# APPENDIX 'F' GEOTECHNICAL REPORT



### PUBLIC WORKS DEPARTMENT • SERVICE DES TRAVAUX PUBLICS

Engineering Division • Division de l'ingénierie

### GEOTECHNICAL INVESTIGATION

### STREET RECONSTRUCTION

Revised October 28th, 2008

### <u>Fieldwork</u>

- 1. Clear all underground services at each testhole location.
- 2. Test holes required every 50 m with a minimum of 3 test holes per street.
- 3. Record location of testhole (offset from curb, distance from cross street and house number).
- 4. Drill 150 mm-diameter core in pavement.
- 5. Drill 125 mm-diameter testhole into fill materials and subgrade
- 6. If a service trench backfilled with granular materials is encountered, another hole shall be drilled to define the existing sub-surface conditions.
- 7. Testhole to be drilled to depth of 2 m  $\pm$  150 mm below surface of the pavement.
- 8. Recover pavement core sample and representative samples of soil (fill materials, pavement structure materials and subgrade).
- 9. Measure and record pavement section exposed in the testhole (thickness of concrete or asphalt and different types of pavement structure materials).
- 10. Pavement structure materials to be identified as crushed limestone or granular fill and the maximum aggregate size of the material (20 mm, 50 mm or 150 mm).
- 11. Log soil profile for the subgrade.
- 12. Representative samples of soil must be obtained at the following depths below the bottom of the pavement structure materials 0.1 m, 0.4 m, 0.7 m, 1.0 m, 1.3 m, 1.6 m, etc. Ensure a sample is obtained from each soil type encountered in the testhole.
- 13. Make note of any water seepage into the testhole.
- 14. Backfill testhole with native materials and additional granular fill, if required. Patch pavement surface with hot mix asphalt or high strength durable concrete mix.
- 15. Return core sample from the pavement and soil samples to the laboratory.

### **Lab Work**

- 1. Test all soil samples for moisture content.
- 2. Photograph core samples recovered from the pavement surface.
- 3. Conduct tests for plasticity index and hydrometer analysis on selected soil samples which are between 0.5 m and 1 m below top of pavement (this is the sub-grade on which the pavement and sub-base will be built). The selection will be based upon visual classification and moisture content test results, with a minimum of one sample of each soil type per street to be tested.
- 4. Prepare testhole logs and classify subgrade (based on hydrometer) as follows;

< 30% silt - classify as clay 30% - 50% silt - classify as silty clay 50% - 70% silt - classify as clayey silt > 70% silt - classify as silt

Prepared by: The National Testing Laboratories Limited and Eng-Tech Consulting

Embrace the Spirit · Vivez l'esprit

### **AECOM Canada Ltd.**

### **GENERAL STATEMENT**

### NORMAL VARIABILITY OF SUBSURFACE CONDITIONS

The scope of the investigation presented herein is limited to an investigation of the subsurface conditions as to suitability for the proposed project. This report has been prepared to aid in the evaluation of the site and to assist the engineer in the design of the facilities. Our description of the project represents our understanding of the significant aspects of the project relevant to the design and construction of earth work, foundations and similar. In the event of any changes in the basic design or location of the structures as outlined in this report or plan, we should be given the opportunity to review the changes and to modify or reaffirm in writing the conclusions and recommendations of this report.

The analysis and recommendations presented in this report are based on the data obtained from the borings and test pit excavations made at the locations indicated on the site plans and from other information discussed herein. This report is based on the assumption that the subsurface conditions everywhere are not significantly different from those disclosed by the borings and excavations. However, variations in soil conditions may exist between the excavations and, also, general groundwater levels and conditions may fluctuate from time to time. The nature and extent of the variations may not become evident until construction. If subsurface conditions differ from those encountered in the exploratory borings and excavations, are observed or encountered during construction, or appear to be present beneath or beyond excavations, we should be advised at once so that we can observe and review these conditions and reconsider our recommendations where necessary.

Since it is possible for conditions to vary from those assumed in the analysis and upon which our conclusions and recommendations are based, a contingency fund should be included in the construction budget to allow for the possibility of variations which may result in modification of the design and construction procedures.

In order to observe compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated, we recommend that all construction operations dealing with earth work and the foundations be observed by an experienced soils engineer. We can be retained to provide these services for you during construction. In addition, we can be retained to review the plans and specifications that have been prepared to check for substantial conformance with the conclusions and recommendations contained in our report.

### **EXPLANATION OF FIELD & LABORATORY TEST DATA**

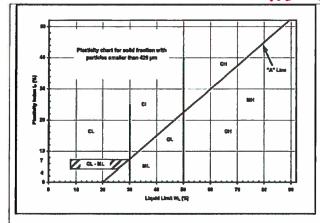
				UMA	USCS		Laborator	y Classification Crit	eria
		Descripti	on	Log Symbols	Classification	Fines (%)	Grading	Plasticity	Notes
		CLEAN GRAVELS	Well graded gravels, sandy gravels, with little or no fines	200	GW	0-5	C <sub>U</sub> > 4 1 < C <sub>C</sub> < 3		
	GRAVELS (More than 50% of coarse	(Little or no fines)	Poorly graded gravels, sandy gravels, with little or no fines		GP	0-5	Not satisfying GW requirements		Dual symbols if 5-
SIIC	fraction of gravel size)	DIRTY GRAVELS	Silty gravels, silty sandy gravels	NI	GM	> 12		Atterberg limits below "A" line or W <sub>P</sub> <4	12% fines. Dual symbols if above "A" line and
AINED S(		(With some fines)	Clayey gravels, clayey sandy gravels		GC	> 12		Atterberg limits above "A" line or W <sub>P</sub> <7	4 <w<sub>P&lt;7</w<sub>
COARSE GRAINED SOILS		CLEAN SANDS	Well graded sands, gravelly sands, with little or no fines	60 M	sw	0-5	C <sub>U</sub> > 6 1 < C <sub>C</sub> < 3		$C_U = \frac{D_{60}}{D_{10}}$
CO	SANDS (More than 50% of	(Little or no fines)	Poorly graded sands, gravelly sands, with little or no fines	000	SP	0-5	Not satisfying SW requirements		$C_U = \frac{D_{60}}{D_{10}}$ $C_C = \frac{(D_{30})^2}{D_{10} x D_{60}}$
	coarse fraction of sand size)	DIRTY SANDS	Silty sands, sand-silt mixtures	BB	SM	> 12		Atterberg limits below "A" line or W <sub>P</sub> <4	
		(With some fines)	Clayey sands, sand-clay mixtures		sc	> 12		Atterberg limits above "A" line or W <sub>P</sub> <7	
	(Below 'A'	W <sub>L</sub> <50	Inorganic silts, silty or clayey fine sands, with slight plasticity		ML				
	negligible organic content)	W <sub>L</sub> >50	Inorganic silts of high plasticity		МН				
SOILS	CLAYS	WL<30	Inorganic clays, silty clays, sandy clays of low plasticity, lean clays		CL				
FINE GRAINED SOILS	(Above 'A' line negligible organic	30 <w<sub>L&lt;50</w<sub>	Inorganic clays and slity clays of medium plasticity		CI			Classification is Based upon Plasticity Chart	
FINE (	content)	W <sub>L</sub> >50	Inorganic clays of high plasticity, fat clays		СН				
	ORGANIC SILTS & CLAYS	<b>W</b> ∟<50	Organic sitts and organic sitty clays of low plasticity		OL				
	(Below 'A'	W <sub>L</sub> >50	Organic clays of high plasticity		он				
Н	HIGHLY ORGA	INIC SOILS	Peat and other highly organic soils		Pt		on Post ification Limit		r odour, and often s texture
		Asphałt		Till	HI.				
[		Concrete		Bedrock iifferentiated)				AE	COM
8	₩	Fill		Bedrock imestone)					

When the above classification terms are used in this report or test hole logs, the designated fractions may be visually estimated and not measured.

Not used to classify subgrade. Refrence to city of Winnipeg Specs for Greatechnical Investigation street reconstruction (Oct. 2008),

# NOT USED TO CLASSIFY SUBGRADE, REFER TO CITY OF WINNIPER SPECS FOR GEOTECHNICAL INVESTIGATION STREET

RECONSTRUCTION (OCT. 2008)



	FRAC	CTION	SEIVE !	SIZE (mm)	PERCENTAG	RANGES OF E BY WEIGHT OMPONENTS
- [			Passing	Retained	Percent	Identifier
ı	O1	Coarse	76	. 19	35-50	and
-	Gravel	Fine	19	4.75	33-50	and
1		Coarse	4.75	2.00	00.05	But an fourt t
	Sand	Medium	2.00	0.425	20-35	"y" or "ey" "
		Fine	0.425	0.075	10.20	same
		n-plastic) (plastic)		75 mm	1-10	trace
,			Definitio	n of Oversize	nm diameter	
			BOULDE	diameter		

### **LEGEND OF SYMBOLS**

Laboratory and field tests are identified as follows:

qu - undrained shear strength (kPa) derived from unconfined compression testing.

T<sub>v</sub> - undrained shear strength (kPa) measured using a torvane

pp - undrained shear strength (kPa) measured using a pocket penetrometer.

L<sub>v</sub> - undrained shear strength (kPa) measured using a lab vane.

F<sub>v</sub> - undrained shear strength (kPa) measured using a field vane.

γ - bulk unit weight (kN/m<sup>3</sup>).

SPT - Standard Penetration Test. Recorded as number of blows (N) from a 63.5 kg hammer dropped 0.76 m (free fall) which is required to drive a 51 mm O.D. Raymond type sampler 0.30 m into the soil.

DPPT - Drive Point Pentrometer Test. Recorded as number of blows from a 63.5 kg hammer dropped 0.76 m (free fall) which is required to drive a 50 mm drive point 0.30 m into the soil.

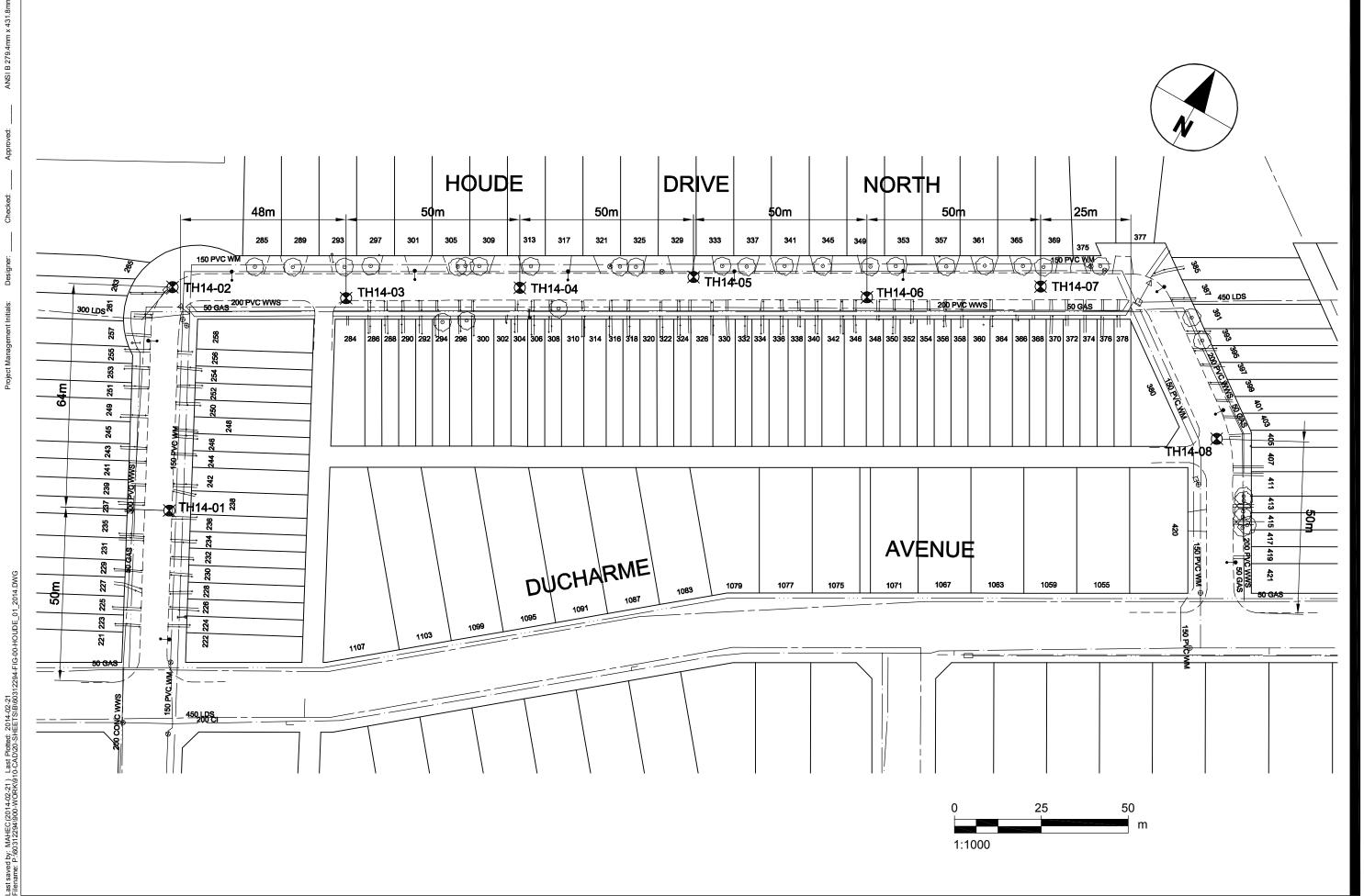
w - moisture content (WL, WP)

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

Su (kPa)	CONSISTENCY
<12	very soft
12 – 25	soft
25 – 50	medium or firm
50 100	stiff
100 – 200	very stiff
200	hard

The resistance (N) of a non-cohesive soil can be related to compactness condition as follows

N - BLOWS/0.30 m	COMPACTNESS
0 - 4	very loose
4 - 10	loose
10 - 30	compact
30 - 50	dense
50	very dense



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Figure 01: Test Holes Location Plan



Photograph 1. Houde Drive – TH14-01



Photograph 2. Houde Drive - TH14-02



Photograph 3. Houde Drive – TH14-03



Photograph 4. Houde Drive - TH14-04



Photograph 5. Houde Drive – TH14-05



Photograph 6. Houde Drive - TH14-06



Photograph 7. Houde Drive – TH14-07



Photograph 8. Houde Drive – TH14-08

		Local street Package 14-R-06		CLII	ENT	: Ci	ty of	Winnipe	eg					STHOLE NO: TH14-0	
		Houde Drive North ;7 m Eas	t of West Curb			_								OJECT NO.: 6031229	94
SAME		OR: Paddock Drilling Ltd  PE GRAB	SHELBY TUBE	<u>ME</u> ⊠si					N with Bulk	150 r	nm Cori	<u>ng</u> ✓ NO F		EVATION (m): RY	
DEPTH (m)	SOIL SYMBOL	_	SCRIPTION		SAMPLE TYPE	SAMPLE #	P SP 0 2	# Bec  Dynami T (Standa (Blows/3) 40  Total U (kN/	lON TEST ker Ж c Cone < rd Pen To 800mm) 60 & Init Wt ■ m³) 19 2	est) <b>♦</b>	□ △P •• F	D SHEAR S Torvane + X QU X Lab Vane [ rocket Pen. Field Vane (kPa)	TRENGTH - - -	COMMENTS	ОЕРТН
0		ASPHALT (thickness = 52 mm)						0 40	50 8	30 100	50	100	150 200		
		CLAY - trace sand - dark grey - frozen to 1.7 m , moist whe - high plasticity  - brown below 1.5 m - soft to firm below 1.7 m.  END OF TEST HOLE AT 2.44 m If NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger of to surface.	N CLAY.			G1 G2 G3 G4 G5 G7								Clay: 79.9%, Silt: 17.5%, Sand: 2.6%, Gravel: 0.0%	1
3		Drilled with 150 mm diamond co m.	io to 0.20 m, somu stem augers	.0 2.4											-
		A=CO4			_		_	GED B						ETION DEPTH: 2.44 m	
3		A=CO/	<b>71</b>					IEWED JECT E			iaiii		COIVIPL	ETION DATE: 2/5/14 Page	1 of 1

LOCATION: House Drive North; I m East of West Curb   CONTRACTOR Pedidock Drilling Lid   METHOD: 125 mm SSA with 150 mm Coring   ELEVATION (m)   SAMPLE TYPE		Local street Package 14-R-0		CLII	ENT:	: Ci	ty of	Winnipe	eg						NO: <b>TH14-</b> 0	
SAMPLE TYPE			st of West Curb	1			405			4=0						94
SOIL DESCRIPTION			SHELBY TUBE							150 r	nm Cor					
ASPHALT (thickness = 95 mm)  CLAY - trace sand - grayish brown, - frizze to 1.5 m, moist when thawed - high plasticity  G8  G9  G10  - some sand and some gravel at 1.4 m - brown, soft to firm, below 1.5 m		_			ΓΥPE	SAMPLE #	◆ SP 0 2 16 1;	ENETRATI	ON TEST ker  COne  CONE CONE CONE CONE CONE CONE CONE CONE	est) <b>♦</b>		ED SHEAF + Torvand × QU > Lab Var Pocket Po Field Var	R STRENG e + × ne □ en. △ ne ❤	СО		DEPTH
- grayish brown, - frozen to 1.5 m, moist when thawed - high plasticity  G8  G9  G10  - some sand and some gravel at 1.4 m - brown, soft to firm, below 1.5 m	0	ASPHALT (thickness = 95 mm)					2	3 40	60 8	100	50	100	150	200		
- some sand and some gravel at 1.4 m - brown, soft to firm, below 1.5 m	-	<ul> <li>grayish brown,</li> <li>frozen to 1.5 m, moist wher</li> </ul>	n thawed													- - - - -
	-	- some sand and some gravel at 1.	4 m													-
END OF TEST HOLE AT 2.44 m IN CLAY. NOTES:  1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sand and asphalt cold patch to surface. 4. Drilled with 150 mm diamond core to 0.330 m, solid stem augers to 2.4		- brown, soft to firm, below 1.5 m				G12		•								-
END OF TEST HOLE AT 2.44 m IN CLAY. NOTES:  1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sand and asphalt cold patch to surface. 4. Drilled with 150 mm diamond core to 0.330 m, solid stem augers to 2.4	RRYDALE AND HOUDE.GP.							•								2-
	ST HOLE STREET PACKAGE 14-R-UB BE	NOTES:  1. No sloughing observed.  2. No seepage observed.  3. Test hole backfilled with auger of to surface.  4. Drilled with 150 mm diamond co	uttings, sand and asphalt cold p													-
LOGGED BY: Saba Ibrahim COMPLETION DEPTH: 2.44 m	ű Ű	A=CO1														
REVIEWED BY: Faris Khalil COMPLETION DATE: 2/5/14 PROJECT ENGINEER: Page 1 of	0 0 0	A=CO/	VI								nalıl		COMF	LE HON D		1 of 1

		Local street Package 14-R-0		CLI	ENT	: Ci	ty of	Winnipe	eg					STHOLE NO: TH14-03	
		: Houde Drive North ;7 m Sou	th of North Curb	1										DJECT NO.: 6031229	4
SAME		FOR: Paddock Drilling Ltd  ✓PE ■ GRAB	SHELBY TUBE	ME					<u>with 1</u> Bulk	<u>50 n</u>	nm Coring	NO RECC		EVATION (m): Y	
DEPTH (m)	SOIL SYMBOL	<del>-</del>	SCRIPTION	Si	SAMPLE TYPE	SAMPLE #	◆ SF 0 2 16 1	ENETRATII	ON TESTS  Ker   C Cone   d Pen Tes  00mm)  60 80  nit Wt   19 20  Liquid	st) <b>♦</b> 0 100	UNDRAINED SH + Toi	HEAR STREN rvane + QU × Vane □ tet Pen. △ d Vane  RPa)	GTH	COMMENTS	DEPTH
0		ASPHALT (thickness = 70 mm)						0 40	60 80	100	50	100 150	200		
2/21/14		CLAY - trace sand - dark grey to grey - frozen to 1.5 m, moist when - high plasticity	n thawed			G15 G16 G17 G18 G20		H•		4				Clay : 81.5%, Silt : 15.1% , Sand : 3.5% , Gravel : 0.0%	
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERRYDALE AND HOUDE.GPJ UMA WINN.GDT		END OF TEST HOLE AT 2.44 m II NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger of to surface. 4. Drilled with 150 mm diamond co. 2.4 m.	uttings, sand and asphalt cold p			G21									-
S S								GED BY						TION DEPTH: 2.44 m	
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		Local street Package 14-R-0		CLII	ENT	: Ci	ty of	Winni	peg						STHOLE NO: TH14	
		: Houde Drive North ;4 m Soi	uth of North Curb			_	405		~						DJECT NO.: 60312	2294
SAME		TOR: Paddock Drilling Ltd  YPE GRAB	SHELBY TUBE	ME ⊠s					SA wit	h 150	mm Co		NO REC		EVATION (m):	
DEPTH (m)	SOIL SYMBOL		SCRIPTION		SAMPLE TYPE	SAMPLE #	◆ SP 0 2 16 1	ENETR/	ATION TI ecker # mic Con dard Pe s/300mr 60 I Unit W N/m³) 19	ESTS  ie	0 1	H Torv X QI □ Lab \\ △ Pocket Field \\ (kP	EAR STRE rane + U × /ane □ t Pen. △ Vane �	NGTH	COMMENTS	DEPTH
0		ASPHALT (thickness = 70 mm)					2	0 40	60	80 10	0 5	0 10	00 150	200		
- - - - - -		CLAY - trace sand - black to dark grey - frozen to 1.8 m, moist whe - high plasticity	n thawed			G22 G23 G24		•								- - - - - 1-
NN.GD1 2/21/14		- dark brown below 1.5 m				G26		•								-
¥  -   <u>4</u>		- silty, light brown, soft below 1.8 r	n													-
S BERKYDALE AND HOUDE.GPJ UM		- sitty, fight brown, soft below 1.01				G27 G28		•								2-
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERKYDALE AND HOUDE GPJ UMA WINN.GDT		END OF TEST HOLE AT 2.44 m I NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger of to surface. 4. Drilled with 150 mm diamond co 2.4 m.	cuttings, sand and asphalt cold p													-
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0.50		A=CO/	<b>VI</b>							Faris K NEER:	halil		CO	MPLE	ETION DATE: 2/5/14	ge 1 of 1
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		Local street Package 14-R-0		CLII	EN	T: Ci	ty of	Winni	oeg					STHOLE NO: TH14-0	
		: Houde Drive North ;1 m Sou	uth of North Curb											OJECT NO.: 6031229	4
		TOR: Paddock Drilling Ltd  YPE ■ GRAB	SHELBY TUBE	ME S							nm Cor		EL RECOVE	EVATION (m):	
DEPTH (m)	SOIL SYMBOL F	<del>-</del>	SCRIPTION		SAMPLE TYPE	# 11	◆ SF 0 2	PENETRA  # Be Dynar T (Stand (Blows) 0 40 Total (ki) 7 18	Unit Wt I V/m³) 19 MC Lic	STS	_ _ _ _	ED SHEAR S + Torvane -  × QU × I Lab Vane Pocket Pen Field Vane (kPa)	STRENGTH + - - - - - - - - - - - -	COMMENTS	ОЕРТН
0		ASPHALT (thickness = 52 mm)					2	0 40	- 60	80 100	50	100	150 200		
-		CLAY (FILL) - trace sand,trace gra - black - frozen, moist when thawed - high plasticity				G29		•							- - - -
-		CLAY - trace sand - grey, - frozen to 1.5 m, moist when - high plasticity	n thawed			G30		•						Clay: 70.5%, Silt: 24%, Sand: 5.5%, Gravel: 0.0%	-
- - - -						G31		•							1 <del></del> - -
3) UMA WINN.GDT 2/21/14		- brown, soft to firm below 1.5 m				G33		•							- - -
ERRYDALE AND HOUDE.GF		- silty, light brown, soft below 2.1 n	n			G34 G35		•							2 —
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERRYDALE AND HOUDE.GPJ UMA WINN.GDT		END OF TEST HOLE AT 2.44 m I NOTES:  1. No sloughing observed.  2. No seepage observed.  3. Test hole backfilled with auger of to surface.  4. Drilled with 150 mm diamond oc 2.4 m.	cuttings, sand and asphalt cold p												- - - -
Ĭ		A = CO !	\ <b>4</b>						BY: Sa					ETION DEPTH: 2.44 m	
0 90		A=CO/	<b>VI</b>						BY: F		halil		COMPL	ETION DATE: 2/5/14	1 05 1
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		Local street Package 14-R-0		CLII	ENT	Γ: Ci	ty of	Winnip	eg						THOLE NO		
		: Houde Drive North ;7 m Sou	uth of North Curb												JECT NO.		94
		TOR: Paddock Drilling Ltd									nm Co				/ATION (m		
DEPTH (m)	SOIL SYMBOL		SCRIPTION	<u></u> Ss	SAMPLE TYPE	SAMPLE#	◆ SF 0 2 16 1	ENETRA	cker ** nic Cone ard Pen (300mm) 60 Unit Wt I I/m³) 19 I/C Liq	TS	<u> </u>	NED SHEA + Torval × QU □ Lab Va △ Pocket F ♣ Field Va (kPa	× ane □ Pen. △ ane �	GTH	COMMI		ОЕРТН
0		ASPHALT (thickness = 70 mm)						0 40		. 100	50	100	150	200			
-		CLAY (FILL) - trace sand - black - frozen, moist when thawed - high plasticity				G36		•									-
-		CLAY - trace oxidation - grey, - frozen to 1.5 m, moist when - high plasticity	n thawed			G37		•									-
-1 -						G38		•									1-
2/21/14		- brown, soft to firm below 1.5 m				G39		•									-
						G40		•									-
LE AND HOUDE.GPJ						G41		•									2
15 14-R-06 BERRYDA		END OF TEST HOLE AT 2.44 m I NOTES: 1. No sloughing observed.	N CLAY.			G42		•									-
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERRYDALE AND HOUDE.GPJ UMA WINN.GDT    C  C  C  C  C  C  C  C  C  C  C  C		No seepage observed.     Test hole backfilled with auger of to surface.     Drilled with 150 mm diamond co.															-
3							LOC	GED E	Y: Sal	oa Ibra	him	:	COM	IPLE1	TION DEPTH	H: 2.44 m	<u> </u>
P P		A=CO/	И				RE\	/IEWED	BY: F	aris K					TION DATE:	2/5/14	
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		Local street Package 14-R-06	CLI	EN <sup>-</sup>	T: Ci	ty c	f Winr	nipeg						STHOLE NO: TH14-0	
		: Houde Drive North ;4 m South of North Curb												OJECT NO.: 6031229	4
		TOR: Paddock Drilling Ltd								50 n	nm Coring			EVATION (m):	
DEPTH (m)	SOIL SYMBOL F	SOIL DESCRIPTION	<u></u> ⊠s	SAMPLE TYPE	# 11		PENETF   Dyn  PT (Sta  (Blov  20 4  Tot  17 18  Plastic	Becker amic Condard F ws/300r 0 60 al Unit (kN/m³) 3 19	TESTS	st) ◆ 100 21	UNDRAINED S + To  X □ Lai  △ Poc  ♣ Fie	orvane + QU X b Vane □ ket Pen. △ ld Vane � kPa)	RENGTH	COMMENTS	DEPTH
0		ASPHALT (thickness = 52 mm)				ļ	20 4	0 60	0 80	100	50	100 15	50 200		
		SILT - some sand - brown to light brown, - frozen to 1.5 m, moist when thawed - low plasticity  SAND light brown, - frozen to 1.5 m, moist when thawed			G43 G44 G45									Clay: 29.3%, Silt: 45.2%, Sand: 25.4%, Gravel: 0.0%	1-
JA WINN.GDT 2/21/14		- loose below 1.5 m.  CLAY -			G47		•								- -
E AND HOUDE.GPJ UM		- brown, firm - moist - high plasticity			G48			•							2 <del>-</del> -
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERRYDALE AND HOUDE.GPJ UMA WINN.GDT		END OF TEST HOLE AT 2.44 m IN CLAY. NOTES:  1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sand and asphalt cold to surface. 4. Drilled with 150 mm diamond core to 0.380 m, solid stem aug. 2.4			G49										- - -
<u> </u>		A = CO 1 1				-	GGED							ETION DEPTH: 2.44 m	
<u>5</u>		A=COM				_	VIEW				nalil	C	OMPLI	ETION DATE: 2/5/14	4 6 4
اد						125	OJEC	I FNC	INEE	:K:				Page	1 of 1

		Local street Package 14-R-06		CLII	ENT	: Ci	ty of	Winnip	eg					STHOLE NO: TH14-0	
		Houde Drive North ;4 m Wes	st of East Curb											OJECT NO.: 603122	94
SAMP		FOR: Paddock Drilling Ltd  /PE	SHELBY TUBE	ME					SA with ∃BULK		nm Cor		RECOVE	EVATION (m): RY	
DEPTH (m)	SOIL SYMBOL	_	SCRIPTION		SAMPLE TYPE	SAMPLE #	◆ SP 0 2 16 1	PENETRA  # Be Dynam T (Stand (Blows) 0 40  Total (kN 7 18	TION TES cker # nic Cone ard Pen ' /300mm) 60 Unit Wt I I/m³) 19	STS	- 2 △ •	ED SHEAR + Torvane × QU × Classification  Clas	STRENGTH	COMMENTS	DEPTH
0		ASPHALT (thickness = 52 mm)						0 40		80 100	50	100	150 200	,	
-		CLAY (FILL) - trace sand - black to dark brown - frozen to 1.5 m, moist when - high plasticity	thawed			G50		•		1				Clay: 78.2%, Silt: 18.5%, Sand: 3.3%, Gravel: 0.0%	-
-		CLAY -	thawed			G51									-
1 - -						G52		•							1
2/21/14		- soft to firm below 1.5 m.				G53		•							-
		- silty, brown to dark brown below 1	.75 m			G54		•							-
1 HOODE: GP3		- grayish brown below 1.9 m				G55		•							2
S BERRYDALE AND		- gypsum lenses below 2.1 m				G56		•							-
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERKYDALE AND HOUDE.GPJ UMA WINN.GDT		END OF TEST HOLE AT 2.44 m IN NOTES:  1. No sloughing observed.  2. No seepage observed.  3. Test hole backfilled with auger cuto surface.  4. Drilled with 150 mm diamond cor 2.4.	uttings, sand and asphalt cold p												-
ī 		A = COA	4					GED E						ETION DEPTH: 2.44 m	
000		A=COM	<b>/</b> 1					/IEWED			nalil		COMPL	ETION DATE: 2/7/14	1 of 1



# City of Winnipeg

# Houde Drive - Package 14-R-06

# Geotechnical Investigation

### Table 01- Summary of Laboratory Soil Testing

Test		Pavement S	urface	Pavement Struc	ture Material	Subgrade	Sample	Moisture		Hydromete	er Analysis		At	terberg Lin	nits
Hole No.	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
			,		, ,	Clay	0.46	38.0	,						
		Asphalt	52			Clay	0.76	38.8							
	Houde Drive North;7 m	•				Clay	1.06	38.6	0.0	2.6	17.5	79.9	84.8	29.3	55.6
TH14-01	East of West Curb			None	n/a	Clay	1.37	37.8							
		<b>C</b>				Clay	1.67	35.6							
		Concrete	n/a			Clay	1.98	39.8							
						Clay	2.28	40.3							
			0-			Clay	0.46	36.5							
		Asphalt	95			Clay	0.76	36.3							
	H 1 D 1 N 1 1					Clay	1.06	37.6							
TH14-02	Houde Drive North ;1 m			None	n/a	Clay	1.37	21.6							
	East of West Curb	Concrete	n/a			Clay	1.67	41.0							
						Clay	1.98	40.8							
						Clay	2.28	44.8							
						Clay	0.46	37.3							
		Asphalt	70			Clay	0.76	36.6	0.0	3.5	15.1	81.5	83.7	27.7	56.0
	Houde Drive North; 7 m					Clay	1.06	37.8							
TH14-03	South of North Curb			None	n/a	Clay	1.37	37.9							
		Concrete	n/a			Clay	1.67	37.4							
						Clay	1.98	37.9							
						Clay	2.28	38.7							
		A l l+	70			Clay	0.46	29.4							
		Asphalt	70			Clay	0.76	31.9							
	Houde Drive North; 4 m					Clay	1.06	34.2							
TH14-04	South of North Curb			None	n/a	Clay	1.37	35.9							
		Concrete	n/a			Clay	1.67	35.3							
						Silty Clay	1.98	37.2							
						Silty Clay	2.28	39.1							
		A mark of the				Clay Fill	0.46	34.4	-						
		Asphalt	52			Clay	0.76	32.1	0.0	5.5	24	70.5	77.9	26.8	51.1
	Houde Drive North; 1 m					Clay	1.06	32.0							
TH14-05	South of North Curb			None	n/a	Clay	1.37	32.0							
		Concrete	n/a			Clay	1.67	30.7							
						Clay	1.98	35.6							
						Silty Clay	2.28	35.4							



Test		Pavement Si	urface	Pavement Struc	ture Material	Subgrade	Sample	Moisture		Hydromete	er Analysis		At	terberg Lin	nits
Hole No.	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
						Clay Fill	0.46	32.9							
		Asphalt	70			Clay	0.76	36.7							
	Houde Drive North; 7 m					Clay	1.06	32.1							
TH14-06	South of North Curb			None	n/a	Clay	1.37	35.6							
		Concrete	n/a			Clay	1.67	36.7							
		Concrete	11/4			Clay	1.98	39.4							
						Clay	2.28	41.1							
		Asphalt	52			Silt	0.46	29.3							
		Aspirait	32			Silt	0.76	24.8	0.0	25.4	45.2	29.3	30	12.9	17.1
	Houde Drive North; 4 m					Silt	1.06	19.1							
TH14-07	South of North Curb			None	n/a	Sand	1.37	21.7							
		Concrete	n/a			Sand	1.67	34.2							
						Clay	1.98	41.2							
						Clay	2.28	46.6							
		Acphalt	52			Clay Fill	0.46	32.5	0.0	3.3	18.5	78.2	82.5	29.2	53.3
		Asphalt	52			Clay	0.76	33.2							
	Houde Drive North; 4 m					Clay	1.06	32.1							
TH14-08	West of East Curb			None	n/a	Clay	1.37	32.7							
		Concrete	n/a			Clay	1.67	38.6							
						Silty Clay	1.98	38.7							
						Silty Clay	2.28	39.5							



Photograph 1. Berrydale Avenue – TH14-09



Photograph 2. Berrydale Avenue – TH14-10



Photograph 3. Berrydale Avenue – TH14-11



Photograph 4. Berrydale Avenue – TH14-12



Photograph 5. Berrydale Avenue – TH14-13



Photograph 6. Berrydale Avenue – TH14-14



Photograph 7. Berrydale Avenue – TH14-15

PROJECT	Local street Package 14-R-06	CLIE	NT: C	ity	of W	/inni	peg							TE:	STHOLE NO: TH14-	09
	: Berrydale Avenue ;1 m South of North Curb			_										PR	OJECT NO.: 603122	294
	TOR: Paddock Drilling Ltd		HOD:						150	mm	Cori				EVATION (m):	
DEPTH (m) SOIL SYMBOL	SOIL DESCRIPTION		SAMPLE TYPE SAMPLE #	•	PEN  SPT  20	X Be Dynar (Stance (Blows 40 Total (kl 18 stic	ecker mic Co dard F s/300r 60 Unit N/m³)	TEST	> est) <b>4</b> 80 10	100		ED SHE Torva X Qu Lab V Cocket	AR ST ane + J × /ane □ : Pen. / /ane € a)	Δ	COMMENTS	DEPTH
0 .4 .	CONCRETE (thickness = 153 mm)				:				:		:	:	0 1	:		
	CLAY (FILL) - trace sand - black, - frozen to 1.5 m, moist when thawed - high plasticity		G577													-
	CLAY -trace oxidation		G58	}		•										-
	- grey, - frozen to 1.5, moist when thawed - high plasticity		G59			•										1-
ALIANT TAKEN	- soft to firm below 1.5 m.		G61													-
2	- brown to light brown below 1.8 m		G62	!		•										2-
	END OF TEST HOLE AT 2.44 m IN CLAY.		G63	;		•										-
200 OF 1EST HOLE STREET PACKAGE 14-15-00 BERKYDALE AND HOUDE. GFD UMA WINN GSD 1 ZIZITIA	END OF TEST HOLE AT 2.44 m IN CLAY. NOTES:  1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sand and asphalt cold patto surface. 4. Drilled with 150 mm diamond core to 0.305 m, solid stem augers to 2.4															-
Ĭ	A=CO44					SED E									ETION DEPTH: 2.44 m	1
200	A=COM			_		ECT				vialli			+	JUIVIPL	ETION DATE: 2/7/14 Pag	e 1 of 1

		Local street Package 14-R-06	CLI	ΕN	T: Ci	ty c	f Win	nipeg	]						STHOLE NO: TH14-1	
		: Berrydale Avenue ;5 m South of North Curb			_										OJECT NO.: 6031229	)4
SAMF		TOR: Paddock Drilling Ltd  YPE ■ GRAB   SHELBY TUBE			<u>OD:</u> T SPO			SSA v BB		150 r	nm Co		NO RE		EVATION (m): RY CORE	
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION		SAMPLE TYPE	# 11		PENET  #  Dyi  PENET  (Blo  20  To  17  Plastic	RATION Becke namic C andard ws/300 40 6 ttal Unit (kN/m <sup>3</sup> 8 1	N TEST  r   Cone  Pen Te  Dmm)  60 8  t Wt   9 20  Liqui	est) <b>♦</b> 0 100	2	NED SH + Tor	EAR STR vane + QU × Vane □ et Pen. △ Vane �	RENGTH	COMMENTS	ОЕРТН
0	• •	CONCRETE (thickness = 128 mm)					:			- 100		<u> </u>		200		
-		CLAY (FILL) - silty, trace sand - black to dark brown - frozen to 1.5 m, moist when thawed - high plasticity			G64 G65		•		-1						Clay: 62%, Silt: 30%, Sand: 7.6%, Gravel: 0.3%	- - - -
1  - -		- some gravel, some sand below 1.2 m			G66 G67		•									1- - - -
JA WINN.GDT 2/21/14		CLAY - silty, - dark brown to brown, - soft, moist - high plasticity			G68		•									-
AND HOUDE.GPJ UM		- light brown - soft, moist to wet - low plasticity			G69		•									2-
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERRYDALE AND HOUDE.GPJ UMA WINN.GDT		END OF TEST HOLE AT 2.44 m IN SILT. NOTES:  1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sand and asphalt or to surface. 4. Drilled with 150 mm diamond core to 0.305 m, solid stem at 2.4			G70											- - - - -
S ES		45044			1	-	GGE						-		ETION DEPTH: 2.44 m	
5		A=COM				-	VIEW				nalil		C	OMPLI	ETION DATE: 2/7/14	
ğ						PF	ROJEC	T EN	GINE	ER:					Page	1 of 1

	: Local street Package 14-R-06	CLIE	ENT	: Ci	ty of	Wini	nipeg						Т	ESTHOLE NO: TH	14-11
	I: Berrydale Avenue ;7.5 m South of North Curb													PROJECT NO.: 603	12294
	CTOR: Paddock Drilling Ltd								150 r	nm C				LEVATION (m):	
SAMPLE	YPE GRAB SHELBY TUBE	SF	TYPE	#		PENETI *  O Dyn	Becke amic (	N TEST r * Cone <	>	UNDRA	AINED S		RECOV STRENG*		
DEPTH (m)	SOIL DESCRIPTION		SAMPLE T	SAMPLE	16	To	ws/300 tal Unit (kN/m <sup>3</sup> 8 1	0mm) 50 € 50 € 50 € 50 € 10 €	0 21		△ Poc <b>②</b> Fie	b Vane ket Pen ld Vane kPa)	. △	COMMENTS	DEPTH
0	CONCRETE (thickness = 140 mm)											:			-
-	CLAY (FILL)- trace sand, trace oxidation - brown - frozen to 1.5 m, moist when thawed - high plasticity			G71											-
	CLAY -silty, trace sand, trace oxidation - grey to light brown, - frozen to 1.5 m, moist when thawed - high plasticity - some sand below 0.7 m			G72		•									-
1	- trace gypsum below 1.0 m			G73		•									1-
PLINING WINNING CLAST	- brown, firm below 1.5 m			G75											
LOG OF TEST HOLE SINKET PACKAGE 14-R-00 BERKTDALE AND HOUDE-GEST DWA WINN, COLO	SILT - clayey, trace oxidation - light brown - soft, moist - low plasticity  END OF TEST HOLE AT 2.44 m IN SILT. NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sand and asphalt cold pato surface. 4. Drilled with 150 mm diamond core to 0.305 m, solid stem augers 2.4			G77			•								2
3	AECOM				-	GGEE VIEW						_		PLETION DEPTH: 2.4 PLETION DATE: 2/7/1	
3					_	OJEC				iulli			JOIVII		Page 1 of 1

		Local street Package 14-R-0		CLII	ENT	Γ: Ci	ty of	Winnip	eg				TES	STHOLE NO: TH14-12	2
		: Berrydale Avenue ;0.5 m Sc	outh of North Curb											OJECT NO.: 6031229	4
		FOR: Paddock Drilling Ltd									nm Corir			EVATION (m):	
DEPTH (m)	SOIL SYMBOL T	<del></del>	SHELBY TUBE	<u></u> Ss	SAMPLE TYPE	SAMPLE #	◆ SP 0 2 16 1	ENETRA	cker # nic Cone ard Pen /300mm) 60 Unit Wt I I/m³) 19	TS	UNDRAINED + □ L △ Pc	Torvane +  X QU X  Lab Vane □  Docket Pen. A  ield Vane €  (kPa)	RENGTH	COMMENTS	DEРТН
0	4 4	CONCRETE (thickness = 128 mm)	1					0 40	- 6U	80 100	50	100 1	50 200		
-		SAND (FILL) - some gravel, - brown, - frozen to 1.5 m, moist when	n thawed			G78									- - -
-		CLAY - trace oxidation, - grey, - fozen to 1.5 m ,moist wher - high plasticity - some sand from 0.6 to 0.9 m	n thawed												-
						G79								Clay : 77.1%, Silt : 22% , Sand : 0.9% , Gravel : 0.0%	-
1 - -						G80									1 -
		- trace gravel at 1.5 m				G81		•							-
MA WINN.GD1 2/21/14		- brown, firm below 1.5 m				G82		•	)						-
- 2 - 2 - 2						G83									2
06 BERRYDALE A						G84		(	•						-
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERKYDALE AND HOUDE.GPJ UMA WINN,GDT		END OF TEST HOLE AT 2.44 m II NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger of to surface. 4. Drilled with 150 mm diamond co 2.4.	uttings, sand and asphalt cold p												- - -
3							1.00	0000	)/ <sub>-</sub> 0 1		h.:	:	· ·	TION DEDTIL 0.44	
=  		A=CO/	A					GED E						ETION DEPTH: 2.44 m ETION DATE: 2/7/14	
3		7=00	71				_	JECT					. U.VII L		1 of 1

		Local street Package 14-R-06		IEN	T: Ci	ty of	Winni	ipeg						THOLE NO: TH14	
		: Berrydale Avenue ;4 m South of Nor												DJECT NO.: 60312	294
		TOR: Paddock Drilling Ltd								mm Co				VATION (m):	
SAMF	PLE T	YPE GRAB	SHELBY TUBE	SPLI	T SPO	ON		BULI	K				COVER	Y CORE	
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIF	PTION	SAMPI F TYPE	SAMPLE #	◆ SF 0 :		ATION TE decker # imic Cond dard Per is/300mm 60 il Unit Wt kN/m³) 19 MC L	e	<u>0</u> 2	+ Torva	ane + U X /ane □ t Pen. △ Vane ❤		COMMENTS	DEPTH
0	4 4	CONCRETE (thickness = 152 mm)		t		ļ <u>'</u>	20 40	:	:	3		19	0 200		
-	. •							:							-
-		CLAY (FILL) - some sand, trace gravel - black to dark brown - frozen to 1.5 m, moist when thawed - high plasticity			G85		•								-
-							<u>.</u>								-
		- some gravel below 0.6 m			G86		•								-
-1															1-
					G87		•								-
-					G88		•								-
2/21/14		CLAY - trace sand, trace oxidation						<u>.</u>							-
		<ul><li>brown,</li><li>soft to firm, moist,</li><li>high plasticity</li></ul>			G89		•								-
J -					000										-
) – 2 - – 2 - – – – – – – – – – – – – – – – – – – –		- some gravel, angular <10 mm in dia. at 2.1			G90										2
KKYDALE AN		- some graver, angular < 10 min m dia. at 2.1			G91		•								-
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERRYDALE AND HOUDE.GPJ UMA WINN.GDT		END OF TEST HOLE AT 2.44 m IN CLAY. NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sa to surface. 4. Drilled with 150 mm diamond core to 0.380 2.4.													
3		<u> </u>				LO	GGFD	BY: Sa	aba Ihra	ahim	. :	CC	 Ompi f	TION DEPTH: 2.44 r	n
<u></u>		A=COM				_		D BY:						TION DATE: 2/7/14	
3						_		ENGIN							ge 1 of 1

		Local street Package 14-R-06	CLI	ΕN	T: Ci	ty o	Winn	ipeg					STHOLE NO: TH14-1	
		: Berrydale Avenue ;7 m South of North Curb											ROJECT NO.: 6031229	94
SAMP		TOR: Paddock Drilling Ltd  YPE ■ GRAB   SHELBY TUBE			<u>OD:</u> T SPO			SA wit		mm Co		EL RECOVE	EVATION (m):	
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION		SAMPLE TYPE	# 11	◆ S 0	PENETR.	ATION TE secker # mic Con dard Per ss/300mr 60 il Unit W kN/m³)	ESTS  e ♦ n Test) ♦ n) 80 100 t ■	1	NED SHEAF  + Torvani  × QU >  □ Lab Var  Necket Po  Pocket Po  (kPa)	R STRENGTH e + ≺ ne □ en. △	COMMENTS	ОЕРТН
0	• •	CONCRETE (thickness = 128 mm)							:		:	:		
-		CLAY (FILL) - some sand - black , - frozen to 1.5 m, moist when thawed - high plasticity			G92									-
-		SILT - some sand - light brown - frozen to 1.5 m, moist when thawed - low plasticity			G93		•						Clay: 20.1%, Silt: 64.1%, Sand: 15.1%, Gravel: 0.7%	-
1 - - -		- dark brown to brown below 1.2 m			G94 G95		•							1
UMA WINN.GD   Z/Z1/14		CLAY brown, - soft to firm, moist, - high plasticity  - soft ,intermediate plasticity below 1.8 m			G96			•						-
SKYDALE AND HOUDE.GFU					G97			•						2
LOG OF TEST HOLE STREET PACKAGE 14-R-06 BERKYDALE AND HOUDE.GPJ UMA WINN,GDT		END OF TEST HOLE AT 2.44 m IN CLAY. NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, sand and asphalt co to surface. 4. Drilled with 150 mm diamond core to 0.380 m, solid stem au 2.4.												-
Τ Π		A=CO14				-			aba Ibra				ETION DEPTH: 2.44 m	
၁၂		A=COM				-		D BY: ENGI	Faris K	nalil		COMPL	ETION DATE: 2/7/14	1 of 1
ان						l LK	∪u⊑UI		NLEK.				rage	ı UI İ

-		Local street Package 14-R-06		CLIE	ENT: C	ity o	f Winı	nipeg						TE	STHOLE NO: TH14-1	5
		: Berrydale Avenue ;1 m Sout	h of North Curb												OJECT NO.: 6031229	94
-		TOR: Paddock Drilling Ltd			HOD:					50 n	nm Co		luo ==		EVATION (m):	
SAMF (m) DEPTH (m)	SOIL SYMBOL	_ <del>_</del>	SHELBY TUBE		SAMPLE TYPE SAMPLE #		PENETI	Becker namic Co indard F ws/300r 40 60 tal Unit (kN/m³) 8 19 MC	TESTS  ** one <> Pen Tes mm) 0 80 Wt  Liquid	st) <b>♦</b>		INED Sh + Tor X ( □ Lab △ Pock ♣ Field (k	HEAR STI vane + QU × Vane □ et Pen. ⊿ I Vane <b>€</b>	<u>^</u>	COMMENTS	DEPTH
0	4	CONCRETE (thickness = 128 mm)					20 4	10 60	0 -80	100		50 1	00 1	50 200		
- - -		CLAY - - grey, -frozen to 1.5 m, moist wher - high plasticity	n thawed,		G99											
- - -					G10	0									Clay: 72.1%, Silt: 26.9%, Sand: 0.9%, Gravel: 0.0%	
1 - -					G10	1	•									1-
-		- some gravel below 1.35			G10	2	•						· · · · · · · · · · · · · · · · · · ·			
-  -  -  -  -  -		- trace oxidation, brown, firm, belo	w 1.5 m		G10	3	•									
		SILT - clayey, trace oxidation - light brown, - soft, moist to wet - low plasticity			G10	4										2-
-					G10	5										
- 2 		END OF TEST HOLE AT 2.44 m IN NOTES:  1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger c to surface. 4. Drilled with 150 mm diamond co 2.4.	uttings, sand and asphalt cold p													
		4 = 2 2 2				_	GGED								ETION DEPTH: 2.44 m	
		A=CO/	И			_	VIEW				nalil		С	OMPLI	ETION DATE: 2/7/14	
I		= = = = = = = = = = = = = = = = = = = =	_			PR	OJEC	T FNC	SINEE	R:					Page	1 of



# City of Winnipeg

# Berrydale Avenue - Package 14-R-06

# Geotechnical Investigation

Table 02- Summary of Laboratory Soil Testing

Test		Pavement	Surface	Pavement Struct	ure Material	Subgrade	Sample	Moisture		Hydromet	er Analysis		At	terberg Lin	nits
Hole No.	Testhole Location	Type	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
			2/2			Clay Fill	0.46	28.4							
		Asphalt	n/a			Clay Fill	0.76	37.3							
	Berrydale Avenue;1 m					Clay	1.06	35.1							
TH14-09	South of North Curb			None	n/a	Clay	1.37	32.4							
		Concrete	153			Clay	1.67	36.7							
		Concrete	133			Clay	1.98	32.9							
						Clay	2.28	30.1							
		Asphalt	n/a			Silty Clay Fill	0.46	28.1							
		Asphalt	II/a			Silty Clay Fill	0.76	28.4	0.3	7.6	30	62	67.4	24.9	42.5
	Berrydale Avenue ;5 m					Silty Clay Fill	1.06	30.0							
TH14-10	South of North Curb			None	n/a	Silty Clay Fill	1.37	27.6							
		Concrete	128			Silty Clay	1.67	32.0							
						Silt	1.98	29.4							
						Silt	2.28	21.9							
		A    +	/-			Clay Fill	0.46	36.3							
		Asphalt	n/a			Silty Clay	0.76	34.2							
	Dawn-1-1- A 7.5					Silty Clay	1.06	30.0							
TH14-11	Berrydale Avenue ;7.5 m			None	n/a	Silty Clay	1.37	32.4							
	South of North Curb	Concrete	140			Silty Clay	1.67	41.2							
		Concrete	140			Silty Clay	1.98	50.4							
						Clayey Silt	2.28	45.7							
		A l l+	/-			Sand Fill	0.46	22.9							
		Asphalt	n/a			Clay	0.76	29.0	0.0	0.9	22	77.1	63.2	24.6	38.6
	Berrydale Avenue ;0.5 m					Clay	1.06	34.9							
TH14-12	South of North Curb			None	n/a	Clay	1.37	41.0							
		Concrete	128			Clay	1.67	43.2							
						Clay	1.98	47.9							
						Clay	2.28	51.2							
		A o.c.l I+	c- 1-			Clay fill	0.46	30.2							
		Asphalt	n/a			Clay fill	0.76	25.8							
	Berrydale Avenue ;4 m					Clay fill	1.06	33.4							
TH14-13	South of North Curb			None	n/a	Clay fill	1.37	25.3							
		Concrete	152			Clay	1.67	44.0							
						Clay	1.98	41.8							
						Clay	2.28	36.8							



Test		Pavement S	urface	Pavement Struct	ture Material	Subgrade	Sample	Moisture		Hydromet	er Analysis		At	terberg Lin	nits
Hole No.	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
						Clay Fill	0.46	36.2							
		Asphalt	n/a			Silt	0.76	23.9	0.7	15.1	64.1	20.1	29.8	14.8	15.0
	Berrydale Avenue ;7 m					Silt	1.06	22.9							
TH14-14	South of North Curb			None	n/a	Silt	1.37	27.3							
		concrete	128			Clay	1.67	56.6							
		concrete	120			Clay	1.98	44.7							
						Clay	2.28	48.6							
		Asphalt	n/a			Clay	0.46	31.3							
		Aspiran	11/a			Clay	0.76	29.8	0.0	0.9	26.9	72.1	69.8	24.6	45.3
	Berrydale Avenue ;1 m					Clay	1.06	30.1							
TH14-15	South of North Curb			None	n/a	Clay	1.37	32.5							
		Concrete	128			Clay	1.67	29.1							
						Clayey Silt	1.98	25.5							
						Clayey Silt	2.28	24.9							