



**TABLE A**  
**ROCK CORE DESCRIPTIONS**

| LOCATION<br>(BH)          | CORE RECOVERY |              |            |            | CORE DESCRIPTION |   |
|---------------------------|---------------|--------------|------------|------------|------------------|---|
|                           | RC            | DEPTH<br>(m) | REC<br>(%) | RQD<br>(%) | DEPTH<br>(m)     | DESCRIPTION   |
| S1-1<br><i>Culvert S1</i> | 8             | 6.9 – 7.6    | 100        | 98         | 6.9 – 9.9        | GRANITIC GNEISS: Light grey, with dipping bands, fine to medium crystalline with occasional coarse crystalline inclusions, high strength, unweathered, moderate to wide spaced flat cross joints, rough planar, tight, excellent quality.   |
|                           | 9             | 7.6 – 9.1    | 98         | 98         |                  |   |
|                           | 10            | 9.1 – 9.9    | 100        | 100        |                  |   |
| S1-2<br><i>Culvert S1</i> | 6             | 4.1 – 5.1    | 100        | 100        | 4.1 – 7.2        | GABBRO: Dark green to black, medium to coarse crystalline, medium strength, slightly weathered to unweathered, moderate to wide spaced flat cross joints, rough planar, tight to slightly altered with red oxidation on parting, excellent quality.   |
|                           | 7             | 5.1 – 6.5    | 100        | 100        |                  |   |
|                           | 8             | 6.5 – 7.2    | 100        | 100        |                  |   |
| S1-3<br><i>Culvert S1</i> | 7             | 6.1 – 7.6    | 100        | 100        | 6.1 – 9.2        | MIGMATITE: Light grey, becoming predominantly dark grey to black with thin white layers, than change to predominantly white with irregular black biotite concentrations, medium crystalline with occasional coarse crystalline inclusions, high strength, slightly weathered to unweathered, moderate to wide spaced flat to dipping cross joints, rough planar, slightly altered with scale on partings to tight, occasionally separates on biotite concentrations, excellent quality. |
|                           | 8             | 7.6 – 9.2    | 100        | 100        |                  |   |

RQD = Rock Quality Designation

Originated: JFW  
 Compiled: FP  
 Checked: MN / CN



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| LOCATION<br>(BH)          | CORE RECOVERY |              |            |            | CORE DESCRIPTION |  |
|---------------------------|---------------|--------------|------------|------------|------------------|--|
|                           | RC            | DEPTH<br>(m) | REC<br>(%) | RQD<br>(%) | DEPTH<br>(m)     | DESCRIPTION  |
| S2-1<br><i>Culvert S2</i> | 7             | 6.4 – 8.0    | 100        | 100        | 6.4 – 9.5        | MIGMATITE: Black, fine to medium crystalline, with irregular white layers and inclusions, high strength, unweathered, wide spaced dipping cross joints, rough planar, tight, excellent quality.  |
|                           | 8             | 8.0 – 9.5    | 100        | 100        |                  |  |
| S2-2<br><i>Culvert S2</i> | 6             | 3.8 – 4.8    | 100        | 100        | 3.8 – 7.0        | GRANITIC GNEISS: Pink and grey, medium to coarse crystalline, garnetiferous, high strength, unweathered, wide (locally close) spaced flat cross joints, rough planar, tight, excellent quality.  |
|                           | 7             | 4.8 – 6.3    | 100        | 100        |                  |  |
|                           | 8             | 6.3 – 7.0    | 100        | 100        |                  |  |
| S2-3<br><i>Culvert S2</i> | 8             | 5.7 – 6.4    | 100        | 90         | 5.7 – 8.6        | GRANITIC GNEISS: Pink and grey, with dipping bands, medium to coarse crystalline, garnetiferous, high strength, slightly weathered to unweathered, wide (locally close) spaced flat cross joints, rough planar, tight, with occasional vertical fissure, with scale and silt, excellent quality. |
|                           | 9             | 6.4 – 7.9    | 100        | 100        |                  |  |
|                           | 10            | 7.9 – 8.6    | 100        | 100        |                  |  |

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|---------------------------|---------------|--------------|------------|------------|------------------|--|
|                           | RC            | DEPTH<br>(m) | REC<br>(%) | RQD<br>(%) | DEPTH<br>(m)     | DESCRIPTION  |
| S3-1<br><i>Culvert S3</i> | 5             | 3.2 – 4.7    | 100        | 82         | 3.2 – 4.7        | GRANITIC GNEISS: Pink and grey with black biotite inclusions, fine to medium crystalline, medium to high strength, slightly to moderately weathered, very close to close flat to dipping cross joints, rough planar, slightly altered with silt or thin friable layer at parting, good quality.  |
|                           | 6             | 4.7 – 5.4    | 100        | 100        |                  |  |
|                           | 6             | 5.4 – 6.2    | 91         | 35         |                  |  |
|                           |               |              |            |            | 4.7 – 5.4        | MIGMATITE: Pink and light grey, becoming predominantly grey with black biotite layers, dioritic appearance at depth, fine to medium crystalline, high strength, slightly weathered, very close to close spaced flat to dipping cross joints, rough planar, occasional slickensides, slightly altered with oxidation or silt on some parting surfaces, excellent quality. |
|                           |               |              |            |            | 5.4 – 6.2        | ARKOSE: Light grey, fine crystalline, with veinlets of green serpentine, medium to high strength, slightly weathered, very close to close spaced, flat to dipping partings, smooth to rough planar, slightly altered with yellow oxidation or scale on some partings, poor quality.  |
| S3-2<br><i>Culvert S3</i> | 6             | 3.3 – 4.9    | 94         | 85         | 3.3 – 6.4        | GRANITIC GNEISS: Pink and grey with slight banding, garnetiferous, fine to medium crystalline, high strength, slightly weathered to unweathered, close to moderate becoming wide spaced flat to dipping cross joints, rough planar, slightly altered with oxidation, scale and/or silt on partings, occasionally separates on biotite layers, good to excellent quality. |
|                           | 7             | 4.9 – 6.4    | 97         | 97         |                  |  |

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| LOCATION<br>(BH)          | CORE RECOVERY |              |            |            | CORE DESCRIPTION |   |
|---------------------------|---------------|--------------|------------|------------|------------------|---|
|                           | RC            | DEPTH<br>(m) | REC<br>(%) | RQD<br>(%) | DEPTH<br>(m)     | DESCRIPTION   |
| S3-3<br><i>Culvert S3</i> | 4             | 2.0 – 3.4    | 100        | 91         | 2.0 – 5.0        | GRANITIC GNEISS: Grey becoming pink and black with slight banding, dioritic appearance with irregular black biotite inclusions, fine to medium, occasional coarse crystalline, high strength, slightly weathered to unweathered, close becoming moderate to wide spaced flat to dipping cross joints, rough planar, tight to slightly altered with silt on partings, occasionally separates on biotite layers, excellent quality. |
|                           | 5             | 3.4 – 5.0    | 98         | 97         |                  |   |
| S4-1<br><i>Culvert S4</i> | 1             | 1.1 – 1.9    | 100        | 91         | 1.1 – 4.1        | MIGMATITE: Pink to light grey and black, garnetiferous, fine to medium, occasional coarse crystalline, high strength, unweathered, close to wide spaced flat cross joints, rough planar, tight, occasionally separates on biotite layers, excellent quality.  |
|                           | 2             | 1.9 – 3.4    | 100        | 100        |                  |   |
|                           | 3             | 3.4 – 4.1    | 100        | 100        |                  |   |
| S4-2<br><i>Culvert S4</i> | 1             | 0.0 – 1.5    | 100        | 100        | 0.0 – 3.0        | MIGMATITE: Pink and grey, fine to medium, occasional coarse crystalline, speckled becoming banded, garnetiferous, high strength, slightly weathered to unweathered, moderate to wide spaced flat cross joints, rough planar, tight, with isolated vertical parting, slightly altered with yellow oxidation on parting surface, good to excellent quality.   |
|                           | 2             | 1.5 – 3.0    | 95         | 83         |                  |   |
| S4-3<br><i>Culvert S4</i> | 7             | 4.9 – 5.3    | -          | -          | 4.9 – 5.3        | COBBLES and BOULDERS:   |
|                           | 7             | 5.3 – 6.4    | 100        | 100        | 5.3 – 8.3        | MIGMATITE: Black and light grey, medium crystalline, garnetiferous, medium to high strength, unweathered, close to moderate spaced flat to dipping cross joints, rough planar, tight, separates readily on biotite concentrations, excellent quality.   |
|                           | 8             | 6.4 – 7.9    | 100        | 100        |                  |   |
|                           | 9             | 7.9 – 8.3    | 97         | 98         |                  |   |

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## EXPLANATION OF TERMS USED IN REPORT

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

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

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

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

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

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

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

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

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

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

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

**JOINTING AND BEDDING:**

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

## ABBREVIATIONS AND SYMBOLS

### FIELD SAMPLING

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

### STRESS AND STRAIN

|                                      |     |                               |
|--------------------------------------|-----|-------------------------------|
| $u_w$                                | kPa | PORE WATER PRESSURE           |
| $u$                                  | 1   | PORE PRESSURE RATIO           |
| $\sigma$                             | kPa | TOTAL NORMAL STRESS           |
| $\sigma'$                            | kPa | EFFECTIVE NORMAL STRESS       |
| $\tau$                               | kPa | SHEAR STRESS                  |
| $\sigma_1, \sigma_2, \sigma_3$       | kPa | PRINCIPAL STRESSES            |
| $\epsilon$                           | %   | LINEAR STRAIN                 |
| $\epsilon_1, \epsilon_2, \epsilon_3$ | %   | PRINCIPAL STRAINS             |
| E                                    | kPa | MODULUS OF LINEAR DEFORMATION |
| G                                    | kPa | MODULUS OF SHEAR DEFORMATION  |
| $\mu$                                | 1   | COEFFICIENT OF FRICTION       |

### MECHANICAL PROPERTIES OF SOIL

|                |                       |                                      |
|----------------|-----------------------|--------------------------------------|
| $m_v$          | $\text{kPa}^{-1}$     | COEFFICIENT OF VOLUME CHANGE         |
| $C_c$          | 1                     | COMPRESSION INDEX                    |
| $C_s$          | 1                     | SWELLING INDEX                       |
| $C_\alpha$     | 1                     | RATE OF SECONDARY CONSOLIDATION      |
| $c_v$          | $\text{m}^2/\text{s}$ | COEFFICIENT OF CONSOLIDATION         |
| H              | m                     | DRAINAGE PATH                        |
| $T_v$          | 1                     | TIME FACTOR                          |
| U              | %                     | DEGREE OF CONSOLIDATION              |
| $\sigma'_{vo}$ | kPa                   | EFFECTIVE OVERBURDEN PRESSURE        |
| $\sigma'_p$    | kPa                   | PRECONSOLIDATION PRESSURE            |
| $\tau_f$       | kPa                   | SHEAR STRENGTH                       |
| $c'$           | kPa                   | EFFECTIVE COHESION INTERCEPT         |
| $\phi'$        | -°                    | EFFECTIVE ANGLE OF INTERNAL FRICTION |
| $c_u$          | kPa                   | APPARENT COHESION INTERCEPT          |
| $\phi_u$       | -°                    | APPARENT ANGLE OF INTERNAL FRICTION  |
| $\tau_R$       | kPa                   | RESIDUAL SHEAR STRENGTH              |
| $\tau_r$       | kPa                   | REMOULDED SHEAR STRENGTH             |
| $S_t$          | 1                     | SENSITIVITY = $\frac{c_u}{\tau_r}$   |

### PHYSICAL PROPERTIES OF SOIL

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

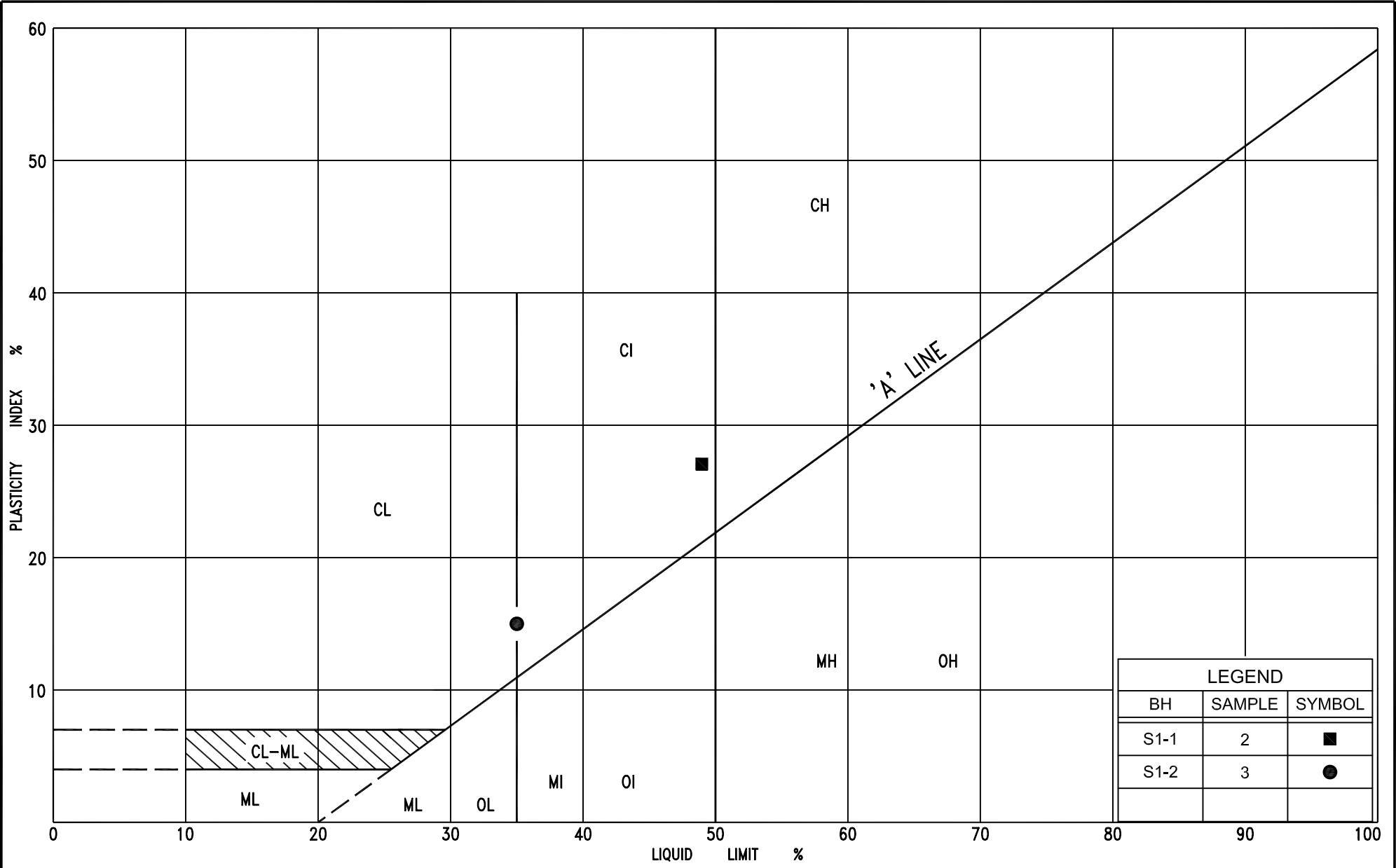
Culvert S1 at Sta. 20+350, Mowat Township

Figures PC-S1-1 to PC-S1-2 - Plasticity Charts

Figures GS-S1-1 to GS-S1-2 - Grain Size Distribution Charts

Record of Borehole Sheets

Drawing S1-1 – Borehole Locations and Soil Strata



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Ontario

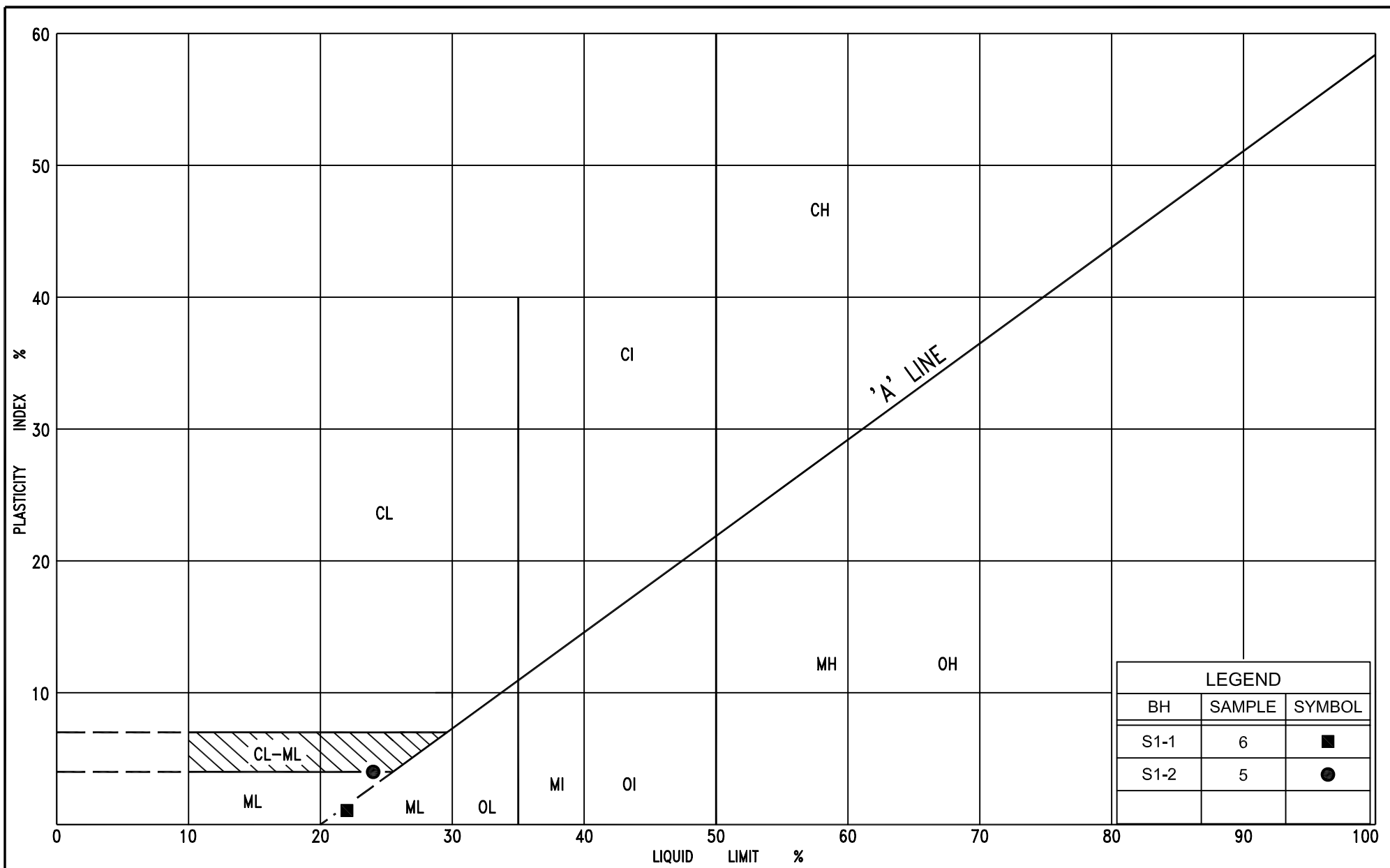
## PLASTICITY CHART

SILTY CLAY, trace sand

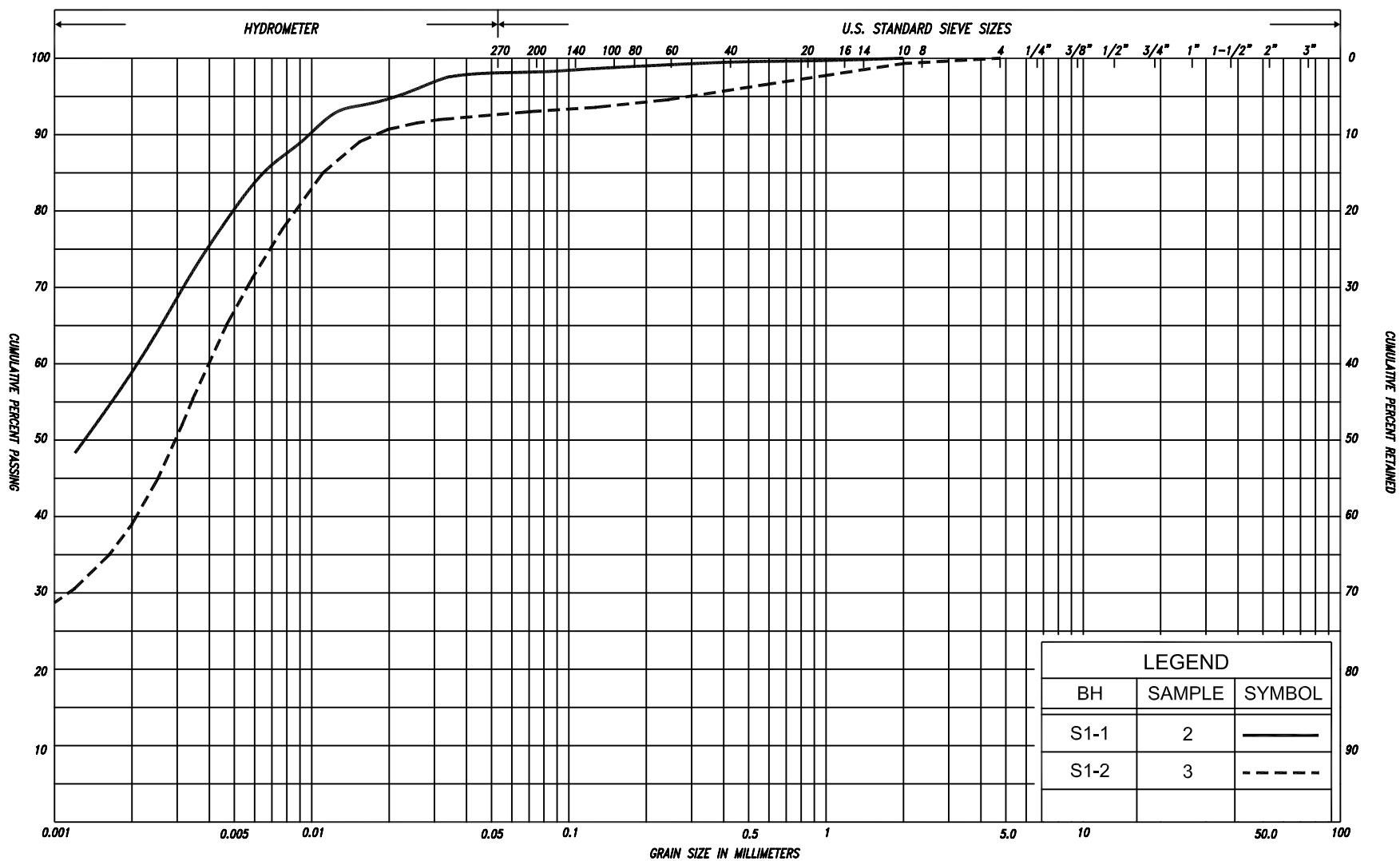
FIG No. PC-S1-1

HWY: 69

G.W.P. No. 5203-06-00







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

## GRAIN SIZE DISTRIBUTION

SILTY CLAY, trace sand

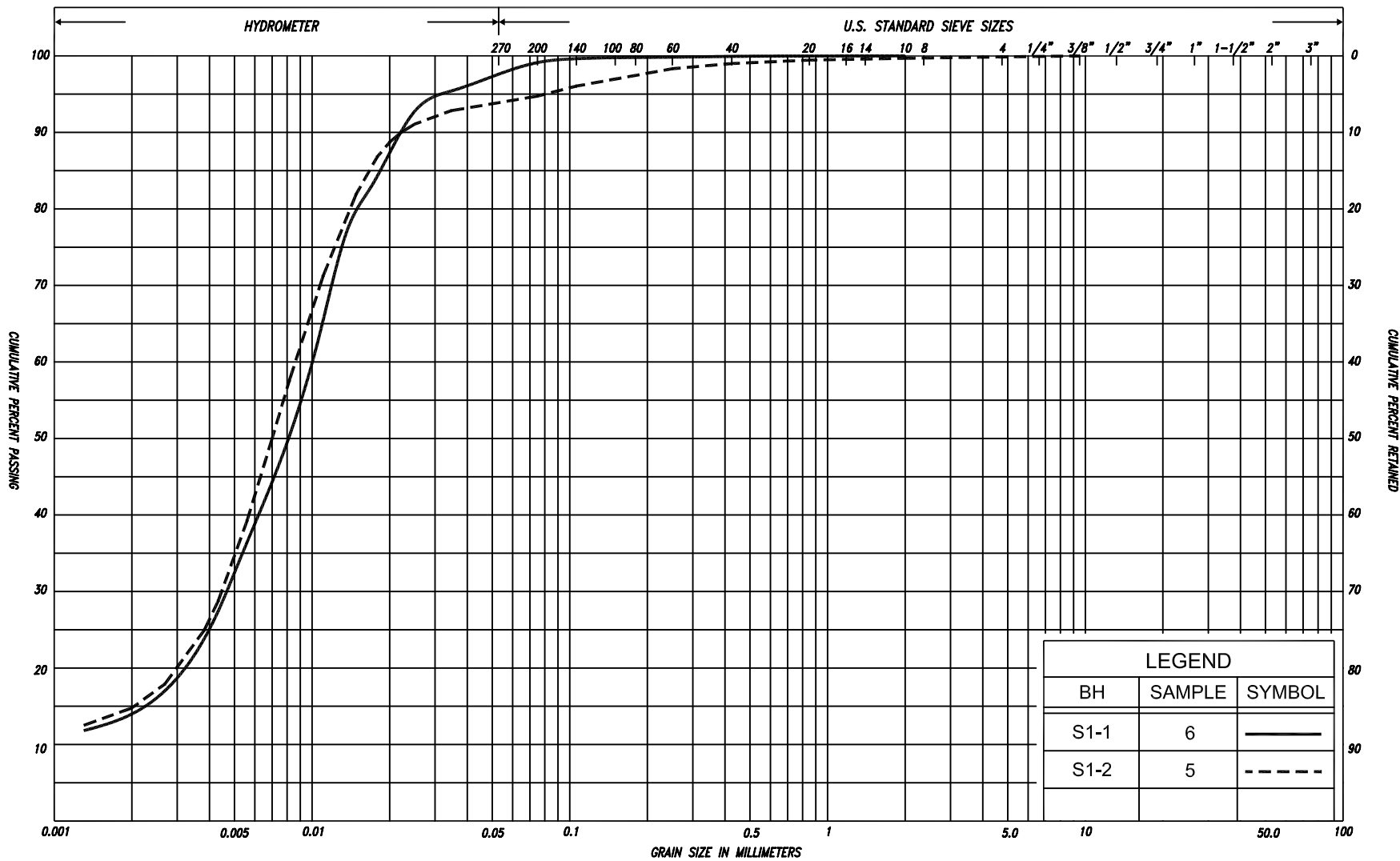
FIG No. GS-S1-1

HWY: 69

G.W.P. No. 5203-06-00



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



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## GRAIN SIZE DISTRIBUTION

SILT, some clay, trace sand

FIG No. GS-S1-2

HWY: 69

G.W.P. No. 5203-06-00





**RECORD OF BOREHOLE No S1-1**

1 of 1

**METRIC**

Coords: 5 096 286.7 N; 221 601.6 E

G.W.P. 5203-06-00 LOCATION Hwy 69 (New), Sta. 20+350, o/s 28.0m Lt CL Med. ORIGINATED BY M.R.  
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Drilling COMPILED BY M.N.  
DATUM Geodetic DATE March 31, 2009 CHECKED BY C.N.

| SOIL PROFILE  |   |   | SAMPLES  |             |             | GROUND WATER<br>CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT |                  |            |              |                | PLASTIC LIMIT<br>NATURAL MOISTURE<br>CONTENT LIQUID LIMIT |                |  | UNIT<br>WEIGHT<br><br>γ<br><br>kN/m³ | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%) |
|---------------|---|---|----------|-------------|-------------|----------------------------|-----------------|---|------------------|------------|--------------|----------------|---|----------------|--|--------------------------------------|---|
| ELEV<br>DEPTH | DESCRIPTION   | STRAT PLOT  | NUMBER   | TYPE        | "N" VALUES  |                            |                 | SHEAR STRENGTH kPa                          |                  |            |              |                | WATER CONTENT (%)   |                |  |                                      |   |
|               |   |   |          |             |             |                            |                 | ○ UNCONFINED                                | ● QUICK TRIAXIAL | ✕ LAB VANE | ✚ FIELD VANE | W <sub>p</sub> | W   | W <sub>L</sub> |  |                                      |   |
| 206.0<br>0.0  | Ground Surface  |    |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 205.9<br>0.1  | Sand, some silt<br>Very loose Brown Wet<br>Silty clay, trace sand<br><br>Firm to stiff Brown Moist to wet |    | 1        | SS          | 5           |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               |   |   | 2        | SS          | 9           |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               |   |   | 3        | SS          | 7           |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               |   |   | 4        | SS          | 2           |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               |   |   | 5        | SS          | 2           |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 202.0<br>4.0  | Silt<br>some clay, trace sand<br><br>Loose Grey Wet   |   |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 6             |   |   | SS       | 5           |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 7             |   |   | SS       | 1           |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 199.1<br>6.9  | Granitic Gneiss Bedrock<br>Unweathered<br>High strength<br>Excellent quality                              |  |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 8             |   |   | RC<br>NQ | REC<br>100% |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 9             |   |   | RC<br>NQ | REC<br>98%  |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
| 196.1<br>9.9  | End of borehole   |   | 10       | RC<br>NQ    | REC<br>100% |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               | Sample 7: N values affected<br>by hydraulic disturbance.  |   |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               | * 2009 02 31  |   |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               | ▽ Water level observed<br>during drilling   |   |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               | ▼ Water level measured<br>after drilling  |   |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               | ■ Penetrometer test   |   |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |
|               | C. F. H. S. A. denotes<br>Continuous Flight Hollow<br>Stem Augers   |   |          |             |             |                            |                 |   |                  |            |              |                |   |                |  |                                      |   |

| <b>RECORD OF BOREHOLE No S1-2</b>   |                                   |            |  |       |            |   |                 |  |                    | 1 of 1 |  | <b>METRIC</b>                      |                                     |                                   |  |  |          |
|---|-----------------------------------|------------|--|-------|------------|---|-----------------|--|--------------------|--------|--|------------------------------------|-------------------------------------|-----------------------------------|--|--|----------|
| G.W.P. 5203-06-00   |                                   |            | LOCATION   |       |            | Coords: 5 096 290.0 N; 221 629.5 E<br>Hwy 69 (New), Sta. 20+350 CL Med. |                 |  | ORIGINATED BY M.R. |        |  |                                    |                                     |                                   |  |  |          |
| DIST 54 HWY 69  |                                   |            | BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring |       |            |   |                 |  | COMPILED BY M.N.   |        |  |                                    |                                     |                                   |  |  |          |
| DATUM Geodetic  |                                   |            | DATE March 31, 2009                                |       |            |   |                 |  | CHECKED BY C.N.    |        |  |                                    |                                     |                                   |  |  |          |
| SOIL PROFILE  |                                   |            | SAMPLES  |       |            | GROUND WATER<br>CONDITIONS  | ELEVATION SCALE | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT                                    |                    |        |  | PLASTIC<br>LIMIT<br>W <sub>p</sub> | NATURAL<br>MOISTURE<br>CONTENT<br>w | LIQUID<br>LIMIT<br>W <sub>L</sub> | UNIT<br>WEIGHT<br>γ<br>kN/m <sup>3</sup> | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%)<br>GR SA SI CL |          |
| ELEV<br>DEPTH   | DESCRIPTION                       | STRAT PLOT | NUMBER   | TYPE  | "N" VALUES |   |                 | SHEAR STRENGTH kPa<br>○ UNCONFINED + FIELD VANE<br>● QUICK TRIAXIAL × LAB VANE |                    |        |  |                                    |                                     |                                   |  |  |          |
| 205.8<br>0.0  | Ground Surface                    | ••         |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
| 205.6<br>0.2  | Sand, some silt                   |            | 1  | SS    | 7          |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   | Loose Brown Wet                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   | Silty clay, trace sand            |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   | Firm to stiff Brown Moist to wet  |            | 2  | SS    | 10         |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   |                                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   |                                   |            | 3  | SS    | 6          |   |                 |  |                    |        |  |                                    |                                     |                                   |  | 0 7 54 39  |          |
| 203.7<br>2.1  | Silt some clay, trace sand        |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   | Loose Grey Wet to compact         |            | 4  | SS    | 10         |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   |                                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   |                                   |            | 5  | SS    | 9          |   |                 |  |                    |        |  |                                    |                                     |                                   |  | 0 5 80 15  |          |
|   |                                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
| 201.7<br>4.1  | Gabbro Bedrock                    |            | 6  | RC NQ | REC 100%   |   |                 |  |                    |        |  |                                    |                                     |                                   |  | RQD 100%   |          |
|   | Slightly weathered to unweathered |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   | Medium strength                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  | RQD 100% |
|   | Excellent Quality                 |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  | RQD 100% |
|   |                                   |            | 7  | RC NQ | REC 100%   |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   |                                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   |                                   |            | 8  | RC NQ | REC 100%   |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
|   |                                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
| 198.6<br>7.2  | End of borehole                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |
| <p>* 2009 03 31</p> <p> Water level observed during drilling</p> <p> Water level measured after drilling</p> <p>C. F. H. S. A. denotes Continuous Flight Hollow Stem Augers</p> |                                   |            |  |       |            |   |                 |  |                    |        |  |                                    |                                     |                                   |  |  |          |

**RECORD OF BOREHOLE No S1-3**

1 of 1

**METRIC**

G.W.P. 5203-06-00 LOCATION Coords: 5 096 293.2 N; 221 657.3 E  
Hwy 69 (New), Sta. 20+350, o/s 28.0m Rt CL Med. ORIGINATED BY M.R.  
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY M.N.  
DATUM Geodetic DATE April 01, 2009 CHECKED BY C.N.

| SOIL PROFILE  |   |            | SAMPLES |          |             | GROUND WATER<br>CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT |                  |              |            |                   | PLASTIC NATURAL LIQUID<br>LIMIT MOISTURE CONTENT LIMIT |   |                | UNIT<br>WEIGHT<br><br>γ<br><br>kN/m³ | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%) |             |
|---------------|---|------------|---------|----------|-------------|----------------------------|-----------------|---|------------------|--------------|------------|-------------------|--|---|----------------|--------------------------------------|---|-------------|
| ELEV<br>DEPTH | DESCRIPTION   | STRAT PLOT | NUMBER  | TYPE     | *N VALUES   |                            |                 | SHEAR STRENGTH kPa                          |                  |              |            |                   | w <sub>p</sub>   | w | w <sub>L</sub> |                                      |   |             |
|               |   |            |         |          |             |                            |                 | ○ UNCONFINED                                | ● QUICK TRIAXIAL | + FIELD VANE | × LAB VANE | WATER CONTENT (%) |  |   |                |                                      |   |             |
| 205.6         | Ground Surface  | •••        |         |          |             | ▽*                         |                 | 20  | 40               | 60           | 80         | 100               |  |   |                |                                      |   | GR SA SI CL |
| 0.0           | Sand, some silt   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 205.3         | Very loose Brown Wet  | •••        | 1       | SS       | 7           |                            |                 |   |                  |              |            |                   |  | ○ |                |                                      |   |             |
| 0.3           | Silty clay, trace sand  | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | Firm to Brown Moist<br>stiff to wet                               | •••        | 2       | SS       | 9           |                            |                 |   |                  |              |            |                   |  | ○ |                |                                      |   |             |
|               |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               |   | •••        | 3       | SS       | 8           |                            |                 |   |                  |              |            |                   |  |   | ○              |                                      |   |             |
|               |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               |   | •••        | 4       | SS       | 3           |                            |                 |   |                  |              |            |                   |  |   |                | ○                                    |   |             |
|               |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               |   | •••        | 5       | SS       | 2           |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               |   | •••        |         | FV       |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 201.4         | Silt<br>some clay, trace sand                                     | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 4.2           | Loose Grey Wet  | •••        | 6       | SS       | 2           |                            |                 |   |                  |              |            |                   |  |   | ○              |                                      |   |             |
|               |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 199.8         | Sand, some silt   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 5.8           |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 199.5         | Brown Wet   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 6.1           | Migmatite Bedrock   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | Slightly weathered to<br>unweathered                              | •••        | 7       | RC<br>NQ | REC<br>100% |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   | RQD 100%    |
|               | High strength   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | Excellent quality   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               |   | •••        | 8       | RC<br>NQ | REC<br>100% |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   | RQD 100%    |
|               |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 196.4         | End of borehole   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
| 9.2           |   | •••        |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | Sample 6: N value affected<br>by hydraulic disturbance            |            |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | <br>* 2009 03 01  |            |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | ▽ Water level observed<br>during drilling                         |            |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | ▽ Water level measured<br>after drilling                          |            |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |
|               | C. F. H. S. A. denotes<br>Continuous Flight Hollow<br>Stem Augers |            |         |          |             |                            |                 |   |                  |              |            |                   |  |   |                |                                      |   |             |

**METRIC**

Hwy 69 (New), Sta. 20+350, o/s 14.0m Lt CL Med.

ORIGINATED BY M.R.

COMPILED BY M.N.

— CHECKED BY C.N.

(%) STRAIN AT FAILURE

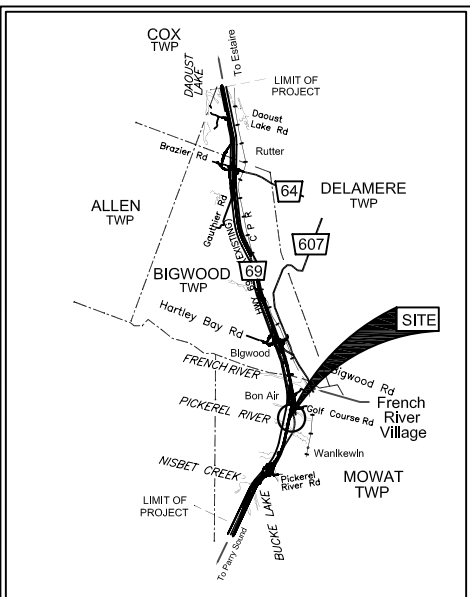
CONT No  
GWP No 5203-06-00

CULVERTS 1 AND 2 (S1)  
HIGHWAY 69 FOUR-LANING  
STA. 20+350 MOWAT TWP  
BOREHOLE LOCATIONS AND SOIL STRATA



SHEET

**PMI Peto MacCallum Ltd.**  
CONSULTING ENGINEERS



KEY PLAN  
SCALE  
0 2 4 6 km

#### LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J/blow)
- CONE Blows/0.3m (60' Cone, 475 J/blow)
- W L at time of investigation  
March & April 2009
- Head  
ARTESIAN WATER  
Encountered
- PIEZOMETER

| BH No | ELEVATION | CO-ORDS       |             |
|-------|-----------|---------------|-------------|
|       |           | NORTHING      | EASTING     |
| S1-1  | 206.0     | N 5 096 286.7 | E 221 601.6 |
| S1-2  | 205.8     | N 5 096 290.0 | E 221 629.5 |
| S1-3  | 205.6     | N 5 096 293.2 | E 221 657.3 |
| S1-4  | 205.8     | N 5 096 288.4 | E 221 615.6 |

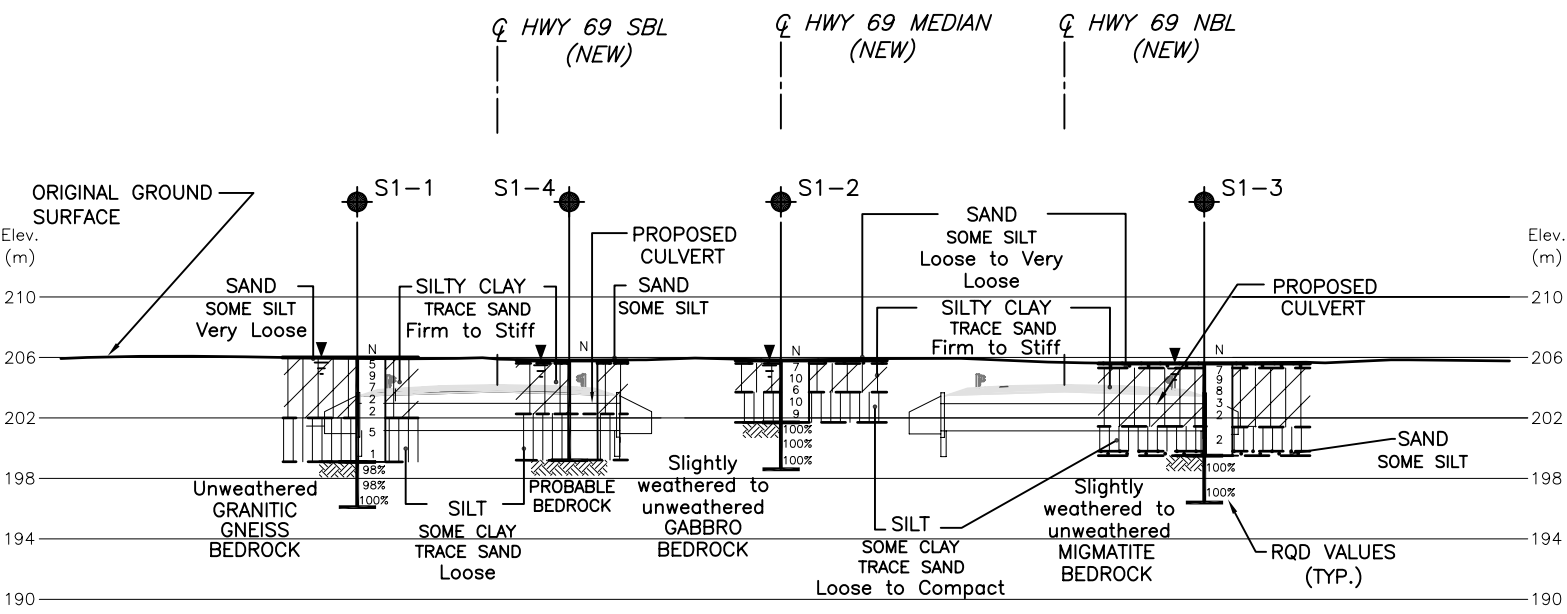
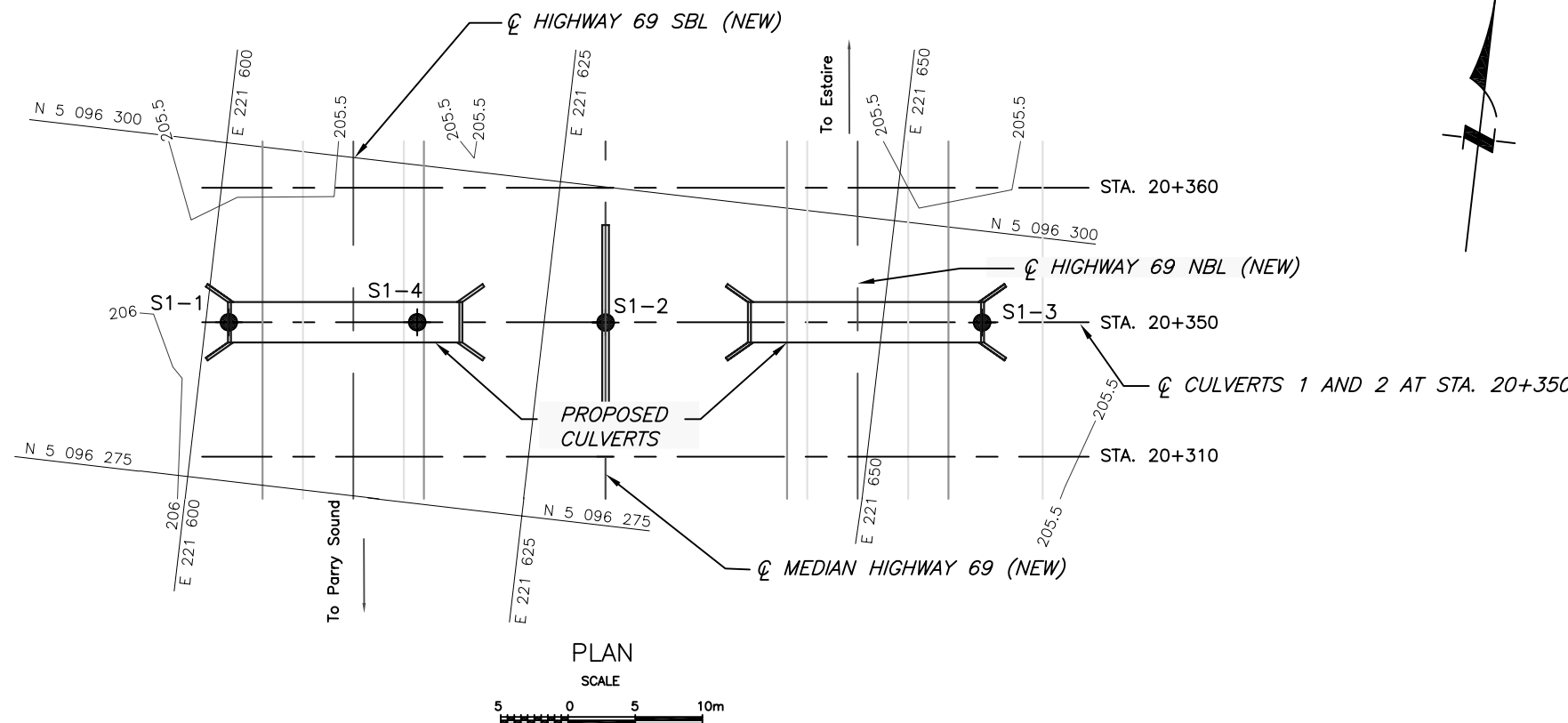
#### NOTE

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. 411-252

|          |               |         |      |
|----------|---------------|---------|------|
| HWY No   | 69            | DIST    | 54   |
| SUBM'D   | MN            | CHECKED | MN   |
| DATE     | FEB. 10, 2010 | SITE    | ---  |
| DRAWN    | NA            | CHECKED | CN   |
| APPROVED | BRG           | DWG     | S1-1 |



PROFILE Q CULVERTS 1 AND 2 AT STA. 20+350

#### NOTES:

- DRAWING S1-1 SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND THE RECORD OF BOREHOLE LOGS.
- CULVERTS 1 AND 2 AT STA. 20+350 WERE DESIGNATED AS CULVERT S1 FOR THE INVESTIGATION.
- 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.



REF.: MRC DRAWINGS  
H6454\_PHASE3\_XA01.dwg; H6454\_PHASE3\_XN01.dwg;  
Plan View of Culverts - 090629.dwg; Phase 3 -  
Snake Culverts Cross Sections - 090714.dwg

Culvert S2 at Sta. 20+460, Mowat Township

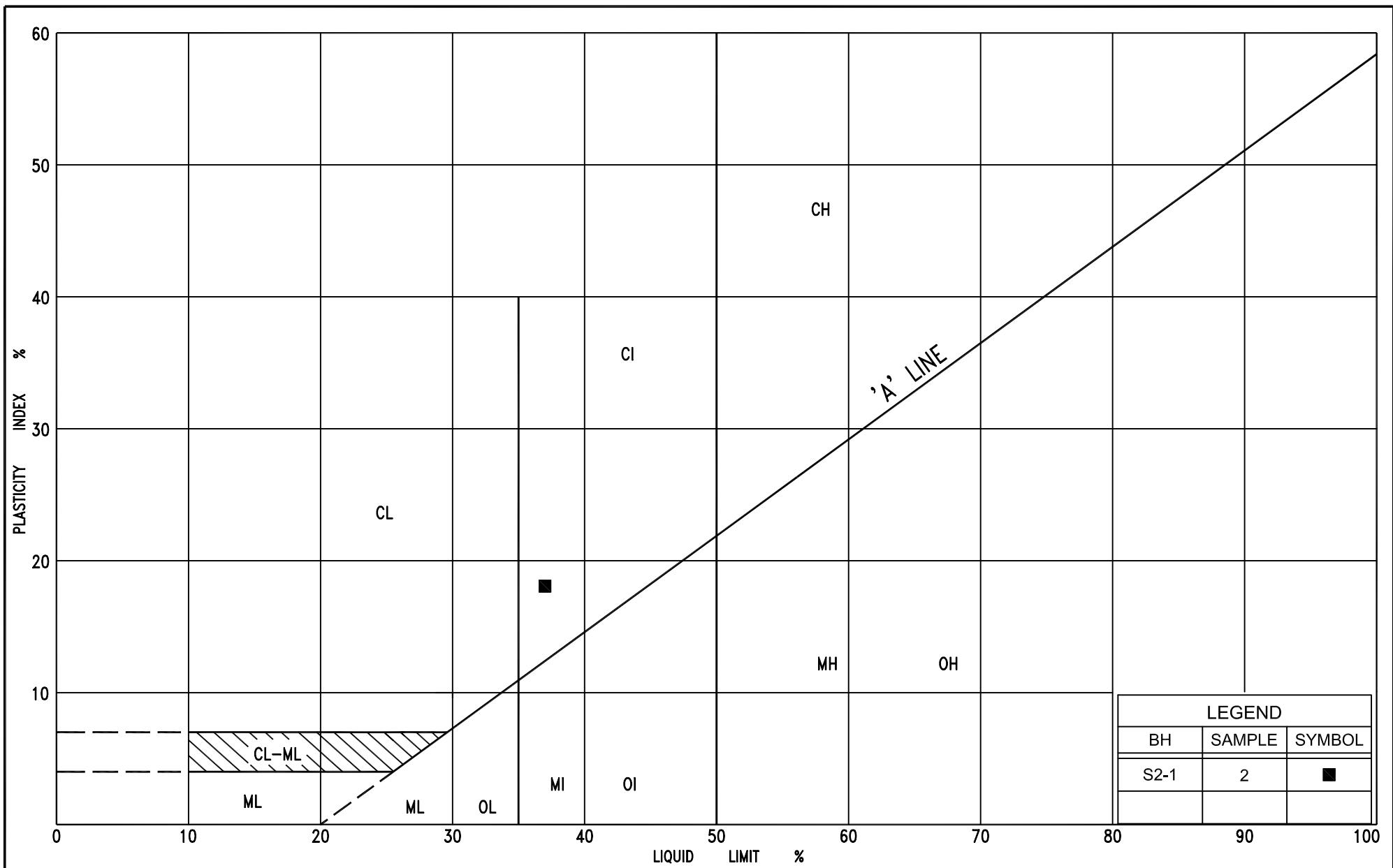
Figures PC-S2-1 to PC-S2-2 - Plasticity Charts

Figures GS-S2-1 to GS-S2-2 - Grain Size Distribution Charts

Record of Borehole Sheets

Drawing S2-1 – Borehole Locations and Soil Strata





Ministry of  
Transportation  
Ontario

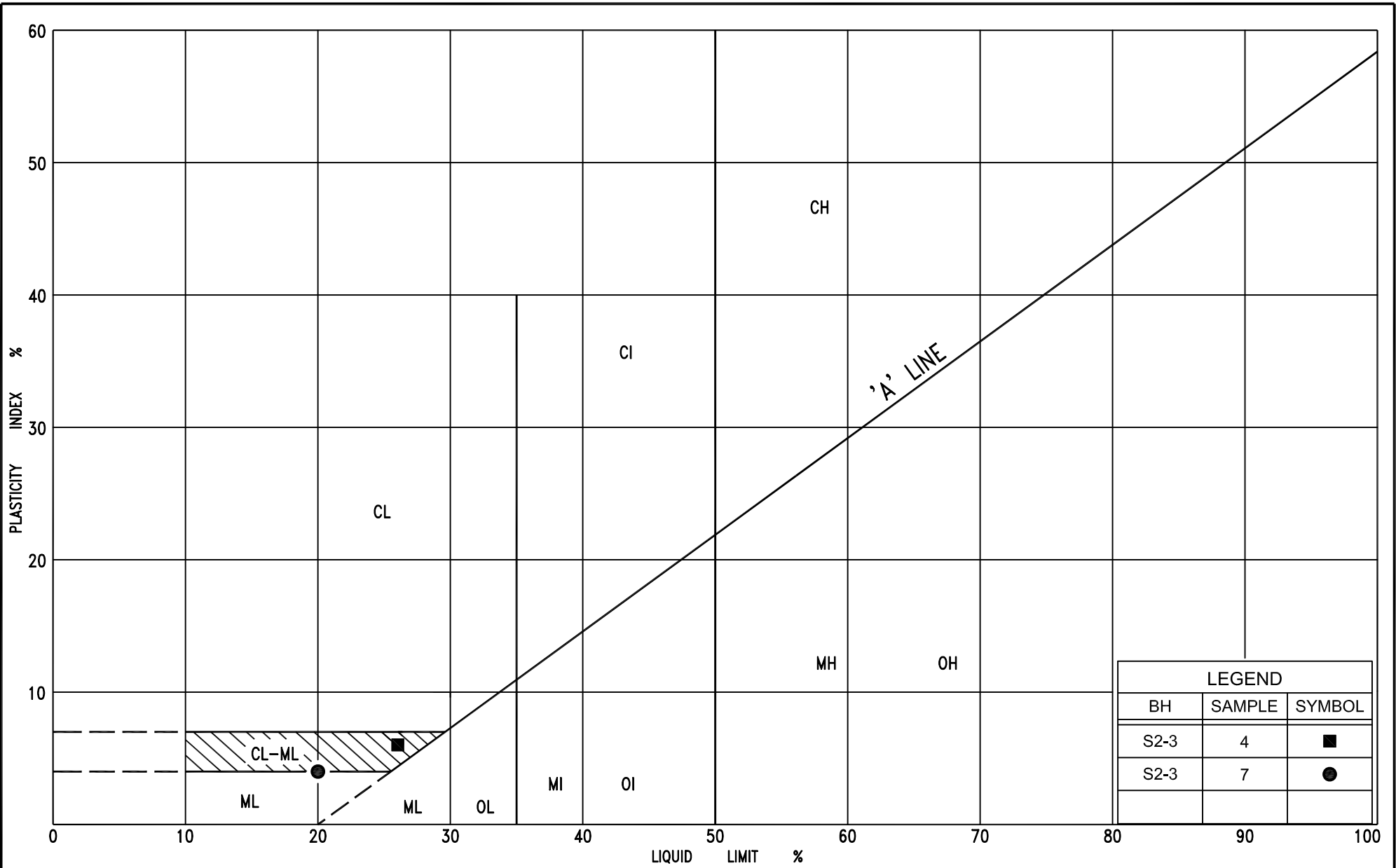
## PLASTICITY CHART

SILTY CLAY, trace sand

FIG No. PC-S2-1

HWY: 69

G.W.P. No. 5203-06-00



Ministry of  
Transportation  
Ontario

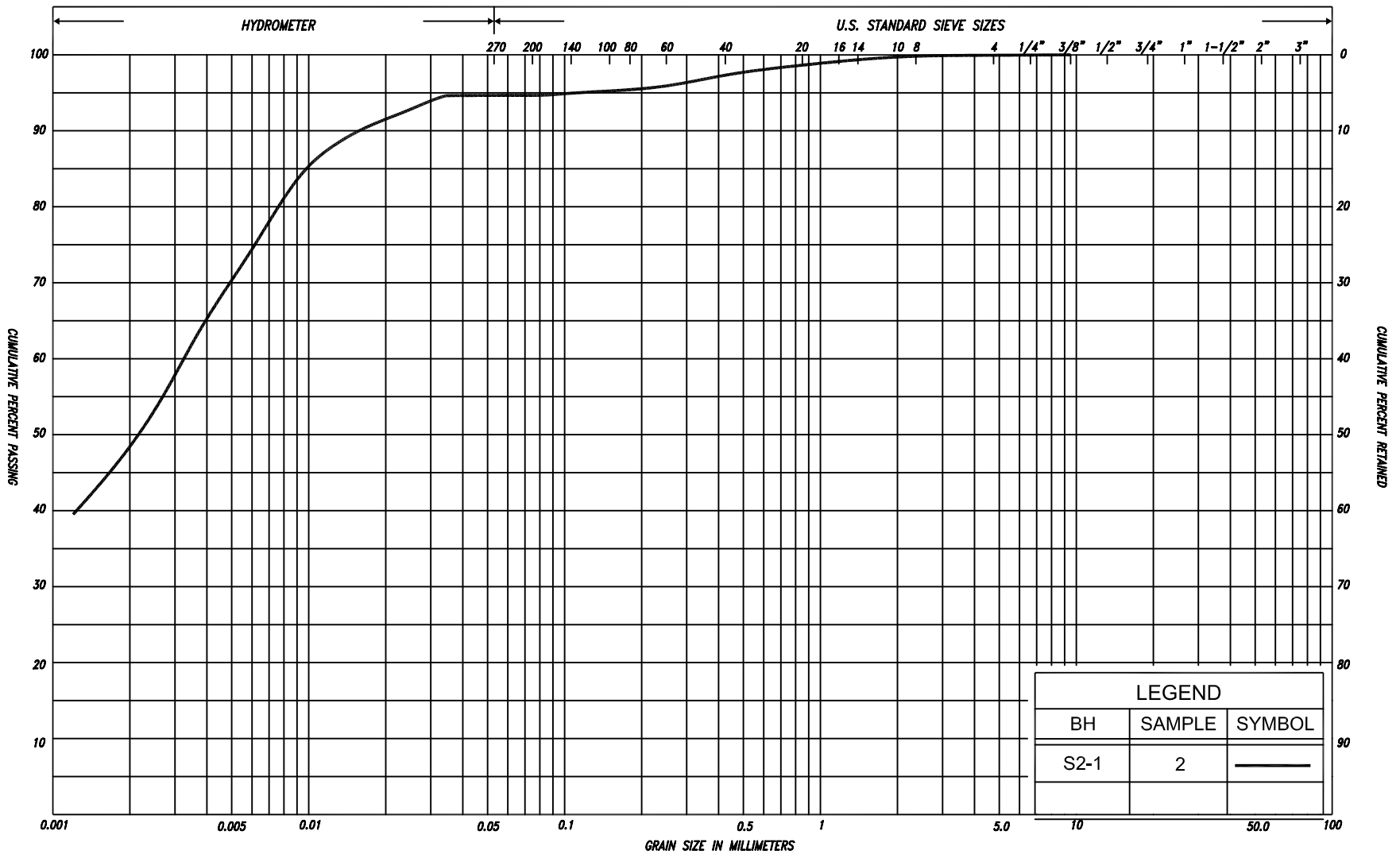
## PLASTICITY CHART

CLAYEY SILT, trace sand / sandy, trace gravel

FIG No. PC-S2-2

HWY: 69

G.W.P. No. 5203-06-00



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

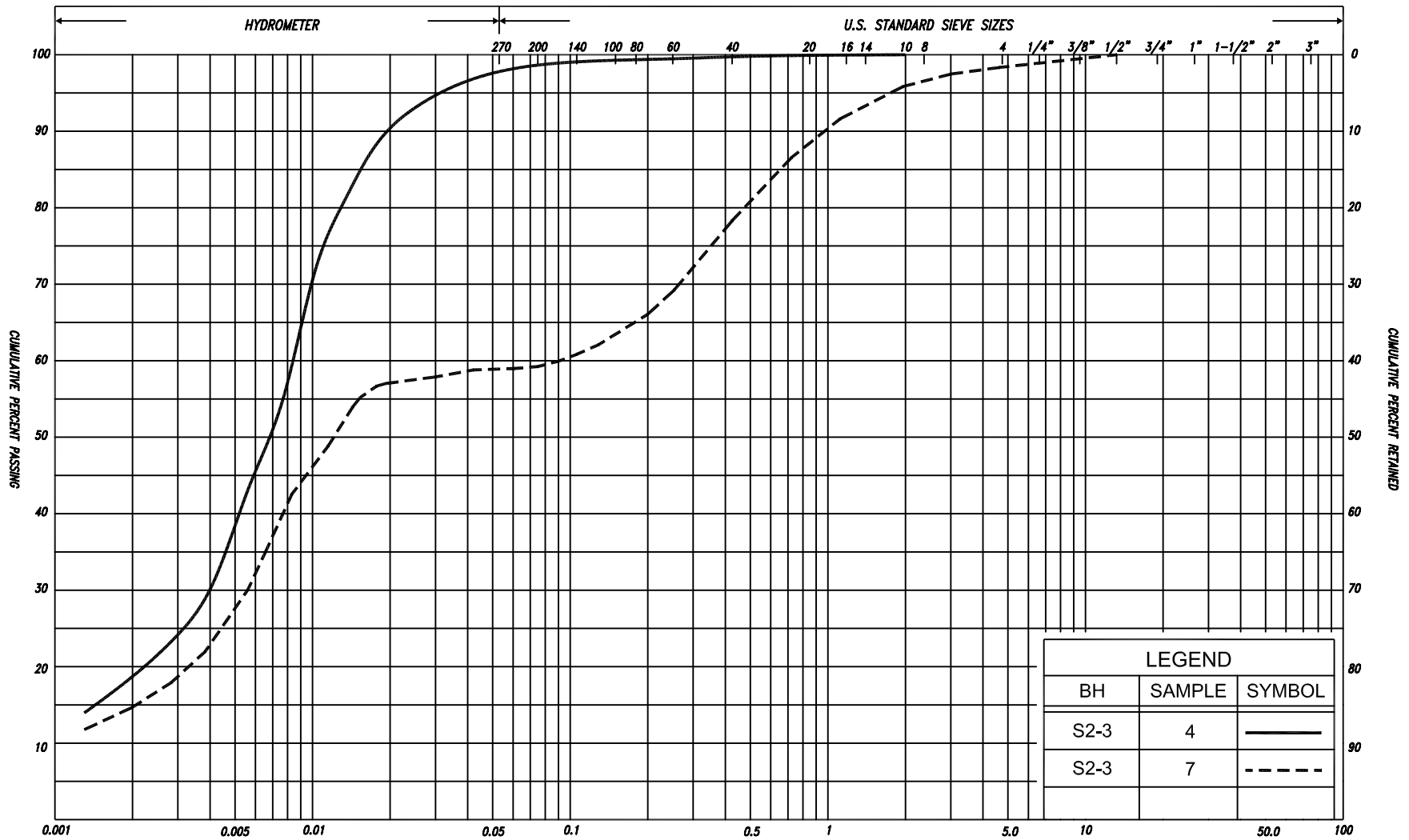
## GRAIN SIZE DISTRIBUTION

SILTY CLAY, trace sand

FIG No. GS-S2-1

HWY: 69

G.W.P. No. 5203-06-00



|             |      |      |        |      |         |        |      |        |        |        |        |  |        |         |         |             |
|-------------|------|------|--------|------|---------|--------|------|--------|--------|--------|--------|--|--------|---------|---------|-------------|
| 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 |         |        |      |        |        |        |        |  |        |         |         |             |

**RECORD OF BOREHOLE No S2-1**

1 of 1

**METRIC**

Coords: 5 096 396.0 N; 221 589.0 E

G.W.P. 5203-06-00 LOCATION Hwy 69 (New), Sta. 20+460, o/s 28.0m Lt CL Med. ORIGINATED BY M.R.  
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY M.N.  
DATUM Geodetic DATE April 01, 2009 CHECKED BY C.N.



















| SOIL PROFILE  |   |            | SAMPLES |          |             | GROUND WATER<br>CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT |    |    |    |     | PLASTIC LIMIT<br>NATURAL MOISTURE<br>CONTENT LIQUID LIMIT |  |  | UNIT<br>WEIGHT<br><br>γ | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%) |
|---------------|---|------------|---------|----------|-------------|----------------------------|-----------------|---|----|----|----|-----|---|--|--|-------------------------|---|
| ELEV<br>DEPTH | DESCRIPTION   | STRAT PLOT | NUMBER  | TYPE     | "N" VALUES  |                            |                 | SHEAR STRENGTH kPa                          |    |    |    |     | WATER CONTENT (%)   |  |  |                         |   |
| 205.9         | Ground Surface  |            |         |          |             |                            |                 | 20  | 40 | 60 | 80 | 100 |   |  |  |                         |   |
| 0.0           | Peat, fine fibrous  |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
| 205.7         | Dark brown  |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
| 0.2           | Silty clay, trace sand<br>silt layers                             |            | 1       | SS       | 6           |                            | 205             |   |    |    |    |     |   |  |  |                         |   |
|               | Firm Brown Moist<br>to wet  |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
|               |   |            | 2       | SS       | 5           |                            | 204             |   |    |    |    |     |   |  |  |                         | 0 5 47 48   |
|               | Grey  |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
|               |   |            | 3       | SS       | 3           |                            | 203             |   |    |    |    |     |   |  |  |                         |   |
|               |   |            | 4       | SS       | 2           |                            | 202             |   |    |    |    |     |   |  |  |                         |   |
| 201.8         | Clayey silt, trace sand   |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
| 4.1           | Firm Grey Wet   |            | 5       | SS       | 5           |                            | 201             |   |    |    |    |     |   |  |  |                         |   |
|               |   |            |         |          |             |                            | 200             |   |    |    |    |     |   |  |  |                         |   |
| 199.5         | Migmatite Bedrock   |            | 6       | SS       | 1/15cm      |                            |                 |   |    |    |    |     |   |  |  |                         |   |
| 6.4           | Unweathered   |            | 7       | RC<br>NQ | REC<br>100% |                            | 199             |   |    |    |    |     |   |  |  |                         | RQD 100%  |
|               | High Strength   |            |         |          |             |                            | 198             |   |    |    |    |     |   |  |  |                         |   |
|               | Excellent quality   |            | 8       | RC<br>NQ | REC<br>100% |                            | 197             |   |    |    |    |     |   |  |  |                         | RQD 100%  |
| 196.4         | End of borehole   |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
| 9.5           | Sample 6: Sampler bouncing.                                       |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
|               | * 2009 04 01  |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
|               | ▽ Water level observed<br>during drilling                         |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
|               | ▼ Water level measured<br>after drilling                          |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |
|               | C. F. H. S. A. denotes<br>Continuous Flight Hollow<br>Stem Augers |            |         |          |             |                            |                 |   |    |    |    |     |   |  |  |                         |   |

**RECORD OF BOREHOLE No S2-2**

1 of 1

**METRIC**

G.W.P. 5203-06-00 LOCATION Coords: 5 096 399.3 N; 221 616.8 E  
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring ORIGINATED BY M.R.  
DATUM Geodetic DATE March 30 and 31, 2009 COMPILED BY M.N.  
CHECKED BY C.N.

| SOIL PROFILE  |  |   | SAMPLES |          |             | GROUND WATER<br>CONDITIONS   | ELEVATION SCALE | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT |  |              |  |  | PLASTIC<br>LIMIT<br>w <sub>p</sub> | NATURAL<br>MOISTURE<br>CONTENT<br>w | LIQUID<br>LIMIT<br>w <sub>L</sub> | UNIT<br>WEIGHT<br>γ<br>kN/m <sup>3</sup> | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%)<br>GR SA SI CL |                   |  |  |
|---------------|--|---|---------|----------|-------------|--|-----------------|---|--|--------------|--|--|------------------------------------|-------------------------------------|-----------------------------------|--|--|-------------------|--|--|
| ELEV<br>DEPTH | DESCRIPTION  | STRAT PLOT  | NUMBER  | TYPE     | *N* VALUES  |  |                 | SHEAR STRENGTH kPa                          |  |              |  |  |                                    |                                     |                                   |  |  | WATER CONTENT (%) |  |  |
|               |  |   |         |          |             |  |                 | ○ UNCONFINED                                |  | + FIELD VANE |  |  |                                    |                                     |                                   |  |  | ● QUICK TRIAXIAL  |  |  |
| 205.8<br>0.0  | Ground Surface                                     |  | 1       | SS       | 8           | <br> | 205             |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
| 205.2<br>0.6  | Silty sand   |  | 2       | SS       | 13          |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | Loose      Grey/      Wet<br>dark brown            |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | Silty clay, trace sand                             |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | Stiff      Brown      Moist<br>to firm      to wet |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |  | 3       | SS       | 4           |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | Soft      Grey                                     |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |  | 4       | SS       | WH**        |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
| 202.9<br>2.9  | Clayey silt, some sand                             |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | Firm      Grey      Wet                            |  | 5       | SS       | 3           |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
| 202.0<br>3.8  | Granitic Gneiss Bedrock                            |  | 6       | RC<br>NQ | REC<br>100% |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | Unweathered  |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | High strength                                      |  | 7       | RC<br>NQ | REC<br>100% |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               | Excellent quality                                  |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |  | 8       | RC<br>NQ | REC<br>100% |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
| 198.8<br>7.0  | End of borehole                                    |  |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |
|               |  |   |         |          |             |  |                 |   |  |              |  |  |                                    |                                     |                                   |  |  |                   |  |  |

**METRIC**

Hwy 69 (New), Sta. 20+460, o/s 28.0m Rt CL Med.

ORIGINATED BY M.R.

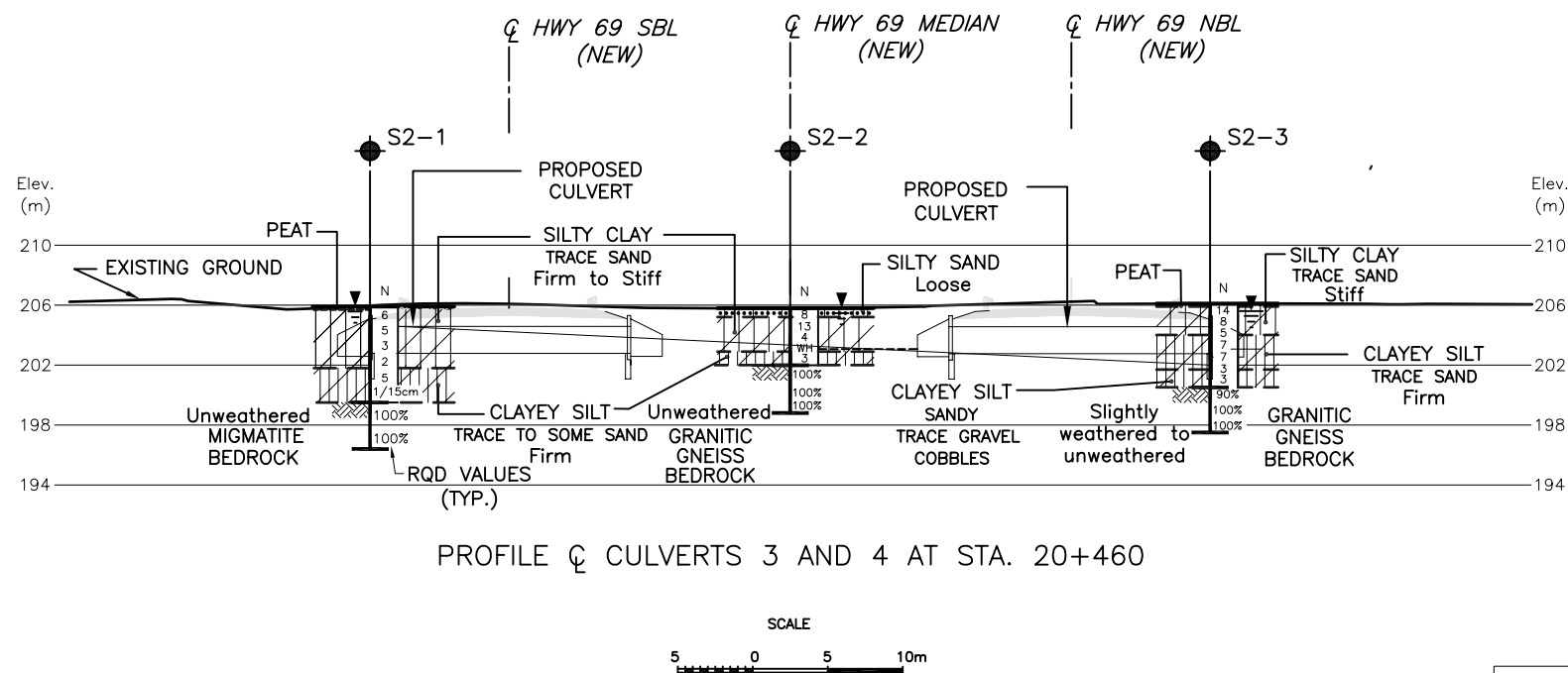
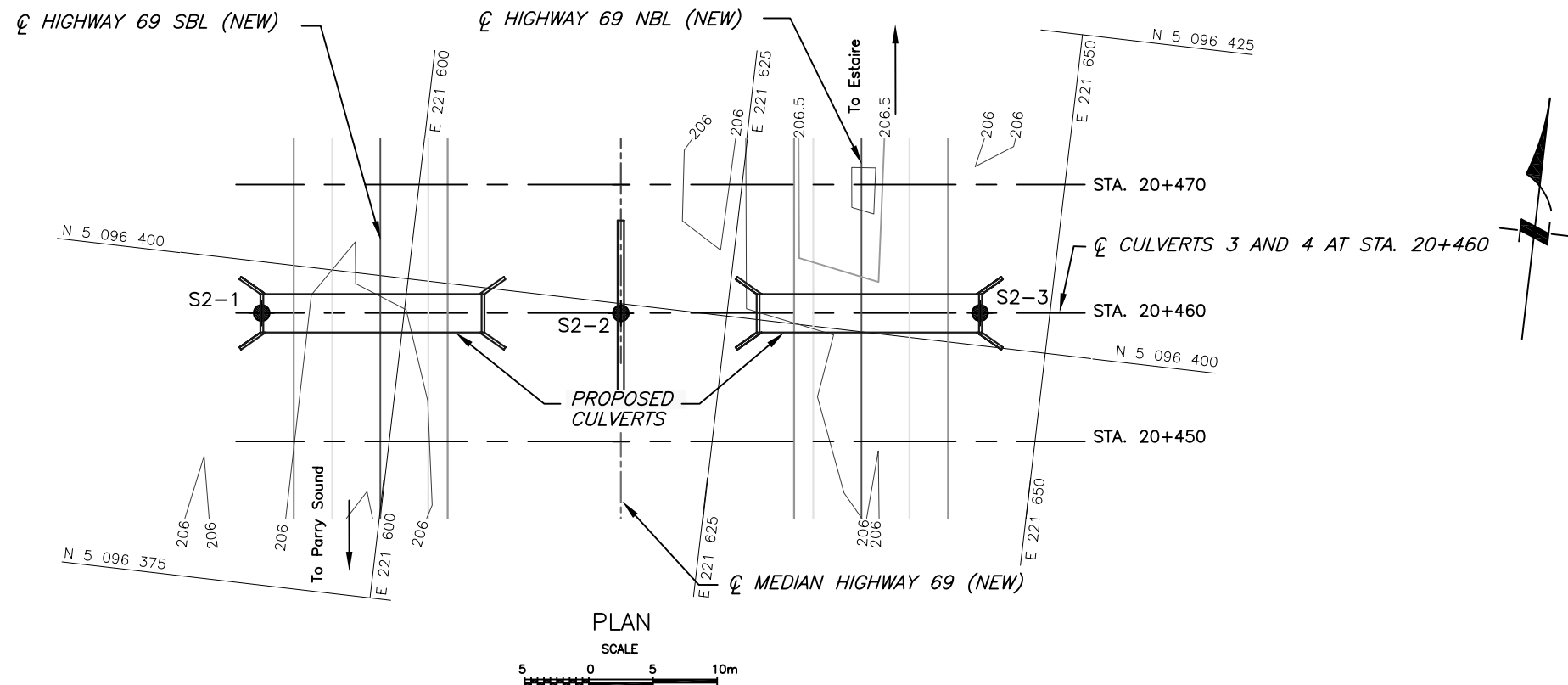
COMPILED BY M.N.

CHECKED BY C.N.

**+<sup>7</sup>, ×<sup>5</sup>:** Numbers refer to Sensitivity

20  
15 — ○ — 5  
10

(%) STRAIN AT FAILURE



#### NOTES:

1. DRAWING S2-1 SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
2. CULVERTS 3 AND 4 AT STA. 20+460 WERE DESIGNATED AS CULVERT S2 FOR THE INVESTIGATION.
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.: MRC DRAWINGS  
H6454\_PHASE3\_XA01.dwg; H6454\_PHASE3\_XN01.dwg;  
Plan View of Culverts - 090629.dwg; Phase 3 -  
Snake Culverts Cross Sections - 090714.dwg

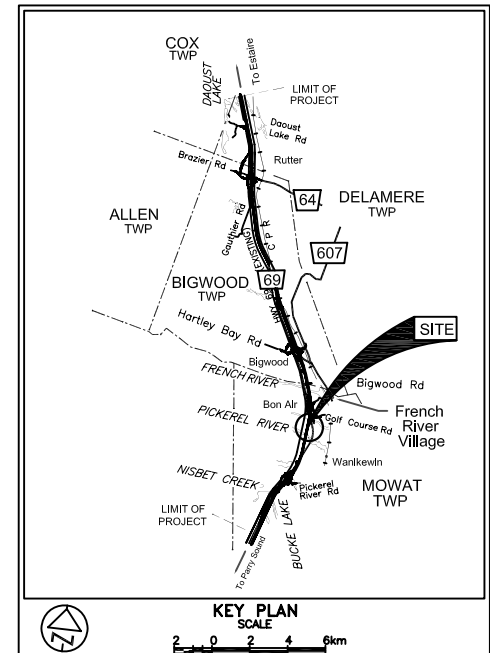
CONT No  
GWP No 5203-06-00

**CULVERTS 3 AND 4 (S2)**  
HIGHWAY 69 FOUR-LANING  
STA. 20+460 - MOWAT TWP  
**BOREHOLE LOCATIONS AND SOIL STRATA**



SHEET

**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)
- WH Penetration due to weight of hammer and rods
- W L at time of investigation Mar & Apr 2009
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

| BH No | ELEVATION | CO-ORDS       |             |
|-------|-----------|---------------|-------------|
|       |           | NORTHING      | EASTING     |
| S2-1  | 205.9     | N 5 096 396.0 | E 221 589.0 |
| S2-2  | 205.8     | N 5 096 399.3 | E 221 616.8 |
| S2-3  | 206.1     | N 5 096 402.5 | E 221 644.6 |

#### 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. 411-252

|          |               |         |      |
|----------|---------------|---------|------|
| HWY No   | 69            | DIST    | 54   |
| SUBM'D   | MN            | CHECKED | MN   |
| DATE     | FEB. 10, 2010 | SITE    | ---  |
| DRAWN    | NA            | CHECKED | CN   |
| APPROVED | BRG           | DWG     | S2-1 |



Culvert S3 at Sta. 20+540, Mowat Township

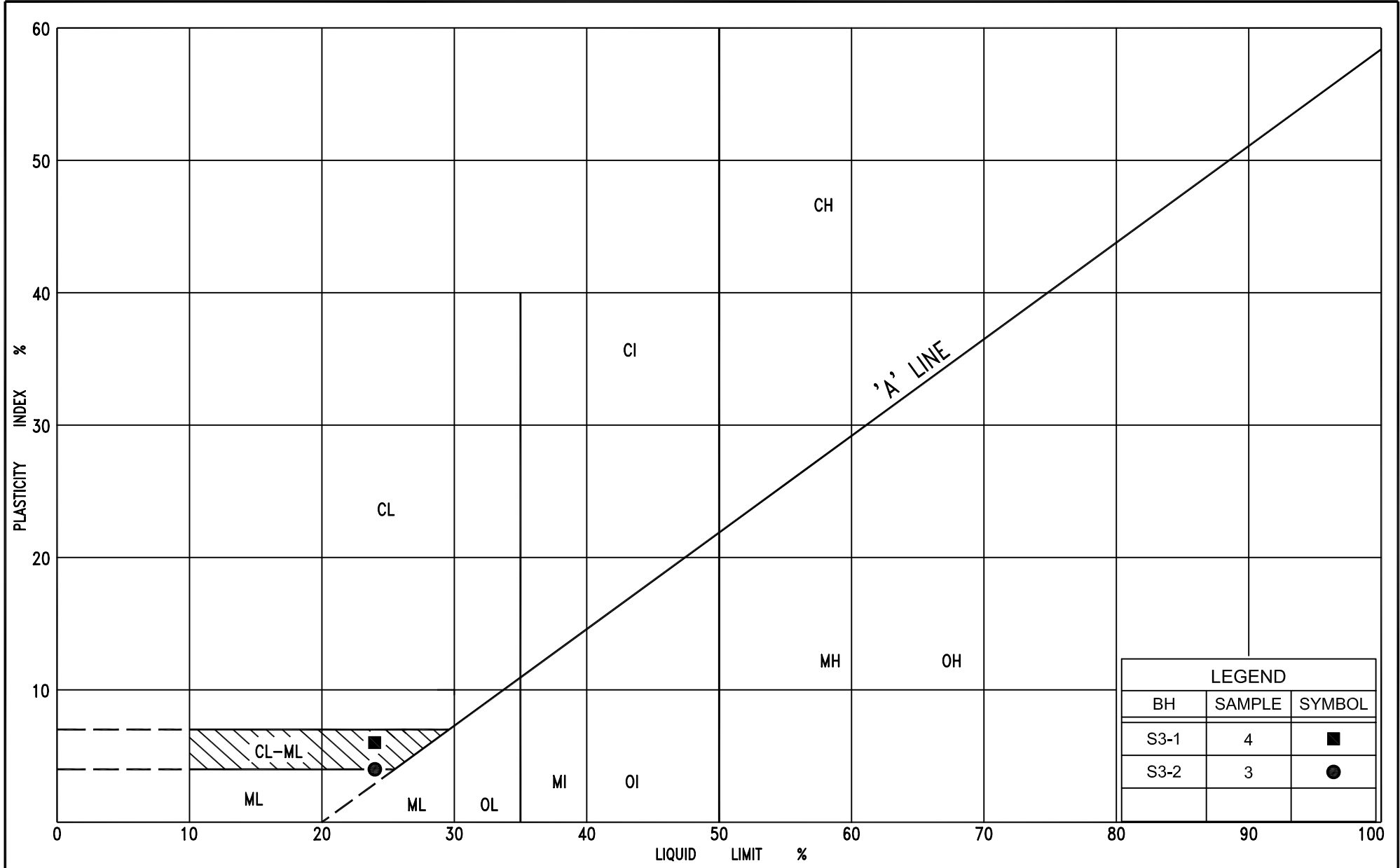
Figures PC-S3-1 to PC-S3-2 - Plasticity Charts

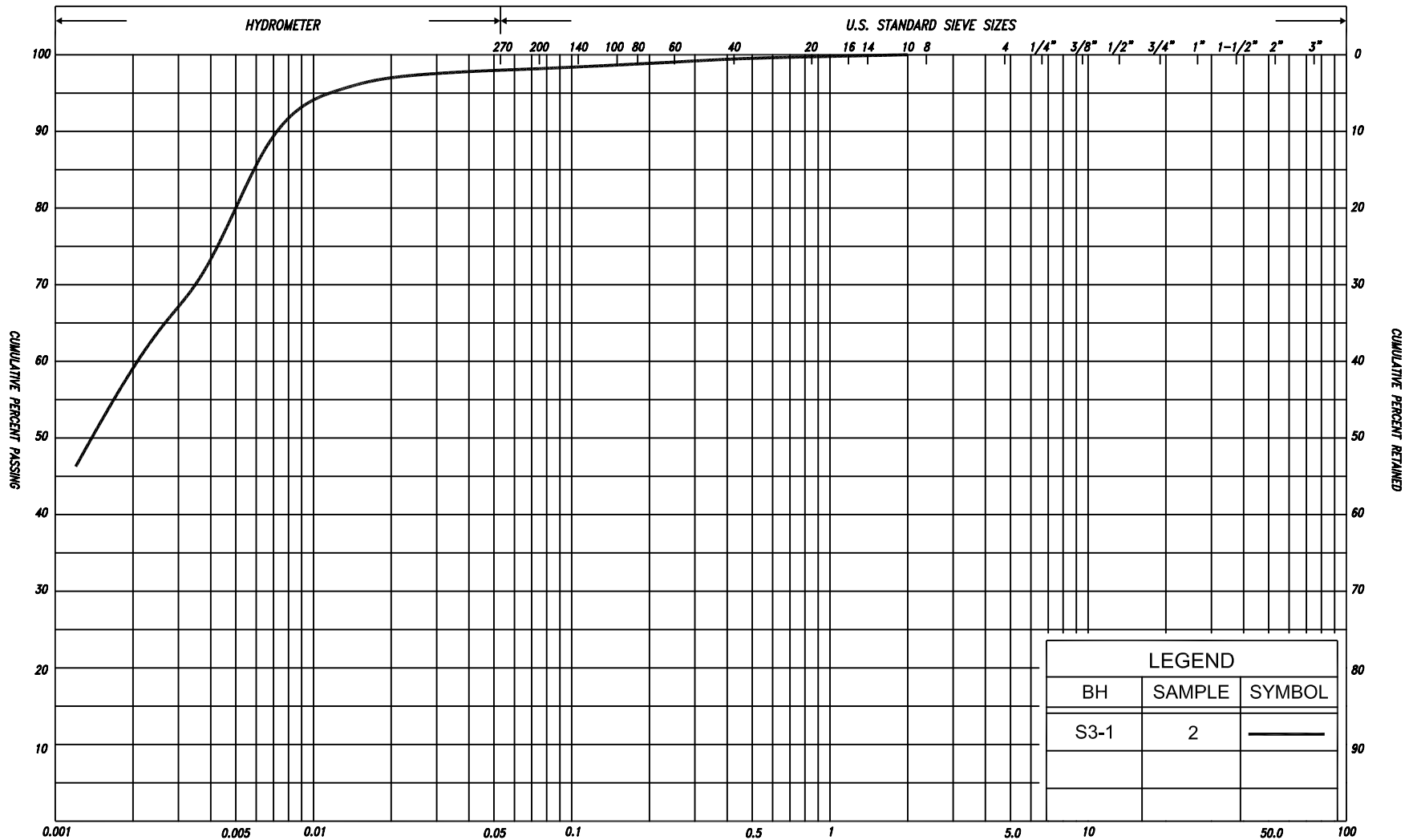
Figures GS-S3-1 to GS-S3-2 - Grain Size Distribution Charts

Record of Borehole Sheets

Drawing S3-1 – Borehole Locations and Soil Strata







|             |      |      |        |      |         |        |      |        |        |        |        |  |        |         |         |             |
|-------------|------|------|--------|------|---------|--------|------|--------|--------|--------|--------|--|--------|---------|---------|-------------|
| 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 |

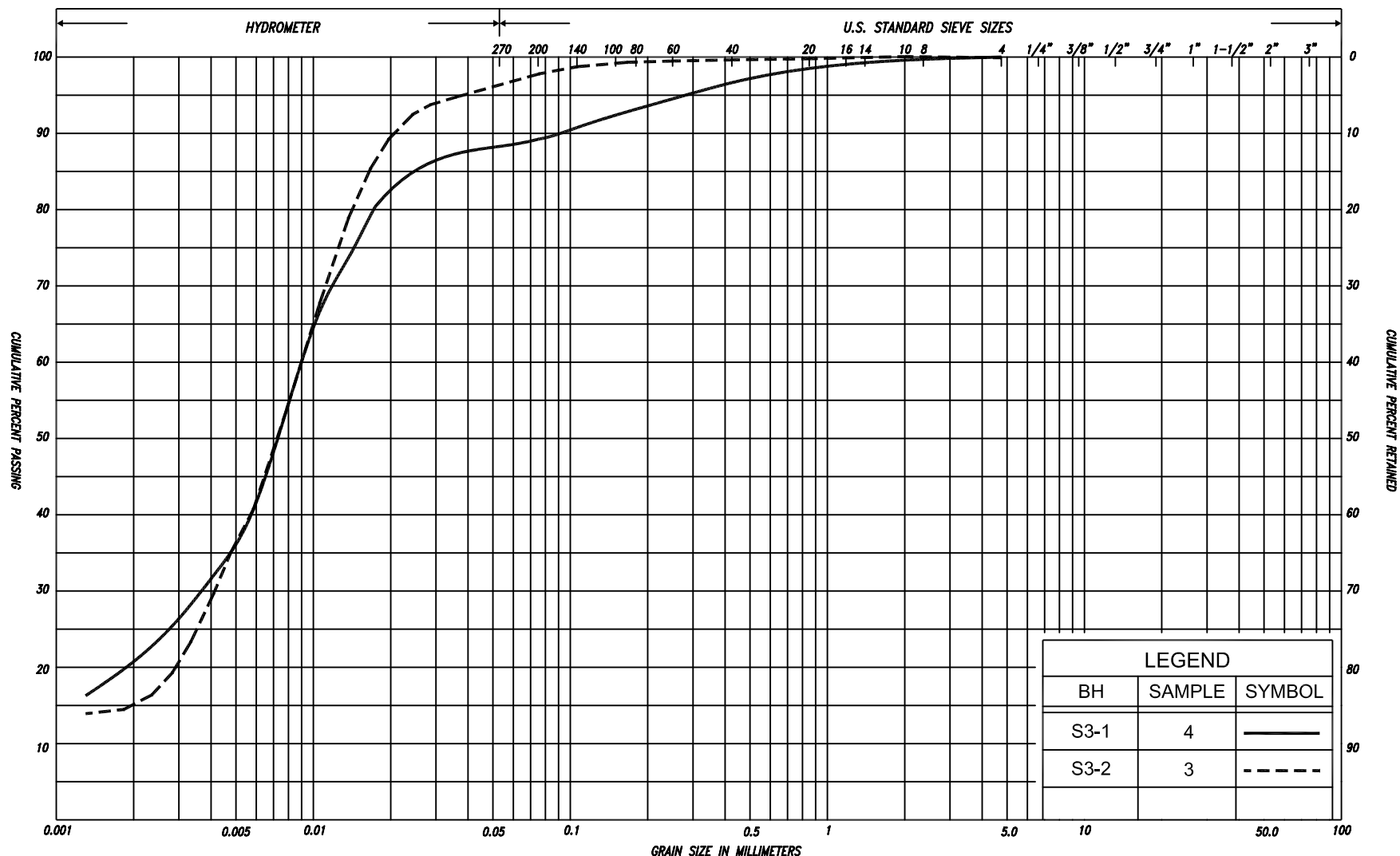
## GRAIN SIZE DISTRIBUTION

SILTY CLAY, trace sand

FIG No. GS-S3-1

HWY: 69

G.W.P. No. 5203-06-00



|             |      |      |        |         |      |        |        |        |        |  |         |             |
|-------------|------|------|--------|---------|------|--------|--------|--------|--------|--|---------|-------------|
| 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    |      |        |        |        |        |  |         |             |

## GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace to some sand

FIG No. GS-S3-2

HWY: 69

G.W.P. No. 5203-06-00

**RECORD OF BOREHOLE No S3-1**

1 of 1

**METRIC**

Coords: 5 096 475.5 N; 221 579.7 E

G.W.P. 5203-06-00 LOCATION Hwy 69 (New), Sta. 20+540, o/s 28.0m Lt CL Med. ORIGINATED BY M.R.  
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY M.N.  
DATUM Geodetic DATE April 02, 2009 CHECKED BY C.N.

| SOIL PROFILE  |                                       |            | SAMPLES |          |             | GROUND WATER<br>CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT |    |    |     |  | PLASTIC NATURAL LIQUID<br>LIMIT MOISTURE CONTENT LIMIT |  |    | UNIT<br>WEIGHT<br><br>γ<br><br>kN/m³ | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%) |   |
|---------------|---------------------------------------|------------|---------|----------|-------------|----------------------------|-----------------|---|----|----|-----|--|--|--|----|--------------------------------------|---|---|
| ELEV<br>DEPTH | DESCRIPTION                           | STRAT PLOT | NUMBER  | TYPE     | "N" VALUES  |                            |                 | SHEAR STRENGTH kPa                          |    |    |     |  | WATER CONTENT (%)                                      |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 | ○ UNCONFINED + FIELD VANE                   |    |    |     |  | w <sub>p</sub> w w <sub>L</sub>                        |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 | ● QUICK TRIAXIAL × LAB VANE                 |    |    |     |  |  |  |    |                                      |   |   |
| 206.1         | Ground Surface                        |            |         |          |             |                            | 20              | 40  | 60 | 80 | 100 |  |  |  |    |                                      |   |   |
| 0.0           | Peat, coarse fibrous                  |            | 1       | SS       | 25          | ▽*                         |                 |   |    |    |     |  |  |  | 92 |                                      | GR SA SI CL                                       |   |
| 205.9         | Dark brown                            |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   | ○ |
| 0.2           | Silty clay, trace sand<br>silt layers |            | 2       | SS       | 6           |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               | Stiff Brown Moist<br>to firm          |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 204.7         | Clayey silt, trace to some<br>sand    |            | 3       | SS       | 6           |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 1.4           | Firm Mottled Wet<br>brown/<br>grey    |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            | 4       | SS       | 4           |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 202.9         | Granitic Gneiss Bedrock               |            | 5       | RC<br>NQ | REC<br>100% |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 3.2           | Slightly to moderately<br>weathered   |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               | Medium to high strength               |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    | RQD 82%                              |   |   |
|               | Good quality                          |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 201.4         | Migmatite Bedrock                     |            | 6       | RC<br>NQ | REC<br>100% |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 4.7           | Slightly weathered                    |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    | RQD 100%                             |   |   |
|               | High strength                         |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 200.7         | Excellent quality                     |            | 6       | RC<br>NQ | REC<br>91%  |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 5.4           | Arkose Bedrock                        |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    | RQD 35%                              |   |   |
|               | Slightly weathered                    |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 199.9         | Medium to high strength               |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
| 6.2           | Poor quality                          |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               | End of borehole                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |
|               |                                       |            |         |          |             |                            |                 |   |    |    |     |  |  |  |    |                                      |   |   |

\* 2009 04 02

▽ Water level observed  
during drilling

▼ Water level measured  
after drilling

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

**METRIC**

|                          |                            |  |                           |
|--------------------------|----------------------------|--|---------------------------|
| G.W.P. <u>5203-06-00</u> |                            | LOCATION <u>Coords: 5 096 478.7 N; 221 607.5 E<br/>Hwy 69 (New), Sta. 20+540 CL Med.</u> | ORIGINATED BY <u>M.R.</u> |
| DIST <u>54</u>           | HWY <u>69</u>              | BOREHOLE TYPE <u>C.F.H.S.A. and Rotary Diamond Coring</u>                                | COMPILED BY <u>M.N.</u>   |
| DATUM <u>Geodetic</u>    | DATE <u>March 30, 2009</u> |  | CHECKED BY <u>C.N.</u>    |

[illegible]

**METRIC**

Hwy 69 (New), Sta. 20+540, o/s 28.0m Rt CL Med.

ORIGINATED BY M.R.

COMPILED BY M.N.

           CHECKED BY            C.N.

**+<sup>7</sup>, ×<sup>5</sup>:** Numbers refer to Sensitivity

20  
15 — ○ — 5  
10

(%) STRAIN AT FAILURE

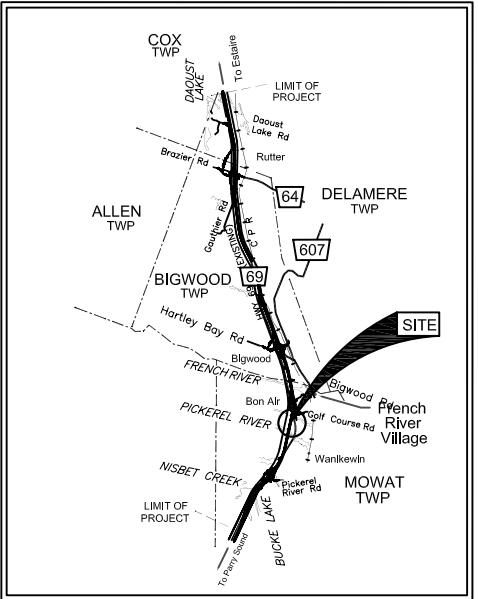


CONT No  
GWP No 5203-06-00

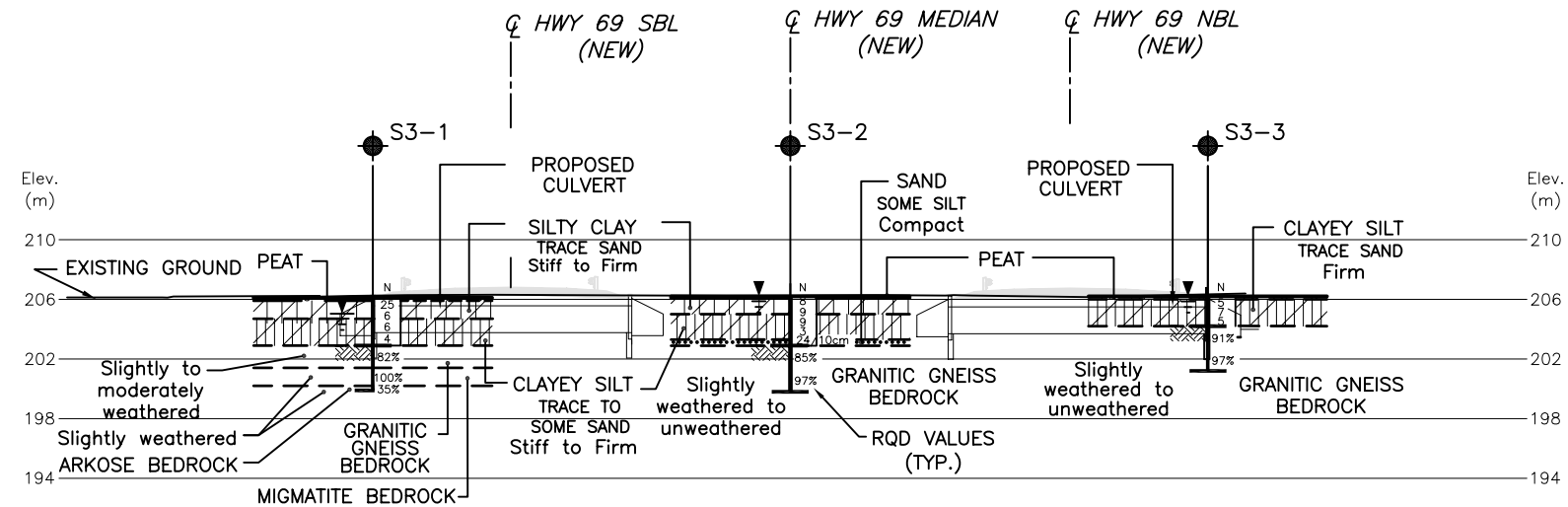
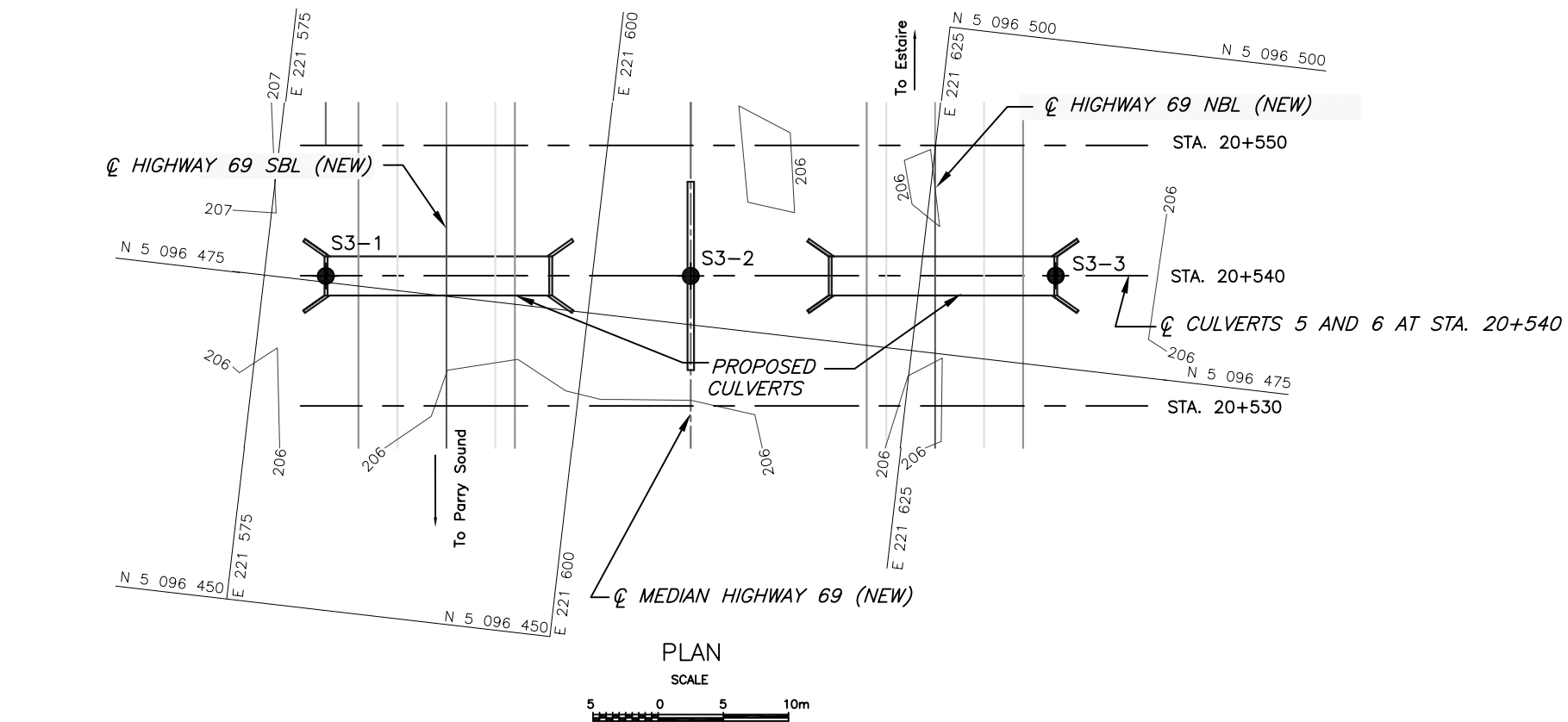
**CULVERTS 5 AND 6 (S3)**  
HIGHWAY 69 FOUR-LANING  
STA. 20+540 - MOWAT TWP  
**BOREHOLE LOCATIONS AND SOIL STRATA**



SHEET



KEY PLAN  
SCALE  
2 0 2 4 6 km



PROFILE  $\perp$  CULVERTS 5 AND 6 AT STA. 20+540

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)
- WH Penetration due to weight of hammer and rods
- W L at time of investigation March & April 2009
- Head ARTESIAN WATER Encountered
- PIEZOMETER

| BH No | ELEVATION | CO-ORDS       |             |
|-------|-----------|---------------|-------------|
|       |           | NORTHING      | EASTING     |
| S3-1  | 206.1     | N 5 096 475.5 | E 221 579.7 |
| S3-2  | 206.2     | N 5 096 478.7 | E 221 607.5 |
| S3-3  | 206.2     | N 5 096 482.0 | E 221 635.3 |

— 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. 411-252 |               |          |      |
| HWY No              | 69            | DIST     | 54   |
| SUBM'D              | MN            | CHECKED  | MN   |
| DRAWN               | NA            | CHECKED  | CN   |
| DATE                | FEB. 10, 2010 | APPROVED | BRG  |
| SITE                | ---           | DWG      | S3-1 |



REF.: MRC DRAWINGS  
H6454\_PHASE3\_XA01.dwg; H6454\_PHASE3\_XN01.dwg;  
Plan View of Culverts - 090629.dwg; Phase 3 -  
Snake Culverts Cross Sections - 090714.dwg

- NOTES:
- DRAWING S3-1 SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
  - CULVERTS 5 AND 6 AT STA. 20+540 WERE DESIGNATED AS CULVERT S3 FOR THE INVESTIGATION.
  - 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.

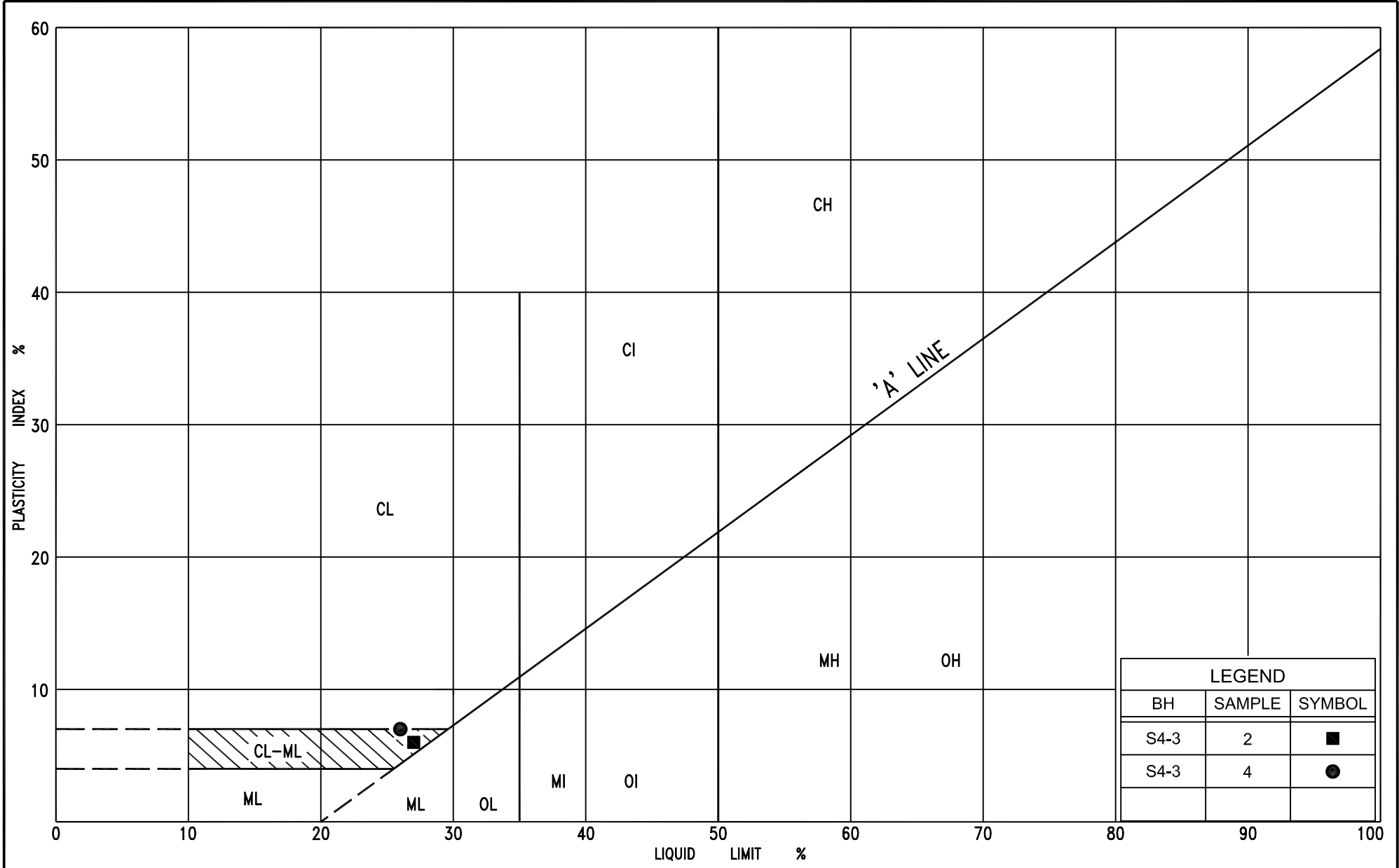
Culvert S4 at Sta. 20+630, Mowat Township

Figure PC-S4-1 - Plasticity Chart

Figure GS-S4-1 - Grain Size Distribution Chart

Record of Borehole Sheets

Drawing S4-1 – Borehole Locations and Soil Strata



Ministry of  
Transportation  
Ontario

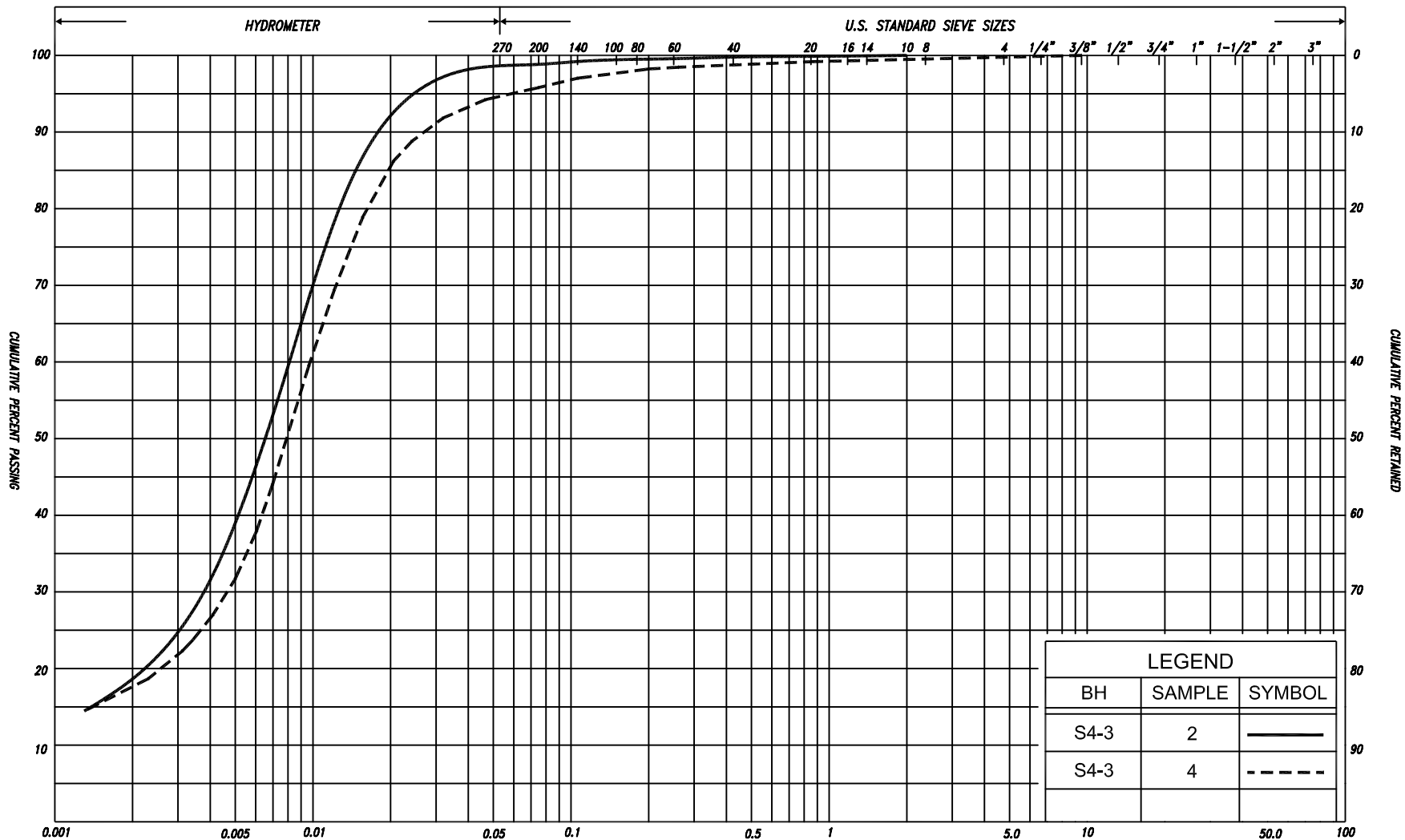
## PLASTICITY CHART

CLAYEY SILT, trace sand

FIG No. PC-S4-1

HWY: 69

G.W.P. No. 5203-06-00



|             |      |  |        |  |        |         |        |      |        |  |        |  |        |  |         |         |         |             |
|-------------|------|--|--------|--|--------|---------|--------|------|--------|--|--------|--|--------|--|---------|---------|---------|-------------|
| 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    |        |      |        |  |        |  |        |  |         |         |         |             |

## GRAIN SIZE DISTRIBUTION

CLAYEY SILT, trace sand

FIG No. GS-S4-1

HWY: 69

G.W.P. No. 5203-06-00

**METRIC**

Hwy 69 (New), Sta. 20+630, o/s 28.0m Lt CL Med.

ORIGINATED BY M.R.

COMPILED BY M.N.

— CHECKED BY C.N.

**+**<sup>7</sup>, **×**<sup>5</sup>: Numbers refer to Sensitivity

| <b>RECORD OF BOREHOLE No S4-2</b> <span style="float: right;">1 of 1</span> <b>METRIC</b> |  |               |         |   |             |                                 |   |                    |  |  |  |                                    |                                     |                                   |  |  |          |
|---|--|---------------|---------|---|-------------|---------------------------------|---|--------------------|--|--|--|------------------------------------|-------------------------------------|-----------------------------------|--|--|----------|
| G.W.P. 5203-06-00   |  | LOCATION      |         | Coords: 5 096 568.1 N; 221 597.1 E<br>Hwy 69 (New), Sta. 20+630 CL Med. |             |                                 |   | ORIGINATED BY M.R. |  |  |  |                                    |                                     |                                   |  |  |          |
| DIST 54 HWY 69  |  | BOREHOLE TYPE |         | C.F.H.S.A. and Rotary Diamond Coring                                    |             |                                 |   | COMPILED BY M.N.   |  |  |  |                                    |                                     |                                   |  |  |          |
| DATUM Geodetic  |  | DATE          |         | April 03, 2009  |             |                                 |   | CHECKED BY C.N.    |  |  |  |                                    |                                     |                                   |  |  |          |
| SOIL PROFILE  |  |               | SAMPLES |   |             | GROUND WATER<br>CONDITIONS<br>* | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT                                 |                    |  |  |  | PLASTIC<br>LIMIT<br>W <sub>p</sub> | NATURAL<br>MOISTURE<br>CONTENT<br>W | LIQUID<br>LIMIT<br>W <sub>L</sub> | UNIT<br>WEIGHT<br>γ<br>kN/m <sup>3</sup> | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%)<br>GR SA SI CL |          |
| ELEV<br>DEPTH   | DESCRIPTION                            | STRAT PLOT    | NUMBER  | TYPE  | "N" VALUES  |                                 | SHEAR STRENGTH kPa  |                    |  |  |  |                                    |                                     |                                   |  |  |          |
| 206.5   | Ground Surface                         |               |         |   |             |                                 | 20 40 60 80 100<br>○ UNCONFINED + FIELD VANE<br>● QUICK TRIAXIAL × LAB VANE |                    |  |  |  | 20 40 60<br>WATER CONTENT (%)      |                                     |                                   |  |  |          |
| 0.0   | Migmatite Bedrock                      |               | 1       | RC<br>NQ  | REC<br>100% |                                 | 206   |                    |  |  |  |                                    |                                     |                                   |  |  | RQD 100% |
|   | Slightly weathered to unweathered      |               |         |   |             |                                 | 205   |                    |  |  |  |                                    |                                     |                                   |  |  |          |
|   | High strength                          |               |         |   |             |                                 | 204   |                    |  |  |  |                                    |                                     |                                   |  |  | RQD 83%  |
| 203.5   | End of borehole                        |               |         |   |             |                                 |   |                    |  |  |  |                                    |                                     |                                   |  |  |          |
| 3.0   | * Borehole charged with drilling water |               |         |   |             |                                 |   |                    |  |  |  |                                    |                                     |                                   |  |  |          |

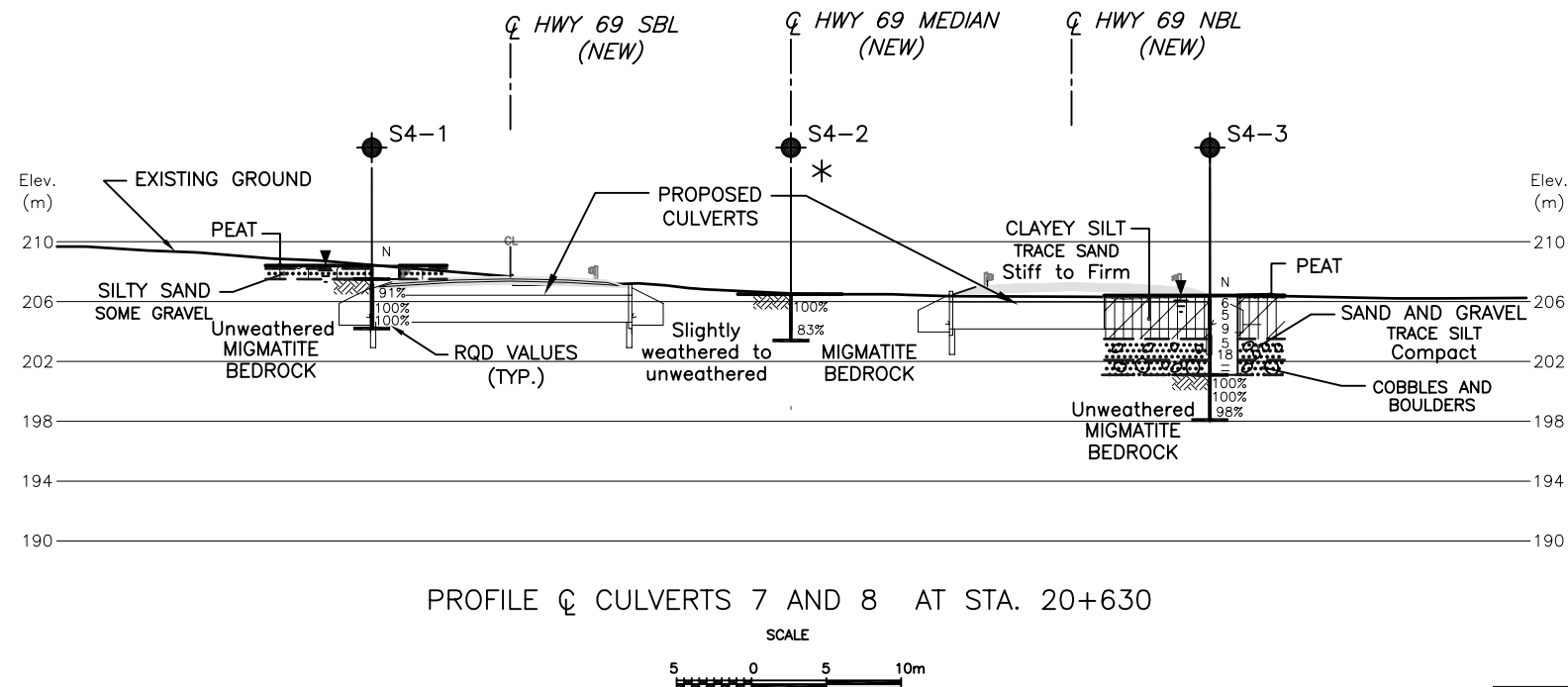
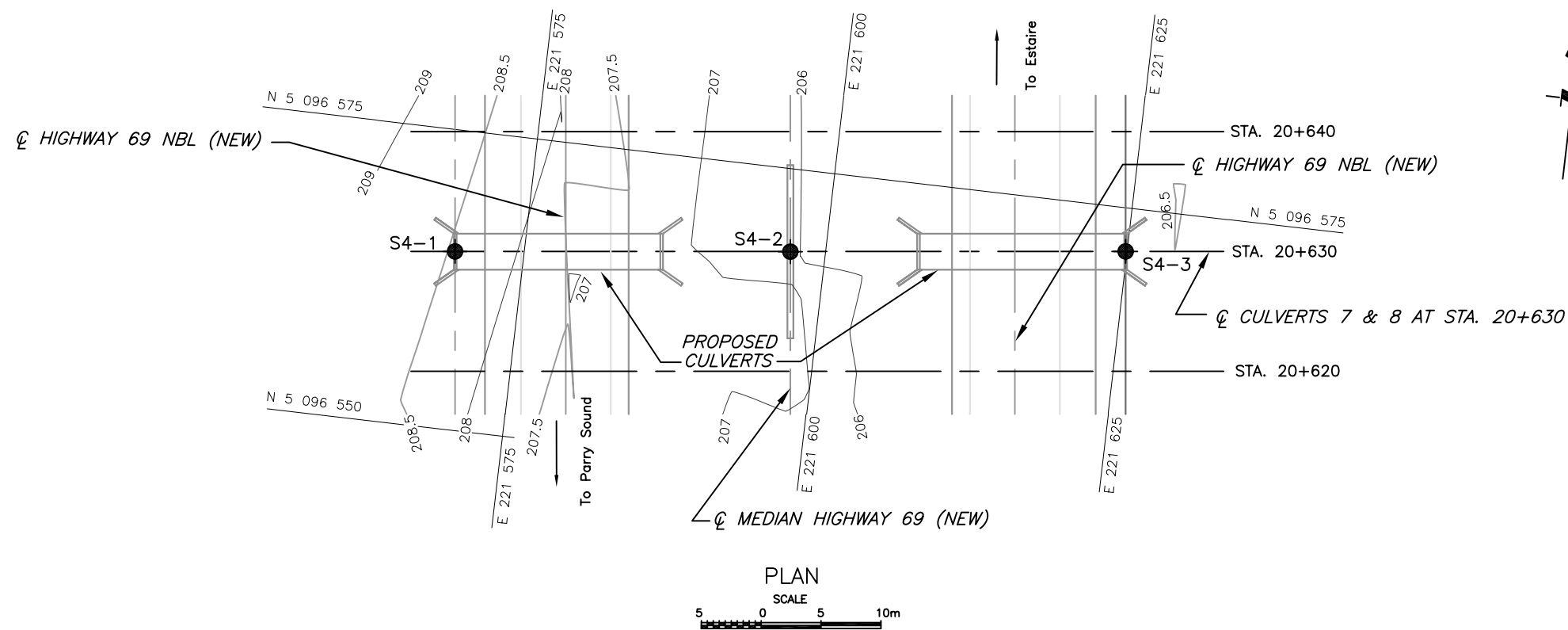
**RECORD OF BOREHOLE No S4-3**

1 of 1

**METRIC**

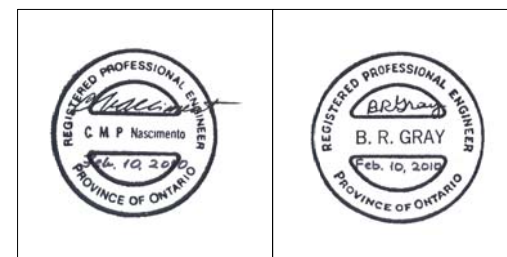
G.W.P. 5203-06-00 LOCATION Coords: 5 096 571.4 N; 221 624.9 E  
Hwy 69 (New), Sta. 20+630, o/s 28.0m Rt CL Med. ORIGINATED BY M.R.  
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. and Rotary Diamond Coring COMPILED BY M.N.  
DATUM Geodetic DATE April 02, 2009 CHECKED BY C.N.

| SOIL PROFILE  |  |            | SAMPLES |          |             | GROUND WATER<br>CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION<br>RESISTANCE PLOT |                  |    |    |            | PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT |   |                | UNIT<br>WEIGHT<br><br>γ<br><br>kN/m³ | REMARKS<br>&<br>GRAIN SIZE<br>DISTRIBUTION<br>(%) |  |           |  |
|---------------|--|------------|---------|----------|-------------|----------------------------|-----------------|---|------------------|----|----|------------|---|---|----------------|--------------------------------------|---|--|-----------|--|
| ELEV<br>DEPTH | DESCRIPTION  | STRAT PLOT | NUMBER  | TYPE     | "N" VALUES  |                            |                 | SHEAR STRENGTH kPa                          |                  |    |    |            | w <sub>p</sub>                                      | w | w <sub>L</sub> |                                      |   |  |           |  |
|               |  |            |         |          |             |                            |                 | ○ UNCONFINED                                | ● QUICK TRIAXIAL | +  | ×  | FIELD VANE |   |   |                |                                      |   |  |           |  |
| 206.4<br>0.0  | Ground Surface   |            |         |          |             |                            |                 | 20  | 40               | 60 | 80 | 100        |   |   |                |                                      |   |  |           |  |
| 206.3<br>0.1  | Peat, fine fibrous<br>Dark brown<br>Clayey silt, trace sand<br>Stiff to firm Brown Wet                                     |            | 1       | SS       | 6           |                            | 206             |   |                  |    |    |            |   | ○ |                |                                      |   |  |           |  |
|               |  |            | 2       | SS       | 5           |                            | 205             |   |                  |    |    |            |   | ⊞ |                |                                      |   |  | 0 1 81 18 |  |
|               |  |            | 3       | SS       | 9           |                            | 204             |   |                  |    |    |            |   | ○ |                |                                      |   |  |           |  |
|               |  |            | 4       | SS       | 5           |                            | 203             |   |                  |    |    |            |   | ⊞ | ○              |                                      |   |  | 0 4 79 17 |  |
| 203.5<br>2.9  | Sand and gravel, trace silt<br>Compact Brown Wet   |            | 5       | SS       | 18          |                            | 202             |   |                  |    |    |            |   |   |                |                                      |   |  |           |  |
|               | Cobbles and boulders   |            | 6       | RC<br>NQ | -           |                            | 201             |   |                  |    |    |            |   |   |                |                                      |   |  | -         |  |
|               |  |            | 7       | RC<br>NQ | -           |                            | 200             |   |                  |    |    |            |   |   |                |                                      |   |  | -         |  |
| 201.1<br>5.3  | Migmatite Bedrock<br>Unweathered<br>Medium to high strength<br>Excellent quality   |            | 7       | RC<br>NQ | REC<br>100% |                            | 199             |   |                  |    |    |            |   |   |                |                                      |   |  | RQD 100%  |  |
|               |  |            | 8       | RC<br>NQ | REC<br>100% |                            |                 |   |                  |    |    |            |   |   |                |                                      |   |  | RQD 100%  |  |
|               |  |            | 9       | RC<br>NQ | REC<br>97%  |                            |                 |   |                  |    |    |            |   |   |                |                                      |   |  | RQD 98%   |  |
| 198.1<br>8.3  | End of borehole  |            |         |          |             |                            |                 |   |                  |    |    |            |   |   |                |                                      |   |  |           |  |
|               | <div>* 2009 04 02</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div> |            |         |          |             |                            |                 |   |                  |    |    |            |   |   |                |                                      |   |  |           |  |



NOTES:

- DRAWING S4-1 SHOULD BE READ IN CONJUNCTION WITH THE TEXT AND RECORD OF BOREHOLE LOGS.
- CULVERTS 7 AND 8 AT STA. 20+630 WERE DESIGNATED AS CULVERT S4 FOR THE INVESTIGATION.
- 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.



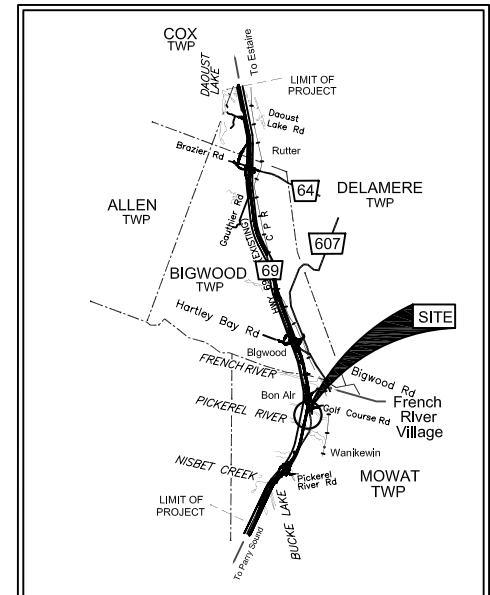
REF.: MRC DRAWINGS  
H6454\_PHASE3\_XA01.dwg; H6454\_PHASE3\_XN01.dwg;  
Plan View of Culverts - 090629.dwg; Phase 3 -  
Snake Culverts Cross Sections - 090714.dwg

CONT No  
GWP No 5203-06-00  
**CULVERTS 7 AND 8 (S4)**  
HIGHWAY 69 FOUR-LANING  
STA. 20+630 - MOWAT TWP  
**BOREHOLE LOCATIONS AND SOIL STRATA**



SHEET

**PML Peto MacCallum Ltd.**  
CONSULTING ENGINEERS



**KEY PLAN**  
SCALE  
2 0 2 4 6km

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 April 2009
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

| BH No | ELEVATION | CO-ORDS       |             |
|-------|-----------|---------------|-------------|
|       |           | NORTHING      | EASTING     |
| S4-1  | 208.4     | N 5 096 564.9 | E 221 569.3 |
| S4-2  | 206.5     | N 5 096 568.1 | E 221 597.1 |
| S4-3  | 206.4     | N 5 096 571.4 | E 221 624.9 |

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. 411-252

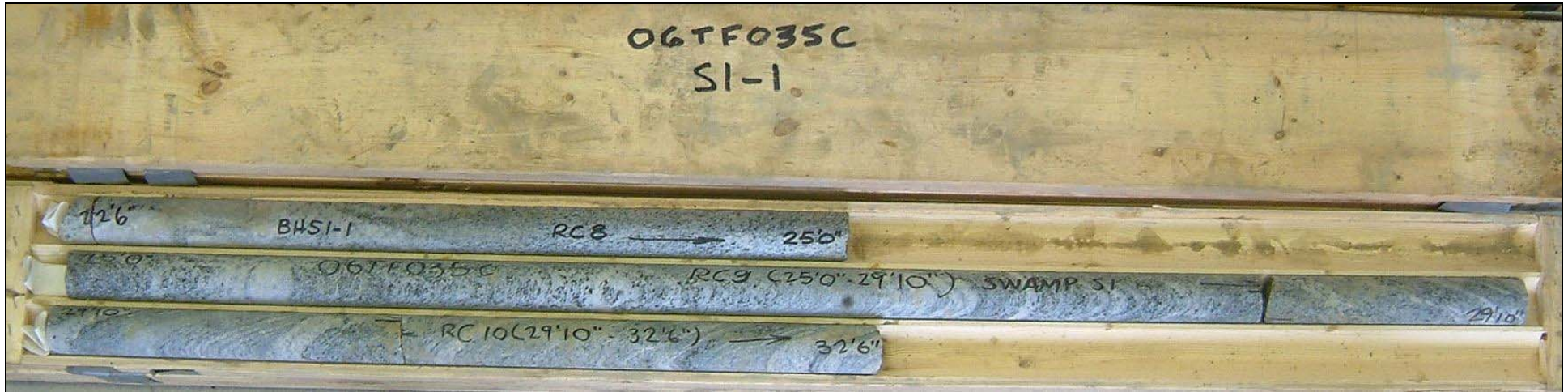
|          |               |         |      |
|----------|---------------|---------|------|
| HWY No   | 69            | DIST    | 54   |
| SUBM'D   | MN            | CHECKED | MN   |
| DATE     | FEB. 10, 2010 | SITE    | --   |
| DRAWN    | NA            | CHECKED | CN   |
| APPROVED | BRG           | DWG     | S4-1 |





## **APPENDIX A**

### Rock Core Photographs



**Photograph 1:** Culvert S1, borehole S1-1, samples RC-8 to RC-10 from 6.9 to 9.9 m depth. The RQD values ranged from 98 to 100%, indicating excellent quality bedrock.



**Photograph 2:** Culvert S1, borehole S1-2, samples RC-6 to RC-8 from 4.1 to 7.2 m depth. The RQD values were 100%, indicating excellent quality bedrock.



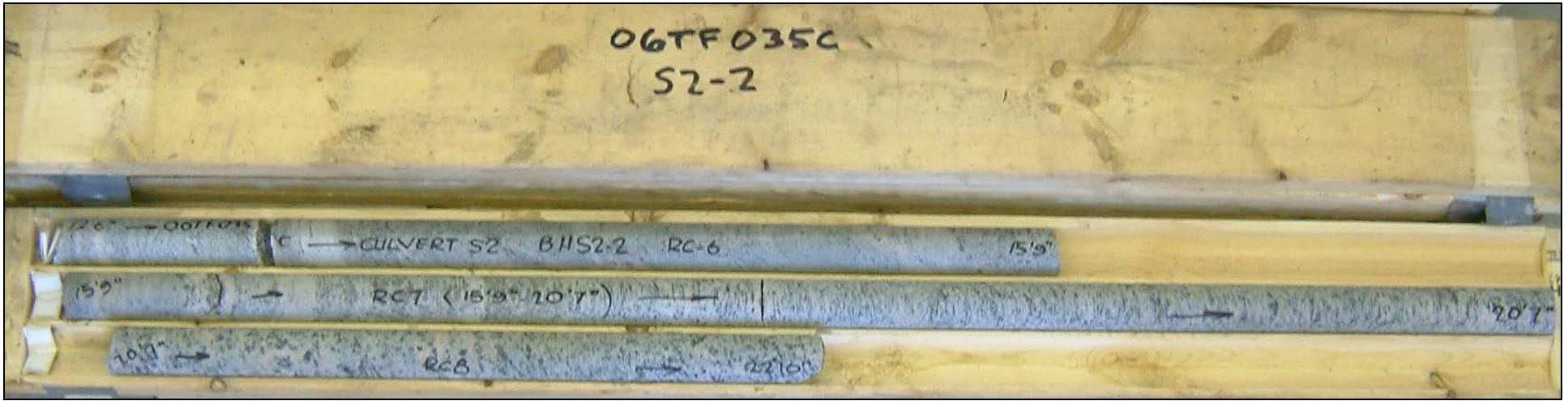


**Photograph 3:** Culvert S1, borehole S1-3, samples RC-7 and RC-8 from 6.1 to 9.2 m depth. The RQD values were 100%, indicating excellent quality bedrock.

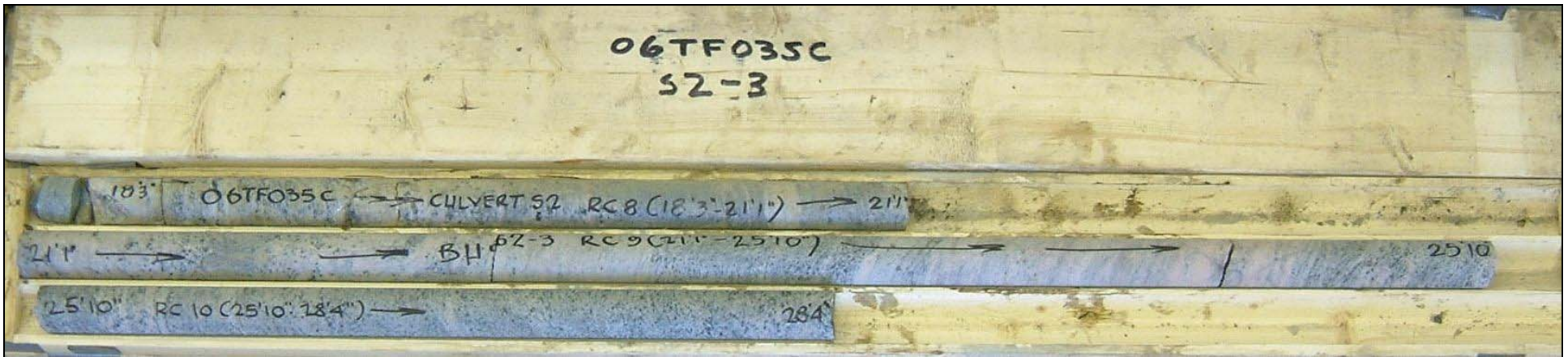


**Photograph 4:** Culvert S2, borehole S2-1, samples RC-7 and RC-8 from 6.4 to 9.5 m depth. The RQD values were 100%, indicating excellent quality bedrock.





**Photograph 5:** Culvert S2, borehole S2-2, samples RC-6 to RC-8 from 3.8 to 7.0 m depth. The RQD values were 100%, indicating excellent quality bedrock.



**Photograph 6:** Culvert S2, borehole S2-3, samples RC-8 to RC-10 from 5.7 to 8.6 m depth. The RQD values ranged from 90 to 100%, indicating excellent quality bedrock.



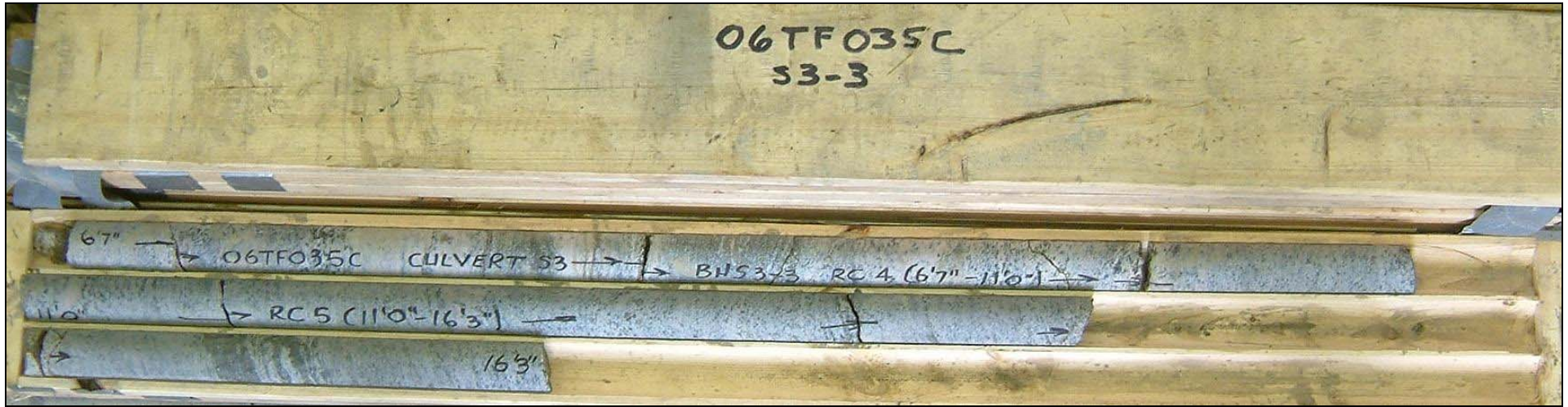


**Photograph 7:** Culvert S3, borehole S3-1, samples RC-5 and RC-6 from 3.2 to 6.2 m depth. The RQD values ranged from 35 to 100%. The Granitic Gneiss bedrock contacted from 3.2 to 4.7 m depth was good quality, the Migmatite bedrock contacted from 4.7 to 5.4 m depth was excellent quality and the Arkose bedrock contacted at 5.4 to 6.2 m depth was poor quality.

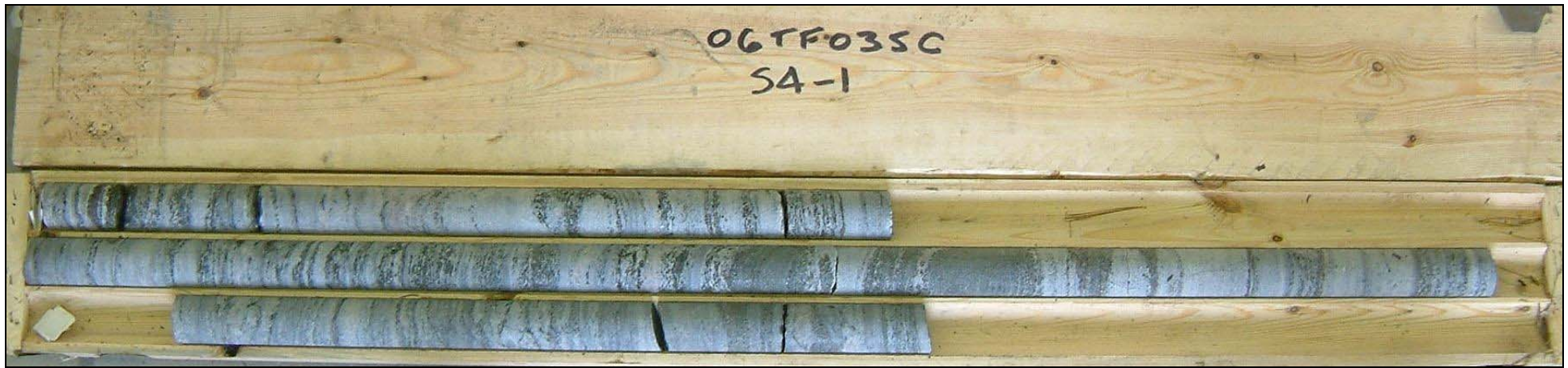


**Photograph 8:** Culvert S3, borehole S3-2, samples RC-6 and RC-7 from 3.3 to 6.4 m depth. The RQD values ranged from 85 to 97%, indicating good to excellent quality bedrock.



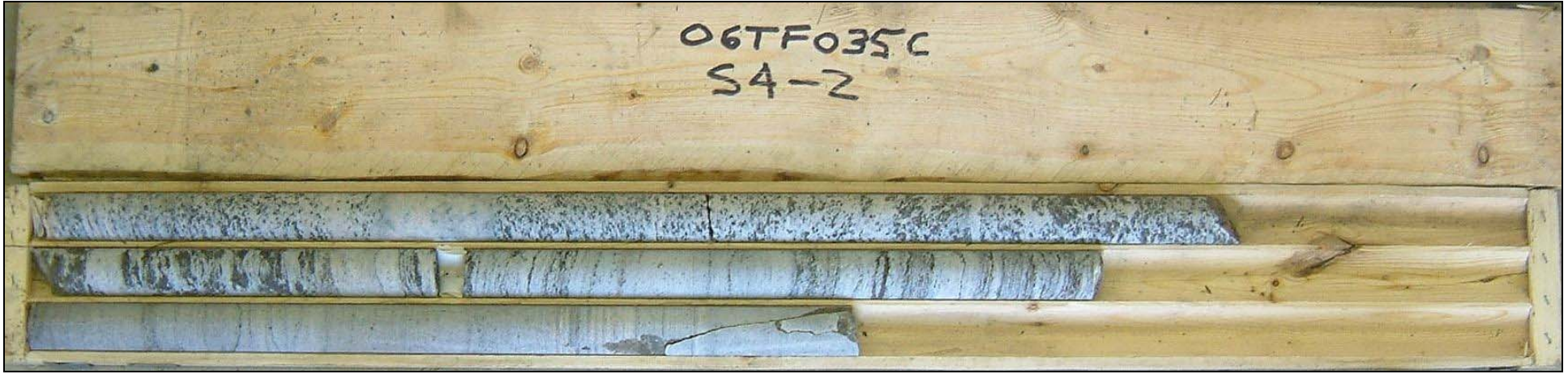


**Photograph 9:** Culvert S3, borehole S3-3, samples RC-4 and RC-5 from 2.0 to 5.0 m depth. The RQD values ranged from 91 to 97%, indicating excellent quality bedrock.



**Photograph 10:** Culvert S4, borehole S4-1, samples RC-1 to RC-3 from 1.1 to 4.1 m depth. The RQD values ranged from 91 to 100%, indicating excellent quality bedrock.





**Photograph 11:** Culvert S4, borehole S4-2, samples RC-1 and RC-2 from the surface to 3.0 m depth. The RQD values ranged from 83 to 100%, indicating good to excellent quality bedrock.



**Photograph 12:** Culvert S4, borehole S4-3, samples RC-6 to RC-9 from 4.2 to 8.3 m depth. The RQD values ranged from 98 to 100%, indicating excellent quality bedrock. Cobbles and boulders were contacted to 5.3 m depth.



## **APPENDIX B**

Data from Geotechnical Pavement Investigation (PML Ref.: 06TF034C)







**Proposed Hwy 69 SBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|           |      |   |       |     |           |           |   |       |    |
|-----------|------|---|-------|-----|-----------|-----------|---|-------|----|
| 20+390.   | 19.0 | Lt C/L                                  | D+0.2 | TP  | 20+410.   | 38.0      | Lt C/L                                  | D+0.5 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |     | 0 - 200   |           | Dk Br/Blk Si Tps W Roots Moist          |       |    |
| 200 - 1.2 |      | Br/Gry Si Tr Cl Moist                   |       |     | 200 - 2.1 |           | Br/Gry Si Tr Sa Tr Cl Occ Cob Moist     |       |    |
| 1.2 - 3.7 |      | Gry/Br Cl(y) Si Moist                   |       |     | 2.1 - 3.5 |           | Gry/Br Cl(y) Si Tr Gr Moist             |       |    |
| 3.7 - 4.8 |      | Dk Gry/Lt Br Si(y) Cl Moist             |       |     | 3.5 - 5.8 |           | Dk Gry/Lt Br Si(y) Cl Moist             |       |    |
|           |      | cu @ 4.5 = 50 kPa (Pocket Penetrometer) |       |     |           |           |   |       |    |
| 20+390.   | 33.0 | Lt C/L                                  | D+0.1 | TP  | 20+430.   | 7.0       | Lt C/L                                  | D+0.2 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |     | 0 - 200   |           | Dk Br/Blk Si Tps W Roots Moist          |       |    |
| 200 - 1.0 |      | Br/Gry Si Tr Cl Moist                   |       |     | 200 - 600 |           | Gry/Br F Sa Tr Si Moist                 |       |    |
| 1.0 - 5.0 |      | Gry/Br Cl(y) Si Moist                   |       |     | 600 - 1.4 |           | Br/Gry Si Tr Cl Moist                   |       |    |
|           |      | cu @ 4.5 = 50 kPa (Pocket Penetrometer) |       |     | 1.4 - 2.7 |           | Gry/Br Cl(y) Si Tr Gr Moist             |       |    |
|           |      |   |       |     | 2.7 - 5.6 |           | Dk Gry/Br Si(y) Cl Moist                |       |    |
| 20+390.   | 38.0 | Lt C/L                                  | D+0.2 | TP  | 20+430.   | 19.0      | Lt C/L                                  | D+0.2 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |     | 0 - 300   |           | Dk Br/Br Sa(y) Si Tps W Roots Moist     |       |    |
| 200 - 1.1 |      | Br/Gry Si Tr Cl Moist                   |       |     | 300 - 2.2 |           | Gry/Br Si Tr Cl Moist                   |       |    |
| 1.1 - 4.8 |      | Gry/Br Cl(y) Si Moist                   |       |     | 2.2 - 5.6 |           | Gry/Br Cl(y) Si Moist                   |       |    |
| 20+410.   | 7.0  | Lt C/L                                  | D+0.2 | TP  | 20+430.   | 33.0      | Lt C/L                                  | D+0.1 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |     | 0 - 300   |           | Dk Br/Br Si(y) Sa Tps W Roots Moist     |       |    |
| 200 - 600 |      | Br/Gry F Sa Tr Gr Tr Si Moist           |       |     | 300 - 2.0 |           | Br/Gry Cl(y) Si Moist                   |       |    |
| 600 - 1.1 |      | Br/Gry Si Tr Cl Moist                   |       |     | 2.0 - 5.4 |           | Dk Gry/Br Si(y) Cl Moist                |       |    |
| 1.1 - 3.7 |      | Gry/Br Cl(y) Si Moist                   |       |     |           |           |   |       |    |
| 3.7 - 5.5 |      | Dk Gry/Lt Br Si(y) Cl Moist             |       |     | 20+430.   | 38.0      | Lt C/L                                  | D+0.1 | TP |
|           |      |   |       |     | 0 - 300   |           | Dk Br/Br Si(y) Sa Tps W Roots Moist     |       |    |
| 20+410.   | 19.0 | Lt C/L                                  | D+0.5 | HD  | 300 - 2.1 |           | Br/Gry Cl(y) Si Moist                   |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |     | 2.1 - 5.5 |           | Dk Gry/Br Si(y) Cl Moist                |       |    |
| 200 - 1.2 |      | Gry Cl(y) Si Tr Sa Tr Org Wet           |       |     |           |           |   |       |    |
| 1.2 - 3.7 |      | Br Si(y) Cl Till Tr Gr Tr Sa Moist      |       |     | 20+450.   | 7.0       | Lt C/L                                  | D-0.2 | TP |
| 3.7 - 4.0 |      | Br Si(y) Cl Tr Sa Wet                   |       |     | 0 - 200   |           | Dk Br/Blk Si Tps W Roots Moist          |       |    |
| 4.0 - 6.7 |      | Gry Si(y) Cl Tr Sa Wet                  |       |     | 200 - 300 |           | Gry/Br F Sa Tr Si Moist                 |       |    |
|           | 6.7  | NFP BR                                  |       |     | 300 - 1.8 |           | Gry/Br Si Tr Cl Moist                   |       |    |
|           |      | Depth                                   | USS   | RSS | St        | 1.8 - 5.5 | Dk Gr/Lt Br Si(y) Cl Moist              |       |    |
|           |      | 3.25-3.70                               | 84    | 17  | 5         |           | cu @ 5.0 = 50 kPa (Pocket Penetrometer) |       |    |
|           |      | 5.00-5.45                               | 68    | 8   | 9         |           |   |       |    |
|           |      | 6.10-6.55                               | 64    | 19  | 3         |           |   |       |    |
| 20+410.   | 33.0 | Lt C/L                                  | D+0.7 | TP  |           |           |   |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |     |           |           |   |       |    |
| 200 - 1.9 |      | Br/Gry Si Tr Sa Tr Cl Occ Cob Moist     |       |     |           |           |   |       |    |
| 1.9 - 3.3 |      | Gry/Br Cl(y) Si Tr Gr Moist             |       |     |           |           |   |       |    |
| 3.3 - 6.0 |      | Dk Gry/Lt Br Si(y) Cl Moist             |       |     |           |           |   |       |    |
|           |      | cu @ 5.0 = 75 kPa (Pocket Penetrometer) |       |     |           |           |   |       |    |



**Proposed Hwy 69 SBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|         |      |   |       |     |    |  |  |  |  |         |      |  |       |     |    |  |  |  |  |
|---------|------|---|-------|-----|----|--|--|--|--|---------|------|--|-------|-----|----|--|--|--|--|
| 20+450. | 19.0 | Lt C/L                                  | D+0.1 | HD  |    |  |  |  |  | 20+470. | 38.0 | Lt C/L                                   | D+0.2 | TP  |    |  |  |  |  |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist          |       |     |    |  |  |  |  | 0 -     | 200  | Blk/Dk Br Si Tps W Roots Moist           |       |     |    |  |  |  |  |
| 200 -   | 1.5  | Gry/Br Si(y) Cl Tr Sa Tr Org Wet        |       |     |    |  |  |  |  | 200 -   | 1.4  | Gry/Br Cl(y) Si Occ Blds Moist           |       |     |    |  |  |  |  |
| 1.5 -   | 2.4  | Gry/Br Si(y) Cl Tr Sa Wet               |       |     |    |  |  |  |  | 1.4 -   | 5.2  | Dk Gry/Lt Br Si(y) Cl Moist              |       |     |    |  |  |  |  |
| 2.4 -   | 6.1  | Gry Si(y) Cl Tr Gr Tr Sa Wet            |       |     |    |  |  |  |  |         |      | cu @ 3.5 = 50 kPa (Pocket Penetrometer)  |       |     |    |  |  |  |  |
| 6.1 -   | 6.9  | Gry Cl(y) Si Tr Gr Tr Sa Wet            |       |     |    |  |  |  |  | 20+490. | 7.0  | Lt C/L                                   | D+/-0 | TP  |    |  |  |  |  |
|         | 6.9  | NFP BR                                  |       |     |    |  |  |  |  | 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist           |       |     |    |  |  |  |  |
|         |      | Depth                                   | USS   | RSS | St |  |  |  |  | 200 -   | 900  | Gry/Br Cl(y) Si Moist                    |       |     |    |  |  |  |  |
|         |      | 3.25-3.70                               | 44    | 7   | 6  |  |  |  |  | 900 -   | 4.9  | Dk Gry/Lt Br Si(y) Cl Moist              |       |     |    |  |  |  |  |
|         |      | 5.00-5.45                               | 56    | 10  | 6  |  |  |  |  |         |      | cu @ 4.0 = 75 kPa (Pocket Penetrometer)  |       |     |    |  |  |  |  |
|         |      | 6.10-6.55                               | 72    | 14  | 5  |  |  |  |  |         |      |  |       |     |    |  |  |  |  |
| 20+450. | 33.0 | Lt C/L                                  | D+/-0 | TP  |    |  |  |  |  | 20+490. | 19.0 | Lt C/L                                   | D+0.1 | CHD |    |  |  |  |  |
| 0 -     | 100  | Dk Br/Blk Si Tps W Roots Moist          |       |     |    |  |  |  |  | 0 -     | 1.8  | Br Cl(y) Si Tr Sa Tr Org Moist           |       |     |    |  |  |  |  |
| 100 -   | 400  | Gry F Sa Tr Si Moist                    |       |     |    |  |  |  |  | 1.8 -   | 5.7  | Gry Si(y) Cl Tr Sa Wet-Sat               |       |     |    |  |  |  |  |
| 400 -   | 1.7  | Gry/Br Cl(y) Si Moist                   |       |     |    |  |  |  |  | 5.7 -   | 6.7  | Gry Si Some Gr Tr Sa Tr Cl Occ Cob Occ   |       |     |    |  |  |  |  |
| 1.7 -   | 5.3  | Dk Gry/Lt Br Si(y) Cl Wet               |       |     |    |  |  |  |  |         | 6.7  | NFP BR                                   |       |     |    |  |  |  |  |
|         |      | cu @ 4.5 = 25 kPa (Pocket Penetrometer) |       |     |    |  |  |  |  |         |      | Seepage @ 2.7                            |       |     |    |  |  |  |  |
| 20+450. | 38.0 | Lt C/L                                  | D+/-0 | TP  |    |  |  |  |  |         |      | Fr Wat @ 5.7                             |       |     |    |  |  |  |  |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist          |       |     |    |  |  |  |  |         |      | Depth                                    | USS   | RSS | St |  |  |  |  |
| 200 -   | 400  | Gry F Sa Tr Si Moist                    |       |     |    |  |  |  |  |         |      | 3.05-3.50                                | 36    | 5   | 7  |  |  |  |  |
| 400 -   | 1.8  | Gry/Br Cl(y) Si Moist                   |       |     |    |  |  |  |  |         |      | 4.60-5.05                                | 40    | 9   | 4  |  |  |  |  |
| 1.8 -   | 5.4  | Dk Gry/Lt Br Si(y) Cl Moist             |       |     |    |  |  |  |  | 20+490. | 33.0 | Lt C/L                                   | D-0.1 | TP  |    |  |  |  |  |
|         |      | cu @ 4.5 = 50 kPa (Pocket Penetrometer) |       |     |    |  |  |  |  | 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist           |       |     |    |  |  |  |  |
| 20+470. | 7.0  | Lt C/L                                  | D+0.2 | TP  |    |  |  |  |  | 200 -   | 1.0  | Gry/Br Cl(y) Si Moist                    |       |     |    |  |  |  |  |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist          |       |     |    |  |  |  |  | 1.0 -   | 4.9  | Dk Gry/Lt Br Si(y) Cl Moist              |       |     |    |  |  |  |  |
| 200 -   | 250  | Gry F Sa Tr Si Moist                    |       |     |    |  |  |  |  |         |      | cu @ 4.5 = 75 kPa (Pocket Penetrometer)  |       |     |    |  |  |  |  |
| 250 -   | 1.5  | Gry/Br Cl(y) Si Occ Blds Moist          |       |     |    |  |  |  |  | 20+490. | 38.0 | Lt C/L                                   | D-0.1 | TP  |    |  |  |  |  |
| 1.5 -   | 5.1  | Dk Gry/Lt Br Si(y) Cl Moist             |       |     |    |  |  |  |  | 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist           |       |     |    |  |  |  |  |
| 20+470. | 19.0 | Lt C/L                                  | D+0.2 | TP  |    |  |  |  |  | 200 -   | 1.1  | Gry/Br Cl(y) Si Moist                    |       |     |    |  |  |  |  |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist          |       |     |    |  |  |  |  | 1.1 -   | 5.0  | Dk Gry/Lt Br Si(y) Cl Moist              |       |     |    |  |  |  |  |
| 200 -   | 300  | Gry F Sa Tr Si Moist                    |       |     |    |  |  |  |  | 20+510. | 7.0  | Lt C/L                                   | D+/-0 | TP  |    |  |  |  |  |
| 300 -   | 1.4  | Gry/Br Cl(y) Si Moist                   |       |     |    |  |  |  |  | 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist           |       |     |    |  |  |  |  |
| 1.4 -   | 5.2  | Dk Gry/Lt Br Si(y) Cl Moist             |       |     |    |  |  |  |  | 200 -   | 1.1  | Br/Gry Si Tr Cl Occ Cob Moist            |       |     |    |  |  |  |  |
|         |      | cu @ 5.0 = 50 kPa (Pocket Penetrometer) |       |     |    |  |  |  |  | 1.1 -   | 4.3  | Gry/Br Cl(y) Si Moist                    |       |     |    |  |  |  |  |
| 20+470. | 33.0 | Lt C/L                                  | D+0.2 | TP  |    |  |  |  |  |         |      | cu @ 3.5 = 100 kPa (Pocket Penetrometer) |       |     |    |  |  |  |  |
| 0 -     | 200  | Blk/Dk Br Si Tps W Roots Moist          |       |     |    |  |  |  |  |         |      |  |       |     |    |  |  |  |  |
| 200 -   | 1.5  | Gry/Br Cl(y) Si Occ Blds Moist          |       |     |    |  |  |  |  |         |      |  |       |     |    |  |  |  |  |
| 1.5 -   | 5.0  | Dk Gry/Lt Br Si(y) Cl Moist-Wet         |       |     |    |  |  |  |  |         |      |  |       |     |    |  |  |  |  |



**Proposed Hwy 69 SBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|           |      |  |       |     |           |      |  |       |    |
|-----------|------|--|-------|-----|-----------|------|--|-------|----|
| 20+510.   | 19.0 | Lt C/L                                   | D+/-0 | TP  | 20+530.   | 38.0 | Lt C/L   | D+0.2 | TP |
| 0 - 200   |      | Blk Si Tps W Roots Moist                 |       |     | 0 - 200   |      | Blk Si Tps W Roots Moist                       |       |    |
| 200 - 4.5 |      | Dk Gry/Lt Br Si(y) Cl Moist              |       |     | 200 - 4.4 |      | Dk Gry/Lt Br Cl(y) Si Tr Sa Wet CL             |       |    |
| 20+510.   | 33.0 | Lt C/L                                   | D+/-0 | TP  |           |      | w = 40%  |       |    |
| 0 - 200   |      | Blk Si Tps W Roots Moist                 |       |     |           |      | % Pass   |       |    |
| 200 - 4.3 |      | Dk Gry/Lt Br Si(y) Cl Moist              |       |     |           |      | 4.75 mm = 100                                  |       |    |
|           |      | cu @ 4.0 = 50 kPa (Pocket Penetrometer)  |       |     |           |      | 2.00 mm = 100                                  |       |    |
| 20+510.   | 38.0 | Lt C/L                                   | D+/-0 | TP  |           |      | 425 um = 99                                    |       |    |
| 0 - 200   |      | Blk Si Tps W Roots Moist                 |       |     |           |      | 75 um = 98                                     |       |    |
| 200 - 4.5 |      | Dk Gry/Lt Br Si(y) Cl Moist              |       |     |           |      | 5 um = 48                                      |       |    |
|           |      |  |       |     |           |      | 2 um = 24                                      |       |    |
| 20+530.   | 7.0  | Lt C/L                                   | D+0.2 | TP  |           |      | MSFH   |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |     |           |      | WL = 28 IP = 10                                |       |    |
| 200 - 1.1 |      | Gry/Br Si Tr Cl Occ Cob Moist            |       |     |           |      | K Factor = 0.59                                |       |    |
| 1.1 - 4.5 |      | Gry/Br Cl(y) Si Moist                    |       |     | 20+550.   | 7.0  | Lt C/L   | D+0.1 | TP |
|           |      | cu @ 4.0 = 100 kPa (Pocket Penetrometer) |       |     | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |
| 20+530.   | 14.0 | Lt C/L                                   | D+0.2 | CHD | 200 - 800 |      | Br/Gry Si Tr Cl Num Cob Occ Blds Moist         |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Sat             |       |     | 800 - 1.4 |      | Gry/Br Cl(y) Si Occ Blds Moist                 |       |    |
| 200 - 1.8 |      | Br Si(y) Cl Tr Sa Sat                    |       |     | 1.4 - 1.8 |      | Gry/Blk Sa And Gr Tr Si Num Cob Moist          |       |    |
| 1.8 - 3.1 |      | Br Cl(y) Si Tr Sa Sat                    |       |     |           |      | NFP BR   |       |    |
| 3.1 - 4.3 |      | Gry/Br Cl(y) Si Sat                      |       |     | 20+550.   | 19.0 | Lt C/L   | D+0.2 | TP |
| 4.3 - 4.6 |      | Gry Si Tr Cl Tr Sa Sat                   |       |     | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |
|           |      | Fr Wat @ 0                               |       |     | 200 - 1.7 |      | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist         |       |    |
|           |      | Depth USS RSS St                         |       |     | 1.7 - 2.3 |      | Gry/Br Cl(y) Si Occ Blds Moist                 |       |    |
|           |      | 2.10-2.55 >100 - -                       |       |     | 2.3 - 3.0 |      | Gry/Blk Gr And Sa Tr Si Num Cob Occ Blds Moist |       |    |
| 20+530.   | 33.0 | Lt C/L                                   | D+0.2 | TP  |           |      | NFP BR   |       |    |
| 0 - 200   |      | Blk Si Tps W Roots Moist                 |       |     |           |      | Seepage @ 2.5                                  |       |    |
| 200 - 4.2 |      | Dk Gry/Lt Br Cl(y) Si Tr Sa Moist        |       |     | 20+550.   | 33.0 | Lt C/L   | D-0.1 | TP |
|           |      | cu @ 4.0 = 50 kPa (Pocket Penetrometer)  |       |     | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |
|           |      |  |       |     | 200 - 1.3 |      | Br/Gry Si Tr Cl Occ Cob Moist                  |       |    |
|           |      |  |       |     | 1.3 - 2.7 |      | Gry/Br Cl(y) Si Num Cob Occ Blds Moist         |       |    |
|           |      |  |       |     | 2.7 - 2.9 |      | Gry/Blk Gr And Sa Tr Si Occ Cob Moist          |       |    |
|           |      |  |       |     |           |      | NFP BR   |       |    |
|           |      |  |       |     | 20+550.   | 38.0 | Lt C/L   | D+0.1 | TP |
|           |      |  |       |     | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |
|           |      |  |       |     | 200 - 1.4 |      | Br/Gry Si Tr Cl Occ Cob Moist                  |       |    |
|           |      |  |       |     | 1.4 - 2.6 |      | Gry/Br Cl(y) Si Num Cob Occ Blds Moist         |       |    |
|           |      |  |       |     | 2.6 - 2.8 |      | Gry/Blk Gr And Sa Tr Si Occ Cob Moist          |       |    |
|           |      |  |       |     |           |      | NFP BR   |       |    |



**Proposed Hwy 69 SBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|           |      |  |       |    |           |      |   |       |    |
|-----------|------|--|-------|----|-----------|------|---|-------|----|
| 20+570.   | 7.0  | Lt C/L   | D+0.7 | HA | 20+610.   | 33.0 | Lt C/L  | D+1.9 | HA |
| 0 - 300   |      | Dk Br/Blk Si Tps Num Cob W Roots Moist             |       |    | 0 - 100   |      | Dk Br/Blk Si Tps W Roots Moist                        |       |    |
| 300       |      | NFP BR   |       |    | 100       |      | NFP BR  |       |    |
| 20+570.   | 19.0 | Lt C/L   | D+0.3 | TP | 20+630.   | 7.0  | Lt C/L  | D+0.1 | HA |
| 0 - 600   |      | Dk Br/Br Si Tps Num Cob Occ Blds W Roots Moist     |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                        |       |    |
| 600       |      | NFP BR   |       |    | 200 - 500 |      | Br Sa(y) Si Some Gr Num Cob Wet                       |       |    |
|           |      |  |       |    | 500       |      | NFP BR  |       |    |
| 20+570.   | 33.0 | Lt C/L   | D+0.3 | TP | 20+630.   | 19.0 | Lt C/L  | D+0.2 | HA |
| 0 - 400   |      | Dk Br/Br Si Tps W Wd Pieces W Roots Moist          |       |    | 0 - 300   |      | Dk Br/Blk Si Tps W Roots Moist                        |       |    |
| 400 - 900 |      | Br/Gry Si Tr Gr Tr Sa Tr Cl Occ Cob Occ Blds Moist |       |    | 300       |      | NFP BR  |       |    |
| 900       |      | NFP BR   |       |    | 20+630.   | 33.0 | Lt C/L  | D+0.9 | TP |
| 20+590.   | 7.0  | Lt C/L   | D+0.7 | HA | 0 - 400   |      | Dk Br/Br Sa(y) Si Tps W Gr Occ Cob W Roots Moist      |       |    |
| 0         |      | NFP BR   |       |    | 400 - 1.1 |      | Br/Lt Br Si W Gr Tr Sa Occ Cob Occ Blds Moist         |       |    |
| 20+590.   | 19.0 | Lt C/L   | D-0.4 | TP | 1.1 - 2.1 |      | Dk Br/Br Gr W Sa Some Si Tr Cl Num Cob Num Blds Moist |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                     |       |    | 2.1       |      | NFP BR  |       |    |
| 200 - 1.7 |      | Br/Gry Cl(y) Si Occ Cob Occ Blds Moist             |       |    | 20+630.   | 38.0 | Lt C/L  | D+1.6 | TP |
| 1.7 - 1.9 |      | Gry/Br Sa And Gr Tr Si Moist                       |       |    | 0 - 300   |      | Dk Br/Br Sa(y) Si Tps W Gr Occ Cob W Roots Moist      |       |    |
| 1.9       |      | NFP BR   |       |    | 300 - 1.2 |      | Br/Lt Br Si W Gr Tr Sa Occ Cob Occ Blds Moist         |       |    |
| 20+590.   | 33.0 | Lt C/L   | D-0.1 | HA | 1.2 - 2.3 |      | Dk Br/Br Gr W Sa Some Si Tr Cl Num Blds Moist         |       |    |
| 0 - 300   |      | Dk Br/Blk Si Tps W Roots Moist                     |       |    | 2.3       |      | NFP BR  |       |    |
| 300       |      | NFP BR   |       |    | 20+650.   | 7.0  | Lt C/L  | D+0.3 | HA |
| 20+610.   | 7.0  | Lt C/L   | D+0.9 | HA | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                        |       |    |
| 0         |      | NFP BR   |       |    | 200       |      | NFP BR  |       |    |
| 20+610.   | 19.0 | Lt C/L   | D+0.3 | TP | 20+650.   | 19.0 | Lt C/L  | D+1.1 | HA |
| 0 - 400   |      | Dk Br/Lt Br Sa(y) Si Tps Tr Gr W Roots Moist       |       |    | 0         |      | NFP BR  |       |    |
| 400 - 1.7 |      | Gry/Br Si W Gr Tr Sa Tr Cl Occ Cob Moist           |       |    | 20+650.   | 33.0 | Lt C/L  | D+2.4 | HA |
| 1.7 - 2.2 |      | Dk Br/Br Gr And Sa Tr Si Num Cob Occ Blds Moist    |       |    | 0 - 150   |      | Dk Br Si Tps Moist                                    |       |    |
| 2.2       |      | NFP BR   |       |    | 150       |      | NFP BR  |       |    |



**Proposed Hwy 69 NBL, Mowat Twp., 20+001 to 21+000**  
**DATUM: Proposed Centreline Median**

|           |      |  |       |    |           |      |  |       |    |
|-----------|------|--|-------|----|-----------|------|--|-------|----|
| 20+290.   | 33.0 | Rt C/L   | D-1.0 | TP | 20+330.   | 19.0 | Rt C/L                                 | D+0.1 | TP |
| 0 - 300   |      | Dk Br/Blk Sa(y) Si Tps Tr Gr Num Cob W Roots Moist |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist         |       |    |
| 300 - 700 |      | Br/Gry F Sa Tr Si Tr Cl Num Cob Moist              |       |    | 200 - 700 |      | Br/Gry F Sa Tr Gr Tr Si Moist          |       |    |
| 700 - 1.8 |      | Gry/Br Si Tr Cl Num Cob Occ Blds Moist             |       |    | 700 - 1.5 |      | Br/Gry Si Tr Cl Num Cob Occ Blds Moist |       |    |
| 1.8       |      | NFP BR   |       |    | 1.5       |      | NFP BR                                 |       |    |
| 20+290.   | 38.0 | Rt C/L   | D-1.2 | TP | 20+330.   | 33.0 | Rt C/L                                 | D-0.3 | TP |
| 0 - 200   |      | Dk Br/Blk Sa(y) Si Tps Tr Gr Num Cob W Roots Moist |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist         |       |    |
| 200 - 600 |      | Br/Gry F Sa Tr Si Tr Gr Num Cob Moist              |       |    | 200 - 1.1 |      | Br/Gry Si Tr Cl Moist                  |       |    |
| 600 - 1.5 |      | Gry/Br Si Tr Cl Num Cob Occ Blds Moist             |       |    | 1.1 - 4.9 |      | Gry/Br Cl(y) Si Moist                  |       |    |
| 1.5       |      | NFP BR   |       |    | 4.9       |      | NFP BR                                 |       |    |
| 20+310.   | 7.0  | Rt C/L   | D-0.1 | TP | 20+330.   | 38.0 | Rt C/L                                 | D-0.6 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                     |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist         |       |    |
| 200 - 800 |      | Br/Gry Si Tr Cl Moist                              |       |    | 200 - 1.0 |      | Br/Gry Si Tr Cl Moist                  |       |    |
| 800 - 4.1 |      | Gry/Br Cl(y) Si Tr Sa Occ Cob Moist                |       |    | 1.0 - 4.7 |      | Gry/Br Cl(y) Si Moist                  |       |    |
| 4.1       |      | NFP BR   |       |    | 4.7       |      | NFP BR                                 |       |    |
| 20+310.   | 19.0 | Rt C/L   | D-0.1 | TP | 20+350.   | 7.0  | Rt C/L                                 | D+0.1 | TP |
| 0 - 300   |      | Dk Br/Blk Si Tps W Roots Moist                     |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist         |       |    |
| 300 - 1.3 |      | Br/Gry Si Tr Cl Num Cob Occ Blds Moist             |       |    | 200 - 600 |      | Br/Gry F Sa Tr Gr Tr Si Moist          |       |    |
| 1.3       |      | NFP BR   |       |    | 600 - 3.2 |      | Gry/Br Cl(y) Si Moist                  |       |    |
| 20+310.   | 33.0 | Rt C/L   | D-0.1 | TP | 3.2 - 4.5 |      | Dk Gry/Lt Br Si(y) Cl Moist            |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                     |       |    | 4.5       |      | NFP BR                                 |       |    |
| 200 - 1.3 |      | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist             |       |    | 20+350.   | 19.0 | Rt C/L                                 | D-0.1 | TP |
| 1.3 - 2.8 |      | Gry/Br Cl(y) Si Tr Sa Moist                        |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist         |       |    |
| 2.8       |      | NFP BR   |       |    | 200 - 500 |      | Br/Gry F Sa Tr Gr Tr Si Moist          |       |    |
| 20+310.   | 38.0 | Rt C/L   | D-0.2 | TP | 500 - 3.3 |      | Gry/Br Cl(y) Si Occ Blds Moist         |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                     |       |    | 3.3 - 5.4 |      | Dk Gry/Lt Br Si(y) Cl Moist            |       |    |
| 200 - 1.4 |      | Br/Gry Si Tr Cl Occ Cob Moist                      |       |    | 5.4       |      | NFP BR                                 |       |    |
| 1.4 - 3.0 |      | Gry/Br Cl(y) Si Tr Sa Moist                        |       |    | 20+350.   | 33.0 | Rt C/L                                 | D+/-0 | TP |
| 3.0       |      | NFP BR   |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist         |       |    |
| 20+330.   | 7.0  | Rt C/L   | D-0.2 | TP | 200 - 800 |      | Br/Gry F Sa Tr Gr Tr Si Moist          |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                     |       |    | 800 - 4.3 |      | Gry/Br Cl(y) Si Moist                  |       |    |
| 200 - 1.8 |      | Br/Gry Si Tr Cl Num Cob Moist                      |       |    | 4.3 - 6.5 |      | Dk Gry/Lt Br Si(y) Cl Moist            |       |    |
| 1.8 - 3.6 |      | Gry/Br Cl(y) Si Moist                              |       |    |           |      |  |       |    |
| 3.6       |      | NFP BR   |       |    |           |      |  |       |    |



**Proposed Hwy 69 NBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|           |      |   |       |    |           |      |                                       |       |        |
|-----------|------|---|-------|----|-----------|------|---------------------------------------|-------|--------|
| 20+350.   | 38.0 | Rt C/L                                  | D+/-0 | TP | 20+390.   | 19.0 | Rt C/L                                | D+0.1 | CHD    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist        |       |        |
| 200 - 700 |      | Br/Gry F Sa Tr Gr Tr Si Moist           |       |    | 200 - 3.1 |      | Br/Gry Cl(y) Si Fill Tr Sa Tr Org Wet |       |        |
| 700 - 3.9 |      | Gry/Br Cl(y) Si Moist                   |       |    | 3.1 - 6.1 |      | Gry Si(y) Cl Tr Sa Wet                |       |        |
| 3.9 - 6.3 |      | Dk Gry/Lt Br Si(y) Cl Moist             |       |    | 6.1 - 6.6 |      | Gry Si(y) Cl Tr Gr Tr Sa Wet          |       |        |
|           |      | cu @ 5.5 = 50 kPa (Pocket Penetrometer) |       |    | 6.6       |      | NFP BR                                |       |        |
| 20+370.   | 7.0  | Rt C/L                                  | D-0.4 | TP |           |      | Depth                                 | USS   | RSS    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |    |           |      | 3.40-3.85                             | 28    | 7      |
| 200 - 600 |      | Br/Gry F Sa Tr Gr Tr Si Moist           |       |    | 20+390.   | 33.0 | Rt C/L                                | D+0.3 | TP     |
| 600 - 4.8 |      | Gry/Br Cl(y) Si Occ Cob Moist           |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist        |       |        |
| 4.8 - 6.0 |      | Dk Gry/Lt Br Si(y) Cl Moist             |       |    | 200 - 800 |      | Br/Gry Si Tr Cl Moist                 |       |        |
|           |      | cu @ 5.0 = 50 kPa (Pocket Penetrometer) |       |    | 800 - 3.2 |      | Gry/Br Cl(y) Si Moist                 |       |        |
| 20+370.   | 19.0 | Rt C/L                                  | D-0.1 | TP |           |      | 3.2                                   |       | NFP BR |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |    | 20+390.   | 38.0 | Rt C/L                                | D+0.4 | TP     |
| 200 - 700 |      | Br/Gry F Sa Tr Gr Tr Si Moist           |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist        |       |        |
| 700 - 3.9 |      | Gry/Br Cl(y) Si Moist                   |       |    | 200 - 700 |      | Br/Gry Si Tr Cl Moist                 |       |        |
| 3.9 - 5.3 |      | Dk Gry/Lt Br Si(y) Cl Tr Sa Moist       |       |    | 700 - 3.1 |      | Gry/Br Cl(y) Si Moist                 |       |        |
| 5.3       |      | NFP BR                                  |       |    | 3.1       |      | NFP BR                                |       |        |
| 20+370.   | 33.0 | Rt C/L                                  | D-0.3 | TP | 20+410.   | 7.0  | Rt C/L                                | D-0.1 | CHD    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist        |       |        |
| 200 - 600 |      | Br/Gry F Sa Tr Gr Tr Si Moist           |       |    | 200 - 700 |      | Br/Gry Sa Tr Gr Tr Si Moist-Wet       |       |        |
| 600 - 4.1 |      | Gry/Br Cl(y) Si Occ Cob Moist           |       |    |           |      | SP                                    |       |        |
| 4.1 - 6.3 |      | Dk Gry/Lt Br Si(y) Cl Moist             |       |    |           |      | w = 8%                                |       |        |
|           |      | cu @ 6.0 = 50 kPa (Pocket Penetrometer) |       |    |           |      | % Pass                                |       |        |
| 20+370.   | 38.0 | Rt C/L                                  | D-0.3 | TP |           |      | 4.75 mm = 97                          |       |        |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |    |           |      | 2.00 mm = 90                          |       |        |
| 200 - 500 |      | Br/Gry F Sa Tr Gr Tr Si Moist           |       |    |           |      | 425 um = 51                           |       |        |
| 500 - 4.2 |      | Gry/Br Cl(y) Si Occ Cob Moist           |       |    |           |      | 75 um = 4                             |       |        |
| 4.2 - 6.4 |      | Dk Gry/Lt Br Si(y) Cl Moist             |       |    |           |      | MWD = 2.090 t/m3                      |       |        |
| 20+390.   | 7.0  | Rt C/L                                  | D+0.1 | TP |           |      | MDD = 1.905 t/m3                      |       |        |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist          |       |    |           |      | Wopt = 10%                            |       |        |
| 200 - 600 |      | Br/Gry F Sa Tr Si Moist                 |       |    |           |      | LSFH                                  |       |        |
| 600 - 1.8 |      | Br/Gry Cl(y) Si Moist                   |       |    |           |      | K Factor = 0.05                       |       |        |
| 1.8 - 5.0 |      | Gry/Br Si(y) Cl Moist                   |       |    | 700 - 1.5 |      | Br Cl(y) Si Tr Gr Tr Sa Tr Org Wet    |       |        |
|           |      | cu @ 4.5 = 50 kPa (Pocket Penetrometer) |       |    | 1.5 - 2.3 |      | Br Si(y) Cl Tr Sa Moist               |       |        |
|           |      |   |       |    | 2.3 - 6.1 |      | Gry Si(y) Cl Tr Sa Wet                |       |        |
|           |      |   |       |    | 6.1       |      | NFP BR                                |       |        |
|           |      |   |       |    |           |      | Depth                                 | USS   | RSS    |
|           |      |   |       |    |           |      | 5.50 - 6.00                           | 52    | 13     |
|           |      |   |       |    |           |      |                                       |       | St     |
|           |      |   |       |    |           |      |                                       |       | 4      |



**Proposed Hwy 69 NBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|           |      |  |       |    |           |      |  |       |    |
|-----------|------|--|-------|----|-----------|------|--|-------|----|
| 20+410.   | 19.0 | Rt C/L                                   | D+0.1 | TP | 20+430.   | 38.0 | Rt C/L                                   | D+0.2 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    |
| 200 - 1.5 |      | Br/Gry Si Tr Sa Tr Cl Occ Cob Moist      |       |    | 200 - 1.7 |      | Br/Gry Si Tr Cl Moist                    |       |    |
| 1.5 - 3.9 |      | Gry/Br Cl(y) Si Moist                    |       |    | 1.7       |      | NFP BR                                   |       |    |
| 3.9 - 4.3 |      | Gry Cob And Blds Some Gr Tr Sa Tr Si Wet |       |    |           |      |  |       |    |
|           |      | Seepage @ 3.9                            |       |    | 20+450.   | 7.0  | Rt C/L                                   | D+/-0 | TP |
| 20+410.   | 33.0 | Rt C/L                                   | D+0.2 | TP | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    | 200 - 3.8 |      | Gry/Br Cl(y) Si Moist                    |       |    |
| 200 - 2.2 |      | Br/Gry Si Tr Cl Num Cob Occ Blds Moist   |       |    | 3.8 - 4.8 |      | Dk Gry/Lt Br Si(y) Cl Moist              |       |    |
| 2.2 - 3.4 |      | Gry/Br Cl(y) Si Moist                    |       |    | 4.8 - 5.0 |      | Gry/Blk Sa Tr Gr Tr Si Moist             |       |    |
| 3.4 - 3.7 |      | Gry/Blk Gr And Sa Tr Si Occ Cob Moist    |       |    | 5.0       |      | NFP BR                                   |       |    |
| 3.7       |      | NFP BR                                   |       |    |           |      |  |       |    |
| 20+410.   | 38.0 | Rt C/L                                   | D+0.2 | TP | 20+450.   | 19.0 | Rt C/L                                   | D+0.1 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    |
| 200 - 2.1 |      | Br/Gry Si Tr Cl Num Cob Occ Blds Moist   |       |    | 200 - 1.7 |      | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist   |       |    |
| 2.1 - 3.3 |      | Gry/Br Cl(y) Si Occ Blds Moist           |       |    | 1.7 - 4.3 |      | Gry/Br Cl(y) Si Moist                    |       |    |
| 3.3       |      | NFP BR                                   |       |    | 4.3 - 5.0 |      | Dk Gry/Lt Br Si(y) Cl Wet                |       |    |
|           |      |  |       |    |           |      | cu @ 4.5 = 50 kPa (Pocket Penetrometer)  |       |    |
| 20+430.   | 7.0  | Rt C/L                                   | D+/-0 | TP | 20+450.   | 33.0 | Rt C/L                                   | D+0.1 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    |
| 200 - 700 |      | Gry/Br F Sa Tr Si Moist                  |       |    | 200 - 1.4 |      | Br/Gry Si Tr Cl Moist                    |       |    |
| 700 - 2.1 |      | Br/Gry Si Tr Cl Moist                    |       |    | 1.4 - 4.9 |      | Gry/Br Cl(y) Si Moist                    |       |    |
| 2.1 - 4.5 |      | Dk Gry/Lt Br Si(y) Cl Moist              |       |    |           |      | cu @ 4.5 = 200 kPa (Pocket Penetrometer) |       |    |
|           |      | cu @ 4.0 = 50 kPa (Pocket Penetrometer)  |       |    | 20+450.   | 38.0 | Rt C/L                                   | D+0.1 | TP |
| 20+430.   | 19.0 | Rt C/L                                   | D+0.3 | TP | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    | 200 - 1.3 |      | Br/Gry Si Tr Cl Moist                    |       |    |
| 200 - 1.3 |      | Br/Gry Si Tr Cl Occ Cob Moist            |       |    | 1.3 - 5.1 |      | Gry/Br Cl(y) Si Occ Blds Moist           |       |    |
| 1.3 - 3.7 |      | Gry/Br Cl(y) Si Tr Sa Moist              |       |    |           |      |  |       |    |
| 3.7       |      | NFP BR                                   |       |    | 20+470.   | 7.0  | Rt C/L                                   | D+0.2 | TP |
| 20+430.   | 33.0 | Rt C/L                                   | D+/-0 | TP | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist           |       |    | 200 - 1.5 |      | Br/Gry Si Tr Cl Occ Cob Moist            |       |    |
| 200 - 1.8 |      | Br/Gry Si Tr Cl Moist                    |       |    | 1.5 - 4.1 |      | Gry/Br Cl(y) Si Occ Cob Occ Blds Moist   |       |    |
| 1.8 - 3.4 |      | Gry/Br Cl(y) Si Tr Sa Moist              |       |    | 4.1       |      | NFP BR                                   |       |    |
| 3.4       |      | NFP BR                                   |       |    | 20+470.   | 19.0 | Rt C/L                                   | D+0.4 | TP |
|           |      |  |       |    | 0 - 200   |      | Dk Br/Br Sa(y) Si Tps W Gr W Roots Moist |       |    |
|           |      |  |       |    | 200 - 1.4 |      | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist   |       |    |
|           |      |  |       |    | 1.4 - 4.2 |      | Gry/Br Cl(y) Si Occ Cob Moist            |       |    |
|           |      |  |       |    | 4.2       |      | NFP BR                                   |       |    |





**Proposed Hwy 69 NBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|         |      |  |       |    |         |        |  |       |    |
|---------|------|--|-------|----|---------|--------|--|-------|----|
| 20+470. | 33.0 | Rt C/L   | D+0.4 | TP | 20+510. | 7.0    | Rt C/L   | D+/-0 | TP |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist                 |       |    | 0 -     | 200    | Dk Br/Blk Si Tps W Roots Moist                     |       |    |
| 200 -   | 1.6  | Br/Gry Si Tr Cl Occ Cob Moist                  |       |    | 200 -   | 1.7    | Br/Gry Si Tr Cl Occ Cob Moist                      |       |    |
| 1.6 -   | 4.4  | Gry/Br Cl(y) Si Occ Blds Moist                 |       |    | 1.7 -   | 3.2    | Gry/Br Cl(y) Si Moist                              |       |    |
|         |      | cu @ 4.0 = 100 kPa (Pocket Penetrometer)       |       |    | 3.2     | NFP BR |  |       |    |
| 20+470. | 38.0 | Rt C/L   | D+0.4 | TP | 20+510. | 19.0   | Rt C/L   | D+0.1 | TP |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist                 |       |    | 0 -     | 200    | Dk Br/Blk Si Tps W Roots Moist                     |       |    |
| 200 -   | 1.8  | Br/Gry Si Tr Cl Occ Cob Moist                  |       |    | 200 -   | 1.7    | Br/Gry Si Tr Cl Num Blds Occ Cob Moist             |       |    |
| 1.8 -   | 4.4  | Gry/Br Cl(y) Si Occ Blds Moist                 |       |    | 1.7 -   | 4.1    | Gry/Br Cl(y) Si Occ Cob Moist                      |       |    |
|         |      |  |       |    | 4.1     | NFP BR |  |       |    |
| 20+490. | 7.0  | Rt C/L   | D+/-0 | TP | 20+510. | 33.0   | Rt C/L   | D+/-0 | TP |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist                 |       |    | 0 -     | 200    | Dk Br/Blk Si Tps W Roots Moist                     |       |    |
| 200 -   | 600  | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist         |       |    | 200 -   | 1.3    | Br/Gry Si Tr Cl Occ Blds Moist                     |       |    |
| 600 -   | 3.5  | Gry/Br Cl(y) Si Moist                          |       |    | 1.3 -   | 3.7    | Gry/Br Cl(y) Si Tr Gr Tr Sa Occ Cob Occ Blds Moist |       |    |
|         | 3.5  | NFP BR   |       |    | 3.7     | NFP BR |  |       |    |
| 20+490. | 19.0 | Rt C/L   | D+0.2 | TP | 20+510. | 38.0   | Rt C/L   | D+/-0 | TP |
| 0 -     | 300  | Dk Br/Blk Si Tps Occ Cob W Roots Moist         |       |    | 0 -     | 200    | Dk Br/Blk Si Tps W Roots Moist                     |       |    |
| 300 -   | 1.5  | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist         |       |    | 200 -   | 1.4    | Br/Gry Si Tr Cl Occ Blds Moist                     |       |    |
| 1.5 -   | 3.3  | Gry/Br Cl(y) Si Moist                          |       |    | 1.4 -   | 3.5    | Gry/Br Cl(y) Si Tr Gr Tr Sa Occ Cob Occ Blds Moist |       |    |
|         | 3.3  | NFP BR   |       |    | 3.5     | NFP BR |  |       |    |
| 20+490. | 33.0 | Rt C/L   | D+0.1 | TP | 20+530. | 7.0    | Rt C/L   | D+/-0 | TP |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist                 |       |    | 0 -     | 200    | Dk Br/Blk Si Tps W Roots Moist                     |       |    |
| 200 -   | 1.3  | Br/Gry Si Tr Cl Occ Cob Moist                  |       |    | 200 -   | 1.2    | Br/Gry Si Tr Cl Moist                              |       |    |
| 1.3 -   | 3.4  | Gry/Br Cl(y) Si Tr Gr Tr Sa Occ Blds Moist     |       |    | 1.2 -   | 3.8    | Gry/Br Cl(y) Si Occ Blds Moist                     |       |    |
| 3.4 -   | 4.0  | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Wet   |       |    | 3.8 -   | 4.4    | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Wet-Sat   |       |    |
|         | 4.0  | NFP BR   |       |    |         |        | Seepage @ 3.8                                      |       |    |
|         |      |  |       |    |         |        | Fr Wat @ 4.0                                       |       |    |
| 20+490. | 38.0 | Rt C/L   | D+0.3 | TP | 20+530. | 19.0   | Rt C/L   | D-0.1 | TP |
| 0 -     | 200  | Dk Br/Blk Si Tps W Roots Moist                 |       |    | 0 -     | 300    | Dk Br/Blk Si Tps Num Cob W Roots Moist             |       |    |
| 200 -   | 1.4  | Br/Gry Si Tr Cl Occ Cob Moist                  |       |    | 300 -   | 1.2    | Br/Gry Si Tr Cl Occ Cob Moist                      |       |    |
| 1.4 -   | 3.2  | Gry/Br Cl(y) Si Tr Gr Tr Sa Occ Blds Moist     |       |    | 1.2 -   | 2.2    | Gry/Br Cl(y) Si Tr Sa Moist                        |       |    |
| 3.2 -   | 3.8  | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Moist |       |    | 2.2 -   | 2.6    | Gry/Br Sa And Gr Tr Si Occ Cob Moist               |       |    |
|         | 3.8  | NFP BR   |       |    | 2.6     | NFP BR |  |       |    |



**Proposed Hwy 69 NBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|           |      |        |       |  |           |      |        |       |  |
|-----------|------|--------|-------|--|-----------|------|--------|-------|--|
| 20+530.   | 33.0 | Rt C/L | D-0.1 | TP   | 20+570.   | 7.0  | Rt C/L | D-0.2 | TP   |
| 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                     | 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                   |
| 200 - 1.4 |      |        |       | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist             | 200 - 1.5 |      |        |       | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist           |
| 1.4 - 3.4 |      |        |       | Gry/Br Cl(y) Si Tr Gr Tr Sa Occ Cob Occ Blds Moist | 1.5       |      |        |       | NFP BR   |
| 3.4       |      |        |       | NFP BR   |           |      |        |       |  |
| 20+530.   | 38.0 | Rt C/L | D-0.1 | TP   | 20+570.   | 19.0 | Rt C/L | D+/-0 | TP   |
| 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                     | 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                   |
| 200 - 1.5 |      |        |       | Br/Gry Si Tr Cl Occ Cob Moist                      | 200 - 700 |      |        |       | Br/Gry Si Tr Cl Moist                            |
| 1.5 - 3.5 |      |        |       | Gry/Br Cl(y) Si Tr Gr Tr Sa Occ Cob Occ Blds Moist | 700 - 2.6 |      |        |       | Gry/Br Cl(y) Si Occ Cob Moist                    |
| 3.5       |      |        |       | NFP BR   | 2.6 - 4.0 |      |        |       | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Wet-Sat |
|           |      |        |       |  |           |      |        |       | Seepage @ 2.7                                    |
|           |      |        |       |  |           |      |        |       | Fr Wat @ 3.5                                     |
| 20+550.   | 7.0  | Rt C/L | D+0.1 | TP   | 20+570.   | 33.0 | Rt C/L | D+/-0 | TP   |
| 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                     | 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                   |
| 200 - 1.4 |      |        |       | Br/Gry Si Tr Cl Moist                              | 200 - 1.2 |      |        |       | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist           |
| 1.4 - 3.0 |      |        |       | Gry/Br Cl(y) Si Occ Cob Occ Blds Moist             | 1.2       |      |        |       | NFP BR   |
| 3.0 - 3.4 |      |        |       | Gry/Blk Gr And Sa Tr Si Num Cob Occ Blds Wet-Sat   |           |      |        |       |  |
|           |      |        |       | Seepage @ 3.1                                      | 20+570.   | 38.0 | Rt C/L | D+/-0 | TP   |
|           |      |        |       | Fr Wat @ 3.3                                       | 0 - 400   |      |        |       | Blds   |
| 20+550.   | 19.0 | Rt C/L | D+/-0 | TP   | 400 - 600 |      |        |       | Dk Br/Blk Si Tps W Roots Moist                   |
| 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                     | 600       |      |        |       | NFP BR   |
| 200 - 1.2 |      |        |       | Br/Gry Si Tr Cl Occ Blds Moist                     |           |      |        |       |  |
| 1.2 - 3.4 |      |        |       | Gry/Br Cl(y) Si Occ Cob Moist                      | 20+590.   | 7.0  | Rt C/L | D-0.2 | TP   |
| 3.4 - 4.1 |      |        |       | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Wet       | 0 - 500   |      |        |       | Dk Br/Br Sa(y) Si Tps W Gr Num Cob W Roots Moist |
| 4.1       |      |        |       | NFP BR   | 500       |      |        |       | NFP BR   |
| 20+550.   | 33.0 | Rt C/L | D+/-0 | TP   | 20+590.   | 19.0 | Rt C/L | D-0.4 | TP   |
| 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                     | 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                   |
| 200 - 1.1 |      |        |       | Br/Gry Si Tr Cl Num Cob Occ Blds Moist             | 200 - 1.2 |      |        |       | Br/Gry Si Tr Cl Moist                            |
| 1.1 - 1.8 |      |        |       | Gry/Br Cl(y) Si Occ Blds Moist                     | 1.2 - 3.3 |      |        |       | Gry/Br Cl(y) Si Occ Cob Occ Blds Moist           |
| 1.8       |      |        |       | NFP BR   | 3.3 - 4.1 |      |        |       | Gry/Blk Sa And Gr Tr Si Num Cob Num Blds Wet-Sat |
| 20+550.   | 38.0 | Rt C/L | D+0.1 | TP   | 4.1       |      |        |       | NFP BR   |
| 0 - 200   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                     |           |      |        |       | Seepage @ 3.5                                    |
| 200 - 1.0 |      |        |       | Br/Gry Si Tr Cl Num Cob Occ Blds Moist             |           |      |        |       | Fr Wat @ 4.0                                     |
| 1.0 - 1.5 |      |        |       | Gry/Br Cl(y) Si Occ Blds Moist                     | 20+590.   | 33.0 | Rt C/L | D-0.2 | TP   |
| 1.5       |      |        |       | NFP BR   | 0 - 100   |      |        |       | Dk Br/Blk Si Tps W Roots Moist                   |
|           |      |        |       |  | 100 - 500 |      |        |       | Dk Br/Blk Blds Tr Si Moist                       |
|           |      |        |       |  | 500       |      |        |       | NFP BR   |



**Proposed Hwy 69 NBL, Mowat Twp., 20+001 to 21+000**

**DATUM: Proposed Centreline Median**

|           |      |  |       |    |           |      |  |       |    |
|-----------|------|--|-------|----|-----------|------|--|-------|----|
| 20+610.   | 7.0  | Rt C/L   | D-0.2 | TP | 20+630.   | 33.0 | Rt C/L   | D-0.2 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                   |       |    |
| 200 - 1.5 |      | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist         |       |    | 200 - 1.8 |      | Br/Gry Si Tr Cl Num Cob Occ Blds Moist           |       |    |
| 1.5 - 1.9 |      | Gry/Blk Gr And Sa Tr Si Num Cob Occ Blds Moist |       |    | 1.8 - 3.1 |      | Gry/Br Cl(y) Si Occ Cob Occ Blds Moist           |       |    |
|           | 1.9  | NFP BR   |       |    | 3.1 - 4.0 |      | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Wet-Sat |       |    |
|           |      |  |       |    |           |      | Seepage @ 3.2                                    |       |    |
|           |      |  |       |    |           |      | Fr Wat @ 3.7                                     |       |    |
| 20+610.   | 19.0 | Rt C/L   | D-0.5 | TP | 20+630.   | 38.0 | Rt C/L   | D-0.2 | TP |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    | 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                   |       |    |
| 200 - 1.7 |      | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist         |       |    | 200 - 1.7 |      | Br/Gry Si Tr Cl Num Cob Occ Blds Moist           |       |    |
| 1.7 - 3.9 |      | Gry/Br Cl(y) Si Occ Blds Moist                 |       |    | 1.7 - 3.0 |      | Gry/Br Cl(y) Si Occ Cob Occ Blds Moist           |       |    |
| 3.9 - 4.0 |      | Gry/Blk Gr And Sa Tr Si Wet                    |       |    | 3.0 - 3.8 |      | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Wet-Sat |       |    |
|           |      | Seepage @ 4.0                                  |       |    |           |      | Seepage @ 3.2                                    |       |    |
|           |      |  |       |    |           |      | Fr Wat @ 3.7                                     |       |    |
| 20+610.   | 33.0 | Rt C/L   | D-0.4 | TP |           |      |  |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |           |      |  |       |    |
| 200 - 1.4 |      | Br/Gry Si Tr Cl Num Blds Occ Cob Moist         |       |    |           |      |  |       |    |
|           | 1.4  | NFP BR   |       |    |           |      |  |       |    |
| 20+610.   | 38.0 | Rt C/L   | D-0.3 | TP |           |      |  |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |           |      |  |       |    |
| 200 - 1.2 |      | Gry/Br Si Tr Cl Num Blds Occ Cob Moist         |       |    |           |      |  |       |    |
|           | 1.2  | NFP BR   |       |    |           |      |  |       |    |
| 20+630.   | 7.0  | Rt C/L   | D-0.1 | TP |           |      |  |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |           |      |  |       |    |
| 200 - 1.5 |      | Br/Gry Si Tr Cl Occ Cob Moist                  |       |    |           |      |  |       |    |
| 1.5 - 2.7 |      | Gry/Br Cl(y) Si Occ Cob Moist                  |       |    |           |      |  |       |    |
|           | 2.7  | NFP BR   |       |    |           |      |  |       |    |
| 20+630.   | 19.0 | Rt C/L   | D-0.1 | TP |           |      |  |       |    |
| 0 - 200   |      | Dk Br/Blk Si Tps W Roots Moist                 |       |    |           |      |  |       |    |
| 200 - 1.7 |      | Br/Gry Si Tr Cl Occ Cob Occ Blds Moist         |       |    |           |      |  |       |    |
| 1.7 - 2.9 |      | Gry/Br Cl(y) Si Moist                          |       |    |           |      |  |       |    |
| 2.9 - 3.8 |      | Gry/Blk Gr And Sa Tr Si Num Cob Num Blds Wet   |       |    |           |      |  |       |    |
|           |      | Seepage @ 3.0                                  |       |    |           |      |  |       |    |