TABLE A

ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	**CORE NO.**	**DEPTH (m)**	**RECOVERY (%)**	**RQD (%)**	**DEPTH (m)**	**DESCRIPTION**
S2	1	0.0 – 1.5	100	45	0.0 – 3.1	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered to unweathered, close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with red oxidation stains, becoming tight, with vertical fissures, rough planar, oxidized, poor to good quality.
	2	1.5 – 3.1	94	79		
S5	3	2.1 – 2.8	97	55	2.1 – 5.2	MIGMATITE: Dark grey to black, fine to medium crystalline, medium to high strength, slightly to moderately weathered, very close to close spaced flat to dipping cross joints, rough planar, slightly altered with red, green and yellow oxidation stains, some scale, single slickensided undulating parting, with few vertical fissures, poor to fair quality.
	4	2.8 – 4.4	100	51		
	5	4.4 – 5.2	100	28		
S7	2	0.2 – 1.8	96	61	0.2 – 3.3	GRANITIC GNEISS: Pink, fine to medium crystalline, high strength, unweathered to slightly weathered, close to moderate (locally very close) spaced flat to dipping cross joints, rough planar, tight to slightly altered with oxidation stains, scale and/or silt in partings, vertical fissure from 2.5 to 2.9 m depth, fair quality.
	3	1.8 – 3.3	100	66		
S8	3	1.2 – 2.0	100	100	1.2 – 4.3	GRANITIC GNEISS: Pink, fine to medium crystalline, with occasional dark grey to black biotite rich layers (up to 75 mm thick), high strength, unweathered, becoming slightly to moderately weathered, moderate becoming close to moderate (locally very close) spaced dipping to near vertical cross joints, rough planar, tight to slightly altered with oxidation stains, excellent becoming good quality.
	4	2.0 – 3.5	100	100		
	5	3.5 – 4.3	95	87		

Originated: JFW
Compiled: FP
Checked: GD/ CN

TABLE A

ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	**CORE NO.**	**DEPTH (m)**	**RECOVERY (%)**	**RQD (%)**	**DEPTH (m)**	**DESCRIPTION**
S9	4	1.8 – 2.1	80	80	1.8 – 4.9	GRANITIC GNEISS: Pink, fine to medium crystalline, with occasional dipping layers of black biotite concentrations, high strength, unweathered, close to moderate becoming moderate to wide (locally close) spaced dipping cross joints, rough planar, tight, good to excellent quality.
	5	2.1 – 3.3	100	97		
	6	3.3 – 4.9	95	90		
S11	1	0.3 – 1.9	100	99	0.3 – 3.4	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered to unweathered, moderate to wide spaced dipping cross joints, rough planar, tight to slightly altered with red oxidation stains on partings, core separates on biotite concentrations, excellent quality.
	2	1.9 – 3.4	100	100		
S13	1	0.0 – 1.6	95	94	0.0 – 3.2	GRANITIC GNEISS: Pink, fine to medium crystalline, high strength, unweathered, close to moderate spaced dipping cross joints, rough planar, tight, excellent quality.
	2	1.6 – 3.2	98	98		
S14	8	14.0 – 15.0	100	52	14.0 – 15.3	MIGMATITE: Dark grey to black, fine crystalline, medium to high strength, slightly to moderately weathered, close spaced dipping cross joints, rough planar, tight to slightly altered with scale on partings, locally open 5 to 10 mm with clay infilling, occasional vertical fissures, fair to good quality.
	9	15.0 – 15.3	80	80		
S16	7	12.3 – 13.3	97	52	12.3 – 15.6	MIGMATITE: Dark grey to black, fine crystalline, medium to high strength, unweathered, close to moderate (locally very close) spaced dipping cross joints, rough planar, tight, fair to excellent (locally poor) quality.
	8	13.3 – 14.2	85	44		
	9	14.2 – 15.6	99	94		

Originated: JFW
Compiled: FP
Checked: GD/ CN

TABLE A

ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	**CORE NO.**	**DEPTH (m)**	**RECOVERY (%)**	**RQD (%)**	**DEPTH (m)**	**DESCRIPTION**
S20	1	0.0 – 0.7	100	100	0.0 – 3.1	GRANITIC GNEISS: Light grey and pink, becoming dark grey, fine to medium crystalline, with dipping bands, high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with red oxidation stains, silt and/or scale on partings, fair to excellent quality. NOTE: Core has rotated and worn down surface of a number of flat discontinuities. It is not possible to determine whether these are natural joints, or are mechanical breaks due to the coring operation.
	2	0.7 – 1.3	100	97		
	3	1.3 – 2.6	100	98		
	4	2.6 – 3.1	95	73		
S23	1	0.0 – 0.7	100	100	0.0 – 1.5	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, close to moderate spaced flat cross joints, rough planar, slightly altered with dark or red oxidation stains, minor scale, excellent quality.
	2	0.7 – 1.5	100	97		
	3	1.5 – 2.4	99	74		
	4	2.4 – 3.1	98	95	1.5 – 3.1	MIGMATITE: Dark grey with few white inclusions, medium crystalline, high strength, unweathered, close to moderate spaced flat to dipping cross joints, rough planar, tight, fair to excellent quality. NOTE: Core has rotated and worn down surface of a number of flat discontinuities. It is not possible to determine whether these are natural joints, or are mechanical breaks due to the coring operation.

Originated:	JFW
Compiled:	FP
Checked:	GD/ CN

TABLE A

ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	**CORE NO.**	**DEPTH (m)**	**RECOVERY (%)**	**RQD (%)**	**DEPTH (m)**	**DESCRIPTION**
S24	1	0.0 – 0.7	96	73	0.0 – 2.2	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, with dipping bands, high strength, slightly weathered to unweathered, very close to moderate spaced flat to dipping cross joints, slightly altered with scale and/or silt on partings, poor to fair quality.
	2	0.7 – 1.5	100	25		
	3	1.5 – 1.9	97	75		
	4	1.9 – 2.2	96	63	2.2 – 3.1	MIGMATITE: Dark grey, fine to medium crystalline, high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, tight to slightly altered with scale on partings, excellent quality.
	5	2.2 – 3.1	99	90		
S25	1	0.0 – 0.5	95	52	0.0 – 1.2	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly to moderately weathered, very close to close spaced flat to dipping (locally vertical) cross joints, tight to slightly altered with oxidation stains and/or silt on partings, fair to good quality.
	2	0.5 – 0.9	100	86		
	3	0.9 – 1.4	100	58		
	4	1.4 – 1.9	100	60	1.2 – 3.1	MIGMATITE: Dark grey, to black and pink, fine to medium crystalline, with pink pegmatite layer, coarse crystalline, high strength, slightly (locally highly) weathered, very close to close becoming moderate spaced flat to dipping cross joints, slightly altered with oxidation on partings (locally friable) becoming tight, fair to excellent quality.
	5	1.9 – 2.8	97	97		
	6	2.8 – 3.1	80	80		

Originated: JFW
Compiled: FP
Checked: GD/ CN

TABLE A

ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	**CORE NO.**	**DEPTH (m)**	**RECOVERY (%)**	**RQD (%)**	**DEPTH (m)**	**DESCRIPTION**
S26	2	1.2 – 1.9	83	72	1.2 – 3.0	MIGMATITE: Dark grey to black, fine crystalline, medium to high strength, slightly weathered, close to moderate spaced dipping cross joints, rough planar, tight, to slightly altered with oxidation stains on partings, fair quality.
	3	1.9 – 3.4	92	84		
	4	3.4 – 4.4	95	35	3.0 – 4.4	GRANITIC GNEISS: Pink, medium to coarse crystalline, medium to high strength, slightly weathered, very close to close spaced flat to dipping cross joints, rough planar, tight, with vertical fractures, with oxidation stains on partings, poor quality.
S27	1	2.6 – 3.0	100	27	2.6 – 5.8	GRANITIC GNEISS: Pink, fine to medium crystalline, high strength, slightly weathered, close becoming moderate spaced flat to dipping cross joints, rough planar, tight, with some vertical fractures, slightly altered with oxidation stains and/or scale on partings, poor to fair (locally good) becoming excellent quality.
	2	3.0 – 3.3	82	82		
	3	3.3 – 4.5	100	47		
	4	4.5 – 5.1	100	70		
	5	5.1 – 5.8	96	96		

Originated: JFW
Compiled: FP
Checked: GD/ CN

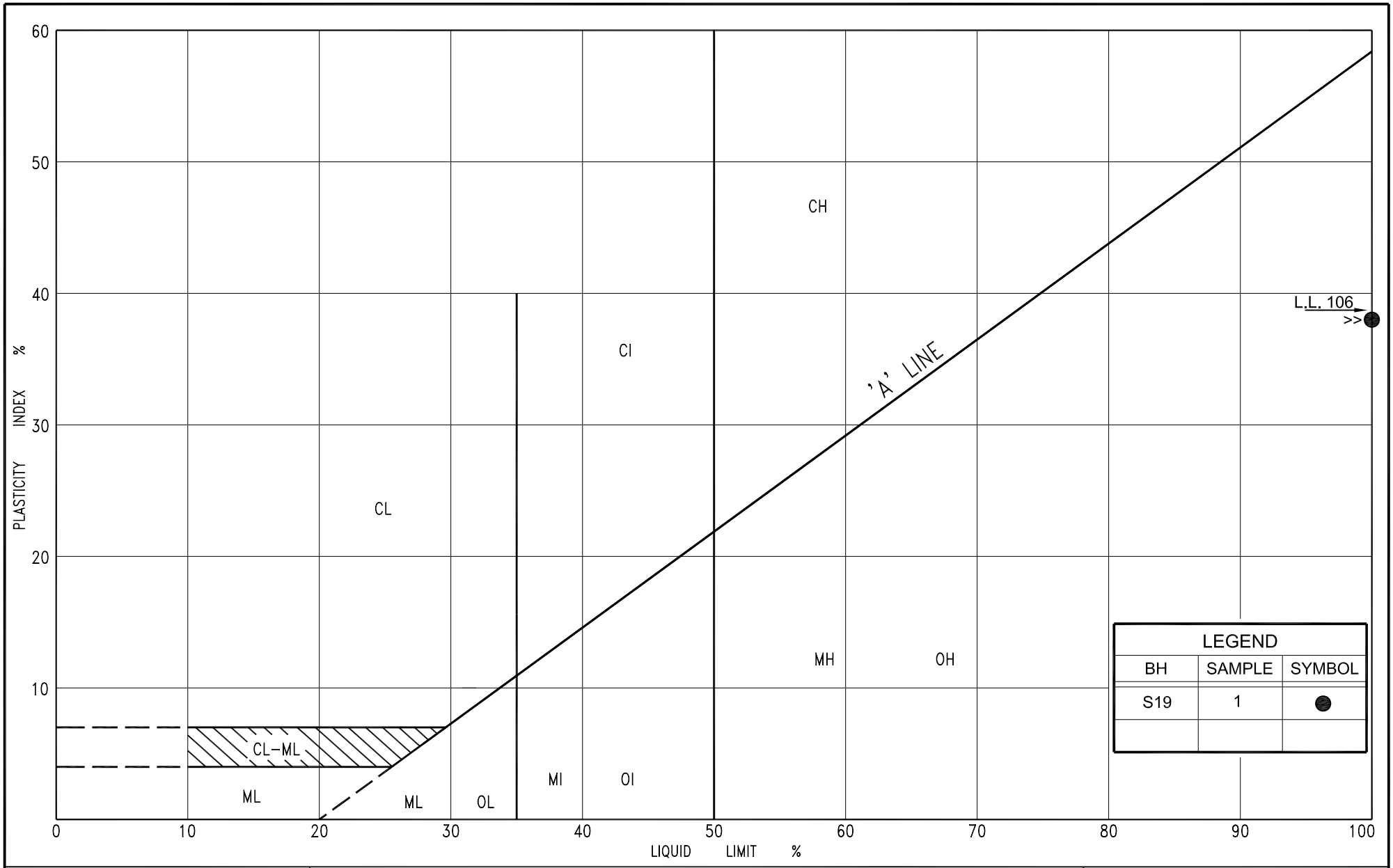
TABLE A

ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	**CORE NO.**	**DEPTH (m)**	**RECOVERY (%)**	**RQD (%)**	**DEPTH (m)**	**DESCRIPTION**
S30	4	3.2 – 4.7	93	83	3.2 – 3.8	PEGMATITE: Pink, coarse crystalline, high strength, slightly weathered, close spaced dipping cross joint, rough planar, oxidation stains, excellent quality.
	5	4.7 – 6.2	100	47		
					3.8 – 6.2	GRANITIC GNEISS: Pink, fine to medium crystalline, with occasional black biotite rich layers, medium to high strength, slightly weathered (locally moderately to highly weathered), close to moderate becoming very close to close spaced flat to dipping cross joints, rough planar, tight, slightly altered with brown oxidation stains, locally friable, occasional vertical fractures, good becoming poor quality.
S31	5	4.1 – 4.9	97	53	4.1 – 6.4	GRANITIC GNEISS: Pink to grey, weathered rust brown in upper 330 mm, fine to medium crystalline, low becoming medium to high strength, highly weathered (friable) becoming slightly weathered, very close to close spaced dipping cross joints, rough planar, slightly altered with scale and or silt on partings, with vertical fractures, very poor to fair quality.
	6	4.9 – 5.8	78	0		
	7	5.8 – 6.4	100	18		
	8	6.4 – 7.0	100	100		
					6.4 – 7.0	MIGMATITE: Dark grey to black with occasional white bands, fine crystalline, high strength, unweathered, moderate spaced dipping cross joints, rough planar, tight, excellent quality.

NOTE: RQD = Rock Quality Designation

Originated:	JFW
Compiled:	FP
Checked:	GD/ CN



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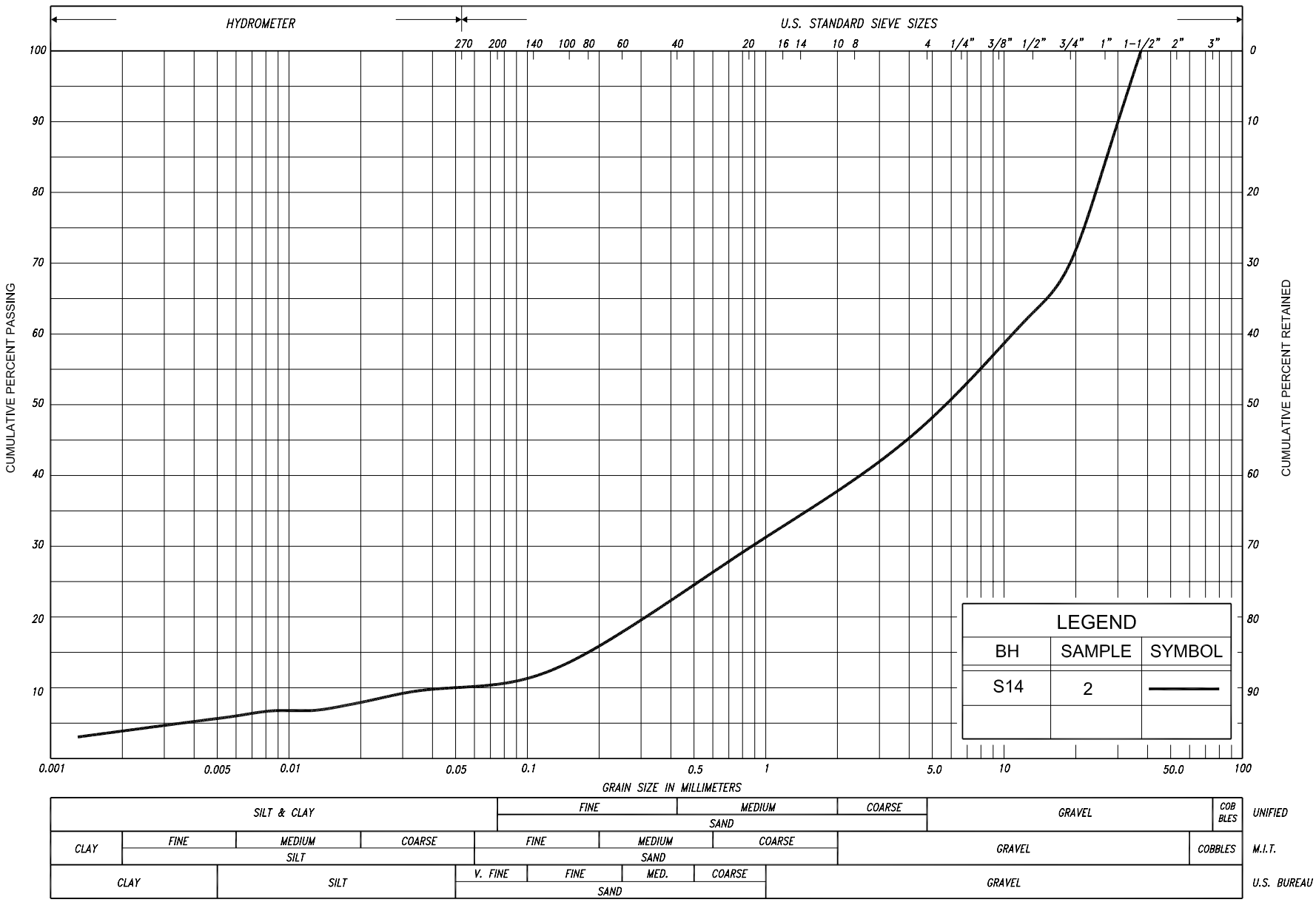
PLASTICITY CHART

ORGANIC SILT

FIG No.	MRS-PC-1
HWY:	69
W.P. No.	5257-05-01



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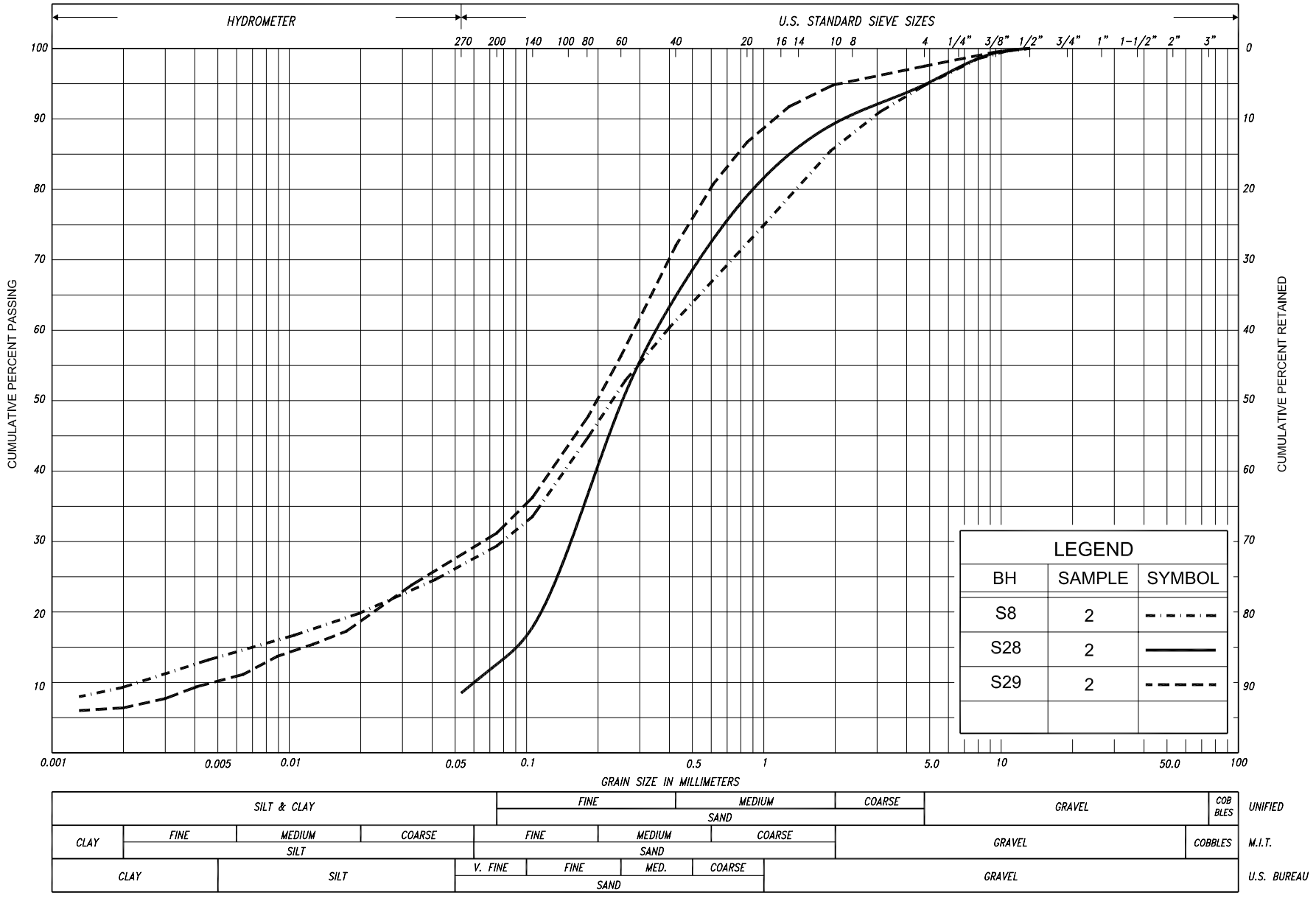
GRAIN SIZE DISTRIBUTION

SANDY GRAVEL, trace silt, trace clay

FIG No.	MRS-GS-1
HWY:	69
W.P. No.	5257-05-01



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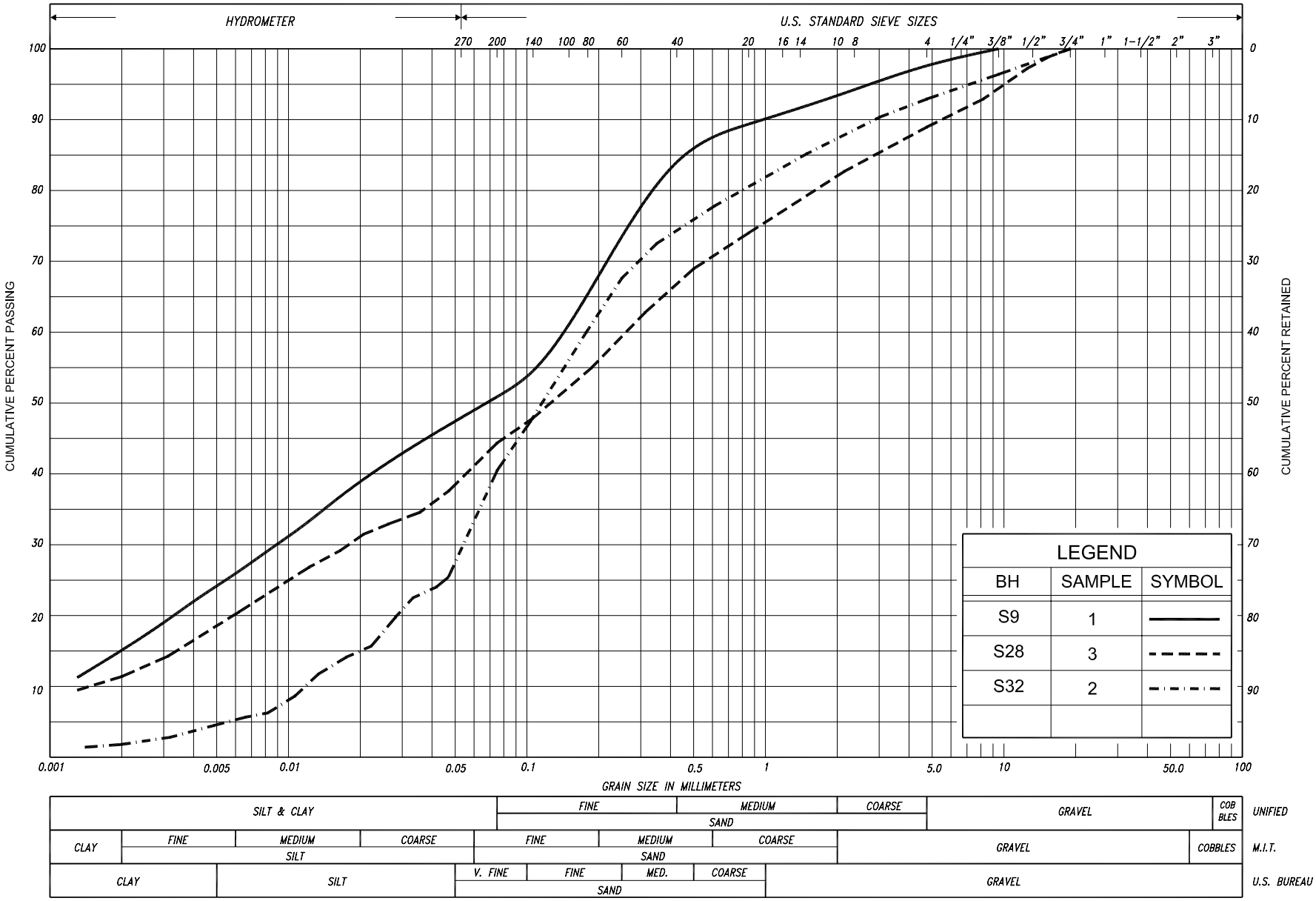
GRAIN SIZE DISTRIBUTION

SAND, some to with silt, trace clay, trace gravel

FIG No.	MRS-GS-2
HWY:	69
W.P. No.	5257-05-01



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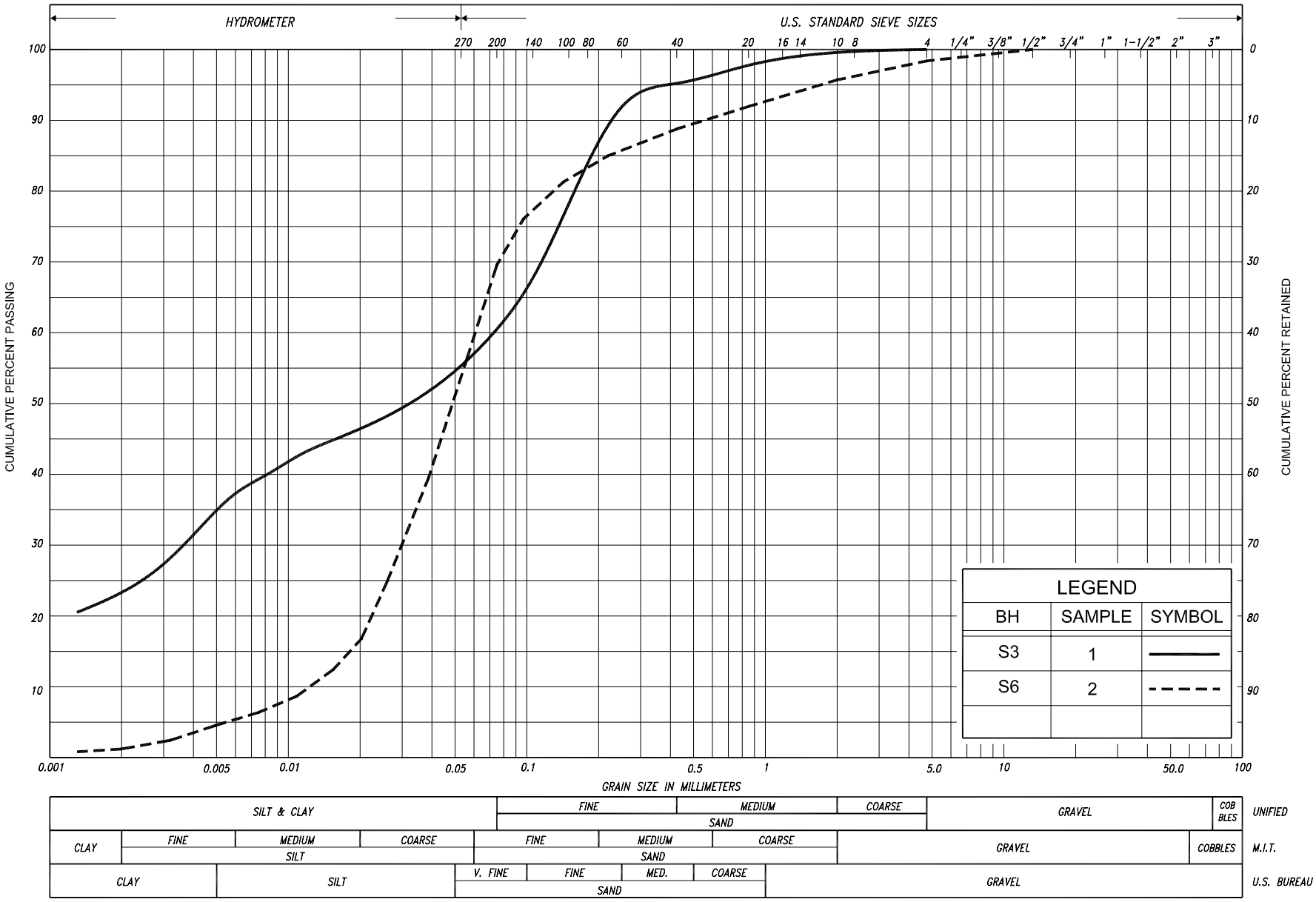
GRAIN SIZE DISTRIBUTION

SILTY SAND, trace to some clay, trace to some gravel

FIG No.	MRS-GS-3
HWY:	69
W.P. No.	5257-05-01



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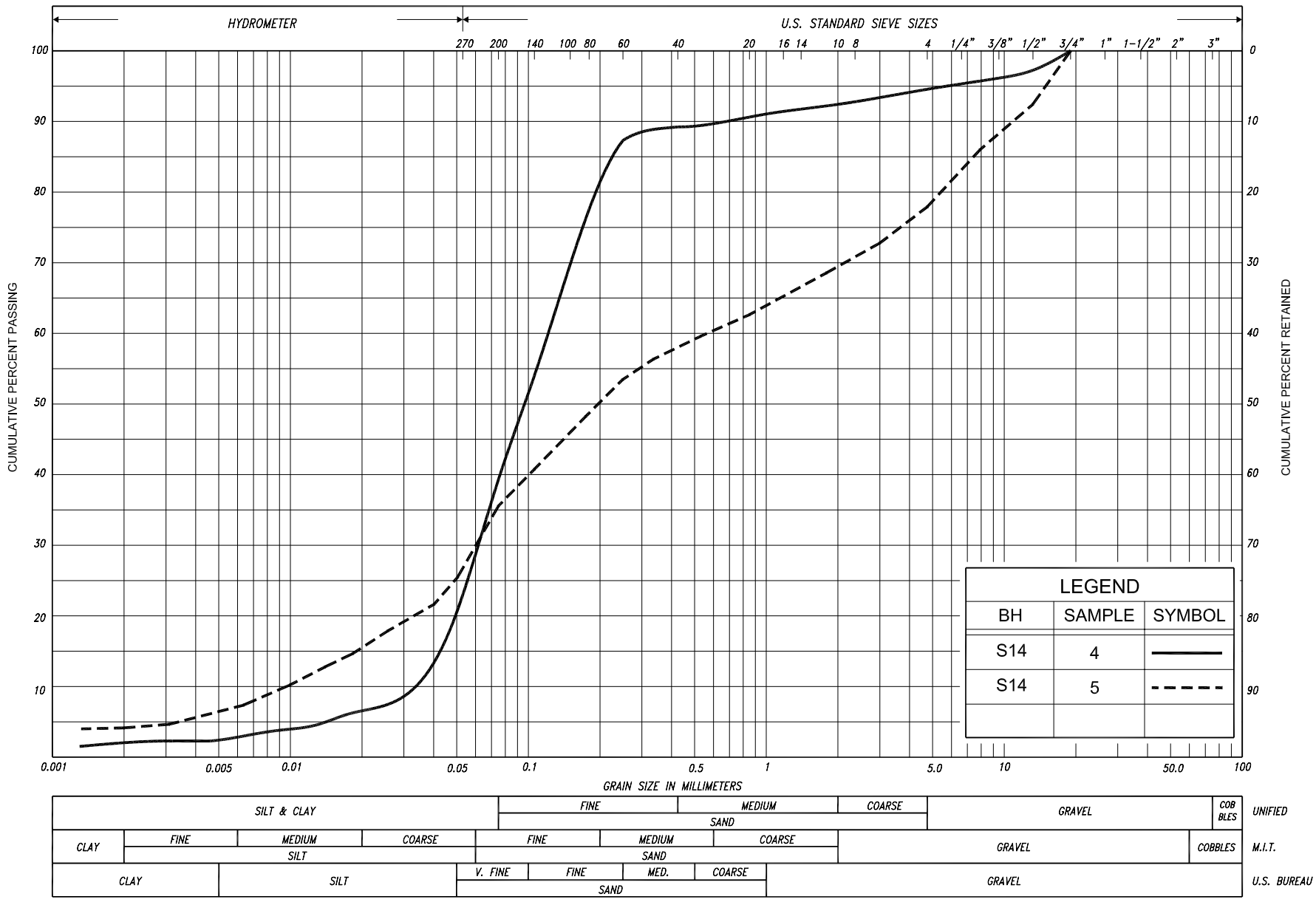
GRAIN SIZE DISTRIBUTION

SAND and SILT, with clay
SILT, with sand, trace clay, trace gravel

FIG No.	MRS-GS-4
HWY:	69
W.P. No.	5257-05-01



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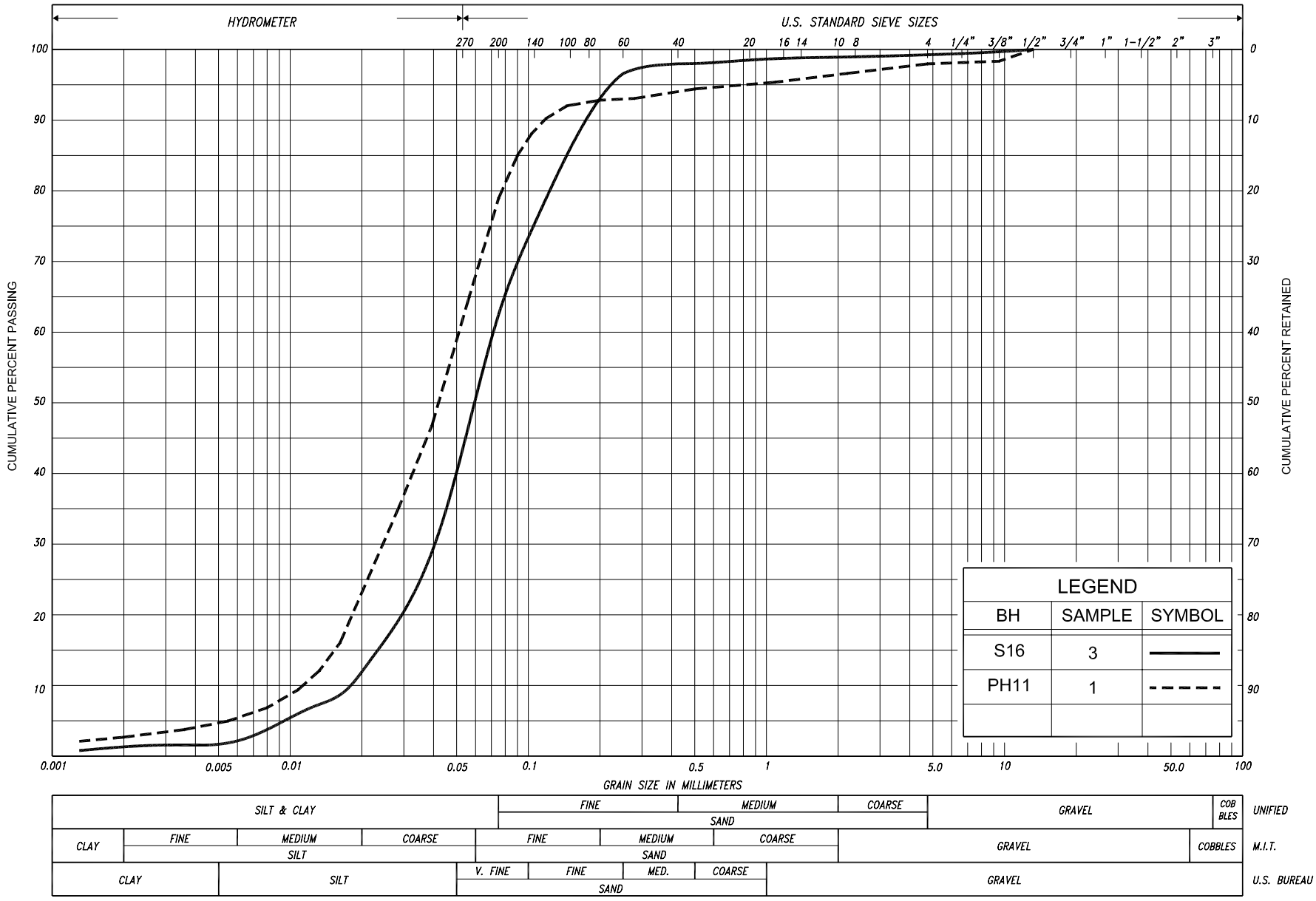
GRAIN SIZE DISTRIBUTION

SILTY SAND, trace to with gravel, trace clay

FIG No.	MRS-GS-5
HWY:	69
W.P. No.	5257-05-01



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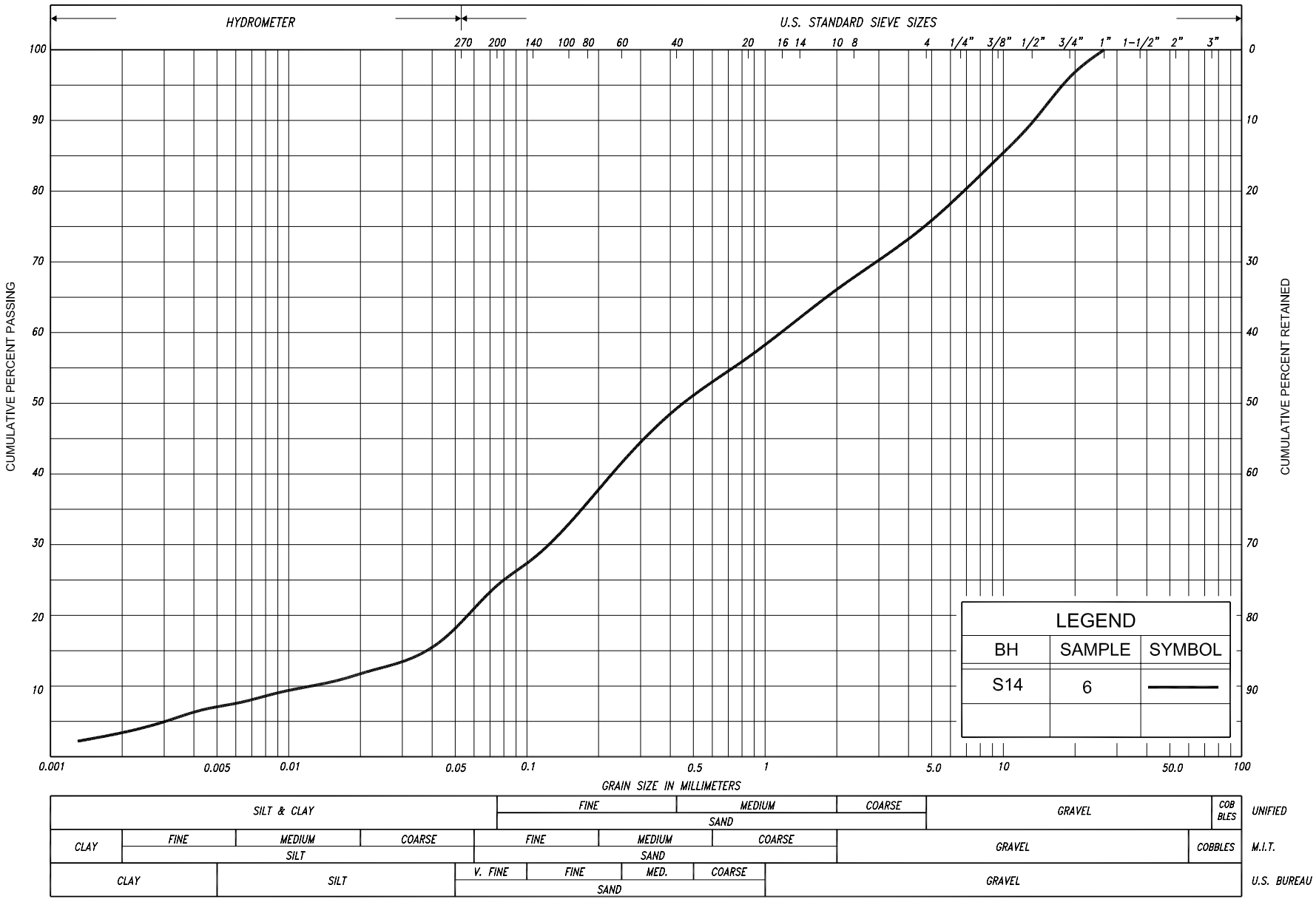
GRAIN SIZE DISTRIBUTION

SANDY SILT, trace clay, trace gravel
SILT, some sand, trace clay, trace gravel

FIG No.	MRS-GS-6
HWY:	69
W.P. No.	5257-05-01



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GRAIN SIZE DISTRIBUTION

SAND, with silt, with gravel, trace clay
(TILL)

FIG No.	MRS-GS-7
HWY:	69
W.P. No.	5257-05-01

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 $\tilde{N}$.

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

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RECORD OF BOREHOLE No S1 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 116 992.1N; 324 740.5 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
197.3 0.0	Ground Surface										
197.1 0.2	Topsoil										
196.8 0.5	Silty sand, trace gravel cobbles and boulders Brown Moist						197				
	End of borehole Refusal on probable bedrock										
	* Borehole dry										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S2 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 006.6 N; 324 732.9 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling COMPILED BY G.D.

DATUM Geodetic DATE July 28, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
194.1	Ground Surface										
0.0	Granitic Gneiss bedrock Slightly weathered to unweathered High strength Poor to good quality		1	RC NQ	REC 100%		194 193				RQD 45%
			2	RC NQ	REC 94%		192				RQD 79%
191.0							191				
3.1	End of borehole										

* Borehole charged with drilling water

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S3 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 116 999.6 N; 324 720.9 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 30, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
192.3	Ground Surface										
0.0	Topsoil										
192.1	Sand and silt, with clay cobbles and boulders		1	SS	2		192				0 39 38 23
0.2	Very loose Brown Moist to dense Wet		2	SS	17/15cm	▽*					
190.8						▼*	191				
1.5	End of borehole										

Refusal on probable bedrock

Sample 2: Sampler bouncing

* 2009 07 30

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

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Ontario

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RECORD OF BOREHOLE No S4 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 009.3 N; 324 729.6 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
193.1	Ground Surface					*					
0.0	Topsoil						193				
192.9 0.2	End of borehole Refusal on probable bedrock										
	* Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 2:59:10 PM

+7 , ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S5 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 004.9 N; 324 725.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE July 29, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
191.4	Ground Surface										
0.0	Topsoil										
191.2	Sandy silt, trace gravel cobbles and boulders		1	SS	3		191				
0.2	Very loose Brown Moist to dense										
			2	SS	28/15cm		190				
189.3											
2.1	Migmatite bedrock		3	RC NQ	REC 97%		189				RQD 55%
	Slightly to moderately weathered										
	Medium to high strength		4	RC NQ	REC 100%		188				RQD 51%
	Poor to fair quality										
			5	RC NQ	REC 100%		187				RQD 28%
186.2											
5.2	End of borehole										

Sample 2: Sampler bouncing

* Borehole charged with drilling water

C.F.S.S.A. denotes Continuous Flight Solid Stem Augers

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S6 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 003.9 N; 324 721.4 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 30, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
191.0	Ground Surface										
0.0 / 190.7	Topsoil		1	SS	3						
0.3	Silt with sand trace clay, trace gravel cobbles and boulders										
	Loose to compact Brown Moist		2	SS	24	▼* ▽*	190				2 28 69 1
189.6 / 1.4	Grey Wet										
	End of borehole										
	Refusal on probable bedrock										

* 2009 07 30

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S7 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 002.3 N; 324 717.7 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and Rotary Diamond Drilling COMPILED BY G.D.

DATUM Geodetic DATE July 29 and 30, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
191.2	Ground Surface										
0.0	Topsoil		1	SS	5/8cm		191				
191.0 0.2	Granitic Gneiss bedrock Unweathered to slightly weathered High strength Fair quality		2	RC NQ	REC 96%		190				RQD 61%
			3	RC NQ	REC 100%		189				RQD 66%
187.9							188				
3.3	End of borehole										

Sample 1: Sampler bouncing

* Borehole charged with drilling water

C.F.S.S.A. denotes Continuous Flight Solid Stem Augers

+7, ×5 : Numbers refer to Sensitivity

(%) STRAIN AT FAILURE: 20 / 15 5 / 10

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RECORD OF BOREHOLE No S8 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 026.2 N; 324 709.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and NQ Rock Coring COMPILED BY G.D.

DATUM Geodetic DATE July 31, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.7	Ground Surface										
0.0 / 188.4	Topsoil		1	SS	1	▼* ▽*	188				
0.3	Silty sand trace clay, trace gravel organic inclusions		2	SS	1				H		5 66 20 9
187.5	Very loose Dark grey Wet		3	RC NQ	REC 100%		187				RQD 100%
1.2	with silt Granitic Gneiss bedrock Unweathered, becoming slightly to moderately weathered High strength Excellent becoming good quality		4	RC NQ	REC 100%		186				RQD 100%
184.4			5	RC NQ	REC 95%		185				RQD 87%
4.3	End of borehole										

* 2009 07 31

▽ Water level observed during drilling

▼ Water level measured after drilling

C.F.S.S.A. denotes Continuous Flight Solid Stem Augers

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S9 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 025.2 N; 324 705.7 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and NQ Rock Coring COMPILED BY G.D.

DATUM Geodetic DATE July 30 and 31, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.8	Ground Surface										
0.0 / 188.5	Topsoil		1	SS	2	▽* ▼*					2 47 36 15
0.3	Silty sand some clay, trace gravel organic inclusions Very loose Dark Wet to compact grey		2	SS	13/15cm		188				
187.0			3	SS	21/8cm						
1.8	Granitic Gneiss bedrock Unweathered High strength Good to excellent quality		4	RC NQ	REC 80%		187				RQD 80%
			5	RC NQ	REC 100%		186				RQD 97%
			6	RC NQ	REC 95%		185				RQD 90%
183.9							184				
4.9	End of borehole Samples 2 & 3: Sampler bouncing * 2009 07 30/31 ▽ Water level observed during drilling ▼ Water level measured after drilling C.F.S.S.A. denotes Continuous Flight Solid Stem Augers										

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S10 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 028.7 N; 324 706.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
188.5	Ground Surface										
0.0	Topsoil										
188.3	Sand		1	SS	1	▼* ▽*	188				
0.2	trace silt, trace gravel Very loose Dark grey Wet to compact		2	SS	13/18cm						
187.3											
1.2	End of borehole										

Refusal on probable bedrock

Sample 2: Sampler bouncing

* 2009 08 05

▽ Water level observed during drilling

▼ Water level measured after drilling

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:07:14 PM

+7, ×5 : Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S11 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 023.5 N; 324 702.8 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE August 04, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
188.8	Ground Surface										
0.0 / 188.5	Topsoil										
0.3	Granitic Gneiss bedrock Slightly weathered to unweathered High strength Excellent quality		1	RC NQ	REC 100%		188				RQD 99%
			2	RC NQ	REC 100%		187 186				RQD 100%
185.4											
3.4	End of borehole										

* Borehole charged with drilling water

C.F.S.S.A. denotes Continuous Flight Solid Stem Augers

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S12 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 019.2 N; 324 697.4 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

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

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:07:16 PM

+7 , ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S13 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 022.0 N; 324 696.4 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
189.2	Ground Surface										
0.0	Granitic Gneiss bedrock Unweathered High strength Excellent quality		1	RC NQ	REC 95%		189 188				RQD 94%
			2	RC NQ	REC 98%		187				RQD 98%
186.0							186				
3.2	End of borehole										

* Borehole charged with drilling water

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S13A 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 021.8 N; 324 694.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
189.5	Ground Surface										
0.0	Bedrock at surface										
	* Borehole dry					*					

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:07:17 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S14 1 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 054.6 N; 324 675.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE August 13 & 14, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of water										
0.0	Water						187				
							186				
							185				
184.0											
4.0	Organic silt Very loose Dark Wet brown						184				
							183				
182.0									398		
6.0	Sandy gravel trace silt, trace clay Dense to Grey Wet compact		1	SS	47		182		○ Org. 21.3%		
			2	SS	12		181		○		52 37 7 4
180.4											
7.6	Silty sand trace clay, trace gravel Very loose Grey Wet		3	SS	3		180				
			4	SS	2		179		○		6 54 38 2
	with gravel Loose		5	SS	7		178				22 42 32 4
177.0							177				
11.0	Sand, with silt with gravel, trace clay Dense to Grey Wet very dense (TILL)		6	SS	46		176		○		25 51 21 3
			7	SS	102/15cm		175				
174.0							174				
14.0	Migmatite bedrock Slightly to moderately weathered Cont'd		8	RC NQ	REC 100%						RQD 52%

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S14 2 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 054.6 N; 324 675.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE August 13 & 14, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
173.0											
172.7	Medium to high strength		9	RC NQ	REC 80%						RQD 80%
15.3	Fair to good quality										
	End of borehole										

* 2009 08 13 & 14

▽ Water level in river during drilling

▼ Water level in river after drilling

C.F.S.H.A. denotes Continuous Flight Hollow Stem Augers

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S15 1 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 047.7 N; 324 663.2 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE August 10 & 11, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of water										
0.0	Water						187				
							186				
							185				
183.8							184				
4.2	Organic silt Very loose Dark brown Wet		1	SS	WH**						
182.5							183				
5.5	Gravelly sand, trace silt Compact Grey Wet		2	SS	28						
			3	SS	17		182				
181.0							181				
7.0	Sandy silt, trace gravel Very loose Grey Wet		4	SS	3						
			5	SS	3		180				
178.4							179				
9.6	Sand, with silt some gravel, trace clay cobbles Compact Grey Wet to dense (TILL) Very dense		6	SS	20		178				
			7	SS	85/15cm		177				
175.2							176				
12.8	End of borehole Refusal on probable bedrock Sample 7: Sampler bouncing Cont'd										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:07:19 PM

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S15 2 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 047.7 N; 324 663.2 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE August 10 & 11, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
173.0											
	* 2009 08 10 & 11										
	▽ Water level in river during drilling										
	▼ Water level in river after drilling										
	WH** Penetration due to the weight of rods and hammer										

+7, ×5 : Numbers refer to Sensitivity

(%) STRAIN AT FAILURE: 20 / 15 — 5 / 10

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RECORD OF BOREHOLE No S16 1 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 052.9 N; 324 667.5 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE August 12 & 13, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of water										
0.0	Water						187				
							186				
							185				
184.2											
3.8	Organic silt Very loose Dark Wet brown						184				
182.5							183				
5.5	Gravelly sand, trace silt cobbles Dense Grey Wet		1	SS	44		182				
181.3											
6.7	Sandy silt trace clay, trace gravel Very loose Grey Wet		2	SS	3		181		○		1 36 62 1
			3	SS	3		180				
179.6											
8.4	Silty sand, trace gravel Loose to dense Grey Wet		4	SS	4		179				
			5	SS	31		178		○		
177.3											
10.7	Sand, with silt some gravel, trace clay Dense to very dense Grey Wet (TILL)		6	SS	55		177				
175.7							176				
12.3	Migmatite bedrock Unweathered Medium to high strength Fair to excellent (locally poor) quality		7	RC NQ	REC 97%		175				RQD 52%
			8	RC NQ	REC 85%		174				RQD 44%
	Cont'd		9	RC	REC 99%						RQD 94%

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:07:20 PM

+7, ×5 : Numbers refer to Sensitivity

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

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Ontario

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RECORD OF BOREHOLE No S16 2 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 052.9 N; 324 667.5 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE August 12 & 13, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
173.0											
172.4				NQ							
15.6	End of borehole										

* 2009 08 12 & 13

▽ Water level in river during drilling

▼ Water level in river after drilling

C.F.H.S.A. denotes Continuous Flight Hollow Stem Augers

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S19 1 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 050.9 N; 324 659.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE August 11 & 12, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of water										
0.0	Water						187				
							186				
							185				
184.2											
3.8	Organic silt Very loose Dark brown Wet						184				
182.7							183		106		
5.3	Gravelly sand, trace silt Dense to compact Grey Wet		1	SS	30				197	Org. 12.2%	
							182				
180.4			2	SS	21		181				
7.6	Sandy silt, trace gravel Loose Grey Wet										
			3	SS	6		180				
178.5							179				
9.5	Silty sand, trace gravel Compact Grey Wet										
			4	SS	18		178				
177.3							177				
10.7	Sand, with silt with gravel, trace clay Dense to very dense Grey Wet		5	SS	75/15cm						
	cobbles and boulders						176				
	(TILL)						175				
			6	RC NQ	-		174				
	Cont'd										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 11/19/2009 4:15:10 PM

+7 , ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S19 2 of 2 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 050.9 N; 324 659.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE August 11 & 12, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
173.0											
			7	RC NQ	-		172				
			8	RC NQ	-						
171.2			9	SS	100/5cm						
16.8	End of borehole										

Samples 5 & 9: Sampler bouncing

* 2009 08 11 & 12

▽ Water level in river during drilling

▼ Water level in river after drilling

C.F.H.S.A. denotes Continuous Flight Hollow Stem Augers

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S20 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 083.1 N; 324 640.9 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling COMPILED BY G.D.

DATUM Geodetic DATE July 21, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
189.5	Ground Surface										
0.0	Granitic Gneiss bedrock Slightly weathered High strength Fair to excellent quality		1	RC NQ	REC 100%		189				RQD 100%
			2	RC NQ	REC 100%						RQD 97%
			3	RC NQ	REC 100%		188				RQD 98%
							187				
186.4			4	RC NQ	REC 95%						RQD 73%
3.1	End of borehole										

* Borehole charged with drilling water

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S21 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 082.8 N; 324 636.6 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
190.7	Ground Surface										
0.0	Bedrock at surface										
	* Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:13:33 PM

+7 , ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S22 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 086.3 N; 324 637.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
192.4	Ground Surface										
0.0	Bedrock at surface										
						*					
	* Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:13:34 PM

+7 , ×5 : Numbers refer to Sensitivity

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

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Ontario

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RECORD OF BOREHOLE No S23 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 081.7 N; 324 632.9 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling COMPILED BY G.D.

DATUM Geodetic DATE July 21, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
192.2	Ground Surface										
0.0	Granitic Gneiss bedrock Slightly weathered High strength Excellent quality		1	RC NQ	REC 100%		192				RQD 100%
			2	RC NQ	REC 100%		191				RQD 97%
	Migmatite bedrock Unweathered High strength		3	RC NQ	REC 99%		190				RQD 74%
189.1	Fair to excellent quality		4	RC NQ	REC 98%						RQD 95%
3.1	End of borehole										

* Borehole charged with drilling water

+7 , ×5 : Numbers refer to Sensitivity

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

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Ontario

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RECORD OF BOREHOLE No S24 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 076.8 N; 324 628.2 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling COMPILED BY G.D.

DATUM Geodetic DATE July 20, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
192.0	Ground Surface										
0.0	Granitic Gneiss bedrock Slightly weathered to unweathered High strength Poor to fair quality		1	RC NQ	REC 96%						RQD 73%
			2	RC NQ	REC 100%		191				RQD 25%
			3	RC NQ	REC 97%						RQD 75%
			4	RC NQ	REC 96%		190				RQD 63%
	Migmatite bedrock Slightly weathered High strength		5	RC NQ	REC 99%						RQD 90%
188.9							189				
3.1	Excellent quality End of borehole										

* Borehole charged with drilling water

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S25 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 079.3 N; 324 625.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling COMPILED BY G.D.

DATUM Geodetic DATE July 20, 2009 CHECKED BY C.N.

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
192.8	Ground Surface										
0.0	Granitic Gneiss bedrock Slightly to moderately weathered High strength Fair to good quality		1	RC NQ	REC 95%						RQD 52%
			2	RC NQ	REC 100%		192				RQD 86%
			3	RC NQ	REC 100%						RQD 58%
			4	RC NQ	REC 100%		191				RQD 60%
	Migmatite bedrock Slightly (locally highly) weathered High strength		5	RC NQ	REC 97%						RQD 97%
189.7	Fair to excellent quality		6	RC NQ	REC 80%		190				RQD 80%
3.1	End of borehole										

* Borehole charged with drilling water

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S26 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 107.7 N; 324 611.4 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE July 15, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
200.9	Ground Surface										
0.0	Silty sand, some gravel cobbles and boulders Compact Brown Moist		1	SS	15/8cm		200				
199.7											
1.2	Migmatite bedrock Slightly weathered Medium to high strength Fair quality		2	RC NQ	REC 83%		199				RQD 72%
			3	RC NQ	REC 92%		198				RQD 84%
	Granitic Gneiss bedrock Slightly weathered Medium to high strength Poor quality		4	RC NQ	REC 95%		197				RQD 35%
196.5											
4.4	End of borehole Sample 1: Sampler bouncing * Borehole charged with drilling water C.F.S.S.A. denotes Continuous Flight Solid Stem Augers										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/27/2009 8:50:28 AM

+7, ×5 : Numbers refer to Sensitivity

(%) STRAIN AT FAILURE (20 / 15 5 / 10)

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RECORD OF BOREHOLE No S27 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 105.4 N; 324 604.4 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE July 15, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
199.7	Ground Surface										
0.0	Silty sand, trace gravel cobbles and boulders Brown Moist						199				
							198				
197.1											
2.6	Granitic Gneiss bedrock Slightly weathered High strength Poor to fair (locally good) becoming excellent quality		1	RC NQ	REC 100%		197				RQD 27%
			2	RC NQ	REC 82%						RQD 82%
			3	RC NQ	REC 100%		196				RQD 47%
			4	RC NQ	REC 100%		195				RQD 70%
			5	RC NQ	REC 96%						RQD 96%
193.9							194				
5.8	End of borehole										

* Borehole charged with drilling water

C.F.S.S.A. denotes Continuous Flight Solid Stem Augers

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

(%) STRAIN AT FAILURE: 20 / 15 — 5 / 10

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RECORD OF BOREHOLE No S28 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 100.7 N; 324 599.5 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 15, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
198.1	Ground Surface										
0.0	Topsoil						198				
197.9 / 0.2	Sand some silt, trace gravel cobbles and boulders		1	SS	2				○		
			2	SS	13/15cm	▽*	197		○		5 82 (13)
196.9 / 1.2	Very loose Brown Wet to compact										
	Silty sand some gravel, some clay cobbles and boulders		3	SS	10/12cm	▼*			○		11 45 33 11
196.1 / 2.0	Compact Brown Wet										
	End of borehole										

Refusal on probable bedrock

Samples 2 & 3 : Sampler bouncing

* 2009 07 15

▽ Water level observed during drilling

▼ Water level measured after drilling

C.F.S.S.A. denotes Continuous Flight Solid Stem Augers

+7 , ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S29 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 110.4 N; 324 608.2 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 15, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
201.1	Ground Surface										
0.0	Sand, with silt trace clay trace gravel cobbles		1	SS	4		201		○		
	Loose to dense Brown Wet		2	SS	43		200		○		2 66 25 7
199.7											
1.4	End of borehole Refusal on probable bedrock Sample 2: Sampler bouncing * Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:13:39 PM

+7, ×5 : Numbers refer to Sensitivity

(%) STRAIN AT FAILURE (20 / 15 5 / 10)

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RECORD OF BOREHOLE No S30 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 102.6 N; 324 601.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE July 16, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
199.0	Ground Surface										
0.0	Topsoil										
198.8	Silty sand, trace gravel cobbles and boulders Compact Brown Moist to wet		1	SS	21		198		○		
197.8											
1.2	Sand trace silt, trace gravel cobbles and boulders Compact Brown Moist to wet		2	SS	15/8cm		197				
			3	SS	20/8cm						
195.8							196				
3.2	Pegmatite bedrock Slightly weathered High strength Excellent quality		4	RC NQ	REC 93%		195				RQD 83%
	Granitic Gneiss bedrock Slightly weathered (locally moderately to highly weathered) Medium to high strength Good becoming poor quality		5	RC NQ	REC 100%		194				RQD 47%
192.8							193				
6.2	End of borehole Samples 2 & 3: Sampler bouncing * Borehole charged with drilling water C.F.S.S.A. denotes Continuous Flight Solid Stem Augers										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No S31 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 103.4 N; 324 596.2 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE C.F.S.S.A. and Rotary Diamond Coring COMPILED BY G.D.

DATUM Geodetic DATE July 16, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
198.4	Ground Surface										
0.0 / 198.1	Topsoil		1	SS	10/15cm						
0.3	Silty sand, trace gravel cobbles and boulders Compact Brown Moist to dense		2	SS	16/8cm		198				
							197				
			3	SS	20/8cm		196				
			4	SS	20/15cm		195				
194.3											
4.1	Granitic Gneiss bedrock Highly weathered (friable) becoming slightly weathered Low becoming medium to high strength Very poor to fair quality		5	RC NQ	REC 97%		194				RQD 53%
			6	RC NQ	REC 78%		193				RQD 0%
			7	RC NQ	REC 100%						RQD 18%
191.4	Migmatite bedrock Unweathered High strength		8	RC NQ	REC 100%		192				RQD 100%
7.0	Excellent quality End of borehole Samples 1, 2, 3 & 4: Sampler bouncing * Borehole charged with drilling water C.F.S.S.A. denotes Continuous Flight Solid Stem Augers										

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No S32 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 118.2 N; 324 589.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 16, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
201.8	Ground Surface										
0.0	Topsoil										
201.6 0.2	Silty sand trace clay, trace gravel		1	SS	7	▽*	201		○		
	Loose to compact Brown Moist		2	SS	31				○		7 52 39 2
200.1	Dense Wet		3	SS	10/5cm						
1.7	End of borehole										
	Refusal on probable bedrock										
	Sample 3: Sampler bouncing										
	2009 07 16										
	▽ Water level observed during drilling										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:13:41 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Peto MacCallum Ltd.
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RECORD OF BOREHOLE No APN-S1 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 102.5 N; 324 586.4 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 16, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
198.7	Ground Surface										
0.0 / 198.4	Topsoil										
0.3	Silty sand, trace gravel cobbles and boulders Brown Moist						198 197				
196.6											
2.1	End of borehole Refusal on probable bedrock * Borehole dry										

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No APN-S2 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 090.9 N; 324 600.4 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
195.0	Ground Surface					*					
0.0	Bedrock at surface										
	* Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:27:49 PM

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No APN-S3 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 114.6 N; 324 607.8 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
202.9	Ground Surface					*					
0.0	Bedrock at surface										
	* Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:27:50 PM

+7, ×5 : Numbers refer to Sensitivity

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

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No APN-S4 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 108.1 N; 324 615.6 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 16, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
201.0	Ground Surface										
0.0 / 200.7	Topsoil										
0.3	Silty sand, trace gravel cobbles and boulders Brown Moist						200				
199.0							199				
2.0	End of borehole Refusal on probable bedrock * Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:27:50 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No APS-S1 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 008.1 N; 324 737.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

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

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:27:51 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No APS-S2 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 116 995.0 N; 324 720.2 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
195.0	Ground Surface										
0.0	Bedrock at surface										
	* Borehole dry										

ON_MOT VER 3A 06TF052-J.GPJ ON_MOT.GDT 10/26/2009 3:27:51 PM

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF BOREHOLE No APS-S3 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 020.4 N; 324 727.2 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.

DATUM Geodetic DATE August 05, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
189.4	Ground Surface										
0.0	Topsoil										
188.9							189				
0.5	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No APS-S4 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 002.7 N; 324 706.3 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.

DATUM Geodetic DATE July 30, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
190.5	Ground Surface										
0.0 / 190.2	Topsoil										
0.3	Silty sand, trace gravel cobbles and boulders Brown Moist Grey Wet					▼* ▽*	190				
189.0							189				
1.5	End of borehole Refusal on probable bedrock										

* 2009 07 30

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF PENETRATION TEST No PH8 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 046.8 N; 324 685.8 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.

DATUM Geodetic DATE August 24, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
188.0	Top of Water						
0.0	Water						
	Probable organic silt						
	Gravelly sand Very dense Grey Wet to compact		1	SS	82		
	Probable silty sand Loose to very loose						
	Probable sand Dense to very dense						
175.5	(TILL)						
12.5	End of dynamic cone penetration test						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

ELEVATION SCALE: 187, 186, 185, 184, 183, 182, 181, 180, 179, 178, 177, 176

255 φ Org. 13.1%

141

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 11/19/2009 4:37:16 PM

+7, ×5 : Numbers refer to Sensitivity

20
15 — 5
10
(%) STRAIN AT FAILURE

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RECORD OF PENETRATION TEST No PH9 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 040.1 N; 324 675.0 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of Water										
0.0	Water										
	Probable organic silt						187				
							186				
							185				
							184				
							183				
	Probable gravelly sand Dense to compact						182				
							181				
	Probable silty sand Loose to very loose						180				
	Probable sand							50/3cm			
179.1 8.9	Very dense (TILL) End of dynamic cone penetration test										

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT; w_P w w_L; WATER CONTENT (%): 20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

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

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Ontario

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RECORD OF PENETRATION TEST No PH10 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 029.6 N; 324 661.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of Water										
0.0	Water										
	Probable organic silt						187				
							186				
							185				
							184				
	Probable sandy silt Loose						183				
	Probable silty sand Compact						182				
							181				
	Probable sand Compact to dense						180	120/18cm			
179.9 8.1	(TILL) End of dynamic cone penetration test										

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 2/16/2010 8:05:16 AM

+7, ×5 : Numbers refer to Sensitivity

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

Ministry of Transportation
Ontario

Peto MacCallum Ltd.
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RECORD OF PENETRATION TEST No PH11 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 027.9 N; 324 650.6 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of Water							20 40 60 80 100	20 40 60		
0.0	Water						187				
	Probable organic silt						186				
							185				
							184		206 ○	Org. 6.3%	
	Silt, some sand trace clay, trace gravel Compact Grey Wet to loose		1	SS	12				○		2 18 77 3
							183				
							182				
	Probable sand Compact to dense (TILL)						181				
179.9							180	50/15cm			
8.1	End of dynamic cone penetration test										

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 2/16/2010 8:05:17 AM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF PENETRATION TEST No PH12 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 064.9 N; 324 674.9 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.

DATUM Geodetic DATE August 24, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
188.0	Top of Water						
0.0	Water						187
							186
							185
							184
	Probable organic silt						183
	Gravelly sand Compact Grey Wet		1	SS	10		182
	Silty sand Loose to compact Grey Wet						181
							180
							179
							178
							177
							176
175.2	Probable sand						
12.8	Dense to very dense (TILL)						
	End of dynamic cone penetration test						

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
20 40 60

UNIT WEIGHT γ kN/m³

221 ○

REMARKS & GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL
0 36 33 31

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 2/16/2010 8:05:18 AM

+7, ×5 : Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

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RECORD OF PENETRATION TEST No PH13 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 040.7 N; 324 650.9 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.

DATUM Geodetic DATE August 26, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of Water										
0.0	Water						187				
							186				
							185				
	Probable organic silt						184				
							183				
	Probable gravelly sand Dense										
	Probable silty sand Very loose to compact						182				
							181				
							180				
							179				
							178	124			
177.6	Probable sand										
10.4	Very dense (TILL) End of dynamic cone penetration test										

+7, ×5: Numbers refer to Sensitivity

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

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RECORD OF PENETRATION TEST No PH14 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 059.1 N; 324 657.0 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
188.0 / 0.0	Top of Water Water										
	Probable organic silt						187 186 185				
	Probable silty sand Loose to compact						184 183 182 181				
	Probable sand Dense to very dense (TILL)						180 179 178 177	141			
176.4 / 11.6	End of dynamic cone penetration test										

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 2/16/2010 8:05:19 AM

+7, ×5 : Numbers refer to Sensitivity

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

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RECORD OF PENETRATION TEST No PH15 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 050.6 N; 324 642.1 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of Water										
0.0	Water						187				
							186				
							185				
	Probable organic silt						184				
							183				
	Gravelly sand, trace silt Dense to compact Grey Wet		1	SS	25						
	Silty sand Very loose to compact Grey Wet						182				
							181				
							180				
							179				
							178				
	Probable sand						177				
176.8	Dense to very dense (TILL)							100/20cm			
11.2	End of dynamic cone penetration test										

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 2/16/2010 8:05:20 AM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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Ontario

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RECORD OF PENETRATION TEST No PH18 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 031.5 N; 324 666.6 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
188.0	Top of Water										
0.0	Water										
	Probable organic silt						187				
							186				
							185				
							184				
	Sandy gravel, trace silt Dense to compact Grey Wet		1	SS	27		183				
							182				
181.0	Probable sand						181	141			
7.0	Very dense (TILL) End of dynamic cone penetration test										

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 2/16/2010 8:05:20 AM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Peto MacCallum Ltd.
Foundation Design

RECORD OF PENETRATION TEST No PH19 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 025.5 N; 324 670.7 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
188.0	Top of Water										
0.0	Water						187				
186.5											
1.5	End of dynamic cone penetration test Refusal on probable boulder / bedrock							120/0cm			

MTO_DCPT WP 06TF052-J.GPJ ON_MOT.GDT 2/16/2010 8:05:21 AM

+7, ×5: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Peto MacCallum Ltd.
Foundation Design

RECORD OF PENETRATION TEST No PH20 1 of 1 METRIC

W.P. 5257-05-01 LOCATION Coords: 5 117 029.6 N; 324 668.9 E ORIGINATED BY F.P.

DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.

DATUM Geodetic DATE August 25, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
188.0	Top of Water										
0.0	Water						187				
	Probable organic silt Very loose						186				
							185				
			1	SS	WH**				448		
			2	SS	2		184				
	Gravelly sand, trace silt Compact to dense Grey Wet						183				
181.7							182	50/15cm			
6.3	End of dynamic cone penetration test										

WH** denotes penetration due to weight of rods and hammer

+7, ×5 : Numbers refer to Sensitivity

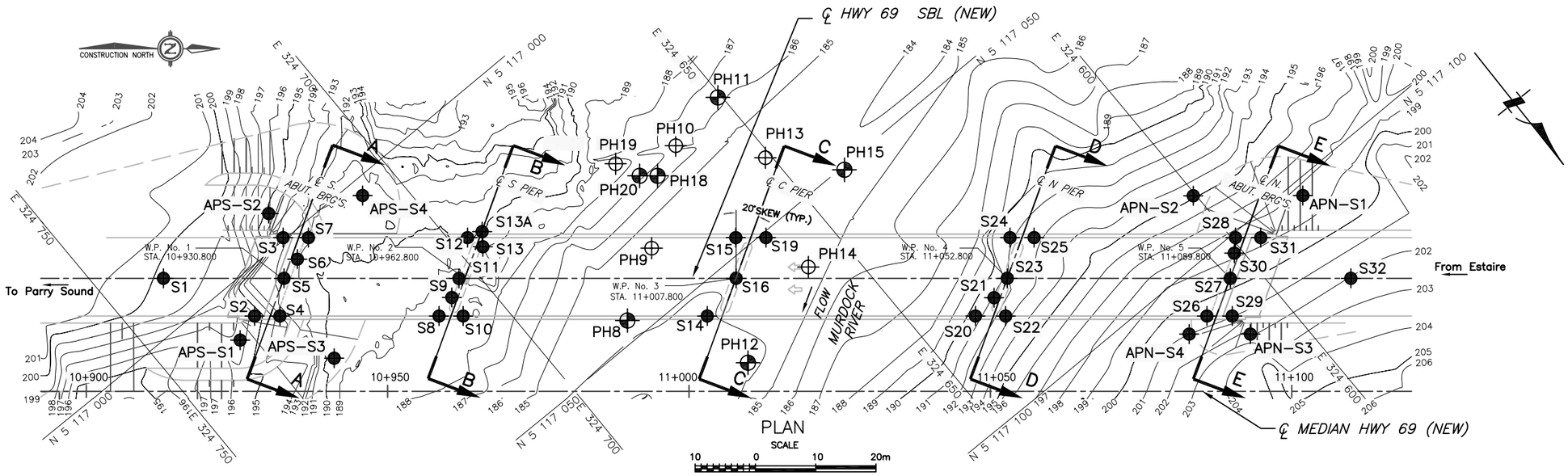
20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

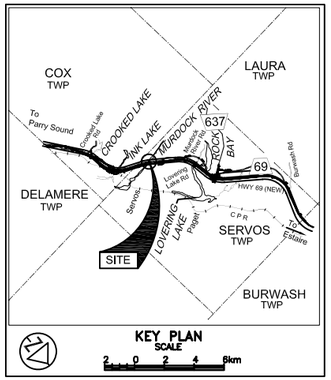
CONT No
WP No 5257-05-01

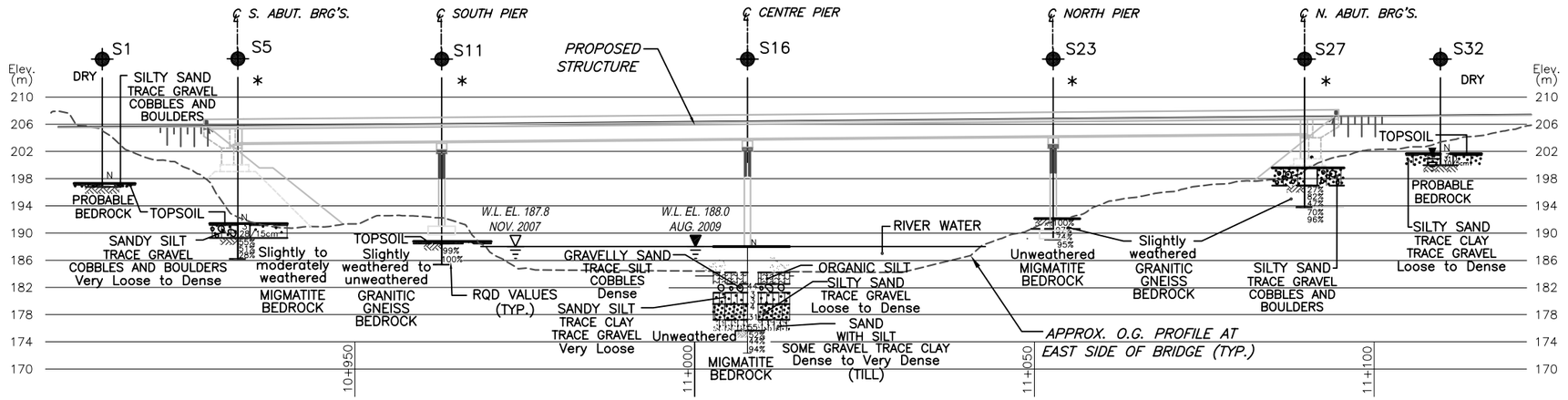
SHEET

MURDOCK RIVER BRIDGE SBL
HIGHWAY 69
BOREHOLE LOCATIONS AND SOIL STRATA

Peto MacCallum Ltd.
CONSULTING ENGINEERS







MURDOCK RIVER SBL ℄ PROFILE

SCALE
10 0 10 20m

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- Borehole & Cone
- CONE Blows/0.3m (60 Cone, 475 J/blow)
- Water level not established
- W L at time of investigation July and August 2009.
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	CO-ORDINATES NORTHINGS	CO-ORDINATES EASTINGS
S1	197.3	5 116 992.1	324 740.5
S2	194.1	5 117 006.6	324 732.9
S3	192.3	5 116 999.6	324 720.9
S4	193.1	5 117 009.3	324 729.6
S5	191.4	5 117 004.9	324 725.1
S6	191.0	5 117 003.9	324 721.4
S7	191.2	5 117 002.3	324 717.7
S8	188.7	5 117 026.2	324 709.3
S9	188.8	5 117 025.2	324 705.7
S10	188.5	5 117 028.7	324 706.3
S11	188.8	5 117 023.5	324 702.8
S12	190.0	5 117 019.2	324 697.4
S13	189.2	5 117 022.0	324 696.4
S13A	189.5	5 117 021.8	324 694.3

Legend Continues

Legend Continued

BH No	ELEVATION	CO-ORDINATES NORTHINGS	CO-ORDINATES EASTINGS
PH15	188.0	5 117 050.6	324 642.1
PH18	188.0	5 117 031.5	324 666.6
PH19	188.0	5 117 025.5	324 670.7
PH20	188.0	5 117 029.6	324 668.9

Legend Continued

BH No	ELEVATION	CO-ORDINATES NORTHINGS	CO-ORDINATES EASTINGS
S32	201.8	5 117 118.2	324 589.1
APN-S1	198.7	5 117 102.5	324 586.4
APN-S2	195.0	5 117 090.9	324 600.4
APN-S3	202.9	5 117 114.6	324 607.8
APN-S4	201.0	5 117 108.1	324 615.6
APS-S1	195.0	5 117 008.1	324 737.3
APS-S2	195.0	5 116 995.0	324 720.2
APS-S3	189.4	5 117 020.4	324 727.2
APS-S4	190.5	5 117 002.7	324 706.3
PH8	188.0	5 117 046.8	324 685.8
PH9	188.0	5 117 040.1	324 675.0
PH10	188.0	5 117 029.6	324 661.1
PH11	188.0	5 117 027.9	324 650.6
PH12	188.0	5 117 064.9	324 674.9
PH13	188.0	5 117 040.7	324 650.9
PH14	188.0	5 117 059.1	324 657.0

Legend Continues

Legend Continued

BH No	ELEVATION	CO-ORDINATES NORTHINGS	CO-ORDINATES EASTINGS
S14	188.0	5 117 054.6	324 675.1
S15	188.0	5 117 047.7	324 663.2
S16	188.0	5 117 052.9	324 667.5
S19	188.0	5 117 050.9	324 659.3
S20	189.5	5 117 083.1	324 640.9
S21	190.7	5 117 082.8	324 636.6
S22	192.4	5 117 086.3	324 637.1
S23	192.2	5 117 081.7	324 632.9
S24	192.0	5 117 076.8	324 628.2
S25	192.8	5 117 079.3	324 625.1
S26	200.9	5 117 107.7	324 611.4
S27	199.7	5 117 105.4	324 604.4
S28	198.1	5 117 100.7	324 599.5
S29	201.1	5 117 110.4	324 608.2
S30	199.0	5 117 102.6	324 601.3
S31	198.4	5 117 103.4	324 596.2

Legend Continues

NOTES:

1. DRAWINGS MRS-1 AND MRS-2 SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. REFER TO DRAWING MRS-2 FOR SECTIONS A-A, B-B, C-C, D-D AND E-E.
3. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.
4. DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS ARE IN KILOMETRES AND METRES.

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Feb. 12, 2010 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY FEB. 12, 2010 PROVINCE OF ONTARIO

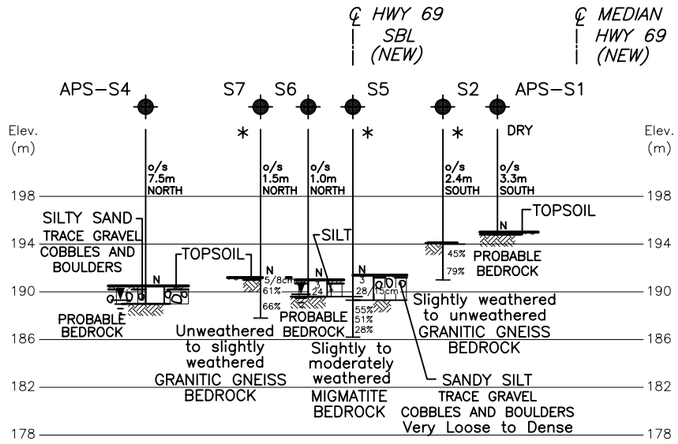
REF. TSH Drawings;
42-91088-MURDOCK-GA-ALT-4SPAN-SOUTH ALT1.dwg; MUDROCH RIVER.dwg and MUDROCH RIVER-CONTOURS dated June, 2007

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

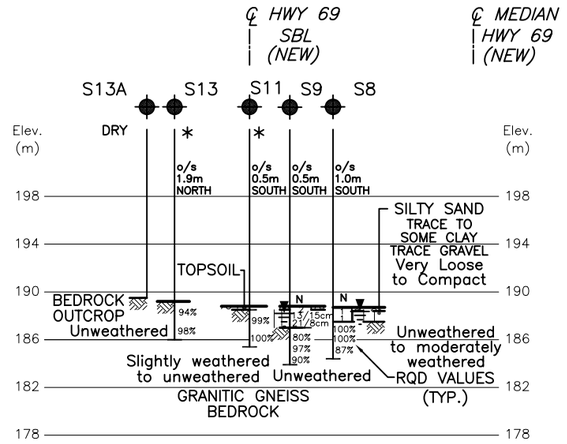
REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41I-256

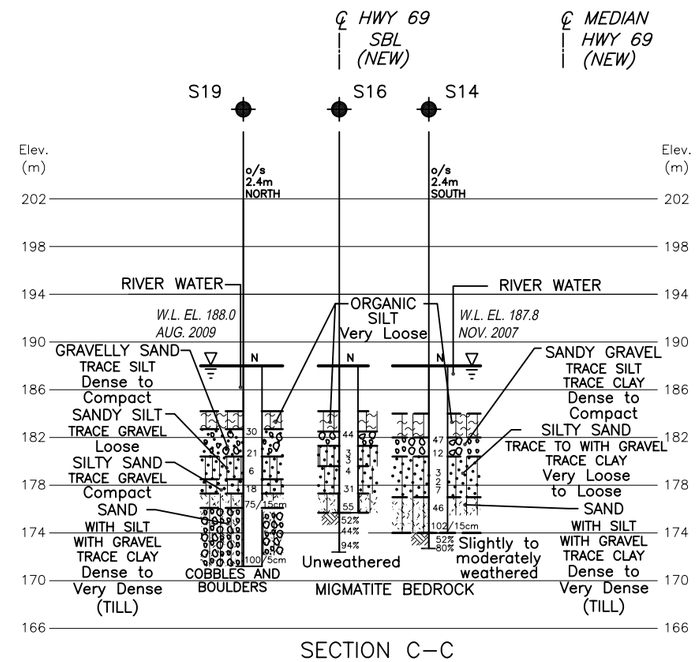
HWY No	69			DIST	54
SUBM'D	MN	CHECKED GD	DATE FEB. 12, 2010	SITE	46-506/2
DRAWN	NA	CHECKED CN	APPROVED BRG	DWG	MRS-1



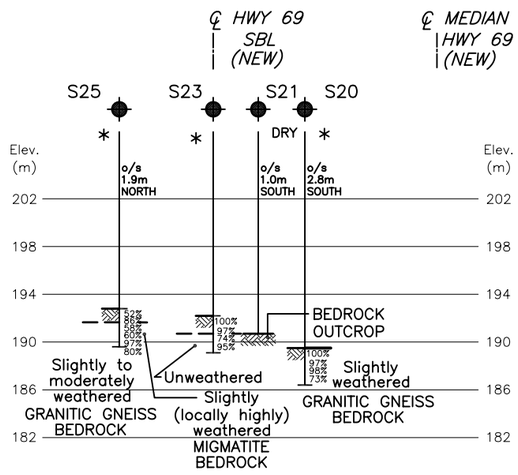
SECTION A–A



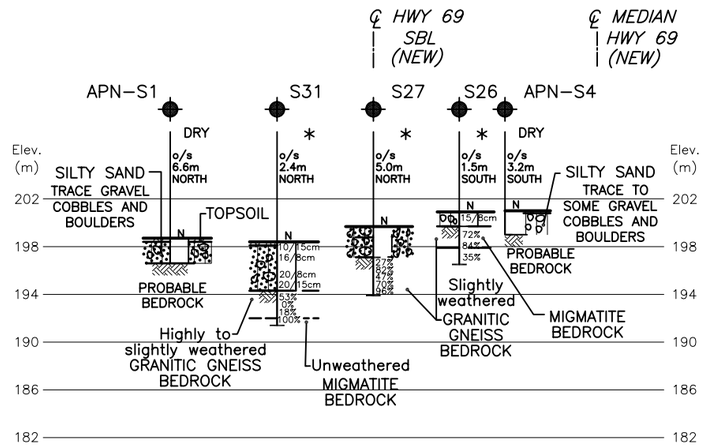
SECTION B–B



SECTION C–C



SECTION D–D

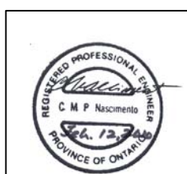


SECTION E–E

SCALE
5 0 5 10m

NOTES:

1. DRAWINGS MRS–1 AND MRS–2 SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. REFER TO DRAWING MRS–1 FOR BORHOLE LOCATIONS PLAN AND CENTRELINE PROFILE.
3. THIS DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.
4. DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS ARE IN KILOMETRES AND METRES.



REF. TSH Drawings;
42–91088–MURDOCK–GA–ALT–4SPAN–SOUTH ALT1.dwg; MUDROCH RIVER.dwg and MUDROCH RIVER–CONTOURS dated June, 2007

CONT No
WP No 5257–05–01

MURDOCK RIVER BRIDGE SBL
HIGHWAY 69
SOIL STRATA

SHEET

Peto MacCallum Ltd.
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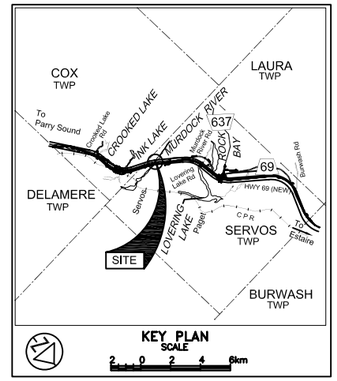


LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- Borehole & Cone
- CONE Blows/0.3m (60 Cone, 475 J/blow)
- Water level not established
- W L at time of investigation July and August 2009
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	CO–ORDINATES NORTHINGS	CO–ORDINATES EASTINGS

SEE DRAWING MRS–1 FOR DETAILS

– 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

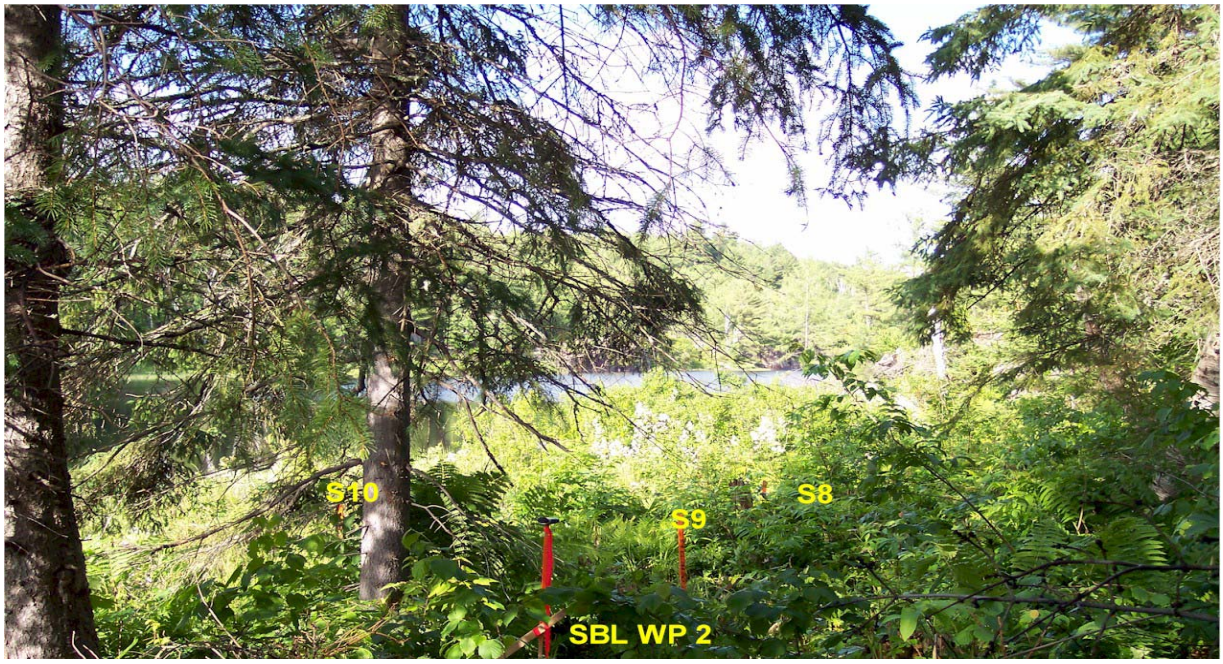
Geocres No. 411–256

HWY No	69			DIST	54
SUBM'D	MN	CHECKED	DG	DATE FEB. 12, 2010	SITE 46–506/2
DRAWN	NA	CHECKED	CN	APPROVED BRG	DWG MRS–2

APPENDIX A

Site Photographs

Photograph 1: Southbound lane WP 1 facing southwest. (August 7, 2009)



Photograph 2: Southbound lane WP 2 facing east. (July 7,2009)

Photograph 3: Southbound lane WP 2 facing west. (July 7, 2009).

Photograph 4: Southbound lane WP 4 facing northeast. (August 7, 2009).

Photograph 5: Southbound lane WP 4 facing northwest. (August 7, 2009)

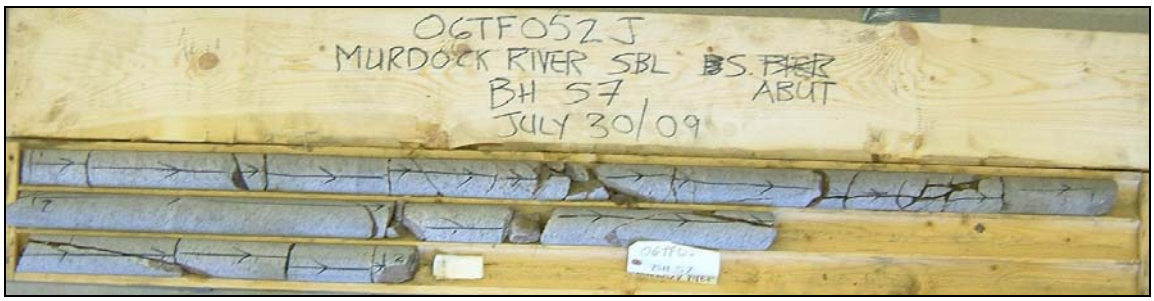
Photograph 6: Southbound lane WP 5 facing west. (August 7, 2009).

APPENDIX B

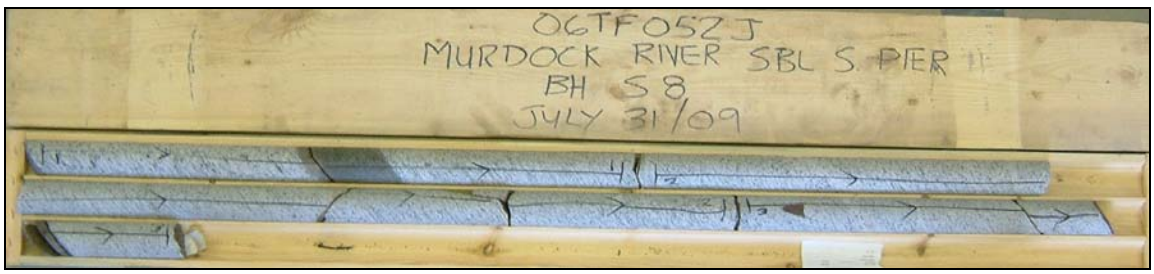
Rock Core Photographs

Photograph 1: Cores retrieved from borehole S2. Cores 1 and 2 from 0.0 to 3.1 m depth. RQD values of 45 and 79%, indicating poor to good rock quality.

Photograph 2: Cores retrieved from borehole S5. Cores 3 to 5 from 2.1 to 5.2 m depth. RQD values ranged from 28 to 55%, indicating poor to fair rock quality.



Photograph 3: Cores retrieved from borehole S7. Cores 2 and 3 from 0.2 to 3.3 m depth. RQD values of 61 and 66%, indicating fair rock quality.

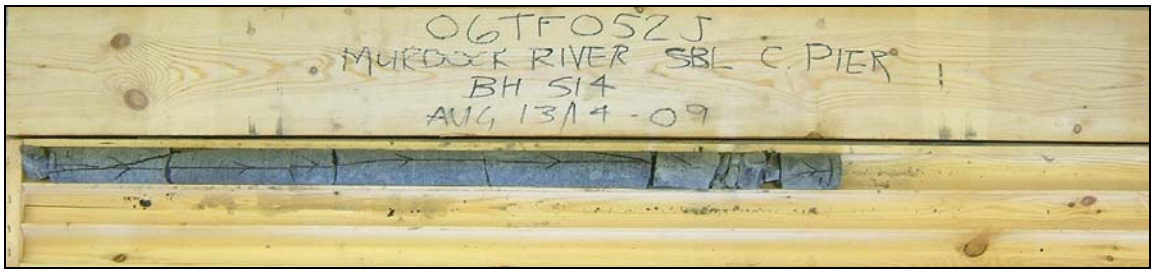


Photograph 4: Cores retrieved from borehole S8. Cores 3 to 5 from 1.2 to 4.3 m depth. RQD values ranged from 100 to 87%, indicating excellent becoming good rock quality.

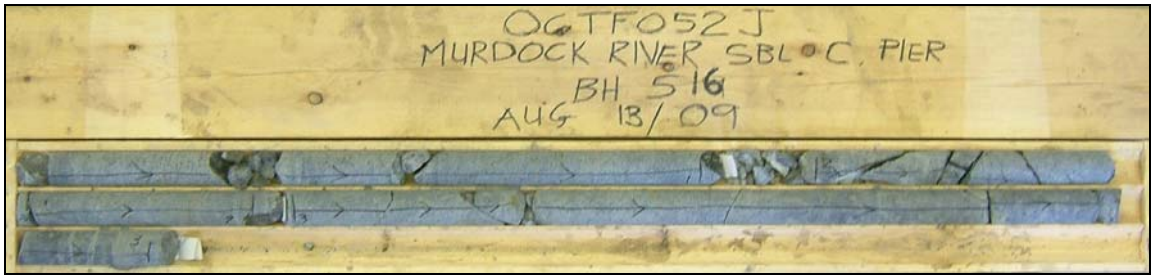
Photograph 5: Cores retrieved from borehole S9. Cores 4 to 6 from 1.8 to 4.9 m depth. RQD values ranged from 80 to 97%, indicating good to excellent rock quality.

Photograph 6: Cores retrieved from borehole S11. Cores 1 and 2 from 0.3 to 3.4 m depth. RQD values of 99 and 100%, indicating excellent rock quality.

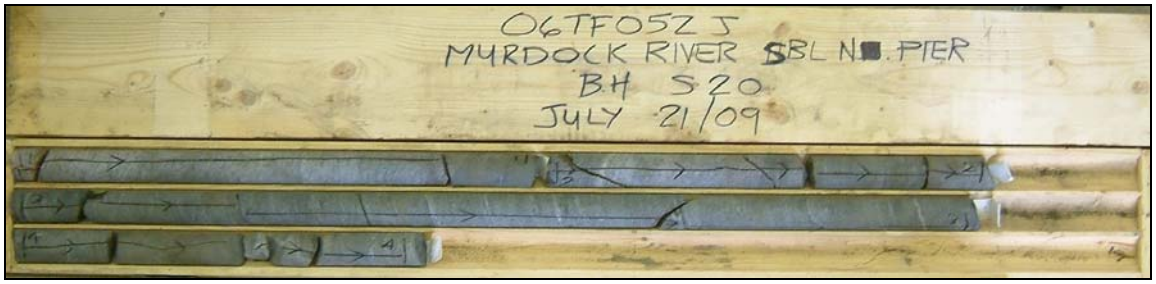
Photograph 7: Cores retrieved from borehole S13. Cores 1 and 2 from 0.0 to 3.2 m depth. RQD values of 94 and 98%, indicating excellent rock quality.



Photograph 8: Cores retrieved from borehole S14. Cores 8 and 9 from 14.0 to 15.3 m depth. RQD values of 52 and 80%, indicating fair to good rock quality.

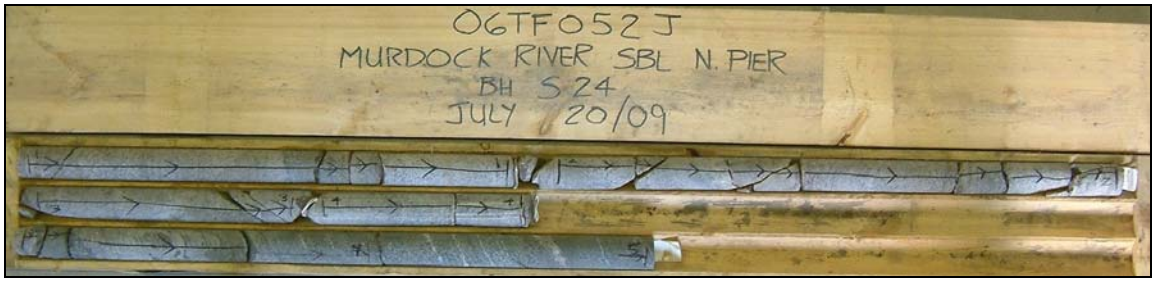


Photograph 9: Cores retrieved from borehole S16. Cores 7 to 9 from 12.3 to 15.6 m depth. RQD values ranged from 44 to 94%, indicating fair to excellent (locally poor) rock quality.

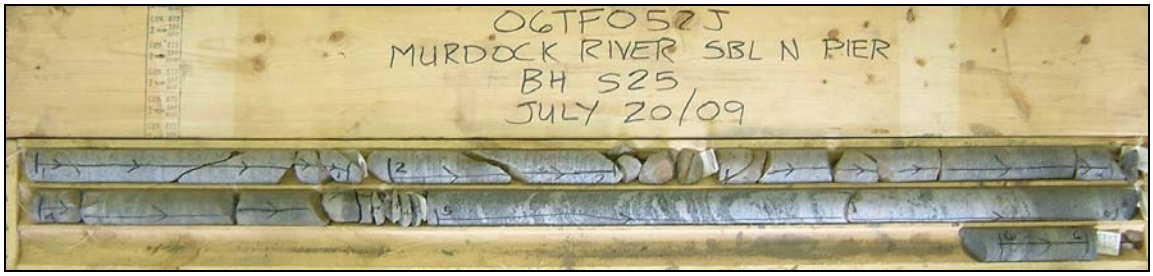


Photograph 10: Cores retrieved from borehole S20. Cores 1 to 4 from 0.0 to 3.1 m depth. RQD values ranged from 73 to 100%, indicating fair to excellent rock quality.

Photograph 11: Cores retrieved from borehole S23. Cores 1 to 4 from 0.0 to 3.1 m depth. RQD values ranged from 74 to 100%, indicating fair to excellent rock quality.

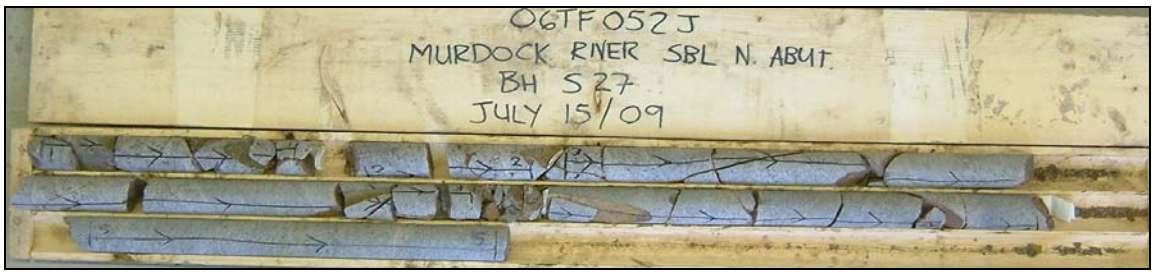


Photograph 12: Cores retrieved from borehole S24. Cores 1 to 5 from 0.0 to 3.1 m depth. RQD values ranged from 25 to 90%, indicating poor to excellent rock quality.

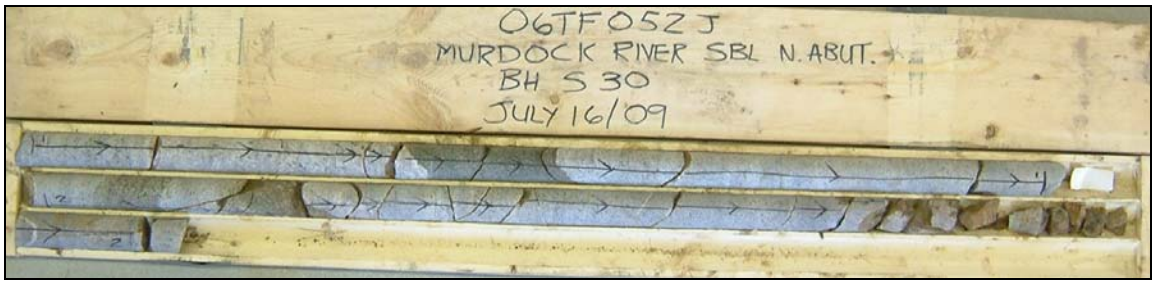


Photograph 13: Cores retrieved from borehole S25. Cores 1 to 6 from 0.0 to 3.1 m depth. RQD values ranged from 52 to 97%, indicating fair to excellent rock quality.

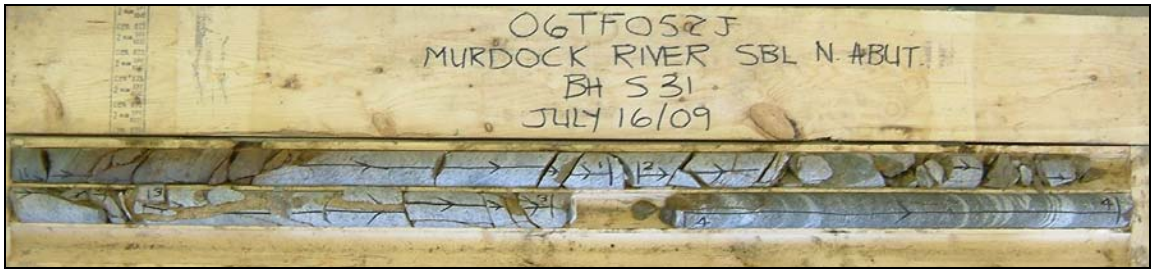
Photograph 14: Cores retrieved from borehole S26. Cores 2 to 4 from 1.2 to 4.4 m depth. RQD values ranged from 35 to 84%, indicating poor to good rock quality.



Photograph 15: Cores retrieved from borehole S27. Cores 1 to 5 from 2.6 to 5.8 m depth. RQD values ranged from 27 to 96%, indicating poor to fair (locally good) becoming excellent rock quality.



Photograph 16: Cores retrieved from borehole S30. Cores 4 and 5 from 3.2 to 6.2 m depth. RQD values of 83 and 47%, indicating good (locally excellent) becoming poor rock quality.



Photograph 17: Cores retrieved from borehole S31. Cores 5 to 8 from 4.1 to 7.0 m depth. RQD values ranged from 0 to 100%, indicating very poor to excellent rock quality.