### **EXPLANATION OF FIELD AND** TREK **LABORATORY TESTING** GEOTECHNICAL 1. Classifications are based on the United Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate. 2. Descriptions on these test hole logs apply only at the specific test hole locations and at the time the test holes were drilled. Variability of soil and groundwater conditions may exist between test hole locations. 3. When the following classification terms are used in this report or test hole logs, the primary and secondary soil fractions may be visually estimated. Laboratory Classification Criteria Well-graded gravels, gravel-sand Poorly-graded gravels, gravel-sand Not meeting all gradation requirements for GW Atterberg limits below "A" line or P.I. less than 4 Silty gravels, gravel-sand-silt Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of Clayey gravels, gravel-sand-silt dual symbols Poorly-graded sands, gravelly Not meeting all gradation requirements for SW Silty sands, sand-silt mixtures Above "A" line with P.I. line or P.I. less than 4 line cases requiring use of Atterberg limits above "A" line or P.I. greater than 7 dual symbols Clayey sands, sand-clay mixtures Inorganic silts and very fine sands, Plasticity Chart rock floor, silty or clayey fine sands or clayey silts with slight plasticity Inorganic clays of low to medium plasticity, gravelly clays, sandy Organic silts and organic silty distomaceous fine sandy or silty Organic clays of medium to high plasticity, organic silts Peat and other highly organic soils Von Post Classification Limit \* Borderline classifications used for soils possessing characteristics of two groups are designated by combinations of groups symbols. For example; GW-GC, well-graded gravel-sand mixture with clay binder. Other Symbol Types Bedrock (undifferentiated) Concrete Boulders and Cobbles Limestone Bedrock Silt Till Cemented Shale Clay Till Non-Cemented Shale



## **EXPLANATION OF FIELD AND LABORATORY TESTING**

#### **LEGEND OF ABBREVIATIONS AND SYMBOLS**

**LL** - Liquid Limit (%) - Plastic Limit (%) ▼ Water Level at End of Drilling Plasticity Index (%) MC - Moisture Content (%) Water Level After Drilling as Indicated on Test Hole Logs SPT - Standard Penetration Test

RQD- Rock Quality Designation Qu - Unconfined Compression - Undrained Shear Strength VW - Vibrating Wire Piezometer Slope Inclinometer

### FRACTION OF SECONDARY SOIL CONSTITUENTS ARE BASED ON THE FOLLOWING TERMINOLOGY

TERM	EXAMPLES	PERCENTAGE		
and	and CLAY	35 to 50 percent		
"y" or "ey"	clayey, silty	20 to 35 percent		
some	some silt	10 to 20 percent		
trace	trace gravel	1 to 10 percent		

#### TERMS DESCRIBING CONSISTENCY OR COMPACTION CONDITION

The Standard Penetration Test blow count (N) of a non-cohesive soil can be related to compactness condition as follows:

Descriptive Terms	SPT (N) (Blows/300 m
Very loose	< 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	> 50

The Standard Penetration Test blow count (N) of a cohesive soil can be related to its consistency as follows:

<b>Descriptive Terms</b>	<u>SPT (N) (Blows/300 mm)</u>		
Very soft	< 2		
Soft	2 to 4		
Firm	4 to 8		
Stiff	8 to 15		
Very stiff	15 to 30		
Hard	> 30		

The undrained shear strength (Su) of a cohesive soil can be related to its consistency as follows:

Descriptive Terms	Undrained Shear <u>Strength (</u> kPa)
Very soft	< 12
Soft	12 to 25
Firm	25 to 50
Stiff	50 to 100
Very stiff	100 to 200
Hard	> 200



### **EXPLANATION OF ROCK CLASSIFICATION**

(Canadian Foundation Engineering Manual, 4<sup>th</sup> Edition, 2006)

Grade*	Term	Uniaxial Comp. Strength (MPa)	Point Load Index (MPa)	Field Estimate of Strength	Examples
R6	Extremely strong	>250	>10	Specimen can only be chipped with a geological hammer	Fresh basalt, chert, diabase, gneiss, granite, quartzite
R5	Very strong	100-250 4-10		Specimen requires many blows of a geological hammer to fracture it	Amphibolite, sandstone, basalt, gabbro, gneiss, granodiorite, peridotite, rhyolite, tuff
R4	Strong	50-100	2-4	Specimen requires more than one blow of a geological hammer to fracture it	Limestone, marble, sandstone, schist
R3	Medium Strong	25-50	1-2	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow from a geological hammer	Concrete, phyllite, schist, siltstone
R2	Weak	5-25	***	Can be peeled with a pocket knife with difficulty, shallow indentation made by a firm blow with the point of a geological hammer	Chalk, claystone, potash, marl, siltstone, shale, rocksalt
R1	Very weak	1-5	***	Crumbles under firm blows with point of a geological hammer, can be peeled with a pocket knife	Highly weathered or altered rock, shale
R0	Extremely weak	0.25-1	***	Indented by thumbnail	Stiff fault gouge

- Grade according to ISRM (1981).
- All rock types exhibit a broad range of uniaxial comprehensive strengths reflecting heterogeneity in composition and anisotropy in structure. Strong rocks are characterized by well-interlocked crystal fabric and few voids.
- Rocks with a uniaxial compressive strength below 25 MPa are likely to yield highly ambiguous results under point load testing.

November 12, 2014 TREK Geotechnical Inc.

## NOTES:

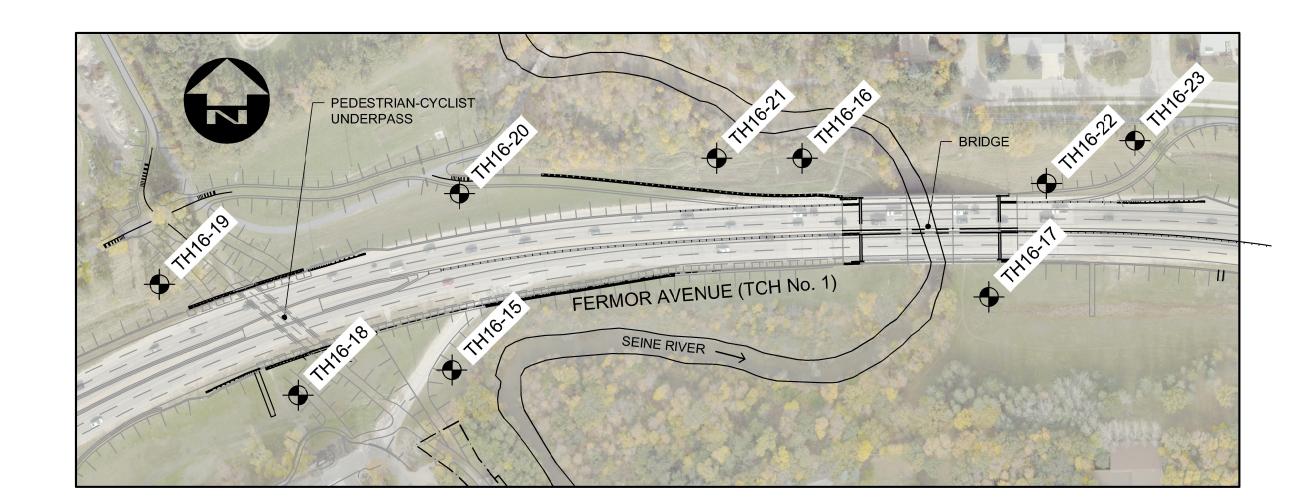
1. THE TEST HOLE LOGS PROVIDED FOR THIS PROJECT HAVE BEEN COMPILED FOR DESIGN PURPOSES ONLY. WHILE IT IS BELIEVED TO CORRECTLY REPRODUCE OR SUMMARIZE OBSERVATIONS MADE DURING TESTING, THE INFORMATION IS VALID ONLY FOR THE PRECISE LOCATION SHOWN AND IS NOT TO BE CONSTRUED AS GUARANTEEING THE ACTUAL ABSENCE OR EXTENT OF BOULDERS, HARD OR SOFT FORMATIONS, WATER TABLES, ARTESIAN CONDITIONS AND OTHER VARIABLES. IT IS THE RESPONSIBILITY OF OTHERS USING THIS INFORMATION TO ENSURE THAT IT IS ADEQUATE FOR THEIR PURPOSES OR TO SUPPLEMENT IT WITH ADDITIONAL INFORMATION.

Page 1 of 1

- 2. ADDITIONAL INFORMATION IS AVAILABLE IN THE GOETECHNICAL REPORT AND IN CASE OF DISCREPANCY, THE GEOTECHNICAL REPORT
- 3. AN EXPLANATION OF FIELD AND LABORATORY TESTING PERTAINING TO THE INFORMATION PROVIDED ON THE TEST HOLE LOGS IS INCLUDED IN THE GEOTECHNICAL REPORT.

### DISCLAIMER NOTE:

THE GEOTECHNICAL INFORMATION PROVIDED ON THE LOGS ARE IN ACCORDANCE WITH CURRENT ENGINEERING PRINCIPLES AND PRACTICES (STANDARD OF PRACTICE). SOIL CONDITIONS ARE NATURAL DEPOSITS THAT CAN BE HIGHLY VARIABLE ACROSS A SITE AND MAY VARY BETWEEN TEST HOLES.



**KEY PLAN** 

	AP	EGM
Certifi	cate of A	uthorization
Dillon Co	nsulting	Limited (MB)
No. 1789	Date: _	2018/02/09

					''''			ENGINEER'S SEAL
						LON		
				DESIGNED BY		CHECKED BY	SSR	
				DRAWN BY	NBG	APPROVED BY	MBL	
				HOR. SCALE	AS SHOWN	RELEASED FOR CONSTRUCTION		
0	ISSUED FOR TENDER	18/02/09	DRA	VERTICAL	AS SHOWN	CONSTRUCTION		CONSULTANT PROJECT NUMBER
NO.	REVISIONS	DATE	BY	DATE	2018/02/09	DATE		17-5932



# THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT

1 0		
FERMOR AVENUE BRIDGE OVER SEINE RIVER	CITY DRAWING NUMBER B-118-2017-CS-004	
RIDGE REHABILITATION, PEDESTRIAN-CYCLIST UNDERPASS STRUCTURE AND ROADWORKS FROM ST. ANNE'S ROAD TO ARCHIBALD STREET	SHEET OF 100	
BORE HOLE 1 OF 6	consultant drawing number  CS - 004	