# Template Version: 2024 02 01- Const Road Works

# APPENDIX A GEOTECHNICAL REPORT



Stantec Consulting Ltd. 199 Henlow Bay Winnipeg MB R3Y 1G4

February 14, 2024

Project/File: 123316853

Lucas Stoffel
Dillon Consulting Ltd.
1558 Willson Place
Winnipeg, MB R3T 0Y4

Good day Lucas,

Reference: Grant Avenue and Taylor Avenue Pavement Renewals

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the Grant Avenue and Taylor Avenue Pavement Renewals in Winnipeg, Manitoba. Use of this report is subject to the Statement of General Conditions provided in **Appendix A**.

The subsurface coring and drilling sampling program was conducted from December 12, 2023, to January 29, 2024. Pavement coring was performed by our geotechnical field personnel, and drilling services were provided by Paddock Drilling under the supervision of our personnel. The borehole locations are shown on the attached Borehole Location Plan provided in **Appendix B**. When subsurface drilling was required, the pavement cores were sampled with a 150 mm bit and boreholes were drilled with 125 mm solid stem augers. Geotechnical drilling boreholes were terminated at a depths ranging from 1.6 m to 2.5 m below the pavement, which resulted in borehole depths ranging from 1.89 m to 2.81 m below the surface. Soil samples were obtained directly from the auger flights at depths of 0.6 m, 0.9 m, 1.2 m, 1.6 m, 2.0 m, and 2.5 m from the bottom of the existing pavement. Upon completion of drilling, the testholes were examined for evidence of sloughing and groundwater seepage. The borehole records are provided in **Appendix C**. The soil classification used in the borehole records is as per ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*. Core photographs are provided in **Appendix D**.

Reference: Grant Avenue and Taylor Avenue Pavement Renewals

# **EXISTING PAVEMENT THICKNESS**

The existing pavement thickness is provided in the following table:

**Table 1 – Existing Pavement Thickness** 

Street	Core ID	Asphalt Thickness (mm)	Concrete Thickness (mm)	Total Pavement Thickness (mm)
Taylor Ave	WB BH 1	50	260	310
Taylor Ave	WB BH 2	70	180	250
Taylor Ave	WB BH 3	25	0	25
Taylor Ave	WB BH 4	70	230	300
Taylor Ave	WB BH 5	80	225	305
Taylor Ave	WB BH 6	100	170	270
Taylor Ave	EB BH 1	60	230	290
Taylor Ave	EB BH 2	70	195	265
Taylor Ave	EB BH 3	100	210	310
Taylor Ave	EB BH 4	125	0	125
Grant Ave	EB BH 1	40	255	295
Grant Ave	EB BH 2	60	255	315
Grant Ave	EB BH 3	55	230	285
Grant Ave	EB BH 4	85	220	305
Grant Ave	EB BH 5	105	225	330
Grant Ave	EB BH 6	100	0	100
Grant Ave	EB BH 7	80	225	305
Grant Ave	WB BH 1	45	235	280
Grant Ave	WB BH 2	30	250	280
Grant Ave	WB BH 3	40	250	290

Reference: Grant Avenue and Taylor Avenue Pavement Renewals

# LABORATORY TESTING

The following laboratory tests were conducted on select soil samples:

- ASTM D2216 Laboratory Determination of Water (Moisture) Content of Soil by Mass
- ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D7928 Particle-Size Distribution of Fine-Grained Soils Using The Sedimentation Analysis
- ASTM D698 Laboratory Compaction Characteristics of Soil Using Standard Effort
- ASTM D1883 California Bearing Ratio (CBR) of Laboratory-Compacted Soils
- CSA A23.2-14C Obtaining and testing drilled cores for compressive strength testing

The CBR tests were performed at 95% maximum dry density under soaked conditions. Prior to testing the concrete core samples for compressive strength, the cores were conditioned in water at room temperature for 48 hours. The moisture content results are shown on the borehole records, and the laboratory test reports are provided in **Appendix E**.

### **CLOSURE**

We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding this report.

Regards,

STANTEC CONSULTING LTD.

Guillaume Beauce P.Eng.

Geotechnical Engineer, Materials Testing Services

Phone: 204-928-7618 Mobile: 204-898-8290

guillaume.beauce@stantec.com

**Jason Thompson** C.E.T.

Manager, Materials Testing Services

Phone: 204-928-4004 Mobile: 204-981-8445

jason.thompson@stantec.com

Attachment: Appendix A – Statement of General Conditions

Appendix B – Borehole Location Plan Appendix C – Borehole Records Appendix D – Core Photographs Appendix E – Laboratory Test Reports

- Atterberg Limits Test Reports
- Particle-Size Analysis Reports
- Standard Proctor Test Reports
- CBR Test Reports
- Concrete Core Compressive Strength Test Results

# **APPENDIX A**

**Statement of General Conditions** 

#### STATEMENT OF GENERAL CONDITIONS

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Stantec's present understanding of the site-specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site-specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock, and groundwater conditions as influenced by geological processes, construction activity, and site use.

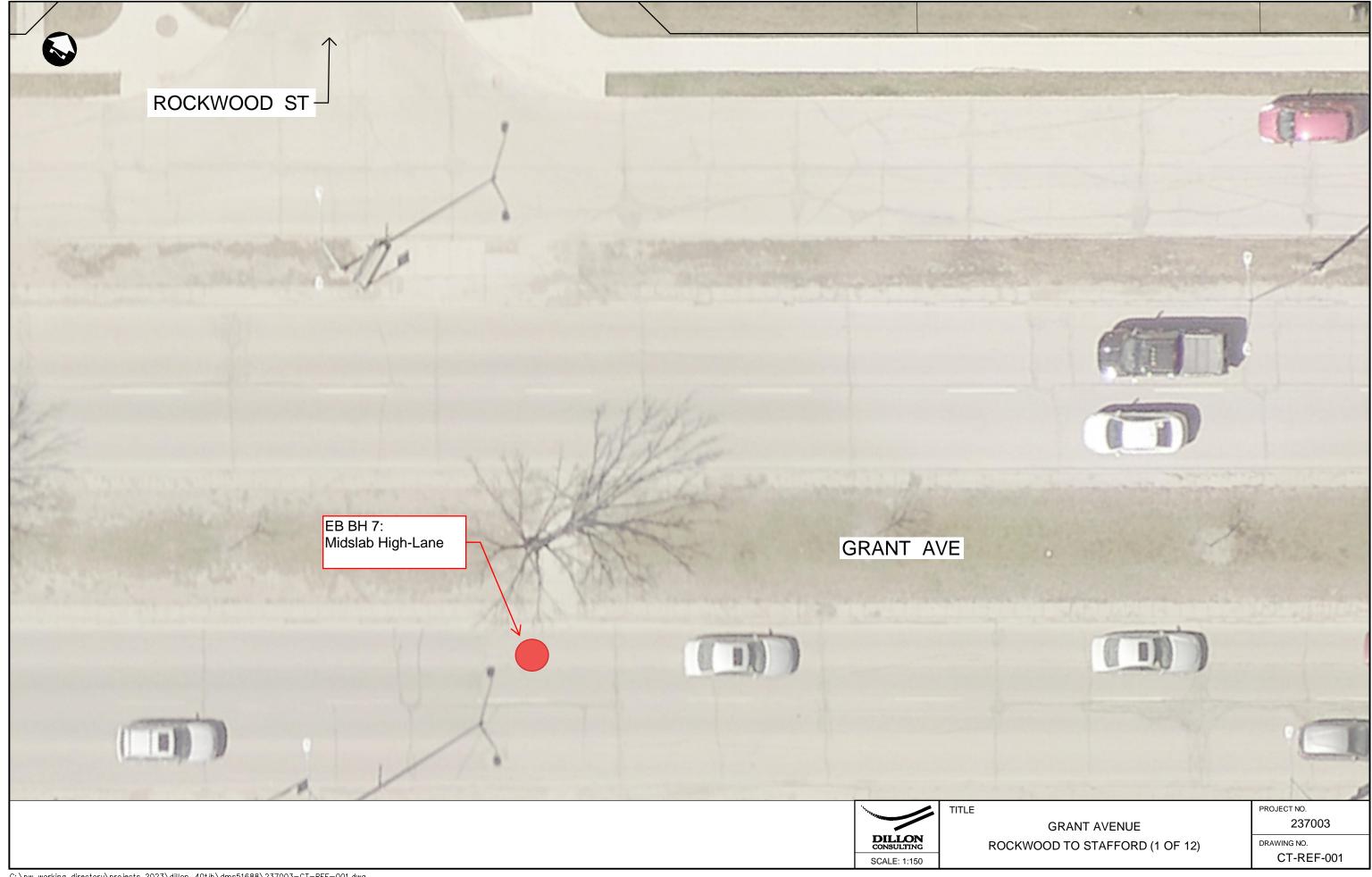
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec will not be responsible to any party for damages incurred as a result of failing to notify Stantec that differing site or sub-surface conditions are present upon becoming aware of such conditions.

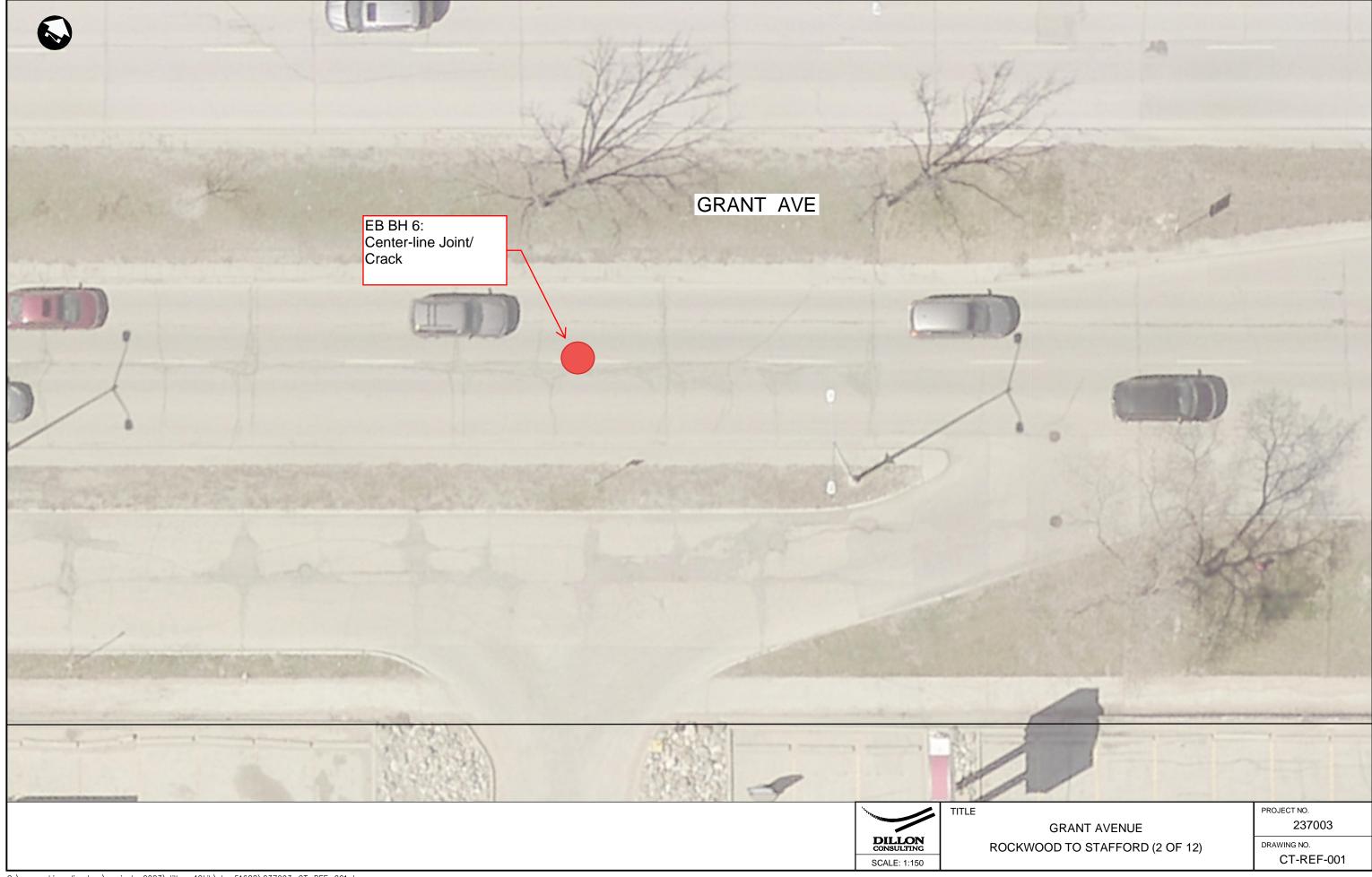
PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc.), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec cannot be responsible for site work carried out without being present.

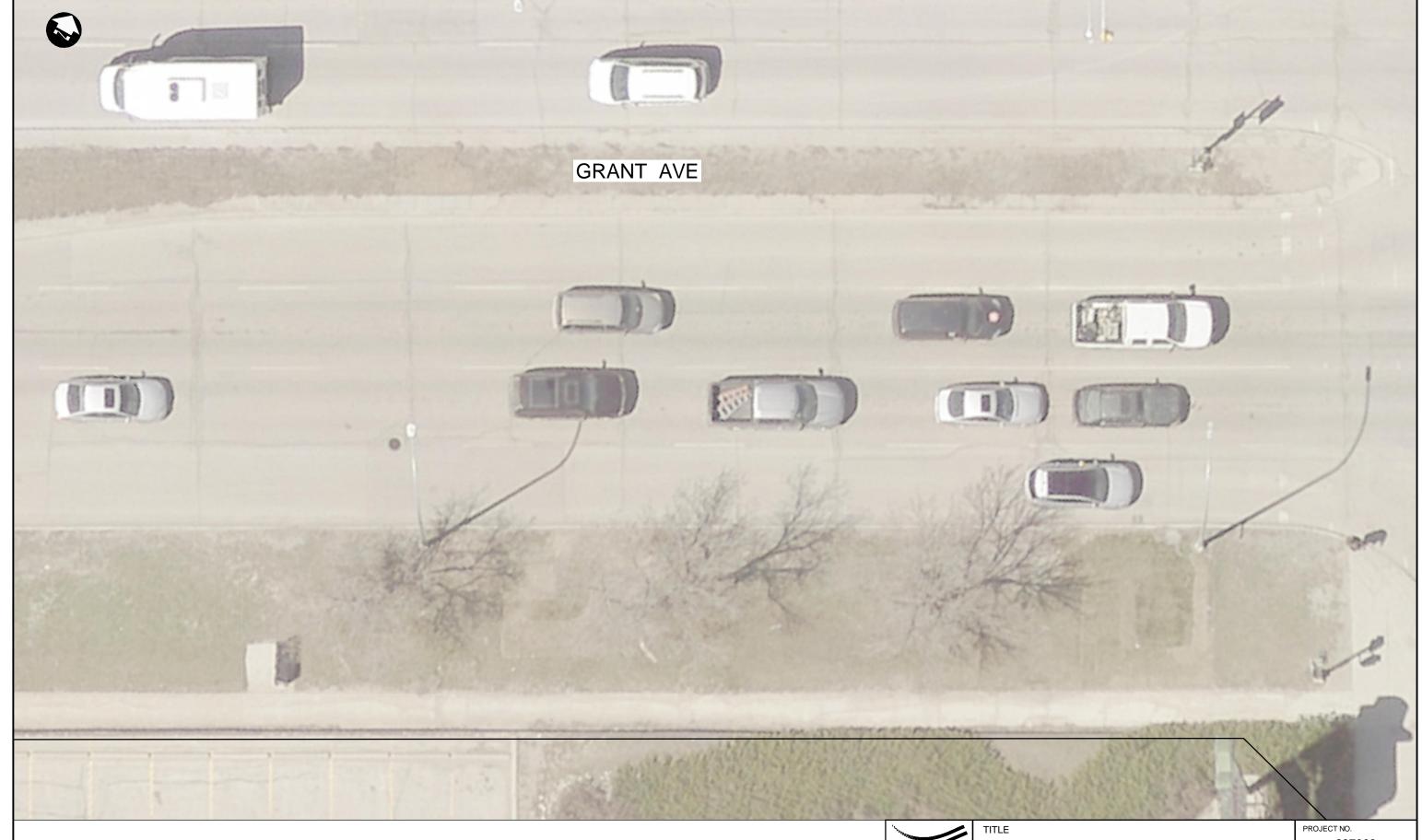


# **APPENDIX B**

**Borehole Location Plan** 



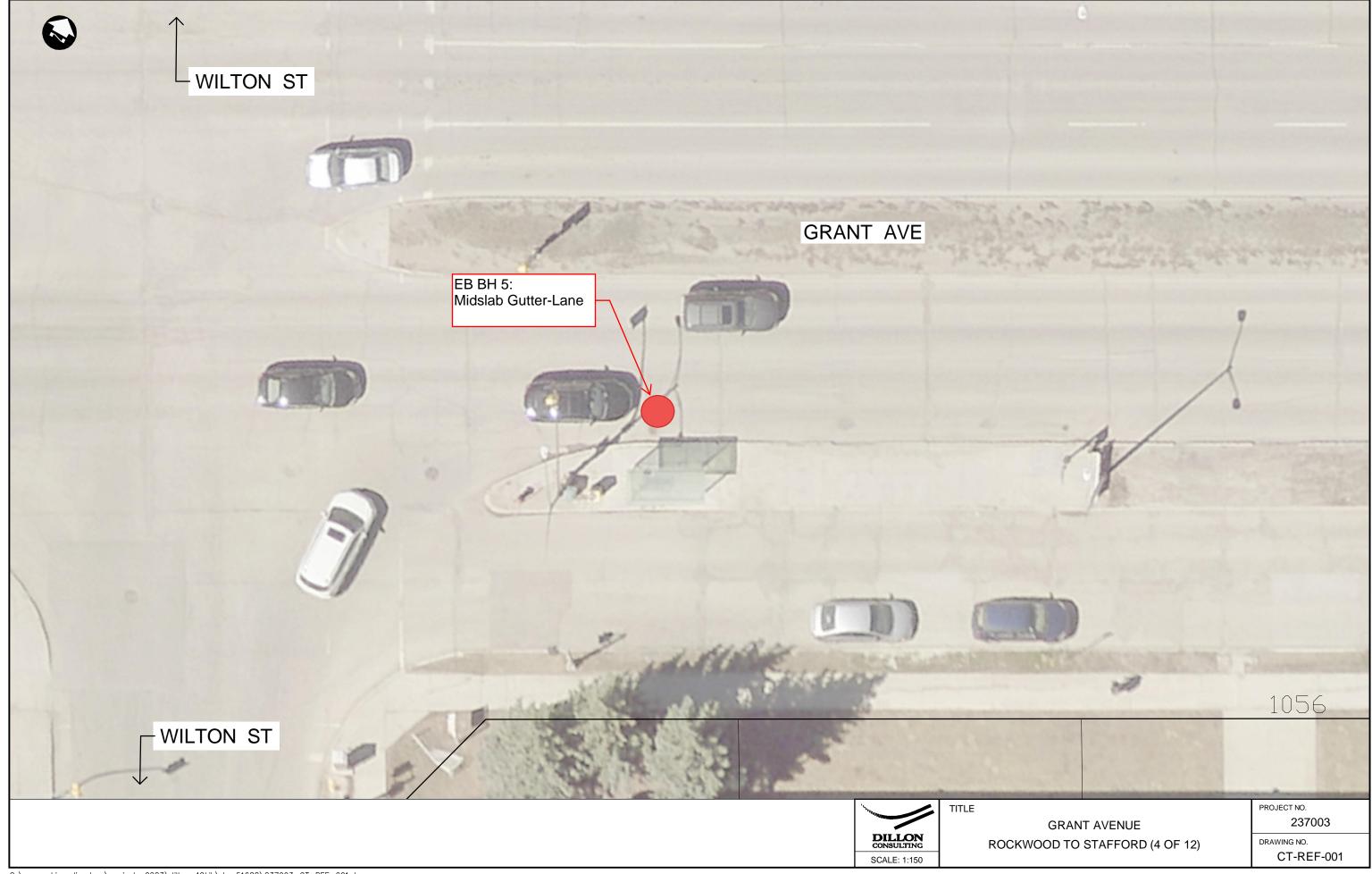


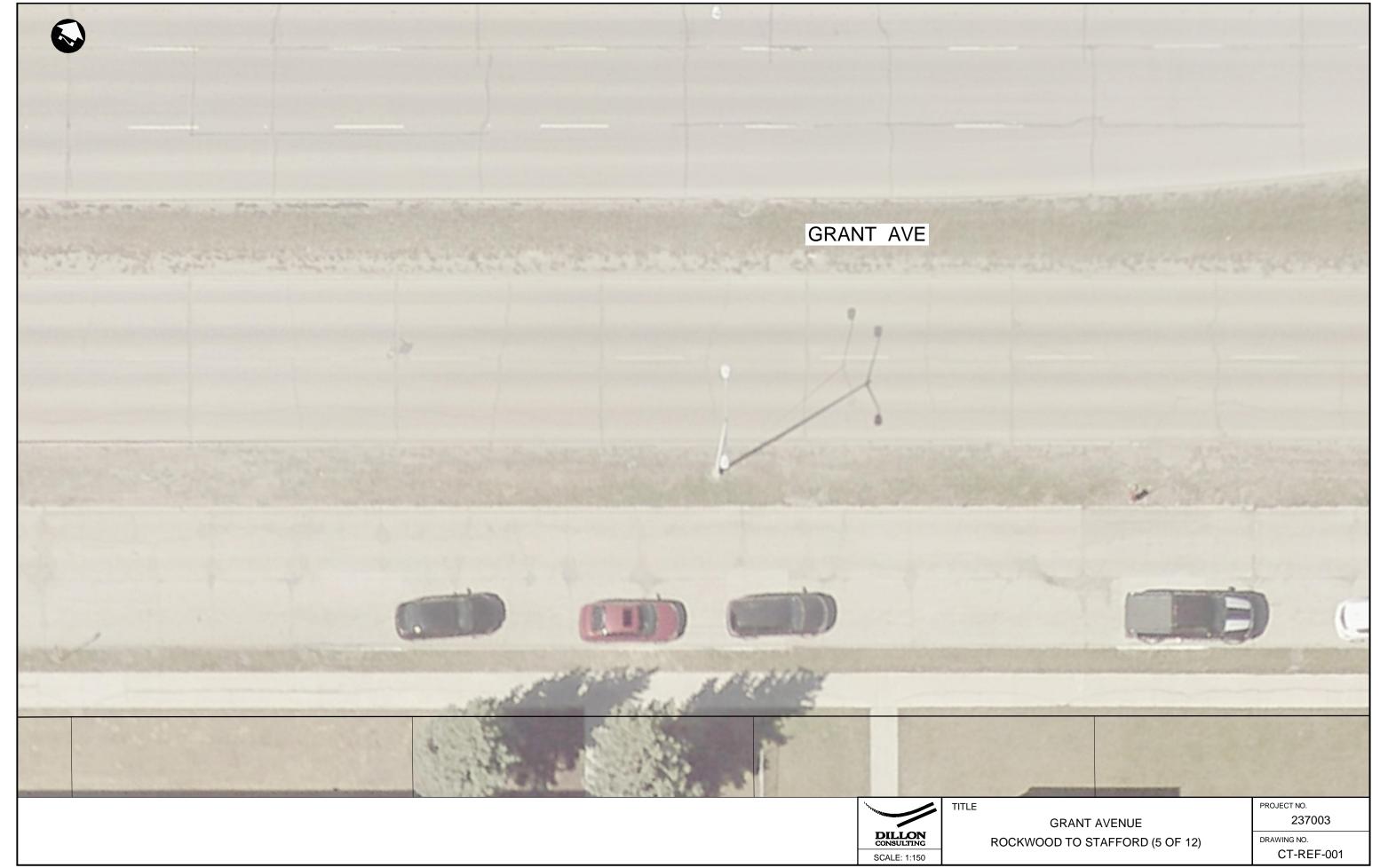


DILLON CONSULTING SCALE: 1:150

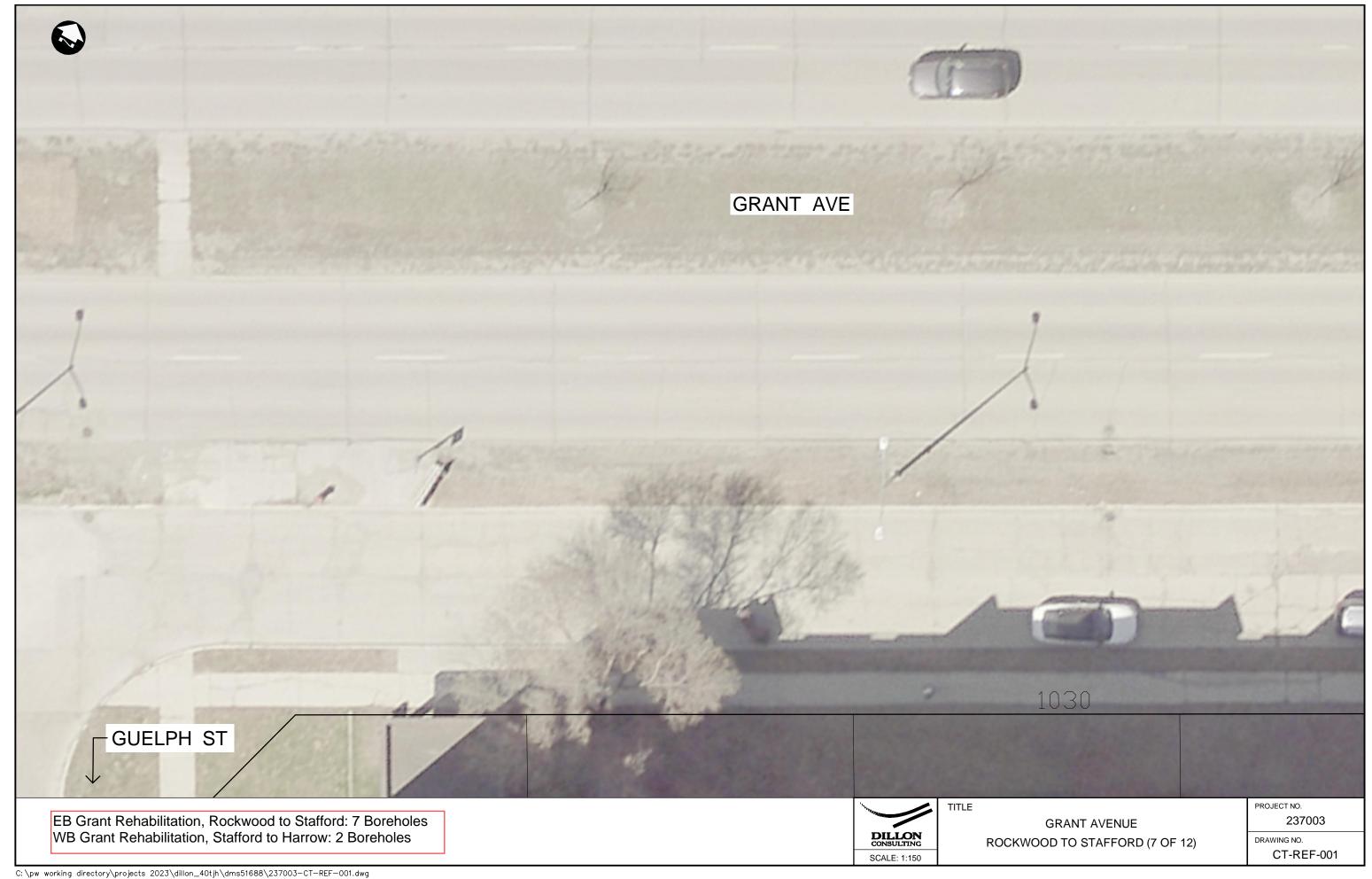
**GRANT AVENUE** ROCKWOOD TO STAFFORD (3 OF 12) 237003

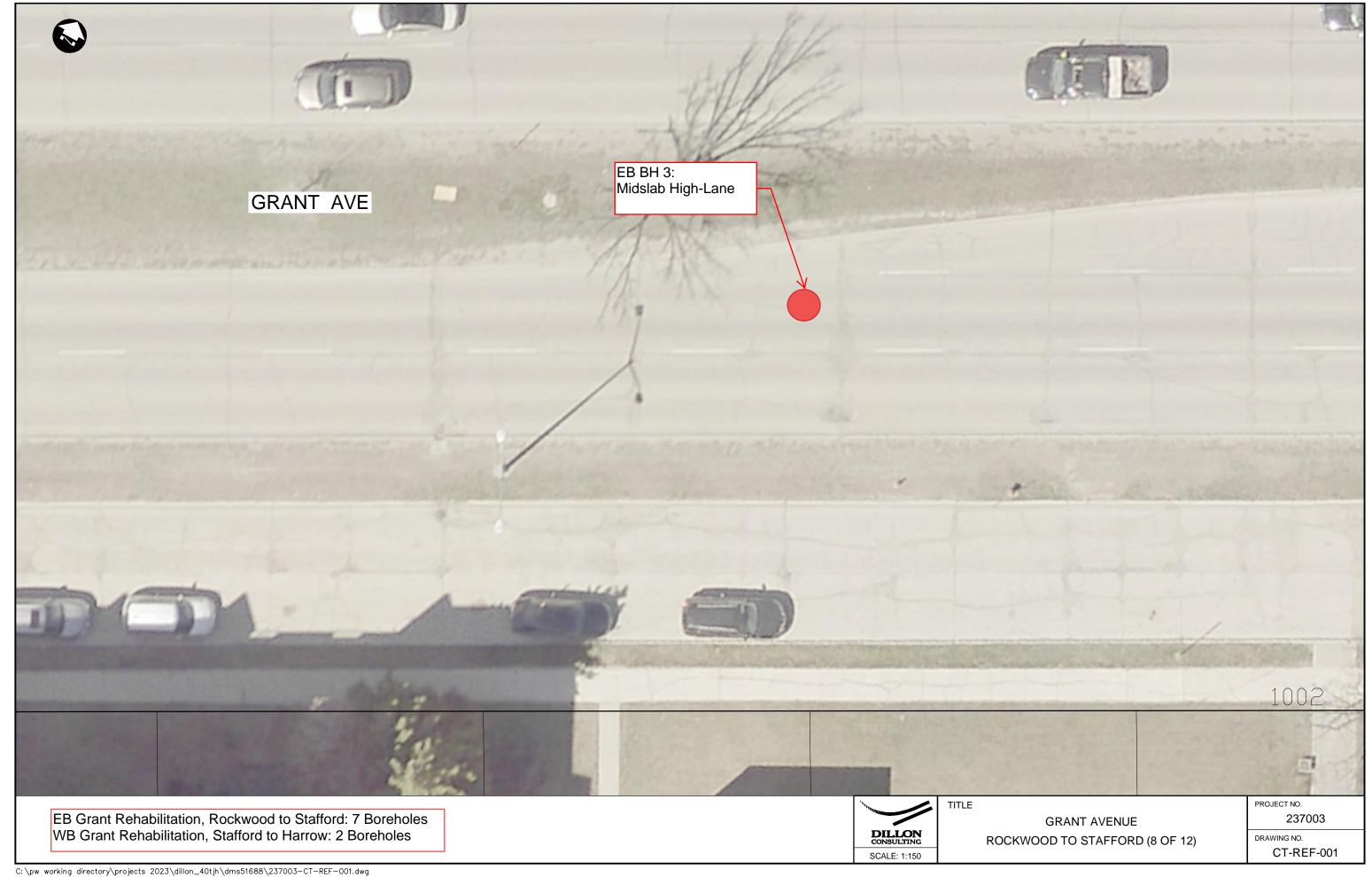
DRAWING NO. CT-REF-001

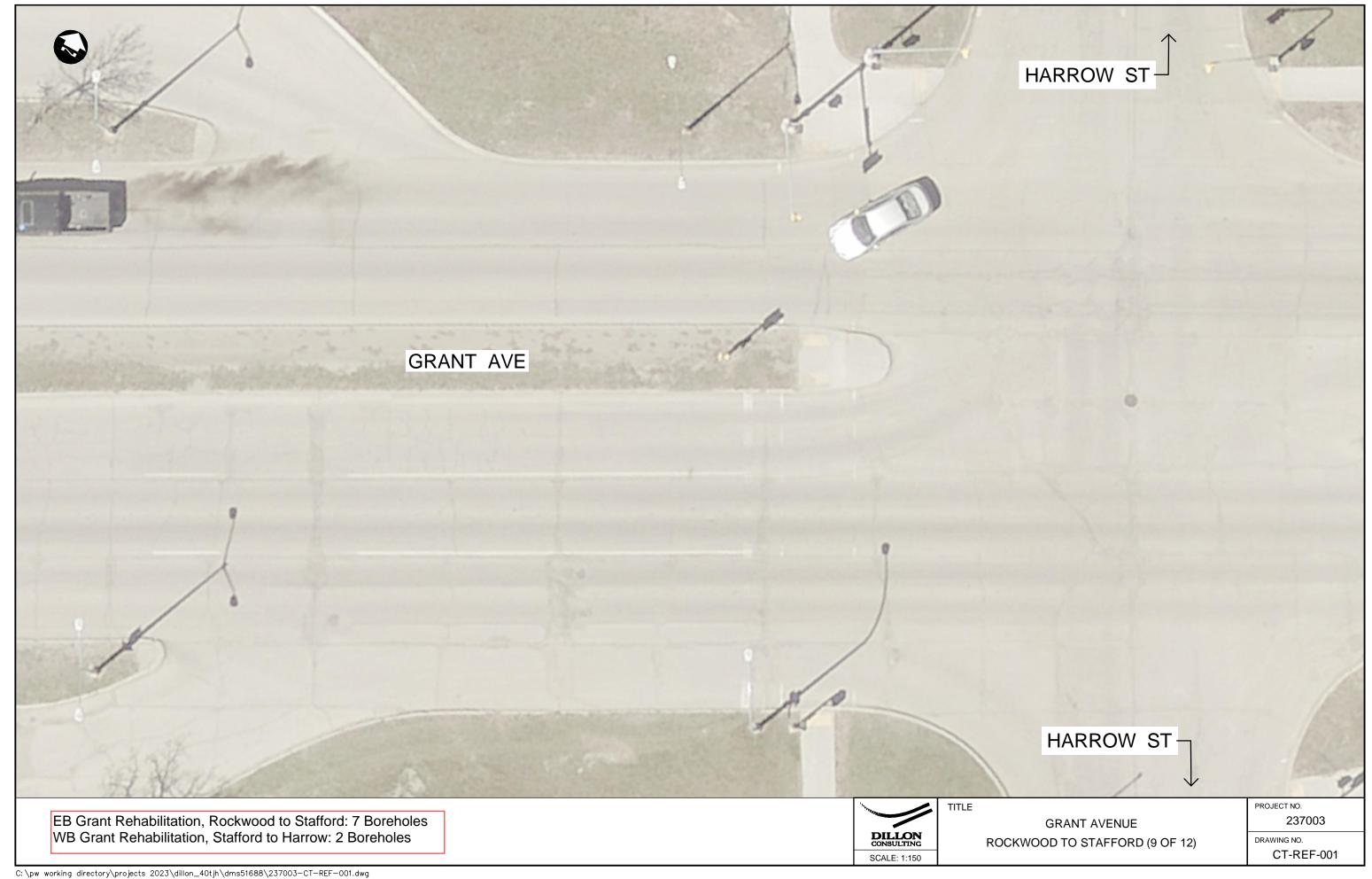


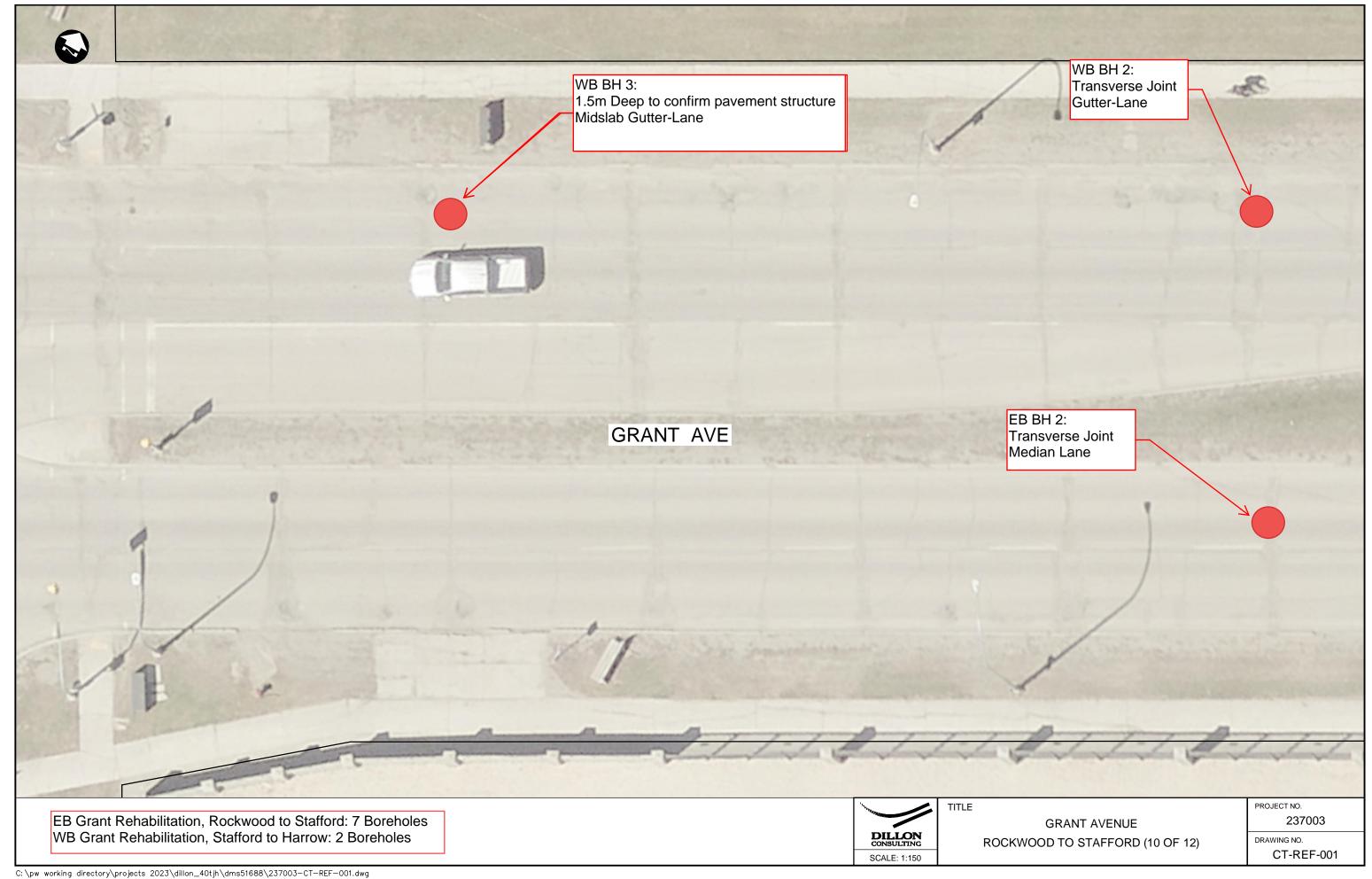


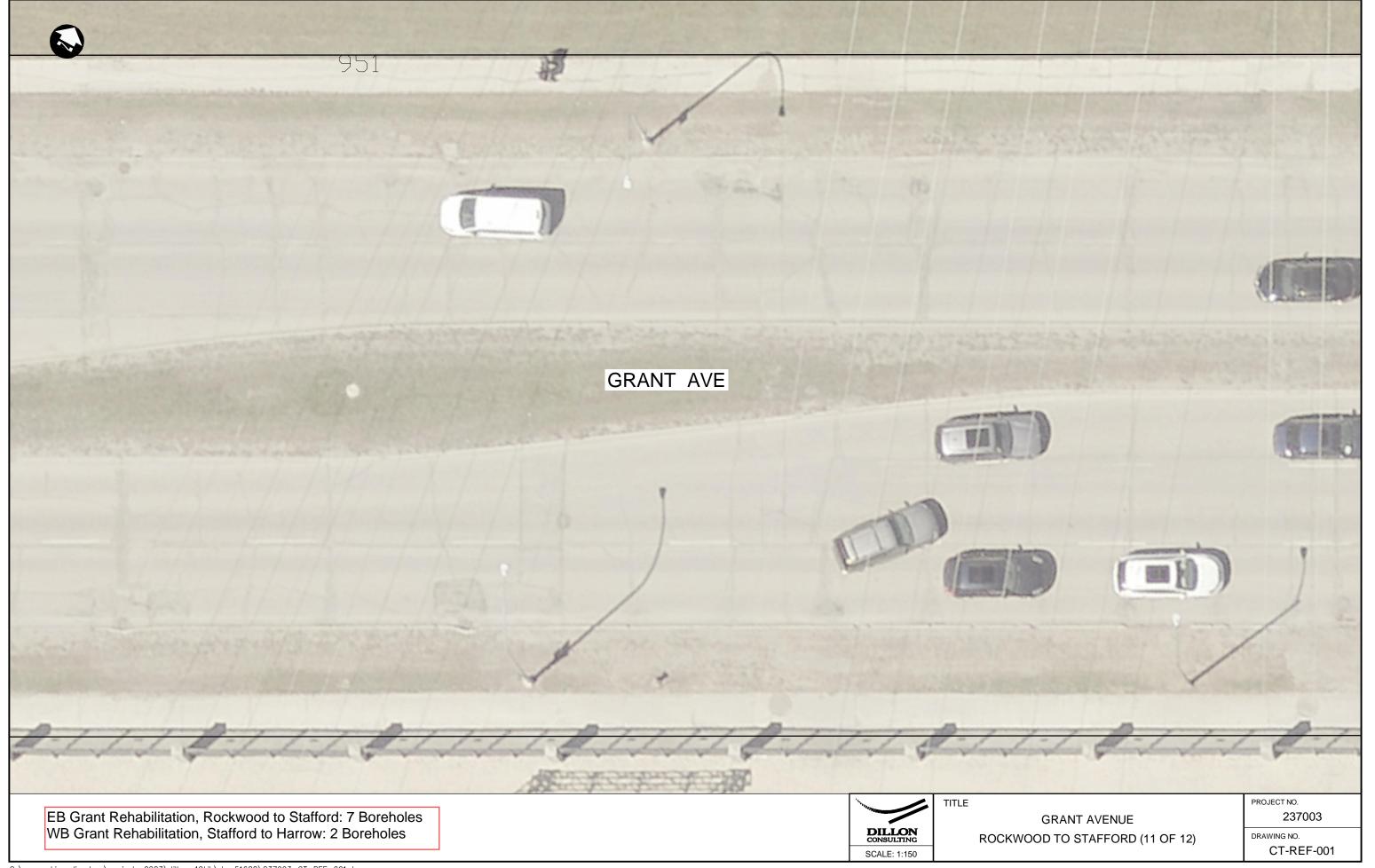


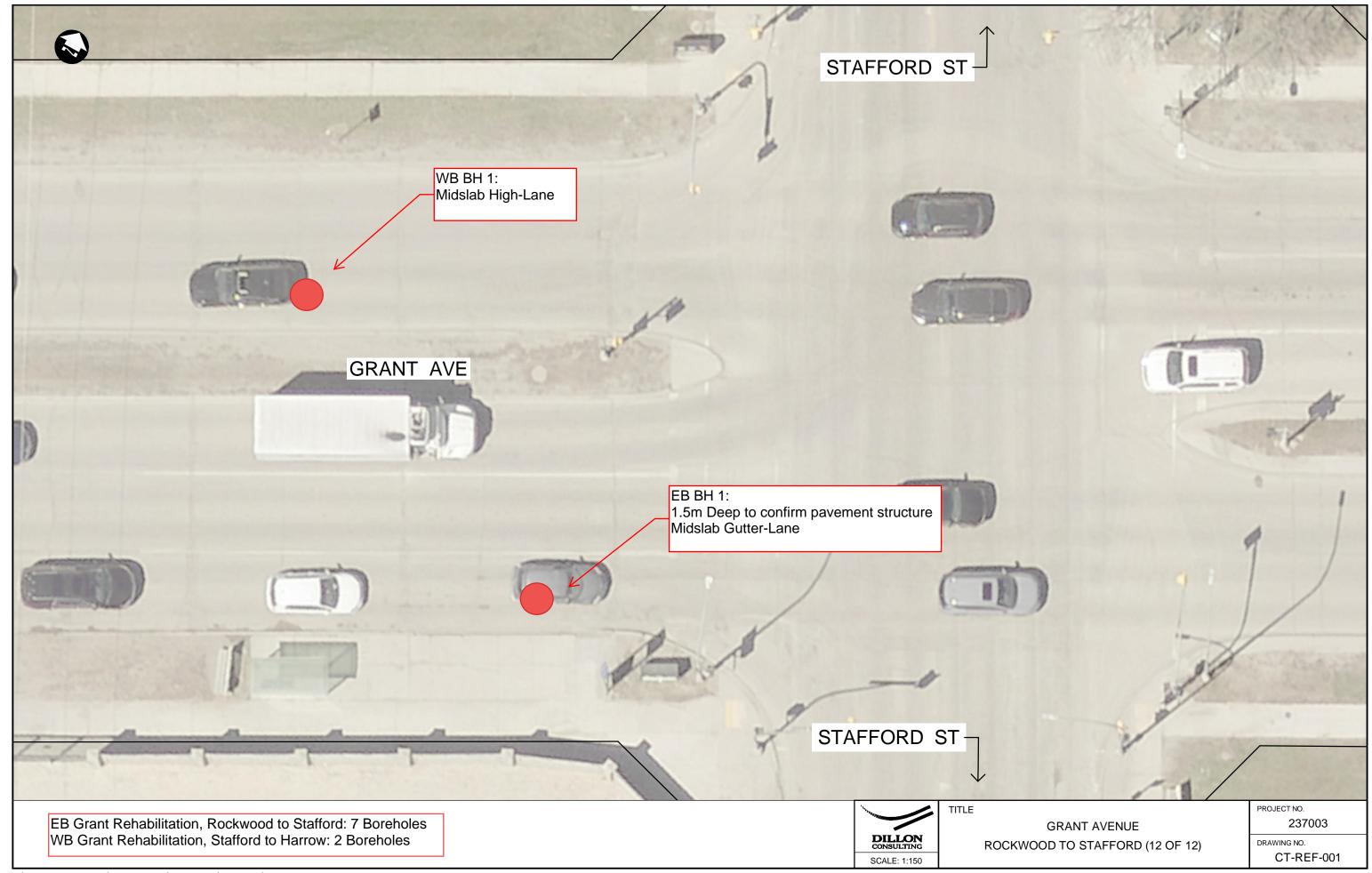


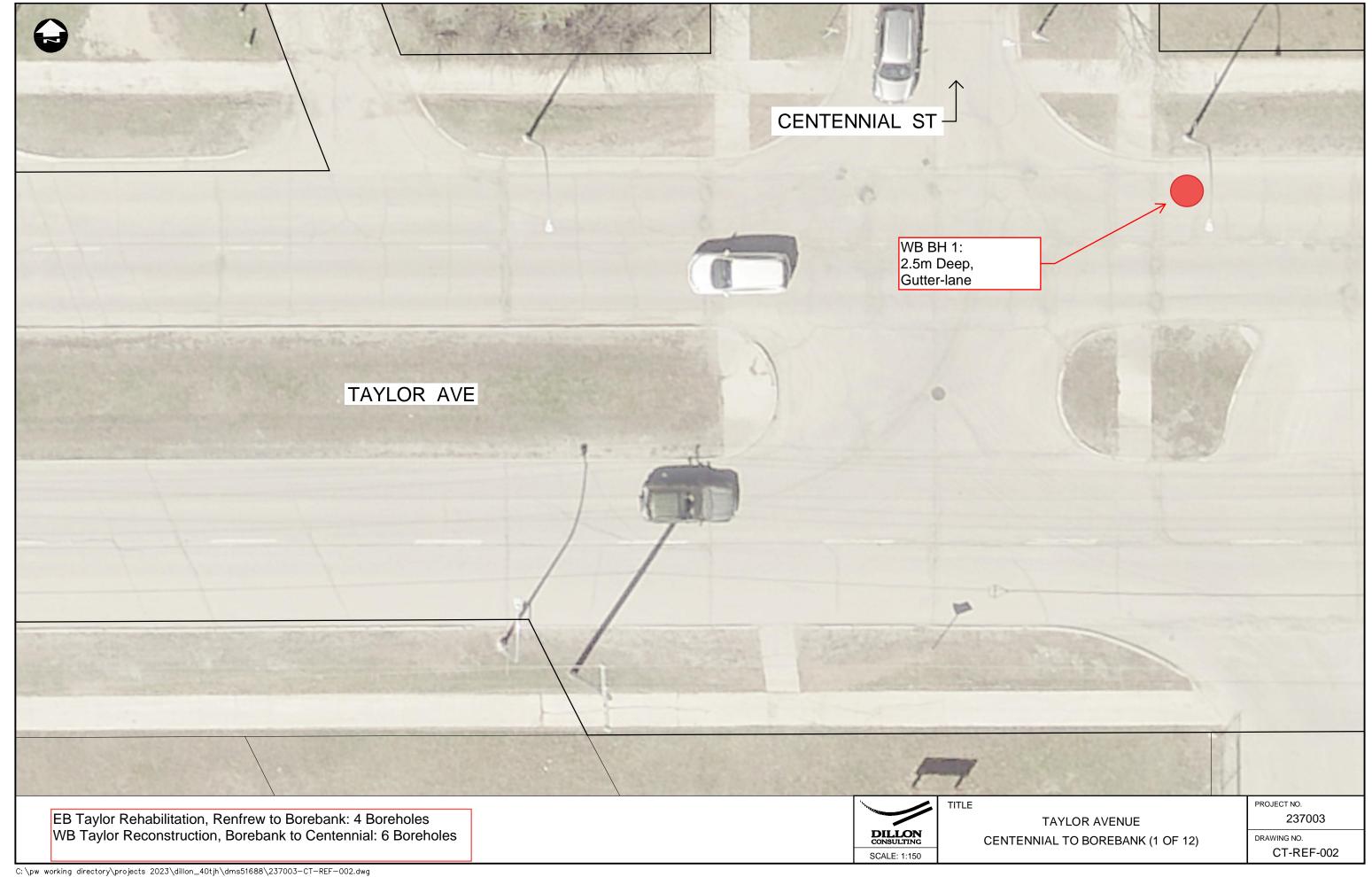


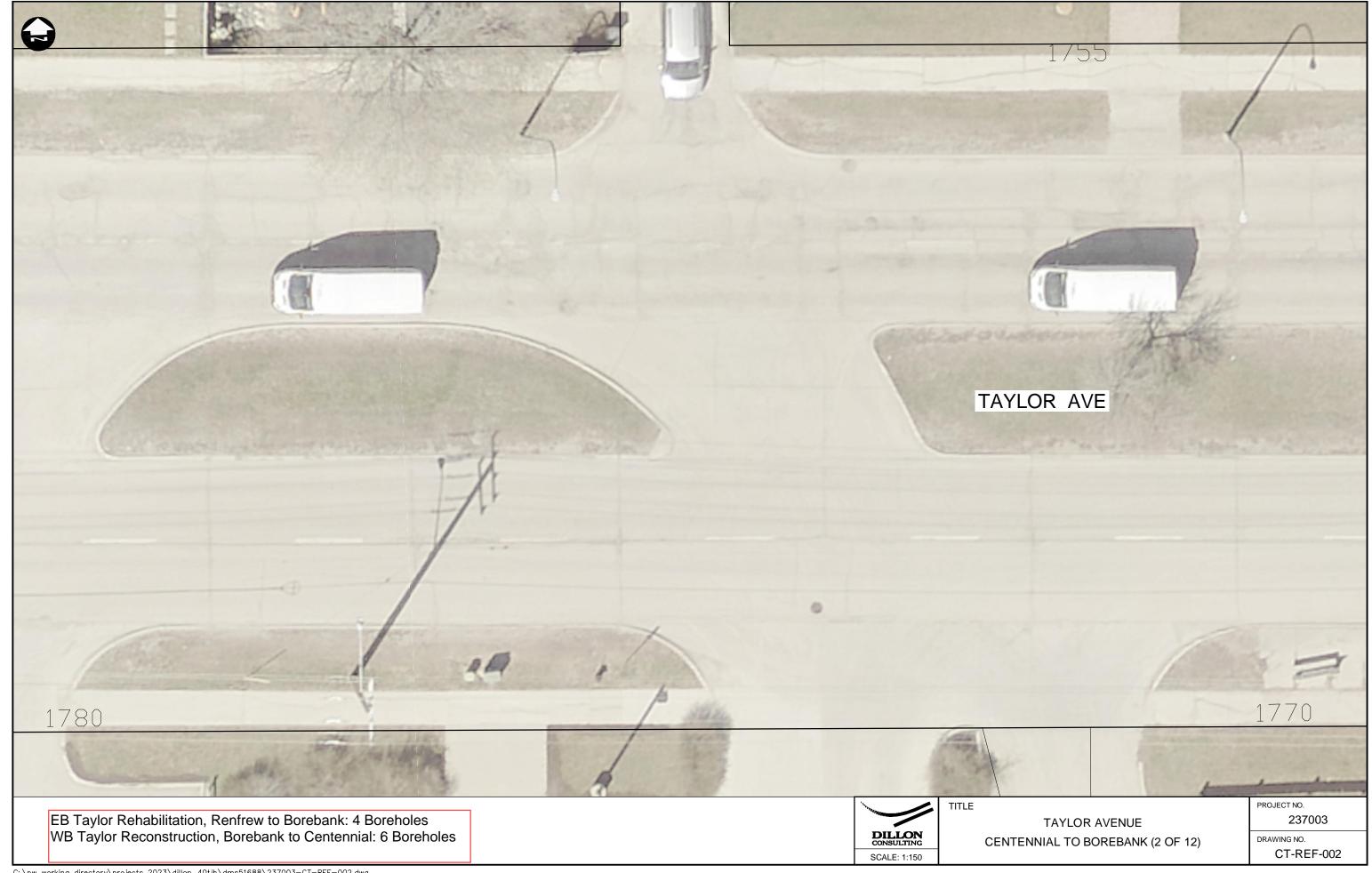


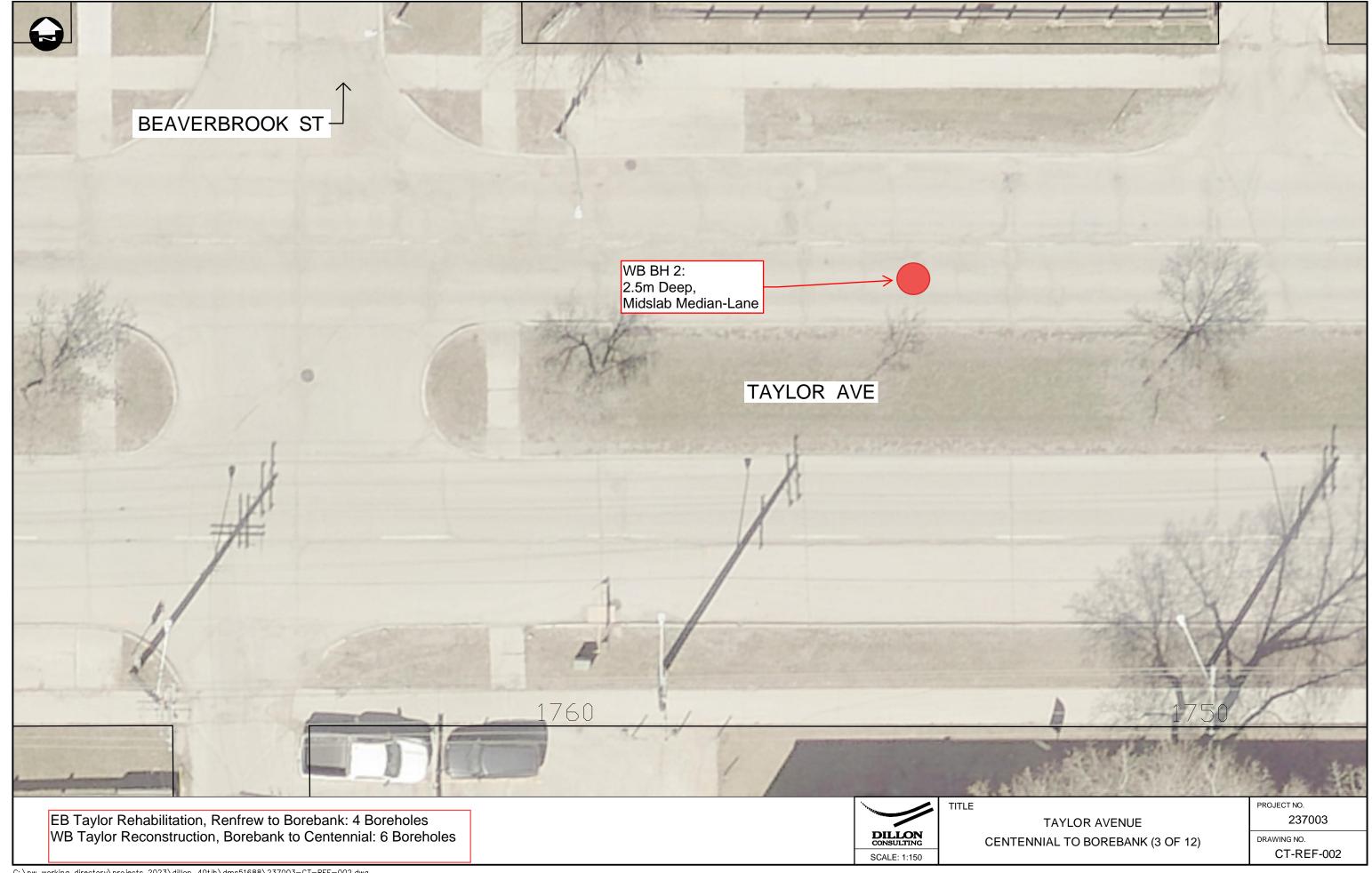


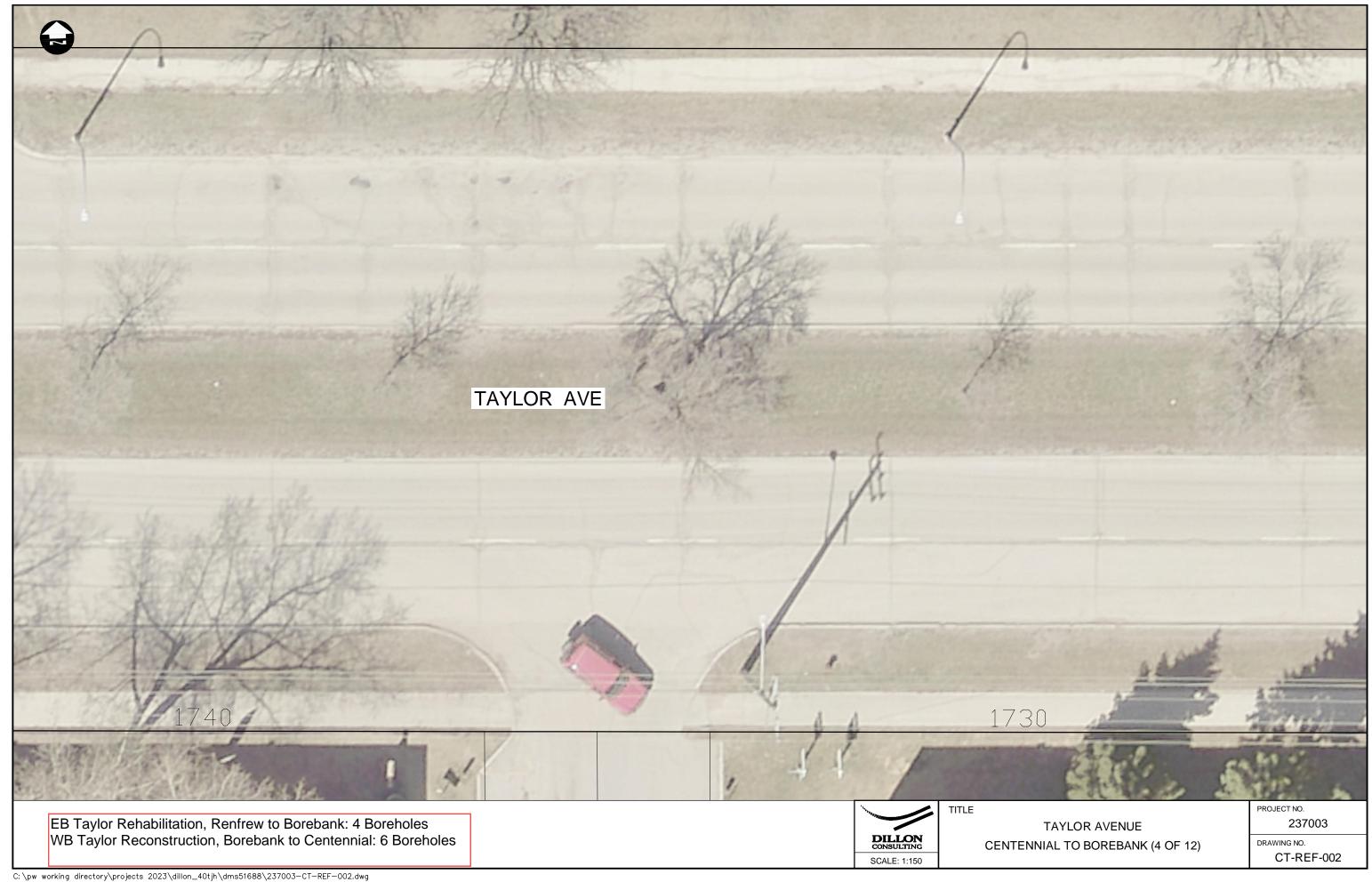


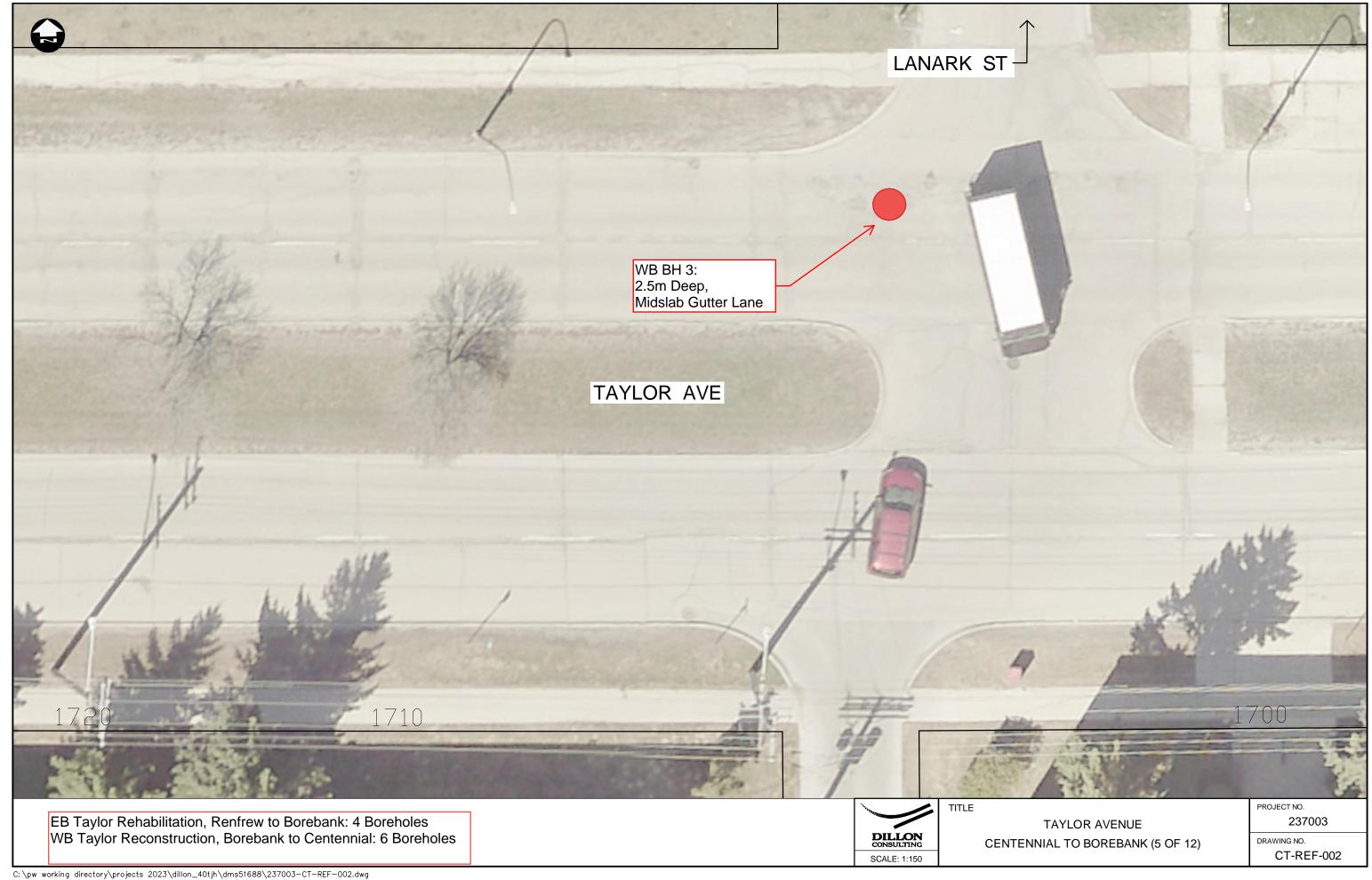


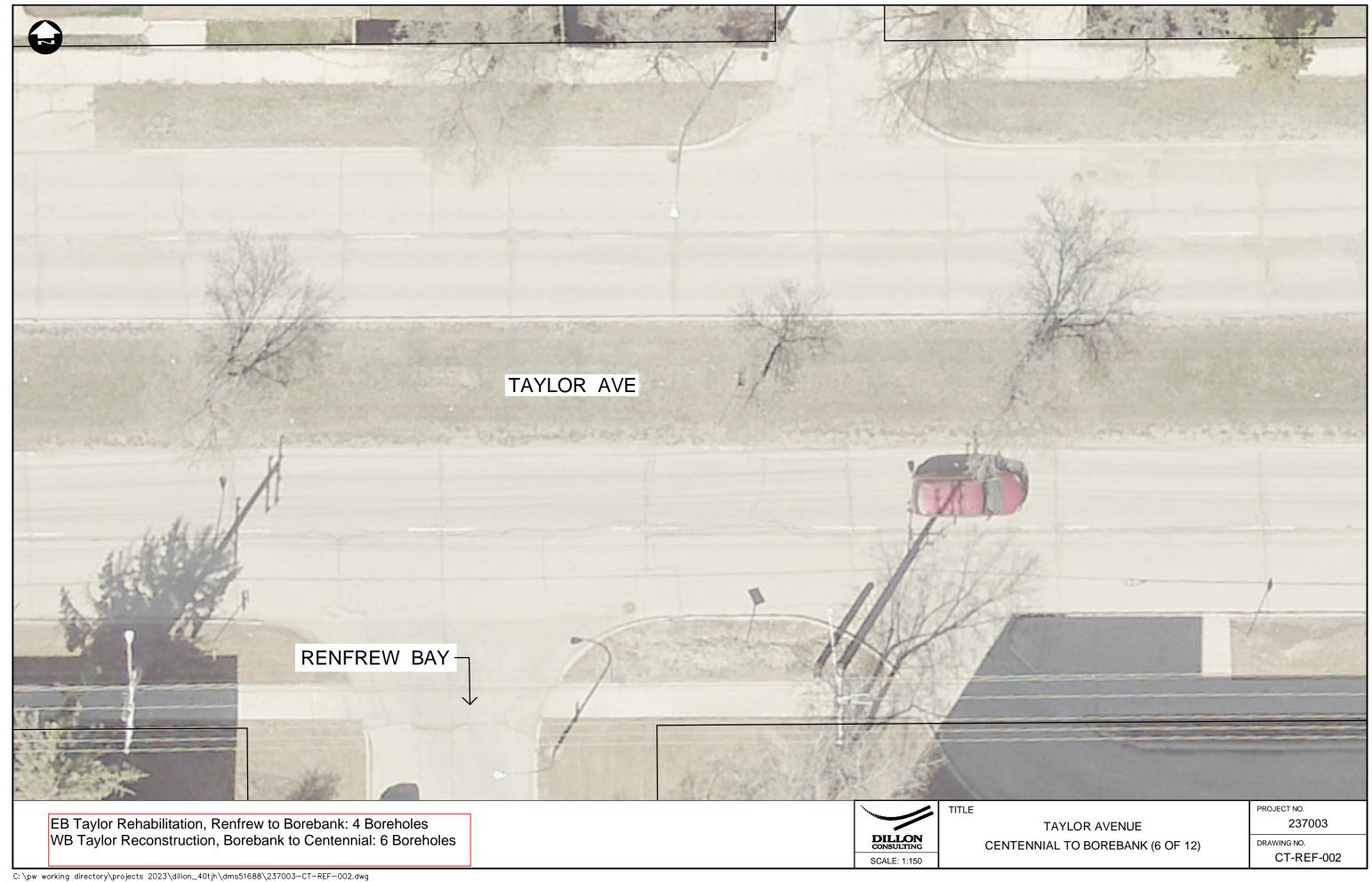


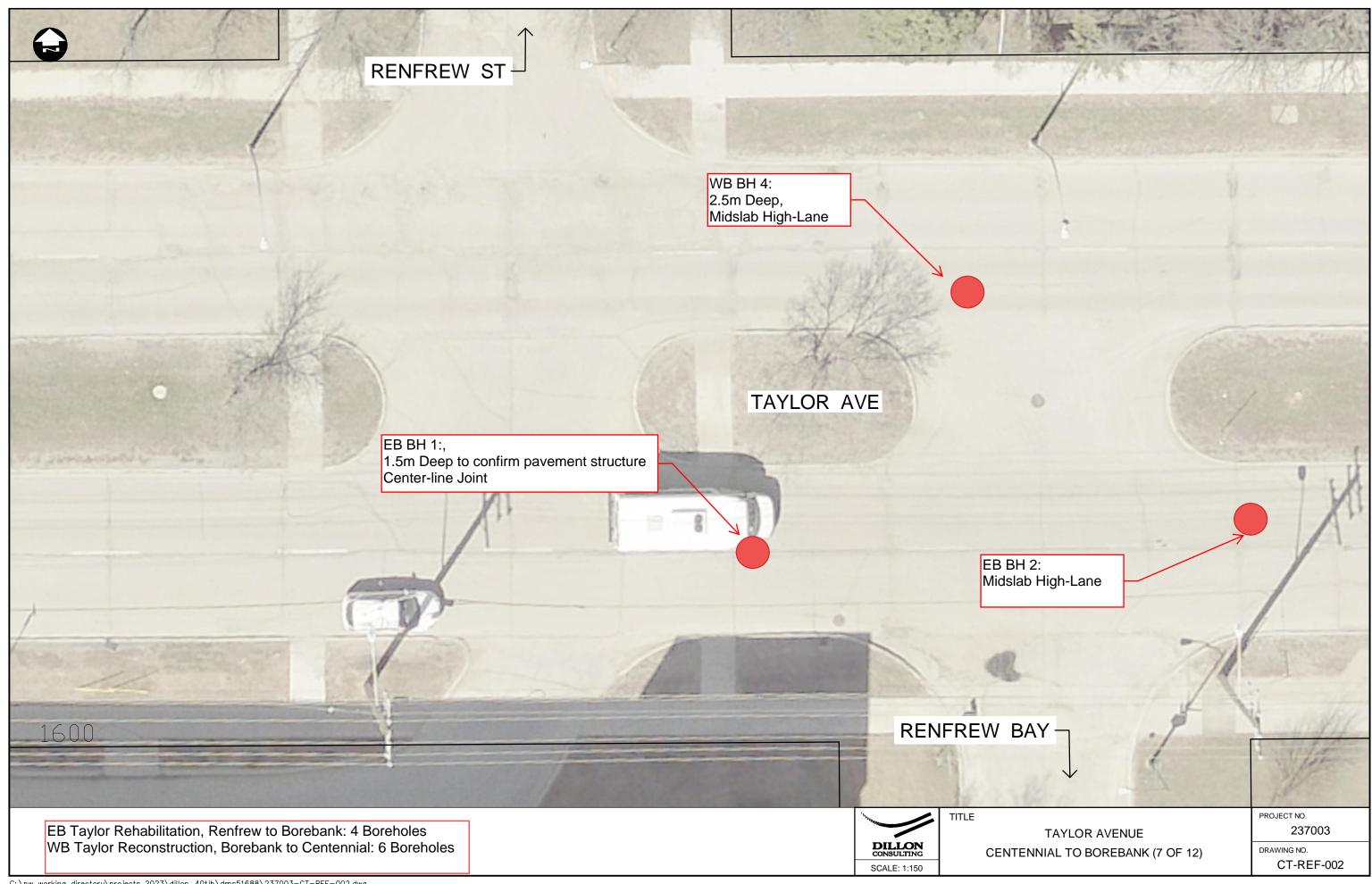


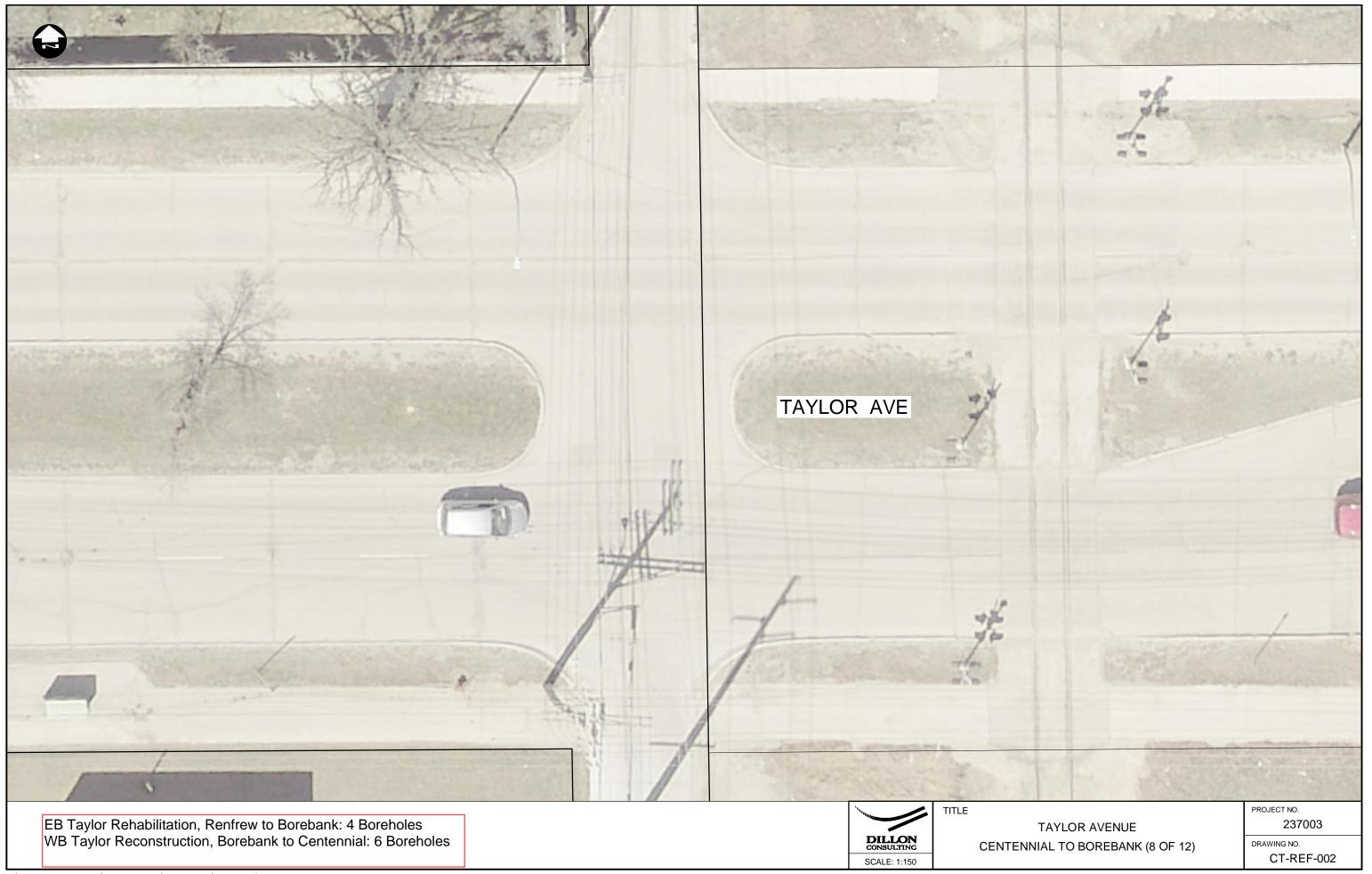


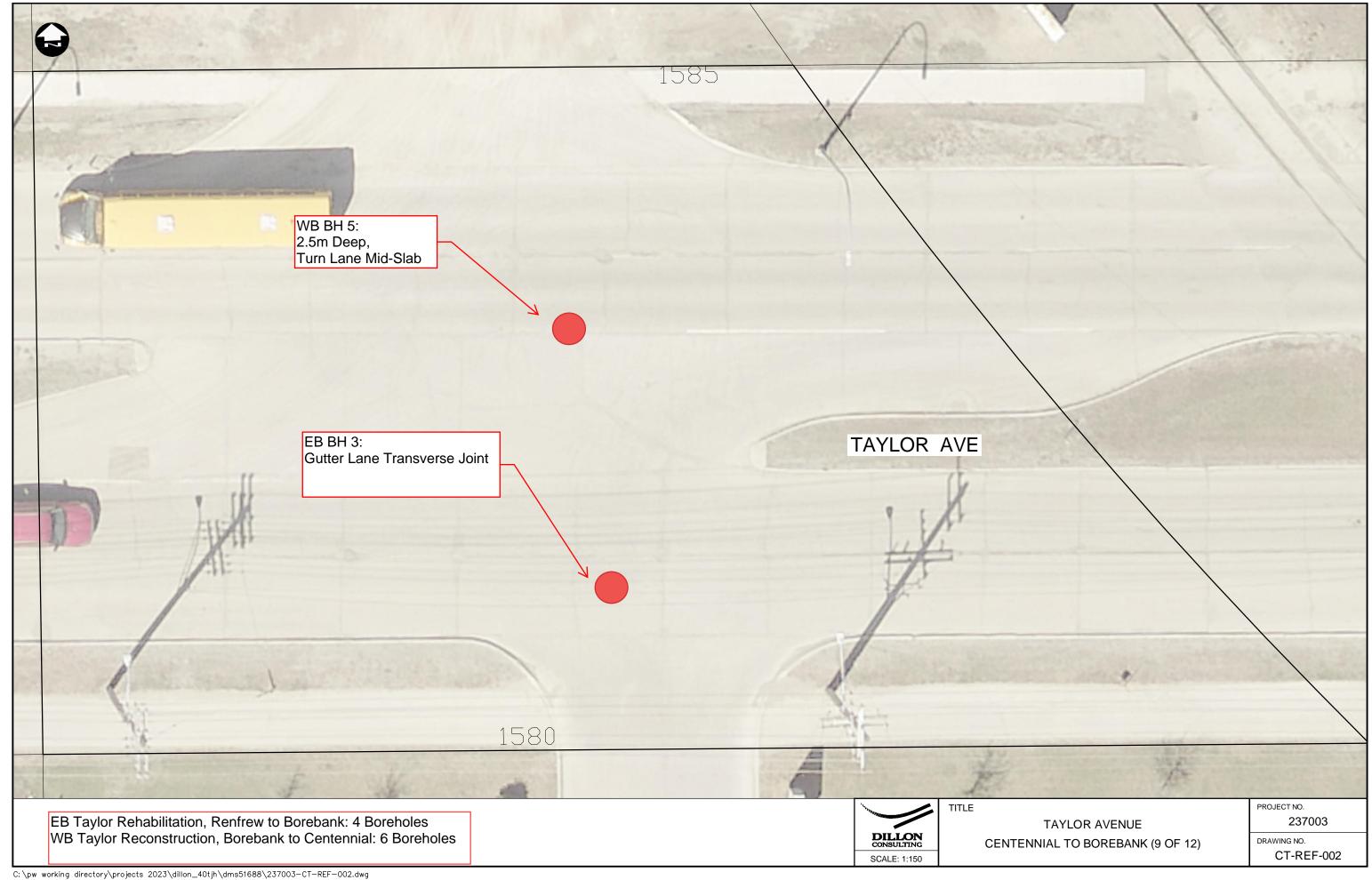


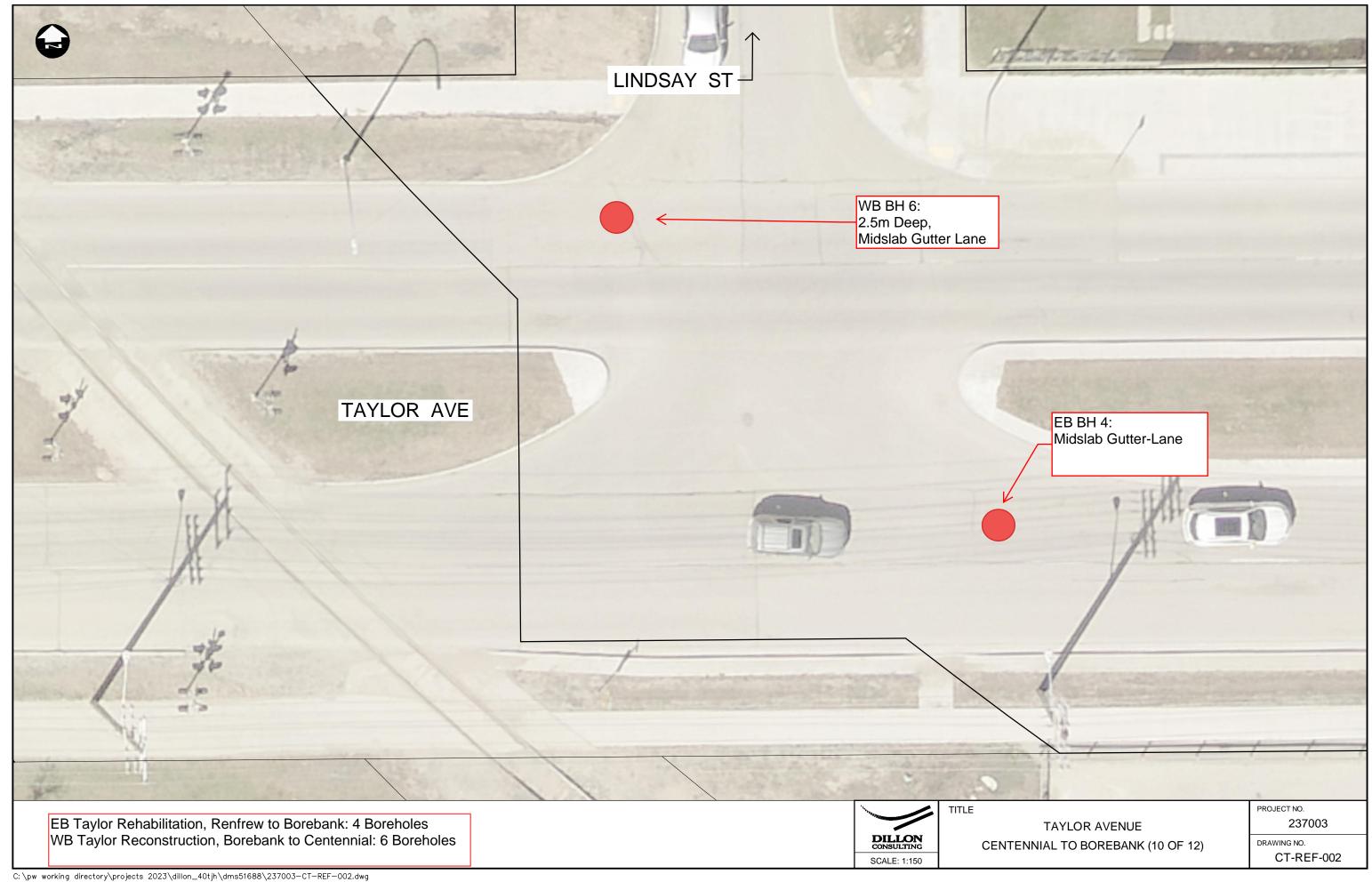




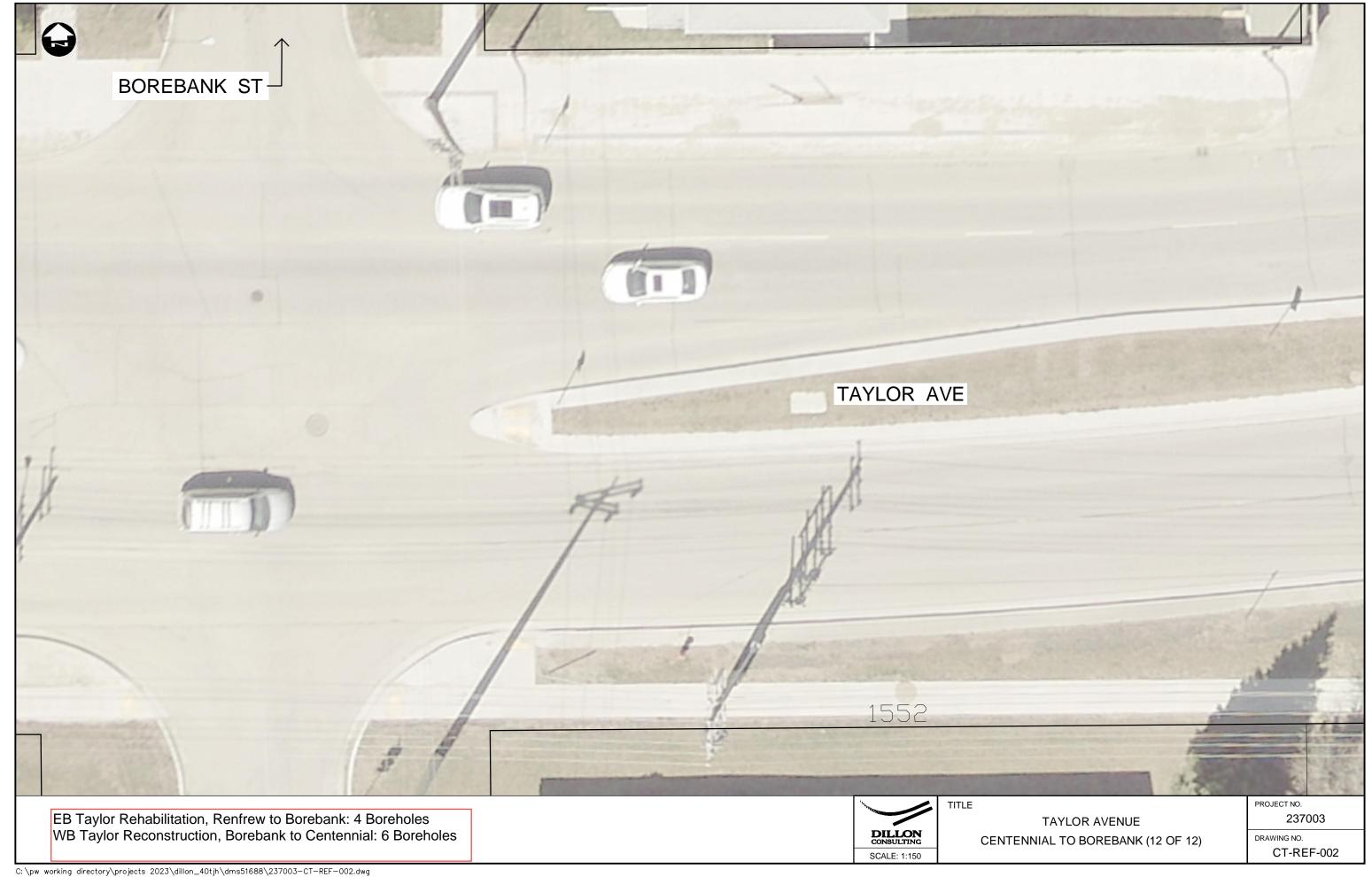












# **APPENDIX C**

**Borehole Records** 

# SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

# **SOIL DESCRIPTION**

#### Terminology describing common soil genesis:

Rootmat	<ul> <li>vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface</li> </ul>
Topsoil	- mixture of soil and humus capable of supporting vegetative growth
Peat	- mixture of visible and invisible fragments of decayed organic matter
Till	- unstratified glacial deposit which may range from clay to boulders
Fill	- material below the surface identified as placed by humans (excluding buried services)

# Terminology describing soil structure:

Desiccated	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	- having cracks, and hence a blocky structure
Varved	- composed of regular alternating layers of silt and clay
Stratified	- composed of alternating successions of different soil types, e.g. silt and sand
Layer	- > 75 mm in thickness
Seam	- 2 mm to 75 mm in thickness
Parting	- < 2 mm in thickness

# Terminology describing soil types:

The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488) which excludes particles larger than 75 mm. For particles larger than 75 mm, and for defining percent clay fraction in hydrometer results, definitions proposed by Canadian Foundation Engineering Manual, 4<sup>th</sup> Edition are used. The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

# Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):

Terminology describing materials outside the USCS, (e.g. particles larger than 75 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

Trace, or occasional	Less than 10%
Some	10-20%
Frequent	> 20%

#### Terminology describing compactness of cohesionless soils:

The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test (SPT) N-Value - also known as N-Index. The SPT N-Value is described further on page 3. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
Very Loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

# Terminology describing consistency of cohesive soils:

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests. Consistency may be crudely estimated from SPT N-Value based on the correlation shown in the following table (Terzaghi and Peck, 1967). The correlation to SPT N-Value is used with caution as it is only very approximate.

Consistency	Undrained Sh	ear Strength	Approximate
Consistency	kips/sq.ft.	kPa	SPT N-Value
Very Soft	<0.25	<12.5	<2
Soft	0.25 - 0.5	12.5 - 25	2-4
Firm	0.5 - 1.0	25 - 50	4-8
Stiff	1.0 - 2.0	50 – 100	8-15
Very Stiff	2.0 - 4.0	100 - 200	15-30
Hard	>4.0	>200	>30

# STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.























**Boulders** Cobbles Gravel

Clay

**Organics Asphalt** 

Igneous Bedrock morphic Bedrock

Sedimentary Bedrock

# **SAMPLE TYPE**

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
D.B.	Direct-Push sample (small diameter tube
DF	sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
HQ, NQ, BQ, etc.	Rock core samples obtained with the use
TIQ, NQ, BQ, EIC.	of standard size diamond coring bits.

# WATER LEVEL MEASUREMENT



measured in standpipe, piezometer, or well



inferred

### **RECOVERY**

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

#### **N-VALUE**

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (150 to 450 mm). However, when a 24 in. (610 mm) sampler is used, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (300 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-Values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N-values corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

# DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to 'A' size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (300 mm) into the soil. The DCPT is used as a probe to assess soil variability.

### **OTHER TESTS**

S	Sieve analysis
Н	Hydrometer analysis
k	Laboratory permeability
Υ	Unit weight
Gs	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore
CU	pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
С	Consolidation
Qυ	Unconfined compression
	Point Load Index (Ip on Borehole Record equals
Ιp	$I_p$ (50) in which the index is corrected to a
	reference diameter of 50 mm)

Ţ	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
, o	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer

	CT: Grant Ave. and Taylor Av														Е	BH E	LEV	/ATI	ON:		233168 N/A
LOCATI DATE B	ON: <u>Taylor Ave, Winnipeg, N</u> ORED: <u>January 29 2024</u>	ianito	oa_						/ATER	LF\	/EI -		N/A			DATU	JM:	N	<u> // A</u>		
	ONED. <u>Guindary 20 202</u> 7			SAMI	PLES			UN	DRAINE LABORA	D SH	IEAF	STI			I, Cu			NE TE	EST		
ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	w	ATER C	) kPa 	ENT	10 & AT	00 kF	Pa RBEF	-	150 k	Pa		SHEAR VANE  200 kPa		BACKFILL
					REC			<b>X</b>	SPT (N-v	alue) 2∩		Vater C		%) and	Blow C	ount 60	,	70	80	,	
	ASPHALT CONCRETE									20			+0					70	- 00		
-	Stiff brown fat <b>CLAY (CH)</b>																				
			AS							9	P										
-   -    - 			AS																		
- - -			AS				Sieve/Hydro at 1.5 m G S M C 0% 1% 43% 56%			,		\ \ \ \ \ \						4			
			AS										<b>b</b>								
	Soft tan lean CLAY (CL)		AS								6	/									
-			AS																		
1											<b>.</b>										
	End of Borehole  Borehole terminated at a depth of 3.00  No groundwater seepage or soil sloug Borehole backfilled with auger cutting  Borehole surface backfilled as per Cit	hing wa	ntonit	e chip	S.			illing													
-																					

CLIEN	Stantec NT: Dillon Consulting Ltd.							_					PR	OJEC	T NC	D.: _1	lor A 1233168
	JECT: Grant Ave. and Taylor A																N/A
	ATION: Taylor Ave, Winnipeg,	Manito	ba											TUM:	_N/	Α	
DATE	BORED: <u>January 12 2024</u>							_									<u> </u>
<sub>=</sub>	<b>E</b>			SAMI	PLES						TEST		H, Cu (kl ♦ FIEL	-	JE TES	ST.	
N		LOT			Ê			1					□ POO				4
EVATION	(E) SOIL DESCRIPTION (MUSCS)	STRATA PLOT		监	E <sub>%</sub>	N-VALUE or RQD %	OTHER TESTS / REMARKS			50 kPa	10	00 kPa	150	kPa	20	00 kPa	BACKFILL
		<u>₩</u>	TYPE	NUMBER	Z CR	VAL		WA	ATFR (	CONTE	NT & A	TTERBE	RG LIMI	TS	W <sub>P</sub> V	w <sub>L</sub>	BAC
-		ο	ľ	ž	S P	żδ					BLOWS				—	<del></del> 1	
, 📙					<u>~</u>				10	20	30	ontent (%) ar	nd Blow Count	80	70	80	
' <u> </u>	ASPHALT																
	CONCRETE	<i>P</i> .															
<b> </b>	Stiff black fat CLAY (CH)																
-																	
-																	****
-																	
1					1												
1			Ä AS		-						₹						
											<u>\</u>			<u>                                     </u>			
]	- brown below 1.0 m		X as		+						\						
1			7) 70		+												
-																	
-			X AS		1		1										
4			П				Sieve/Hydro at 1.5 m G S M C 0% 0% 11% 89%			:   : : <b>!</b>							
-							0% 0% 11% 89%					1					
1																	
1	Soft tan lean <b>CLAY (CL)</b> - some sand		X AS		1												
, [																	
? -																	
]			X as		+												
-												: : <b>\</b>					
-												: :::	<b>\</b>  ::::				
+	Firm brown fat CLAY (CH)												:\\:::::				
-	. IIII SIOIII IGI OLAT (OII)												:   \( \) : : :				
-			AS		_												
-																	
, 1																	
'				•		•	•										
1	End of Borehole  • Borehole terminated at a depth of 3.	.000 m.															
-	No groundwater seepage or soil slo     Borehole backfilled with auger cuttir	ughing wa	s obse	erved e chin	during	g or up	oon completion of dr	illing.									
-	Borehole surface backfilled as per C	City of Win	nipeg	Stree	t Cuts	Manu	ıal.										
+																	
+																	
1																	
1																	
1																	
-	•						Drilling Cont	tracto	r: F	Paddoo	k Drill	ng Ltd	l		L	ogge	d By: G
CKFIL	LL SYMBOL 📆 ASPHALT	GR	OUT	·D	]CON	ICRE	TE Drilling Meth	nod:	125	mm S	SA						ved By:
	TONITE DRILL CUTTINGS	SA	ND		SLO	UGH	Completion	Depth	ı.	3 m					F	Page	1 of 1

		Dillon Consulting Ltd.	D		-4.5		-1-		_															33168
		CT: Grant Ave. and Taylor A																						N/A
		ON: <u>Taylor Ave, Winnipeg,</u>	wanito	ba						, A T			\	_	NI/			JAI	IUN	1: _	IN/	<u> </u>		
DA	(IEB	ORED: <u>January 12 2024</u>							-					_: _ .R ST				. /kE	20)					
	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RY (mm)	N-VALUE or RQD %	OTHER TESTS / REMARKS	<b>▲</b> I	LAB	ORA KET	ATOF	RY T	EST ROM		R	<b>♦</b> F	FIEL	D V	ΓSH	EAR 20	VAN 0 kPa	a	BACKFILL
	ᆸ		STR	Ţ	NON	RECOVE or To	N-V							OWS	5/0.3ı	m	RG L		ΓS	W H	P (	v v	ı	ñ
) -		ASPHALT	/**						1:::	10	:::	20	3	0	40		50	6	0	_70 :::	) : : :	80		
┪		FILL: granular																						
-		Stiff brown fat CLAY (CH)																						<b>***</b>
-		Soft tan lean CLAY (CL) - some sand		X AS										) 										
-				X as									70											
-		Firm brown fat <b>CLAY (CH)</b>		X as										\										
-				() AS											þ									
-				X as											\	þ								
1				V																				
- - -				Ă AS												0								
-				X as																				
1																O								
- - 3 - - -		End of Borehole  Borehole terminated at a depth of 2  No groundwater seepage or soil slo Borehole backfilled with auger cuttin Borehole surface backfilled as per 0	ughing wa	entonit	e chip	S.			rilling.															
1																								
-																								
											_		_							_	Τ.			
		SYMBOL ASPHALT						Drilling Con	tracto	or:	Pa	addo	ock	Drill	ıng	Ltd.							jed E	By: G d By:

DATUM: NA  DATE BORED  January 12 2024  Soil DESCRIPTION (MINS:S)  Soil DESCRIPTION (MINS:S)  ASPHALT  CONCRETE  Fill: some fine sand, some coarse gravel  Fill: some file sand, some coarse gravel  Fill: some file sand, some file sand some file sa		T: Grant Ave. and Taylor Ave																				N/A
SOIL DESCRIPTION (MUSCS)  SOIL DESCRIPTION (			amo	va					_	'ATE	R LE	VEL	: _	N/A	\		ıΑΙ	IVI: .		_		
ASPHALT  CONCRETE  FILL: some fine sand, some coarse gravel  AS  Soft tan lean CLAY (CL) with sand  Inace gravel  Sovethydro at 1.5 m  215 54% 35% 46%  AS  Firm brown fat CLAY (CH)  AS  End of Bovehole  Bovehole backfilled with ager cuttings and bentontle chips.	ELEVATION (m)		STRATA PLOT	TYPE			N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ L ★ F	ABOF POCK ATER	RATO ET PE 50 kP	RY TIENETI	EST ROMI 10  **AT DWS/	ETEI 00 kF 	R Pa RBER	◆F □P 1	TIELD POCK 150 ki	VAN ET SI Pa	HEAR 20	R VAN 00 kPa	E a /L	BACKFILL
FILL: some fine sand, some coarse gravel  As  Soft tan lean CLAY (CL) with sand  Usos gravel  Firm brown fat CLAY (CH)  As  Firm brown fat CLAY (CH)  As  Firm brown fat CLAY (CH)  As  Sovered with sand  As  Firm brown fat CLAY (CH)  As  As  Firm brown fat CLAY (CH)  As  As  As  Firm brown fat CLAY (CH)  As  As  As  As  As  As  As  As  As  A		ASPHALT	24	_		_			:::	10	20		0	40 : :				7	0	80	:: [:	
FILL: some fine sand, some coarse gravel  AS  Soft tan lean CLAY (CL) with sand  - trace gravel  Soft tan lean CLAY (CH)  AS  Soft tan lean CLAY (CH)  AS  Firm brown fat CLAY (CH)  AS  Firm brown fat CLAY (CH)  AS  End of Borehole  • Borehole lemmated at a depth of 3,000 m.  • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  • Borehole backfilled with auger cuttings and bentonite chips.																						
Soft tan lean CLAY (CL) with sand  - trace gravel  Soft tan lean CLAY (CL) with sand  - trace gravel  AS  AS  AS  AS  AS  AS  AS  AS  AS  End of Borehole  • Borehole terminated at a depth of 3.000 m.  • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips.	1		×××																			
Soft tan lean CLAY (CL) with sand - trace gravel    Soft tan lean CLAY (CL) with sand   NAS   Slevel-hydro at 1.5 m   CR   14% 38% 48%	-																					
Soft tan lean CLAY (CL) with sand - trace gravel    Soft tan lean CLAY (CL) with sand   NAS   Slevel-hydro at 1.5 m   CR   14% 38% 48%	]																					
Soft tan lean CLAY (CL) with sand -trace gravel  AS  Sievel-tydro at 1.5 m 2/8 14% 30% 48%  Firm brown fat CLAY (CH)  Firm brown fat CLAY (CH)  End of Borehole  Borehole terminated at a depth of 3.000 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backfilled with auger cuttings and bentonite chips.	]																					$\bowtie$
Soft tan lean CLAY (CL) with sand  - trace gravel  SieveHydro at 1.5 m  G S M C  Z% 14% 36% 48%  AS  Firm brown fat CLAY (CH)  Firm brown fat CLAY (CH)  End of Borehole  - Borehole terminated at a depth of 3.000 m.  - No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  - Borehole backfilled with auger cuttings and bentonite chips.	-			X AS																		$\bowtie$
Soft tan lean CLAY (CL) with sand  - trace gravel  SieveHydro at 1.5 m  G S M C  Z% 14% 36% 48%  AS  Firm brown fat CLAY (CH)  Firm brown fat CLAY (CH)  End of Borehole  - Borehole terminated at a depth of 3.000 m.  - No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  - Borehole backfilled with auger cuttings and bentonite chips.	1			1					: °												${{{}{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{{}{{{{}{}{}{}}{}{}{{{}{}{}}}{}{}{{{{}{}{}}}}{{}{}{}{}}}{}{{{{}{{{}{}}}}}{{{{}{}{}{}}}}$	$\bowtie$
Soft tan lean CLAY (CL) with sand  - trace gravel  Sievel Hydro at 1.5 m  G M C  Z% 14% 30% 48%  AS  Firm brown fat CLAY (CH)  End of Borehole  - Borehole terminated at a depth of 3.000 m.  - No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  - Borehole backfilled with auger cuttings and bentonite chips.	-			V ΔS																		$\bowtie$
- trace gravel    Sievel-hydro at 1.5 m C S N N N N N N N N N Groundwater seepage or soil sloughing was observed during or upon completion of drilling.   Borehole backfilled with auger cuttings and bentonite chips.	1			1.0																		$\bigotimes$
- trace gravel    Sievel-hydro at 1.5 m	1	Coff ton loan CLAY (CL) with cond		V																		$\bowtie$
Firm brown fat CLAY (CH)  End of Borehole  Borehole terminated at a depth of 3.000 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auguer cuttings and bentonite chips.				Å AS				Sieve/Hydro at 1.5 m					7									$\bowtie$
Firm brown fat CLAY (CH)  End of Borehole  Borehole terminated at a depth of 3.000 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.	1							2% 14% 36% 48%					<b>/</b>									$\bowtie$
Firm brown fat CLAY (CH)  End of Borehole  Borehole terminated at a depth of 3.000 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.	-			Y As								/										$\bowtie$
Firm brown fat CLAY (CH)  End of Borehole  • Borehole terminated at a depth of 3.000 m.  • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  • Borehole backfilled with auger cuttings and bentonite chips.	1			7,710								<b>d</b> :										$\bowtie$
Firm brown fat CLAY (CH)  End of Borehole  • Borehole terminated at a depth of 3.000 m.  • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  • Borehole backfilled with auger cuttings and bentonite chips.	]																					$\bowtie$
End of Borehole  • Borehole terminated at a depth of 3.000 m.  • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  • Borehole backfilled with auger cuttings and bentonite chips.	1			X AS																		$\bowtie$
End of Borehole  • Borehole terminated at a depth of 3.000 m.  • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  • Borehole backfilled with auger cuttings and bentonite chips.		Firm brown fat CLAY (CH)													ψ: :							$\bowtie$
End of Borehole  • Borehole terminated at a depth of 3.000 m.  • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  • Borehole backfilled with auger cuttings and bentonite chips.	-																					$\bowtie$
End of Borehole  Borehole terminated at a depth of 3.000 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.	1																					$\bowtie$
<ul> <li>Borehole terminated at a depth of 3.000 m.</li> <li>No groundwater seepage or soil sloughing was observed during or upon completion of drilling.</li> <li>Borehole backfilled with auger cuttings and bentonite chips.</li> </ul>	-			AS		_									) }							$\bowtie$
<ul> <li>Borehole terminated at a depth of 3.000 m.</li> <li>No groundwater seepage or soil sloughing was observed during or upon completion of drilling.</li> <li>Borehole backfilled with auger cuttings and bentonite chips.</li> </ul>	-																					$\bowtie$
1	-	<ul> <li>Borehole terminated at a depth of 3.00</li> <li>No groundwater seepage or soil slougl</li> <li>Borehole backfilled with auger cuttings</li> </ul>	ning wa	ntonit	e chip	s. `		·	illing.													
Drilling Contractor: Paddock Drilling Ltd. Logged By:	1																					

PR	OJEC	Dillon Consulting Ltd.  CT: Grant Ave. and Taylor Av			nt Re	newa	als		WB BH-05 (T PROJECT NO.: BH ELEVATION	_12331686 :N/A
LO	CATI	ON: <u>Taylor Ave, Winnipeg, N</u>	/lanito	ba					_ Datum: <u><b>N/A</b></u>	
DA.	TE B	ORED: <u>January 12 2024</u>						T	WATER LEVEL: _ <b>N/A</b>	
DEPIH (M)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	ТҮРЕ	NUMBER	COVERY (mm) TO SO OT TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa)  ▲ LABORATORY TEST	(Pa
						2			Water Content (%) and Blow Count 10 20 30 40 50 60 70 80	,
0 <del> </del> - - -		ASPHALT CONCRETE	D. D.							
- - -		FILL: some fine sand, some coarse gravel								
- 1 - -				X AS					G &	
-		Stiff brown fat CLAY (CH)		AS				Sieve/Hydro at 1.5 m G S M C 0% 4% 26% 70%		1
- - 2 -				X as					•	
-		Firm below 2.3 m		AS					10	
-				AS						
3 +										
		End of Borehole  • Borehole terminated at a depth of 3.00  • No groundwater seepage or soil sloug  • Borehole backfilled with auger cutting  • Borehole surface backfilled as per Cit	ghing wa s and be	entonit	e chip	S.			illing.	
₄ <u> </u>								Drilling Cont	Proton Daddook Drilling Ltd	
•								Drilling Cont	ractor: Paddock Drilling Ltd. Lo	gged By: GF

	IENT	Stantec  Dillon Consulting Ltd.	·					OLE RECO	_						•	PR	OJE	СТ	NO.	: _1	lor A
		CT: Grant Ave. and Taylor A																			N/A
		ON: Taylor Ave, Winnipeg,	Manito	ba								-\ <i>(</i>					TUM	1:	N/A	١	
DA	TE B	ORED: <u>January 12 2024</u>							_				L: _				D-)				T
()	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	ECOVERY (mm) TO ST OF TO ST OF THE S	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ L ★ F	ABO	RATO	ORY TENT	TEST TROM 10	IETEF 00 kPa 	R a BER	Cu (k  ◆ FIE  □ PO  150  G LIM	LD V/ CKET ) kPa	SHE	200	/ANE kPa 	BACKFILL
, _						<u> </u>			ļ	10.	. 20	) 3		40		Blow Coun	50	_70	8	80	
		ASPHALT	<b>Z</b> \$																		
		CONCRETE	D																		
		Stiff brown fat CLAY (CH)																			
-		Soft tan lean CLAY (CL)																			
1		- some sand		AS																	
-													1								
				AS										.							
				M																	
				Ă AS										:   : :  :   : :							
-		Firm brown fat CLAY (CH)																			
4																					
+				AS																	
-														<b>P</b>							
-												<u> </u>	:::						<u> </u>		
1											$  \cdot  $										
1				X AS																	
											$  \cdot  $										
											$  \cdot  $				1::						
4															1						
-				X as							$  \cdot  $				1						
-															ijφ						
$\frac{1}{2}$																					
		End of Borehole  Borehole terminated at a depth of 3.  No groundwater seepage or soil slo Borehole backfilled with auger cuttir Borehole surface backfilled as per 0	oughing wa	entonit	e chip	S.			rilling.												
								Drilling Con	tracto	 r:_	Pad	dock	Drilli	ing L	.td.				Lo	ogged	d By: G
Ck	(FII I	. SYMBOL ASPHALT	GR	OUT	· <u>~</u>	lcor	ICRE					n SS									ed By:
·U	4 IFF	DNITE DRILL CUTTINGS	GR SA		<i><u>ط</u>ن</i>	100h	UGH					. 55	-						1.		J·

DATE BORED: January 29 2024  SAMPLES  SOIL DESCRIPTION (MISCS)  WATER LEVEL: MARKS  THE LOVING STREETS  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER CONTENTS AT STREET (MISCS)  A LABORATORY TEST  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER LEVEL: MARKS  THE LOVING STREETS  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER LEVEL: MISC (LIPONET)  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER LEVEL: MISC (LIPONET)  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER LEVEL: MISC (LIPONET)  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER LEVEL: MISC (MISCS)  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER LEVEL: MISC (MISCS)  POCKET PERSTROMETER: DIPONET SHEAR VANE  SORT (MISCS)  WATER LEVEL: MISC (MISCS)  POCKET PERSTROMETER: DIPONET SHEAR VANE  POCKET PERSTROMETER: DIP	DATE BORED: January 29 2024  SAMPLES  SOIL DESCRIPTION  AND SOIL D	PR	OJE	: Dillon Consulting Ltd.  CT: Grant Ave. and Taylor A  ON: Taylor Ave, Winnipeg,			nt Re											ВІ	H EI	LEV	ATIO	N:	233166 N/A
SOIL DESCRIPTION (MUSCS)  WATER CONTENT & ATTERBERG LMITS  WAS SPI [Number of the proceeding statement of the proceeding state	Solit DESCRIPTION (MUSCS)  Solit DESCRIPTION (MUSCS) (										_ W	ATE	RL	EVE	L: _	N/	Ά						
ASPHALT CONCRETE  Soft tan lean CLAY (CL)  Soft tan lean CLAY (CH) - silty  End of Borehole  • Borehole terminated at a depth of 2,100 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled as per City of Winnipeg Street Cuts Manual.	ASPHALT CONCRETE  Soft lam lean CLAY (CL)  Soft lam lean CLAY (CH) - silty  As  End of Borehole - Borehole terminated at a depth of 2 100 m. No groundwater seep age or cell stoughing was observed during or upon completion of drilling Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.  Drilling Contractor: Paddock Drilling Ltd. Logged By: Co	DEPTH (m)	ELEVATION (m)		STRATA PLOT	TYPE		1	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ L ★ P	ABO OCK	RAT ŒT 50	FORY PENE kPa H	TEST TROM	MET 100 I 100 I TTE S/0.3	ER KPa ERBEF	◆ FI □ PC 15	ELD OCKI 50 kF H	VAN ET S	HEAR 200	VANE 0 kPa +	BACKFILL
Soft tan lean CLAY (CL)  Soft tan lean CLAY (CL)  Suff black fat CLAY (CH) - sifty  As  End of Borehole  Borehole terminated at a depth of 2.100 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Sorehole backfilled with auger cuttings and bentonite chips. Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	Soft tan loan CLAY (CL)  Soft tan loan CLAY (CL)  Stiff black fat CLAY (CH) - silly  As  As  Borehole  Borchole terminated at a depth of 2-100 m No groundwhater seepage or sogil solidying was observed during or upon completion of drilling Borchole backfilled was par City of Winnipeg Street Cuts Manual.  Drilling Contractor: Paddock Drilling Ltd. Logged By: Co	0 -		ASPHALT	24			Ι_			1 1 1 1	10	::	0						7	0	80	
Stiff black fat CLAY (CH) - silty  End of Borehole - Borehole terminated at a depth of 2.100 m No groundwater seepage or soil sloughing was observed during or upon completion of drilling Borehole backfilled with auger cuttings and bentonite chips Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	Siff black fat CLAY (CH)  Siff black fat CLAY (CH)  Siff black fat CLAY (CH)  Somehole terminated at a depth of 2,100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backfilled with super cultings and bentonite chips. Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	-																					
Stiff black fat CLAY (CH) - silty  End of Borehole  • Borehole terminated at a depth of 2.100 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with suger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  - Borehole terminated at a depth of 2.100 m.  - Borehole backfilled with auger cuttings and bentonite chips Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.  3 - Drilling Contractor: Paddock Drilling Ltd. Logged By: Caper Contractor: Paddock Drilling Ltd. Logged By: Caper Caper Contractor: Paddock Drilling Ltd. Logged By: Caper			Soft tan lean <b>CLAY (CL)</b>	<u> </u>																		
Stiff black fat CLAY (CH) - silty  End of Borehole - Borehole terminated at a depth of 2.100 m No groundwater seepage or soil sloughing was observed during or upon completion of drilling Borehole backfilled with auger cuttings and bentonite chips.	End of Borehole  End of Borehole  End of Borehole  Forehole surfinated at a depth of 2,100 m.  No groundwaler seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.					AS								: ::									
Stiff black fat CLAY (CH) - silty  End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backfilled with auger cuttings and bentonite chips. Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil slouphing was observed during or upon completion of drilling.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	1 -											::	: : <b>`\</b>	\ !::		<u> </u>			:::			
End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  End of Borehole  Experiments of a committee of a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled as per City of Winnipeg Street Cuts Manual.  Drilling Contractor: Paddock Drilling Ltd.  Logged By: Committee of the committee of	-				X as			$\vdash$						\								
End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  Borehole terminated at a depth of 2.100 m.  So groundwater seepage or soll sloughing was observed during or upon completion of drilling.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.  Drilling Contractor: Paddock Drilling Ltd. Logged By: Company Contractor: Paddock Drilling Ltd. Logged	]														Ö							
End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with suger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	]		- Sitty		M AS																	
End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with suger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	-				AS											þ:::						
End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with suger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	1																					
End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with suger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	-				M ^2																	
End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	End of Borehole  Borehole terminated at a depth of 2 100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	-				M AS			$\vdash$							: d							
<ul> <li>End of Borehole</li> <li>Borehole terminated at a depth of 2.100 m.</li> <li>No groundwater seepage or soil sloughing was observed during or upon completion of drilling.</li> <li>Borehole backfilled with auger cuttings and bentonite chips.</li> <li>Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.</li> </ul>	End of Borehole  Borehole terminated at a depth of 2.100 m.  No groundwater seepage or soil sloughing was observed during or upon completion of drilling.  Borehole backfilled with auger cuttings and bentonite chips.  Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	2 -																					
		-		Borehole terminated at a depth of 2.     No groundwater seepage or soil slou     Borehole backfilled with auger cuttin	ighing wa	entoni	e chip	S.		·	illing.												
Pailling Controller Builder Builder 144		3 -																					

_	OJE	E Dillon Consulting Ltd.  CT: Grant Ave. and Taylor A  ON: Taylor Ave, Winnipeg,			nt Re										ВІ	H ELE	VATIC	D.: <u>1</u> DN: A	N/A
DA		ORED: <u>January 29 2024</u>								ATE	R LE	EVEL	.: <u> </u>	I/A					
()	(m) NC		PLOT		SAMI	1			<b>▲</b> L	ABOF	ATC	RY T				ELD VA	ANE TES		ب
	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PI	TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS		TER (		TENT	- & ATT	.3m	RG LIN			00 kPa ├ W W <sub>L</sub>	BACKFILL
۱ -		ASPHALT		1		<del> </del>			 	10	20	3			50	60 : :::	70	80	
-		CONCRETE																	
-		Stiff black fat CLAY (CH)																	
-				V 46															
-				X AS									ο						
-		- grey and firm below 1.2 m		AS									φ.						
, ,				AS									α						
-				AS									<b>.</b>						
2 -									:::::										
4		End of Borehole	100 m	s obse	erved	during	g or up	n completion of d	illing.										
		Borehole terminated at a depth of 2     No groundwater seepage or soil slo     Borehole backfilled with auger cutti     Borehole surface backfilled as per 0	oughing wa	entonit			Manua	l.											
		Borehole terminated at a depth of 2     No groundwater seepage or soil slo     Borehole backfilled with auger cutting	oughing wa	entonit			Manua	I.											
		Borehole terminated at a depth of 2     No groundwater seepage or soil slo     Borehole backfilled with auger cutting	oughing wa	entonit			Manua	I.											
		Borehole terminated at a depth of 2     No groundwater seepage or soil slo     Borehole backfilled with auger cutting	oughing wa	entonit			Manua	I.											
		Borehole terminated at a depth of 2     No groundwater seepage or soil slo     Borehole backfilled with auger cutting	oughing wa	entonit			Manua	I.  Drilling Con	tracto	г	Pado	dock	Drillin	ht I pa				Logged	I Byr.

LC	ROJE	: Dillon Consulting Ltd.  CT: Grant Ave. and Taylor A												PR BH	OJEC I ELEV	OITA\	).: <u>1</u> N:	nt A 233168 N/A
D.4		ON: <u>Taylor Ave, Winnipeg,</u> ORED: <u>January 12 2024</u>	wanito	ра						ΔΤ⊏⊏	?   E\/	EL: _	N/A	DA	TUM:	_ N/A	4	
Ur	VIE D	ORED. Caridary 12 2024			SAMI	DI EC			_			EAR STE		ł, Cu (k	(Pa)			
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm)		OTHER TESTS / REMARKS	★ P	OCKE 5 TER C	T PEN 0 kPa	TEST ETROME 10  NT & AT BLOWS/	0 kPa   TERBEF	□ PO 15	CKET S 0 kPa -	W <sub>P</sub> W	VANE 0 kPa 	BACKFILL
						쀭			",	(	20	Water Co	ontent (%) and			70	80	
0 -		ASPHALT									-	30	1			70	] ]:::::	
		CONCRETE																
, , ,		Stiff brown fat CLAY (CH)																****
-																		
1 – -				V														
-				Ă AS														
		Soft tan lean <b>CLAY (CL)</b> - some sand		AS							Ø	/:   : : : : : : : : : : : : : : : : : :						
-		Firm brown fat CLAY (CH)		X AS														
2 -																		
-		<ul><li>End of Borehole</li><li>Borehole terminated at a depth of 2.</li><li>No groundwater seepage or soil slot</li></ul>	ughing wa	entonit	e chip	s. `		•	rilling.									
- - - 3 - -		Borehole backfilled with auger cuttin     Borehole surface backfilled as per C		nipeg	Siree	Cours	, wana											
3		Borehole backfilled with auger cutting		nipeg	Silee	t Outs	, mand											
3 4 -		Borehole backfilled with auger cutting		nipeg	Suee	· Outa	, mand	Drilling Con	tractor	: P	addor	k Drillin	ng Ltd			1	.oaged	By: G

## **APPENDIX D**

**Core Photographs** 





Figure 1 – WB BH-01 (Taylor Ave)



Figure 3 – WB BH-03 (Taylor Ave)



Figure 2 – WB BH-02 (Taylor Ave)



Figure 4 – WB BH-04 (Taylor Ave)



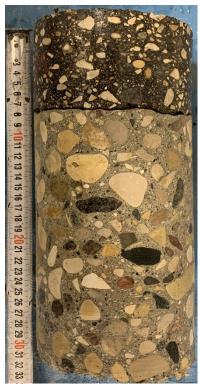


Figure 5 – WB BH-05 (Taylor Ave)



Figure 7 – EB BH-01 (Taylor Ave)



Figure 6 – WB BH-06 (Taylor Ave)



Figure 8 – EB BH-02 (Taylor Ave)





Figure 9 – EB BH-03 (Taylor Ave)



Figure 11 – EB BH-01 (Grant Ave)









Figure 23 – EB BH-03 (Grant Ave)



Figure 15 – EB BH-05 (Grant Ave)



Figure 14 – EB BH-04 (Grant Ave)



Figure 16 – EB BH-06 (Grant Ave)





Figure 37 – EB BH-07 (Grant Ave)



Figure 19 – WB BH-02 (Grant Ave)



Figure 18 – WB BH-01 (Grant Ave)



Figure 20 – WB BH-03 (Grant Ave)

## **APPENDIX E**

**Laboratory Test Reports** 



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



# ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

PROJECT

TO Dillon Consulting Ltd.300 - 100 Innovation Drive

Winnipeg, Manitoba

R3T 6A8

PROJECT NO. 123316861

ATTN Lucas Stoffel REPORT NO. 1

DATE SAMPLED: 2024.Jan.29 DATE RECEIVED: 2024.Jan.29 DATE TESTED: 2024.Feb.05
SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Graeme Patrick

MATERIAL IDENTIFICATION

TRIAL

**BLOWS** 

MC (%)

CLIENT FIELD ID Taylor WB BH-01, 1510 mm

STANTEC SAMPLE NO. 4024

DI ACTIC LIMIT

LIQUID LIMIT

1 2

28 27

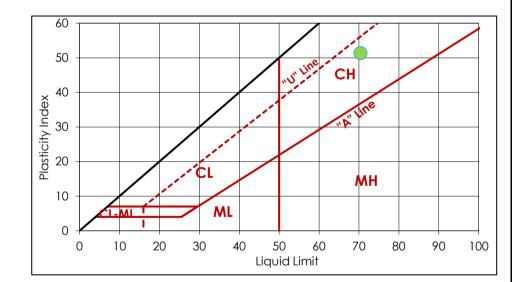
69 70

	FLASIII	C LIIVIII
TRIAL	1	2
MC (%)	19	19

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

638-2023 Grant Ave. & Taylor Ave. Pavement Renewals - Geotechnical Investigation

70	ı
19	
51	
31.10	l



COMMENTS
No comments.

REPORT DATE 2024.Feb.06

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



### ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO Dillon Consulting Ltd. 300 - 100 Innovation Drive

Winnipea, Manitoba

**R3T 6A8** 

Lucas Stoffel

PROJECT

638-2023 Grant Ave. & Taylor Ave. Pavement

Renewals - Geotechnical Investigation

123316861 PROJECT NO.

REPORT NO.

DATE SAMPLED: 2024.Jan.12

LIQUID LIMIT

29

DATE RECEIVED: 2024. Jan. 12

TRIAL

MC (%)

DATE TESTED: 2024.Jan.23

SAMPLED BY:

**ATTN** 

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID

TRIAL

**BLOWS** 

MC (%)

Taylor WB BH-02, 1450 mm

2

27

97

2964 STANTEC SAMPLE NO.

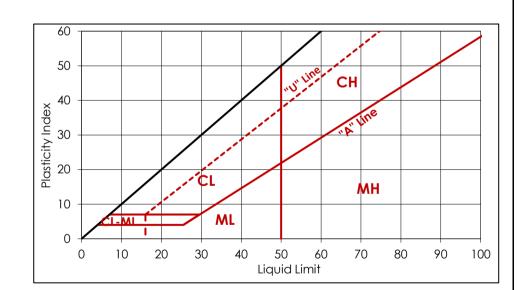
PLASTIC LIMIT

2

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI

AS REC'D MC (%)

25 72 38.40



**COMMENTS** No comments.

REPORT DATE 2024.Jan.25

**REVIEWED BY** 

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



### ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

PROJECT

TO Dillon Consulting Ltd. 300 - 100 Innovation Drive

Winnipea, Manitoba

**R3T 6A8** 

123316861 PROJECT NO.

Lucas Stoffel **ATTN** 

3 REPORT NO.

DATE SAMPLED: 2024.Jan.12

Stantec Consulting Ltd.

LIQUID LIMIT

21

49

DATE RECEIVED: 2024. Jan. 12

DATE TESTED: 2024.Jan.23

638-2023 Grant Ave. & Taylor Ave. Pavement Renewals - Geotechnical Investigation

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID

SAMPLED BY:

TRIAL

**BLOWS** 

MC (%)

Taylor WB BH-04, 1500 mm

2

22

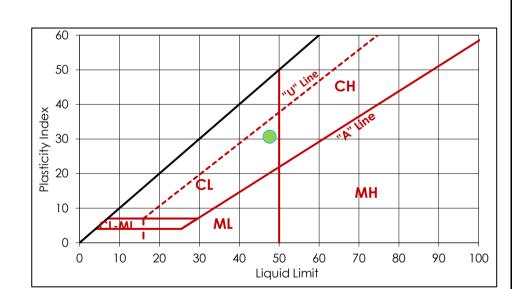
2965 STANTEC SAMPLE NO.

2

PLASTIC LIMIT TRIAL MC (%)

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

48 17 31 33.70



**COMMENTS** No comments.

REPORT DATE 2024.Jan.25 **REVIEWED BY** 

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



# ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO Dillon Consulting Ltd.
300 - 100 Innovation Drive

Winnipeg, Manitoba

R3T 6A8

ATTN Lucas Stoffel

PROJECT 638-2023 Grant Ave. & Taylor Ave. Pavement

Renewals - Geotechnical Investigation

PROJECT NO. 123316861

REPORT NO. 4

DATE SAMPLED: 2024.Jan.12

DATE RECEIVED: 2024.Jan.12

DATE TESTED: 2024.Jan.23

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Carson Cockwell

MATERIAL IDENTIFICATION

TRIAL

**BLOWS** 

MC (%)

CLIENT FIELD ID Taylor WB BH-05, 1505 mm

STANTEC SAMPLE NO. 2966

LIQUID LIMIT

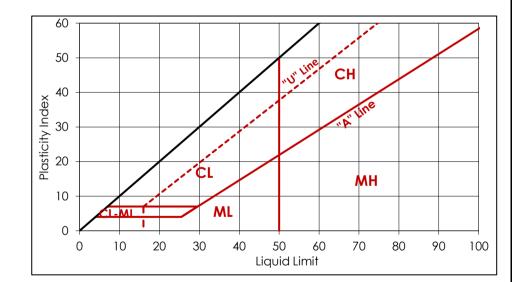
1 2

28 26

86 85

	PLASTIC	C LIMIT
TRIAL	1	2
MC (%)	21	22

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%) 86 22 65 32.90



COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



## ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

PROJECT

TO Dillon Consulting Ltd.

300 - 100 Innovation Drive Winnipeg, Manitoba

Willingey, Marinoba

R3T 6A8

PROJECT NO. 123316861

ATTN Lucas Stoffel REPORT NO. 1

DATE SAMPLED: 2024.Jan.29 DATE RECEIVED: 2024.Jan.29 DATE TESTED: 2024.Feb.02 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID Taylor WB BH-01, 1510 mm

STANTEC SAMPLE NO. 4024

	100	<b>◇◇◇◇</b> ♠;;;; <b>◇</b> ;;;	<b>◇</b>	<b>♦</b>		
	90					
	80					
8	70					
ing	60					
Percent Passing (%)	50					
entl	40					
erce	30					
	20					
	10					
	0					
	100	10	1	0.1	0.01	0.001
			Particle Si	ze (mm)		

Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	99.9
1.18	99.9
0.600	99.9
0.300	99.8
0.150	99.8
0.075	98.7
0.005	65.5
0.002	56.0
0.001	48.7
•	•

Gravel	Sand Silt Clay		Colloids			
Glavel	Coarse	Medium	Fine	3111	Cidy	Colloids
0.0	0.1	0.0	1.2	42.7	56.0	48.7

COMMENTS

No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY

Guillaume Beauce, P.Eng.

638-2023 Grant Ave. & Taylor Ave. Pavement Renewals - Geotechnical Investigation

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



#### ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

PROJECT

REPORT NO.

TO Dillon Consulting Ltd.

300 - 100 Innovation Drive

Winnipeg, Manitoba

R3T 6A8

123316861 PROJECT NO.

Lucas Stoffel **ATTN** 

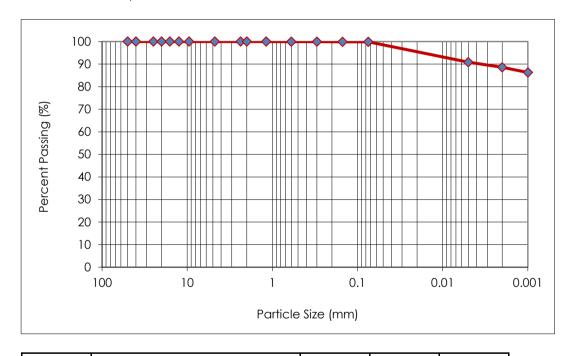
DATE SAMPLED: 2024.Jan.12 SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024. Jan. 12 DATE TESTED: 2024.Jan.17 SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

638-2023 Grant Ave. & Taylor Ave. Pavement Renewals - Geotechnical Investigation

MATERIAL IDENTIFICATION

CLIENT FIELD ID Taylor WB BH-02, 1450 mm STANTEC SAMPLE NO. 2964



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	100.0
0.600	100.0
0.300	99.9
0.150	99.9
0.075	99.9
0.005	90.9
0.002	88.6
0.001	86.3

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Cidy	Colloids
0.0	0.0	0.1	0.0	11.3	88.6	86.3

**COMMENTS** 

No comments.

REPORT DATE 2024.Jan.22 **REVIEWED BY** 

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



#### ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO Dillon Consulting Ltd. 300 - 100 Innovation Drive PROJECT

638-2023 Grant Ave. & Taylor Ave. Pavement

Renewals - Geotechnical Investigation

Winnipea, Manitoba

Lucas Stoffel

PROJECT NO.

123316861

3 REPORT NO.

DATE SAMPLED: 2024.Jan.12

R3T 6A8

ATTN

DATE RECEIVED: 2024. Jan. 12

DATE TESTED: 2024.Jan.17

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Larry Presado

MATERIAL IDENTIFICATION

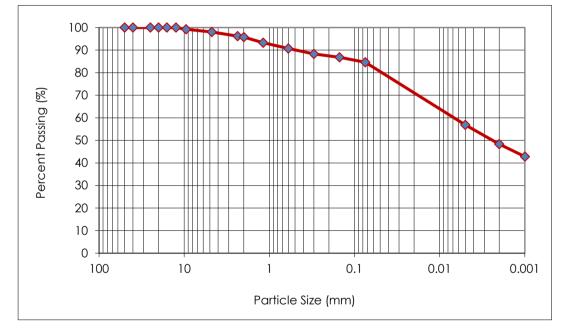
CLIENT FIELD ID

Taylor WB BH-04, 1500 mm

STANTEC SAMPLE NO.

2965

Sieve Size % Passina (mm) 50.0 100.0 40.0 100.0 25.0 100.0 20.0 100.0 16.0 100.0 100.0



9.5	99.2
4.75	98.1
2.36	96.2
2.00	95.8
1.18	93.3
0.600	90.7
0.300	88.3
0.150	86.8
0.075	84.6
0.005	56.9
0.002	48.3
0.001	42.8

Gravel		Sand		6:11	Silt Clay Colloi	
Glavei	Coarse	Medium	Fine	Silt	Cidy	Colloids
1.9	2.3	6.5	4.7	36.3	48.3	42.8

**COMMENTS** 

No comments.

REPORT DATE 2024.Jan.22 **REVIEWED BY** 

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



#### ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO Dillon Consulting Ltd. 300 - 100 Innovation Drive PROJECT

638-2023 Grant Ave. & Taylor Ave. Pavement

Renewals - Geotechnical Investigation

Winnipeg, Manitoba

123316861 PROJECT NO.

Lucas Stoffel ATTN

REPORT NO.

DATE SAMPLED: 2024.Jan.12

R3T 6A8

DATE RECEIVED: 2024. Jan. 12

DATE TESTED: 2024.Jan.17

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

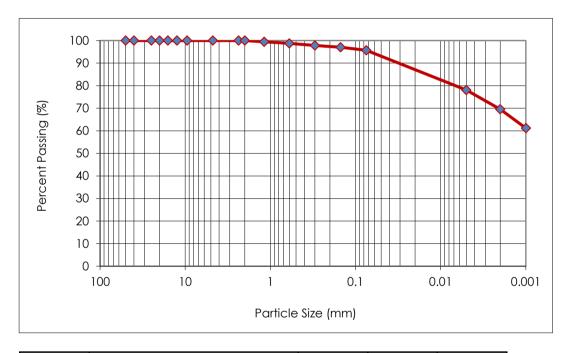
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID

Taylor WB BH-05, 1505 mm

2965 STANTEC SAMPLE NO.



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.5
0.600	98.7
0.300	97.8
0.150	97.0
0.075	95.7
0.005	78.1
0.002	69.6
0.001	61.2

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cluy	Colloids
0.0	0.0	1.8	2.5	26.1	69.6	61.2

**COMMENTS** 

No comments.

REPORT DATE 2024.Jan.22 **REVIEWED BY** 

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services





## **PROCTOR TEST REPORT**

Dillon Consulting Ltd. 300 - 100 Innovation Dr. Winnipeg, MB R3T 6A8

CLIENT Dillon Consulting Ltd. C.C.

ATTN: Lucas Stoffel

PROJECT Grant Ave & Taylor Ave Pavement Renewals Geotechnical Investigation

PROJECT NO.

123316861

PROCTOR NO.

DATE SAMPLED

2024.Jan.29

DATE RECEIVED

2024.Jan.29

DATE TESTED

2024.Feb.07

INSITU MOISTURE 32.9 %

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE **DESCRIPTION** 

Fat Clay (CH)

**SUPPLIER** 

**Existing Materials SOURCE** Taylor Ave - WB BH-01, 1.510 m COMPACTION STANDARD

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

Standard Proctor, ASTM D698

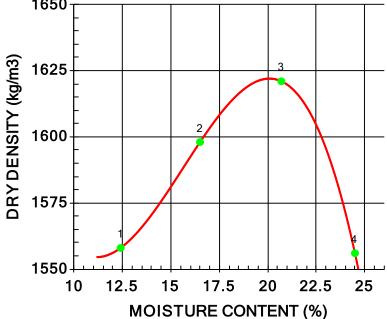
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %

1650



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1751	1558	12.4
2	1862	1598	16.5
3	1956	1621	20.7
4	1937	1556	24.5

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1620	20.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 4024.

Page 1 of 1

2024.Feb.08

Stantec Consulting Ltd.

REVIEWED BY:





## **PROCTOR TEST REPORT**

Dillon Consulting Ltd. 300 - 100 Innovation Dr. Winnipeg, MB R3T 6A8

CLIENT Dillon Consulting Ltd. C.C.

ATTN: Lucas Stoffel

PROJECT Grant Ave & Taylor Ave Pavement Renewals Geotechnical Investigation

PROJECT NO. 123316861

DATE RECEIVED PROCTOR NO. DATE SAMPLED 2024.Jan.12 2024.Jan.12 DATE TESTED 2024.Jan.22

INSITU MOISTURE 43.0 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE

Fat Clay (CH) **DESCRIPTION** 

**SUPPLIER Existing Materials** 

**SOURCE** Taylor Ave - WB BH-02, 1.450 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** 

OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

D698

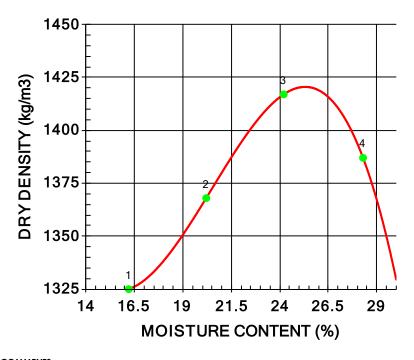
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1540	1325	16.2
2	1644	1368	20.2
3	1760	1417	24.2
4	1779	1387	28.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1420	25.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2964.

Page 1 of 1

2024.Jan.23

Stantec Consulting Ltd.

REVIEWED BY:





## **PROCTOR TEST REPORT**

Dillon Consulting Ltd.
300 - 100 Innovation Dr.
Winnipeg, MB
R3T 6A8

CLIENT Dillon Consulting Ltd. C.C.

ATTN: Lucas Stoffel

PROJECT Grant Ave & Taylor Ave Pavement Renewals
Geotechnical Investigation

PROJECT NO. 123316861

PROCTOR NO. 3 DATE SAMPLED 2024, Jan. 12 DATE RECEIVED 2024, Jan. 12 DATE TESTED 2024, Jan. 22

INSITU MOISTURE 42.5 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Lean Clay with sand (CL)

DESCRIPTION Learn Clay Will's Saina (CE)

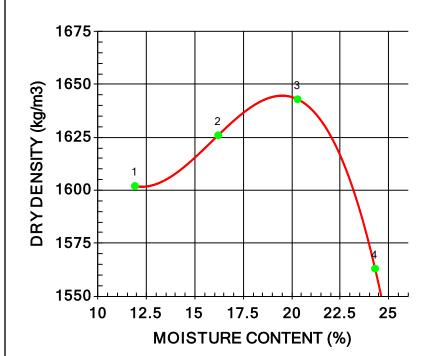
SUPPLIER Existing Materials
SOURCE Taylor Ave - WB BH-04, 1.500 m

D698

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1793	1602	11.9
2	1889	1626	16.2
3	1976	1643	20.3
4	1943	1563	24.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1640	19.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2965.

Page 1 of 1 2024. Jan. 23 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.





## **PROCTOR TEST REPORT**

Dillon Consulting Ltd. 300 - 100 Innovation Dr. Winnipeg, MB R3T 6A8

CLIENT Dillon Consulting Ltd. C.C.

ATTN: Lucas Stoffel

PROJECT Grant Ave & Taylor Ave Pavement Renewals Geotechnical Investigation

PROJECT NO. 123316861

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.12 2024.Jan.12 DATE TESTED 2024.Jan.22

INSITU MOISTURE 36.0 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE

Fat Clay (CH) **DESCRIPTION** 

**SUPPLIER Existing Materials** 

**SOURCE** Taylor Ave - WB BH-05, 1.505 m

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

D698

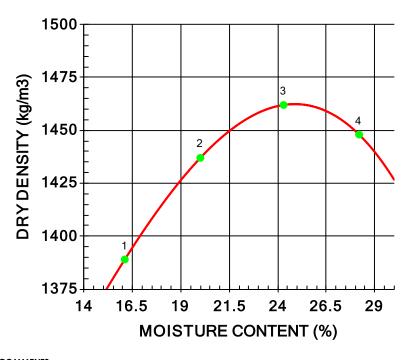
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	moisture Content (%)	
1	1613	1389	16.1	
2	1724	1437	20.0	
3	1817	1462	24.3	
4	1856	1448	28.2	

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1460	25.0
OVERSIZE CORRECTED		

COMMENTS

Page 1 of 1

Stantec Sample No. 2966.

2024.Jan.23

Stantec Consulting Ltd.

REVIEWED BY:

Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



#### ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO Dillon Consulting Ltd.

300 - 100 Innovation Drive

Winnipeg, Manitoba

**R3T 6A8** 

**PROJECT** 

Grant Ave & Taylor Ave Pavement

Renewals - Geotechnical

Investigation

PROJECT NO. 123316861

1

Lucas Stoffel

REPORT NO.

**SUPPLIER** 

**SOURCE** 

DATE TESTED: 2024.Feb.09

SAMPLED BY:

MATERIAL TYPE

SPECIFICATION ID

IMMERSION PERIOD

ATTN

DATE SAMPLED: 2024.Jan.29

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Donald Eliazar

Existing Material

MATERIAL IDENTIFICATION

MATERIAL USE MAX. NOMINAL SIZE

Subgrade 4.75 mm

Fat Clay (CH) Not Applicable SAMPLE LOCATION

DATE RECEIVED: 2024.Jan.29

Existing Material WB BH-01, 1.510 m

STANTEC SAMPLE NO. 4024

TARGET MAX. DRY DENSITY

TARGET OPTIMUM MOISTURE

1620 kg/m<sup>3</sup>

20.0 %

CONDITION OF SAMPLE SURCHARGE MASS

Soaked 4.54 kg

96 ± 2 hr

0 %

AS-COMPACTED DRY DENSITY AS-COMPACTED MOISTURE

 $1541 \text{ kg/m}^3$ 19.9 %

95 %

+19 mm OVERSIZE **SWELL OF SAMPLE** POST-TEST MOISTURE

5.30 %

35.5 %

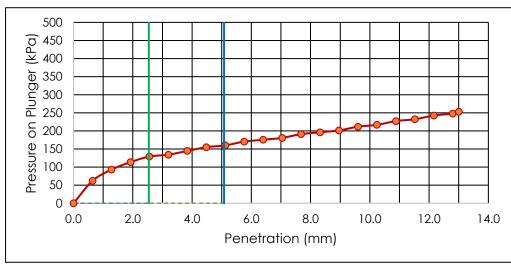
AS-COMPACTED % COMPACTION

**CBR VALUE AT 2.54 mm PENETRATION** 

1.9

CBR VALUE AT 5.08 mm **PENETRATION** 

1.6



**COMMENTS** 

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.13 **REVIEWED BY** Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



## ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO Dillon Consulting Ltd. PROJECT Grant Ave & Taylor Ave Pavement

Renewals - Geotechnical

Investigation

R3T 6A8 PROJECT NO. 123316861

ATTN Lucas Stoffel REPORT NO. 2

DATE SAMPLED: 2024.Jan.12 DATE RECEIVED: 2024.Jan.12 DATE TESTED: 2024.Jan.25
SAMPLED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

300 - 100 Innovation Dr.

Winnipeg, MB

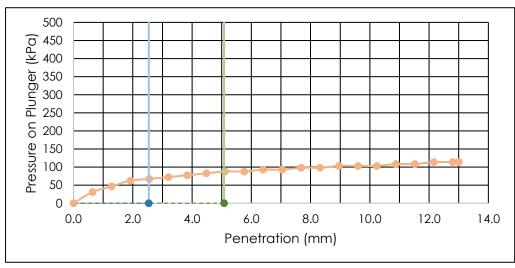
MATERIAL USE Subgrade SUPPLIER Existing Material
MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material
MATERIAL TYPE Fat Clay (CH) SAMPLE LOCATION WB BH-02, 1.450m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2964

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY $1420 \text{ kg/m}^3$ CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE25.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1350 kg/m $^3$  SWELL OF SAMPLE 0.09 % AS-COMPACTED MOISTURE 25.4 % POST-TEST MOISTURE 48.9 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.0

CBR VALUE AT 5.08 mm PENETRATION 0.9

**COMMENTS** 

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.30

REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



#### ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO Dillon Consulting Ltd. **PROJECT** Grant Ave & Taylor Ave Pavement

Renewals - Geotechnical

Investigation

Winnipeg, MB **R3T 6A8** PROJECT NO. 123316861

Lucas Stoffel **ATTN** REPORT NO. 3

DATE SAMPLED: 2024.Jan.12 DATE RECEIVED: 2024.Jan.12 DATE TESTED: 2024.Jan.25 Graeme Patrick SUBMITTED BY: Graeme Patrick Donald Eliazar **TESTED BY:** SAMPLED BY:

MATERIAL IDENTIFICATION

300 - 100 Innovation Dr.

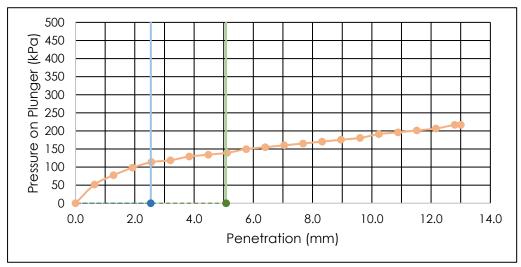
Existing Material MATERIAL USE Subgrade **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** MATERIAL TYPE Lean Clay with sand (CL) WB BH-04, 1.500m SAMPLE LOCATION

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2965

96 ± 2 hr **IMMERSION PERIOD** TARGET MAX. DRY DENSITY 1640 kg/m<sup>3</sup> Soaked 19.5 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE

SURCHARGE MASS 4.54 kg

 $1556 \text{ kg/m}^3$ +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 0.05 % 19.6 % **SWELL OF SAMPLE** AS-COMPACTED MOISTURE POST-TEST MOISTURE 34.4 % AS-COMPACTED % COMPACTION 95 %



**CBR VALUE AT 2.54 mm PENETRATION** 1.6

CBR VALUE AT 5.08 mm **PENETRATION** 1.4

**COMMENTS** 

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.30 **REVIEWED BY** Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



#### ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO Dillon Consulting Ltd. **PROJECT** Grant Ave & Taylor Ave Pavement

Renewals - Geotechnical

Investigation

**R3T 6A8** PROJECT NO. 123316861

Lucas Stoffel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.12 DATE RECEIVED: 2024.Jan.12 DATE TESTED: 2024.Jan.25 Graeme Patrick SUBMITTED BY: Graeme Patrick Donald Eliazar **TESTED BY:** SAMPLED BY:

MATERIAL IDENTIFICATION

300 - 100 Innovation Dr.

Winnipeg, MB

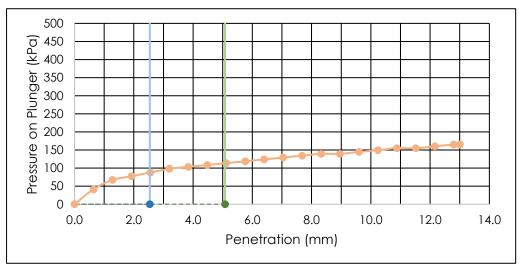
Existing Material MATERIAL USE Subgrade **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** MATERIAL TYPE Fat Clay (CH) WB BH-05, 1.505m SAMPLE LOCATION

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2966

96 ± 2 hr **IMMERSION PERIOD** TARGET MAX. DRY DENSITY 1460 kg/m<sup>3</sup> Soaked 25.0 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE

SURCHARGE MASS 4.54 kg

0 %  $1389 \text{ kg/m}^3$ +19 mm OVERSIZE AS-COMPACTED DRY DENSITY 24.9 % **SWELL OF SAMPLE** 0.06 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 44.4 % AS-COMPACTED % COMPACTION 95 %



**CBR VALUE AT 2.54 mm PENETRATION** 1.3

CBR VALUE AT 5.08 mm **PENETRATION** 1.1

**COMMENTS** 

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

2024.Jan.30 REPORT DATE

**REVIEWED BY** Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



**Table 2 - Compressive Strength Test Data** 

Street	Core ID	Diameter		Length L/D (mm) Ratio	Correction Factor	Peak Load (kN)	Compressive Strength (MPa)	
		(mm) (r	(mm)				Measured	Corrected
Taylor Ave	EB BH-02	75.61	128.07	1.694	0.9755	155.95	34.73	33.88
Taylor Ave	EB BH-03	75.80	190.59	> 2.000	1.0000	204.34	45.28	45.28
Grant Ave	EB BH-02	75.57	167.54	> 2.000	1.0000	351.30	78.32	78.32
Grant Ave	EB BH-04	75.52	119.91	1.588	0.9670	279.11	62.31	60.25
Grant Ave	EB BH-07	75.80	171.54	> 2.000	1.0000	198.11	43.90	43.90
Grant Ave	WB BH-01	75.75	154.22	> 2.000	1.0000	326.39	72.42	72.42
Grant Ave	WB BH-03	75.60	160.80	> 2.000	1.0000	181.03	40.33	40.33