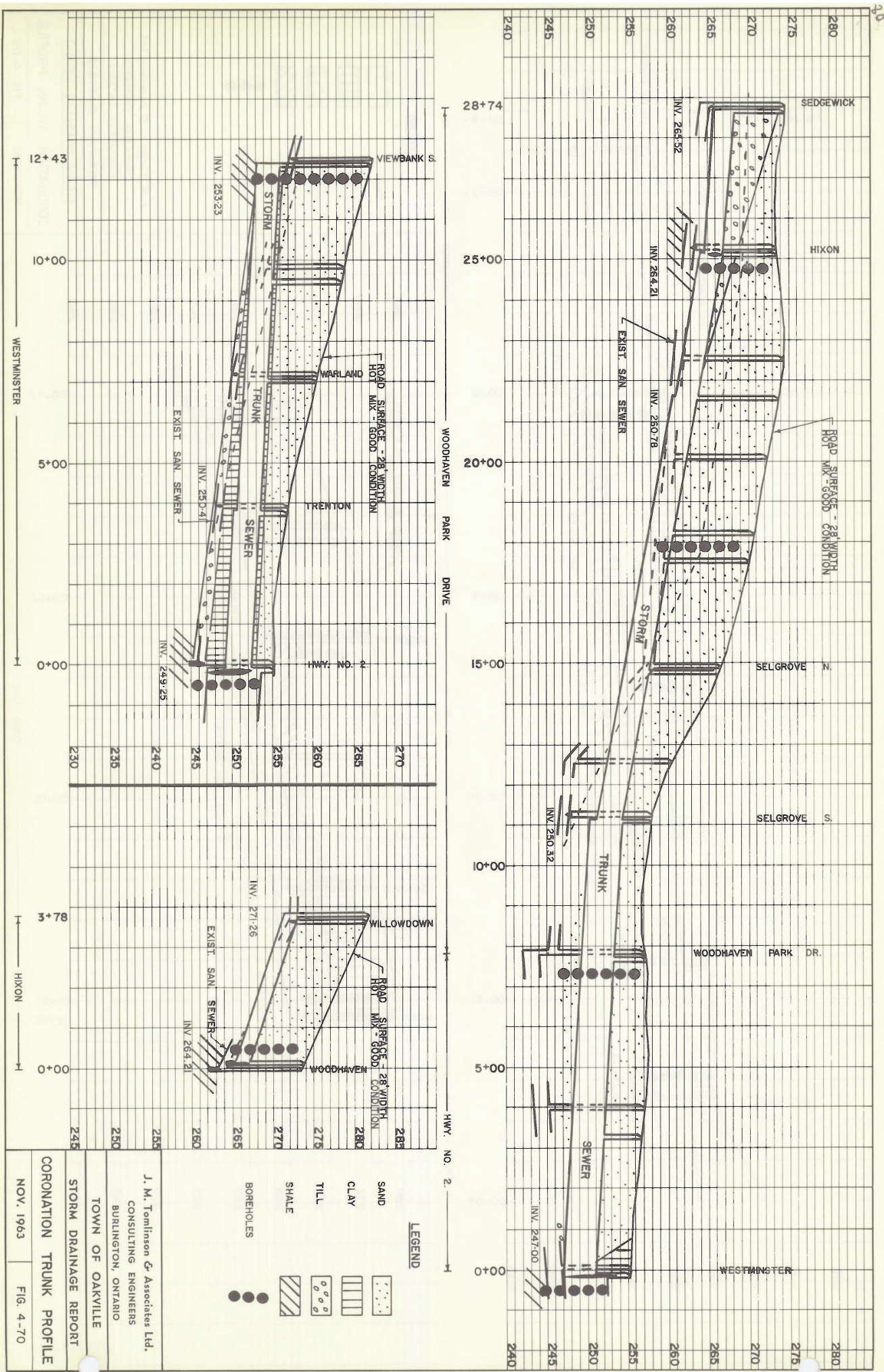
- SAND
- CLAY
- TILL
- SHALE
- BOREHOLES

J. M. Tomlinson & Associates Ltd.
 CONSULTING ENGINEERS
 BURLINGTON, ONTARIO

TOWN OF OAKVILLE
 STORM DRAINAGE REPORT
 CORONATION TRUNK PROFILE

NOV. 1963

FIG. 4-69



LEGEND
 SAND
 CLAY
 TILL
 SHALE
 BOREHOLES

J. M. Tomlinson & Associates Ltd.
 CONSULTING ENGINEERS
 BURLINGTON, ONTARIO

TOWN OF OAKVILLE
 STORM DRAINAGE REPORT

CORONATION TRUNK PROFILE
 NOV. 1963 FIG. 4-70

**GEOTECHNICAL INVESTIGATION
THIRD LINE RECONSTRUCTION
REBECCA STREET TO LAKESHORE ROAD WEST
OAKVILLE, ONTARIO**

Report Submitted

To

Hatch Mott MacDonald

Thurber Engineering Ltd.
Suite 103, 2010 Winston Park Drive
Oakville, Ontario
L6H 5R7
Tel. (905) 829-8666
Fax. (905) 829-1166

P.K. Chatterji, P.Eng.
Review Principal



June 19, 2008
File: 14-155-3

Murray R. Anderson, P.Eng.
Associate

RECORD OF BOREHOLE 08-01

PROJECT : Third Line, Rebecca Street to Lakeshore Road West
 LOCATION : Oakville, Ontario
 STARTED : May 21, 2008
 COMPLETED : May 21, 2008

Project No. 14-155-3

SHEET 1 OF 1

DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE		SAMPLES		COMMENTS	SHEAR STRENGTH: Cu, KPa		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	NUMBER	TYPE		nat V - ●	Q - X			
		GROUND SURFACE	90.74								
		ASPHALT: (75mm)	90.68								
		SAND and GRAVEL, silty, compact, brown, moist: (FILL)	0.08	1	SS	34	Grain Size Analysis: Gr 17%/Sa 59%/Si 20%/Cl 3%	○			
1	Solid Stem Augers	SAND, fine grained, silty, trace gravel, loose to compact, brown, moist	90.05					○			
			0.69	2	SS	7		○			
2									○		
					3	SS		12	○		
3			wet		4	SS	26	○			
				5	SS	27	○				
4		END OF BOREHOLE AT 3.66m. BOREHOLE OPEN AND DRY UPON COMPLETION. BOREHOLE BACKFILLED WITH AUGER CUTTINGS TO 0.33m THEN ASPHALT TO SURFACE.	87.08 3.66								
5											
6											
7											

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL (date)

LOGGED : ES
 CHECKED : RPR



THURBER2S 1553.GPJ 05/08



RECORD OF BOREHOLE 08-02

PROJECT : Third Line, Rebecca Street to Lakeshore Road West
 LOCATION : Oakville, Ontario
 STARTED : May 21, 2008
 COMPLETED : May 21, 2008

Project No. 14-155-3

SHEET 1 OF 1

DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE			SAMPLES		COMMENTS DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	SHEAR STRENGTH: Cu, KPa nat V - ● Q - ✕ rem V - ● Open ▲				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE		BLOWS/0.3m	WATER CONTENT, PERCENT wp ----- w					
		GROUND SURFACE		87.01										
		ASPHALT: (100mm)		86.99 0.10										
		SAND, some gravel, compact, brown, moist: (FILL)			1	SS	30							
1	Solid Stem Augers	SAND, silty, trace gravel, loose, brown, moist		86.32 0.69	2	SS	5	Grain Size Analysis: Gr 3%/ Sa 49%/ Si 42%/ Cl 6%						
2					3	SS	4							
3			compact, wet			4	SS		25					
4						5	SS		29					
5					83.35 3.66									
4		END OF BOREHOLE AT 3.66m. BOREHOLE OPEN AND DRY UPON COMPLETION. BOREHOLE BACKFILLED WITH AUGER CUTTINGS TO 0.33m THEN ASPHALT TO SURFACE.												
5														
6														
7														

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
WATER LEVEL (date)

▽ DEEP/DUAL INSTALLATION
WATER LEVEL (date)

LOGGED : ES
CHECKED : RPR



THURBER2S 1553.GPJ 6/6/08

RECORD OF BOREHOLE 08-03

PROJECT : Third Line, Rebecca Street to Lakeshore Road West
 LOCATION : Oakville, Ontario
 STARTED : May 21, 2008
 COMPLETED : May 21, 2008

Project No. 14-155-3

SHEET 1 OF 1

DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE		SAMPLES			COMMENTS	SHEAR STRENGTH: Cu, KPa		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE		BLOWS/0.3m	nat V - ●		
		GROUND SURFACE		85.10							
		ASPHALT: (125mm)		84.97							
		SAND, silty, some gravel, compact, dark brown, damp: (FILL)		0.13	1	SS	34	Grain Size Analysis: Gr 10%/ Sa 43%/ Si 33%/ Cl 14%			
1	Solid Stem Augers	SAND, silty, trace gravel, compact, brown to dark brown, moist		0.69	2	SS	11				
2		grey silt layer		1.11	3	SS	14				
		SHALE, highly weathered, thinly bedded, reddish brown		2.11	4	SS	68				
3		END OF BOREHOLE AT 2.74m. BOREHOLE OPEN AND DRY UPON COMPLETION. BOREHOLE BACKFILLED WITH AUGER CUTTINGS TO 0.25m THEN ASPHALT TO SURFACE.		2.74							

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL (date)

▼ DEEP/DUAL INSTALLATION
 WATER LEVEL (date)

LOGGED : ES
 CHECKED : RPR



RECORD OF BOREHOLE 08-04

PROJECT : Third Line, Rebecca Street to Lakeshore Road West
 LOCATION : Oakville, Ontario
 STARTED : May 21, 2008
 COMPLETED : May 21, 2008

Project No. 14-155-3

SHEET 1 OF 1

DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE		SAMPLES			COMMENTS DYNAMIC CONE PENETRATION RESISTANCE PLOT	SHEAR STRENGTH: Cu, KPa		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE		BLOWS/0.3m	nat V - ●		
		GROUND SURFACE		84.19							
		ASPHALT: (100mm)		84.00							
		SAND, some gravel, compact, brown, moist: (FILL)		0.10	1	SS	21				
1	Solid Stem Augers	SAND, silty, loose, brown, wet		83.50 0.69							
		CLAY, silty, some sand, trace gravel, firm, brown to reddish brown: (TILL)		83.12 1.07	2	SS	4				
2		SHALE, highly weathered, thinly bedded, reddish brown		82.46 1.73	3	SS	26				
		END OF BOREHOLE AT 2.13m. BOREHOLE OPEN AND DRY UPON COMPLETION. BOREHOLE BACKFILLED WITH AUGER CUTTINGS TO 0.33m THEN ASPHALT TO SURFACE.		82.05 2.13							

GROUNDWATER ELEVATIONS

▽ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL (date)

▽ DEEP/DUAL INSTALLATION
 WATER LEVEL (date)

LOGGED : ES
 CHECKED : RPR



THURBER25 1553.GPJ 6/5/08

RECORD OF BOREHOLE 08-05

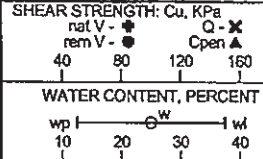
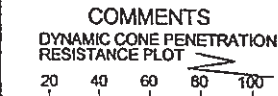
PROJECT : Third Line, Rebecca Street to Lakeshore Road West
 LOCATION : Oakville, Ontario
 STARTED : May 21, 2008
 COMPLETED : May 21, 2008

Project No. 14-155-3

SHEET 1 OF 1

DATUM Geodetic

DEPTH SCALE (metres)	BORING METHOD	SOIL PROFILE		SAMPLES		COMMENTS	SHEAR STRENGTH: Cu, KPa		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER TYPE		BLOWS/0.3m	nat V - \bullet rem V - \circ		
		GROUND SURFACE		80.79						
		ASPHALT: (100mm)		80.86						
		SAND and GRAVEL, trace silt, trace clay, compact, brown, moist: (FILL)		0.10	1	SS	13			
1	Solid Stem Augers	SAND, silty, some clay, loose, brown, moist to wet		80.11 0.69	2	SS	5			
		CLAY, silty, trace to some sand, occasional shale fragments, occasional grey silt pockets, very stiff, brown: (TILL)		79.48 1.31	3	SS	17			
2		SHALE, highly weathered, thinly bedded, reddish brown		78.84 1.96 78.66 2.13						
3		END OF BOREHOLE AT 2.13m. BOREHOLE OPEN AND DRY UPON COMPLETION. BOREHOLE BACKFILLED WITH AUGER CUTTINGS TO 0.33m THEN ASPHALT TO SURFACE.								



Grain Size Analysis:
 Gr 0% / Sa 1% / Si 61% / Cl 39%

GROUNDWATER ELEVATIONS

∇ SHALLOW/SINGLE INSTALLATION
 WATER LEVEL (date)

\blacktriangledown DEEP/DUAL INSTALLATION
 WATER LEVEL (date)

LOGGED : ES
 CHECKED : RPR



THURBER23 1553.GPJ 05/08



Terraprobe

*Consulting Geotechnical & Environmental Engineering
Construction Materials Engineering, Inspection & Testing*

**GEOTECHNICAL INVESTIGATION
PROPOSED WASHROOM
SERVICE BAY AND SHADE STRUCTURE
1426 LAKESHORE ROAD WEST
(CORONATION PARK)
OAKVILLE, ONTARIO**

Prepared for: Town of Oakville
1225 Trafalgar Road
Oakville, Ontario
L6J 5A6

Attention: Mr. Rakesh Mistry, O.A.L.A., C.S.L.A.

File No.1-09-4042

May 28, 2009

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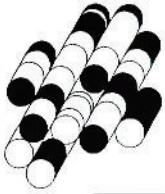
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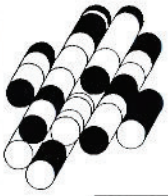
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LOG OF BOREHOLE 2

PROJECT: Coronation Park - Washroom / Service Bay / DATE: March 27, 2009
 LOCATION: Concession Stand Building, Oakville, Ontario EQUIPMENT: Truck / Solid Stem Augers
 CLIENT: Town of Oakville ELEVATION DATUM: Geodetic FILE: 1-09-4042

SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID			ORGANIC VAPOUR	STANDPIPE INSTALLATION OR REMARKS	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	20 40 60 80 100	W _p	W	W _L			(ppm)
76.6	Ground Surface												
76.8	90mm TOPSOIL												
0.1	Weathered / Disturbed trace organics		1	SS	5								
75.8	SILTY SAND - Fine to Medium, trace to some gravel, trace clay, compact, brown, very moist		2	SS	23								
0.8													
75.1	SILTY CLAY trace sand, trace gravel, stiff, brown / grey, moist		3	SS	11								
1.5													
74.3	CLAYEY SILT trace sand, trace gravel, hard, grey, moist (GLACIAL TILL)		4	SS	50/15cm								
2.3													
73.6	WEATHERED SHALE (Georgian Bay Formation)		5	SS	50/13cm								
3.0													
73.5	End of Borehole												
3.1	Auger Refusal at 3.1m												

NOTES:
Wet cave at 1.4m (Elev. 75.2m) upon completion of drilling.



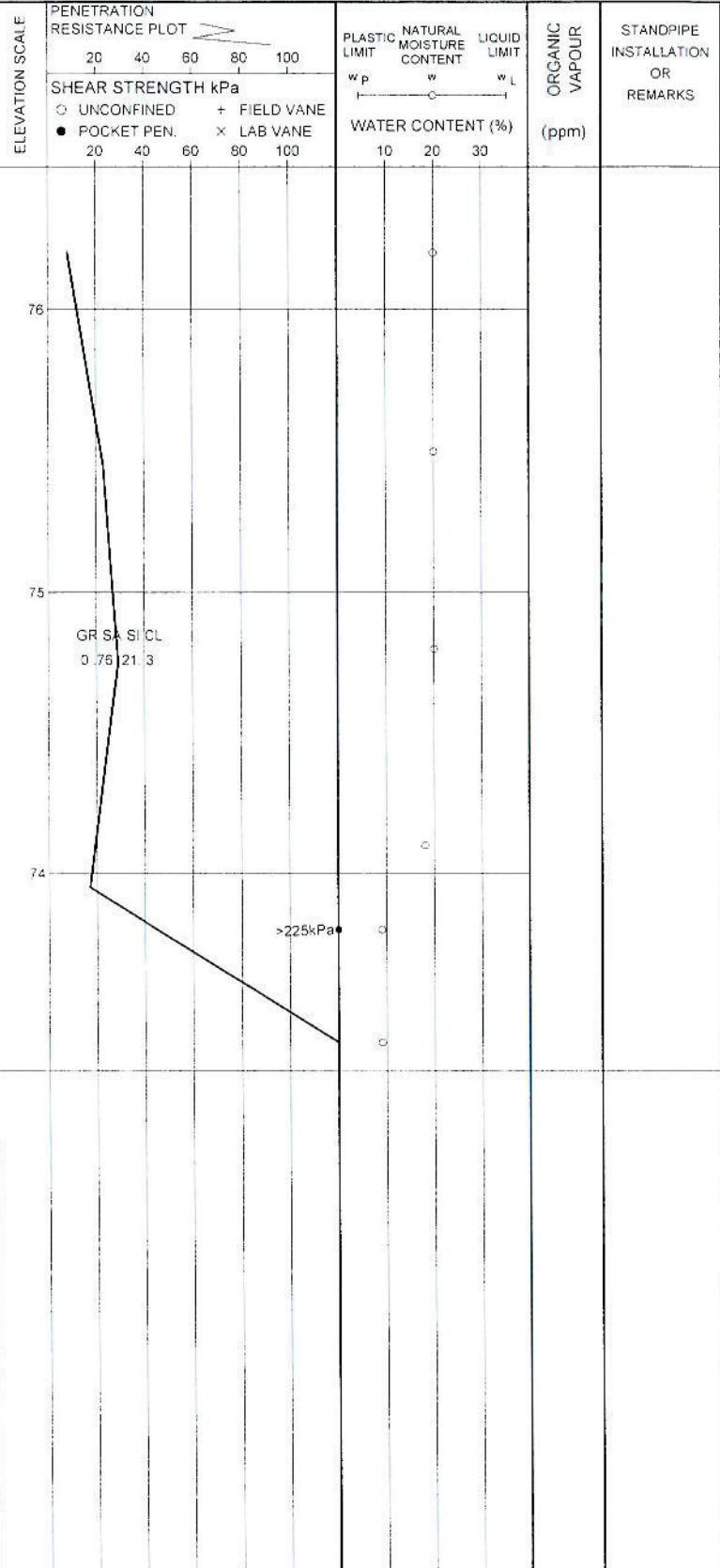
Terraprobe

LOG OF BOREHOLE 3

PROJECT: Coronation Park - Washroom / Service Bay /
 LOCATION: Concession Stand Building, Oakville, Ontario
 CLIENT: Town of Oakville

DATE: March 27, 2009
 EQUIPMENT: Truck / Solid Stem Augers
 ELEVATION DATUM: Geodetic FILE: 1-09-4042

SOIL PROFILE			SAMPLES			PENETRATION RESISTANCE PLOT	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT	ORGANIC VAPOUR (ppm)	STANDPIPE INSTALLATION OR REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES				
76.5	Ground Surface								
0.0	180mm TOPSOIL								
76.3									
0.2	Weathered / Disturbed trace organics		1	SS	8				
75.9									
0.6	SILTY SAND - Fine to Medium, trace to some gravel, trace clay, compact, brown, very moist to wet		2	SS	23				
			3	SS	29				
73.9			4	SS	17				
2.6	CLAYEY SILT trace sand, trace gravel, very stiff, brown / grey, moist (GLACIAL TILL)								
73.5									
3.0	WEATHERED SHALE (Georgian Bay Formation)		5	SS	50/6cm				
73.3									
3.2	End of Borehole Auger Refusal at 3.2m								



NOTES:
Wet cave at 3.1m (Elev. 73.4m) upon completion of drilling.



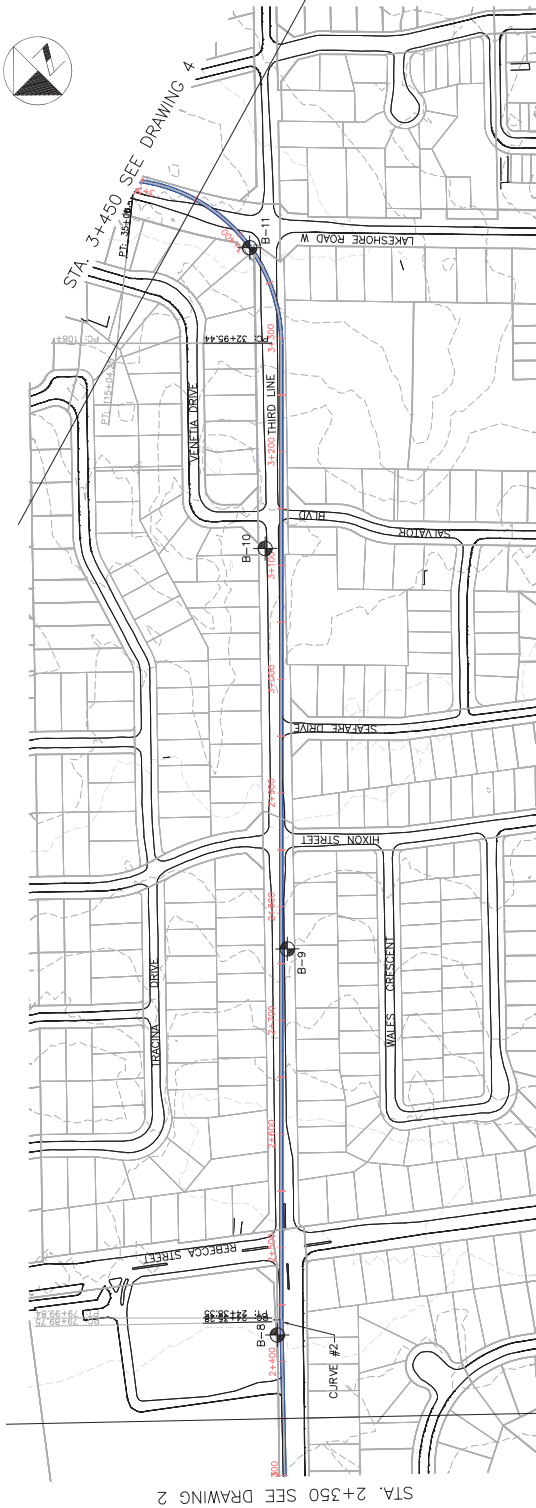
**GEOTECHNICAL DATA REPORT ON-
SHORE PORTION OF THE MID-HALTON
WWTP EFFLUENT SEWER AND OUTFALL
PROJECT**

Regional Municipality of Halton
c/o Hatch Mott MacDonald Ltd.
5035 South Service Road
Sixth Floor
Burlington, Ontario
L7L 6M9

GEOTMARK00281AA
August 23, 2013

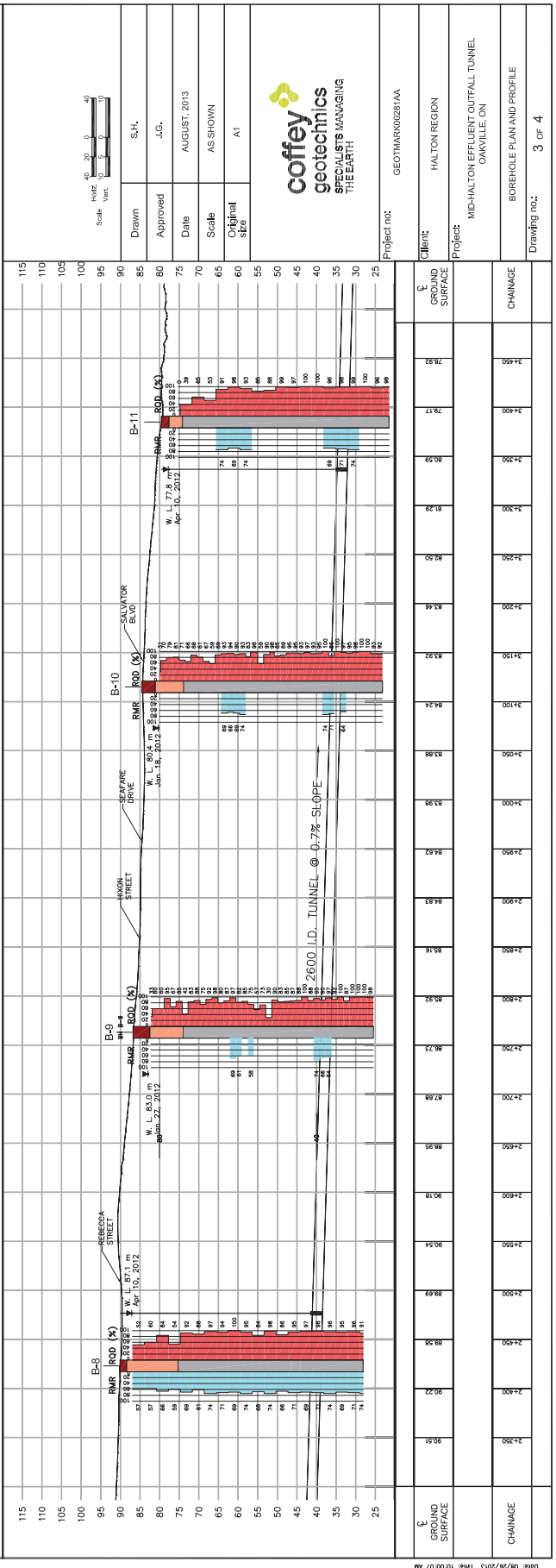
LEGEND

- B-1 → BOREHOLE BY COFFEY (CURRENT INVESTIGATION)
- HG-1 → BOREHOLE BY COFFEY (PREVIOUS INVESTIGATION)
- OVERBURDEN (TLL)
- QUEENSTON FORMATION
- GEORGIAN BAY FORMATION
- WATER LEVEL
- MONITORING WELL SCREEN
- RMR → ROCK MASS RATING
- ROD (X) → ROCK QUALITY DESIGNATION

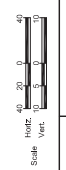


STA. 2+350 SEE DRAWING 2

STA. 3+450 SEE DRAWING 4



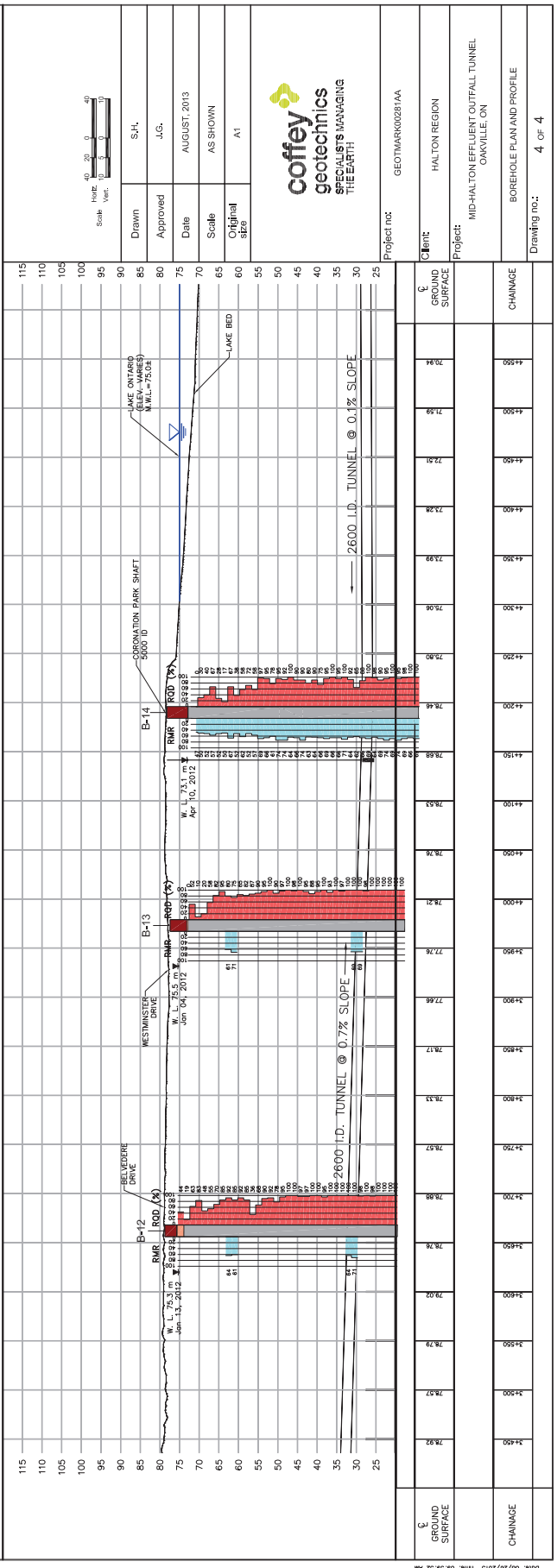
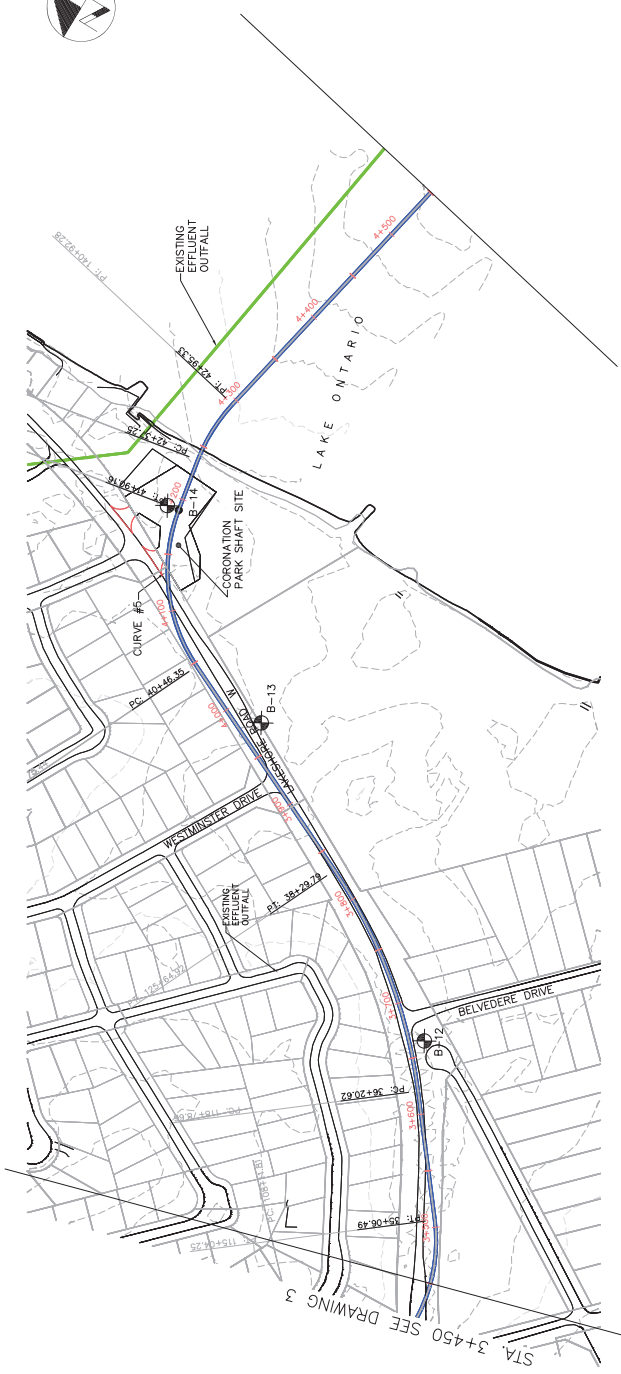
115	GROUND SURFACE	25
110		30
105		35
100		40
95		45
90		50
85		55
80		60
75		65
70		70
65		75
60		80
55		85
50		90
45		95
40		100
35		105
30		110
25		115



Drawn	S.H.
Approved	J.G.
Date	AUGUST, 2013
Scale	AS SHOWN
Original size	A1
Project no:	GEOTMARK00281AA
Client:	HALTON REGION
Project:	MID-HALTON EFFLUENT OUTFALL TUNNEL ORVILLE, ON
Change:	BOREHOLE PLAN AND PROFILE
Drawing no.:	3 OF 4

LEGEND

- B-1 BOREHOLE BY COFFEY (CURRENT INVESTIGATION)
- HG-1 BOREHOLE BY COFFEY (PREVIOUS INVESTIGATION)
- OVERBURDEN (TILL)
- QUEENSTON FORMATION
- GEORGINA BAY FORMATION
- WATER LEVEL
- MONITORING WELL SCREEN
- RMR ROD (%)
- ROCK MASS RATING
- ROCK QUALITY DESIGNATION



PROJECT: Mid-Halton WWTP Effluent Sewer and Outfall
 CLIENT: Hatch Mott MacDonald
 PROJECT LOCATION: Region of Halton
 DATUM ELEVATION: Geodetic
 BOREHOLE LOCATION: N 4807177 E 605912

DRILLING DATA
 Method: Hollow Stem Augering
 Diameter: 205mm in Overburden, 96mm in Rock REF. NO.: GEOTMARK00281AA
 Date: Dec 5 to 14, 2011 ENCL NO.: 14

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT				UNIT WEIGHT γ (kN/m ³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%)	
(m) ELEV DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE			"N" BLOWS / 0.3 m	SHEAR STRENGTH (kPa)					
78.2	Ground Surface												
78.0	TOPSOIL 200mm												
0.2	FILL SILTY SAND fine grained, trace rootlets, brown, compact		1	SS	15								
76.7	SANDY SILT fine grained, trace clay, brown, compact to dense		2	SS	30							0 30 66 4	
75.1	CLAYEY SILT fine grained, trace sand, indistinctly laminated, brown/grey, compact some shale fragment (completely weathered shale), blue/grey, hard		3	SS	17								
			4	SS	8								0 2 80 18
			5	SS	12								
			6	SS	50 / 125mm								
72.9	BEDROCK highly to completely weathered, blue/grey, SHALE		7	SS	50 / 50mm								
5.3			8	SS	50 / 75mm								
70.8	Borehole augered to 7.4m. HW casing (103mm dia.) was installed at 7.4m and rock coring was started. (SEE ROCK CORE LOG) Groundwater Levels Observed in the Borehole Date Elev. (m) Dec 8, 2011 70.7m Dec 12, 2011 72.9m Dec 13, 2011 73.0m Dec 13, 2011 73.6m Mar 22, 2012 73.3m Apr 10, 2012 73.1m												
7.4													

COFFEY SOIL LOG - 2 GM00281AA BOREHOLE LOGS JAN 2012.GPJ - 4/9/13

Continued Next Page

GRAPH NOTES +3, x3: Numbers refer to Sensitivity ○ e=3% Strain at Failure