STRUCTURE GEOTECHNICAL REPORT
LONGMEADOW PARKWAY BRIDGE CORRIDOR
RETAINING WALL
SN: RW-02, STA. 2150+00 TO 2155+00
IDOT JOB No. P-91-393-94, SECTION: 94-00215-01-ES
KANE COUNTY, ILLINOIS

for

McDonough Associates, Inc.

130 East Randolph Street, Suite 1000

Chicago, IL 60601

(312) 946-8600

submitted by

Wang Engineering, Inc.

1145 North Main Street

Lombard, IL 60148

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March 8, 2011

Technical Report Documentation Page

1. Title and Subtitle Structure Geotechnical Report Longmeadow Parkway Bridge Corridor Retaining Wall No. 2		**2. Report Date** March 8, 2011 **3. Report Type** ☒ SGR ☐ RGR ☐ Draft ☒ Final ☐ Revised
4. Route / Section / County Longmeadow Parkway/ 94-00215-01-ES / Kane		**5. IDOT Job / Contract No.** Job No. P-91-393-94 Contract
6. PTB / Item No. N / A	**5. Existing Structure Number(s)** N/A	**6. Proposed Structure Number(s)** S.N. RW-02
7. Prepared by Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148	**Contributor(s)** Author: Mohammed Kothawala, P.E. QC/QA: Jerry W.H. Wang, PhD, P.E. PM: Mohammed Kothawala, P.E.	**Contact Phone Number** (630) 953-9928 ext 36
9. Prepared for McDonough Associates, Inc. 130 East Randolph Street Suite 1000 Chicago, IL 60601	**Design / Structural Engineer** Gerald E. Koylass, S.E.	**Contact Phone Number** (312) 946-8600

10. Abstract

A new retaining wall will be constructed to retain a cut along the south side of the new Longmeadow Parkway roadway and west of IL Route 31. This report provides geotechnical recommendations for the design and construction of the proposed retaining wall. The proposed wall's maximum exposed height is 18 feet. Wang obtain twelve structure borings along the wall alignment in 2005.

Beneath the topsoil, the borings revealed in descending order, medium stiff to hard silty clay loam, medium dense to very dense sand and gravelly sand with a layer of medium dense to very dense loam, and medium stiff to hard clay loam. Groundwater was measured during and at completion of drilling at various depths ranging from 25.5 to 71.8 feet below ground surface.

Cast-in-place concrete cantilever or Mechanically Stabilized Earth (MSE) walls are feasible but cost prohibitive, thus we recommend flexible cantilever walls, more explicitly soldier pile wall. The report provides soil parameters for the design of the soldier pile wall.

11. Path to archived file

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Wang Engineering

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LONGMEADOW PARKWAY BRIDGE CORRIDOR
RETAINING WALL
SN: RW-02, STA. 2150+00 TO 2155+00
IDOT Job No. P-91-393-94, SECTION: 94-00215-01-ES
KANE COUNTY, ILLINOIS

FOR

MCDONOUGH ASSOCIATES, INC.

1.0 INTRODUCTION

This report presents the results of Wang Engineering, Inc. (Wang) subsurface investigation, laboratory testing, and geotechnical evaluation and recommendations for the proposed Retaining Wall No. 2 located on the south side of Longmeadow Parkway and immediately west of IL Route 31 in the City of Algonquin, Illinois. The project area is located in the northeastern part of Kane County. On the USGS "Crystal Lake" Quadrangle Map, the proposed Retaining Wall No. 2 is located in the NE ¼ of Section 9, Tier 42 North, Range 8 East. A Site Location Map is presented as Exhibit 1.

The purpose of our investigation was to characterize the site subsurface soil and groundwater conditions and provide geotechnical analyses and recommendations for the design and construction of the new wall.

2.0 METHODS OF INVESTIGATION

2.1 Subsurface Investigation

For the Retaining Wall No. 2, twelve structure borings (S-015 through S-037, odd numbers) were drilled along the Longmeadow Parkway alignment between approximate Stations 2149+50 and 2155+50 between the period of April 13 and June 28, 2005. As drilled boring locations are shown in Exhibits 2A and 2B. The boring locations were marked in the field by Engineering Enterprises, Inc. (EEI) based on the plans provided by the Design Consultant, McDonough Associates, Inc. (MAI). Some of the borings were relocated in the field by

Wang from their originally intended locations due to the access problem or refusal encountered at shallower depths. As-drilled northing, easting, coordinates, stations, offsets, and elevations were measured by EEI and are included in our boring logs (Appendix A). The borings were performed on the grass area south side of the proposed roadway from elevations ranging from 886.2 to 897.8 feet. Borings S-015, S-019, S-023, S-027, S-031, and S-035 were drilled and sampled from the ground surface to boring termination depths of 65.0 to 85.0 feet below ground surface (bgs), whereas Borings S-017, S-021, S-025, S-029, S-033, and S-037 were drilled without obtaining samples from ground surface to depths of 26.0 to 41.0 feet and sampled thereafter to boring termination depths of 47.5 to 90.0 feet bgs.

An All Terrain Vehicle (ATV) -mounted drilling rig, equipped with hollow stem augers, was used to advance and maintain an open borehole. Soil sampling was performed according to AASHTO T 206, "*Penetration Test and Split Barrel Sampling of Soils*." The soil was sampled at 2.5-foot interval to boring termination depths. Exceptions were noted in Borings S-015, S-017, S-019, S-021, S-035, and S-037 where the soil was sampled at 2.5-foot interval to depths of 55 to 70 feet bgs and at 5-foot interval thereafter to boring termination depths. Samples collected from each sampling interval were placed in sealed glass jars.

Field boring logs, prepared and maintained by a Wang soil inspector, included lithological descriptions, visual-manual soil classifications, results of Rimac or pocket penetrometer unconfined compression tests, and Standard Penetration Tests (SPT) recorded as blows per 6 inches of penetration.

Groundwater levels were measured while drilling and at the completion of drilling operations. Upon completion, the boreholes were backfilled with bentonite chips mixed with soil cuttings. In addition, the ground surface was restored as close as possible to the original condition.

2.2 Laboratory Testing

Samples obtained in the field were transported to our in-house laboratory in Lombard, Illinois. The testing program included moisture content (AASHTO T 265) on all soil samples. Atterberg limits tests (AASHTO T 89-96 & T 90-96) and particle-size analyses (AASHTO T 88-97) were performed on selected soil samples. The laboratory test results are shown on the boring

logs (Appendix A) and included in Appendix B. All field visual classifications were verified in the laboratory. The soil samples are no longer available because they have been discarded several years after the completion of drilling.

3.0 RESULTS OF FIELD AND LABORATORY INVESTIGATIONS

Detailed descriptions of the soil conditions encountered during the subsurface investigation are presented in the attached *Boring Logs* (Appendix A) and in the *Subsurface Soil Data Profile* (Exhibits 3A and 3B). Please note that strata contact lines represent approximate boundaries between soil types. The actual transition between soil types in the field may be gradual in horizontal and vertical directions.

3.1 Soil Conditions

The existing surface along the proposed retaining wall includes 3.0 to 13.0 inches of black and brown silty clay loam topsoil. In descending order, the general lithologic succession encountered beneath the topsoil includes: 1) medium stiff to hard silty clay loam; 2) medium dense to very dense sand and gravelly sand; 3) medium dense to very dense loam; 4) medium dense to very dense sand and gravelly sand; and 5) medium stiff to hard clay loam.

1) Medium stiff to hard silty clay loam

Beneath the topsoil, the borings encountered 9.7 to 18.3 feet of medium stiff to hard, brown, and gray silty clay loam. The silty clay loam has unconfined compressive strength (Qu) values of 0.8 to 4.5 tsf with an average of 2.0 tsf and moisture contents (MC) of 10 to 23% with an average of 14%.

2) Medium dense to very dense sand and gravelly sand

At elevations of 882.3 to 874.5 feet (9.7 to 19.0 bgs), the borings advanced through up to 25-foot thick, medium dense to very dense, brown to gray sand and gravelly sand with lenses of silt outwash deposits. The soil has SPT N-values ranging from 19 to 74 blows/foot, with an average of 39 blows/foot and MC of 3 to 26% with an average of 10%.

3) Medium dense to very dense loam

Beneath the outwash deposits, the borings encountered up to 15.0 feet thick medium dense to very dense, brown to gray loam. This layer has an N-value ranging from 11 blows/foot to sampler refusal, with an average of 42 blows/foot and MC of 5 to 18% averaging 10%.

4) Medium dense to very dense sand and gravelly sand

At elevations of 853.5 to 839.5 feet (43.0 to 48.0 bgs), discontinuous outwash deposits are present. The soil has SPT N-values ranging from 10 blows/foot to sampler refusal, and MC of 5 to 16% with an average of 12%.

5) Medium stiff to hard clay loam

The borings were terminated in stiff to hard, gray clay loam. This soil has Qu values of 0.7 to 10.3 tsf with an average of 3.7 tsf and MC of 10 to 18% with an average of 12%. Laboratory index testing show L_L values of 20 to 24% and P_L values of 11 to 13%. The diamictons are AASHTO classified as A-4 (2) to A-6(4). Lenses to layers of very dense sand, up to 7-foot thick are present within this layer.

3.2 Groundwater Conditions

With the exception of Boring S-025, groundwater was encountered in all borings. While drilling, groundwater was measured between elevations ranging from 838.4 to 870.2 feet (25.5 to 50.5 ft bgs). At the completion of drilling, groundwater was measured from elevations 814.4 to 848.5. feet (40.0 to 71.8 ft bgs). In general, Layer 2 described above was identified as the water bearing layer.

3.3 Seismic Considerations

According to IDOT Bridge Manual, seismic data are not applicable for the retaining wall.

4.0 ANALYSIS AND RECOMMENDATIONS

Based on information provided by MAI on January 17, 2011, the proposed 500-foot long retaining wall will be located on south side of proposed Longmeadow Parkway from Station 2150+00 to 2155+00 and basically is a "cut type" wall. The ground surfaces in front and behind the wall are sloped at 1:3 (V:H). The exposed height of the wall range from 0.5 to 18.4 feet. Wang has evaluated possible wall types that can be considered for the support of the proposed cut associated with the roadway construction.

4.1 Wall Type Feasibility

The proposed Retaining Wall No. 2 can be a cast-in-place concrete cantilever supported on spread continuous footing or Mechanically Stabilized Earth wall. The construction of these

types of walls would require additional open cut excavation with or without temporary earth retention system and also possibly outside the right-of-way (ROW). This would also require backfilling, more construction time and possibly additional handling and disposal of excavated soils. Therefore, it is our opinion that wall with shallow foundation system could be cost prohibitive.

The other possible wall types that could be considered are soldier-pile wall and steel sheet pile wall with concrete facing. Based on the soil information from the borings, it appears hard driving would be anticipated, and driving steel sheet piles through very dense and hard soils will be very difficult. We therefore, do not recommend steel sheet pile wall. A soldier pile wall, driven or drilled could be considered. Driven H-piles will eliminate any constructability problem associated with drilling and utilizing encasement; however, the required embedment depths and vertical plumb may not be achieved due to high blow counts granular soils particularly containing cobbles, thus H-piles will need to be driven with metal shoes. Therefore, we recommend drilled soldier pile wall.

4.2 Soldier-Pile Wall

Soldier piles installed in drilled shafts will provide more passive resistance and wider section can be used such as wide flange beam (W) section. For the higher wall section, a larger pile size, smaller spacing between piles or ground anchors may be necessary. The plan should show minimum timber lagging thickness to be 3 inches. A geocomposite wall drain should be placed over the timber lagging area in front face of the wall and connected to the 6-inch diameter perforated drain pipe.

4.3 Geotechnical Parameters for Design

The soil parameters shown in Table 1 are recommended to be used for the design of the soldier pile wall. These parameters were determined based on the soil conditions encountered in the borings. The design of the soldier-pile wall should ignore 3 feet of soil in front of the wall measured from the finished ground surface elevation in providing passive pressure due to excavation required for installation of concrete facing, drainage system and frost-heave condition. In developing the design lateral pressure, the lateral pressure due to construction equipment surcharge load should be added to the lateral earth pressure. We recommend using granular backfill, if required behind the wall. The water pressure should be added to the earth pressure if drainage is not provided. The simplified earth pressure distributions shown in AASHTO Standard Specifications for Highway Bridges or other suitable earth pressure

distributions should be used. We recommend linearly increasing lateral active earth pressure at 40 and 52 psf per foot of depth below the grade behind the wall considering horizontal and 1V:3H embankment slope respectively with drainable backfill. Design considerations should also include deflection control at the top of the wall. We recommend following 2009 IDOT Bridge Manual and Federal Highway Administration Manual FHWA –IF-99-015 for some other requirements. The recommendations pertaining to site preparation and earthwork are presented in subsequent sections of this report.

Table 1
Geotechnical Parameters for Design of Soldier-Pile Walls

Soil Description	Moist Unit Weight (pcf)	Shear Strength Properties			Estimated Lateral Soil Modulus Parameter (Static), k (pci)	Estimated Soil Strain Parameter, ε_{50}
		Undrained Condition (Short Term)		Drained Condition (Long Term)		
		Cohesion Cu (psf)	Friction Angle, φ (Degree)	Friction Angle, φ' (Degree)		
Stiff to Very Stiff Cohesive (Qu 1.0 to 3.99 tsf)	125	1700	0	30	450	0.007
Hard Cohesive (Qu > 4.0 tsf)	125	4000	0	33	1500	0.004
Loose Granular (N < 10)	110	0	28	28	20	-
Medium Dense Granular (N 10 to 29)	120	0	32	32	100	-
Dense Granular (N 30 to 50)	130	--	36	36	160	-
Very Dense Granular (N > 50)	135	--	38	38	250	-

- Granular soils are classified as Sand, Gravelly Sand, Silt, Sandy Loam and Gravelly Sandy Loam on the boring logs (generally soil layers indicated "NP" in Qu column on the boring logs).
- Cohesive soils are classified as Silty Clay Loam and Clay Loam on the boring logs.
- Unconfined Compressive Strength values of the cohesive soils are shown as Qu on the boring logs.

- Boring logs show SPT values number for three consecutive 6-inch penetration. N value is the sum of the total of second and the third numbers.
- Moist unit weight and Friction Angle estimated from SPT numbers.
- Drained cohesion is zero for long term analysis.

4.4 Global Stability

The conventional slope stability analyses were performed at Stations 2151+00, 2152+00, 2153+00, and 2154+00 considering retained height of 5.65, 11.5, 18.1 and 7.9 feet as per undated cross sections provided on January 17, 2011 by MAI. Analyses were performed with SLIDE v5 computer software. The minimum factor of safety (FOS) calculated was less than minimum required of 1.5 without considering soldier pile embedment. We performed global stability analysis considering pile embedment to obtain FOS of at least 1.5. The embedded portion of the soldier piles will provide resistance against the slope instability above the tip of the soldier piles. We recommend that the wall tip embedment should be at least to the elevations shown in Table 2 to provide global stability with FOS of at least 1.5. Details of the global stability analysis with critical failure surfaces and results are presented in Appendix C.

Table 2
Minimum embedment for sheet pile and soldier pile wall

Station Range	Minimum Embedment Tip Elevation, feet
Sta. 2150+00 to Sta. 2151+50	864.5
Sta. 2151+50 to Sta. 2152+50	854.5
Sta. 2152+50 to Sta. 2153+50	853.0
Sta. 2153+50 to Sta. 2155+00	849.0

4.5 Settlement

Settlement is no concern since the wall is a flexible wall retaining excavated soil.

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5.0 CONSTRUCTION CONSIDERATIONS

5.1 Excavation

Any required excavations should be performed in accordance with local, state, and federal regulations including current OSHA regulations. The potential effect of ground movements upon nearby utilities should also be taken into consideration.

5.2 Dewatering

Based on the results of borings, we do not anticipate any significant groundwater problems during the construction for an excavation to a depth of 15 feet below the existing ground surface elevations. Perched groundwater charged during the wet seasons in the granular soils below a depth of about 15 feet will seep into the excavation and could be removed using the sump pump method.

5.3 Filling and Backfilling

All fill and backfill materials should be pre-approved by the site engineer. The backfill material should be porous granular material free of organic materials and debris. Backfill material should be compacted in lifts no greater than 8 inches in loose thickness. Each layer should be compacted to a minimum 95 percent of the maximum dry density as determined by AASHTO T 99, Standard Proctor Method.

5.4 Wall Construction

The wall should be constructed as per IDOT Standard Specifications. The special provision developed by IDOT for construction of soldier-pile wall, available at the IDOT web-site (http://www.dot.state.il.us/bridges/gbsp.html) should be used. A temporary casing and/or slurry method in granular soils will be required.

5.5 Construction Monitoring

There is no need for a special construction monitoring for the retaining wall except normally required by the IDOT Standard Specifications.

6.0 QUALIFICATIONS

The analysis and recommendations submitted in this report are based upon the data obtained from the borings performed by Wang at the locations shown on the boring logs and Exhibit 2. This report does not reflect any variations that may occur between the borings or elsewhere on the site, variations whose nature and extent may not become evident until the course of construction. In the event that any changes in the design and/or location of the retaining wall are planned, we should be timely informed so that foundation recommendations can be re-reviewed, and revised if necessary.

It has been a pleasure to assist McDonough Associates, Inc. and the Kane County Division of Transportation on this project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

WANG ENGINEERING, INC.

Jerry W.H. Wang, Ph.D., P.E.
Principal

Mohammed A. Kothawala, P.E., D.GE
Sr. Project Manager/Sr. Geotechnical Engineer

Wang Engineering

REFERENCES

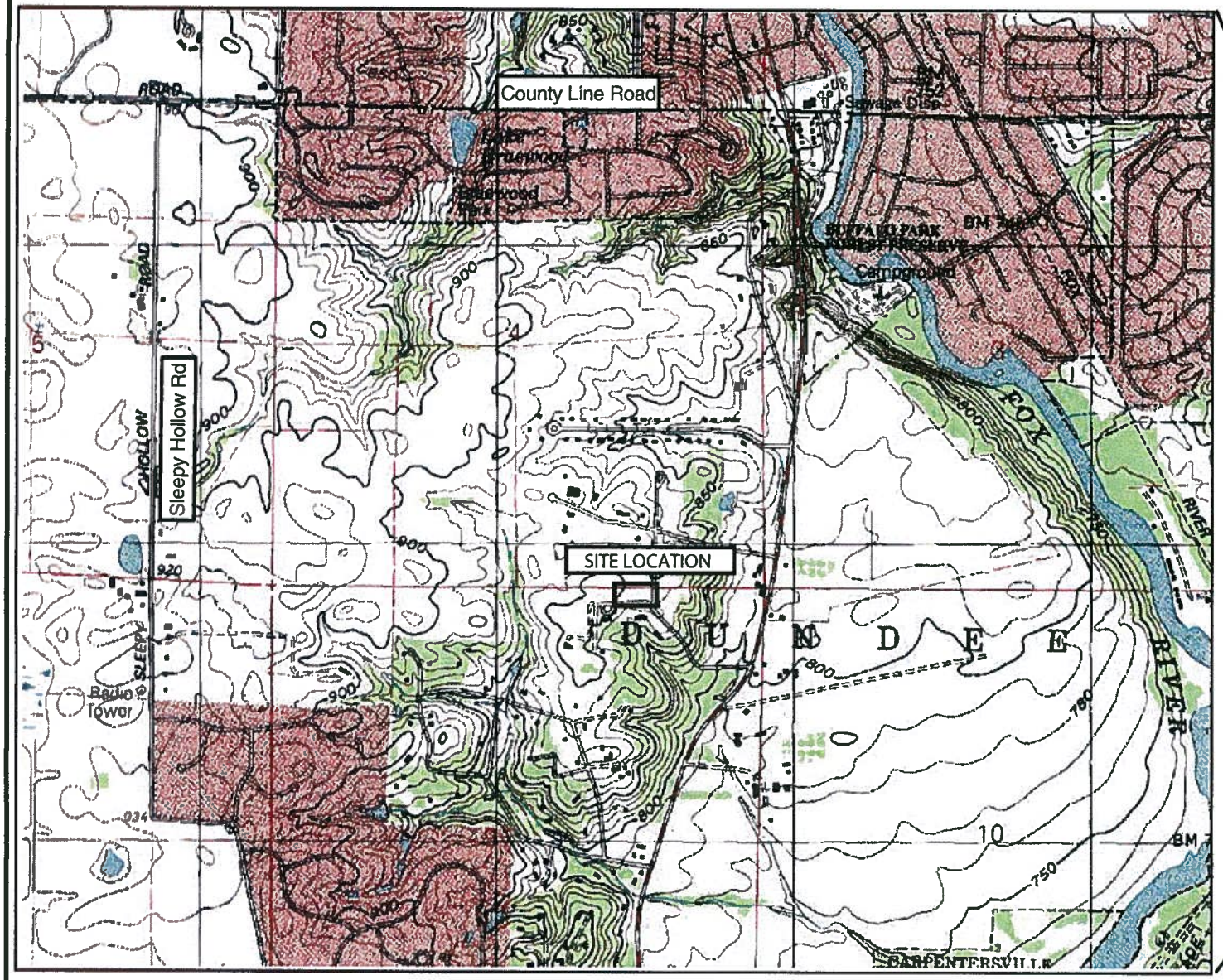
AASHTO 2002. *Standard Specifications for Highway Bridges*. American Association of State Highway and Transportation Officials, Inc., Washington, D.C.

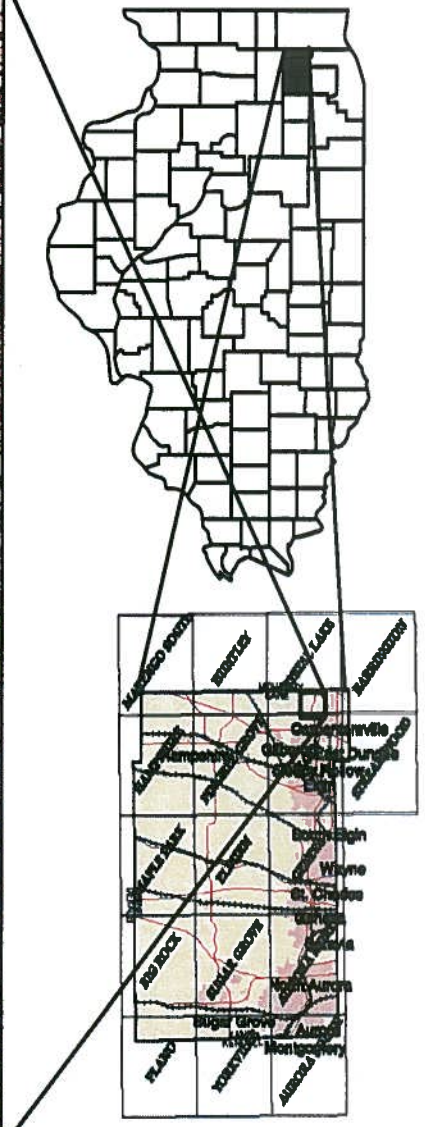
IDOT 1999. *Geotechnical Manual*. Illinois Department of Transportation.

IDOT 2007. *Standard Specifications for Road and Bridge Construction*. Illinois Department of Transportation

IDOT 2009. Bridge Manual, Illinpois Department of transportation

EXHIBITS





0 0.5 1.0 Mile

SITE LOCATION MAP: RETAINING WALL NO. 2, IDOT NO. P-91-393-94, LONGMEADOW PARKWAY/BOLZ ROAD, KANE COUNTY, IL

SCALE: GRAPHICAL	EXHIBIT 1	DRAWN BY: A.A.K. CHECKED BY: M. A. K.

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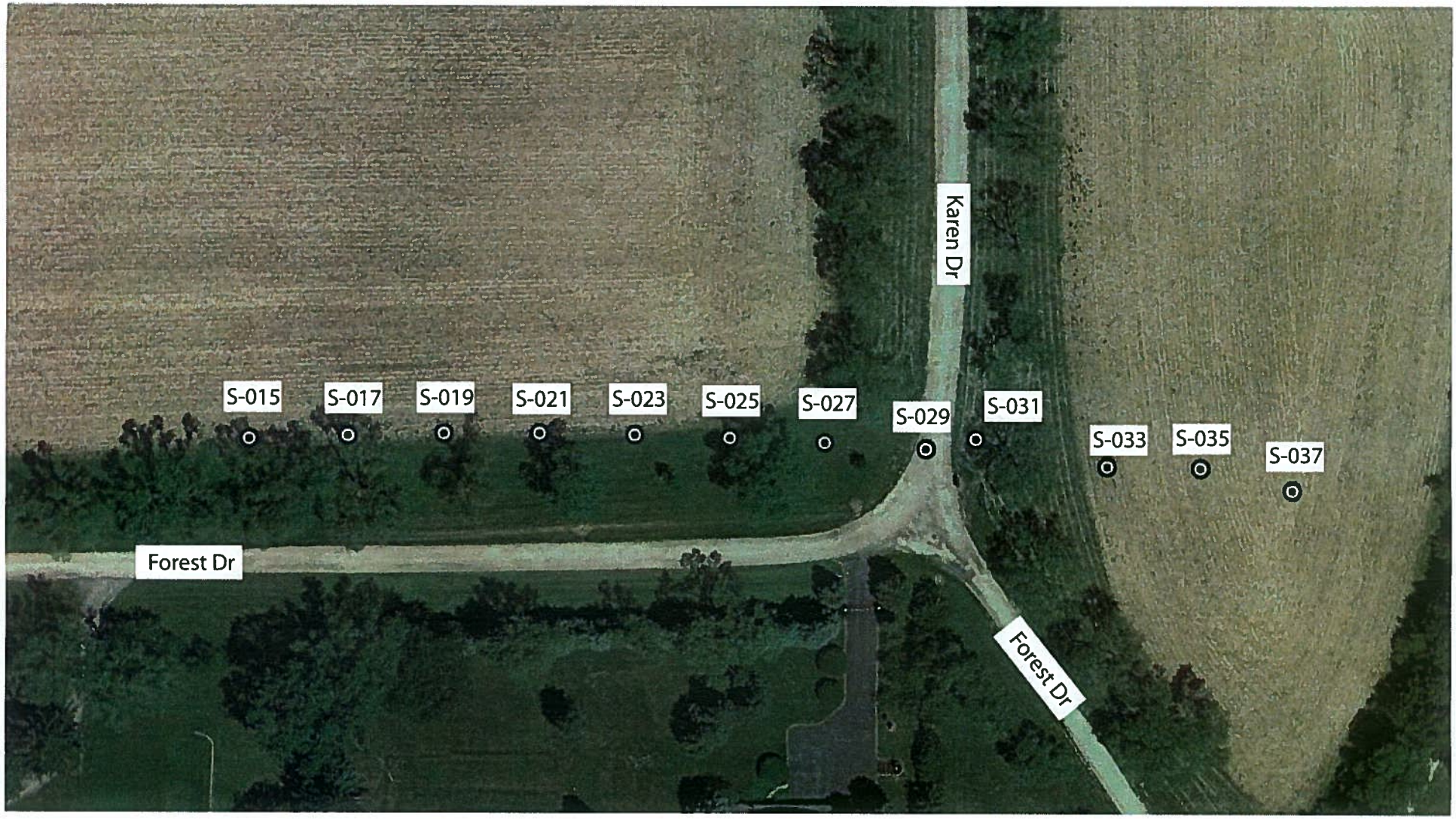
FOR MCDONOUGH ASSOCIATES, INC. | 201-23-01



N

0 50 100 Feet

BORING LOCATION PLAN: RETAINING WALL NO. 2. IDOT NO. P-91-393-94
LONGMEADOW PARKWAY/BOLZ ROAD, KANE COUNTY, IL

SCALE: GRAPHIC	EXHIBIT 2-A	DRAWN BY: A.A.K. CHECKED BY: M. A. K.

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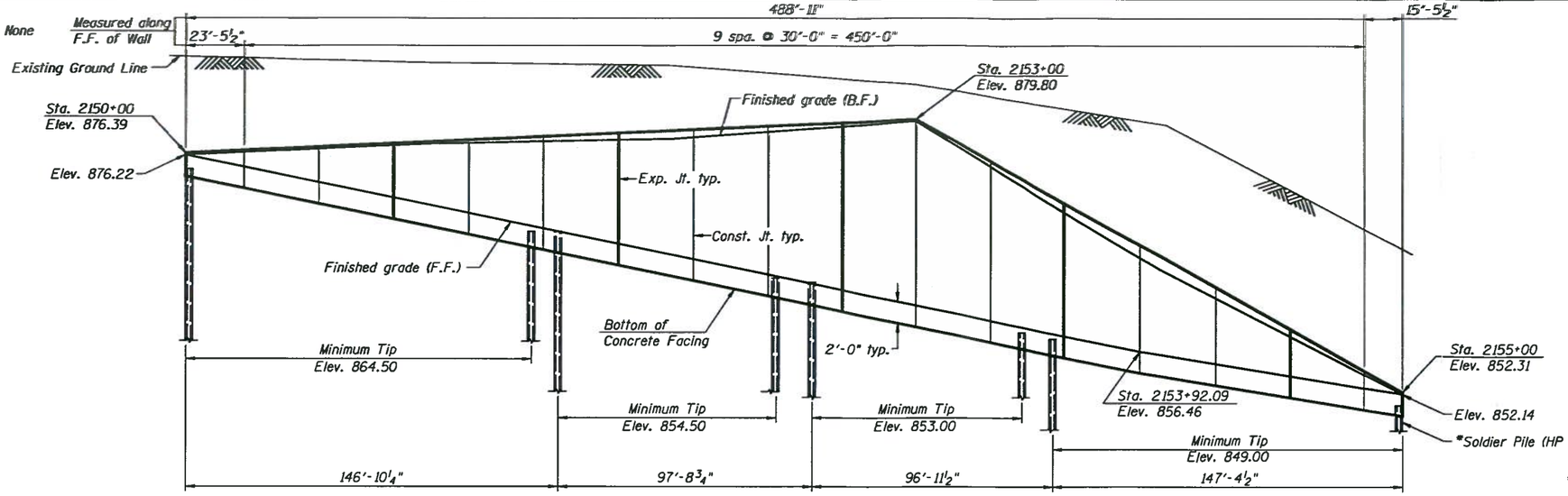
FOR MCDONOUGH ASSOCIATES, INC. 201-23-01

Benchmark:
Existing Structure: None



ELEVATION

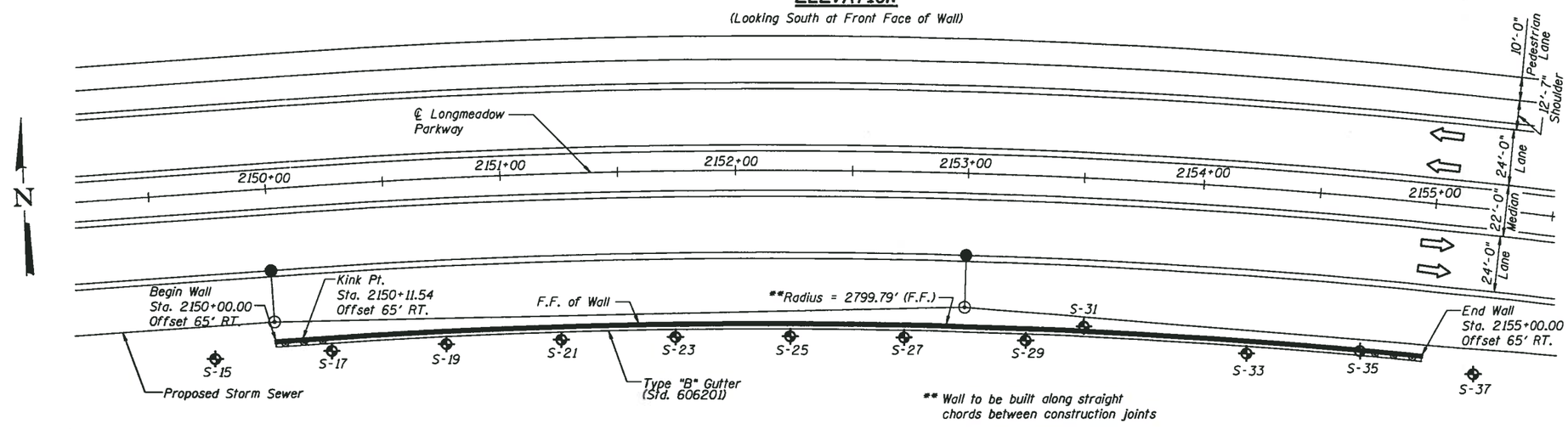
(Looking South at Front Face of Wall)

HIGHWAY CLASSIFICATION

Longmeadow Parkway
Functional Class: Minor Arterial
ADT: 24,000 (2020)
ADTT: 960 (2020)
DHV: 1,864
Design Speed: 50 m.p.h.
Posted Speed: 45 m.p.h.
Two-Way Traffic
Directional Distribution:

*Pile section, spacing, and tip elevation, to be determined during final design.

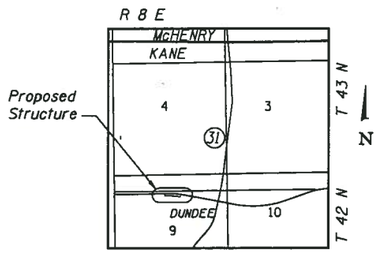
Note: 1) Offsets are measured from the ℄ Longmeadow Parkway to the front face of wall.
2) F.F. - Front Face
3) B.F. - Back Face



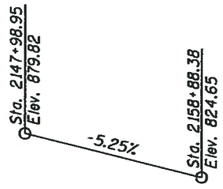
PLAN

LEGEND

Soil Boring Location
F.F. - Front Face
B.F. - Back Face



LOCATION SKETCH



PROFILE GRADE

(along ℄ Longmeadow Pkwy)

CURVE DATA

Δ = 12°09'45"
D = 2°00'00"
T = 305.21'
L = 608.12'
E = 16.21'
R = 2864.79'
S.E. = 2.75
P.C. = Sta. 2150+11.54
P.T. = Sta. 2156+19.67
P.I. = Sta. 2153+16.75

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

BORING LOCATION PLAN: RETAINING WALL NO.2. IDOT NO. P-91-393-84
LONGMEADOW PARKWAY/BOLZ ROAD, KANE COUNTY, IL

EXHIBIT 2-B

Drawn By: A.A.K.
Checked By: M.A.K.

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FOR MCDONOUGH ASSOCIATES, INC. 201-23-01

GENERAL PLAN AND ELEVATION
LONGMEADOW PARKWAY OVER FOX RIVER
F.A.I. RTE. -
KANE COUNTY
STATION 2150+00 TO 2155+00
STRUCTURE NO. RW-02

McDonough Associates Inc.
Engineers / Architects
180 East Randolph Street Chicago, Illinois 60601

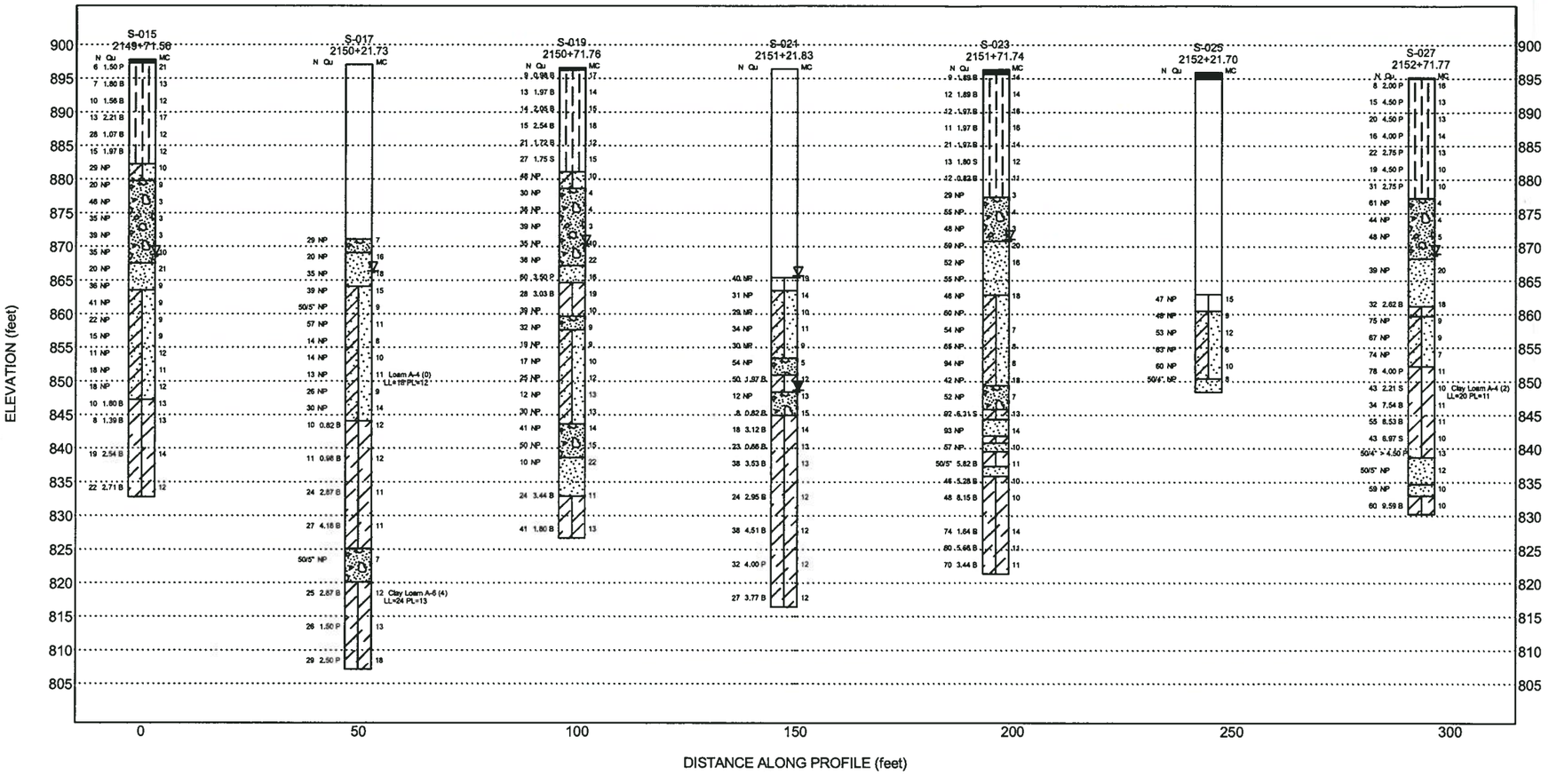
FILE NAME = *FILEL*	USER NAME =	DESIGNED - ___	REVISED - ___
		CHECKED - ___	REVISED - ___
	PLOT SCALE =	DRAWN - ___	REVISED - ___
	PLOT DATE =	CHECKED - ___	REVISED - ___

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 1 OF 2 SHEETS

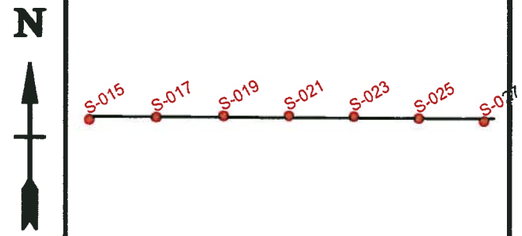
F.A.*RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
RTE	*SECT*	*CNTY*	*TOT*	*SHT*
	-	CONTRACT NO. *CON*		
	ILLINOIS FED. AID PROJECT			

FINAL



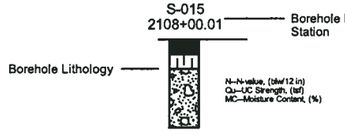
Lithology Graphics

- Topsoil
- IDH Silty Clay, Silty Clay Loam
- IDH Loam
- Gravelly sand, sandy gravel
- IDH Sand, Sandy Loam
- IDH Clay Loam
- IDH Silt, Silty Loam



Site Map Scale 1 inch equals 110 feet

Explanation:



Water Level Reading at time of drilling.

Water Level Reading 24-hr after drilling or at end of drilling

Horizontal Scale (feet)

Vertical Exaggeration: 1.5x

Wang Engineering, Inc.
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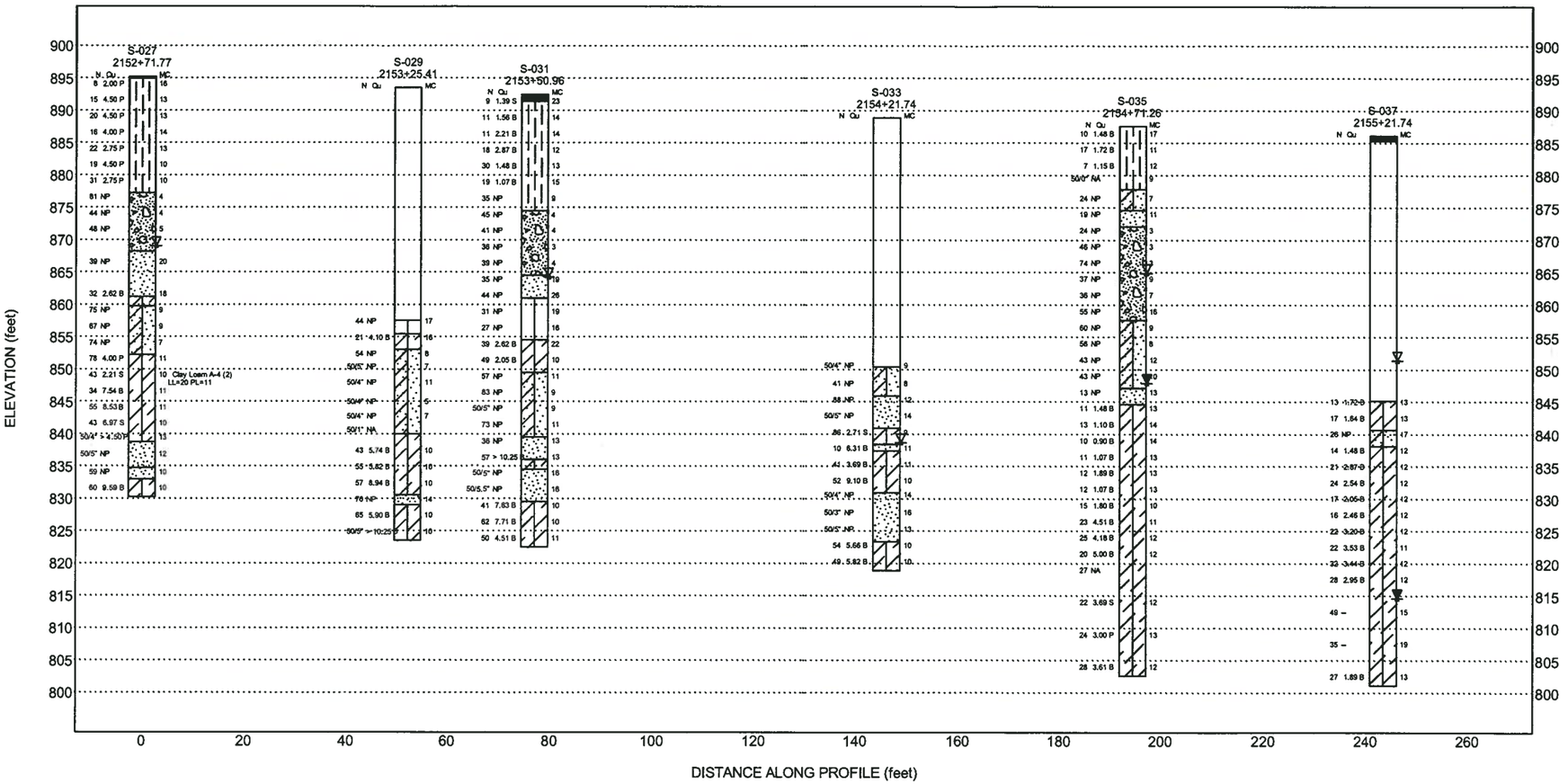
Subsurface Data Profile
Retaining Wall No. 2

Bolz Road/Longmeadow Parkway
Kane County, Illinois

JOB NUMBER	PLATE NUMBER
201-23-01	EXHIBIT 3A

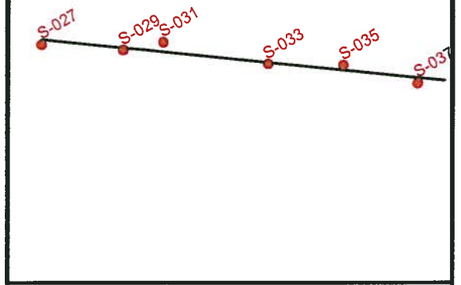
WEI 11X17 2012301.GPJ WANGENG.GDT 1/17/11



Lithology Graphics

- Topsoil
- IDH Silty Clay, Silty Clay Loam
- Gravelly sand, sandy gravel
- IDH Sand, Sandy Loam
- IDH Clay Loam
- IDH Loam
- IDH Silt, Silty Loam

N



Site Map Scale 1 inch equals 95 feet

Explanation:

S-027
2108+00.01 — Borehole Number Station

Borehole Lithology

N--N-value, (bbl/12 in)
Qu--UC Strength, (tsf)
MC--Moisture Content, (%)

Water Level Reading at time of drilling.

Water Level Reading 24-hr after drilling or at end of drilling

0 — 26

Horizontal Scale (feet)

Vertical Exaggeration: 1.5x

Wang Engineering, Inc.
1145 N Main Street
Lombard, IL 60148

Subsurface Data Profile
Retaining Wall No. 2

WEI SINCE 1982

Bolz Road/Longmeadow Parkway
Kane County, Illinois

JOB NUMBER	PLATE NUMBER
201-23-01	EXHIBIT 3B

WEI 11X17 2012301.GPJ WANGENG.GDT 1/17/11

APPENDIX A

Wang Engineering
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BORING LOG S-015

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 897.79 ft
North: 1993281.31 ft
East: 992754.33 ft
Station: 2149+71.56
Offset: 74.98R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	897.3	Brown CLAY LOAM --TOPSOIL--						
		Stiff to very stiff, brown SILTY CLAY LOAM			1	1 2 4	1.50 P	21
			5		2	1 3 4	1.80 B	13
					3	2 4 6	1.56 B	12
			10		4	2 5 8	2.21 B	17
					5	6 11 17	1.07 B	12
			15		6	5 6 9	1.97 B	12
	882.3	Medium dense, gray LOAM			7	9 14 15	NP	10
	879.8	Medium dense to dense, brown GRAVELLY SAND			8	12 11 9	NP	9
			20		9	12 21 25	NP	3
			25		10	8 16 19	NP	3
	867.5	Medium dense, brown, coarse SAND	30		11	11 21 18	NP	3
					12	11 18 17	NP	10
					13	2 9 11	NP	21
	863.5	Medium dense to dense, brown LOAM	35		14	9 15 21	NP	9
					15	12 18 23	NP	9
			40		16	9 15 7	NP	9
					17	5 7 8	NP	9
			45		18	5 4 7	NP	12
					19	4 8 10	NP	11
			50		20	10 11 7	NP	12

GENERAL NOTES

Begin Drilling: 04-15-2005 Complete Drilling: 04-15-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: J&R Logger: Y. Shiu Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 29.25 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

WANGENGINC 2012301.GPJ WANGENG.GDT 1/26/11

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BORING LOG S-015

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 897.79 ft
North: 1993281.31 ft
East: 992754.33 ft
Station: 2149+71.56
Offset: 74.98R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	847.3	Stiff to very stiff, gray CLAY LOAM						
					21	2 3 7	1.80 B	13
					22	4 3 5	1.39 B	13
			55					
			60		23	6 8 11	2.54 B	14
					24	7 11 11	2.71 B	12
	832.8		65					
		Boring terminated at 65.00 ft						
			70					
			75					

GENERAL NOTES

Begin Drilling: 04-15-2005 Complete Drilling: 04-15-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: J&R Logger: Y. Shiu Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 29.25 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-017

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 897.12 ft
North: 1993282.88 ft
East: 992804.22 ft
Station: 2150+21.73
Offset: 75.00R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		–BLIND DRILLING TO 26 FEET–	0					
			5					
			10					
			15					
			20					
			25					
	871.1	Medium dense, brown GRAVELLY SAND	0		1	20 12 17	NP	7
	869.1	Medium dense to dense, brown, medium SAND	2		2	7 8 12	NP	16
			30		3	7 12 23	NP	18
	864.1	Medium dense to very dense, brown LOAM	35		4	12 21 18	NP	15
					5	12 24 50/5"	NP	9
			40		6	20 25 32	NP	11
					7	7 7 7	NP	8
			45		8	4 5 9	NP	10
		–A-4 (0)– –LL=18% PL=12%– GRAVEL=9.8% SAND=38.5% SILT=38.8% CLAY=12.9%			9	4 4 9	NP	11
			50		10	5 6 20	NP	9

GENERAL NOTES

Begin Drilling: 05-26-2005 Complete Drilling: 05-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: T. Rickey Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 31.00 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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BORING LOG S-017

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 897.12 ft
North: 1993282.88 ft
East: 992804.22 ft
Station: 2150+21.73
Offset: 75.00R

Depth (ft)	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	844.1	Medium stiff to hard, brown CLAY LOAM					
			X	11	5 8 22	NP	14
55			X	12	4 4 6	0.82 B	12
60			X	13	4 4 7	0.98 B	12
65			X	14	8 9 15	2.87 B	11
70			X	15	7 10 17	4.18 B	11
	825.1	Very dense, brown and gray GRAVELLY SAND					
75			X	16	36 50/5"	NP	7
	820.1	Stiff to very stiff, gray CLAY LOAM					
		–A-6 (4)– –LL=24% PL=13%– GRAVEL=6.2% SAND=31.1% SILT=39.9% CLAY=22.8%					
80			X	17	5 10 15	2.87 B	12
85			X	18	7 10 16	1.50 P	13
90	807.1		X	19	8 10 19	2.50 P	18
		Boring terminated at 90.00 ft					
95							
100							

GENERAL NOTES

Begin Drilling: 05-26-2005 Complete Drilling: 05-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: T. Rickey Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 31.00 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-019

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 896.65 ft
North: 1993283.91 ft
East: 992852.99 ft
Station: 2150+71.76
Offset: 75.00R

Depth (ft)	Soil and Rock Description	Elevation (ft)	Sample No.	Sample Type / recovery	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
0	35-inch thick black TOPSOIL	896.3					
0	Medium stiff to very stiff, brown SILTY CLAY LOAM		1		4 4 5	0.98 B	17
5			2		4 5 8	1.97 B	14
			3		5 5 9	2.05 B	15
10			4		3 6 9	2.54 B	16
			5		8 8 13	1.72 B	12
15			6		7 5 22	1.75 S	15
		881.2					
	Dense, brown LOAM		7		36 27 21	NP	10
		878.7					
20	Dense, brown GRAVELLY SAND		8		12 13 17	NP	4
			9		12 15 21	NP	4
25			10		13 17 22	NP	3
30		867.2	12		7 14 22	NP	22
	Dense, brown, fine SAND						
		864.7	13		21 26 34	3.50 P	16
35	Very stiff, brown to gray CLAY LOAM with interbedded sand and silt lenses		14		8 13 15	3.03 B	19
		859.7	15		14 17 22	NP	10
	Dense, gray GRAVELLY SAND						
		857.7					
40	Medium dense to dense, brown LOAM		16		14 16 16	NP	9
			17		6 8 11	NP	9
45			18		12 8 9	NP	10
			19		7 9 16	NP	12
50			20		5 3 9	NP	13

GENERAL NOTES

Begin Drilling: 05-19-2005 Complete Drilling: 05-20-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&D Logger: J. Kosloski Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 26.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-019

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 896.65 ft
North: 1993283.91 ft
East: 992852.99 ft
Station: 2150+71.76
Offset: 75.00R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
					21	8 15 15	NP	13
	843.7	Dense to very dense, brown GRAVELLY SAND	55		22	11 19 22	NP	14
					23	10 18 32	NP	15
	838.7	Medium dense, brown SANDY LOAM	60		24	3 4 6	NP	22
	832.9	Stiff to very stiff, brown CLAY LOAM	65		25	5 9 15	3.44 B	11
					26	13 16 25	1.80 B	13
	826.7	Boring terminated at 70.00 ft	70					
			75					

GENERAL NOTES

Begin Drilling: 05-19-2005 Complete Drilling: 05-20-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&D Logger: J. Kosloski Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 26.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-021

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 896.46 ft
North: 1993283.98 ft
East: 992901.68 ft
Station: 2151+21.83
Offset: 75.03R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		--BLIND DRILLING TO 31 FEET--	5					
			10					
			15					
			20					
			25					
	865.5	Dense, brown SANDY LOAM	30		1	18 14 26	NP	19
	863.5	Medium dense to dense, brown LOAM	35		2	11 13 18	NP	14
					3	11 12 17	NP	10
			40		4	14 15 19	NP	11
					5	8 12 18	NP	9
	853.5	Very dense, brown GRAVELLY SAND, with cobbles	45		6	48 28 26	NP	5
	851.0	Stiff, brown CLAY LOAM			7	21 21 29	1.97 B	12
	848.5	Medium dense, brown GRAVELLY SAND	50		8	9 7 5	NP	13

GENERAL NOTES

Begin Drilling: 05-27-2005 Complete Drilling: 05-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: T. Rickey Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 31.00 ft
At Completion of Drilling: ▼ 48.00 ft
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-021

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 896.46 ft
North: 1993283.98 ft
East: 992901.68 ft
Station: 2151+21.83
Offset: 75.03R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	845.0	Medium stiff to hard, brown CLAY LOAM			9	3 3 5	0.82 B	15
			55		10	6 8 10	3.12 B	14
					11	9 9 14	0.66 B	13
			60		12	7 14 24	3.53 B	13
			65		13	7 10 14	2.95 B	12
			70		14	8 14 24	4.51 B	12
			75		15	10 12 20	4.00 P	12
	816.5	Boring terminated at 80.00 ft	80		16	6 10 17	3.77 B	12
			85					
			90					
			95					
			100					

GENERAL NOTES

Begin Drilling: 05-27-2005 Complete Drilling: 05-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: T. Rickey Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 31.00 ft
At Completion of Drilling: ▼ 48.00 ft
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-023

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 896.37 ft
North: 1993283.24 ft
East: 992950.28 ft
Station: 2151+71.74
Offset: 75.04R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	895.7	8-inch thick TOPSOIL						
		Medium stiff to stiff, brown SILTY CLAY LOAM			1	3 3 6	1.89 B	14
			5		2	4 4 8	1.89 B	14
					3	3 5 7	1.97 B	16
			10		4	4 4 7	1.97 B	16
					5	8 8 13	1.97 B	14
			15		6	3 4 9	1.80 S	12
					7	3 5 7	0.82 B	11
	877.4	Medium dense to very dense, gray to brown GRAVELLY SAND	20		8	6 11 18	NP	3
					9	14 22 33	NP	4
			25		10	13 18 30	NP	3

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	870.9	Very dense, brown SANDY LOAM			11	18 23 36	NP	20
			30		12	12 18 34	NP	18
					13	10 22 33	NP	
	862.9	Dense to very dense, brown LOAM			14	14 18 28	NP	18
			35		15	17 25 35	NP	
			40		16	19 24 30	NP	7
					17	23 29 36	NP	8
			45		18	30 43 51	NP	8
	849.4	Very dense, brown GRAVELLY SAND			19	20 19 23	NP	18
			50		20	18 22 30	NP	7

GENERAL NOTES

Begin Drilling: 05-17-2005 Complete Drilling: 05-17-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&D Logger: J. Kosloski Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 25.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-023

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 896.37 ft
North: 1993283.24 ft
East: 992950.28 ft
Station: 2151+71.74
Offset: 75.04R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	845.9							
		Hard, gray CLAY LOAM						
	844.4				21	21 29 63	6.31 S	13
		Very dense, brown, fine SAND						
	841.9				22	15 36 57	NP	14
		Hard, gray CLAY LOAM	55					
	840.9							
		Very dense, gray, medium to coarse SAND						
	839.6				23	10 31 26	NP	10
		Hard, gray CLAY LOAM						
	837.4							
		Very dense, gray SANDY LOAM			24	9 31 50/5"	5.82 B	11
	835.9		60					
		Stiff to hard, gray CLAY LOAM						
					25	13 18 28	5.28 B	10
					26	12 18 30	6.15 B	10
			65					
			70		27	25 26 48	1.64 B	14
					28	15 22 38	5.66 B	11
					29	12 25 45	3.44 B	11
	821.4		75					
		Boring terminated at 75.00 ft						

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)

GENERAL NOTES

Begin Drilling: 05-17-2005 Complete Drilling: 05-17-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&D Logger: J. Kosloski Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 25.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-025

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 895.95 ft
North: 1993281.71 ft
East: 992998.91 ft
Station: 2152+21.70
Offset: 75.00R

Elevation (ft)	Depth (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
894.9	0	12-inch black and brown SILTY CLAY LOAM					
		--TOPSOIL--					
		--BLIND DRILLING--					
862.9	32	Dense, gray SILTY LOAM		1	8 18 29	NP	15
860.4	34.5	Dense to very dense, gray LOAM		2	13 27 21	NP	9
	39			3	32 28 25	NP	12
	44			4	19 29 34	NP	6
850.4	45	Very dense, brown SANDY LOAM		5	17 20 40	NP	10
	47			6	50/4"	NP	8
848.4	47.5	--AUGER REFUSAL--					
		Boring terminated at 47.50 ft					

GENERAL NOTES

Begin Drilling: 06-09-2005 Complete Drilling: 06-09-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&B Logger: T. Rickey Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: DRY
At Completion of Drilling: DRY
Time After Drilling: NA
Depth to Water: NA

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

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BORING LOG S-027

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 895.25 ft
North: 1993279.32 ft
East: 993047.58 ft
Station: 2152+71.77
Offset: 75.00R

Depth (ft)	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	895.0	3-inch thick, brown SILTY CLAY LOAM –TOPSOIL–					
		Very stiff to hard, brown SILTY CLAY LOAM		1	3 4 4	2.00 P	16
5				2	6 7 8	4.50 P	13
				3	6 9 11	4.50 P	13
10				4	5 7 9	4.00 P	14
				5	3 11 11	2.75 P	13
15				6	6 9 10	4.50 P	10
				7	8 11 20	2.75 P	10
	877.2	Dense to very dense, brown GRAVELLY SAND					
20				8	16 34 27	NP	4
				9	13 22 22	NP	4
25				10	17 20 28	NP	5
	868.2	Dense, brown, SANDY LOAM					
30				11	13 17 22	NP	20
	861.2	Very stiff, gray CLAY LOAM		12	16 13 19	2.62 B	18
35	859.7	Very dense, gray LOAM		13	19 29 46	NP	9
40				14	23 29 38	NP	9
				15	19 32 42	NP	7
	852.2	Very stiff to hard, brown CLAY LOAM					
45				16	22 31 47	4.00 P	11
		–A-4 (2)– –LL=20% PL=11%– GRAVEL=8.8% SAND=30.4% SILT=39.2% CLAY=21.6%		17	14 17 26	2.21 S	10
50				18	2 16 18	7.54 B	11

GENERAL NOTES

Begin Drilling: 04-13-2005 Complete Drilling: 04-13-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: K&S Logger: Y. Shiu Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 26.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-027

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 895.25 ft
North: 1993279.32 ft
East: 993047.58 ft
Station: 2152+71.77
Offset: 75.00R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
					19	12 23 32	8.53 B	11
					20	12 18 25	6.97 S	10
			55					
	838.7				21	24 50/4"	> 4.50 P	13
		Very dense, brown SANDY LOAM						
					22	32 50/5"	NP	12
			60					
	834.7							
		Very dense, brown, medium to coarse SAND			23	11 32 27	NP	10
	833.0							
		Hard, brown CLAY LOAM			24	16 26 34	9.59 B	10
	830.2		65					
		Boring terminated at 65.00 ft						
			70					
			75					

GENERAL NOTES

Begin Drilling: 04-13-2005 Complete Drilling: 04-13-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: K&S Logger: Y. Shiu Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 26.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-029

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 893.53 ft
North: 1993276.08 ft
East: 993099.74 ft
Station: 2153+25.41
Offset: 74.68R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		--BLIND DRILLING TO 36 FEET--	0					
			5					
			10					
			15					
			20					
			25					
	857.5	Dense, gray SILT	30					
	855.5	Hard, brown CLAY LOAM	35					
	853.0	Very dense, brown LOAM	40					
			45					
			50					

Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
1	12 23 21	NP	17
2	7 9 12	4.10 B	16
3	12 22 32	NP	8
4	50/5"	NP	7
5	50/4"	NP	11
6	31 50 50/4"	NP	5

GENERAL NOTES

Begin Drilling: 06-27-2005 Complete Drilling: 06-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: K&J Logger: J. Kasnick Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ <36
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-029

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 893.53 ft
North: 1993276.08 ft
East: 993099.74 ft
Station: 2153+25.41
Offset: 74.68R

Elevation (ft)	Depth (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
				7	52 50/4"	NP	7
840.0							
		Hard, brown CLAY LOAM		8	50/1"		
	55						
				9	13 18 25	5.74 B	10
	60			10	16 26 29	5.82 B	10
				11	16 27 30	8.94 B	10
830.5							
		Very dense, fine to coarse SAND		12	26 46 24	NP	14
829.0							
		Hard, brown CLAY LOAM		13	11 22 43	5.90 B	10
	65						
				14	15 28 50/5"	> 10.25 B	10
823.5	70						
		Boring terminated at 70.00 ft					
	75						

GENERAL NOTES

Begin Drilling: 06-27-2005 Complete Drilling: 06-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: K&J Logger: J. Kasnick Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ <36
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-031

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 892.54 ft
North: 1993281.02 ft
East: 993125.15 ft
Station: 2153+50.96
Offset: 67.68R

Depth (ft)	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
0	891.4	13-inch thick, black and brown SILTY CLAY LOAM --TOPSOIL--					
		Stiff to very stiff, brown SILTY CLAY LOAM					
				1	3 4 5	1.39 S	23
5				2	3 4 7	1.56 B	14
				3	2 5 6	2.21 B	14
10				4	3 8 10	2.87 B	12
				5	4 7 23	1.48 B	13
15				6	12 11 8	1.07 B	15
				7	14 14 21	NP	9
	874.5	Dense, brown GRAVELLY SAND					
20				8	16 23 22	NP	4
				9	16 21 20	NP	4
25				10	13 17 19	NP	3
	864.5	Dense, brown fine SAND					
30				11	16 19 20	NP	4
				12	12 17 18	NP	19
	861.0	Medium dense to dense, brown to gray SILTY LOAM					
				13	15 21 23	NP	26
35				14	8 12 19	NP	19
				15	15 13 14	NP	16
	854.5	Very stiff, gray CLAY LOAM to LOAM					
40				16	9 17 22	2.62 B	22
				17	14 22 27	2.05 B	10
	849.5	Very dense, brown LOAM					
45				18	12 26 31	NP	11
				19	29 33 50	NP	9
50				20	18 29 50/5"	NP	9

GENERAL NOTES

Begin Drilling: 06-09-2005 Complete Drilling: 06-10-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&B Logger: T. Rickey Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 28.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-031

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 892.54 ft
North: 1993281.02 ft
East: 993125.15 ft
Station: 2153+50.96
Offset: 67.68R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	839.5				21	31 38 35	NP	11
		Dense, gray, medium to coarse SAND	55		22	8 20 16	NP	13
	836.0	Hard, gray CLAY LOAM			23	11 25 32	> 10.25 B	13
	834.5	Dense to very dense, gray, fine to coarse SAND	60		24	8 36 50/5"	NP	16
					25	9 46 50/5.5"	NP	16
	829.5	Hard, gray CLAY LOAM	65		26	14 18 23	7.63 B	10
					27	14 31 31	7.71 B	10
	822.5		70		28	15 20 30	4.51 B	11
		Boring terminated at 70.00 ft	75					

GENERAL NOTES

Begin Drilling: 06-09-2005 Complete Drilling: 06-10-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&B Logger: T. Rickey Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 28.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-033

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 888.93 ft
North: 1993266.95 ft
East: 993193.10 ft
Station: 2154+21.74
Offset: 75.01R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		--BLIND DRILLING TO 38.5 FEET--	5					
			10					
			15					
			20					
			25					
			30					
			35					
	850.4	Dense to very dense, brown LOAM	40		1	41 50/4"	NP	9
					2	4 16 25	NP	8
	845.9	Very dense, gray SANDY LOAM	45		3	25 35 53	NP	12
					4	18 27 50/5"	NP	14
	840.9	Very stiff, brown CLAY LOAM	50		5	24 39 47	2.71 S	9

GENERAL NOTES

Begin Drilling: 06-27-2005 Complete Drilling: 06-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: J. Kasnick Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 50.50 ft
At Completion of Drilling: ▼ DRY
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-033

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 888.93 ft
North: 1993266.95 ft
East: 993193.10 ft
Station: 2154+21.74
Offset: 75.01R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	838.4 ▽	Loose, gray, medium SAND						
	837.4	Very stiff to hard, brown CLAY LOAM			6	2 4 6	6.31 B	11
			55		7	5 20 21	3.69 B	11
					8	10 22 30	9.10 B	10
	830.9	Very dense, brown, fine SAND			9	18 50/4" ▽	NP	14
			60		10	25 49 50/3" ▽	NP	16
			65		11	23 47 50/5"	NP	13
	823.4	Hard, brown CLAY LOAM			12	14 25 29	5.66 B	10
	818.9		70		13	12 19 30	5.82 B	10
		Boring terminated at 70.00 ft	75					

GENERAL NOTES

Begin Drilling: 06-27-2005 Complete Drilling: 06-27-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: J. Kasnick Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling ▽: 50.50 ft
At Completion of Drilling ▼: DRY
Time After Drilling: NA
Depth to Water ▼: NA

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

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BORING LOG S-035

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 887.63 ft
North: 1993266.09 ft
East: 993241.61 ft
Station: 2154+71.26
Offset: 70.08R

Depth (ft)	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		Stiff, brown SILTY CLAY LOAM					
				1	2 4 6	1.48 B	17
				2	3 8 9	1.72 B	11
5							
				3	2 3 4	1.15 B	12
				4	10 50/0"		9
	877.9						
10		Medium dense, brown LOAM		5	10 14 10	NP	7
	874.6						
		Medium dense, brown SANDY LOAM		6	5 7 12	NP	11
15							
	872.1						
		Medium dense to very dense, brown GRAVELLY SAND		7	4 10 14	NP	3
				8	12 24 22	NP	3
20							
				9	21 38 36	NP	3
				10	8 18 19	NP	9
25							
				11	11 18 18	NP	7
				12	2 25 30	NP	16
30	857.6						
		Dense to very dense, gray LOAM		13	24 28 32	NP	9
				14	11 23 33	NP	8
35							
				15	14 24 19	NP	12
				16	6 15 28	NP	10
40							
	847.1						
		Medium dense, gray SANDY LOAM		17	1 1 12	NP	13
	844.6						
		Medium stiff to hard, brown CLAY LOAM		18	3 5 6	1.48 B	13
45							
				19	4 6 7	1.10 B	14
				20	4 4 6	0.90 B	14
50							

GENERAL NOTES

Begin Drilling: 06-13-2005 Complete Drilling: 06-14-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: W. Wang Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 23.00 ft
At Completion of Drilling: ▼ 40.00 ft
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-035

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 887.63 ft
North: 1993266.09 ft
East: 993241.61 ft
Station: 2154+71.26
Offset: 70.08R

Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
55		21	3 5 6	1.07 B	13
		22	2 4 8	1.89 B	13
		23	4 4 8	1.07 B	13
60		24	4 6 9	1.80 B	10
		25	4 8 15	4.51 B	11
65		26	9 11 14	4.18 B	12
		27	5 7 13	5.00 B	12
70		28	9 13 14		
75		29	7 10 12	3.69 S	12
80		30	10 14 10	3.00 P	13
85		31	7 12 16	3.61 B	12

802.6 Boring terminated at 85.00 ft

GENERAL NOTES

Begin Drilling: 06-13-2005 Complete Drilling: 06-14-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: S&J Logger: W. Wang Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling: ▽ 23.00 ft
At Completion of Drilling: ▼ 40.00 ft
Time After Drilling: NA
Depth to Water: ▼ NA

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

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BORING LOG S-037

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 886.19 ft
North: 1993254.42 ft
East: 993289.68 ft
Station: 2155+21.74
Offset: 75.09R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	885.4	10-inch thick, brown LOAM –TOPSOIL–						
		–BLIND DRILL–	5					
			10					
			15					
			20					
			25					
	845.2	Stiff, brown CLAY LOAM	30					
			35 ▽					
			40					
			45	1		5 5 8	1.72 B	13
				2		6 7 10	1.64 B	13
	840.7	Medium dense, brown LOAM		3		9 12 14	NP	17
	838.2	Stiff to very stiff, brown CLAY LOAM	50	4		5 6 8	1.48 B	12

GENERAL NOTES

Begin Drilling: 06-28-2005 Complete Drilling: 06-28-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: K&J Logger: K. Anderson Checked by: N. Davis
Drilling Method: 3.25-inch HSA

WATER LEVEL DATA

While Drilling ▽ 35.00 ft
At Completion of Drilling ▼ 71.80 ft
Time After Drilling NA
Depth to Water ▼ NA

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

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BORING LOG S-037

WEI Job No.: 201-23-01

Client: McDonough Associates, Inc.
Project: Bolz Road/Longmeadow Parkway
Location: Kane County, Illinois

Datum: NGVD
Elevation: 886.19 ft
North: 1993254.42 ft
East: 993289.68 ft
Station: 2155+21.74
Offset: 75.09R

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			55		5	7 8 13	2.87 B	12
					6	7 12 12	2.54 B	12
					7	6 8 9	2.05 B	12
			60		8	5 6 10	2.46 B	12
					9	5 9 13	3.20 B	12
			65		10	7 11 11	3.53 B	11
					11	8 15 17	3.44 B	12
			70		12	10 12 16	2.95 B	12
			75		13	11 21 28	–	15
			80		14	13 17 18	–	19
	801.2	Boring terminated at 85.00 ft	85		15	21 14 13	1.89 B	13
			90					
			95					
			100					

GENERAL NOTES

Begin Drilling: 06-28-2005 Complete Drilling: 06-28-2005
Drilling Contractor: PRECON DRILLING Drill Rig: CME-75 ATV
Driller: K&J Logger: K. Anderson Checked by: N. Davis
Drilling Method: 3.25 -inch HSA

WATER LEVEL DATA

While Drilling: ▽ 35.00 ft
At Completion of Drilling: ▼ 71.80 ft
Time After Drilling: NA
Depth to Water: ▼ NA

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

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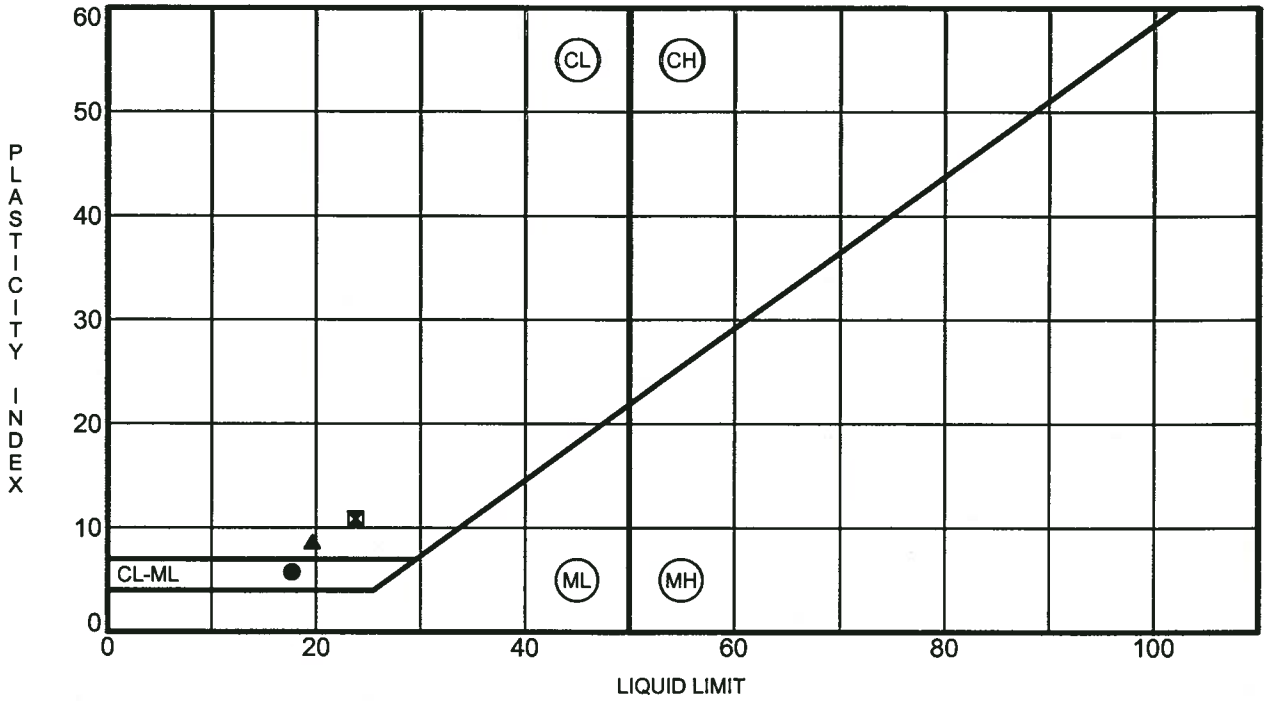
APPENDIX B



Specimen Identification		LL	PL	PI	Fines	IDH Classification
● S-017#9	46.0 ft	18	12	6	52	**Loam**
⊠ S-017#17	78.5 ft	24	13	11	63	**Clay Loam**
▲ S-027#17	46.0 ft	20	11	9	61	**Clay Loam**

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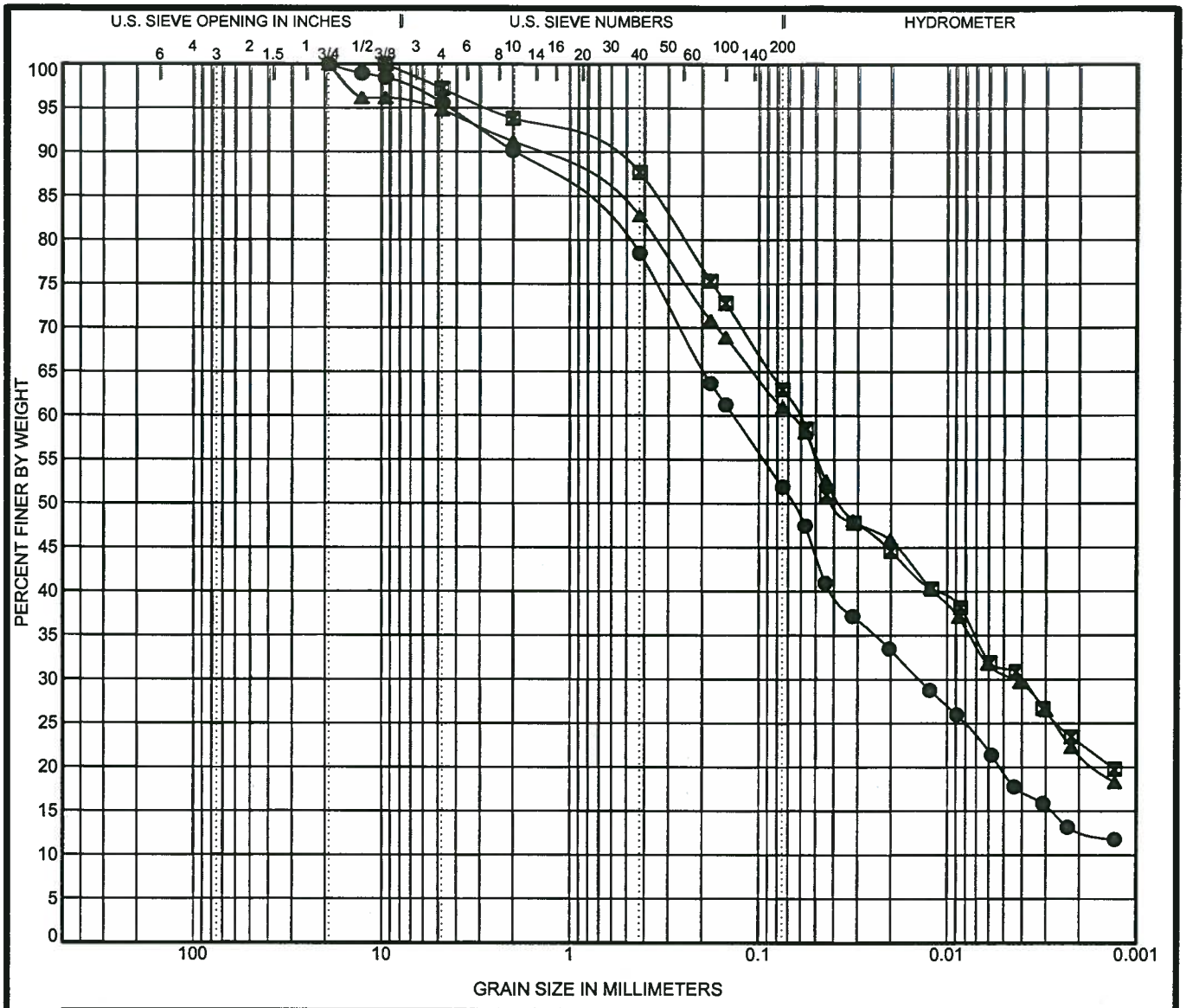
ATTERBERG LIMITS' RESULTS

Project: Bolz Road/Longmeadow Parkway

Location: Kane County, Illinois

Number: 201-23-01



COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

Specimen Identification		IDH Classification	LL	PL	PI	Cc	Cu
● S-017#9	46.0 ft	Loam	18	12	6		
⊠ S-017#17	78.5 ft	Clay Loam	24	13	11		
▲ S-027#17	46.0 ft	Clay Loam	20	11	9		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● S-017#9	46.0 ft	19	0.137	0.014		9.8	38.5	38.8	12.9
⊠ S-017#17	78.5 ft	9.5	0.062	0.004		6.2	31.1	39.9	22.8
▲ S-027#17	46.0 ft	19	0.068	0.004		8.8	30.4	39.2	21.6

WEI GRAIN SIZE IDH 2012301.GPJ US_LAB.GDT 3/10/11

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GRAIN SIZE DISTRIBUTION

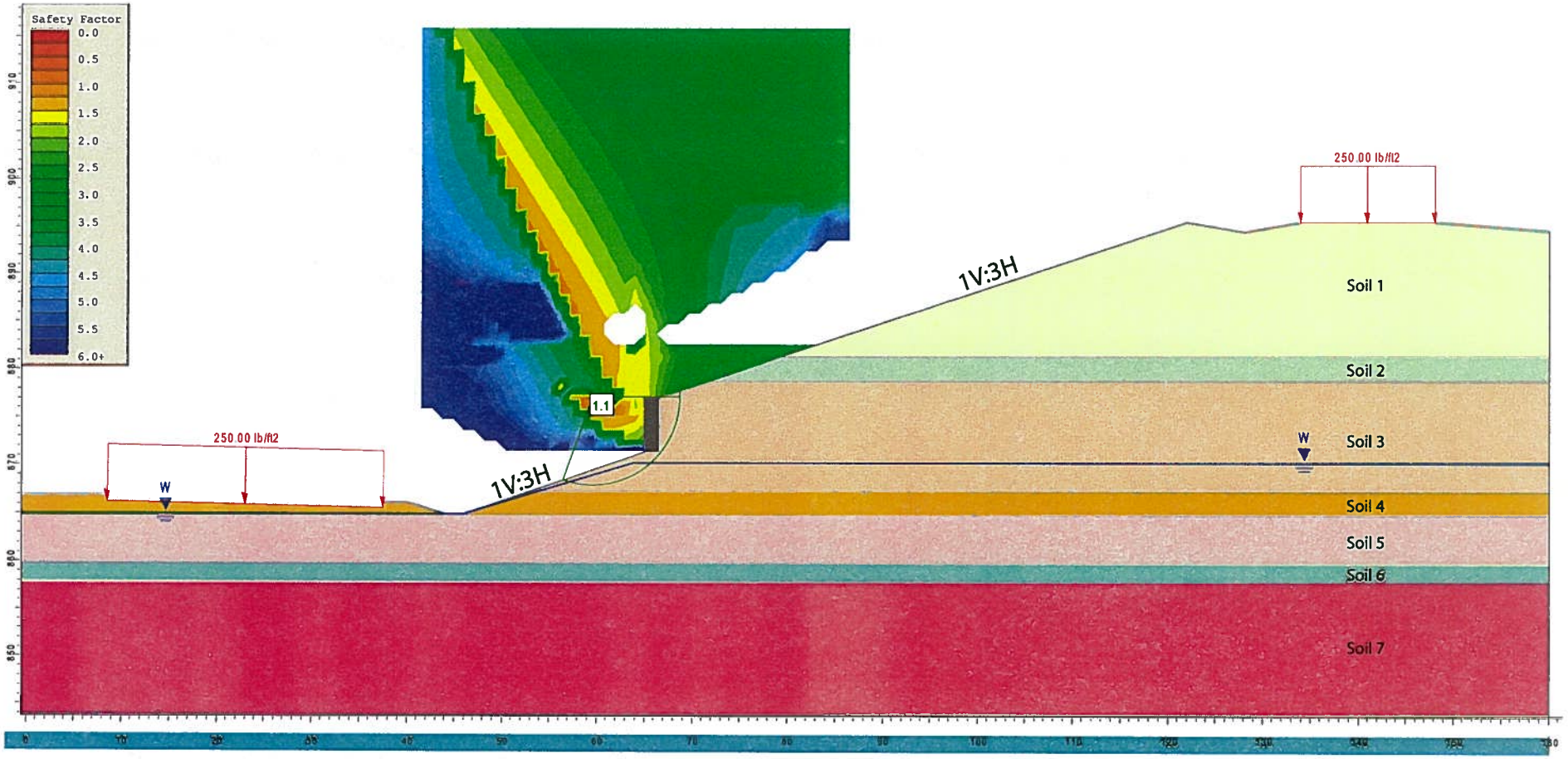
Project: Bolz Road/Longmeadow Parkway

Location: Kane County, Illinois

Number: 201-23-01

APPENDIX C

RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2151+00 (REFERENCED BORING S-019) RETAINED HEIGHT = 5.65 FT
WITHOUT WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Stiff Silty Clay	120	1830	0
2	Dense Loam	130	0	38
3	Dense Gravelly Sand	125	0	36
4	Dense Fine Sand	120	0	35
5	Very Stiff Clay Loam	130	3000	0
6	Dense Gravelly Sand	125	0	36
7	Medium Dense Loam	120	0	33

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-1A** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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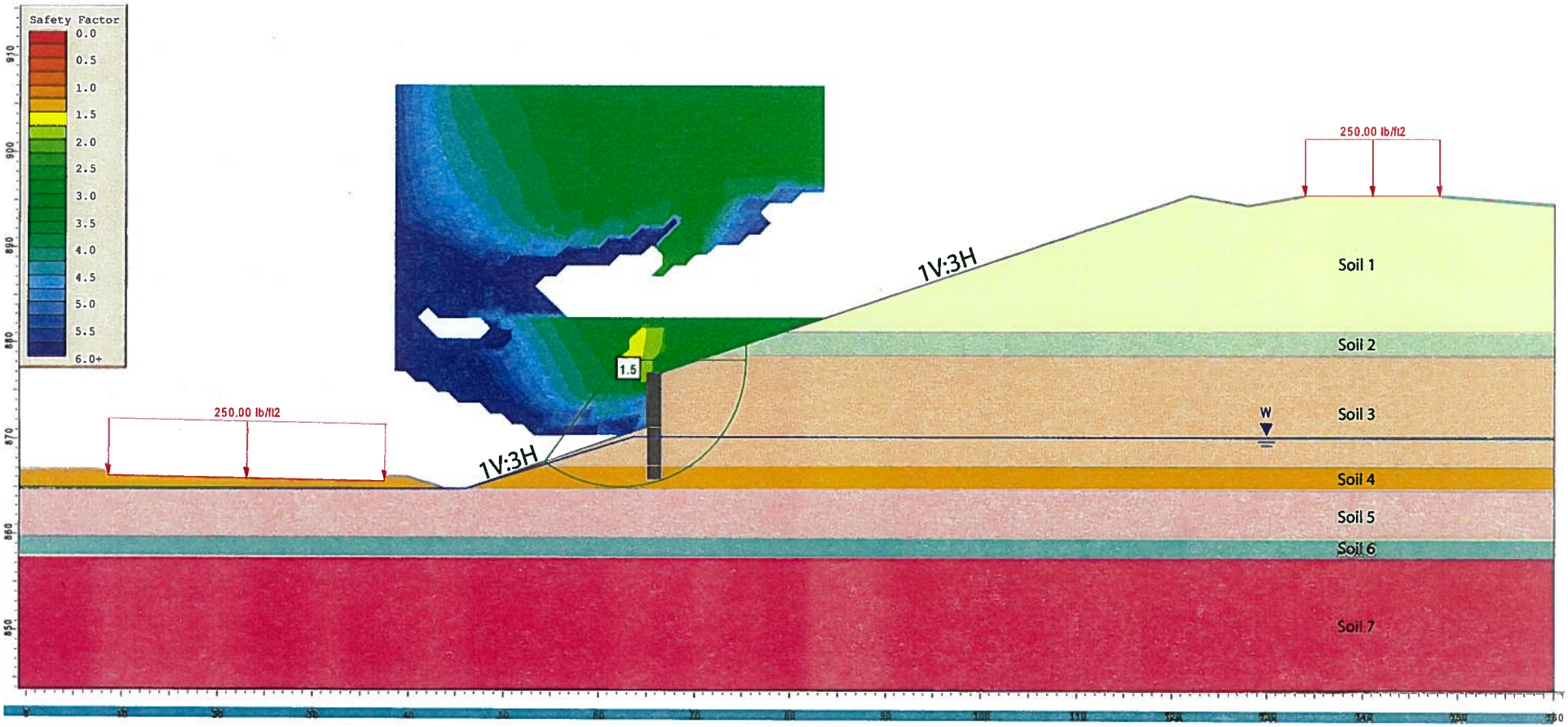
RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2151+00 (REFERENCED BORING S-019) RETAINED HEIGHT = 5.65 FT
WITH 5.5-FOOT DEEP WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Stiff Silty Clay	120	1830	0
2	Dense Loam	130	0	38
3	Dense Gravelly Sand	125	0	36
4	Dense Fine Sand	120	0	35
5	Very Stiff Clay Loam	130	3000	0
6	Dense Gravelly Sand	125	0	36
7	Medium Dense Loam	120	0	33

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-1B** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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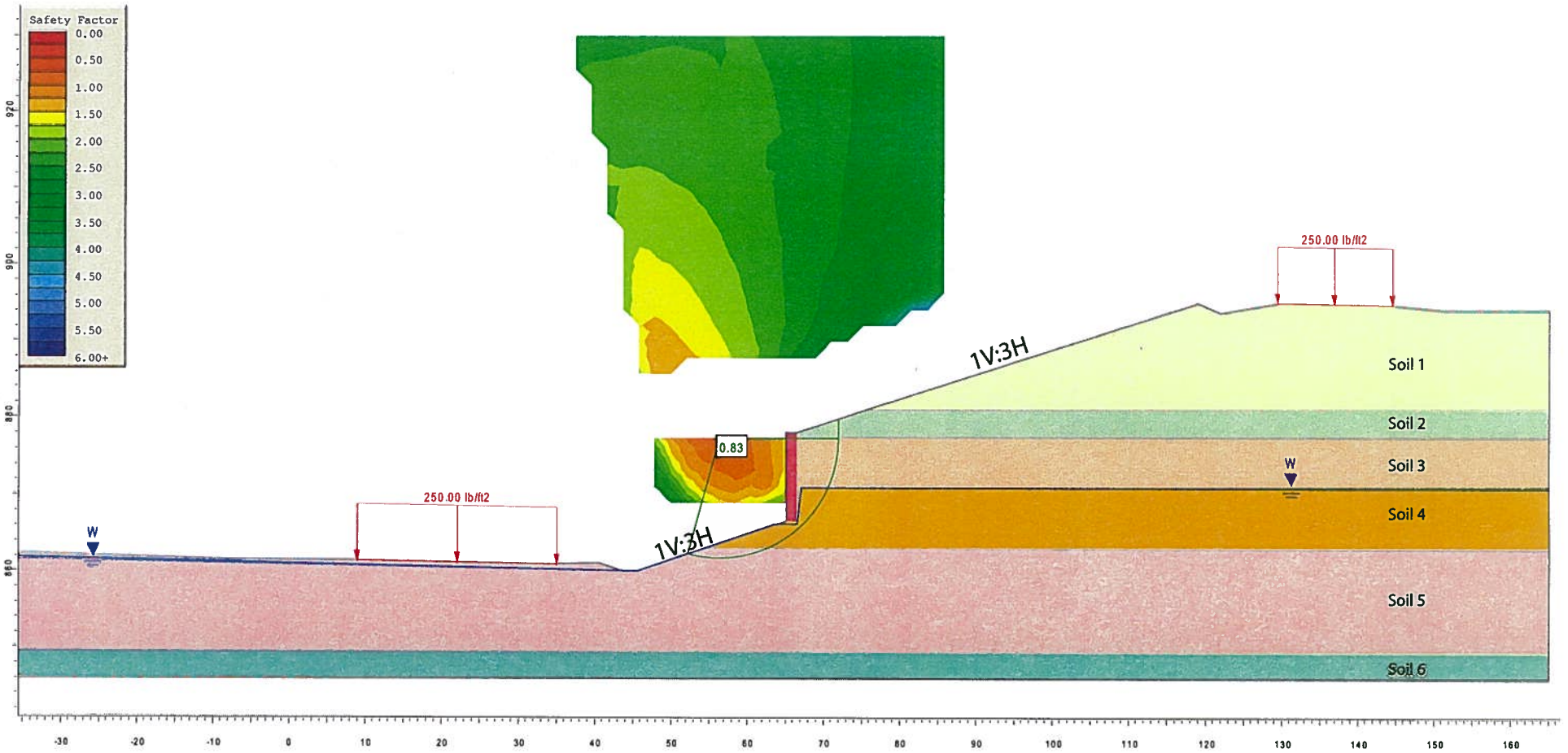
RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2152+00 (REFERENCED BORING S-023) RETAINED HEIGHT = 11.5 FT
WITHOUT WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Stiff Silty Clay Loam	125	1890	0
2	Medium Stiff Silty Clay Loam	120	800	0
3	Med. Dense to Very Dense Gravelly Sand	130	0	38
4	Very Dense Sandy Loam	130	0	39
5	Dense to Very Dense Loam	130	0	40
6	Very Dense Gravelly Sand	130	0	40

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-2A** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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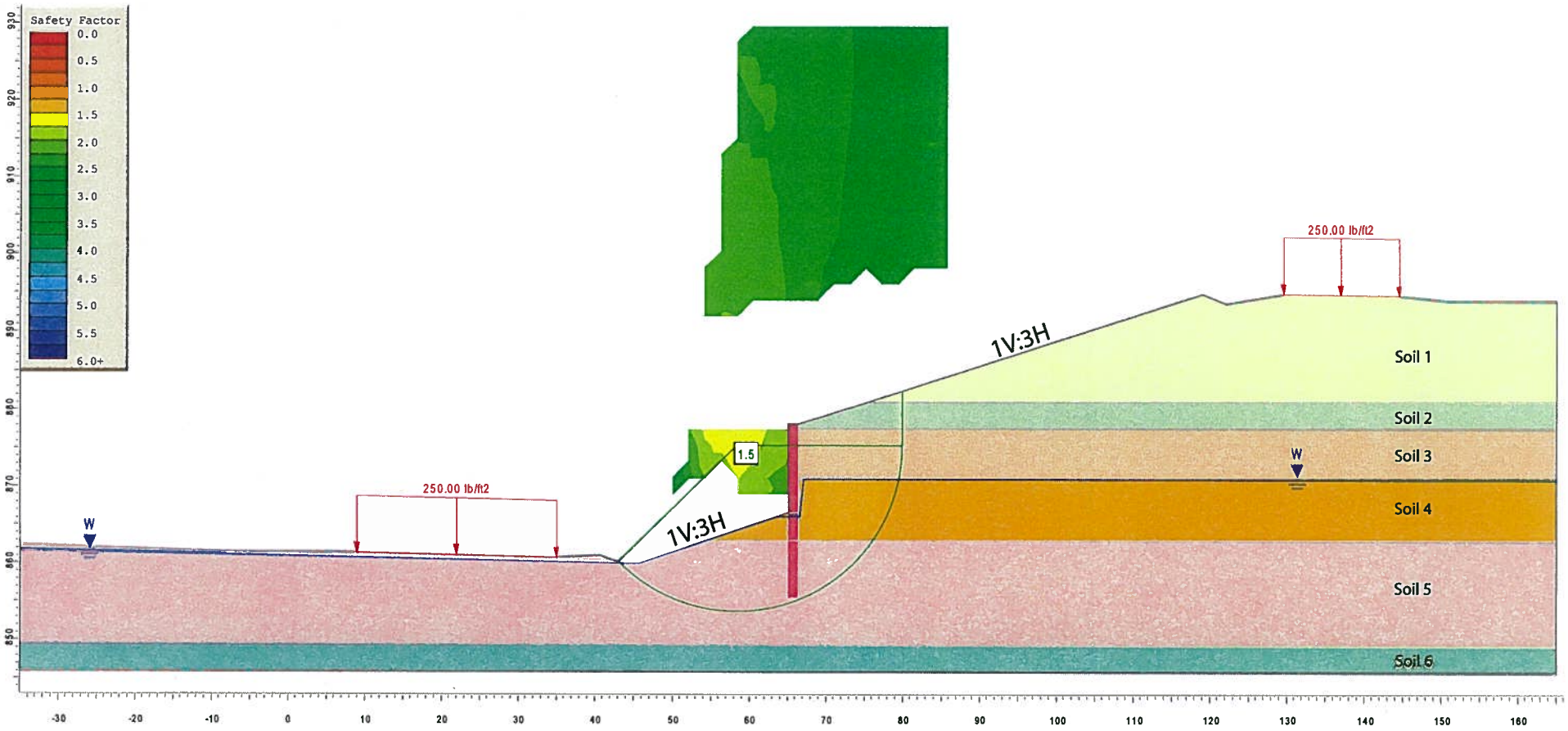
RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2152+00 (REFERENCED BORING S-023) RETAINED HEIGHT = 11.5 FT
WITH 11-FOOT DEEP WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Stiff Silty Clay Loam	125	1890	0
2	Medium Stiff Silty Clay Loam	120	800	0
3	Med. Dense to Very Dense Gravelly Sand	130	0	38
4	Very Dense Sandy Loam	130	0	39
5	Dense to Very Dense Loam	130	0	40
6	Very Dense Gravelly Sand	130	0	40

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-2B** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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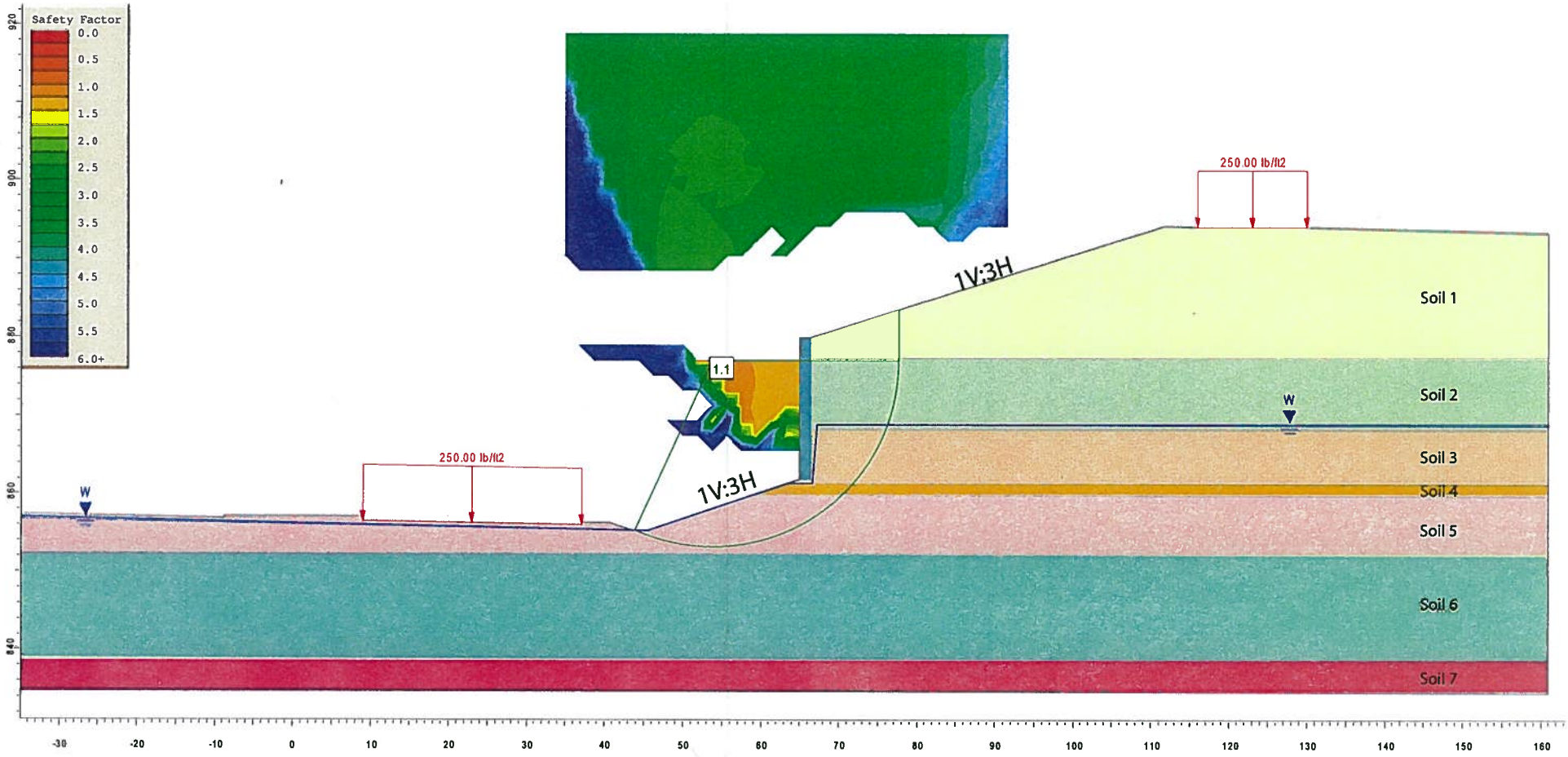
RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2153+00 (REFERENCED BORING S-027) RETAINED HEIGHT = 18.1 FT
WITHOUT WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Very Stiff to Hard Silty Clay Loam	130	3570	0
2	Dense to Very Dense Gravelly Sand	130	0	38
3	Dense Sandy Loam	130	0	37
4	Very Stiff Clay Loam	130	2600	0
5	Very Dense Loam	130	0	39
6	Very Stiff to Hard Clay Loam	130	5000	0
7	Very Dense Sandy Loam	130	0	40

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-3A** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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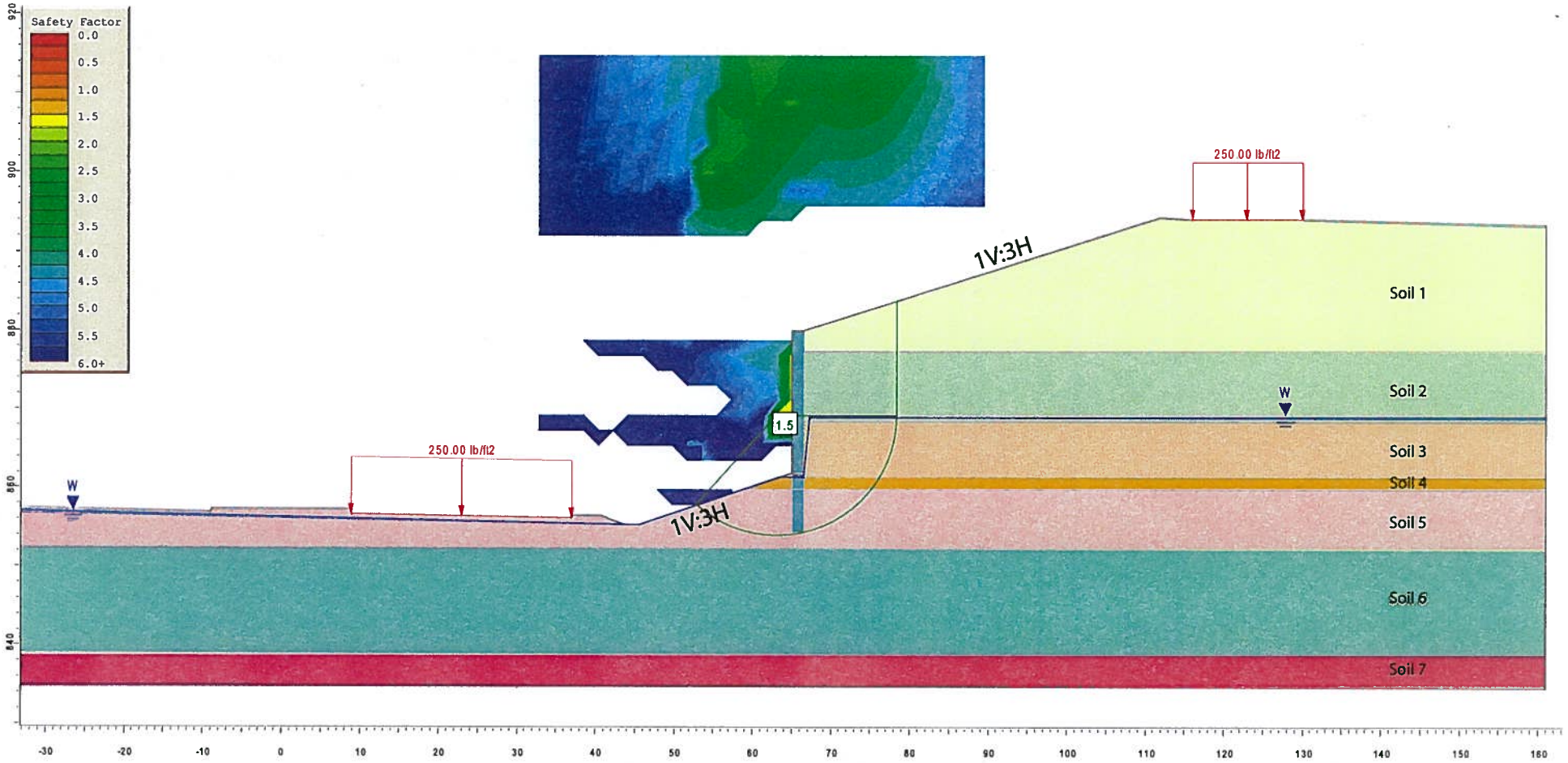
RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2153+00 (REFERENCED BORING S-027) RETAINED HEIGHT = 18.1 FT
WITH 7.5-FOOT DEEP WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Very Stiff to Hard Silty Clay Loam	130	3570	0
2	Dense to Very Dense Gravelly Sand	130	0	38
3	Dense Sandy Loam	130	0	37
4	Very Stiff Clay Loam	130	2600	0
5	Very Dense Loam	130	0	39
6	Very Stiff to Hard Clay Loam	130	5000	0
7	Very Dense Sandy Loam	130	0	40

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-3B** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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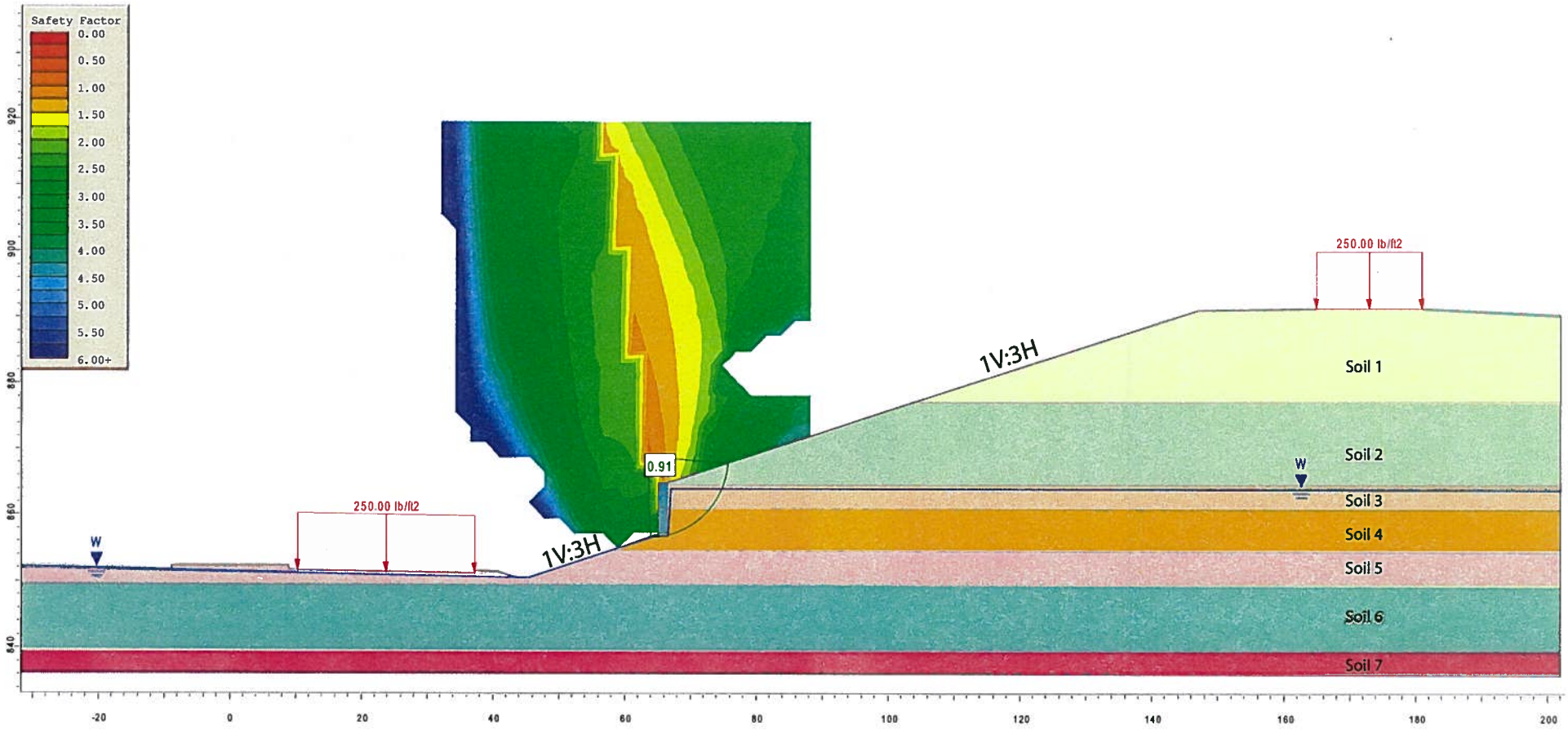
RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2154+00 (REFERENCED BORING S-031) RETAINED HEIGHT = 7.9 FT
WITHOUT WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Stiff to Very Stiff Silty Clay Loam	125	1760	0
2	Dense Gravelly Sand	130	0	38
3	Dense Fine Sand	130	0	36
4	Medium Dense to Dense Silty Loam	125	0	35
5	Very Stiff Clay Loam	130	2200	0
6	Very Dense Loam	130	0	39
7	Dense Sand	125	0	36

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-4A** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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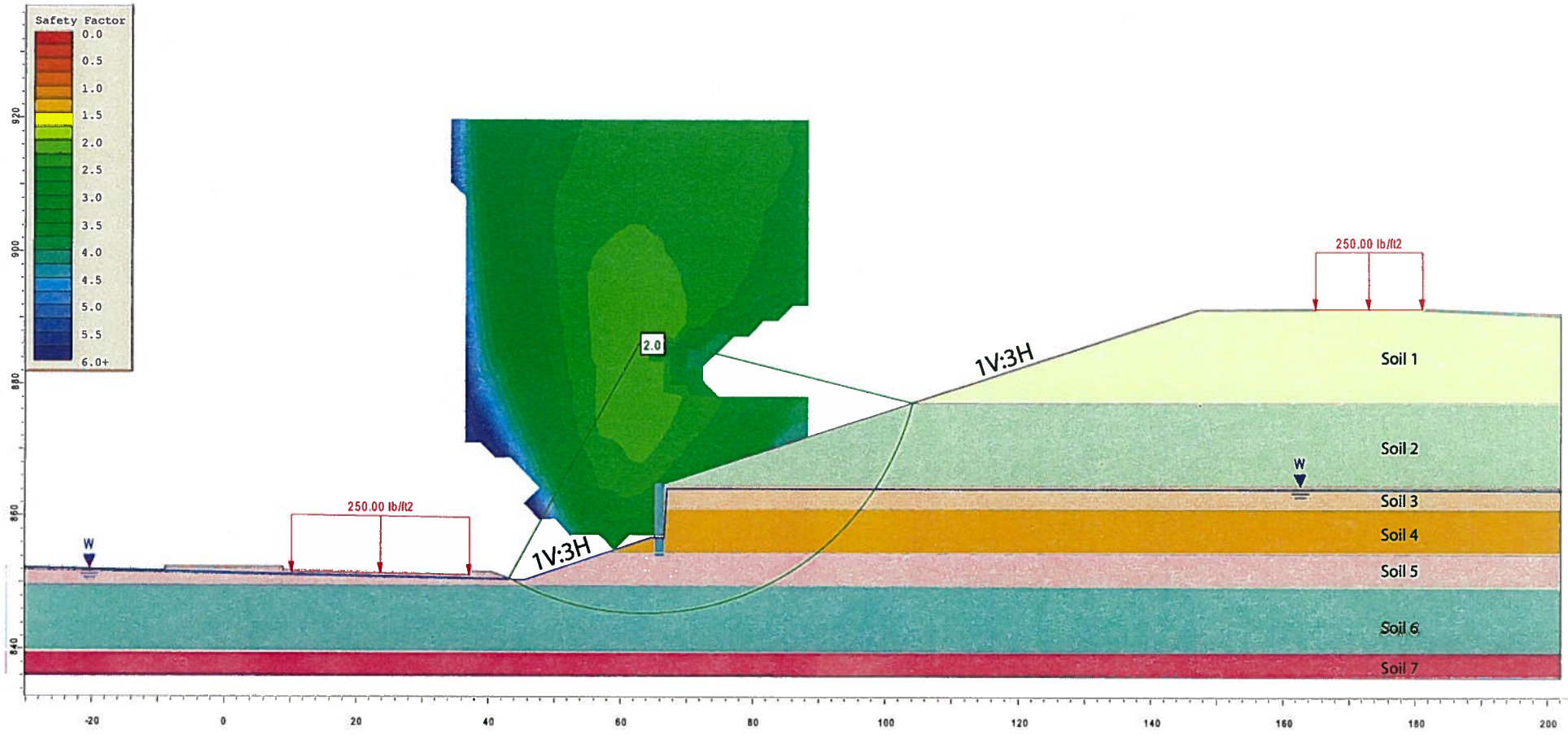
RETAINING WALL 2 - UNDRAINED GLOBAL STABILITY ANALYSIS
STATION 2154+00 (REFERENCED BORING S-031) RETAINED HEIGHT = 7.9 FT
WITH 3-FOOT DEEP WALL PENETRATION



Soil Properties:

Soil ID	Soil Type	Unit Weight (pcf)	Undrained Parameter c_u (psf)	ϕ (deg.)
1	Stiff to Very Stiff Silty Clay Loam	125	1760	0
2	Dense Gravelly Sand	130	0	38
3	Dense Fine Sand	130	0	36
4	Medium Dense to Dense Silty Loam	125	0	35
5	Very Stiff Clay Loam	130	2200	0
6	Very Dense Loam	130	0	39
7	Dense Sand	125	0	36

GLOBAL STABILITY ANALYSIS: BOLZ ROAD/LONGMEADOW PKW OVER FOX RIVER, IDOT NO. P-91-393-94, KANE COUNTY, IL

SCALE: GRAPIC | **APPENDIX C-4B** | DRAWN BY: A.A.K. CHECKED BY: M.A.K.

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