ISO A1 - 594mm x 841mm

EXPLANATION OF FIELD AND LABORATORY TESTING

GENERAL NOTES

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.

Major Divisions		USCS Classification	Symbols	Typical Names	Laboratory Classification Criteria		
Coarse Grained Soils (More than half the material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than 5 mm)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain size curve, depending on which percentage is larger, the soil is classified as follows: Less than 5 percent ..... GW, GP, SW, SP. More than 12 percent ..... GM, GC, SM, SC. 5 to 12 percent ..... Borderline cases requiring dual symbols*	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
		GP		Poorly-graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		GM		Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
		GC		Clayey gravels, gravel-sand-silt mixtures		Atterberg limits above "A" line or P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than 5 mm)	SW		Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
		SP		Poorly-graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		SM		Silty sands, sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
		SC		Clayey sands, sand-clay mixtures		Atterberg limits above "A" line or P.I. greater than 7	
Fine Grained Soils (More than half the material is smaller than No. 200 sieve size)	Silts and Clays (Liquid limit less than 50)	ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	Plasticity Chart		
		CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
		OL		Organic silts and organic silty clays of low plasticity			
	Silts and Clays (Liquid limit greater than 50)	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, organic silts			
		CH		Inorganic clays of high plasticity, fat clays			
		OH		Organic clays of medium to high plasticity, organic silts			
Highly Organic Soils		Pt		Peat and other highly organic soils	Von Post Classification Limit	Strong colour or odour, and often fibrous texture	

Particle Size Chart (ASTM Sieve Sizes): Boulders > 300 mm; Cobbles 75 to 300 mm; Gravel — Coarse 19 to 75 mm, Medium 4.75 to 19 mm, Fine 2.00 to 4.75 mm; Sand — Coarse 0.425 to 2.00 mm, Medium 0.075 to 0.425 mm, Fine < 0.075 mm; Silt or Clay < 0.075 mm.

Material Chart (ASTM Sieve Sizes): Boulders > 300 mm; Cobbles 75 to 300 mm; Gravel — Coarse 19 to 75 mm, Fine 4.75 to 19 mm; Sand — Coarse 2.00 to 4.75 mm, Medium 0.425 to 2.00 mm, Fine 0.075 to 0.425 mm; Silt or Clay < 0.075 mm.

* 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

Asphalt	Bedrock (undifferentiated)	Cobbles
Concrete	Limestone Bedrock	Boulders and Cobbles
Fill	Cemented Shale	Silt Till
	Non-Cemented Shale	Clay Till

Sub-Surface Log — Test Hole TH19-14 (1 of 3)

Client: Morrison Hershfield
Project Name: Sherwin Road Bridge Over Omands Creek
Contractor: TREK Geotechnical
Method: 125mm Solid Stem Auger / HQ Coring, Acker MP8 Truck Mount
Project Number: 0035-079-00
Location: UTM N-5530379, E-628408
Ground Elevation: 235.10 m
Date Drilled: September 11, 2019

Sample Type: Grab (G), Shelby Tube (T), Split Spoon (SS), Split Barrel (SB), Core (C)
Particle Size Legend: Fines, Clay, Silt, Sand, Gravel, Cobbles, Boulders
Backfill Legend: Bentonite, Cement, Drill Cuttings, Filter Pack Sand, Grout, Slough

Elevation (m)	Depth (m)	MATERIAL DESCRIPTION	Sample Number	RQD (%)	SPT (N)
235.10	0.0	ASPHALT (35 mm thick)			
234.95	0.15	CONCRETE (200 mm thick)			
	0.5	CLAY (FILL) - trace sand, trace silt inclusions (diam. < 10 mm), trace gravel (diam. < 25 mm) - brownish grey - moist, firm to stiff - high plasticity	G131		
	1.0		G132		
	1.5		G133		
	2.0		G134		
	2.5		T135		
	3.0		G136		
	3.5	- grey below 2.9 m.	G137		
	4.0		G138		
231.3	4.0	CLAY - silty, trace gravel (diam. < 30 mm) - brown - moist, firm to stiff - high plasticity	G139		
	5.0		T140		
230.1	5.0	TRANSITION ZONE BELOW 5.0 m.	G141		
229.3	5.5	SILT (TILL) - trace clay, trace gravel - brownish grey - moist, firm to stiff - intermediate plasticity	G142		
	6.5		SS143	16	
	7.0		G144		
	7.5	- reddish brown below 7.3 m.	G145		
	8.0	- brownish grey below 8.2 m.	G146		
	9.5		SS147	39	

Logged By: Jashan Bhullar Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

Sub-Surface Log — Test Hole TH19-14 (2 of 3)

Elevation (m)	Depth (m)	MATERIAL DESCRIPTION	Sample Number	RQD (%)	SPT (N)
	10.5		G148		
222.9	12.2	SAND (TILL) - trace silt, trace clay - brown - moist, very dense becoming dense with depth - no to low plasticity - granite and limestone coubles and boulders below 12.5 m.	SS149	50 / 128mm	
	15.5		SS151	68	
	18.5		SS152	41	
215.9	19.0	DOLOMITE (Red River formation, Upper Fort Garry) - chert nodules, calcareous - cream to light grey, hard, R3-R4 - brecciated, vuggy	C153		
	20.5		C154	23	
	22.0	- vuggy layers, horizontal fractures and fractures at 60 degrees to	C155	30	

Logged By: Jashan Bhullar Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

Sub-Surface Log — Test Hole TH19-14 (3 of 3)

Elevation (m)	Depth (m)	MATERIAL DESCRIPTION	Sample Number	RQD (%)
	22.5	the core axis below 22.1 m.		
	23.0	- cherty dolomite and minor subhorizontal fractures below 22.95 m.	C156	66
	24.5		C157	86
209.6	25.0	- dolomite with subhorizontal thin clay seams at 25.05 m. - white to pink, hard and minor vugs below 25.2 m.		

END OF TEST HOLE AT 25.4 m IN DOLOMITE BEDROCK.
Notes:
1) No seepage observed.
2) No sloughing observed.
3) Switched to HWT casing and HQ coring below 12.6 m.
4) SP19-14 installed in TH19-14A located approx. 1 m South-west of the test hole.
5) Test hole backfilled with bentonite chips and auger cuttings.
6) Test hole top sealed with asphalt cold patch.

Logged By: Jashan Bhullar Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

Sub-Surface Log — Test Hole TH19-15 (1 of 2)

Client: Morrison Hershfield
Project Name: Sherwin Road Bridge Over Omands Creek
Contractor: TREK Geotechnical Inc.
Method: 125 mm Solid Stem Augers / HQ Coring, Acker Renegade Track Mount
Project Number: 0035-079-00
Location: UTM N-5530379, E-628408
Ground Elevation: 235.05 m
Date Drilled: September 6, 2019

Elevation (m)	Depth (m)	MATERIAL DESCRIPTION	Sample Number	RQD (%)	SPT (N)
235.05	0.0	ASPHALT (30 mm thick)			
234.85	0.2	CONCRETE (210 mm thick)	G98		
	0.5	CLAY (FILL) - silty, trace sand, trace gravel (diam. < 25 mm) - dark brown to grey - moist, stiff - high plasticity	G99		
			G100		
	1.0		G101		
			G102		
233.5	1.5	CLAY - silty, trace silt inclusions (diam. < 5 mm), trace sand, trace gravel (diam. < 20 mm) - dark brown - moist, stiff - high plasticity	G103		
	2.0		G104		
232.3	2.5				
	3.0	- TRANSITION ZONE BELOW 2.7 m.	G105		
231.4	3.5		T106	22.8	
	4.0	SILT (TILL) - trace to some clay, trace sand, trace gravel (diam. < 30 mm) - light brown - moist, compact - low plasticity - trace clay below 4.6 m.	G107		
	4.5		G108		
	5.0		SS109	11	
	6.0		G110		
	6.5	- compact to dense below 6.0 m.	SS111	12	
	7.5		G112		
	8.0		SS113	16	
	9.0		G114		
	9.5		SS115	15	

Logged By: Jashan Bhullar Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

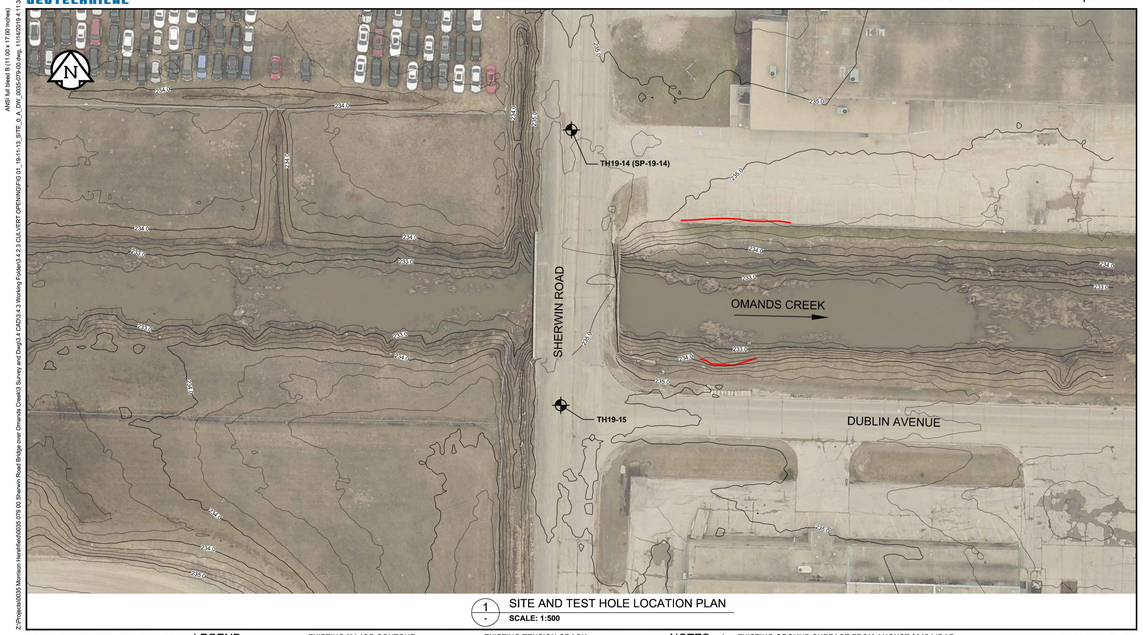
Sub-Surface Log — Test Hole TH19-15 (2 of 2)

Elevation (m)	Depth (m)	MATERIAL DESCRIPTION	Sample Number	RQD (%)	SPT (N)
	0.5	- compact below 10.7 m.	G116		
	1.0		SS117		17
	2.0		G118		
	2.5		SS119		15
	3.5		G120		
	4.0	- no clay, no plasticity and very dense below 13.7 m. - trace limestone gravel at 13.7 m.	SS121		53
	5.0		G122		
219.8	5.5	SANDY SILT (TILL) - brown - damp, very dense - no to low plasticity	SS123		68
218.6	6.5	SANDY SILT - trace gravel - light brown - wet, very dense - no plasticity	G124		
			SS125		105
216.8	8.0		G126		
	8.5	SAND (TILL) - silty, trace gravel - brown - moist, very dense - no plasticity	SS127		142 / 24mm
			C128		
215.2	20.0	SAND - poorly graded, fine grained, trace to some gravel, brown, wet, very loose, no plasticity - limestone cobble at 20.3 m.	SS129		51 / 37mm
214.6			C130		

END OF TEST HOLE AT 20.5 m IN SAND.
Notes:
1) Power auger refusal at 18.4 m in SAND (TILL).
2) Switched to HWT casing and HQ coring below 18.4 m.
3) Seepage observed at 15.0 m in SILT (TILL) and below 16.5 m in SANDY SILT.
3) No sloughing observed.
4) Test hole backfilled with bentonite chips and auger cuttings.
5) Test hole top sealed with asphalt cold patch.

Logged By: Jashan Bhullar Reviewed By: Nelson Ferreira Project Engineer: Michael Van Helden

0035 079 00
Morrison Hershfield
Sherwin Road over Omands Creek Culvert Replacement



1 SITE AND TEST HOLE LOCATION PLAN
SCALE: 1:500

SCALE = 1 : 500 (279mm x 432mm)

LEGEND: EXISTING MAJOR CONTOUR; EXISTING MINOR CONTOUR; TEST HOLES (TREK, 2019); EXISTING TENSION CRACK

NOTES: 1. EXISTING GROUND SURFACE FROM AUGUST 2015 LIDAR 2. CONTOUR INTERVAL 0.25m to 1.00m

FIGURE 01
SITE AND TEST HOLE LOCATION PLAN
TENDER No. 24-2020

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
MORRISON HERSHFIELD
No. 1736

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

LOCATION APPROVED
UNDERGROUND STRUCTURES
SUPR. U/G STRUCTURES COMMITTEE DATE

NOTE:
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

BM 23-018
ELEV 235.300 m
S.E. Cor. Notre Dame Ave. & Sherwin Rd., Tblt. in W. Conc. foundation No. 2070 Notre Dame Ave., 0.8 m S. & 0.7 m below Conc. block of N.W. Cor. of bldg.

No.	REVISIONS	YY/MM/DD	BY
D	ISSUED FOR TENDER	20/07/15	BE
C	ISSUED FOR 100% REVIEW	20/07/10	BE
B	ISSUED FOR 95% REVIEW	20/05/26	BE
A	ISSUED FOR 50% REVIEW	20/04/08	BE

MORRISON HERSHFIELD

DESIGNED BY	TN	CHECKED BY	AGG
DRAWN BY	AH	APPROVED BY	BE
HOR SCALE / VERT SCALE	AS SHOWN	RELEASED FOR CONSTRUCTION	
DATE		DATE	

PROFESSIONAL'S SEAL
PRELIMINARY DRAWING
NOT TO BE USED FOR CONSTRUCTION
CONSULTANT FILE NAME 1903811 - SHERWIN - BH.DWG

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

RECONSTRUCTION OF SHERWIN ROAD AND REPLACEMENT OF EXISTING CULVERT AT OMAND'S CREEK

BORE HOLE LOGS

CITY DRAWING NUMBER C319-20-03
SHEET 03 OF 44
DRAWING No. 03 REV

P:\2019\190381100-Sherwin Road Reconstruction\09. CAD\07 Sheets\Structural\1903811 - Sherwin - BH.dwg Last Saved: 7/13/2020 4:54 PM by AHeppner Plotted: 7/15/2020 11:16 AM by Alex Heppner