



TABLE A
ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	CORE NO.	DEPTH (m)	RECOVERY (%)	RQD (%)	DEPTH (m)	DESCRIPTION
N4	3	1.5 – 3.0	99	72	1.5 – 4.3	MIGMATITE: Black and white, medium to coarse crystalline, high strength, with 75 mm thick purple micaceous layer, low to medium strength, slightly weathered to unweathered, close spaced dipping cross joints, rough planar, tight, with vertical fissures, slightly altered with friable muscovite mica on partings, fair quality. AMPHIBOLITE: Black, fine to medium crystalline, high strength, unweathered, close spaced dipping cross joints, rough planar, tight, excellent quality. NOTE: There was some loss of material at the migmatite/amphibolite contact.
	4	3.0 – 4.3	98	62		
	5	4.3 – 4.6	93	93		
					4.3 – 4.6	
N6	4	2.4 – 3.4	100	56	2.4 – 5.7	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, with occasional black layers, high strength, slightly weathered, very close to close becoming close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with rust brown oxidation stains on partings, with 50 mm cavity at 3.5 m depth coated with secondary mineralization, with vertical fissures between 3.8 and 4.7 m depth, poor to fair quality.
	5	3.4 – 4.7	98	27		
	6	4.7 – 5.7	91	62		
N7	3	1.6 – 1.9	100	75	1.6 – 4.7	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 (locally smooth) planar, generally tight, occasionally slightly altered with dark green mineralization and/or red oxidation stains on partings, good to excellent quality.
	4	1.9 – 3.5	98	86		
	5	3.5 – 4.7	98	98		

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
N8	1	0.3 – 1.2	97	97	0.3 – 3.5	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered to unweathered, close to moderate becoming wide spaced dipping cross joints, rough planar, slightly altered with dark brown or red oxidation on partings, good to excellent quality.
	2	1.2 – 1.5	92	75		
	3	1.5 – 3.0	100	96		
	4	3.0 – 3.5	95	95		
N9	1	0.0 – 1.6	95	87	0.0 – 3.1	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with red oxidation on partings, good quality.
	2	1.6 – 3.1	93	86		
N10	1	0.0 – 1.5	93	93	0.0 – 3.2	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, moderate spaced dipping cross joints, rough planar, slightly altered with red oxidation on partings, excellent quality.
	2	1.5 – 2.5	100	100		
	3	2.5 – 3.2	100	100		
N13	1	0.0 – 0.7	100	98	0.0 – 3.1	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with red oxidation on partings, fair to excellent quality.
	2	0.7 – 1.5	97	89		
	3	1.5 – 2.4	100	60		
	4	2.4 – 3.1	93	43		
N20	1	0.2 – 1.7	99	96	0.2 – 3.3	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, close to moderate (locally very close) spaced flat to dipping cross joints, rough planar, slightly altered with red oxidation stains on partings, excellent quality.
	2	1.7 – 3.3	97	97		

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
N22	3	1.2 – 2.2	86	78	1.2 – 4.4	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with red oxidation stains, silt and/or sand on partings, fair to excellent quality.
	4	2.2 – 3.6	100	100		
	5	3.6 – 4.4	84	73		
N24	1	0.4 – 1.7	93	93	0.4 – 3.5	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, slight banding, high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with oxidation stains and occasional scale on partings, with vertical fissures, silt on partings, excellent becoming very poor to poor quality.
	2	1.7 – 3.1	100	32		
	3	3.1 – 3.5	100	0		
N25	1	0.0 – 1.6	98	98	0.0 – 3.1	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, wide spaced dipping cross joints, rough planar, slightly altered with oxidation stains on partings, excellent quality.
	2	1.6 – 3.1	99	99		
N26	2	0.8 – 1.8	99	58	0.8 – 3.9	GRANITIC GNEISS: Light grey, fine to medium crystalline, high strength, slightly weathered, close spaced flat to dipping cross joints, rough planar, slightly altered with dark green to black mineralization and occasional dark red oxidation stains and/or scale on partings, thin white dipping layer at 2.5 m depth with multiple dipping to near vertical joints and brecciated zone, fair quality.
	3	1.8 – 3.4	100	63		
	4	3.4 – 3.9	82	50		
N27	2	1.1 – 2.0	97	43	1.1 – 4.1	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, high strength, slightly weathered, close spaced dipping cross joints, rough planar, slightly altered with dark green to black mineralization and occasional dark red oxidation stains and/or scale on partings, some vertical fissures with black oxidation on partings, poor to fair quality.
	3	2.0 – 2.9	100	37		
	4	2.9 – 3.5	100	66		
	5	3.5 – 4.1	93	36		

Originated: JFW
Compiled: FP
Checked: GD/ CN

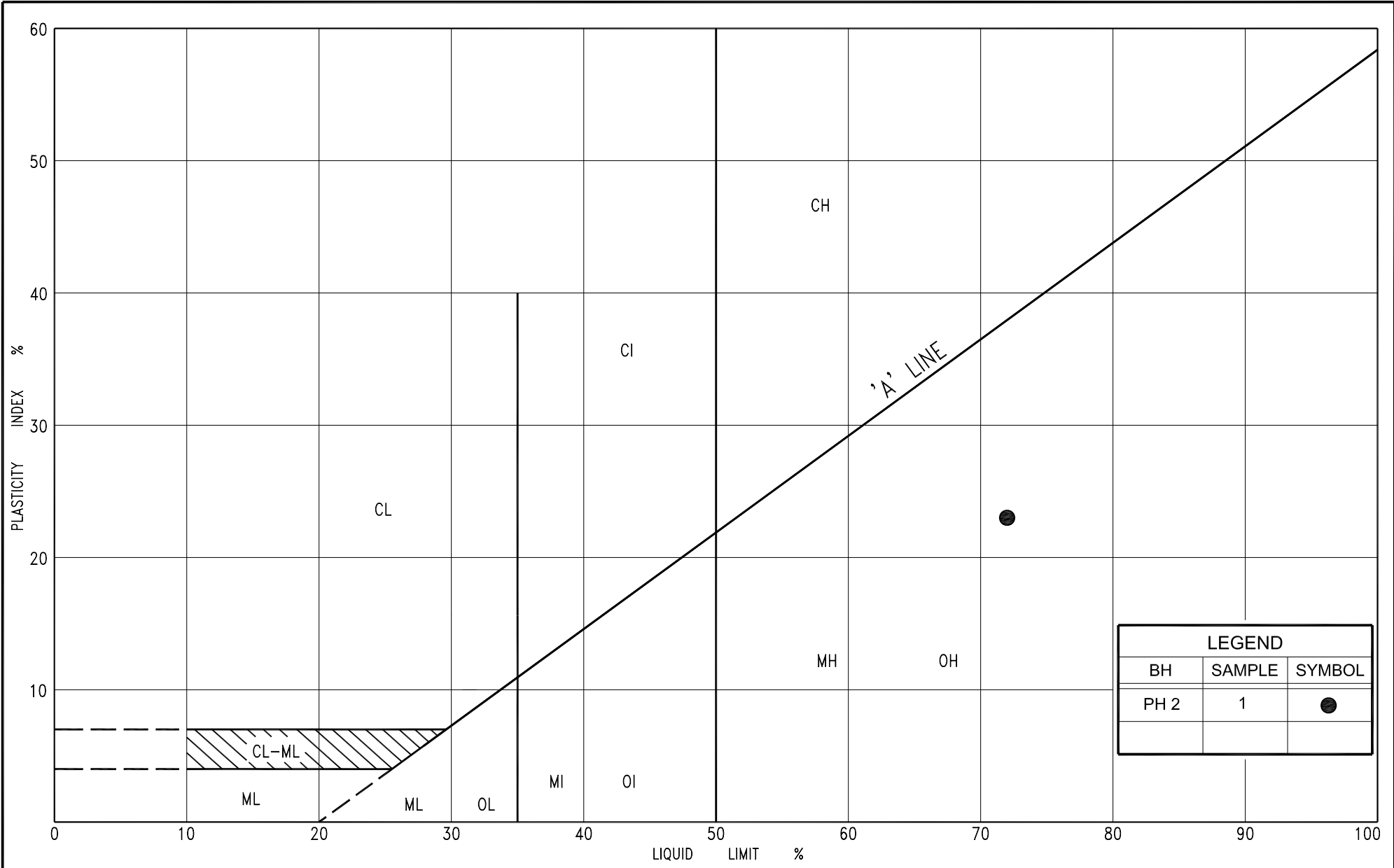


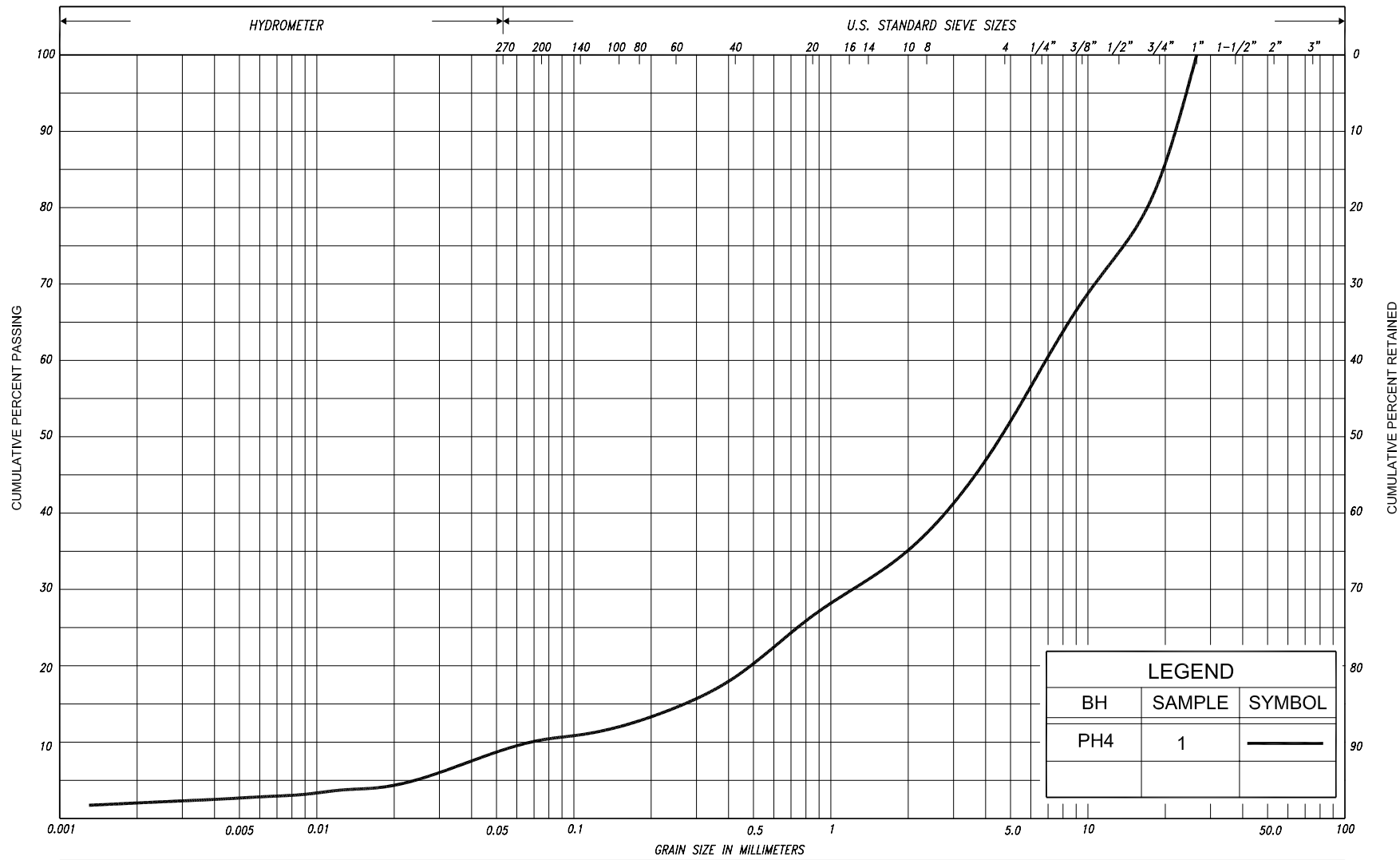
TABLE A
ROCK CORE DESCRIPTIONS

CORE RECOVERY					CORE DESCRIPTION	
HOLE NO.	CORE NO.	DEPTH (m)	RECOVERY (%)	RQD (%)	DEPTH (m)	DESCRIPTION
N28	1	0.0 – 1.5	96	91	0.0 – 3.4	GRANITIC GNEISS: Pink and grey, fine to medium crystalline, with some pyrite mineralization, high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, rough planar, slightly altered with dark green mineralization, red oxidation stains and/or scale on partings, good to excellent quality.
	2	1.5 – 2.8	100	83		
	3	2.8 – 3.4	100	93		
N31	3	1.6 – 2.4	93	60	1.6 – 3.1	GRANITIC GNEISS: Pink, fine to medium crystalline, with 150 to 230 mm thick layers of black biotite gneiss, medium to high strength, slightly weathered, close to moderate spaced flat to dipping cross joints, rough planar, tight to oxidized, vertical parting in upper 0.3 m, slightly altered with red oxidation stains, fair quality.
	4	2.4 – 3.1	97	62		
	5	3.1 – 4.2	100	100	3.1 – 4.9	BIOTITE GNEISS: Black, fine crystalline, with 430 mm thick layer of pink granitic gneiss, medium strength, slightly weathered to unweathered, wide becoming close spaced flat to dipping cross joints, rough planar, tight, with occasional scale on partings, excellent becoming poor quality.
	6	4.2 – 4.9	100	46		

NOTE: RQD = Rock Quality Designation

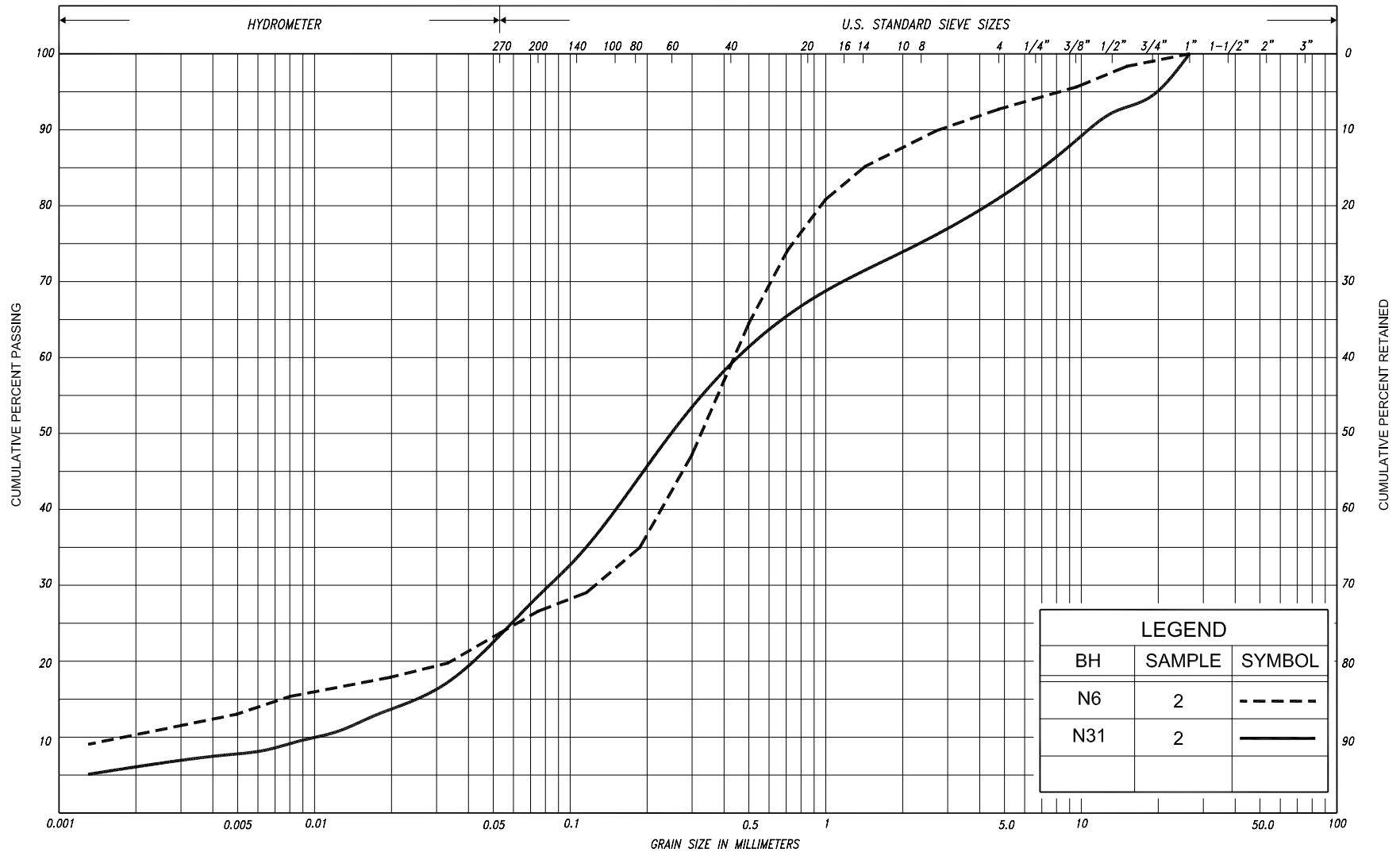
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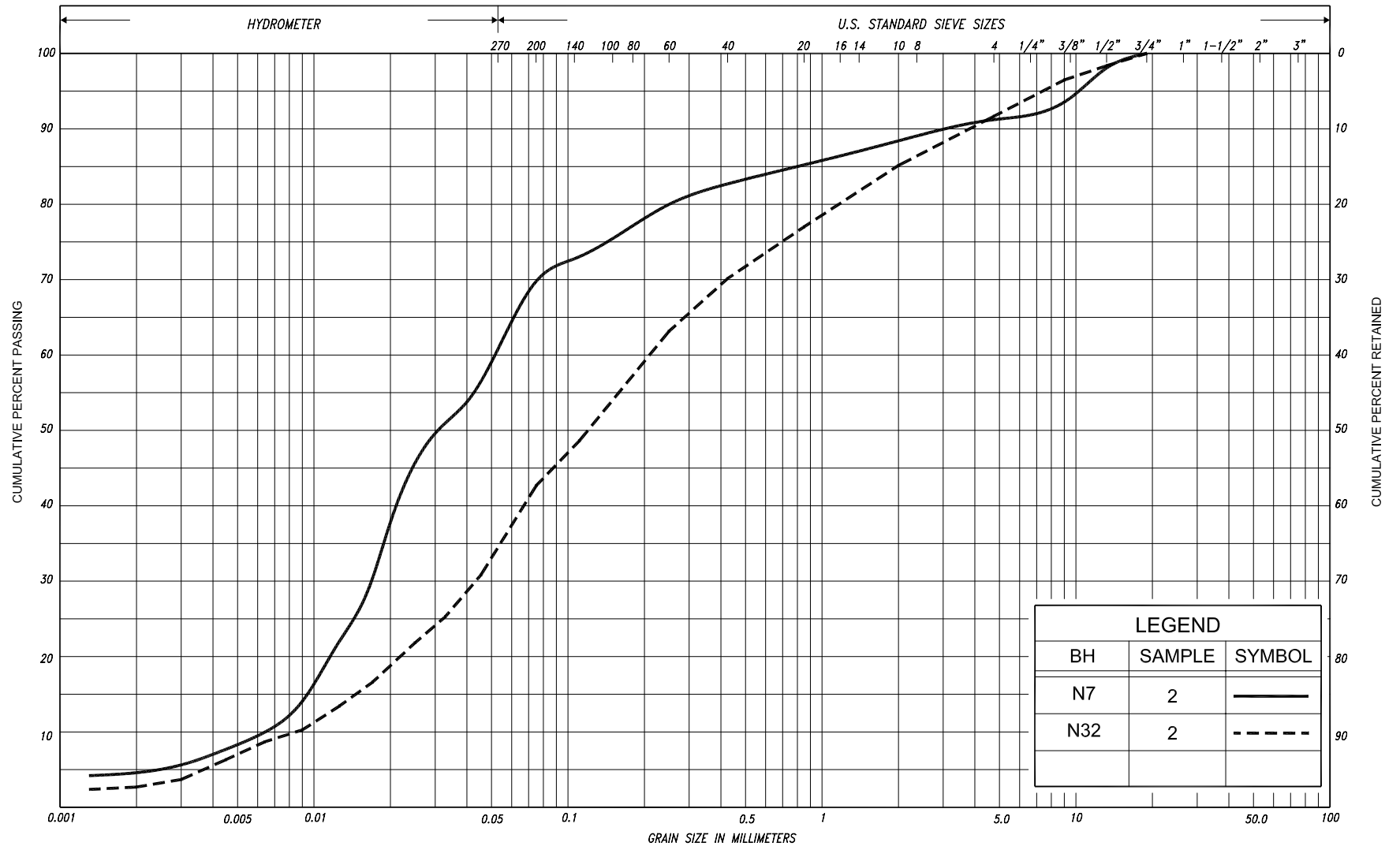


LEGEND		
BH	SAMPLE	SYMBOL
PH4	1	—

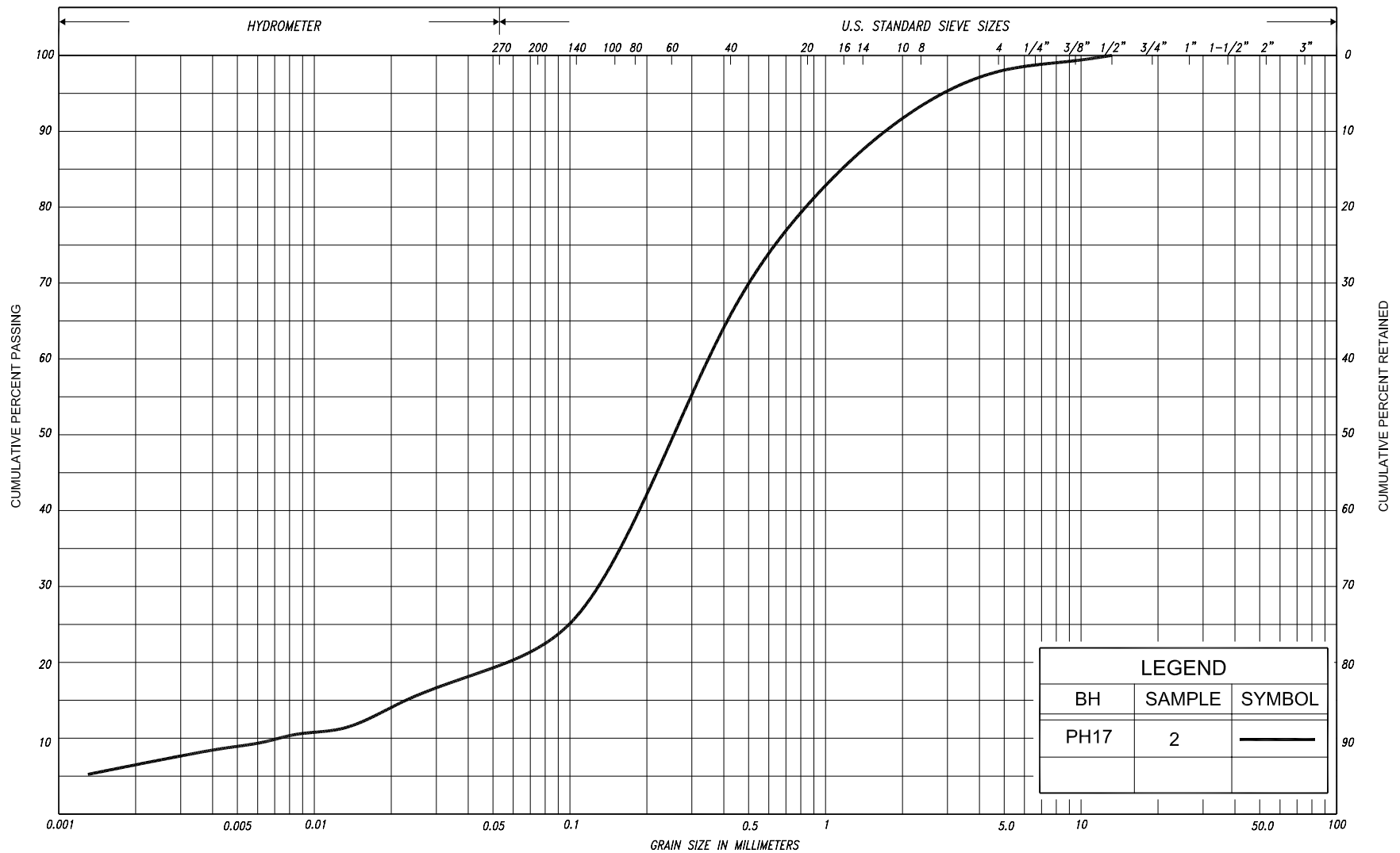
SILT & CLAY					FINE		MEDIUM		COARSE	GRAVEL			COBBLES	UNIFIED		
					SAND											
CLAY	FINE		MEDIUM	COARSE	FINE		MEDIUM		COARSE		GRAVEL			COBBLES	M.I.T.	
	SILT															
CLAY		SILT			V. FINE	FINE	MED.	COARSE	GRAVEL							U.S. BUREAU
					SAND											



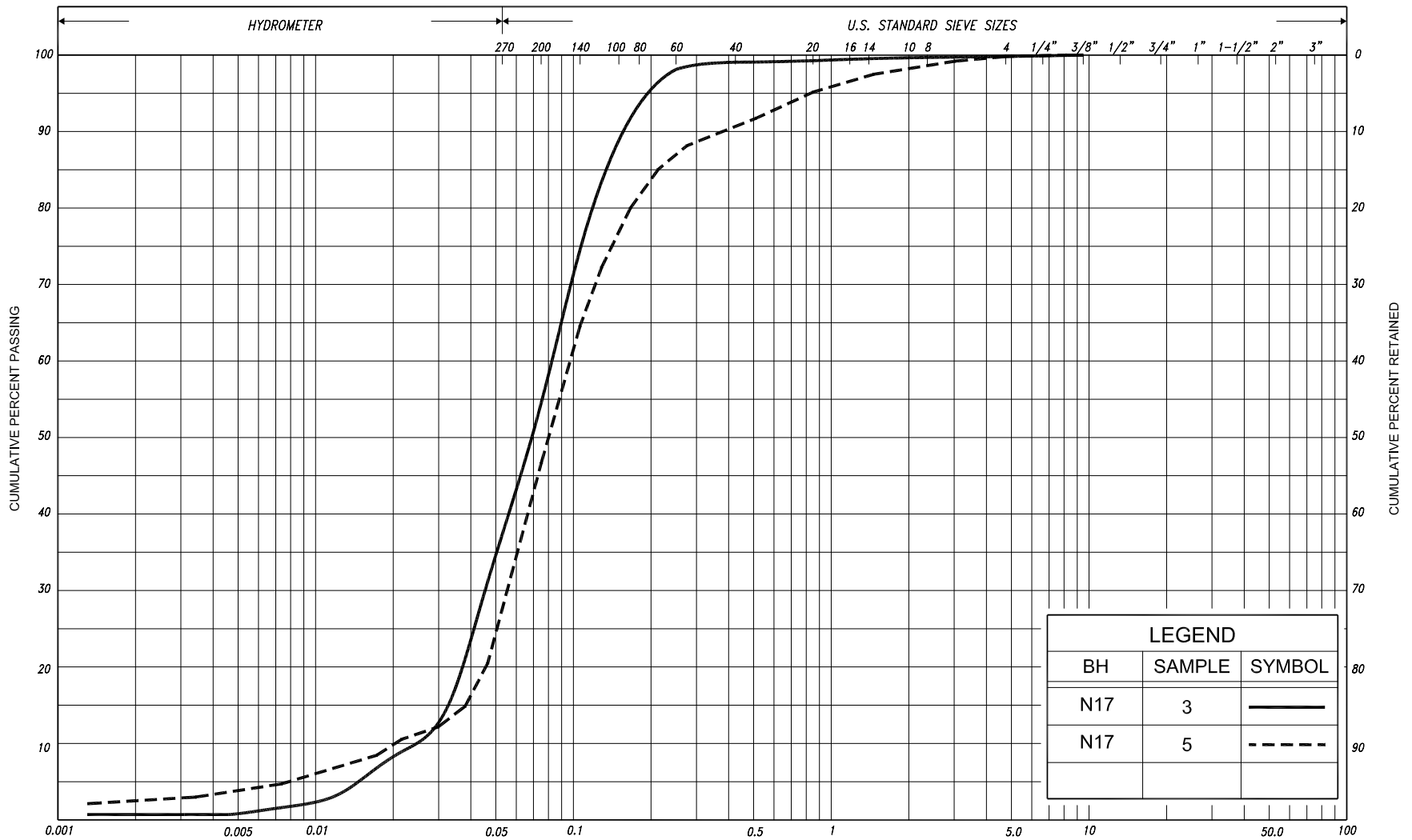
SILT & CLAY				FINE		MEDIUM		COARSE	GRAVEL		COBBLES	UNIFIED		
				SAND										
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE	GRAVEL	COBBLES	M.I.T.
	SILT					SAND								
CLAY			SILT			V. FINE	FINE	MED.	COARSE	GRAVEL				U.S. BUREAU
					SAND									



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



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



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

EXPLANATION OF TERMS USED IN REPORT

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

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

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

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

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

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

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

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

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

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

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

JOINTING AND BEDDING:

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

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

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

STRESS AND STRAIN

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

MECHANICAL PROPERTIES OF SOIL

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

PHYSICAL PROPERTIES OF SOIL

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

RECORD OF BOREHOLE No N1

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 001.6 N; 324 788.5 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					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L					
								○ UNCONFINED	+	FIELD VANE	● QUICK TRIAXIAL	×	LAB VANE	WATER CONTENT (%)						
199.9 0.0	Ground Surface					*		20	40	60	80	100								
199.8 0.1	Topsoil																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry																			

RECORD OF BOREHOLE No N3

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 014.8 N; 324 776.8 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					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		WATER CONTENT (%)	GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE								
193.4	Ground Surface					*															
0.0	Bedrock at surface																				
	* Borehole dry																				


RECORD OF BOREHOLE No N4

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 019.4 N; 324 776.9 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 28, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE LIQUID LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa						w _p	w	w _L		
191.6	Ground Surface							20	40	60	80	100						
0.0 191.3	Topsoil		1	SS	17/18cm		191											
0.3	Silty sand, trace gravel cobbles and boulders																	
	Compact Brown Moist		2	SS	15/5cm													
190.1																		
1.5	Migmatite bedrock						190											
	Slightly weathered to unweathered		3	RC NQ	REC 99%		189										RQD 72%	
	High strength																	
	Fair quality																	
			4	RC NQ	REC 98%		188										RQD 62%	
187.0	Amphibolite bedrock		5	RC NQ	REC 93%		187										RQD 93%	
4.6	Unweathered High strength Excellent quality																	
	End of borehole																	
	Samples 1 & 2: Sampler bouncing																	
	* Borehole charged with drilling water																	
	C.F.S.S.A. denotes Continuous Flight Solid Stem Augers																	

<div style="display: flex; justify-content: space-between;"> RECORD OF BOREHOLE No N5 1 of 1 METRIC </div>																
W.P. 5256-05-01		LOCATION		Coords: 5 117 009.1 N; 324 768.9 E				ORIGINATED BY F.P.								
DIST 54 HWY 69		BOREHOLE TYPE		Continuous Flight Solid Stem Augers				COMPILED BY G.D.								
DATUM Geodetic		DATE		July 28, 2009				CHECKED BY C.N.								
SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					W _p W W _L			
192.6	Ground Surface															
0.0	Topsoil		1	SS	25/13cm											
192.4	Sandy silt, some gravel															
0.2	cobbles and boulders															
191.8			2	SS	10/3cm	192										
0.8	Compact Brown Moist															
	End of borehole															
	Refusal on probable bedrock															
	Samples 1 & 2: Sampler bouncing															
	* Borehole dry															

RECORD OF BOREHOLE No N6

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 014.7 N; 324 771.9 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 28, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
191.9	Ground Surface						20	40	60	80	100						
0.0 191.6	Topsoil		1	SS	13/18cm												
0.3	Sand, some silt some clay, trace gravel cobbles and boulders																
	Compact Brown Wet		2	SS	20/3cm												
			3	SS	15/8cm												
189.5																	
2.4	Granitic Gneiss bedrock																
	Slightly weathered		4	RC NQ	REC 100%												
	High strength																
	Poor to fair quality		5	RC NQ	REC 98%												
			6	RC NQ	REC 91%												
186.2																	
5.7	End of borehole																
	Samples 1, 2 & 3: Sampler bouncing																
	* Borehole charged with drilling water																
	C.F.S.S.A. denotes Continuous Flight Solid Stem Augers																

RECORD OF BOREHOLE No N7

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 011.8 N; 324 765.7 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 23, 2009 CHECKED BY C.N.

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa					W _p	W	W _L		
192.2	Ground Surface						20	40	60	80	100					
0.0 191.9	Topsoil		1	SS	8	192						o				
0.3	Silt, with sand trace clay, trace gravel cobbles and boulders		2	SS	15/23cm	191						o				9 21 66 4
190.6	Compact Brown Moist to wet															
1.6	Granitic Gneiss bedrock		3	RC NQ	REC 100%	190										RQD 75%
	Slightly weathered to unweathered		4	RC NQ	REC 98%	189										RQD 86%
	High strength															
	Good to excellent quality		5	RC NQ	REC 98%	188										RQD 98%
187.5 4.7	End of borehole															
	Sample 2: Sampler bouncing															
	* Borehole charged with drilling water															
	C.F.S.S.A. denotes Continuous Flight Solid Stem Augers															


RECORD OF BOREHOLE No N8

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 035.6 N; 324 757.4 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 23, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
192.4	Ground Surface							20	40	60	80	100					
0.0	Silty sand						192										
192.1	topsoil inclusions																
0.3	Brown Moist Granitic Gneiss bedrock		1	RC NQ	REC 97%												RQD 97%
	Slightly weathered to unweathered		2	RC NQ	REC 92%		191										RQD 75%
	High strength		3	RC NQ	REC 100%		190										RQD 96%
	Good to excellent quality		4	RC NQ	REC 95%												RQD 95%
188.9	End of borehole						189										
3.5	* Borehole charged with drilling water C.F.S.S.A. denotes Continuous Flight Solid Stem Augers																

RECORD OF BOREHOLE No N9										1 of 1		METRIC					
W.P. 5256-05-01		LOCATION		Coords: 5 117 036.9 N; 324 755.8 E				ORIGINATED BY F.P.									
DIST 54		HWY 69		BOREHOLE TYPE Rotary Diamond Drilling				COMPILED BY G.D.									
DATUM Geodetic		DATE		July 24, 2009				CHECKED BY C.N.									
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
191.9	Ground Surface																
0.0	Granitic Gneiss bedrock		1	RC NQ	REC 95%												RQD 87%
	Slightly weathered																
	High strength																
	Good quality		2	RC NQ	REC 93%												RQD 86%
188.8																	
3.1	End of borehole																
	* Borehole charged with drilling water																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No N10

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 032.5 N; 324 752.2 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling COMPILED BY G.D.
 DATUM Geodetic DATE July 27, 2009 CHECKED BY C.N.

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		20	40	60	80	100	W _p	W	W _L		
192.2	Ground Surface															
0.0	Granitic Gneiss bedrock					192										
	Slightly weathered		1	RC NQ	REC 93%	191										RQD 93%
	High strength		2	RC NQ	REC 100%	190										RQD 100%
	Excellent quality		3	RC NQ	REC 100%	189										RQD 100%
189.0	End of borehole															
3.2																
	* Borehole charged with drilling water															

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No N13

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 031.2 N; 324 742.3 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Rotary Diamond Drilling 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					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		20	40	60	80	100	W _p	w	W _L		
192.4	Ground Surface															
0.0	Granitic Gneiss bedrock		1	RC NQ	REC 100%	192										RQD 98%
	Slightly weathered		2	RC NQ	REC 97%	191										RQD 89%
	High strength		3	RC NQ	REC 100%	190										RQD 60%
	Fair to excellent becoming poor quality		4	RC NQ	REC 93%											RQD 43%
189.3	End of borehole															
3.1	* Borehole charged with drilling water															

RECORD OF PENETRATION TEST No N14

1 of 1 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 064.1 N; 324 723.2 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE August 20, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
188.0 0.0	Top of water Water					↓*								
	Probable organic silt													
	Probable sandy gravel Compact to dense													
	Probable sandy silt Loose to very loose													
	Probable sand, with silt trace to some gravel Compact to very dense (TILL)													
173.5 14.5	End of dynamic cone penetration test													

RECORD OF BOREHOLE No N17

1 of 2

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 062.1 N; 324 715.0 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 18 and 19, 2009 CHECKED BY C.N.




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100		
188.0 0.0	Top of water Water					▼* ▼*								
183.4 4.6	Organic silt Very loose Dark brown													
181.4 6.6	Sandy gravel, trace silt Dense to Grey Wet compact		1	SS	39									
			2	SS	27									
179.5 8.5	Sand and silt, trace clay Loose to Grey Wet very loose		3	SS	8									
			4	SS	1									
			5	SS	3									
174.3 13.7	Sand, with silt trace to some gravel Compact Grey Wet to dense (TILL) Cont'd		6	SS	10									

RECORD OF BOREHOLE No N17

2 of 2

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 062.1 N; 324 715.0 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 18 and 19, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				GR	SA	SI	CL		
173.0																						
	Sand, with silt trace to some gravel Dense to Grey Wet very dense (TILL) cobbles and boulders		7	SS	37		172															
			8	SS	100/10cm																	
			9	RC NQ	-																	
			10	RC NQ	-																	
			11	RC NQ	-																	
			12	RC NQ	-																	
			13	RC NQ	-																	
			14	SS	100/10cm																	
167.6																						
20.4	End of borehole																					
	<div><div></div>Water level in river during drilling</div> <div><div></div>Water level in river after drilling</div> <div>C.F.S.H.A. denotes Continuous Flight Hollow Stem Augers</div>																					

RECORD OF PENETRATION TEST No N19

1 of 2 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 060.3 N; 324 707.4 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE August 20, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
188.0 0.0	Top of water Water													
	Probable organic silt													
	Probable sandy gravel													
	Dense to compact													
	Probable sandy silt													
	Loose to very loose													
	Probable sand, with silt trace to some gravel													
	Compact to very dense (TILL)													
	Cont'd													

2 of 2 **METRIC**

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No N20										1 of 1		METRIC					
W.P. 5256-05-01		LOCATION		Coords: 5 117 093.2 N; 324 688.2 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 22, 2009				CHECKED BY C.N.									
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
190.8	Ground Surface																
0.0	Topsoil																
190.6	Granitic Gneiss bedrock																
0.2	Slightly weathered		1	RC NQ	REC 99%		190										RQD 96%
	High strength						189										
	Excellent quality		2	RC NQ	REC 97%		188										RQD 97%
187.5	End of borehole																
3.3	* Borehole charged with drilling water C.F.S.S.A. denotes Continuous Flight Solid Stem Augers																

RECORD OF BOREHOLE No N21

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 095.8 N; 324 685.1 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.
 DATUM Geodetic DATE July 22, 2009 CHECKED BY C.N.







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

RECORD OF BOREHOLE No N22

1 of 1

METRIC


W.P. 5256-05-01 LOCATION Coords: 5 117 092.3 N; 324 680.3 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 22, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED	+	FIELD VANE								
						● QUICK TRIAXIAL	×	LAB VANE	WATER CONTENT (%)									
191.4 0.0	Ground Surface Topsoil		1	SS	15/10cm		191											
191.2 0.2	Silty sand, some gravel cobbles and boulders						190											
190.2 1.2	Compact Brown Moist Granitic Gneiss bedrock		2	SS	20/5cm		189											
	Slightly weathered High strength		3	RC NQ	REC 86%		188											
	Fair to excellent quality		4	RC NQ	REC 100%													
			5	RC NQ	REC 84%													
187.0 4.4	End of borehole						187											
	Samples 1 & 2: Sampler bouncing																	
	* Borehole charged with drilling water																	
	C.F.S.S.A. denotes Continuous Flight Solid Stem Augers																	

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No N24										1 of 1		METRIC					
W.P. 5256-05-01		LOCATION		Coords: 5 117 090.7 N; 324 676.8 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		July 21, 2009				CHECKED BY C.N.									
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa					WATER CONTENT (%)					
192.5	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
192.1																	
0.4	Granitic Gneiss bedrock					192											
	Slightly weathered		1	RC NQ	REC 93%												RQD 93%
	High strength					191											
	Excellent becoming very poor to poor quality		2	RC NQ	REC 100%	190											RQD 32%
189.0			3	RC NQ	REC 100%	189											RQD 0%
3.5	End of borehole																
<p>* Borehole charged with drilling water</p> <p>C.F.S.S.A. denotes Continuous Flight Solid Stem Augers</p>																	


RECORD OF BOREHOLE No N25										1 of 1		METRIC					
W.P. 5256-05-01		LOCATION		Coords: 5 117 088.8 N; 324 673.2 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					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
192.9	Ground Surface																
0.0	Granitic Gneiss bedrock		1	RC NQ	REC 98%											RQD 98%	
	Slightly weathered																
	High strength																
	Excellent quality		2	RC NQ	REC 99%											RQD 99%	
189.8	End of borehole																
3.1																	
	* Borehole charged with drilling water																

RECORD OF BOREHOLE No N26

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 117.1 N; 324 659.5 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 21, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)							
								○ UNCONFINED		+ FIELD VANE			w _p w w _L							
						● QUICK TRIAXIAL × LAB VANE														
198.0	Ground Surface		1	SS	15/3cm			20	40	60	80	100	20	40	60		GR SA SI CL			
0.0	Silty sand, trace gravel topsoil inclusions cobbles and boulders																			
197.2	Compact Brown Moist Granitic Gneiss bedrock		2	RC NQ	REC 99%			197												RQD 58%
0.8	Slightly weathered High strength Fair quality		3	RC NQ	REC 100%			196												RQD 63%
194.1			4	RC NQ	REC 82%	195										RQD 50%				
3.9	End of borehole																			
	Sample 1: Sampler bouncing																			
	* Borehole charged with drilling water																			
	C.F.S.S.A. denotes Continuous Flight Solid Stem Augers																			

RECORD OF BOREHOLE No N27

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 115.8 N; 324 655.7 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 20, 2009 CHECKED BY C.N.


SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa					W _p	w	W _L		
198.0	Ground Surface		1	SS	21/15cm		20	40	60	80	100				kN/m ³	GR SA SI CL
0.0	Silty sand, trace gravel cobbles and boulders															
	Compact Brown Moist															
196.9	Granitic Gneiss bedrock		2	RC NQ	REC 97%	197										RQD 43%
1.1	Slightly weathered															
	High strength		3	RC NQ	REC 100%	196										RQD 37%
	Poor to fair quality		4	RC NQ	REC 100%	195										RQD 66%
			5	RC NQ	REC 93%	194										RQD 36%
193.9	End of borehole															
4.1	Sample 1: Sampler bouncing															
	* Borehole charged with drilling water															
	C.F.S.S.A. Denotes Continuous Flight Solid Stem Augers															

RECORD OF BOREHOLE No N28

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 115.8 N; 324 650.5 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			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT			LIQUID LIMIT	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						W _p W W _L					WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE															
200.0	Ground Surface							20	40	60	80	100		20	40	60		GR	SA	SI	CL		
0.0	Granitic Gneiss bedrock		1	RC NQ	REC 96%	199													RQD 91%				
	Slightly weathered																						
	High strength		2	RC NQ	REC 100%	198														RQD 83%			
	Good to excellent quality																						
196.6			3	RC NQ	REC 100%	197													RQD 93%				
3.4	End of borehole																						
	* Borehole charged with drilling water																						

RECORD OF BOREHOLE No N28A

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 114.5 N; 324 652.0 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.
 DATUM Geodetic DATE July 20, 2009 CHECKED BY C.N.



SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
199.5	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No N29

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 119.8 N; 324 656.2 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Probe 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					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
199.5 0.0	Ground Surface Topsoil					*											
199.3 0.2	Silty sand, some gravel cobbles and boulders							199									
198.6 0.9	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry																

RECORD OF BOREHOLE No N30

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 110.2 N; 324 647.5 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY G.D.
 DATUM Geodetic DATE July 17, 2009 CHECKED BY C.N.





SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		20	40	60	80	100	W _p	W	W _L		
199.1 0.0	Ground Surface															
198.9	Topsoil		1	SS	20	199										
0.2 198.6	Silty sand, trace gravel															
0.5	Loose to Brown Moist compact															
	End of borehole															
	Refusal on probable bedrock															
	* Borehole dry															


RECORD OF BOREHOLE No N31

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 112.9 N; 324 644.3 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 & 17, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
199.8	Ground Surface						20	40	60	80	100						
0.0 199.5	Topsoil		1	SS	18/15cm												
0.3	Sand, with silt some gravel, trace clay cobbles and boulders		2	SS	20/5cm												
	Compact Brown Wet																
198.2	Granitic Gneiss bedrock		3	RC NQ	REC 93%												
1.6	Slightly weathered																
	Medium to high strength																
	Fair quality		4	RC NQ	REC 97%												
	Biotite Gneiss bedrock			5	RC NQ	REC 100%											
	Slightly weathered to unweathered																
	Medium strength																
	Excellent becoming poor quality		6	RC NQ	REC 100%												
194.9	End of borehole																
4.9																	
	Samples 1 & 2: Sampler bouncing																
	* Borehole charged with drilling water																
	C.F.S.S.A. denotes Continuous Flight Solid Stem Augers																

RECORD OF BOREHOLE No N32										1 of 1		METRIC					
W.P. 5256-05-01		LOCATION		Coords: 5 117 127.6 N; 324 637.1 E				ORIGINATED BY F.P.									
DIST 54		HWY 69		BOREHOLE TYPE Continuous Flight Solid Stem Augers				COMPILED BY G.D.									
DATUM Geodetic		DATE		July 22, 2009				CHECKED BY C.N.									
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
202.8	Ground Surface		1	SS	15/8cm	202											
0.0	Topsoil																
202.6 0.2	Sand and silt, trace gravel cobbles and boulders																
	Compact Brown Moist to dense to wet		2	SS	38												
201.3	End of borehole																
1.5	Refusal on probable bedrock																
	Sample 1: Sampler bouncing																
	* Borehole dry																

RECORD OF BOREHOLE No APN-N1

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 112.5 N; 324 640.1 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					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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200.2	Ground Surface					*																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

RECORD OF BOREHOLE No APN-N2 1 of 1 METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 105.9 N; 324 647.9 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					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
199.1	Ground Surface																							
0.0	Bedrock at surface																							
	* Borehole dry																							

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No APS-N1

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 017.6 N; 324 785.3 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.
 DATUM Geodetic DATE August 06, 2009 CHECKED BY C.N.


SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
197.1	Ground Surface					*																	
0.0	Bedrock at surface																						
	* Borehole dry																						

RECORD OF BOREHOLE No APS-N2

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 004.5 N; 324 768.2 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					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	20	40	60	80	100	W _p	W		
193.8	Ground Surface															
193.0	Topsoil															
193.5	Silty sand, trace gravel cobbles and boulders															
0.3	Brown Moist															
	End of borehole															
	Refusal on probable bedrock															
	* Borehole dry															

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No APS-N4

1 of 1

METRIC

W.P. 5256-05-01 LOCATION Coords: 5 117 012.1 N; 324 754.3 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Probe COMPILED BY G.D.
 DATUM Geodetic DATE August 06, 2009 CHECKED BY C.N.

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

1 of 1 **METRIC**

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

20
15 — \bigcirc — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No PH2

1 of 2 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 056.7 N; 324 734.0 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.
 DATUM Geodetic DATE August 20, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
188.0 0.0	Top of water Water													
	Probable organic silt													
	Sandy gravel, trace silt Very dense Grey Wet to compact		1	SS	66									
	Probable sandy silt Loose to very loose													
	Probable sand Compact (TILL)													
	Dense to very dense													
	Cont'd													

2 of 2 **METRIC**

20
15 — 5 (%) STRAIN AT FAILURE
10

1 of 1 **METRIC**

[illegible]

RECORD OF PENETRATION TEST No PH4

1 of 1 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 041.3 N; 324 697.8 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.
 DATUM Geodetic DATE August 21, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
188.0 0.0	Top of water Water													
	Probable organic silt													
	Sand and gravel trace silt, trace clay Very dense Grey Wet to compact		1	SS	68								224	49 41 8 2
	Probable silty sand Loose to very loose													
	Probable sand Compact to very dense (TILL)													
175.3 12.7	End of dynamic cone penetration test													

RECORD OF PENETRATION TEST No PH5

1 of 2 **METRIC**


W.P. 5256-05-01 LOCATION Coords: 5 117 074.1 N; 324 722.5 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.
 DATUM Geodetic DATE August 20, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
188.0 0.0	Top of water Water													
	Probable organic silt													
	Sandy gravel, trace silt Very dense Grey Wet to compact		1	SS	72									
	Probable sandy silt Loose to very loose													
	Probable sand Compact to very dense (TILL)													
	Cont'd													

RECORD OF PENETRATION TEST No PH5

2 of 2 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 074.1 N; 324 722.5 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.
 DATUM Geodetic DATE August 20, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
173.0 15.0	Probable sand Very dense (TILL)																							
172.0 16.0	End of dynamic cone penetration test																							

RECORD OF PENETRATION TEST No PH6

1 of 2 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 066.7 N; 324 703.3 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE August 20 and 21, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
188.0 0.0	Top of water Water													
	Probable organic silt													
	Probable sandy gravel Dense to compact													
	Probable sandy silt Loose to very loose													
	Probable sand Compact to dense (TILL)													
	Cont'd													

RECORD OF PENETRATION TEST No PH6

2 of 2 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 066.7 N; 324 703.3 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE August 20 and 21, 2009 CHECKED BY C.N.

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)		
173.0 15.0	Probable sand							20	40	60	80	100					
172.4 15.6	Very dense																
	(TILL)																
	End of dynamic cone penetration test																

RECORD OF PENETRATION TEST No PH7

1 of 1 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 056.7 N; 324 687.1 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test + Spoon COMPILED BY G.D.
 DATUM Geodetic DATE August 24, 2009 CHECKED BY C.N.

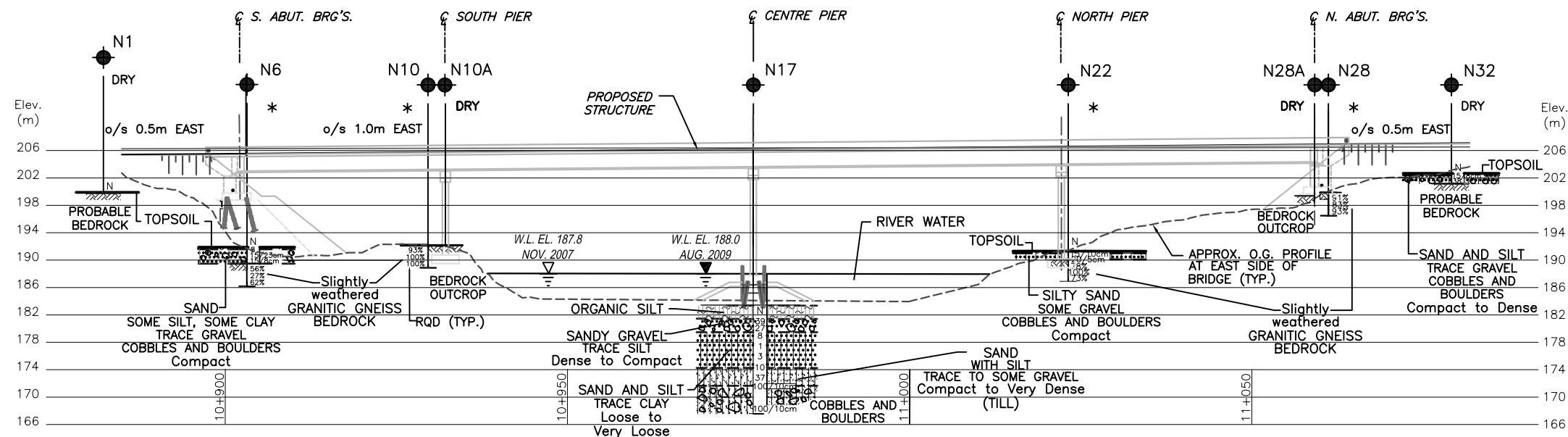
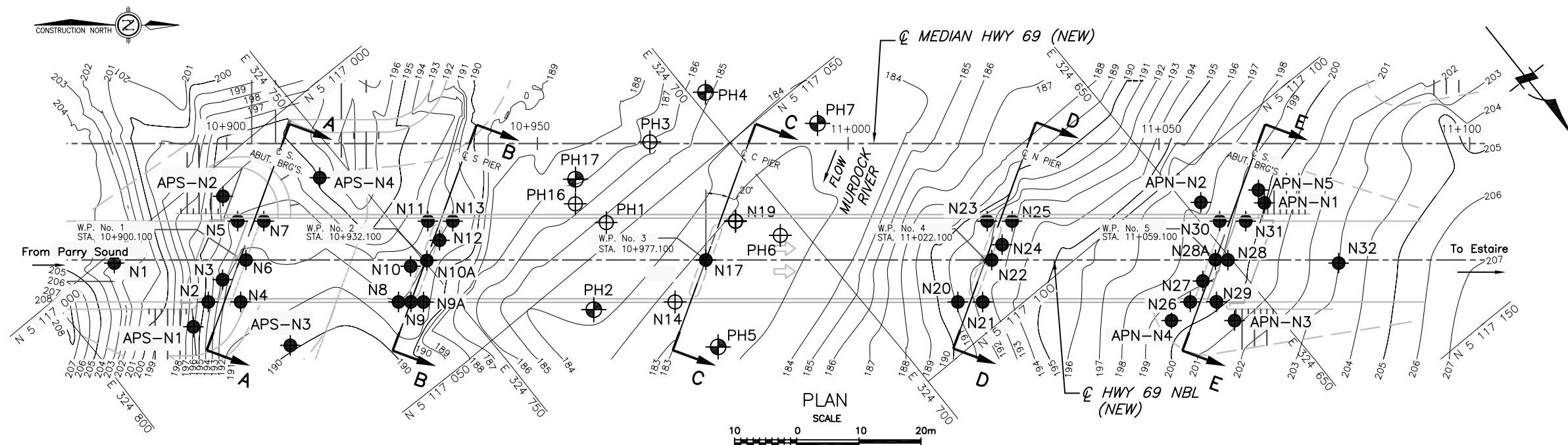
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
188.0 0.0	Top of water Water																
	Probable organic silt																
	Gravelly sand		1	SS	30												
	Compact Grey Wet to dense																
	Probable silty sand																
	Very loose to loose																
	Probable sand																
	Compact to very dense (TILL)																
174.0 14.0	End of dynamic cone penetration test																

RECORD OF PENETRATION TEST No PH16

1 of 1 **METRIC**

W.P. 5256-05-01 LOCATION Coords: 5 117 041.7 N; 324 725.4 E ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY G.D.
 DATUM Geodetic DATE August 24, 2009 CHECKED BY C.N.

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa										
188.0 0.0	Top of water Water								20 40 60 80 100							
	Probable organic silt						187									
							186									
	Probable sandy silt Very loose						185									
	Probable silty sand Loose to compact						184									
							183									
	Probable sand						182									
							181									
180.2 7.8	Dense to very dense (TILL) End of dynamic cone penetration test															



MURDOCK RIVER NBL Q PROFILE

Legend Continued

BH No	ELEVATION	CO-ORDINATES	
		NORTHINGS	EASTINGS
PH4	188.0	5 117 041.3	324 697.8
PH5	188.0	5 117 074.1	324 722.5
PH6	188.0	5 117 066.7	324 703.3
PH7	188.0	5 117 056.7	324 687.1
PH16	188.0	5 117 041.7	324 725.4
PH17	188.0	5 117 038.7	324 722.8

Legend Continued

BH No	ELEVATION	CO-ORDINATES	
		NORTHINGS	EASTINGS
N30	199.1	5 117 110.2	324 647.5
N31	199.8	5 117 112.9	324 644.3
N32	202.8	5 117 127.6	324 637.1
APN-N1	200.2	5 117 112.5	324 640.1
APN-N2	199.1	5 117 105.9	324 647.9
APN-N3	197.5	5 117 124.0	324 655.9
APN-N4	197.8	5 117 117.5	324 663.7
APN-N5	200.0	5 117 110.3	324 639.5
APS-N1	197.1	5 117 017.6	324 785.3
APS-N2	193.8	5 117 004.5	324 768.2
APS-N3	190.4	5 117 029.9	324 775.2
APS-N4	195.1	5 117 012.1	324 754.3
PH1	188.0	5 117 047.2	324 723.5
PH2	188.0	5 117 056.7	324 734.0
PH3	188.0	5 117 041.7	324 709.8

(Legend Continues)

Legend Continued

BH No	ELEVATION	CO-ORDINATES	
		NORTHINGS	EASTINGS
N13	192.4	5 117 031.2	324 742.3
N14	188.0	5 117 064.1	324 723.2
N17	188.0	5 117 062.1	324 715.0
N19	188.0	5 117 060.3	324 707.4
N20	190.8	5 117 093.2	324 688.2
N21	191.8	5 117 095.8	324 685.1
N22	191.4	5 117 092.3	324 680.3
N23	190.8	5 117 086.2	324 676.3
N24	192.5	5 117 090.7	324 676.8
N25	192.9	5 117 088.8	324 673.2
N26	198.0	5 117 117.1	324 659.5
N27	198.0	5 117 115.8	324 655.7
N28	200.0	5 117 115.8	324 650.5
N28A	199.5	5 117 114.5	324 652.0
N29	199.5	5 117 119.8	324 656.2

(Legend Continues)

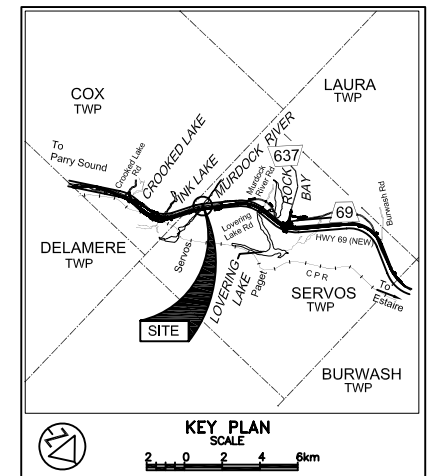


REF. TSH Drawings;
42-91088-MURDOCK-GA-ALT-4SPAN-SOUTH
ALT1.dwg; MUDROCH RIVER.dwg and MUDROCH
RIVER-CONTOURS dated June, 2007

CONT No
WP No 5256-05-01

MURDOCK RIVER BRIDGE NBL
HIGHWAY 69
BOREHOLE LOCATIONS AND SOIL STRATA

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



- LEGEND
- Borehole
 - Dynamic Cone Penetration Test (Cone)
 - Borehole & Cone
 - N Blows/0.3m (Std. Pen Test, 475 J/blow)
 - CONE Blows/0.3m (60 Cone, 475 J/blow)
 - * 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	EASTINGS
N1	199.9	5 117 001.6	324 788.5
N2	195.3	5 117 016.0	324 780.9
N3	193.4	5 117 014.8	324 776.8
N4	191.6	5 117 019.4	324 776.9
N5	192.6	5 117 009.1	324 768.9
N6	191.9	5 117 014.7	324 771.9
N7	192.2	5 117 011.8	324 765.7
N8	192.4	5 117 035.6	324 757.4
N9	191.9	5 117 036.9	324 755.8
N9A	191.9	5 117 038.2	324 754.3
N10	192.2	5 117 032.5	324 752.2
N10A	192.2	5 117 033.3	324 749.6
N11	193.3	5 117 028.7	324 745.4
N12	192.3	5 117 032.2	324 745.9

(Legend Continues)

NOTE -

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

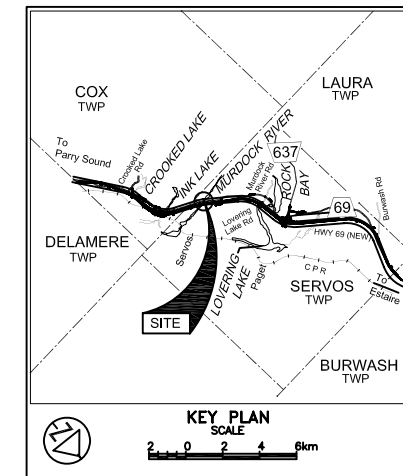
DATE	BY	DESCRIPTION

Geocres No. 411-255

HWY No 69	CHECKED GD	DATE FEB. 12, 2010	DIST 54
SUBMD MN	CHECKED CN	APPROVED BRG	SITE 46-506/1
DRAWN NA			DWG MRN-1

NOTES:

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



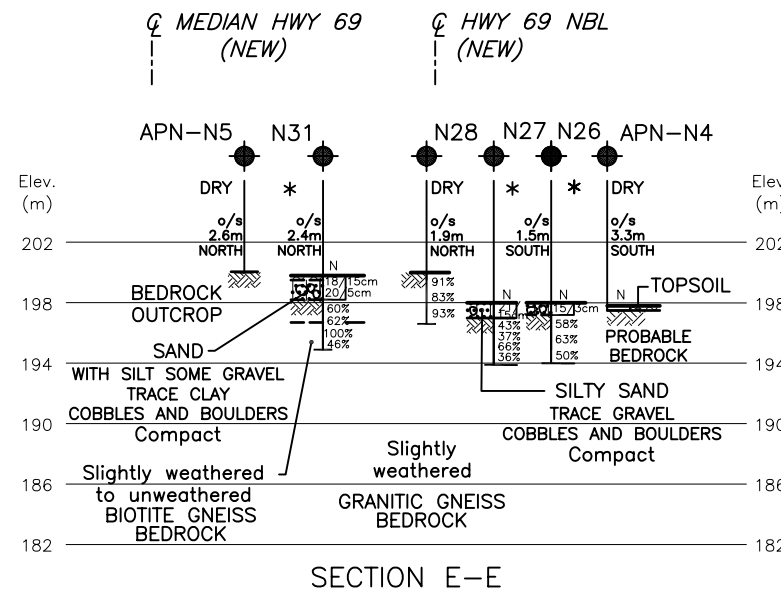
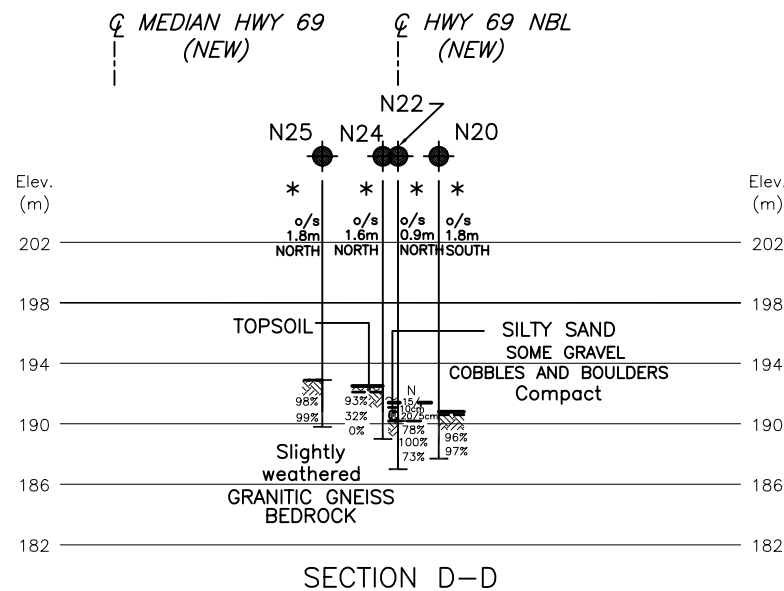
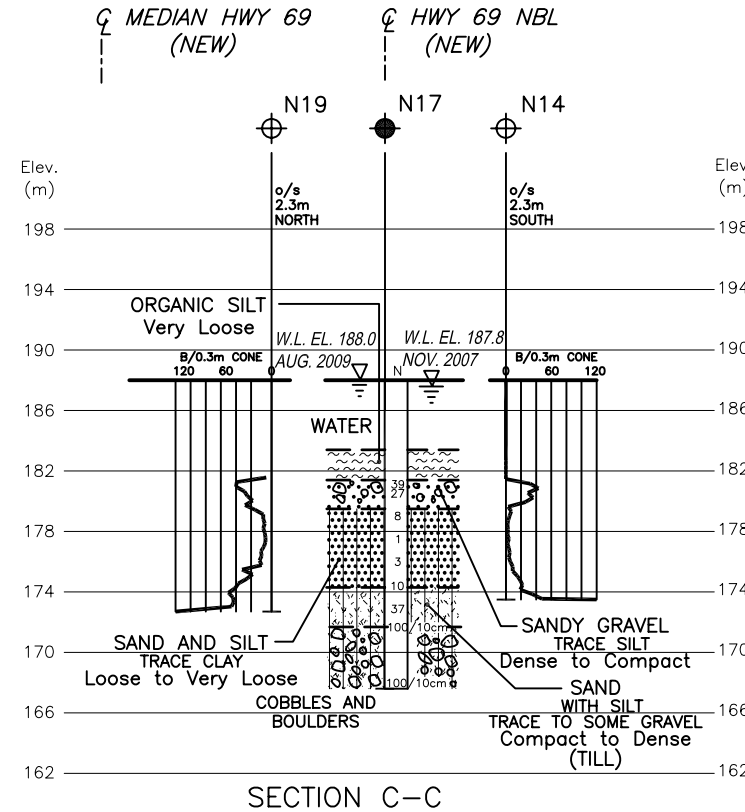
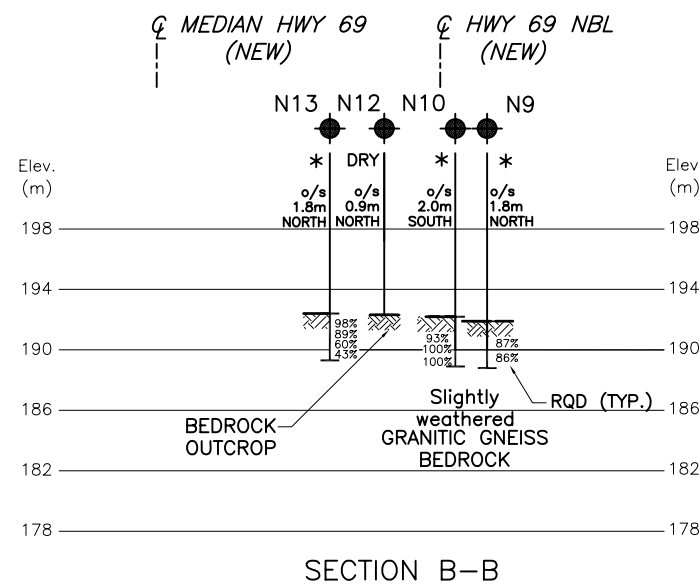
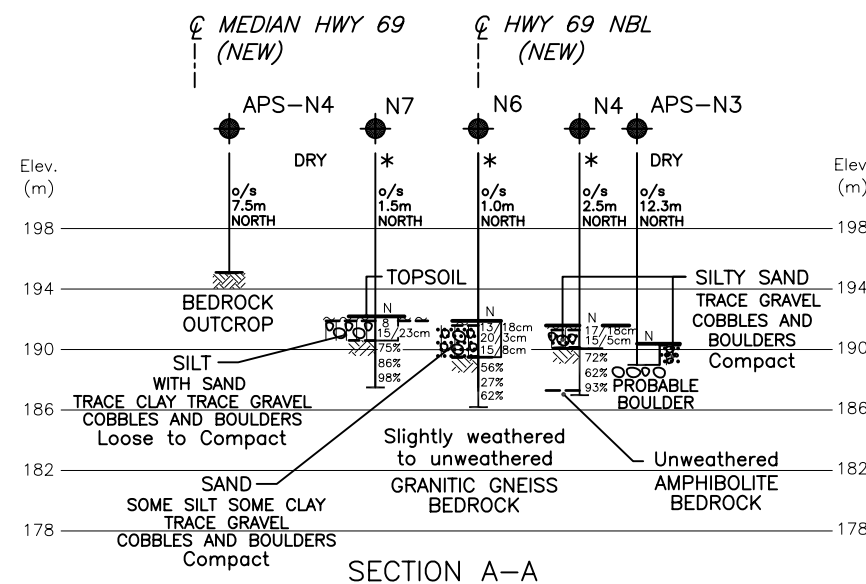
LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
N	Blows/0.3m (Std. Pen Test, 475 J/blow)		
	Borehole & Cone		
CONE	Blows/0.3m (60 Cone, 475 J/blow)		
*	Water level not established		
	W L at time of investigation July and August 2009.		
	Head		
	ARTESIAN WATER		
	Encountered		
	PIEZOMETER		

BH No	ELEVATION	CO-ORDINATES	
		NORTHINGS	EASTINGS
SEE DRAWING MRN-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. 411-255			
HWY No	69	CHECKED GD	DIST 54
SUBM'D MN	CHECKED CN	DATE FEB. 12, 2010	SITE 46-506/1
DRAWN NA	CHECKED CN	APPROVED BRG	DWG MRN-2



NOTES:

- DRAWINGS MRN-1 AND MRN-2 SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- REFER TO DRAWING MRN-1 FOR BOREHOLE LOCATIONS PLAN AND CENTRELINE PROFILE.
- DRAWING IS FOR SUBSURFACE INFORMATION ONLY. SURFACE DETAILS AND FEATURES ARE FOR CONCEPTUAL ILLUSTRATION.
- 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



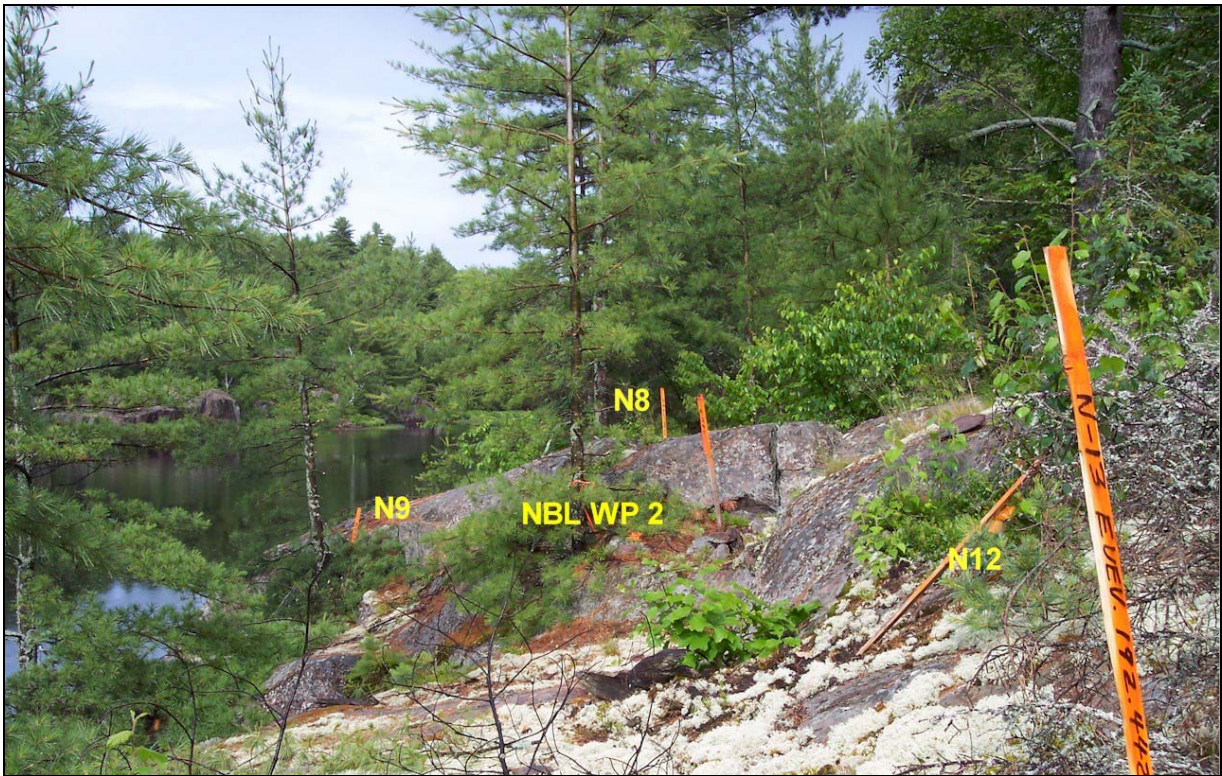


APPENDIX A

Site Photographs



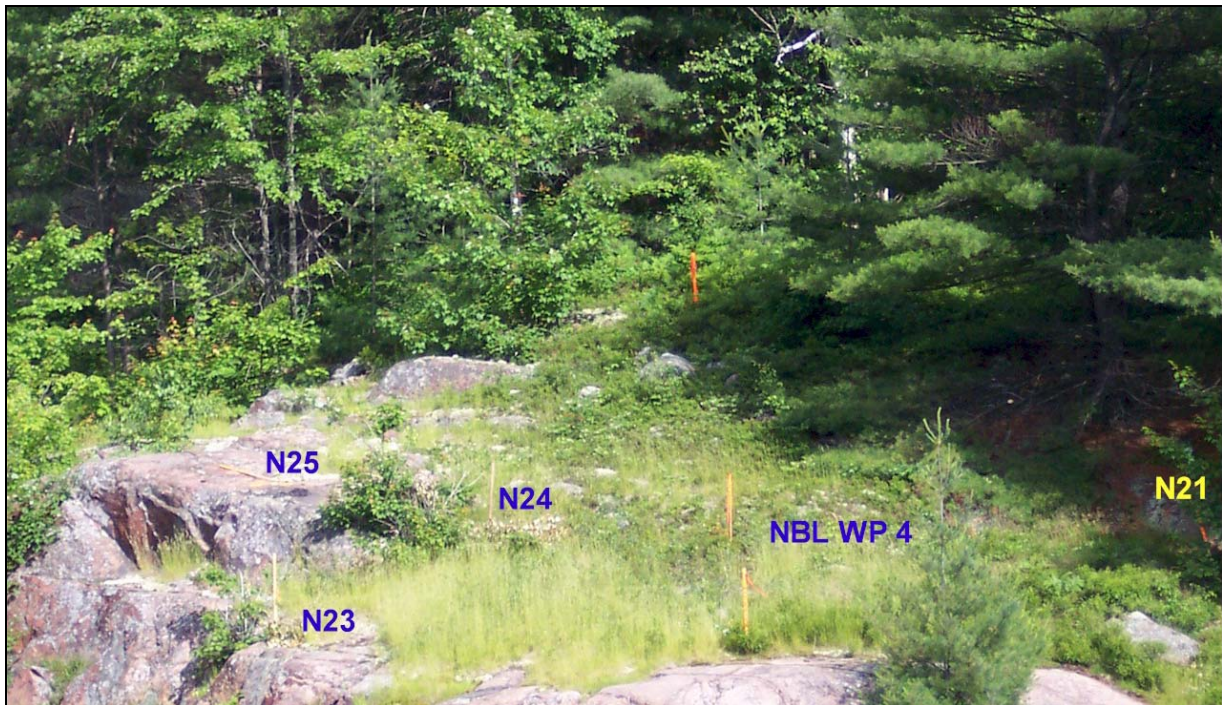
Photograph 1: Northbound lane WP 1 facing southeast (August 7, 2009)



Photograph 2: Northbound lane WP 2 facing east (August 7, 2009)



Photograph 3: Northbound lane WP 4 facing east (August 7, 2009)



Photograph 4: Northbound lane WP 4 facing north (August 7, 2009)

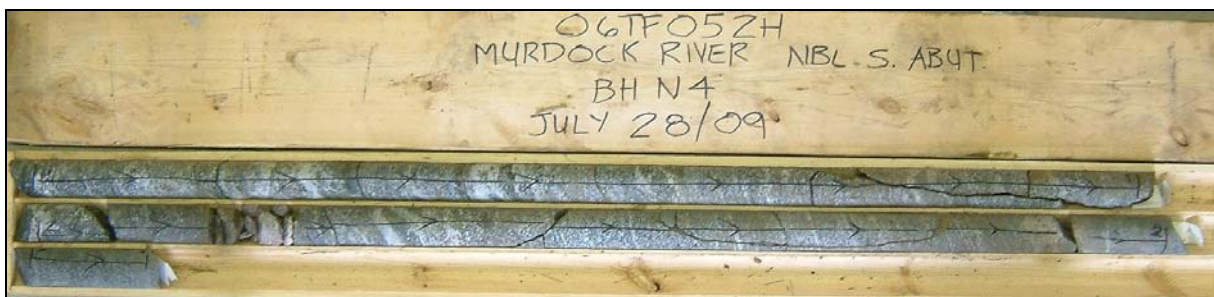


Photograph 5: Northbound lane WP 5 facing southeast (August 7, 2009)

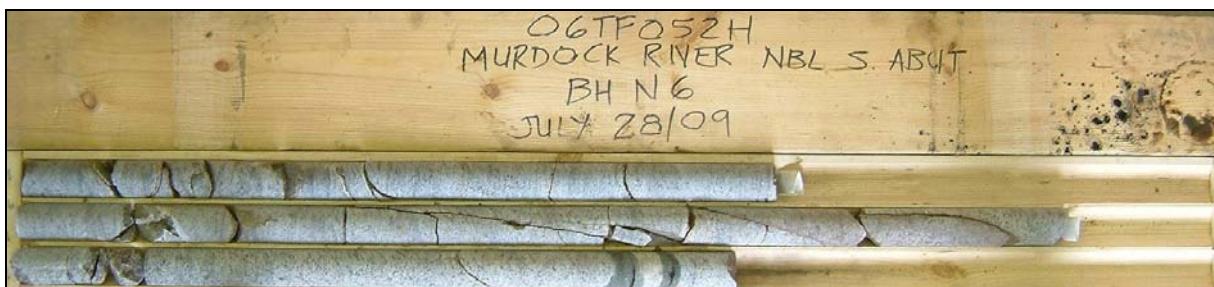


APPENDIX B

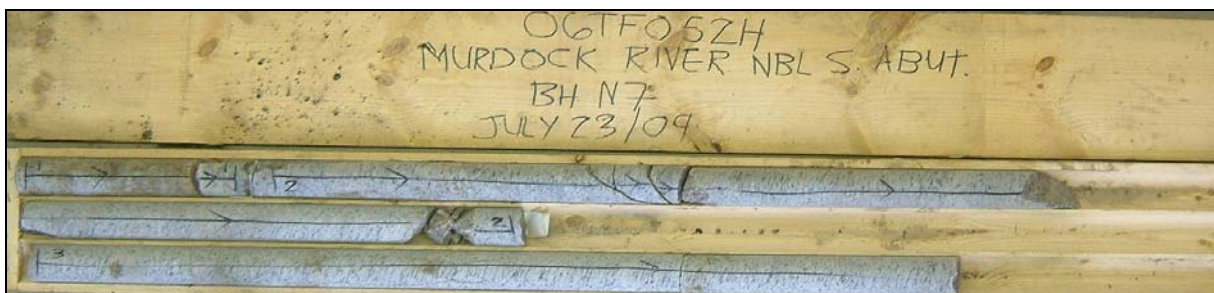
Rock Core Photographs



Photograph 1: Cores retrieved from borehole N4. Cores 3 to 5 from 1.5 to 4.6 m depth. RQD values ranged from 62 to 93%, indicating fair to excellent rock quality.



Photograph 2: Cores retrieved from borehole N6. Cores 4 to 6 from 2.4 to 5.7 m depth. RQD values ranged from 27 to 62%, indicating poor to fair rock quality.



Photograph 3: Cores retrieved from borehole N7. Cores 3 to 5 from 1.6 to 4.7 m depth. RQD values ranged from 75 to 98%, indicating good to excellent rock quality.



Photograph 4: Cores retrieved from borehole N8. Cores 1 to 4 from 0.3 to 3.5 m depth. RQD values ranged from 75 to 97%, indicating good to excellent rock quality.



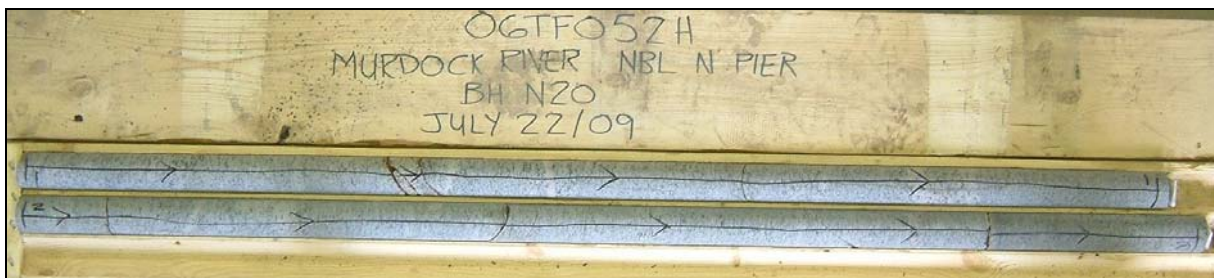
Photograph 5: Cores retrieved from borehole N9. Cores 1 and 2 from 0.0 to 3.1 m depth. RQD values of 86 and 87%, indicating good rock quality.



Photograph 6: Cores retrieved from borehole N10. Cores 1 to 3 from 0.0 to 3.2 m depth. RQD values ranged from 93 to 100%, indicating excellent rock quality.



Photograph 7: Cores retrieved from borehole N13. Cores 1 to 4 from 0.0 to 3.1 m depth. RQD values ranged from 43 to 98%, indicating poor to excellent rock quality.



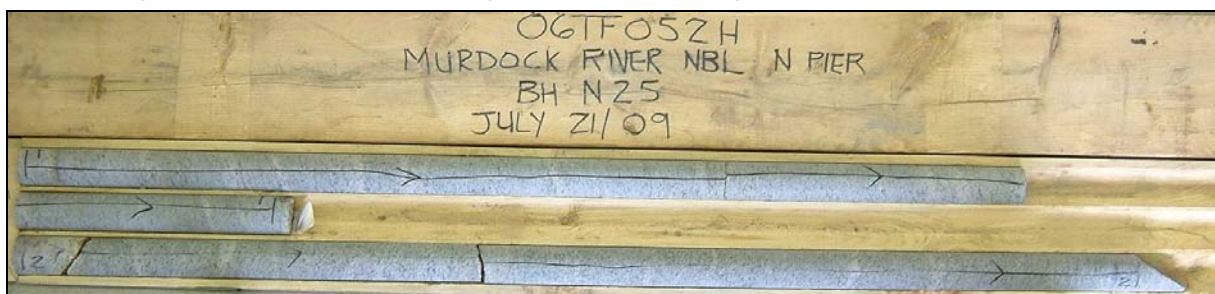
Photograph 8: Cores retrieved from borehole N20. Cores 1 and 2 from 0.2 to 3.3 m depth. RQD values of 96 and 97%, indicating excellent rock quality.



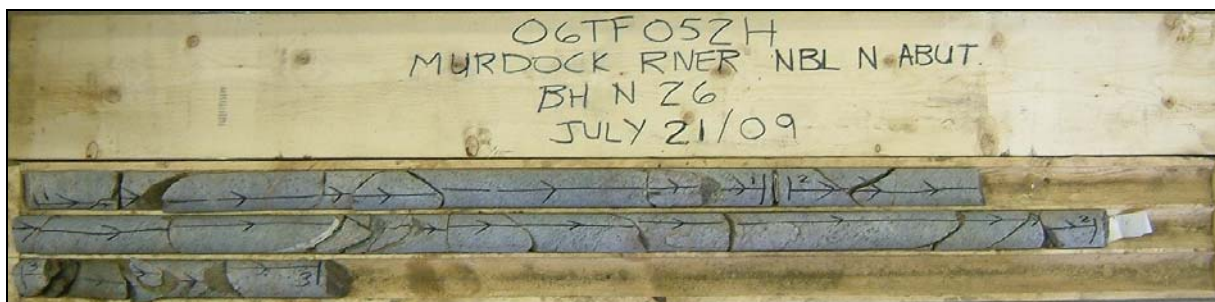
Photograph 9: Cores retrieved from borehole N22. Cores 3 to 5 from 1.2 to 4.4 m depth. RQD values ranged from 73 to 100%, indicating fair to excellent rock quality.



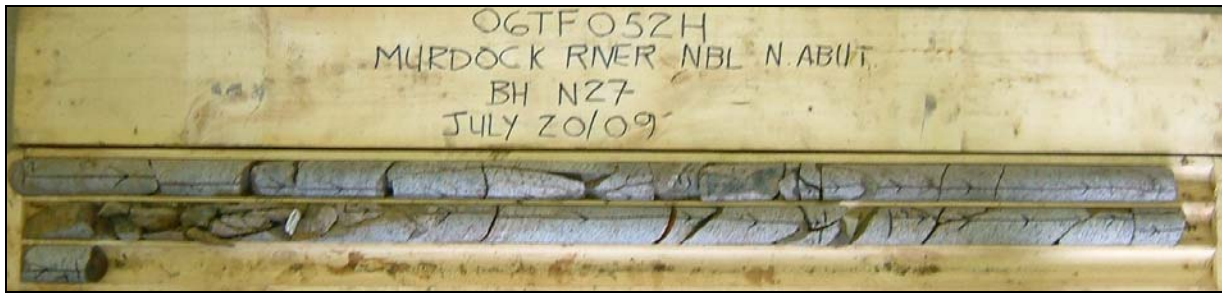
Photograph 10: Cores retrieved from borehole N24. Cores 1 to 3 from 0.4 to 3.5 m depth. RQD values ranged from 93 to 0%, indicating excellent becoming poor to very poor rock quality.



Photograph 11: Cores retrieved from borehole N25. Cores 1 and 2 from 0.0 to 3.1 m depth. RQD values of 98 and 99%, indicating excellent rock quality.



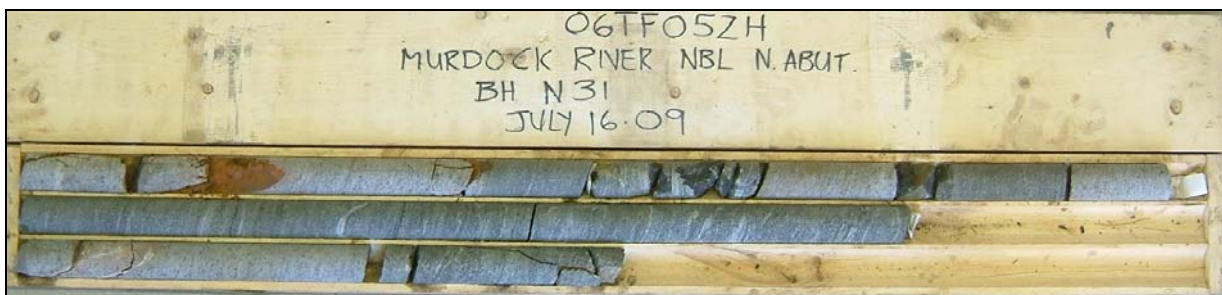
Photograph 12: Cores retrieved from borehole N26. Cores 2 to 4 from 0.8 to 3.9 m depth. RQD values ranged from 50 to 63%, indicating fair rock quality.



Photograph 13: Cores retrieved from borehole N27. Cores 2 to 5 from 1.1 to 4.1 m depth. RQD values ranged from 36 to 66%, indicating poor to fair rock quality.



Photograph 14: Cores retrieved from borehole N28. Cores 1 to 3 from 0.0 to 3.4 m depth. RQD values ranged from 83 to 93%, indicating good to excellent rock quality.



Photograph 15: Cores retrieved from borehole N31. Cores 3 to 6 from 1.6 to 4.9 m depth. RQD values ranged from 46 to 100%, indicating poor to excellent rock quality.