CGC, Inc.

Construction • Geotechnical
Consulting Engineering/Testing

April 19, 2010
C10062

Ms. Sara Hole
Common Wealth Development
1501 Williamson Street
Madison, WI 53703

Re: Geotechnical Exploration Report
Garver Feed Mill
Madison, Wisconsin

Dear Ms Hole:

Construction • Geotechnical Consultants, Inc. (CGC) has completed the geotechnical exploration program for the project referenced above. The purpose of this exploration program was to evaluate the subsurface conditions within the proposed construction area and to provide geotechnical recommendations regarding site preparation, asphalt pavement and stormwater infiltration design/construction. Three copies of this report are provided for your use.

PROJECT/SITE DESCRIPTION

Redevelopment of the Garver Feed Mill is planned. The building will be refurbished. New asphalt pavement parking/drive areas will be constructed. A stormwater infiltration area is planned south of the building.

The site is east of Fair Oaks Avenue and just north of the Wisconsin and Southern Railroad line. Starkweather Creek runs along the east and north sides of the site. The City of Madison is currently using this property for storage, etc. Multiple piles consisting of mulch, asphalt and soil exist on the site. Some asphalt pavement remains around the building. The site is relatively flat (besides the stockpiles) based on visual observations.

SUBSURFACE CONDITIONS

Subsurface conditions on site were explored by drilling eight Standard Penetration Test (SPT) soil borings to depths ranging from 5 to 10 ft below existing site grades at locations selected by others and field staked by CGC personnel. The elevations at the boring locations were not determined. The borings were drilled on April 12, 2010 by Badger State Drilling (under subcontract to CGC) using a rotary drill rig equipped with hollow-stem continuous flight augers. An all-terrain (ATV) drill rig was used to access the boring locations. The approximate boring locations are shown in plan on the Soil Boring Location Map attached in Appendix B.

The surficial soils within the proposed construction area are generally dominated by the presence of fill. The fill encountered within the borings was quite variable. Brown lean clay, dark brown clayey topsoil, cinders, gray-green/brown silty clay, brown silt and brick/concrete pieces were all noted within the fill. The fill was underlain by black peat, very soft to stiff brown/gray-green lean clay and/or medium dense granular soils.

Groundwater was generally not observed in the shallower borings (Borings 1, 2, 3, 5 and 6) during or shortly after drilling. In our opinion, the water encountered in Boring 3 was likely from surficial water ponded in this area. Groundwater was encountered in Borings 4, 7 and 8 at depths ranging from 6 to 7 ft below existing grade. Groundwater levels can be expected to fluctuate with seasonal variations in precipitation, infiltration, evapotranspiration and other factors. A more detailed description of the site soil and groundwater conditions is presented on the Soil Boring Logs attached in Appendix B.

2921 Perry Street, Madison WI 53713
Telephone: 608/288-4100
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DISCUSSION AND RECOMMENDATIONS

Subject to the limitations described below and based on the subsurface exploration, it is our opinion that the site is suitable for the proposed construction. *However, due to the presence of the existing fill, topsoil, peat and soft/medium stiff clays, some undercutting will likely be required and should be budgeted for.* Our recommendations for site preparation and asphalt pavement design/construction, as well as stormwater infiltration potential are presented in the following subsections. Additional information regarding the conclusions and recommendations presented in this report is discussed in Appendix C.

1. Site Preparation

After removal of the on-site stockpiles, we recommend that the surficial topsoil (if any) and vegetation be stripped and removed to at least 5 to 10 ft beyond the construction limits. Although topsoil was typically not encountered in the borings, some may be present and should be stockpiled for re-use in landscaped areas. The existing asphalt pavement should be removed or broken up sufficiently to provide drainage. Some of the existing pavement is in good condition while other areas are already broken up sufficiently (i.e., into pieces less than about 3 in. in size).

After removal as described above, the exposed subgrades are expected to consist of existing fill. The exposed soils should be proof-rolled with a loaded tri-axle dump truck. If soft/yielding areas are detected, they should be undercut and removed. Also, if an appreciable amount of organic material is observed, undercutting to a minimum 1-ft depth should be conducted. Deeper undercuts are possible if trees/stumps/trash, etc. are encountered. *Based on the subsurface conditions encountered, we anticipate that undercutting below at least 50% of the pavement area will be necessary and should be budgeted for. Typical undercut depths are about 1 ft but some deeper undercuts could be required.* Grade should be re-established using granular backfill compacted to at least 95% compaction based on modified Proctor methods (ASTM D1557). As an alternative, soft/yielding areas may be stabilized with compacted breaker rock. Note that if finished grades are raised slightly above existing grade, undercutting may not be necessary if the area can be stabilized with breaker rock.

Fill placement to establish grades (where required) can then proceed. We recommend using granular soils (i.e., sands/gravels) as structural fill because these soils are relatively easy to place and compact in most weather conditions. Clay and silt soils are not recommended as structural fill because moisture conditioning will be required to achieve desired compaction levels, which could delay construction progress. Clay and silt soils are best suited for use as fill in landscaped areas provided the soils are dried back to facilitate compaction. We recommend that fill/backfill placed in the pavement area be compacted to at least 95% (ASTM D1557) in accordance with our Recommended Compacted Fill Specifications presented in Appendix D. A minimum compaction level of 85% to 90% (ASTM D1557) should be achieved within fill placed in non-structural areas. Periodic field density tests should be taken by CGC staff within the fill/backfill to document the adequacy of compactive effort.

2. Pavement Design

We anticipate that the subgrade soils within the parking and drive areas will likely consist of existing fill or newly placed fill. Pavement subgrades should be proof-rolled/recompacted as described in the Site Preparation section of this report and stabilized as needed with breaker rock or replaced with compacted granular fill. We anticipate that some undercutting/stabilization with breaker run stone will be required during subgrade preparation, and the construction budget should include a contingency for this operation. Also, a geotextile fabric (e.g., Mirafi 600X or

equivalent) or biaxial geogrid (e.g., Tensar BX1100 or equivalent) may be used to provide additional stabilization and reduce the breaker rock undercut thickness. We assume that the automobile parking areas will experience light traffic loads (Traffic Class I, which includes less than 1 design daily equivalent 18-kip single axle loads – ESALs) and drive lanes will be subjected to heavier automobile and truck traffic (i.e., Traffic Class II, which includes 2 to 5 design daily -ESALs). The clay soils will control the pavement thickness design. Accordingly, the pavement sections tabulated below were selected assuming a CBR value of approximately 1 and a design life of 20 years.

TABLE 1
RECOMMENDED PAVEMENT SECTIONS

Material	Thickness (in.)		WDOT Specification[1]
	Parking Area (less than 1 ESAL)	Drive Lanes (1 to 5 ESALs)	
Bituminous upper layer	1.5	1.5	Section 460, Table 460-1, 9.5 mm
Bituminous lower layer	1.5	2.5	Section 460, Table 460-1, 12.5 mm
Dense Graded Base	8.0	10.0	Sections 301 and 305, 31.5 mm and 75 mm
TOTAL THICKNESS	**11.0**	**14.0**	

Notes:

1. Wisconsin DOT *Standard Specifications for Highway and Structure Construction*, latest edition, including supplemental specifications, but excluding Section 460.3.2 relating layer thickness to aggregate size.

2. Compaction requirements:
   - Bituminous concrete: Refer to Section 460-3.
   - Base course: Refer to Section 301.3.4.2, Standard Compaction
3. Mixture Type E-0.3 bituminous pavement is recommended; refer to Section 460, Table 460-2 of the *Standard Specifications.*

Note that if traffic volumes are greater than those assumed, CGC should be allowed to review the recommended pavement sections and adjust them accordingly. The pavement design assumes a stable/non-yielding subgrade and a regular program of preventative maintenance. Alternative pavement designs may prove applicable and should be reviewed by CGC. If there is a delay between subgrade preparation and placing the base course, the subgrade should be recompacted.

Pavement areas subjected to concentrated wheel loads (i.e., loading docks, dumpster pads, entrance/exit slabs, truck/bus parking, etc.) should be constructed of Portland cement concrete. The slab should be a minimum of 6-in. thick and should contain mesh reinforcement for crack control. A subgrade modulus of 100 pci should be used for concrete pavement design on proof-rolled/recompacted subgrades.

3. **Infiltration Potential**

The surficial soils encountered at this site are typically clayey/silty fill. These soils have relatively low infiltration rates (i.e., 0.04 to 0.13 in./hr). Also, shallow groundwater is present at the site. Therefore, this site is not well suited for direct infiltration of a significant amount of stormwater. The Wisconsin Department of Commerce Soil Evaluation form is attached in Appendix E for the borings. Also, the majority of the on-site soils would be within hydrologic soil group D.

CONSTRUCTION CONSIDERATIONS

Due to variations in weather, construction methods and other factors, specific construction problems are difficult to predict. Soil related difficulties that could be encountered on the site are discussed below:

- We recommend that the future entrance drive be constructed where the gravel access road exists. If the new entrance is constructed at the preferred entrance (in the area of Borings 1 and 2), substantial undercutting to remove soft clays/black peat would likely be required.

- Due to the potentially sensitive nature of the on-site soils, we recommend that general site grading activities be completed during dry weather, if possible. Construction traffic should be avoided on prepared subgrades to minimize potential disturbance.

- Earthwork construction during the early spring or late fall could be complicated as a result of wet weather and freezing temperatures. During cold weather, exposed subgrades should be protected from freezing before and after footing construction. Fill should never be placed while frozen or on frozen ground.

- Excavations extending greater than 4 ft in depth below the existing ground surface should be sloped or braced in accordance with current OSHA standards.

- Any new foundations or slabs for the remodeled building will require special considerations based on the widespread presence of variable fill and compressible native soils encountered in the borings. We can provide additional consultation for slab and foundation support, if needed.

- If any cutting is planned to achieve new site grades or if undercutting to remove unsatisfactory soils is necessary, we assume that the cut/undercut material can be used on-site (most likely in landscape areas). If the material is to be hauled off-site, it may be required to be delivered to a licensed landfill if it contains cinders/fly ash.

RECOMMENDED CONSTRUCTION MONITORING

The quality of the pavement subgrades will be largely determined by the level of care exercised during site development. To check that earthwork and foundation construction proceeds in accordance with our recommendations, the following operations should be monitored by CGC:

- Subgrade proof-rolling within the pavement areas;
- Fill/backfill placement and compaction; and
- Asphalt placement.

* * * * *

It has been a pleasure to serve you on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

CGC, Inc.

Eric C. Neuhauser

Eric C. Neuhauser, P.E.
Consulting Professional

David A Staab /ECN

David A. Staab, P.E., LEED AP
Consulting Professional

Encl:	Appendix A -	Field Exploration
	Appendix B -	Soil Boring Location Map
		Logs of Test Borings (8)
		Log of Test Boring-General Notes
		Unified Soil Classification System
	Appendix C -	Document Qualifications
	Appendix D -	Recommended Compacted Fill Specifications
	Appendix E -	Soil Evaluation Form

APPENDIX A

FIELD EXPLORATION

APPENDIX A

FIELD EXPLORATION

A total of eight Standard Penetration Test (SPT) soil borings were drilled on April 12, 2010 at approximate locations selected by others and field-staked by CGC personnel. The borings were drilled to depths ranging from 5 to 10 ft below existing site grades. The approximate locations of the borings are shown on the Boring Location Map presented in Appendix B. The soil borings were drilled by Badger State Drilling (under subcontract to CGC) using a CME-750, all-terrain (ATV) drill rig equipped with hollow-stem augers. Ground surface elevations at the boring locations were not determined.

Soil samples were obtained at 2.5-ft intervals for a depth of 10 ft and at 5-ft intervals thereafter. The soil samples were obtained in general accordance with specifications for standard penetration testing, ASTM D 1586. The specific procedures used for drilling and sampling are described below.

1. Boring Procedures Between Samples

   The boring is extended downward, between samples, by a hollow-stem auger.

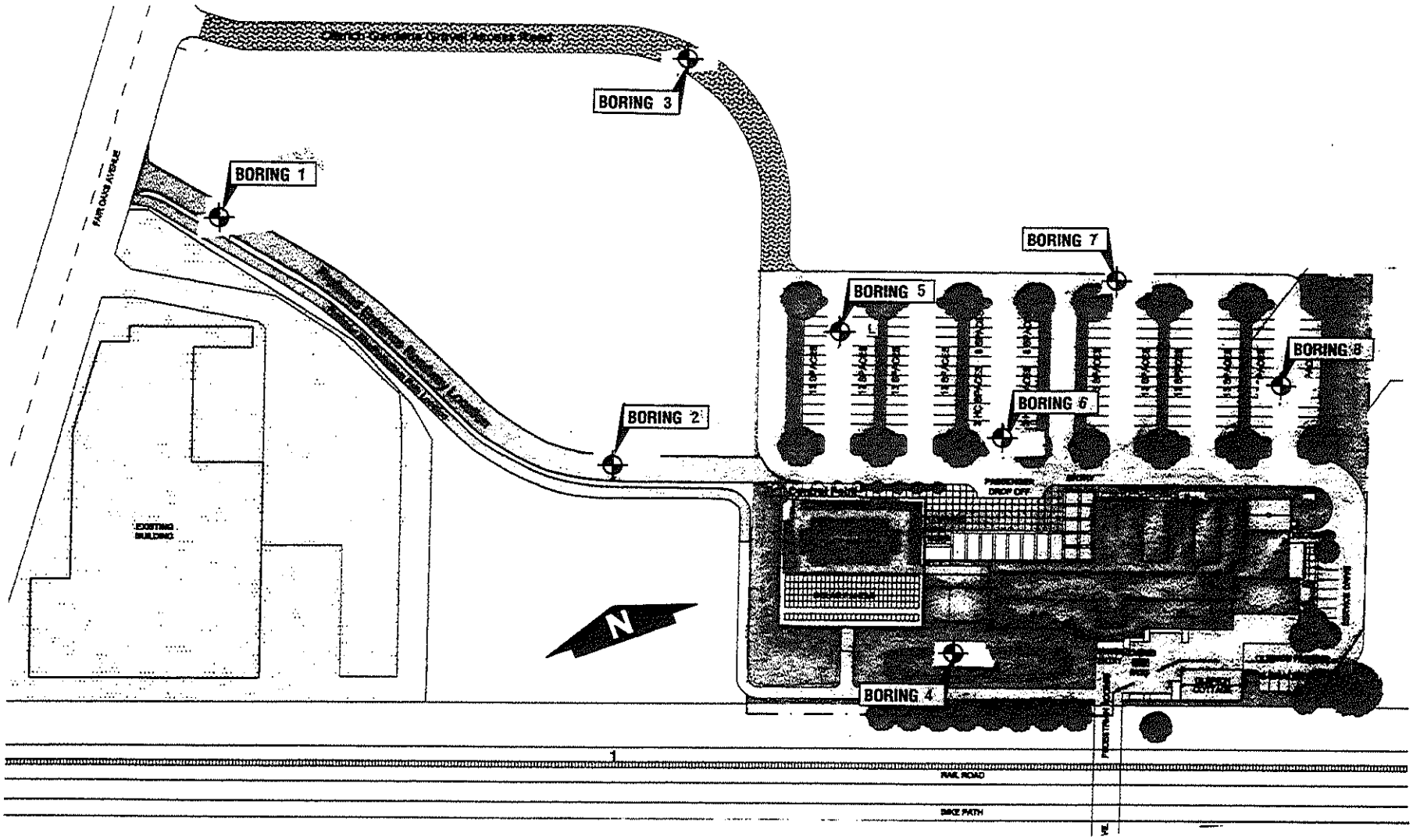
2. Standard Penetration Test and Split-Barrel Sampling of Soils
   (ASTM Designation: D 1586)

   This method consists of driving a 2-inch outside diameter split barrel sampler using a 140-pound weight falling freely through a distance of 30 inches. The sampler is first seated 6 inches into the material to be sampled and then driven 12 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the log of borings and is known as the Standard Penetration Resistance. Recovered samples are first classified as to texture by the driller.

During the field exploration, the driller visually classified the soil and prepared a field log. *Field screening of the samples for possible environmental contaminants was not conducted by the drillers, as environmental site assessment activities were not part of CGC's work scope.* Water level observations were made in each boring during and after drilling and are shown at the bottom of each boring log. Upon completion of drilling, the borings were backfilled with bentonite in accordance with WDNR regulations, and the soil samples were delivered to our laboratory for visual classification and laboratory testing. The soils were visually classified by a geotechnical engineer using the Unified Soil Classification System. The final logs prepared by the engineer (including estimated ground surface depths) and a description of the Unified Soil Classification System are presented in Appendix B.

APPENDIX B

SOIL BORING LOCATION MAP
LOGS OF TEST BORINGS (8)
LOG OF TEST BORING-GENERAL NOTES
UNIFIED SOIL CLASSIFICATION SYSTEM



Legend

⊕ Denotes Soil Boring Location and Number

Notes

1. Soil borings were drilled by Badger State Drilling on April 12, 2010.
2. Base map provided by Common Wealth Development personnel.
3. Boring locations are approximate.

Date: 04/10	CGC, Inc.	**SOIL BORING LOCATION MAP**
Job No. C10062		**Garver Feed Mill**
		Madison, Wisconsin

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 1
Surface Elevation (ft)
Job No. C10062
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
						FILL: Dark Brown Clayey Topsoil Intermixed with Brown Lean Clay					
1		2	M	0							
						Black PEAT (PT)					
2		8	M	0							
					5	End Boring at 5 ft Borehole backfilled with soil cuttings					
					10						
					15						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
Drill Method 2 1/4 HSA

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 2
Surface Elevation (ft)
Job No. C10062
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
						Black Cinders (Driller's Description)					
1		12	M	2		Soft, Brown Lean CLAY, Trace to Little Sand (CL)	(0.5)				
2		14	M	1			(0.25)				
					5	End Boring at 5 ft Borehole backfilled with soil cuttings					
					10						
					15						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
Drill Method 2 1/4 HSA

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 3
Surface Elevation (ft)
Job No. C10062
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 in. Aggregate Base Course					
1		14	W	10		FILL: Medium Dense, Brown Sand, Some Gravel, Cinders					
					∇						
2		12	W	5		Probable FILL: Gray/Green/Brown Silty Clay, Little Sand and Gravel					
					5	End Boring at 5 ft Borehole backfilled with bentonite chips Note: Water is ponded within this area and was likely the cause of the soil samples being wet.					
					10						
					15						

WATER LEVEL OBSERVATIONS

While Drilling ∇ 3.0' Upon Completion of Drilling _____
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 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
Drill Method 2 1/4 HSA

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 4
Surface Elevation (ft)
Job No. C10062
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
						FILL: Brown/Black Silt, Brick Pieces					
1		12	M	9							
						Stiff, Gray-Green Lean CLAY, Trace Sand (CL)					
2		12	M	3			(1.5)				
					5						
					▽	Medium Dense, Black-Gray Fine SAND, Little Silt, Occasional Thin Silt Seams/Layers					
3		13	W	16							
4		14	W	15							
					10						
						End Boring at 10 ft Borehole backfilled with bentonite chips					
					15						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 6.0' Upon Completion of Drilling _____
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 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
Drill Method 2 1/4 HSA

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 5
Surface Elevation (ft)
Job No. C10062
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
						FILL: Brown Silty Clay Intermixed with Dark Brown Clayey Topsoil					
1		6	M	3							
2		12	M	1		Very Soft, Gray-Green Lean CLAY, Trace Sand (CL)	(0.25)				
					5	End Boring at 5 ft Borehole backfilled with soil cuttings					
					10						
					15						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
Drill Method 2 1/4 HSA

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 6
Surface Elevation (ft)
Job No. C10062
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/6 in. Base Course					
1		11	M	11		FILL: Cinders, Concrete Pieces					
2		6	M	8		Stiff, Brown Lean CLAY, Trace Sand (CL)	(1.25)				
					5	End Boring at 5 ft Borehole backfilled with soil cuttings					
					10						
					15						

WATER LEVEL OBSERVATIONS

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

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

GENERAL NOTES

Start 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
Drill Method 2 1/4 HSA

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 7
Surface Elevation (ft)
Job No. C10062
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
						FILL: 4 in. Dark Brown Topsoil					
1		13	M	15		FILL: Medium Dense, Brown Silt, Little Gravel and Sand					
2		12	M	4	5	FILL: Brown Silty Clay Intermixed with Dark Brown Clayey Topsoil					
3		14	W	11		Medium Dense, Brown Fine to Medium SAND, Trace Silt (SP)					
4		14	W	12	10						
						End Boring at 10 ft Borehole backfilled with bentonite chips					
					15						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 7.0' Upon Completion of Drilling _____
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 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
Drill Method 2 1/4 HSA

CGC Inc.

LOG OF TEST BORING

Project: Garver Feed Mill

Location: Madison, Wisconsin

Boring No. 8
Surface Elevation (ft)
Job No. C10062
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					
						Black Cinders					
1		13	M	8		FILL: Loose, Brown Silt, Trace Sand					
2		14	M	4		FILL: Soft, Brown Lean Clay	(0.25)				
					5						
3		10	W	4	▽						
						Black PEAT (PT)					
						Loose, Gray, Fine SAND, Little Silt (SP-SM)					
4		12	W	9							
					10	End Boring at 10 ft					
						Borehole backfilled with bentonite chips					
					15						

WATER LEVEL OBSERVATIONS

While Drilling ▽ 7.0' Upon Completion of Drilling _____
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 4/12/10 End 4/12/10
Driller Badger Chief BR Rig CME-750, ATV
Logger BR Editor ECN
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_p--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

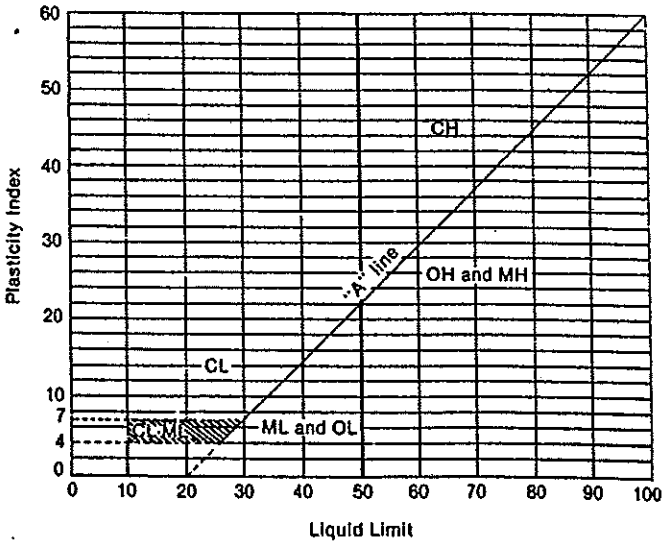
LABORATORY CLASSIFICATION CRITERIA

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)

APPENDIX C

DOCUMENT QUALIFICATIONS

APPENDIX C
DOCUMENT QUALIFICATIONS

I. GENERAL RECOMMENDATIONS/LIMITATIONS

CGC, Inc. should be provided the opportunity for a general review of the final design and specifications to confirm that earthwork and foundation requirements have been properly interpreted in the design and specifications. CGC should be retained to provide soil engineering services during excavation and subgrade preparation. This will allow us to observe that construction proceeds in compliance with the design concepts, specifications and recommendations, and also will allow design changes to be made in the event that subsurface conditions differ from those anticipated prior to the start of construction. CGC does not assume responsibility for compliance with the recommendations in this report unless we are retained to provide construction testing and observation services.

This report has been prepared in accordance with generally accepted soil and foundation engineering practices and no other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of the subsurface information revealed by the test borings indicated on the location plan. The report does not reflect potential variations in subsurface conditions between or beyond these borings. Therefore, variations in soil conditions can be expected between the boring locations and fluctuations of groundwater levels may occur with time. The nature and extent of the variations may not become evident until construction.

II. IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. *No one except you* should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one - not even you* - should apply the report for any purpose or project except the one originally contemplated.

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, *do not rely on a geotechnical engineering report* that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or project ownership.

As a general rule, , *always* inform your geotechnical engineer of project changes - even minor ones - and request an assessment of their impact. *CGC cannot accept responsibility or liability for problems that occur because our reports do not consider developments of which we were not Informed.*

SUBSURFACE CONDITIONS CAN CHANGE

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL OPINION

Site exploration identifies subsurface conditions only at those points where surface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgement to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ - sometimes significantly - from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A REPORT'S RECOMMENDATIONS ARE NOT FINAL

Do not over-rely on the construction recommendations included in your report. *Those recommendations are not final*, because geotechnical engineers develop them principally from judgement and opinion, geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. *CGC cannot assume responsibility or liability for the report's recommendations if we do not perform construction observation.*

A GEOTECHNICAL ENGINEERING REPORT IS SUBJECT TO MISINTERPRETATION

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having CGC participate in prebid and preconstruction conferences, and by providing construction observation.

DO NOT REDRAW THE ENGINEER'S LOGS

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

GIVE CONTRACTORS A COMPLETE REPORT AND GUIDANCE

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

READ RESPONSIBILITY PROVISIONS CLOSELY

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce such risks, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineer's responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

GEOENVIRONMENTAL CONCERNS ARE NOT COVERED

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

OBTAIN PROFESSIONAL ASSISTANCE TO DEAL WITH MOLD

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

RELY ON YOUR GEOTECHNICAL ENGINEER FOR ADDITIONAL ASSISTANCE

Membership in ASFE exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with CGC, a member of ASFE, for more information.

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ASFE/The Best People on Earth
881 Colesville Road, Suite G 106
Silver Spring, MD 20910

APPENDIX D

RECOMMENDED COMPACTED FILL SPECIFICATIONS

APPENDIX D

CGC, INC.

RECOMMENDED COMPACTED FILL SPECIFICATIONS

General Fill Materials

Proposed fill shall contain no vegetation, roots, topsoil, peat, ash, wood or any other non-soil material which by decomposition might cause settlement. Also, fill shall never be placed while frozen or on frozen surfaces. Rock, stone or broken concrete greater than 6 in. in the largest dimension shall not be placed within 10 ft of the building area. Fill used greater than 10 ft beyond the building limits shall not contain rock, boulders or concrete pieces greater than a 2 sq ft area and shall not be placed within the final 2 ft of finish subgrade or in designated utility construction areas. Fill containing rock, boulders or concrete pieces should include sufficient finer material to fill voids among the larger fragments.

Special Fill Materials

In certain cases, special fill materials may be required for specific purposes, such as stabilizing subgrades, backfilling undercut excavations or filling behind retaining walls. For reference, WisDOT gradation specifications for various types of granular fill are attached in Table 1.

Placement Method

The approved fill shall be placed, spread and leveled in layers generally not exceeding 10 in. in thickness before compaction. The fill shall be placed at a moisture content capable of achieving the desired compaction level. For clay soils or granular soils containing an appreciable amount of cohesive fines, moisture conditioning will likely be required.

It is the Contractor's responsibility to provide all necessary compaction equipment and other grading equipment that may be required to attain the specified compaction. Hand-guided vibratory or tamping compactors will be required whenever fill is placed adjacent to walls, footings, columns or in confined areas.

Compaction Specifications

Maximum dry density and optimum moisture content of the fill soil shall be determined in accordance with modified Proctor methods (ASTM D1557). The recommended field compaction as a percentage of the maximum dry density is shown in Table 2. Note that these compaction guidelines would generally not apply to coarse gravel/stone fill. Instead, a method specification would apply (e.g., compact in thin lifts with a vibratory compactor until no further consolidation is evident).

Testing Procedures

Representative samples of proposed fill shall be submitted to CGC, Inc. for optimum moisture-maximum density determination (ASTM D1557) prior to the start of fill placement. The sample size should be approximately 50 lb.

CGC, Inc. shall be retained to perform field density tests to determine the level of compaction being achieved in the fill. The tests shall generally be conducted on each lift at the beginning of fill placement and at a frequency mutually agreed upon by the project team for the remainder of the project.

Table 1
Gradation of Special Fill Materials

Material	WisDOT Section 311	WisDOT Section 312	WisDOT Section 305			WisDOT Section 209		WisDOT Section 210
	Breaker Run	Select Crushed Material	3-in. Dense Graded Base	1 1/4-in. Dense Graded Base	3/4-in. Dense Graded Base	Grade 1 Granular Backfill	Grade 2 Granular Backfill	Structure Backfill
Sieve Size	Percent Passing by Weight							
6 in.	100							
5 in.		90-100						
3 in.			90-100					100
1 1/2 in.		20-50	60-85					
1 1/4 in.				95-100				
1 in.					100			
3/4 in.			40-65	70-93	95-100			
3/8 in.				42-80	50-90			
No. 4			15-40	25-63	35-70	100 (2)	100 (2)	25-100
No. 10		0-10	10-30	16-48	15-55	75 (2)		
No. 40			5-20	8-28	10-35	15 (2)	30 (2)	
No. 200			2-12	2-12	5-15	8 (2)	15 (2)	15 (2)

Notes:

1. Reference: Wisconsin Department of Transportation *Standard Specifications for Highway and Structure Construction.*
2. Percentage applies to the material passing the No. 4 sieve, not the entire sample.
3. Per WisDOT specifications, both breaker run and select crushed material can include concrete that is 'substantially free of steel, building materials and other deleterious material'.

Table 2
Compaction Guidelines

Area	Percent Compaction (1)	
	Clay/Silt	Sand/Gravel
Within 10 ft of building lines		
Footing bearing soils	93 - 95	95
Under floors, steps and walks		
- Lightly loaded floor slab	90	90
- Heavily loaded floor slab and thicker fill zones	92	95
Beyond 10 ft of building lines		
Under walks and pavements		
- Less than 2 ft below subgrade	92	95
- Greater than 2 ft below subgrade	90	90
Landscaping	85	90

Notes:

1. Based on Modified Proctor Dry Density (ASTM D 1557)

APPENDIX E

SOIL EVALUATION FORM

Wisconsin Department of Commerce
Division of Safety and Buildings

SOIL EVALUATION - STORM

In accordance with Comm 82.365 & 85, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and BM referenced to nearest road.

Please print all information.

Personal information you provide may be used for secondary purposes (Privacy Law, s. 15.04 (1) (m)).

County: Dane
Parcel I.D.: 071005400967/83
Reviewed by: Date:

Property Owner: City of Madison
Property Owner's Mailing Address: 210 MLK JR Blvd Rm 104
City: Madison State: WI Zip Code: 53703 Phone Number: ( )

Property Location
Govt. Lot: 1/4 1/4 S T N R E (or) W
Lot #: Block #: Subd. Name or CSM#:
☒ City ☐ Village ☐ Town Nearest Road: Madison Fair Oaks Ave.

Drainage area _____ ☐ sq. ft. ☐ acres
Optional:
Test Site Suitable for (check all that apply)
☐ Irrigation ☐ Bioretention trench ☐ Trench(es)
☐ Rain garden ☐ Grassed swale ☐ Reuse
☐ Infiltration trench ☐ SDS (> 15' wide) ☐ Other _____

Hydraulic Application Test Method:
☒ Morphological Evaluation
☐ Double-Ring Infiltrometer
☐ Other (specify) _____

Obs. # 1 ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor — in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-30	10YR 2/2	FILL	SiCL	2msbk	mfi	cs	<5	0.04
2	30-60	2.5YR 2.5/0		PEAT	—	—	—	—	—

Obs. # 2 ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor — in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-18	2.5YR 2.5/0	CINDERS	—	—	—	—	—	—
2	18-60	7.5YR 4/4		SiCL	2msbk	mfi	—	<5	0.04

CST/PSS Name (Please Print): Eric Neuhauser
Signature: Eric C. Neuhauser
CST/PSS Number: 47077
Address: CGC Inc. 2921 Perry Street, Madison, WI 53713
Date Evaluation Conducted: 4/12/10
Telephone Number: 608-288-4100

SBD-10793 (R.1/05)

Property Owner City Madison Parcel ID # 07100540096 7/83 Page 2 of 3

3 Obs. # ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor 36 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-6	7.5YR4/4	Base Course	—	—	—	—	—	—
2	6-36	7.5YR4/4	FILL	LS	0sg	ml	cs	25±	1.63
3	36-60	5YR5/1	Probable Fill	SiCL	2msbk	mfi	-	<5	0.04

4 Obs. # ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor 72 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-24	7.5YR4/4	FILL	L	—	—	g	—	0.24
2	24-66	5YR5/1		SiCL	2msbk	mfi	g	<5	0.04
3	66-120	2.5YR2.5/0		S	0sg	ml		<5	3.60

5 Obs. # ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor — in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-42	7.5YR4/4	FILL	SiCL	—	—	g	—	0.04
2	42-60	5YR5/1		SiCL	2msbk	mfi		<5	0.04

Property Owner City of Madison Parcel ID # 071005400967/83 Page 3 of 3

6 Obs. # ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor — in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-8		2" Asphalt / 6"	Base	Course	—	—	—	—
2	8-42		FILL Cinders	/ Concrete		—	—	—	—
3	42-60	7.5YR4/4		SiCL	2msbk	mfi		<5	0.04

7 Obs. # ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor 84 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-4	10YR3/2	FILL	SiCL	2msbk	mfi	g	<5	0.04
2	4-36	7.5YR4/4	FILL	L	0sg	mfr	g	<15	0.24
3	36-78	7.5YR4/4	FILL	SiCL	2msbk	mfi	g	<5	0.04
4	78-120	7.5YR4/4		S	0sg	ml		<5	3.60

8 Obs. # ☒ Boring ☐ Pit Ground surface elev. — ft. Depth to limiting factor 84 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frag.	Hydraulic App. Rate Inches/Hr
1	0-2	Asphalt Pavement		—	—	—	—	—	—
2	2-18	Black Cinders		—	—	—	—	—	—
3	18-48	7.5YR4/4	FILL	L	0sg	mfr	g	<10	0.24
4	48-84	7.5YR4/4	FILL	SiCL	2msbk	mfi	g	<5	0.04
5	84-90	2.5YR2.5/0		PEAT	—	—	—	—	—
6	90-120	5YR5/1		S	0sg	mfr	g	<5	3.60