




**Legend**  
 Denotes Boring Location

**Notes**  
 1. Boring locations are approximate  
 2. Soil Borings performed by Badger State Drilling in November 2020

Scale: Reduced

**Date:**  
11/2020

**Job No.:**  
C20051-29

**CGC, Inc.**

**Soil Boring Location Map**  
**Hooker Avenue Area**  
**Madison, WI**



# LOG OF TEST BORING

Project Hooker Avenue Area  
Steensland: 300'W of Sherman, 5'S of CL  
 Location Madison, WI

Boring No. 1  
 Surface Elevation (ft) 874±  
 Job No. C20051-29  
 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 <sub>u</sub> (qa) (tsf)	W	LL	PL	LI
				0	4 in. Asphalt Pavement/8 in. Base Course					
1	18	M	7	7	Very Stiff, Brown Lean CLAY (CL)	(2.75)				
2	18	M	19	19	Medium Dense to Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
3	18	M	8 1/8"	8 1/8"	Weathered to Competent Apparent Dolomitic Limestone Bedrock					
4	1	M	50/2"	50/2"	End Boring at 10 ft Due to Auger Refusal on Apparent Competent Bedrock  Borehole Backfilled with Bentonite Chips and Asphalt Patch					

### WATER LEVEL OBSERVATIONS

### GENERAL NOTES

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

Start 11/5/20 End 11/5/20  
 Driller BSD Chief MC Rig CME-55  
 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 Hooker Avenue Area  
Hooker: 105'S of Sheridan, 10'E of CL  
 Location Madison, WI

Boring No. 2  
 Surface Elevation (ft) 867±  
 Job No. C20051-29  
 Sheet 1 of 1

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SAMPLE					VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Rec (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
					4 in. Asphalt Pavement/8 in. Base Course					
1	18	M	7		Stiff, Brown Lean CLAY (CL - Possible Fill)	(1.5)				
				5	Medium Dense to Dense, Brown and Dark Brown Fine to Coarse SAND, Some Gravel and Silt, Scattered Cobbles (SM - Possible Fill)					
2	18	M	19							
				10	Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
3	18	M	35							
				15	Medium Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
4	18	M	15							
				20	End Boring at 15 ft  Borehole Backfilled with Bentonite Chips and Asphalt Patch					
5	18	M/W	29							

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	∇	NW	Upon Completion of Drilling	NW	Start	11/5/20	End	11/5/20	
Time After Drilling					Driller	BSD	Chief	MC	Rig CME-55
Depth to Water				∇	Logger	GB	Editor	ESF	
Depth to Cave in					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 Hooker Avenue Area  
Hooker: 95'S of Logan, 8'E of CL  
 Location Madison, WI

Boring No. 3  
 Surface Elevation (ft) 869±  
 Job No. C20051-29  
 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 <sub>u</sub> (qa) (tsf)	W	LL	PL	LI
					4 in. Asphalt Pavement/8 in. Base Course					
1	18	M	12		Very Stiff, Brown Lean CLAY (CL)	(3.25)				
2	18	M	17		Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
3	18	M	12							
4	18	M	11		Medium Dense to Very Dense, Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
5	10	M	61/9"		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  NW  
 Time After Drilling \_\_\_\_\_  
 Depth to Water \_\_\_\_\_  
 Depth to Cave in \_\_\_\_\_

Start 11/5/20 End 11/5/20  
 Driller BSD Chief MC Rig CME-55  
 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 Hooker Avenue Area  
 Location Sheridan: 90'SW of Logan, 10'NE of CL  
Madison, WI

Boring No. 4  
 Surface Elevation (ft) 870±  
 Job No. C20051-29  
 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.	REMARKS (in.)	Moist	N	Depth (ft)		qu (qa) (tsf)	W	LL	PL	LI
				0	4 in. Asphalt Pavement/5.5 in. Base Course					
1	16	M	8	8	Stiff, Brown Lean CLAY (CL - Possible Fill)	(1.0)				
				5	Loose, Brown and Dark Brown SAND, Some Silt (SM - Possible Fill)					
2	18	M	8	8						
				10	Medium Dense, Light Brown Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
3	18	M	21	21						
				15	Increasing Gravel Content with Depth					
4	18	M	15	15						
				20	End Boring at 15 ft Borehole Backfilled with Bentonite Chips and Asphalt Patch					
5	16	M	10	10						

WATER LEVEL OBSERVATIONS					GENERAL NOTES				
While Drilling	∇	NW	Upon Completion of Drilling	NW	Start	11/5/20	End	11/5/20	
Time After Drilling					Driller	BSD	Chief	MC	Rig CME-55
Depth to Water				∇	Logger	GB	Editor	ESF	
Depth to Cave in					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 <sub>a</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>u</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)

#### Clean Gravels (Less than 5% fines)

**GRAVELS**  
More than 50% of coarse fraction larger than No. 4 sieve size



GW

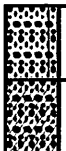
Well-graded gravels, gravel-sand mixtures, little or no fines



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



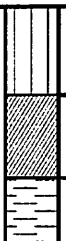
SC

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

