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September 26, 2016

Mr. Scott McCurdy
Cedar Corporation
604 Wilson Avenue
Menomonie, Wisconsin 54751

Subject: Subsurface Exploration and Infiltration Evaluation
Proposed Industrial Park Infiltration Areas
Black River Falls, Wisconsin
PSI Project No. 0095621

Dear Mr. McCurdy,

INTRODUCTION

In accordance with your request, Professional Service Industries, Inc. (PSI) has performed a subsurface exploration and evaluation at the above referenced site. An electronic copy of this report is being provided via e-mail. Hard copies can be provided upon request.

These services were performed in accordance with an executed agreement (PSI Proposal No. 184555, dated July 5, 2016) between PSI and Cedar Corporation. This subsurface exploration report has been prepared on behalf of and exclusively for the use of Cedar Corporation. The information contained in this report may not be relied upon by any other parties without the written consent of PSI, and acceptance by such parties of PSI's General Conditions.

PURPOSE

The purpose of the subsurface exploration was to evaluate the soil and groundwater conditions encountered at selected locations on the subject site, and to provide subsurface information for preliminary design planning for the potential stormwater management areas.

SCOPE

The scope of services included a site reconnaissance, the subsurface exploration, a determination of soil characteristics by field and laboratory testing, and an evaluation and

analysis of the data obtained. The number, depth and location of the borings were selected by the client, who will also be performing the design.

The field work for classification of the subgrade soils in accordance with the WDNR Technical Standard 1002 "Site Evaluation for Stormwater Infiltration" guidelines was performed to provide information for use by the basin design personnel when considering requirements of Chapter NR151 of the Wisconsin Administrative Code. The design of the stormwater management areas was beyond the scope of services for this project. Additionally, field infiltration testing was not requested or performed.

SITE AND PROJECT DESCRIPTION

The subject site is located at the southeast corner of the intersection of Airport Road and Red Iron Road, in Black River Falls, Wisconsin. The site generally extends east to Haipek/Airport Road and south to Timber Road. At the time of the exploration, the subject site consisted of a heavily-wooded field, with a few open grassy areas. ATV trails traverse through the eastern portion of the site. The size, type, bottom elevation and other design details of the proposed stormwater management areas had not been determined at the time of this report preparation.

FIELD EXPLORATION AND LABORATORY TESTING

Five (5) soil borings, each to a depth of about 25.5 feet below the existing ground surface, were performed for this project. The borings were located in the field by the drill crew utilizing conventional taping procedures referenced to existing site features. They are estimated accurate to within a few feet. Ground surface elevations were not provided, and due to the size and heavily-wooded nature of the site, they were not obtained at the time of the exploration.

The soil test borings were performed with a truck-mounted rotary drilling rig utilizing continuous flight hollow stem augers to advance the holes. Representative samples were obtained by the Standard Penetration Test (SPT) method in general accordance with ASTM D-1586. Samples were obtained at 2-foot continuous intervals at throughout the depth of the borings. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer, falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of the three (3) successive increments of six (6) inches penetration. The "N" value is obtained by adding the second and third incremental numbers. The SPT provides a means of estimating the relative density of granular soils and comparative consistency of cohesive soils, thereby providing a method of evaluating the subsoil's relative strength and compressibility characteristics of the subsoils.

All samples obtained from the borings were visually classified in general accordance with USDA Natural Resources Conservation Service textural soil classification procedures. After completion of the borings, the auger holes were backfilled to the ground surface with bentonite chips.

DESCRIPTION OF SUBSURFACE CONDITIONS

General

A description of the subsurface conditions encountered at the test boring locations is shown on the Soil Boring Logs. The lines of demarcation shown on the logs represent approximate boundaries between the various soil classifications. It must be recognized that the soil descriptions are considered representative for the specific test hole location, but that variations may occur between and beyond the sampling intervals and boring locations. Soil depths, topsoil and layer thicknesses, and demarcation lines utilized for preconstruction planning should not be expected to yield exact and final quantities. A summary of the major soil profile components is described in the following paragraphs.

Soil Conditions

The surface of the site at the boring locations was covered with about 6 to 12 inches of sand topsoil. The topsoil was underlain by sand to at least the termination depth of the borings (25.5 feet). These soils may be considered loose to very dense, with standard penetration resistances ranging from 5 to 48 blows per foot. Natural moisture contents ranged from about 1 to 12 percent.

Groundwater Observations

Groundwater observations were made during the drilling operations and in the open boreholes at completion. Groundwater was encountered during auger advancement in boring B-4, at a depth of about 25 feet below the existing ground surface. No groundwater was observed in any of the borings upon completion and removal of the augers.

The groundwater observations reported herein are considered approximate. It must be recognized that groundwater levels fluctuate with time due to variations in seasonal precipitation, lateral drainage conditions, and soil permeability characteristics. Longer term monitoring would be required to better evaluate groundwater levels on this site.

STORMWATER MANAGEMENT CONSIDERATIONS

The subgrade soils encountered in the borings have been classified in general accordance with the USDA textural soil classification system. Estimated infiltration rates for various soil types are shown. Table 2 of the Site Evaluation for Stormwater Infiltration (1002)

document, which is published by the Wisconsin Department of Natural Resources Conservation Practice Standards, is shown below:

Soil Texture[1]	Design Infiltration Rate Without Measurement Inches/hour
Coarse sand or coarser (COS)	3.60
Loamy coarse sand (LCOS)	3.60
Sand (S)	3.60
Loamy sand (LS)	1.63
Sandy loam (SL)	0.50
Loam (L)	0.24
Silt loam (Si, L)	0.13
Sandy clay loam (SCL)	0.11
Clay loam (CL)	0.03
Silty Clay loam (Si, CL)	0.04
Sandy clay (SC)	0.04
Silty clay (Si, C)	0.07
Clay (C)	0.07

[1]Use sandy loam design infiltration rates for fine sand, very fine sand, and loamy fine sand soil textures.

NR-151 guidelines indicate infiltration rates shall be based on the least permeable soil horizon within 5 feet of the bottom elevation of the proposed infiltration system. However, at the time of this report, the bottom elevation had not been established. Therefore, the entire soil profile encountered at the test locations was used as the soil horizon of interest.

The fine-textured sand soils present at depths of about 22 to 24 feet in B-3 and 16 to 24 feet in B-4 have an estimated infiltration rate of 0.50 inches per hour, based on Table 2 above. This infiltration rate is less than 0.6 inches per hour and these soils may be exempt from the infiltration requirements of NR151.124. However, field verification testing of the actual in-situ infiltration rate for these materials is required per NR151.124 under NR151.124(4)(c)1 and under Step C5 of the Site Evaluation for Stormwater Infiltration document, to confirm they are exempt from the infiltration requirements.

The remaining soils in the borings consisted of medium to coarse-grained sand. These soils have an estimated infiltration rate of 3.60 inches per hour. This infiltration rate is greater than 0.6 inches per hour, and these soils are therefore not exempt from the infiltration requirements of NR151.124 under NR151.124(4)(c)2. It must be recognized that areas of the site may be exempt or excluded from the infiltration requirements of NR 151.124 under other provisions (dependent upon the final bottom elevation), such as NR

151.124(4)(b), due to insufficient separation distance between the bottom of the basin and the groundwater or bedrock, or as defined in NR151.002(14r) due to the lack of a layer of sufficient thickness containing soils with sufficient fines content between the bottom of the basin and the groundwater. This layer of sufficient thickness containing soils with sufficient fines content is denoted by NR151.124(4)(b) as a "filtering layer". As indicated in NR151.002(14r), a "filtering layer" is defined as a layer at least 3 feet thick, with at least 20 percent fines; or at least 5 feet thick, with at least 10 percent fines.

It should be noted that some of the granular soils with increasing depth are in a dense to very dense condition, and infiltration rates within such materials may be substantially less than the estimates provided in Table 2.

General Stormwater Management Area Recommendations

It must be recognized that actual infiltration rates will be somewhat variable depending upon the uniformity, in-place density of the natural soils, and/or grading of the subsoils below the individual basin or trench footprint. It should be noted that the borings were widely spaced and some variation in soil character may occur between and beyond the borings.

The preceding infiltration rate estimates and groundwater elevations are based on the subgrade conditions encountered in the borings, and soil characterization in accordance with the USDA Classification system and NR-151 guidelines. They are intended only for use in preliminary planning. It is recommended that the basin bottoms be observed by qualified geotechnical engineering personnel at the time of construction to verify the soil types. In-situ testing, such as with a double ring infiltrometer, along with additional soil borings or test pits in other areas of the pond, are recommended to better classify the soils, further evaluate subsurface conditions and provide more representative infiltration rates for the design. The type of basin, and intended use, such as being "wet" or "dry", must be carefully considered when evaluating infiltration rates.

With regard to basements in the areas of stormwater management basins, proper consideration of soils and subsurface conditions must be given during site and design planning, and care must be exercised during construction. Lateral migration of water may result in increased sump pump activity or even flooding, especially if basement floors are below the elevation of basin bottoms (not recommended). In addition, the presence of granular soils in the areas of structures, especially within utility backfill or other development trenches, can act as migration channels to carry water from basins and into nearby basements. Building codes or municipal regulations may require that basement floor elevations be a specified distance above the water level of nearby basins.

GENERAL COMMENTS

The limited evaluation has been prepared on the basis of the subsurface conditions encountered in the borings discussed above. Preliminary recommendations presented herein are based on available soil information and test data collected. This study has been conducted in the manner consistent with that level of care ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions. The findings and opinions contained herein have been promulgated in accordance with general accepted practices in the fields of soil mechanics and engineering geology. No other representations, expressed or applied, and no warranty or guarantee is included or intended in this report.

After you have had the opportunity of reading this report, please call at any time with any questions or comments you may have. PSI appreciates the opportunity to be of service on this project.

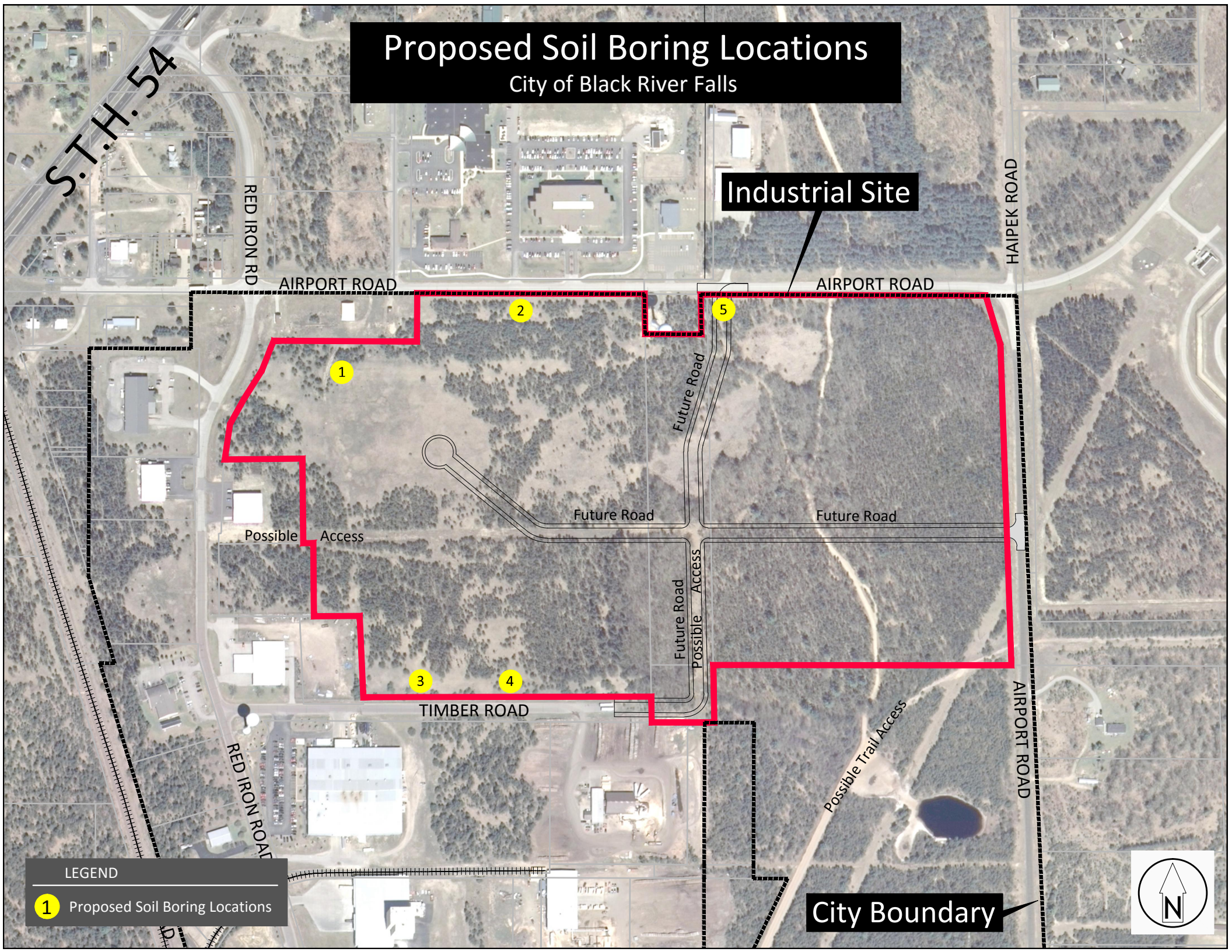
Sincerely,

PROFESSIONAL SERVICE INDUSTRIES, INC.

Jeffrey A. Manninen
Branch Manager

James M. Becco, P.E.
Vice President

Enclosures: Boring Location Plan
Boring Logs
General Notes


Proposed Soil Boring Locations
City of Black River Falls
S.T.H. 54
RED IRON RD
AIRPORT ROAD
Industrial Site
AIRPORT ROAD
HAIPEK ROAD
1
2
3
4
5
Future Road
Future Road
Future Road
Future Road
Possible Access
Possible Access
TIMBER ROAD
RED IRON ROAD
Possible Trail Access
AIRPORT ROAD
City Boundary
LEGEND
1 Proposed Soil Boring Locations
N

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SOIL BORING LOG: B - 1

Project: Proposed Industrial Park Infiltration Areas **Project No.:** 0095621

Location: Black River Falls, Wisconsin **Drill Date:** August 31, 2016

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION:	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 -1.0	0-12": 10 YR 3/2, Very Dark Grayish Brown SAND, roots, m, damp (TOPSOIL)	AU-1	--			4	
2 -2.0	10 YR 5/6, Yellowish Brown SAND, m, damp						
3 -3.0		2-SS	7			2	
4 -4.0							
5 -5.0		3-SS	14			2	
6 -6.0							
7 -7.0		4-SS	19			2	
8 -8.0							
9 -9.0		5-SS	21			2	
10 -10.0							
11 -11.0		6-SS	29			2	
12 -12.0							
13 -13.0		7-SS	27			3	
14 -14.0	10 YR 8/2, Very Pale Brown SAND, m, damp						
15 -15.0		8-SS	30			5	
16 -16.0							
17 -17.0		9-SS	28			5	
18 -18.0							
19 -19.0		10-SS	30			5	
20 -20.0							
21 -21.0		11-SS	27			4	
22 -22.0							
23 -23.0		12-SS	19			5	
24 -24.0							
25 -25.0		13-SS	27			4	
26 -26.0	**END OF BORING @ 25.5± FEET**						
27 -27.0							
28 -28.0							
29 -29.0							
30 -30.0							

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: None Encountered ▼

Water Level $_{\text{upon completion}}$: None Encountered ▼

Caved at $_{\text{upon completion}}$: 22± feet below ground surface (EL ±)

Delay Time: N/A

Water Level $_{\text{delayed}}$: N/A

Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

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.

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SOIL BORING LOG: B - 2

Project: Proposed Industrial Park Infiltration Areas **Project No.:** 0095621

Location: Black River Falls, Wisconsin **Drill Date:** August 31, 2016

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION:	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 -1.0	0-8": 10 YR 3/2, Very Dark Grayish Brown SAND, roots, m, damp (TOPSOIL)	AU-1	--			4	
2 -2.0	10 YR 5/6, Yellowish Brown SAND, m, damp						
3 -3.0	10 YR 7/6, Yellow SAND, m, damp	2-SS	7			3	
4 -4.0							
5 -5.0	10 YR 8/2, Very Pale Brown SAND, m, damp	3-SS	13			2	
6 -6.0							
7 -7.0		4-SS	20			2	
8 -8.0							
9 -9.0	10 YR 7/6, Yellow SAND, m, damp	5-SS	32			5	
10 -10.0							
11 -11.0	10 YR 4/6, Dark Yellowish Brown SAND, c, damp	6-SS	33			6	
12 -12.0							
13 -13.0	10 YR 4/4, Dark Yellowish Brown SAND, c, damp	7-SS	30			4	
14 -14.0							
15 -15.0	10 YR 5/4, Yellowish Brown SAND, m, damp	8-SS	24			3	
16 -16.0							
17 -17.0		9-SS	16			3	
18 -18.0							
19 -19.0		10-SS	17			5	
20 -20.0							
21 -21.0		11-SS	17			4	
22 -22.0							
23 -23.0		12-SS	21			4	
24 -24.0							
25 -25.0	10 YR 6/3, Pale Brown SAND, m, damp	13-SS	16			4	
26 -26.0	**END OF BORING @ 25.5± FEET**						
27 -27.0							
28 -28.0							
29 -29.0							
30 -30.0							

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: None Encountered ▼

Water Level $_{\text{upon completion}}$: None Encountered ▼

Caved at $_{\text{upon completion}}$: 22± feet below ground surface (EL ±)

Delay Time: N/A

Water Level $_{\text{delayed}}$: N/A

Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

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.

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SOIL BORING LOG: B - 3

Project: Proposed Industrial Park Infiltration Areas **Project No.:** 0095621

Location: Black River Falls, Wisconsin **Drill Date:** August 31, 2016

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION:	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 -1.0	0-12": 10 YR, 2/2, Very Dark Brown SAND, roots, m, damp (TOPSOIL)	AU-1	--			5	
2 -2.0	10 YR 4/4, Dark Yellowish Brown SAND, m, damp						
3 -3.0	10 YR 5/6, Yellowish Brown SAND, m, damp	2-SS	5			3	
4 -4.0							
5 -5.0	10 YR 7/6, Yellow SAND, m, damp	3-SS	10			1	
6 -6.0							
7 -7.0		4-SS	13			2	
8 -8.0							
9 -9.0	10 YR 8/2, Very Pale Brown SAND, m, damp	5-SS	21			2	
10 -10.0							
11 -11.0		6-SS	30			2	
12 -12.0							
13 -13.0	10 YR 8/2, Very Pale Brown SAND, m, damp	7-SS	43			2	
14 -14.0							
15 -15.0	10 YR 7/6, Yellow SAND, m, damp	8-SS	45			2	
16 -16.0							
17 -17.0		9-SS	38			4	
18 -18.0							
19 -19.0	10 YR 8/3, Very Pale Brown SAND, m, damp	10-SS	37			4	
20 -20.0							
21 -21.0	10 YR 7/6, Yellow SAND, m, damp	11-SS	38			5	
22 -22.0							
23 -23.0	10 YR 7/4, Very Pale Brown SAND, f, damp	12-SS	40			5	
24 -24.0							
25 -25.0	10 YR 7/3, Very Pale Brown SAND, m, moist	13-SS	33			7	
26 -26.0	**END OF BORING @ 25.5± FEET**						
27 -27.0							
28 -28.0							
29 -29.0							
30 -30.0							

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: None Encountered ▼

Water Level $_{\text{upon completion}}$: None Encountered ▼

Caved at $_{\text{upon completion}}$: 22.5± feet below ground surface (EL ±)

Delay Time: N/A

Water Level $_{\text{delayed}}$: N/A

Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

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.

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SOIL BORING LOG: B - 4

Project: Proposed Industrial Park Infiltration Areas **Project No.:** 0095621

Location: Black River Falls, Wisconsin **Drill Date:** August 31, 2016

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION:	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 -1.0	0-12": 10 YR, 2/2, Very Dark Brown SAND, roots, m, damp (TOPSOIL)	AU-1	--			4	
2 -2.0	10 YR 3/3, Dark Brown SAND, roots, m, damp						
3 -3.0	10 YR 6/6, Brownish Yellow SAND, m, damp	2-SS	8			2	
4 -4.0							
5 -5.0		3-SS	13			3	
6 -6.0							
7 -7.0		4-SS	20			2	
8 -8.0							
9 -9.0	10 YR 7/4, Very Pale Brown SAND, m, damp	5-SS	27			2	
10 -10.0							
11 -11.0		6-SS	28			3	
12 -12.0							
13 -13.0	10 YR 6/6, Brownish Yellow SAND, m, damp	7-SS	30			3	
14 -14.0							
15 -15.0	2.5 YR 7/4, Very Pale Brown SAND, m, damp	8-SS	32			5	
16 -16.0							
17 -17.0	2.5 YR 7/2, Light Gray SAND, f, damp to moist	9-SS	25			5	
18 -18.0							
19 -19.0		10-SS	34			5	
20 -20.0							
21 -21.0		11-SS	38			6	
22 -22.0							
23 -23.0		12-SS	27			7	
24 -24.0							
25 -25.0	10 YR 5/6, Yellowish Brown SAND, m, very moist to wet	13-SS	24			14	▼
26 -26.0	**END OF BORING @ 25.5± FEET**						
27 -27.0							
28 -28.0							
29 -29.0							
30 -30.0							

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: 25± feet below ground surface (EL ±) ▼

Water Level $_{\text{upon completion}}$: None Encountered ▼

Caved at $_{\text{upon completion}}$: 22± feet below ground surface (EL ±)

Delay Time: N/A

Water Level $_{\text{delayed}}$: N/A

Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

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.

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SOIL BORING LOG: B - 5

Project: Proposed Industrial Park Infiltration Areas **Project No.:** 0095621

Location: Black River Falls, Wisconsin **Drill Date:** August 31, 2016

DEPTH/EL. (feet)	VISUAL SOIL CLASSIFICATION GROUND SURFACE ELEVATION:	SAMPLE NO.	N (bpf)	Qp (tsf)	Qu (tsf)	MC (%)	REMARKS
1 -1.0	0-6": 10 YR 3/3, Dark Brown SAND, roots, m, damp (TOPSOIL)	AU-1	--			4	
2 -2.0	10 YR 4/6, Dark Yellowish Brown SAND, m, damp						
3 -3.0	10 YR 5/8, Yellowish Brown SAND, m, damp	2-SS	10			3	
4 -4.0							
5 -5.0	10 YR, 6/6, Brownish Yellow SAND, m, damp	3-SS	23			4	
6 -6.0							
7 -7.0	2.5 YR 7/4, Very Pale Brown SAND, m, damp	4-SS	42			5	
8 -8.0							
9 -9.0		5-SS	48			5	
10 -10.0							
11 -11.0	10 YR 5/4, Yellowish Brown SAND, m, damp	6-SS	16			6	
12 -12.0							
13 -13.0	10 YR 4/3 Brown SAND, c, damp	7-SS	33			5	
14 -14.0							
15 -15.0	10 YR 5/3, Brown SAND, m, moist	8-SS	16			8	
16 -16.0							
17 -17.0		9-SS	27			8	
18 -18.0							
19 -19.0	10 YR 4/3, Brown SAND, m, moist	10-SS	23			11	
20 -20.0							
21 -21.0		11-SS	12			13	
22 -22.0							
23 -23.0	10 YR 4/4, Dark Yellowish Brown SAND, c, moist	12-SS	23			12	
24 -24.0							
25 -25.0	10 YR 4/3, Brown SAND, m, moist	13-SS	22			11	
26 -26.0	**END OF BORING @ 25.5± FEET**						
27 -27.0							
28 -28.0							
29 -29.0							
30 -30.0							

FIELD OBSERVATIONS:

Water Level $_{\text{during drilling}}$: None Encountered ▼

Water Level $_{\text{upon completion}}$: None Encountered ▼

Caved at $_{\text{upon completion}}$: 22± feet below ground surface (EL ±)

Delay Time: N/A

Water Level $_{\text{delayed}}$: N/A

Caved at $_{\text{delayed}}$: N/A

ADDITIONAL COMMENTS:

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.

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.		
ST:	Shelby Tube, 2" O.D. or 3" O.D., as noted in text	RB:	Roller Bit
AU:	Auger Sample	WS:	Wash Sample
DB:	Diamond Bit	BS:	Bag Sample
CB:	Carbide Bit	HA:	Hand Auger

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.