



October 3, 2012

City of Menomonie
C/O Mr. Dave Schofield
Cedar Corporation
604 Wilson Avenue
Menomonie, Wisconsin 54751

**SUBJECT: Preliminary Subsurface Exploration
City of Menomonie TID #13 Industrial Park
Menomonie, Wisconsin
MES Project No. 4-23311**

Dear Mr. Schofield:

In accordance with your request, the results of the soil borings for the above-referenced site are provided herein. The description of services and authorization to perform this preliminary subsurface exploration were in the form of a signed copy of MES Proposal No. 4-12159, dated August 17, 2012. This work was performed on behalf of and exclusively for the use of the City of Menomonie. The information contained herein may not be relied upon by any other parties without the written consent of MES, and acceptance by such parties of MES' General Conditions. As requested, an evaluation of the data has not been performed and no recommendations are being made.

The soil test borings were performed with a truck-mounted rotary drilling rig utilizing continuous flight hollow stem augers (HSA) to advance the boreholes. Representative soil samples were obtained by the Standard Penetration Test (SPT) method in general accordance with ASTM D-1586 procedures at the intervals indicated on the Boring Logs. The SPT provides a means of determining the relative density of granular soils and comparative consistency of cohesive soils, thereby providing a method of determining the subsoils' relative strength and compressibility characteristics.

Twenty (20) soil borings to a depth of about 21.5 feet below the ground surface were performed for this project. Cedar Corporation staked the boring locations and provided ground surface elevations. The scope of the field exploration program, including the number, depth and locations of the borings, was determined by the client. The purpose of the soil borings was to characterize the on-site soils and measure depths to groundwater at the specific boring locations.

The surface of the site at the boring locations consisted of about 5 to 15 inches of topsoil. The topsoil was underlain by relatively fine-grained clayey sand and sandy clay soils to depths of about 2 to 4 feet (EL 899.1 to EL 908.9) below ground surface. These soils may be considered medium stiff/medium dense to dense/very stiff, with standard penetration

resistances ranging from 7 to 18 blows per foot, and natural moisture contents ranging from 4 to 7 percent.

The underlying soils generally consisted of sand, with variable amounts of gravel, and trace silt content, to at least the termination depth of the borings (21.5 feet). These soils may be considered medium dense to dense, with standard penetration resistances ranging from 7 to 32 blows per foot, and natural moisture contents ranging from 1 to 6 percent.

Groundwater was not encountered during auger advancement or upon completion of the borings. It must be recognized that groundwater levels fluctuate with time due to variations in seasonal precipitation, lateral drainage conditions, and soil permeability characteristics.

In accordance with your request, MES has not performed an evaluation of the subsurface conditions that may be involved with construction on this site and makes no recommendations.

Please call at any time with any questions or comments you may have. MES appreciates the opportunity to be of service on this project, and looks forward to continuing as your geotechnical consultant during the design and construction phases, as well as your upcoming projects.

Sincerely,

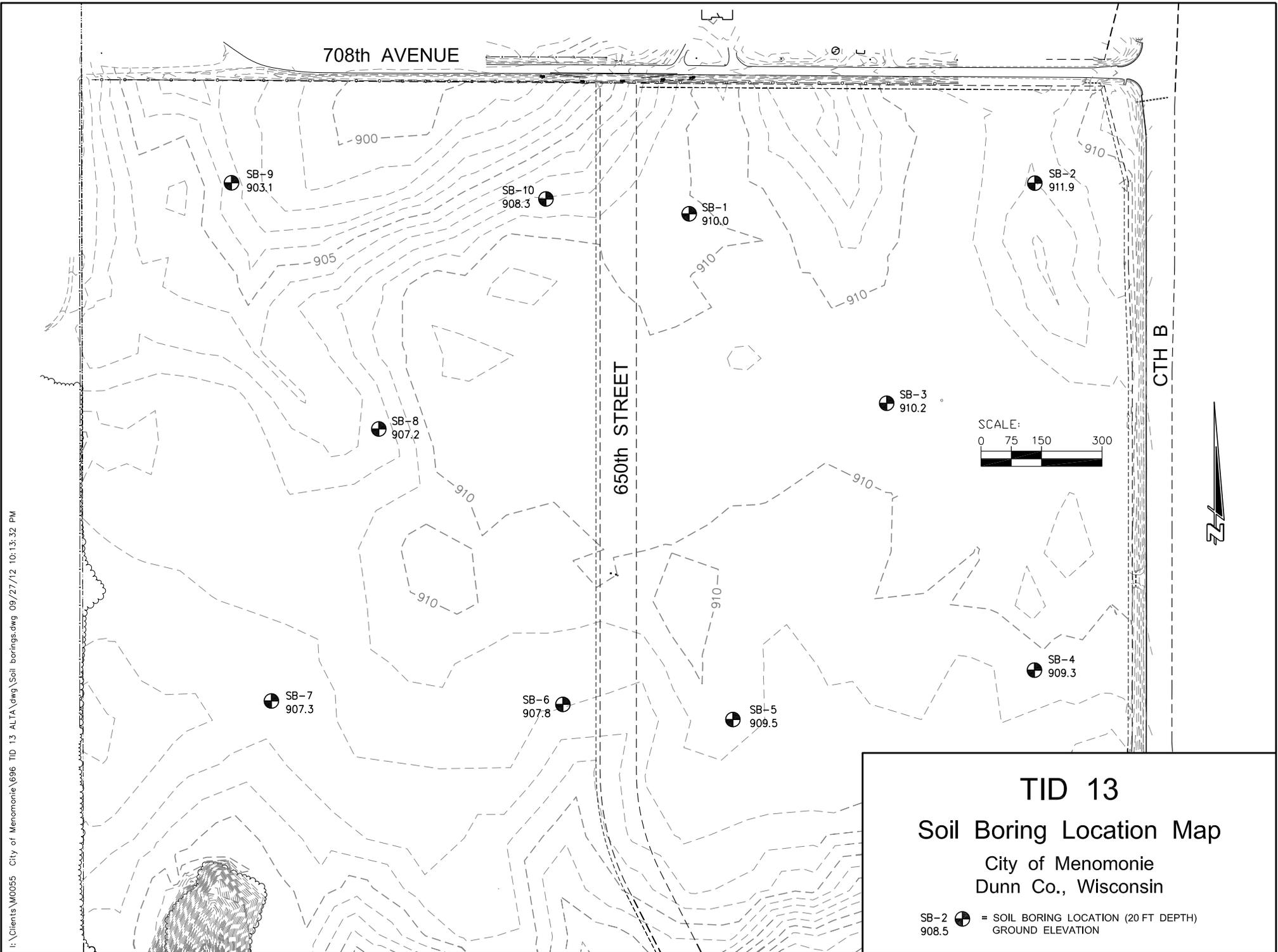
MIDWEST ENGINEERING SERVICES, INC.



Jeffrey A. Manninen
Branch Manager - Chippewa Falls

Attachments: Soil Boring Location Map
Soil Boring Logs
General Notes

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TID 13
Soil Boring Location Map
City of Menomonee
Dunn Co., Wisconsin

SB-2  = SOIL BORING LOCATION (20 FT DEPTH)
908.5 GROUND ELEVATION



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SOIL BORING LOG: B - 1

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Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS	
	GROUND SURFACE ELEVATION: 910.0							
1	909 0-10": TOPSOIL	1-SS	11			5		
2	908 Brown sandy CLAY, damp							
3	907	2-SS	7			2		
4	906 Yellowish brown SAND, little silt, trace gravel, damp							
5	905							
6	904 Light brown SAND, trace silt and gravel, damp	3-SS	13			4		
7	903							
8	902	4-SS	18			2		
9	901							
10	900							
11	899	5-SS	17			2		
12	898							
13	897 Light brown SAND, with gravel, trace silt, damp							
14	896							
15	895							
16	894	6-SS	17			3		
17	893							
18	892							
19	891							
20	890							
21	889	7-SS	13			3		
22	888							
23	887	END OF BORING @ 21.5± FEET						
24	886							
25	885							
26	884							
27	883							
28	882							
29	881							
30	880							
31	879							
32	878							
33	877							
34	876							
35	875							
36	874							
37	873							
38	872							
39	871							
40	870							
41	869							
42	868							
WATER LEVEL OBSERVATIONS:		ADDITIONAL COMMENTS:						
During drilling: None Observed		-No groundwater encountered while drilling or upon completion.						
Upon completion: None Observed								
Depth/Delay: NA								
Caved at: 16.3± feet (EL 893.7±)								

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 2

Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)		VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
		GROUND SURFACE ELEVATION: 911.9						
1	910.9	0-5": TOPSOIL	1-SS	9			7	
2	909.9	Brown sandy CLAY, damp						
3	908.9							
4	907.9	Orangish brown SAND, with gravel, trace silt, damp	2-SS	19			2	
5	906.9							
6	905.9	Light brown SAND, little gravel, trace silt, damp	3-SS	15			2	
7	904.9							
8	903.9	Light brown SAND, trace silt, damp	4-SS	14			4	
9	902.9							
10	901.9	Light brown SAND, with gravel, trace silt, damp	5-SS	20			4	
11	900.9							
12	899.9							
13	898.9							
14	897.9	Light brown SAND, trace silt and gravel, damp	6-SS	15			2	
15	896.9							
16	895.9	Light brown SAND, trace silt and gravel, damp	7-SS	11			2	
17	894.9							
18	893.9							
19	892.9							
20	891.9	END OF BORING @ 21.5± FEET						
21	890.9							
22	889.9							
23	888.9							
24	887.9							
25	886.9							
26	885.9							
27	884.9							
28	883.9							
29	882.9							
30	881.9							
31	880.9							
32	879.9							
33	878.9							
34	877.9							
35	876.9							
36	875.9							
37	874.9							
38	873.9							
39	872.9							
40	871.9							
41	870.9							
42	869.9							
WATER LEVEL OBSERVATIONS: During drilling: None Observed Upon completion: None Observed Depth/Delay: NA Caved at: 15.8± feet (EL 896.1±)			ADDITIONAL COMMENTS: -No groundwater encountered while drilling or upon completion.					

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 3

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Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)		VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS	
		GROUND SURFACE ELEVATION: 910.2							
1	909.2	0-11": TOPSOIL	1-SS	10			7		
2	908.2	Brown sandy CLAY, damp							
3	907.2								
4	906.2	Light brown SAND, trace silt and gravel, damp	2-SS	10			2		
5	905.2								
6	904.2	Light brown SAND, with gravel, trace silt, damp	3-SS	18			2		
7	903.2								
8	902.2								
9	901.2			4-SS	30			3	
10	900.2								
11	899.2			5-SS	17			3	
12	898.2								
13	897.2								
14	896.2								
15	895.2								
16	894.2		6-SS	32			2		
17	893.2								
18	892.2								
19	891.2								
20	890.2								
21	889.2		7-SS	10			2		
22	888.2								
23	887.2	END OF BORING @ 21.5± FEET							
24	886.2								
25	885.2								
26	884.2								
27	883.2								
28	882.2								
29	881.2								
30	880.2								
31	879.2								
32	878.2								
33	877.2								
34	876.2								
35	875.2								
36	874.2								
37	873.2								
38	872.2								
39	871.2								
40	870.2								
41	869.2								
42	868.2								
WATER LEVEL OBSERVATIONS: During drilling: None Observed Upon completion: None Observed Depth/Delay: NA Caved at: 16± feet (EL 894.2±)			ADDITIONAL COMMENTS: -No groundwater encountered while drilling or upon completion.						

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 4

Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)		VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
		GROUND SURFACE ELEVATION: 909.3						
1	908.3	0-8": TOPSOIL	1-SS	9			7	
2	907.3	Brown sandy CLAY, damp						
3	906.3							
4	905.3							
5	904.3							
6	903.3	Light brown SAND, trace silt and gravel, damp	2-SS	8			2	
7	902.3							
8	901.3							
9	900.3							
10	899.3							
11	898.3							
12	897.3							
13	896.3	Light brown SAND, with gravel, trace silt, damp						
14	895.3							
15	894.3							
16	893.3							
17	892.3	Light brown SAND, trace silt and gravel, damp	6-SS	17			3	
18	891.3							
19	890.3							
20	889.3	Light brown SAND, trace silt and gravel, damp						
21	888.3							
22	887.3							
23	886.3	END OF BORING @ 21.5± FEET						
24	885.3							
25	884.3							
26	883.3							
27	882.3							
28	881.3							
29	880.3							
30	879.3							
31	878.3							
32	877.3							
33	876.3							
34	875.3							
35	874.3							
36	873.3							
37	872.3							
38	871.3							
39	870.3							
40	869.3							
41	868.3							
42	867.3							
WATER LEVEL OBSERVATIONS: During drilling: None Observed Upon completion: None Observed Depth/Delay: NA Caved at: 17.2± feet (EL 892.1±)			ADDITIONAL COMMENTS: -No groundwater encountered while drilling or upon completion.					

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 5

Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	GROUND SURFACE ELEVATION: 909.5						
1	908.5 0-12" TOPSOIL	1-SS	12			6	
2	907.5 Brown sandy CLAY, damp						
3	906.5	2-SS	17			1	
4	905.5 Orangish brown SAND, with gravel, trace silt, damp						
5	904.5	3-SS	20			2	
6	903.5						
7	902.5	4-SS	21			2	
8	901.5 Light brown SAND, trace silt and gravel, damp						
9	900.5	5-SS	20			3	
10	899.5						
11	898.5	6-SS	25			3	
12	897.5						
13	896.5 Light brown SAND, little gravel, trace silt, damp	7-SS	14			2	
14	895.5						
15	894.5	END OF BORING @ 21.5± FEET					
16	893.5						
17	892.5						
18	891.5 Light brown SAND, trace silt and gravel, damp						
19	890.5						
20	889.5						
21	888.5 Light brown SAND, with gravel, trace silt, damp						
22	887.5						
23	886.5						
24	885.5						
25	884.5						
26	883.5						
27	882.5						
28	881.5						
29	880.5						
30	879.5						
31	878.5						
32	877.5						
33	876.5						
34	875.5						
35	874.5						
36	873.5						
37	872.5						
38	871.5						
39	870.5						
40	869.5						
41	868.5						
42	867.5						
WATER LEVEL OBSERVATIONS: During drilling: None Observed Upon completion: None Observed Depth/Delay: NA Caved at: 16.7± feet (EL 892.8±)		ADDITIONAL COMMENTS: -No groundwater encountered while drilling or upon completion.					

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 6

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Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)		VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
		GROUND SURFACE ELEVATION: 907.8						
1	906.8	0-10": TOPSOIL	1-SS	18			5	
2	905.8	Brown clayey SAND, trace gravel, damp						
3	904.8							
4	903.8	Light brown SAND, trace silt and gravel, damp	2-SS	13			2	
5	902.8							
6	901.8							
7	900.8	Light brown SAND, with gravel, trace silt, damp	3-SS	11			2	
8	899.8							
9	898.8							
10	897.8							
11	896.8	Light brown SAND, with gravel, trace silt, damp	4-SS	19			2	
12	895.8							
13	894.8							
14	893.8							
15	892.8	Light brown SAND, trace gravel and silt, damp	5-SS	20			2	
16	891.8							
17	890.8							
18	889.8	Light brown SAND, trace gravel and silt, damp	6-SS	8			4	
19	888.8							
20	887.8	Light brown SAND, little gravel, trace silt, damp						
21	886.8							
22	885.8	END OF BORING @ 21.5± FEET	7-SS	14			3	
23	884.8							
24	883.8							
25	882.8							
26	881.8							
27	880.8							
28	879.8							
29	878.8							
30	877.8							
31	876.8							
32	875.8							
33	874.8							
34	873.8							
35	872.8							
36	871.8							
37	870.8							
38	869.8							
39	868.8							
40	867.8							
41	866.8							
42	865.8							

WATER LEVEL OBSERVATIONS:

During drilling: None Observed
 Upon completion: None Observed
 Depth/Delay: NA
 Caved at: 17.2± feet (EL 890.6±)

ADDITIONAL COMMENTS:

-No groundwater encountered while drilling or upon completion.

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 7

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Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)		VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
		GROUND SURFACE ELEVATION: 907.3						
1	906.3	0-7": TOPSOIL	1-SS	13			7	
2	905.3	Brown sandy CLAY, damp						
3	904.3							
4	903.3							
5	902.3							
6	901.3							
7	900.3							
8	899.3		Light brown SAND, trace silt and gravel, damp					
9	898.3							
10	897.3							
11	896.3							
12	895.3							
13	894.3							
14	893.3							
15	892.3	END OF BORING @ 21.5± FEET						
16	891.3							
17	890.3							
18	889.3							
19	888.3							
20	887.3							
21	886.3							
22	885.3							
23	884.3							
24	883.3							
25	882.3							
26	881.3							
27	880.3							
28	879.3							
29	878.3							
30	877.3							
31	876.3							
32	875.3							
33	874.3							
34	873.3							
35	872.3							
36	871.3							
37	870.3							
38	869.3							
39	868.3							
40	867.3							
41	866.3							
42	865.3							
WATER LEVEL OBSERVATIONS: During drilling: None Observed Upon completion: None Observed Depth/Delay: NA Caved at: 16± feet (EL 891.3±)			ADDITIONAL COMMENTS: -No groundwater encountered while drilling or upon completion.					

Note: Lines of stratification represent an **approximate** boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 8

Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
GROUND SURFACE ELEVATION: 907.2							
1	906.2 0-14" TOPSOIL	1-SS	7			5	
2	905.2 Brown clayey SAND, trace gravel, damp						
3	904.2						
4	903.2 Light brown SAND, with gravel, trace silt, damp	2-SS	12			2	
5	902.2						
6	901.2	3-SS	12			2	
7	900.2						
8	899.2						
9	898.2	4-SS	14			2	
10	897.2 Light brown SAND, trace silt and gravel, damp						
11	896.2	5-SS	17			2	
12	895.2						
13	894.2						
14	893.2						
15	892.2						
16	891.2	6-SS	13			3	
17	890.2						
18	889.2						
19	888.2						
20	887.2						
21	886.2	7-SS	15			3	
22	885.2						
23	884.2						
24	883.2						
25	882.2						
26	881.2						
27	880.2						
28	879.2						
29	878.2						
30	877.2						
31	876.2						
32	875.2						
33	874.2						
34	873.2						
35	872.2						
36	871.2						
37	870.2						
38	869.2						
39	868.2						
40	867.2						
41	866.2						
42	865.2						
END OF BORING @ 21.5± FEET							
WATER LEVEL OBSERVATIONS: During drilling: None Observed Upon completion: None Observed Depth/Delay: NA Caved at: 17.5± feet (EL 889.7±)		ADDITIONAL COMMENTS: -No groundwater encountered while drilling or upon completion.					

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 9

Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
	GROUND SURFACE ELEVATION: 903.1						
1	902.1 0-15" TOPSOIL	1-SS	11			4	
2	901.1 Brown SAND, little clay, damp						
3	900.1 Brown clayey SAND, trace gravel, damp	2-SS	15			5	
4	899.1						
5	898.1	3-SS	18			2	
6	897.1 Brown SAND, with gravel, trace silt, damp						
7	896.1	4-SS	16			3	
8	895.1						
9	894.1	5-SS	10			4	
10	893.1						
11	892.1	6-SS	14			3	
12	891.1						
13	890.1 Light brown SAND, trace silt, damp	7-SS	21			2	
14	889.1						
15	888.1	END OF BORING @ 21.5± FEET					
16	887.1						
17	886.1						
18	885.1						
19	884.1						
20	883.1						
21	882.1						
22	881.1						
23	880.1						
24	879.1						
25	878.1	END OF BORING @ 21.5± FEET					
26	877.1						
27	876.1						
28	875.1						
29	874.1						
30	873.1						
31	872.1						
32	871.1						
33	870.1						
34	869.1						
35	868.1	END OF BORING @ 21.5± FEET					
36	867.1						
37	866.1						
38	865.1						
39	864.1						
40	863.1						
41	862.1						
42	861.1						

WATER LEVEL OBSERVATIONS:

During drilling: None Observed
 Upon completion: None Observed
 Depth/Delay: NA
 Caved at: 17.6± feet (EL 885.5±)

ADDITIONAL COMMENTS:

-No groundwater encountered while drilling or upon completion.

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.



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SOIL BORING LOG: B - 10

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Project: City of Menomonie TID #13 Industrial Park
Location: Menomonie, Wisconsin

Project No.: 4-23311
Drill Date: September 28, 2012
Drilled by: JB

DEPTH/EL. (feet)		VISUAL SOIL CLASSIFICATION	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
		GROUND SURFACE ELEVATION: 908.3						
1	907.3	0-7": TOPSOIL						
2	906.3	Brown clayey SAND, trace gravel, damp	1-SS	11			6	
3	905.3							
4	904.3	Light brown SAND, little gravel, damp	2-SS	18			2	
5	903.3							
6	902.3		3-SS	20			2	
7	901.3							
8	900.3							
9	899.3		4-SS	10			3	
10	898.3							
11	897.3	Light brown SAND, trace silt and gravel, damp	5-SS	7			4	
12	896.3							
13	895.3							
14	894.3							
15	893.3							
16	892.3		6-SS	7			6	
17	891.3							
18	890.3							
19	889.3							
20	888.3							
21	887.3		7-SS	10			2	
22	886.3							
23	885.3	END OF BORING @ 21.5± FEET						
24	884.3							
25	883.3							
26	882.3							
27	881.3							
28	880.3							
29	879.3							
30	878.3							
31	877.3							
32	876.3							
33	875.3							
34	874.3							
35	873.3							
36	872.3							
37	871.3							
38	870.3							
39	869.3							
40	868.3							
41	867.3							
42	866.3							
WATER LEVEL OBSERVATIONS: During drilling: None Observed Upon completion: None Observed Depth/Delay: NA Caved at: 18± feet (EL 890.3±)			ADDITIONAL COMMENTS: -No groundwater encountered while drilling or upon completion.					

Note: Lines of stratification represent an approximate boundary between soil types. Variations may occur between sampling intervals and/or boring locations. Transitions may also be gradual. Dashed lines are indicative of potentially erratic or unknown transitions, such as fill-to-natural soil zone transitions.

GENERAL NOTES

SAMPLE IDENTIFICATION

Visual soil classifications are made in general accordance with the Unified Soil Classification System on the basis of textural and particle size categorization, and various soil behavior characteristics. Visual classifications should be substantiated by appropriate laboratory testing when a more exact soil identification is required to satisfy specific project applications criteria.

PARTICLE SIZE±

Boulders: 8 inches	Coarse Sand: 2 to 4 mm	Silt: 0.005 to 0.074 mm
Cobbles: 3 to 8 inches	Medium Sand: 0.42 to 2 mm	Clay: -0.005 mm
Gravel: 5 mm to 3 inches	Fine Sand: 0.074 to 0.42 mm	

DRILLING & SAMPLING SYMBOLS

SS: Split-spoon, 2" O.D. by 1 3/8" I.D.	RB: Roller Bit
ST: Shelby Tube, 2" O.D. or 3" O.D., as noted in text	WS: Wash Sample
AU: Auger Sample	BS: Bag Sample
DB: Diamond Bit	HA: Hand Auger
CB: Carbide Bit	

SOIL PROPERTY SYMBOLS

N: Standard penetration count, indicating number of blows of a 140 lb. hammer with a 30 inch drop, required to advance a split-spoon sampler one foot.		
Qu: Unconfined compressive strength, tons per square foot (tsf)		
Qp: Calibrated hand penetrometer resistance, tsf		
MC: Moisture content, %		
LL: Liquid Limit	PL: Plastic Limit	PI: Plasticity Index
Dd: Dry Density, pounds per cubic foot (pcf)		
PID: Photoionization Detector (Hnu meter) volatile vapor level, ppm		

SOIL RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

NON-COHESIVE SOILS		COHESIVE SOILS		
Classifier	N-Value Range	Classifier	Qu Range (tsf)	N-Value Range
very loose	0-3	very soft	0-0.25	0-2
loose	3-7	soft	0.25-0.5	2-5
medium dense	7-15	medium stiff	0.5-1.0	5-10
dense	15-38	stiff	1.0-2.0	10-14
very dense	38+	very stiff	2.0-4.0	14-32
		hard	4.0+	32+

GROUNDWATER



: Approximate Groundwater level at time noted on soil boring log, measured in open borehole unless otherwise noted. Groundwater levels often vary with time, and are affected by soil permeability characteristics, weather conditions, & lateral drainage conditions.