

**Legend**

● Denotes Boring Location



Scale: Reduced

**Notes**

1. Soil Borings performed by Badger State Drilling in November 2021
2. Boring locations are approximate



Date:  
11/2021

Job No.  
C21051-21

**Soil Boring Location Map**  
**Hammersley Road**  
**Madison, WI**



# LOG OF TEST BORING

Project Hammersley Road  
460'E of Rae, 10'N of Centerline  
 Location Madison, WI

Boring No. 1  
 Surface Elevation (ft) 1062±  
 Job No. C21051-21  
 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 Coarse				
1		8	M	34		Medium Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)				
2		6	M	12						
3		8	M	61/ 10"						
4		18	M	14						
5		18	M	25						
6		18	M	27						
					15	End Boring at 15 ft				
						Borehole backfilled with bentonite chips and asphalt patch				
					20					

## WATER LEVEL OBSERVATIONS

While Drilling  NW Upon Completion of Drilling \_\_\_\_\_  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_

## GENERAL NOTES

Start 11/17/21 End 11/17/21  
 Driller BSD Chief KD Rig D-120  
 Logger GB 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 Hammersley Road  
950'W of Whitney, 15'S of Centerline  
 Location Madison, WI

Boring No. 2  
 Surface Elevation (ft) 1030±  
 Job No. C21051-21  
 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
				5	X	4 in. Asphalt Pavement/8 in. Base Course				
1	12	M	24			Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM - Possible Fill to 3')				
2	18	M	18							
3	1	M	31							
4	1	M	41	10		Dense, Light Brown Fine SAND, Some Gravel, Little to Some Silt (SP-SM/SM)				
5	18	M	65/9"			Very Dense, Brown Silty Fine SAND, Some Gravel, Scattered Cobbles and Boulders (SM)				
6	14	M	98/8"	15						
End Boring at 15 ft										
Borehole backfilled with bentonite chips and asphalt patch										
				20						

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling  NW Upon Completion of Drilling \_\_\_\_\_  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_

Start 11/17/21 End 11/17/21  
 Driller BSD Chief KD Rig D-120  
 Logger GB 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 Hammersley Road  
460'E of Whitney, 15'S of Centerline  
 Location Madison, WI

Boring No. 3  
 Surface Elevation (ft) 1044±  
 Job No. C21051-21  
 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
					X	4 in. Asphalt Pavement/7 in. Base Course				
1	14	M	10							
2	12	M	27							
				5						
3	0			50/1"		Very Dense, Grayish-Brown Fine to Coarse SAND and GRAVEL with Numerous Cobbles and Variable Silt Content (SP-SM/GP-GM)				
4	0			50/2"						
				10						
5	6	M		90/7"						
6	2	M		50/3"						
				15		End Boring at 15 ft  Borehole backfilled with bentonite chips and asphalt patch				
				20						

### WATER LEVEL OBSERVATIONS

While Drilling  NW Upon Completion of Drilling \_\_\_\_\_  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_

### GENERAL NOTES

Start 11/17/21 End 11/17/21  
 Driller BSD Chief KD Rig D-120  
 Logger GB 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 Hammersley Road  
850'E of Gilbert, 15'S of Centerline  
 Location Madison, WI

Boring No. 4  
 Surface Elevation (ft) 1037±  
 Job No. C21051-21  
 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 (tsf)	W	LL	PL	LI
					X	4 in. Asphalt Pavement/8 in. Base Course				
1	18	M	9			FILL: Stiff Brown Sandy Clay				
				5						
2	18	M	49		.....	Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)				
				10						
3	18	M	41		.....					
				15						
4	18	M	37		.....					
				20						
5	18	M	53		.....					
				15		End Boring at 15 ft				
						Borehole backfilled with bentonite chips and asphalt patch				

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

While Drilling  NW Upon Completion of Drilling \_\_\_\_\_  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_

Start 11/17/21 End 11/17/21  
 Driller BSD Chief KD Rig D-120  
 Logger GB 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 Hammersley Road  
420'W of Reetz, 15'S of Centerline  
 Location Madison, WI

Boring No. 5  
 Surface Elevation (ft) 1029±  
 Job No. C21051-21  
 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	4 in. Asphalt Pavement/8 in. Base Course				
1	18	M		20		Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)				
2	18	M		17						
3	8	M		27						
4	18	M		27						
				10		End Boring at 10.5 ft Due to Auger Refusal on Presumed Boulder/Possible Bedrock.  Borehole backfilled with bentonite chips and asphalt patch				
				15						
				20						

## WATER LEVEL OBSERVATIONS

While Drilling  NW Upon Completion of Drilling \_\_\_\_\_  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_

## GENERAL NOTES

Start 11/17/21 End 11/17/21  
 Driller BSD Chief KD Rig D-120  
 Logger GB Editor ESF  
 Drill Method 2.25" HSA; Autohammer

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CGC, Inc.

**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 <sub>w</sub> -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<sub>a</sub> – Penetrometer Reading, tons/sq ft
- q<sub>a</sub> – 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)		
GRAVELS More than 50% of coarse fraction larger than No. 4 sieve size	Clean Gravels (Less than 5% fines)	
	 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
SANDS 50% or more of coarse fraction smaller than No. 4 sieve size	Clean Sands (Less than 5% fines)	
	 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

