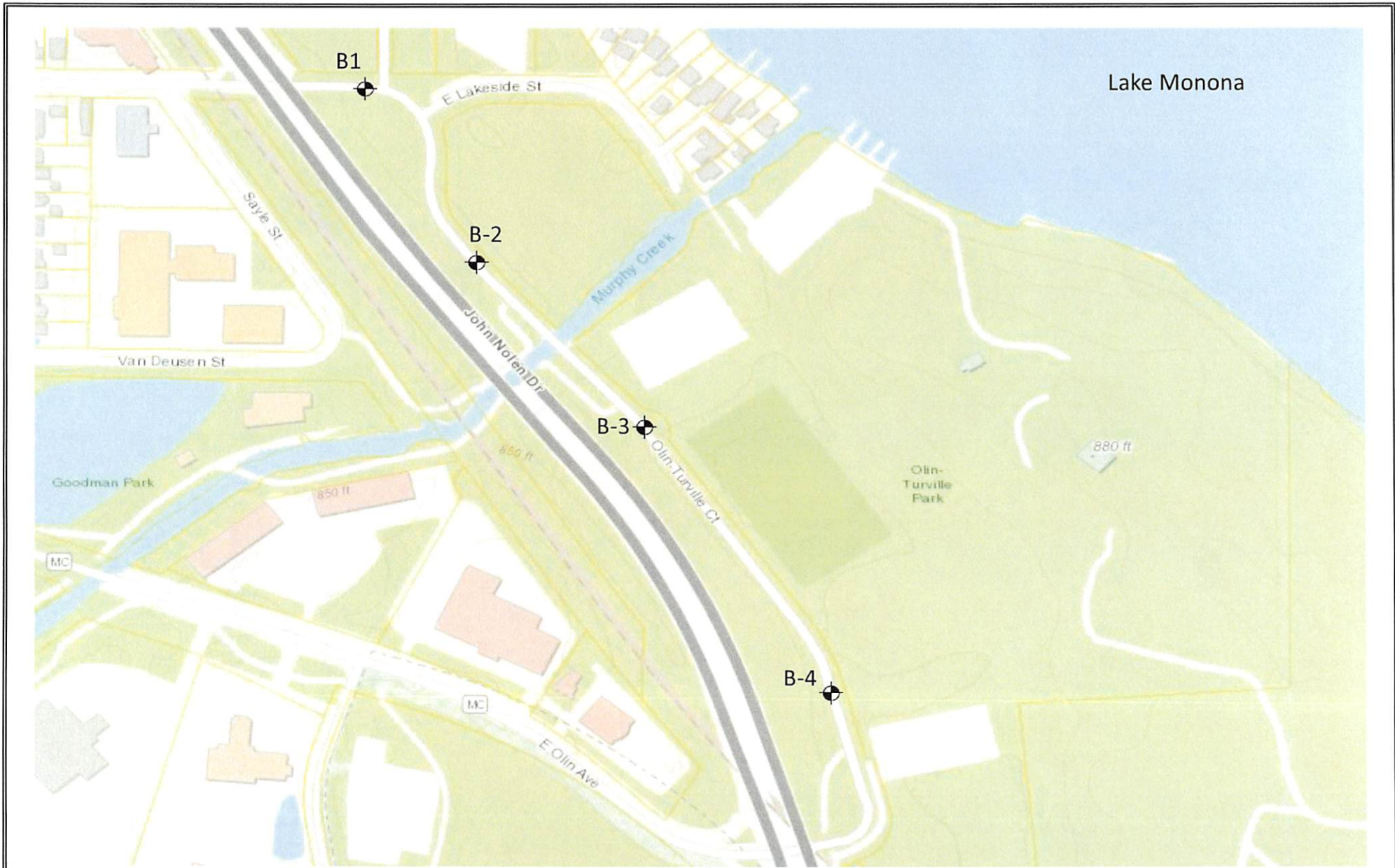



APPENDIX A

**SOIL BORING LOCATION MAP
LOGS OF TEST BORINGS (4)
LOG OF TEST BORINGS-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM**



Legend

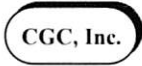
 Denotes boring location



Notes

1. Boring locations are approximate
2. Soil borings performed by Badger State Drilling in October 2021

Scale: Reduced

Date: 12/2021	
Job No. C21051-20	

**Soil Boring Location Map
Olin Turville Court Area
Madison, WI**



LOG OF TEST BORING

Project Olin Turville Court Area
Lakeside: 200'E of John Nolen, 15'S of Centerline
 Location Madison, WI

Boring No. 1
 Surface Elevation (ft) 850±
 Job No. C21051-20
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		q _u (qa) (tsf)	W	LL	PL	LI
				0	X	4 in. Asphalt Pavement/8 in. Base Course				
1	16	M	5	5	□	FILL: Loose to Very Loose Brown Sand with Silt and Gravel to 3'				
2	4	M	2	7	□	Mixed Very Soft Gray Clay and Very Loose Brown Silty Sand with Traces Glass to 6'				
3	12	M	3	9	□	Very Loose, Gray SILT, Some Sand, Trace Clay and Organics (ML)				
4	10	M/W	15	11	□	Medium Dense to Loose, Light Gray to Brown Silty Fine SAND to Sandy SILT (SM/ML)				
5	18	W	10	13	□					
6	18	W	10	15	□					
15					End Boring at 15 ft					
					Borehole backfilled with bentonite chips and asphalt patch					
20										

WATER LEVEL OBSERVATIONS

While Drilling ∇ 11.0' Upon Completion of Drilling 10'
 Time After Drilling _____
 Depth to Water _____
 Depth to Cave in 13'

GENERAL NOTES

Start 10/22/21 End 10/22/21
 Driller BSD Chief MC Rig CME-55
 Logger MA Editor ESF
 Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Olin Turville Court Area
 Location Olin Turville: 375'SE of Lakeside, 8'NE of Centerline
Madison, WI

Boring No. 2
 Surface Elevation (ft) 852±
 Job No. C21051-20
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	TYPE	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
					X	4 in. Asphalt Pavement/8 in. Base Course				
1	█	18	M	18	█	FILL: Medium Dense Brown Sand with Silt and Gravel to 5'				
2	█	15	M	13	█	Medium Dense Orange-Brown Sand with Some Silt and Gravel (Crushed Sandstone) to 8'				
3	█	16	M	26	█					
4	█	18	M/W	8	█	Loose, Dark Gray to Brown Silty Fine SAND to Sandy SILT (SM/ML)				
5	█	18	W	8	█	Loose, Gray SILT, Some Sand, Trace Clay and Organics (ML)				
6	█	18	W	9	█	Loose, Light Brown Fine SAND, Little Silt (SP-SM)				
					15	End Boring at 15 ft				
						Borehole backfilled with bentonite chips and asphalt patch				
					20					

WATER LEVEL OBSERVATIONS

While Drilling ∇ 10.0' Upon Completion of Drilling 11'
 Time After Drilling _____
 Depth to Water _____
 Depth to Cave in 11'

GENERAL NOTES

Start 10/22/21 End 10/22/21
 Driller BSD Chief MC Rig CME-55
 Logger MA Editor ESF
 Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.



LOG OF TEST BORING

Project Olin Turville Court Area
 Olin Turville: 1100'SE of Lakeside, 5'NE of Centerline
 Location Madison, WI

Boring No. 3
 Surface Elevation (ft) 851±
 Job No. C21051-20
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
				0	X	3 in. Asphalt Pavement/8 in. Base Course				
1	8	M	7	7		FILL: Loose to Very Loose Dark Gray and Brown Sand with Silt, Gravel, Traces Clay, Brick and Glass				
2	4	M	4	4						
3	3	W	2	2		Traces of Organics Noted Beginning Near 6'				
4	18	W	9	9		Loose, Light Gray to Brown Silty Fine SAND to Sandy SILT (SM/ML)				
5	20	W	6	6		Soft to Very Stiff, Gray Varved Lean to Silty CLAY, Trace Sand (CL/CL-ML)				
6	24	W	9	9		(0.5)				
				15		(2.25)				
					15	End Boring at 15 ft				
						Borehole backfilled with bentonite chips and asphalt patch				
					20					

WATER LEVEL OBSERVATIONS	GENERAL NOTES
While Drilling ∇ <u>6.0'</u> Upon Completion of Drilling <u>6'</u> Time After Drilling _____ Depth to Water _____ Depth to Cave in <u>8'</u>	Start <u>10/22/21</u> End <u>10/22/21</u> Driller <u>BSD</u> Chief <u>MC</u> Rig <u>CME-55</u> Logger <u>MA</u> Editor <u>ESF</u> Drill Method <u>2.25" HSA; Autohammer</u>
The stratification lines represent the approximate boundary between soil types and the transition may be gradual.	



LOG OF TEST BORING

Project Olin Turville Court Area
Olin Turville: 1600'SE of Lakeside, 5'SW of Centerline
 Location Madison, WI

Boring No. 4
 Surface Elevation (ft) 851±
 Job No. C21051-20
 Sheet 1 of 1

2921 Perry Street, Madison, WI 53713 (608) 288-4100, FAX (608) 288-7887

SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	DEPTH (ft)	Rec (in.)	Moist	N		Depth (ft)	qu (qa) (tsf)	W	LL	PL
					X	4 in. Asphalt Pavement/4 in. Base Course				
1	18	M	13		▽	FILL: Medium Dense to Very Loose Dark Gray and Brown Sand with Silt, Gravel, Traces Clay, Brick and Glass				
2	7	W	3		▽					
3	2	W	2		▽					
4	13	W	11		▽	Rubber Noted Near 9'				
5	22	W	8		▽	Medium Stiff to Very Stiff, Gray Varved Lean to Silty CLAY, Trace Sand (CL/CL-ML)				
6	30	W	12		▽	(0.75)				
					▽	(2.75)				
					▽	End Boring at 15 ft				
					▽	Borehole backfilled with bentonite chips and asphalt patch				

WATER LEVEL OBSERVATIONS

While Drilling ▽ 3.5' Upon Completion of Drilling _____
 Time After Drilling _____ 30 Mins.
 Depth to Water _____ 4' ▽
 Depth to Cave in _____ 8'

GENERAL NOTES

Start 10/22/21 End 10/22/21
 Driller BSD Chief MC Rig CME-55
 Logger MA Editor ESF
 Drill Method 2.25" HSA; Autohammer

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

LOG OF TEST BORING
General Notes

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction	Particle Size	U.S. Standard Sieve Size
Boulders	Larger than 12"	Larger than 12"
Cobbles	3" to 12"	3" to 12"
Gravel: Coarse.....	¾" to 3"	¾" to 3"
Fine	4.76 mm to ¾".....	#4 to ¾"
Sand: Coarse.....	2.00 mm to 4.76 mm.....	#10 to #4
Medium	0.42 to mm to 2.00 mm	#40 to #10
Fine	0.074 mm to 0.42 mm.....	#200 to #40
Silt.....	0.005 mm to 0.074 mm.....	Smaller than #200
Clay.....	Smaller than 0.005 mm.....	Smaller than #200

Plasticity characteristics differentiate between silt and clay.

General Terminology

Physical Characteristics
 Color, moisture, grain shape, fineness, etc.
Major Constituents
 Clay, silt, sand, gravel
Structure
 Laminated, varved, fibrous, stratified, cemented, fissured, etc.
Geologic Origin
 Glacial, alluvial, eolian, residual, etc.

Relative Density

Term	"N" Value
Very Loose.....	0 - 4
Loose.....	4 - 10
Medium Dense.....	10 - 30
Dense.....	30 - 50
Very Dense.....	Over 50

Relative Proportions Of Cohesionless Soils

Proportional Term	Defining Range by Percentage of Weight
Trace.....	0% - 5%
Little.....	5% - 12%
Some.....	12% - 35%
And	35% - 50%

Consistency

Term	q _u -tons/sq. ft
Very Soft.....	0.0 to 0.25
Soft.....	0.25 to 0.50
Medium.....	0.50 to 1.0
Stiff.....	1.0 to 2.0
Very Stiff.....	2.0 to 4.0
Hard.....	Over 4.0

Organic Content by Combustion Method

Soil Description	Loss on Ignition
Non Organic.....	Less than 4%
Organic Silt/Clay.....	4 - 12%
Sedimentary Peat.....	12% - 50%
Fibrous and Woody Peat...	More than 50%

Plasticity

Term	Plastic Index
None to Slight.....	0 - 4
Slight.....	5 - 7
Medium.....	8 - 22
High to Very High ..	Over 22

The penetration resistance, N, is the summation of the number of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140 lb. weight falling 30" and is seated to a depth of 6" before commencing the standard penetration test.

SYMBOLS

Drilling and Sampling

- CS – Continuous Sampling
- RC – Rock Coring: Size AW, BW, NW, 2"W
- RQD – Rock Quality Designation
- RB – Rock Bit/Roller Bit
- FT – Fish Tail
- DC – Drove Casing
- C – Casing: Size 2 ½", NW, 4", HW
- CW – Clear Water
- DM – Drilling Mud
- HSA – Hollow Stem Auger
- FA – Flight Auger
- HA – Hand Auger
- COA – Clean-Out Auger
- SS - 2" Dia. Split-Barrel Sample
- 2ST – 2" Dia. Thin-Walled Tube Sample
- 3ST – 3" Dia. Thin-Walled Tube Sample
- PT – 3" Dia. Piston Tube Sample
- AS – Auger Sample
- WS – Wash Sample
- PTS – Peat Sample
- PS – Pitcher Sample
- NR – No Recovery
- S – Sounding
- PMT – Borehole Pressuremeter Test
- VS – Vane Shear Test
- WPT – Water Pressure Test

Laboratory Tests

- q_a – Penetrometer Reading, tons/sq ft
- q_u – Unconfined Strength, tons/sq ft
- W – Moisture Content, %
- LL – Liquid Limit, %
- PL – Plastic Limit, %
- SL – Shrinkage Limit, %
- LI – Loss on Ignition
- D – Dry Unit Weight, lbs/cu ft
- pH – Measure of Soil Alkalinity or Acidity
- FS – Free Swell, %

Water Level Measurement

- ▽ - Water Level at Time Shown
- NW – No Water Encountered
- WD – While Drilling
- BCR – Before Casing Removal
- ACR – After Casing Removal
- CW – Cave and Wet
- CM – Caved and Moist
















Note: Water level measurements shown on the boring logs represent conditions at the time indicated and may not reflect static levels, especially in cohesive soils.

CGC, Inc.

Madison - Milwaukee

Unified Soil Classification System

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART

COARSE-GRAINED SOILS (more than 50% of material is larger than No. 200 sieve size)		
Clean Gravels (Less than 5% fines)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size		GW Well-graded gravels, gravel-sand mixtures, little or no fines
		GP Poorly-graded gravels, gravel-sand mixtures, little or no fines
	Gravels with fines (More than 12% fines)	
		GM Silty gravels, gravel-sand-silt mixtures
		GC Clayey gravels, gravel-sand-clay mixtures
Clean Sands (Less than 5% fines)		
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size		SW Well-graded sands, gravelly sands, little or no fines
		SP Poorly graded sands, gravelly sands, little or no fines
	Sands with fines (More than 12% fines)	
		SM Silty sands, sand-silt mixtures
		SC Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (50% or more of material is smaller than No. 200 sieve size.)		
SILTS AND CLAYS Liquid limit less than 50%		ML Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL Organic silts and organic silty clays of low plasticity
SILTS AND CLAYS Liquid limit 50% or greater		MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH Inorganic clays of high plasticity, fat clays
		OH Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS		PT Peat and other highly organic soils

LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limits above "A" line or P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for GW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in shaded zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
SC	Atterberg limits above "A" line with P.I. greater than 7	

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

Less than 5 percent GW, GP, SW, SP
 More than 12 percent GM, GC, SM, SC
 5 to 12 percent Borderline cases requiring dual symbols

PLASTICITY CHART

