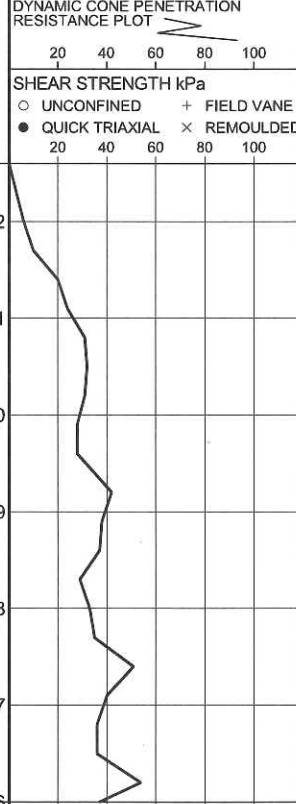
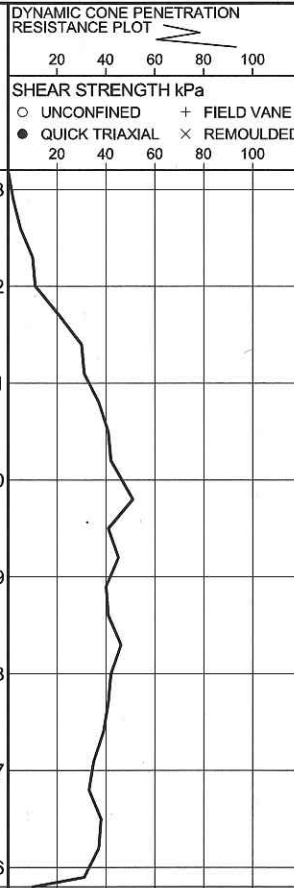


PROJECT <u>11-1191-0007</u>		RECORD OF DCPT No H1-DC5		1 OF 1 METRIC	
G.W.P. <u>156-98-00</u>	LOCATION <u>N 5136086.8; E 273276.3</u>	ORIGINATED BY <u>GM</u>			
DIST <u> </u> HWY <u>17</u>	BOREHOLE TYPE <u>Dynamic Cone Penetration Test</u>	COMPILED BY <u>EC</u>			
DATUM <u>Geodetic</u>	DATE <u>April 21, 2012</u>	CHECKED BY <u>SEMP</u>			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT <div><div>20406080100</div></div>	PLASTIC LIMIT w _p <div>NATURAL MOISTURE CONTENT w</div> LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
242.6 0.0	GROUND SURFACE										
236.0 6.6	END OF DCPT REFUSAL TO FURTHER PENETRATION (HAMMER BOUNCING)										

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

PROJECT 11-1191-0007		RECORD OF DCPT No H1-DC6				1 OF 1 METRIC							
G.W.P. 156-98-00		LOCATION N 5136117.6; E 273321.3				ORIGINATED BY GM							
DIST _____ HWY 17		BOREHOLE TYPE Dynamic Cone Penetration Test				COMPILED BY EC							
DATUM Geodetic		DATE April 21, 2012				CHECKED BY SEMP							
SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE									"N" VALUES
243.2 0.0	GROUND SURFACE						<div style="text-align: center;">  </div>						
235.8 7.4	END OF DCPT REFUSAL TO FURTHER PENETRATION (HAMMER BOUNCING)												

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

PROJECT 11-1191-0007		RECORD OF DCPT No H1-DC7				1 OF 1 METRIC													
G.W.P. 156-98-00		LOCATION N 5136047.6; E 273024.2				ORIGINATED BY GM													
DIST HWY 17		BOREHOLE TYPE Dynamic Cone Penetration Test				COMPILED BY EC													
DATUM Geodetic		DATE May 23, 2012				CHECKED BY SEMP													
SOIL PROFILE			SAMPLES			DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT			REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × REMOULDED			W _p W W _L WATER CONTENT (%)			γ kN/m ³			GR SA SI CL		
241.2 0.0	GROUND SURFACE						241												
							240												
							239												
							238												
							237												
							236												
234.6 6.6	END OF DCPT REFUSAL TO FURTHER PENETRATION (HAMMER BOUNCING)						235												

SUD-MTO-001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



SSUD-MTO 001 11-1191-0007.GPJ GAL-MISS,GDT 17/03/14 DATA INPUT:

Continued Next Page

+ 3, × 3: Numbers refer to Sensitivity

○ 3% STRAIN AT FAILURE

PROJECT <u>11-1191-0007</u>		RECORD OF DCPT No H1-DC8		2 OF 2 METRIC	
G.W.P. <u>156-98-00</u>		LOCATION <u>N 5136028.9; E 273076.0</u>		ORIGINATED BY <u>AC</u>	
DIST <u> </u> HWY <u>17</u>		BOREHOLE TYPE <u>Dynamic Cone Penetration Test</u>		COMPILED BY <u>EC</u>	
DATUM <u>Geodetic</u>		DATE <u>May 31, 2012</u>		CHECKED BY <u>SEMP</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)	
								○ UNCONFINED	+ FIELD VANE							
--- CONTINUED FROM PREVIOUS PAGE ---						● QUICK TRIAXIAL	× REMOULDED									
							20 40 60 80 100			20 40 60						
							226									
							225									
							224									
							223									
							222									
							221									
220.2																
21.0	END OF DCPT REFUSAL TO FURTHER PENETRATION (100 Blows / 0.30 m)															

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>11-1191-0007</u>		RECORD OF DCPT No H1-DC9		1 OF 2 METRIC	
G.W.P. <u>156-98-00</u>	LOCATION <u>N 5136056.1; E 273123.9</u>	ORIGINATED BY <u>AC</u>			
DIST <u> </u> HWY <u>17</u>	BOREHOLE TYPE <u>Dynamic Cone Penetration Test</u>	COMPILED BY <u>EC</u>			
DATUM <u>Geodetic</u>	DATE <u>May 31, 2012</u>	CHECKED BY <u>SEMP</u>			

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa	W _p	W	W _L		
241.3 0.0	GROUND SURFACE						<div style="display: flex; justify-content: space-between; font-size: small;"> 20 40 60 80 100 20 40 60 80 100 </div> <div style="display: flex; justify-content: space-between; font-size: x-small;"> ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x REMOULDED </div>						
241													
240													
239													
238													
237													
236													
235													
234													
233													
232													
231													
230													
229													
228													
227													

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

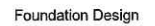
Continued Next Page

+ 3, x 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT <u>11-1191-0007</u>		RECORD OF DCPT No H1-DC9		2 OF 2 METRIC	
G.W.P. <u>156-98-00</u>		LOCATION <u>N 5136056.1; E 273123.9</u>		ORIGINATED BY <u>AC</u>	
DIST <u> </u> HWY <u>17</u>		BOREHOLE TYPE <u>Dynamic Cone Penetration Test</u>		COMPILED BY <u>EC</u>	
DATUM <u>Geodetic</u>		DATE <u>May 31, 2012</u>		CHECKED BY <u>SEMP</u>	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × REMOULDED	WATER CONTENT (%)					
--- CONTINUED FROM PREVIOUS PAGE ---								20 40 60 80 100	20 40 60					
							226							
							225							
							224							
							223							
							222							
							221							
220.3														
21.0	END OF DCPT REFUSAL TO FURTHER PENETRATION (100 Blows / 0.30)													

SUD-MTO 001 11-1191-0007.GPJ CAL-MISS.GDT 17/03/14 DATA INPUT:

1 OF 2 **METRIC**

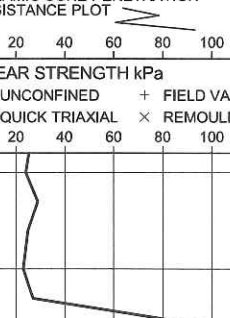
— CHECKED BY — SEMP

Continued Next Page

☐ 3% STRAIN AT FAILURE

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:

PROJECT <u>11-1191-0007</u>		RECORD OF DCPT No H1-DC10		2 OF 2 METRIC	
G.W.P. <u>156-98-00</u>	LOCATION <u>N 5136037.5; E 273175.7</u>	ORIGINATED BY <u>ID</u>			
DIST <u> </u> HWY <u>17</u>	BOREHOLE TYPE <u>Dynamic Cone Penetration Test</u>	COMPILED BY <u>EC</u>			
DATUM <u>Geodetic</u>	DATE <u>October 23, 2012</u>	CHECKED BY <u>SEMP</u>			

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT <div style="text-align: center;">  </div>	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
	— CONTINUED FROM PREVIOUS PAGE —												
224.4							226						
16.8	END OF DCPT REFUSAL TO FURTHER PENETRATION (HAMMER BOUNCING)						225						

SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



+ 3, × 3: Numbers refer to Sensitivity ○ 3% STRAIN AT FAILURE

PROJECT 11-1191-0007

RECORD OF DCPT No H1-DC12

1 OF 1 **METRIC**

G.W.P. 156-98-00

LOCATION N 5136081.2; E 273327.9

ORIGINATED BY GM

DIST HWY 17

BOREHOLE TYPE Dynamic Cone Penetration Test

COMPILED BY EC

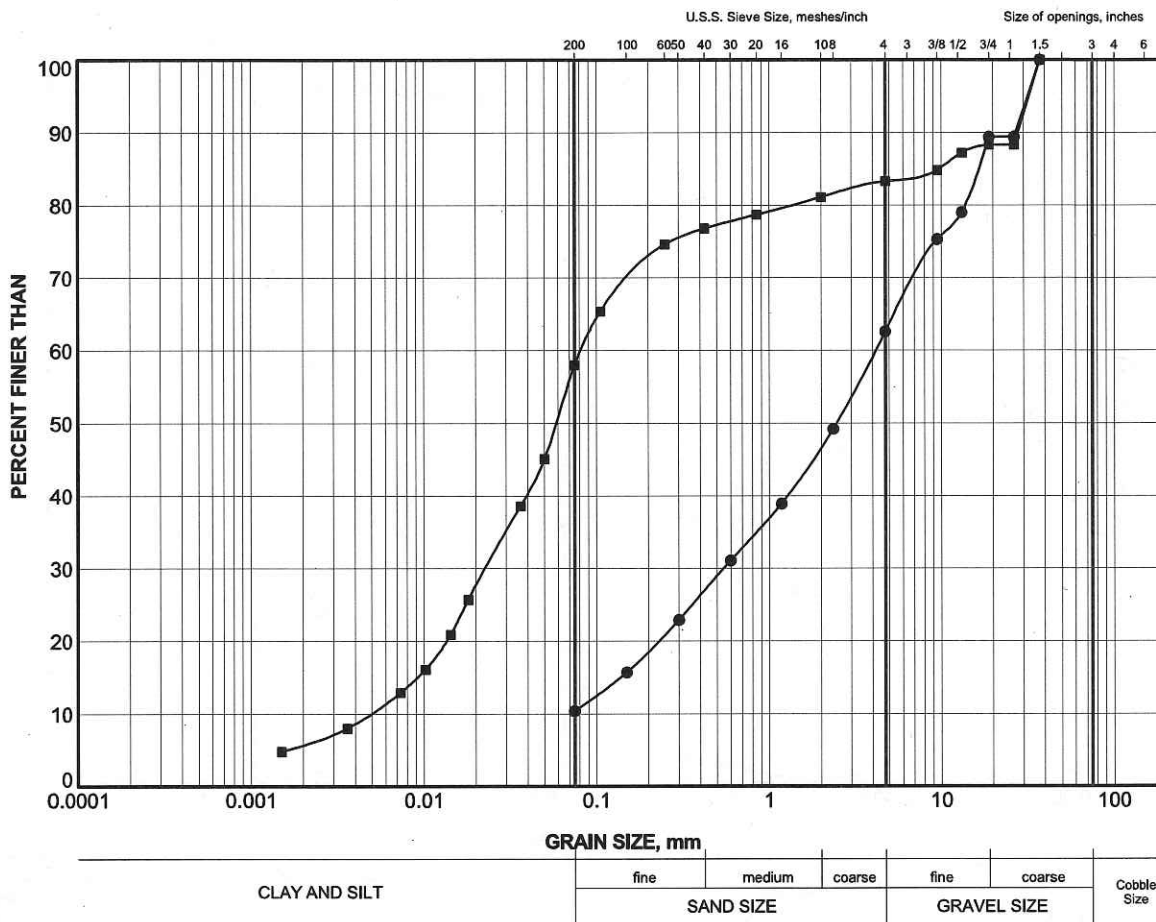
DATUM Geodetic

DATE April 26, 2012

CHECKED BY SEMP


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								
241.2 0.0	GROUND SURFACE												
							241						
							240						
							239						
							238						
							237						
							236						
							235						
							234						
							233						
							232						
							231						
230.9 10.3	END OF DCPT REFUSAL TO FURTHER PENETRATION (HAMMER BOUNCING)												

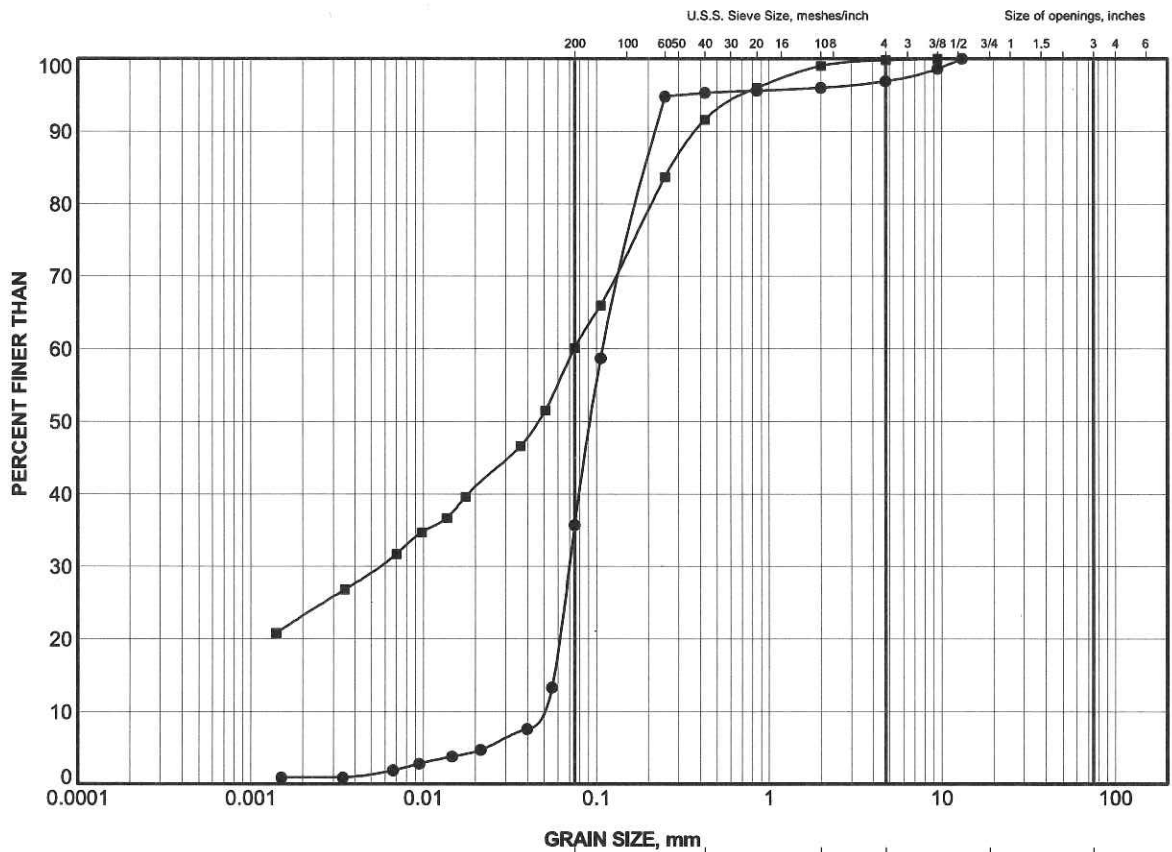
SUD-MTO 001 11-1191-0007.GPJ GAL-MISS.GDT 17/03/14 DATA INPUT:



LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-3	2	245.5
■	H1-8	4	242.4


PROJECT					
HIGHWAY 17					
TITLE					
GRAIN SIZE DISTRIBUTION SAND and GRAVEL to SANDY SILT (FILL)					
PROJECT No.		11-1191-0007		FILE No. 11-1191-0007.GPJ	
DRAWN	JJL	Jun 2015	SCALE	N/A	REV.
CHECK	SEMP	Jun 2015			
APPR		Jun 2015			
 Golder Associates SUDBURY, ONTARIO			FIGURE A1		

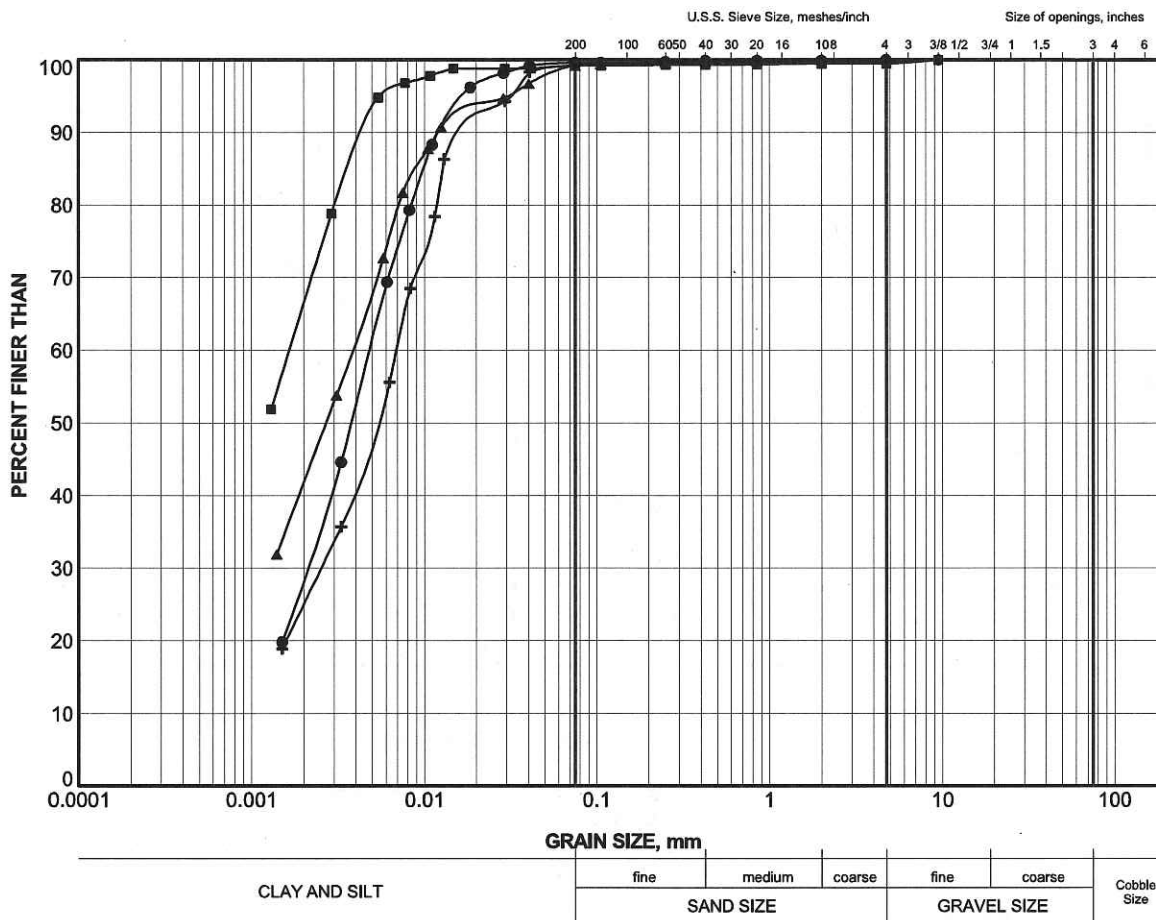


CLAY AND SILT						Cobble Size
	fine	medium	coarse	fine	coarse	
	SAND SIZE			GRAVEL SIZE		

LEGEND


SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-3	7	241.3
■	H1-7	6	239.6

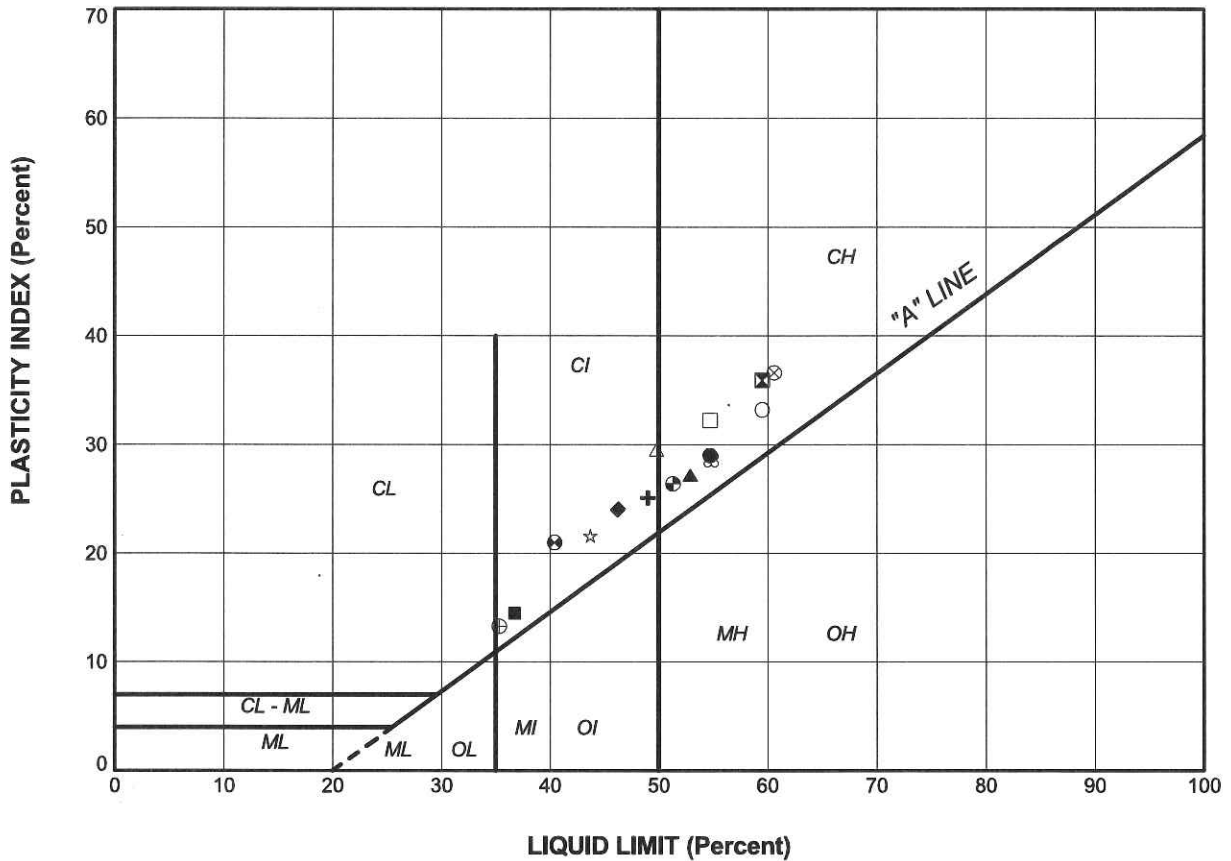
PROJECT						HIGHWAY 17					
TITLE						GRAIN SIZE DISTRIBUTION SAND and SILT					
PROJECT No.			11-1191-0007			FILE No.			11-1191-0007.GPJ		
DRAWN		JJL		Mar 2014		SCALE		N/A		REV.	
CHECK		SEMP		Mar 2014		FIGURE A2					
APPR				Mar 2014							
 Golder Associates SUDBURY, ONTARIO											



LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-7	10	233.5
■	H1-8	7	236.4
▲	H1-11	2	242.1
+	H1-14	5	240.4

PROJECT					
HIGHWAY 17					
TITLE					
GRAIN SIZE DISTRIBUTION					
SILTY CLAY to CLAY					
PROJECT No.		11-1191-0007		FILE No. 11-1191-0007.GPJ	
DRAWN	JUL	Mar 2014	SCALE	N/A	REV.
CHECK	SEMP	Mar 2014			
APPR		Mar 2014			
 Golder Associates SUDBURY, ONTARIO			FIGURE A3		



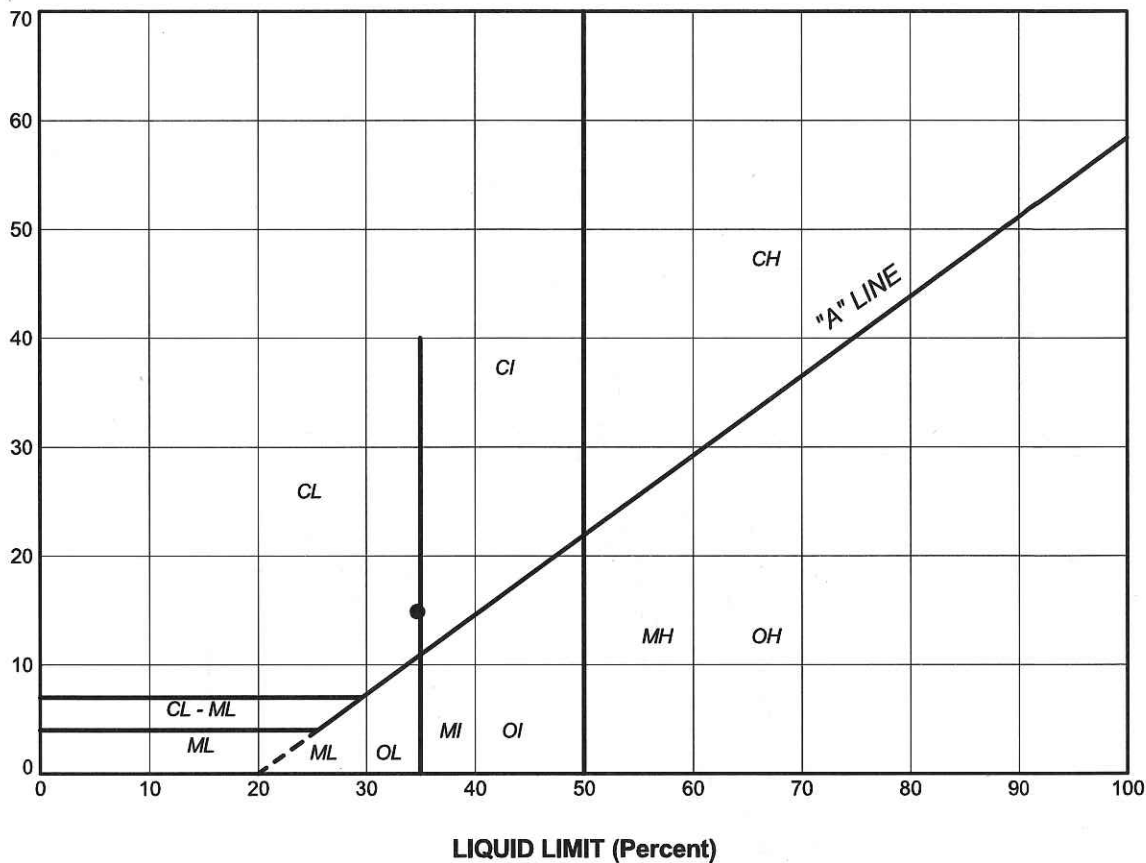
LEGEND

SYMBOL	BOREHOLE	SAMPLE	LL(%)	PL(%)	PI
●	C1-1	1	54.7	25.7	29.0
■	C1-1	5	36.7	22.2	14.5
▲	C1-2	2	52.9	25.7	27.2
+	C1-2	5	49.0	23.9	25.1
◆	C1-3	2	46.3	22.2	24.1
◇	C1-3	5	46.2	22.2	24.0
○	H1-5	7	59.5	26.3	33.2
△	H1-6	4	49.8	20.3	29.5
⊗	H1-7	7	60.6	24.0	36.6
⊕	H1-7	10	35.3	22.0	13.3
□	H1-8	7	54.7	22.5	32.2
⊗	H1-9	4	40.4	19.4	21.0
⊕	H1-9	6	51.3	24.9	26.4
*	H1-13	3	43.7	22.1	21.6
⊗	H1-14	2	54.8	26.2	28.6
⊗	H1-15	3	59.5	23.6	35.9

PROJECT					
HIGHWAY 17					
TITLE					
PLASTICITY CHART					
SILTY CLAY to CLAY					
PROJECT No.		11-1191-0007		FILE No. 11-1191-0007.GPJ	
DRAWN	JJL	Mar 2014	SCALE	N/A	REV.
CHECK	SEMP	Mar 2014	FIGURE A4		
APPR		Mar 2014			



PLASTICITY INDEX (Percent)




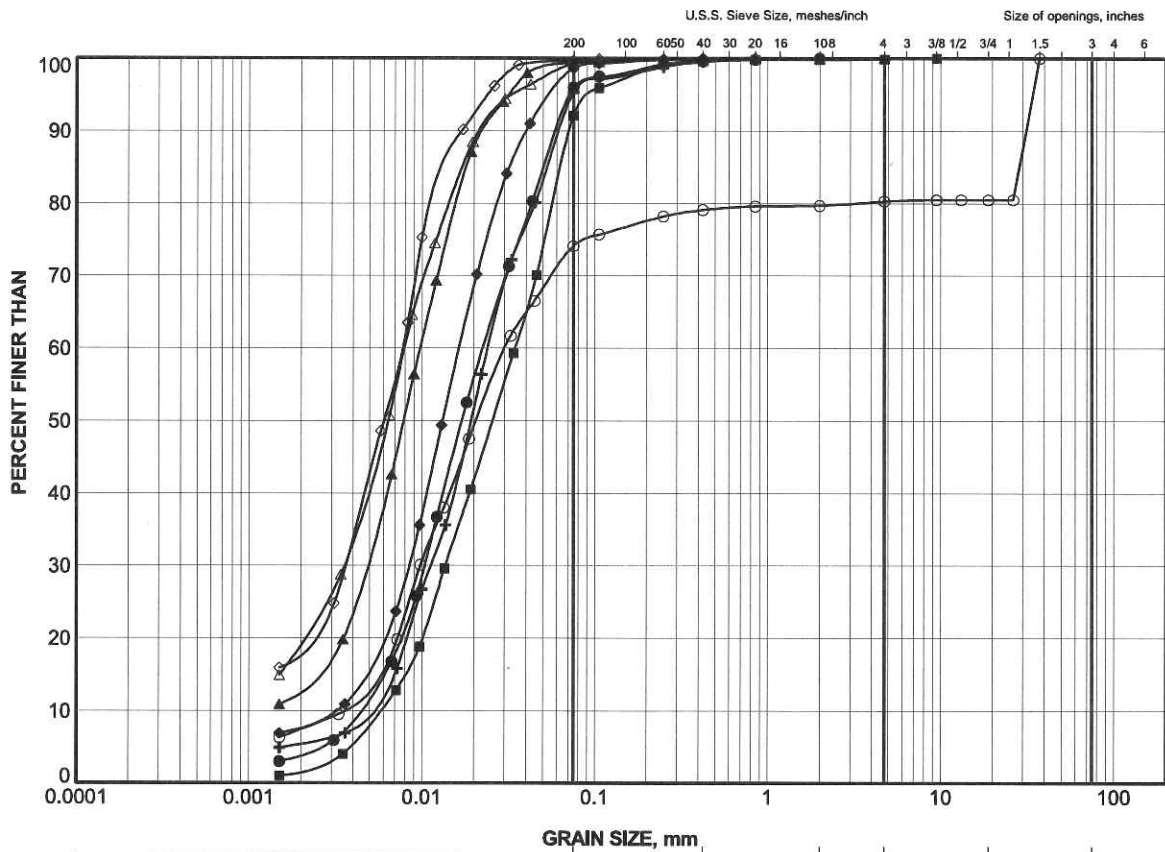
SOIL TYPE
 C = Clay
 M = Silt
 O = Organic

PLASTICITY
 L = Low
 I = Intermediate
 H = High

LEGEND

SYMBOL	BOREHOLE	SAMPLE	LL(%)	PL(%)	PI
●	H1-6	7	34.7	19.8	14.9

PROJECT					HIGHWAY 17				
TITLE					PLASTICITY CHART CLAYEY SILT				
PROJECT No.		11-1191-0007		FILE No.		11-1191-0007.GPJ			
DRAWN	JJL	Mar 2014		SCALE	N/A		REV.		
CHECK	SEMP	Mar 2014		FIGURE A5					
APPR		Mar 2014							
 Golder Associates SUDBURY, ONTARIO									



CLAY AND SILT

fine

medium

coarse

fine

coarse

Cobble Size

SAND SIZE

GRAVEL SIZE

LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	C1-1	8	233.8
■	C1-2	7	235.8
▲	H1-5	9	232.3
+	H1-7	12	230.5
◆	H1-8	10	231.8
◇	H1-9	8	233.3
○	H1-11	5	239.8
△	H1-12	5	240.0

PROJECT

HIGHWAY 17

TITLE

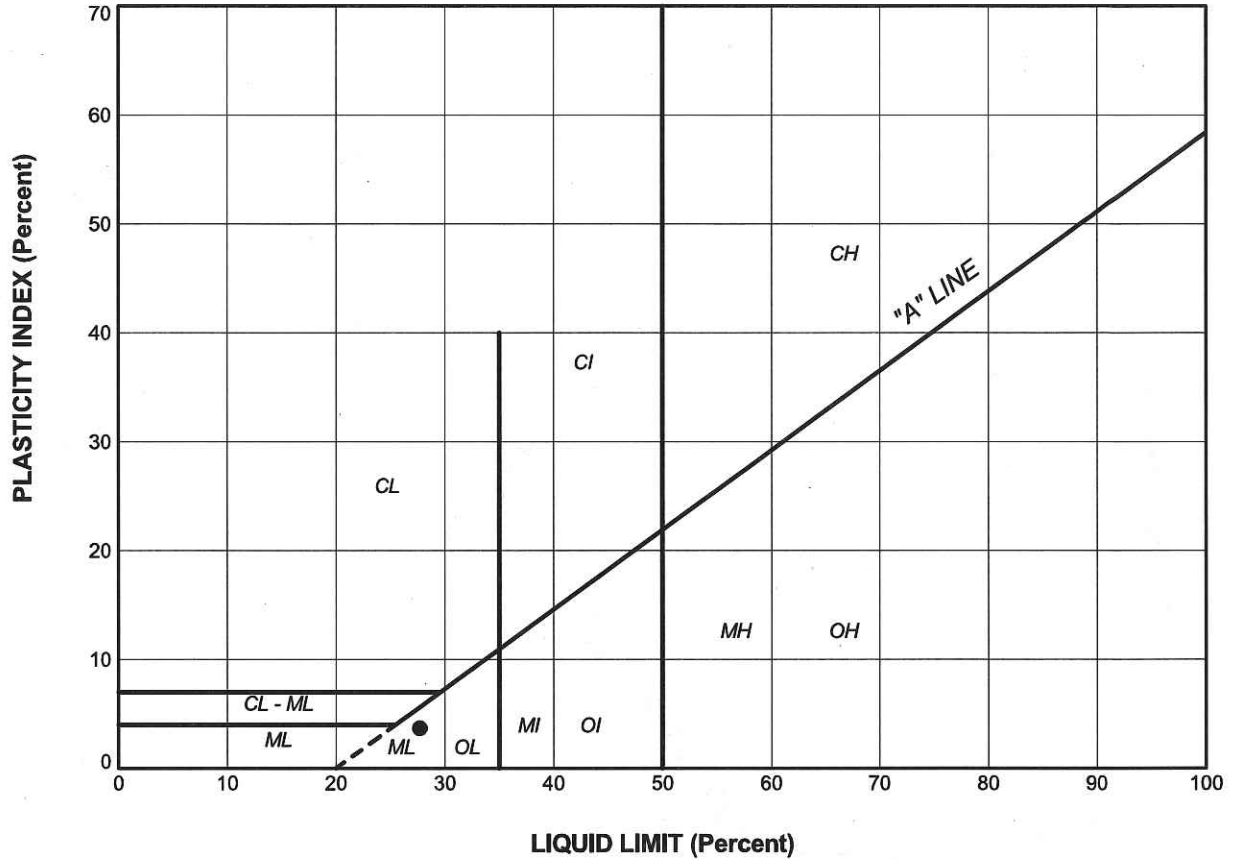
GRAIN SIZE DISTRIBUTION

SILT




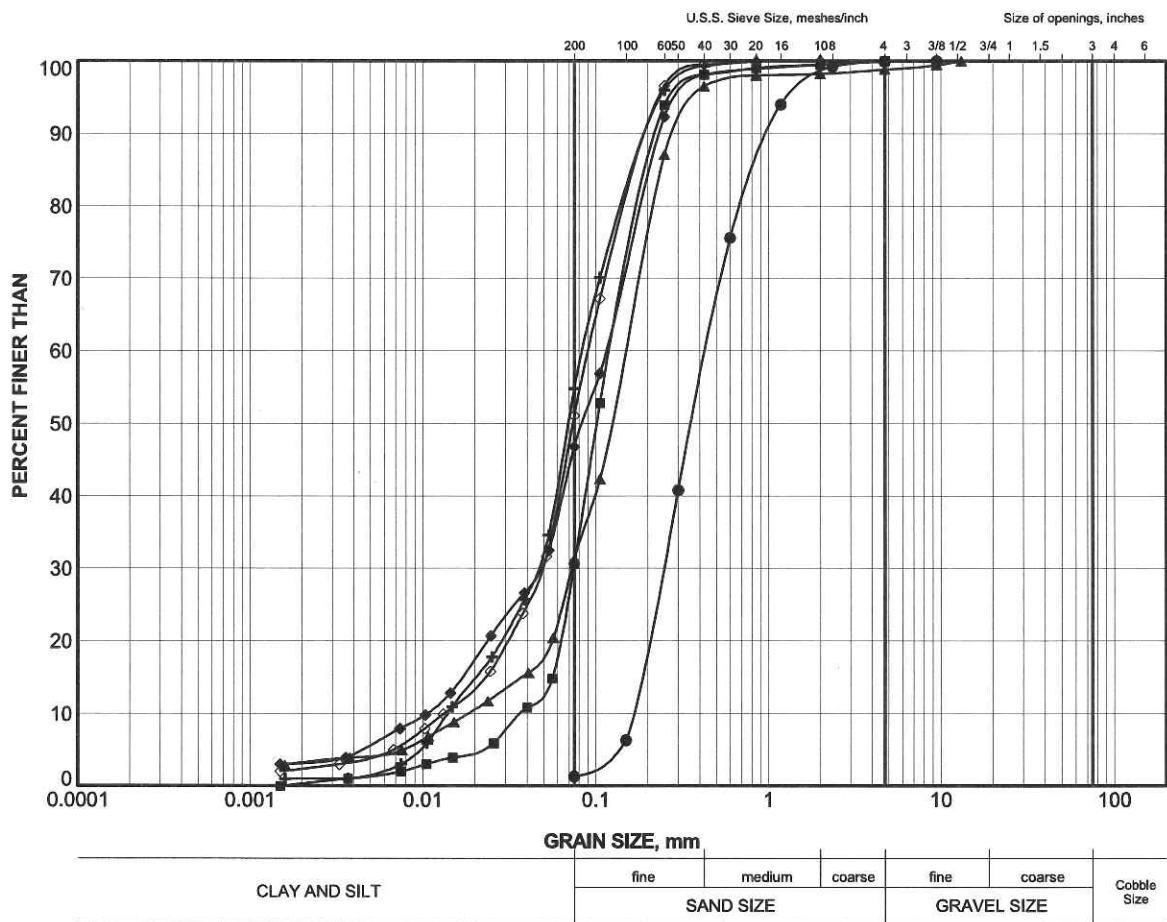
PROJECT No.	11-1191-0007	FILE No.	11-1191-0007.GPJ
DRAWN	JJL	Mar 2014	SCALE N/A REV.
CHECK	SEMP	Mar 2014	
APPR		Mar 2014	

FIGURE A6



SUD-MTO PL (NEW) GLDR LDN.GDT

PROJECT				
HIGHWAY 17				
TITLE				
PLASTICITY CHART				
SILT				
PROJECT No.		11-1191-0007		FILE No.
DRAWN		JJL	Mar 2014	SCALE N/A
CHECK		SEMP	Mar 2014	REV.
APPR			Mar 2014	
 Golder Associates SUDBURY, ONTARIO		FIGURE A7		

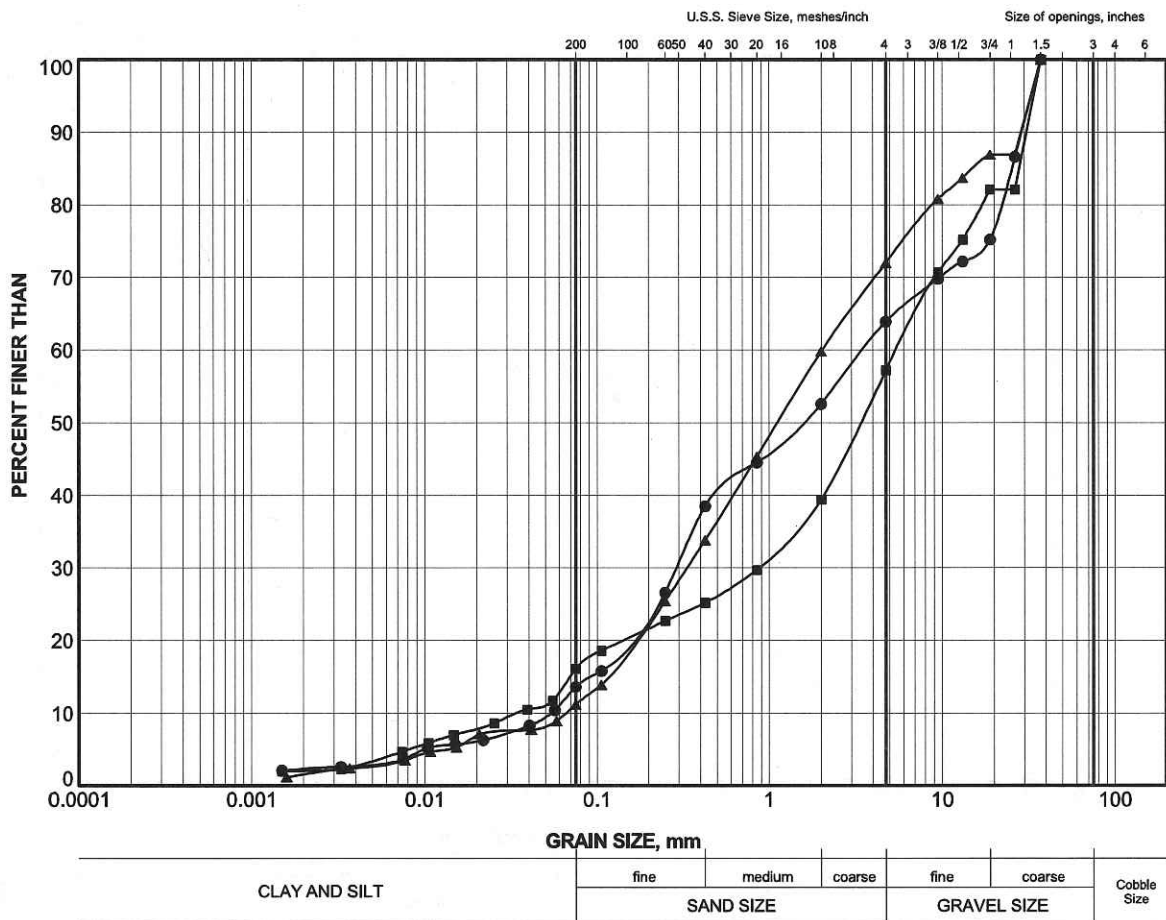


LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	C1-3	9	232.1
■	H1-5	12	227.7
▲	H1-6	12	225.8
+	H1-7	14	227.4
◆	H1-8	13	227.2
◇	H1-9	10	230.3


PROJECT					
HIGHWAY 17					
TITLE					
GRAIN SIZE DISTRIBUTION					
SAND and SILT to SAND					
PROJECT No.		11-1191-0007		FILE No. 11-1191-0007.GPJ	
DRAWN	JJL	Mar 2014	SCALE	N/A	REV.
CHECK	SEMP	Mar 2014	FIGURE A8		
APPR		Mar 2014			

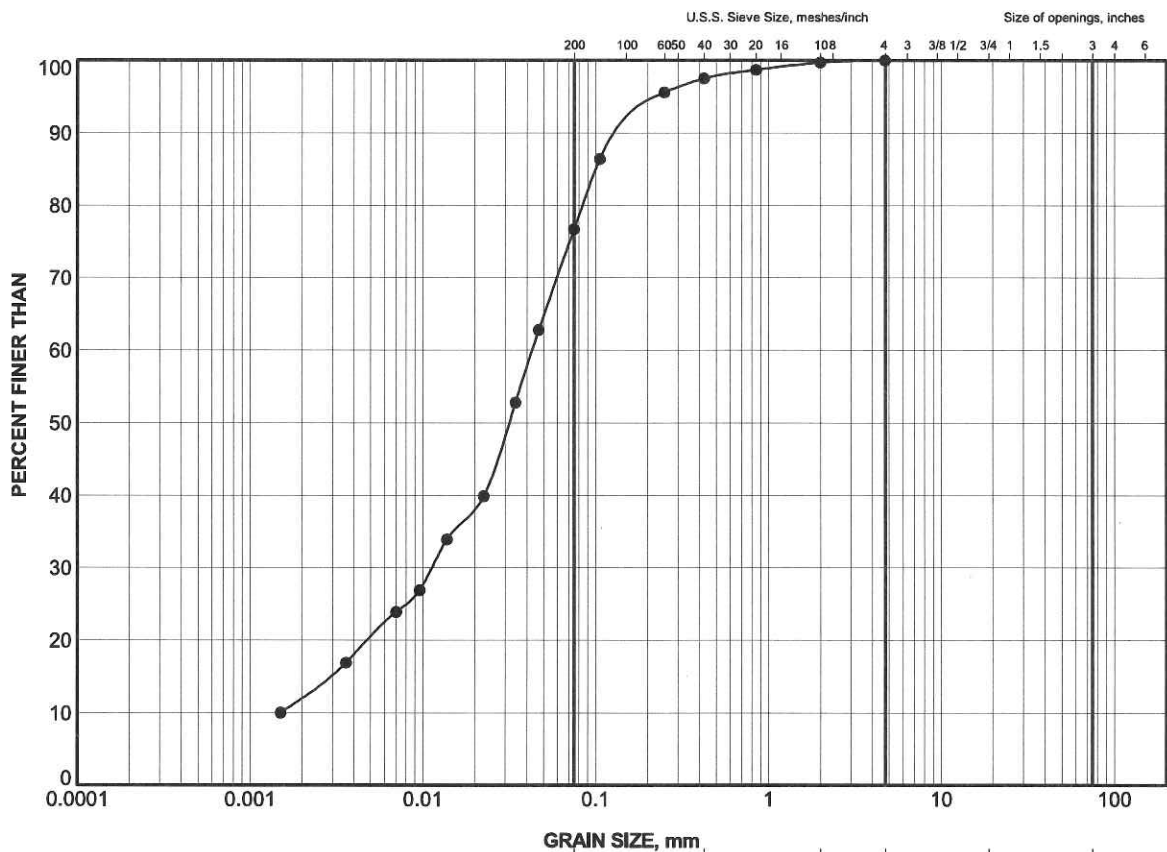




LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-11	8	236.8
■	H1-13	7	236.8
▲	H1-15	8	236.7

PROJECT					
HIGHWAY 17					
TITLE					
GRAIN SIZE DISTRIBUTION					
SAND to SAND and GRAVEL					
PROJECT No.		11-1191-0007		FILE No.	
DRAWN		JUL		Mar 2014	
CHECK		SEMP		Mar 2014	
APPR				Mar 2014	
 Golder Associates SUDBURY, ONTARIO				SCALE N/A REV.	
FIGURE A9					



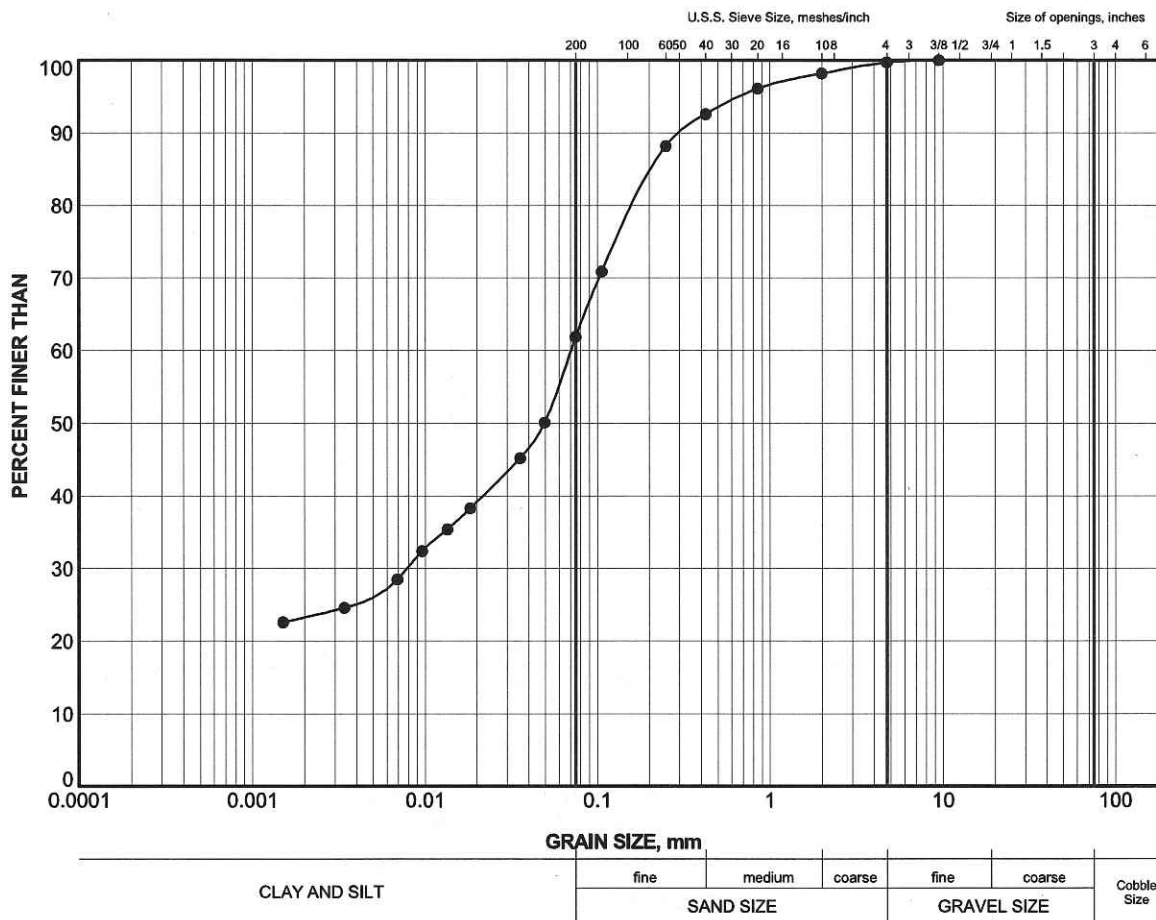
GRAIN SIZE, mm				
CLAY AND SILT		fine	medium	coarse
		SAND SIZE		fine
				coarse
		GRAVEL SIZE		Cobble Size

LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-18	2b	240.2


PROJECT					HIGHWAY 17				
TITLE					GRAIN SIZE DISTRIBUTION SANDY SILT				
PROJECT No.			11-1191-0007		FILE No.			11-1191-0007.GPJ	
DRAWN	JJL	Mar 2014	SCALE	N/A	REV.				
CHECK	SEMP	Mar 2014	FIGURE A10						
APPR		Mar 2014							

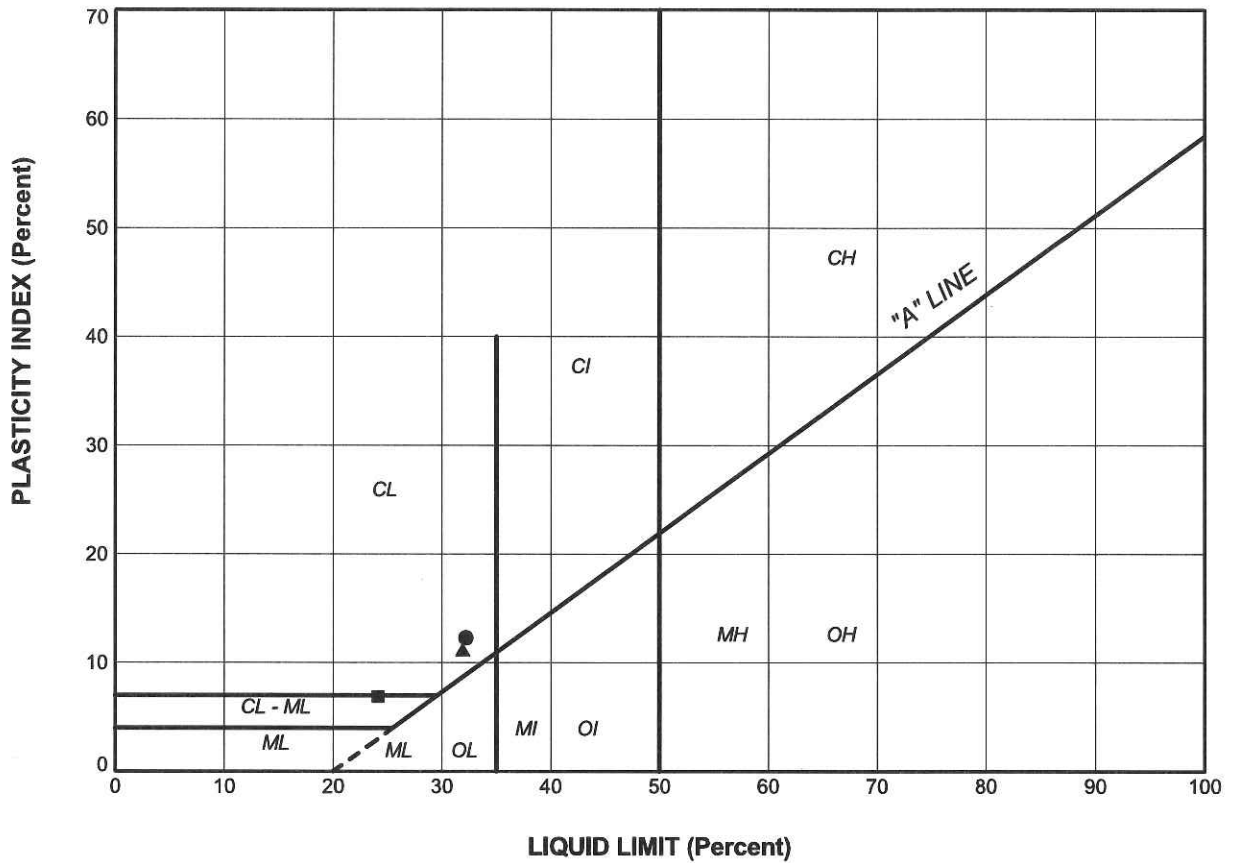




LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-23	3	239.5

PROJECT				
HIGHWAY 17				
TITLE				
GRAIN SIZE DISTRIBUTION				
CLAYEY SILT to SILT				
PROJECT No.		11-1191-0007		FILE No.
DRAWN		JUL	Mar 2014	SCALE
CHECK		SEMP	Mar 2014	N/A
APPR			Mar 2014	REV.
 Golder Associates SUDBURY, ONTARIO				FIGURE A11




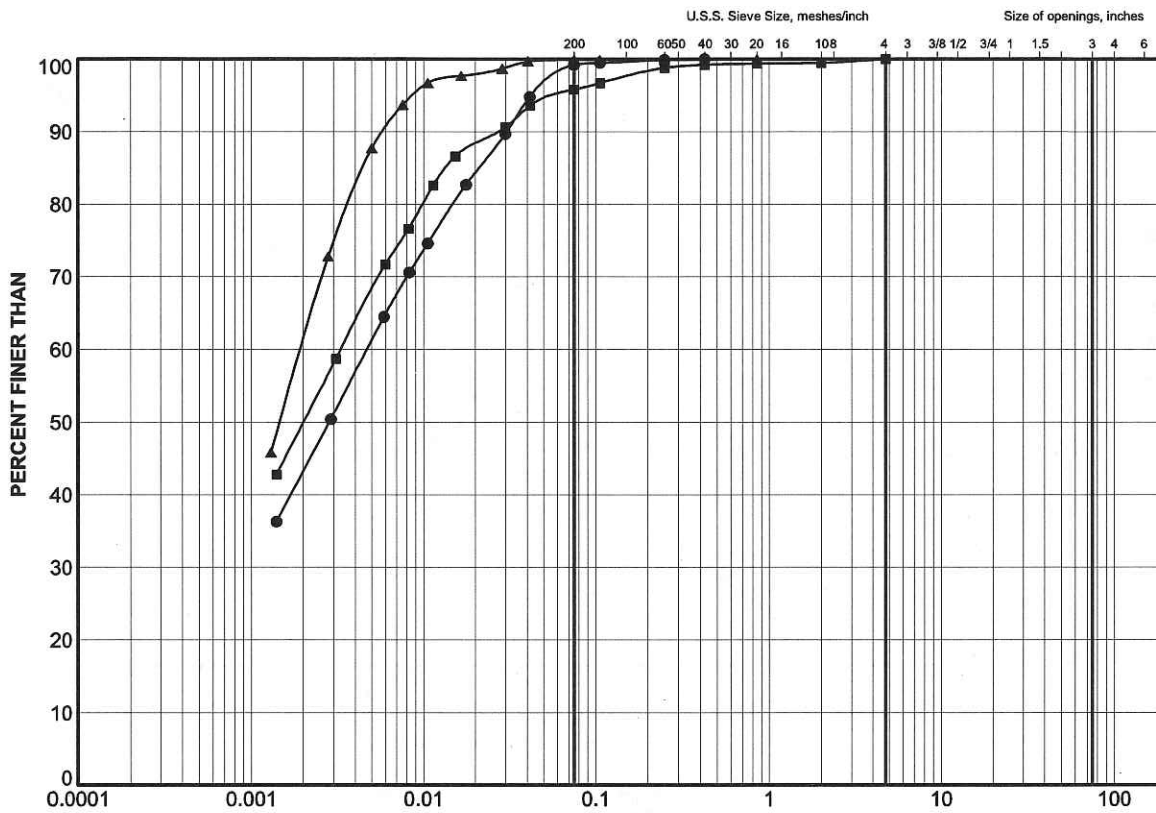
SOIL TYPE
 C = Clay
 M = Silt
 O = Organic

PLASTICITY
 L = Low
 I = Intermediate
 H = High

LEGEND

SYMBOL	BOREHOLE	SAMPLE	LL(%)	PL(%)	PI
●	H1-17	2B	32.2	19.9	12.3
■	H1-23	3	24.1	17.2	6.9
▲	H1-25	3	31.9	20.7	11.2


PROJECT					
HIGHWAY 17					
TITLE					
PLASTICITY CHART					
CLAYEY SILT to SILT					
PROJECT No.		11-1191-0007		FILE No. 11-1191-0007.GPJ	
DRAWN	JJL	Mar 2014	SCALE	N/A	REV.
CHECK	SEMP	Mar 2014			
APPR		Mar 2014			
 Golder Associates SUDBURY, ONTARIO			FIGURE A12		

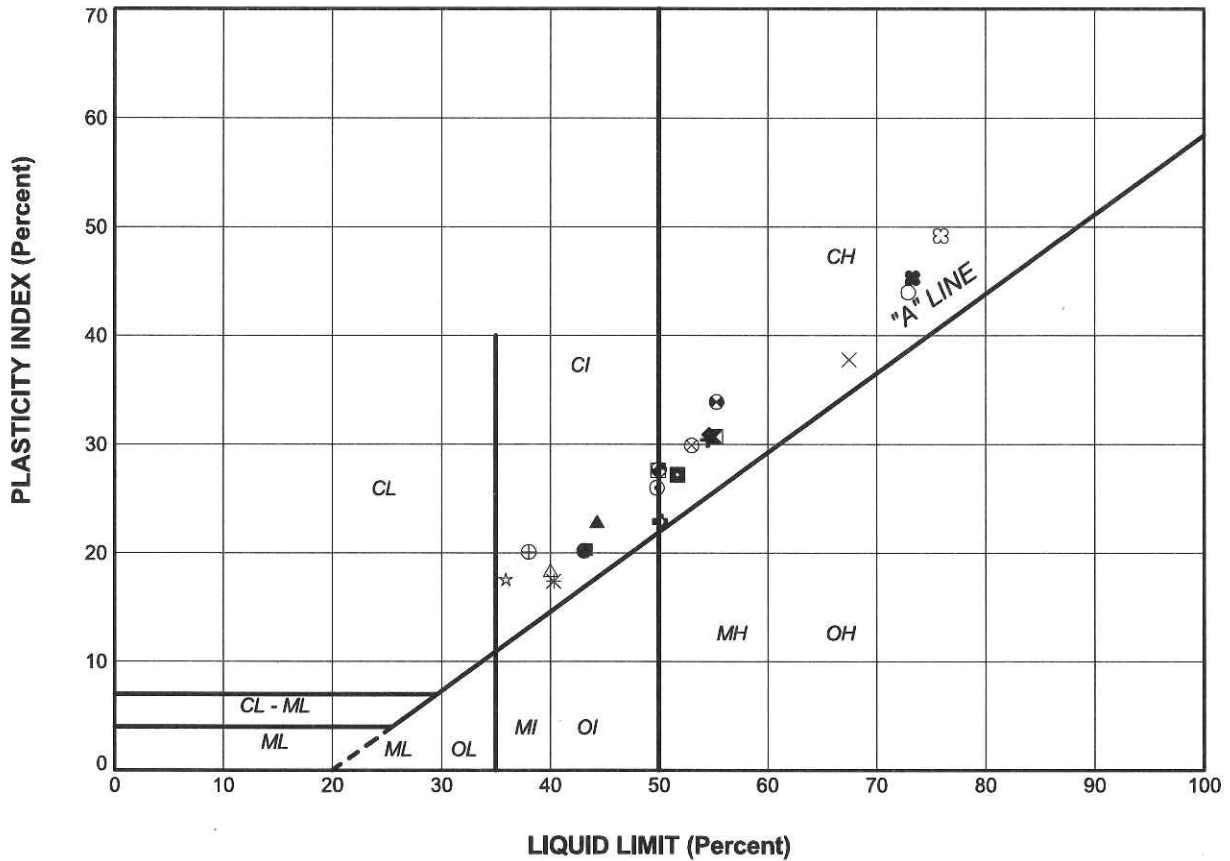


CLAY AND SILT	GRAIN SIZE, mm					Cobble Size
	fine	medium	coarse	fine	coarse	
	SAND SIZE			GRAVEL SIZE		

LEGEND


SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	C1-3	2	240.4
■	H1-20	5	237.2
▲	H1-25	7	236.4

PROJECT						HIGHWAY 17					
TITLE											
GRAIN SIZE DISTRIBUTION SILTY CLAY to CLAY											
PROJECT No. 11-1191-0007				FILE No. 11-1191-0007.GPJ							
DRAWN		JJL		Mar 2014		SCALE		N/A		REV.	
CHECK		SEMP		Mar 2014							
APPR				Mar 2014							
 Golder Associates SUDBURY, ONTARIO						FIGURE A13					



LEGEND

SYMBOL	BOREHOLE	SAMPLE	LL(%)	PL(%)	PI
●	C1-4	2	43.1	22.9	20.2
■	C1-4	6	43.3	23.0	20.3
▲	H1-16	2	44.3	21.4	22.9
+	H1-17	6A	54.5	24.1	30.4
◆	H1-18	6	54.6	23.7	30.9
◇	H1-19	5	50.0	22.5	27.5
○	H1-19	6	72.9	28.9	44.0
△	H1-20	4B	40.0	21.6	18.4
⊗	H1-21	5	53.0	23.1	29.9
⊕	H1-22	5	38.0	17.9	20.1
□	H1-22	8	49.9	22.3	27.6
⊙	H1-23	5	55.3	21.4	33.9
⊗	H1-24	3	50.0	22.3	27.7
☆	H1-24	5	35.9	18.3	17.6
⊗	H1-24	7	75.9	26.7	49.2
⊗	H1-25	7	55.2	24.5	30.7
⊙	H1-25	8	49.8	23.8	26.0
⊗	H1-26	2	50.1	27.2	22.9
×	H1-27	2	67.5	29.7	37.8
■	H1-28	3	73.3	28.0	45.3
■	H1-29	3	51.7	24.5	27.2
※	H1-30	2	40.3	22.9	17.4

PROJECT					
HIGHWAY 17					
TITLE					
PLASTICITY CHART					
SILTY CLAY to CLAY					
PROJECT No.		11-1191-0007		FILE No. 11-1191-0007.GPJ	
DRAWN	JJL	Mar 2014	SCALE	N/A	REV.
CHECK	SEMP	Mar 2014			
APPR		Mar 2014			
 Golder Associates SUDBURY, ONTARIO			FIGURE A14		

CONSOLIDATION TEST SUMMARY

FIGURE A15

Pg. 1 of 4

SAMPLE IDENTIFICATION

Project Number: 11-1191-0007 Sample Number: 6
Borehole Number: H1-19 Sample Depth, m: 4.9

TEST CONDITIONS

Test Type Standard Load Duration, hr 24
Oedometer Number 2
Date Started 8/16/12
Date Completed 8/31/12

SAMPLE DIMENSIONS AND PROPERTIES - INITIAL

Sample Height, cm 2.526 Unit Weight, kN/m³ 16.27
Sample Diameter, cm 6.351 Dry Unit Weight, kN/m³ 9.49
Area, cm² 31.68 Specific Gravity, Measured 2.77
Volume, cm³ 80.02 Solids Height, cm 0.884
Water Content, % 71.33 Volume of Solids, cm³ 28.02
Wet Mass, g 132.73 Volume of Voids, cm³ 52.00
Dry Mass, g 77.47 Degree of Saturation, % 106.3

TEST COMPUTATIONS

Pressure kPa	Primary Consolidation	Corr. Height cm	Void Ratio	Average Height cm	t ₉₀ sec	cv. cm ² /s	mv m ² /kN	k cm/s	Total Work kJ/m ³
0	0	2.526	1.856	2.526					
4	0.04	2.522	1.852	2.524	86	0.0156	3.59E-04	5.51E-07	0.003
13	0.03	2.519	1.848	2.521	60	0.0224	1.33E-04	2.93E-07	0.013
31	0.06	2.513	1.842	2.516	101	0.0132	1.31E-04	1.70E-07	0.065
66	0.09	2.504	1.831	2.509	135	0.0099	1.06E-04	1.03E-07	0.248
137	0.19	2.485	1.810	2.494	240	0.0055	1.05E-04	5.67E-08	1.005
277	0.58	2.427	1.744	2.456	577	0.0022	1.64E-04	3.57E-08	5.859
558	2.81	2.146	1.427	2.287	3840	0.0003	3.96E-04	1.12E-08	54.116
1117	1.60	1.987	1.246	2.067	2774	0.0003	1.13E-04	3.61E-09	116.364
558	-0.12	1.999	1.260	1.993					
137	-0.50	2.049	1.316	2.024					
31	-0.61	2.109	1.385	2.079					
4	-0.50	2.159	1.442	2.134					

Note:

k calculated using α based on t₉₀ values.

SAMPLE DIMENSIONS AND PROPERTIES - FINAL

Sample Height, cm 2.159 Unit Weight, kN/m³ 16.19
Sample Diameter, cm 6.35 Dry Unit Weight, kN/m³ 11.11
Area, cm² 31.68 Specific Gravity, Measured 2.77
Volume, cm³ 68.41 Solids Height, cm 0.884
Water Content, % 45.79 Volume of Solids, cm³ 28.02
Wet Mass, g 112.94 Volume of Voids, cm³ 40.39
Dry Mass, g 77.47

Prepared By: TG

Golder Associates

Checked By:

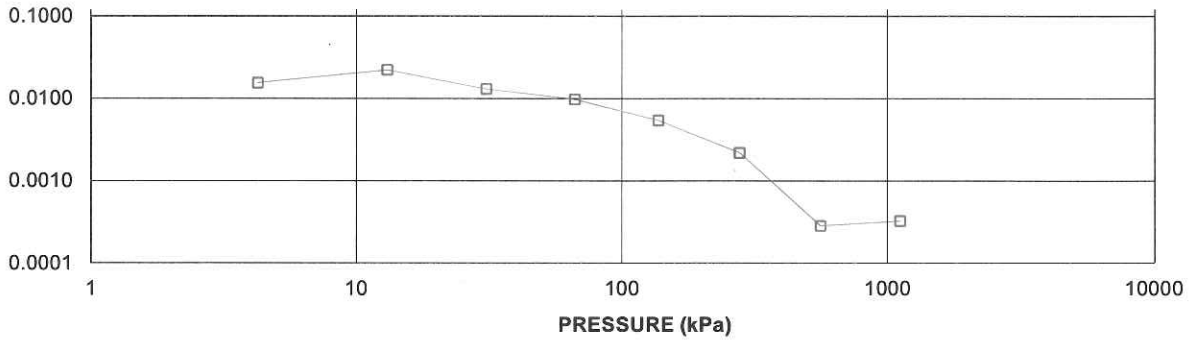
CONSOLIDATION TEST SUMMARY

FIGURE A15

Pg. 2 of 4

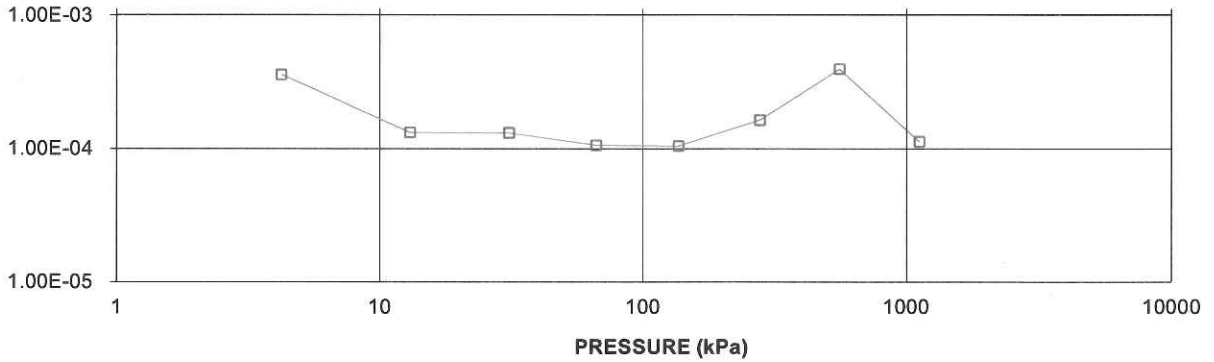
COEFFICIENT OF CONSOLIDATION,
cm²/s

CONSOLIDATION TEST
CV cm²/s VS PRESSURE (kPa)
BH H1-19 Sa 6



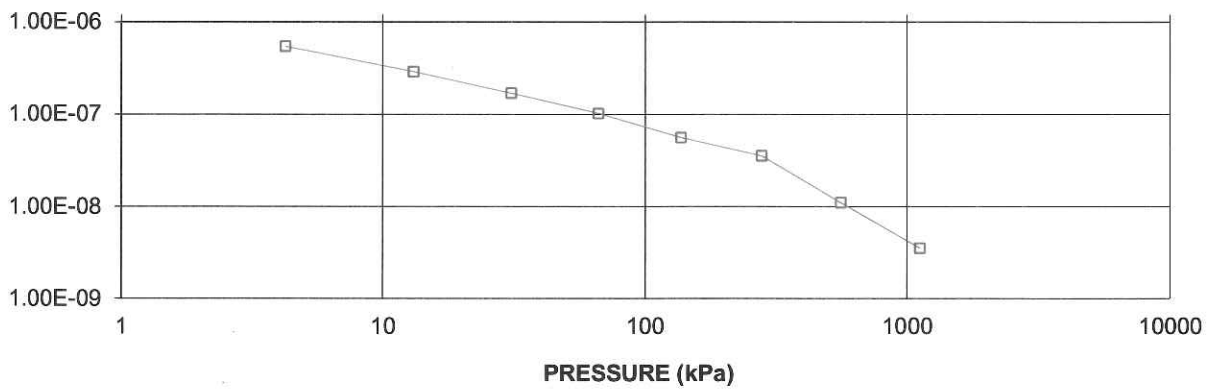
VOLUME COMPRESSIBILITY, m²/kN

CONSOLIDATION TEST
MV m²/kN vs PRESSURE (kPa)
BH H1-19 Sa 6



HYDRAULIC CONDUCTIVITY,
cm/s

CONSOLIDATION TEST
HYDRAULIC CONDUCTIVITY vs PRESSURE
BH H1-19 Sa 6



Project No.11-1191-0007

Prepared By: TG

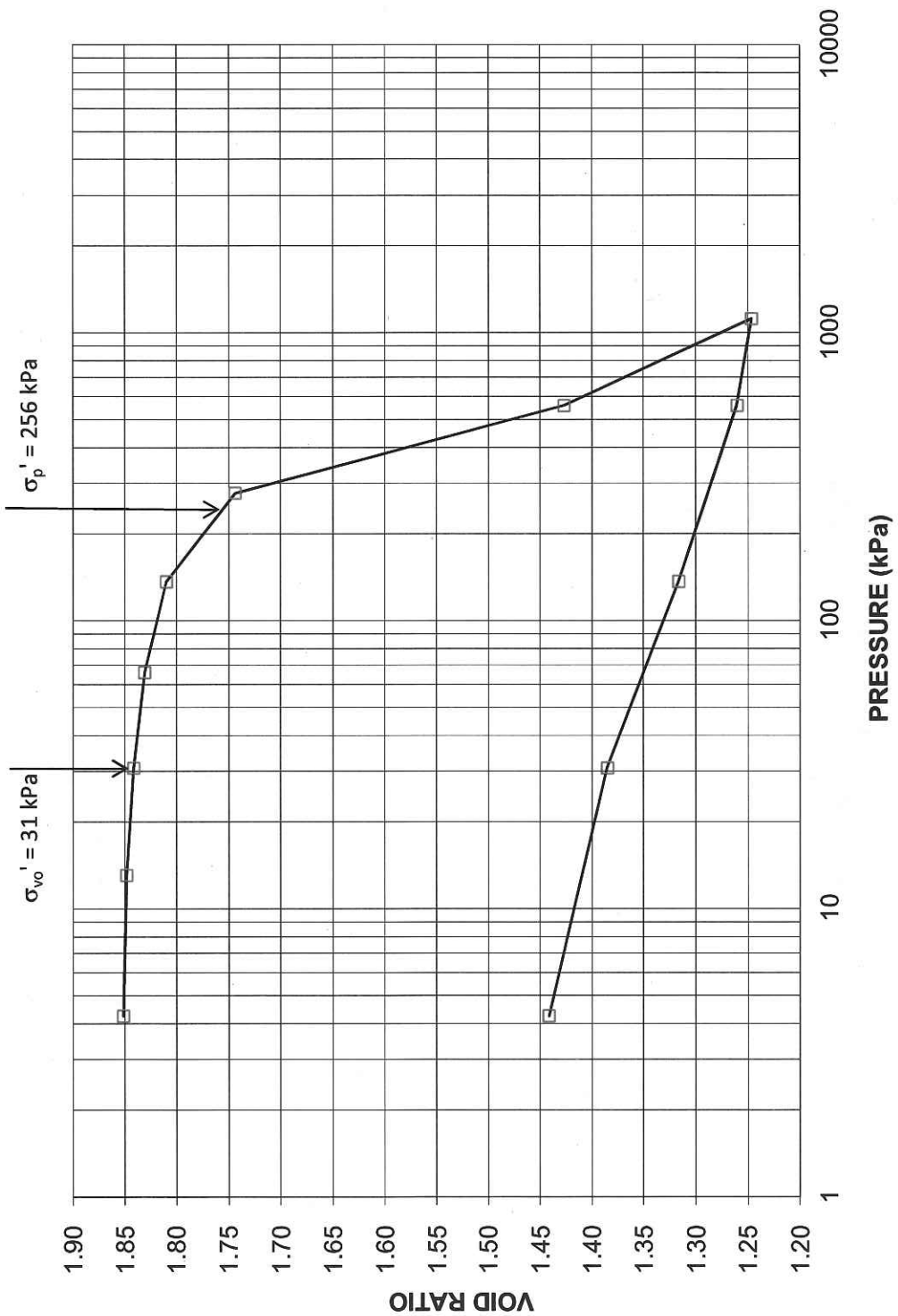
Golder Associates

Checked By:

**CONSOLIDATION TEST
VOID RATIO VS LOG PRESSURE**

FIGURE A15
Pg. 3 of 4

**CONSOLIDATION TEST
VOID RATIO vs PRESSURE
BH H1-19 Sa 6**



Project No. 11-1191-0007

Prepared By TG

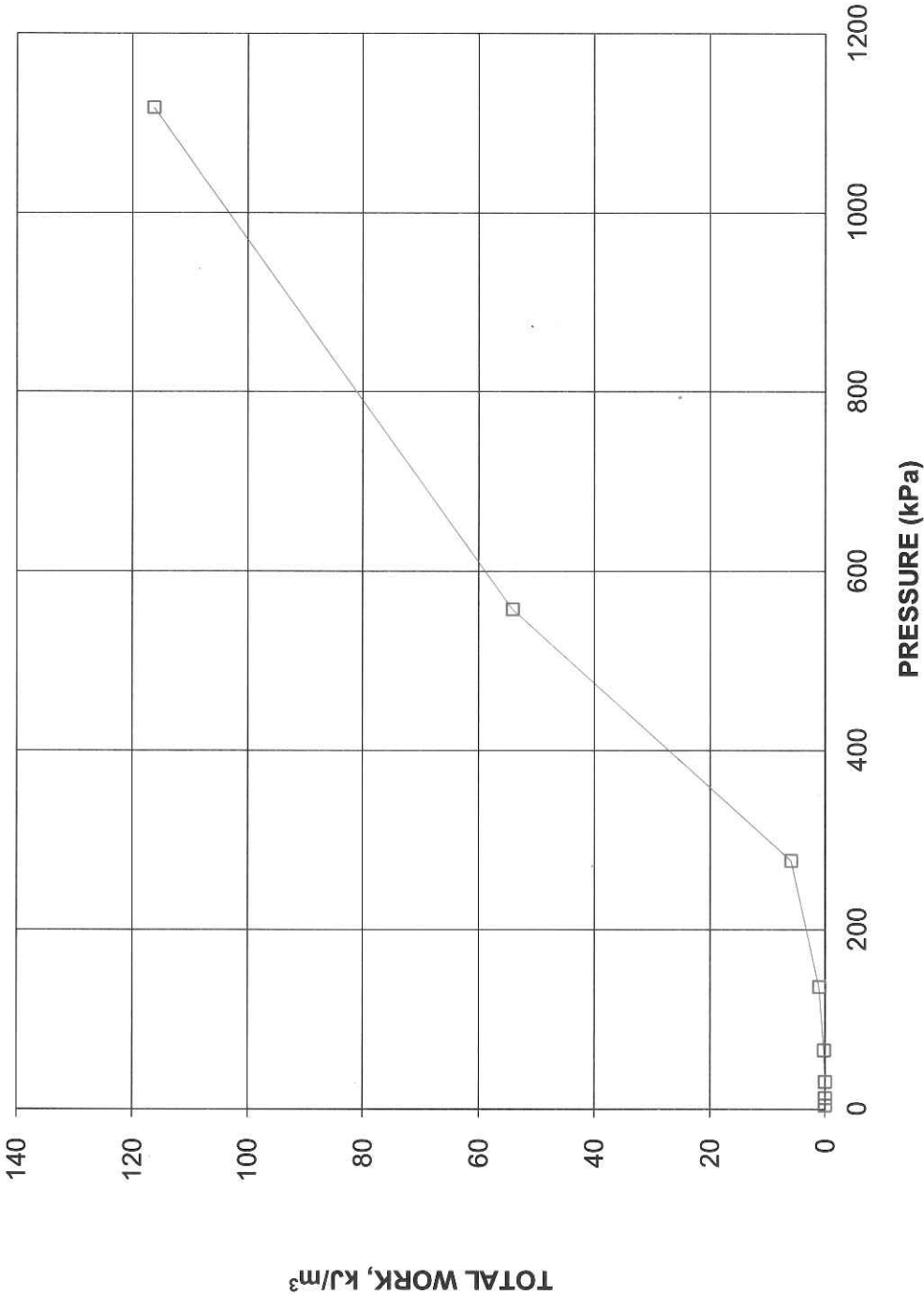
Golder Associates

Checked By:

CONSOLIDATION TEST
TOTAL WORK VS PRESSURE

FIGURE A15
Pg. 4 of 4

CONSOLIDATION TEST
TOTAL WORK, kJ/m^3 vs PRESSURE
BH H1-19 Sa 6



CONSOLIDATION TEST SUMMARY**FIGURE A16**
Pg. 1 of 4**SAMPLE IDENTIFICATION**

Project Number	11-1191-0007	Sample Number	8
Borehole Number	H1-25	Sample Depth, m	6.55

TEST CONDITIONS

Test Type	Standard	Load Duration, hr	24
Oedometer Number	1		
Date Started	January 10, 2013		
Date Completed	January 24, 2013		

SAMPLE DIMENSIONS AND PROPERTIES - INITIAL

Sample Height, cm	2.544	Unit Weight, kN/m ³	16.85
Sample Diameter, cm	6.353	Dry Unit Weight, kN/m ³	10.83
Area, cm ²	31.70	Specific Gravity, measured	2.78
Volume, cm ³	80.64	Solids Height, cm	1.011
Water Content, %	55.54	Volume of Solids, cm ³	32.06
Wet Mass, g	138.52	Volume of Voids, cm ³	48.58
Dry Mass, g	89.06		

TEST COMPUTATIONS

Pressure kPa	Primary Consolidation	Corr. Height cm	Void Ratio	Average Height cm	t ₉₀ sec	cv. cm ² /s	mv m ² /kN	k cm/s	Total Work kJ/m ³
0	0.00	2.544	1.515	2.544					
9	0.04	2.540	1.512	2.542	135	0.0101	1.65E-04	1.64E-07	0.007
18	0.03	2.537	1.508	2.538	118	0.0116	1.45E-04	1.65E-07	0.024
35	0.06	2.531	1.503	2.534	101	0.0134	1.36E-04	1.78E-07	0.086
69	0.12	2.519	1.490	2.525	135	0.0100	1.41E-04	1.38E-07	0.337
143	0.25	2.493	1.465	2.506	217	0.0061	1.35E-04	8.16E-08	1.401
285	2.01	2.292	1.266	2.393	866	0.0014	5.56E-04	7.63E-08	18.660
570	1.10	2.182	1.158	2.237	505	0.0021	1.51E-04	3.12E-08	39.187
1140	0.83	2.099	1.076	2.141	173	0.0056	5.70E-05	3.13E-08	71.517
570	-0.01	2.100	1.077	2.100					
143	-0.22	2.122	1.099	2.111					
35	-0.29	2.151	1.127	2.137					
9	-0.27	2.178	1.154	2.165					

Note:

k calculated using α based on t₉₀ values.**SAMPLE DIMENSIONS AND PROPERTIES - FINAL**

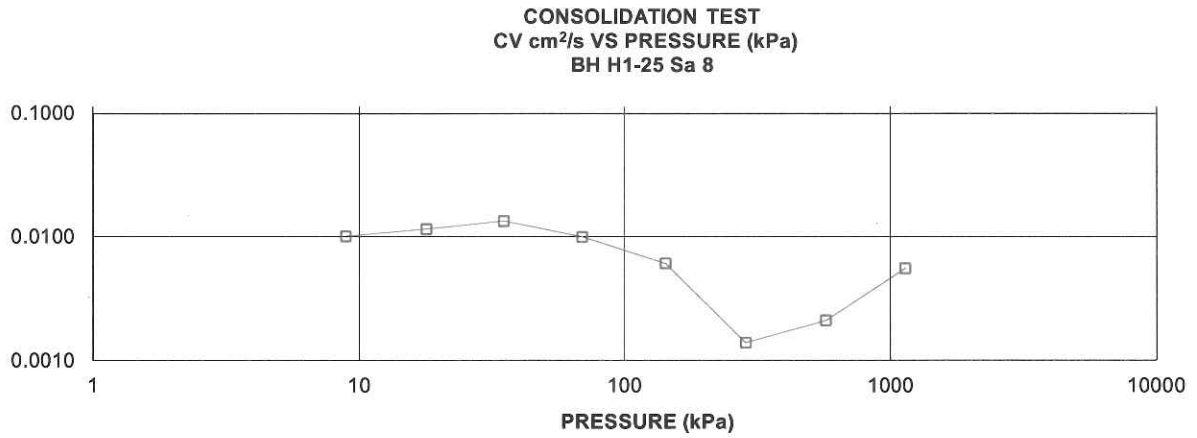
Sample Height, cm	2.178	Unit Weight, kN/m ³	17.14
Sample Diameter, cm	6.35	Dry Unit Weight, kN/m ³	12.65
Area, cm ²	31.70	Specific Gravity, measured	2.78
Volume, cm ³	69.06	Solids Height, cm	1.011
Water Content, %	35.52	Volume of Solids, cm ³	32.06
Wet Mass, g	120.69	Volume of Voids, cm ³	37.00
Dry Mass, g	89.06		

CONSOLIDATION TEST SUMMARY

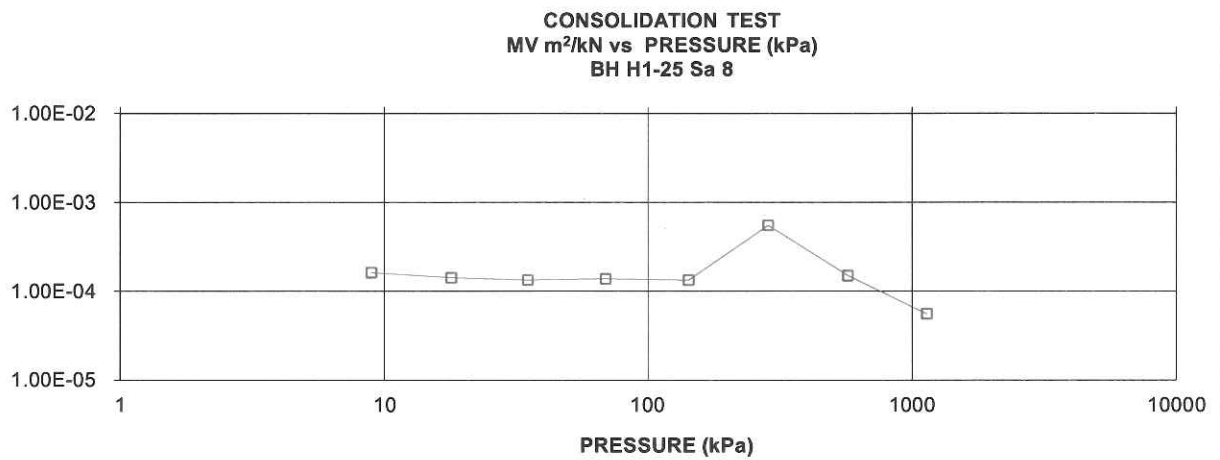
FIGURE A16

Pg. 2 of 4

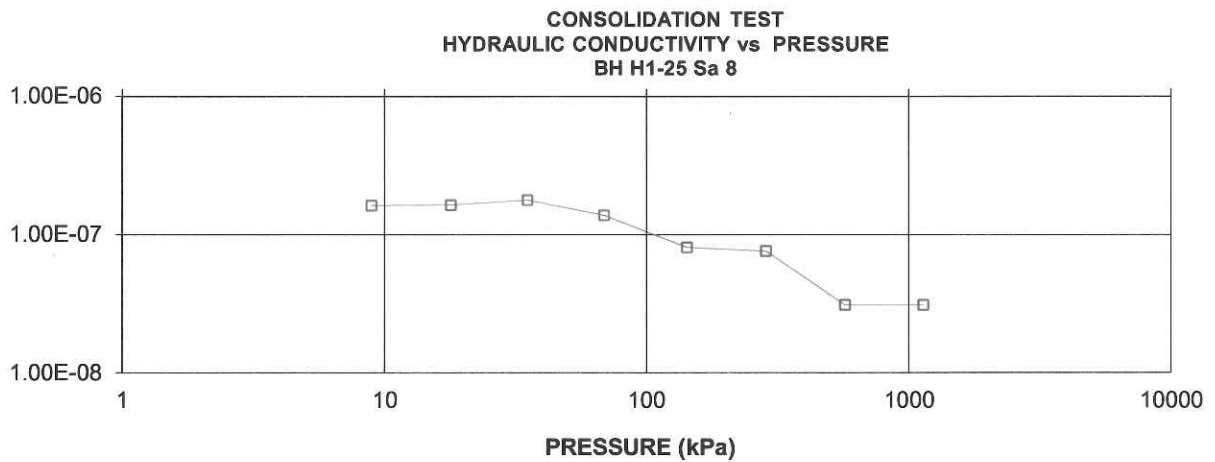
COEFFICIENT OF CONSOLIDATION,
cm²/s



VOLUME COMPRESSIBILITY, m²/kN



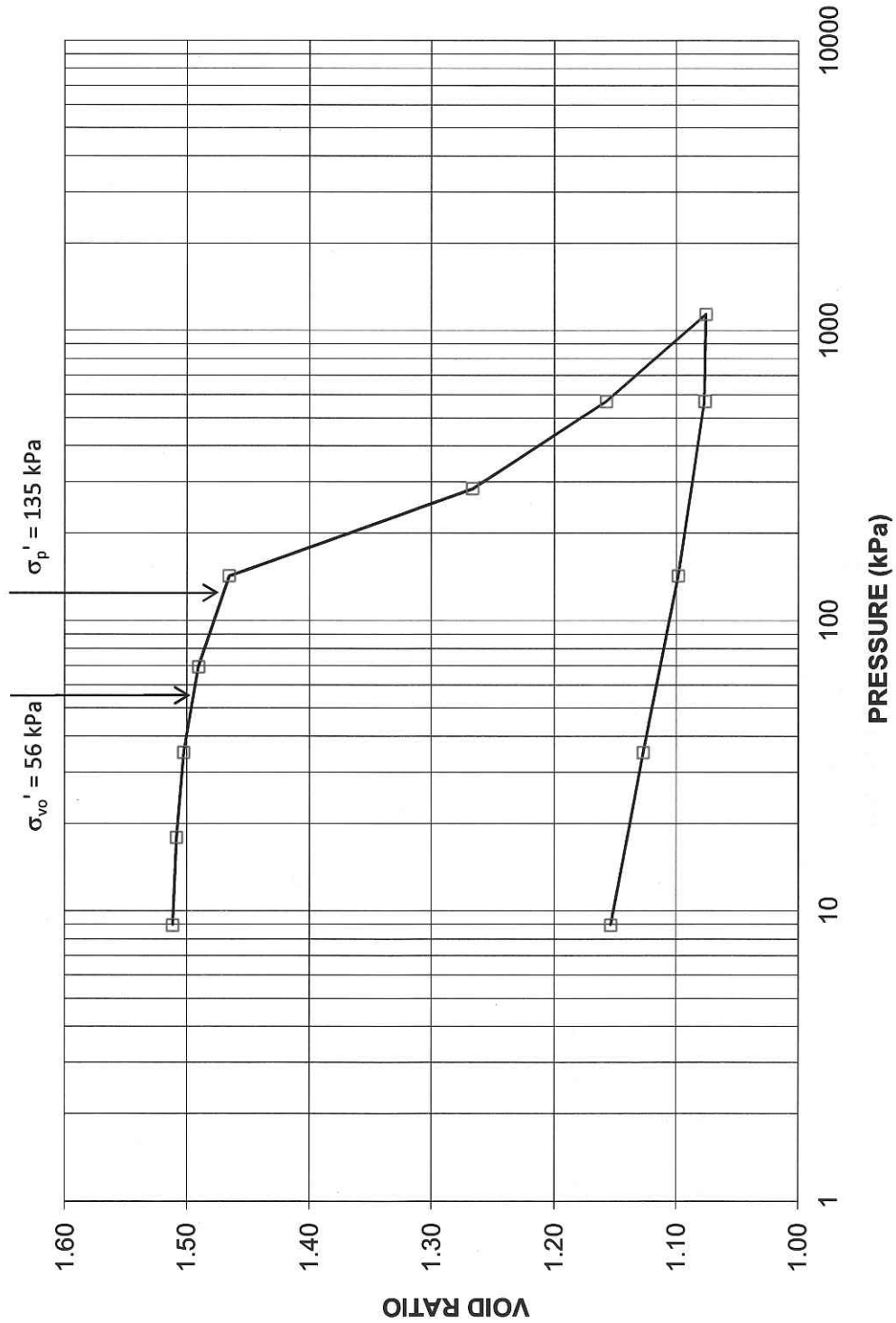
HYDRAULIC CONDUCTIVITY,
cm/s



**CONSOLIDATION TEST
VOID RATIO VS LOG PRESSURE**

FIGURE A16
Pg. 3 of 4

**CONSOLIDATION TEST
VOID RATIO vs PRESSURE
BH H1-25 Sa 8**



Project No. 11-1191-0007

Prepared By: TG

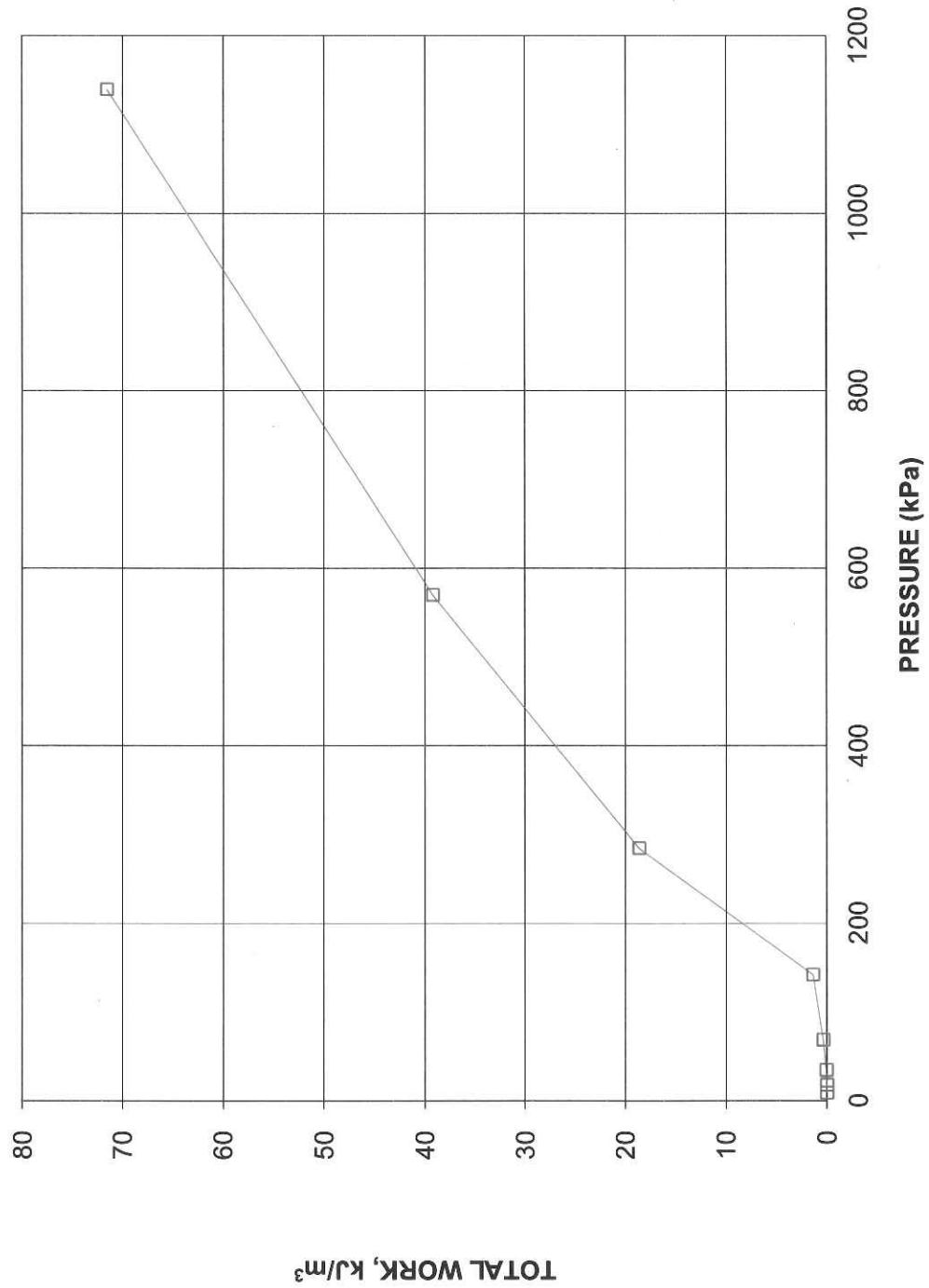
Golder Associates

Checked

**CONSOLIDATION TEST
TOTAL WORK VS PRESSURE**

FIGURE A 16
Pg. 4 of 4

**CONSOLIDATION TEST
TOTAL WORK, kJ/m^3 vs PRESSURE
BH H1-25 Sa 8**

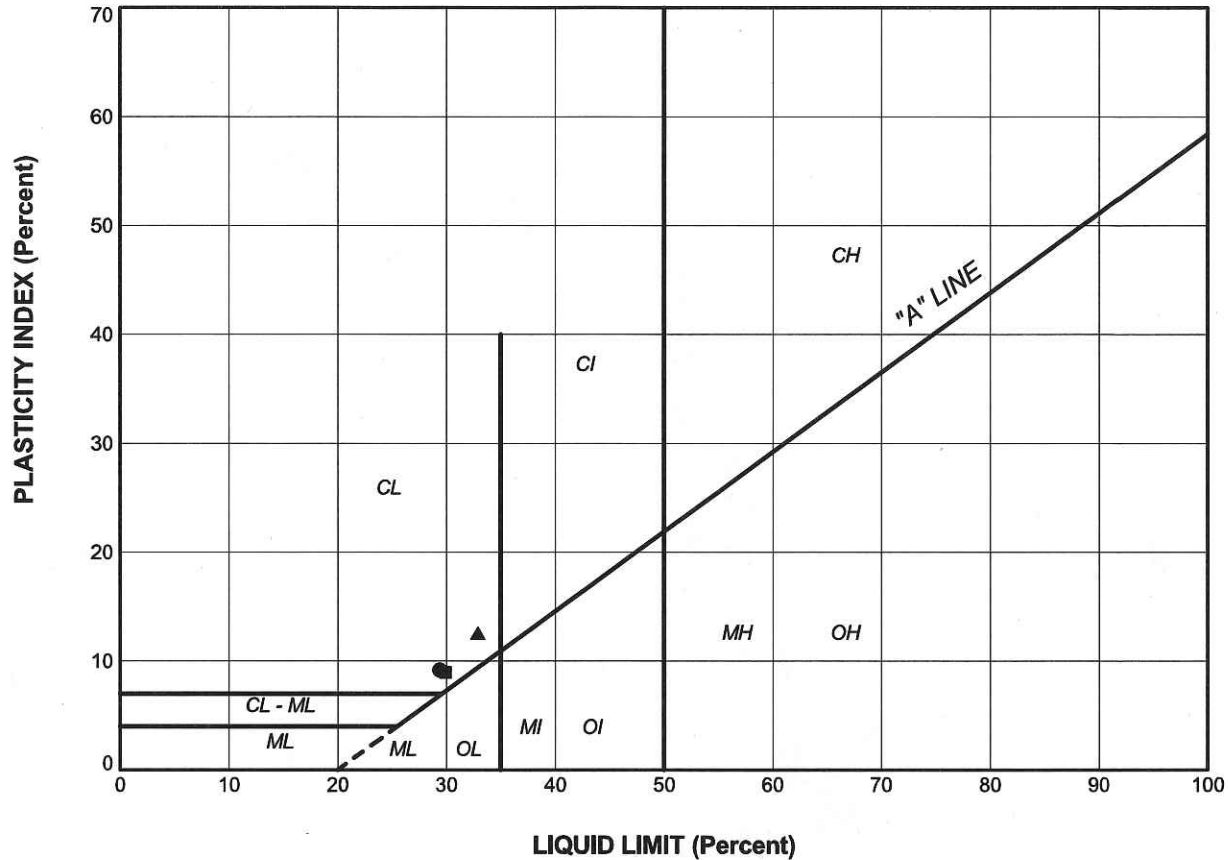


Project No: 11-1191-0007

Prepared By: TG

Golder Associates

Checked By:

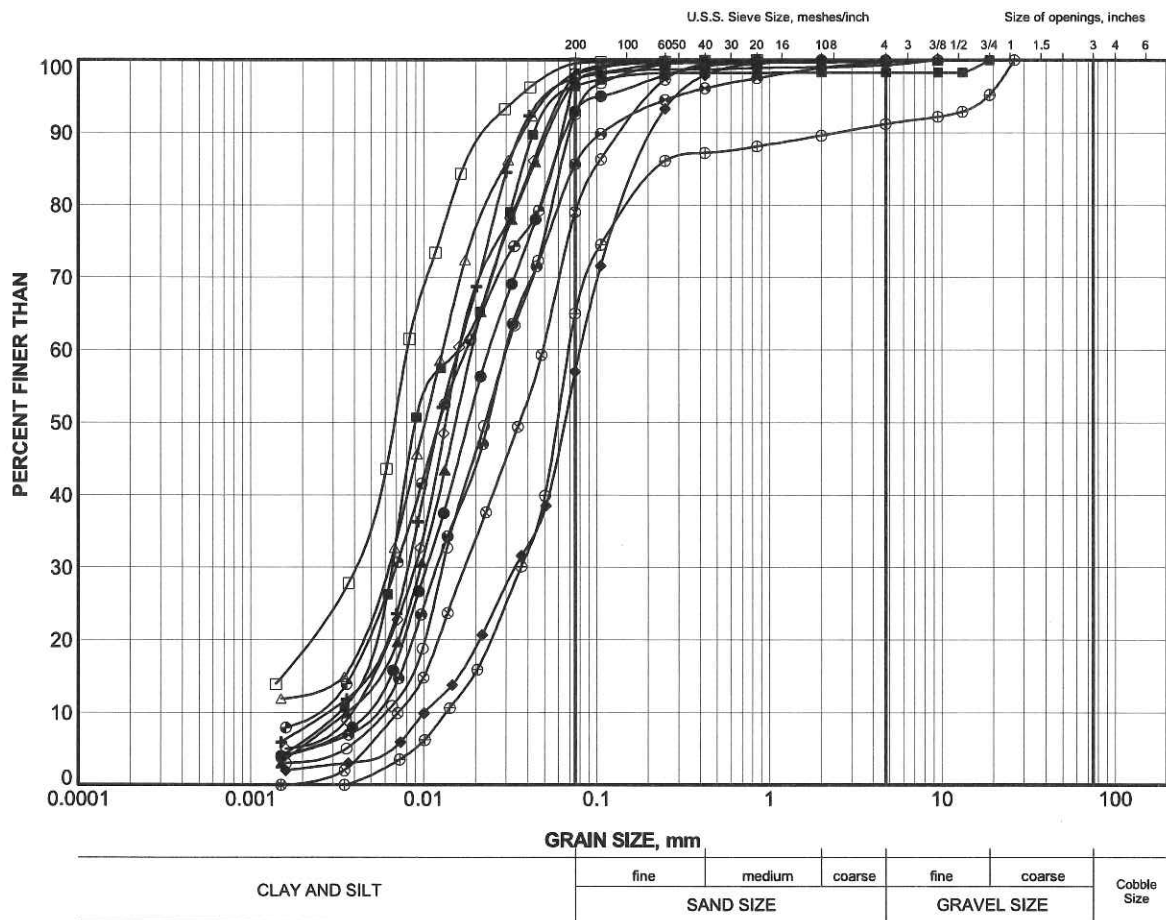


LEGEND

SYMBOL	BOREHOLE	SAMPLE	LL(%)	PL(%)	PI
●	H1-19	9B	29.4	20.2	9.2
■	H1-20	8	29.9	20.9	9.0
▲	H1-23	8	32.9	20.3	12.6

PROJECT					HIGHWAY 17				
TITLE					PLASTICITY CHART CLAYEY SILT				
PROJECT No.		11-1191-0007			FILE No.		11-1191-0007.GPJ		
DRAWN	JJL	Mar 2014			SCALE	N/A		REV.	
CHECK	SEMP	Mar 2014							
APPR		Mar 2014			FIGURE A17				





LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	C1-4	8	231.8
■	H1-16	5B	237.9
▲	H1-17	10	230.3
+	H1-18	9	231.9
◆	H1-19	11	228.8
◇	H1-21	10	230.3
○	H1-22	12	228.7
△	H1-23	9	231.9
⊗	H1-24	11	230.2
⊕	H1-24	13	227.2
□	H1-25	9	233.3
⊙	H1-29	6	235.8
⊖	H1-30	4	238.6

PROJECT

HIGHWAY 17

TITLE

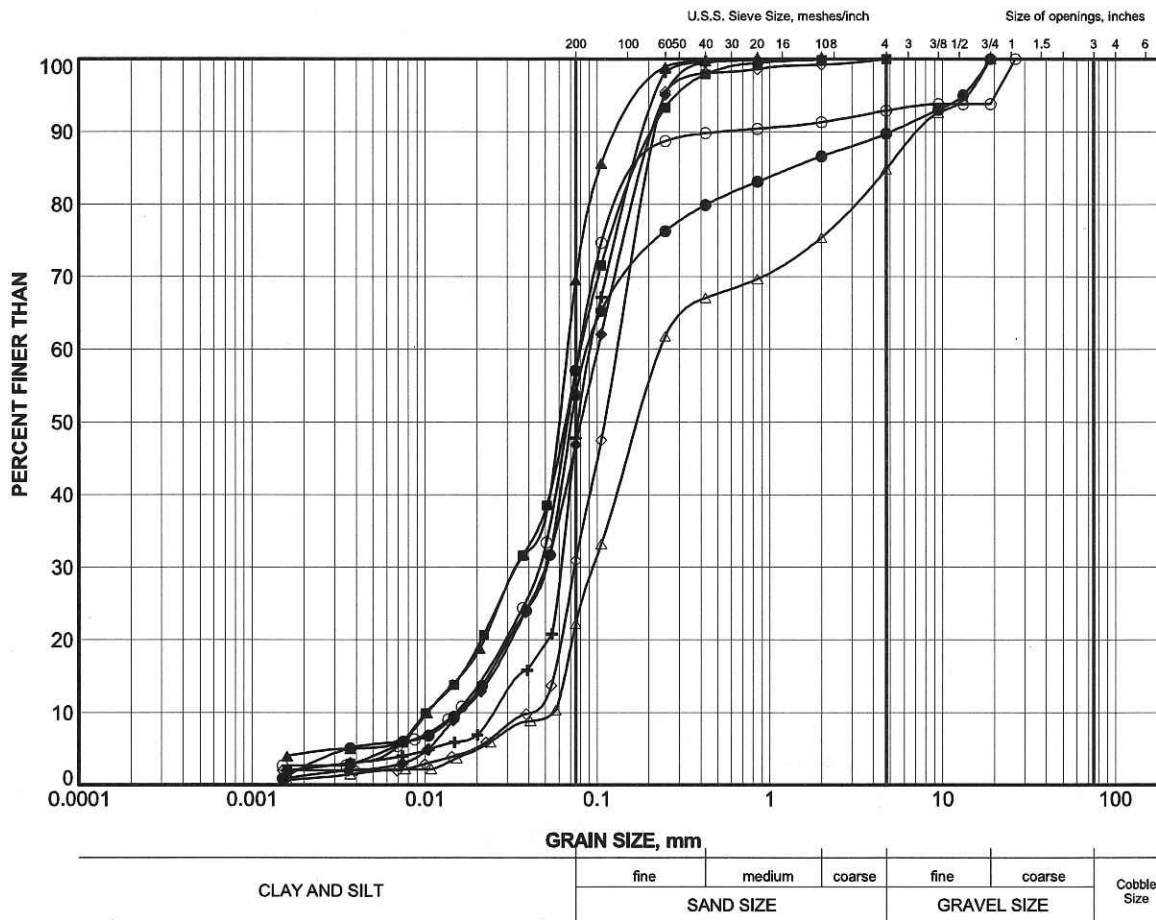
GRAIN SIZE DISTRIBUTION

SILT to SAND and SILT



PROJECT No.	11-1191-0007	FILE No.	11-1191-0007.GPJ
DRAWN	JJL	Mar 2014	SCALE N/A
CHECK	SEMP	Mar 2014	REV.
APPR		Mar 2014	

FIGURE A18



LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-17	12	227.3
■	H1-19	12	227.3
▲	H1-20	11	227.2
+	H1-21	13	225.8
◆	H1-23	12	227.3
◇	H1-25	12	228.7
○	H1-26	7	234.9
△	H1-30	8	234.8

PROJECT

HIGHWAY 17

TITLE

GRAIN SIZE DISTRIBUTION

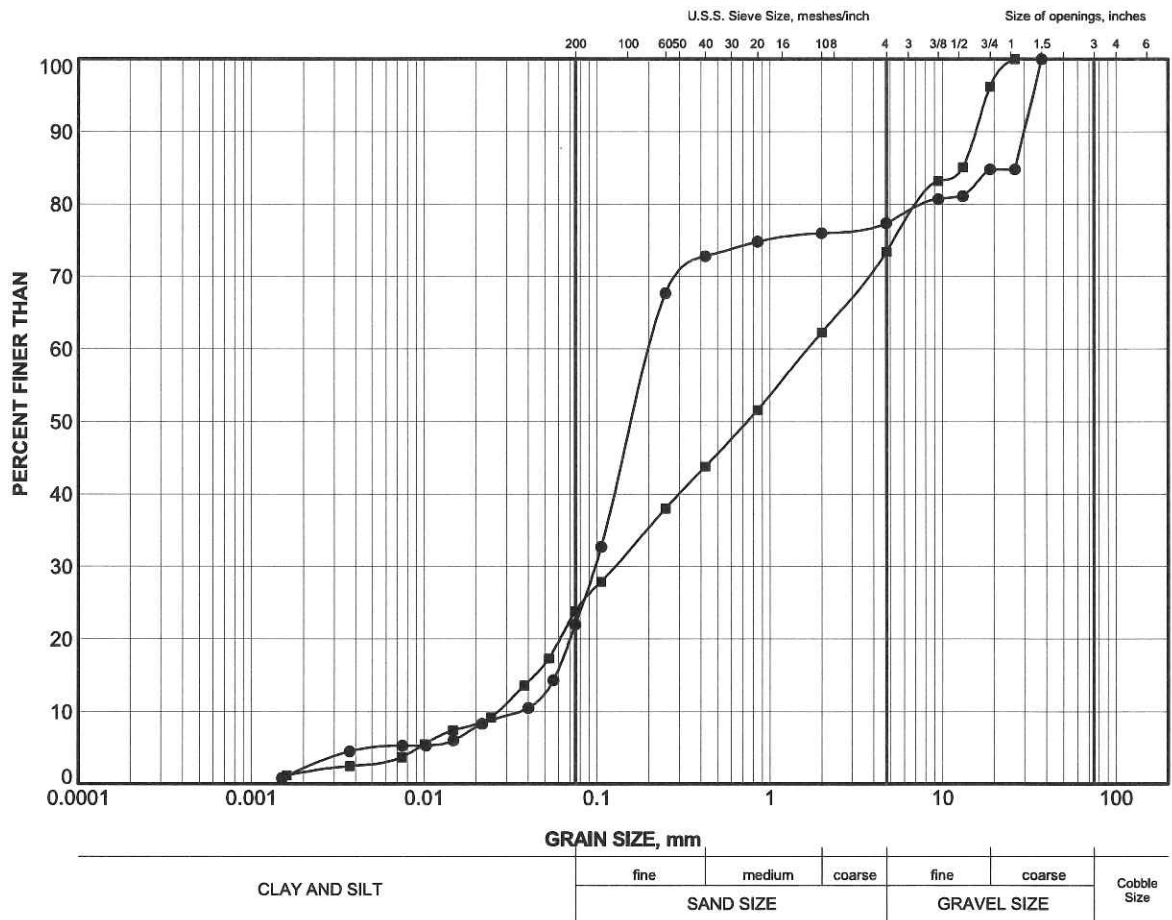
SAND and SILT to SAND



Golder Associates
SUDBURY, ONTARIO


PROJECT No.	11-1191-0007	FILE No.	11-1191-0007.GPJ
DRAWN	JUL	Mar 2014	SCALE N/A
CHECK	SEMP	Mar 2014	REV.
APPR		Mar 2014	

FIGURE A19



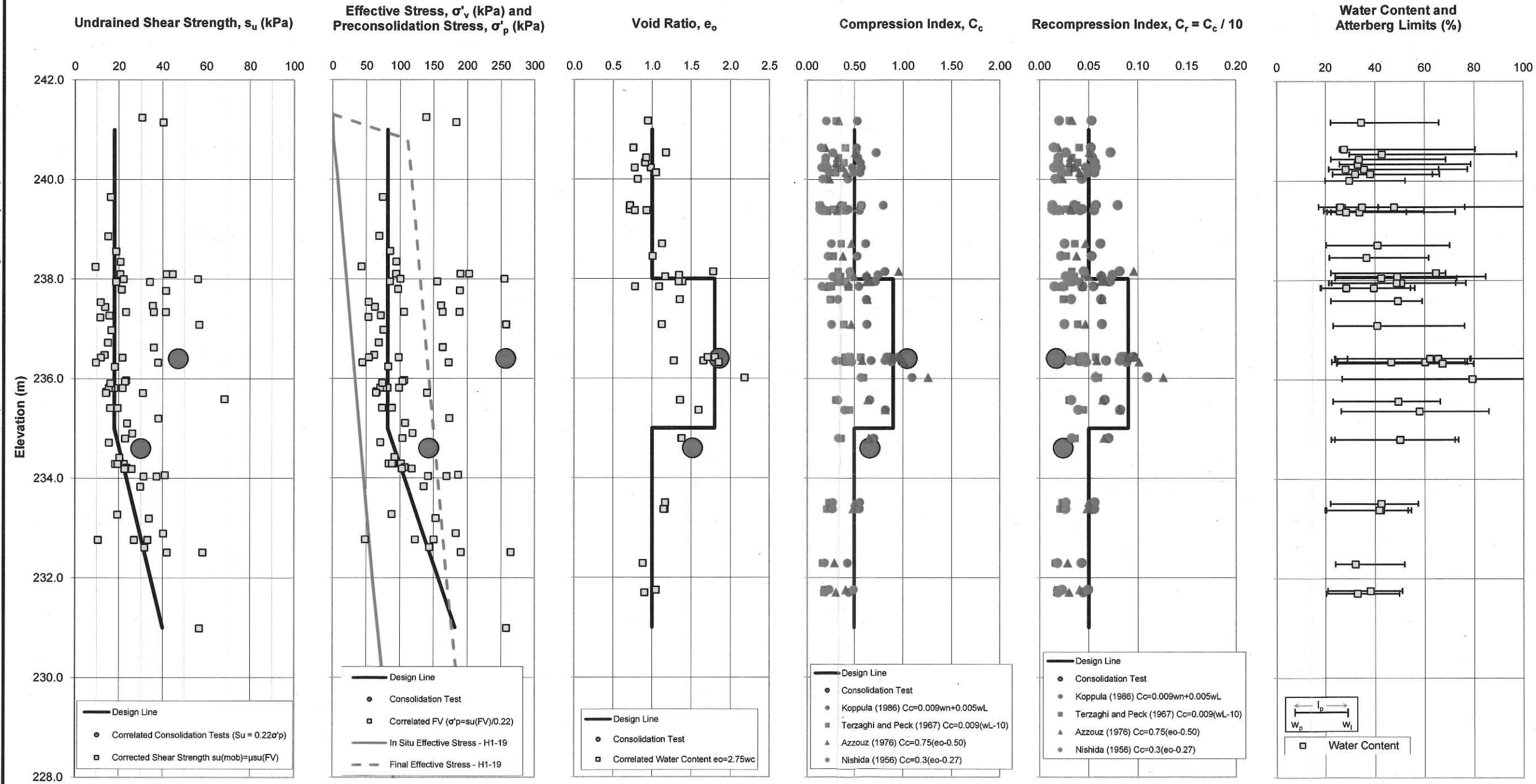
LEGEND

SYMBOL	BOREHOLE	SAMPLE	ELEV (m)
●	H1-19	15	222.7
■	H1-27	8	233.7

PROJECT					
HIGHWAY 17					
TITLE					
GRAIN SIZE DISTRIBUTION					
GRAVELLY SAND					
PROJECT No.		11-1191-0007		FILE No. 11-1191-0007.GPJ	
DRAWN	JJL	Mar 2014	SCALE	N/A	REV.
CHECK	SEMP	Mar 2014			
APPR		Mar 2014			
 Golder Associates SUDBURY, ONTARIO			FIGURE A20		

SUMMARY PLOT OF ENGINEERING PARAMETERS FOR
COHESIVE DEPOSITS
Highway 17 - STA 12+220 to 12+570 Township of Louise (H1)

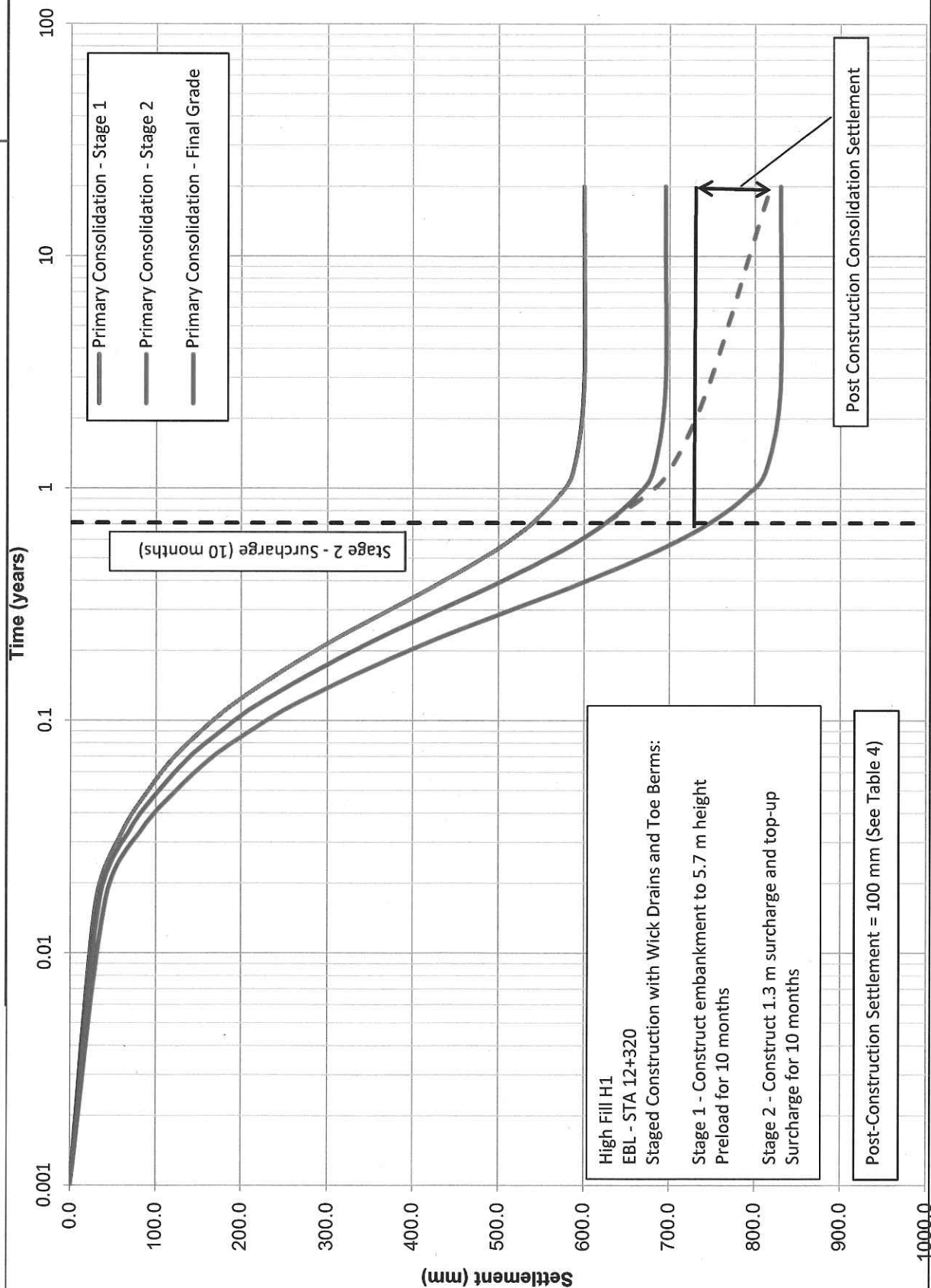
FIGURE A21



Settlement Analysis STA - 12+320 - EBL

Figure A26

Settlement vs. log Time - Staged Construction



Date July 6, 2015

Project No: 11-1191-0007

Analysis By: DAM

Reviewed By: SEMP





APPENDIX B

**HIGHWAY 17 WBL – STA 13+140 TO 13+390;
HIGHWAY 17 EBL – STA 13+140 TO 13+390; AND
ST. POTHIER ROAD – STA 9+400 TO 9+600 (HIGH FILL H2)**

