



TABLE A
ROCK CORE DESCRIPTION

CORE RECOVERY					CORE DESCRIPTION	
BH	RC	DEPTH (m)	Rec (%)	RQD (%)	DEPTH (m)	DESCRIPTION
E2	1	0.4 – 2.0	100	100	0.4 – 3.5	GRANODIORITE GNEISS: Grey, fine to medium grained, high strength, unweathered, close to moderate spaced flat cross joints, rough planar, upper parting open to 1 mm with sand filling, lower partings generally oxidized to slightly altered, purple staining on surface, occasionally friable, some vertical partings, excellent quality.
	2	2.0 – 3.5	100	100		
E4	1	0.4 – 2.0	100	97	0.4 – 3.5	GRANODIORITE GNEISS: Grey, with occasional pink inclusions, fine to medium grained, slight banding, high strength, unweathered, with 10 mm thick dipping layer of friable gneiss/schist at 2.3 m depth, close to moderate spaced flat to dipping cross joints, rough planar, tight, some vertical partings with some silt on partings, excellent quality.
	2	2.0 – 3.5	100	92		
E5	1	1.7 – 2.0	100	100	1.7 – 4.8	GRANODIORITE GNEISS: Grey, fine to medium grained, high strength, slightly weathered to unweathered, close to wide spaced flat to dipping cross joints, rough planar, tight becoming oxidized to slightly altered with brown to black mineralization on parting, minor silt, excellent quality.
	2	2.0 – 3.2	100	91		
	3	3.2 – 4.8	100	100		
E7	1	0.4 – 1.9	100	95	0.4 – 4.0	GRANODIORITE GNEISS: Grey, fine to medium grained, slight banding, high strength, unweathered, close to moderate spaced flat to dipping cross joints, rough planar, tight to oxidized with red, brown and black mineralization on parting, locally open to 1 mm with silt infilling, excellent quality.
	2	1.9 – 3.2	100	96		
	3	3.2 – 4.0	100	100		
E8	1	0.7 – 1.8	100	79	0.7 – 4.2	GRANODIORITE GNEISS: Grey, fine to medium grained, dipping bands, high strength, unweathered, close to moderate spaced flat to dipping cross joints, rough planar, oxidized to slightly altered with red to dark red mineralization on parting surface, locally porous for 0.5 mm, some vertical partings, tight, fair to excellent quality.
	2	1.8 – 3.3	100	83		
	3	3.3 – 4.2	100	91		
E10	1	0.1 – 1.7	92	88	0.1 – 3.4	GRANITE-GRANODIORITE GNEISS: Pink, medium grained, slight banding, sugary texture, high strength, unweathered, close to moderate spaced flat to vertical cross joints, rough planar, oxidized to tight, fair to good quality.
	2	1.7 – 3.4	100	64		

RQD: Rock Quality Designation

Originated: JFW
 Compiled: IS
 Checked: CN

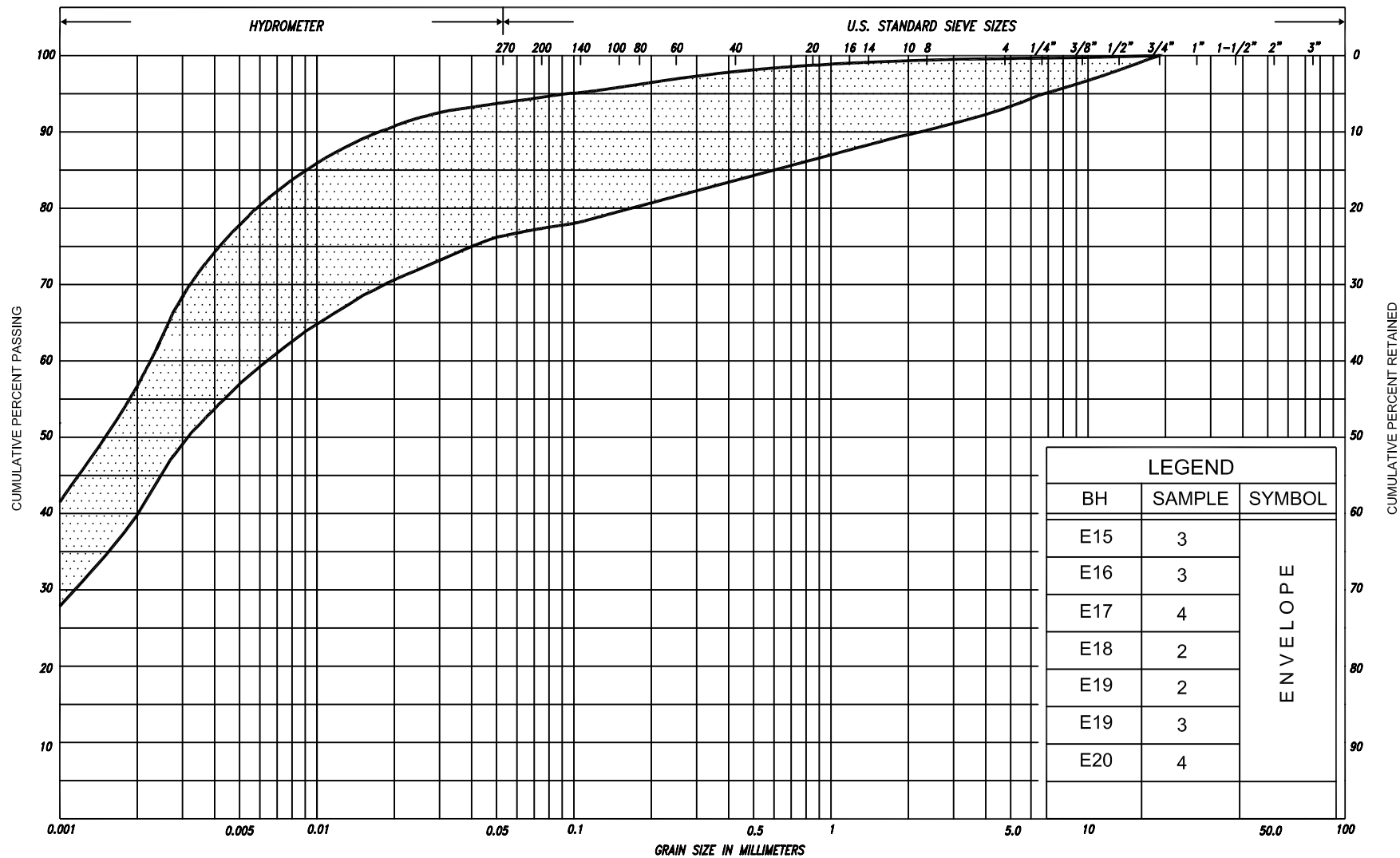


TABLE A
ROCK CORE DESCRIPTION

CORE RECOVERY					CORE DESCRIPTION	
BH	RC	DEPTH (m)	Rec (%)	RQD (%)	DEPTH (m)	DESCRIPTION
E11	1	0.0 – 1.6	100	68	0.0 – 3.1	GRANITE-GRANODIORITE GNEISS: Pink, fine grained, high strength, unweathered, close to moderate spaced flat to dipping cross joints, rough planar, tight to oxidized with yellow and brown mineralization on parting, locally with silt, fair to excellent quality.
	2	1.6 – 3.1	98	98		
E13	1	0.1 – 1.7	100	97	0.1 – 3.6	GRANITE-GRANODIORITE GNEISS: Pink, medium grained, slight banding, sugary texture, high strength, unweathered, very close to moderate spaced flat to vertical cross joints, rough planar, tight to oxidized, occasionally with red residue on parting, good to excellent quality.
	2	1.7 – 3.0	100	94		
	3	3.0 – 3.6	83	83		
E14	1	0.3 – 1.8	95	95	0.3 – 4.0	GRANODIORITE GNEISS: Grey, medium grained, slight banding, high strength, unweathered, moderate to wide spaced flat cross joints, rough planar, tight, excellent quality.
	2	1.8 – 3.4	95	94		
	3	3.4 – 4.0	96	96		
E16	5	2.7 – 3.5	66	66	2.7 – 6.4	GRANODIORITE GNEISS: Dark grey, medium grained, dipping bands, high strength, unweathered, close to moderate becoming wide spaced flat to dipping cross joints, rough planar, tight, fair to excellent quality.
	6	3.5 – 4.9	100	95		
	7	4.9 – 6.4	100	100		
E17	5	3.5 – 4.3	89	65	3.5 – 7.4	GRANODIORITE GNEISS: Grey to dark grey, medium grained, dipping bands, high strength, unweathered, very close to moderate becoming wide spaced flat to dipping cross joints, rough planar, tight to oxidized, with occasional vertical partings, oxidized to slightly altered with dark green mineralization on surface, good to excellent quality.
	6	4.3 – 5.7	100	96		
	7	5.7 – 6.1	100	100		
	8	6.1 – 7.4	98	98		
E19	7	5.7 – 6.6	100	100	5.7 – 9.2	GRANODIORITE GNEISS: Grey to dark grey, medium grained, dipping bands, high strength, unweathered, close to moderate becoming wide spaced flat to dipping cross joints, rough planar, tight, excellent quality. [Low recovery and RQD for Run 3 due to piece lost down hole]
	8	6.6 – 7.8	100	100		
	9	7.8 – 9.2	79	79		

RQD: Rock Quality Designation

Originated: JFW
Compiled: IS
Checked: CN



SILT & CLAY				FINE		MEDIUM		COARSE		GRAVEL			COB BLES	UNIFIED			
				SAND													
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL		COBBLES	M.I.T.	
	SILT																
CLAY			SILT			V. FINE		FINE		MED.		COARSE		GRAVEL			U.S. BUREAU
						SAND											



Ministry of
Transportation
Ontario

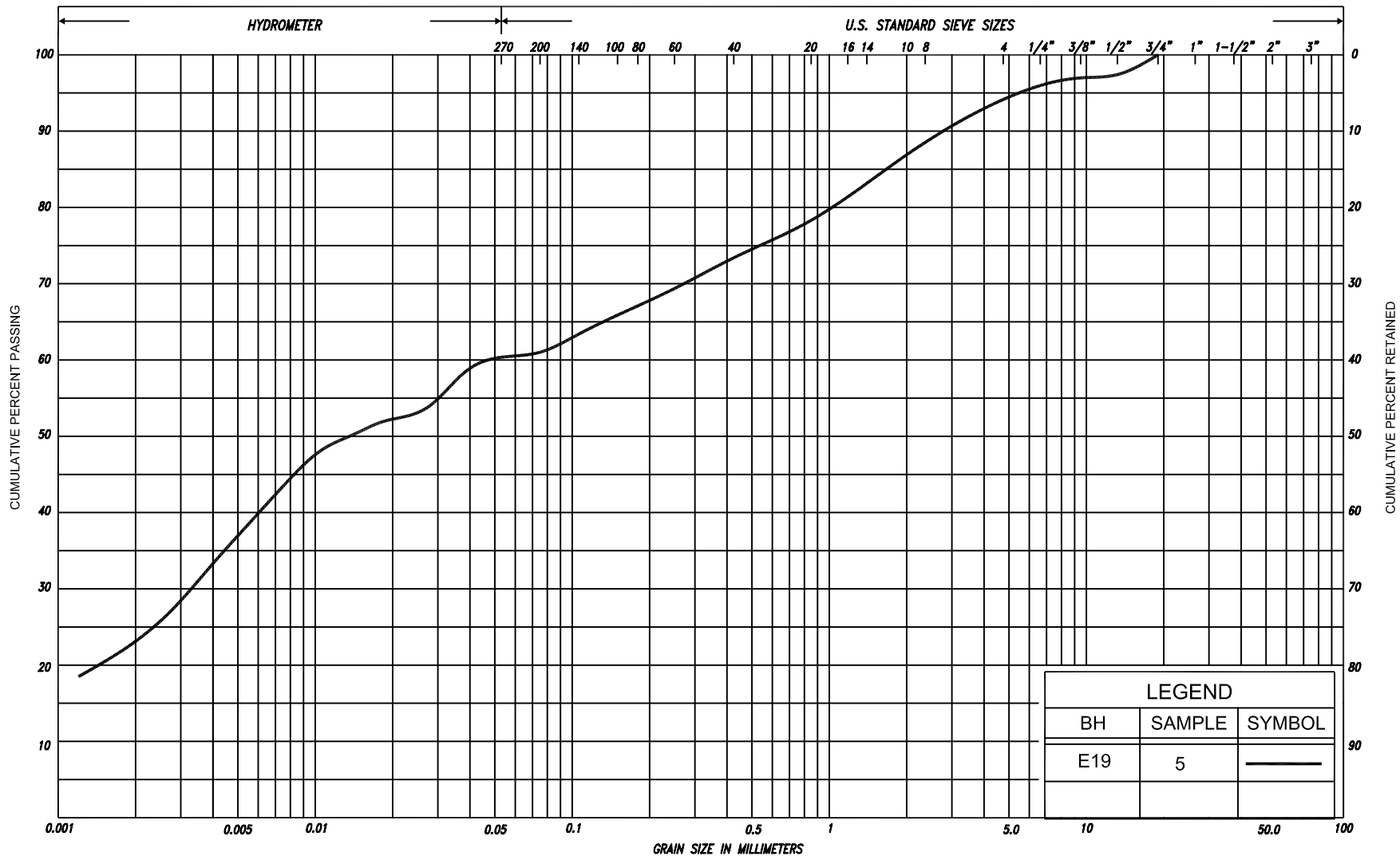
GRAIN SIZE DISTRIBUTION

SILTY CLAY, some sand, trace gravel

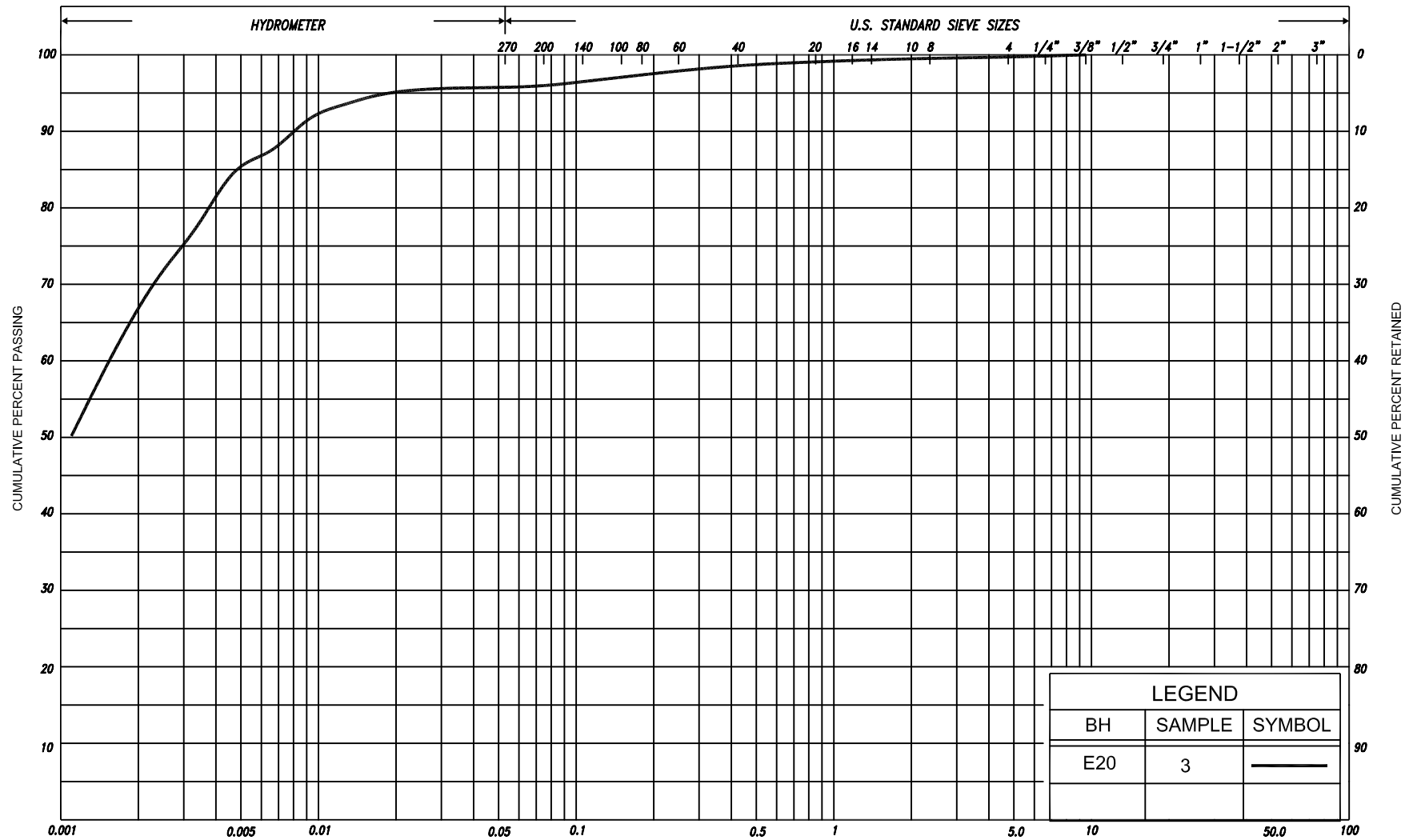
FIG No. GS-1

HWY: 69 & 637

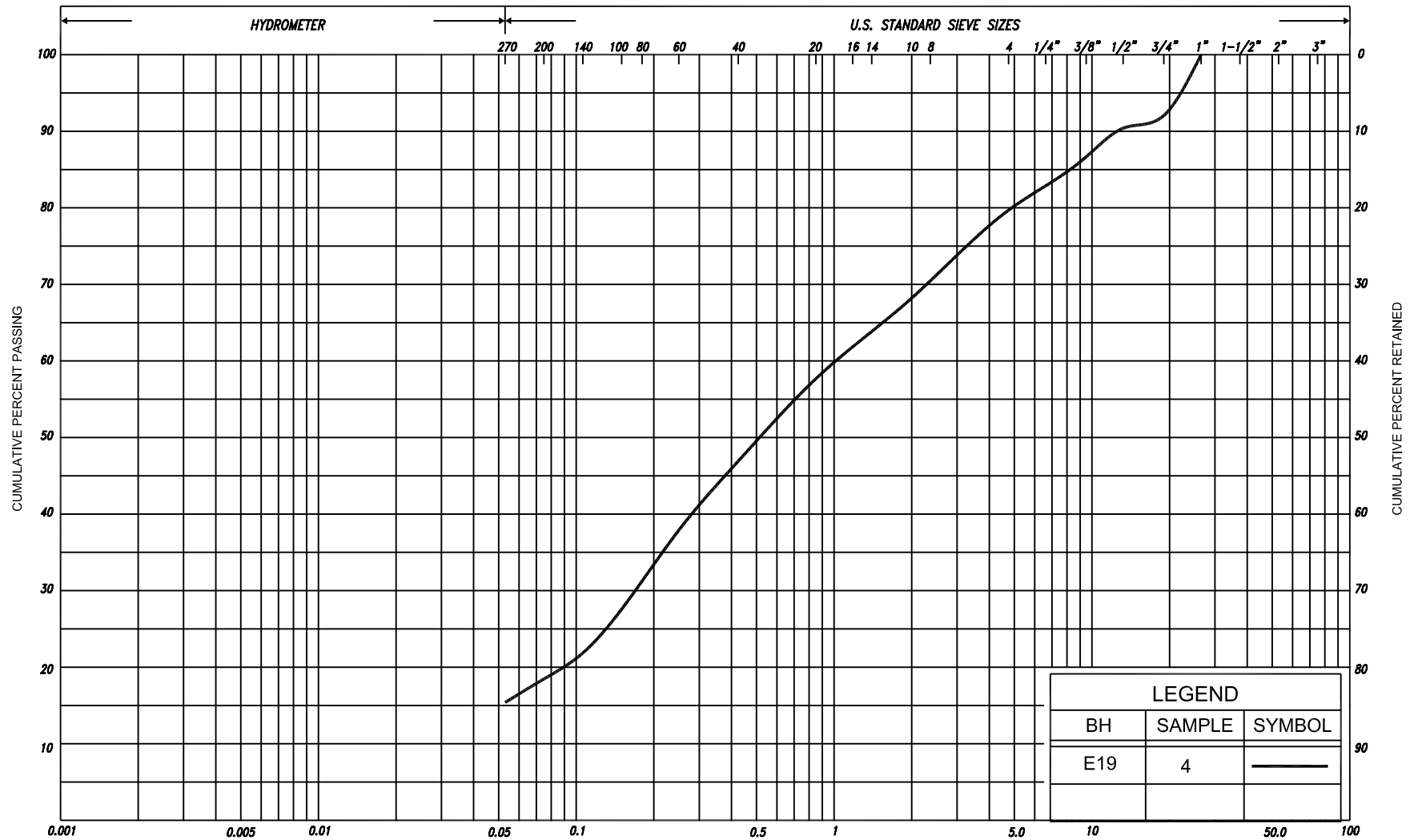
G.W.P. No. 5265-05-01



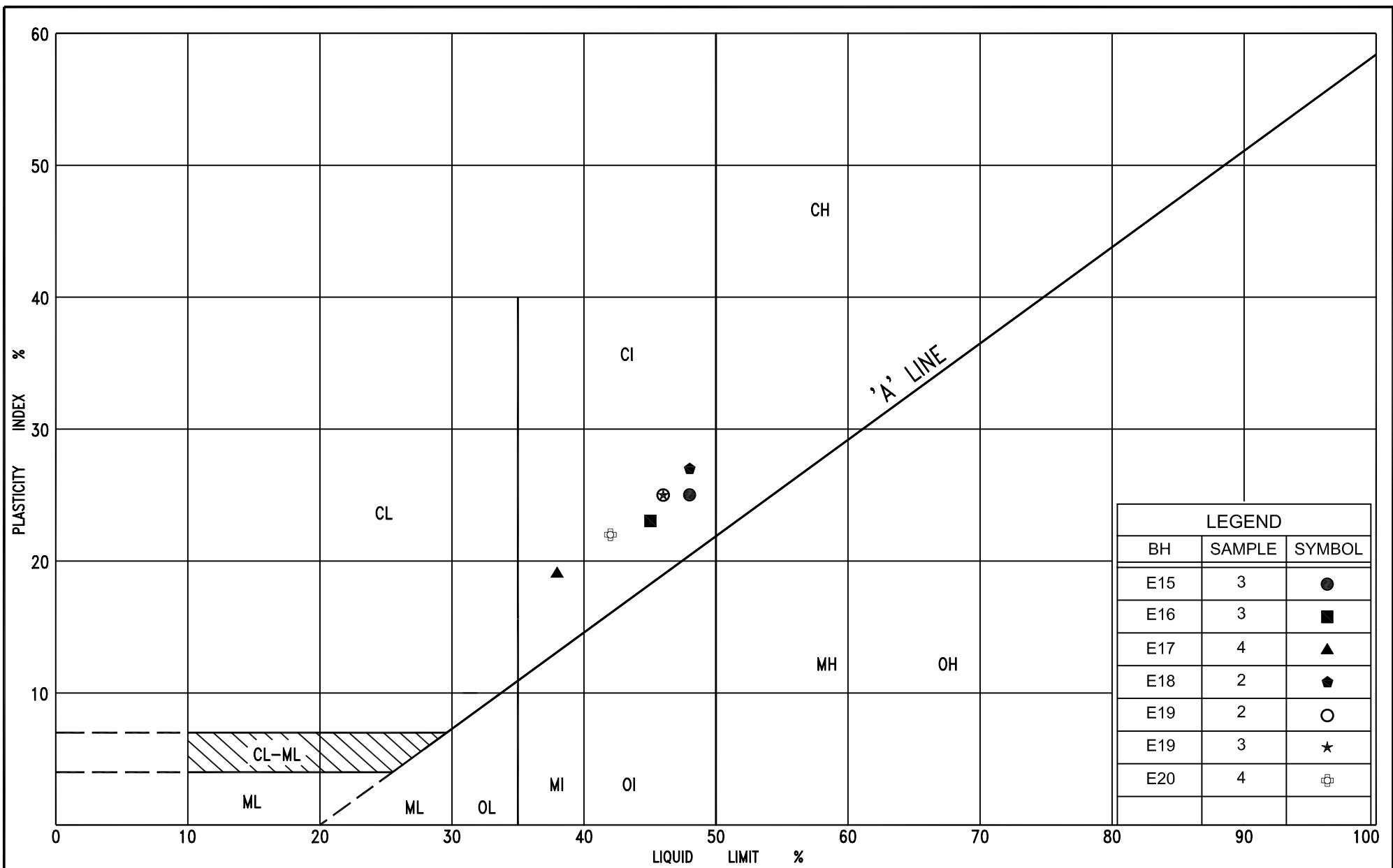
SILT & CLAY					FINE		MEDIUM		COARSE	GRAVEL			COB BLES	UNIFIED		
					SAND											
CLAY	FINE		MEDIUM	COARSE	FINE		MEDIUM		COARSE		GRAVEL			COBBLES	M.I.T.	
	SILT						SAND									
CLAY		SILT			Y. FINE	FINE	MED.	COARSE	GRAVEL							U.S. BUREAU
					SAND											

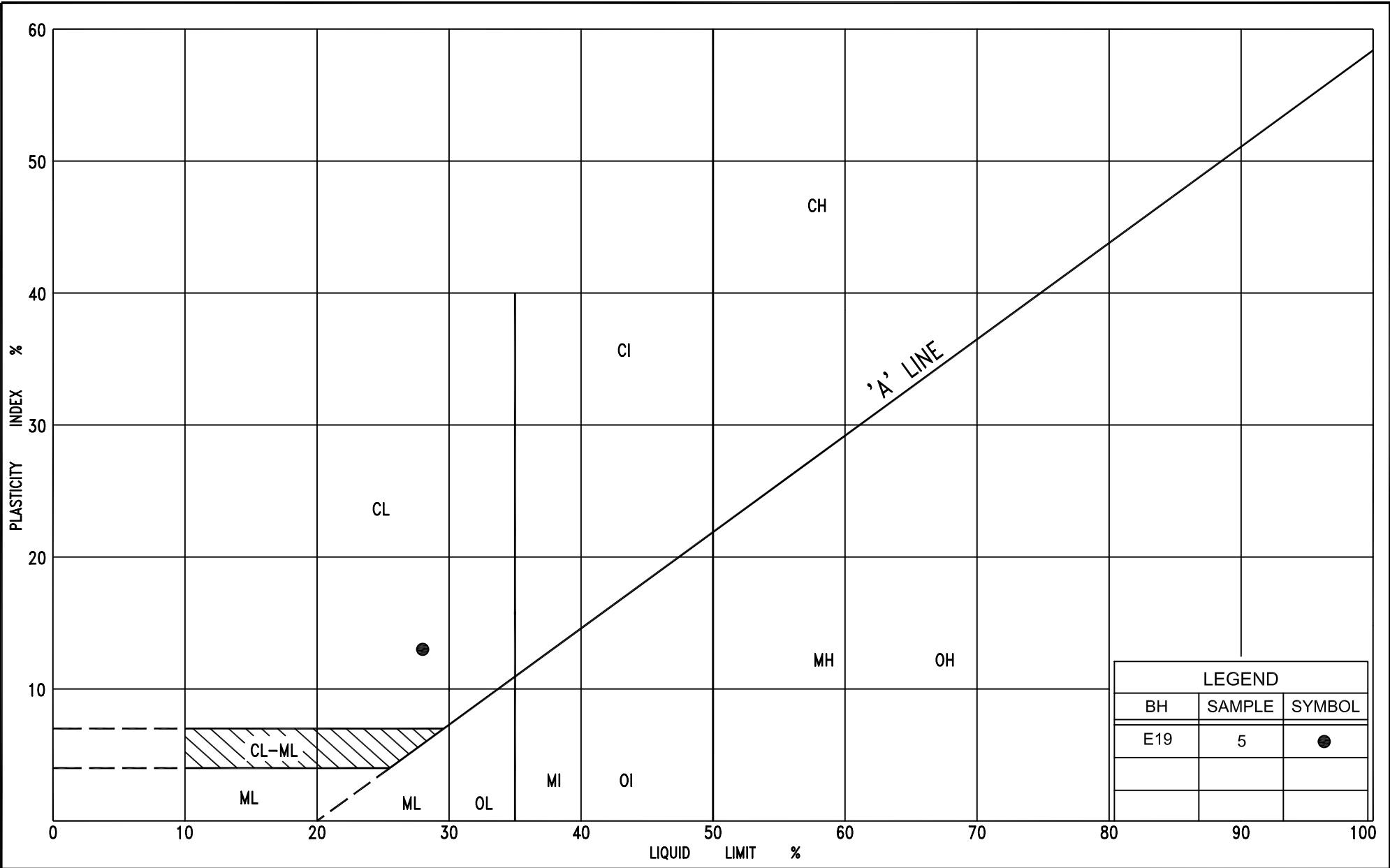


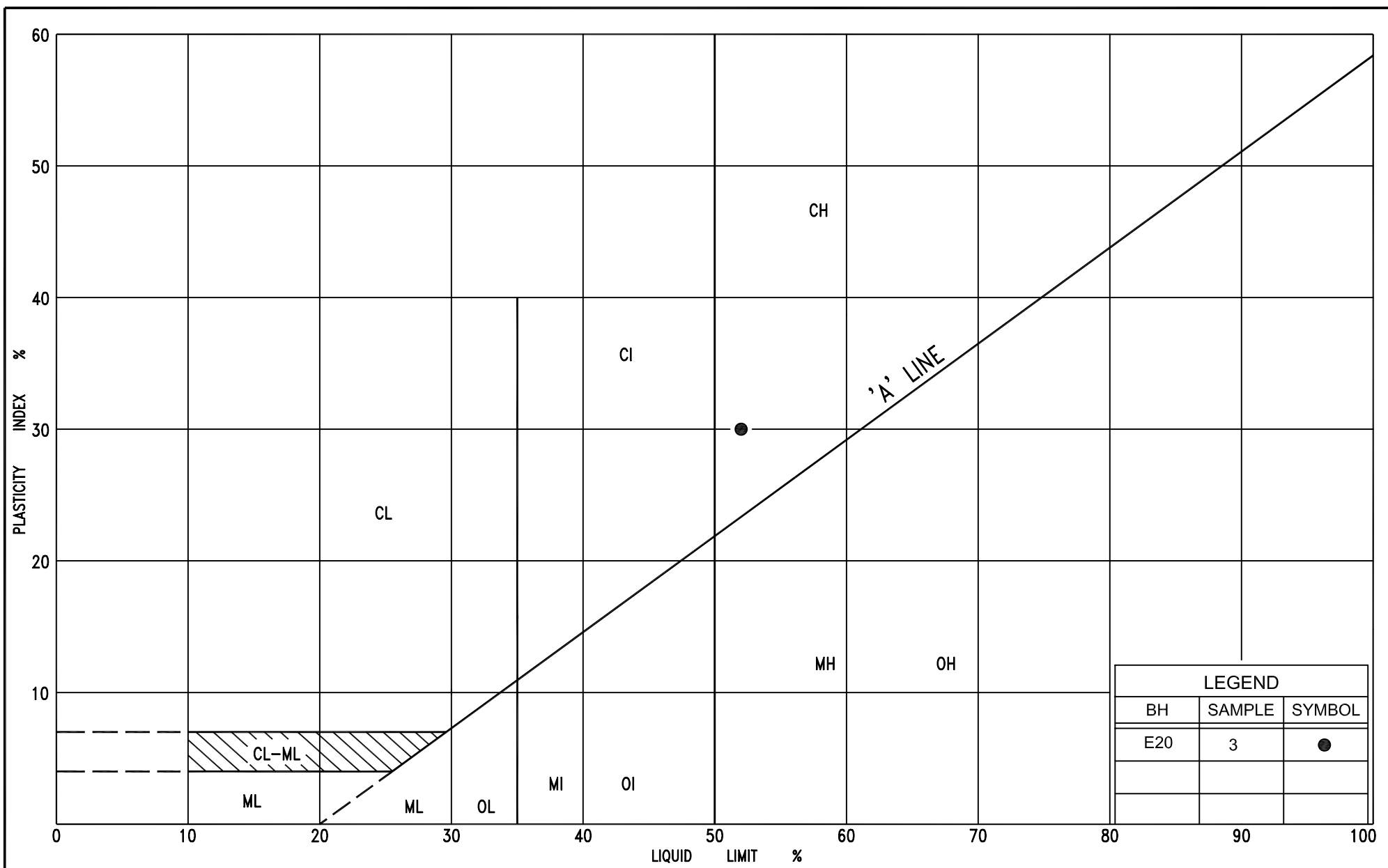
SILT & CLAY				FINE SAND			MEDIUM SAND		COARSE SAND	GRAVEL		COBBLES	UNIFIED
CLAY	SILT			FINE SAND			MEDIUM SAND			GRAVEL			M.I.T.
	CLAY			V. FINE SAND			FINE SAND			GRAVEL			U.S. BUREAU



SILT & CLAY				FINE		MEDIUM		COARSE		GRAVEL			COBBLES	UNIFIED		
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL		COBBLES	M.I.T.
	CLAY		SILT		V. FINE		FINE		MED.		COARSE		GRAVEL			U.S. BUREAU







EXPLANATION OF TERMS USED IN REPORT

N VALUE: THE STANDARD PENETRATION TEST (SPT) N VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D. SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N VALUE IS DENOTED THUS \bar{N} .

DYNAMIC CONE PENETRATION TEST: CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475 J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

CONSISTENCY: COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH (c_u) AS FOLLOWS:

c_u (kPa)	0 - 12	12 - 25	25 - 50	50 - 100	100 - 200	> 200
	VERY SOFT	SOFT	FIRM	STIFF	VERY STIFF	HARD

DENSENESS: COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF DENSENESS AS INDICATED BY SPT N VALUES AS FOLLOWS:

N (BLOWS/0.3m)	0 - 5	5 - 10	10 - 30	30 - 50	> 50
	VERY LOOSE	LOOSE	COMPACT	DENSE	VERY DENSE

ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND / OR STRENGTH.

RECOVERY: SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH OF THE CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (R Q D), FOR MODIFIED RECOVERY, IS:

RQD (%)	0 - 25	25 - 50	50 - 75	75 - 90	90 - 100
	VERY POOR	POOR	FAIR	GOOD	EXCELLENT

JOINTING AND BEDDING:

SPACING	50mm	50 - 300mm	0.3m - 1m	1m - 3m	> 3m
JOINTING	VERY CLOSE	CLOSE	MOD. CLOSE	WIDE	VERY WIDE
BEDDING	VERY THIN	THIN	MEDIUM	THICK	VERY THICK

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

S S	SPLIT SPOON	T P	THINWALL PISTON
W S	WASH SAMPLE	O S	OSTERBERG SAMPLE
S T	SLOTTED TUBE SAMPLE	R C	ROCK CORE
B S	BLOCK SAMPLE	P H	T W ADVANCED HYDRAULICALLY
C S	CHUNK SAMPLE	P M	T W ADVANCED MANUALLY
T W	THINWALL OPEN	F S	FOIL SAMPLE
F V	FIELD VANE		

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
u	1	PORE PRESSURE RATIO
σ	kPa	TOTAL NORMAL STRESS
σ'	kPa	EFFECTIVE NORMAL STRESS
τ	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
ϵ	%	LINEAR STRAIN
$\epsilon_1, \epsilon_2, \epsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
μ	1	COEFFICIENT OF FRICTION

MECHANICAL PROPERTIES OF SOIL

m_v	kPa^{-1}	COEFFICIENT OF VOLUME CHANGE
C_c	1	COMPRESSION INDEX
C_s	1	SWELLING INDEX
C_α	1	RATE OF SECONDARY CONSOLIDATION
c_v	m^2/s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
T_v	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
σ'_{vo}	kPa	EFFECTIVE OVERBURDEN PRESSURE
σ'_p	kPa	PRECONSOLIDATION PRESSURE
τ_f	kPa	SHEAR STRENGTH
c'	kPa	EFFECTIVE COHESION INTERCEPT
ϕ'	-°	EFFECTIVE ANGLE OF INTERNAL FRICTION
c_u	kPa	APPARENT COHESION INTERCEPT
ϕ_u	-°	APPARENT ANGLE OF INTERNAL FRICTION
τ_R	kPa	RESIDUAL SHEAR STRENGTH
τ_r	kPa	REMOULDED SHEAR STRENGTH
S_t	1	SENSITIVITY = $\frac{c_u}{\tau_r}$

PHYSICAL PROPERTIES OF SOIL

ρ_s	kg/m^3	DENSITY OF SOLID PARTICLES	n	1, %	POROSITY	e_{\max}	1, %	VOID RATIO IN LOOSEST STATE
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES	w	1, %	WATER CONTENT	e_{\min}	1, %	VOID RATIO IN DENSEST STATE
ρ_w	kg/m^3	DENSITY OF WATER	S_r	%	DEGREE OF SATURATION	I_D	1	DENSITY INDEX = $\frac{e_{\max} - e}{e_{\max} - e_{\min}}$
γ_w	kN/m^3	UNIT WEIGHT OF WATER	w_L	%	LIQUID LIMIT	D	mm	GRAIN DIAMETER
ρ	kg/m^3	DENSITY OF SOIL	w_p	%	PLASTIC LIMIT	D_n	mm	n PERCENT - DIAMETER
γ	kN/m^3	UNIT WEIGHT OF SOIL	w_s	%	SHRINKAGE LIMIT	C_u	1	UNIFORMITY COEFFICIENT
ρ_d	kg/m^3	DENSITY OF DRY SOIL	I_p	%	PLASTICITY INDEX = $w_L - w_p$	h	m	HYDRAULIC HEAD OR POTENTIAL
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL	I_L	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	q	m^3/s	RATE OF DISCHARGE
ρ_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	v	m/s	DISCHARGE VELOCITY
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL	DTPL		DRIER THAN PLASTIC LIMIT	i	1	HYDRAULIC GRADIENT
ρ'	kg/m^3	DENSITY OF SUBMERGED SOIL	APL		ABOUT PLASTIC LIMIT	k	m/s	HYDRAULIC CONDUCTIVITY
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL	WTPL		WETTER THAN PLASTIC LIMIT	j	kN/m^2	SEEPAGE FORCE
e	1, %	VOID RATIO						

RECORD OF BOREHOLE No E 1

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 120 999 N; 322 292 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Manual Probe COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p W W _L				WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
236.9 0.0	Ground Surface					*		20	40	60	80	100		20	40	60		GR	SA	SI	CL
236.8 0.1	Topsoil																				
	End of borehole																				
	Refusal on bedrock outcrop																				
								</													

RECORD OF BOREHOLE No E 2

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 011 N; 322 306 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling COMPILED BY A.S.
 DATUM Geodetic DATE August 12, 2008 CHECKED BY C.N.


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 (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
236.2	Ground Surface						20	40	60	80	100						
0.0	Topsoil						236										
235.8																	
0.4	Granodiorite Gneiss bedrock Unweathered High strength Excellent quality		1	RC NQ	REC 100%		235									RQD 100%	
			2	RC NQ	REC 100%		234									RQD 100%	
232.7	End of borehole						233										
3.5																	
	* Borehole dry C.F.H.S.A. Denotes Continuous Flight Hollow Stem Augers																

RECORD OF BOREHOLE No E 3

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 120 999 N; 322 311 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.


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 × LAB VANE																	
236.0	Ground Surface		1	SS	3/15cm												
0.0	Topsoil																
235.8	End of borehole																
0.2	Refusal on probable bedrock																
	Sample 1: Sampler bouncing																
	* Borehole dry																

RECORD OF BOREHOLE No E 4										1 of 1		METRIC	
G.W.P. 5265-05-01			LOCATION Co-ords: 5 121 006 N; 322 310 E			ORIGINATED BY F.P.							
DIST 54 HWY 69 & 637			BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling			COMPILED BY A.S.							
DATUM Geodetic			DATE August 13, 2008			CHECKED BY C.N.							
SOIL PROFILE			SAMPLES			DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT		UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	20 40 60 80 100	W _p W W _L				
236.2	Ground Surface												
0.0	Topsoil						236						
235.8	Granodiorite Gneiss bedrock Unweathered High strength Excellent quality		1	RC NQ	REC 100%		235					RQD 97%	
0.4								234					RQD 92%
			2	RC NQ	REC 100%			233					
232.7	End of borehole												
3.5	* Borehole dry C.F.H.S.A. Denotes Continuous Flight Hollow Stem Augers												

METRIC

+⁷, ×⁵: Numbers refer to Sensitivity

15 — 20 — 5
|
10
(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No E 6										1 of 1		METRIC	
G.W.P. 5265-05-01			LOCATION Co-ords: 5 121 013 N; 322 309 E			ORIGINATED BY F.P.							
DIST 54 HWY 69 & 637			BOREHOLE TYPE Continuous Flight Hollow Stem Augers			COMPILED BY A.S.							
DATUM Geodetic			DATE August 13, 2008			CHECKED BY C.N.							
SOIL PROFILE			SAMPLES			DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC NATURAL LIQUID UNIT WEIGHT REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	20 40 60 80 100 ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE		W _p ——— W ——— W _L WATER CONTENT (%)	γ	GR SA SI CL	
236.0	Ground Surface												
0.0 235.7	Topsoil		1	SS	2								
0.3	Silty sand												
235.2 0.8	Loose Brown Moist End of borehole Refusal on probable bedrock												
* Borehole dry													

METRIC

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No E 9

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 014 N; 322 345 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE August 11, 2008 CHECKED BY C.N.


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										W _p			W			W _L			γ	kN/m ³	GR SA SI CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

RECORD OF BOREHOLE No E 10

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 021 N; 322 344 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling COMPILED BY A.S.
 DATUM Geodetic DATE August 11, 2008 CHECKED BY C.N.


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)						
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE											
								20	40	60	80	100	20	40	60				
236.0 0.0	Ground Surface															GR	SA	SI	CL
235.9 0.1	Topsoil		1	RC NQ	REC 92%		235										RQD	88%	
	234																		
	2		RC NQ	REC 100%	233														RQD
232.6 3.4	End of borehole																		
	* Borehole dry C.F.H.S.A. Denotes Continuous Flight Hollow Stem Augers																		

RECORD OF BOREHOLE No E 11

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 025 N; 322 345 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling COMPILED BY A.S.
 DATUM Geodetic DATE August 12, 2008 CHECKED BY C.N.

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 (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
235.7	Ground Surface							20	40	60	80	100												
0.0	Granite-granodiorite Gneiss bedrock		1	RC NQ	REC 100%		235													RQD 68%				
	Unweathered																							
	High strength		2	RC NQ	REC 98%		234														RQD 98%			
	Fair to excellent quality																							
232.6	End of borehole						233																	
3.1																								
	* Borehole dry																							
	C.F.H.S.A. Denotes Continuous Flight Hollow Stem Augers																							

RECORD OF BOREHOLE No E 12

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 028 N; 322 343 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Manual Probe COMPILED BY A.S.
 DATUM Geodetic DATE August 12, 2008 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)			GR	SA	SI		CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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235.3 0.0	Ground Surface Bedrock at surface																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													



RECORD OF BOREHOLE No E 13										1 of 1		METRIC		
G.W.P. 5265-05-01			LOCATION Co-ords: 5 121 016 N; 322 349 E			ORIGINATED BY F.P.								
DIST 54 HWY 69 & 637			BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling			COMPILED BY A.S.								
DATUM Geodetic			DATE August 11, 2008			CHECKED BY C.N.								
SOIL PROFILE			SAMPLES			DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa		W _p W W _L				
233.8 0.0	Ground Surface							20 40 60 80 100 ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE		20 40 60				
233.7 0.1	Topsoil Granite- Granodiorite Gneiss Bedrock Unweathered High Strength Good to excellent quality		1	RC NQ	REC 100%		233							RQD 97%
			2	RC NQ	REC 100%		232							RQD 94%
			3	RC NQ	REC 83%		231							RQD 83%
230.2 3.6	End of borehole													
	* Borehole dry C.F.H.S.A. Denotes Continuous Flight Hollow Stem Augers													

RECORD OF BOREHOLE No E 14

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 043 N; 322 375 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling COMPILED BY A.S.
 DATUM Geodetic DATE August 06, 2008 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)							
								○ UNCONFINED + FIELD VANE					w _p w w _L							
								● QUICK TRIAXIAL × LAB VANE												
231.9	Ground Surface							20	40	60	80	100					GR	SA	SI	CL
0.0	Topsoil		1	SS	3/15cm															
231.6	Granodiorite Gneiss Bedrock Unweathered High strength Excellent quality		2	RC NQ	REC 95%		231											RQD	95%	
0.3			3	RC NQ	REC 95%		230												RQD	94%
			4	RC NQ	REC 96%		229													
								228												RQD
227.9	End of borehole																			
4.0	Sample 1: Sampler bouncing																			
	* Borehole dry																			
	C.F.H.S.A. Denotes Continuous Flight Hollow Stem Augers																			

METRIC[illegible]

ON_MOT VER3 06TF052E.GPJ ON_MOT.GDT 5/5/2009 3:08:57 PM

(%) STRAIN AT FAILURE

METRIC

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — ○ — 5
10

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No E 17

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 036 N; 322 383 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling COMPILED BY A.S.
 DATUM Geodetic DATE August 08, 2008 CHECKED BY C.N.

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 × LAB VANE											
								WATER CONTENT (%)											
								20	40	60	80	100	20	40	60				
231.3 0.0	Ground Surface																		
230.8 0.5	Topsoil		1	SS	5		231												
227.8 3.5	Silty clay some sand, trace gravel rootlets Stiff Mottled Moist grey/ brown		2	SS	11		230												
			3	SS	13														
			4	SS	3														
			FV																
223.9 7.4	Granodiorite Gneiss Bedrock Unweathered High strength Good to excellent quality		5	RC NQ	REC 89%		228										2 11 47 40		
			6	RC NQ	REC 100%		227										RQD 65%		
			7	RC NQ	REC 100%		226										RQD 96%		
			8	RC NQ	REC 98%		225										RQD 100%		
223.9 7.4	End of borehole						224												

RECORD OF BOREHOLE No E 18

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 045 N; 322 378 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE August 06, 2008 CHECKED BY C.N.














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 (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
231.4	Ground Surface						20	40	60	80	100						
0.0	Topsoil		1	SS	2		231							○			
230.8 0.6	Silty clay, trace sand trace gravel, rootlets Stiff to Mottled Moist very stiff grey/brown		2	SS	10		230										1 7 35 57
			3	SS	17						225	●	○				
			4	SS	4/15cm							138	■	○			
228.8 2.6	thin layers of sand Moist																
End of borehole																	
Refusal on probable bedrock																	
Sample 4: Sampler bouncing																	
* Borehole dry																	
■ Penetrometer test																	

RECORD OF BOREHOLE No E 19

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 032 N; 322 384 E ORIGINATED BY F.P.
DIST 54 HWY 69 & 637 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling COMPILED BY A.S.
DATUM Geodetic DATE August 06, 2008 CHECKED BY C.N.

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 (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		
231.3	Ground Surface																			
0.0	Topsoil		1	SS	6		231													
230.9	Silty clay some sand, trace gravel rootlets Stiff Mottled Moist grey/brown		2	SS	15		230									1 12 39 48				
0.4			3	SS	8		230									1 4 41 54				
229.0							229										20 62 (18)			
2.3	Sand, some gravel some silt, trace clay		4	SS	14		228									6 33 38 23				
228.2	Compact Grey Wet																			
3.1	Sandy clayey silt trace gravel Very soft Grey Wet to soft		5	SS	1		227													
			6	SS	1															
				FV																
226.4	Gravelly sand cobbles and boulders						226													
4.9	Grey Wet																			
225.6	Granodiorite Gneiss Bedrock Unweathered High strength Excellent quality		7	RC NQ	REC 100%		225									RQD 100%				
5.7			8	RC NQ	REC 100%		224									RQD 100%				
			9	RC NQ	REC 79%		223									RQD 79%				
222.1	End of borehole																			
9.2	Low RQD and recovery in rock coring due to piece lost down hole																			
	* 2008 08 06																			
	 Water level observed during drilling																			
	 Water level measured after drilling																			
	C.F.H.S.A. Denotes Continuous Flight Hollow Stem Augers																			

RECORD OF BOREHOLE No E 20										1 of 1		METRIC	
G.W.P. 5265-05-01			LOCATION Co-ords: 5 121 046 N; 322 398 E			ORIGINATED BY F.P.							
DIST 54 HWY 69 & 637			BOREHOLE TYPE Continuous Flight Hollow Stem Augers			COMPILED BY A.S.							
DATUM Geodetic			DATE August 06, 2008			CHECKED BY C.N.							
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 × LAB VANE		W _p W W _L WATER CONTENT (%)		γ	GR SA SI CL
231.0	Ground Surface												
0.0	Topsoil		1	SS	4								
230.7	Clay trace sand, trace gravel		2	SS	12		230						
0.3	Stiff Brown Moist		3	SS	8		229						1 3 29 67
228.7	Silty clay some sand, trace gravel		4	SS	10								
2.3	Stiff Mottled Moist grey/brown		5	SS	10/1cm		228						7 16 34 43
227.8	thin layers of silty sand												
3.2	End of borehole												
	Refusal on probable bedrock												
	Sample 5: Sampler bouncing												
	2008 08 06												
	▽ Water level observed during drilling												
	▼ Water level measured after drilling												
	■ Penetrometer test												

RECORD OF BOREHOLE No APE 1

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 044 N; 322 377 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.

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 × LAB VANE						WATER CONTENT (%)							
231.7	Ground Surface								20	40	60	80	100						
0.0	Topsoil																		
231.4	Silty clay, trace sand																		
0.3	Brown Moist							231											
230.7	End of borehole																		
1.0	Refusal on probable bedrock																		
	Auger probes were not sampled. Soil boundaries were estimated from auger cuttings																		
	* Borehole dry																		

METRIC


20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No APE 3

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 031 N; 322 382 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.

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 × LAB VANE																
231.3 0.0	Ground Surface Topsoil						20	40	60	80	100	20	40	60		
231.1 0.2	Silty clay, trace sand Brown Moist					231										
						230										
						229										
						228										
227.7 3.6	Sand trace silt, trace gravel cobbles															
227.2 4.1	Brown Wet End of borehole Refusal on probable bedrock Auger probes were not sampled. Soil boundaries were estimated from auger cuttings * Borehole dry															

RECORD OF BOREHOLE No APE 4 1 of 1 METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 037 N; 322 378 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Manual Probe COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					w _p	w	w _L	WATER CONTENT (%)	GR	SA		SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE									
231.7	Ground Surface																					
0.0	Bedrock at surface																					
	* Borehole dry																					

RECORD OF BOREHOLE No APE 5

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords; 5 121 033 N; 322 386 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE December 17, 2008 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	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					
231.3	Ground Surface														
0.0 231.0 0.3	Peat, fine fibrous Dark brown														
	Silty clay trace sand, trace gravel Brown Moist		1	CS	-										

RECORD OF BOREHOLE No APE 6

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords; 5 121 036 N; 322 384 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE December 17, 2008 CHECKED BY C.N.

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									
								20	40	60	80	100					
								20	40	60	80	100					
231.3	Ground Surface																
0.0 231.0 0.3	Peat, fine fibrous Dark brown						231										
	Silty clay trace sand, trace gravel						230										
	Brown Moist																
	Grey Wet						229										
							228										
227.3 4.0	Sand, trace silt trace clay, trace gravel						227										
226.6 4.7	Grey Wet																
	End of borehole																
	Refusal on probable bedrock																
	Auger probes were not sampled. Soil boundaries were estimated from auger cuttings																
	* 2008 12 17																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC












20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No APE 9

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords; 5 121 045 N; 322 380 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE December 17, 2008 CHECKED BY C.N.

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	● QUICK TRIAXIAL	✚ FIELD VANE	✕ LAB VANE									
231.4	Ground Surface																			
0.0 231.1 0.3	Peat, fine fibrous Dark brown																			
	Silty clay trace sand, trace gravel Brown Moist					231														
			1	CS	-															
	with sand					230														
	Grey Wet																			
	cobbles and boulders		2	CS	-															
						229														
228.2 3.2	End of borehole Refusal on probable bedrock																			
	Auger probes were not sampled. Soil boundaries were estimated from auger cuttings																			
	* 2008 12 17																			
	 Water level observed during drilling																			
	 Water level measured after drilling																			

RECORD OF BOREHOLE No APE 10

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords; 5 121 041 N; 322 380 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE December 17, 2008 CHECKED BY C.N.

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 × LAB VANE									
231.4 0.0	Ground Surface						20	40	60	80	100						
231.2 0.2	Peat, fine fibrous Dark brown																
	Silty clay trace sand, trace gravel Brown Moist						231										

	silty sand layers cobbles and boulders						230										
229.3 2.1	End of borehole Refusal on probable bedrock																
	Auger probes were not sampled. Soil boundaries were estimated from auger cuttings																
	* Borehole dry on completion of drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No APP 2

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 023 N; 322 343 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Manual Probe COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					w _p	w	w _L	WATER CONTENT (%)	GR	SA		SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE								
235.8	Ground Surface																				
0.0	Bedrock at surface																				
	* Borehole dry																				

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No APW 1 1 of 1 METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 003N; 322 309 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.

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									
236.2	Ground Surface							20	40	60	80	100					
0.0	Topsoil						236										
235.6	End of borehole																
0.6	Refusal on probable bedrock																
	* Borehole dry																

METRIC


20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No APW 3

1 of 1

METRIC

G.W.P. 5265-05-01 LOCATION Co-ords: 5 121 012 N; 322 307 E ORIGINATED BY F.P.
 DIST 54 HWY 69 & 637 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY A.S.
 DATUM Geodetic DATE August 14, 2008 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL 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			20	40	60	80	100	W _p	W	W _L		
236.2	Ground Surface																
0.0	Topsoil						236										
235.4	End of borehole																
0.8	Refusal on probable bedrock																
	* Borehole dry																

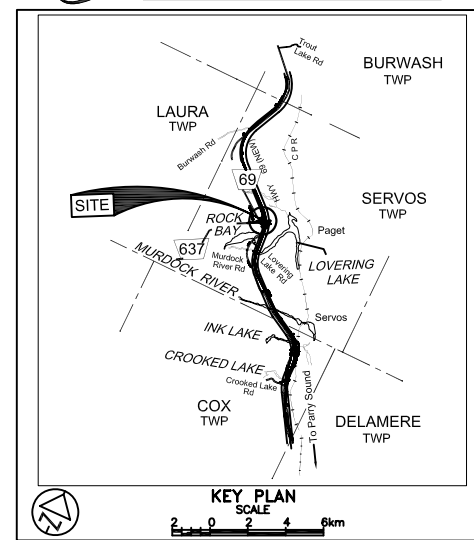
METRIC

DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No 2009-5131
GWP No 5265-05-01

HIGHWAY 637 UNDERPASS
HIGHWAY 69 FOUR-LANING
SOIL STRATA

PML Peto MacCallum Ltd
CONSULTING ENGINEERS



LEGEND

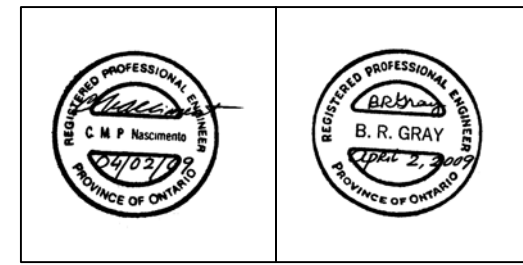
- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60 Cone, 475 J / blow)
- W L at time of investigation Aug 2008
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDINATES	
		NORTHINGS	EASTINGS

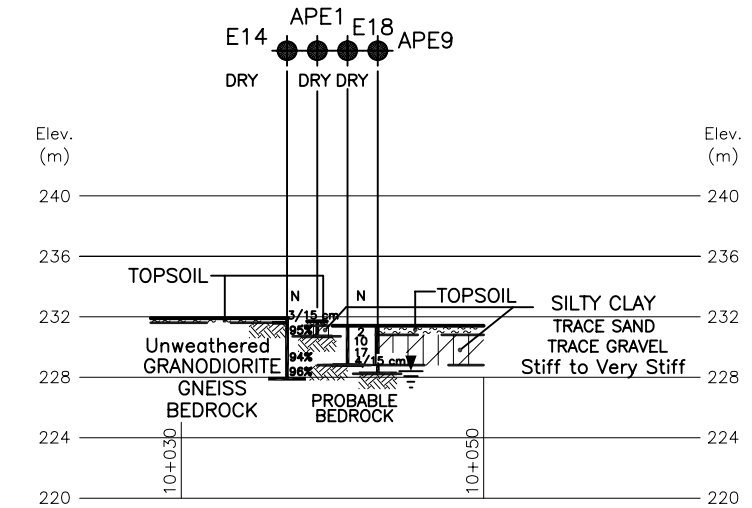
NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

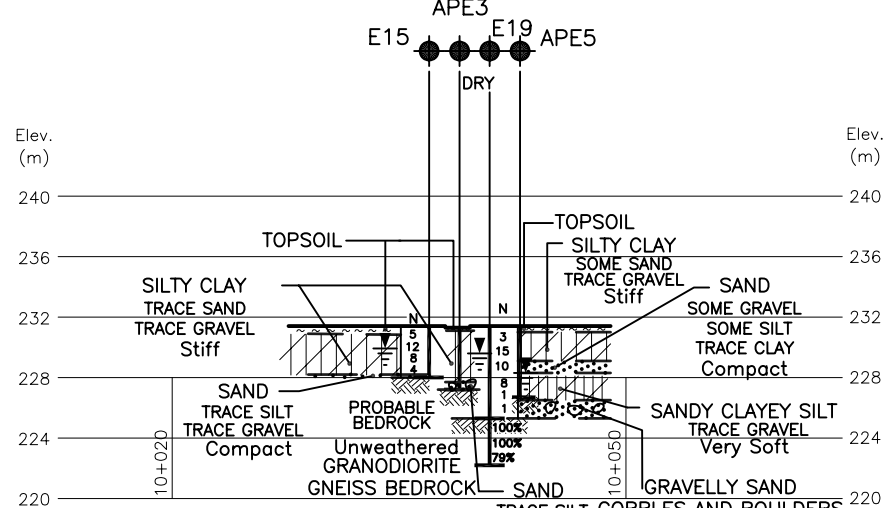
Geocres No. 411-232			
HWY No 69 & 637			DIST 54
SUBM'D AS	CHECKED CN	DATE APRIL 02, 2009	SITE 46-511
DRAWN NA	CHECKED CN	APPROVED BRG	DWG E 2



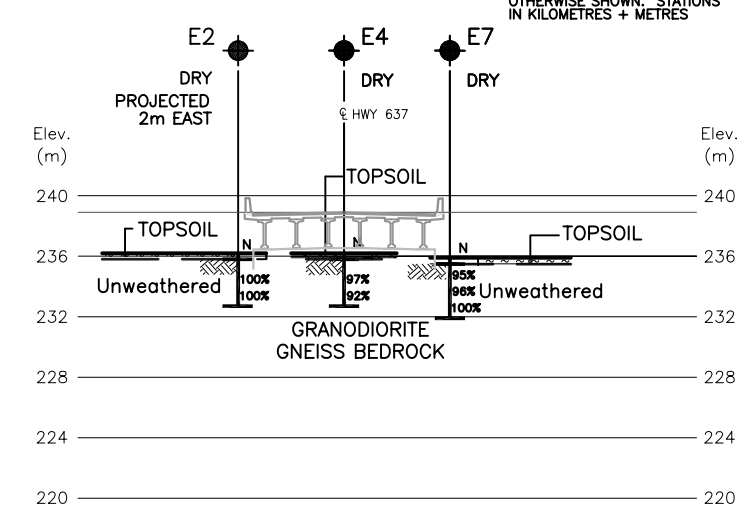
REF. TSH Drawings; Hwy 69 Servos Contract 2 Lidar Contours.dwg dated December 19, 2007; and 91088-HWY637-1-GA.dwg; Received August 27, 2008



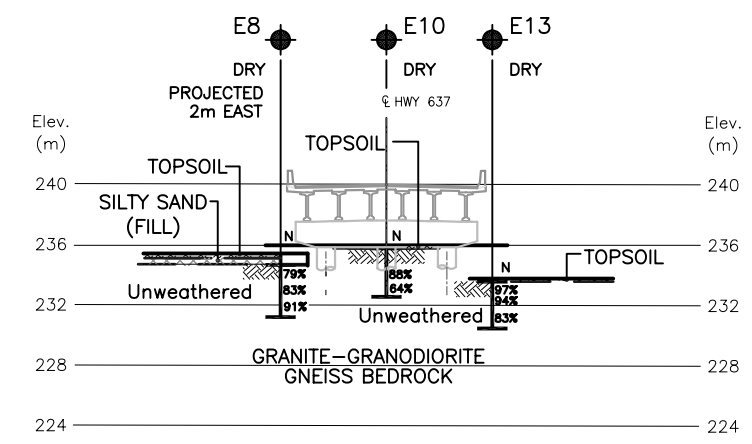
SECTION A-A



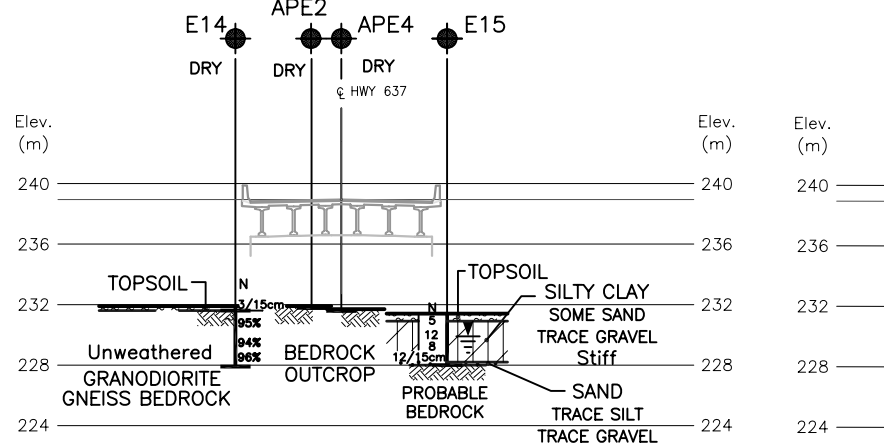
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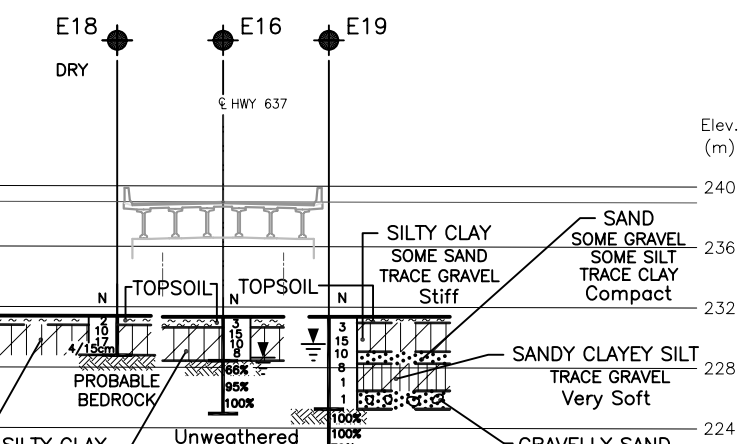
SECTION C-C



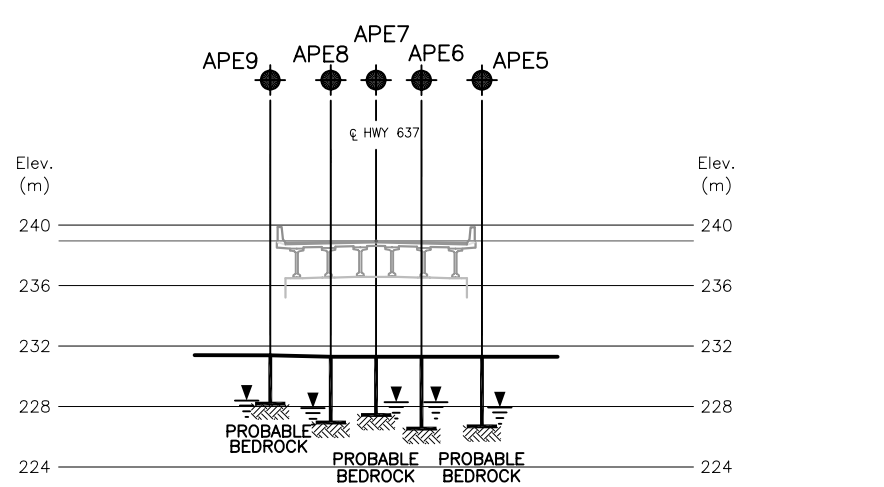
SECTION D-D



SECTION E-E



SECTION F-F



SECTION G-G



NOTES:

- REFER TO DRAWING E1 FOR BOREHOLE LOCATIONS PLAN AND CENTRE LINE PROFILE.
- THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.
- ELEVATIONS OF AUGER PROBES APE5 TO APE10 ARE APPROXIMATE.



APPENDIX A

SITE PHOTOGRAPHS



Photograph 1: Viewing Centre Pier location. Note the rock outcrop at the middle and bottom of the photograph.



Photograph 2: Viewing East Abutment location. Note stakes at borehole locations.



APPENDIX B

ROCK CORE PHOTOGRAPHS

WEST ABUTMENT



West Abutment Core Photograph 1 : Rock core from borehole E2 - RC-1 and RC-2

WEST ABUTMENT



West Abutment Core Photograph 2 : Rock core from borehole E4 - RC-1 and RC-2

WEST ABUTMENT



West Abutment Core Photograph 3: Rock core from borehole E5 - RC-1 to RC-3

WEST ABUTMENT



West Abutment Core Photograph 4: Rock core from borehole E7 - RC-1, RC-2 and RC-3

CENTRE PIER



Centre Pier Core Photograph 1 : Rock core from borehole E8 - RC-1, RC-2 and RC-3

CENTRE PIER



Centre Pier Core Photograph 2 : Rock core from borehole E10 - RC-1

CENTRE PIER



Centre Pier Core Photograph 3: Rock core from borehole E10 - RC-2 and RC-3

CENTRE PIER



Centre Pier Core Photograph 4: Rock core from borehole E11 - RC-1 and RC-2

CENTRE PIER



Centre Pier Core Photograph 5: Rock core from borehole E13 - RC-1

CENTRE PIER



Centre Pier Core Photograph 6: Rock core from borehole E13 - RC-2 and RC-3

EAST ABUTMENT



East Abutment Core Photograph 1: Rock core from borehole E14 - RC-2

EAST ABUTMENT



East Abutment Core Photograph 2: Rock core from borehole E14 - RC-3 and RC-4

EAST ABUTMENT



East Abutment Core Photograph 3: Rock core from borehole E16 - RC-5 and RC-6

EAST ABUTMENT



East Abutment Core Photograph 4: Rock core from borehole E16 - RC-7

EAST ABUTMENT



East Abutment Core Photograph 5: Rock core from borehole E17 - RC-5 and top of RC-6

EAST ABUTMENT



East Abutment Core Photograph 6: Rock core from borehole E17, bottom of RC-6, RC-7 and RC-8

EAST ABUTMENT



East Abutment Core Photograph 7: Rock core from borehole E19 - RC-7 and RC-8

EAST ABUTMENT



East Abutment Core Photograph 8: Rock core from borehole E19 - RC-9