Legend

Denotes Boring Location

N

Scale: Reduced

Notes

1. Boring locations are approximate
2. Soil Borings performed by Badger State Drilling in 2011 and 2020
3. B1, B5A, B5B and B6 performed in 2020; B2-B5 performed in 2011 (as part of a previous City project)

Date: 10/2020	CGC, Inc.	**Soil Boring Location Map**
Job No. C20051-23		**Russell Street Area**
		Madison, WI

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Jenifer: 60'W of Division, 8'N of Centerline
Location: Madison, WI

Boring No. 1
Surface Elevation (ft) 851±
Job No. C20051-23
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						6.5 in. Asphalt Pavement/11 in. Base Course					
1		18	M	7		FILL: Loose Brown Sand with Little to Some Silt and Trace Gravel					
2		18	W	5							
					5						
3		18	W	8		Loose, Gray Silty Fine SAND (SM)					
4		18	W	14		Medium Dense, Gray SILT, Some Sand, Trace to Little Clay (ML)					
					10						
						Stiff, Gray Laminated Lean and Silty CLAY, Occasional Sand Partings (CL/CL-ML)					
5		18	W	11			(1.25)				
					15	End Boring at 15 ft Borehole Backfilled with Bentonite Chips and Asphalt Patch					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 3.5'			Upon Completion of Drilling	3.5'
Time After Drilling				15 Min.
Depth to Water				3.5' ▼
Depth to Cave in				4'

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

GENERAL NOTES

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

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Jenifer: 310'NE of Walton, 6'SE of Centerline
Location: Madison, WI

Boring No. 2
Surface Elevation (ft) 852±
Job No. C20051-23
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						3 in. Asphalt Pavement/8 in. Concrete Pavement/8 in. Base Course					
1		12	M	9		Loose, Light Brown Fine to Medium SAND, Little to Some Silt (SP/SP-SM - Possible Fill)					
2		12	M	4	5	Loose to Very Loose at 4 ft					
3		18	W	15		Medium Dense, Gray Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
4		18	W	24	10						
5		18	W	9		Stiff, Gray Lean CLAY (CL)	(1.25)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell Street and Helena Street. Note: Previously identified as Boring 9 in CGC Report C11054-17 and drilled in 2011.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 5.0' Upon Completion of Drilling 5'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/10/11 End 8/10/11
Driller BSD Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2.25" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Russell: 110'NW of Jenifer, 6'NE of Centerline
Location: Madison, WI

Boring No. 3
Surface Elevation (ft) 853±
Job No. C20051-23
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						8 in. Concrete Pavement/8 in. Base Course					
1		18	M	12		Medium Dense to Loose, Light Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM - Probable Fill)					
2		18	M	4	5	Loose to Very Loose, Dark Brown to Black Fine to Medium SAND, Some Silt and Clay (SM/SC)					
3		18	W	13		Medium Dense, Gray Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
4		18	W	14	10						
5		18	W	11		Stiff, Gray Lean CLAY (CL)	(1.25)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips Note: Previously identified as Boring 8 in CGC Report C11054-17 and drilled in 2011.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller BSD Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2.25" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Helena: 90'NE of Russell, 7'SE of Centerline
Location: Madison, WI

Boring No. 4
Surface Elevation (ft) 852±
Job No. C20051-23
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						2 in. Asphalt Pavement/8 in. Concrete Pavement/10 in. Base Course					
1		18	M	13		Medium Dense, Light Brown Fine to Medium SAND, Little to Some Silt and Gravel (SP-SM/SM - Possible Fill)					
2		18	M	4	▽	Loose, Brown to Gray Fine to Coarse SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
					5						
3		18	W	10		Loose to Medium Dense, Gray Fine to Medium SAND, Little Silt (SP-SM)					
4		18	W	8		Medium Stiff to Stiff, Gray Lean CLAY, Trace Sand (CL)	(0.75)				
					10						
5		18	W	10			(1.75)				
					15	End of Boring at 15 ft Backfilled with Bentonite Chips Note: Previously identified as Boring 7 in CGC Report C11054-17 and drilled in 2011.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 4.0' Upon Completion of Drilling 4'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller BSD Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2.25" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Russell: 135'NW of Helena, 9'NE of Centerline
Location: Madison, WI

Boring No. 5
Surface Elevation (ft) 853±
Job No. C20051-23
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						3 in. Asphalt Pavement/6 in. Concrete Pavement/8 in. Base Course					
1		18	M	12		Loose to Medium Dense, Light Brown Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM - Probable Fill)					
2		18	M	8	5						
3		18	W	9		Soft, Dark Brown to Black Sandy Lean CLAY (CL - Possible Buried Topsoil)	(0.4)				
						Loose, Gray Fine to Medium SAND, Some Silt (SM)					
4		18	W	17	10	Medium Dense, Gray-Brown Sandy SILT with Clay Seams and Lenses (ML/CL)					
						Medium Dense, Brown Fine SAND, Little to Some Silt (SP/SP-SM)					
5		18	W	27	15						
						End of Boring at 15 ft Backfilled with Bentonite Chips Note: Previously identified as Boring 6 in CGC Report C11054-17 and drilled in 2011.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller BSD Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2.25" HSA; Autohammer

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Russell: 115'NW of Helena, 6'NE of Centerline
Location: Madison, WI

Boring No. 5A
Surface Elevation (ft) 852±
Job No. C20051-23
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	LI
						2 in. Asphalt Pavement/7 in. Concrete Pavement/4 in. Base Course					
1		0	M	54/8"		FILL: Loose Brown Sand					
						End Boring at 1.7 ft Due to Spoon Refusal on Presumed Concrete Borehole Backfilled with Bentonite Chips and Asphalt Patch					
					5						
					10						
					15						
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling NW
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

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

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Russell: 118'NW of Helena, 6'NE of Centerline
Location: Madison, WI

Boring No. 5B
Surface Elevation (ft) 852±
Job No. C20051-23
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						2 in. Asphalt Pavement/7 in. Concrete Pavement/4 in. Base Course					
1		0	M	53/6"		FILL: Loose Brown Sand					
						End Boring at 1.5 ft Due to Spoon Refusal on Presumed Concrete					
						Borehole Backfilled with Soil Cuttings and Asphalt Patch					

5
10
15
20
25

WATER LEVEL OBSERVATIONS

While Drilling ▽ NW Upon Completion of Drilling NW
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

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

CGC Inc.

LOG OF TEST BORING

Project: Russell Street Area
Helena: 285'SW of Russell, 3'SE of Centerline
Location: Madison, WI

Boring No. 6
Surface Elevation (ft) 852±
Job No. C20051-23
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						2 in. Asphalt Pavement/7 in. Concrete Pavement					
1		18	M	7		FILL: Loose Brown Fine Sand with Little to Some Silt and Trace Gravel to 3'					
2		18	M	3		Very Loose Brown Fine to Coarse Sand with Some Silt to 4.5'					
					5	Very Loose, Dark Brown to Black Organic SAND (OL)					
3		18	W	11		Medium Dense, Gray Sandy SILT (ML)					
4		18	W	11							
					10	Having Occasional Thin (<1/4 in.) Seams of Clay with Depth					
						Stiff, Gray Lean CLAY, Trace Sand (CL)					
5		18	W	11			(1.75)				
					15	End Boring at 15 ft Borehole Backfilled with Bentonite Chips and Asphalt Patch					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0'	Upon Completion of Drilling			6.5'
Time After Drilling				15 Min.
Depth to Water				6.5' ▼
Depth to Cave in				7'

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

GENERAL NOTES

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

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_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)			
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

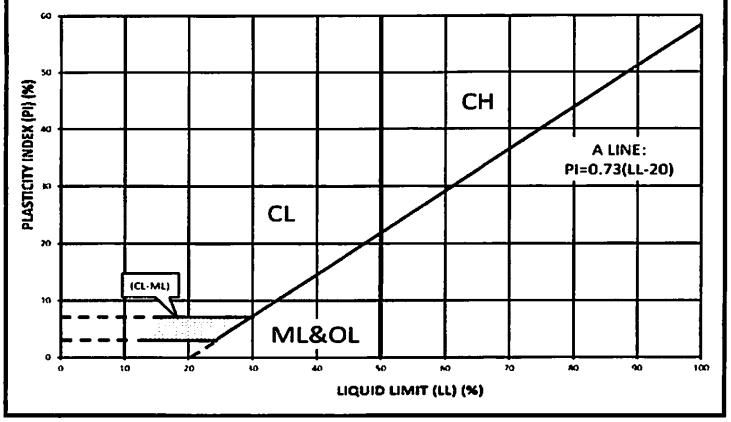
LABORATORY CLASSIFICATION CRITERIA

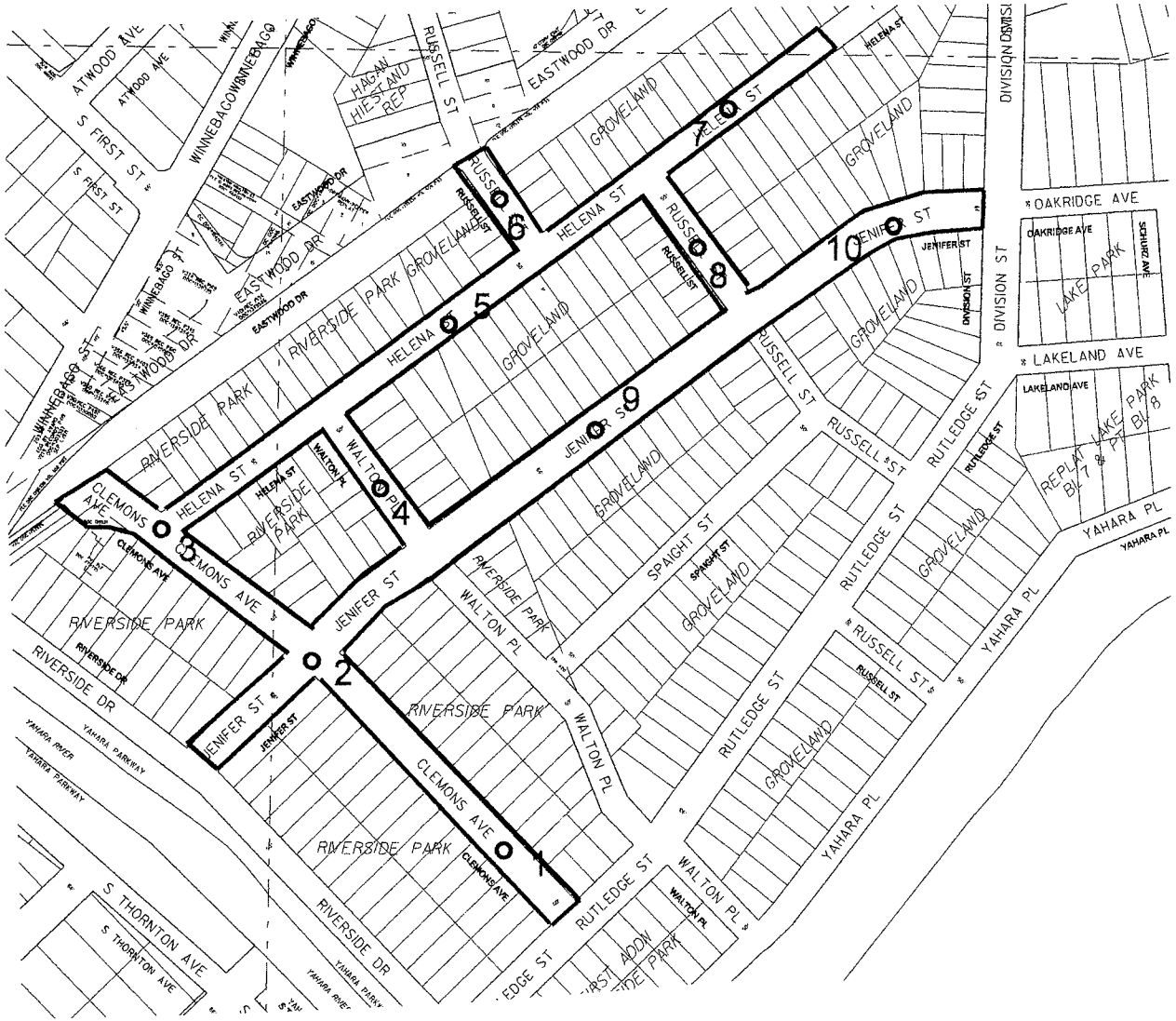
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_C = \frac{D_{30}}{D_{10} \times D_{60}}$ between 1 and 3	
GP	Not meeting all gradation requirements for GW	
GM	Atterberg limts below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
GC	Atterberg limts 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





Legend

○ Denotes Boring Location (approximate)

N

Notes

1. Soil boring performed by Badger State Drilling in August 2011

DWN: -	APP'D: MNS	Date: 8/11	C11054-17	CGC, Inc.	**SOIL BORING LOCATION PLAN** **Clemons Avenue Area** **Madison, Wisconsin**

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Clemons: 180'NW of Rutledge, 6'NE of Centerline
Location: Madison, Wisconsin

Boring No. 1
Surface Elevation (ft) 94.1*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						6" Concrete Pavement/8" Base Course					
1		18	M	11		Very Loose to Medium Dense, Light Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Possible Fill)					
2		18	M	3	5						
3		12	W	13		Loose to Medium Dense, Gray Fine to Medium SAND, Some Silt and Gravel (SM)					
4		6	W	6	10						
5		18	W	14							
					15	End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Clemons: 60'SE of Jenifer, 6'NE of Centerline
Location: Madison, Wisconsin

Boring No. 2
Surface Elevation (ft) 93.9*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						6" Asphalt Pavement/10" Base Course					
1		18	M	6		Loose, Light Brown Fine SAND, Trace Silt and Gravel (SP) (Possible Fill)					
2		18	M	6	5	Loose, Dark Brown Fine to Medium SAND, Some Silt, Trace to Little Organics (SM)		20.7			5.4
3		18	W	28		Medium Dense, Light Brown Sandy SILT (ML)					
4		18	W	9	10	Loose, Gray Silty Fine SAND (SM)					
5		18	W	9		Stiff, Gray Lean CLAY (CL)	(1.75)				
					15	End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/8/11 End 8/8/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Clemons: 80'NW of Helena, 18'SW of Centerline
Location: Madison, Wisconsin

Boring No. 3
Surface Elevation (ft) 94.9*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						6" Asphalt Pavement/8" Base Course					
1		12	M	10		FILL: Dark Brown Sand with Silt and Gravel					
						Very Stiff, Light Gray-Brown Lean CLAY (CL)					
2		12	M	13	5		(3.75)				
3		15	M	23		Loose to Dense, Gray to Brown Fine to Medium SAND, Some Silt and Gravel, Scattered Cobbles and Boulders (SM)					
					▽						
4		4	W	8	10						
5		18	W	31	15						
						End Boring at 15 ft					
						Borehole backfilled with bentonite chips					
						*Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 8.0' Upon Completion of Drilling 8'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/8/11 End 8/8/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Walton: 165'SE of Helena, 6'NE of Centerline
Location: Madison, Wisconsin

Boring No. 4
Surface Elevation (ft) 94.5*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						6" Concrete Pavement/8" Base Course					
1		18	M	15		Medium Dense, Light Brown Fine SAND, Trace to Little Silt (SP/SP-SM) (Possible Fill)					
2		18	M	8	5	Loose, Gray Silty Fine SAND to Sandy SILT (SM/ML)					
3		18	W	21	▽	Medium Dense, Light Brown Sandy SILT (ML)					
4		18	W	5	10	Medium Stiff to Stiff, Gray Lean CLAY (CL)	(1.0)				
5		18	W	16	15		(1.5)				
						End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Helena: 180'SW of Russell, 9'NW of Centerline
Location: Madison, Wisconsin

Boring No. 5
Surface Elevation (ft) 95.5*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						2" Asphalt Pavement/6" Concrete Pavement/6" Base Course					
1		18	M	10		FILL: Light Brown Fine Sand, Trace to Little Silt					
2		18	M	4		Loose, Dark Brown Sedimentary PEAT (PT)		53.4			14.6
					5						
						Loose, Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
3		18	W	8							
						Loose, Gray Sandy SILT (ML)					
4		18	W	9			(1.75)				
					10						
						Medium Stiff to Stiff, Gray Lean CLAY (CL)					
5		18	W	9			(1.0)				
					15	End Boring at 15 ft					
						Borehole backfilled with bentonite chips					
						*Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Russell: 135'NW of Helena, 9'NE of Centerline
Location: Madison, Wisconsin

Boring No. 6
Surface Elevation (ft) 97.5*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu (qa) (tsf)	W	LL	PL	LI
						3" Asphalt Pavement/6" Concrete Pavement/8" Base Course					
1		18	M	12		Loose to Medium Dense, Light Brown Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Probable Fill)					
2		18	M	8	5						
3		18	W	9		Soft, Dark Brown to Black Sandy Lean CLAY (CL) (Possible Buried Topsoil)	(0.4)				
						Loose, Gray Fine to Medium SAND, Some Silt (SM)					
4		18	W	17		Medium Dense, Gray-Brown Sandy SILT with Clay Seams and Lenses (ML/CL)					
					10						
						Medium Dense, Brown Fine SAND, Little to Some Silt (SP/SP-SM)					
5		18	W	27							
					15	End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Helena: 90'NE of Russell, 7'SE of Centerline
Location: Madison, Wisconsin

Boring No. 7
Surface Elevation (ft) 96.4*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						2" Asphalt Pavement/8" Concrete Pavement/10" Base Course					
1		18	M	13		Medium Dense, Light Brown Fine to Medium SAND, Little to Some Silt and Gravel (SP-SM/SM) (Possible Fill)					
2		18	M	4	▽	Loose, Brown to Gray Fine to Coarse SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
					5						
3		18	W	10		Loose to Medium-Dense, Gray Fine to Medium SAND, Little Silt (SP-SM)					
4		18	W	8		Medium Stiff to Stiff, Gray Lean CLAY, Trace Sand (CL)	(0.75)				
					10						
5		18	W	10			(1.75)				
					15	End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 4.0' Upon Completion of Drilling 4'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Russell: 110'NW of Jenifer, 6'NE of Centerline
Location: Madison, Wisconsin

Boring No. 8
Surface Elevation (ft) 95.6*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						8" Concrete Pavement/8" Base Course					
1		18	M	12		Medium Dense to Loose, Light Brown Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Probable Fill)					
2		18	M	4	5	Loose to Very Loose, Dark Brown to Black Fine to Medium SAND, Some Silt and Clay (SM/SC)					
3		18	W	13		Medium Dense, Gray Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
4		18	W	14	10						
5		18	W	11		Stiff, Gray Lean CLAY (CL)	(1.25)				
					15	End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling 6'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/11/11 End 8/11/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Jenifer: 310'NE of Walton, 6'SE of Centerline
Location: Madison, Wisconsin

Boring No. 9
Surface Elevation (ft) 95.6*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						3" Asphalt Pavement/8" Concrete Pavement/8" Base Course					
1		12	M	9		Loose, Light Brown Fine to Medium SAND, Little to Some Silt (SP/SP-SM) (Possible Fill)					
2		12	M	4		Loose to Very Loose at 4 ft					
					5						
3		18	W	15		Medium Dense, Gray Fine to Medium SAND, Trace to Little Silt and Gravel (SP/SP-SM)					
4		18	W	24							
					10						
						Stiff, Gray Lean CLAY (CL)					
5		18	W	9			(1.25)				
					15	End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 5.0' Upon Completion of Drilling 5'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/10/11 End 8/10/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

CGC Inc.

LOG OF TEST BORING

Project: Clemons Avenue Area
Jenifer: 100'NE of Russell, 7'SE of Centerline
Location: Madison, Wisconsin

Boring No. 10
Surface Elevation (ft) 96.0*
Job No. C11054-17
Sheet 1 of 1

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

SAMPLE No.	TYPE	Rec (in.)	Moist	N	Depth (ft)	VISUAL CLASSIFICATION and Remarks	qu (qa) (tsf)	W	LL	PL	LI
						3" Asphalt Pavement/8" Concrete Pavement/8" Base Course					
1		18	M	4		Loose to Very Loose, Light Brown Fine SAND, Trace to Little Silt and Gravel (SP/SP-SM) (Possible Fill)					
2		18	M	8	▽	Loose, Brown Fine to Coarse SAND, Little Silt and Gravel (SP-SM)					
					5						
3		18	W	14		Medium Dense, Gray Fine to Medium SAND, Little Silt and Gravel (SP-SM)					
4		18	W	18		Medium Dense, Gray Sandy SILT (ML)					
					10						
5		18	W	10		Medium-Stiff/Loose to Medium Dense, Gray SILT and Lean CLAY, Trace Sand (ML/CL)	(0.8)				
					15	End Boring at 15 ft Borehole backfilled with bentonite chips *Elevation determined using an assumed datum of 100.0 ft referencing the top nut of a hydrant situated at the intersection of Russell St. and Helena St.					
					20						
					25						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 4.0' Upon Completion of Drilling 4'
Time After Drilling
Depth to Water ▼
Depth to Cave in

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

GENERAL NOTES

Start 8/10/11 End 8/10/11
Driller Badger Chief BM Rig CME-55
Logger MC Editor ESF
Drill Method 2 1/4" HSA

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	3/4" to 3"	3/4" to 3"
Fine	4.76 mm to 3/4"	#4 to 3/4"
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 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 Designator
RB--Rock Bit
FT--Fish Tail
DC--Drove Casing
C--Casing: Size 2 1/2", 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" Diameter Split-Barrel Sample
2ST--2" Diameter Thin-Walled Tube Sample
3ST--3" Diameter Thin-Walled Tube Sample
PT--3" Diameter 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--Caved 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.

UNIFIED SOIL CLASSIFICATION SYSTEM

COARSE-GRAINED SOILS

(More than half of material is larger than No. 200 seive size.)

GRAVELS More than half of coarse fraction larger than No. 4 sieve size	**Clean Gravels** (Little or no 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 (Appreciable amount of fines)	GM^{d}_{u}	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
SANDS More than half of coarse fraction smaller than No. 4 sieve size	**Clean Sands** (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines
		SP	Poorly graded sands, gravelly sands, little or no fines
	Sands with Fines (Appreciable amount of fines)	SM^{d}_{u}	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures

FINE-GRAINED SOILS

(More than half of material is smaller than No. 200 sieve.)

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 greater than 50%	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

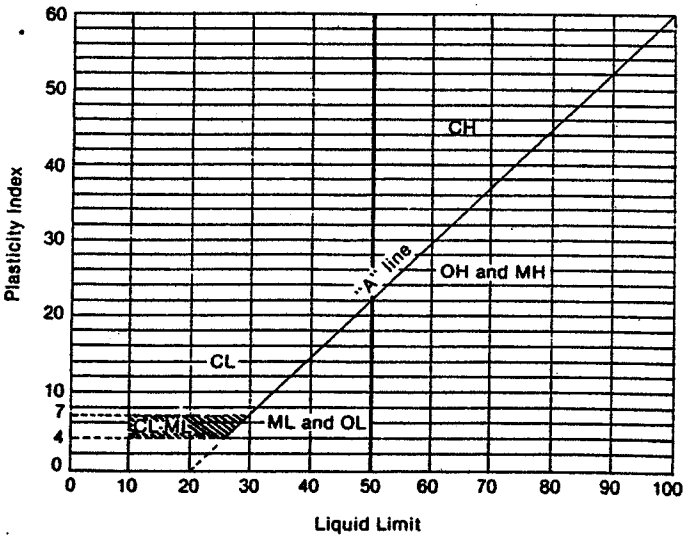
LABORATORY CLASSIFICATION CRITERIA

GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} X D_{60}}$ 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 with P.I. greater than 7	
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} X D_{60}}$ between 1 and 3	
SP	Not meeting all gradation requirements for SW	
SM	Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched 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 per cent ..... GW, GP, SW, SP
More than 12 per cent ..... GM, GC, SM, SC
5 to 12 per cent ..... Borderline cases requiring dual symbols

PLASTICITY CHART



For classification of fine-grained soils and fine fraction of coarse-grained soils.

Atterberg Limits plotting in hatched area are borderline classifications requiring use of dual symbols.

Equation of A-line: PI = 0.73 (LL - 20)