PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848901.2 ;E 302949.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-001

BORING DATE: June 2, 3 and 4, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 4

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		189.07							Sand
0		TOPSOIL with surficial grass : 150 mm		188.92							Concrete
		Brown, soft, moist, clayey silt, some sand, black organic matter, wood pieces, grass; FILL		0.15	1	SS	3	ND			50.5 Bentonite Seal 06/24/09 (Well B)
				188.16							
1		Brown to grey, hard, moist, sandy clayey SILT, oxidized sand seams; TILL (CL-ML)		0.91	2	SS	66				
		Black stain, rock fragments			3	SS	69			MH AL	
2		Grey			4	SS	43				06/25/09 (Well B)
3					5	SS	59				
				185.37							
		Grey, soft to hard, moist, clayey SILT, trace sand; TILL (CL-ML)		3.70	6	SS	52				
4											
					7	SS	37			MH AL	Bentonite Grout
5	Power Auger / 200 mm Hollow Stem Auger										
6		Saturated			8	SS	13				Sand
7											Screen (Well B)
		Soft			9A	SS	2	ND		MH	
8				180.95							
		Grey, hard, moist, silty CLAY, trace sand; TILL (CL)		8.12	9B	SS					Bentonite Seal
9											06/25/09 (Well A) 06/24/09 (Well A)
					10	SS	39			MH AL	
10		*CONTINUED NEXT PAGE*									

0.86 m (Well A)
0.77 m (Well B)

DEPTH SCALE
1 : 50

INSPEC-SOL

LOGGED: S.H.
CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848901.2 ;E 302949.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-001

BORING DATE: June 2, 3 and 4, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
10	Wash Boring/Hollow Stem Auger	Grey, hard, moist, silty CLAY, trace sand; TILL (CL)									Sand
11					11	SS	38	*ND*	○		
				177.37							Screen (Well A)
		Grey, very stiff to hard, partly varved, damp to moist, silty CLAY; (CL)		11.70							
12					12	SS	20	⊕	○		
13											
		Varved, black stain									
14					13	SS	18	⊕	⊖	MH AL	
15					14	SS	23	⊕	○		
16											
17					15	SS	28	⊕	○		
18											
19					16	SS	28	⊕	○		
20					17	SS	31				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848901.2 ;E 302949.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-001

BORING DATE: June 2, 3 and 4, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- *CONTINUED FROM PREVIOUS PAGE* ---									B A
20	Wash Boring	Grey, very stiff to hard, partly varved, damp to moist, silty CLAY; (CL)			17	SS	31	*ND*	○		
21		Plastic			18	SS	22	*ND*	○		
22											
23					19	SS	41	⊕	⊕	AL	
24											
25					20	SS	29	⊕	⊕	MH AL	
					21	SS	27	⊕	○		
				163.31 / 25.76							
26		END OF BOREHOLE at 25.76 m bgs									
27		NOTE :									
28		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
29		2. A 50 mm diameter monitoring well (N : 4848901.24 E : 302949.09) was installed at 12.20 m depth in the sampled borehole.									
30		3. An additional hole, well B (N : 4848899.42 E : 302948.78) was installed to 8.23 m depth adjacent to sampled borehole for the 50 mm diameter monitoring well.									
		Water Level Measurements :									
		Well A (Surface Elevation : 189.07 m)									
		Date / Depth (mbgs) / Elev. (m)									
		06/24/09 / 9.06 / 180.01									
		06/25/09 / 8.79 / 180.28									
		Well B (Surface Elevation : 189.07 m)									
		Date / Depth (mbgs) / Elev. (m)									
		06/24/09 / 0.58 / 188.49									
		CONTINUED NEXT PAGE									

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848901.2 ;E 302949.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-001

BORING DATE: June 2, 3 and 4, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖ w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION B A
30		*--- CONTINUED FROM PREVIOUS PAGE ---*									
		06/25/09 5.83 183.24									
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849006.2 ;E 302927.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-003

BORING DATE: March 12 and 13, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 4

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		195.65							
0		SAND and GRAVEL: 150 mm		195.50							Concrete
		Brown to dark brown, stiff, moist, clayey silt, some sand, trace gravel, wood fragments; FILL		0.15	1	SS	10	⊕	○		Bentonite Seal
1		Mottled brown to grey			2	SS	11	⊕	○		
				193.97							
		Brown, loose to very dense, heterogeneous, moist, sandy SILT, trace clay, trace gravel; TILL (ML)		1.68	3	SS	12	⊕	○		
2					4	SS	18	⊕	○	ENV	
3					5	SS	23	⊕	○	MH	
											Bentonite Grout
4		Loose			6	SS	6	⊕	○		
											05/04/09
					7	SS	50/ 0.10	⊕	○		06/30/09
5	Power Auger 200 mm O.D. Hollow Stem Auger										
		Grey, very dense, moist, slightly plastic SILT, trace sand and gravel, trace clay; TILL (ML)		190.25 5.40							
6					8	SS	50/ 0.13	⊕	○H	MH AL	
											Bentonite Seal
				188.65							
7		Grey, compact to dense, moist, sandy SILT, trace clay and gravel; TILL (ML)		7.00							Sand
8					9	SS	42	⊕	○		
											Screen
9											
					10	SS	23	⊕	○		
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849006.2 ;E 302927.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-003

BORING DATE: March 12 and 13, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger; 200 mm O.D. Hollow Stem Auger	Grey, compact to dense, moist, sandy SILT, trace clay and gravel; TILL (ML)									Screen
11					11	SS	36	⊕	○	MH	
				183.95 / 11.70							
12		Grey, very stiff to hard, moist, silty CLAY, trace sand; TILL (CL)			12	SS	30	⊕	○	AL	
13											
		Fine sand seams			13	SS	50	⊕	○		
14											
15					14	SS	22	⊕	○	MH AL	
16											
		Hard, partly varved			15	SS	54	⊕	○		
17											
18					16	SS	57	⊕	○		
19											
20					17	SS	53				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849006.2 ;E 302927.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-003

BORING DATE: March 12 and 13, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		*--- CONTINUED FROM PREVIOUS PAGE ---*									
	Wash Boring	Grey, very stiff to hard, moist, silty CLAY, trace sand; TILL (CL)			17	SS	53	⊕	○		
				174.75							
21		Grey, very stiff to hard, moist, silty CLAY; (CL)		20.90							
					18	SS	23	⊕	⊖	MH AL	
22											
23					19	SS	50/ 0.10	⊕	○		
24											
					20	SS	26	⊕	⊖	MH AL ENV	
25											
26											
					21	SS	31	⊕	⊖	MH AL	
27											
28					22	SS	40	⊕	○		
29											
					23	SS	38	⊕	○		
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849006.2 ;E 302927.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-003

BORING DATE: March 12 and 13, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- *CONTINUED FROM PREVIOUS PAGE* ---									
30	Wash Boring	Grey, very stiff to hard, moist, silty CLAY; (CL)									
					24	SS	36	⊕	○		
31											
32					25	SS	31	⊕	○	MH AL	
33											
34					26	SS	30	⊕	○		
35											
					27	SS	30	⊕	○		
				159.98							
				35.67							
36		END OF BOREHOLE at 35.67 m bgs									
37		NOTE :									
		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
		2. A 50 mm diameter monitoring well (N : 4849006.22 E : 302927.93) was installed at 10.70 m depth in the sampled borehole.									
38		Water Level Measurements :									
		(Surface Elevation : 195.65 m) Date — Depth (mbgs) — Elev. (m) 05/04/09 — 4.42 — 191.23 06/30/09 — 4.66 — 190.99									
39											
40											

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

DEPTH SCALE

1 : 50

iNSPEC·SOL

LOGGED: M.R.

CHECKED: K.R.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848997.9 ;E 302875.5

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-004

BORING DATE: February 2, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 2

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		195.23					Sand
0	Power Auger 200 mm O.D. Hollow Stem Auger	TOPSOIL : 200 mm		0.00 / 195.03	1	SS	3		Concrete
		Dark brown, soft to stiff, moist, clayey silt, trace sand, trace topsoil, sand pockets; FILL		0.20					04/04/09 Bentonite Seal
1		Brown to grey, stiff, moist			2	SS	11		03/19/09 06/30/09
		Trace organics		193.40	3	SS	10		05/22/09 05/04/09
2		Brown, firm to stiff, moist to saturated, silty clay, some sand, trace gravel; FILL		1.83					Bentonite Grout
		Loose, sand and silt seams			4	SS	6	MH AL	
3				191.93	5	SS	10	ENV	
		Brown, compact to dense, moist, sandy SILT, some clay, trace gravel; TILL (ML)		3.30					Bentonite Seal
4					6	SS	37	MH	
		Sand seam			7	SS	81/ 0.28		Sand
5				189.83					
		Grey, hard, moist, clayey SILT, trace sand and gravel; TILL (CL-ML)		5.40					Screen
6					8	SS	42		
7									
		Some sand			9	SS	61	MH AL	
8				186.53					
		Grey, very stiff to hard, moist, sandy clayey SILT; TILL (CL-ML)		8.70					
9					10	SS	91/ 0.28	MH AL	
10		*CONTINUED NEXT PAGE*							

ORGANIC VAPOUR READINGS (ppm) ⊕ — 10 20 30 40

% LEL Methane □ — 100 200 300 400

SHEAR STRENGTH Cu, kPa — nat V. - + Q - ● — rem V. - ⊕ U - ○ — 20 40 60 80

WATER CONTENT PERCENT — wp ⊢ w ⊣ wl — 10 20 30 40

0.16 m

DEPTH SCALE 1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848997.9 ;E 302875.5

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-004

BORING DATE: February 2, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 2

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ / % LEL Methane □	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) / WATER CONTENT PERCENT (wp, w, wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		--- *CONTINUED FROM PREVIOUS PAGE* ---									
10	Wash Boring	Grey, very stiff to hard, moist, sandy clayey SILT; TILL (CL-ML)									
11					11	SS	27	⊕	○	ENV	
				183.53 / 11.70							
12		Grey, hard, moist, silty CLAY, trace sand; TILL (CL)			12	SS	31	⊕	○ —	MH AL	
13											
14					13	SS	50	⊕	○		
15											
		Sand seams		179.71 / 15.52	14	SS	74/ 0.28		○		
16		END OF BOREHOLE at 15.52 m bgs									
17		NOTE :									
18		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
19		2. A 50 mm diameter monitoring well (N : 4848997.92 E : 302875.51) was installed at 6.25 m depth in the sampled borehole.									
20		Water Level Measurements :									

(Surface Elevation : 195.23 m)

Date	Depth (mbgs)	Elev. (m)
03/19/09	0.79	194.44
04/04/09	0.38	194.85
05/04/09	1.28	193.95
05/22/09	1.25	193.98
06/30/09	0.93	194.30

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849059.7 ;E 302915.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-005

BORING DATE: February 13 and 18, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		195.68							0.82 m Sand
0	Power Auger 200 mm O.D. Hollow Stem Auger	TOPSOIL with surficial grass : 150 mm		195.53							Concrete
		Dark brown, soft, very moist, clayey silt intermixed with topsoil, trace sand and gravel; FILL		0.15	1	SS	4				Bentonite Seal
1				194.61	2	SS	3			ENV	
		Brown to grey, very loose to loose, saturated, sandy silt, some clay, trace gravel; FILL		1.07							
		Loose			3	SS	9			ENV	
2				193.24							
		Brown to grey, stiff to hard, moist, sandy clayey SILT, trace gravel; TILL (CL-ML)		2.44	4	SS	12			ENV	
3		Stiff			5	SS	8			MH AL ENV	
4					6	SS	19			ENV	
					7	SS	34			MH AL ENV	Bentonite Grout
5											
6					8	SS	67				
7											
		Trace sand			9	SS	34			MH AL	
8											
9					10	SS	25				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849059.7 ;E 302915.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-005

BORING DATE: February 13 and 18, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger 200 mm O.D. Hollow Stem Auger	Brown to grey, stiff to hard, moist, sandy clayey SILT, trace gravel; TILL (CL-ML)									
11					11	SS	46	⊕	○		
12		Moderately fissured			12	SS	22	⊕	○		
13				182.43							
		Grey, hard, moist, silty CLAY, trace sand; TILL (CL)		13.25							
14					13	SS	56	⊕	○	MH AL	
15											Bentonite Grout
		Slightly fissured, varved			14	SS	43	⊕	○		
16											
17		Fissured, silt pockets			15	SS	47	⊕	○		
18											
19					16	SS	76	⊕	○		
20					17	SS	51				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849059.7 ;E 302915.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-005

BORING DATE: February 13 and 18, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl ⊣ 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Wash Boring/Hollow Stem Auger	Grey, hard, moist, silty CLAY, trace sand; TILL (CL)			17	SS	51	⊕		MH AL ENV	
21		Silt pockets			18	SS	41	⊕			06/25/09 04/04/09 03/19/09 05/04/09 05/21/09
22											
23					19	SS	40	⊕			
24		Grey, very stiff, moist, CLAY; (CH)		171.78 23.90							
		Silty			20	SS	27	⊕		MH AL	
25											Bentonite Grout
		Grey, hard, moist, silty CLAY; (CL)		170.28 25.40							
26					21	SS	37	⊕			
27											
28					22	SS	40	⊕		ENV	
29											
					23	SS	54	⊕		MH AL	
30		*CONTINUED NEXT PAGE*									

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849059.7 ;E 302915.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-005

BORING DATE: February 13 and 18, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
30	Wash Boring	Grey, hard, moist, silty CLAY; (CL)									
					24	SS	40	⊕			
31											
32					25	SS	75	⊕			
33											Bentonite Grout
					26	SS	57	⊕			
34											
35					27	SS	36	⊕		MH AL	
											Bentonite Seal
36											Sand
37					28	SS	36				
38											Screen
					29	SS	42			MH AL	
39				156.48							
		Grey, compact, saturated, silty SAND, trace clay; (SM)		39.20							
40					30	SS	12			MH	
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849059.7 ;E 302915.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-005

BORING DATE: February 13 and 18, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 5 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
40		*--- CONTINUED FROM PREVIOUS PAGE ---*									
				155.54	30	SS	12				
				40.14							
		END OF BOREHOLE at 40.14 m bgs NOTE : 1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test' 2. A 32 mm diameter monitoring well (N : 4849059.69 E : 302914.96) was installed at 39.50 m depth in the sampled borehole. Water Level Measurements : (Surface Elevation : 195.68 m) Date / Depth (mbgs) / Elev. (m) 03/19/09 20.75 174.93 04/04/09 20.69 174.99 05/04/09 21.48 174.20 05/21/09 21.50 174.18 06/25/09 20.53 175.15									
41											
42											
43											
44											
45											
46											
47											
48											
49											
50											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849057.8 ;E 302870.7

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-006

BORING DATE: March 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 2

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		195.85							0.17 m Sand
0	Power Auger 200 mm Hollow Stem Auger	TOPSOIL : 200 mm		0.00 / 195.65							Concrete
		Dark brown, stiff, damp, clayey silt, some sand, trace gravel, trace topsoil, trace rootlets; FILL		0.20	1	SS	13	ND			Bentonite Seal
1					2	SS	7	ND		ENV	
		Brown to grey, loose, moist, silt, some sand and clay, trace gravel; FILL		194.63 / 1.22							
2					3	SS	7				
		Brown, stiff, moist, silty clay, trace sand and gravel; FILL		193.56 / 2.29	4	SS	15	ND		MH AL	
3				192.80							05/04/09
		Grey, compact, moist, sandy SILT, trace clay, trace gravel; TILL (np)		3.05	5	SS	13				04/04/09 03/19/09 06/30/09 05/21/09
4					6	SS	27				
					7	SS	21			MH	
5											Bentonite Grout
6					8	SS	24				
7				188.65							
		Grey, hard, moist, clayey SILT, some sand; TILL (CL-ML)		7.20							
8					9	SS	54			MH AL ENV	
9											
					10	SS	46				
10											Bentonite Seal
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849057.8 ;E 302870.7

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-006

BORING DATE: March 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 2

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢○ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Wash Boring/Hollow Stem Auger			185.65							Bentonite Seal
		Grey, hard, moist, silty CLAY; (CL)		10.20							
11					11	SS	51			MH AL	Sand
				184.15							
		Grey, dense, moist, slightly plastic sandy SILT, trace clay; TILL (ML)		11.70							Screen
12					12	SS	46			MH AL	
13				182.55							
		Grey, hard, moist, silty CLAY, trace sand; TILL (CL)		13.30							
14					13	SS	56			MH AL	
15					14	SS	58				
				180.00							
16		END OF BOREHOLE at 15.85 m bgs		15.85							
17		NOTE :									
		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
		2. A 32 mm diameter monitoring well (N : 4849057.83 E : 302870.70) was installed at 12.59 m depth in the sampled borehole.									
18		Water Level Measurements :									
		(Surface Elevation : 195.85 m)									
19		Date / Depth (mbgs) / Elev. (m)									
		03/19/09 3.36 192.49									
		04/04/09 3.18 192.67									
		05/04/09 2.78 193.07									
		05/21/09 3.56 192.29									
20		06/30/09 3.54 192.31									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848826.4 ;E 303040.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-007

BORING DATE: April 20, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		192.16							0.83 m Sand
		TOPSOIL with surficial grass : 100 mm		0.00							Concrete
		GRANULAR BASE : 150 mm		191.91	1	SS	10				
		Brown, stiff, moist, clayey silt, trace sand and gravel; FILL		0.25							Bentonite Seal
1					2	SS	8				
		Some sand			3	SS	8				
2				189.87							
		Brown, loose, moist, sandy silt, some clay, trace gravel; FILL		2.29	4	SS	4				
3				189.11							
		Grey, compact to very dense, moist, sandy SILT, some clay, trace gravel; TILL (ML)		3.05	5	SS	25				
4	Power Auger / 200 mm Hollow Stem Auger				6	SS	85/ 0.28			MH	
					7	SS	28				Bentonite Grout
5				186.56							
		Grey, hard, moist, silty CLAY, trace sand, trace gravel; TILL (CL)		5.60							
6					8	SS	31			MH AL	
7											
8					9	SS	48			MH AL	
9											
					10	SS	36				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848826.4 ;E 303040.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-007

BORING DATE: April 20, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖ w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Wash Boring/Hollow Stem Auger	Grey, hard, moist, silty CLAY, trace sand, trace gravel; TILL (CL)									Bentonite Grout
11		Trace gravel			11	SS	42	⊕	⊖	MH AL	Bentonite Seal
12					12	SS	50	⊕	○		Sand
13											
14					13	SS	55	⊕	○		Screen
15		Partly varved			14	SS	31	⊕	○		05/21/09
16				175.86 16.30							05/04/09
17		Grey, very stiff to hard, varved, moist, silty CLAY; (CL)			15	SS	22		⊖	MH AL ENV	
18											
19					16	SS	20		⊖	MH AL	
20					17	SS	26				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848826.4 ;E 303040.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-007

BORING DATE: April 20, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Wash Boring	Grey, very stiff to hard, varved, moist, silty CLAY; (CL)			17	SS	26				
21											
22					18	SS	24				
23					19	SS	54			MH AL	
24											
25				167.21 / 24.95	20	SS	22			MH AL	
26		**END OF BOREHOLE** at 24.95 m bgs NOTE : 1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test' 2. A 32 mm diameter monitoring well (N : 4848826.44 E : 303040.42) was installed at 15.89 m depth in the sampled borehole. Water Level Measurements : (Surface Elevation : 192.16 m) Date Depth (mbgs) Elev. (m) 05/04/09 15.78 176.38 05/21/09 14.43 177.73									
27											
28											
29											
30											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848858.1 ;E 302997.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-008

BORING DATE: May 7, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 3

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		190.89					0.66 m Sand
0	Power Auger; 200 mm Hollow Stem Auger	VEGETATION with TOPSOIL : 200 mm		0.00 / 190.69					Concrete
		Brown, firm to very stiff, moist, clayey silt, trace sand and gravel, trace topsoil; FILL		0.20	1	SS	6		Bentonite Seal
1		Oxidized seams			2	SS	21		
				189.37					
		Brown to grey, stiff to hard, moist, clayey SILT, trace sand; TILL (CL-ML)		1.52	3	SS	24	MH AL	
2		Grey			4	SS	13	MH	
3					5	SS	50/ 0.13		
		Auger grinding		187.29					
		Grey, very dense, moist, gravelly sandy SILT, trace clay, rock fragments; TILL (SM)		3.60	6	SS	50/ 0.14	MH	
4									
		Saturated, sand pockets Auger grinding			7	SS	62		Bentonite Grout
5				185.34					
		Grey, hard, moist to saturated, silty CLAY, trace sand; TILL (CL)		5.55					
6					8	SS	77		
7									
		Trace sand			9	SS	68	MH AL	05/21/09
8									
9					10	SS	46		06/25/09
10		*CONTINUED NEXT PAGE*							

ORGANIC VAPOUR READINGS (ppm) ⊕ — 10 20 30 40

% LEL Methane □ — 100 200 300 400

SHEAR STRENGTH Cu, kPa — nat V. - + Q - ● — rem V. - ⊕ U - ○ — 20 40 60 80

WATER CONTENT PERCENT — wp ⊢ w ⊣ wl — 10 20 30 40

DEPTH SCALE 1 : 50

LOGGED: M.R./S.H.

CHECKED: K.R.

INSPEC-SOL

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848858.1 ;E 302997.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-008

BORING DATE: May 7, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		*--- CONTINUED FROM PREVIOUS PAGE ---*									
	Wash Boring/Hollow Stem Auger	Grey, hard, moist to saturated, silty CLAY, trace sand; TILL (CL)									
11					11	SS	50	⊕	○		
12					12	SS	46	⊕	○		
13											
14					13	SS	24	⊕	○		
15											Bentonite Grout
					14	SS	22	⊕	○	ENV	
16				174.59							
		Grey, very stiff to hard, varved, moist, clayey SILT; (CL-ML)		16.30							
17					15	SS	54	⊕	⊢○	MH AL ENV	
18											
19					16	SS	24	⊕	○		
20					17	SS	31				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC·SOL

LOGGED: M.R./S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848858.1 ;E 302997.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-008

BORING DATE: May 7, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		*--- CONTINUED FROM PREVIOUS PAGE ---*									
	Wash Boring	Grey, very stiff to hard, varved, moist, clayey SILT; (CL-ML)			17	SS	31				Bentonite Grout
				170.09							
21		Grey, very stiff to hard, homogeneous, saturated, silty CLAY; (CL)		20.80							Bentonite Seal
											Sand
					18	SS	24			AL	
22											
											Screen
23					19	SS	34				
24											
					20	SS	22			AL	
25				165.89 25.00							
		END OF BOREHOLE at 25.00 m bgs									
26		NOTE :									
		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
27		2. A 50 mm diameter monitoring well (N : 4848858.10 E : 302996.95) was installed at 23.30 m depth in the sampled borehole.									
		Water Level Measurements :									
28		(Surface Elevation : 190.89 m)									
		Date / Depth (mbgs) / Elev. (m)									
29		05/21/09 7.66 183.23									
		06/25/09 9.78 181.11									
30											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R./S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848916.0 ;E 303030.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-009

BORING DATE: June 18 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 3

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION 0.71 m (Well A) 0.75 m (Well B)
		GROUND SURFACE		193.78						Sand	B A
0		TOPSOIL with surficial grass : 150 mm		193.63						Concrete	
		Brown, stiff to very stiff, moist, sandy clayey silt, some gravel, trace rootlets, black organic matter; FILL		0.15	1	SS	18	ND			Bentonite Seal
1					2	SS	14	⊕	○		Bentonite Grout
				192.01	3A	SS	16	⊕	○		
		Brown, compact, moist to saturated, SILT and SAND, trace clay and gravel; TILL (np)		1.77	3B	SS		⊕	○	MH	06/25/09 (Well B)
2											06/24/09 (Well B)
				191.29	4A	SS	18	⊕	○		06/25/09 (Well A)
		Brown to yellowish orange, very stiff, moist, silty CLAY, some sand; TILL (CL)		2.49	4B	SS		⊕	○		**06/24/09 (Well A)**
3					5	SS	16	⊕	○	MH AL	Sand
				190.18							
		Grey, very stiff to hard, moist, clayey SILT, some sand, trace gravel; TILL (CL-ML)		3.60	6	SS	25	⊕	○		**Screen (Well B)**
4											
					7	SS	38	⊕	○	MH AL	
5	Power Auger / 200 mm Hollow Stem Auger										
6											Bentonite Grout
					8	SS	20	⊕	○		
7											**Bentonite Seal**
					9	SS	26	⊕	○		**Sand**
8				185.08							
		Grey, dense to very dense, saturated, silty SAND, trace to some gravel, trace clay; (SM)		8.70							**Screen (Well A)**
9					10	SS	36	⊕	○	MH	
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848916.0 ;E 303030.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-009

BORING DATE: June 18 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ / % LEL Methane □	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) / WATER CONTENT PERCENT (wp, w, wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- *CONTINUED FROM PREVIOUS PAGE* ---									B A
10	Wash Boring/Hollow Stem Auger	Grey, dense to very dense, saturated, silty SAND, trace to some gravel, trace clay; (SM)									Screen (Well A)
11					11	SS	98/ 0.28	⊕	○	MH	
				182.08							
		Grey, hard, damp to moist, clayey SILT, some sand; TILL (CL-ML)		11.70							
12					12	SS	58	⊕	⊖	MH AL	
13											
14					13	SS	62	⊕	○		
15					14	SS	55	⊕	○		
16				177.48							
		Grey, hard, moist, silty CLAY; (CL)		16.30							
17		Trace sand			15	SS	53	*ND*	⊖	MH AL	
18											
19					16	SS	56	⊕	○		
20					17	SS	37				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848916.0 ;E 303030.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-009

BORING DATE: June 18 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
20		Grey, hard, moist, silty CLAY; (CL)		173.35	17	SS	37	⊕		MH AL	
				20.43							
21		**END OF BOREHOLE**at 20.43 m bgs									
22		NOTE :									
23		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
24		2. A 32 mm diameter monitoring well A (N : 4848916.00 E : 303030.06) was installed at 11.28 m depth in the sampled borehole.									
25		3. An additional well B (N : 4848915.83 E : 303029.16) was installed to 5.03 m depth adjacent to Borehole 407-009 for the 50 mm diameter monitoring well and is protected in above ground casing.									
26		Water Level Measurements :									
27		Well A (Surface Elevation : 193.78 m) Date Depth (mbgs) Elev. (m) 06/24/09 2.51 191.27 06/25/09 2.46 191.32									
28		Well B (Surface Elevation : 193.76 m) Date Depth (mbgs) Elev. (m) 06/24/09 2.11 191.65 06/25/09 1.89 191.87									
29											
30											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848908.0 ;E 302979.5

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-010

BORING DATE: May 11, 12 and 14, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		189.08							Sand
0		TOPSOIL with surficial grass : 150 mm		188.93							Concrete
		Dark brown, very soft, moist, clayey silt, trace sand intermixed with topsoil, trace wood pieces, trace rootlets; FILL		0.15	1	SS	2	⊕	○		Bentonite Seal
				188.17							
1		Brown/grey, hard, moist, sandy clayey SILT; TILL (CL-ML)		0.91	2	SS	37	⊕	○	ENV	
											05/21/09 (Well B)
		Grey, trace rock fragments			3	SS	67	⊕	⊢○⊣	MH AL	
2											Sand
					4	SS	70	⊕	○		
3											Screen (Well B)
					5	SS	90/ 0.23	⊕	○		
											06/30/09 (Well B)
4					6	SS	59	⊕	○		
					7	SS	30	⊕	○		
5	Power Auger / 200 mm Hollow Stem Auger										05/21/09 (Well A)
				183.48							
		Grey, compact, homogeneous, moist, SILT, trace sand, trace clay; (np)		5.60							
6					8	SS	10	⊕	○	MH	
7											Bentonite Grout
				181.88							
		Grey, very stiff to hard, varved, saturated, silty CLAY; (CL)		7.20							
8					9	SS	35	⊕	○		
9											
					10	SS	41	⊕	○	ENV	
10											
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R./S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848908.0 ;E 302979.5

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-010

BORING DATE: May 11, 12 and 14, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ● / rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- *CONTINUED FROM PREVIOUS PAGE* ---									B A
10	Wash Boring/Hollow Stem Auger	Grey, very stiff to hard, varved, saturated, silty CLAY; (CL)									
11					11	SS	33			ENV	Bentonite Grout
12											Bentonite Seal
					12	SS	46			MH AL ENV	06/30/09 (Well A)
13											Sand
14					13	SS	18			MH AL ENV	
15											Screen (Well A)
					14	SS	23			ENV	
16				172.78							
		Grey, dense, varved, saturated, slightly plastic SILT, some clay; (ML)		16.30							
17					15	SS	41			MH	
				171.28							
18		Grey, very stiff to hard, moist to saturated, silty CLAY; (CL)		17.80							
		Sand seams			16	SS	27				
19											
20					17	SS	28				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R./S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848908.0 ;E 302979.5

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-010

BORING DATE: May 11, 12 and 14, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION B A
		--- *CONTINUED FROM PREVIOUS PAGE* ---									
20	Wash Boring	Grey, very stiff to hard, moist to saturated, silty CLAY; (CL)			17	SS	28			MH AL	
21											
22		Hard, partly varved			18	SS	34				
23					19	SS	53			AL	
24		Varved									
25				164.08 / 25.00	20	SS	22				
26		**END OF BOREHOLE** at 25.00 m bgs									
27		NOTE :									
28		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
29		2. A 32 mm diameter monitoring well A (N : 4848907.96 E : 302979.51) was installed at 16.01 m depth in the sampled borehole.									
30		3. An additional well B (N : 4848906.42 E : 302980.23) was installed to 3.96 m depth adjacent to Borehole 407-010 for the 50 mm diameter monitoring well and is protected in above ground casing.									

Water Level Measurements :

Well A
(Surface Elevation : 189.08 m)

Date	Depth (mbgs)	Elev. (m)
05/21/09	5.09	183.99
06/30/09	12.39	176.69

Well B
(Surface Elevation : 189.11 m)

Date	Depth (mbgs)	Elev. (m)
05/21/09	1.44	187.67
06/30/09	3.05	186.06

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R./S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848967.8 ;E 302957.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-011

BORING DATE: May 26, 27 and 29, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 5

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ / % LEL Methane □	SHEAR STRENGTH Cu, kPa (nat V. + Q ● / rem V. ⊕ U ○) / WATER CONTENT PERCENT (wp, w, wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		189.60							Sand
		TOPSOIL with surficial grass : 75 mm		0.00							Cement
		Grey, firm, moist, clayey silt, trace sand, trace wood pieces; FILL		0.10	1	SS	4	ND			Bentonite Seal
1		Brown to grey, dense, moist, SILT, some clay, trace sand, trace wood pieces; TILL (ML)		188.69 / 0.91	2	SS	36	⊕	○	MH SG	
		Grey, compact, moist, silty SAND, some clay; TILL (SM)		187.80 / 1.80	3	SS	52	⊕	○	MH	
2		Grey, dense to very dense, moist, slightly plastic SILT, some clay, trace sand; TILL (ML)		187.11 / 2.49	4	SS	16	⊕	○		
3					5	SS	31	⊕	○		
4	Power Auger / 200 mm Hollow Stem Auger				6	SS	91/ 0.28	⊕	⊕	MH AL SG	
5					7	SS	50/ 0.13	⊕	○	Bentonite Grout	Bentonite Seal
		Grey, hard, moist, silty CLAY, black stain; (CL)		183.95 / 5.65							
6					8	SS	89	⊕	○		
7										Sand	Screen (Well B)
8		Sand seam			9	SS	70	ND	○		06/24/09 (Well B)
9											
		Trace sand			10	SS	40	⊕	⊖	MH AL	
10		*CONTINUED NEXT PAGE*									

0.60 m (Well A)
0.75 m (Well B)

DEPTH SCALE
1 : 50

INSPEC-SOL

LOGGED: S.H.
CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848967.8 ;E 302957.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-011

BORING DATE: May 26, 27 and 29, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
10	Power Auger 200 mm Hollow Stem Auger	Grey, hard, moist, silty CLAY, black stain; (CL)									
11					11	SS	74	⊕	○		
				177.90							
		Grey, dense, moist, slightly plastic SILT, trace clay, trace sand; (ML)		11.70							
12					12	SS	41	⊕	○	MH	
				177.00							
		Grey, hard, moist, silty CLAY; (CL)		12.60							
13											
14		Trace sand			13	SS	41	⊕	⊖	MH AL SG	
15											Bentonite Grout
					14	SS	39	⊕	○		▽ 06/24/09 (Well A)
16											
17		Varved			15	SS	33	*ND*	⊖	MH AL SG	
18											
					16	SS	55	⊕	○		
19											
20					17	SS	40				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848967.8 ;E 302957.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-011

BORING DATE: May 26, 27 and 29, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
20	Wash Boring/Hollow Stem Auger	Grey, hard, moist, silty CLAY; (CL)			17	SS	40	*ND*			
21											
22					18	SS	33	⊕			
23					19	SS	54	⊕			
24											
25					20A	SS	39	⊕			Bentonite Grout
					20B	SS	31	⊕			
26					21	SS	33	⊕			
27											
28					22	SS	39	⊕			Sand
29					23	SS	33	⊕		MH AL	
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848967.8 ;E 302957.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-011

BORING DATE: May 26, 27 and 29, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
30		Grey, hard, moist, silty CLAY; (CL)									
					24	SS	36	ND	○		
31											
32					25	SS	38	ND	○		
33				156.55							
		Grey, very dense, saturated, SILT and SAND, trace clay; (np)		33.05							Bentonite Grout
					26	SS	65	ND	○	MH SG	
34											
35	Wash Boring				27	SS	55/ 0.08	⊕	○		
36											
											Bentonite Seal
					28	SS	60/ 0.13	ND	○		
37											
38											
					29	SS	60/ 0.08	ND	○		
											Screen (Well A)
39											
					30	SS	55/ 0.13	ND	○		
40		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848967.8 ;E 302957.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-011

BORING DATE: May 26, 27 and 29, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 5 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
40		Grey, very dense, saturated, SILT and SAND, trace clay; (np)		149.01 / 40.59	30B	SS	55/ 0.10	*ND*	○		Screen (Well A)
41		**END OF BOREHOLE** at 40.59 m bgs									
42		NOTE :									
43		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test' SG denotes 'specific gravity'									
44		2. A 32 mm diameter monitoring well (N : 4848967.82 E : 302957.84) was installed at 40.42 m depth in the sampled borehole.									
45		3. An additional hole B was drilled (N : 4848968.76 E : 302958.59) to 7.92 m depth adjacent to borehole FWS-011 for the 50 mm diameter monitoring well.									
46		Water Level Measurements :									
47		Well (A) (Surface Elevation : 189.66 m) Date Depth (mbgs) Elev. (m) 06/24/09 15.64 174.02									
48		Well (B) (Surface Elevation : 189.68 m) Date Depth (mbgs) Elev. (m) 06/24/09 7.74 181.94									
49											
50											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848984.5 ;E 302984.2

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-012

BORING DATE: June 17, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 1

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		190.33							
0	Power Auger, 200 mm O.D. Hollow Stem Auger	TOPSOIL with surficial grass : 150 mm		190.18							Concrete
		Brown to grey, loose to compact, moist, sandy silt, some clay, trace gravel, trace rootlets, wood pieces; FILL		0.15	1	SS	5	⊕	○		Bentonite Seal
		Oxidized seams			2	SS	13	⊕	○		06/25/09 06/24/09
1				188.81							
		Brown to grey, hard, moist, sandy clayey SILT, trace gravel; TILL (CL-ML)		1.52	3	SS	61	⊕	○		Bentonite Grout
2		Grey			4	SS	47	⊕	○	MH AL	Bentonite Seal / Sand
3		Sand pockets			5	SS	45	⊕	○		
				186.60							Screen
		Grey, very stiff, moist, clayey SILT, trace gravel, some sand; TILL (ML)		3.73	6	SS	28	⊕	○		
4											
5				185.15	7	SS	27	⊕	○	MH AL	
		END OF BOREHOLE at 5.18 m bgs		5.18							
6		NOTE :									
7		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
		2. A 50 mm monitoring well (N : 4848984.53 E : 302984.23) was installed at 4.42 m depth in the sampled borehole and is protected in an above ground casing.									
8		Water level measurements :									
		(Surface Elevation : 190.33 m)									
		Date / Depth (mbgs) / Elev. (m)									
		06/24/09 / 0.61 / 189.72									
		06/25/09 / 0.57 / 189.76									
9											
10											

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848976.6 ;E 302985.2

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-012A

BORING DATE: June 17, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 1

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) / % LEL Methane	SHEAR STRENGTH Cu, kPa (nat V. / rem V.) / WATER CONTENT PERCENT (wp, w, wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		189.91							0.66 m Sand
		TOPSOIL with surficial grass : 150 mm		189.76							Concrete
	Power Auger, 200 mm O.D. Hollow Stem Auger	Brown to grey, loose to compact, moist, sandy silt, some clay, some gravel, trace rootlets, oxidized seams; FILL		0.15	1	SS	4	⊕			Bentonite Seal
1					2	SS	27	⊕			Sand #3
				188.39							
		Brown to grey, very stiff to hard, moist, sandy clayey SILT, trace gravel, oxidized seams; TILL (CL-ML)		1.52	3	SS	55	⊕			
2											Screen
		Grey			4	SS	31	⊕		MH AL	
					5A	SS	26	⊕			06/25/09
3				186.63							06/24/09
		Grey, stiff to very stiff, damp to moist, silty CLAY, some sand; TILL (CL)		3.28	5B	SS					
4					6	SS	18	⊕		MH AL	
		Rock fragments			7	SS	13	ND			
5				184.73							
		END OF BOREHOLE at 5.18 m bgs		5.18							
6											
7											
8											
9											
10											

NOTE :

1. 407 denotes 'Highway 407 Station'
   bgs denotes 'below ground surface'
   ENV denotes 'chemical analysis'
   MH denotes 'mechanical hydrometer test'
   AL denotes 'atterburg limit test'

2. A 50 mm monitoring well (N : 4848976.58 E : 302985.20) was installed at 3.05 m depth in the sampled borehole and is protected in an above ground casing.

Water level measurements :

(Surface Elevation : 189.91 m)

Date	Depth (mbgs)	Elev. (m)
06/24/09	2.87	187.04
06/25/09	2.76	187.15

DEPTH SCALE

1 : 50

iNSPEC·SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848972.2 ;E 302986.2

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-012B

BORING DATE: June 16, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 1

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		189.81							0.66 m Sand
0	Power Auger 200 mm O.D. Hollow Stem Auger	TOPSOIL with surficial grass : 150 mm		189.66							Concrete
		Brown, soft, moist, sandy clayey silt, trace rootlets, black organic matter; FILL		0.15 / 189.05	1	SS	3	⊕	○		Bentonite Seal 06/24/09 06/25/09
1		Brown, stiff, moist, sandy clayey silt, trace gravel, oxidized seams; FILL		0.76 / 188.70	2A	SS	14	⊕	○		Sand #3
		Brown to grey, hard, moist, sandy clayey SILT, trace gravel; TILL (CL-ML)		1.11	2B	SS		⊕	○		
2					3	SS	51	⊕	○	MH AL	Screen
		Grey		187.21	4A	SS	40	⊕	○		
		Grey, very dense, moist, slightly plastic sandy SILT, trace gravel, trace clay; TILL (ML)		2.60	4B	SS		⊕	○	MH AL	
3		No samples			5	SS	60/ 0.03	⊕			
		Grey, hard, moist, clayey SILT, some sand, trace gravel; TILL (CL-ML)		186.11 / 3.70	6	SS	56	⊕	○		
4											
					7	SS	31	ND	○	MH AL	
5				184.71							
		END OF BOREHOLE at 5.10 m bgs		5.10							
6											
7											
8											
9											
10											

NOTE :

1. 407 denotes 'Highway 407 Station'
   bgs denotes 'below ground surface'
   ENV denotes 'chemical analysis'
   MH denotes 'mechanical hydrometer test'
   AL denotes 'atterburg limit test'

2. A 50 mm monitoring well (N : 4848972.21 E : 302986.18) was installed at 2.90 m depth in the sampled borehole and is protected in an above ground casing.

Water level measurements :

(Surface Elevation : 189.81 m)

Date	Depth (mbgs)	Elev. (m)
06/24/09	0.57	189.24
06/25/09	0.61	189.20

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848968.2 ;E 302987.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-012C

BORING DATE: June 15, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 1

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		189.89							0.70 m Sand
0		TOPSOIL with surficial grass : 150 mm		189.74							Concrete
		Brown to grey, loose, moist, sandy silt, some clay, trace gravel, trace rootlets; FILL		0.15 / 189.13	1	SS	5	ND			Bentonite Seal 06/25/09 06/24/09
1		Brown, stiff to hard, moist, clayey silt, some sand, oxidized seams; FILL		0.76 / 188.24	2	SS	15	⊕	○	MH ENV	Sand #3
					3A	SS	58	ND	○		
2	Power Auger 200 mm O.D. Hollow Stem Auger	Brown to grey, very dense, moist, slightly plastic SILT, some sand, trace gravel, trace clay; TILL (ML)		1.65	3B	SS			○		Screen
		Grey			4	SS	67	⊕	○	MH AL	
3					5	SS	55	ND	○		
		Grey, hard, moist, sandy clayey SILT, trace gravel; TILL (CL-ML)		186.24 / 3.65							
4					6	SS	33	ND	○	MH AL ENV	
					7	SS	30	ND	○		
5				184.82							
		END OF BOREHOLE at 5.07 m bgs		5.07							

NOTE :

1. 407 denotes 'Highway 407 Station'
   bgs denotes 'below ground surface'
   ENV denotes 'chemical analysis'
   MH denotes 'mechanical hydrometer test'
   AL denotes 'atterburg limit test'

2. A 50 mm monitoring well (N : 4848968.17 E : 302986.99) was installed at 3.05 m depth in the sampled borehole and is protected in an above ground casing.

Water level measurements :

(Surface Elevation : 189.89 m)

Date	Depth (mbgs)	Elev. (m)
06/24/09	0.69	189.20
06/25/09	0.66	189.23

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848987.8 ;E 302962.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-013

BORING DATE: June 8 and 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 5

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m
		GROUND SURFACE		190.08			
0		TOPSOIL with surficial grass : 150 mm		189.93			
		Brown to grey, firm, moist, sandy silt, trace clay, wood and charcoal pieces, black organic matters; FILL		0.15 189.32	1	SS	5
1		Brown to grey, very stiff, moist, sandy clayey silt, some gravel, oxidized sand seams; FILL		0.76 188.56	2	SS	16
		Brown to grey, hard, damp to moist, clayey SILT, some sand, oxidized seams, rock fragments; TILL (CL-ML)		1.52	3	SS	38
2				187.56	4A	SS	54
		Grey, very stiff, moist to saturated, sandy clayey SILT, rock fragments; TILL (CL-ML)		2.52	4B	SS	
3				186.38	5	SS	29
		Grey, compact, moist, slightly plastic SILT, some clay; (ML)		3.70	6	SS	25
4							
					7	SS	24
5	Power Auger 200 mm O.D. Hollow Stem Auger			184.58			
		Grey, compact, damp to moist, silty CLAY, trace sand and gravel; TILL (CL)		5.50			
6					8	SS	23
					8A	SS	60
7							
					9	SS	66
8							
9		Black stain			10	SS	44
10		*CONTINUED NEXT PAGE*					

ORGANIC VAPOUR READINGS (ppm) ⊕ — 10 20 30 40

% LEL Methane □ — 100 200 300 400

SHEAR STRENGTH Cu, kPa — nat V. - + Q - ● — rem V. - ⊕ U - ○ — 20 40 60 80

WATER CONTENT PERCENT — wp ⊢ w ⊣ wl — 10 20 30 40

ADDITIONAL LAB. TESTING

PIEZOMETER OR STANDPIPE INSTALLATION

0.64 m (Well A)
0.62 m (Well B)
0.69 m (Well C)

Sand
Cement
06/24/09 (Well C)
06/25/09 (Well C)
Bentonite Seal
MH AL
Screen (Well C)
MH AL
MH AL
06/24/09 (Well B)
06/25/09 (Well B)
Bentonite Grout
06/24/09 (Well A)
06/25/09 (Well A)
MH AL

C B A

DEPTH SCALE
1 : 50

LOGGED: S.H.
CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848987.8 ;E 302962.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-013

BORING DATE: June 8 and 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									C-B A
10	Power Auger 200 mm O.D. Hollow Stem Auger	Grey, compact, damp to moist, silty CLAY, trace sand and gravel; TILL (CL)									
11					11	SS	31	⊕	○		
12					12	SS	39	⊕	○		
13											
14					13	SS	28	⊕	○		
15											Bentonite Grout
					14	SS	23	⊕	⊢○⊣	MH AL	
16		Partly varved									
17					15	SS	35	⊕	○		
18											
19					16	SS	50	⊕	○		Bentonite Seal
20					17	SS	35				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848987.8 ;E 302962.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-013

BORING DATE: June 8 and 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									C-B A
20	Wash Boring	Grey, compact, damp to moist, silty CLAY, trace sand and gravel; TILL (CL)			17	SS	35	⊕	○		
21											Screen (Well B)
22					18	SS	52	⊕	○		
23		Varved			19	SS	46	⊕	○		
24											
25					20	SS	53	⊕	○		Bentonite Grout
26					21	SS	42	⊕	○		
27											
28					22	SS	40	***ND***	○		
29					23	SS	31	***ND***	⊖	MH AL	
30		*CONTINUED NEXT PAGE*		160.08							

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848987.8 ;E 302962.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-013

BORING DATE: June 8 and 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl ⊣ 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									C-B A
30	Wash Boring	Grey, hard, varved, moist, silty CLAY; (CL)		30.00							
					24	SS	31	⊕		MH AL	Bentonite Grout
31											Bentonite Seal
											Sand
32					25	SS	34	⊕			
33											
				156.39	26A	SS	60/ 0.08	*ND*			Screen (Well A)
		Grey, very dense, saturated, SAND and SILT, trace clay; (SM)		33.69	26B	SS		*ND*			
34											
35					27	SS	55/ 0.08	*ND*		MH	
				154.82							
		END OF BOREHOLE at 35.26 m bgs		35.26							
36		NOTE :									
		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
37		2. A 50 mm diameter monitoring well (N : 4848987.79 E : 302962.88) was installed at 35.06 m depth in the sampled borehole.									
		3. An additional hole, well B (N : 4848986.38 E : 302963.18) was installed to 23.02 m depth adjacent to borehole 407-013 for the 50 mm diameter monitoring well.									
38		4. Third hole, well C (N : 4848985.56 E : 302963.11) was installed to 3.05 m depth on the other side of well A for the 50 mm diameter monitoring well.									
		Water level measurements :									
39		Well A : (Surface Elevation : 190.08 m) Date Depth (mbgs) Elev. (m) 06/24/09 6.91 183.17 06/25/09 6.98 183.10									
		Well B : (Surface Elevation : 190.05 m) Date Depth (mbgs) Elev. (m)									
40		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848987.8 ;E 302962.9

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-013

BORING DATE: June 8 and 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 5 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. - + Q - ● / rem V. - ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp ⊖w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									C-B A
40		06/24/09 5.08 184.97 06/25/09 5.09 184.96 Well C : (Surface Elevation : 190.00 m) Date Depth (mbgs) Elev. (m) 06/24/09 0.24 189.76 06/25/09 0.25 189.75									
41											
42											
43											
44											
45											
46											
47											
48											
49											
50											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849063.8 ;E 302967.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-014

BORING DATE: March 11, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		194.32							0.60 m Sand
0	Power Auger / 200 mm Hollow Stem Auger	TOPSOIL : 200mm		0.00 / 194.12							Concrete
		Dark brown, soft to firm, moist, clayey silt, trace sand and gravel, trace topsoil; FILL		0.20	1	SS	4	⊕	⊕		03/19/09 Bentonite Seal
1		Mottled grey to brown			2	SS	5	⊕	⊕		04/04/09
				192.80							05/21/09
		Brown to grey, compact, saturated, silt, trace sand, trace clay; FILL		1.52	3	SS	11	⊕	⊕	MH	05/04/09
2				192.03	4	SS	50/ 0.10	⊕	⊕		
		Brown/grey, very dense, moist, SILT and SAND, trace gravel; TILL (SM)		2.29							
3					5	SS	50/ 0.08	⊕	⊕	MH	
4					6	SS	50/ 0.10	⊕	⊕		
				190.02							
		Grey, hard, moist, clayey SILT, trace sand; TILL (CL-ML)		4.30	7	SS	88/ 0.28	⊕	⊕	MH AL	
5											Bentonite Grout
				188.76							
		Grey, hard, moist, silty CLAY, trace to some sand; TILL (CL)		5.56							
6					8	SS	48	⊕	⊕	MH AL	
7											
		Highly fissured, damp, trace sand			9	SS	83/ 0.28	⊕	⊕		06/25/09
8											
9											
		Slightly fissured			10	SS	50/ 0.13	⊕	⊕		
10											
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849063.8 ;E 302967.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-014

BORING DATE: March 11, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		*--- CONTINUED FROM PREVIOUS PAGE ---*									
		Grey, hard, moist, silty CLAY, trace to some sand; TILL (CL)									
11		Trace sand			11	SS	73	⊕		MH AL	
12					12	SS	63	⊕			Bentonite Grout
13											
14		Fine sand pockets and partings			13	SS	68	⊕			
15	Wash Boring/Hollow Stem Auger										
		Some sand			14	SS	55	⊕		MH AL	
16											Sand
17					15	SS	72	⊕			Screen
18											
		Trace sand			16	SS	60	⊕		MH AL	
19											
		Stratified, lens of sand			17	SS	76/ 0.25	⊕			
20		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849063.8 ;E 302967.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-014

BORING DATE: March 11, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 3

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖ w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20		--- *CONTINUED FROM PREVIOUS PAGE* ---									
				174.25 / 20.07							
		END OF BOREHOLEat 20.07 m bgs									
		NOTE :									
21		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
22		2. A 32 mm diameter monitoring well (N : 4849063.80 E : 302967.41) was installed at 18.08 m depth in the sampled borehole.									
		Water Level Measurements :									
23		(Surface Elevation : 194.32 m) Date / Depth (mbgs) / Elev. (m) 03/19/09 0.40 193.92 04/04/09 0.73 193.59 05/04/09 1.72 192.60 05/21/09 1.14 193.18 06/25/09 7.60 186.72									
24											
25											
26											
27											
28											
29											
30											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849042.9 ;E 302942.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-015

BORING DATE: February 19 and 20, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 4

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖ w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		195.96							0.66 m Sand
0		TOPSOIL with surficial grass : 150 mm		195.81							Concrete
		Dark brown, firm, very moist, clayey silt with intermixed topsoil, trace wood pieces, trace sand, trace gravel, FILL		0.15	1	SS	7	⊕	○		Bentonite Seal
1					2	SS	5	⊕	○	ENV	
				194.13							
		Brown, compact, moist, SAND and SILT, trace clay and gravel; TILL (np)		1.83	3	SS	9	⊕	○		
2					4	SS	19	⊕	○	MH	
3					5	SS	12	⊕	○		03/19/09
4					6	SS	13	⊕	○	MH	04/04/09
				191.46							
		Grey, compact to dense, moist, sandy SILT, some clay; TILL (ML)		4.50	7	SS	36	⊕	○	MH	
5	Power Auger 200 mm Hollow Stem Auger										Bentonite Grout
											05/04/09
6											05/21/09
					8	SS	43	⊕	○		
7											06/25/09
8					9	SS	35	⊕	○	ENV	
9											
					10	SS	21	⊕	○		
10		*CONTINUED NEXT PAGE*									

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849042.9 ;E 302942.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-015

BORING DATE: February 19 and 20, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger 200 mm Hollow Stem Auger	Grey, compact to dense, moist, sandy SILT, some clay; TILL (ML)		185.29							
		Grey, hard, highly fissured, damp, silty CLAY, trace sand; TILL (CL)		10.67							
11					11	SS	31	⊕	○		
12					12	SS	52	⊕	○	MH AL	
13											
14					13	SS	51	⊕	○		
15					14	SS	53	⊕	○	ENV	Bentonite Grout
16											
17					15	SS	51	⊕	○		
18		Slightly fissured, grey silt pockets			16	SS	45	⊕	○	MH AL	
19											
20					17	SS	46				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849042.9 ;E 302942.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-015

BORING DATE: February 19 and 20, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ○w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Wash Boring/Hollow Stem Auger	Grey, hard, highly fissured, damp, silty CLAY, trace sand; TILL (CL)			17	SS	46	⊕	○		
21											Bentonite Grout
					18	SS	42	⊕	○		
22											Bentonite Seal
											Sand
23					19	SS	57	⊕	○		
24											
		Partly varved			20	SS	44	⊕	○—	MH AL	Screen
25											
26					21	SS	69	⊕	○		
				169.06 26.90							
27		Grey, hard, homogeneous, moist to saturated, clayey SILT; (CL-ML)			22	SS	63	⊕	—⊕	MH AL	
28											
29					23	SS	52	⊕	○		
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849042.9 ;E 302942.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-015

BORING DATE: February 19 and 20, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
30		--- *CONTINUED FROM PREVIOUS PAGE* ---									
	Wash Boring	Grey, hard, homogeneous, moist to saturated, clayey SILT; (CL-ML)			24	SS	55	⊕	○		
31				164.56							
		Grey, hard, varved, moist, silty CLAY; (CL)		31.40							
32					25	SS	55		⊖	MH AL	
33											
34					26	SS	50		○		
35					27	SS	47		○		
				160.29							
		END OF BOREHOLE at 35.67 m bgs		35.67							
36		NOTE :									
37		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
		2. A 50 mm diameter monitoring well (N : 4849042.87 E : 302942.03) was installed at 26.03 m depth in the sampled borehole.									
38		Water Level Measurements :									
		(Surface Elevation : 195.96 m)									
39		Date / Depth (mbgs) / Elev. (m) 03/19/09 3.04 192.92 04/04/09 4.09 191.89 05/04/09 5.62 190.34 05/21/09 5.91 190.05 06/25/09 7.60 188.36									
40											

DEPTH SCALE

1 : 50

iNSPEC·SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849105.8 ;E 302921.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-017

BORING DATE: February 3 and 5, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 5

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢○ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		195.64						Sand	0.18 m (Well A) 0.15 m (Well B)
0		TOPSOIL : 200 mm		0.00 / 195.44						Concrete	B A
		Dark brown, soft, moist, clayey silt, some sand, trace gravel, trace topsoil; FILL		0.20	1	SS	3			Bentonite Seal	
		Brown			2	SS	4			04/04/09 (Well B)	
1										03/19/09 (Well B)	
		Mottled brown to grey, sand products			3	SS	4			05/04/09 (Well B) 05/21/09 (Well B)	
2											
				193.20						03/19/09 (Well A) 04/04/09 (Well A)	
		Brown, very stiff, moist, sandy clayey SILT, trace gravel; TILL (CL-ML)		2.44	4	SS	16			MH AL	
3				192.59							
		Grey, dense to very dense, moist, sandy SILT, trace clay, trace limestone fragments; TILL (ML)		3.05	5	SS	31			05/04/09 (Well A) 05/21/09 (Well A) ENV	
4					6	SS	91/ 0.28			MH	
					7	SS	50/ 0.13				
5	Power Auger 200 mm O.D. Hollow Stem Auger									Bentonite Grout	
		Grey, hard, moist, silty CLAY, some sand, trace gravel; TILL (CL)		190.24 5.40							
6										Bentonite Seal	
					8	SS	89			MH AL ENV	
7				188.44						Sand	Sand
		Grey, very dense, very moist, gravelly SAND, some silt; (SM)		7.20							
					9	SS	50/ 0.08			MH	
8										Screen (Well B)	
9											
					10	SS	50/ 0.08				Bentonite Grout
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849105.8 ;E 302921.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-017

BORING DATE: February 3 and 5, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ ○w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
10	Wash Boring/Hollow Stem	Grey, very dense, very moist, gravelly SAND, some silt; (SM)		185.34							
		Grey, hard, moist, silty CLAY, trace sand, trace gravel; TILL (CL)		10.30							
11					11	SS	65 ⊕		○ ⊢	MH AL	Bentonite Grout
12					12	SS	96/ 0.25 ⊕		○		
13											Bentonite Seal
											Sand
14					13	SS	80 ⊕		○		
15											
					14	SS	83/ 0.28 ⊕		○		Screen
16											
17		Trace gravel			15	SS	71 ⊕		○ ⊢	MH AL	
18											
					16	SS	81 ⊕		○		
19											
20					17	SS	78				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849105.8 ;E 302921.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-017

BORING DATE: February 3 and 5, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
20	Wash Boring	Grey, hard, moist, silty CLAY, trace sand, trace gravel; TILL (CL)			17	SS	78	⊕	○		
21					18	SS	61	⊕	○		
22											
23					19	SS	78	⊕	○		
24											
25					20	SS	61	⊕	○ —	MH AL	
26											
27				168.64 / 27.00	21	SS	60	⊕	○	ENV	
		Grey, very stiff to hard, moist to saturated, silty CLAY; (CL)									
28		Very stiff			22	SS	21	⊕	○		
29		Varved			23	SS	50/ 0.10	⊕	○		
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849105.8 ;E 302921.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-017

BORING DATE: February 3 and 5, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ●, rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
30	Wash Boring	Grey, very stiff to hard, moist to saturated, silty CLAY; (CL)									
					24	SS	60	ND			
31											
32					25	SS	52	ND		MH AL	
33											
34					26	SS	57	ND			
35					27	SS	54	ND			
36											
37					28	SS	76	ND		MH AL	
38					29	SS	54				
39											
40		*CONTINUED NEXT PAGE*			30	SS	51				

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849105.8 ;E 302921.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-017

BORING DATE: February 3 and 5, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 5 OF 5

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION B A
40		--- *CONTINUED FROM PREVIOUS PAGE* ---									
				155.39	30	SS	51				
				40.25							
41		END OF BOREHOLE at 40.25 m bgs NOTE : 1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test' 2. A 50 mm diameter monitoring well A (N : 4849105.79 E : 302921.82) was installed at 16.80 m depth in the sampled borehole. 3. An additional hole, well B (N : 4849106.34 E : 302919.46) was installed to 9.00 m depth adjacent to sampled borehole for the 50 mm diameter monitoring well. Water Level Measurements : Well A : (Surface Elevation : 195.64 m) Date / Depth (mbgs) / Elev. (m) 03/19/09 2.23 193.41 04/04/09 2.27 193.37 05/04/09 3.18 192.46 05/21/09 3.25 192.39 06/30/09 13.40 182.24 Well B : (Surface Elevation : 195.70 m) Date / Depth (mbgs) / Elev. (m) 03/19/09 1.02 194.68 04/04/09 0.62 195.08 05/04/09 1.41 194.29 05/21/09 1.55 194.15 06/30/09 0.99 194.71									
42											
43											
44											
45											
46											
47											
48											
49											
50											

DEPTH SCALE

1 : 50

iNSPEC·SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849122.3 ;E 302880.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-018

BORING DATE: February 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 6

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl ⊣ 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		196.39							0.79 m Sand
0	Power Auger 200 mm O.D. Hollow Stem Auger	TOPSOIL with surficial grass : 200 mm		0.00 / 196.19							Concrete
		Brown to dark brown, firm, moist, clayey silt, trace sand and gravel, trace rootlets; FILL		0.20	1	SS	6	⊕	○		Bentonite Seal
1					2	SS	14	⊕	○		
				194.74							
		Brown to grey, stiff to very stiff, moist, sandy silty CLAY, trace gravel; TILL (CL)		1.65	3	SS	11	⊕	○		
2					4	SS	13	⊕	○		
3					5	SS	16	⊕	⊕ ⊢ ⊣	MH AL	
				192.66							
		Grey, compact to dense, moist, SILT and SAND, trace clay; TILL (np)		3.73	6	SS	24	⊕	○		
4											
		Trace limestone fragments			7	SS	34	⊕	○	MH	Bentonite Grout
5											
6					8	SS	40	⊕	○		
				189.29							
7		Grey, hard, highly fissured, moist, clayey SILT; (CL-ML)		7.10							
					9	SS	52	⊕	○	ENV	
8											
9					10	SS	97	⊕	⊕ ⊢ ⊣	MH AL	
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849122.3 ;E 302880.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-018

BORING DATE: February 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ○w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Wash Boring/Hollow Stem	Grey, hard, highly fissured, moist, clayey SILT; (CL-ML)									
11		Slightly fissured			11	SS	63	⊕	○		
12					12	SS	51	⊕	○		
13											
14		Grey, hard, silty CLAY, trace sand; TILL (CL)		182.39 / 14.00	13	SS	54	⊕	○		
15											Bentonite Grout
					14	SS	40	⊕	○	MH AL	
16											
17					15	SS	39	⊕	○	ENV	
18											
19					16	SS	38	⊕	○		
20					17	SS	48				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849122.3 ;E 302880.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-018

BORING DATE: February 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl ⊣ 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Wash Boring	Grey, hard, silty CLAY, trace sand; TILL (CL)			17	SS	48	⊕	○ ⊢ ⊣	MH AL	
21											
		Silt pockets			18	SS	63	⊕	○		
22											
23		Very stiff			19	SS	28	⊕	○		04/04/09 03/19/09 05/21/09
				172.44							
24		Grey, very stiff to hard, varved, moist, silty CLAY; (CL)		23.95							05/04/09
					20	SS	72	⊕	○	ENV	
25											Bentonite Grout
26					21	SS	31	⊕	○ ⊢ ⊣	MH AL	
27											
					22	SS	28	⊕	○		
28											
29					23	SS	39	⊕	○		
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849122.3 ;E 302880.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-018

BORING DATE: February 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
30	Wash Boring	Grey, very stiff to hard, varved, moist, silty CLAY; (CL)									
					24	SS	54	⊕	○		
31											
32					25	SS	26	⊕	○ w	MH AL	
33											
34					26	SS	38	⊕	○		
35					27	SS	41	⊕	○		Bentonite Grout
36											
37					28	SS	24	⊕	○		
38											
39				157.24	29	SS	25	⊕	○		
		Grey, dense to very dense, saturated, silty SAND, trace clay; (SM)		39.15							
40					30	SS	45	⊕	○	MH	
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849122.3 ;E 302880.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-018

BORING DATE: February 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 5 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
40		*--- CONTINUED FROM PREVIOUS PAGE ---*									
	Wash Boring	Grey, dense to very dense, saturated, silty SAND, trace clay; (SM)			30	SS	45				
41					31	SS	80/ 0.28	⊕	○		
42											
43					32	SS	50/ 0.08	⊕	○		
				152.89							
		Grey, very dense, moist, SILT, trace sand; (ML)		43.50							Bentonite Grout
44					33	SS	50/ 0.13	⊕	○	MH	
45				151.29							
		Grey, very dense, saturated, silty SAND, trace clay; (SM)		45.10							
					34	SS	50/ 0.10	⊕	○		
46											
47					35	SS	50/ 0.13	⊕			
				148.39							Bentonite Seal
48		Grey, hard, moist, silty CLAY, some fine sand; TILL (CL)		48.00							Sand
49					36	SS	85/ 0.28	⊕	○	AL	Screen
				146.39							
50		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849122.3 ;E 302880.1

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-018

BORING DATE: February 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 6 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp ⊖w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
50	Wash Boring	Grey, compact to very dense, saturated, medium SAND, some silt, trace clay; (SM)		50.00	37	SS	11	⊕	○	MH	Screen
51											
52					38	SS	77/ 0.25	⊕	○		
				143.59							
53		Grey, hard, moist, silty CLAY, trace to some sand, trace gravel; TILL (CL)		52.80	39	SS	50/ 0.10	⊕	⊖	AL	
54											
				141.44	40	SS	50/ 0.08	⊕	○		
55		END OF BOREHOLE at 54.95 m bgs		54.95							
56		NOTE : 1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test' 2. A 32 mm diameter monitoring well (N : 4849122.32 E : 302880.14) was installed at 51.82 m depth in the sampled borehole.									
57		Water Level Measurements : (Surface Elevation : 196.39 m)									
58		Date / Depth (mbgs) / Elev. (m): 03/19/09 23.41 172.98; 04/04/09 23.40 172.99; 05/04/09 24.21 172.18; 05/21/09 23.59 172.80									
59											
60											

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848909.8 ;E 302998.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-019

BORING DATE: May 13, 14, 15 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 6

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ADDITIONAL LAB. TESTING
		GROUND SURFACE		189.46				
0		TOPSOIL with surficial grass		189.31				
		Brown to grey, compact, moist, sandy silt, some clay, some gravel, black organic matter, oxidized seams; FILL		0.15	1	SS	13	
				188.70				
1		Brown to grey, compact, moist, sandy silt; FILL		0.76	2	SS	11	
				187.94				
		Grey, compact to very dense, damp to moist, sandy SILT, trace clay, rock fragments; TILL (np)		1.52	3	SS	81	
2					4	SS	27	MH
3					5	SS	61	
				185.78				
		Grey, compact, dilatant, moist, SILT, trace clay, trace sand; (ML)		3.68	6A	SS	24	
4								
		Trace sand			7	SS	21	MH
5	Power Auger 200 mm O.D. Hollow Stem Auger							
				183.86				
		Grey, hard, moist, silty CLAY, trace sand, black stain,; TILL (CL)		5.60				
6					8	SS	44	
7								
					9	SS	50	MH AL
8								
9					10	SS	43	
10		*CONTINUED NEXT PAGE*						

ORGANIC VAPOUR READINGS (ppm) ⊕ — 10 20 30 40

% LEL Methane □ — 100 200 300 400

SHEAR STRENGTH Cu, kPa — nat V. - + Q - ● — rem V. - ⊕ U - ○ — 20 40 60 80

WATER CONTENT PERCENT — wp ⊢ w ○ wl — 10 20 30 40

PIEZOMETER OR STANDPIPE INSTALLATION

0.69 m (Well A)
0.80 m (Well B)

Sand
Concrete
Bentonite Seal
Bentonite Grout
B
A

DEPTH SCALE
1 : 50

INSPEC-SOL

LOGGED: S.H.
CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848909.8 ;E 302998.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-019

BORING DATE: May 13, 14, 15 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ / % LEL Methane □	SHEAR STRENGTH Cu, kPa (nat V. + Q ● / rem V. ⊕ U ○) / WATER CONTENT PERCENT (wp, w, wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- *CONTINUED FROM PREVIOUS PAGE* ---									B A
10		Grey, hard, moist, silty CLAY, trace sand, black stain,; TILL (CL)									
11	Wash Boring/Hollow Stem				11	SS	45				
12					12	SS	41				
13				176.26							
		Grey, very stiff to hard, moist, silty CLAY; (CL)		13.20							
14					13	SS	29				
15		Partly varved									Bentonite Grout
					14	SS	17				MH AL 06/30/09 (Well B)
16											06/30/09 (Well A) 05/21/09 (Well A)
17		Hard			15	SS	54				
18											
		Black stain			16	SS	39				
19											
20					17	SS	32				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848909.8 ;E 302998.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-019

BORING DATE: May 13, 14, 15 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖ w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
20	Wash Boring	Grey, very stiff to hard, moist, silty CLAY; (CL)			17	SS	32				
21											
22					18	SS	62				
23		Partly varved			19	SS	57				
24											
25					20	SS	36				Bentonite Grout
26		Varved			21	SS	28				
27											
28					22	SS	29				
29											
30					23	SS	26				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848909.8 ;E 302998.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-019

BORING DATE: May 13, 14, 15 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) 10 20 30 40 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. + Q ● / rem V. ⊕ U ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
30	Wash Boring	Grey, very stiff to hard, moist, silty CLAY; (CL)									
					24	SS	27	⊕		MH AL	
31											Screen (Well B)
32		Very soft			25	SS	0	⊕			
				156.66							
33		Grey, compact to very dense, saturated, SILT and SAND; (np)		32.80							
					26A	SS	10	⊕			
34											Bentonite Grout
					26B	SS	55/ 0.08	⊕			
35					27	SS	55/ 0.08	⊕			
36											
					28	SS	60/ 0.10	⊕		MH	Bentonite Grout
37											
38											
					29	SS	60/ 0.14	⊕			
39											
					30	SS	60/ 0.08	⊕			
40		*CONTINUED NEXT PAGE*									

DEPTH SCALE

1 : 50

iNSPEC·SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848909.8 ;E 302998.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-019

BORING DATE: May 13, 14, 15 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 5 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl ⊣ 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									B A
40	Wash Boring	Grey, compact to very dense, saturated, SILT and SAND; (np)		148.96							Bentonite Grout
		Grey, very dense, saturated, gravelly SAND, some silt, trace clay, rock fragments; (SM)		40.50							
41					31	SS	55/ 0.13 ⊕		○	MH	Bentonite Seal
											Sand
42				147.46							
		Grey, hard, moist, silty CLAY, some sand; TILL (CL)		42.00							
43					32	SS	50 ⊕		○ ⊢ ⊣	MH AL	
				145.76							Screen (Well A)
		Grey, very dense, saturated, silty SAND, trace clay; (SM)		43.70							
44					33	SS	50/ 0.13 ⊕		○	MH	
45											
46					34	SS	99/ 0.23 *ND*		○		
				143.35							
		END OF BOREHOLE at 46.11 m bgs		46.11							
47		NOTE :									
		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
48		2. A 32 mm diameter monitoring well (N : 4848909.83 E : 302998.01) was installed at 45.00 m depth in the sampled borehole.									
		3. An additional hole B was drilled (N : 4848907.85 E : 302996.95) to 33.54 m depth adjacent to borehole 407-019 for the 50 mm diamater monitoring well.									
49		Water level measurements :									
		Well A (Surface Elevation : 189.46 m)									
		Date / Depth (mbgs) / Elev. (m)									
		05/21/09 16.09 173.37									
		06/30/09 15.99 173.47									
		Well B (Surface Elevation : 189.46 m)									
50		*CONTINUED NEXT PAGE*									

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848909.8 ;E 302998.0

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-019

BORING DATE: May 13, 14, 15 and 19, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 6 OF 6

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖ w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION B A
50		*--- CONTINUED FROM PREVIOUS PAGE ---*									
		Date 06/30/09 Depth (mbgs) 15.63 Elev. (m) 173.83									
51											
52											
53											
54											
55											
56											
57											
58											
59											
60											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: S.H.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848873.8 ;E 302870.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-020

BORING DATE: March 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 2

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ○ wl ⊣ 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		193.56							0.14 m Sand
0	Power Auger 200 mm O.D. Hollow Stem Auger	TOPSOIL : 250 mm		0.00 / 193.31							Concrete
		Dark brown, stiff, moist, clayey silt, trace sand and gravel, trace topsoil; FILL		0.25 / 192.49	1	SS	9	⊕	○		Bentonite Seal
1		Brown, compact, moist, sandy SILT, trace clay, trace gravel; TILL (ML)		1.07 / 191.34	2	SS	14	⊕	○		
					3	SS	17	⊕	○		
2		Light brown, very stiff, moist, silty CLAY, trace sand; TILL (CL)		2.22 / 190.51	4	SS	20	ND	⊢○⊣	MH AL	
3		Grey, very dense, silty SAND; TILL (SM)		3.05 / 189.11	5	SS	93	⊕	○		04/04/09 03/19/09 05/21/09 Bentonite Grout 05/04/09
4					6	SS	85	⊕	○	MH	
		Grey, very dense, moist, sandy SILT, trace clay and gravel; TILL (np)		4.45 / 184.18	7	SS	53	⊕	○	MH	
5		Auger grinding at 5.18 m depth									
6					8	SS	81/ 0.28		○		Bentonite Seal
7											Sand
					9	SS	61		○	MH	
8											Screen
9					10	SS	88/ 0.23		○		
		END OF BOREHOLE at 9.38 m bgs		9.38							
		NOTE :									
10		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848873.8 ;E 302870.4

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-020

BORING DATE: March 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 2

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	SOIL PROFILE: STRATA PLOT	SOIL PROFILE: ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 10 20 30 40 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊖ w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		*--- CONTINUED FROM PREVIOUS PAGE ---*									
		1. Boulder encountered at 5.49 m depth. Borehole was relocated and drilled to 9.38 m 2. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test' 3. A 32 mm diameter monitoring well (N : 4848873.60 E : 302870.39) was installed at 9.12 m depth in the sampled borehole. <u>Water level measurements :</u> (Surface Elevation : 193.56 m) Date Depth (mbgs) Elev. (m) 03/19/09 3.30 190.26 04/04/09 3.20 190.36 05/04/09 3.78 189.78 05/21/09 3.36 190.20									
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4848870.3 ;E 302786.6

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-021

BORING DATE: March 6, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 1

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) / % LEL Methane	SHEAR STRENGTH Cu, kPa (nat V. / rem V.) / WATER CONTENT PERCENT (wp, w, wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		192.53							0.20 m Sand
0	Power Auger 200 mm O.D. Hollow Stem Auger	TOPSOIL : 200 mm		0.00 / 192.33							Concrete; 03/19/09; 04/04/09; Bentonite Grout; 05/21/09
		Dark brown to brown, stiff, moist, clayey silt, trace sand and gravel, trace topsoil, trace rootlets; FILL		0.20	1	SS	9				
1		Mottled brown to grey			2	SS	6			ENV	Bentonite Seal; 05/04/09; Bentonite Seal
		Brown, stiff, moist, sandy silty CLAY, trace gravel; TILL (CL)		1.52 / 191.01	3	SS	14			MH AL	
2		Brown, compact to very dense, stratified, moist, SILT and SAND, some gravel; (SM)		2.22 / 190.31	4	SS	22	ND		MH	Sand
3					5	SS	83				Screen
		Grey, dense, moist, sandy SILT, trace clay, trace gravel; TILL (np)		3.74 / 188.79	6	SS	50			MH	
4											
5				187.35	7	SS	33				
		END OF BOREHOLE at 5.18 m bgs		5.18							
6											
7											
8											
9											
10											

NOTE :

1. 407 denotes 'Highway 407 Station'
   bgs denotes 'below ground surface'
   ENV denotes 'chemical analysis'
   MH denotes 'mechanical hydrometer test'
   AL denotes 'atterburg limit test'

2. A 50 mm monitoring well (N : 4848870.30 E : 302786.64) was installed at 3.88 m depth in the sampled borehole and is protected in an above ground casing.

Water level measurements :

(Surface Elevation : 192.53 m)

Date	Depth (mbgs)	Elev. (m)
03/19/09	0.15	192.38
04/04/09	0.17	192.36
05/04/09	1.20	191.33
05/21/09	0.47	192.06

DEPTH SCALE

1 : 50

iNSPEC·SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: HIGHWAY 407 STATION

LOCATION: N 4849070.9 ;E 302748.6

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 407-022

BORING DATE: March 9, 2009

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

Toronto-York Spadina Subway Extension

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 1

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/ 0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ / % LEL Methane □	SHEAR STRENGTH Cu, kPa: nat V. + Q ● / rem V. ⊕ U ○ / WATER CONTENT PERCENT wp w wl	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		195.25							0.15 m Sand
0	Power Auger 200 mm O.D. Hollow Stem Auger	TOPSOIL : 200 mm		0.00 / 195.05							Concrete
		Dark brown, firm to stiff, moist, clayey silt, trace sand and gravel, topsoil pockets; FILL		0.20	1	SS	11	⊕			04/04/09, 03/19/09
1		Oxidized seams			2	SS	5	⊕		ENV	05/21/09, 05/04/09, Bentonite Seal
		Brown, stiff, moist, sandy silty CLAY, trace gravel; TILL (CL)		193.57 / 1.68	3	SS	11	⊕		MH AL	
2		Brown to grey, very stiff, moist, slightly plastic sandy SILT, some clay; TILL (ML)		193.03 / 2.22	4	SS	20	ND		MH AL	Sand
3		Grey, very stiff to hard, moist, sandy clayey SILT, trace gravel; TILL (CL-ML)		192.27 / 2.98	5	SS	42	⊕			Screen
4					6	SS	27	⊕		MH AL ENV	
5					7	SS	40	⊕			
				190.07 / 5.18							
6		END OF BOREHOLE at 5.18 m bgs									
7		NOTE :									
8		1. 407 denotes 'Highway 407 Station' bgs denotes 'below ground surface' ENV denotes 'chemical analysis' MH denotes 'mechanical hydrometer test' AL denotes 'atterburg limit test'									
9		2. A 50 mm monitoring well (N : 4849070.91 E : 302748.55) was installed at 5.30 m depth in the sampled borehole and is protected in an above ground casing.									
10		Water level measurements :									

(Surface Elevation : 195.25 m)

Date	Depth (mbgs)	Elev. (m)
03/19/09	0.25	195.00
04/04/09	0.24	195.01
05/04/09	1.16	194.09
05/21/09	0.67	194.58

DEPTH SCALE

1 : 50

INSPEC-SOL

LOGGED: M.R.

CHECKED: K.R.

MIS-TTC BHS 001 T040233-2.0.GPJ GAL-MISS.GDT 7/7/09 F.T.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-005

Toronto-York Spadina Subway Extension

LOCATION: N 4848640.2 ;E 303260.6

BORING DATE: May 27 to June 1, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 ⊕ / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		194.44							
0		~~80 mm TOPSOIL~~		0.00							Cement
		200 mm **SAND & GRAVEL**		0.08 / 194.16							
		Brown, stiff to very stiff, heterogeneous, moist, clayey SILT (FILL), trace topsoil, trace sand & gravel		0.28	1	50 DO	25	⊕	○		
											Bentonite
1					2	50 DO	9	⊕	○	ENV	
					3	50 DO	8	⊕	○	ENV	
2					4	50 DO	10	⊕	○		
3					5	50 DO	21	⊕	○		
4				190.24	6	50 DO	17	⊕	○ H	MH, AL	
		Brown, hard, heterogeneous, damp, sandy clayey SILT, trace gravel, TILL (CL-ML)		4.20							
5					7	50 DO	31	⊕	○	ENV	
					8	50 DO	35	⊕	○ H	MH, AL	Grout
6		brown / grey			9	50 DO	38	⊕	○		
7											
					10	50 DO	80	⊕	○ H	MH, AL	
8											
9					11	50 DO	99	⊕	○	▼ = 23.0	
				184.69 / 9.75							
10		CONTINUED NEXT PAGE									

Power Auger Boring
102 mm Solid Stem Auger May 27, 2009

MIS-TTC BHS 001 TTC TYSSE-AUG 10, 09.GPJ GAL-MISS.GDT 8/20/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: A.P.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-005

Toronto-York Spadina Subway Extension

LOCATION: N 4848640.2 ;E 303260.6

BORING DATE: May 27 to June 1, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. - + Q - ● / rem V. - ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp 10 20 30 40 wl	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger Boring	Grey, hard, massive, heterogeneous, moist, silty CLAY, some sand, trace gravel, TILL (CL)			12	50 DO	97			ENV	
11											
12					13	50 DO	80			ENV	
13											Grout
14	Power Auger Boring 102 mm Solid Stem Auger May 29, 2009				14	50 DO	82				
15					15	50 DO	66			ENV	
16											July 9, 2009 / Bentonite
17					16	50 DO	67			ENV	
18	Power Auger Boring 102 mm Solid Stem Auger May 30, 2009	Grey, very stiff, heterogeneous, damp, silty CLAY, trace sand (CL)		176.94 / 17.50	17	50 DO	18				Screen Sand
19		Grey, hard, stratified, moist, clayey SILT, trace sand (CL-ML)		175.44 / 19.00							
20					18	50 DO	49			ENV	
		CONTINUED NEXT PAGE									

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: A.P.

CHECKED: L.C./S.S.

MIS-TTC BHS 001 TTC TYSSE-AUG 10, 09.GPJ GAL-MISS.GDT 8/20/09

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-005

Toronto-York Spadina Subway Extension

LOCATION: N 4848640.2 ;E 303260.6

BORING DATE: May 27 to June 1, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. - + Q - ●, rem V. - ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp 10 20 30 40 wl	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Power Auger Boring 102 mm Solid Stem Auger May 30, 2009	Grey, hard, stratified, moist, clayey SILT, trace sand (CL-ML)			18		49				Sand
21					19	50 DO	80 ⊕				Bentonite
22		Grey, very stiff to hard, stratified, damp, silty CLAY, trace sand, contains partings of clayey silt to silt (CL)		172.44 / 22.00	20	50 DO	31 ⊕			MH, AL	
23											
24					21	50 DO	42 ⊕				
25											Grout
26					22	50 DO	38 ⊕				
27					23	50 DO	51 ⊕				
28											
29					24	50 DO	31 ⊕				
30		hard / very stiff									
		CONTINUED NEXT PAGE									

MIS-TTC BHS 001 TTC TYSSE-AUG 10, 09 GPJ GAL-MISS.GDT 8/20/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: A.P.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-005

Toronto-York Spadina Subway Extension

LOCATION: N 4848640.2 ;E 303260.6

BORING DATE: May 27 to June 1, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 100 200 300 400 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ ○w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
30		--- CONTINUED FROM PREVIOUS PAGE ---									
	Power Auger Boring / 102 mm Solid Stem Auger June 1, 2009	Grey, very stiff to hard, stratified, damp, silty CLAY, trace sand, contains partings of clayey silt to silt (CL)			25	50 DO	26 ⊕		○		
31											
32					26	50 DO	29 ⊕		○		
33											
34		hard			27	50 DO	28 ⊕		○		Grout
35					28	50 DO	38 ⊕		○		
36		Grey, very dense, massive, moist, sandy SILT, trace to some clay (np)		158.63 / 35.81	29	50 DO	50/50 mm ⊕		○		
37											
		END OF BOREHOLE 1- 50 mm dia. monitoring well installed at depth 19.96 m upon completion. 2- ENV denotes chemical analysis; MH denotes Mechanical Hydrometer test; AL denotes Atterberg Limits test		158.87 / 37.57	30	50 DO	50/75 mm ⊕		○	MH	
38		Water Level Measurements Ground Surface / Top of PVC pipe Elev. 194.44 / 194.26 m									
39		Date — W.L. Depth (m) — W.L. Elev. (m) June 4, 2009 — 11.52 — 182.90 June 9, 2009 — 16.34 — 178.10 June 11, 2009 — 15.77 — 178.67 June 16, 2009 — 16.04 — 178.41 June 24, 2009 — 17.30 — 177.14 July 9, 2009 — 15.54 — 178.90									
40											

MIS-TTC BHS 001 TTC TYSSE-AUG 10, 09.GPJ GAL-MISS.GDT 8/20/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: A.P.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-007

Toronto-York Spadina Subway Extension

LOCATION: N 4848653.7 ;E 303226.1

BORING DATE: April 29 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 / % LEL Methane 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. - + Q - ● / rem V. - ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp — w — wl 10 20 30 40	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		194.40							
0	Power Auger Boring; 102 mm Solid Stem Auger April 29, 2009	Brown, compact, damp, gravelly SAND (FILL), trace to some clay & silt		0.00	1	50 DO	18				Cement
				193.50							
1		Brown mottled with grey, firm to stiff, moist, clayey silt to silty clay (FILL), some sand to sandy, trace gravel		0.90	2	50 DO	11				
		Grey, trace rootlets and organics			3	50 DO	7				
2				192.11							
		Grey, stiff, heterogeneous, damp to moist, sandy silty CLAY, trace gravel, occasional sand seams, TILL (CL)		2.29	4	50 DO	11			MH, AL	
3					5	50 DO	8				
				190.65							
		Grey, very stiff to hard, massive, heterogeneous, moist, sandy clayey SILT, trace gravel, TILL (CL-ML)		3.75	6	50 DO	30				
4											
					7	50 DO	24				Grout July 9, 2009
5											
					8	50 DO	25			MH, AL	
6											
					9	50 DO	33			MH, AL	
7				187.24							
		Grey, hard, massive, heterogeneous, moist, sandy clayey SILT, trace gravel, TILL (CL-ML)		7.16							
					10	50 DO	56			AL	
8				185.80							
		Grey, hard, massive, heterogeneous, damp, silty CLAY, trace sand, contains occasional clayey silt to silt seams (CL)		8.60							
9					11	50 DO	62				
10		*CONTINUED NEXT PAGE*									

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

MIS-TTC BHS 001 TTC TYSSE-AUG 24_09.GPJ GAL-MISS.GDT 8/24/09

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-007

Toronto-York Spadina Subway Extension

LOCATION: N 4848653.7 ;E 303226.1

BORING DATE: April 29 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 100 200 300 400 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger Boring 102 mm Solid Stem Auger April 29, 2009	Grey, hard, massive, heterogeneous, damp, silty CLAY, trace sand, contains occasional clayey silt to silt seams (CL)			12	50 DO	93 / 250 mm			MH, AL	
11					13	50 DO	50 / 150 mm			MH, AL	Grout
12					14	50 DO	50 / 125 mm				
13											
14					15	50 DO	134			ENV γ=21.5	
15					16	50 DO	50 / 125 mm				
16					17	50 DO	50 / 150 mm			γ=21.3	3 m Screen Sand
17					18	50 DO	94 / 280 mm			MH, AL	
				176.95	19	50 DO	148			ENV γ=21.2	
		Grey, very stiff, massive, heterogeneous, damp, silty CLAY, trace sand (CH)		17.45					56		
18					20	50 DO	28			MH, AL	Bentonite
		Grey, hard, massive, heterogeneous, damp, silty CLAY, trace sand (CL)		176.20 18.20							
					21	50 DO	36			γ=19	
		Grey, hard, massive, heterogeneous, damp, clayey SILT, trace sand (CL-ML)		175.45 18.95							Grout
					22	50 DO	43			MH, AL	
				174.65 19.75							
20		*CONTINUED NEXT PAGE*			23	50 DO	28				

MIS-TTC BHS 001 TTC TYSSE-AUG 24_09.GPJ GAL-MISS.GDT 8/24/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-007

Toronto-York Spadina Subway Extension

LOCATION: N 4848653.7 ;E 303226.1

BORING DATE: April 29 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 100 200 300 400 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. - + Q - ● / rem V. - ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Power Auger, 108mm I.D. Wash Boring April 30, 2009	Grey, very stiff to hard, massive, heterogeneous, damp, silty CLAY, trace sand, contains occasional clayey silt to silt seams (CL)			23	50 DO	28 ⊕				
21					24	50 DO	43 ⊕				
					25	50 DO	49 ⊕			MH, AL	
22											
23					26	50 DO	63 ⊕				
24					27	50 DO	28 ⊕				
25											Grout
26					28	50 DO	29 ⊕				
27					29	50 DO	38 ⊕				
28											
29					30	50 DO	49 ⊕				
30		*CONTINUED NEXT PAGE*									

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-007

Toronto-York Spadina Subway Extension

LOCATION: N 4848653.7 ;E 303226.1

BORING DATE: April 29 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928)

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 ⊕ / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ ○w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
30		*--- CONTINUED FROM PREVIOUS PAGE ---*									
	Power Auger, 108mm I.D. Wash Boring April 30, 2009	Grey, very stiff to hard, massive, heterogeneous, damp, silty CLAY, trace sand, contains occasional clayey silt to silt seams (CL)			31	50 DO	30 ⊕		○		Grout
31				163.31							
		END OF BOREHOLE		31.09							
32		Notes: 1- 50 mm dia monitoring well installed at depth 17.37 m upon completion of borehole 2- ENV denotes chemical analysis; MH denotes Mechanical Hydrometer test; AL denotes Atterberg Limits test									
33		Water Level Measurements Ground Surface / Top of PVC pipe Elev. 194.40 / 194.33 m Date — W.L. Depth (m) — W.L. Elev. (m) May 15, 2009 — 1.98 — 192.42 June 9, 2009 — 2.44 — 191.96 June 11, 2009 — 2.51 — 191.89 June 16, 2009 — 7.86 — 186.54 June 24, 2009 — 6.54 — 187.86 July 2, 2009 — 5.91 — 188.49 July 9, 2009 — 5.25 — 189.15									
34											
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MIS-TTC BHS 001 TTC TYSSE-AUG 24, 09.GPJ GAL-MISS.GDT 8/24/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-008

Toronto-York Spadina Subway Extension

LOCATION: N 4848674.1 ;E 303141.6

BORING DATE: April 24 to 27, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 ⊕ / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa (nat V. - + Q - ● / rem V. - ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp ⊢ w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Boring 102 mm Solid Stem Auger April 24, 2009	GROUND SURFACE		192.39							
		150 mm **TOPSOIL**		192.24 0.00							well stick up 0.78m
		Brown, firm, moist, silty CLAY (FILL), trace topsoil & rootlets, some sand		191.72 0.15	1	50 DO	8				
1		Brown, very stiff to hard, massive, heterogeneous, damp, sandy silty CLAY, trace gravel, TILL (CL)		0.67	2	50 DO	17				
2					3	50 DO	18				
					4	50 DO	26			MH, AL	
3					5	50 DO	50 / 150 mm				
		Grey, compact, moist, sandy SILT, some clay, trace gravel, TILL (ML)		188.79 3.60	6	50 DO	10				
4		Grey, very stiff, massive, heterogeneous, damp to moist, sandy clayey SILT, trace gravel, TILL (CL-ML)		187.89 4.50	7	50 DO	22			MH, AL	
5				187.12							Grout
		Grey, very stiff to hard, massive, heterogeneous, damp, silty CLAY, trace sand (CL)		5.27	8	50 DO	51				
6					9	50 DO	85				
7					10	50 DO	76				
8					11	50 DO	90 / 280 mm				
					12	50 DO	50 / 125 mm				
9					13	50 DO	50 / 150 mm				
10					14		37				

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DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

MIS-TTC BHS 001 TTC TYSSE-AUG 10_09.GPJ GAL-MISS.GDT 8/20/09

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-008

Toronto-York Spadina Subway Extension

LOCATION: N 4848674.1 ;E 303141.6

BORING DATE: April 24 to 27, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 4

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 ⊕ / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp — w — wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger Boring 102 mm Solid Stem Auger April 24, 2009	Grey, very stiff to hard, massive, heterogeneous, damp, silty CLAY, trace sand (CL)			14	50 DO	37 ⊕				
11					15	50 DO	90 ⊕ ⊕			▼=21.5 MH, AL	
					16	50 DO	58 ⊕				
12											Grout
					17	50 DO	81 ⊕			ENV ▼=21.4	
13					18	50 DO	91 ⊕				
14	Power Auger Boring 102 mm Solid Stem Auger April 25, 2009				19	50 DO	97 ⊕			ENV ▼=21.2	
					20	50 DO	50 / 150 mm ⊕				
15											July 9, 2009
					21	50 DO	92 ⊕			▼=21.4	1.5 m Screen Sand
16					22	50 DO	28 ⊕				Bentonite
17					23	50 DO	28 ⊕			ENV ▼=16.8 MH, AL	
				174.94							
		Grey, hard, massive, heterogeneous, moist, clayey SILT, trace sand (CL-ML)		17.45							
18					24	50 DO	54 ⊕				
	Power Auger Boring 102 mm Solid Stem Auger April 27, 2009				25	50 DO	79 ⊕			MH, AL	Grout
19					26	50 DO	37 ⊕				
				172.99							
		Grey, very stiff to hard, stratified, moist, silty CLAY, contains silt seams (CL)		19.40							
20					27	50 DO	78 / 125 mm ⊕				
		CONTINUED NEXT PAGE									

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

MIS-TTC BHS 001 TTC TYSSE-AUG 10, 09.GPJ GAL-MISS.GDT 8/20/09

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-008

Toronto-York Spadina Subway Extension

LOCATION: N 4848674.1 ;E 303141.6

BORING DATE: April 24 to 27, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 ⊕ / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp W wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger, 110mm I.D. Augers Wash Boring April 27, 2009	--- CONTINUED FROM PREVIOUS PAGE --- Grey, very stiff to hard, stratified, moist, silty CLAY, contains silt seams (CL)			27	50 DO	78 / 125 mm ⊕				
21					28	50 DO	73 ⊕				
22					29	50 DO	54 ⊕				
23					30	50 DO	26 ⊕			MH, AL	
24					31	50 DO	64 ⊕				
25					32	50 DO	41 ⊕				
26					33	50 DO	48 ⊕				Grout
27					34	50 DO	28 ⊕				
28					35	50 DO	24 ⊕				
29					36	50 DO	25 ⊕				Caved-in material
30		CONTINUED NEXT PAGE									

MIS-TTC BHS 001 TTC TYSSE-AUG 10_09.GPJ GAL-MISS.GDT 8/20/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-008

Toronto-York Spadina Subway Extension

LOCATION: N 4848674.1 ;E 303141.6

BORING DATE: April 24 to 27, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928)

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 ⊕	% LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80	WATER CONTENT PERCENT wp ⊢ o^w ⊣ wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---											
30	Wash Boring April 27, 2009	Grey, very stiff to hard, stratified, moist, silty CLAY, contains silt seams (CL)		161.29	37	50 DO	58 ⊕			o			Caved-in material
31		END OF BOREHOLE		31.10									
32		Notes: 1- 50 mm dia. monitoring well installed at depth 16.1 m upon completion of borehole 2- ENV denotes chemical analysis; MH denotes Mechanical Hydrometer test; AL denotes Atterberg Limits test											
33		Water Level Measurements Ground Surface / Top of PVC pipe Elev. 192.39 / 193.17 m Date — W.L. Depth (m) — W.L. Elev. (m) May 15, 2009 — 1.16 — 191.23 May 28, 2009 — 1.83 — 190.56 June 3, 2009 — 2.22 — 190.17 June 9, 2009 — 15.13 — 177.26 June 11, 2009 — 15.06 — 177.33 June 16, 2009 — 15.02 — 177.37 June 24, 2009 — 14.96 — 177.43 July 2, 2009 — 14.87 — 177.52 July 9, 2009 — 14.76 — 177.63											
34													
35													
36													
37													
38													
39													
40													

MIS-TTC BHS 001 TTC TYSSE-AUG 10_09.GPJ GAL-MISS.GDT 8/20/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: V.I.

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-009

Toronto-York Spadina Subway Extension

LOCATION: N 4848744.3 ;E 303037.5

BORING DATE: May 28 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 1 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) / % LEL Methane	SHEAR STRENGTH Cu, kPa (nat V. - + Q - ●, rem V. - ⊕ U - ○) / WATER CONTENT PERCENT (wp, w, wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger Boring; 102 mm Solid Stem Auger May 28, 2009	GROUND SURFACE		192.61							
		100 mm TOPSOIL		0.00							
		Dark brown, firm to hard, moist, sandy silty CLAY (FILL), trace gravel		0.10	1	50 DO	37				Cement
1					2	50 DO	12				Bento
2					3	50 DO	6			MH	
				190.52							
		Brown, stiff to very stiff, massive, heterogeneous, moist to damp, sandy clayey SILT, trace to some gravel, TILL (CL-ML)		2.29	4	50 DO	14				
3					5	50 DO	27				July 9, 2009
		brown / grey			6	50	50 / mm Initial				
4				188.56							
		Grey, very dense, massive, heterogeneous, sandy SILT, some clay, trace gravel, TILL (ML)		4.25	7	50 DO	50 / 100 mm			MH, AL	
5				187.71							
		Grey, hard, massive, heterogeneous, moist to damp, sandy clayey SILT, trace to some gravel, TILL (CL-ML)		5.10	8	50 DO	50 / 75 mm				
6					9	50 DO	50 / 75 mm				Grout
				185.91							July 9, 2009
7		Grey, hard, massive, damp to moist, heterogeneous, silty CLAY, trace sand, trace gravel (CL)		6.90							
8					10	50 DO	40			MH, AL	
9					11	50 DO	82				
10					12		70				

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DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: T.W

CHECKED: L.C./S.S.

MIS-TTC BHS 001 TTC TYSSE-AUG 24, 09.GPJ GAL-MISS.GDT 8/24/09

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-009

Toronto-York Spadina Subway Extension

LOCATION: N 4848744.3 ;E 303037.5

BORING DATE: May 28 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 2 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) 100 200 300 400 ⊕ / % LEL Methane □	SHEAR STRENGTH Cu, kPa (net V. - + Q - ●; rem V. - ⊕ U - ○) 20 40 60 80 / WATER CONTENT PERCENT wp w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
10	Power Auger Boring; 102 mm Solid Stem Auger May 29, 2009	Grey, hard, massive, damp to moist, heterogeneous, silty CLAY, trace sand, trace gravel (CL)			12	50 DO	70			ENV	
11					13	50 DO	92 / 280 mm			ψ = 21.2	
12					14	50 DO	90 / 280 mm				Grout
13					15	50 DO	80			ENV ψ = 21.2	
14					16	50 DO	50 / 150 mm				Bentonite
15					17	50 DO	50 / 125 mm			ψ = 21.4 MH, AL	
16					18	50 DO	50 / 110 mm				
17		contains clayey silt to silt seams and partings from 17.0 m to 29.6 m BGL			19	50 DO	50 / 110 mm			ψ = 21.5 ENV	Screen Sand
18					20	50 DO	31				
19					21	50 DO	41			ψ = 18.8	
					22	50 DO	50 / 50 mm Initial			ENV	
					23	50 DO	50 / 140 mm			AL	Bentonite
20					24	50 DO	78				
		CONTINUED NEXT PAGE									

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: T.W

CHECKED: L.C./S.S.

MIS-TTC BHS 001 TTC TYSSE-AUG 24, 09.GPJ GAL-MISS.GDT 8/24/09

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-009

Toronto-York Spadina Subway Extension

LOCATION: N 4848744.3 ;E 303037.5

BORING DATE: May 28 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 3 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 100 200 300 400 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp W wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		--- CONTINUED FROM PREVIOUS PAGE ---									
20	Power Auger Boring 102 mm Solid Stem Auger May 29, 2009	Grey, hard, massive, damp to moist, heterogeneous, silty CLAY, trace sand, trace gravel (CL)			24	50 DO	78	⊕	○		
21											
22					25	50 DO	50	⊕	○	ENV	
23					26	50 DO	93 / 285 mm	⊕	○	MH	
24	Power Auger, 108mm I.D. Rotary Mud Drilling (Wash Boring) May 30, 2009										
25					27	50 DO	50	⊕	○	ENV	Bentonite
26		contains pockets of sand at 26.3 m BGL			28	50 DO	62	⊕	○		
27											
28					29	50 DO	58	⊕	○		
29					30	50 DO	31	⊕	⊢○	MH, AL	
		END OF BOREHOLE		163.24 / 29.57							
30		Notes: 1- 50 mm dia. monitoring well installed at									
		CONTINUED NEXT PAGE									

MIS-TTC BHS 001 TTC TYSSE-AUG 24, 09.GPJ GAL-MISS.GDT 8/24/09

DEPTH SCALE 1 : 50

coffey geotechnics

LOGGED: T.W

CHECKED: L.C./S.S.

PROJECT: TYSSE Twin Tunnels

RECORD OF BOREHOLE: T407-009

Toronto-York Spadina Subway Extension

LOCATION: N 4848744.3 ;E 303037.5

BORING DATE: May 28 to 30, 2009

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DATUM: City of Toronto (CGVD 1928) SHEET 4 OF 4

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	ORGANIC VAPOUR READINGS (ppm) ⊕ 100 200 300 400 / % LEL Methane □ 100 200 300 400	SHEAR STRENGTH Cu, kPa nat V. - + Q - ● rem V. - ⊕ U - ○ 20 40 60 80 / WATER CONTENT PERCENT wp O w wl 10 20 30 40	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
30		--- CONTINUED FROM PREVIOUS PAGE ---									
		depth 17.07 m upon completion. 2- 50mm dia. monitoring well installed at 13.03 m depth in adjacent borehole 1.0 m north of T407-009. 3- ENV denotes chemical analysis; MH denotes Mechanical Hydrometer test; AL denotes Atterberg Limits test.									
31		Water Level Measurements Deep Monitoring Well Date W.L. Depth (m) W.L. Elev. (m) June 4, 2009 3.89 188.92 June 11, 2009 8.10 184.71 June 16, 2009 6.83 185.98 June 24, 2009 6.28 186.53 July 2, 2009 6.00 186.81 July 9, 2009 5.95 186.86									
32		Water Level Measurements Shallow Monitoring Well Date W.L. Depth (m) W.L. Elev. (m) June 9, 2009 11.61 181.20 June 11, 2009 10.31 182.50 June 16, 2009 4.14 188.67 June 24, 2009 3.07 189.74 July 2, 2009 3.12 189.69 July 9, 2009 3.28 189.53									
33											
34											
35											
36											
37											
38											
39											
40											

DEPTH SCALE
1 : 50

coffey geotechnics

LOGGED: T.W
CHECKED: L.C./S.S.

MIS-TTC BHS 001 TTC TYSSE-AUG 24, 09.GPJ GAL-MISS.GDT 8/24/09