

---

**ROADWAY GEOTECHNICAL REPORT  
FAP 866 (IL 83)  
FROM IL 120 TO IL 137 AT ATKINSON ROAD  
IDOT P-91-237-11, PTB 166, ITEM 4  
LAKE COUNTY, ILLINOIS**

**For  
exp. U.S. Services Inc.  
205 North Michigan Avenue  
Suite 3600  
Chicago, IL 60601-5924**

**Submitted by  
Wang Engineering, Inc.  
1145 North Main Street  
Lombard, IL 60148  
(630) 953-9928**

**Original: June 23, 2014  
Revised: July 25, 2014**

**Technical Report Documentation Page**

<b>1. Title and Subtitle</b> Roadway Geotechnical Report FAP 866 (IL 83) from IL 120 to IL 137 at Atkinson Road Lake County, Illinois		<b>2. Report Date</b> July 25, 2014
		<b>3. Report Type</b> <input type="checkbox"/> SGR <input checked="" type="checkbox"/> RGR <input type="checkbox"/> Draft <input checked="" type="checkbox"/> Final <input checked="" type="checkbox"/> Revised
<b>4. Route / Section / County</b> 866 /xxx-xxxx / Lake		<b>5. IDOT Job/ Contract No.</b> P-91-237-11/NA
<b>6. PTB / Item No.</b> 166/004	<b>5. Existing Structure Number(s)</b> N/A	<b>6. Proposed Structure Number(s)</b> N/A
<b>7. Prepared by</b> Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148	<b>Contributor(s)</b> Author: Metin W. Seyhun, P.E. PIC: Corina T. Farez, P.E., P.G. QA/QC: Jerry W.H. Wang, Ph.D., P.E.	<b>Contact Phone Number</b> (630) 953-9928, Ext. 1018 mseyhun@wangeng.com
<b>9. Prepared for</b> exp US Services Inc. 205 North Michigan Avenue, Suite 3600 Chicago, IL 60601-5924	<b>Design / Structural Engineer</b> Andrew Lee, P.E.	<b>Contact Phone Number</b> (312) 616-6184
<b>10. Abstract</b>  <p>The following report presents the roadway geotechnical subsurface investigation results and recommendations for the design and construction of Illinois Route 83(IL 83) from IL 120 to IL 137 at Atkinson Road. The proposed sections will consist of new alignments to IL 137, IL 83 and Ivanhoe Road. The proposed sections will include up to 11 feet of new embankment fill and cuts up to 18 feet deep.</p> <p>The top subgrade soils consist of medium stiff to hard clay to silty clay loam with occasional cohesive and granular surface fills encountered. Up to 9 feet of crushed stone and asphalt fill was encountered in the vicinity of the Vulcan Yard along the proposed IL 83 alignment near the existing Canadian National railroad.</p> <p>IDOT Mechanistic Pavement Design (MPD) should include a minimum 12 inches of improved subgrade thickness. This blanket improvement will cover the majority of the proposed improvements with the exception of three locations where additional improvement beyond the MPD improved aggregate subgrade will be needed due to weak soils. The roadway sections should be designed for an SSR value of POOR or IBR value of 2.</p> <p>The subgrade soils will exhibit poor drainage characteristics due to its cohesive nature. Wang recommends the installation of transverse pipe underdrains installed at 300 to 500 foot intervals and at low points in the roadway.</p> <p>The surcharge caused by the proposed maximum 11 foot embankment fill along the new alignment gave an estimated long-term settlement of less than 1 inch, which is acceptable. Proposed deep cuts along the alignment showed adequate factors of safety against global instability.</p>		
<b>11. Path to archived file</b> S:\Netprojects\3410701\Reports\ RGR\RPT_Wang_MWS_3410701IL83AtkinsonRoadRGRV02_20140725.pdf		

## TABLE OF CONTENTS

<b>1.0 INTRODUCTION .....</b>	<b>1</b>
2.1 PHYSIOGRAPHY .....	2
2.2 SITE PEDOLOGICAL FEATURES .....	2
2.3 SURFICIAL COVER .....	3
2.4 BEDROCK.....	3
2.5 CLIMATE DATA.....	3
<b>3.0 METHODS OF INVESTIGATION .....</b>	<b>5</b>
3.1 SUBSURFACE INVESTIGATION .....	5
3.2 LABORATORY TESTING.....	7
<b>4.0 RESULTS OF FIELD AND LABORATORY INVESTIGATIONS.....</b>	<b>7</b>
4.1 TOPSOIL CHARACTERIZATION .....	7
4.2 EXISTING PAVEMENT STRUCTURE.....	8
4.3 SUBGRADE SOIL CONDITIONS.....	8
4.3.1 PR IL 137/PR IL 83/PR INTERIM PR IL 83 Alignment.....	8
4.3.2 PR IL 83/EX Atkinson Road Alignment.....	9
4.3.3 PR Ivanhoe Road Alignment (North and South).....	9
4.4 GROUNDWATER CONDITIONS .....	10
<b>5.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS.....</b>	<b>10</b>
5.1 SITE PREPARATION AND EARTHWORK.....	10
5.2 SUBGRADE TREATMENT AND RECOMMENDATIONS .....	11
5.3 SUBGRADE SUPPORT RATING .....	13
5.4 ROADWAY DRAINAGE .....	13
5.5 EMBANKMENTS .....	13
5.5.1 Embankment Settlement.....	14
5.5.2 Global Stability.....	14
<b>6.0 CONSTRUCTION CONSIDERATIONS.....</b>	<b>14</b>
6.1 EXCAVATION AND DEWATERING .....	14
6.2 FILLING AND BACKFILLING.....	15
6.3 EARTHWORK OPERATIONS.....	15

**7.0 QUALIFICATIONS..... 16**

REFERENCES

EXHIBITS

- 1. Site Location Map*
- 2. Site Pedological Map and Features*
- 3. Site and Regional Geology*
- 4. IDH Textural Classification Chart*
- 5. Subgrade Support Rating Chart*

APPENDIX A

*Boring Logs and Pavement Core Photographs*

APPENDIX B

*IDOT BMPR 507A and 508B Forms and Special Provisions*

APPENDIX C

*Laboratory Test Results*

APPENDIX D

*Global Stability Evaluations*

APPENDIX E

*Soil Boring Location Plans and Soil Profiles*

---

**ROADWAY GEOTECHNICAL REPORT**  
**FAP 866 (IL 83)**  
**IDOT JOB P-91-237-11, PTB 166, ITEM 4**  
**LAKE COUNTY, ILLINOIS**  
**FOR**  
**exp. U.S. Services Inc.**

## 1.0 INTRODUCTION

This report presents the results of our roadway geotechnical subsurface investigation, laboratory testing, and engineering analyses and evaluations for the design and construction of FAP 966 (IL 83) from IL 120 to IL 137 at Atkinson Road. The work will consist of the reconstruction of the roadway and the realignment of IL 137 and IL 83 intersection to align with the Atkinson Road extension in Lake County, Illinois. A *Site Location Map* is presented as Exhibit 1.

Based on Phase II Roadway Design Drawings provided by exp. April 2014, Wang Engineering, Inc. (Wang) understands the realignment improvement is for the following proposed (PR) sections:

- PR IL 137/ PR IL 83/INTERIM PR IL 83 from Station 175+12.00 (meet existing) to Station 211+00.00 (end of scope)
- PR IL 83/EX Atkinson Road from Station 411+23.00 (meet existing) to Station 437+01.00
- New Intersection at PR IL 83/EX Atkinson Road at Station 432+40.00 (approx.) and PR IL 137 Station 191+80.00 (approx.)
- PR Ivanhoe Road (South) from Station 283+51.87(intersect PR IL 83) to approx. Station 295+00.00 (cul de sac)
- PR Ivanhoe Road (North) from approx. Station 302+00.00 (cul de sac) to approx. Station 309+50.00 (curb return IL 120)

A total of 47 soil borings and 5 pavement cores were obtained by Wang. Forty one of the soil borings were drilled in April 2011 as part of PTB 158/004. Six additional soil borings as well as the pavement cores were performed in May 2014 as part of the new PTB 166/004. This Roadway Geotechnical Report (RGR) combines the results of Wang investigations, as well as investigations performed by others.

The purpose of the investigations was to characterize the site soil and groundwater conditions and

provide geotechnical analyses and recommendations for the design and construction of the proposed roadway improvements.

## **2.0 SITE AND REGIONAL GEOLOGY**

The project area is located south of IL 120 in the Village of Grayslake, Lake County, Illinois. On the USGS *Grayslake Quadrangle 15 Minute Series* map, E1/2 of Section 35 Tier 45N and NE1/4 Section 2 Tier 44N, and Range 10 E of the Third Principal Meridian.

The following review of published pedological, geological, and climatological data, with emphasis on factors that might influence the design and construction of the proposed engineering works, is meant to place the project area within a physiographic and geological framework and thus to confirm the dependability and consistency of the subsurface investigation results. For the study of the regional geologic framework, Wang considered the northeastern Illinois area in general and Lake County in particular.

### **2.1 Physiography**

The project area is part of the Wheaton Morainal County, characterized by glacial morainic topography. A series of broad, morainic ridges parallel the Lake Michigan shores. Valparaiso morainic system dominates the Grayslake Quadrangle. Today topography shows a variety of elongated hills, mounds, basins, sags, and valleys (Leighton 1948). An approximately 250-foot thick glacial drift covers the bedrock (Stumpf 2004). The surface elevation slopes westward with an average slope of 4% from as high as 823 feet to as low as 790 feet.

### **2.2 Site Pedological Features**

The project site was shaped during the Wisconsin glaciation. After the Wisconsin glaciation, several types of soils developed through weathering on the glacial sediments. In Lake County, the soil types were surveyed by the United States Department of Agriculture (USDA). Exhibits 2-1 through 2-3 present *Site Pedological Maps and Features* and summarize the USDA soil types within the project area, their relevant geotechnical index properties, and suitability rating as subgrade for light to medium traffic and as construction material for road fill. The soil information provided by USDA (Version 7, Dec. 8, 2013) is meant to be used as a general reference in the absence of a site-specific investigation. In this instance, our findings regarding soil features affecting suitability for highway and street construction are not necessarily consistent with the information presented in the Exhibits 2-1 to 2-3. Though a useful guide to general surficial soil conditions within the county, the USDA ratings for soil frost susceptibility and suitability as road subgrade seem overly critical and are

probably based on different criteria than those applied in roadway engineering works. In addition, a map showing the average organic content for the soils delineated along the project is presented in Exhibit 2-1.

### **2.3 Surficial Cover**

The surficial cover is the result of Wisconsin-age glacial activity. The glacial deposits were emplaced during pulsating advances and retreats of an icesheet lobe responsible for the formation of end moraines and associated low-relief till and lake plains (Hansel and Johnson 1996). The depressions left behind by the melting glacier today are mainly filled by fine-grained lake plain deposits of the Equality Formation which are occasionally accompanied by peat, muck and organic-rich silt of the Grayslake Peat. Most of the glacial drift is made up of silty clay loam to silty clay diamicton of the Wadsworth Formation. Interbedded silt, sand and gravel are present occasionally within the diamicton (Stumpf 2004, Hansel and Johnson 1996). Along the project area the drift thickness is approximately 250-foot thick. Exhibit 3 illustrates the *Site and Regional Geology*.

### **2.4 Bedrock**

In Lake County, the surficial cover rests unconformably on top of Silurian-age bedrock that dips eastward at a pace of about 30 feet per mile. The top of the bedrock lies at approximately 250 feet below the ground surface (bgs) and 550 feet elevation. The approximately 300-foot thick Silurian bedrock is made up of dolostone (Leetaru et al 2003). Roadway borings drilled along the project have not encountered bedrock.

Our subsurface investigation results fit into the local geologic context. The borings drilled in the project area revealed the native sediments consists of occasional organic silt and clay (Grayslake Peat), lacustrine clays (Equality Formation) underlain by silty clay diamicton (Wadsworth Formation).

### **2.5 Climate Data**

The subsurface investigation was largely performed between August 10 and August 30, 2011. To assess the possible effects of temperature and precipitation on water table data and soil moisture, the climatic conditions for the investigation period and three months prior to the start of the investigation are summarized graphically in Figures 1 and 2. The precipitation and temperature data for the investigation period are compared against thirty-year monthly data (1981 to 2010) in box-and-whiskers format to show deviations from “normal” climate conditions during the current investigation. Local climatologic data were obtained from the Chicago, O’Hare Station (NCDC 2013).

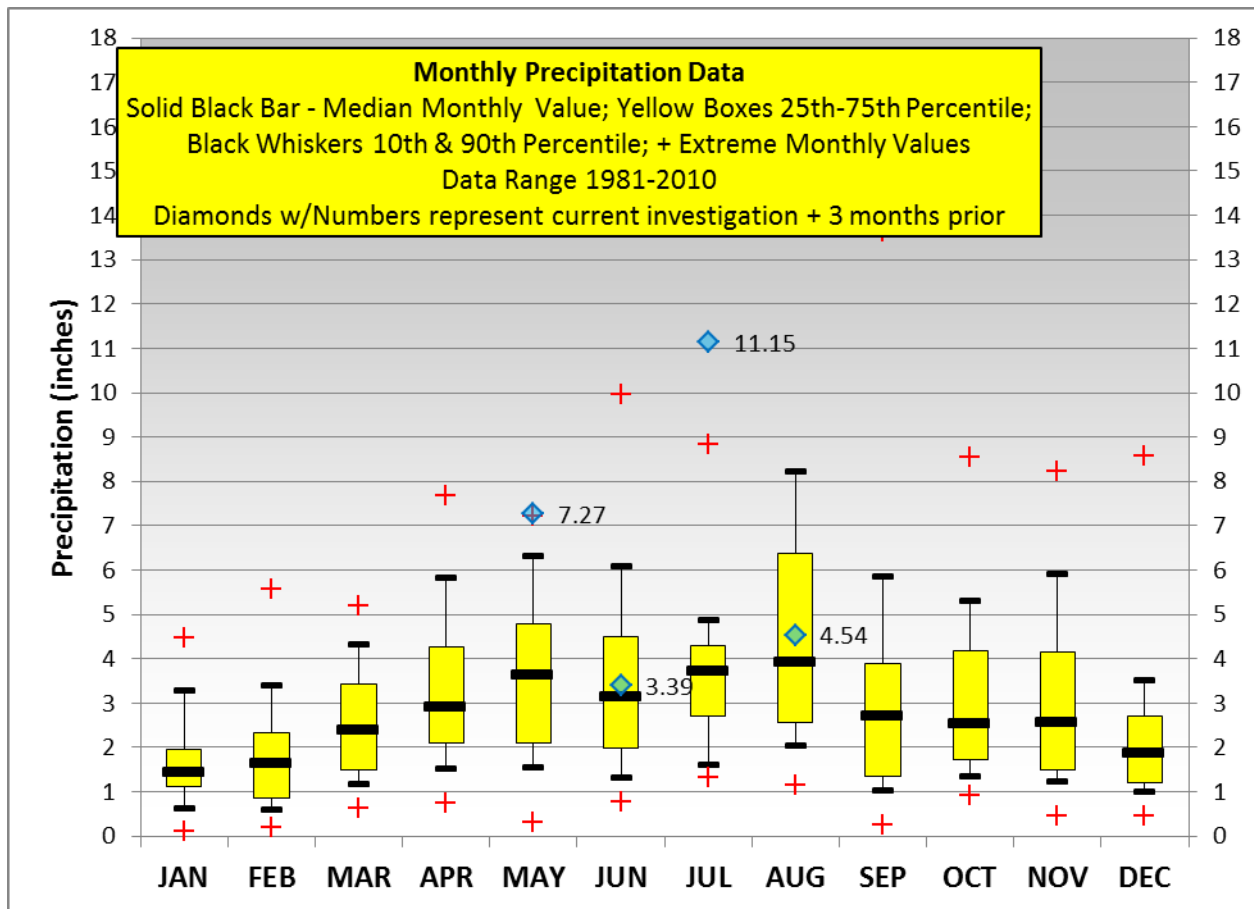


Figure 1: Monthly Precipitation Data



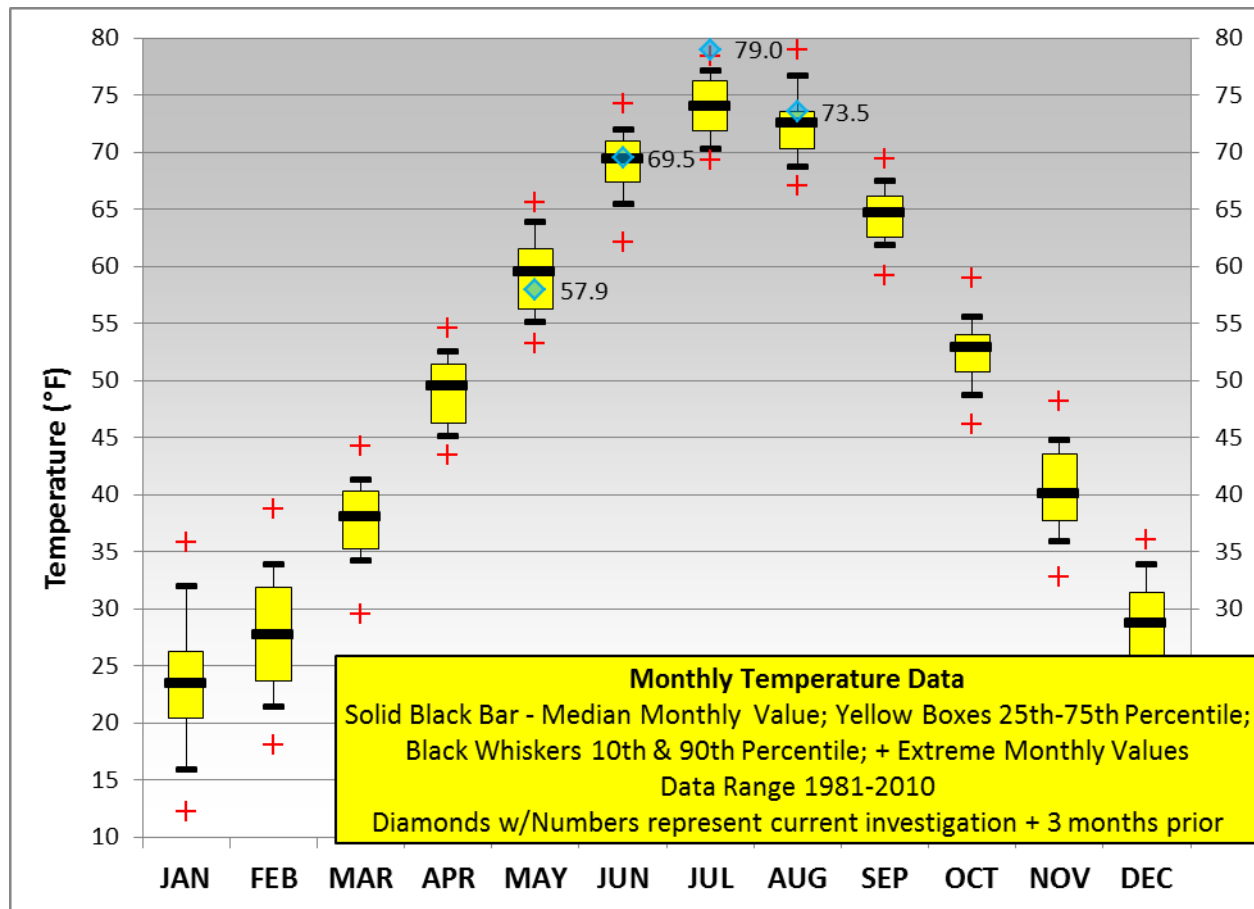


Figure 2: Monthly Temperature Data

The average monthly precipitation in July 2011 is significantly higher than the thirty-year monthly average. A record precipitation of 6.86 inch in one day was recorded in July 23, 2011, the highest since 1957. However, during our investigation that started 18 days later, groundwater was encountered in only seven borings at depths varying from 3.8 to 10.5 feet bgs. Thus, we are of the opinion the soil moisture data obtained during our investigation were not affected by this event or other short-term fluctuations of the climatic conditions.

### 3.0 METHODS OF INVESTIGATION

#### 3.1 Subsurface Investigation

The subsurface investigation consisted of a total of 47 roadway borings and 5 pavement cores obtained by Wang. Forty one of the soil borings, designated as R-01 to R-43 (with the exception of Borings R-24 and 26), were drilled in April 2011. Six additional soil borings, designated as R-44 to R-49, were drilled in May 2014 to investigate areas of unstable and /or unsuitable subgrade. Also, pavement cores

designated as PC-01 to PC-05, were cored using a hand-operated coring machine equipped with a 4.0-inch diameter diamond-impregnated core barrel.

Previous borings drilled along the roadway alignment by Baxter and Woodman, Inc. in 2002 were also used to supplement the investigation. Table 1 summarizes existing ground surface elevations, reference borings, and boring termination depths for each investigated roadway alignment. The as-drilled locations for the borings were surveyed by Wang with a mapping-grade GPS unit. Boring location data are indicated in the *Boring Logs and Pavement Core Photographs* (Appendix A). The as-drilled locations are shown in the *Boring Location Plans and Soil Profiles* (Appendix E).

Table 1: Boring Investigation Summary

Roadway Alignment	Reference Borings	Existing Surface Elevation (feet)	Boring Depth (feet)
PR IL 137/PR IL 83/INTERIM PR IL 83 from Station 175+12.00 to approximate Station 211+00.00	R-01 to R-16; R-47 to R-49 (19 Borings) Borings by others B-1, B-14 to B-17 (5 Borings)	790.20 to 823.24	10.0 to 14.0
PR IL 83/ EX Atkinson Road from Station 411+23.00 (meet existing) to Station 437+01.00	R-17 to R-23, R-25; R-27 to R-34; R-44 to R-46 (19 Borings)	796.87 to 811.47	10.0 to 12.0
PR Ivanhoe Road (North and South) from Station 283+51.87 (intersect PR IL 83) to approximate Station 309+50.00	R-35 to R-43 (9 Borings) Boring by others B-21 (1 Boring)	790.77 to 808.80	10.0 to 12.0

Truck- or ATV-mounted drilling rigs, equipped with hollow stem augers, were 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 in roadway borings was continuously sampled to the boring termination depths. Samples collected from each interval were placed in sealed jars for further examination and laboratory testing.

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

Groundwater observations were made in each boring during and at the completion of drilling operations. The borings were backfilled with soil cuttings and bentonite chips after completion, and the surface was restored as close as possible to its original condition.

### **3.2 Laboratory Testing**

Soil samples were tested in the laboratory for moisture content (AASHTO T 265). Atterberg limits (AASHTO T 89/T 90) and particle size (AASHTO T 88) analyses were performed to classify selected samples representing the primary soil layers encountered during the investigation. Field visual descriptions of the soil samples were verified in the laboratory. Tested soils were classified according to the IDH Soil Classification System, and the *IDH Classification Charts* for the roadway subgrade soils are attached as Exhibit 4. Laboratory test results are shown in the *Boring Logs and Pavement Core Photographs* (Appendix A), in *IDOT Forms BMPR 507A and 508A* (Appendix B), and in the *Laboratory Test Results* (Appendix C).

## **4.0 RESULTS OF FIELD AND LABORATORY INVESTIGATIONS**

Detailed descriptions of encountered lithologic units are presented in the attached *Boring Logs and Pavement Core Photographs* (Appendix A) and in the *Soil Boring Location Plans and Soil Profiles* (Appendix E). Please note the lithologic boundaries shown on logs and profiles represent approximate limits between soil types. In the field, the actual transition between soil types might be gradual in horizontal and vertical directions.

The following sections summarize existing topsoil, pavement, and subgrade composition and properties.

### **4.1 Topsoil Characterization**

Topsoil observations and measurements were performed in 21 boreholes. The topsoil consists of brown to black silty clay and silty loam; the thickness ranges between 2.0 and 20.0 inches, with an average of 9.3 inches. In 65% of the observation points, the topsoil thickness measured less than 12 inches. The distribution of topsoil thickness is summarized in Table 2.

Table 2: Topsoil Thickness Distribution

Alignment	No. of measurements	Range (inches)	Average (inches)
PR IL 137/PR IL 83/PR INTERIM IL 83	16	2.0 – 18.0	9.0
PR IL 83/EX Atkinson Rd.	8	6.0 – 20.0	14.0
PR Ivanhoe Road (North and South)	2	4.0 – 5.0	5.0

## 4.2 Existing Pavement Structure

The existing pavement structure of the existing roadway, parking lot, and yard was examined in 11 boreholes and cored at 5 locations. The pavement consists of asphalt, concrete, and aggregate base course. Table 3 summarizes the existing pavement structure information.

Table 3: Existing Road Pavement Measurements

Existing Alignment	Reference Borings	Range/Average (inches)		
		Asphalt	Concrete	Aggregate Base
IL 137	PC-04, PC-05, R-11, R-14, R-15, and B-17	3 to 14/ 7	10 to 5.5/ 8	5 to 8/ 7
IL 83	PC-01, R-18, R-19, R-21, and R-22	6 to 20/ 10	7.25/7.25	4 to 6/ 5
Ivanhoe Road	PC-02, PC-03, R-39 and R-43	5 to 13/ 8	6 to 7.75/7	4 to 5/ 5

A total of 11 borings were also performed on the roadway shoulder. The aggregate shoulder thickness ranges between 2.0 and 12.0 inches, with an average of 8.0 inches.

## 4.3 Subgrade Soil Conditions

The following sections present the soil conditions encountered during our subsurface investigation along PR IL 137, PR IL 83, INTERIM PR IL 83 and PR Ivanhoe Road (North and South).

### 4.3.1 PR IL 137/PR IL 83/PR INTERIM PR IL 83 Alignment.

Underneath topsoil, pavement, or aggregate shoulder, the subsurface investigation generally revealed cohesive soils. The cohesive soils consist of medium stiff to hard, brown and gray clay to silty clay loam. The cohesive soils have unconfined compressive strength ( $Q_u$ ) values of 0.5 to 7.8 tsf with an average of 3.4 tsf and moisture content values of 12 to 29% with an average of 19%. Below the cohesive soil, several borings (Borings B-01, R-02, R-09, and R-13) encountered

granular soils consisting of very loose to medium dense, brown and gray silt to sandy loam. The granular soils have SPT N-values of 3 to 11 blows/foot with an average of 9 blows/foot and moisture content values of 16 to 22% with an average of 19%. Fill was also encountered in some of the borings drilled along this alignment. Boring R-08 contained about 6 feet of sandy loam fill. The cohesive fill consist of medium stiff to very stiff, brown and gray silty clay to silty clay loam or loose sandy loam having  $Q_u$  values of 0.8 to 2.8 tsf with an average of 1.5 tsf and moisture content values of 19 to 28% with an average of 24%. Laboratory index testing on cohesive fill samples shows a liquid limit ( $L_L$ ) value of 39% and plastic limit ( $P_L$ ) value of 18%. The granular fill consists of loose sandy loam having SPT N-values of 6 to 8 blows/foot with an average of 7 blows/foot and moisture content values of 9 to 17% with an average of 13%.

Buried topsoil consisting of stiff, dark brown silty clay was encountered at a depth of 3 feet bgs in Boring R-01. It has a  $Q_u$  of 1.0 tsf with moisture content of 28 %. Based on depth of burial, proposed section and strength characteristics, we anticipate no settlement issues.

#### **4.3.2 PR IL 83/EX Atkinson Road Alignment**

Underneath topsoil, pavement, or aggregate shoulder, the subsurface investigation generally revealed cohesive soils with interbedded granular soil. The cohesive soils consist of medium stiff to hard, brown and gray clay to silty clay loam. The cohesive soils have  $Q_u$  values of 0.8 to 8.6 tsf with an average of 3.2 tsf and moisture content values of 11 to 32% with an average of 18%. Laboratory index testing shows  $L_L$  values of 46 to 60% and  $P_L$  values of 17 to 23%. The interbedded granular materials consist of loose to medium dense, brown and gray sandy loam to sand having SPT N-values of 4 to 14 blows/foot with an average of 9 blows/foot and moisture content values of 13 to 16% with an average of 15%. Up to 9.0-foot thick granular fill layer was encountered in Borings R-22, R-23, and R-25, located in the vicinity of Vulcan Yard. The fill consists of medium dense to very dense crushed stone and asphalt.

Buried topsoil consisting of stiff, dark brown silty clay to silty clay loam was encountered at a depth of 2.5 to 6 feet bgs in Borings 23 and 27. It has a  $Q_u$  value 1.0 tsf with moisture content of 27 %. Based on depth of burial, proposed section and strength characteristics, we anticipate no settlement issues.

#### **4.3.3 PR Ivanhoe Road Alignment (North and South)**

Below the topsoil, pavement, or aggregate shoulder, the borings encountered up to 5.6 feet cohesive and granular fill. The cohesive fill consists of medium stiff to very stiff, brown and gray silty clay to

silty clay loam having  $Q_u$  values of 0.8 to 3.4 tsf with an average of 1.9 tsf and moisture content values of 15 to 23% with an average of 19%. Granular fill was only encountered in Boring R-35 (Vulcan Yard) and consists of dense, black and gray crushed asphalt and gravel. Below the fill, the borings encountered medium stiff to hard, brown and gray clay to silty clay loam. The clayey soils have  $Q_u$  values of 0.8 to 6.6 tsf with an average of 2.9 tsf and moisture content values of 12 to 35% with an average of 19%. Laboratory index testing shows  $L_L$  value of 48 and  $P_L$  value of 16%.

#### **4.4 Groundwater Conditions**

Nine of the borings encountered groundwater. The groundwater was encountered between 3.5 and 10.5 feet during drilling, while two borings encountered groundwater at the completion of drilling at 6.0 feet bgs.

### **5.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS**

The following subsections present the results of our analyses and recommendations for the design and construction of the proposed roadway.

#### **5.1 Site Preparation and Earthwork**

It is recommended the existing pavement, aggregate subbase, aggregate shoulder, and surface topsoil be stripped within the limits of the proposed improvement. For estimating purpose, the recommended topsoil thickness to be stripped is 12 inches, representing the average topsoil thickness measured during our investigation. Preparation of existing ground surface and treatment of existing pavement should follow IDOT Section 205.03 (2012). IDOT District One policy requires a shrinkage factor of 15% to measure borrowed and furnished excavation quantities. We recommend the Contractor creates sufficient runoff drainage during site preparation to prevent excess pooling of precipitation and facilitate runoff in the event of extended construction delays.

After stripping, the stability of the exposed subgrade should be observed for the presence of any unsuitable and unstable soils immediately after excavation of overlying material to determine if remedial treatment is necessary. The subgrade should be proofrolled to observe the amount of deflection and rutting taking place under the wheels of heavy construction equipment such as a fully loaded dumptruck. Using either static (SCP) or dynamic (DCP) cone penetrometer, all soft areas should be tested and evaluated according to the IDOT *Subgrade Stability Manual* (IDOT 2005).

## 5.2 Subgrade Treatment and Recommendations

The proposed pavement structure will be supported primarily by very stiff silty clay loam or new embankment. The embankments will rest on top of the very stiff silty clay to silty clay loam. A pavement conforming to IDOT's Mechanistic Pavement Design (MPD) requires a minimum of 12 inches improved aggregate below the design pavement structure to ensure stability during construction and for long-term pavement performance (IDOT 1999). As per IDOT policy, the top 12 inches of existing subgrade will be improved to facilitate MPD and additional subgrade improvement requirements should be identified beyond the initial 12 inches of improvement (IDOT 2005)

The proposed improvements to PR IL 137/PR IL 83/ INTERIM PR IL 83 will include both cut and fill sections. The proposed pavement structure will be supported primarily on stiff to hard silty clay loam or new embankment fill. In general, the subgrade soil will provide a stable working platform. It should be noted that there is a bush area near Boring R-49, between Sta. 205+25 and Sta. 206+25 which may require additional treatment due to possible deep vegetation. This should be confirmed during construction.

The proposed improvements to PR IL 83 to EX Atkinson Rd will include cut and fill. The proposed pavement structure will be supported mainly by stiff to very stiff silty clay loam or new embankment fill. In general, the subgrade soil will provide a stable working platform except at the locations of Boring R-18, R-45 and R-46. These borings revealed potentially unstable soil with  $Q_u$  of 0.25 to 0.75 tsf, moisture contents of 24% to 31%, and LL of 47 to 60%. The limits of the area with the unstable soil requiring additional subgrade improvement beyond the required aggregate subgrade for MPD are shown in Table 4.

Table 4: Summary of Subgrade Treatment Recommendations within PR IL 83 to EX Atkinson and PR Ivanhoe Road (North)

Limits	Treatment Width	Treatment Type	Treatment Depth (inch)	Reference Boring, Subgrade Concerns
Station to Station				
413+00 to 415+50	Full pavement width	Aggregate Subgrade Improvement	6	R-18 (Qu=0.75 tsf, MC=24%, LL=60%)
419+00 to 421+60	Full pavement width	Aggregate Subgrade Improvement	12	R-45 (Qu=0.50, MC=24% LL=47%)
423+60 to 425+00	Full pavement width	Aggregate Subgrade Improvement	12	R-46 (Qu=0.25 tsf, MC=30%, LL=51%)
306+50 to 308+50	Full pavement width	Aggregate Subgrade Improvement	6	R-42 (Qu=0.75 tsf, MC=28%, LL=48%)

The actual need for removal and replacement of unstable and unsuitable soils, including the required width of the improvement shown in Tables 4, should be determined in the field at the time of construction. The subgrade should be proofrolled as defined in section 5.1. Any unstable and unsuitable soils encountered during construction should be removed at least 12 inches below the proposed base of aggregate subgrade elevation and replaced with IDOT Special Provision “Aggregate Subgrade Improvement”.

The frost depth for pavement design in northeastern Illinois is 42 inches. Wang estimates the subgrade soils exhibit low frost susceptibility due to deep-seated groundwater and P.I. values greater than 12. Any highly moist soils, if not otherwise unsuitable or unstable, encountered within the exposed roadway subgrade should be disked or tilled, dried, and compacted before placing of embankment or pavement base materials.



### 5.3 Subgrade Support Rating

Laboratory testing on the subgrade soils show Subgrade Support Ratings (SSR) of POOR to FAIR (Exhibits 5). Given the worst subgrade support rating, we recommend the pavement be designed for SSR rating of POOR. The pavement could also be designed based on an IBR of 2, as per IDOT (1999) correlation to the predominant A-7-6 soil classification encountered within project area.

### 5.4 Roadway Drainage

The proposed subgrade and pavement should have proper surface grading to remove water accumulations and prevent the pooling of water. The clayey subgrade soils encountered immediately beneath the existing surface will exhibit poor drainage characteristics due to clay contents generally between 25 and 40%. Furthermore, the fill material to be placed for support of the profile will likely be cohesive '*Borrow and Furnished Excavation,*' and it will also exhibit poor drainage characteristics.

The proposed cross sections show ditches to be seeded. Rip rap lining will is also provided in ditches at drainage sections. Additionally, we recommend the installation of transverse pipe underdrains installed at 300 to 500 foot intervals and at low points in the roadway. The underdrains should be installed 12 inches below the subbase granular material and should be wrapped in geofabric. Special Provisions for Pipe Underdrains, Check Sheet #19 should be referenced (IDOT 2014).

### 5.5 Embankments

Construction of IL 83 from IL 120 to IL 137 at Atkinson road will include various embankment geometries involving both fill and cut sections. The profile and section drawings show major centerline profile changes in the following sections.

- Fill sections measuring up to 11.0 feet are proposed along PR IL 137 and PR IL 83 between Station 190+00 and Station 198+00. The highest fill section is located at the intersection of PR IL 137 and PR IL 83 at Station 192+00;
- Fill sections measuring up to 10.0 feet are proposed along PR IL 83 between Station 431+00 and Station 431+50; and
- Cut sections measuring up to 18.0 feet are proposed along PR IL 137 between Station 177+00 and Station 184+00.

The following sections present our assessment of anticipated embankment settlements and global

stability at critical cross sections and soil conditions

### **5.5.1 Embankment Settlement**

In general, given the low moisture contents and high shear strengths of the primary soil layers encountered during the investigation, we do not anticipate excessive long-term settlement to occur under the new embankment loads.

Settlement analysis was performed using traditional consolidation theory with the use of the computer program FoSSA 2.0. The settlement of the new roadway embankment at the intersection of PR IL 137 and PR IL 83 (Station 192+00) with 11-foot high roadway embankment was evaluated, and we estimate a long-term consolidation settlement of less than 1.0 inch which is not a concern.

We also evaluated the settlement of the new 10-foot high roadway embankment at proposed PR IL 83 between Station 431+00 and Station 431+50. The effects of deep buried topsoil encountered in Boring R-27 at depths of 2.5 to 4.0 feet bgs were considered. Based on a  $Q_u$  value of 1.0 tsf, moisture content of 27%, and less than 10% organic content at this location, our analysis showed a long-term consolidation settlement of less than 1.0 inch; therefore, settlement is in not a concern.

### **5.5.2 Global Stability**

In general, the proposed embankment slopes along the typical roadway sections are gradual at 1:3 (V:H) or milder. The global stability of proposed embankments at their respective maximum heights were analyzed using *Slide V5* under short-term (undrained) and long-term (drained) soil conditions based on the general soil profile described in Section 4.3.

The slope stability of the proposed maximum 18-foot cut section, located at Station 181+00 as represented by Boring R-03, was evaluated and gave FOS value of 2.3 which satisfies IDOT's minimum requirement of 1.7 for cut slopes. The slope stability analyses are presented in Appendix D.

## **6.0 CONSTRUCTION CONSIDERATIONS**

### **6.1 Excavation and Dewatering**

Excavations should be performed in accordance with local, state, and federal regulations. The potential effect of ground movements upon nearby roadways and utilities should be considered during construction. Excavations should be sloped at no greater than 1:2 (V:H). Considerations for removal of existing buildings and pavements along PR IL 137 between Station 201+00 and Station 211+00 and along PR IL 83 near Vulcan yard between Station 425+00 and Station 429+50 will need to be

addressed in Phase II.

Undercut excavations will not require dewatering as the water table is seated deeper than the excavation depths. The Contractor should ensure proper surface grading to prevent the pooling of run-off into open excavations. Any water allowed to enter excavations should immediately be removed via sump pump.

## **6.2 Filling and Backfilling**

Fill used as embankment material and to complete removal and replacement of any poor soils encountered during construction should be pre-approved by the Engineer. We recommend that all barrow and furnished excavation material meets the requirements of the District One Embankment One Special Provision, effective November 1, 2013.

For new fill to be placed on existing slopes, we recommend benching the slopes according to IDOT embankment construction details.

## **6.3 Earthwork Operations**

The required earthwork can be accomplished with conventional construction equipment. Moisture and traffic will cause deterioration of exposed subgrade soils. Precautions should be taken by the Contractor to prevent water erosion of the exposed subgrade. A compacted subgrade will minimize water runoff erosion.

Earth moving operations should be scheduled to avoid excessive cold or wet weather (early spring, late fall or winter). Any soil allowed to freeze or soften due to the standing water should be removed. Wet weather can cause problems with subgrade compaction.

It is recommended that an experienced geotechnical engineer be retained to inspect the exposed subgrade, monitor earthwork operations, and provide material inspection services during the construction phase of this project.

## 7.0 QUALIFICATIONS

The analysis and recommendations submitted in this report are based upon the data obtained from the borings drilled at the locations shown on the boring logs and in Appendix E. This report does not reflect any variations that may occur between 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 are planned, we should be timely informed so that our recommendations may be adjusted accordingly.

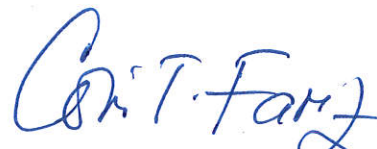
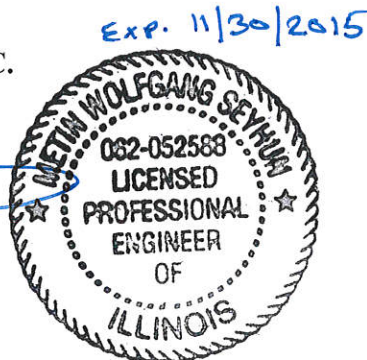
It has been a pleasure to assist exp. U.S. Services, Inc. and the Illinois Department of Transportation on this project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

WANG ENGINEERING, INC.



Metin W. Seyhun, P.E.  
Senior Geotechnical Engineer



Corina T. Farez, P.E., P.G.  
Principal

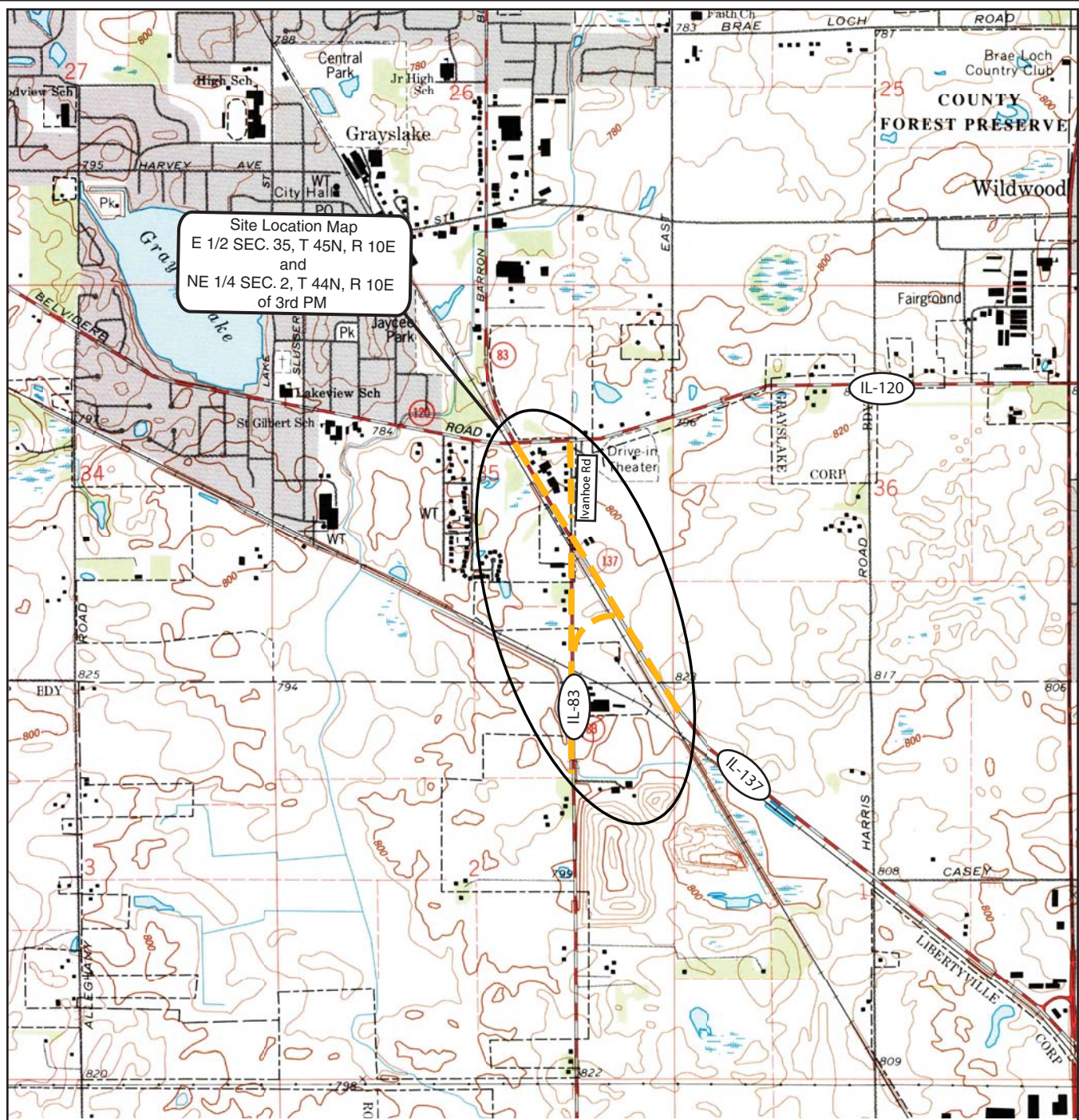


Jerry W.H. Wang, Ph.D., P.E.  
QA/QC Reviewer

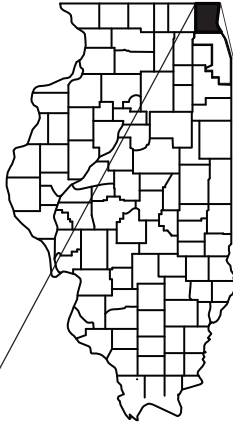
## ***REFERENCES***

- HANSEL, A.K., AND JOHNSON, W.H. (1996) *Wedron and Mason Groups: Lithostratigraphic Reclassification of the Wisconsin Episode, Lake Michigan Lobe Area. ISGS Bulletin 104.* Champaign, Illinois State Geological Survey.
- LEETARU, H.E. et Al. (2003) *3-D Visualization of Bedrock Resources in Lake County.* 1:62,500 Lake County map atlas, OFS 2003-12 Lake-3D Series.
- STUMPF, A.J., (2004) *Surficial Geology of Grayslake Quadrangle, Lake County, Illinois.* Illinois State Geological Survey, Illinois Geologic Map. IPGM Grayslake-SG, 1:24,000.
- ILLINOIS DEPARTMENT OF TRANSPORTATION (1999) *Geotechnical Manual.* IDOT Bureau of Materials and Physical Research.
- ILLINOIS DEPARTMENT OF TRANSPORTATION (2005) *Subgrade Stability Manual.* IDOT Bureau of Bridges and Structures.
- ILLINOIS DEPARTMENT OF TRANSPORTATION (2012) *Standard Specifications for Road and Bridge Construction.*
- ILLINOIS DEPARTMENT OF TRANSPORTATION (2014) *Supplemental Specifications and Recurring Special Provisions.*
- National Weather Service Forecast Office-Chicago, O'Hare Station (NCDC 2014), <http://www.weather.gov/climate> .
- USDA – NRCS, Web Soil Survey, National Cooperative Soil Survey, Kane County, IL, Version 7, December 8, 2013, <http://websoilsurvey.nrcs.usda.gov>

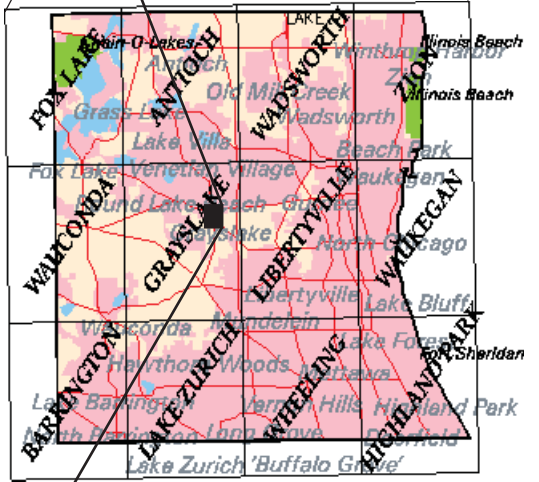
## **EXHIBITS**



Site Location Map  
 E 1/2 SEC. 35, T 45N, R 10E  
 and  
 NE 1/4 SEC. 2, T 44N, R 10E  
 of 3rd PM



Illinois  
 Lake County



SITE LOCATION MAP: FAP 866; IL-83 FROM IL-120 TO IL-137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL

EXHIBIT 1

DRAWN BY: A. Kurnia  
 CHECKED BY: M. Seyhun



1145 N. Main Street  
 Lombard, IL 60148  
 www.wangeng.com

For exp US Services, Inc. 341-07-01



0 1/4 1/2 3/4 1 Mile



0 1/4 1/2 3/4 1 Mile

Organic Matter (%)

- <= 0.76
- > 0.76 and <= 1.25
- > 1.25 and <= 1.52
- > 1.52 and <= 2.44
- > 2.44 and <= 84.50

SITE PEDOLOGY MAP: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL		
SCALE: GRAPHICAL	EXHIBIT 2-1	DRAWN BY: C. Marin CHECKED BY: M. Seyhur
		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR exp U.S. Services, Inc.		341-07-01



Map unit symbol and soil name	Depth <i>In</i>	USDA texture	Classification	Fragments		Sand %	Silt %	Clay %	Moist bulk density g/cc	Saturated hydraulic conductivity micro m/sec	Liquid limit %	Plasticity index	Organic matter %	Potential as a source of roadfill	Local roads and streets	Shallow excavations
			AASHTO	>10 inches	3-10 inches									Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
153A—Pella silty clay loam, 0 to 2 percent slopes																
Pella	0-12	Silty clay loam	A-7-6, A-7-5	0	0	0-9-15	50-60-73	27-31-35	1.10-1.30	4.23-14.11	45-57	18-24	4.0-6.0	Poor, Wetness, Low strength, Dusty	Very limited, Ponding, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Ponding, Depth to saturated zone, Dusty, Unstable excavation walls
	12-33	Silty clay loam	A-6, A-7-6	0	0	0-9-15	50-60-73	27-31-35	1.20-1.45	4.23-14.11	38-49	19-25	0.5-2.0			
	33-42	Clay loam, loam, silty clay loam, sandy loam, silt loam	A-6, A-4	0-1	0-5	10-27-55	15-51-75	15-22-30	1.35-1.60	4.23-14.11	25-40	9-21	0.2-0.5			
	42-60	Stratified loamy sand to silty clay loam	A-2-6, A-4, A-6, A-2-4	0-1	0-5	15-58-85	0-22-75	10-20-30	1.40-1.70	4.23-42.34	20-39	6-21	0.0-0.2			
232A—Ashkum silty clay loam, 0 to 2 percent slopes																
Ashkum, drained	0-12	Silty clay loam	A-7-6, A-7-5	0	0	1-8-15	45-55-64	35-37-40	1.20-1.45	1.41-4.23	51-67	25-28	3.0-8.0	Poor, Wetness, Low strength, Shrink-swell, Dusty	Very limited, Ponding, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Ponding, Depth to saturated zone, Dusty, Unstable excavation walls, Too clayey
	12-29	Silty clay loam, silty clay	A-7-6	0	0	2-8-15	43-51-63	35-41-42	1.30-1.50	1.41-4.23	46-58	25-30	0.5-2.5			
	29-54	Silty clay loam, silty clay	A-6, A-7-6	0	0-1	5-9-20	40-58-65	30-33-42	1.50-1.70	1.41-4.23	39-53	21-30	0.1-1.0			
	54-60	Silty clay loam	A-6, A-7-6	0	0-1	5-9-20	45-61-68	27-30-35	1.55-1.75	1.41-4.23	37-47	19-25	0.0-1.0			
298B—Beecher silt loam, 2 to 4 percent slopes																
Beecher	0-7	Silt loam	A-7-6, A-6	0	0	2-8-15	58-68-78	20-24-27	1.25-1.45	4.23-14.11	33-45	13-18	2.0-4.0	Poor, Wetness, Low strength, Dusty	Very limited, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls, Dense layer
	7-24	Silty clay, silty clay loam	A-7-6	0	0	2-8-15	35-53-63	35-39-50	1.40-1.60	0.42-4.23	44-60	25-36	0.2-1.0			
	24-36	Silty clay loam	A-6, A-7-6	0	0-1	5-10-20	40-59-65	27-32-40	1.50-1.70	0.42-4.23	37-50	19-29	0.1-0.5			
	36-60	Silty clay loam	A-7-6, A-6	0	0-3	5-10-20	45-62-65	27-29-35	1.70-1.90	0.42-1.41	35-44	18-25	0.0-0.5			
330A—Peotone silty clay loam, 0 to 2 percent slopes																
Peotone	0-13	Silty clay loam	A-7-5, A-7-6	0	0	0-7-10	50-57-67	33-37-40	1.20-1.40	1.41-4.23	52-64	23-28	5.0-7.0	Poor, Wetness, Low strength, Shrink-swell, Dusty	Very limited, Ponding, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Ponding, Depth to saturated zone, Dusty, Unstable excavation walls, Too clayey
	13-50	Silty clay loam, silty clay	A-7-6	0	0-3	0-7-10	45-52-65	35-42-45	1.30-1.60	1.41-4.23	46-61	25-32	0.5-3.0			
	50-60	Silty clay loam, silt loam, silty clay	A-6, A-7-6	0	0-5	0-11-20	38-56-75	25-34-42	1.40-1.65	1.41-4.23	35-53	17-30	0.2-0.5			
442A—Mundelein silt loam, 0 to 2 percent slopes																
Mundelein	0-17	Silt loam	A-6, A-7-6	0	0	0-9-15	58-68-80	20-24-27	1.15-1.30	4.23-14.11	35-47	13-18	3.0-5.0	Fair, Wetness, Dusty	Very limited, Depth to saturated zone, Frost action, Low strength	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls
	17-31	Silty clay loam, silt loam	A-6, A-7-6	0	0	0-9-15	50-61-75	25-30-35	1.20-1.45	4.23-14.11	36-49	17-25	0.5-2.0			
	31-42	Sandy loam, silt loam, clay loam, loam	A-4, A-6	0	0	10-25-60	10-52-75	15-23-30	1.40-1.55	4.23-14.11	25-40	9-21	0.2-0.5			
	42-60	Stratified sandy loam to silt loam	A-2-4, A-4, A-6, A-2-6	0	0	10-40-75	5-45-80	5-15-25	1.50-1.70	4.23-42.34	16-35	2-17	0.0-0.2			
531C2—Markham silt loam, 4 to 6 percent slopes, eroded																
Markham, eroded	0-8	Silt loam	A-7-6, A-6	0	0-2	5-10-15	58-65-73	20-25-27	1.10-1.40	4.23-14.11	33-43	13-18	2.0-3.0	Poor, Wetness, Low strength, Dusty	Very limited, Ponding, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls
	8-20	Silty clay, silty clay loam	A-7-6	0-1	0-5	5-12-20	35-49-60	35-39-50	1.40-1.60	0.42-4.23	44-60	25-36	0.2-1.0			
	20-29	Silty clay, silty clay loam	A-6, A-7-6	0-2	0-5	5-12-20	35-52-65	30-36-45	1.55-1.75	0.42-1.41	39-55	21-32	0.1-0.5			
	29-60	Silty clay loam, clay loam	A-6, A-7-6	0-2	0-5	5-15-25	37-53-68	27-32-38	1.65-1.85	0.42-1.41	35-47	18-27	0.0-0.5			
531D2—Markham silt loam, 6 to 12 percent slopes, eroded																
Markham, eroded	0-7	Silt loam	A-7-6, A-6	0	0-2	5-10-15	58-65-73	20-25-27	1.10-1.40	4.23-14.11	33-43	13-18	2.0-3.0	Poor, Wetness, Low strength, Dusty	Very limited, Slope, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Slope, Unstable excavation walls
	7-20	Silty clay, silty clay loam	A-7-6	0-1	0-5	5-12-20	35-49-60	35-39-50	1.40-1.60	0.42-4.23	44-60	25-36	0.2-1.0			
	20-30	Silty clay, silty clay loam	A-6, A-7-6	0-2	0-5	5-12-20	35-52-65	30-36-45	1.55-1.75	0.42-1.41	39-55	21-32	0.1-0.5			
	30-60	Silty clay loam, clay loam	A-6, A-7-6	0-2	0-5	5-15-25	37-53-68	27-32-38	1.65-1.85	0.42-1.41	35-47	18-27	0.0-0.5			
802B—Orthents, loamy, undulating																
Orthents, loamy, undulating	0-7	Loam	A-6, A-7-6	0	0-5	23-35-50	28-40-50	22-25-27	1.70-1.75	1.41-4.23	32-41	15-19	0.5-2.0	Poor, Low strength, Shrink-swell, Dusty	Very limited, Frost action, Low strength, Shrink-swell	Somewhat limited, Dusty, Unstable excavation walls
	7-60	Loam, silt loam, clay loam	A-6, A-7-6	0-1	0-5	20-38-50	25-35-58	22-28-30	1.70-1.80	1.41-4.23	33-43	15-21	0.2-1.0			
805B—Orthents, clayey, undulating																
Orthents, clayey, undulating	0-7	Silty clay	A-7-6	0	0-3	2-8-20	40-48-58	40-44-55	1.50-1.65	0.42-1.41	50-68	29-40	0.5-2.0	Poor, Wetness, Dusty, Low strength, Shrink-swell	Very limited, Frost action, Low strength, Shrink-swell	Somewhat limited, Dusty, Depth to saturated zone, Unstable excavation walls, Too clayey
	7-60	Silty clay, clay, silty clay loam	A-7-6	0	0-3	2-11-30	10-41-60	35-48-60	1.60-1.90	0.14-0.42	46-70	25-44	0.2-1.0			

SITE PEDOLOGY TABLE: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL

EXHIBIT 2-2

DRAWN BY: C. Marin  
CHECKED BY: M. Seyhur



1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

FOR exp U.S. Services, Inc.

341-07-01

Map unit symbol and soil name	Depth	USDA texture	Classification	Fragments		Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Liquid limit	Plasticity index	Organic matter	Potential as a source of roadfill	Local roads and streets	Shallow excavations
			AASHTO	>10 inches	3-10 inches									Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
	In			%	%	%	%	%	g/cc	micro m/sec	%	%				
978A—Wauconda and Beecher silt loams, 0 to 2 percent slopes																
Wauconda	0-9	Silt loam	A-4, A-6	0	0	0-9-15	58-70-85	15-21-27	1.15-1.30	4.23-14.11	25-40	8-20	2.0-4.0	Poor, Wetness, Dusty	Very limited, Slope, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls
	9-14	Silt loam	A-4, A-6	0	0	0-9-15	58-71-85	15-20-27	1.20-1.35	4.23-14.11	20-35	5-15	0.5-1.0			
	14-30	Silty clay loam, silt loam	A-6, A-7-6	0	0	0-9-15	50-61-75	25-30-35	1.25-1.45	4.23-14.11	30-45	15-30	0.2-1.0			
	30-38	Silt loam, sandy loam, loam	A-6, A-4	0	0	10-42-60	13-40-75	10-19-27	1.40-1.60	4.23-14.11	25-40	8-20	0.2-0.5			
	38-60	Stratified loamy sand to silt loam	A-2-4, A-4, A-6, A-2-6	0-1	0-5	15-45-87	0-43-80	5-13-20	1.50-1.70	4.23-42.34	2-30	NP-15	0.0-0.2			
Beecher	0-9	Silt loam	A-4, A-6	0	0	2-8-15	58-68-78	20-24-27	1.25-1.45	4.23-14.11	29-37	7-15	2.0-4.0	Poor, Wetness, Low strength, Shrink-swell, Dusty	Very limited, Slope, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls, Dense layer
	9-21	Silty clay, silty clay loam	A-6, A-7-5, A-7-6	0	0	2-8-15	35-53-63	35-39-50	1.40-1.60	0.42-4.23	35-55	15-30	0.2-1.0			
	21-37	Silty clay loam	A-6, A-7-6	0	0-1	5-10-20	40-59-65	27-32-40	1.50-1.70	0.42-4.23	33-42	12-20	0.1-0.5			
	37-60	Silty clay loam	A-6	0	0-3	5-10-20	45-62-65	27-29-35	1.70-1.90	0.42-1.41	31-37	10-17	0.0-0.5			
978B—Wauconda and Beecher silt loams, 2 to 4 percent slopes																
Wauconda	0-9	Silt loam	A-4, A-6	0	0	0-9-15	58-70-85	15-21-27	1.15-1.30	4.23-14.11	25-40	8-20	2.0-4.0	Poor, Wetness, Low strength, Dusty	Very limited, Slope, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls
	9-33	Silty clay loam, silt loam	A-6, A-7-6	0	0	0-9-15	50-61-75	25-30-35	1.25-1.45	4.23-14.11	30-45	15-30	0.2-1.0			
	33-39	Silt loam, sandy loam, loam	A-6, A-4	0	0	10-42-60	13-40-75	10-19-27	1.40-1.60	4.23-14.11	25-40	8-20	0.2-0.5			
	39-60	Stratified loamy sand to silt loam	A-2-4, A-4, A-6, A-2-6	0-1	0-5	15-45-87	0-43-80	5-13-20	1.50-1.70	4.23-42.34	2-30	NP-15	0.0-0.2			
Beecher	0-7	Silt loam	A-4, A-6	0	0	2-8-15	58-68-78	20-24-27	1.25-1.45	4.23-14.11	29-37	7-15	2.0-4.0	Poor, Wetness, Low strength, Dusty	Very limited, Slope, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls, Dense layer
	7-24	Silty clay, silty clay loam	A-7-5, A-7-6, A-6	0	0	2-8-15	35-53-63	35-39-50	1.40-1.60	0.42-4.23	35-55	15-30	0.2-1.0			
	24-36	Silty clay loam	A-6, A-7-6	0	0-1	5-10-20	40-59-65	27-32-40	1.50-1.70	0.42-4.23	33-42	12-20	0.1-0.5			
	36-60	Silty clay loam	A-6	0	0-3	5-10-20	45-62-65	27-29-35	1.70-1.90	0.42-1.41	31-37	10-17	0.0-0.5			
979B—Grays and Markham silt loams, 2 to 4 percent slopes																
Grays	0-8	Silt loam	A-4, A-6	0	0	0-9-15	58-70-85	15-21-27	1.15-1.30	4.23-14.11	25-40	8-20	2.0-4.0	Poor, Wetness, Low strength, Dusty	Very limited, Frost action, Low strength, Shrink-swell	Somewhat limited, Dusty, Unstable excavation walls, Depth to saturated zone
	8-11	Silt loam	A-4, A-6	0	0	0-9-15	58-71-85	15-20-27	1.20-1.35	4.23-14.11	20-35	5-15	0.5-1.0			
	11-34	Silty clay loam, silt loam	A-6, A-7-6	0	0	0-9-15	50-61-75	25-30-35	1.25-1.45	4.23-14.11	30-45	15-30	0.2-1.0			
	34-42	Silt loam, sandy loam, loam	A-6, A-4	0	0	15-42-60	15-42-75	8-17-25	1.40-1.60	4.23-14.11	25-40	8-20	0.2-0.5			
	42-60	Stratified loamy sand to silt loam	A-2-4, A-4, A-6, A-2-6	0-1	0-5	15-50-85	0-38-80	5-13-20	1.50-1.70	4.23-42.34	2-30	NP-15	0.0-0.2			
Markham	0-8	Silt loam	A-4, A-6	0-1	0-2	5-10-15	58-66-73	20-24-27	1.15-1.35	4.23-14.11	25-40	6-17	2.0-4.0	Poor, Wetness, Low strength, Dusty	Very limited, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls
	8-21	Silty clay, silty clay loam	A-7-6, A-7-5	0-1	0-5	5-12-20	35-49-60	35-39-50	1.40-1.60	0.42-4.23	40-55	20-35	0.2-1.0			
	21-32	Silty clay, silty clay loam	A-6, A-7-6	0-2	0-5	5-12-20	35-52-65	30-36-45	1.55-1.75	0.42-1.41	30-50	15-30	0.1-0.5			
	32-60	Silty clay loam, clay loam	A-6, A-7-6	0-2	0-10	5-15-25	37-53-68	27-32-38	1.65-1.85	0.42-1.41	30-45	13-25	0.0-0.5			
989A—Mundelein and Elliott silt loams, 0 to 2 percent slopes																
Mundelein	0-17	Silt loam	A-4, A-6, A-7-6	0	0	0-9-15	58-68-80	20-24-27	1.15-1.30	4.23-14.11	25-45	5-20	3.0-5.0	Fair, Wetness, Dusty	Very limited, Depth to saturated zone, Frost action, Low strength	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls
	17-31	Silty clay loam, silt loam	A-6, A-7-6	0	0	0-9-15	50-61-75	25-30-35	1.20-1.45	4.23-14.11	35-50	15-25	0.5-2.0			
	31-42	Sandy loam, silt loam, clay loam	A-4, A-6, A-7-6	0	0	10-25-60	10-52-75	15-23-30	1.40-1.55	4.23-14.11	20-45	8-20	0.2-0.5			
	42-60	Stratified fine sand to silt loam	A-2-4, A-4, A-6, A-2-6	0	0	10-40-87	2-45-80	5-15-25	1.50-1.70	4.23-42.34	5-35	NP-20	0.0-0.2			
Elliott	0-6	Silt loam	A-4, A-6	0	0	2-8-15	58-67-78	20-25-27	1.25-1.45	4.23-14.11	29-37	7-15	3.5-5.0	Poor, Wetness, Low strength, Shrink-swell, Dusty	Very limited, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls, Dense layer
	6-11	Silty clay loam	A-7-5, A-7-6	0	0	2-8-15	50-62-71	27-30-35	1.20-1.40	4.23-14.11	40-46	15-19	2.5-4.0			
	11-16	Silty clay	A-7-5, A-7-6	0	0	1-5-20	30-50-61	40-45-50	1.40-1.60	0.42-4.23	42-56	18-30	0.5-1.5			
	16-41	Silty clay loam	A-6, A-7-6	0	0-1	5-10-20	40-59-65	27-32-40	1.50-1.70	0.42-4.23	33-42	12-20	0.1-0.5			
	41-60	Silty clay loam	A-6	0	0-3	5-10-20	45-62-65	27-29-35	1.70-1.90	0.42-1.41	31-37	10-17	0.0-0.5			
989B—Mundelein and Elliott silt loams, 2 to 4 percent slopes																
Mundelein	0-12	Silt loam	A-4, A-6, A-7-6	0	0	0-9-15	58-68-80	20-24-27	1.15-1.30	4.23-14.11	25-45	5-20	3.0-5.0	Fair, Wetness, Dusty	Very limited, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls
	12-30	Silty clay loam, silt loam	A-6, A-7-6	0	0	0-9-15	50-61-75	25-30-35	1.20-1.45	4.23-14.11	35-50	15-25	0.5-2.0			
	30-37	Sandy loam, silt loam, clay loam	A-4, A-6, A-7-6	0	0	10-25-60	10-52-75	15-23-30	1.40-1.55	4.23-14.11	20-45	8-20	0.2-0.5			
	37-60	Stratified fine sand to silt loam	A-2-4, A-4, A-6, A-2-6	0	0	10-40-87	2-45-80	5-15-25	1.50-1.70	4.23-42.34	5-35	NP-20	0.0-0.2			
Elliott	0-9	Silt loam	A-4, A-6	0	0	2-8-15	58-67-78	20-25-27	1.25-1.45	4.23-14.11	29-37	7-15	3.5-5.0	Poor, Wetness, Low strength, Shrink-swell, Dusty	Very limited, Depth to saturated zone, Frost action, Low strength, Shrink-swell	Very limited, Depth to saturated zone, Dusty, Unstable excavation walls, Dense layer
	9-13	Silty clay loam	A-7-5, A-7-6	0	0	2-8-15	50-62-71	27-30-35	1.20-1.40	4.23-14.11	40-46	15-19	2.5-4.0			
	13-17	Silty clay, silty clay loam	A-7-5, A-7-6	0	0	1-5-20	35-56-61	38-39-45	1.40-1.60	0.42-4.23	40-52	15-28	0.5-1.5			
	17-35	Silty clay loam	A-6, A-7-6	0	0-1	5-10-20	40-59-65	27-32-40	1.50-1.70	0.42-4.23	33-42	12-20	0.1-0.5			
Houghton, undrained	0-7	Muck	A-8	0	0	—	—	—	0.20-0.35	1.41-42.34	0-0	NP	70.0-99.0	Poor, Wetness, Dusty	Very limited, Ponding, Depth to saturated zone, Frost action, Subsidence	Very limited, Ponding, Depth to saturated zone, Organic matter content, Dusty, Unstable excavation walls
	7-60	Muck	A-8	0	0	—	—	—	0.15-0.25	1.41-42.34	0-0	NP	70.0-99.0			

SITE PEDOLOGY TABLE: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL

EXHIBIT 2-3

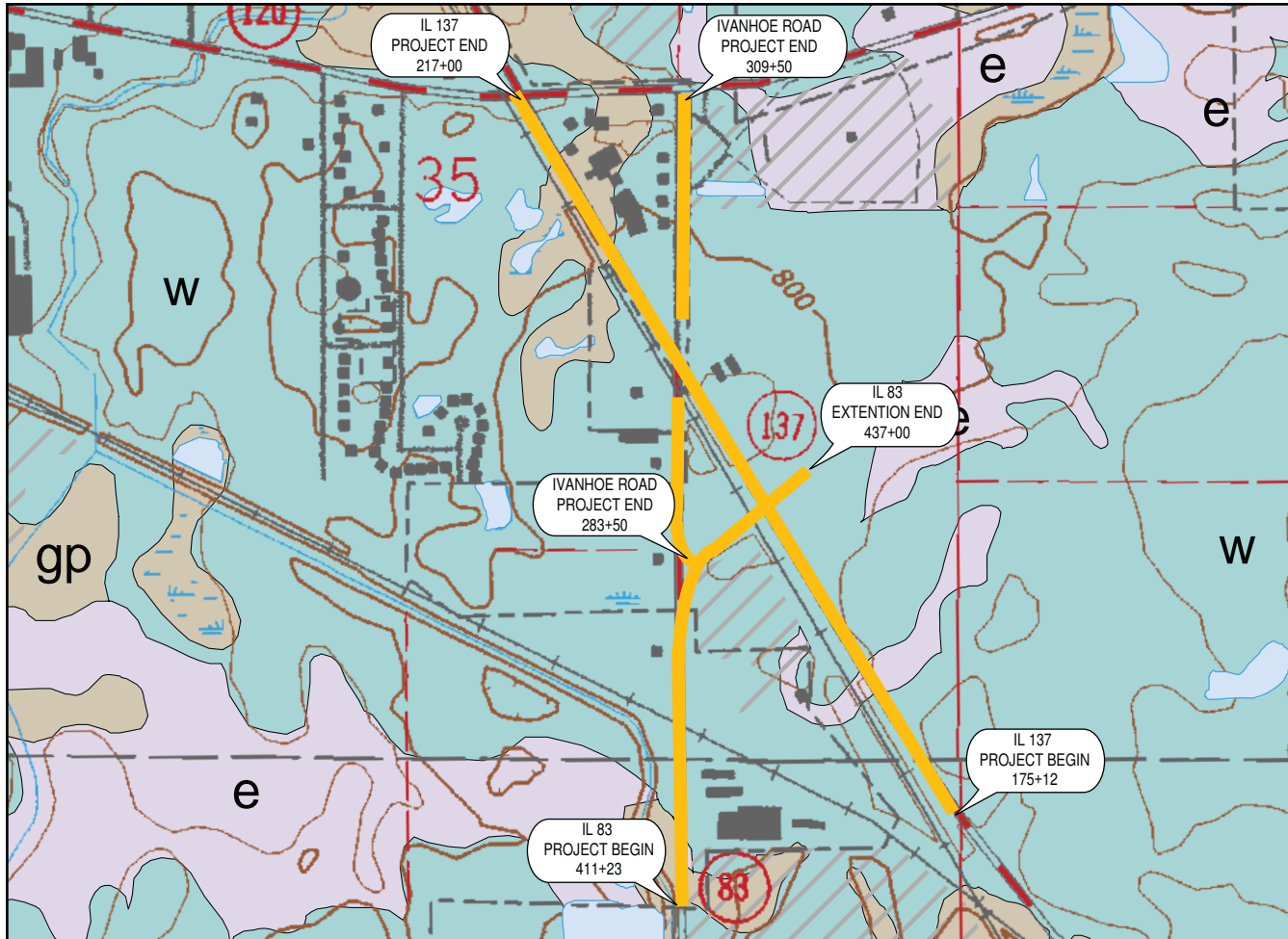
DRAWN BY: C. Marin  
CHECKED BY: M. Seyhur



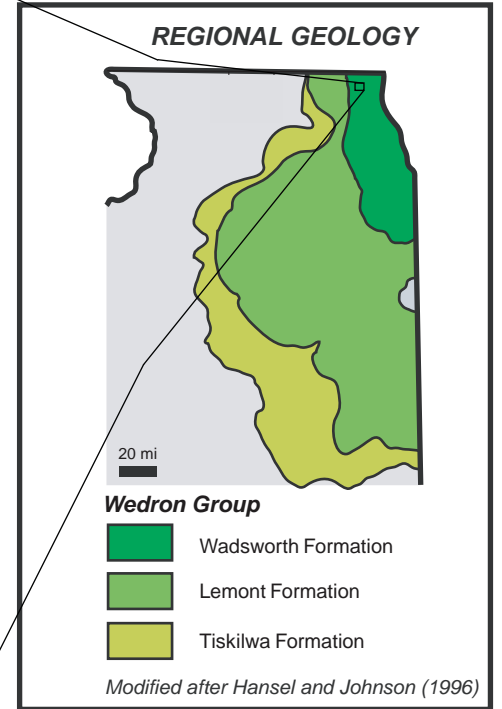
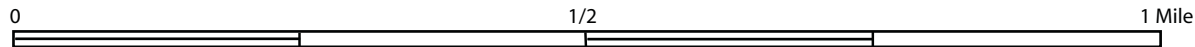
1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

FOR exp U.S. Services, Inc.

341-07-01



Modified after Stumpf (2004)



**LEGEND**

**Grayslake Peat**

**gp** Peat, muck, organic silt and clay; interbedded with sand silt and clay in some places

**Equality Formation**

**e** Clay and silt, containing some fine to medium sand beds; laminated to massive

**Wadsworth Formation**

**w** Silty clay loam to silty clay; pebbly with occasional cobbles and boulders; silt, sand, and gravel lenses common

**Disturbed ground**

Human-disturbed deposits found in gravel pits, retention ponds, landfills, and other excavations. Native underlying sediments have been identified and described

SITE AND REGIONAL GEOLOGY: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL

**EXHIBIT 3**

DRAWN BY: B. Wilson  
CHECKED BY: M. Seyhun

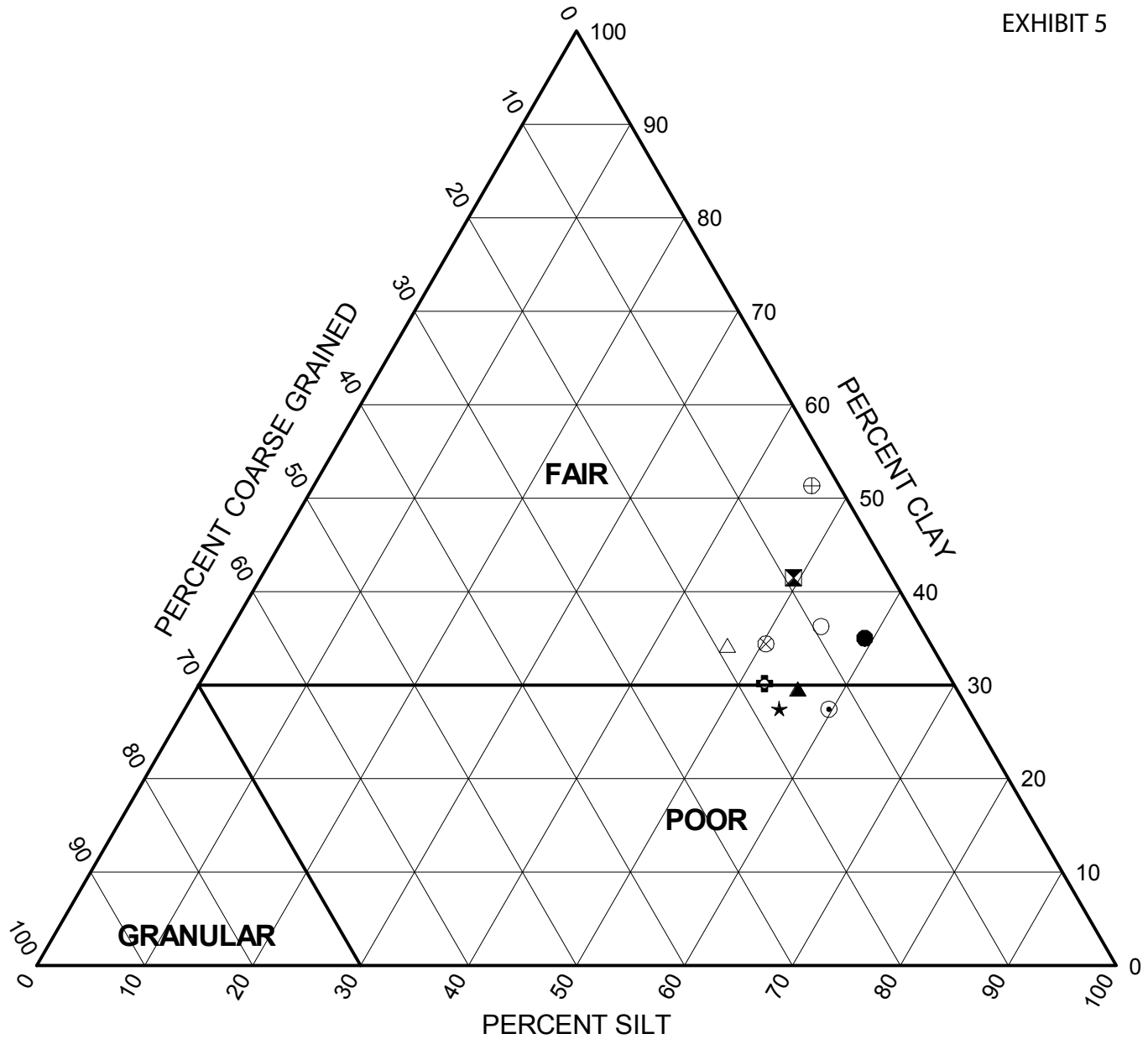


1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.

341-07-01





	Sample	Depth (ft)	Coarse (%)	Silt (%)	Clay (%)	Classification		
						IL DOT	AASHTO	RATING
●	R-12#2	2.0	5.8	59.2	35.0	Silty Clay	A-6 (20)	FAIR
⊠	R-18#1	2.0	9.2	49.3	41.5	Clay	A-7-6 (42)	FAIR
▲	R-20#2	2.0	14.7	55.7	29.6	Silty Clay Loam	A-7-6 (25)	POOR
★	R-27#2	2.0	17.5	55.0	27.5	Silty Clay Loam	A-7-6 (21)	POOR
⊙	R-34#2	2.0	12.9	59.7	27.4	Silty Clay Loam	A-7-6 (22)	POOR
⊕	R-42#2	2.0	17.5	52.3	30.2	Silty Clay	A-7-6 (26)	FAIR
○	R-44#2	2.0	9.2	54.5	36.3	Silty Clay	A-6 (18)	FAIR
△	R-45#2	2.0	18.9	46.9	34.2	Clay	A-7-6 (21)	FAIR
⊗	R-46#2	2.0	15.2	50.3	34.4	Silty Clay	A-7-6 (27)	FAIR
⊕	R-48#2	2.0	2.5	46.1	51.4	Clay	A-7-6 (35)	FAIR

WEI SSR 3410701.GPJ WANGENG.GDT 6/23/14



Wang Engineering, Inc.  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

### Subgrade Support Rating Chart

Project: IL 83 from IL 120 to IL 137 at Atkinson Road  
 Location: E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.  
 Number: 341-07-01

## **APPENDIX A**



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-01

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 813.73 ft  
 North: 2061765.04 ft  
 East: 1068043.91 ft  
 Station: 175+13.4  
 Offset: 18.7 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	813.62	2-inch thick CRUSHED STONE --AGGREGATE SHOULDER--				2											
		Loose, brown SANDY LOAM, some gravel			1	3	NP	12									
		--FILL--				3											
	811.7					4											
		Very stiff, brown and gray SILTY CLAY (3.0P - 3.5P)				4											
		--FILL--				4											
	810.7				2	4	1.00	28									
		Stiff, dark brown SILTY CLAY, trace organic matters				4	P										
		--BURIED TOPSOIL--				5											
	809.5					2											
		Medium stiff, brown SILTY CLAY				2											
			5		3	2	0.50	25									
						3	P										
						4											
	807.7					2											
		Very stiff to hard, brown and gray SILTY CLAY, trace gravel				4	2.50	15									
						5	P										
						6											
						2											
					5	5	4.50	14									
						8	P										
						10											
	803.7		10														
		Boring terminated at 10.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-02

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 818.65 ft  
 North: 2061999.40 ft  
 East: 1067879.83 ft  
 Station: 178+00.7  
 Offset: 11.6 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	817.8	10-inch thick, brown SANDY GRAVEL --AGGREGATE SHOULDER--			1	5	2.50	19									
		Very stiff, brown SILTY CLAY LOAM, some gravel --FILL--				3											
	816.4	Stiff, brown SILTY CLAY LOAM			2	2	1.25	20									
						2											
						2											
	814.4	Medium dense, brown and gray SILT to SILTY LOAM --WET--			3	5	NP	22									
						5											
						6											
						4											
						4											
						6											
						6											
						4											
						5											
						5											
						6											
						6											
	808.7	Boring terminated at 10.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

While Drilling  $\nabla$  **6.00 ft**  
 At Completion of Drilling  $\blacktriangledown$  **6.00 ft**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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





wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-03

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 823.24 ft  
 North: 2062264.91 ft  
 East: 1067699.65 ft  
 Station: 181+21.1  
 Offset: 7.9 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	822.2	12-inch thick, brown SANDY GRAVEL --AGGREGATE SHOULDER--			1	2 3	3.03 B	15									
	821.0	Very stiff, brown and gray SILTY CLAY			2	3 3 3	0.75 P	22									
		Medium stiff to very stiff, brown CLAY --SILT LAMINATIONS--			3	3 3 3 4	1.64 B	23									
					4	3 4 5 6	2.46 B	23									
	815.2	Very stiff to hard, gray SILTY CLAY, trace gravel			5	5 6 7 7	2.05 B	22									
					6	5 7 11 8	2.50 P	15									
					7	4 5 7 9	5.33 B	12									
	809.2	Boring terminated at 14.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.

WANGENG 3410701.GPJ WANGENG.GDT 6/24/14



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-04

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 815.81 ft  
 North: 2062528.05 ft  
 East: 1067577.06 ft  
 Station: 184+10.0  
 Offset: 20.6 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	815.4	5-inch thick, black SILTY LOAM --TOPSOIL--				3											
		Stiff to very stiff, brown SILTY CLAY --SAND LAMINATIONS--			1	5 5 7	1.64 S	17									
					2	3 3 5 6	2.95 S	20									
			5		3	3 2 4 7	3.25 P	18									
					4	3 4 5 7	1.15 B	20									
					5	3 4 5 7	2.30 B	22									
	805.8	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

Begin Drilling **08-30-2011** Complete Drilling **08-30-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **N. Boddy** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

### 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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-05

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 810.52 ft  
 North: 2062791.29 ft  
 East: 1067416.26 ft  
 Station: 187+18.4  
 Offset: 16.3 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	809.7	10-inch thick, black SILTY LOAM --TOPSOIL--				3											
		Very stiff to hard, brown and gray SILTY CLAY, trace to little gravel			1	5 6 7	4.25 P	24									
					2	4 5 8 8	3.53 S	17									
			5		3	4 5 9 11	5.74 S	16									
					4	4 6 6 11	4.51 B	18									
					5	4 6 7 12	5.41 B	15									
	800.5	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-30-2011** Complete Drilling **08-30-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **N. Boddy** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-06

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 812.60 ft  
 North: 2062917.43 ft  
 East: 1067297.05 ft  
 Station: 188+87.7  
 Offset: 22.1 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	811.9	8-inch thick, black SILTY LOAM --TOPSOIL--				2											
		Very stiff to hard, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace to little gravel			1	4 4 5	4.25 P	18									
					2	5 11 13 13	4.51 P	22									
				5	3	4 7 10 10	7.79 B	12									
					4	3 3 7 10	4.67 B	18									
					5	4 5 8 9	3.77 B	15									
	802.6	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-30-2011** Complete Drilling **08-30-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **N. Boddy** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-07

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 810.04 ft  
 North: 2063081.54 ft  
 East: 1067277.35 ft  
 Station: 190+38.9  
 Offset: 44.6 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	809.1	11-inch thick, black SILTY LOAM --TOPSOIL--				3											
		Very stiff to hard, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace to little gravel			1	3	3.00	21									
						4		P									
					2	3	4.67	13									
						4											
						7											
					3	4	6.56	16									
						6											
						9											
						11											
					4	4	5.17	19									
						5											
						7											
						11											
					5	3	4.84	19									
						5											
						9											
						11											
	800.0	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-30-2011** Complete Drilling **08-30-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **N. Boddy** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-08

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 807.22 ft  
 North: 2063273.29 ft  
 East: 1067050.65 ft  
 Station: 193+19.4  
 Offset: 52.9 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)											
	801.5	Loose, brown SANDY LOAM, some gravel	--FILL--	X	1	2 3 3 3	NP	9																				
					2	3 2 4 4													NP	15								
					3	3 3 5 6															NP	17						
					4	7 6 6 8																	1.25 P	15				
					5	5 6 4 9																			3.00 P	16		
					6																							
					7																							
					8																							
					9																							
					10																							
					11																							
					12																							
					13																							
					14																							
					15																							

801.5

797.2

Stiff to very stiff, brown SILTY CLAY, trace gravel

Boring terminated at 10.00 ft

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-09

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 807.03 ft  
 North: 2063422.52 ft  
 East: 1066975.82 ft  
 Station: 194+86.0  
 Offset: 41.3 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	806.4	8-inch thick, black SILTY CLAY --TOPSOIL--				2											
		Stiff, brown and gray SILTY CLAY			1	2 2 3 4	1.64 B	22									
					2	2 3 3 3	1.72 B	26									
			5		3	3 3 3 3	1.48 B	19									
	801.0	Very loose to medium dense, brown and gray LOAM			4	2 1 2 2	NP	22									
		--WET--			5	3 5 5 6	NP	17									
	797.0	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-29-2011** Complete Drilling **08-29-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

While Drilling  $\nabla$  **8.00 ft**  
 At Completion of Drilling  $\blacktriangledown$  **6.00 ft**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-10

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 812.47 ft  
 North: 2063710.08 ft  
 East: 1066814.32 ft  
 Station: 198+15.7  
 Offset: 33.8 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	812.14	14-inch thick, brown SILTY LOAM --TOPSOIL-- Loose to medium dense, brown and gray SILTY LOAM			1	3 3 4 6	NP	18									
					2	4 6 7 7	NP	15									
	808.2	Very stiff to hard, brown and gray SILTY CLAY	5		3	8 10 11 11	2.46 S	16									
					4	5 6 7 7	4.10 B	20									
					5	4 4 5 5	2.62 B	23									
	802.5	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-29-2011** Complete Drilling **08-29-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.





wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-11

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 808.91 ft  
 North: 2064005.79 ft  
 East: 1066676.48 ft  
 Station: 201+40.4  
 Offset: 1.8 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	808.74	1/2-inch thick ASPHALT --PAVEMENT--															
	807.98	8-inch thick CRUSHED STONE --BASE COURSE--															
	806.9	Very stiff, brown and gray SILTY CLAY --FILL--			1	3	2.50	24									
		Stiff to hard, brown and gray SILTY CLAY				3											
					2	5	4.50	18									
						6											
						7											
						8											
					3	5	3.50	20									
						6											
						8											
					4	5	1.75	21									
						6											
						6											
						6											
					5	4	1.50	21									
						4											
						4											
						5											
						5											
	797.9	Boring terminated at 11.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-12

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 805.20 ft  
 North: 2064246.46 ft  
 East: 1066503.01 ft  
 Station: 204+35.8  
 Offset: 28.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	804.7	6-inch thick, dark brown SILTY CLAY				3											
		--TOPSOIL--			1	4	2.75	21									
		Medium stiff to very stiff, brown and gray SILTY CLAY to SILTY CLAY LOAM, little to some gravel				4	P										
		--FILL--				5											
		--L <sub>L</sub> (%)=39, P <sub>L</sub> (%)=18--				3											
		--%Gravel=1.9--			2	2	1.23	26									
		--%Sand=3.9--				2	B										
		--%Silt=59.2--				2											
		--%Clay=35.0--				3											
		--A-6 (20)--															
			5		3	2	0.75	26									
						3	P										
						2											
	799.2	Stiff to very stiff, brown and gray SILTY CLAY, trace gravel			4	2	2.13	20									
						3	B										
						4											
						6											
					5	3	1.72	18									
						5	B										
						5											
	795.2	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-13

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 799.48 ft  
 North: 2064453.63 ft  
 East: 1066372.28 ft  
 Station: 206+80.7  
 Offset: 35.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	798.7	9-inch thick, black SILTY LOAM --TOPSOIL--				2											
	797.5	Very stiff, brown and gray SILTY CLAY --FILL--			1	2 2 5 6	3.75 P	24									
	795.7	Very stiff, brown and gray SILTY CLAY			2	3 2 3 3	2.21 B	22									
	793.2	Loose, brown SANDY LOAM	5		3	3 4 4 5	NP	16									
	789.5	Hard, brown and gray SILTY CLAY, trace gravel			4	3 5 7 9	6.64 B	14									
	789.5	Boring terminated at 10.00 ft	10		5	5 6 9 11	4.26 B	13									
			15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-30-2011** Complete Drilling **08-30-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **N. Boddy** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-14

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 793.89 ft  
 North: 2064801.79 ft  
 East: 1066198.23 ft  
 Station: 210+69.0  
 Offset: 7.9 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	793.63	3-inch thick ASPHALT --PAVEMENT--															
	793.08	8-inch thick CRUSHED STONE --BASE COURSE--															
		Stiff to very stiff, brown and gray SILTY CLAY, trace gravel			1	3 4 3 6	2.81 B	15									
					2	3 4 5 6	3.28 B	16									
					3	3 4 8 9	3.44 B	18									
					4	4 5 7 7	1.80 B	14									
					5	5 5 6 7	2.05 B	13									
	782.9	Boring terminated at 11.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-15

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 790.58 ft  
 North: 2064977.17 ft  
 East: 1066124.50 ft  
 Station: 212+57.5  
 Offset: 17.9 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	790.3	3-inch thick ASPHALT --PAVEMENT--															
	789.9	5-inch thick CRUSHED STONE --BASE COURSE--															
		Stiff to hard, brown and gray SILTY CLAY, trace gravel			1	4 3 3 5	1.56 B	15									
					2	5 5 5 6	2.54 B	16									
					3	4 5 8 10	3.53 B	16									
					4	5 6 10 12	4.26 B	15									
					5	4 7 10 12	4.76 B	16									
	779.6	Boring terminated at 11.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-16

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 792.55 ft  
 North: 2065301.02 ft  
 East: 1065879.99 ft  
 Station: 216+60.7  
 Offset: 27.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	792.42	42-inch thick, brown SILTY CLAY --TOPSOIL-- Medium stiff, brown SILTY CLAY, trace gravel --FILL--			1	2 3 3 3	0.75 P	23										
	790.1	Very stiff to hard, brown and gray SILTY CLAY, trace gravel			2	2 5 6 6	4.25 P	16										
			5		3	5 5 6 7	4.02 B	17										
					4	9 9 12 12	4.50 P	14										
					5	7 9 9 10	3.44 B	16										
	782.6	Boring terminated at 10.00 ft	10															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-17

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 796.87 ft  
 North: 2061362.62 ft  
 East: 1066577.12 ft  
 Station: 411+41.3  
 Offset: 17.5 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	796.2	8-inch thick CRUSHED STONE --AGGREGATE SHOULDER--				6											
		Very stiff, brown and gray SILTY CLAY, trace gravel			1	3 4 4	2.75 P	16									
					2	4 4 4 4	3.50 P	13									
	793.1	Medium dense, brown and gray SANDY LOAM, some gravel --WET--			3	3 5 9 8	NP	16									
		Very stiff, brown and gray SILTY CLAY, trace gravel			4	5 7 8 7	2.50 P	18									
					5	4 5 6 8	2.75 P	18									
	786.9	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

While Drilling  $\nabla$  **3.75 ft**  
 At Completion of Drilling  $\blacktriangledown$  **DRY**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-18

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 798.68 ft  
 North: 2061666.81 ft  
 East: 1066548.14 ft  
 Station: 414+45.8  
 Offset: 7.8 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		20-inch thick ASPHALT --PAVEMENT--															
	797.0																
	796.5	6-inch thick SANDY GRAVEL --BASE COURSE--															
		Medium stiff, brown CLAY --L <sub>L</sub> (%)=60, P <sub>L</sub> (%)=17-- --%Gravel=0.3-- --%Sand=8.8-- --%Silt=49.3-- --%Clay=41.6-- --A-7-6 (42)--			1	4 3 4 4	0.75 P	24									
	794.2																
		Loose, brown and gray, medium SAND, some gravel --WET--			2	2 2 2 3	NP	13									
	792.7																
		Very stiff, gray SILTY CLAY, trace gravel			3	3 3 4 6	2.25 P	17									
					4	3 4 5 6	3.50 P	16									
	788.7		10														
		Boring terminated at 10.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

While Drilling  $\nabla$  **4.50 ft**  
 At Completion of Drilling  $\nabla$  **DRY**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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





wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-19

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 800.92 ft  
 North: 2061960.81 ft  
 East: 1066601.35 ft  
 Station: 417+39.1  
 Offset: 49.0 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	800.4	6-inch thick ASPHALT --PAVEMENT--															
	799.9	6-inch thick CRUSHED STONE --BASE COURSE--															
		Stiff to very stiff, brown and gray SILTY CLAY, trace gravel			1	2 3 3 3	2.50 P	14									
					2	3 4 4 5	1.75 P	19									
					3	4 5 6 6	1.50 P	16									
					4	4 5 8 8	3.25 P	14									
					5	4 6 8 10	3.75 P	14									
	789.9	Boring terminated at 11.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



# BORING LOG R-20

wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

WEI Job No.: 341-07-01

Client: **exp US Services Inc.**  
 Project: **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location: **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 807.01 ft  
 North: 2062265.49 ft  
 East: 1066533.15 ft  
 Station: 420+44.6  
 Offset: 15.4 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	806.5	6-inch thick CRUSHED STONE --AGGREGATE SHOULDER--				6												
		Loose, brown SANDY LOAM --FILL--			1	5 3 3	NP	8										
	805.0	Stiff, dark brown SILTY CLAY LOAM			2	2 3 4 5	1.75 P	25										
		--L <sub>L</sub> (%)=51, P <sub>L</sub> (%)=23-- --%Gravel=0.8-- --%Sand=13.8-- --%Silt=55.7-- --%Clay=29.7-- --A-7-6 (25)--																
	803.3	Very stiff to hard, brown and gray SILTY CLAY, trace gravel			3	3 4 5 6	2.25 P	26										
						4	5 7 9 12	4.50 P	17									
						5	5 6 8 9	4.50 P	18									
	797.0	Boring terminated at 10.00 ft																

WANGENG 3410701.GPJ WANGENG.GDT 6/24/14

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling: **08-11-2011** Complete Drilling: **08-11-2011**  
 Drilling Contractor: **GSG** Drill Rig: **D 50 TMR**  
 Driller: **J&J** Logger: **B. Wilson** Checked by: **A. Kurnia**  
 Drilling Method: **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-21

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 806.25 ft  
 North: 2062490.03 ft  
 East: 1066562.64 ft  
 Station: 422+70.5  
 Offset: 9.9 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	805.8	6-inch thick ASPHALT --PAVEMENT--															
	805.4	4-inch thick CRUSHED STONE --BASE COURSE--															
	804.4	Stiff, dark brown SILTY CLAY			1	3											
		Stiff to hard, brown and gray SILTY CLAY, trace gravel			1	4	1.75	24									
					2	2											
					2	2	1.50	17									
					3	3											
					3	3											
					3	3	3.50	14									
					4	4											
					4	4	3.25	16									
					5	5											
					5	6	4.00	18									
					5	9											
					5	10											
	795.3	Boring terminated at 11.00 ft															

### GENERAL NOTES

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

### 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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-22

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 804.56 ft  
 North: 2062753.24 ft  
 East: 1066647.22 ft  
 Station: 425+51.7  
 Offset: 4.6 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	804.1	6-inch thick ASPHALT --PAVEMENT--															
		Medium dense, CRUSHED ASPHALT and GRAVEL --FILL--	10 12 16		1	50/5	NP										
	800.6	Stiff, brown and gray SILTY CLAY, some plant material --FILL--	2 2 2		2		1.50 P	28									
	799.6	Stiff to very stiff, brown and gray SILTY CLAY, trace gravel	2 2 4 4		3		2.79 B	18									
			2 2 3 3		4		1.56 B	18									
			2 3 3 4		5		1.56 B	18									
	793.6	Boring terminated at 11.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-23

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 806.17 ft  
 North: 2062981.64 ft  
 East: 1066817.18 ft  
 Station: 428+33.6  
 Offset: 22.2 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	803.2	Very dense, gray CRUSHED STONE --FILL--	19		1	25	NP	4										
						45												
						25/2												
						31												
						32												
			Stiff to hard, brown and gray SILTY CLAY, trace gravel --FILL--	14		2	14	4.50 P	14									
				10			10											
				5		3	4											
				5			5	1.64 B	20									
				6			6											
			6			6												
	800.2	Stiff, dark brown SILTY CLAY (Qu 1.75p) --BURIED TOPSOIL--	4		4	4	1.97 B	24										
	799.7		5			5												
			5			5												
			5			5												
			3			3												
			4			4												
			4			4												
			4			4												
			4			4	1.50 P	24										
	796.2		10															
		Boring terminated at 10.00 ft																

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-25

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 807.34 ft  
 North: 2062976.11 ft  
 East: 1066942.11 ft  
 Station: 429+33.6  
 Offset: 52.3 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	805.1	Very dense, CRUSHED ASPHALT --FILL--			1	15	NP	4									
						30											
						20											
						15											
	802.8	Stiff, brown and gray SILTY CLAY, trace gravel --FILL--			2	4	1.64 B	17									
						5											
						5											
						4											
	802.8	Medium dense to very dense, CRUSHED STONE and ASPHALT --FILL--	5		3	5	NP	13									
						7											
						16											
						14											
798.3	--WET--			4	12	NP	12										
					14												
					50/1												
796.8	Very soft, gray SILTY CLAY			5	6	< 0.25 P	52										
					5												
					2												
					1												
796.8	Stiff, brown and gray SILTY CLAY, trace gravel			6	1	1.80 B	18										
					2												
					3												
					4												
795.3	Boring terminated at 12.00 ft																

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

While Drilling **4.50 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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-27

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 807.84 ft  
 North: 2063202.60 ft  
 East: 1067052.85 ft  
 Station: 431+50.8  
 Offset: 75.7 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	806.8	12-inch thick SANDY GRAVEL --AGGREGATE SHOULDER--				4											
		Very stiff, brown SILTY CLAY LOAM --FILL--			1	4	2.50	17									
	805.3	Stiff, dark brown SILTY CLAY LOAM, trace organic matters --BURIED TOPSOIL-- --L <sub>L</sub> (%)=46, P <sub>L</sub> (%)=21-- --%Gravel=0.7-- --%Sand=16.7-- --%Silt=55.0-- --%Clay=27.6-- --A-7-6 (21)--			2	3	1.00	27									
	803.8	Very stiff, brown and gray SILTY CLAY, trace gravel			3	3	3.75	26									
					4	5		13									
					5	4	2.75	16									
	797.8	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-28

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 808.23 ft  
 North: 2063092.95 ft  
 East: 1067118.48 ft  
 Station: 431+45.2  
 Offset: 52.0 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	807.2	12-inch thick SANDY GRAVEL --AGGREGATE SHOULDER--				8											
	806.2	Very stiff, brown SILTY CLAY LOAM, little gravel --FILL--			1	3 3 3	2.50 P	18									
		Stiff to hard, brown and gray SILTY CLAY, trace to little gravel			2	3 3 6 6	1.50 P	26									
			5		3	4 5 7	2.00 P	18									
					4	3 5 7 8	2.50 P	11									
					5	5 6 9 11	4.50 P	15									
	798.2	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.





# BORING LOG R-29

wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 804.93 ft  
 North: 2063178.42 ft  
 East: 1067161.42 ft  
 Station: 432+28.1  
 Offset: 4.3 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		18-inch thick, brown SILTY CLAY --TOPSOIL--			1	2 3 4	1.15 P	21									
	803.4	Stiff to hard, brown and gray SILTY CLAY, trace gravel			2	2 3 3 4	2.30 B	16									
			5		3	4 5 5 6	5.00 B	16									
					4	5 6 8 8	4.76 B	18									
					5	5 6 8 8	4.76 B	17									
	794.9	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-29-2011** Complete Drilling **08-29-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-30

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 807.60 ft  
 North: 2063154.57 ft  
 East: 1067258.38 ft  
 Station: 432+95.9  
 Offset: 77.7 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	806.9	8-inch thick, black SILTY LOAM --TOPSOIL--				2												
		Very stiff to hard, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace gravel			1	4 3 3	2.75 P	16										
					2	3 4 5 6	2.87 B	16										
					3	7 7 7 9	5.00 B	18										
					4	4 5 9 13	5.25 B	17										
					5	3 6 10 14	7.71 B	15										
	797.6		Boring terminated at 10.00 ft	10														
				15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-30-2011** Complete Drilling **08-30-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **N. Boddy** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-31

WEI Job No.: 341-07-01

Client: **exp US Services Inc.**  
 Project: **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location: **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 803.58 ft  
 North: 2063246.34 ft  
 East: 1067199.55 ft  
 Station: 432+97.3  
 Offset: 31.3 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	801.9	20-inch thick, dark brown SILTY CLAY  --TOPSOIL--		X	1	2	2.00 P	31									
						2											
						2											
						2											
		Stiff to hard, brown and gray SILTY CLAY, trace gravel		X	2	2	1.64 B	25									
						3											
						3											
						3											
			5	X	3	2	1.23 B	24									
						2											
						3											
						3											
				X	4	4	4.02 B	16									
						7											
						8											
9																	
	793.6		X	5	4	3.03 B	15										
					5												
					6												
					7												
Boring terminated at 10.00 ft																	

### GENERAL NOTES

Begin Drilling **08-29-2011** Complete Drilling **08-29-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

### WATER LEVEL DATA

While Drilling  $\nabla$  **DRY**  
 At Completion of Drilling  $\blacktriangledown$  **DRY**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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

WANGENGINC 3410701.GPJ WANGENG.GDT 6/24/14



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-32

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 804.89 ft  
 North: 2063292.48 ft  
 East: 1067286.80 ft  
 Station: 433+95.6  
 Offset: 21.8 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	804.4	6-inch thick, brown SILTY CLAY --TOPSOIL--				2											
		Very stiff to hard, brown and gray SILTY CLAY, trace gravel			1	2 2 3 3	2.00 P	21									
					2	3 3 5 6	2.46 B	17									
			5		3	4 6 7 6	6.78 B	17									
					4	4 6 8 12	8.61 B	17									
					5	4 6 7 9	4.84 B	16									
	794.9	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

Begin Drilling **08-29-2011** Complete Drilling **08-29-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

### 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.





wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-34

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 811.47 ft  
 North: 2063395.31 ft  
 East: 1067567.25 ft  
 Station: 436+81.6  
 Offset: 50.3 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	810.5	12-inch thick, brown SILTY CLAY --TOPSOIL--				2											
		Stiff to hard, brown and gray SILTY CLAY LOAM, trace gravel --L <sub>L</sub> (%)=43, P <sub>L</sub> (%)=18-- --%Gravel=1.4-- --%Sand=11.5-- --%Silt=59.7-- --%Clay=27.4-- --A-7-6 (22)--			1	2 2 3 5	1.25 P	32									
					2	2 2 3 4	1.39 B	32									
			5		3	4 5 6 6	1.64 S	13									
					4	4 5 6 6	5.41 B	17									
					5	3 5 6 6	5.00 B	15									
	801.5	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-29-2011** Complete Drilling **08-29-2011**  
 Drilling Contractor **GTC** Drill Rig **CME ATV**  
 Driller **T&K** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-35

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 806.20 ft  
 North: 2062857.33 ft  
 East: 1066630.07 ft  
 Station: 284+21.7  
 Offset: 8.3 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
		Dense, black and gray CRUSHED ASPHALT and GRAVEL --FILL--	10		1	10	NP	6										
						12												
						26												
						15												
						19												
	803.2		Very stiff to hard, brown and gray SILTY CLAY, trace gravel	12		2	12	6.64 B	12									
							8											
							6											
							7											
	5						8	4.26 B	14									
							7											
							4											
							5	2.46 B	17									
							8											
							4											
						5												
						5	2.05 B	20										
						7												
	796.2	Boring terminated at 10.00 ft	10															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-36

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 802.83 ft  
 North: 2063020.62 ft  
 East: 1066554.09 ft  
 Station: 286+08.9  
 Offset: 10.1 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	802.3	6-inch thick CRUSHED STONE --AGGREGATE SHOULDER-- Stiff, brown SILTY CLAY --FILL--	0		1	14 6 3 3	1.50 P	18										
	800.8	Very stiff to hard, brown and gray SILTY CLAY, trace gravel	3		2	3 4 4 5	3.50 P	18										
	5		5	3	5 8 9	4.25 P	13											
			4	4	6 8 11 13	4.50 P	19											
			Boring terminated at 10.00 ft		5	5	8 8 10 14	4.50 P	18									
	792.8																	
				10														
				15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.





wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-37

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 805.63 ft  
 North: 2063260.17 ft  
 East: 1066552.94 ft  
 Station: 288+50.3  
 Offset: 16.3 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	805.0	8-inch thick CRUSHED STONE --AGGREGATE SHOULDER--				8												
		Very stiff, dark brown SILTY CLAY, trace organic matter			1	4 4 5	2.00 P	24										
	803.7	Stiff to hard, brown and gray, SILTY CLAY, trace gravel			2	3 3 3 5	1.50 P	20										
					3	3 4 5 5	2.50 P	19										
					4	3 5 7 9	3.75 P	18										
					5	3 5 7 9	4.00 P	18										
	795.6	Boring terminated at 10.00 ft																

### GENERAL NOTES

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

### 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.



# BORING LOG R-38

wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 808.60 ft  
 North: 2063547.94 ft  
 East: 1066513.83 ft  
 Station: 291+38.5  
 Offset: 19.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	808.3	4-inch thick, dark brown SILTY CLAY --TOPSOIL-- Very stiff, brown SILTY CLAY --FILL--			1	2 3 3 4	2.50 P	15										
	806.1	Stiff to very stiff, brown and gray SILTY CLAY			2	2 2 2 2	1.50 P	19										
	5				3	2 2 4 4	3.50 P	19										
					4	3 3 4 4	2.00 P	22										
					5	3 5 7 8	1.50 P	21										
	799.1	Brown and gray SANDY LOAM																
	798.6	Boring terminated at 10.00 ft																

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

While Drilling  $\nabla$  **9.50 ft**  
 At Completion of Drilling  $\blacktriangledown$  **DRY**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-39

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 806.93 ft  
 North: 2063864.42 ft  
 East: 1066511.67 ft  
 Station: 294+54.8  
 Offset: 19.5 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	806.5	5-inch thick ASPHALT															
	806.2	--PAVEMENT--															
		4-inch thick CRUSHED STONE															
		Very stiff to hard, brown and gray SILTY CLAY			1	4 4 4 6	2.50 P	25									
					2	4 4 5 7	4.50 P	17									
			5		3	4 5 7 7	4.50 P	18									
	799.9	Medium stiff, brown and gray CLAY			4	4 5 5 5	0.75 P	35									
	797.4	Medium dense, brown and gray SANDY LOAM			5	4 5 7 7	NP	17									
	795.9	Boring terminated at 11.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-11-2011** Complete Drilling **08-11-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-40

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 796.40 ft  
 North: 2064669.41 ft  
 East: 1066509.01 ft  
 Station: 302+59.8  
 Offset: 21.2 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	796.0	5-inch thick, brown SILTY CLAY --TOPSOIL--				3											
		Medium stiff to very stiff, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace gravel --FILL--			1	4 5 4	3.44 B	15									
					2	2 3 3 4	1.50 P	22									
			5		3	2 2 2 2	0.75 P	23									
	790.4	Medium stiff, brown and gray SILTY CLAY, trace gravel			4	1 2 2 2	0.82 B	31									
					5	2 2 2 2	0.75 P	31									
	785.9	Loose, gray SANDY GRAVEL			6	2 2 3 3	NP	13									
	784.4	Boring terminated at 12.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

While Drilling  $\nabla$  **10.50 ft**  
 At Completion of Drilling  $\blacktriangledown$  **DRY**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-41

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 793.74 ft  
 North: 2064899.13 ft  
 East: 1066549.76 ft  
 Station: 304+89.5  
 Offset: 19.9 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
		Very stiff to hard, brown and gray SILTY CLAY, trace gravel			1	6 4 5 5	2.00 P	17										
					2	3 3 3 3	2.46 B	18										
				5	3	3 4 6 7	4.43 B	17										
					4	4 7 9 11	4.84 B	17										
					5	4 6 8 9	4.10 B	17										
	783.7			10														
			Boring terminated at 10.00 ft															
				15														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-42

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 790.77 ft  
 North: 2065144.70 ft  
 East: 1066514.62 ft  
 Station: 307+35.1  
 Offset: 14.9 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	790.4	4-inch thick, CRUSHED STONE --AGGREGATE SHOULDER--				4												
		Stiff, brown SILTY CLAY LOAM, little gravel			1	3	1.50	21										
		--FILL--				3												
	788.8	Medium stiff to very stiff, brown and gray SILTY CLAY, trace gravel			2	3	0.75	28										
		--L <sub>L</sub> (%)=48, P <sub>L</sub> (%)=16-- --%Gravel=0.4-- --%Sand=17.1-- --%Silt=52.3-- --%Clay=30.2-- --A-7-6 (26)--				3	4											
						5	2	2.38	16									
						3	3											
						6	5											
						4	6	3.77	17									
						7	7											
					5	4	3.44	15										
					7	7												
					8	8												
	780.8	Boring terminated at 10.00 ft	10															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-12-2011** Complete Drilling **08-12-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-43

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NGVD  
 Elevation: 791.82 ft  
 North: 2065359.22 ft  
 East: 1066557.85 ft  
 Station: 309+49.6  
 Offset: 28.6 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	791.2	8-inch thick ASPHALT --PAVEMENT--															
	790.7	5-inch thick CRUSHED STONE --BASE COURSE--															
		Very stiff, brown and gray SILTY CLAY LOAM, little gravel --FILL--			1	6 5 5 5	3.00 P	23									
	788.6	Stiff to very stiff, brown and gray SILTY CLAY, trace gravel			2	4 4 4 5	1.50 P	15									
					3	4 5 6 7	3.50 P	16									
					4	4 5 7 7	3.50 P	18									
					5	4 5 6 7	2.50 P	16									
	780.8	Boring terminated at 11.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **08-10-2011** Complete Drilling **08-10-2011**  
 Drilling Contractor **GSG** Drill Rig **D 50 TMR**  
 Driller **J&J** Logger **B. Wilson** Checked by **A. Kurnia**  
 Drilling Method **3.25 IDA HSA; Boring backfilled upon completion**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-44

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NAVD  
 Elevation: 799.29 ft  
 North: 2061868.35 ft  
 East: 1066534.69 ft  
 Station: 416+47.5  
 Offset: 18.8 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		18-inch thick, dark brown SILTY LOAM --TOPSOIL-- --MOIST--			1	5 3 4	NP	27									
	797.8	Very stiff to hard, brown and gray SILTY CLAY, trace gravel --L <sub>L</sub> (%)=37, P <sub>L</sub> (%)=17-- --%Gravel=0.9-- --%Sand=8.3-- --%Silt=54.5-- --%Clay=36.3--			2	4 2 3 5 7	3.85 B	19									
			5		3	5 7 10 13	4.43 B	17									
	793.3	Medium dense, brown, coarse SAND and gravel --WET--			4	6 6 7	NP	15									
	791.7	Hard, gray, SILTY CLAY LOAM with trace gravel			5	4 4 6 9	4.51 B	15									
	789.3	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **05-30-2014** Complete Drilling **05-30-2014**  
 Drilling Contractor **WTS** Drill Rig **CME 55**  
 Driller **RR** Logger **D. Kolpacki** Checked by **C. Marin**  
 Drilling Method **2.25" HSA; 2' continous sampling; Boring backfilled upon completion**

While Drilling  $\nabla$  **6.00 ft**  
 At Completion of Drilling  $\blacktriangledown$  **10.00 ft**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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

WANGENG 3410701.GPJ WANGENG.GDT 6/24/14





wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-45

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NAVD  
 Elevation: 806.10 ft  
 North: 2062271.97 ft  
 East: 1066531.17 ft  
 Station: 420+51.1  
 Offset: 17.3 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	805.9	Brown GRAVELLY SAND --MOIST--				2											
		Very loose to Loose, brown SILTY LOAM			1	2	NP	25									
	804.6	--MOIST--				1											
		Medium stiff, dark brown CLAY to SILTY CLAY --L <sub>L</sub> (%)=47, P <sub>L</sub> (%)=21-- --%Gravel=2.5-- --%Sand=16.3-- --%Silt=46.9-- --%Clay=51.4-- --A-7-6 (21)--			2	3	0.50	26									
	802.6					4	P										
		Hard, brown and gray SILTY CLAY to SILTY CLAY LOAM, trace gravel	5		3	3	4.02	18									
						6	B										
						8											
						5											
						10	4.25	18									
						13	P										
						15											
						6											
						8											
						13	6.97	17									
						16	B										
	796.1	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

Begin Drilling **05-30-2014** Complete Drilling **05-30-2014**  
 Drilling Contractor **WTS** Drill Rig **CME 55**  
 Driller **RR** Logger **D. Kolpacki** Checked by **C. Marin**  
 Drilling Method **2.25" HSA; 2' continous sampling; Boring backfilled upon completion**

### 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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-46

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NAVD  
 Elevation: 803.52 ft  
 North: 2062661.12 ft  
 East: 1066602.56 ft  
 Station: 424+48.5  
 Offset: 5.2 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	803.0	6-inch thick, dark brown SILTY CLAY LOAM, trace roots --TOPSOIL-- Soft, brown SILTY CLAY			1	P U S H	0.25 P	31									
		--L <sub>L</sub> (%)=51, P <sub>L</sub> (%)=21-- --%Gravel=0.0-- --%Sand=15.2-- --%Silt=50.3-- --%Clay=34.4-- --A-7-6 (27)--			2	P U S H	0.25 P	30									
	799.8	Very soft (<0.25P), gray CLAY															
	798.8	Hard, brown SILTY CLAY, trace gravel	5		3	P U S H	4.50 P	17									
					4	P U S H	3.00 P										
	795.5	Boring terminated at 8.00 ft															

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **05-30-2014** Complete Drilling **05-30-2014**  
 Drilling Contractor **WEI** Drill Rig **GEOPROBE**  
 Driller **FB** Logger **M. de los Reyes** Checked by **C. Marin**  
 Drilling Method **Jackhammer driven 1.5" OD Geoprobe LB Sampler**

While Drilling  **NA**  
 At Completion of Drilling  **NA**  
 Time After Drilling **NA**  
 Depth to Water  **NA**

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



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-47

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NAVD  
 Elevation: 807.00 ft  
 North: 2063221.81 ft  
 East: 1067127.04 ft  
 Station: 192+36.2  
 Offset: 13.3 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	806.2	10-inch thick, dark brown SILTY LOAM --TOPSOIL--				1											
		Stiff to very stiff, brown SILTY CLAY LOAM, trace gravel			1	1	NP	26									
					2	5	3.75	15									
					3	3	P										
					4	4											
					5	4											
					3	2	1.72	23									
					4	4	B										
					4	5											
					5	4	3.85	17									
					5	8	B										
	799.5	Medium dense, brown GRAVELLY SAND --WET--			6	6											
					5	14	NP	15									
					5	8											
					5	5											
	797.0	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

Begin Drilling **05-30-2014** Complete Drilling **05-30-2014**  
 Drilling Contractor **WTS** Drill Rig **CME 55**  
 Driller **RR** Logger **D. Kolpacki** Checked by **C. Marin**  
 Drilling Method **2.25" HSA; 2' continous sampling; Boring backfilled upon completion**

### WATER LEVEL DATA

While Drilling  $\nabla$  **8.00 ft**  
 At Completion of Drilling  $\blacktriangledown$  **8.00 ft**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-48

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NAVD  
 Elevation: 805.97 ft  
 North: 2063538.73 ft  
 East: 1066977.06 ft  
 Station: 195+85.3  
 Offset: 19.0 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	
	805.0	12-inch thick, very stiff, brown SILTY CLAY, trace gravel --TOPSOIL--			1	P U S H	2.20 P	20										
	803.0	Stiff to very stiff, dark brown SILTY CLAY LOAM  --L <sub>L</sub> (%)=55, P <sub>L</sub> (%)=24-- --%Gravel=0.0-- --%Sand=2.5-- --%Silt=46.1-- --%Clay=51.4-- --A-7-6 (35)--			2	P U S H	2.00 P	31										
	802.0	Very stiff, brown and gray SILTY CLAY LOAM to SILTY LOAM Very stiff, brown SILTY CLAY	5		3	P U S H	3.75 P	21										
	799.0	Brown SANDY LOAM			4	P U S H	NP	19										
	797.5	Soft, gray CLAY LOAM			5	P U S H	0.25 P	17										
	796.5	Brown, medium to coarse SAND, trace gravel	10															
	796.0	Boring terminated at 10.00 ft																

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **05-30-2014** Complete Drilling **05-30-2014**  
 Drilling Contractor **WEI** Drill Rig **GEOPROBE**  
 Driller **N/A** Logger **M. de los Reyes** Checked by **C. Marin**  
 Drilling Method **Jackhammer driven 1.5" OD Geoprobe LB Sampler**

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.



wangeng@wangeng.com  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

# BORING LOG R-49

WEI Job No.: 341-07-01

Client **exp US Services Inc.**  
 Project **IL 83 from IL 120 to IL 137 at Atkinson Road**  
 Location **E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.**

Datum: NAVD  
 Elevation: 798.93 ft  
 North: 2064380.92 ft  
 East: 1066480.42 ft  
 Station: 205+63.1  
 Offset: 20.5 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	797.9	12-inch thick, dark brown CLAY LOAM, trace gravel --TOPSOIL--			1	P U S H	3.00 P	19									
	795.4	Very stiff, brown SILTY CLAY LOAM, trace gravel			2	P U S H	3.25 P	19									
	794.4	Brown SANDY LOAM															
	793.4	Brown GRAVELLY SAND	5		3	P U S H	NP	24									
	790.9	Hard, brown SILTY CLAY to CLAY, trace gravel			4	P U S H	4.50 P	14									
	789.9	Brown GRAVELLY SAND															
	788.9	Very stiff, gray SILTY CLAY			5	P U S H	2.00 P	13									
		Boring terminated at 10.00 ft	10														

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **05-30-2014** Complete Drilling **05-30-2014**  
 Drilling Contractor **WEI** Drill Rig **GEOPROBE**  
 Driller **N/A** Logger **M. de los Reyes** Checked by **C. Marin**  
 Drilling Method **Jackhammer driven 1.5" OD Geoprobe LB Sampler**

While Drilling  **NA**  
 At Completion of Drilling  **NA**  
 Time After Drilling **NA**  
 Depth to Water  **NA**

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







File No. 16615 **BORING LOG** 15

Client Baxter & Woodman, Inc. Sheet 1 of 1

Comments Route 83

Project Phase I Pavement Investigation Date 11/19/02  
Atkinson Rd., Rte. 83, Rte. 120

Sta. 202+65

Location Rte. 137 & Ivanhoe Rd. Drilled By AC  
Improvements - Grayslake, IL

18' E. of Prop. C.L.

Equipment  CME 45B  H.A.  Other Logged By DA

Elev., ft.	Description	Depth, ft.	0	S	T	R	B	N	Pen.	W	Uw	Qu
	Dark brown-black silt, some clay, trace sand & roots, damp (topsoil)						6					
			1	J			5					
			2	SS	15"		9	14	2.5	34.4	26.1	
	Brown clay, some silt, trace sand & gravel, damp, very tough to hard						5					
							6					
							8	14				
			3	SS	22"		11		2.25	27.0	94.3	2.3
							4					
			5				6					
							9	15				
			4	SS	24"		13		4.0	19.9	108.6	5.3
							4					
							7					
							10	17				
			5	SS	24"		11		3.75	21.7	107.6	4.9
							3					
							5					
							7	12				
	Brown clay, some silt, trace sand & gravel, damp, very tough		10	SS	18"		10		1.5	23.3	106.8	2.5
	End of Boring											
			15									
			20									

Water Level — depth, ft. elev., ft.  
 - while drilling: Dry  
 - after drilling: Dry  
 - hrs. after drilling: \_\_\_\_\_

S - sample T - type: J(Jar), SS(split-spoon), ST(shelby tube) R - recovery length, in.  
 B - Standard Penetration Test (SPT), blows/ 6" interval. W - water content, %  
 N - SPT, blows/ foot to drive 2" O.D. split-spoon sampler with 140 lb. hammer falling 30".  
 Pen. - pocket penetrometer reading, tons/ sq. ft. Uw - dry unit weight of soil, lbs./ cu.ft.  
 Qu - unconfined compressive strength, tons./ sq. ft.









File No. 16615

**BORING LOG** 21

Client Baxter & Woodman, Inc. Sheet 1 of 1

Comments Route 83/Atkinson Rd.  
Sta. 33+75  
26' E. of Prop. C.L.

Project Phase I Pavement Investigation Date 12/3/02  
 Location Atkinson Rd., Rte. 83, Rte. 120  
Rte. 137 & Ivanhoe Rd. Drilled By AC  
Improvements - Grayslake, IL  
 Equipment  CME 45B  H.A.  Other Logged By DA

Elev., ft.	Description	Depth, ft.	0	S	T	R	B	N	Pen.	W	Uw	Qu
	Crushed gravel, damp - 6.0"											
	(a) see below						4					
				1	J		8			27.7		
	Brown clay, some silt, trace sand & gravel, damp, very tough to hard			2	SS	15"	10	18	3.15	26.2		
							6					
							9					
							10	19				
				3	SS	24"	12		4.5+	18.6	103.6	3.2
							6					
				5			8					
							10	18				
				4	SS	24"	13		4.5+	18.6	106.3	5.1
	Brown-gray clay & silt, trace fine sand, damp, very tough						4					
							5					
							6	11				
				5	SS	24"	6		2.5	23.7	100.0	2.3
							4					
							5					
							6	11				
				10	6	SS	24"	9	2.0	22.7	114.2	2.7
	End of Boring											
	(a) Black-dark brown silt, some clay, trace sand, damp, medium dense (topsoil)											
				15								
				20								

Water Level — depth, ft. elev., ft.  
 - while drilling: Dry  
 - after drilling: Dry  
 - hrs. after drilling: \_\_\_\_\_

S - sample T - type: J(Jar), SS(split-spoon), ST(sheiby tube) R - recovery length, in.  
 B - Standard Penetration Test (SPT), blows/ 6" interval. W - water content, %.  
 N - SPT, blows/ foot to drive 2" O.D. split-spoon sampler with 140 lb. hammer falling 30".  
 Pen. - pocket penetrometer reading, tons/ sq. ft.. Uw - dry unit weight of soil, lbs./ cu.ft.  
 Qu - unconfined compressive strength, tons./ sq. ft..



PC-01 (11' Offset)  
 Ivanhoe Road (IL 83) SB  
 Total Core Length: 13.00 in  
 Asphalt: 13.00 in  
 Concrete: 0.00 in



PC-01 (7.5' Offset)  
 Ivanhoe Road (IL 83) SB  
 Total Core Length: 15.25 in  
 Asphalt: 8.00 in  
 Concrete: 7.25 in

PAVEMENT CORE PHOTOGRAPHS: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: NONE	<b>APPENDIX A-1</b>	DRAWN BY: S. MANN CHECKED BY: M. SEYHUN
-------------	---------------------	--

 <b>Wang Engineering</b>	1145 N. Main Street Lombard, IL 60148 www.wangeng.com
--	---

FOR exp U.S. SERVICES, INC.	<b>341-07-01</b>
-----------------------------	------------------



PC-02 (11' Offset)  
Ivanhoe Road (IL 83) SB  
Total Core Length: 13.00 in  
Asphalt: 13.00 in  
Concrete: 0.00 in



PC-02 (7.5' Offset)  
Ivanhoe Road (IL 83) SB  
Total Core Length: 15.75 in  
Asphalt: 8.00 in  
Concrete: 7.75 in

PAVEMENT CORE PHOTOGRAPHS: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: NONE	<b>APPENDIX A-2</b>	DRAWN BY: S. MANN CHECKED BY: M. SEYHUN
-------------	---------------------	--



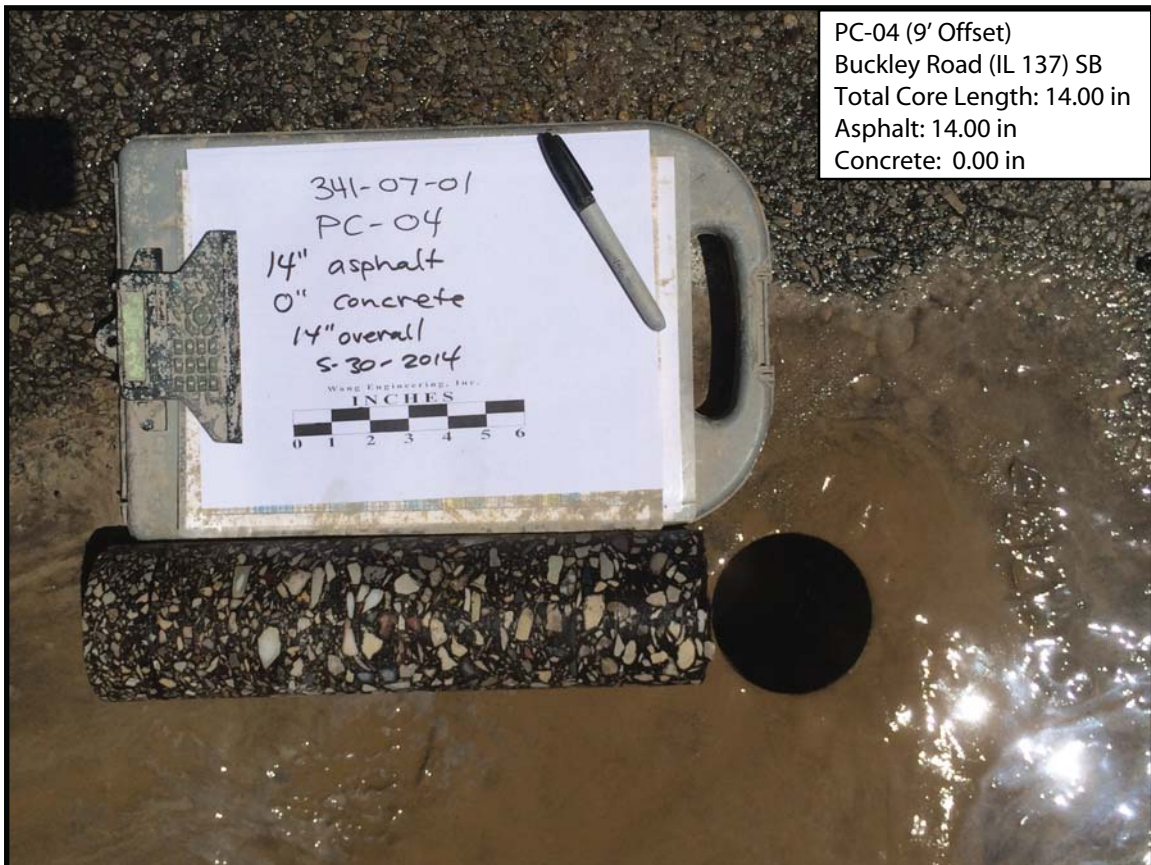
**Wang Engineering**  
1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

FOR exp U.S. SERVICES, INC. 341-07-01



PC-03  
 Ivanhoe Road (IL 83) SB  
 Total Core Length: 11.75 in  
 Asphalt: 5.75 in  
 Concrete: 6.00 in

PAVEMENT CORE PHOTOGRAPHS: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL		
SCALE: NONE	<b>APPENDIX A-3</b>	DRAWN BY: S. MANN CHECKED BY: M. SEYHUN
		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR exp U.S. SERVICES, INC.		<b>341-07-01</b>



PC-04 (9' Offset)  
 Buckley Road (IL 137) SB  
 Total Core Length: 14.00 in  
 Asphalt: 14.00 in  
 Concrete: 0.00 in



PC-04 (7.5' Offset)  
 Buckley Road (IL 137) SB  
 Total Core Length: 19.75 in  
 Asphalt: 10.75 in  
 Concrete: 9.00 in

PAVEMENT CORE PHOTOGRAPHS: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL


SCALE: NONE	<b>APPENDIX A-4</b>	DRAWN BY: S. MANN CHECKED BY: M. SEYHUN
-------------	---------------------	--

 <b>Wang Engineering</b>	1145 N. Main Street Lombard, IL 60148 www.wangeng.com
--	---

FOR exp U.S. SERVICES, INC.	<b>341-07-01</b>
-----------------------------	------------------



PC-05  
 Buckley Road (IL 137) SB  
 Total Core Length: 16.00 in  
 Asphalt: 6.00 in  
 Concrete: 10.00 in

PAVEMENT CORE PHOTOGRAPHS: FAP 866; IL 83 FROM IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL		
SCALE: NONE	<b>APPENDIX A-5</b>	DRAWN BY: S. MANN CHECKED BY: M. SEYHUN
		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR exp U.S. SERVICES, INC.		<b>341-07-01</b>



## **APPENDIX B**



State Job Number: P-91-237-11 Project: IL 83 from IL 120 to IL 137 Route: FAP866

Section: xxx-xxxx City or County: Lake Date: 3/10/2014

ADT: - Year: - Design Period: - Class Highway: -

Passenger Cars Per Day: - Trucks S.U. Per Day: - Trucks M.U. Per Day: -

Pavement Structure: N/A

Type Surface Course: - Thickness: -

Type Base Course: - Thickness: -

Type Subbase Material: - Thickness: -

Sta. to Sta.	175+12 to 217+00	411+23 to 437+01	283+52 to 309+50	+ to +
*Sta. of Test	204+35.8	436+50.8	307+35.1	
*Drainage Class	POOR	POOR	POOR	
*Ave. Frost Penetration	42	42	42	
Illinois Textural Classification	Silty Clay	Silty Cay Loam	Silty Clay	
Classification and Group Index (AASHTO M 145)	A-6(20)	A-7-6(22)	A-7-6(26)	
*Percent Silt (AASHTO T 88)	59.2	59.7	52.3	
*Illinois Bearing Ratio (%)	3	2	2	
Std. Dry Density (IL Mod. AASHTO T 99)	N/A	N/A	N/A	
Optimum Moisture (IL Mod AASHTO T 99)	N/A	N/A	N/A	

\* Indicates worst condition within the above station limits.

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SOIL TEST DATA**

**ROUTE**  
FAP 866

**PROJECT**  
IL 83 from IL 120 to IL 137 at Atkinson Road

**SECTION**  
xxx(xxx-xx)

**COUNTY**  
Lake County

Lab. No.	R-12 No.2	R-18 No.1	R-20 No.2	R-27 No.2	R-34 No.2
Station (ft)	204+35.8	414+45.8	420+44.6	431+50.8	436+81.6
Offset (ft)	28.5 LT	7.8 LT	15.4 LT	75.7 LT	50.3 RT
Depth (ft)	2.0	2.0	2.0	2.0	2.0
AASHTO M 145 Classification and Group Index	A-6 (20)	A-7-6 (42)	A-7-6 (25)	A-7-6 (21)	A-7-6 (22)
Illinois Textural Classification (Illinois Method)	Silty Clay	Clay	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam
Gradation--Passing 1" Sieve %					
--" 3/4" Sieve %					
--" 1/2" Sieve %					100.0
--" No.4 Sieve %	99.5	100.0	99.7	100.0	99.1
--" No.10 Sieve %	98.1	99.7	99.2	99.3	98.6
--" No.40 Sieve %	96.2	97.9	95.1	95.7	96.0
--" No.100 Sieve %	94.9	92.9	88.7	86.8	90.8
--" No.200 Sieve %	94.2	90.8	85.3	82.5	87.1
Sand % (AASHTO T 88)	3.9	8.8	13.8	16.7	11.5
Silt % (AASHTO T 88)	59.2	49.3	55.7	55.0	59.7
Clay % (AASHTO T 88)	35.0	41.5	29.6	27.5	27.4
Liquid limit % (AASHTO T 89)	39	60	51	46	43
Plasticity index % (AASHTO T 90)	21	43	27	25	25
Organic Matter Content					
IBR % (Illinois Method)					
Standard Dry Density % (AASHTO T 99)					
Optimum Moisture % (AASHTO T 99)					
Subgrade Support Rating	FAIR	FAIR	POOR	POOR	POOR
In situ Moisture % (AASHTO T 99)	26	24	25	27	32

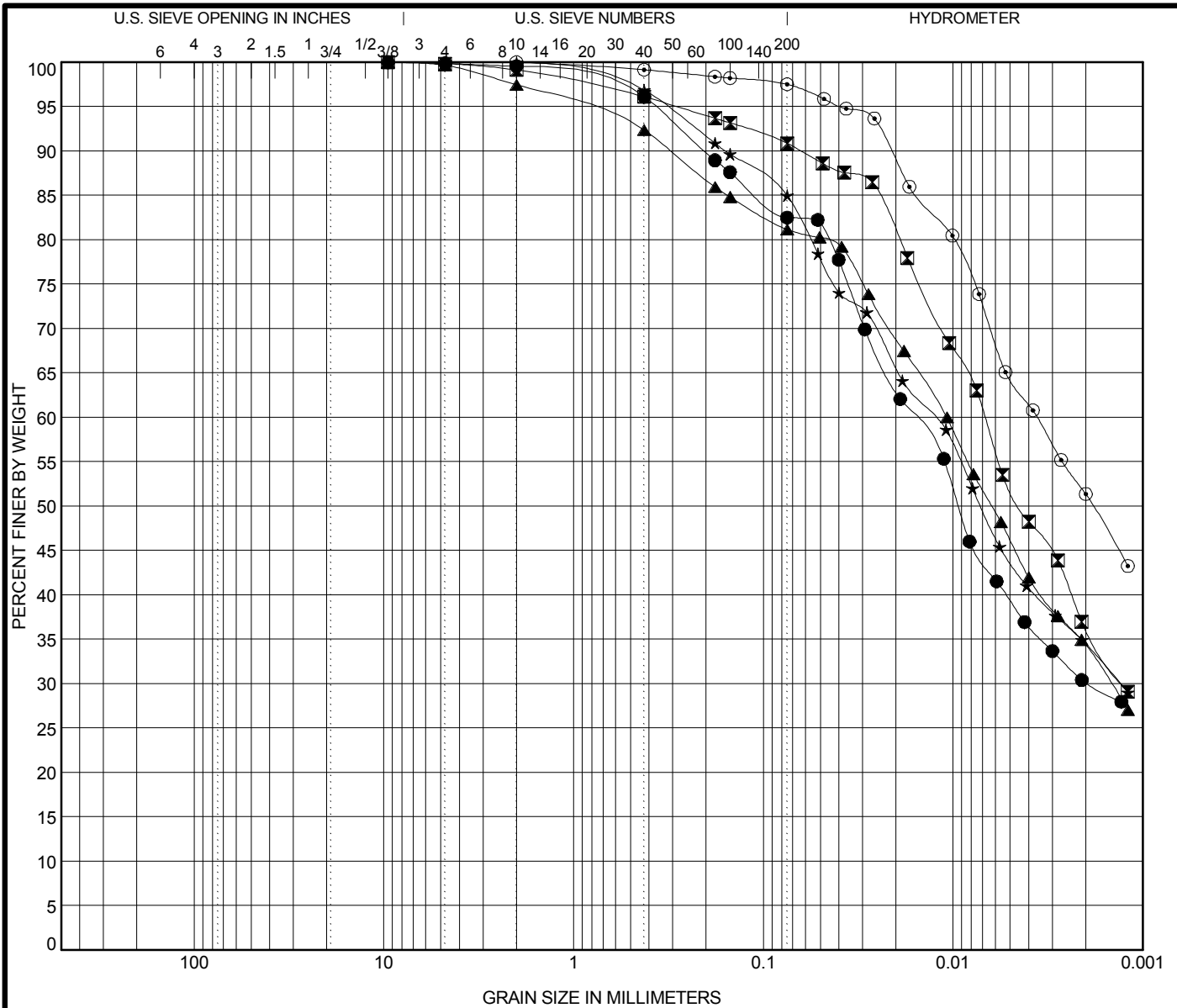
### SOIL TEST DATA

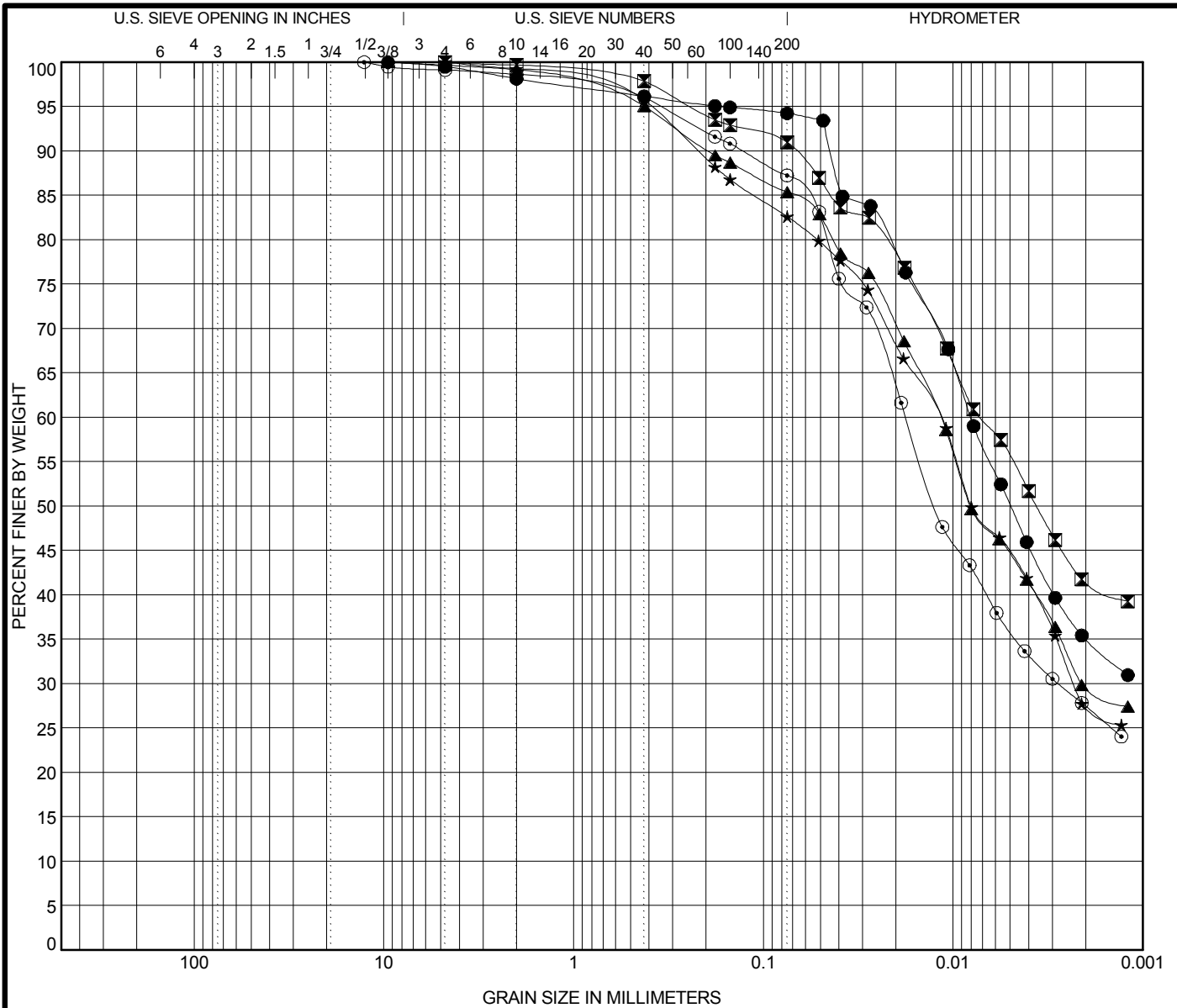
**SECTION**

xxx(xxx-xx)

Lab. No.	R-42 No.2	R-44 No.2	R-45 No.2	R-46 No.2	R-48 No.2
Station (ft)	307+35.1	416+47.5	420+51.1	424+48.5	195+85.3
Offset (ft)	14.9 LT	18.8 LT	17.3 LT	5.2 RT	19.0 RT
Depth (ft)	2.0	2.0	2.0	2.0	2.0
AASHTO M 145 Classification and Group Index	A-7-6 (26)	A-6 (18)	A-7-6 (21)	A-7-6 (27)	A-7-6 (35)
Illinois Textural Classification (Illinois Method)	Silty Clay	Silty Clay	Clay	Silty Clay	Clay
Gradation--Passing 1" Sieve %					
--" 3/4" Sieve %					
--" 1/2" Sieve %					
--" No.4 Sieve %	99.9	99.8	99.7	100.0	
--" No.10 Sieve %	99.6	99.1	97.5	100.0	100.0
--" No.40 Sieve %	96.1	96.1	92.4	96.9	99.1
--" No.100 Sieve %	87.6	93.2	84.8	89.6	98.2
--" No.200 Sieve %	82.5	90.8	81.1	84.8	97.5
Sand % (AASHTO T 88)	17.1	8.3	16.3	15.2	2.5
Silt % (AASHTO T 88)	52.3	54.5	46.9	50.3	46.1
Clay % (AASHTO T 88)	30.2	36.3	34.2	34.4	51.4
Liquid limit % (AASHTO T 89)	48	37	47	51	55
Plasticity index % (AASHTO T 90)	32	20	25	29	30
Organic Matter Content IBR % (Illinois Method)					
Standard Dry Density % (AASHTO T 99)					
Optimum Moisture % (AASHTO T 99)					
Subgrade Support Rating	FAIR	FAIR	FAIR	FAIR	FAIR
Insitu Moisture % (AASHTO T 99)	28	19	26	30	31

## **APPENDIX C**





COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

Specimen Identification	IDH Classification	LL	PL	PI	Cc	Cu
● R-12#2 2.0 ft	<b>Silty Clay</b>	<b>39</b>	<b>18</b>	<b>21</b>		
☒ R-18#1 2.0 ft	<b>Clay</b>	<b>60</b>	<b>17</b>	<b>43</b>		
▲ R-20#2 2.0 ft	<b>Silty Clay Loam</b>	<b>51</b>	<b>23</b>	<b>28</b>		
★ R-27#2 2.0 ft	<b>Silty Clay Loam</b>	<b>46</b>	<b>21</b>	<b>25</b>		
⊙ R-34#2 2.0 ft	<b>Silty Clay Loam</b>	<b>43</b>	<b>18</b>	<b>25</b>		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● R-12#2 2.0 ft	<b>9.5</b>	<b>0.008</b>			<b>1.9</b>	<b>3.9</b>	<b>59.2</b>	<b>35.0</b>
☒ R-18#1 2.0 ft	<b>4.75</b>	<b>0.007</b>			<b>0.3</b>	<b>8.8</b>	<b>49.3</b>	<b>41.5</b>
▲ R-20#2 2.0 ft	<b>9.5</b>	<b>0.012</b>	<b>0.002</b>		<b>0.8</b>	<b>13.8</b>	<b>55.7</b>	<b>29.6</b>
★ R-27#2 2.0 ft	<b>4.75</b>	<b>0.012</b>	<b>0.002</b>		<b>0.7</b>	<b>16.7</b>	<b>55.0</b>	<b>27.5</b>
⊙ R-34#2 2.0 ft	<b>12.7</b>	<b>0.018</b>	<b>0.003</b>		<b>1.4</b>	<b>11.5</b>	<b>59.7</b>	<b>27.4</b>



Wang Engineering, Inc.  
 1145 N Main Street  
 Lombard, IL 60148  
 Telephone: 630 953-9928  
 Fax: 630 953-9938

### GRAIN SIZE DISTRIBUTION

Project: IL 83 from IL 120 to IL 137 at Atkinson Road  
 Location: E 1/2 Sec. 35, T 45N, R 10E of the 3rd P.M.  
 Number: 341-07-01

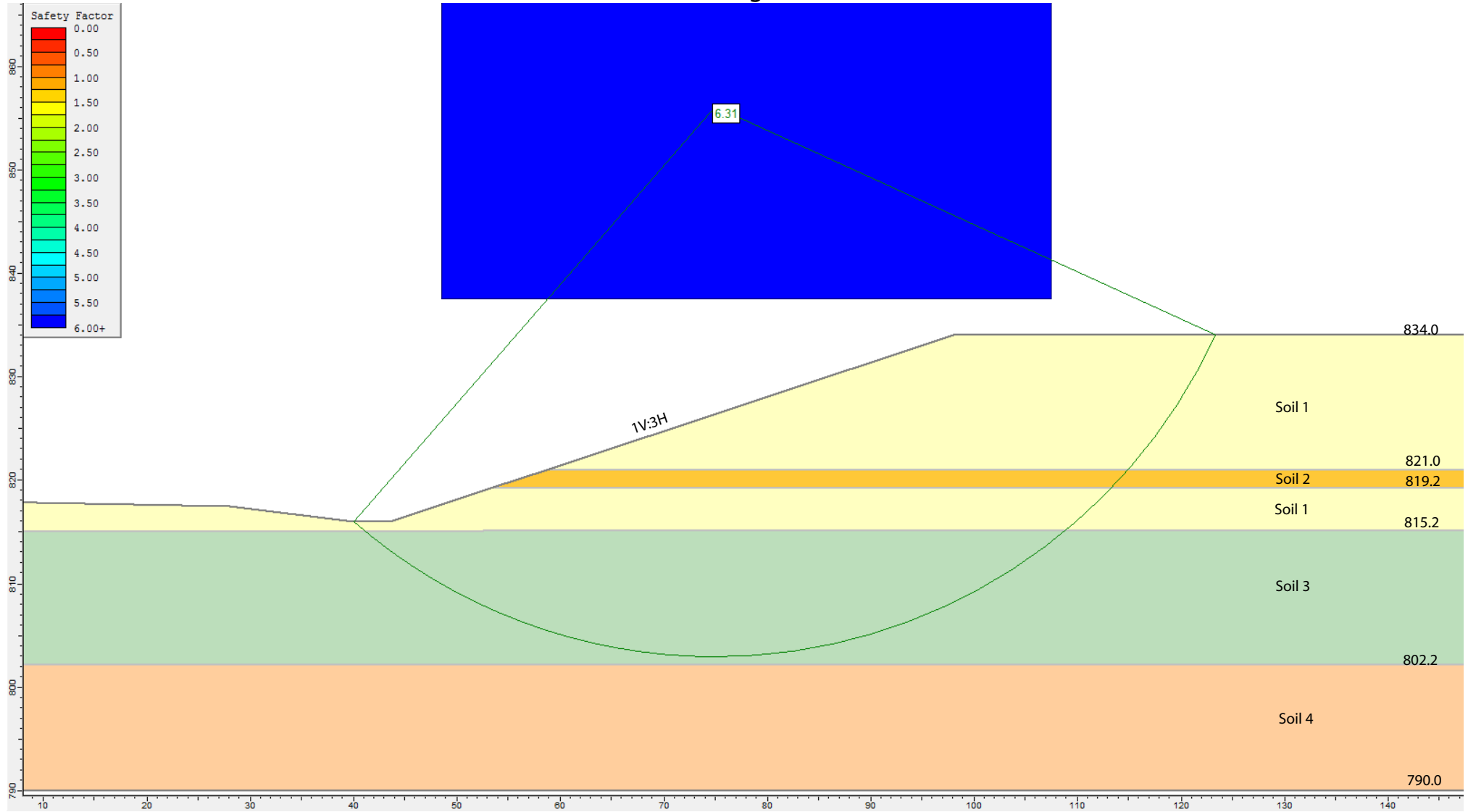
WEI GRAIN SIZE IDH 3410701.GPJ US LAB.GDT 6/24/14





## **APPENDIX D**

## Slope Stability Analysis - Short Term Station 181+00 (Boring ref.: R-01 to R-04)



### Soil Properties:

Soil ID	Soil Type	Undrained Parameter		
		Unit Weight (pcf)	$C_u$ (psf)	$\phi$ (deg.)
1	Existing Stiff Cohesive FILL	120	1600	0
2	Existing Medium Stiff Cohesive FILL	150	750	0
3	Very Stiff Silty CLAY	120	2200	0
4	Hard Silty CLAY	120	4500	0

SLOPE STABILITY ANALYSIS: FAP 866; IL 83 FROM IL 120 TO IL 137  
AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHIC

**APPENDIX D-1**

DRAWN BY: A. Kurnia  
CHECKED BY: M. Seyhun

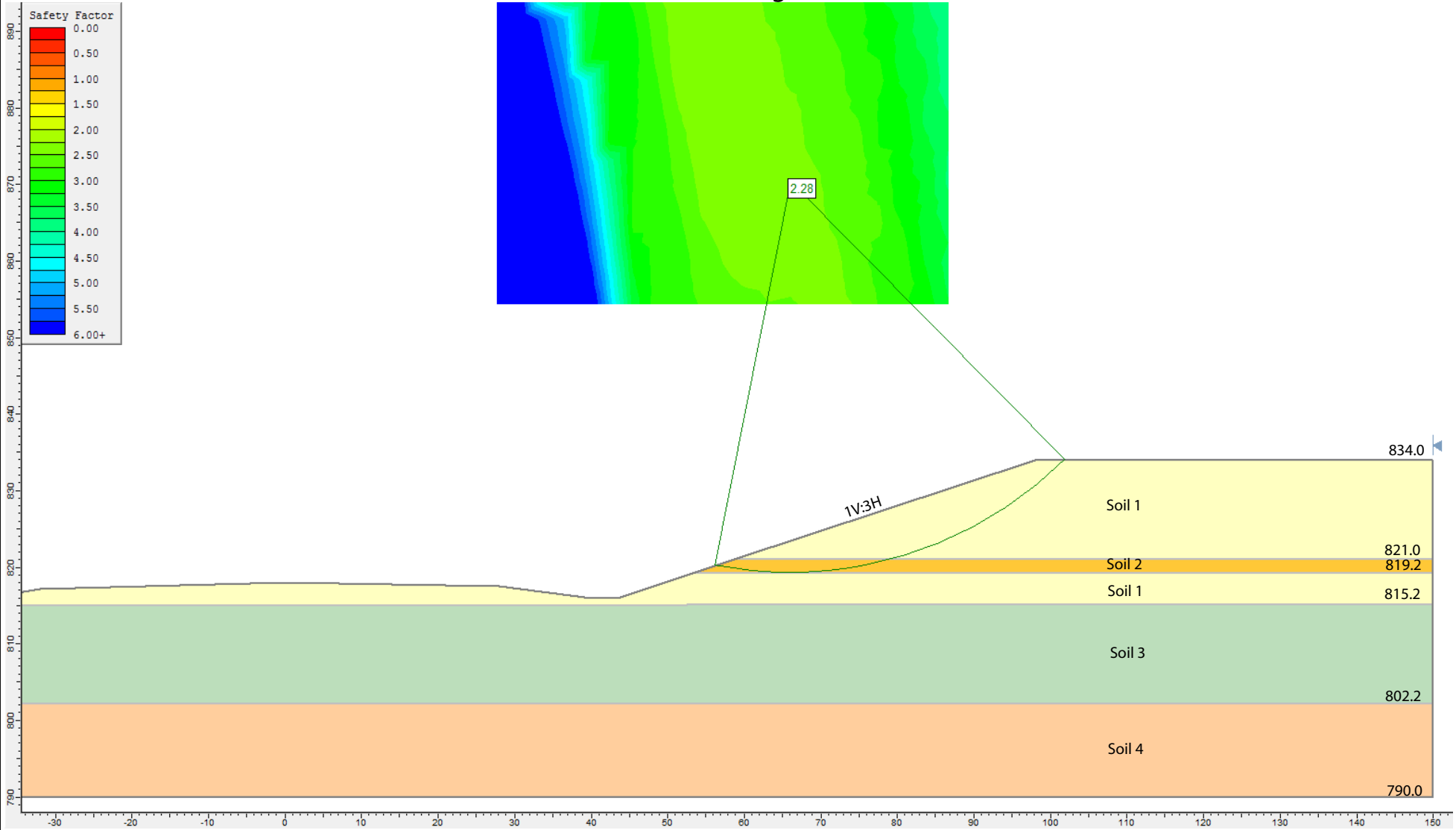


1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.

**341-07-01**

## Slope Stability Analysis - Long Term Station 181+00 (Boring ref.: R-01 to R-04)



### Soil Properties:

Soil ID	Soil Type	Unit Weight	Drained Parameter	
		(pcf)	C' (psf)	$\phi$ (deg.)
1	Existing Stiff Cohesive FILL	120	100	28
2	Existing Medium Stiff Cohesive FILL	120	50	26
3	Very Stiff Silty CLAY	120	100	30
4	Hard Silty CLAY	120	100	31

SLOPE STABILITY ANALYSIS: FAP 866; IL 83 FROM IL 120 TO IL 137  
AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHIC

**APPENDIX D-2**

DRAWN BY: A. Kurnia  
CHECKED BY: M. Seyhun



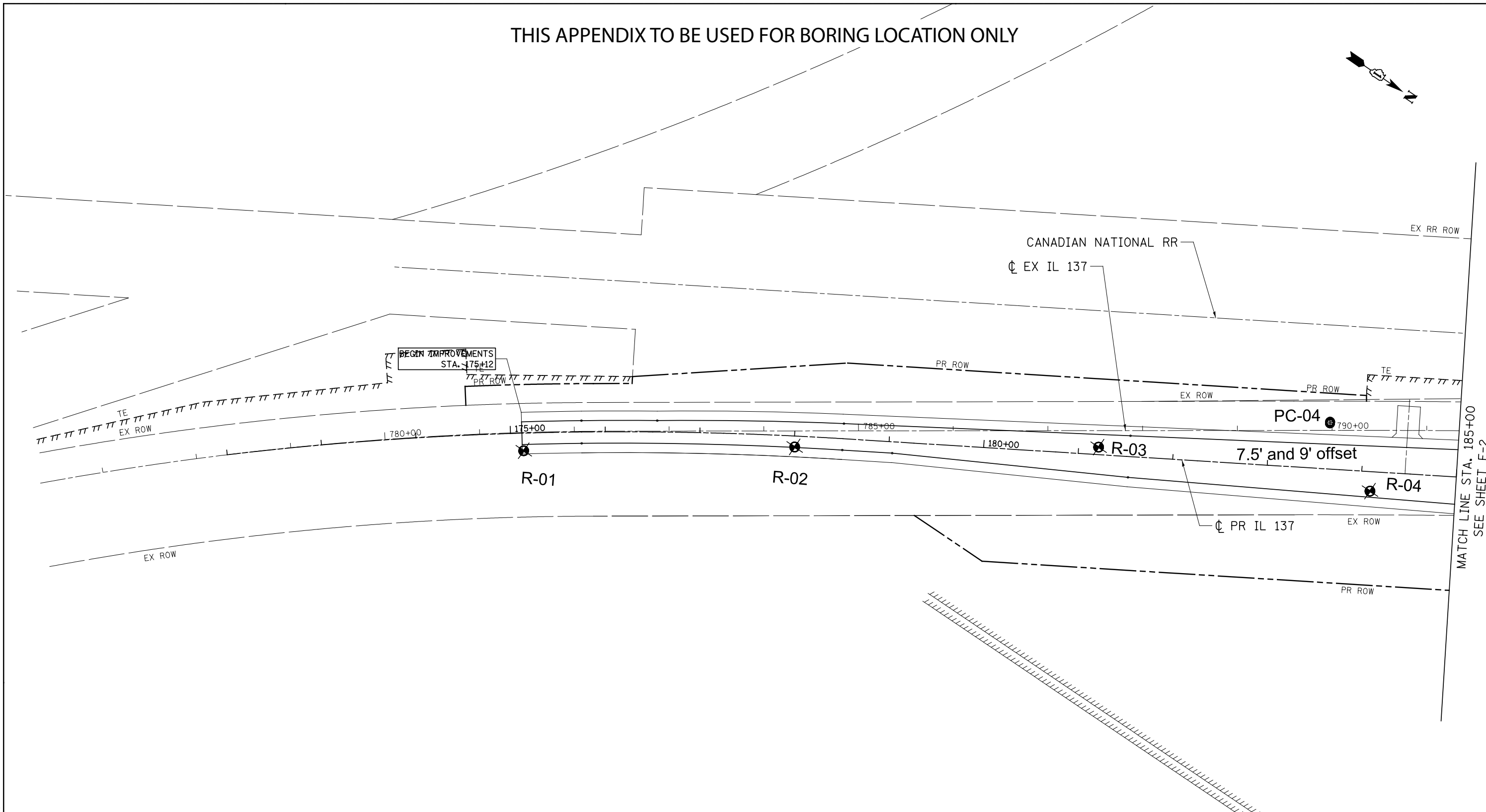
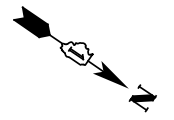
1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.

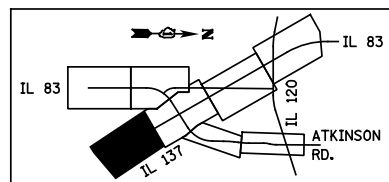
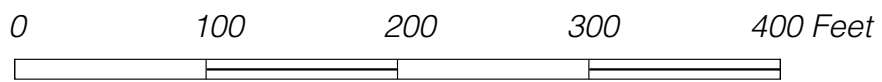
**341-07-01**

**APPENDIX E (see attachment)**

THIS APPENDIX TO BE USED FOR BORING LOCATION ONLY



MATCH LINE STA. 185+00  
SEE SHEET E-2



SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137  
AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL      **APPENDIX E-1**      DRAWN BY: A. Kurmia  
CHECKED BY: M. Seyhun

**Wang Engineering**      1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.      **341-07-01**

\$\$\$\$\$.ref. ....name\$\$\$\$\$  
\$\$\$\$\$.date.time\$\$\$\$\$  
\$\$\$\$\$.user\$\$\$\$\$

FILE NAME =	USER NAME = *USER*	DESIGNED - JB	REVISED -
*FILEL*		DRAWN - JB	REVISED -
exp U.S. Services Inc. Chicago, IL	PLOT SCALE = *SCALE*	CHECKED - ACL	REVISED -
BUILDINGS-EARTH & ENVIRONMENT-ENERGY INDUSTRIAL-INFRASTRUCTURE-SUSTAINABILITY	PLOT DATE = *DATE*	DATE - 06/30/14	REVISED -

**STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION**  
FAP ROUTE 866 (IL 83)

**SOIL BORING PLAN  
IL ROUTE 137**

SCALE: 1"=50'      SHEET      OF      SHEETS      STA. 172+00      TO      STA. 185+00

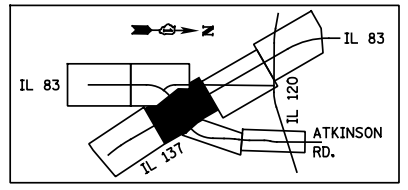
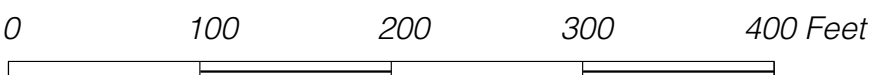
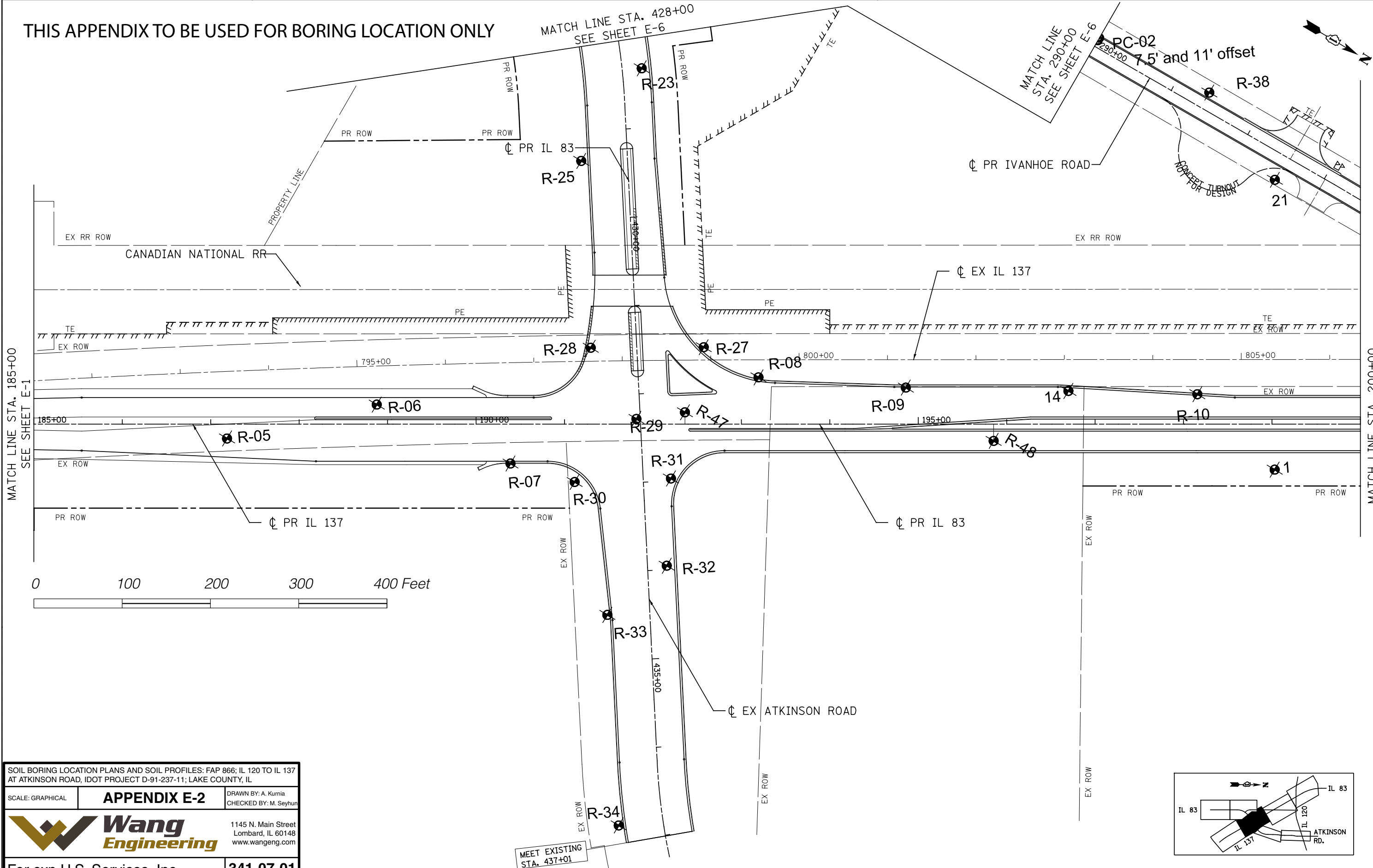
F.A.P. RTE. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.
PRELIM CHECK			CONTRACT NO. 60N11	
ILLINOIS FED. AID PROJECT				

THIS APPENDIX TO BE USED FOR BORING LOCATION ONLY

MATCH LINE STA. 428+00  
SEE SHEET E-6

MATCH LINE  
STA. 290+00  
SEE SHEET E-6

MATCH LINE STA. 200+00  
SEE SHEET E-3



SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137  
AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL      **APPENDIX E-2**      DRAWN BY: A. Kurmia  
CHECKED BY: M. Seyhun

**Wang Engineering**      1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.      **341-07-01**

FILE NAME =	USER NAME = \$USER\$	DESIGNED - JB	REVISED -
*FILEL*		DRAWN - JB	REVISED -
exp U.S. Services Inc.	PLOT SCALE = *SCALE*	CHECKED - ACL	REVISED -
BUILDINGS-EARTH & ENVIRONMENT-ENERGY	PLOT DATE = *DATE*	DATE - 06/30/14	REVISED -
INDUSTRIAL-INFRASTRUCTURE-SUSTAINABILITY			

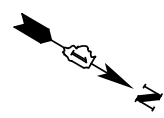
**STATE OF ILLINOIS**  
**DEPARTMENT OF TRANSPORTATION**  
FAP ROUTE 866 (IL 83)

**SOIL BORING PLAN**  
**IL ROUTE 137**

SCALE: 1"=50'      SHEET OF SHEETS      STA. 185+00 TO STA. 200+00

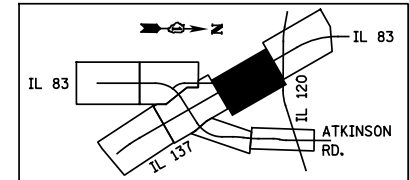
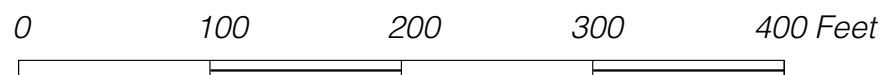
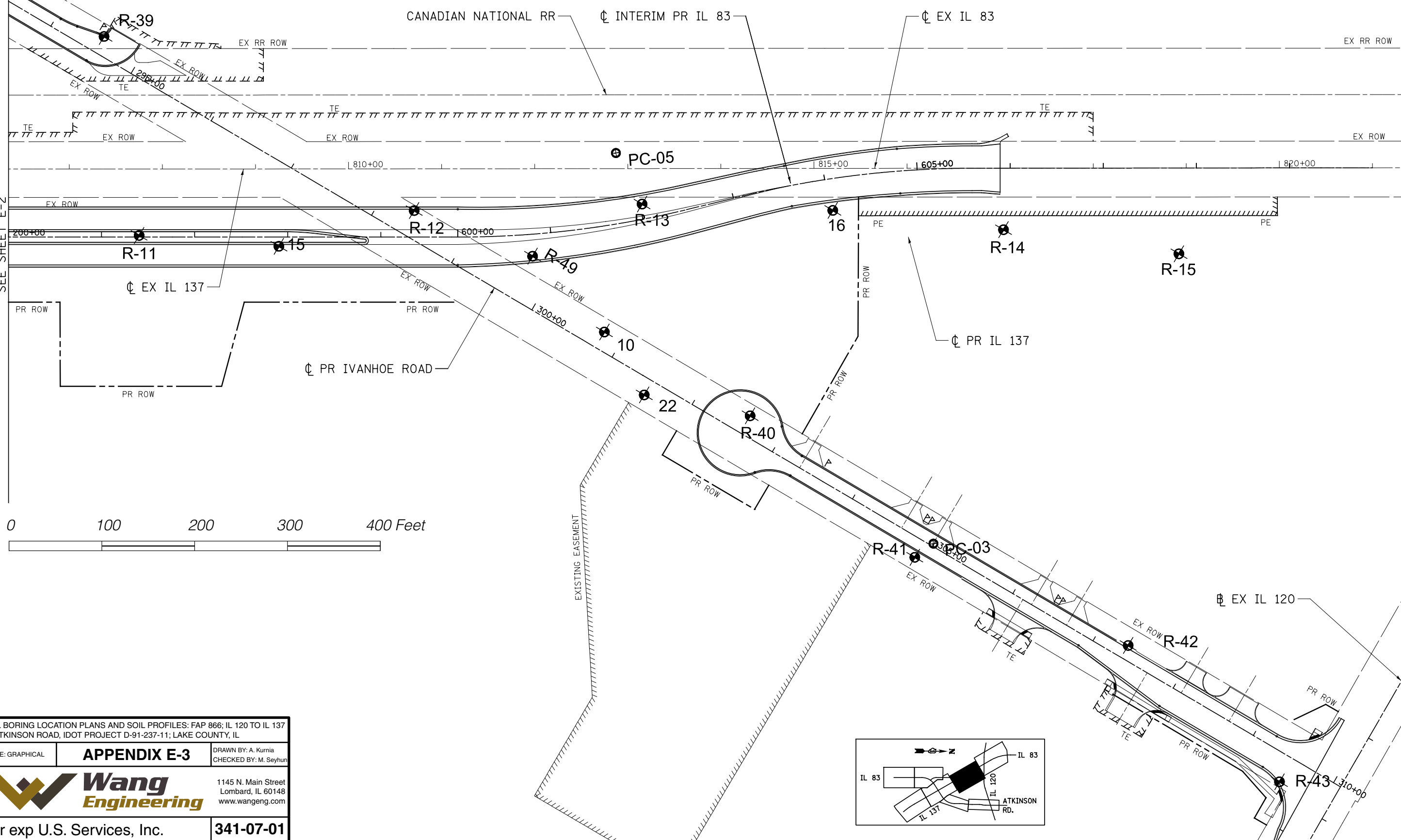
F.A.P. RTE. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.
CONTRACT NO. 60N11				
PRELIM CHECK ILLINOIS FED. AID PROJECT				

THIS APPENDIX TO BE USED FOR BORING LOCATION ONLY



MATCH LINE STA. 200+00  
SEE SHEET E-2

MATCH LINE STA. 821+34.67  
SEE SHEET E-4



SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137  
AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL      **APPENDIX E-3**      DRAWN BY: A. Kurnia  
CHECKED BY: M. Seyhun

1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.      **341-07-01**

FILE NAME =	USER NAME = \$USER\$	DESIGNED - JB	REVISED -
*FILEL\$		DRAWN - JB	REVISED -
exp U.S. Services Inc.	PLOT SCALE = *SCALE*	CHECKED - ACL	REVISED -
INDUSTRIAL-INFRASTRUCTURE-SUSTAINABILITY	PLOT DATE = \$DATE*	DATE - 06/30/14	REVISED -

**STATE OF ILLINOIS**  
**DEPARTMENT OF TRANSPORTATION**  
FAP ROUTE 866 (IL 83)

**SOIL BORING PLAN**  
**IL ROUTE 137**

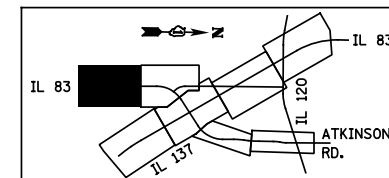
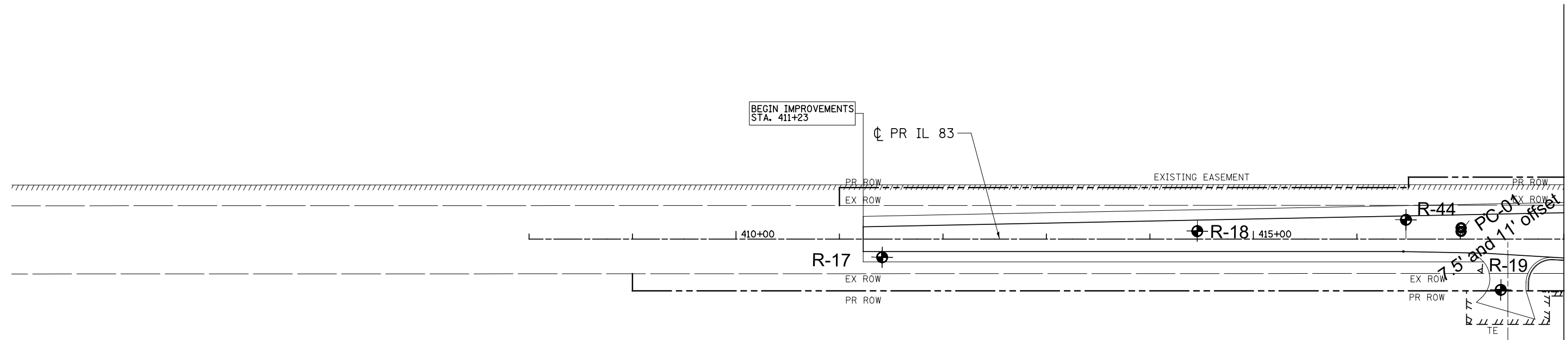
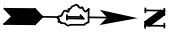
SCALE: 1"=50'      SHEET      OF      SHEETS      STA. 200+00      TO STA. 215+00

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
866	3Y-R	LAKE		
CONTRACT NO. 60N11				
PRELIM CHECK    ILLINOIS FED. AID PROJECT				





THIS APPENDIX TO BE USED FOR BORING LOCATION ONLY



SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL      **APPENDIX E-5**      DRAWN BY: A. Kurmia  
CHECKED BY: M. Seyhun

**Wang Engineering**      1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.      **341-07-01**

FILE NAME =	USER NAME = \$USER\$	DESIGNED - JB	REVISED -
\$FILEL\$		DRAWN - JB	REVISED -
exp U.S. Services Inc. Chicago, IL BUILDINGS-EARTH & ENVIRONMENT-ENERGY INDUSTRIAL-INFRASTRUCTURE-SUSTAINABILITY	PLOT SCALE = \$SCALE\$	CHECKED - ACL	REVISED -
	PLOT DATE = \$DATE\$	DATE - 06/30/14	REVISED -

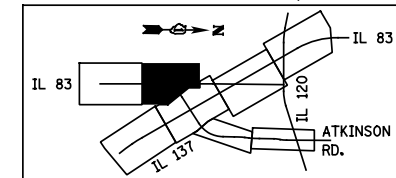
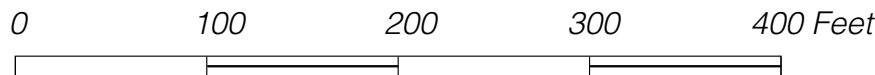
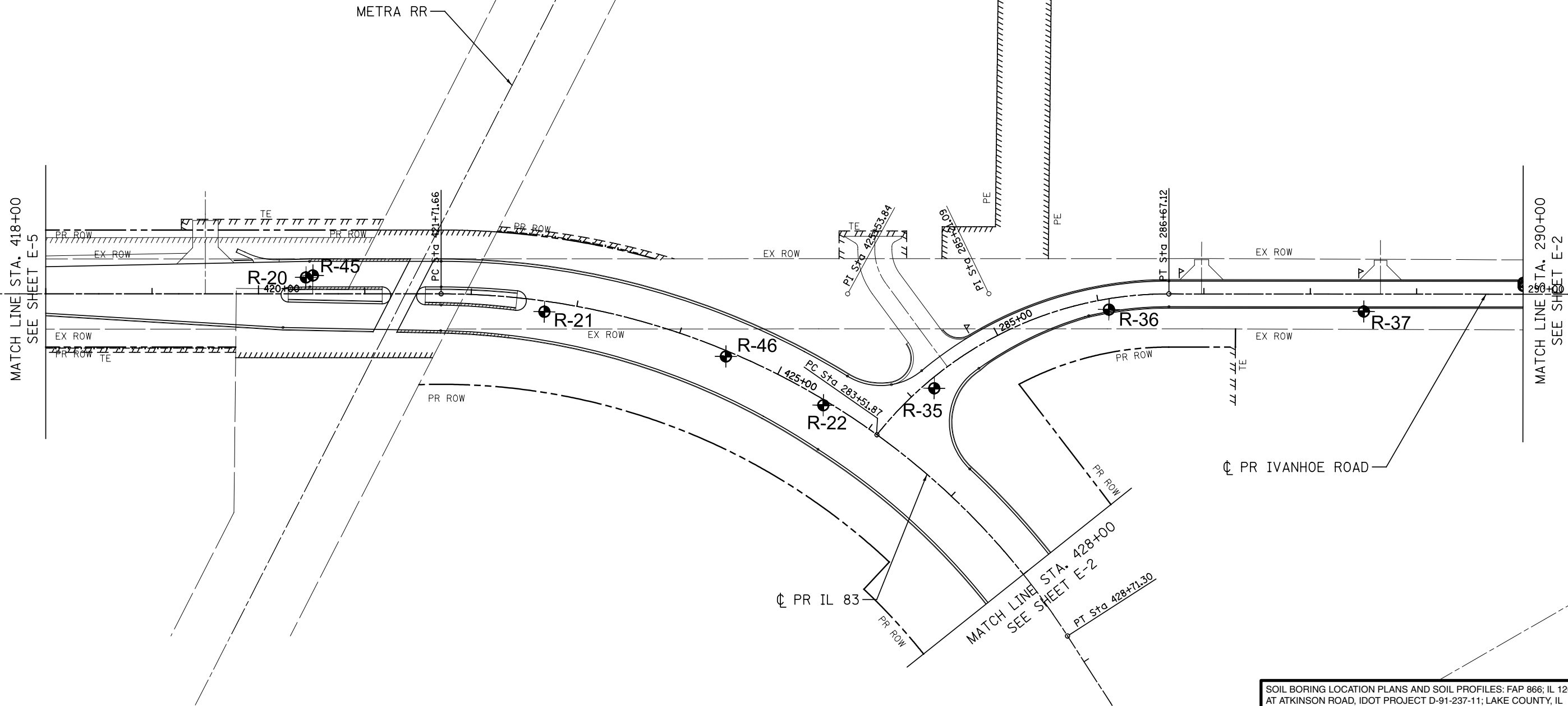
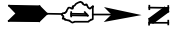
**STATE OF ILLINOIS**  
**DEPARTMENT OF TRANSPORTATION**  
FAP ROUTE 866 (IL 83)

**SOIL BORING PLAN**  
**IL ROUTE 83**

SCALE: 1"=50'      SHEET OF SHEETS      STA. 408+00 TO STA. 418+00

F.A.P. RTE. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.
PRELIM CHECK			ILLINOIS FED. AID PROJECT	
CONTRACT NO. 60N11				

THIS APPENDIX TO BE USED FOR BORING LOCATION ONLY



SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137  
AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL      **APPENDIX E-6**      DRAWN BY: A. Kurnia  
CHECKED BY: M. Seyhun

**Wang Engineering**      1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc.      **341-07-01**

FILE NAME =	USER NAME = \$USER\$	DESIGNED - JB	REVISED -
\$FILEL\$		DRAWN - JB	REVISED -
exp U.S. Services Inc. Chicago, IL	PLOT SCALE = \$SCALE\$	CHECKED - ACL	REVISED -
BUILDINGS-EARTH & ENVIRONMENT-ENERGY INDUSTRIAL-INFRASTRUCTURE-SUSTAINABILITY	PLOT DATE = \$DATE\$	DATE - 06/30/14	REVISED -

**STATE OF ILLINOIS**  
**DEPARTMENT OF TRANSPORTATION**  
FAP ROUTE 866 (IL 83)

**SOIL BORING PLAN**  
**IL ROUTE 83**

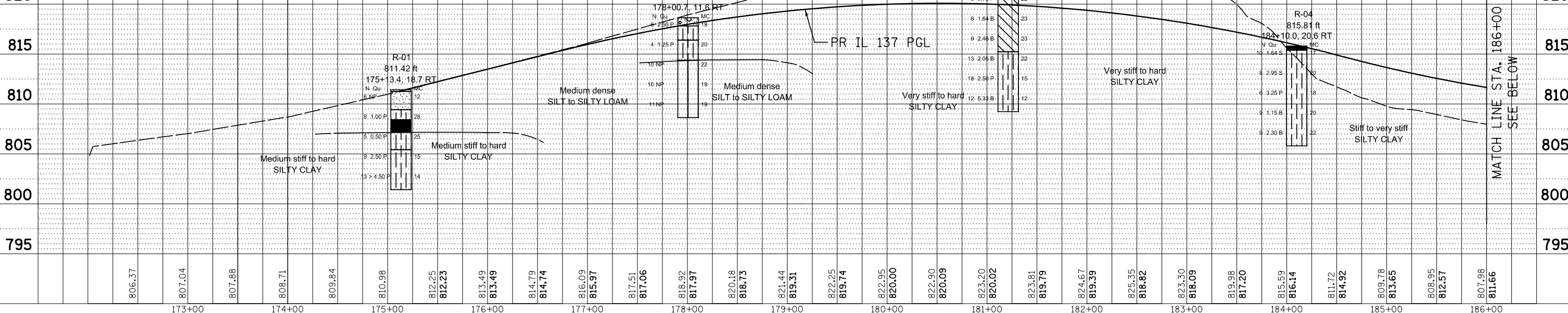
SCALE: 1"=50'      SHEET OF SHEETS      STA. 418+00 TO STA. 428+00

F.A.P. RTE. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.
PRELIM CHECK [ILLINOIS] FED. AID PROJECT				CONTRACT NO. 60N11

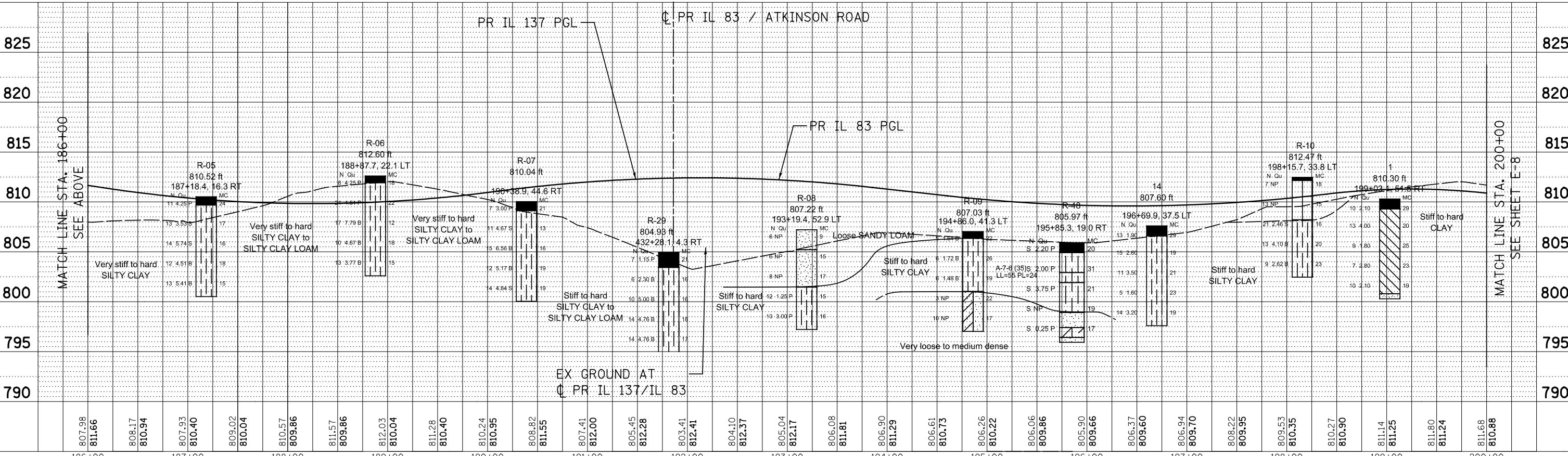
\$\$\$\$ref\_list\_name\$\$\$\$  
\$\$\$\$date\_time\$\$\$\$  
\$\$\$\$user\$\$\$\$

830	SCALE: GRAPHICAL	<b>APPENDIX E-7</b>	DRAWN BY: A. Kurmia CHECKED BY: M. Seyhun
825			1145 N. Main Street Lombard, IL 60148 www.wangeng.com
820	For exp U.S. Services, Inc.		<b>341-07-01</b>

PLAN	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	ALIGNMENT CHECKED	
	STRUCTURE NOTATIONS CHKD	
	NO.	



PROFILE	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	ALIGNMENT CHECKED	
	STRUCTURE NOTATIONS CHKD	
	NO.	



\$\$\$\$\$do not time\$\$\$\$\$ \$\$\$\$\$\$do not time\$\$\$\$\$

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

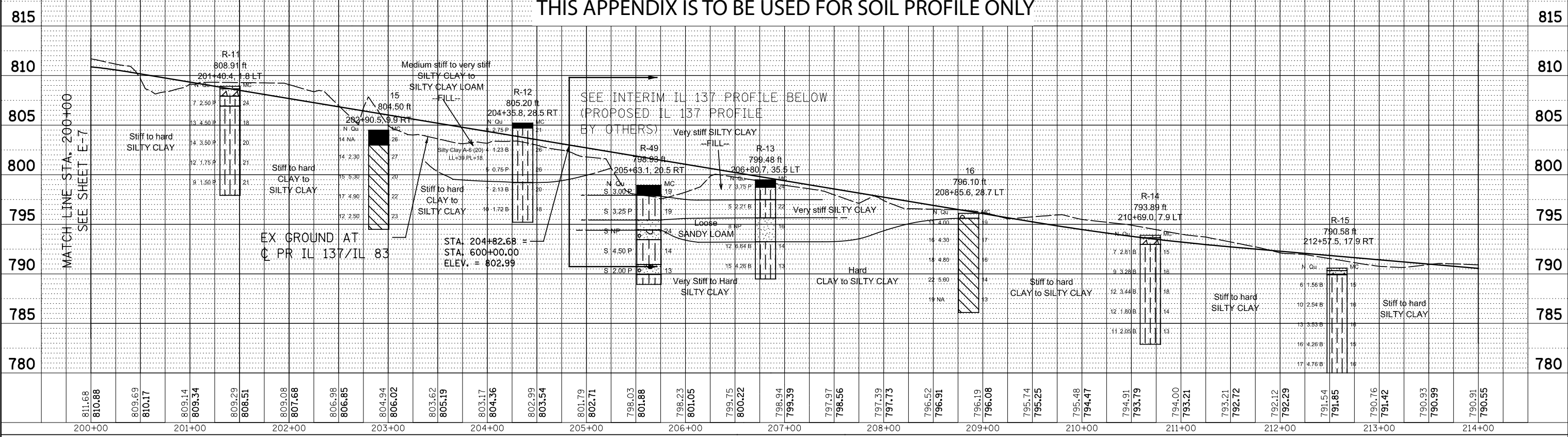
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
FAP ROUTE 866 (IL 83)

SOIL BORING PROFILE  
IL ROUTE 137/L 83

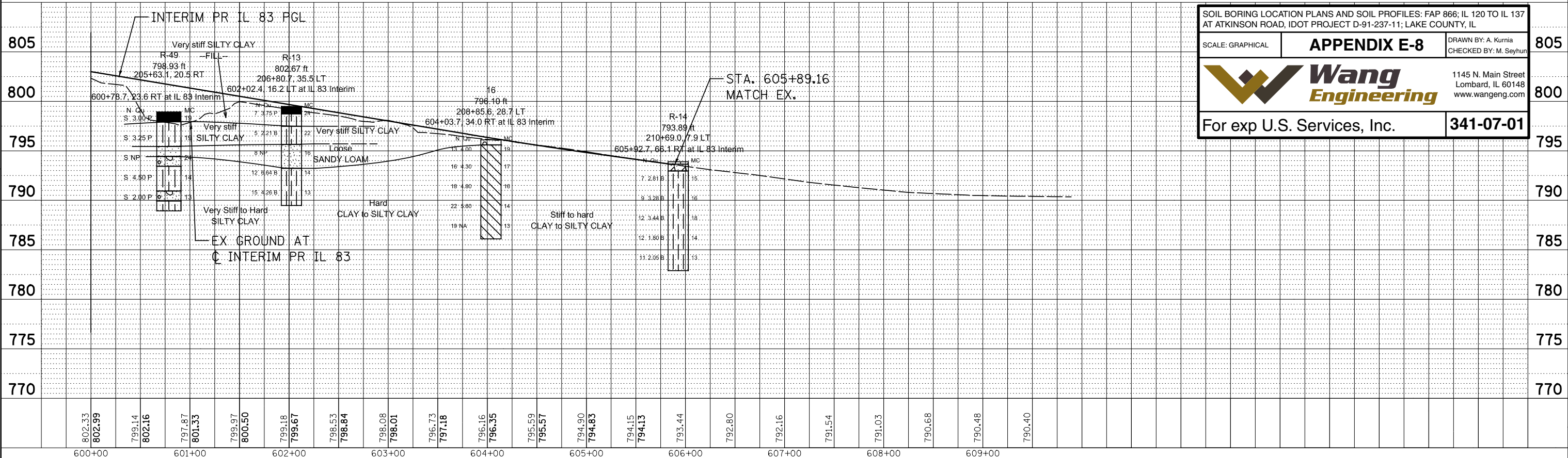
SCALE: HORIZ. 1"=50'      VERT. 1"=5'

F.A.P. RTE. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.
CONTRACT NO. 60N11				

THIS APPENDIX IS TO BE USED FOR SOIL PROFILE ONLY



PLAN	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	STRUCTURE NOTATIONS CHKD	
	NOTE BOOK NO.	
	CARD FILE NAME	



PROFILE	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	STRUCTURE NOTATIONS CHKD	
	NOTE BOOK NO.	
	CARD FILE NAME	

SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL

**APPENDIX E-8**

DRAWN BY: A. Kurnia  
CHECKED BY: M. Seyhoun

1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc. **341-07-01**

\$\$\$\$\$date,time\$\$\$\$\$ \$\$\$\$\$\$user\$\$\$\$\$

FILE NAME =	USER NAME = *USER*	DESIGNED - JB	REVISED -
*FILEL*		DRAWN - JB	REVISED -
	PLOT SCALE = *SCALE*	CHECKED - ACL	REVISED -
	PLOT DATE = *DATE*	DATE - 06/30/14	REVISED -

**STATE OF ILLINOIS**  
**DEPARTMENT OF TRANSPORTATION**  
FAP ROUTE 866 (IL 83)

**SOIL BORING PROFILE**  
**IL ROUTE 83**

SCALE: HORIZ. 1"=50'    VERT. 1"=5'

STA. 200+00    TO STA. 228+00

F.A.P. RTE. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.
PRELIM CHECK    ILLINOIS FED. AID PROJECT				

CONTRACT NO. 60N11

SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

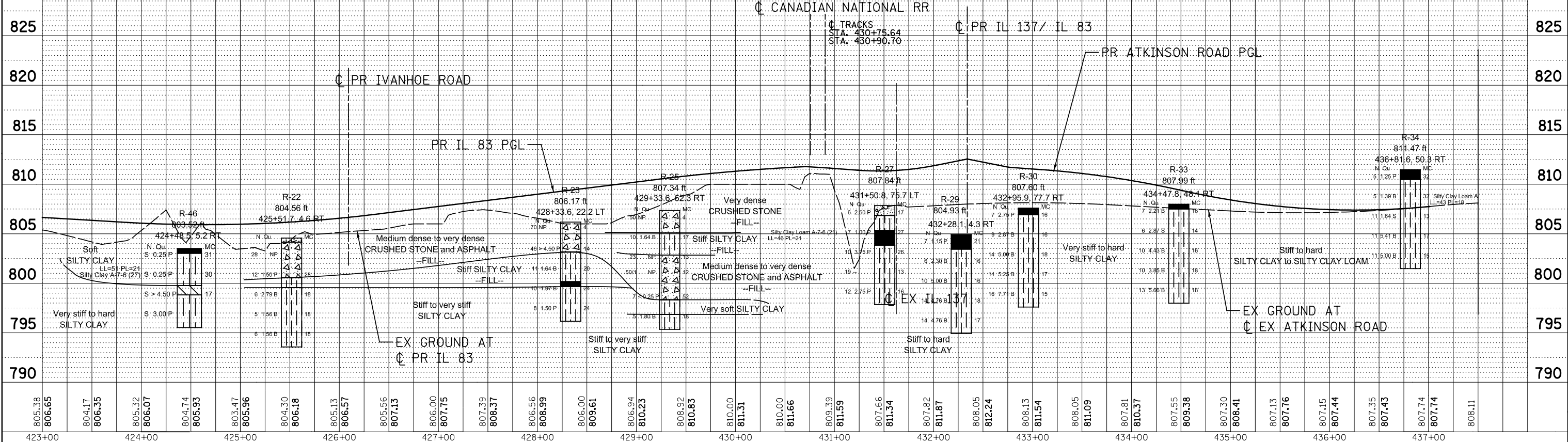
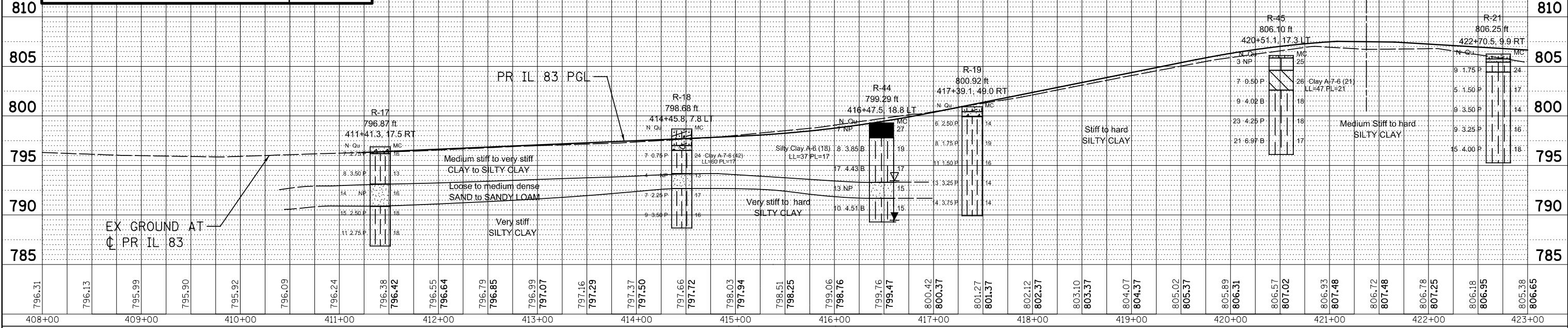
**THIS APPENDIX IS TO BE USED FOR SOIL PROFILE ONLY**

820 SCALE: GRAPHICAL **APPENDIX E-9** DRAWN BY: A. Kurnia CHECKED BY: M. Seyhun

**Wang Engineering**  
1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc. **341-07-01**

820 METRA RR  
815 STA. 421+37.26  
810  
805  
800  
795  
790  
785



PLAN

REVIEWED	DATE
ALIGNED	BY
CHECKED	
FILE NAME	
NO.	

PROFILE

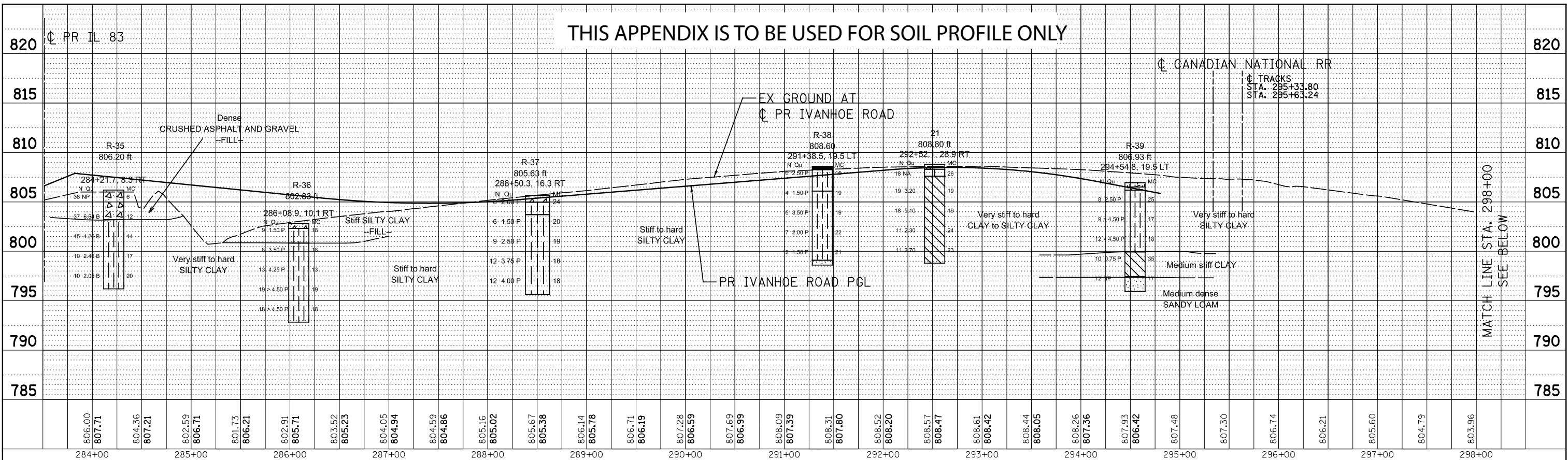
REVIEWED	DATE
GRADES CHECKED	BY
STRUCTURE	
NOT THIS DPKD	
NO.	

\*\*\*\*\*date,time\*\*\*\*\* \$user=\$s  
\*\*\*\*\*\$design\_name\*\*\*\*\*

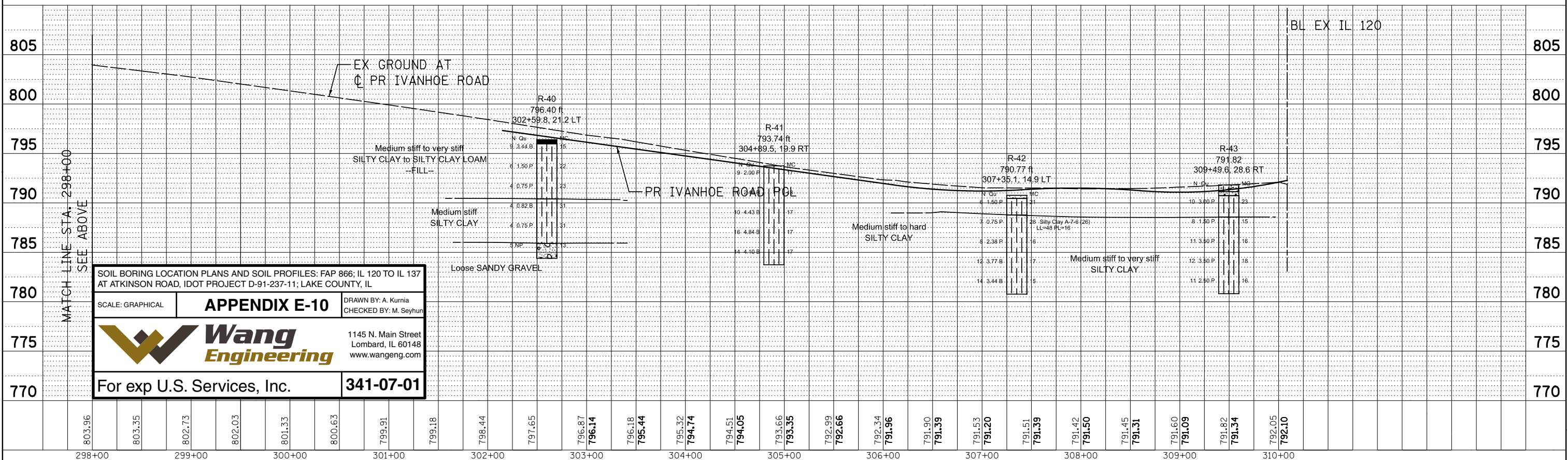
FILE NAME =	USER NAME = \$USER*	DESIGNED - JB	REVISED -	<b>STATE OF ILLINOIS</b> <b>DEPARTMENT OF TRANSPORTATION</b> FAP ROUTE 866 (IL 83)		<b>SOIL BORING PROFILE</b>		F.A.P. RT. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.	
\$FILEL\$		DRAWN - JB	REVISED -			<b>IL ROUTE 83 / ATKINSON ROAD</b>							
PLOT SCALE = \$SCALE\$		CHECKED - ACL	REVISED -			SCALE: HORIZ. 1"=50' VERT. 1"=5'		STA. 408+00	TO STA. 437+50	<b>PRELIM CHECK</b>	ILLINOIS FED. AID PROJECT		
PLOT DATE = \$DATE\$		DATE - 06/30/14	REVISED -										

THIS APPENDIX IS TO BE USED FOR SOIL PROFILE ONLY

PLAN	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	STRUCTURE NOTATIONS CHECKED	
	NO. _____	
	CADD FILE NAME	



PROFILE	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	STRUCTURE NOTATIONS CHECKED	
	NO. _____	
	CADD FILE NAME	



SOIL BORING LOCATION PLANS AND SOIL PROFILES: FAP 866; IL 120 TO IL 137 AT ATKINSON ROAD, IDOT PROJECT D-91-237-11; LAKE COUNTY, IL

SCALE: GRAPHICAL

**APPENDIX E-10**

DRAWN BY: A. Kurnia  
CHECKED BY: M. Seyhun

**Wang Engineering**  
1145 N. Main Street  
Lombard, IL 60148  
www.wangeng.com

For exp U.S. Services, Inc. **341-07-01**

FILE NAME =	USER NAME = #USER#	DESIGNED - JB	REVISED -	<b>STATE OF ILLINOIS</b> <b>DEPARTMENT OF TRANSPORTATION</b> FAP ROUTE 866 (IL 83)	<b>SOIL BORING PROFILE</b> <b>IVANHOE ROAD</b>		F.A.P. RTE. 866	SECTION 3Y-R	COUNTY LAKE	TOTAL SHEETS	SHEET NO.	
*FILEL*	PLOT SCALE = #SCALE#	DRAWN - JB	REVISED -		SCALE: HORIZ. 1"=50'	VERT. 1"=5'	STA. 283+51.87	TO STA. 310+00.00	<b>PRELIM CHECK</b> ILLINOIS FED. AID PROJECT			
exp U.S. Services Inc.	PLOT DATE = #DATE#	CHECKED - ACL	REVISED -									
BUILDINGS-EARTH & ENVIRONMENT-ENERGY INDUSTRIAL-INFRASTRUCTURE-SUSTAINABILITY	DATE - 06/30/14	REVISIED -	REVISED -									