APPENDIX 2

GEOTECHNICAL MEMORANDUM FOR TEST PIT 2025

Memorandum

To:	Andrew Sinclair, Eng.L., C.E.T. City of Winnipeg	**Date:**	September 4, 2025
		Project No.:	25-0107-011
From:	Taunya Ernst, P.Eng., P.E., P.G.	**Cc:**	Chris Kozak (City of Winnipeg) John Bain (City of Winnipeg) Carmen Anseeuw (KGS Group) Jason Mann (KGS Group) Tony Kuluk (KGS Group) Nathan Bruce (KGS Group) Ivy Hu (KGS Group)
Re:	Brady Road Resource Management Facility Area D Contingency Cell – Winnipeg, Manitoba Geotechnical Investigation Memorandum		

1.0 INTRODUCTION

As part of the detailed design, tendering and construction support services for the contingency cell in Area D at the Brady Road Resource Management Facility (BRRMF), KGS Group was retained to complete a one (1) day geotechnical test pitting program to evaluate possible unsuitable soil within the contingency cell limits and address data gaps regarding the edge of waste for former cells, where needed. In June 2025, the investigation was completed consisting of 15 test pits. The investigation was completed to determine soil stratigraphy around existing cells 9-1978 and 10-1978, in particular the presence/absence of silt layers and/or buried waste at the selected locations. A summary of the tasks that were completed and the results are presented below.

1.1 Scope of Services

The scope of this assignment included the following:

- **Utility Clearances** – Prior to undertaking any test pit activities, KGS Group submitted a request for locates through Click Before You Dig MB and connected with the landfill operations team and obtained a drawing of their known underground utilities. No utilities were located within the test pit locations.
- **Geotechnical Investigation** – A geotechnical investigation was completed to determine the soil conditions around two (2) existing cells from the 1970s and confirm the thickness of the existing clay cover and silt layer (if exits). Additionally, determine the presence/absence of topsoil and thicknesses at test pit locations, if present, to inform soil stripping requirements.

2.0 GEOTECHNICAL INVESTIGATION

2.1 Test Pit Excavation

A test pitting program consisting of 15 test pits (TP25-01 to TP25-15) was advanced to depths ranging from 0.8 to 3.0 m (2.7 to 9.8 ft). Excavation services were provided by the City of Winnipeg (CoW) and Earth Max Construction Inc. of Stony Mountain, Manitoba. All test pits were excavated using a Kobelco SK210 track excavator (CoW) and a John Deere 250G track excavator (Earth Max).

Upon completion of test pit excavation, test pits were examined for indications of sloughing and seepage and then backfilled to grade with the excavated material. Test pits TP25-04 to TP25-06, TP25-11 and TP25-13 encountered buried waste immediately below the capping material. Test pit TP25-06 had ~0.25 m of water after digging and was bubbling up into the excavation. Test pit TP25-13 had trace amounts of water in the debris after digging. All test pits remained open upon completion of excavating.

Of the 10 test pits completed outside of the existing cells, eight (8) of them encountered unsuitable silt soil. The silt ranged in thickness from 0.15 m (in TP25-03) to 1.1 m (in TP25-08). The silt was light brown in colour with some light grey mottling, damp to moist, soft to firm in consistency and of no plasticity. The silt also contained trace clay, fine sand and oxidation.

Test pits completed over top of the existing cells had a cap thickness ranging from 0.63 m (at TP25-11) to 2.13 m (at TP25-06). Organic soil and/or topsoil thickness ranged from 24 mm (at TP25-03) to 610 mm (at TP25-09), with not topsoil at at TP25-06.

Summary test pit logs of the encountered soils and field observations are attached in Appendix A.

Approximate test pit locations are shown in Figure 1 Test Pit Location Plan below and UTM coordinates (Zone 14) and elevations are listed in Table 1.

FIGURE 1: TEST PIT LOCATION PLAN

The soil profile encountered across the site are also presented on the attached Figures 2, 3 and 4 for Cross-sections A-A', B-B' and C-C', respectively.

TABLE 1: TEST PIT COORDINATES

Test Pit ID	Elevation (m)	UTM Coordinates[1]	
		Northing (m)	Easting (m)
TP25-01	233.117	5,513,231.74	629,782.41
TP25-02	233.502	5,513,106.68	629,850.99
TP25-03	232.703	5,512,983.90	629,778.48
TP25-04	237.028	5,513,053.18	629,778.48
TP25-05	237.622	5,513,133.04	629,646.78
TP25-06	234.513	5,513,262.22	629,627.77
TP25-07	236.68	5,513,216.31	629,498.02
TP25-08	232.84	5,513,177.12	629,554.55
TP25-09	233.069	5,513,141.87	629,470.73

Test Pit ID	Elevation (m)	UTM Coordinates[1]	
		Northing (m)	Easting (m)
TP25-10	233.076	5,513,106.90	629,375.44
TP25-11	236.468	5,513,037.83	629,424.58
TP25-12	233.854	5,513,055.22	629,559.34
TP25-13	238.049	5,512,953.88	629,580.66
TP25-14	233.364	5,512,956.25	629,649.22
TP25-15	234.053	5,512,903.33	629,636.59

Notes: Test pit locations were obtained after excavating by the City of Winnipeg using a survey grade GPS unit with an accuracy of ± 25 mm.

2.2 Groundwater Conditions

Upon completion of digging, all test pits were monitored for groundwater seepage. Groundwater was encountered in two of the 15 test pits. Water was encountered in TP25-06 at a depth of 2.29 m after encountering the buried waste and in TP25-13 at 0.84 m, again at the depth of the waste. Groundwater levels may differ from those provided in this report in response to seasonal conditions and following heavy precipitation or spring snow melt events; hence, the actual water level at the time of construction could differ from those reported in this report.

3.0 SUMMARY

The test pits were completed in June 2025. Clay cover over garbage debris was encountered in six (6) of the test pits, with cover thicknesses ranging from 0.63 to 2.13 m. The buried waste was observed only in the footprint of the existing waste piles/mounds, as expected, in test pits TP25-04, 05, 06, 07, 11 and 13. Topsoil and/or organic soil was encountered at the surface in 14 of the 15 test pits with thicknesses ranging from 24 to 610 mm. Test pits TP25-06 and TP25-13 encountered leachate at the interface with the waste debris at depths of 2.29 and 0.84 m below ground surface, respectively. The water/leachate encountered in TP25-06 was noted to be “gassy” and bubbling.

Where cover soil and debris was not encountered, a silt layer ranging from 0.15 to 1.10 m thick, was encountered at varying depths within high plasticity clay. With the silt being confined/interbedded within the clay, it is not expected to create constructability issues.

Overall, the subsurface conditions observed during the June 2025 test pitting program are consistent with previous investigations, and no obvious constructability concerns were identified.

STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

This memorandum has been prepared for the City of Winnipeg in accordance with the agreement between KGS Group and the City of Winnipeg (the "Agreement"). This memorandum represents KGS Group's professional judgment and exercising due care consistent with the preparation of similar documents. The information, data, recommendations and conclusions in this memorandum are subject to the constraints and limitations in the Agreement and the qualifications in this memorandum. This memorandum must be read as a whole, and sections or parts should not be read out of context.

This memorandum is based on information made available to KGS Group by the City of Winnipeg. Unless stated otherwise, KGS Group has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith. KGS Group shall not be responsible for conditions/issues it was not authorized or able to investigate or which were beyond the scope of its work. The information and conclusions provided in this memorandum apply only as they existed at the time of KGS Group's work.

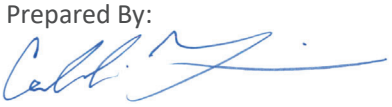
Third Party Use of Memorandum

Any use a third party makes of this memorandum or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this memorandum.

Geotechnical Investigation Statement of Limitations

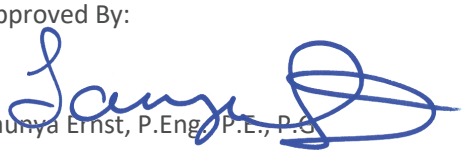
The geotechnical investigation findings and recommendations of this memorandum were prepared in accordance with generally accepted professional engineering principles and practice. The findings and recommendations are based on the results of field and laboratory investigations, combined with an interpolation of soil and groundwater conditions found at and within the depth of the test pits excavated by KGS Group at the site at the time of digging. If conditions encountered during construction appear to be different from those shown by the test holes drilled by KGS Group or if the assumptions stated herein are not in keeping with the design, KGS Group should be notified in order that the recommendations can be reviewed and modified if necessary.

Prepared By:



Caleb Friesen, C.E.T.
Civil Technologist

Approved By:



Taunya Ernst, P.Eng., P.E., P.G.
Civil Geotechnical Department Head

CAF/TE/kv
Attached

FIGURES

Cross-sections A-A’, B-B’, C-C’

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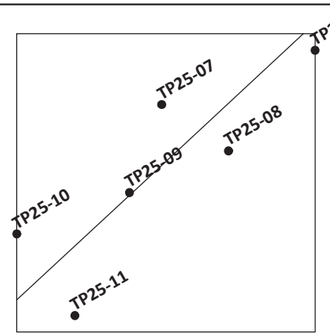

SW
A

NE
A'

ELEVATION (m)

239
238
237
236
235
234
233
232
231
230
229

TP25-11
236.47 m

TP25-07
236.68 m

TP25-06
234.51 m

TP25-10
233.08 m

TP25-09
233.07 m

TP25-08
232.84 m

0
50
100
150
200
250
300
350
400

DISTANCE ALONG PROFILE (metres)

0 21
Horizontal Scale (meters)
Vertical Exaggeration: 16x

Lithology Graphics

- Fill
- Garbage/Debris
- Organics
- Organic Clay (OL)
- Clay (CH, high plasticity)
- Silt (ML)

Legend

TP25-06 — Test Hole ID
Test Hole Lithology

- Water Level During Drilling
- Water Level Upon Completion
- Water Level Static/Remeasured
- SPT, N-Value
- DCPT Value
- > > values greater than 100
- Torvane Cu (kPa)
- Moisture Content (%)

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CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT

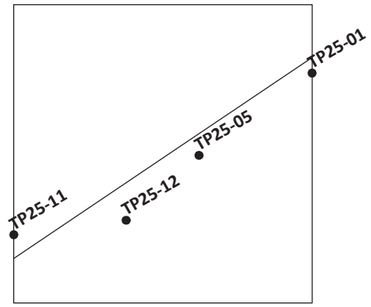
BRRMF Area D Contingency Cell

A-A'

Sep 2025

Figure 2

FENCE W/O WELL DATA PLOT U:\FMS\25-0107-011\BRRMF AREA D TEST PITTING.GPJ



SW
B

NE
B'

ELEVATION (m)

TP25-11
236.47 m

TP25-12
233.85 m

TP25-05
237.62 m

TP25-01
233.12 m

DISTANCE ALONG PROFILE (metres)

Horizontal Scale (meters)
Vertical Exaggeration: 19.5x

Lithology Graphics

- Organics
- Garbage/Debris
- Clay (CH, high plasticity)
- Silt (ML)
- Fill

Legend

- TP25-01 — Test Hole ID
- Test Hole Lithology
- Water Level During Drilling
- Water Level Upon Completion
- Water Level Static/Remeasured
- SPT, N-Value
- DCPT Value
- > > values greater than 100
- Torvane Cu (kPa)
- Moisture Content (%)

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CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT

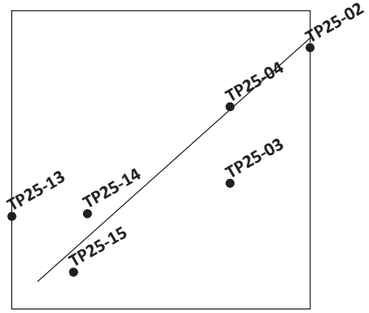
BRRMF Area D Contingency Cell

B-B'

Sep 2025

Figure 3

FENCE W/O WELL DATA PLOT U:\FMS\25-0107-011\BRRMF AREA D TEST PITTING.GPJ



SW

C

NE

C'

ELEVATION (m)

239
238
237
236
235
234
233
232
231
230
229

TP25-13
238.05 m

TP25-15
234.05 m

TP25-14
233.36 m

TP25-04
237.03 m

TP25-03
232.70 m

TP25-02
233.50 m

0 50 100 150 200 250 300 350

DISTANCE ALONG PROFILE (metres)

0 18

Horizontal Scale (meters)
Vertical Exaggeration: 14x

Lithology Graphics

- Organics
- Garbage/Debris
- Clay (CH, high plasticity)
- Organic Clay (OL)
- Silt (ML)
- Fill

Legend

TP25-02 — Test Hole ID

Test Hole Lithology

- Water Level During Drilling
- Water Level Upon Completion
- Water Level Static/Remeasured
- SPT, N-Value
- DCPT Value
- > > values greater than 100
- Torvane Cu (kPa)
- Moisture Content (%)

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CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT

BRRMF Area D Contingency Cell

C-C'

Sep 2025

Figure 4

FENCE W/O WELL DATA PLOT U:\FMS\25-0107-011\BRRMF AREA D TEST PITTING.GPJ

APPENDIX A

Test Pit Logs

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TEST PIT LOG

HOLE NO.
TP25-01

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	233.12 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	East Edge of Area D, North of Centre	**UTM (m)**	N 5,513,231.74
EXCAVATOR	Kobelco SK210 Trackhoe		E 629,782.41 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
233				**ORGANIC SOIL** - 152 mm, Brown, damp, loose, roots.	233.0			
				CLAY (CH) - Brown, moist, stiff, high plasticity, some silt.				
				- Some wood debris at 0.6 m.				
	1.0				231.9			
232				**SILT (ML)** - Light brown, moist, firm, some light grey mottling, trace clay.	231.7			
		5		**CLAY (CH)** - Brown, moist, stiff, high plasticity, trace silt pockets.				
				- Mottled brown/grey below 1.8 m.				
	2.0							
231				- Gypsum layer (~1mm thick) at 2.7 m.	230.1			
	3.0	10		Notes: 1. End of test pit at 3.0 m. 2. Test pit remained open to 3.0 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
230								
	4.0							
229								

WATER LEVELS	▽ **During Drilling/Digging**	None Encountered	CONTRACTOR **City of Winnipeg**	INSPECTOR **C. FRIESEN**
	▼ **Upon Completion**	Dry	APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-02

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	233.50 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	East Edge of Area D, South of Centre	**UTM (m)**	N 5,513,106.68
EXCAVATOR	Kobelco SK210 Trackhoe		E 629,850.99 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
				ORGANIC SOIL - 152 mm, Brown, damp, loose, roots.	233.3			
233				**CLAY (CH)** - Brown to grey, moist, stiff, high plasticity, some silt, trace wood/roots.				
				- No wood/roots below 0.3 m.				
	1.0				232.3			
				SILT (ML) - Light brown, moist, soft, some light grey mottling, trace clay.				
232		5			231.8			
				CLAY (CH) - Brown, moist, stiff, high plasticity, some silt lenses.				
	2.0							
231								
				- Trace gypsum pockets below 2.9 m.				
	3.0	10			230.5			
				Notes: 1. End of test pit at 3.0 m. 2. Test pit remained open to 3.0 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
230								
	4.0							
229								

WATER LEVELS	▽ **During Drilling/Digging**	None Encountered	CONTRACTOR **City of Winnipeg**	INSPECTOR **C. FRIESEN**
	▼ **Upon Completion**	Dry	APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-03

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	232.70 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Toe of Slope, South of East Cell	**UTM (m)**	N 5,512,983.9
EXCAVATOR	Kobelco SK210 Trackhoe		E 629,778.48 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
				ORGANIC SOIL - 24 mm, Black, damp, loose, roots.	232.7			
				CLAY (CH) - Dark greyish brown, moist, stiff, high plasticity, some roots.				
				- No roots below 0.3 m.				
232								
					231.8			
	1.0			**SILT (ML)** - Light brown, moist, soft, some light grey mottling, trace clay.	231.6			
				CLAY (CH) - Brown, moist, stiff, high plasticity, some silt.				
		5		- Mottled brown/grey, trace silt below 1.5 m.				
231								
	2.0							
				- Trace gypsum pockets below 2.4 m.				
230								
					229.7			
	3.0	10		Notes: 1. End of test pit at 3.0 m. 2. Test pit remained open to 3.0 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
229								
	4.0							

WATER LEVELS
- ▽ **During Drilling/Digging** — None Encountered
- ▼ **Upon Completion** — Dry

CONTRACTOR	INSPECTOR
City of Winnipeg	**C. FRIESEN**
APPROVED	DATE
T. ERNST	9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-04

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	237.03 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Top of Pile, Southeast Corner of East Cell	**UTM (m)**	N 5,513,053.18
EXCAVATOR	Kobelco SK210 Trackhoe		E 629,778.48 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
237				**ORGANIC SOIL** - 52 mm, Black, dry, loose, roots.	237.0			
				CLAY FILL - 2082 mm, Dark greyish brown, damp, firm, intermediate to high plasticity, some roots, some silt, trace gravel.				
				- No roots below 0.3 m.				
				- Brown, no gravel below 0.9 m.				
236	1.0			- With light grey silt, trace rebar from 1.3 m to.				
		5						
				- Dark grey, trace garbage below 1.8 m.				
235	2.0				234.9			
				GARBAGE - 52 mm, Black, moist, bags, cans.	234.8			
				Notes: 1. End of test pit at 2.2 m. 2. Test pit remained open to 2.2 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
234	3.0	10						
233	4.0							

WATER LEVELS	▽ **During Drilling/Digging**	None Encountered	CONTRACTOR **City of Winnipeg**	INSPECTOR **C. FRIESEN**
	▼ **Upon Completion**	Dry	APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-05

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	237.62 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Top of Pile, Near Northwest Corner of East Cell	**UTM (m)**	N 5,513,133.04
EXCAVATOR	John Deere 250G Trackhoe		E 629,646.78 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
				ORGANIC SOIL - 52 mm, Black, dry, loose, roots.	237.6			
				CLAY FILL - 1015 mm, Dark brown, damp, stiff, intermediate to high plasticity, crumbly, some gravel.				
237				- Trace cobbles below 0.6 m.				
				- Moist, trace black colouring below 0.8 m.				
	1.0				236.6			
				GARBAGE - 76 mm, Black, moist, bags, wood.	236.5			
				Notes: 1. End of test pit at 1.1 m. 2. Test pit remained open to 1.1 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
		5						
236								
	2.0							
235								
	3.0	10						
234								
	4.0							

WATER LEVELS
- **During Drilling/Digging** — None Encountered
- **Upon Completion** — Dry

CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-06

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	234.51 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	North of East Cell	**UTM (m)**	N 5,513,262.22
EXCAVATOR	Kobelco SK210 Trackhoe		E 629,627.77 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
234				**CLAY FILL** - 762 mm, Greyish brown, moist, firm, intermediate to high plasticity, some coarse sand, some fine gravel.				
				- Black, organic layer (grass) below 0.7 m.	233.8			
	1.0			**CLAY FILL** - 1372 mm, Grey, damp, stiff, low to intermediate plasticity, some silt, some coarse sand, some gravel, crumbly.				
				- trace waste at 1.2 m.				
233		5		- Moist, intermediate to high plasticity below 1.5 m.				
	2.0				232.4			
				GRAVEL FILL - 305 mm, Black, damp, compact, coarse, trace garbage, trace asphalt pieces, trace cobbles.		▼		
					232.1	▽		
232				**GARBAGE** - 101 mm, Black, wet, wood, bags, water bubbling.	232.0			
				Notes: 1. End of test pit at 2.5 m. 2. Test pit remained open to 2.5 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
	3.0	10						
231								
	4.0							
230								

WATER LEVELS
▽ **During Drilling/Digging** 2.44 m on 6-20-2025
▼ **Upon Completion** 2.29 m on 6-20-2025

CONTRACTOR **City of Winnipeg**
INSPECTOR **C. FRIESEN**
APPROVED T. ERNST
DATE 9-3-2025

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KGS GROUP

TEST PIT LOG

HOLE NO.
TP25-07

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	236.68 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Top of Small Berm, North Central of Area D	**UTM (m)**	N 5,513,216.31
EXCAVATOR	John Deere 250G Trackhoe		E 629,498.02 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
				ORGANIC SOIL - 52 mm, Black, damp, loose, roots.	236.6			
				CLAY FILL - 863 mm, Brown to grey, damp, stiff, intermediate to high plasticity, some silt, blocky.				
236					235.8			
	1.0			**ORGANIC CLAY** - Black, damp, very stiff, low plasticity, rootlets, blocky.				
		5						
235								
	2.0			- Moist, intermediate to high plasticity below 2.1 m.				
234					233.7			
	3.0	10		Notes: 1. End of test pit at 3.0 m. 2. Test pit remained open to 3.0 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
233								
	4.0							

WATER LEVELS ▽ **During Drilling/Digging** None Encountered
▼ **Upon Completion** Dry

CONTRACTOR **Earth Max Construction Inc.**
INSPECTOR **C. FRIESEN**
APPROVED T. ERNST
DATE 9-3-2025

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KGS GROUP

TEST PIT LOG

HOLE NO.
TP25-08

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	232.84 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Toe of Slope, Northwest of East Cell	**UTM (m)**	N 5,513,177.12
EXCAVATOR	John Deere 250G Trackhoe		E 629,554.55 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
				ORGANIC SOIL - 305 mm, Grey and black, damp, firm, roots.				
					232.5			
				CLAY (CH) - Greyish brown, moist, stiff, high plasticity.				
					232.3			
				SILT (ML) - Light grey, damp, soft.				
232				- Brown below 0.8 m.				
	1.0							
		5						
					231.2			
				CLAY (CH) - Brown, moist, stiff, high plasticity, trace silt.				
231								
	2.0			- Mottled brown/grey below 2.1 m.				
					230.1			
230				Notes: 1. End of test pit at 2.7 m. 2. Test pit remained open to 2.7 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
	3.0	10						
229								
	4.0							

WATER LEVELS	▽ **During Drilling/Digging**	None Encountered	CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
	▼ **Upon Completion**	Dry	APPROVED T. ERNST	DATE 9-3-2025

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KGS GROUP

TEST PIT LOG

HOLE NO.
TP25-09

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	233.07 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Low Area Near Monitoring Wells, Northeast of West Cell	**UTM (m)**	N 5,513,141.87
EXCAVATOR	John Deere 250G Trackhoe		E 629,470.73 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
233				**ORGANIC SOIL** - 52 mm, Black, dry, loose, roots.	233.0			
				ORGANIC CLAY - 558 mm, Grey, moist, firm, low plasticity, some roots.				
					232.5			
				CLAY (CH) - Grey, moist, stiff, high plasticity, trace silt.				
232	1.0							
		5		- Mottled grey/brown, some silt below 1.2 m.				
	2.0				231.0			
231				**SILT (ML)** - Light brown, damp, soft, some light grey mottling.	230.9			
				CLAY (CH) - Brown, moist, stiff, high plasticity, trace silt pockets.				
	3.0	10			230.0			
230				Notes: 1. End of test pit at 3.0 m. 2. Test pit remained open to 3.0 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
	4.0							
229								

WATER LEVELS	▽ **During Drilling/Digging**	None Encountered	CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
	▼ **Upon Completion**	Dry	APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-10

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	233.08 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Toe of Slope, North of West Cell	**UTM (m)**	N 5,513,106.9
EXCAVATOR	John Deere 250G Trackhoe		E 629,375.44 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
233			**ORGANIC CLAY** - 305 mm, Grey, moist, stiff, low plasticity, with roots.	232.8			
			SILT (ML) - Light brown to grey, moist, firm, trace oxidation.	232.2			
232	1.0		**CLAY (CH)** - Brown, moist, stiff, high plasticity, some silt, trace silt pockets.				
	5		- Mottled brown/grey below 1.4 m.				
231	2.0		- Silty pocket (~50-100 mm thick) around 1.8 m.	230.3			
230	3.0 10		Notes: 1. End of test pit at 2.7 m. 2. Test pit remained open to 2.7 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
229	4.0						

WATER LEVELS
- ▽ **During Drilling/Digging** — None Encountered
- ▼ **Upon Completion** — Dry

CONTRACTOR: **Earth Max Construction Inc.**
INSPECTOR: **C. FRIESEN**
APPROVED: T. ERNST
DATE: 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-11

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	236.47 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Top of Pile Near Northeast Edge of West Cell	**UTM (m)**	N 5,513,037.83
EXCAVATOR	John Deere 250G Trackhoe		E 629,424.58 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
				ORGANIC SOIL - 76 mm, Black, damp, loose, roots.	236.4			
				ORGANIC CLAY FILL - 634 mm, Black, moist, stiff, intermediate to high plasticity, some rootlets.				
236				- Trace rootlets below 0.5 m.				
					235.8			
				GARBAGE - 104 mm, Black, moist, tires, wood, plastic, metal.	235.7			
				Notes: 1. End of test pit at 0.8 m. 2. Test pit remained open to 0.8 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
	1.0							
235		5						
	2.0							
234								
	3.0	10						
233								
	4.0							
232								

WATER LEVELS	▽ **During Drilling/Digging**	None Encountered	CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
	▼ **Upon Completion**	Dry	APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-12

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	233.85 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Toe of Slope, East of West Cell	**UTM (m)**	N 5,513,055.22
EXCAVATOR	John Deere 250G Trackhoe		E 629,559.34 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
				ORGANIC SOIL - 52 mm, Dark brown, damp, loose, roots.	233.8			
				CLAY (CH) - Brown, moist, stiff, intermediate to high plasticity, some silt, some rootlets, some silt pockets.				
				- Greyish brown below 0.5 m.				
					233.1			
233	1.0			**SILT (ML)** - Brown, moist, firm, non-plastic, trace fine sand lenses, trace oxidation, some light grey mottling.				
		5						
					232.0			
232	2.0			**CLAY (CH)** - Brown to grey, moist, stiff, high plasticity, some silt, some silt pockets.				
231	3.0	10			230.8			
				Notes: 1. End of test pit at 3.0 m. 2. Test pit remained open to 3.0 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
230	4.0							

WATER LEVELS	▽ **During Drilling/Digging**	None Encountered
	▼ **Upon Completion**	Dry

CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-13

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	238.05 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Top of Pile, Near Southeast Corner of West Cell	**UTM (m)**	N 5,512,953.88
EXCAVATOR	John Deere 250G Trackhoe		E 629,580.66 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
238				**ORGANIC SOIL** - 152 mm, Brown, dry to damp, loose, roots, some clay.				
					237.9			
				CLAY FILL - 686 mm, Grey, moist, stiff, high plasticity, some silt, trace gravel, trace garbage.				
					237.2	▽		
				GARBAGE - 76 mm, Black, moist, wood, plastics, some water.	237.1	▼		
				Notes: 1. End of test pit at 0.9 m. 2. Test pit remained open to 0.9 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
237	1.0							
		5						
236	2.0							
235	3.0	10						
234	4.0							

WATER LEVELS	▽ **During Drilling/Digging**	0.84 m on 6-20-2025	CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
	▼ **Upon Completion**	0.91 m on 6-20-2025 Trace water	APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-14

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	233.36 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Low Area Between East/West Cells, South of Interior Road	**UTM (m)**	N 5,512,956.25
EXCAVATOR	John Deere 250G Trackhoe		E 629,649.22 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
			ORGANIC SOIL - 52 mm, Black, damp, loose, roots, moss.	233.3			
233			**CLAY (CH)** - Brown, damp, firm, intermediate to high plasticity, some rootlets.				
			- Light brown, with silt from 0.1 m to 0.5 m.				
			- Moist, stiff, trace rootlets below 0.3 m.				
			- Brown, high plasticity, no rootlets below 0.6 m.				
	1.0						
232			- Some silt pockets below 1.3 m.				
	5						
	2.0						
231				230.6			
			Notes: 1. End of test pit at 2.7 m. 2. Test pit remained open to 2.7 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
	3.0						
	10						
230							
	4.0						
229							

WATER LEVELS
- **During Drilling/Digging** — None Encountered
- **Upon Completion** — Dry

CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
APPROVED T. ERNST	DATE 9-3-2025

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TEST PIT LOG

HOLE NO.
TP25-15

CLIENT	**CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT**	**PROJECT NO.**	25-0107-011
PROJECT	**BRRMF Area D Contingency Cell**	**SURFACE ELEV.**	234.05 m
LOCATION	Winnipeg, Manitoba	**START DATE**	6-20-2025
DESCRIPTION	Toe of Slope, Southeast Corner of West Cell	**UTM (m)**	N 5,512,903.33
EXCAVATOR	John Deere 250G Trackhoe		E 629,636.59 Zone 14
METHOD(S)			

ELEVATION (m)	DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	ELEV (m)	WATER LEVEL	SAMPLE TYPE	NUMBER
234				**ORGANIC CLAY** - 457 mm, Black, damp, loose, low plasticity, roots, blocky.				
					233.6			
				CLAY (CH) - Grey and black, damp, stiff, intermediate to high plasticity, trace rootlets, blocky.				
					233.3			
				SILT (ML) - Light brown, damp, firm, non-plastic, some light grey mottling.				
	1.0			- Layer of wood on North side of test pit around 0.9 m.				
233								
		5			232.5			
				CLAY (CH) - Brown, moist, stiff, high plasticity, some silt pockets.				
	2.0							
232				- Greyish brown below 2.3 m.				
					231.3			
				Notes: 1. End of test pit at 2.7 m. 2. Test pit remained open to 2.7 m upon completion of drilling/digging. 3. Test pit backfilled with excavated material.				
	3.0	10						
231								
	4.0							
230								

WATER LEVELS
- ▽ **During Drilling/Digging** — None Encountered
- ▼ **Upon Completion** — Dry

CONTRACTOR **Earth Max Construction Inc.**	INSPECTOR **C. FRIESEN**
APPROVED T. ERNST	DATE 9-3-2025

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KEY TO SYMBOLS

LITHOLOGIC SYMBOLS


Clay (CH, high plasticity)


Fill


Garbage/Debris


Silt (ML)


Organic Clay (OL)


Organics

SAMPLER SYMBOLS

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - Liquid Limit
PL - Plastic Limit
PI - Plastic Index
MC - Moisture Content
DD - Dry Density
NP - Non-Plastic
-200 - Percent Passing No. 200 Sieve
TV - Torvane (kPa)
PP - Pocket Penetrometer (kPa)
PSA - Particle Size Analysis
TOC - Top Of Casing

PN - Pneumatic Piezometer
VW - Vibrating Wire Piezometer
PID - Photoionization Detector
ppm - Parts Per Million
▽ Water Level During Drilling
▼ Water Level Upon Completion of Drilling
▼ Water Level Remeasured/Static

KGS GROUP

CLIENT CITY OF WINNIPEG - WATER AND WASTE DEPARTMENT **PROJECT NO.** 25-0107-011
PROJECT NAME BRRMF Area D Contingency Cell **LOCATION** Winnipeg, Manitoba