STRUCTURE GEOTECHNICAL REPORT

I-57 over Illinois Route 17
(East Court Street)

Proposed S.N. 046-0154 (NB) and (SB)

F.A.I. ROUTE 57 (I-57)
SECTION (46-3)HBK
KANKAKEE COUNTY, ILLINOIS
JOB NO. P-93-065-02
PTB 159/20
KEG NO. 11-1017

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EXECUTIVE SUMMARY

I-57 over Illinois Route 17
F.A.I. Route 57 (I-57)
Section (46-3)HBK
Kankakee County, Illinois
Job No. P-93-065-02
PTB 159/20
Proposed Structure No. 046-0154 (NB) and (SB)

The project consists of a complete replacement of existing three-span dual structures (SN 046-0006 and 046-0007) with a new single point urban interchange (SPUI) located at I-57 over IL 17 in Kankakee County, Illinois. This report summarizes the analysis of the proposed structure.

Slope stability at various sideslopes and the north and south abutments is not anticipated to be an issue.

Kaskaskia Engineering Group, LLC (KEG) recommends a test pile be performed at both abutment locations. A test pile is performed prior to production driving so that actual, on-site field data can be gathered to further evaluate pile driving requirements for the project.

TABLE OF CONTENTS

TABLES

Page

EXHIBITS

1.0 Project Description and Proposed Structure Information

1.1 Introduction

The geotechnical study summarized in this report was performed for the proposed single-point urban interchange for I-57 over IL 17 in Kankakee County, Illinois. The purpose of this report is to present design and construction recommendations for the proposed structure.

1.2 Project Description

The project consists of a complete replacement of an existing three-span dual structure (SN 046-0006 NB and 046-0007 SB) with a new single-point urban interchange located at the intersection of I-57 over IL 17 in Kankakee County, Illinois. The general location of the structure is shown on a Location Map, Exhibit A. The site lies within the limits of the Second Principal Meridian, (T. 30N R. 13W Section 4) and the Third Principal Meridian, (T. 31N R. 12E Sections 33 and 34). The project lies within the Kankakee Plain of the Till Plains section of the Central Lowland Province.

1.3 Existing Structure

The existing structure was originally constructed in 1955, and widened in 1989. The existing structures consists of two, three-span continuous wide flange beam structures with a 7.5 in. thick concrete deck. It measures 51 ft. – 2 in. out-to-out, and 166 ft. – 1 in. back-to-back of abutment length. The end spans of both structures measures 50 ft., with a 62 ft. – 6 in. center span. The structures are skewed 1° - 19' left ahead. The original substructure consisted of open abutments, supported by three tapered columns on a spread footing. Three column piers on spread footings also supported the structure. When widened in 1987, the abutments were widened with pile bent abutments on steel H piles. The piers were widened on the median side using pile bent piers supported by H piles. Concrete slopewalls are located at each abutment. The horizontal alignment is tangent and the vertical alignment is on a crest vertical curve. Utilities and lights are present on the bridge.

1.4 Proposed Bridge Information

The proposed three-span structure and single point urban interchange (SPUI), located at I-57 (station 190+94.06) over IL 17 (station 133+35.68), will be built on a 14° skew from Pier 1. The structure will measure 527 ft. – 6 in. back-to-back of the abutments. The overall out-to-out bridge width will measure 106 ft. - 8 in. Vertical clearance of I-57 over IL 17 will be 16 ft. – 5 in. The first and third spans of the bridge section will be 143 ft. – 9 in. in length. The second span (middle portion) of the bridge will be 240 ft. in length. Piers will be supported on steel H-piles. Integral abutments are proposed. Construction will be staged so that four lanes remain open at all times.

The district has developed two conditions for designs. The proposed structure SN 046-0154 shall be constructed to replace the existing dual structures. The proposed shall be constructed wide enough to accommodate an Interim Condition. The Interim Condition will consist of two lanes and two shoulders in each direction. At a future date, the proposed structure shall be widened to an Ultimate Condition under a separate contract . The Ultimate Condition shall consist of three lanes and two shoulders in each direction. The structure's superstructure and substructure units shall be structurally designed to support leads for the Ultimate Condition.

2.0 Site Investigation, Subsurface Exploration, and Generalized Subsurface Conditions

The site investigation plan was developed and performed by IDOT District personnel. A site visit by a KEG representative to observe all or part of the borings, or to make site observations, was not included in the scope of services. Therefore, no site observations have been made relative to current conditions of the structure or immediate surroundings, including the soil samples retained during drilling.

Twelve Standard Penetration Test (SPT) borings, designated BH 11 through BH 22, were drilled between August 7, 2013 and August 21, 2013. The boring locations are shown on the Type, Size and Location plan (TS&L), Exhibit B, as provided by Lochmueller Group. Detailed information regarding the nature and thickness of the soils encountered and the results of the field sampling and laboratory testing are shown on the Boring Logs, Exhibit C. A soil profile can be found under Subsurface Profile, Exhibit D.

Table 2.1 – Boring Summary

Boring Location	Station	Offset	Ground Surface Elevation
BH 11	188+18.09	62.1 LT	653.12
BH 12	188+43.42	9.6 RT	667.16
BH 13	188+55.99	112.4 RT	668.61
BH 14	189+45.06	107.2 RT	670.92
BH 15	189+52.67	10.5 RT	669.44
BH 16	189+65.26	58.0 LT	653.03
BH 17	192+03.07	71.9 LT	652.59
BH 18	192+40.68	8.0 RT	670.25
BH 19	192+37.82	105.9 RT	673.27
BH 20	193+78.09	104.6 RT	673.62
BH 21	193+59.93	3.6 RT	673.57
BH 22	193+44.80	68.6 LT	654.32

*Stationing and offsets are based off of existing structure

2.1 Subsurface Conditions

Borings BH 11, BH 12, and BH 13 are located at various locations near the proposed North Abutment. For Boring BH 11, from the ground surface (El. 653.12) to El. 650.62, the soils were a silty clay loam, gravel fill, and silty clay. A hard silty clay followed to El. 631.12, with driving resistances (N-values) ranging from 9 to 27 blows per foot (bpf), unconfined compressive strengths (Q_u) values from 4.0 to 8.7 tons per square foot (tsf), and moisture contents ranging from 22 to 24 percent. A very stiff silty clay till followed to El. 625.62. N-values ranged from 12 to 14 bpf, with Q_u values from 3.3 to 3.9 tsf, and a moisture content of 22 percent. A very stiff to hard silty clay loam/silty loam till with silt layers followed to El. 617.37, with N-values ranging from 15 to 64 bpf, Q_u values between 4.0 to 4.7 tsf, and moisture contents from 11 to 15 percent. A dense limestone was noted around the boring termination depth at El. 617.37, with an N-value of 100/3 in., and a moisture content of 11 percent.

Boring BH 12 consisted of bituminous shoulder and silty clay fill from the ground surface (El. 667.16) to El. 664.66. A very stiff silty clay till fill followed to El. 657.16, with N-values between 5 to 8 bpf, Q_u values between 2.5 to 3.0 tsf, and moisture contents from 17 to 22 percent. A hard silty clay till fill with some silty clay loam followed to El. 650.16, with N-values between 14 and 22

bpf, a Q_u value of >4.5 tsf, and moisture contents from 14 to 16 percent. A small layer of very stiff silty clay followed to El. 647.66, with an N-value of 8 bpf, a Q_u value of 2.5 tsf, and a moisture content of 29 percent. A hard, silty clay till followed until El. 635.16, with N-values ranging from 16 to 22 bpf, Q_u values from 5.3 to 7.0 tsf, and moisture contents between 19 to 22 percent. A very stiff to hard clay/silty clay followed to El. 625.16, with N-values ranging from 15 to 18 bpf, Q_u values between 3.5 to 4.5 tsf, and moisture contents from 20 to 23 percent. A hard, silty clay loam till with silt pockets followed to El. 619.66, with N-values between 20 and 28 bpf, Q_u values from >4.5 to 6.1 tsf, and moisture contents from 13 to 16 percent. A medium fine sand to coarse gravel that was loamy, followed until El. 614.66, with N-values between 24 and 26 bpf, and moisture contents from 12 to 13 percent. Dense limestone was encountered until boring termination at El. 614.41, with an N-value of 100/3 in. and a moisture content of 9 percent.

Boring BH 13 consisted of a bituminous shoulder and silty clay fill from ground surface (El. 668.61) to El. 663.61. A hard silty clay till fill with silty clay loam and debris followed to El. 650.61, with N-values between 12 and 14 bpf, a Q_u value of 4.0 tsf, and a moisture content of 17 to 23 percent. A hard silty clay till followed to El. 636.61, with N-values between 21 to 30 bpf, Q_u values between 5.7 to 8.9 tsf, and moisture contents from 19 to 22 percent. A hard, silty clay followed to El. 624.11, with N-values between 12 to 19 bpf, Q_u values from 5.0 to 6.2 tsf, and moisture contents from 19 to 21 percent. A very stiff to hard silty clay loam/silty loam till followed until boring termination at El. 615.69, with N-values between 17 bpf to 100/5 in., Q_u values between 3.0 to 7.0 tsf, and moisture contents from 12 to 14 percent. A dense limestone was noted after boring termination, near the 100/5 in. N-value.

Borings BH 14, BH 15, and BH 16 are located near the proposed location for Pier 1. Boring BH 14 consisted of bituminous shoulder and silty clay fill from ground surface (El. 670.92) to El. 665.92. A very stiff, silty clay till fill with silty clay loam fill followed until El. 652.92, with N-values between 4 to 11 bpf, Q_u values between 2.0 and 3.5 tsf, and moisture contents from 19 to 21 percent. A hard, silty clay till followed to El. 638.92, with N-values between 11 and 30 bpf, Q_u values from 4.0 to 10.9 (max Rimac) tsf, and moisture contents from 17 to 24 percent. A hard silty clay with fine roots followed to El. 626.42, with N-values between 13 and 18 bpf, Q_u values between 4.0 to 5.4 tsf, and moisture contents from 20 to 22 percent. A layer of hard silty clay loam/silty loam till followed to El. 618.42, with N-values between 16 to 27 bpf, Q_u values between 5.2 to 7.1 tsf, and moisture contents from 10 to 19 percent. Dense limestone fragments with sand and gravel followed to El. 615.42, with an N-value of 57 bpf and a moisture content of 12 percent. Dense limestone followed until boring termination at El. 615.25, with an N-value of 100/2 in. and a moisture content of 12 percent.

Boring BH 15 consisted of bituminous shoulder and silty clay fill from ground surface (El. 669.44) to El. 664.44. A very stiff to hard silty clay fill with some till and topsoil followed to El. 650.44, with N-values between 7 to 13 bpf, Q_u values from 3.5 to 4.5 tsf, and moisture contents from 19 to 23 percent. A hard silty clay followed to El. 629.94, with N-values between 15 to 30 bpf, Q_u values from 4.6 to 9.8 tsf, and moisture contents from 19 to 23 percent. A very stiff silty clay/clay followed to El. 624.94, with N-values from 12 to 15 bpf, Q_u values from 3.4 to 3.8 tsf, and a moisture content of 22 percent. A small layer of hard silty clay/silty loam, followed to El. 622.44, with an N-value of 24 percent, a Q_u value of 5.7 tsf, and a moisture content of 17 percent. A medium loamy fine to coarse sand with loam till layers followed to boring termination at El. 615.69, with N-values from 21 bpf to 100/3 in., and a moisture content of 12 percent. A dense limestone was noted around the boring termination, near the 100/3 in. N-value.

Boring BH 16 consisted of silty clay loam fill with large limestone debris pieces fill and silty clay from ground surface (El. 653.03) to El. 648.03. A hard silty clay followed to El. 635.53, with N-

values between 14 to 27 bpf, Q_u values between 4.4 to 9.6 tsf, and moisture contents from 19 to 24 percent. A very stiff silty clay till followed to El. 626.03, with N-values from 10 to 13 bpf, Q_u values between 2.4 to 3.3 tsf, and moisture contents from 23 to 26 percent. A very stiff to hard silty clay loam/silty loam till with silt layers followed to El. 618.53, with N-values from 14 to 26 bpf, Q_u values from 4.0 to 4.6 tsf, and moisture contents from 15 to 20 percent. A dense, loamy fine sand to coarse gravel followed to boring termination depth at El. 616.53. The N-value for this material was 66 bpf, with a moisture content of 15 percent. A dense limestone was noted at termination depth.

Borings BH 17, BH 18, and BH 19 are located near the proposed location of Pier 2. Boring BH 17 consisted of silty clay loam fill and silty clay from ground surface (El. 652.59) to El. 650.09. A very stiff silty clay followed to El. 645.59, with an N-value of 9 bpf, a Q_u value of 3.5 tsf, and moisture contents from 24 to 25 percent. A hard silty clay followed to El. 640.09, with N-values between 18 to 26 bpf, Q_u values from 5.1 to 8.3 tsf, and moisture contents from 20 to 21 percent. A hard silty clay followed to El. 633.09, with N-values between 13 to 22 bpf, Q_u values from 5.1 to 6.1 tsf, and moisture contents from 21 to 23 percent. A hard silty clay till followed to El. 630.59, with an N-value of 11 bpf, a Q_u of 4.7 tsf, and a moisture content of 22 percent. A very stiff silty clay followed to El. 622.59, with N-values between 10 to 12 bpf, with Q_u values between 3.1 to 3.4 tsf, and moisture contents from 23 to 25 percent. A hard to very stiff silty clay loam/silty loam till with silt and sand layers followed to El. 615.09, with N-values between 12 to 26 bpf, Q_u values from 4.1 to 6.1 tsf, and moisture contents from 11 to 20 percent. A dense limestone was encountered until boring termination at El. 615.01, with an N-value of 100/1 in.

Boring BH 18 consisted of bituminous shoulder, sand and gravel, and silty clay fill from ground surface (El. 670.25) to El. 655.25. A very stiff silty clay till fill followed to El. 648.25, with N-values from 12 to 13 bpf, a Q_u value of 3.5 tsf, and moisture contents from 18 to 30 percent. A very stiff to hard silty clay followed to El. 630.75, with N-values from 11 to 39 bpf, Q_u values from 3.5 to 6.8 tsf, and moisture contents from 22 to 27 percent. A hard to very stiff silty clay followed to El. 623.25, with N-values from 16 to 23 bpf, Q_u values between 3.7 to 5.1 tsf, and moisture contents from 21 to 24 percent. A very stiff to hard silty clay loam/silty loam till with silt and clay layers and sand/gravel layers followed until El. 610.25, with N-values from 13 to 21 bpf, Q_u values between 3.0 to 5.1 tsf, and moisture contents from 14 to 24 percent. Dense limestone followed to boring termination at El. 610.00, with an N-value of 100/3 in., and a moisture content of 8 percent.

Boring BH 19 consisted of bituminous shoulder, silty clay loam, and silty clay loam/silty loam fill from ground surface (El. 673.27) to El. 653.27. A very stiff silty clay loam topsoil followed to El. 651.27, with an N-value of 12 bpf, a Q_u value of 3.0 tsf, and a moisture content of 29 percent. A hard silty clay followed to El. 641.27, with N-values between 12 to 28 bpf, Q_u values between 4.2 to 9.2 tsf, and moisture contents from 21 to 23 percent. A hard to very stiff silty clay till followed to El. 624.27, with N-values between 11 and 22 bpf, Q_u values from 2.9 to 7.1 tsf, and moisture contents from 19 to 24 percent. A very stiff to hard silty clay loam/silty loam till, with silt and silty clay layers followed to El. 613.27. N-values for this material ranged from 11 to 27 bpf, with Q_u values between 2.5 to 4.7 tsf, and moisture contents from 17 to 23 percent. A dense weathered limestone followed until boring termination at El. 613.02, with an N-value of 100/3 in. and a moisture content of 8 percent.

Borings BH 20, BH 21, and BH 22 are located along and near the proposed location for the south abutment. Boring BH 20 consisted of bituminous shoulder, and silty clay loam fill from ground surface (El. 673.62) to El. 668.62. Very stiff to hard silty clay loam/silty loam fill and silty clay loam fill with layers of silty clay fill followed until El. 655.62. The N-values of this material ranged from 6 to 11 bpf, with Q_u values between 3.0 to 4.5 tsf, and moisture contents from 15 to 22 percent.

A hard silty clay followed to El. 641.62, with N-values between 12 to 34 bpf, Q_u values from 4.0 to 10.9 (max Rimac) tsf, and moisture contents between 18 to 30 percent. A hard to very stiff silty clay followed to El. 623.62, with N-values between 14 and 24 bpf, Q_u values from 4.0 to 6.4 tsf, and moisture contents from 19 to 24 percent. A hard silty loam till with layers of loamy sand/gravel followed until El. 616.12, with N-values between 14 and 59 bpf, Q_u values between 4.0 to 5.1 tsf, and moisture contents from 10 to 22 percent. A dense weathered limestone followed to boring termination at El. 615.79, with an N-value of 100/4 in. and a moisture content of 9 percent.

Boring BH 21 consisted of bituminous shoulder and silty clay fill from ground surface (El. 673.57) to El. 668.57. A hard to very stiff silty clay with some till, fill and silty clay loam followed to El. 653.57, with N-values between 8 to 23 bpf, Q_u values from 3.0 to 6.1 tsf, and moisture contents from 17 to 24 percent. A hard silty clay followed to El. 636.57, with N-values between 12 to 29 bpf, Q_u values from 4.0 to 8.3 tsf, and moisture contents from 18 to 24 percent. A hard to very stiff silty clay followed to El. 626.07, with N-values between 12 and 17 bpf, Q_u values from 3.1 to 4.7 tsf, and moisture contents from 22 to 25 percent. A hard silty clay loam/silty loam till with sand and gravel layers, and silt/clay layers followed to El. 616.07. N-values for this material ranged from 28 to 53 bpf, with Q_u values between >4.5 and 6.7 tsf, and moisture contents from 10 to 18 percent. A dense limestone followed until boring termination at El. 614.90, with an N-value of 100/2 in. and a moisture content of 11 percent.

Boring BH 22 consisted of silty clay loam fill and silty clay from ground surface (El. 651.82) to El. 651.82. A hard silty clay followed to El. 631.82, with N-values from 14 to 25 bpf, Q_u values from >4.5 to 10.5 tsf, and moisture contents from 16 to 24 percent. A layer of hard to very stiff silty clay followed to El. 626.82, with N-values between 13 to 20 bpf, Q_u values from 3.1 to 4.1 tsf, and moisture contents from 22 to 23 percent. A very stiff to hard silty clay loam/silty loam till with layers of silt, sand, and gravel followed to El. 616.82. The N-values for this material ranged from 14 to 35 bpf, with Q_u values between 3.0 to >4.5 tsf, and moisture contents from 11 to 25 percent. Weathered and reworked limestone surface followed until auger refusal at El. 614.32. N-values for this material ranged from 61 to 100/3 in., with moisture contents of 11 to 14 percent. The boring was terminated at El. 614.07.

2.2 Groundwater

Groundwater was encountered in all of the borings. Table 2.2 shows the elevations and the time of the readings. Without extended periods of observation, measurement of true groundwater levels may not be possible. It should be further noted that the groundwater level is subject to seasonal and climatic variations.

Table 2.2 – Groundwater

Boring	First Encounter Elevation (ft.)	Upon Completion Elevation (ft.)
BH 11	618.1	618.1
BH 12	627.2	627.2
BH 13	623.6	623.6
BH 14	625.9	625.9
BH 15	624.4	624.4
BH 16	617.5	619.0
BH 17	616.6	622.6
BH 18	666.3	645.3
BH 19	623.3	628.3
BH 20	621.6	630.6
BH 21	617.6	618.6
BH 22	616.8	618.3

3.0 Geotechnical Evaluations

3.1 Settlement

Since newly constructed embankments are anticipated for the proposed structure, settlement calculations were performed. Due to the relatively stiff cohesive soils present, it is estimated that the existing soils will experience settlements of less than 0.5 in. Because of this, downdrag was not included in the pile capacity calculations.

3.2 Slope Stability

Integral abutments are proposed for the structure. The proposed sideslopes at various locations around the site are combinations of mainly 1 Vertical to 3 Horizontal (1V:3H) and 1V:6H slopes, with some slopes of 1V:4.3H and 1V:2H. The proposed slopes at both abutments are 1V:2H with a concrete slopewall. Slope stability of the sideslopes and the Global Stability of the Abutments were analyzed using: SLOPE-W; the soil properties at the site; and sideslope or endslope geometrics. Three conditions were modeled: end-of-construction, long-term, and a design seismic event. A critical factor of safety (FOS) was calculated for each condition. According to current standards of practice when using RIMAC and/or SPT data, the target FOS for a cut slope is 1.7 for end-of-construction, 1.5 for long-term slope stability, and 1.0 for the design seismic event.

In order to model the end-of-construction condition, undrained soil parameters were used with a friction angle of 0 degrees assumed for cohesive soils. Drained soil parameters with assumed friction angles ranging from 26 to 32 degrees were used to model the long-term and seismic conditions and to analyze the condition where excess pore water pressure from construction has

dissipated. For cohesive materials, a nominal cohesion value of 100 psf was included in the drained strength parameters.

The Modified Bishop Method, which generates circular-arc failure surfaces, was used to calculate the critical failure surfaces and FOS for the analyzed conditions. The FOS obtained in the analysis is shown in Table 3.1. SLOPE-W program output from this analysis can be found in SLOPE-W Slope Stability Analysis, Exhibit E.

Table 3.1 – Slope Stability Critical FOS

Location	Slope	End-of-Construction	Long-Term	Seismic
North Abutment	1V:2H	9.1	1.8	1.5
South Abutment	1V:2H	5.3	1.7	1.6
North Abutment Side Slope	1V:6H & 1V:3H	3.7	2.2	1.9
South Abutment Side Slope	1V:6H & 1V:3H	3.5	2.1	1.8
Ramp A Side Slope	1V:4.3H	11.6	2.8	2.3
Ramp B Side Slope	1V:6H & 1V:2H	2.8	1.8	1.6
Ramp C Side Slope	1V:6H & 1V:3H	2.9	2.1	1.8

The results of the analysis, as provided in Table 3.1, indicate an acceptable FOS will exist at all sideslopes and the north and south abutment endslopes.

3.3 Seismic Considerations

The determination of Seismic Site Class was based on the method described by IDOT AGMU Memo 09.1 - Seismic Site Class Definition and the IDOT-provided spreadsheet titled: *Seismic Site Class Determination*. Using these resources, the controlling global site class for this project is Soil Site Class C.

Additional seismic parameters were calculated for use in design of the structure and evaluation of liquefaction potential. The USGS published information and mapping (http://earthquake.usgs.gov/), including software directly applicable to the *AASHTO Guide Specifications for LRFD Seismic Bridge Design*, was used to develop the parameters for the project site location. The values, based on a 1000-Year Return Period with a Probability of Exceedance (PE) of 7 percent in 75 years and Soil Site Class C, are summarized below.

Table 3.2 – Summary of Seismic Parameters

Parameter	Value
Soil Site Class	C
Spectral Response Acceleration, 0.2 Sec, S_{DS}	0.125 g (Site Class C)
Spectral Response Acceleration, 1.0 Sec, S_{D1}	0.073 g (Site Class C)
Seismic Performance Zone	1

As indicated in the table above, the Seismic Performance Zone is 1, based on S_{D1} and Table 3.15.2-1 in the IDOT Bridge Manual, the Soil Site Class C, and Figure 2.3.10-2 in the IDOT Bridge Manual.

3.4 Scour

The proposed structure will not cross a river or other tributary; therefore, scour is not an issue.

3.5 Mining Activity

According to the Illinois State Geological Survey (ISGS) website, coal mining has occurred in Kankakee County (http://www.isgs.illinois.edu/maps-data-pub/coal-maps.shtml). According to the Coal Mines and Underground Industrial Mines Map of Kankakee County, dated January 28, 2015, most of this activity is located in the western part of the county. No areas of mining are located near the project site.

No visual indications of subsurface mining activities were brought to our attention prior to issuance of this report.

The listed disclaimer indicates locations of some features on the mine map may be offset by 500 ft. or more due to errors in the original source maps, the compilation process, digitizing, or a combination of these factors. Refer to Illinois State Geological Survey Mine Map, Exhibit F.

3.6 Liquefaction

As per the IDOT AGMU 10.1 Liquefaction Analysis, a liquefaction analysis is not required to be performed for structures located in Seismic Performance Zone 1. Therefore, liquefaction was not considered as a reduction for the pile design capacity or other foundation considerations included herein.

4.0 Foundation Evaluations and Design Recommendations

4.1 General Feasibility

According to the IDOT All Bridge Designers (ABD) Memo 12.3 dated July 25, 2012, HP 14X102 and HP 14X117 are feasible pile types for foundation support of the proposed Integral abutments. Based on the IDOT Geotechnical Manual 2015, borings BH 11-13 for the north abutment and BH 20-22 for the south abutment contain soils that have an average unconfined compressive strength exceeding 3.0 tsf. In order to utilize integral abutments, the effective strength of the soils from

the base of the abutment cap to 10 ft. below must be reduced to ensure proper function of the proposed integral abutment. KEG recommends pre-coring the pile locations to 10 ft. below the abutment cap and backfill with hydrated bentonite pellets prior to pile installation. Another option would be removal and replacement with an engineered fill. In KEG's opinion removal and replacement would be cost prohibitive compared to the pre-core alternative.

The Modified IDOT Static Method of Estimating Pile Length, provided by IDOT BBS Foundations and Geotechnical Unit, was used to calculate the design length of the piles. In addition, the soils encountered near proposed bearing elevation of the piers appear suitable for shallow foundation support. Shallow foundation recommendations are provided below in Section 4.4.

4.2 Pile Supported Foundations

The foundations supporting the proposed bridge must provide sufficient support to resist dead and live loads, including seismic loadings. Based on the encountered subsurface conditions, the Modified IDOT Static Method of Estimating Pile Length provided by IDOT BBS Foundations and Geotechnical Unit, and the information available to date, H-piles are acceptable for use at the abutment locations. The Modified IDOT Static Method uses the LRFD Pile Design Guide Procedure to estimate the pile lengths (Pile Length/Pile Type, Exhibit F).

The loads were provided by Lochmueller Group. The abutments will each experience a Total Factored Load of 3,434 kips, and the piers will experience a Total Factored Load of 12,743 kips. The estimated pile lengths for the pile types considered are shown in Tables 4.2.1 and 4.2.2 below and under Exhibit F, Pile Length/Pile Type.

The Nominal Required Bearing (R_N) represents the resistance the pile will experience during driving, and will assist the contractor in selecting a proper hammer size. The Allowable Resistance Available (R_F) documents the net long-term axial factored pile capacity available at the top of the pile to support factored substructure loadings.

As shown in Pile Length/Pile Type, Exhibit F, downdrag, scour, and liquefaction have not been considered at the abutment locations.

Table 4.2.1 – Estimated Pile Lengths for HP 14X102 H-pile

	Estimated Pile Tip Elevation (ft.)	R_n Nominal Required Bearing (kips)	R_F Factored Resistance Available (LRFD) (kips)	Estimated Pile Length (ft.)	Assumed Pile Cut-off Elevation (ft.)
North Abutment (BH-12)	613.6	377	208	54	667.6
	612.6	571	314	55	667.6
	611.6	810	445	56	667.6
South Abutment (BH-21)	623.8	530	292	46	669.8
	622.8	706	388	47	669.8
	621.8	810	445	48	669.8
Pier 1 (BH-15)	614.7	512	282	34	648.7
	613.7	688	378	35	648.7
	612.7	810	445	36	648.7
Pier 2 (BH-18)	608.1	528	291	41	649.1
	607.1	704	387	42	649.1
	606.1	810	445	43	649.1

Table 4.2.2 – Estimated Pile Lengths for HP 14X117 H-pile

	Estimated Pile Tip Elevation (ft.)	R_n Nominal Required Bearing (kips)	R_F Factored Resistance Available (LRFD) (kips)	Estimated Pile Length (ft.)	Assumed Pile Cut-off Elevation (ft.)
North Abutment (BH-12)	612.6	583	320	55	667.6
	611.6	760	418	56	667.6
	610.6	929	511	57	667.6
South Abutment (BH-21)	623.8	542	298	46	669.8
	622.8	719	396	47	669.8
	621.8	929	511	48	669.8
Pier 1 (BH-15)	613.7	701	385	35	648.7
	612.7	878	483	36	648.7
	611.7	929	511	37	648.7
Pier 2 (BH-18)	608.1	540	297	41	649.1
	607.1	717	394	42	649.1
	606.1	929	511	43	649.1

Due to the varying elevation of the top of limestone indicated on the boring logs, KEG recommends a test pile be performed at the north abutment location and at Pier 2. A test pile is performed prior to production driving so that actual, on-site field data can be gathered to further evaluate pile driving requirements for the project. This also is the manner in which the contractor's proposed equipment and methodologies identified in their Pile Installation Plan can be assessed. In general, based on the boring logs, an abrupt change in driving conditions between the cohesive soils and limestone bedrock is anticipated. Therefore, pile shoes are recommended for all the proposed substructure units.

4.3 Lateral Pile Response

Generally, the geotechnical engineer provides soil parameters to the structural engineer so that an L-Pile program or other approved software can be used for the lateral or displacement analysis of the foundations. Table 4.3 is included for the structural engineer's use in evaluating lateral pile

response. The values were estimated based on the descriptions as listed on the boring logs. No specific hydrometer analyses were performed on the site soils for estimation of parameters.

Table 4.3 – Soil Parameters for Lateral Pile Load Analysis

Boring	Elev. At Bottom of Layer	γ (pcf)	Short-term		Long-term		K (pci)	N	Assumed % fines < #200	ε_{50}
			c' (psf)	Φ (degrees)	c' (psf)	Φ (deg)				
BH-11 (N. Abut.)	650.62	125	1500	0	100	26	500	N/A	75	0.007
	631.12	120	6200	0	100	26	2000	17	80	0.004
	625.62	120	3600	0	100	26	1000	13	80	0.005
	617.37	120	4400	0	100	26	2000	33	70	0.005
BH-12 (N. Abut.)	664.66	125	1500	0	100	26	500	N/A	75	0.007
	657.16	120	2833	0	100	26	1000	6	80	0.005
	653.16	120	4500	0	100	26	2000	18	80	0.005
	650.16	120	4500	0	100	26	2000	14	80	0.005
	647.66	120	2500	0	100	26	1000	8	80	0.005
	635.16	120	6340	0	100	26	2000	19	80	0.004
	625.16	120	3975	0	100	26	1000	16	75	0.005
	619.66	120	5300	0	100	26	2000	24	70	0.004
	614.66	115	0	30	0	30	60	25	3	N/A
BH-13 (N. Abut.)	663.61	125	1500	0	100	26	500	N/A	75	0.007
	650.61	120	4000	0	100	26	2000	13	80	0.005
	636.61	120	7100	0	100	26	2000	26	80	0.004
	624.11	120	5620	0	100	26	2000	16	80	0.004
	615.69	120	5533	0	100	26	2000	26	80	0.004
BH-14 (N. Pier)	665.92	125	1500	0	100	26	500	N/A	80	0.007
	652.92	120	3000	0	100	26	1000	9	80	0.005
	645.92	120	5700	0	100	26	2000	21	80	0.004
	643.42	120	10900	0	100	26	2000	30	80	0.004
	638.92	120	6150	0	100	26	2000	23	80	0.004
	626.42	120	4440	0	100	26	2000	15	80	0.005
	618.42	120	5867	0	100	26	2000	21	75	0.004
BH-15 (N. Pier)	664.44	125	1500	0	100	26	500	N/A	80	0.007
	650.44	120	4000	0	100	26	2000	10	80	0.005
	629.94	120	7162	0	100	26	2000	21	80	0.004
	624.94	120	3600	0	100	26	1000	14	85	0.005
	622.44	120	5700	0	100	26	2000	24	75	0.004
	615.69	110	0	32	0	32	60	24	3	N/A
BH-16 (N. Pier)	648.03	125	1500	0	100	26	500	N/A	80	0.007
	635.53	120	7640	0	100	26	2000	20	80	0.004
	626.03	120	2775	0	100	26	1000	12	80	0.005
	618.53	120	4400	0	100	26	2000	21	80	0.005
	616.53	115	0	30	0	30	125	66	3	N/A
BH-17 (S. Pier)	650.09	125	1500	0	100	26	500	N/A	80	0.007
	645.59	120	3500	0	100	26	1000	9	80	0.005
	640.09	120	6700	0	100	26	2000	22	80	0.004
	633.09	120	5533	0	100	26	2000	18	80	0.004
	630.59	120	4700	0	100	26	2000	11	80	0.005
	622.59	120	3300	0	100	26	1000	11	80	0.005
	615.09	120	4900	0	100	26	2000	18	80	0.005

Boring	Elev. At Bottom of Layer	γ (pcf)	Short-term		Long-term		K (pci)	N	Assumed % fines < #200	ε_{50}
			c' (psf)	Φ (degrees)	c' (psf)	Φ (deg)				
BH-18 (S. Pier)	655.25	125	1500	0	100	26	500	N/A	80	0.007
	648.25	120	3500	0	100	26	1000	13	80	0.005
	630.75	120	5430	0	100	26	2000	22	80	0.004
	623.25	120	4300	0	100	26	2000	18	80	0.005
	610.25	120	4020	0	100	26	2000	17	70	0.005
BH-19 (S. Pier)	653.27	125	1500	0	100	26	500	N/A	75	0.007
	651.27	120	3000	0	100	26	1000	12	75	0.005
	641.27	120	6250	0	100	26	2000	20	80	0.004
	624.27	120	4630	0	100	26	2000	16	80	0.005
	613.27	120	3250	0	100	26	1000	21	80	0.005
BH-20 (S. Abut.)	668.62	125	1500	0	100	26	500	N/A	80	0.007
	655.62	120	3833	0	100	26	1000	8	75	0.005
	641.62	120	7960	0	100	26	2000	22	80	0.004
	623.62	120	4900	0	100	26	2000	18	80	0.005
	616.12	115	4550	0	100	28	2000	32	65	0.005
BH-21 (S. Abut.)	668.57	125	1500	0	100	26	500	N/A	80	0.007
	653.57	120	4117	0	100	26	2000	13	80	0.005
	651.07	120	4000	0	100	26	2000	12	80	0.005
	636.57	120	7617	0	100	26	2000	22	80	0.004
	626.07	120	3750	0	100	26	1000	14	80	0.005
	616.07	120	5200	0	100	26	2000	41	75	0.004
BH-22 (S. Abut.)	651.82	125	1500	0	100	26	500	N/A	80	0.007
	631.82	120	6600	0	100	26	2000	19	80	0.004
	626.82	120	3600	0	100	26	1000	17	80	0.005
	616.82	120	3925	0	100	26	1000	21	75	0.005

4.4 Shallow Foundations

The presence of stiff soils near the bottom of the "pile cap" at approximate El. 645.5 make spread footings a feasible option for support of the piers. The foundations supporting the north and south piers must provide sufficient support to resist dead and live loads, including seismic loading. The piers will experience a Total Factored Load of 12,743 kips.

The boring logs indicated competent silty clay with an average Q_u of 7.6 tsf at the proposed approximate bearing elevation of 645.5 at both pier locations. Based on AASHTO LRFD Bridge Design Specifications Section 10.6 and C10.6.2.6.1-1, KEG recommends a bearing resistance of 20 ksf (10 tsf) for footings bearing in these competent silty clays. The sliding resistance of the silty clay material is estimated to be 5.2 kips.

5.0 Construction Considerations

5.1 Construction Activities

Construction activities should be performed in accordance with the current IDOT Standard Specifications for Road and Bridge Construction and any pertinent Special Provisions or Policies.

5.2 Temporary Sheeting and Soil Retention

Temporary sheeting may be required at the substructure units during construction, as staged construction is anticipated for this project. The average Q_u-value for the assumed embedment depth is greater than 4.5 tsf at both abutment locations. The *IDOT Temporary Sheet Piling Design Guide and Charts* indicate that a Cantilevered Sheet Piling System is not feasible since sheet piling may have difficultly penetrating these layers.

A Temporary Soil Retention System will be required. An Illinois-licensed structural engineer is required to seal the design of the Temporary Soil Retention System, if deemed necessary.

5.3 Site and Soil Conditions

Should any bridge or embankment design considerations assumed by either IDOT or KEG change, KEG should be contacted to determine if the recommendations stated in this report still apply.

5.4 Retaining Walls

The design parameters and construction considerations for the abutment retaining walls will be covered under a separate SGR.

5.5 Foundation Construction

Conventional pile-driving equipment and methodologies should be assumed.

Prior to construction, a JULIE locate shall be conducted to determine if any underground utilities are present in the area of the proposed structure. IDOT shall also be contacted to locate any private utilities. If utilities become a problem during construction, the appropriate owner shall be contacted immediately.

6.0 Computations

Computations and analyses for special circumstances, if any, are included as exhibits. Please refer to each section of the report for reference to the exhibit containing any such calculations or analysis used.

7.0 Geotechnical Data

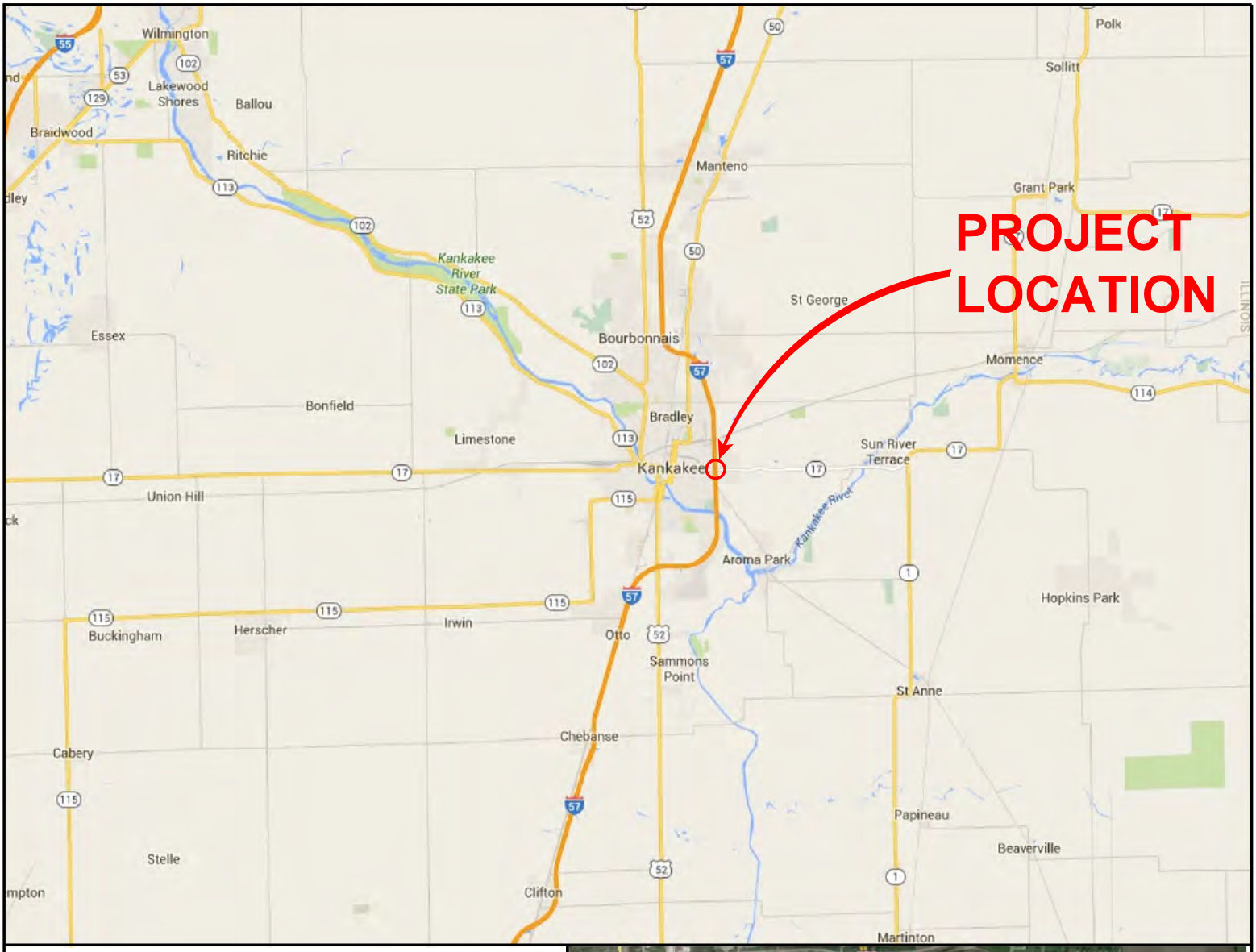
Soil boring logs can be found in Exhibit C. The Subsurface Profile can be found in Exhibit D.

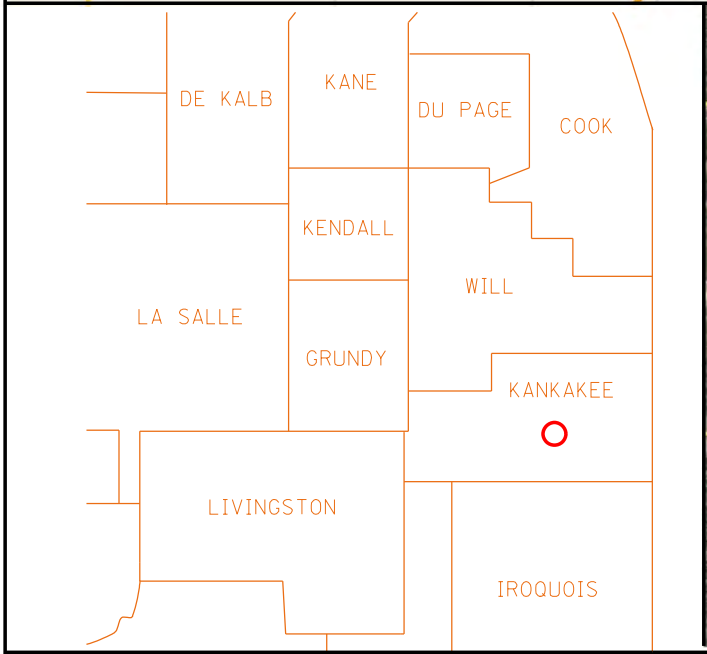
8.0 Limitations

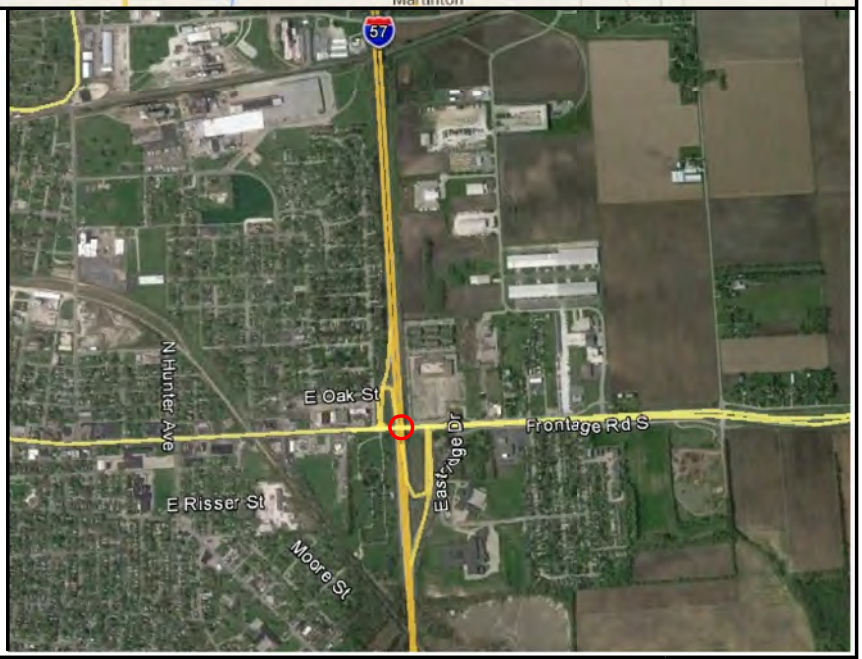
The recommendations provided herein are for the exclusive use of Lochmueller Group and IDOT. They are specific only to the project described and are based on the subsurface information obtained by IDOT at the twelve boring locations within the bridge area in 2013, KEG's understanding of the project as described herein, and geotechnical engineering practice consistent with the standard of care. No other warranty is expressed or implied. KEG should be contacted if conditions encountered during construction are not consistent with those described.

EXHIBIT A

USGS TOPOGRAPHIC LOCATION MAP







Kaskaskia Engineering Group, LLC
208 E. Main St., Suite 100
Belleville, Illinois 62220
618.233.5877 phone
618.233.5977 fax
www.kaskaskiaeng.com

PROFESSIONAL REGISTRATIONS | LICENSE NO.
Illinois Professional Design Firm | 184.004773
Professional Engineering Group | 20-5080586

I-57 OVER IL ROUTE 17
KANKAKEE COUNTY, ILLINOIS

EXHIBIT NO.

A

KEG JOB # 11-1017

$FILEL$

EXHIBIT B

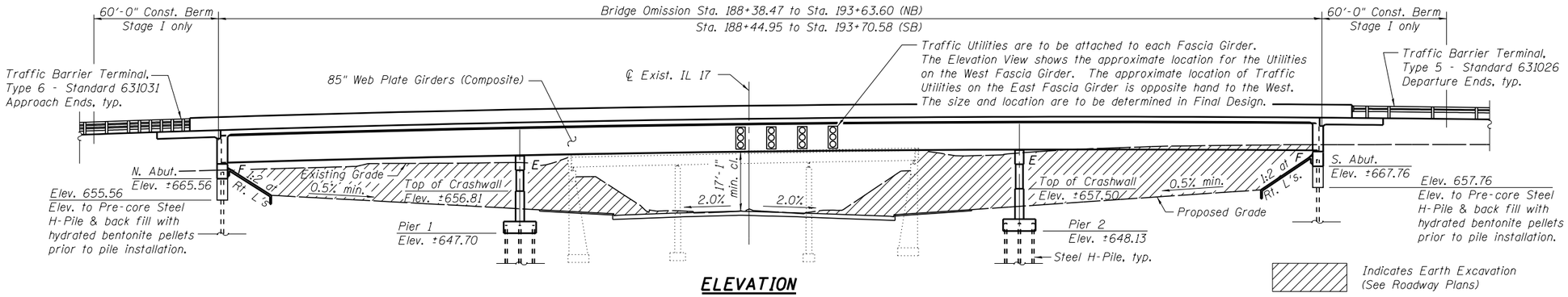
TYPE, SIZE, AND LOCATION PLAN (TS&L)

Benchmark: Point 8528, Northing 1621955.641 & Easting 1121273.357, Cut "X" in concrete Median on IL Route 17 approximately 50' west of Existing Southbound Interstate 57 Structure 046-0007 over Illinois Route 17. Elev. 654.97

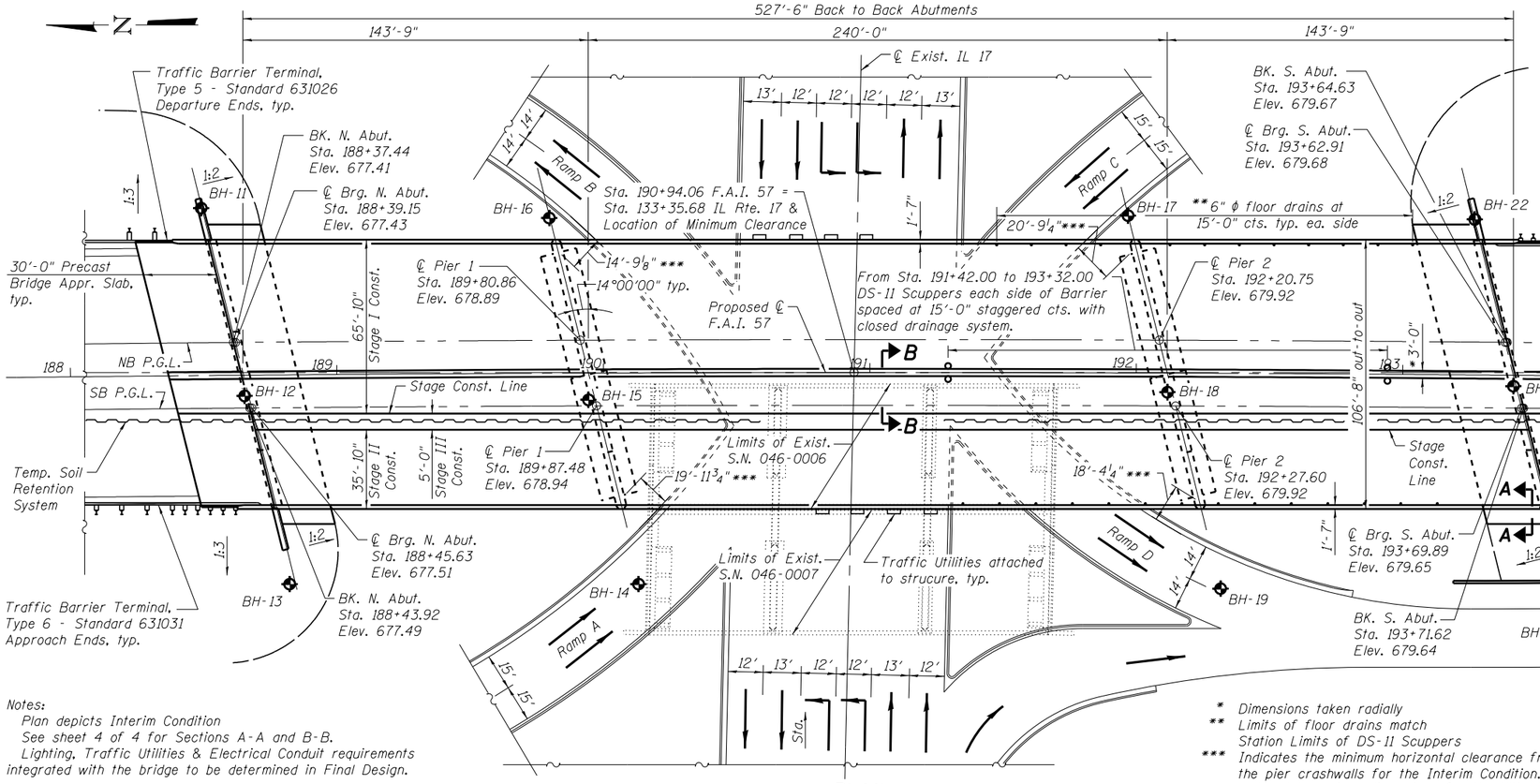
Existing Structures: Dual structures carrying Interstate 57 over Illinois Route 17 (East Court Street) existing SN 046-0006 (NB) & 046-0007 (SB) were originally constructed in 1955 and rehabilitated in 1989. Each of these structures are 3 spans with 166'-1" back to back of abutment length and 51'-2" out to out width. The superstructures are reinforced concrete decks with composite steel stringers in the positive moment region. The substructure consists of a combination of 1955 and 1989 reinforced concrete construction. The 1955 portion of the existing structures is supported by spread footings while the 1989 construction is supported by steel H-piles. Construction shall be staged so that four lanes remain open at all times.

No Salvage

Proposed Structure: The proposed structure SN 046-0154 shall be constructed to replace the existing dual structures. The proposed structure shall be constructed wide enough to accommodate an Interim Condition. The Interim Condition will consist of two lanes and two shoulders in each direction. At a future date, the proposed structure shall be widened to an Ultimate Condition. The Ultimate Condition shall consist of three lanes and two shoulders in each direction. The structure's superstructure and substructure units shall be structurally designed to support loads for the Ultimate Condition.



ELEVATION



PLAN

Notes:
Plan depicts Interim Condition
See sheet 4 of 4 for Sections A-A and B-B.
Lighting, Traffic Utilities & Electrical Conduit requirements integrated with the bridge to be determined in Final Design.

* Dimensions taken radially
** Limits of floor drains match Station Limits of DS-11 Scuppers
*** Indicates the minimum horizontal clearance from the edge of the Ramp curbs to the pier crashwalls for the Interim Condition. Each of the clearances will be reduced to various dimensions for the Ultimate Condition. The minimum horizontal clearance for the Ultimate Condition will be 8'-4⅝".

DESIGN SPECIFICATIONS

AASHTO LRFD Bridge Design Specifications, 7th Edition with 2016 Interims

LOADING HL-93

Allow 50#/sq. ft. for future wearing surface.

SEISMIC DATA

Seismic Performance Zone (SPZ) = C
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 0.073g
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 0.125g
Soil Site Class = 1

DESIGN STRESSES

FIELD UNITS

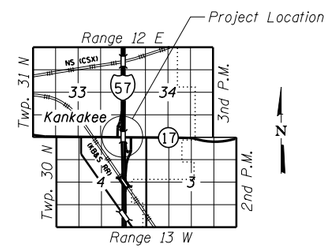
f'c = 3,500 psi
f'c = 4,000 psi (Superstructure Concrete)
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

HIGHWAY CLASSIFICATION

F.A.I. Route 57
Functional Class: Interstate
ADT: 28,000 (2016); 37,675 (2040)
DHV: 2,205 (2016); 2,636 (2040)
ADTT: 32% (2016); 28% (2040)
Design Speed: 75 m.p.h.
Posted Speed: 70 m.p.h.
2-Way Traffic
Directional Distribution: 49 (SB); 51 (NB)

HIGHWAY CLASSIFICATION

F.A.P. Rte. 330 (Illinois Rte. 17)
Functional Class: Other Principal Arterial
ADT: 15,200 (2016); 24,500 (2040)
DHV: 1,274 (2016); 1,869 (2040)
ADTT: 11% (2016); 17% (2040)
Design Speed: 35 m.p.h.
Posted Speed: 30 m.p.h.
2-Way Traffic
Directional Distribution: 57 (SB); 43 (NB)



LOCATION SKETCH

GENERAL PLAN
I-57 OVER ILLINOIS ROUTE 17 (EAST COURT STREET)
F.A.I. RTE. 57 - SEC. (46-3)HBK
KANKAKEE COUNTY
STATION 190+94.06
STRUCTURE NO. 046-0154 (NB) & (SB)

LOCHMUELLER GROUP
1928 SA Bradley R. Smith Drive
Troy, IL 62294
PHONE: 618.667.1400

USER NAME = bseibel	DESIGNED - CJF	REVISED	
Illinois Design Firm Number 184.001670	CHECKED - ACS	REVISED	
PLOT SCALE =	DRAWN - WS	REVISED	
PLOT DATE = 1/13/2017 10:24:17 AM	CHECKED - CJF	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 1 OF 4 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HBK	KANKAKEE		
STRUCTURE NUMBER 046-0154		CONTRACT NO. 66863		
ILLINOIS FED. AID PROJECT				

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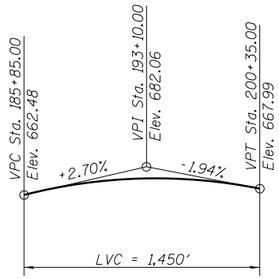
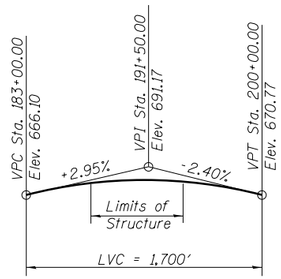
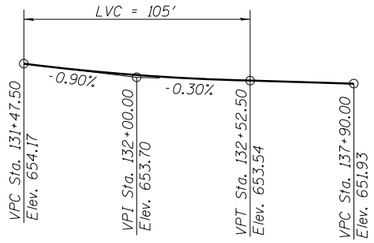


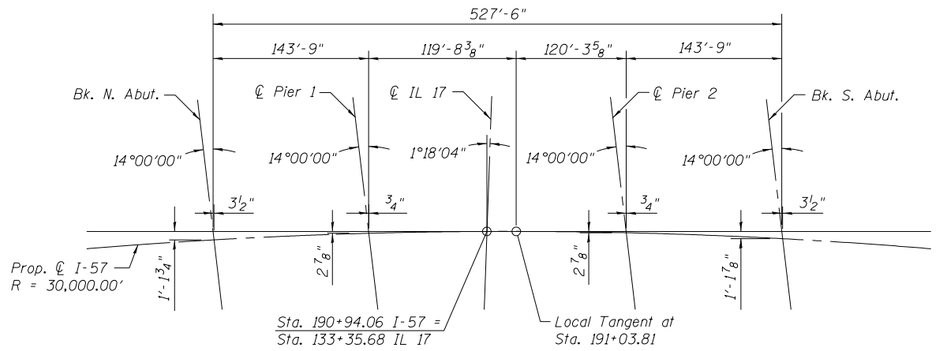
PROFILE GRADE
(Existing F.A.I. 57)



PROFILE GRADE
(Proposed F.A.I. 57)



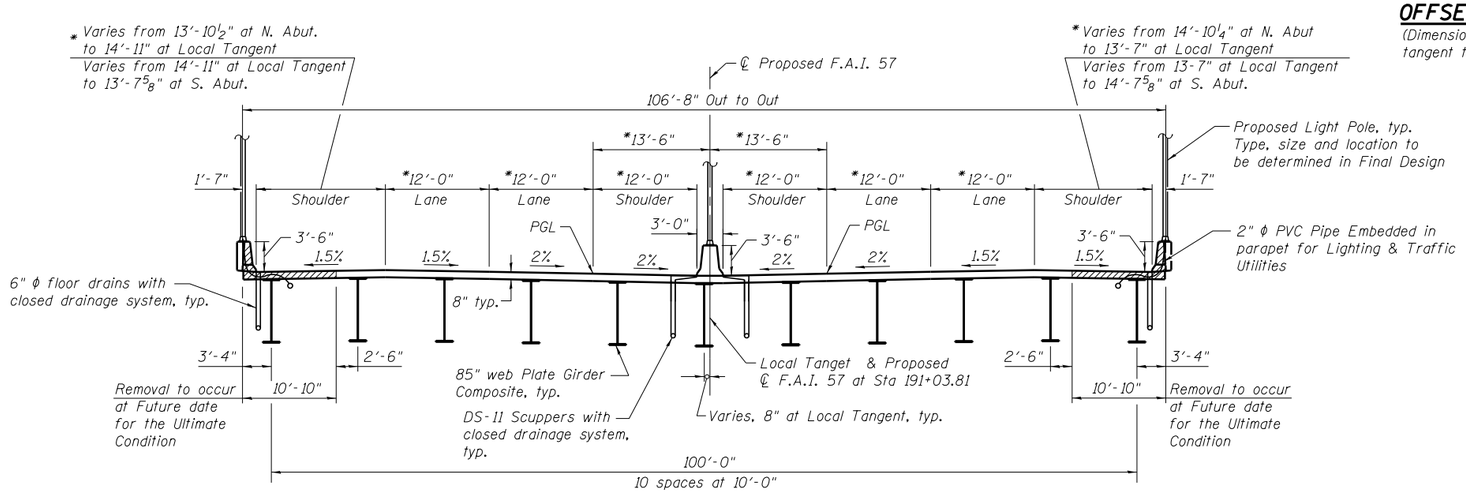
PROFILE GRADE
(Proposed IL Rte. 17)



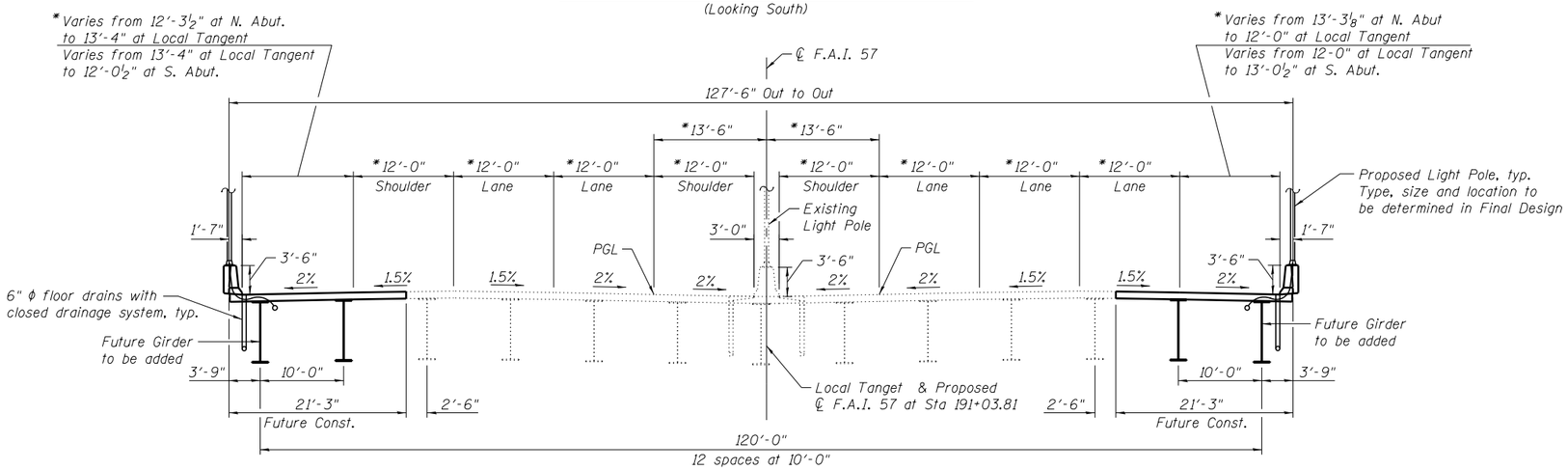
HORIZONTAL CURVE DATA

F.A.I. Route 57
P.I. Sta. = 189+74.14
Δ = 2°52'07" (RT.)
D = 0°11'28"
R = 30,000.00'
T = 751.18'
L = 1,502.04'
E = 9.40'
e = NC
T.R. = NA
S.E. Run = NA
P.C. Sta. = 182+22.96
P.T. Sta. = 197+25.00

OFFSET SKETCH
(Dimensions along local tangent to I-57)



TYPICAL SECTION - INTERIM CONDITION
(Looking South)



TYPICAL SECTION - FUTURE ULTIMATE CONDITION
(Looking South)

Note:
* Indicates dimensions taken at Rt. angles to ℄ F.A.I. Rte. 57

GENERAL DATA
I-57 OVER ILLINOIS ROUTE 17
(EAST COURT STREET)
F.A.I. RTE. 57 - SEC. (46-3)HBK
KANKAKEE COUNTY
STATION 190+94.06
STRUCTURE NO. 046-0154 (NB) & (SB)

LOCHMUELLER GROUP
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Troy, IL 62294
PHONE: 618.667.1400

USER NAME = bselbel	DESIGNED - CJF	REVISED	
Illinois Design Firm Number 184.001670	CHECKED - ACS	REVISED	
PLOT SCALE =	DRAWN - WS	REVISED	
PLOT DATE = 1/13/2017 10:25:02 AM	CHECKED - CJF	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 2 OF 4 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HBK	KANKAKEE		
STRUCTURE NUMBER 046-0154		CONTRACT NO. 66863		
ILLINOIS	FED. AID PROJECT			

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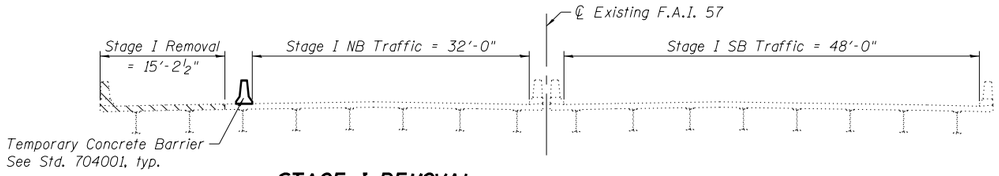
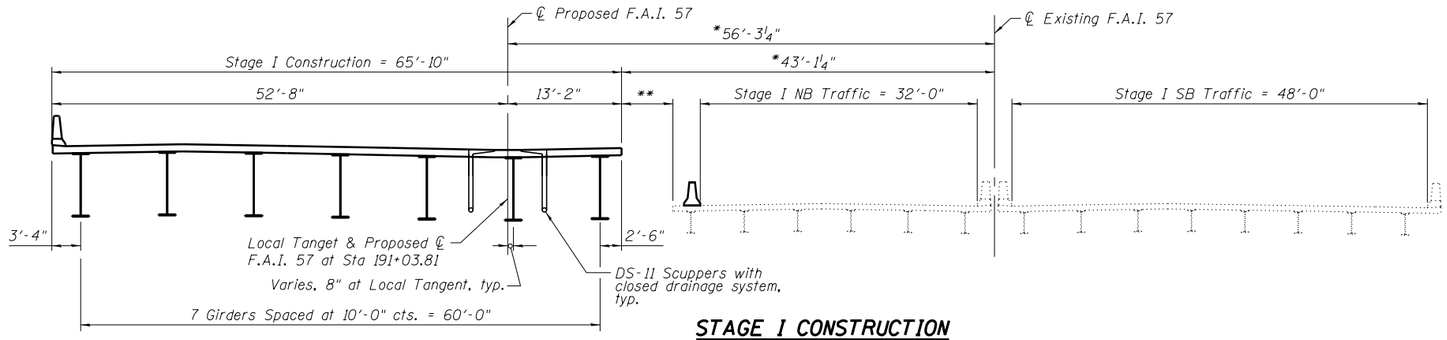
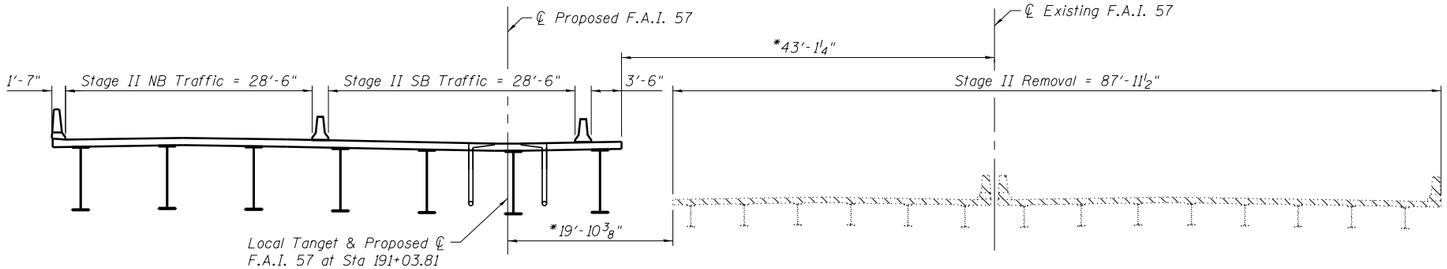


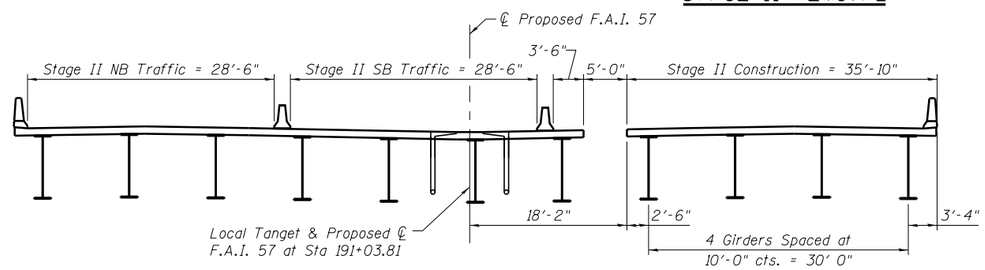
STAGE I REMOVAL



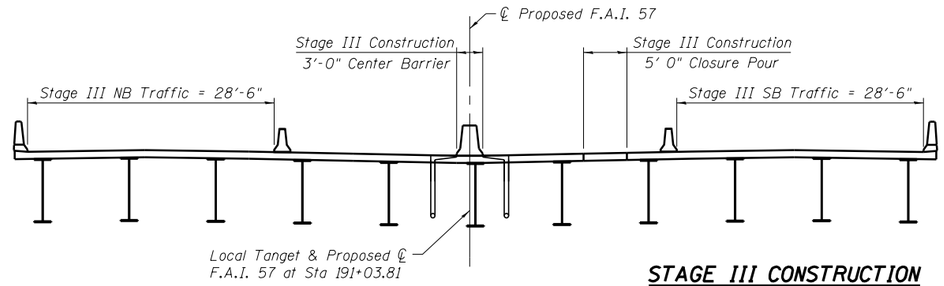
STAGE I CONSTRUCTION



STAGE II REMOVAL



STAGE II CONSTRUCTION



STAGE III CONSTRUCTION

Notes:
** Indicates dimension at Station of Local Tangent.*
*** Dimension Varies ±6′-9″ to ±6′-83#8″ from Back to Back of Existing Abutments.*
Lighting Bumpouts on parapets not shown.

STAGE CONSTRUCTION
I-57 OVER ILLINOIS ROUTE 17
(EAST COURT STREET)
F.A.I. RTE. 57 - SEC. (46-3)HBK
KANKAKEE COUNTY
STATION 190+94.06
STRUCTURE NO. 046-0154 (NB) & (SB)

LOCHMUELLER GROUP
1928 S/A Bradley R. Smith Drive
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PHONE: 618.667.1400

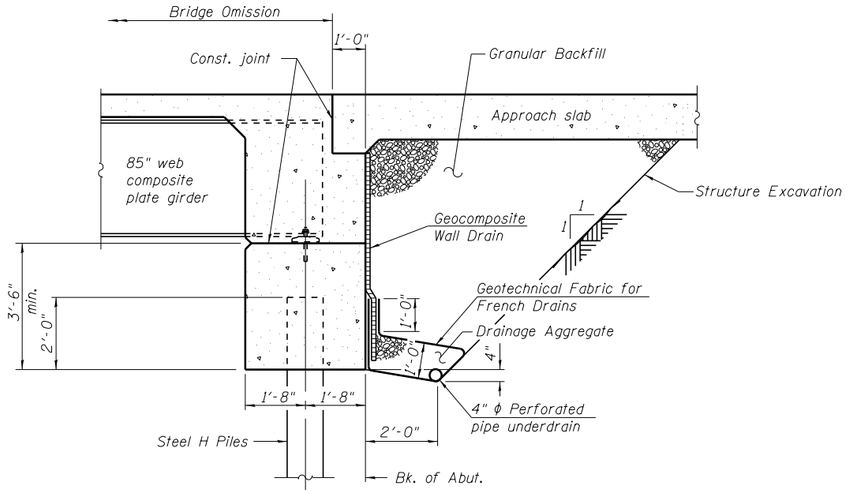
USER NAME = bseibel	DESIGNED - CJF	REVISED	
Illinois Design Firm Number 184.001670	CHECKED - ACS	REVISED	
PLOT SCALE =	DRAWN - WS	REVISED	
PLOT DATE = 1/13/2017 10:25:50 AM	CHECKED - CJF	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 3 OF 4 SHEETS

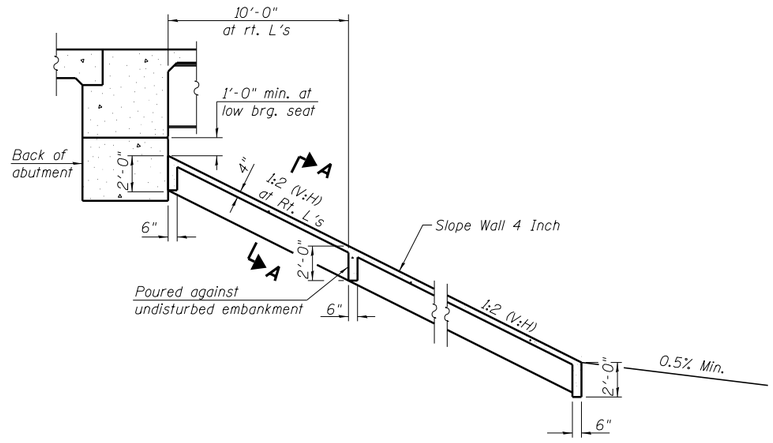
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HBK	KANKAKEE		
STRUCTURE NUMBER 046-0154		CONTRACT NO. 66863		
	ILLINOIS FED. AID PROJECT			

FILE NAME = S:\Projects\41I-8005-6HY I-57 SPUI\Bridge\DGN\TSL Bridge 157 over IL 17 SPUI\2016-11-17-TSL_Japan-CAD Drawing\ex046006-66863-003-TSL.dgn

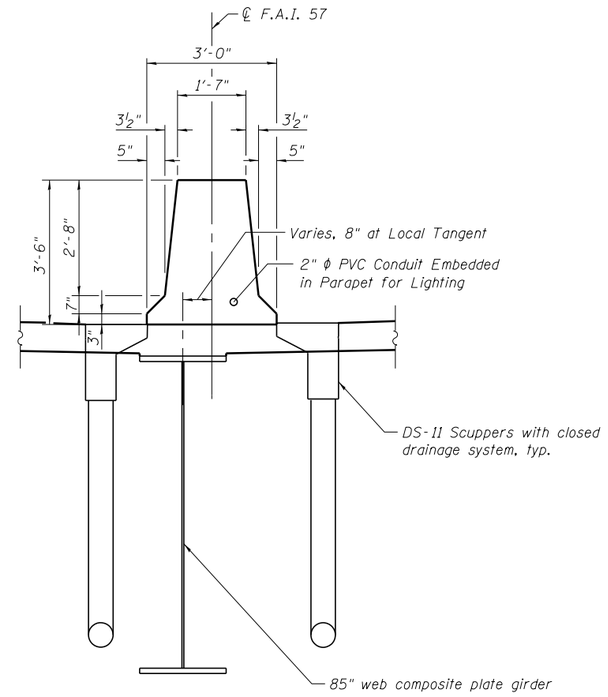


SECTION THRU INTEGRAL ABUTMENT

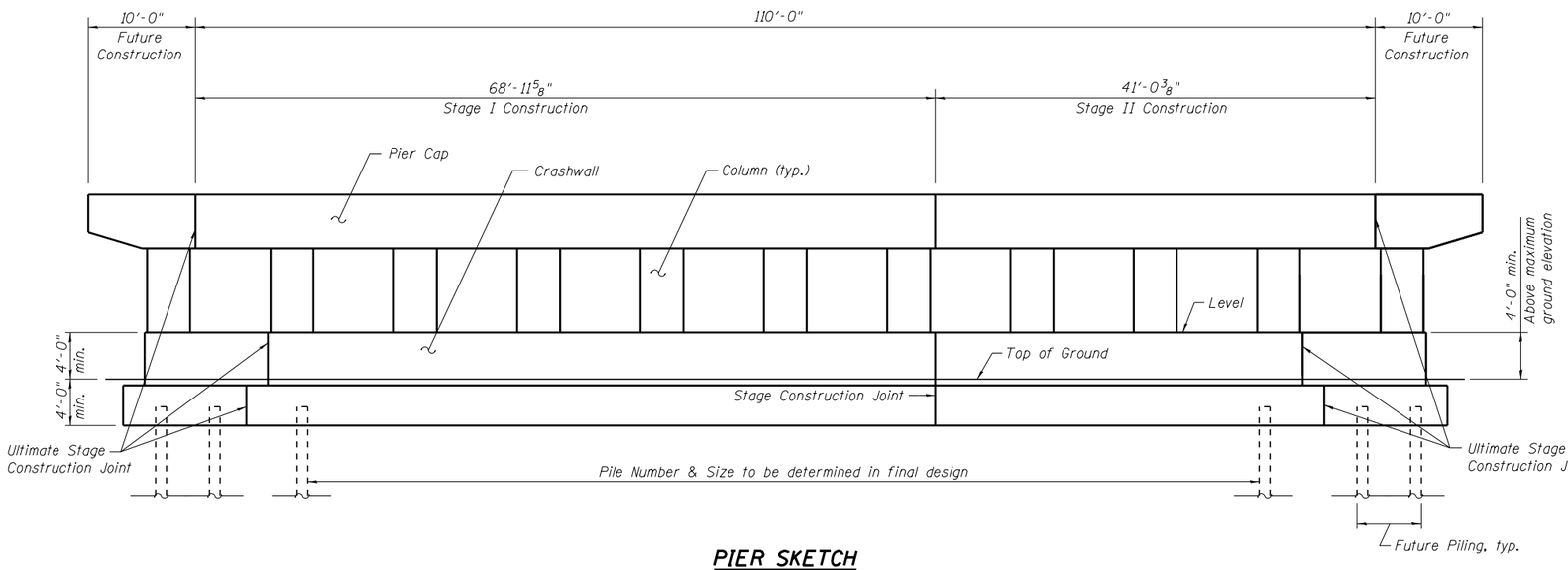
(Horiz. dim. @ Rt. L's)



SECTION THRU CONCRETE SLOPEWALL

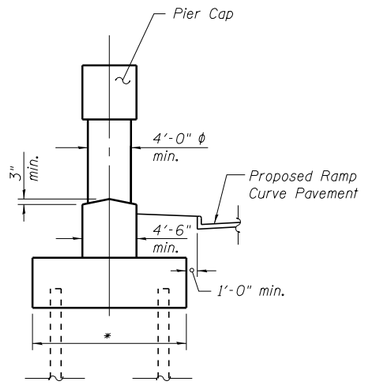


SECTION B-B



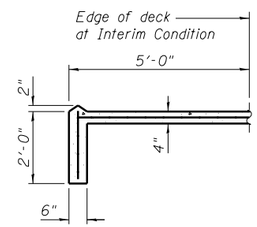
PIER SKETCH

All dimensions are shown along the skew



PIER END VIEW

* The final dimensions for the Ultimate Condition shall not undercut the Proposed F.A.I. 57 & IL 17 Ramp Curbs.



SECTION A-A

DETAILS
I-57 OVER ILLINOIS ROUTE 17 (EAST COURT STREET)
F.A.I. RTE. 57 - SEC. (46-3)HBK
KANKAKEE COUNTY
STATION 190+94.06
STRUCTURE NO. 046-0154 (NB) & (SB)

LOCHMUELLER GROUP
1928 S/A Bradley R. Smith Drive
Troy, IL 62294
PHONE: 618.667.1400

USER NAME = bselbel	DESIGNED - CJF	REVISED	
Illinois Design Firm Number 184.001670	CHECKED - ACS	REVISED	
PLOT SCALE =	DRAWN - WS	REVISED	
PLOT DATE = 1/13/2017 10:26:24 AM	CHECKED - CJF	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 4 OF 4 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HBK	KANKAKEE		
STRUCTURE NUMBER 046-0154		CONTRACT NO. 66863		
ILLINOIS	FED. AID PROJECT			

FILE NAME = S:\Projects\411-0005-0HY I-57 SPUI\Bridge\DGN\TSL Bridge 157 over IL 17 SPUI\2016-11-17_TSL_3span_CAD Drawing\ex8160806-66863-004-TSBL.dgn

EXHIBIT C

BORING LOGS

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/13/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119736, **Longitude** -87.835262

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 11 (N. Abut.)
Station 188+18.09
Offset 62.1 ft Lt.
Ground Surface Elev. 653.12 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 618.1 ft ▼
Upon Completion 618.1 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Augered Black Silty Clay Loam, Gravel Fill and Brown & Gray Silty Clay
650.62				
	3			Hard Brown & Gray Silty Clay
	4 5	4.0 P	24	
-5				
	4			
	6 8	4.1 S	23	
	6			
	12 15	8.7 S	22	
-10				
	5			
	7 12	7.1 S	24	
	4			
	7 10	7.4 S	24	
-15				
	5			
	7 10	6.4 S	22	
	5			
	7 10	6.8 S	22	
-20				
	5			Hard Brown & Gray Silty Clay *(continued)*
	6 8	5.1 S	24	
631.12				
	5			Very Stiff Gray Silty Clay - Tillish
	6 8	3.9 B	22	
-25				
	4			
	5 7	3.3 B	22	
625.62				
	5			Very Stiff to Hard Gray Silty Clay Loam/Silty Loam Till with Silt Layers
	9 12	4.0 P	15	
-30				
	7			
	7 8	4.7 B	15	
	17			
	22 42	>4.5 P	11	
-35 ▽▼				
	17			
617.37	100/3"		11	
				Dense Gray Limestone End of Boring
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/8/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119658, **Longitude** -87.835518

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 12 (N. Abut.)
Station 188+43.42
Offset 9.6 ft Rt.
Ground Surface Elev. 667.16 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 627.2 ft ▼
Upon Completion 627.2 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Bituminous Shoulder, Brown & Gray Silty Clay Fill			
664.66			
Very Stiff Brown & Gray Silty Clay Tillish Fill	4		
	3 5	3.0 P	20
-5			
	2		
	3 2	2.5 P	17
	2		
	3 3	3.0 P	22
657.16 -10			
Hard Brown & Gray Silty Clay Till Fill with Black Silty Clay Loam @ 16.5'	3		
	6 8	>4.5 P	14
	8		
	10 12	>4.5 P	15
-15			
	5		
	5 9	>4.5 P	16
650.16			
Very Stiff Brown & Gray Silty Clay	2		
	3 5	2.5 B	29
647.66			
-20			
Hard Brown & Gray Silty Clay - Tillish *(continued)*	6		
	9 10	5.9 S	19
	8		
	10 12	5.3 S	21
-25			
	5		
	7 10	6.6 S	22
	6		
	8 11	7.0 S	22
-30			
	5		
	7 9	6.9 S	20
635.16			
Very Stiff to Hard Gray Clay/Silty Clay	5		
	6 10	3.5 S	23
-35			
	5		
	6 10	3.9 S	20
	6		
	8 10	4.5 S	20
▽▼ -40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/8/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119658, **Longitude** -87.835518

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 12 (N. Abut.)
Station 188+43.42
Offset 9.6 ft Rt.
Ground Surface Elev. 667.16 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 627.2 ft ▼
Upon Completion 627.2 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Very Stiff to Hard Gray Clay/Silty Clay *(continued)*		5		
		6 9	4.0 B	21
	625.16			
Hard Gray Silty Clay Loam Till with Silt Pockets		9		
		13 15	>4.5 P	16
	-45			
		5		
		8 12	6.1 S	13
	619.66			
Medium Gray Fine Sand to Coarse Gravel - Loamy		13		
		13 13		12
	-50			
		7		
		9 15		13
	614.66			
Dense Gray Limestone	614.41	100/3"		9
End of Boring				
	-55			
	-60			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
	-65			
	-70			
	-75			
	-80			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/7/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SE 1/4, **SEC.** 33, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119613, **Longitude** -87.835889

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 13 (N. Abut.)
Station 188+55.99
Offset 112.4 ft Rt.
Ground Surface Elev. 668.61 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 623.6 ft ▼
Upon Completion 623.6 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Bituminous Shoulder, Brown & Gray Silty Clay Fill				
663.61	-5			
Hard Brown & Gray Silty Clay Tillish Fill with Black Silty Clay Loam & Debris @ 16'		4		
		5 8	4.0 P	17
	-10	3		
		5 7	4.0 P	18
	-15	3		
		5 9	4.0 P	23
650.61				
Hard Brown & Gray Silty Clay Tillish	-20			
Hard Brown & Gray Silty Clay Tillish *(continued)*		8		
		12 18	8.9 S	19
		9		
		12 18	6.7 S	20
	-25	9		
		12 17	7.0 S	22
		6		
		9 13	5.7 S	19
	-30	5		
		8 13	7.2 S	19
636.61				
Hard Gray Silty Clay		6		
		8 11	6.1 B	21
	-35	4		
		5 7	5.0 B	20
		5		
		8 11	6.2 B	20
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/7/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SE 1/4, **SEC.** 33, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119613, **Longitude** -87.835889

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 13 (N. Abut.)
Station 188+55.99
Offset 112.4 ft Rt.
Ground Surface Elev. 668.61 ft

Surface Water Elev. ____ ft
Stream Bed Elev. ____ ft

Groundwater Elev.:
First Encounter 623.6 ft ▼
Upon Completion 623.6 ft ▽
After ____ **Hrs.** ____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard Gray Silty Clay *(continued)*		6		
		8 10	5.7 B	21
		4		
		5 9	5.1 B	19
624.11				
Very Stiff to Hard Gray Silty Clay Loam/Silty Loam Till	▽▼-45	5		
		7 10	3.0 P	14
		10		
		17 22	6.6 S	12
	-50	6		
		9 13	7.0 S	12
615.69		100/5"		14
Dense Gray Limestone End of Boring	-55			
	-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/7/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119370, **Longitude** -87.835858

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 14 (N. Pier)
Station 189+45.06
Offset 107.2 ft Rt.
Ground Surface Elev. 670.92 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 625.9 ft ▼
Upon Completion 625.9 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Bituminous Shoulder, Brown & Gray Silty Clay Fill				
665.92	-5			
Very Stiff Brown & Gray Silty Clay Tillish Fill with Gray & Black Silty Clay Loam Fill @ 16'		4		
		2 2	2.0 P	21
	-10	3		
		5 6	3.5 P	19
	-15	4		
		5 6	3.5 P	19
652.92				
Hard Brown & Gray Silty Clay - Tillish	-20			
Hard Brown & Gray Silty Clay - Tillish *(continued)*		4		
		5 6	4.0 P	20
		9		
		12 18	7.4 S	18
	-25	9		
**Max Rimac @ 10%		12 18	10.9 S**	17
		9		
		12 18	7.2 S	19
	-30	5		
		6 10	5.1 S	24
638.92				
Hard Gray Silty Clay with Fine Roots in the Cracks		4		
		6 10	5.4 B	20
	-35	4		
		6 10	4.4 B	21
		5		
		7 11	4.3 B	21
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/7/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119370, **Longitude** -87.835858

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 14 (N. Pier)
Station 189+45.06
Offset 107.2 ft Rt.
Ground Surface Elev. 670.92 ft

Surface Water Elev. ____ ft
Stream Bed Elev. ____ ft

Groundwater Elev.:
First Encounter 625.9 ft ▼
Upon Completion 625.9 ft ▽
After ____ **Hrs.** ____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard Gray Silty Clay with Fine Roots in the Cracks *(continued)*		4		
		5 9	4.1 B	21
		4		
		5 8	4.0 B	22
	626.42			
Hard Gray Silty Clay Loam/Silty Loam Till	-45	5		
		6 10	5.3 S	19
		5		
		7 12	7.1 S	10
	-50	9		
		12 15	5.2 S	13
	618.42			
Dense Gray Limestone Fragments with Sand & Gravel		18		
		25 32		12
	-55			
	615.42	46		
Dense Gray Limestone	~~615.25~~	100/2"		12
End of Boring				
	-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/8/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119359, **Longitude** -87.835506

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 15 (N. Pier)
Station 189+52.67
Offset 10.5 ft Rt.
Ground Surface Elev. 669.44 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 624.4 ft ▼
Upon Completion 624.4 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Bituminous Shoulder, Brown & Gray Silty Clay Fill			
664.44	-5		
Very Stiff to Hard Gray & Brown Silty Clay Fill with some Till & Topsoil Mixed in at 16'	3		
	3 4	3.5 P	20
	-10		
	4		
	5 5	4.0 P	19
	-15		
	5		
	6 7	4.5 P	23
650.44			
Hard Brown & Gray Silty Clay	-20		
Hard Brown & Gray Silty Clay *(continued)*			
	3		
	6 9	4.6 S	19
	5		
	8 10	5.6 S	19
	-25		
	9		
	12 18	9.8 S	20
	8		
	10 12	7.0 S	22
	-30		
	9		
	10 13	8.6 S	21
	6		
	8 10	6.6 S	23
	-35		
	5		
	8 12	8.0 S	21
	8		
	10 15	7.1 S	19
629.94			
Very Stiff Gray Silty Clay/Clay	-40		

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/8/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119359, **Longitude** -87.835506

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 15 (N. Pier)
Station 189+52.67
Offset 10.5 ft Rt.
Ground Surface Elev. 669.44 ft

Surface Water Elev. ____ ft
Stream Bed Elev. ____ ft

Groundwater Elev.:
First Encounter 624.4 ft ▼
Upon Completion 624.4 ft ▽
After ____ **Hrs.** ____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Very Stiff Gray Silty Clay/Clay *(continued)*		5		
		6 9	3.8 B	22
		4		
		5 7	3.4 B	22
	624.94			
Hard Gray Silty Clay/Silty Loam ▽▼	-45	8		
		11 13	5.7 S	17
	622.44			
Medium Loamy Fine to Coarse Sand with Loam Till Layers		8		
		8 13		12
	-50	12		
		13 13		12
		8		
		12 100/3"		12
	615.69			
Dense Gray Limestone End of Boring	-55			
	-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/13/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** SW 1/4, **SEC.** 34, **TWP.** 31N, **RNG.** 12E, 3rd **PM**,
Latitude 41.119331, **Longitude** -87.835256

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 16 (N. Pier)
Station 189+65.26
Offset 58.0 ft Lt.
Ground Surface Elev. 653.03 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 617.5 ft ▼
Upon Completion 619.0 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Black Silty Clay Loam Fill with Large Limestone Debris Pieces Fill and Brown & Gray Silty Clay			
-5			
648.03			
Hard Brown & Gray Silty Clay	5		
	7 10	7.2 S	19
	9		
	11 16	9.6 S	20
-10			
	8		
	11 12	8.5 S	20
	6		
	8 11	8.5 S	21
-15			
	5		
	6 8	4.4 S	24
635.53			
Very Stiff Gray Silty Clay - Tillish	4		
	5 8	3.3 B	23
-20			
Very Stiff Gray Silty Clay - Tillish *(continued)*	4		
	5 6	3.0 B	24
	4		
	5 7	2.4 B	26
-25			
	3		
	4 6	2.4 B	25
626.03			
Very Stiff to Hard Gray Silty Clay Loam/Silty Loam Till with Silt Layers	3		
	6 8	4.0 S	20
-30			
	8		
	11 11	4.6 S	15
	8		
	11 15	4.6 S	16
618.53 ▽			
-35			
Dense Gray Loamy Fine Sand to Coarse Gravel ▼	8		
	15 51		15
616.53			
Dense Gray Limestone			
End of Boring			
-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/15/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118678, **Longitude** -87.835179

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 17 (S. Pier)
Station 192+03.07
Offset 71.9 ft Lt.
Ground Surface Elev. 652.59 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 616.6 ft ▼
Upon Completion 622.6 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Augered Black Silty Clay Loam Fill, Brown & Gray Silty Clay
650.09				
	5			Very Stiff Brown & Gray Silty Clay
	4 5	3.5 P	25	
-5				
	3			
	4 5	3.5 P	24	
645.59				
	5			Hard Brown & Gray Silty Clay
	7 11	5.1 S	20	
-10				
	7			
	11 15	8.3 S	21	
640.09				
	8			Hard Gray Silty Clay
	10 12	6.1 S	23	
-15				
	6			
	8 10	5.4 S	21	
	4			
	6 7	5.1 S	23	
633.09				
-20				Hard Brown & Gray Silty Clay Till
	3			Hard Brown & Gray Silty Clay Till *(continued)*
	5 6	4.7 S	22	
630.59				
	3			Very Stiff Gray Silty Clay
	5 7	3.4 B	25	
-25				
	3			
	4 6	3.1 B	23	
	3			
	5 7	3.4 B	23	
622.59 ▽				
-30				
	4			Hard to Very Stiff Gray Silty Clay Loam/Silty Loam Till with Silt & Sand Layers
	7 9	4.5 P	11	
	4			
	5 7	4.1 S	20	
-35				
	10			
▼	12 14	6.1 S	17	
615.09				
615.01	100/1"			Dense Gray Limestone
				End of Boring
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/14/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118569, **Longitude** -87.835465

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 18 (S. Pier)
Station 192+40.68
Offset 8.0 ft Rt.
Ground Surface Elev. 670.25 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 666.3 * ft
Upon Completion 645.3 ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Augered Bituminous Shoulder, White Sand & Gravel, Brown & Gray Silty Clay Fill
				*Groundwater at 4' due to Plugged Underdrain
-5				
-10				
655.25 -15				
	5			Very Stiff Brown & Gray Silty Clay Till Fill, Free Water from Blocked Underdrains
	5 7	3.5 P	18	
-20				
	3			Very Stiff Brown & Gray Silty Clay Till Fill, Free Water from Blocked Underdrains *(continued)*
	5 8		30	
648.25				Very Stiff to Hard Brown & Gray Silty Clay
	4			
	5 6	3.5 P	26	
-25				
	4			
	7 9	5.2 S	24	
	5			
	8 13	5.2 S	22	
-30				
	9			
	18 21	6.2 S	23	
	5			
	9 13	5.7 S	27	
-35				
	7			
	9 12	5.4 S	25	
	7			
	12 13	6.8 S	24	
630.75				Hard to Very Stiff Gray Silty Clay
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/14/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118569, **Longitude** -87.835465

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 18 (S. Pier)
Station 192+40.68
Offset 8.0 ft Rt.
Ground Surface Elev. 670.25 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 666.3 * ft
Upon Completion 645.3 ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
	7			Hard to Very Stiff Gray Silty Clay *(continued)*
	11 12	5.1 B	21	
	5			
	7 9	4.1 B	24	
-45	5			
	7 9	3.7 B	24	
623.25				
	4			Very Stiff to Hard Gray Silty Clay Loam/Silty Loam Till with Silt & Clay Layers and Sand/Gravel Layers
	5 8	4.0 P	22	
-50	5			
	9 4	3.0 P	14	
	5			
	9 12	5.1 S	18	
-55	5			
	7 9	4.0 P	19	
	6			
	9 12	4.0 P	24	
610.25	-60			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
610.00	100/3"		8	Dense Gray Limestone
				End of Boring
-65				
-70				
-75				
-80				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/21/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118570, **Longitude** -87.835821

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 19 (S. Pier)
Station 192+37.82
Offset 105.9 ft Rt.
Ground Surface Elev. 673.27 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 623.3 ft ▼
Upon Completion 628.3 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Augered Bituminous Shoulder, Black Silty Clay Loam, Gray Silty Clay Loam/Silty Loam Fill
-5				
-10				
653.27 -20				
	4			Very Stiff Black Silty Clay Loam Topsoil
	5 7	3.0 P	29	
				651.27
				Hard Brown & Gray Silty Clay
	4			
	5 7	4.2 S	23	
-25				
	6			
	8 11	5.1 S	21	
	9			
	12 16	6.5 S	21	
-30				
	5			
	9 12	9.2 S	21	
				641.27
				Hard Gray to Very Stiff Silty Clay - Tillish
	7			
	9 13	7.1 S	20	
-35				
	4			
	7 10	5.0 S	23	
	4			
	7 10	5.0 S	23	
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/21/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118570, **Longitude** -87.835821

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 19 (S. Pier)
Station 192+37.82
Offset 105.9 ft Rt.
Ground Surface Elev. 673.27 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 623.3 ft ▼
Upon Completion 628.3 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard Gray to Very Stiff Silty Clay - Tillish *(continued)*		5		
		7 10	5.0 S	23
		4		
		5 6	2.9 B	24
	▽ -45	4		
		5 9	4.3 B	21
		4		
	624.27	5 7	3.1 B	19
Very Stiff to Hard Gray Silty Clay Loam/Silty Loam Till with Silt Layers & Silty Clay Layers	▼ -50	4		
		5 6	2.5 B	23
		7		
		12 15	4.7 S	17
	-55	8		
		11 13	3.1 B	22
		8		
		10 11	2.7 B	21
	613.27 -60			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Dense Gray Limestone Weathered Surface	613.02	100/3"		8
End of Boring	-65			
	-70			
	-75			
	-80			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/21/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118186, **Longitude** -87.835804

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 20 (S. Abut.)
Station 193+78.09
Offset 104.6 ft Rt.
Ground Surface Elev. 673.62 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 621.6 ft ▼
Upon Completion 630.6 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Augered Bituminous Shoulder, Gray Silty Clay Loam Fill
-5				668.62
	3			Very Stiff to Hard Gray Silty Clay Loam/Silty Loam Fill and Black Silty Clay Loam Fill with Layers of Brown/Gray Silty Clay Fill
	3 3	3.0 P	22	
-10				
	3			
	3 5	4.0 P	15	
-15				
	4			
	4 7	4.5 P	22	
				655.62
-20				Hard Brown & Gray Silty Clay
	4			
	5 7	4.0 P	30	
	7			
	8 10	6.1 S	22	
-25				
	8			
	10 11	8.1 S	18	
	10			
	15 19	10.7 S	20	
-30				
	8			**Max Rimac @ 10%
	13 21	10.9 S**	19	
				641.62
	8			Hard to Very Stiff Gray Silty Clay
	10 12	6.1 S	21	
-35				
	8			
	9 11	6.4 S	20	
	7			
	10 14	5.0 S	24	
-40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/21/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118186, **Longitude** -87.835804

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 20 (S. Abut.)
Station 193+78.09
Offset 104.6 ft Rt.
Ground Surface Elev. 673.62 ft

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft

Groundwater Elev.:
First Encounter 621.6 ft ▼
Upon Completion 630.6 ft ▽
After _____ **Hrs.** _____ ft

Material Description	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard to Very Stiff Gray Silty Clay *(continued)*		5		
		6 9	4.1 B	23
		4		
		5 10	4.0 B	22
	-45	5		
		5 9	4.6 B	22
		5		
		6 9	4.1 B	19
	623.62 -50	4		
Hard Gray Silty Loam Till with Layers of Loamy Sand/Gravel		6 8	4.0 B	22
		6		
		9 14	5.1 S	10
	-55	16		
		28 31		10
	616.12			
Dense Gray Limestone Weathered Surface	615.79	100/4"		9
End of Boring	-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/14/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118242, **Longitude** -87.835439

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 21 (S. Abut.)
Station 193+59.93
Offset 3.6 ft Rt.
Ground Surface Elev. 673.57 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 617.6 ft ▼
Upon Completion 618.6 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Augered Bituminous Shoulder, Brown & Gray Silty Clay Fill				
668.57	-5			
Hard to Very Stiff Gray & Brown Silty Clay - some Till. All Fill with some Black Silty Clay Loam @ 16.5'		4		
		5 6	4.1 B	22
		3		
		3 5	3.0 P	24
	-10			
		3		
		4 5	4.0 P	17
		8		
		11 12	6.1 S	18
	-15			
		4		
		6 7	4.0 P	21
		4		
		5 6	3.5 P	24
653.57	-20			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard Brown & Gray Silty Clay		4		
		5 7	4.0 P	24
		6		
		8 12	7.4 S	22
	-25			
		7		
		11 18	8.3 S	23
		7		
		11 13	7.4 S	23
	-30			
		7		
		9 11	7.4 S	22
		7		
		9 11	7.8 S	18
	-35			
		8		
		9 11	7.4 S	22
636.57				
Hard to Very Stiff Gray Silty Clay		5		
		6 9	4.7 B	22
	-40			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/14/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118242, **Longitude** -87.835439

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 21 (S. Abut.)
Station 193+59.93
Offset 3.6 ft Rt.
Ground Surface Elev. 673.57 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 617.6 ft ▼
Upon Completion 618.6 ft ▽
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Hard to Very Stiff Gray Silty Clay *(continued)*		5		
		7 10	3.7 B	23
		4		
		5 8	3.5 B	25
	-45	4		
		5 7	3.1 B	24
		11		
Hard Gray Silty Clay Loam/Silty Loam Till with Sand & Gavel Layers and Silt/Clay Layers		21 18	>4.5 P	12
	-50	11		
		22 31	>4.5 P	10
		12		
		24 19	6.7 S	12
	▽ -55	9		
	▼	12 16	5.1 S	18
		18		
Dense Gray Limestone, Top 1' Fractured & Reworked - Solid @ 58.5'		34 100/2"		11
End of Boring	-60			

626.07
616.07
614.90

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/15/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118288, **Longitude** -87.835178

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 22 (S. Abut.)
Station 193+44.80
Offset 68.6 ft Lt.
Ground Surface Elev. 654.32 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 616.8 ft ▼
Upon Completion 618.3 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Augered Black Silty Clay Loam Fill, Brown & Gray Silty Clay
651.82				
	6			Hard Brown & Gray Silty Clay
	9 12	>4.5 P	16	
-5	7			
	10 15	10.5 S	19	
	6			
	8 14	7.0 S	20	
-10	6			
	8 12	6.4 S	23	
	5			
	6 10	6.4 S	24	
-15	5			
	6 10	7.4 S	20	
	4			
	6 8	5.2 S	19	
-20				
	4			Hard Brown & Gray Silty Clay *(continued)*
	6 8	5.4 S	23	
631.82				
	6			Hard to Very Stiff Gray Silty Clay
	8 12	4.1 B	22	
-25	5			
	6 7	3.1 B	23	
626.82				
	4			Very Stiff to Hard Gray Silty Clay Loam/Silty Loam Till with Layers of Silt, Sand, Gravel
	6 8	3.7 S	21	
-30	7			
	7 7	3.0 P	25	
	8			
	16 19	>4.5 P	11	
-35	8			
▽	10 12	>4.5 P	13	
616.82 ▼				
	30			Gray Weathered & Reworked Limestone Surface
	31 30		14	
614.32 -40				

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Illinois Department of Transportation
Division of Highways
IDOT

SOIL BORING LOG

Date 8/15/13

ROUTE I-57 (FAI 57) **DESCRIPTION** I-57 over IL 17 in Kankakee **LOGGED BY** Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR **LOCATION** NE 1/4, **SEC.** 4, **TWP.** 30N, **RNG.** 13W, 2nd **PM**,
Latitude 41.118288, **Longitude** -87.835178

COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0006/0007(Exist.)
Station 190+92.05 (Exist.)

BORING NO. BH 22 (S. Abut.)
Station 193+44.80
Offset 68.6 ft Lt.
Ground Surface Elev. 654.32 ft

Surface Water Elev. ____ ft
Stream Bed Elev. ____ ft

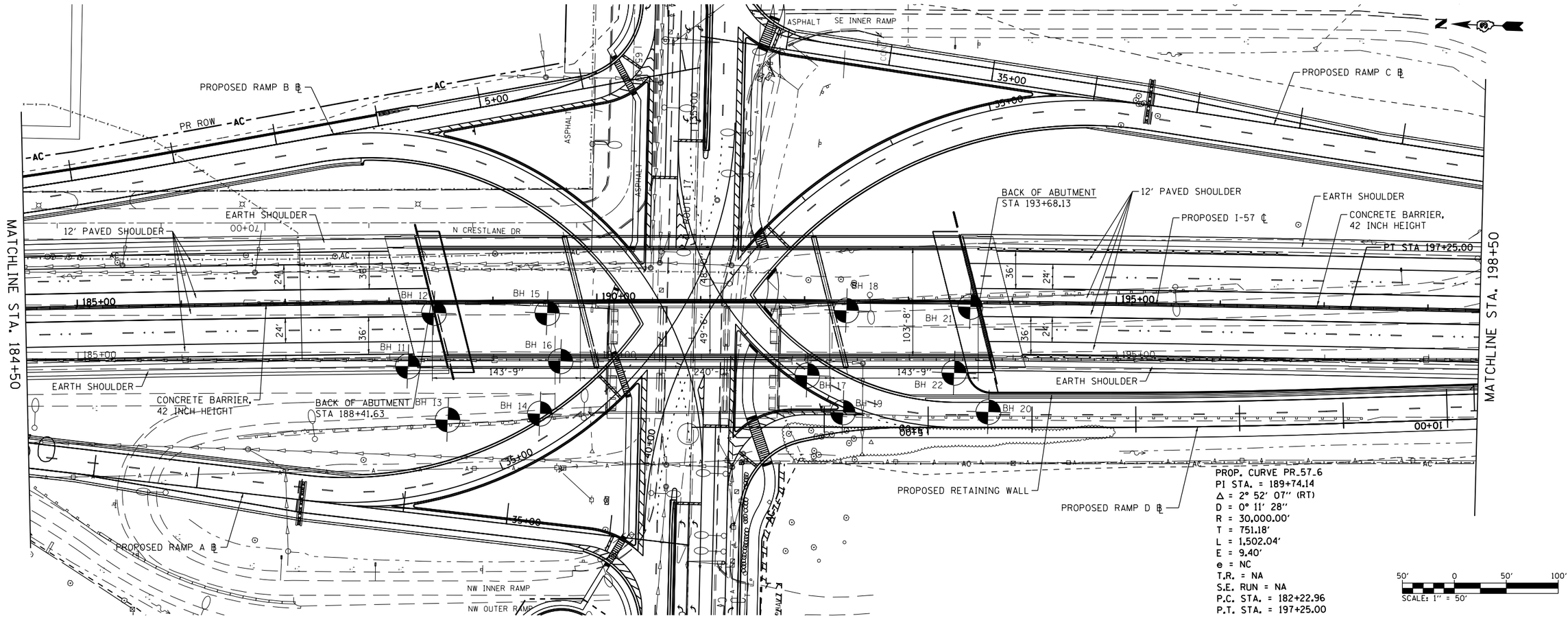
Groundwater Elev.:
First Encounter 616.8 ft ▼
Upon Completion 618.3 ft ▽
After ____ **Hrs.** ____ ft

Material	Elevation	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Auger Refusal @ 40'	614.07		100/3"		11
End of Boring					
		-45			
		-50			
		-55			
		-60			

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

EXHIBIT D

SOIL PLAN AND PROFILE



PLAN — SURVEYED | PLOTTED | DRAWN | ALIGNMENT CHECKED | RT. OF WAY CHECKED | CADD FILE NAME | NOTE BOOK | NO. | BY | DATE

PROFILE — SURVEYED | PLOTTED | DRAWN | CHECKED | BM. NOTED | STRUCTURE NOTATNS CHKD | NOTE BOOK | NO. | BY | DATE

FILE NAME = $FILE1$

PREPARED BY: Kaskaskia Engineering Group, LLC — 301 East Main Street, Suite 100, Salem, Illinois 62881 — 618.548.9717 ph — 618.548.9775 fax — www.kaskaskiaeng.com — PROFESSIONAL REGISTRATIONS — LICENSE NO. — Illinois Professional Design Firm — 184.006773 — Professional Engineering Survey — 35.3005366

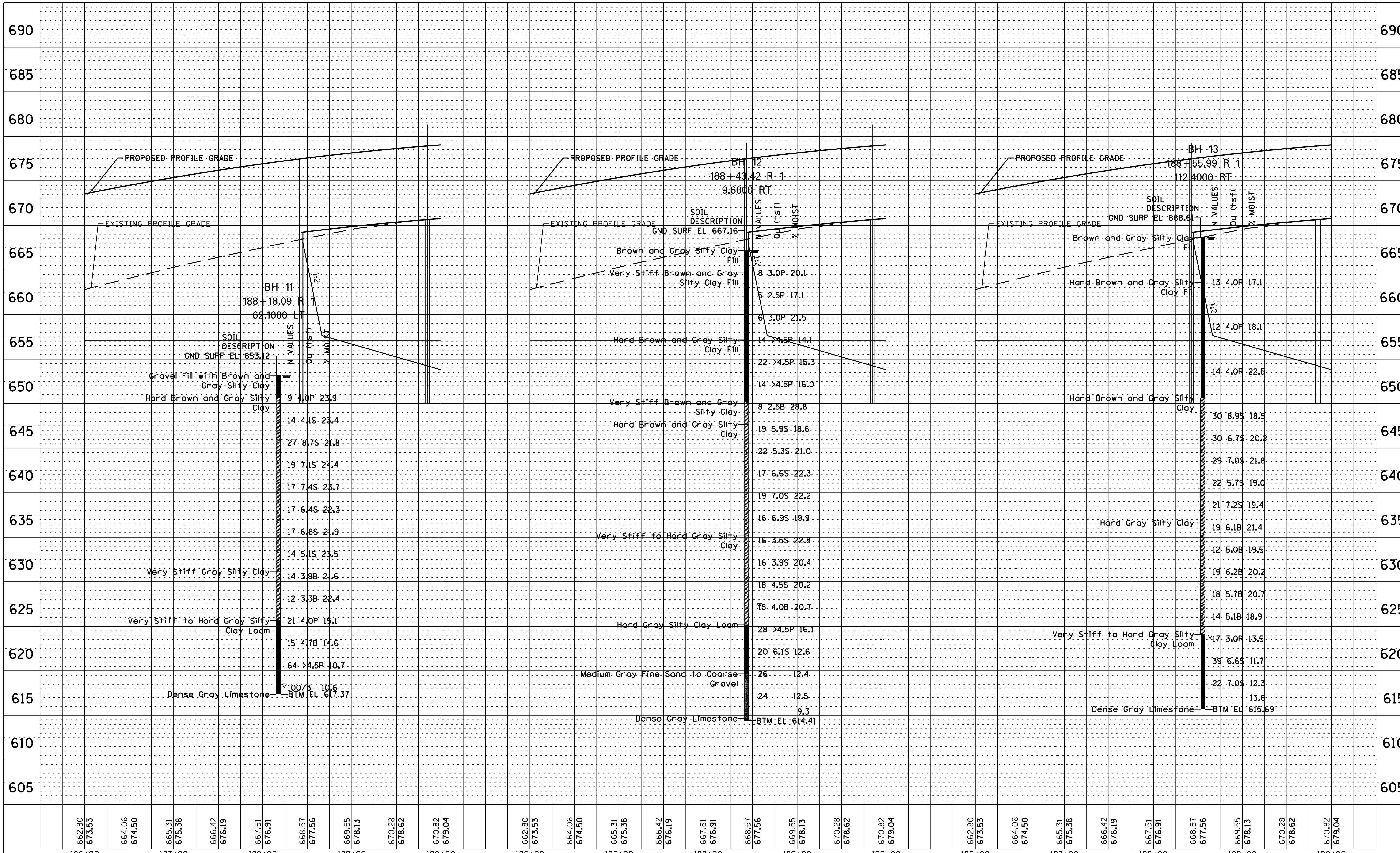
USER NAME = $USER$	DESIGNED -	REVISED -
MODEL NAME = $MODELNAME$	DRAWN -	REVISED -
PLOT SCALE = $SCALE$	CHECKED -	REVISED -
PLOT DATE = $DATE$	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERSTATE 57
PLAN AND PROFILE

SCALE:1"=50' | SHEET 1 OF SHEETS | STA 186+00 to STA 196+00

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)R, HBK, 5HBR, 6HBR	KANKAKEE	150	1
		CONTRACT NO. 66863		
	ILLINOIS FED. AID PROJECT			



PLAN — SURVEYED, PLOTTED, ALIGNMENT CHECKED, R.T. OF WAY CHECKED, CADD FILE NAME, NOTE BOOK NO. ____ — BY — DATE

PROFILE — SURVEYED, PLOTTED, GRADES CHECKED, B.M. NOTED, STRUCTURE NOTATIONS CHK'D, NOTE BOOK NO. ____ — BY — DATE

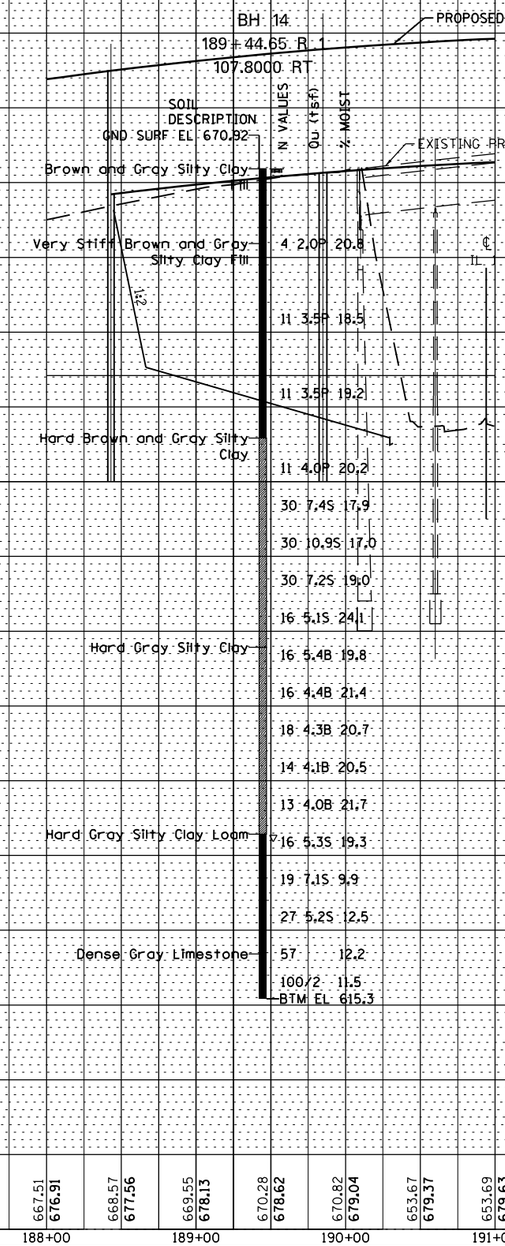
PRELIMINARY – NOT FOR CONSTRUCTION

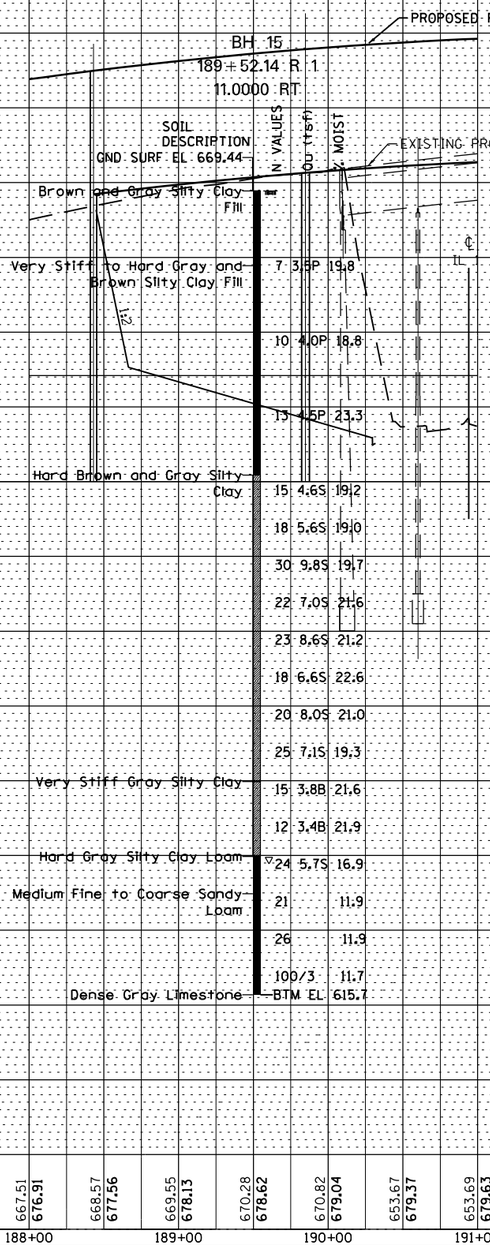
FILE NAME = $FILE$	USER NAME = $USER$	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	INTERSTATE 57 PLAN AND PROFILE	F.A.P. RTE. 57 — SECTION (46-3)R, HBK, 5HBR, 6HBR — COUNTY KANKAKEE — TOTAL SHEETS $TOTAL — SHEET NO.
		DRAWN -	REVISED -			CONTRACT NO. 66863
	PLOT SCALE = $SCALE$	CHECKED -	REVISED -			
	PLOT DATE = $DATE$	DATE -	REVISED -		SCALE: 1" = 50' SHEET OF SHEETS STA. TO STA.	ILLINOIS FED. AID PROJECT

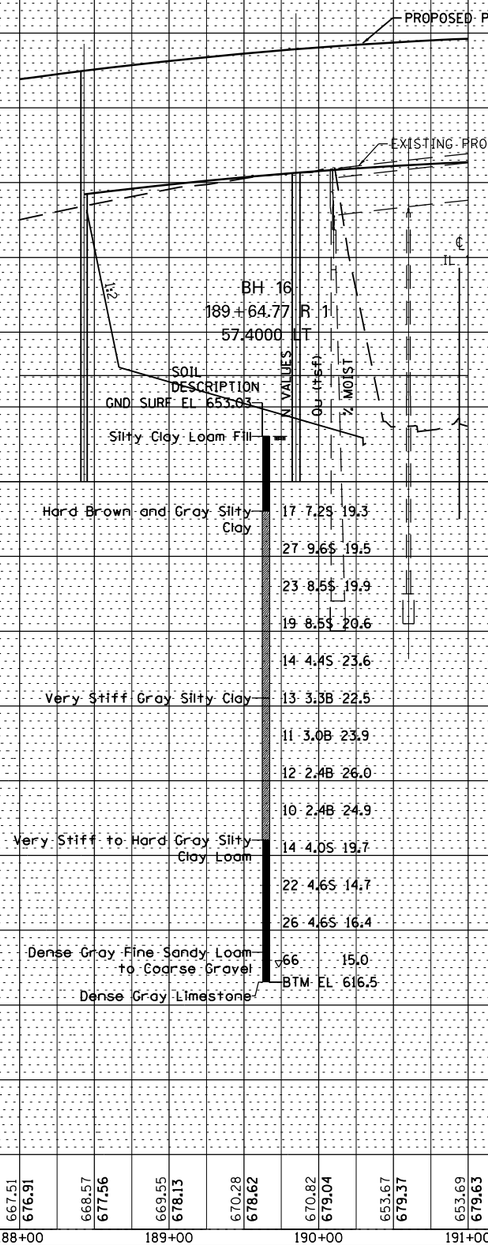
PLAN
SURVEYED
PLOTTED
CROSS SECTIONS CHECKED
R/T. OF WAY CHECKED
CADD FILE NAME
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
CROSS SECTIONS CHECKED
B.M. NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE

690 685 680 675 670 665 660 655 650 645 640 635 630 625 620 615 610 605







667.51 676.91 | 668.57 677.56 | 669.55 678.13 | 670.28 678.62 | 670.82 679.04 | 653.67 679.37 | 653.69 679.63

188+00 189+00 190+00 191+00

667.51 676.91 | 668.57 677.56 | 669.55 678.13 | 670.28 678.62 | 670.82 679.04 | 653.67 679.37 | 653.69 679.63

188+00 189+00 190+00 191+00

667.51 676.91 | 668.57 677.56 | 669.55 678.13 | 670.28 678.62 | 670.82 679.04 | 653.67 679.37 | 653.69 679.63

188+00 189+00 190+00 191+00

PRELIMINARY – NOT FOR CONSTRUCTION

FILE NAME = $FILES$	USER NAME = $USER$	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = $SCALE$	CHECKED -	REVISED -
	PLOT DATE = $DATE$	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

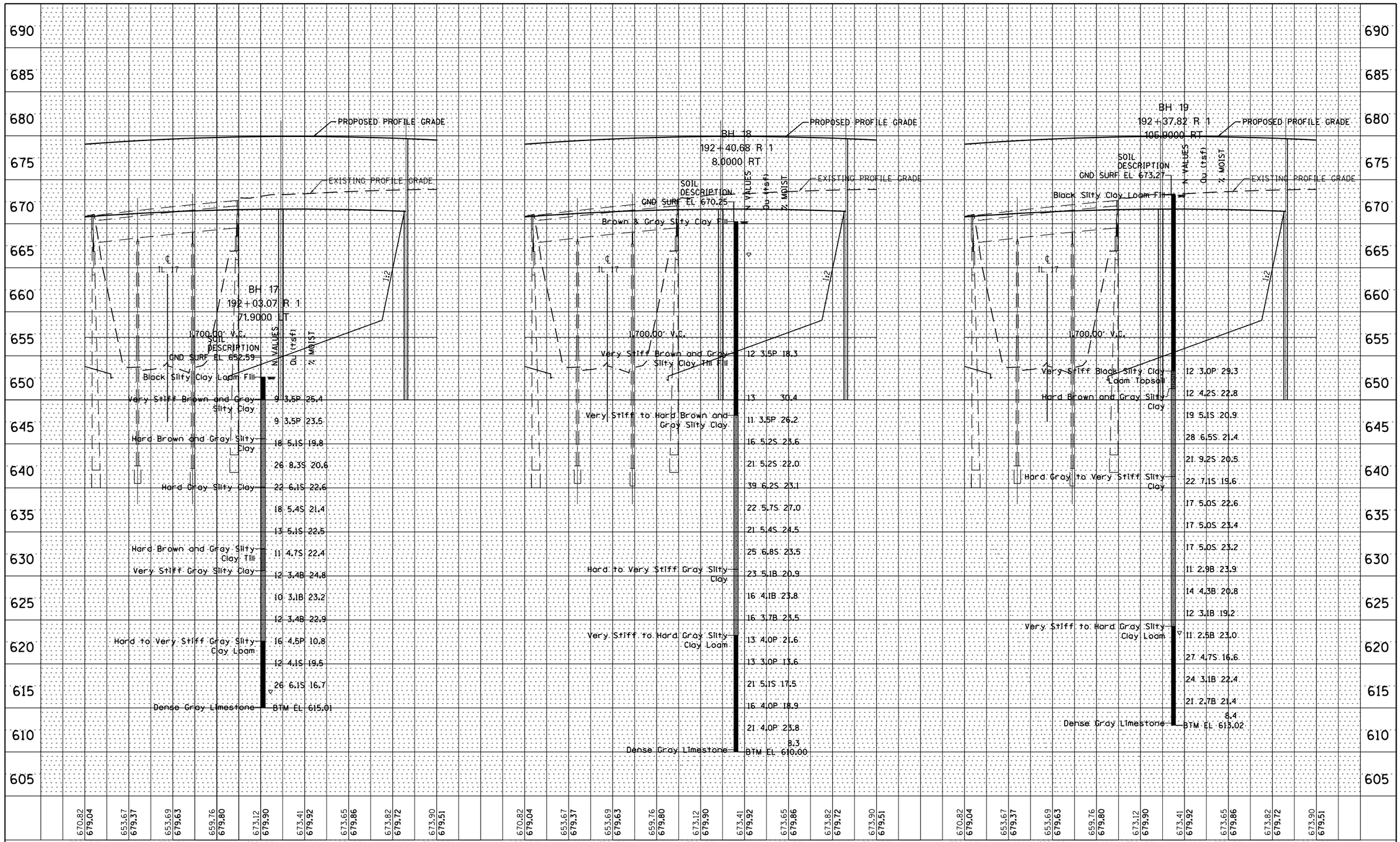
INTERSTATE 57
PLAN AND PROFILE

SCALE: 1" = 50' | SHEET OF SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)R, HBK, 5HBR, 6HBR	KANKAKEE	$TOTAL	
		CONTRACT NO. 66863		
	ILLINOIS	FED. AID PROJECT		

PLAN
NOTE BOOK
NO.
SURVEYED
PLOTTED
HORIZONTAL CHECKED
RT. OF WAY CHECKED
CADD FILE NAME
BY
DATE

PROFILE
NOTE BOOK
NO.
SURVEYED
PLOTTED
VERT. CHECKED
B.M. NOTED
STRUCTURE NO
STATIONS CHKD
BY
DATE



PRELIMINARY – NOT FOR CONSTRUCTION

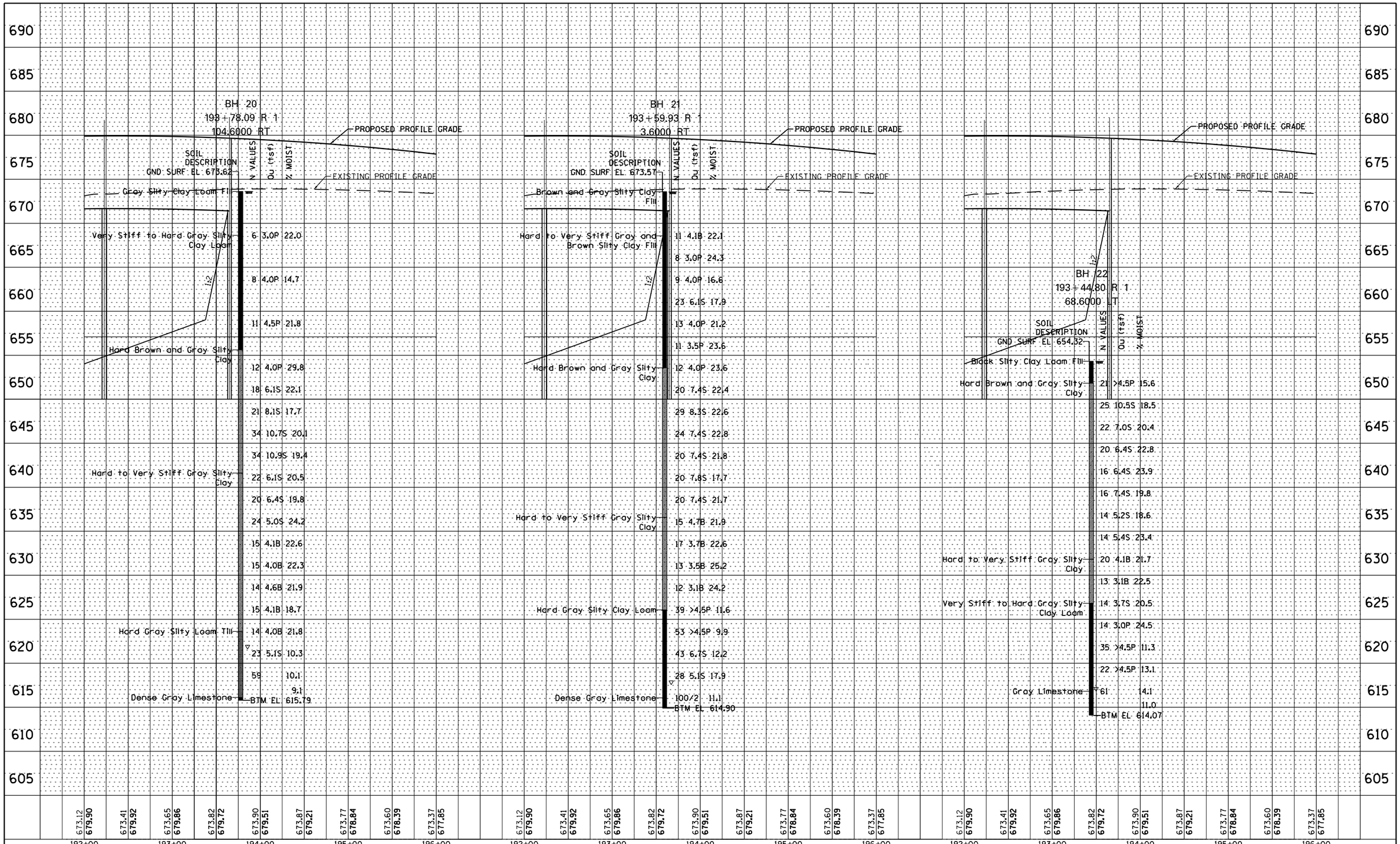
FILE NAME = $FILES$	USER NAME = $USER$	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = $SCALE$	CHECKED -	REVISED -
	PLOT DATE = $DATE$	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERSTATE 57
PLAN AND PROFILE

SCALE: 1" = 50' | SHEET OF SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)R, HBK, 5HBR, 6HBR	KANKAKEE	$TOTAL	
		CONTRACT NO. 66863		
	ILLINOIS	FED. AID PROJECT		



PLAN
SURVEYED
PLOTTED
GRADES CHECKED
ALIGNMENT CHECKED
NOTE BOOK
NO.
BY
DATE
CADD FILE NAME

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
ALIGNMENT CHECKED
NOTE BOOK
NO.
BY
DATE
STRUCTURE NO
TAINS CHKD

PRELIMINARY – NOT FOR CONSTRUCTION

FILE NAME = $FILES$	USER NAME = $USER$	DESIGNED -	REVISED -
		DRAWN -	REVISED -
	PLOT SCALE = $SCALE$	CHECKED -	REVISED -
	PLOT DATE = $DATE$	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERSTATE 57
PLAN AND PROFILE

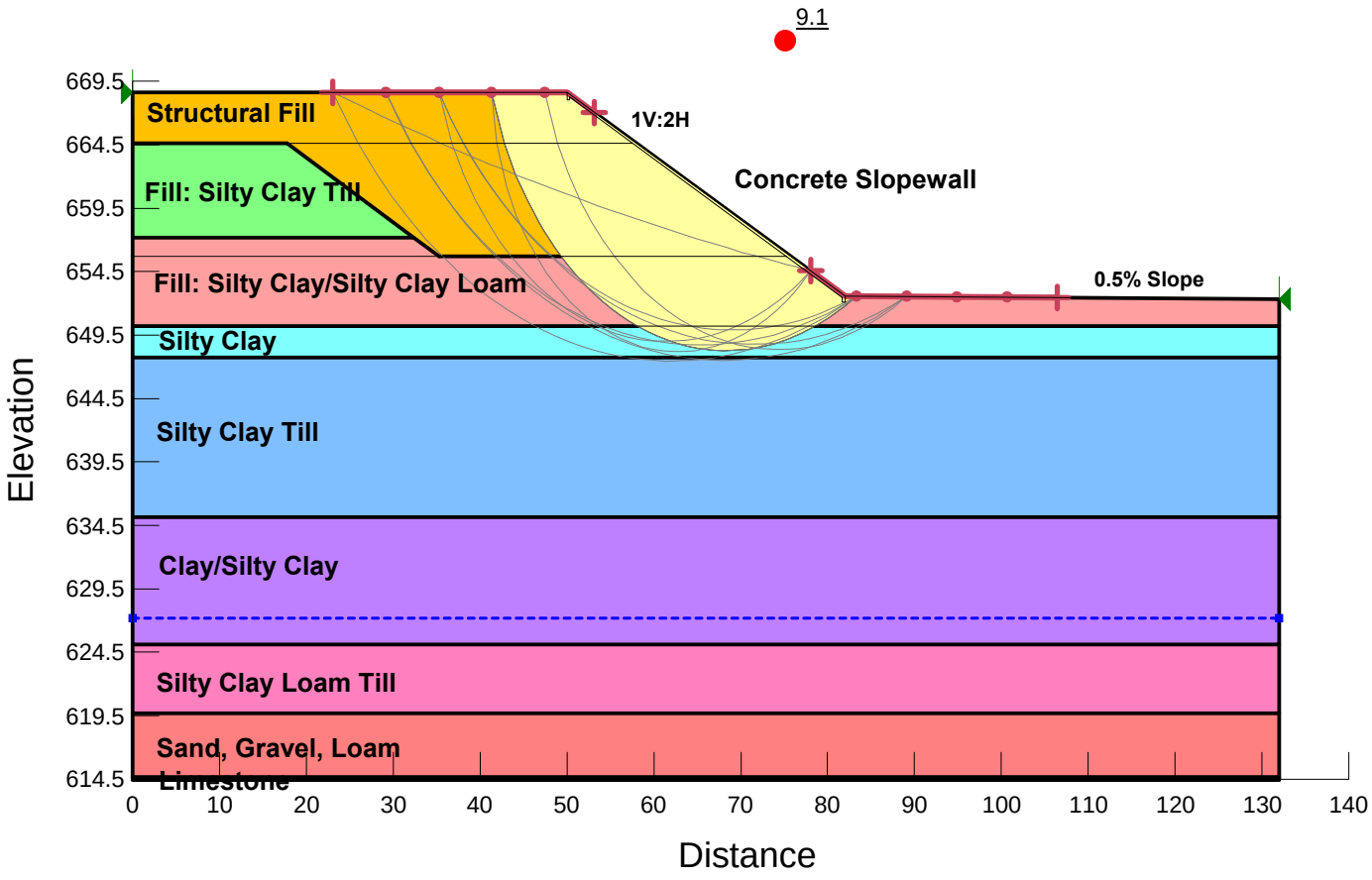
SCALE: 1" = 50' | SHEET OF SHEETS | STA. | TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)R, HBK, 5HBR, 6HBR	KANKAKEE	$TOTAL	
		CONTRACT NO. 66863		
	ILLINOIS FED. AID PROJECT			

EXHIBIT E

SLOPE/W SLOPE STABILITY ANALYSIS

I-57 over IL 17, Kankakee, IL
North Abutment End Slope
EOC Analysis



Name: Concrete
Unit Weight: 145 pcf
Cohesion': 5,000 psf
Phi': 45 °

Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 1,000 psf
Phi': 0 °

Name: Fill: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 2,833 psf
Phi': 0 °

Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 4,500 psf
Phi': 0 °

Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 2,500 psf
Phi': 0 °

Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 6,340 psf
Phi': 0 °

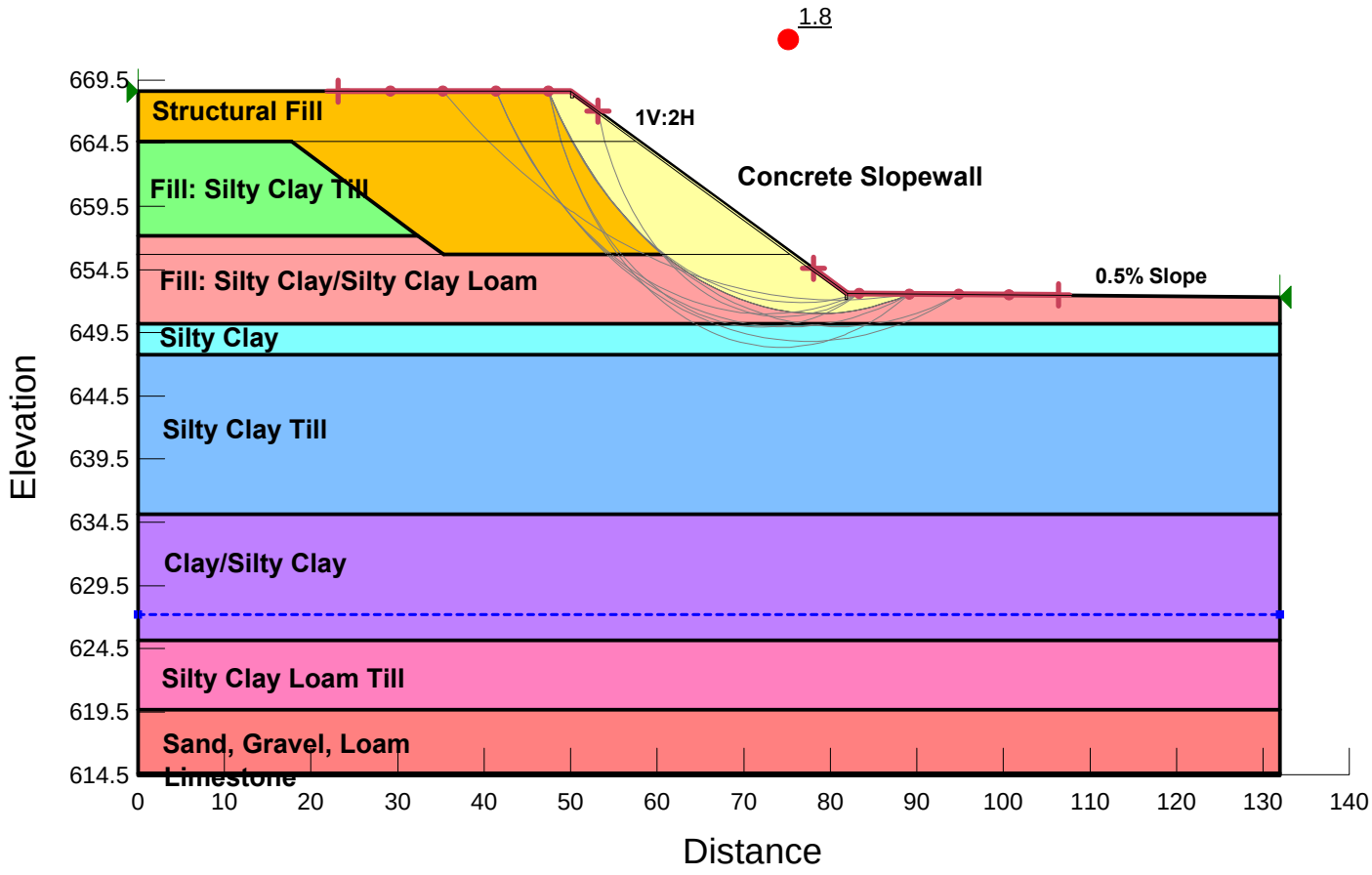
Name: Clay/Silty Clay
Unit Weight: 120 pcf
Cohesion': 3,975 psf
Phi': 0 °

Name: Silty Clay Loam Till
Unit Weight: 120 pcf
Cohesion': 5,300 psf
Phi': 0 °

Name: Sand, Gravel, Loam
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °

Name: Limestone

I-57 over IL 17, Kankakee, IL
North Abutment End Slope
LT Analysis



Name: Concrete
Unit Weight: 145 pcf
Cohesion': 5,000 psf
Phi': 45 °

Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Fill: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

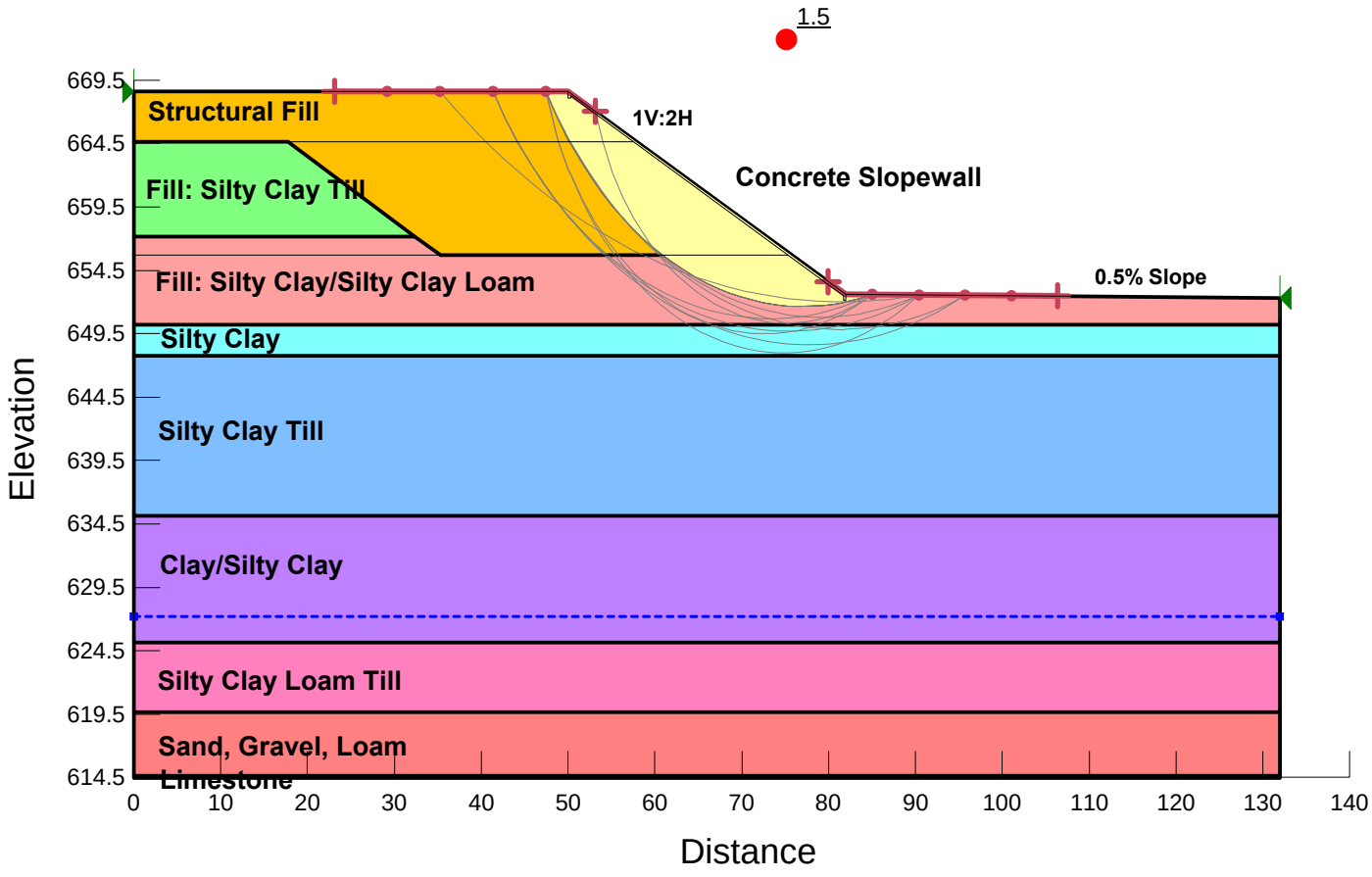
Name: Clay/Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Sand, Gravel, Loam
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °

Name: Limestone, Impenetrable Bedrock

I-57 over IL 17, Kankakee, IL
North Abutment End Slope
Seismic Analysis
PGA: 0.046 g



Name: Concrete
Unit Weight: 145 pcf
Cohesion': 5,000 psf
Phi': 45 °

Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Fill: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

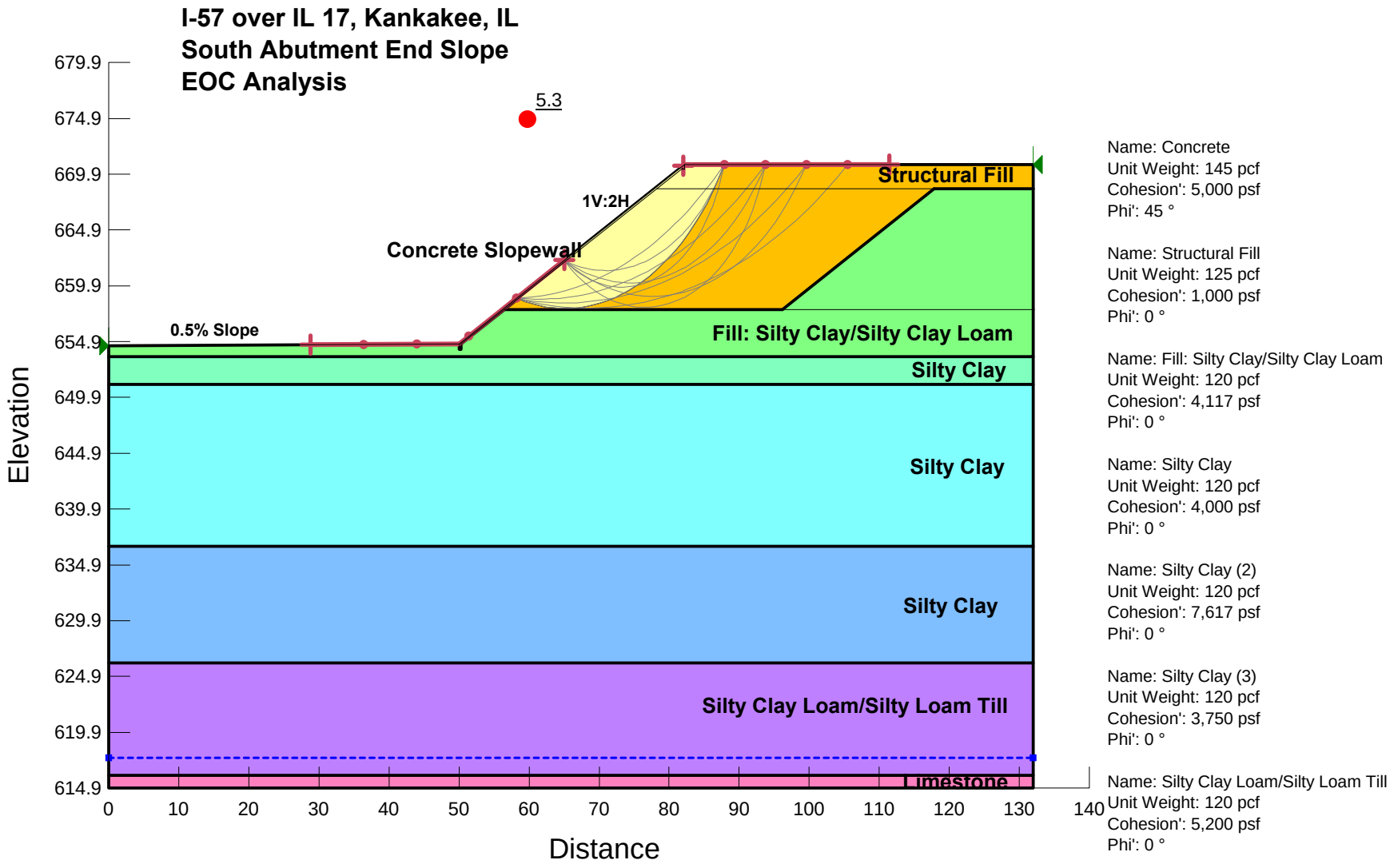
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Clay/Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Sand, Gravel, Loam
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °

Name: Limestone, Impenetrable Bedrock



Name: Concrete
Unit Weight: 145 pcf
Cohesion': 5,000 psf
Phi': 45 °

Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 1,000 psf
Phi': 0 °

Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 4,117 psf
Phi': 0 °

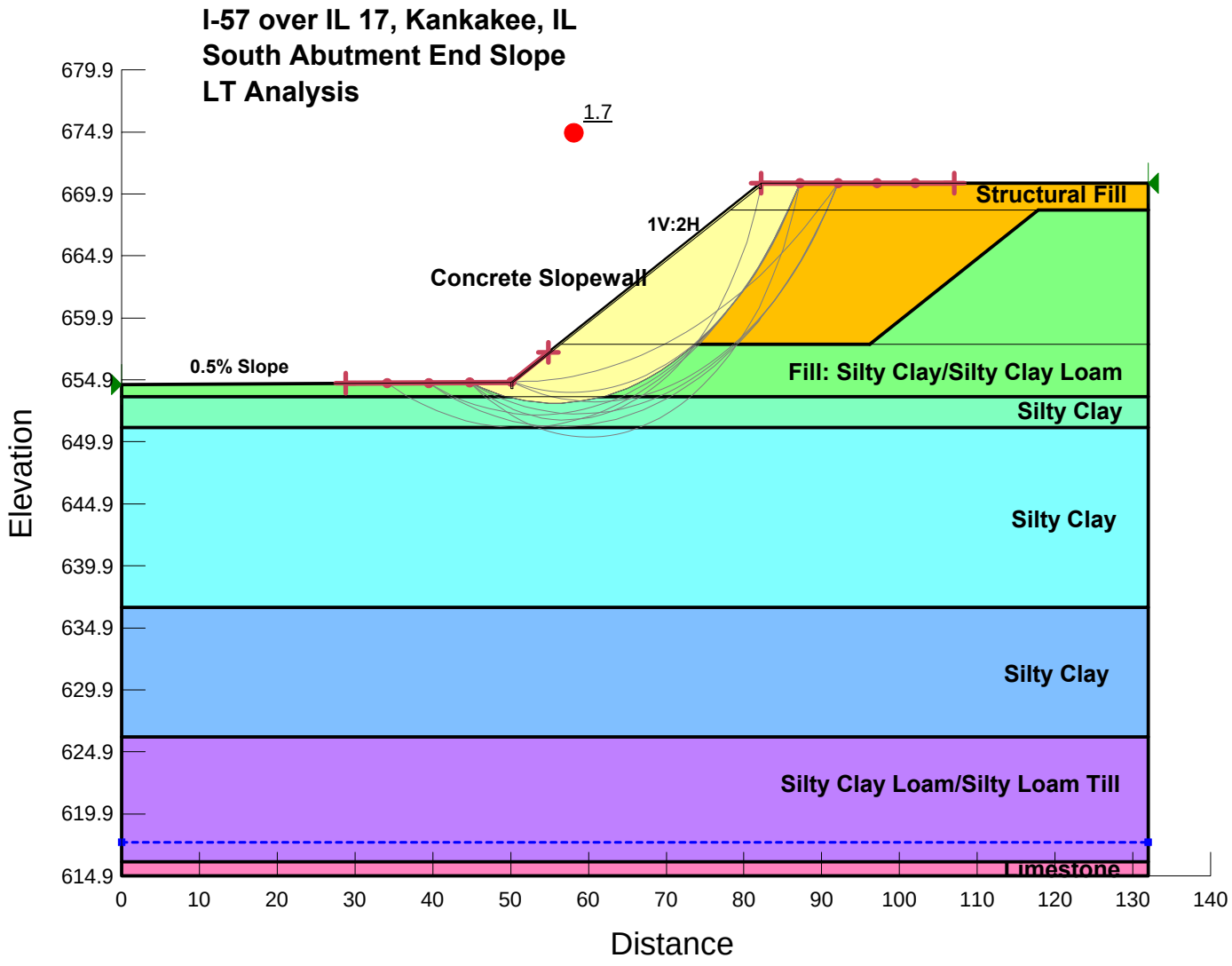
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 4,000 psf
Phi': 0 °

Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 7,617 psf
Phi': 0 °

Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 3,750 psf
Phi': 0 °

Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 5,200 psf
Phi': 0 °

Name: Limestone



Name: Concrete
Unit Weight: 145 pcf
Cohesion': 5,000 psf
Phi': 45 °

Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

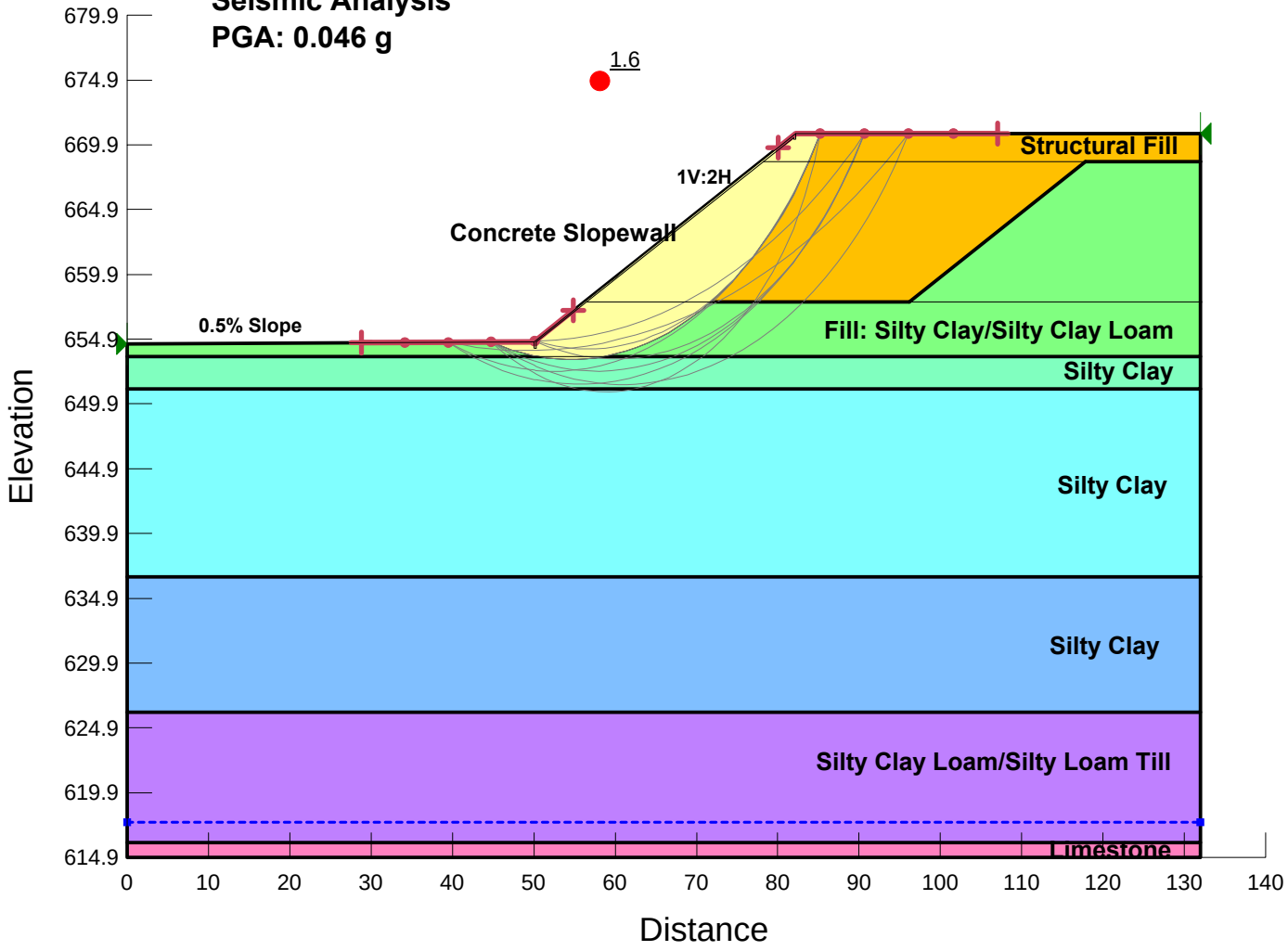
Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Limestone, Impenetrable Bedrock

I-57 over IL 17, Kankakee, IL
South Abutment End Slope
Seismic Analysis
PGA: 0.046 g



Name: Concrete
Unit Weight: 145 pcf
Cohesion': 5,000 psf
Phi': 45 °

Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

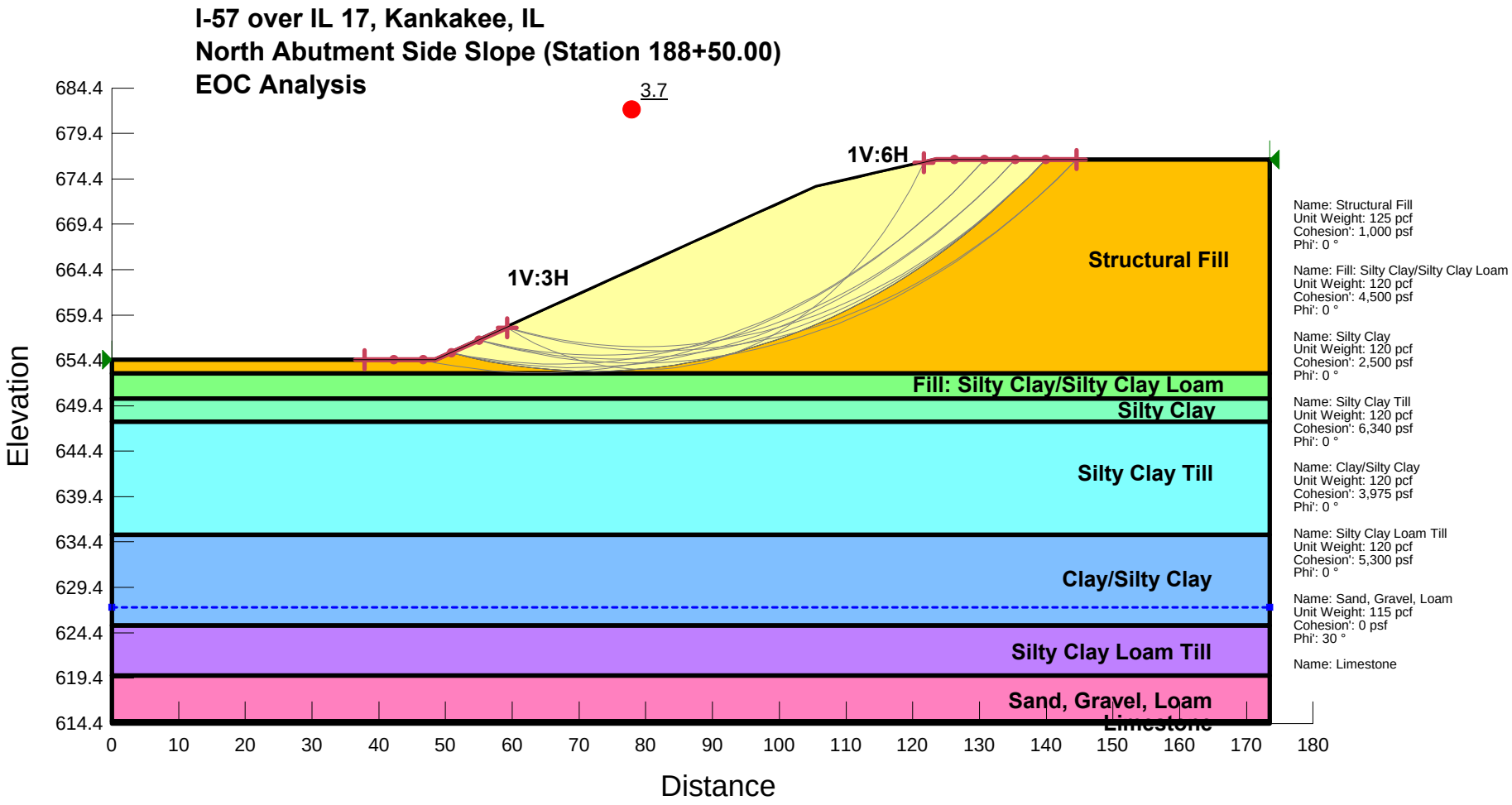
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

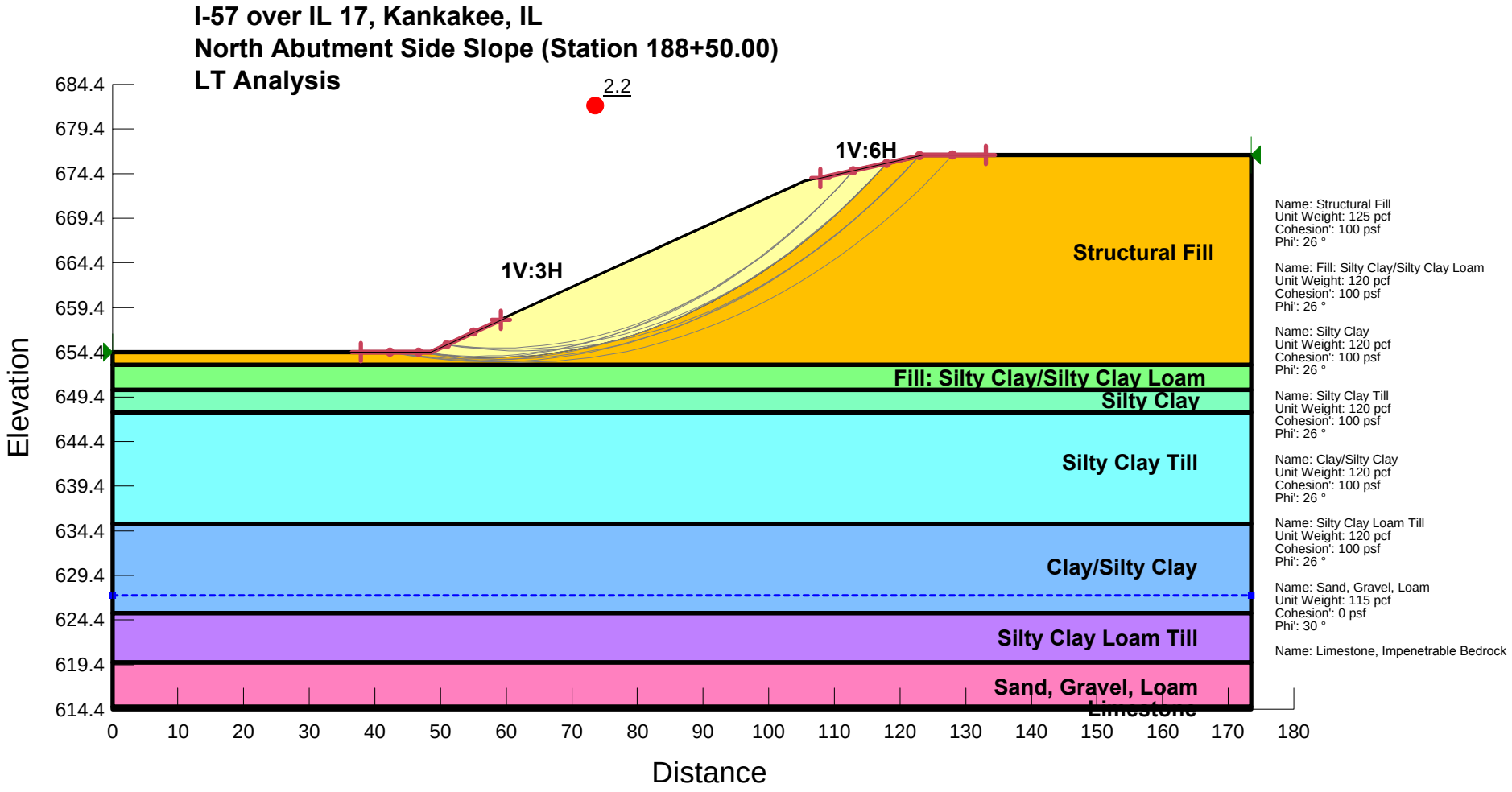
Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

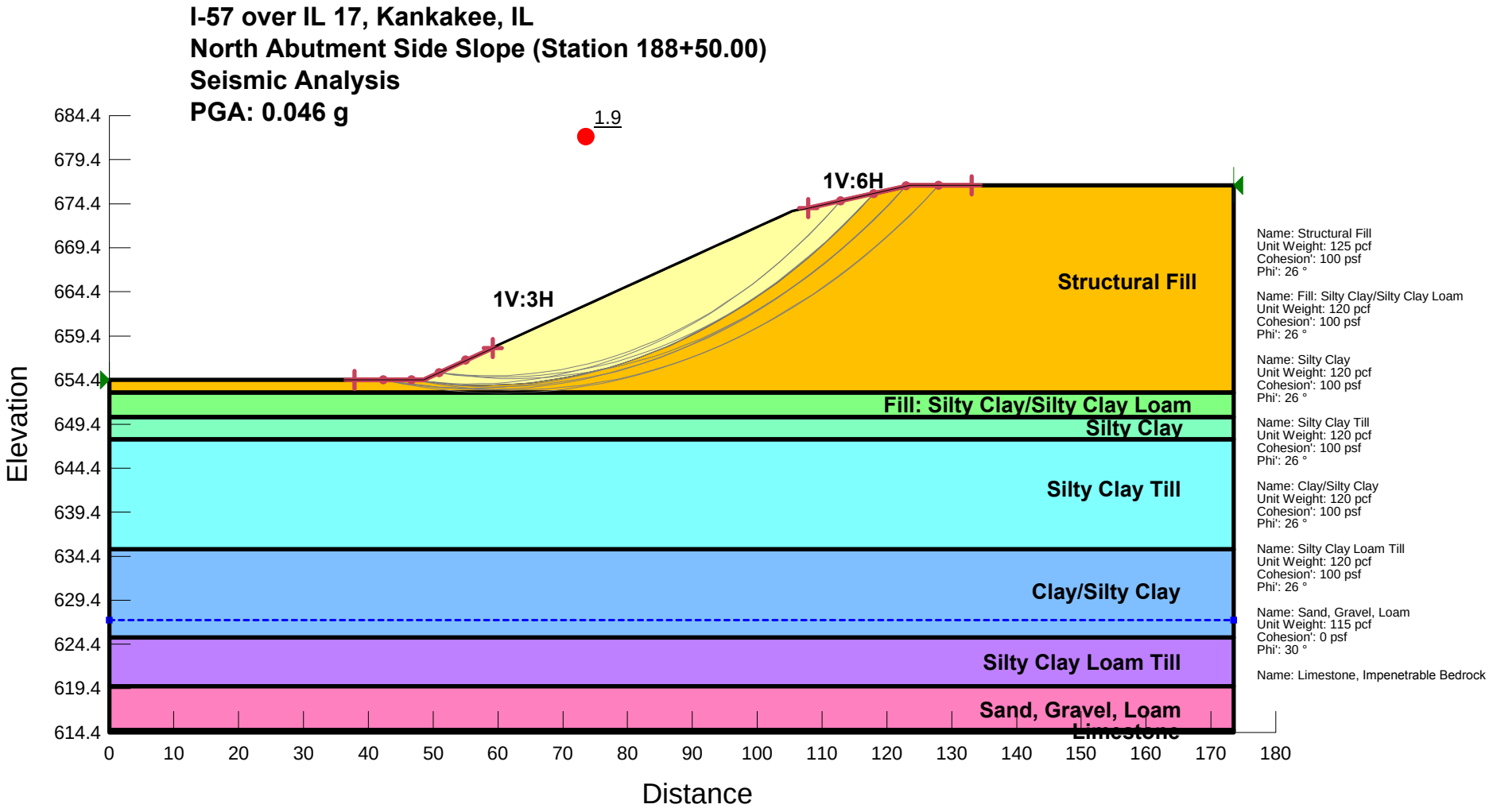
Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

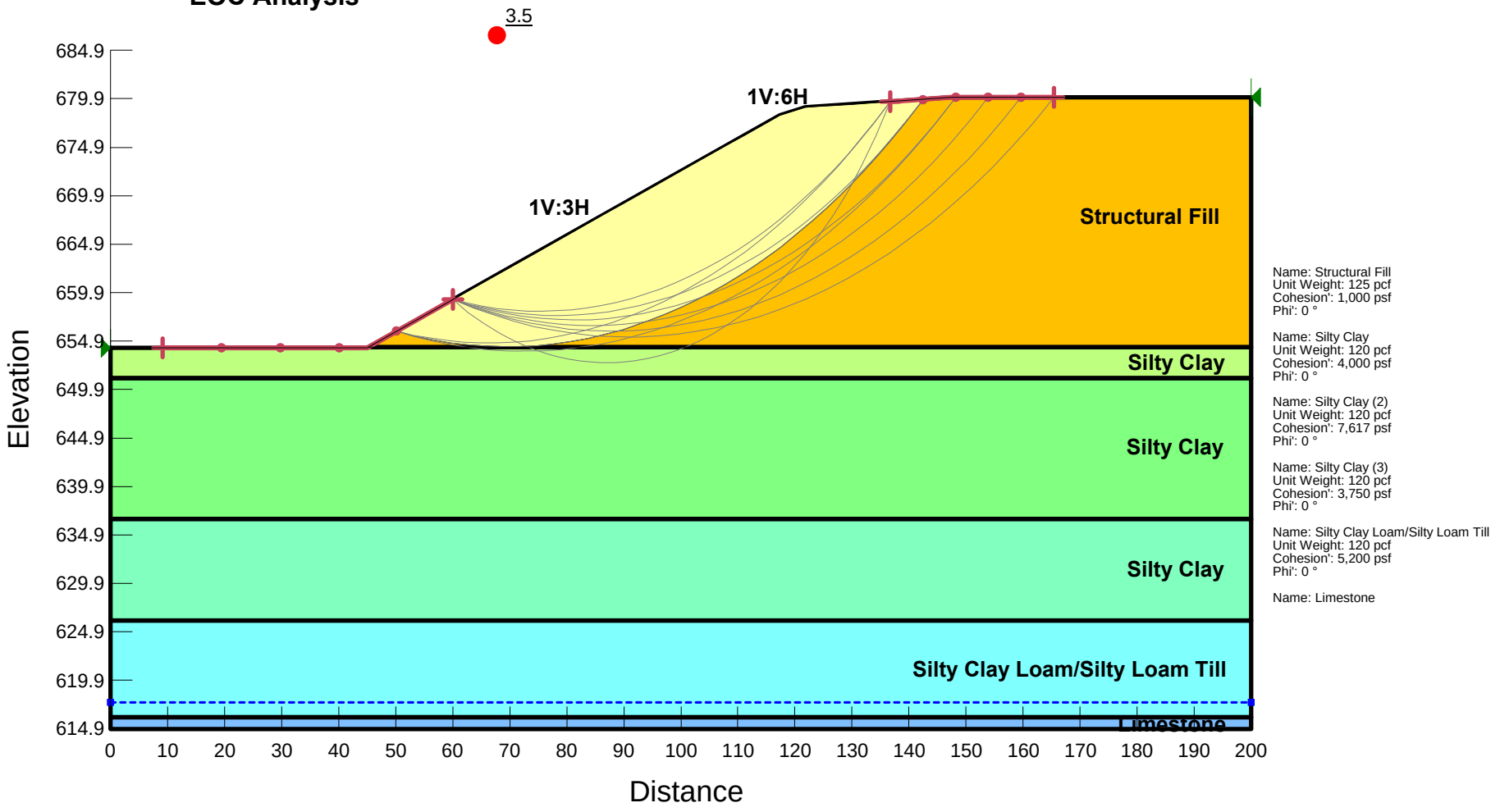
Name: Limestone, Impenetrable Bedrock


I-57 over IL 17, Kankakee, IL
North Abutment Side Slope (Station 188+50.00)
EOC Analysis
3.7
1V:6H
1V:3H
Structural Fill
Fill: Silty Clay/Silty Clay Loam
Silty Clay
Silty Clay Till
Clay/Silty Clay
Silty Clay Loam Till
Sand, Gravel, Loam
Limestone
Elevation
684.4
679.4
674.4
669.4
664.4
659.4
654.4
649.4
644.4
639.4
634.4
629.4
624.4
619.4
614.4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
Distance
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 1,000 psf
Phi': 0 °
Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 4,500 psf
Phi': 0 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 2,500 psf
Phi': 0 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 6,340 psf
Phi': 0 °
Name: Clay/Silty Clay
Unit Weight: 120 pcf
Cohesion': 3,975 psf
Phi': 0 °
Name: Silty Clay Loam Till
Unit Weight: 120 pcf
Cohesion': 5,300 psf
Phi': 0 °
Name: Sand, Gravel, Loam
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °
Name: Limestone


I-57 over IL 17, Kankakee, IL
North Abutment Side Slope (Station 188+50.00)
LT Analysis
2.2
1V:6H
1V:3H
Structural Fill
Fill: Silty Clay/Silty Clay Loam
Silty Clay
Silty Clay Till
Clay/Silty Clay
Silty Clay Loam Till
Sand, Gravel, Loam
Limestone
Elevation
Distance
684.4
679.4
674.4
669.4
664.4
659.4
654.4
649.4
644.4
639.4
634.4
629.4
624.4
619.4
614.4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Clay/Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Sand, Gravel, Loam
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °
Name: Limestone, Impenetrable Bedrock


I-57 over IL 17, Kankakee, IL
North Abutment Side Slope (Station 188+50.00)
Seismic Analysis
PGA: 0.046 g
1.9
1V:6H
1V:3H
Structural Fill
Fill: Silty Clay/Silty Clay Loam
Silty Clay
Silty Clay Till
Clay/Silty Clay
Silty Clay Loam Till
Sand, Gravel, Loam
Limestone
Elevation
684.4
679.4
674.4
669.4
664.4
659.4
654.4
649.4
644.4
639.4
634.4
629.4
624.4
619.4
614.4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
Distance
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Clay/Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Sand, Gravel, Loam
Unit Weight: 115 pcf
Cohesion': 0 psf
Phi': 30 °
Name: Limestone, Impenetrable Bedrock

I-57 over IL 17, Kankakee, IL
South Abutment Side Slope (Station 193+50)
EOC Analysis



Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 1,000 psf
Phi': 0 °

Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 4,000 psf
Phi': 0 °

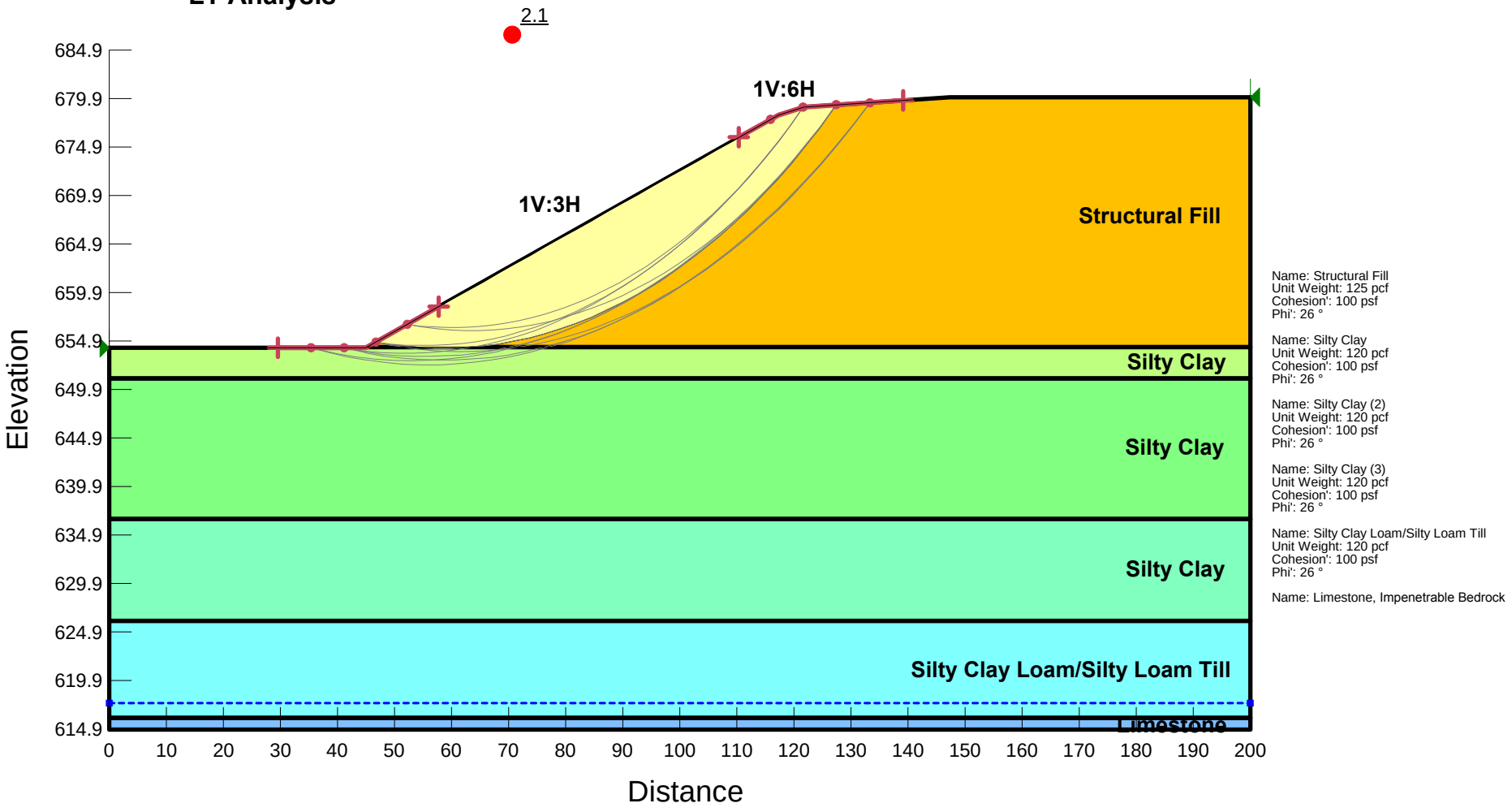
Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 7,617 psf
Phi': 0 °

Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 3,750 psf
Phi': 0 °

Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 5,200 psf
Phi': 0 °

Name: Limestone

I-57 over IL 17, Kankakee, IL
South Abutment Side Slope (Station 193+50)
LT Analysis



Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

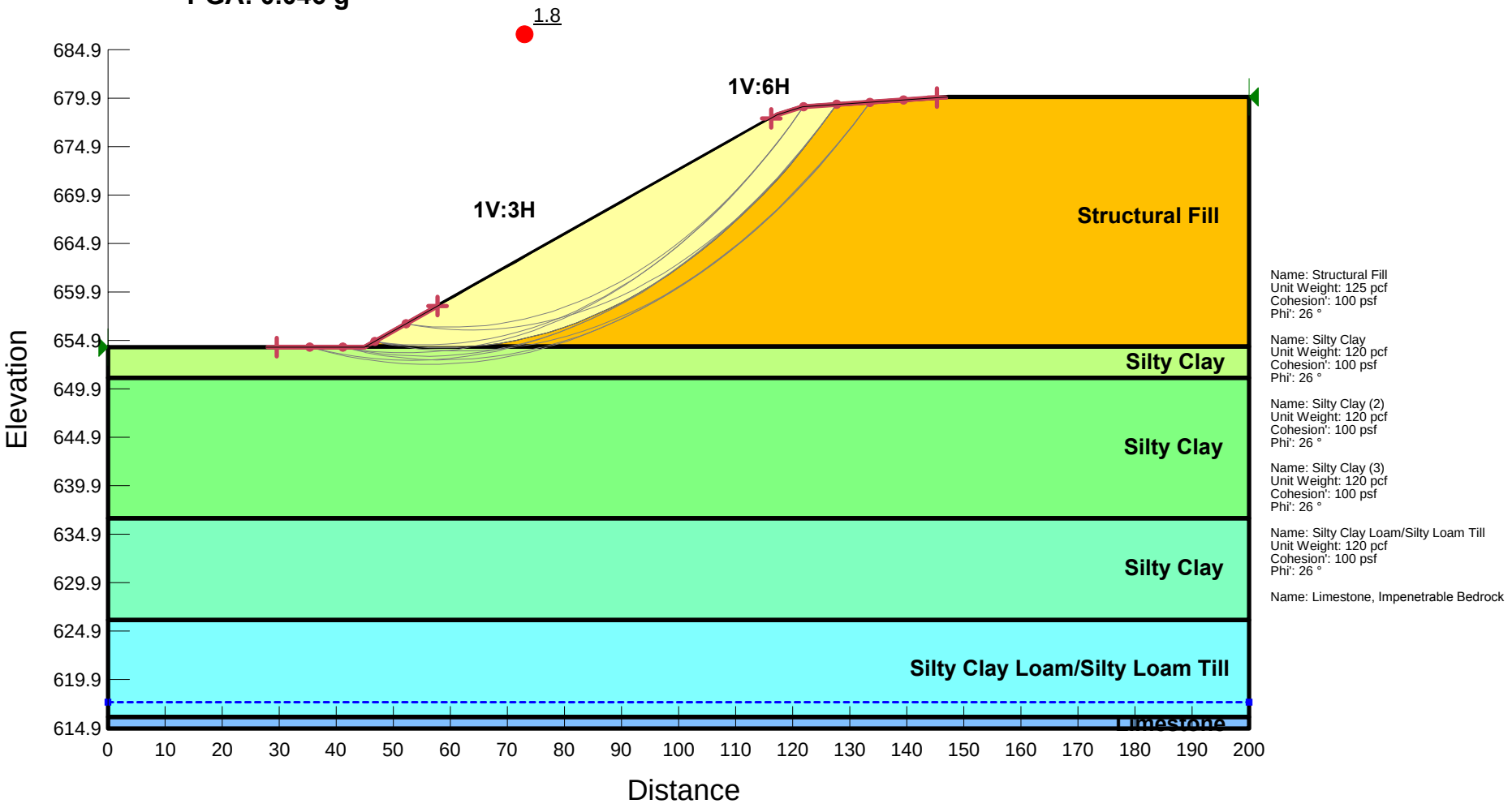
Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Limestone, Impenetrable Bedrock

I-57 over IL 17, Kankakee, IL
South Abutment Side Slope (Station 193+50)
Seismic Analysis
PGA: 0.046 g



Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °

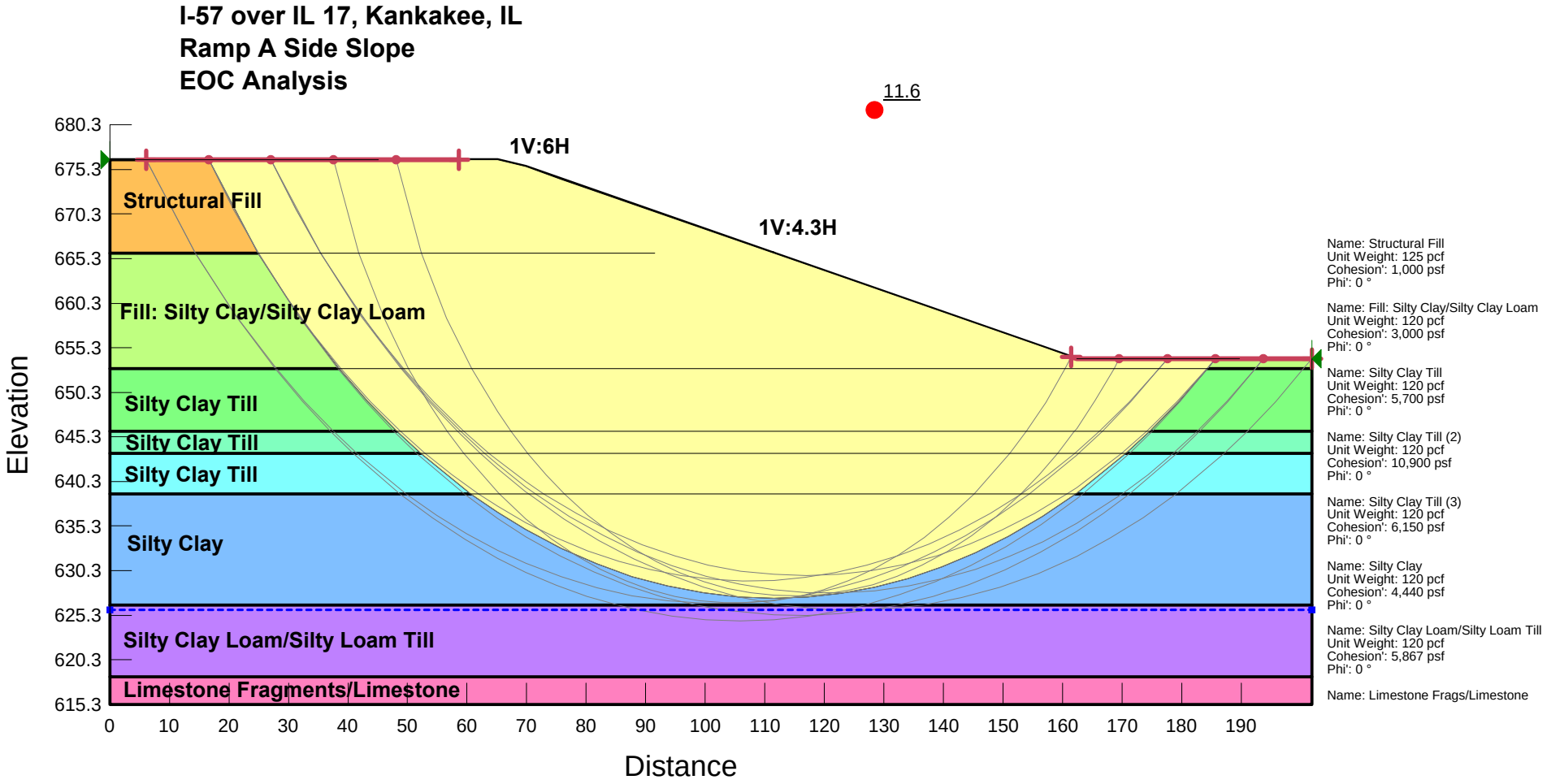
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

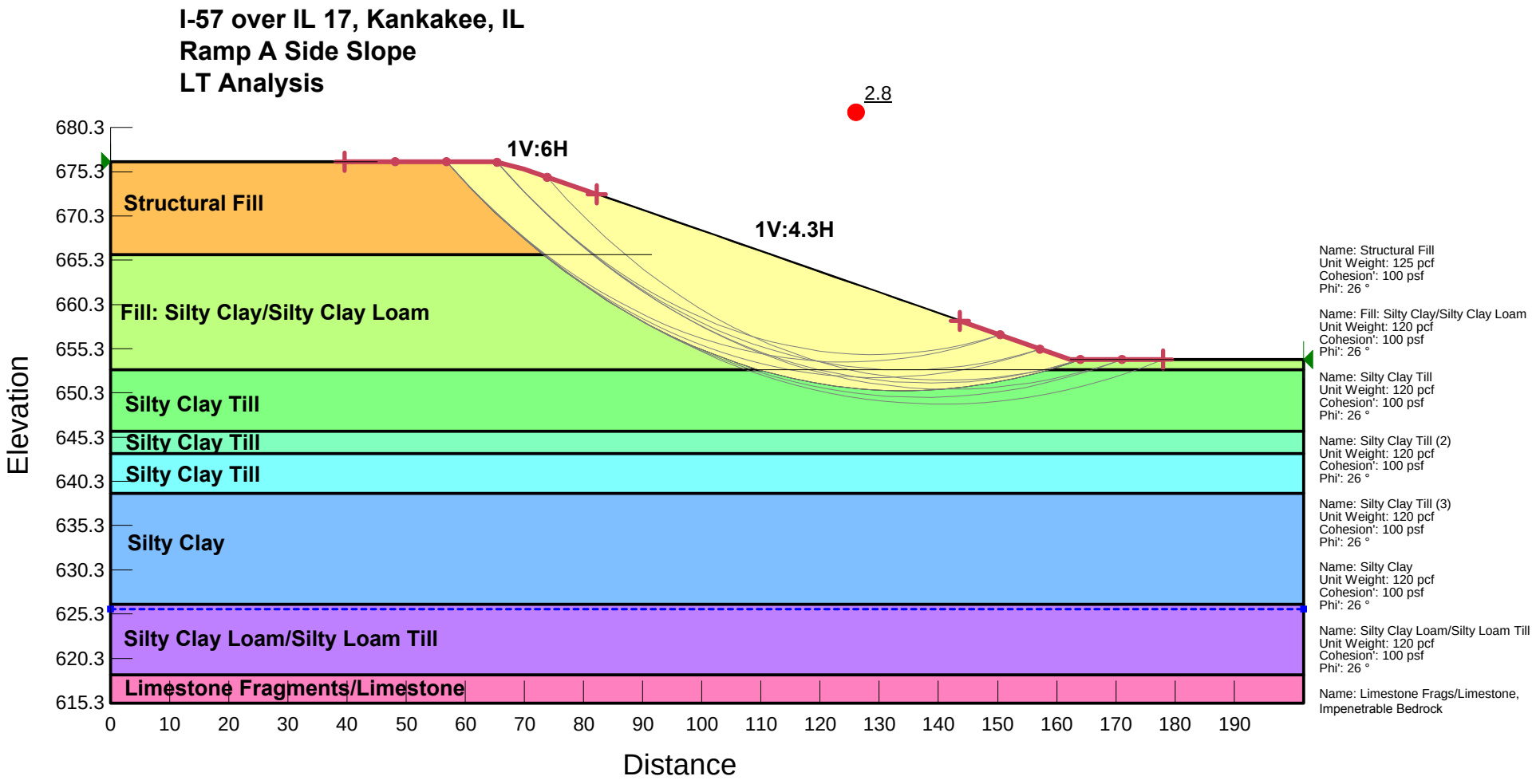
Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

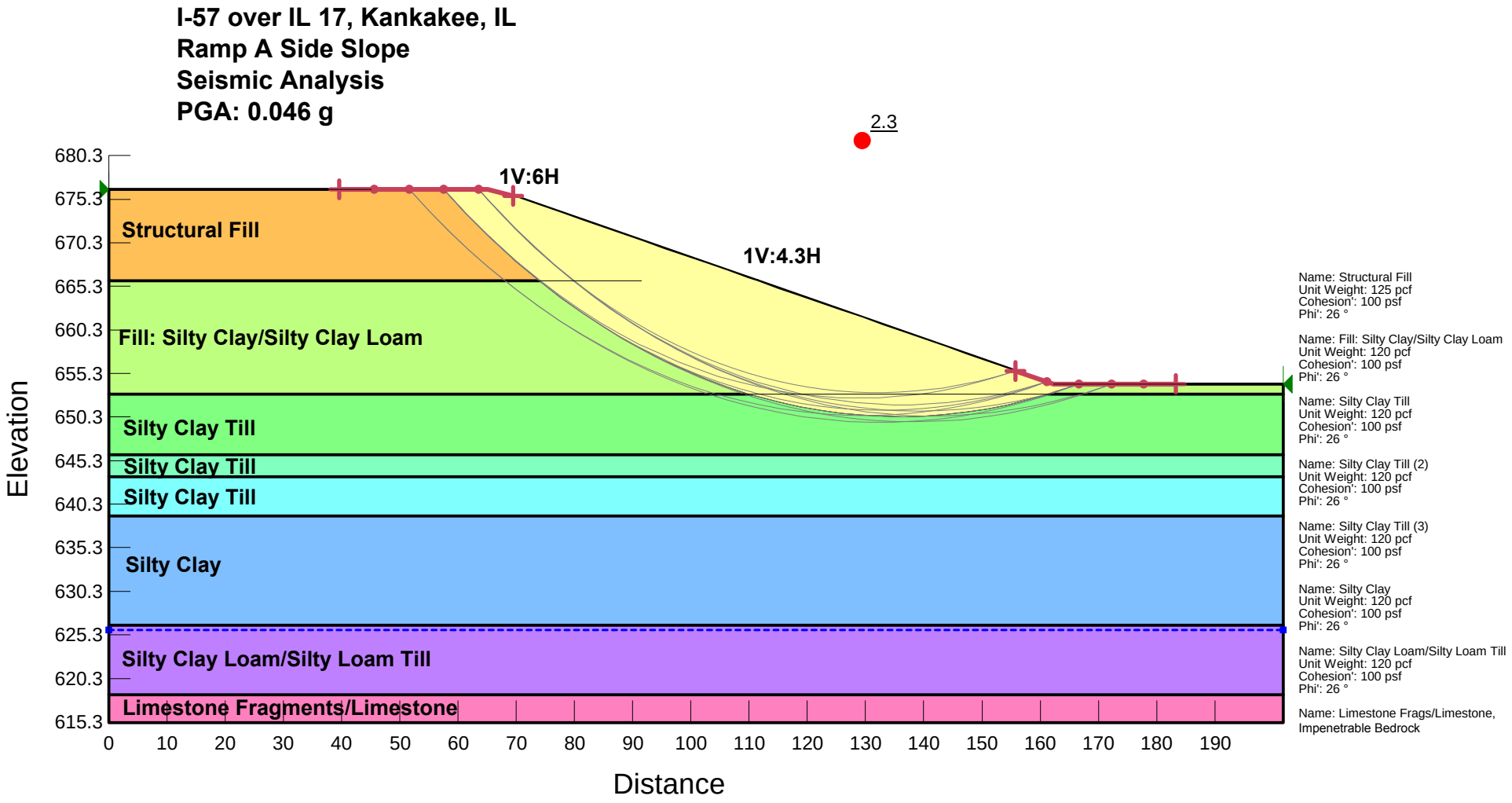
Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

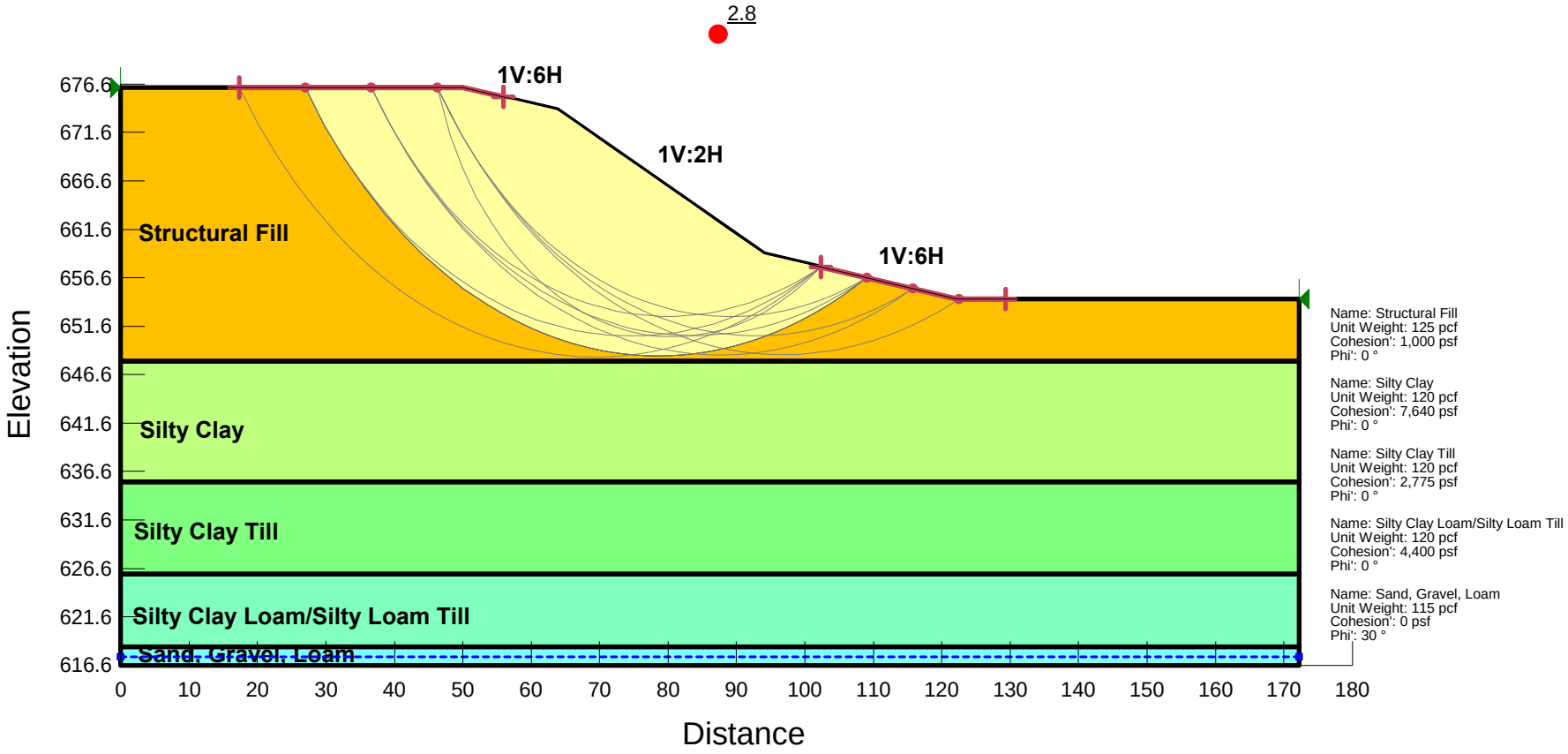
Name: Limestone, Impenetrable Bedrock


I-57 over IL 17, Kankakee, IL
Ramp A Side Slope
EOC Analysis
11.6
1V:6H
1V:4.3H
Structural Fill
Fill: Silty Clay/Silty Clay Loam
Silty Clay Till
Silty Clay Till
Silty Clay Till
Silty Clay
Silty Clay Loam/Silty Loam Till
Limestone Fragments/Limestone
Elevation
Distance
680.3
675.3
670.3
665.3
660.3
655.3
650.3
645.3
640.3
635.3
630.3
625.3
620.3
615.3
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 1,000 psf
Phi': 0 °
Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 3,000 psf
Phi': 0 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 5,700 psf
Phi': 0 °
Name: Silty Clay Till (2)
Unit Weight: 120 pcf
Cohesion': 10,900 psf
Phi': 0 °
Name: Silty Clay Till (3)
Unit Weight: 120 pcf
Cohesion': 6,150 psf
Phi': 0 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 4,440 psf
Phi': 0 °
Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 5,867 psf
Phi': 0 °
Name: Limestone Frags/Limestone

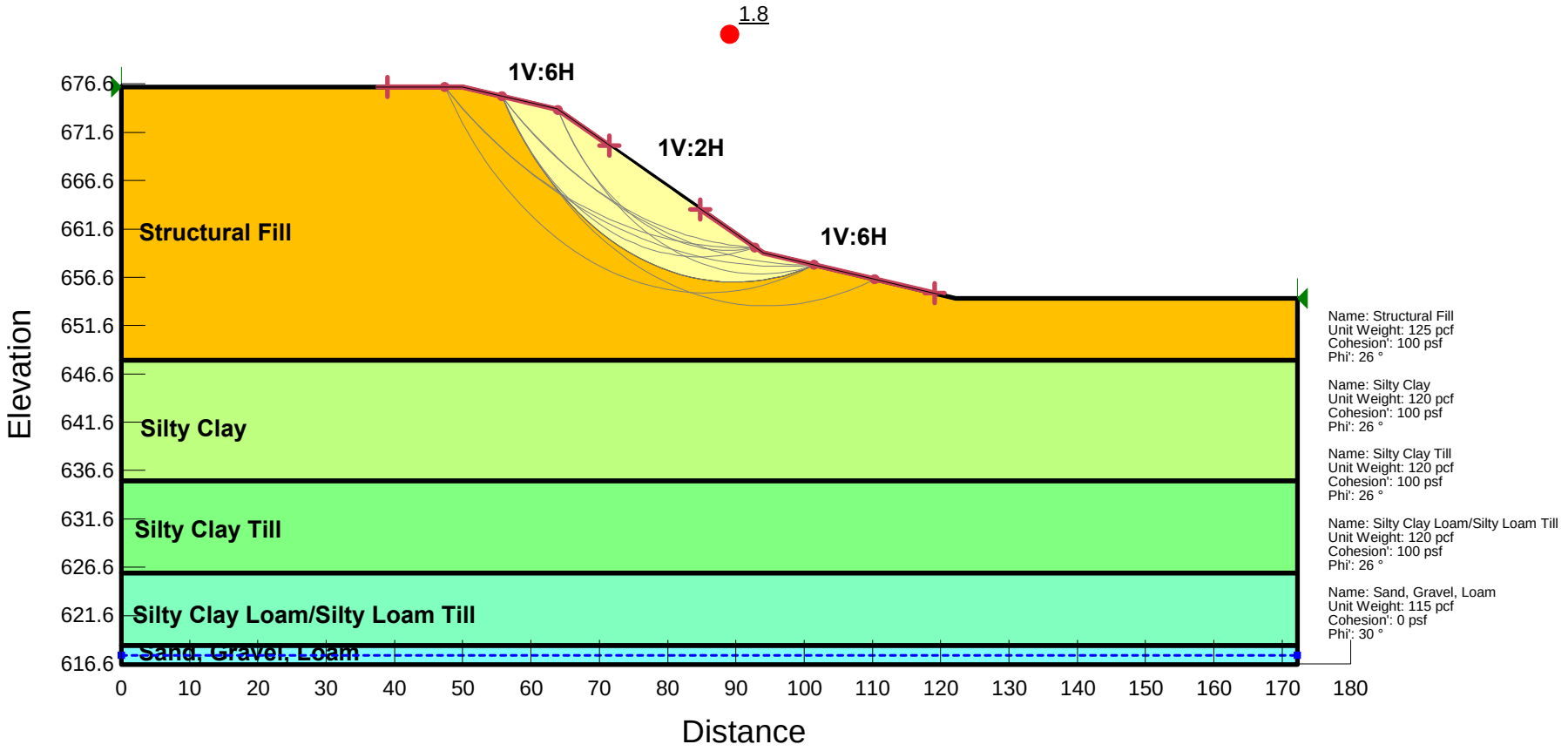

I-57 over IL 17, Kankakee, IL
Ramp A Side Slope
LT Analysis
2.8
1V:6H
1V:4.3H
Structural Fill
Fill: Silty Clay/Silty Clay Loam
Silty Clay Till
Silty Clay Till
Silty Clay Till
Silty Clay
Silty Clay Loam/Silty Loam Till
Limestone Fragments/Limestone
Elevation
680.3
675.3
670.3
665.3
660.3
655.3
650.3
645.3
640.3
635.3
630.3
625.3
620.3
615.3
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
Distance
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till (2)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till (3)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Limestone Frags/Limestone, Impenetrable Bedrock


I-57 over IL 17, Kankakee, IL
Ramp A Side Slope
Seismic Analysis
PGA: 0.046 g
2.3
1V:6H
1V:4.3H
Structural Fill
Fill: Silty Clay/Silty Clay Loam
Silty Clay Till
Silty Clay Till
Silty Clay Till
Silty Clay
Silty Clay Loam/Silty Loam Till
Limestone Fragments/Limestone
Elevation
680.3
675.3
670.3
665.3
660.3
655.3
650.3
645.3
640.3
635.3
630.3
625.3
620.3
615.3
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
Distance
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Fill: Silty Clay/Silty Clay Loam
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till (2)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till (3)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Limestone Frags/Limestone,
Impenetrable Bedrock

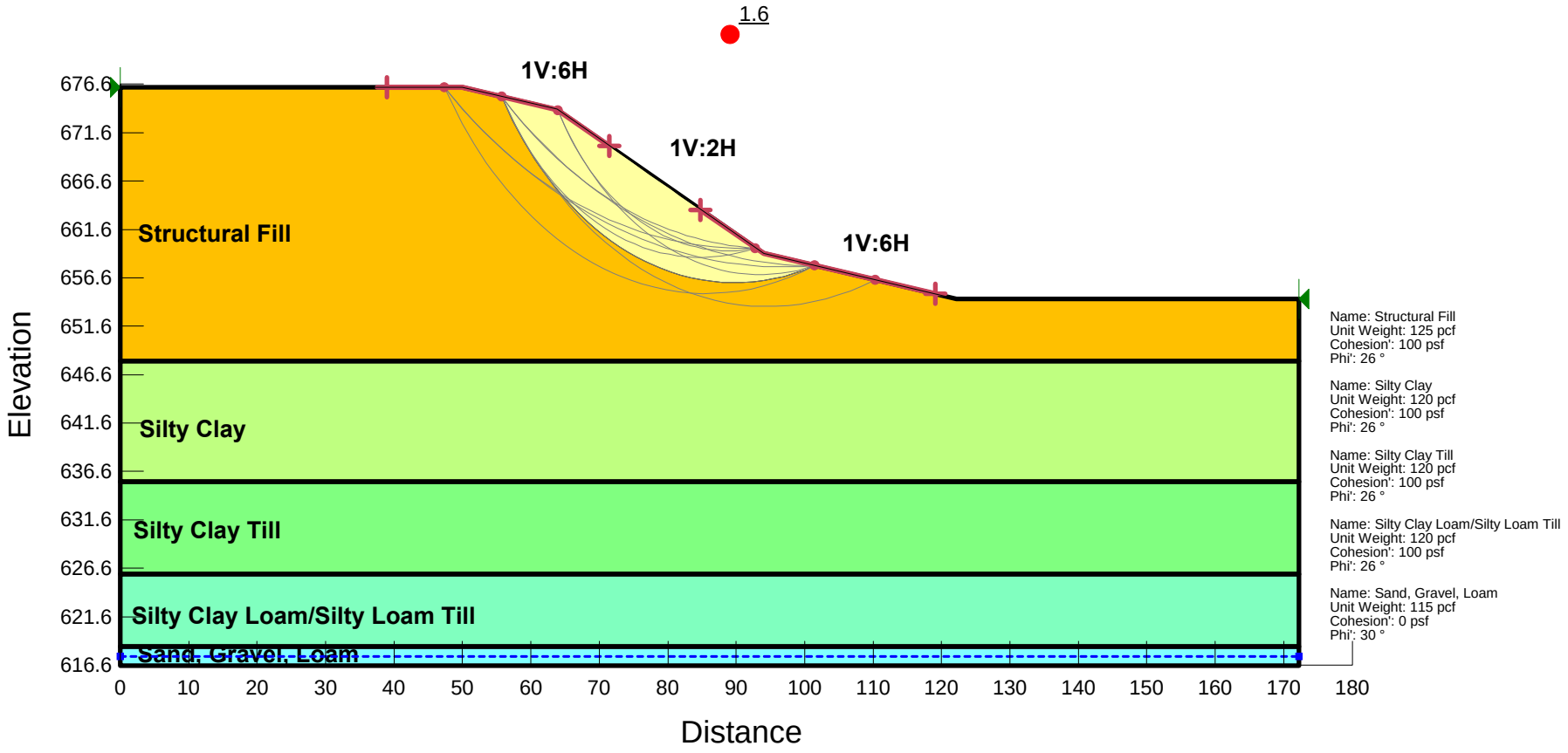
I-57 over IL 17, Kankakee, IL
Ramp B Side Slope
EOC Analysis

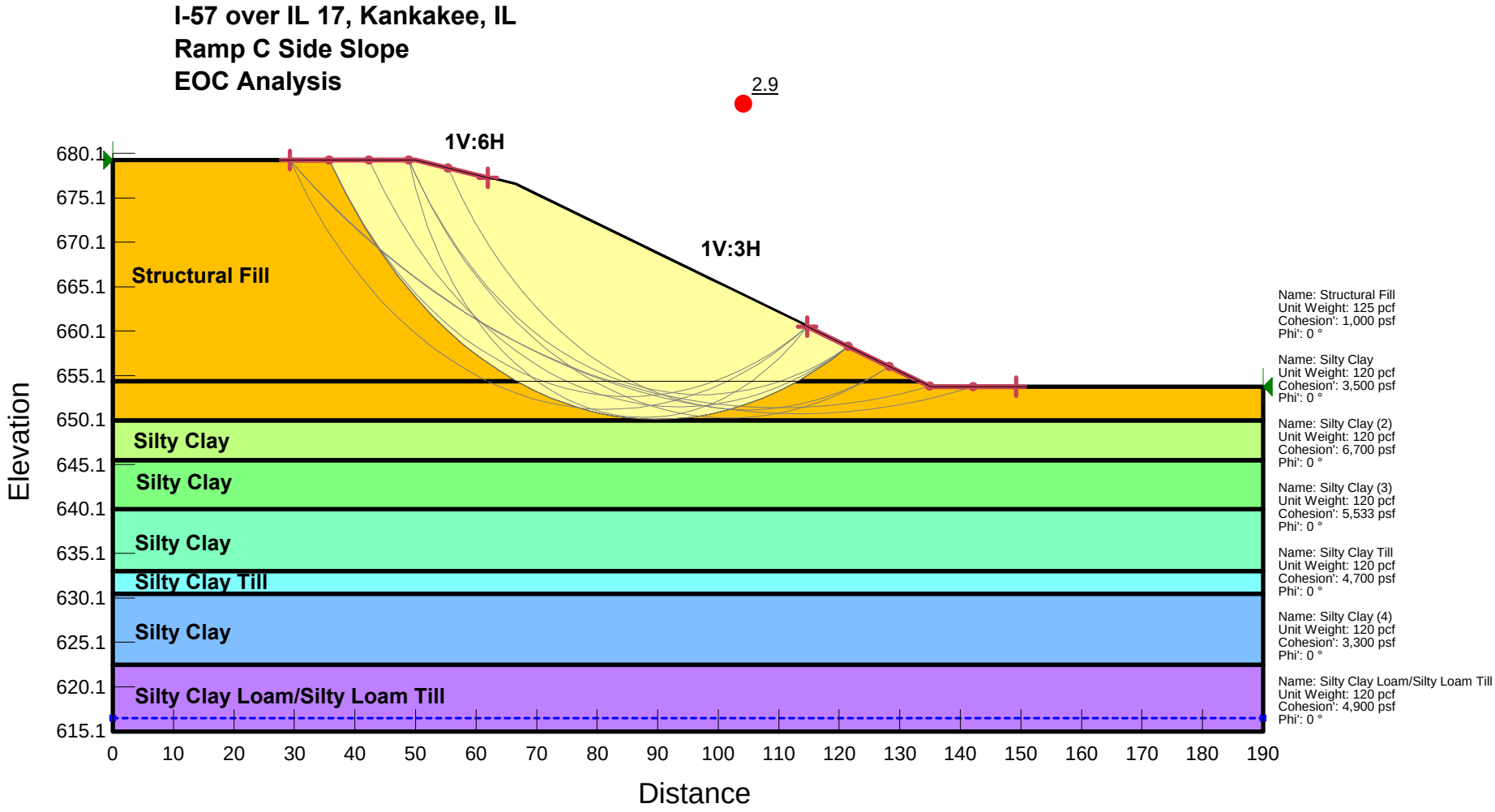


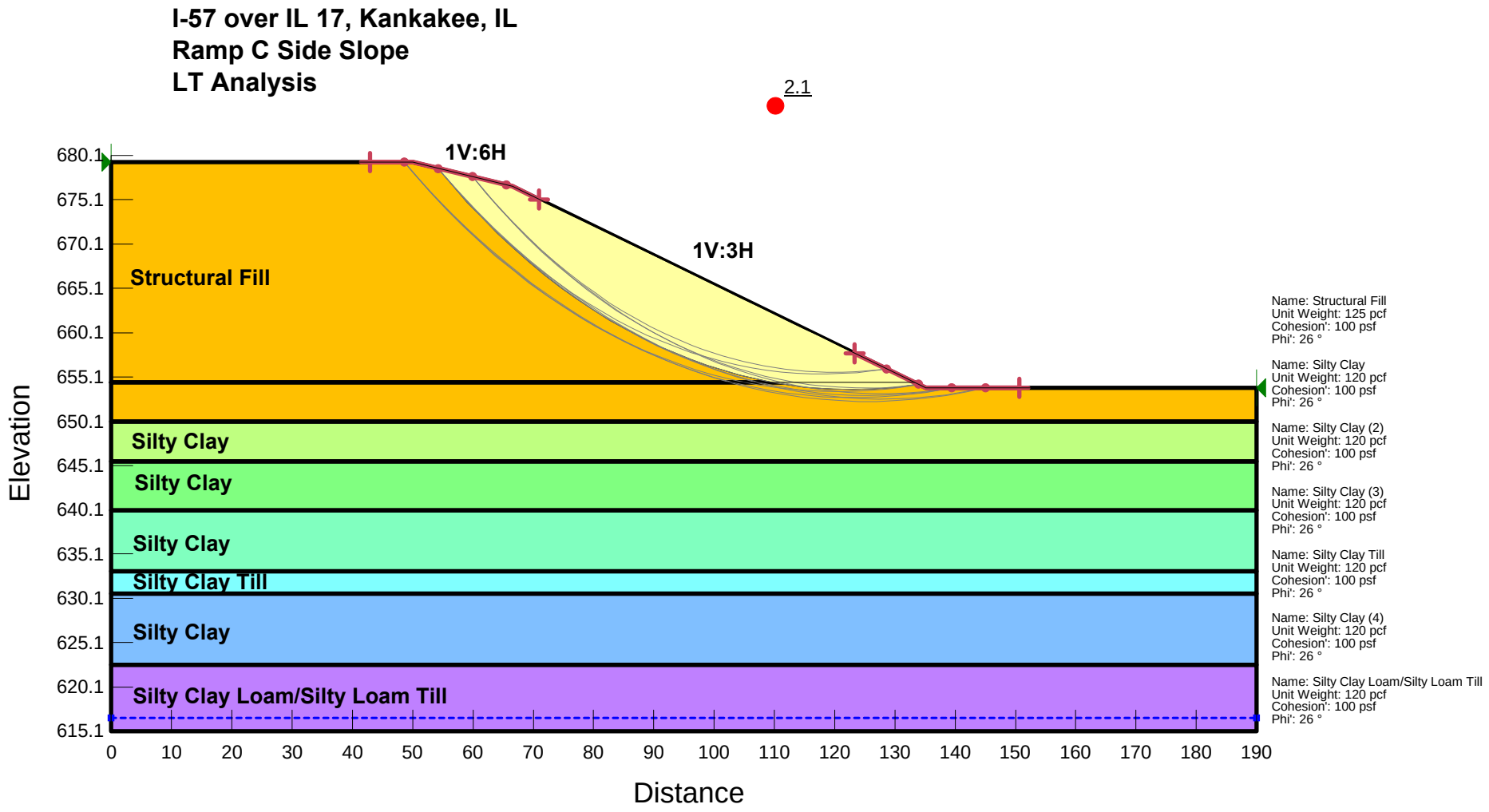
I-57 over IL 17, Kankakee, IL
Ramp B Side Slope
LT Analysis



I-57 over IL 17, Kankakee, IL
Ramp B Side Slope
Seismic Analysis
PGA: 0.046 g




I-57 over IL 17, Kankakee, IL
Ramp C Side Slope
EOC Analysis
2.9
1V:6H
1V:3H
Structural Fill
Silty Clay
Silty Clay
Silty Clay
Silty Clay Till
Silty Clay
Silty Clay Loam/Silty Loam Till
Elevation
680.1
675.1
670.1
665.1
660.1
655.1
650.1
645.1
640.1
635.1
630.1
625.1
620.1
615.1
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
Distance
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 1,000 psf
Phi': 0 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 3,500 psf
Phi': 0 °
Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 6,700 psf
Phi': 0 °
Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 5,533 psf
Phi': 0 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 4,700 psf
Phi': 0 °
Name: Silty Clay (4)
Unit Weight: 120 pcf
Cohesion': 3,300 psf
Phi': 0 °
Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 4,900 psf
Phi': 0 °


I-57 over IL 17, Kankakee, IL
Ramp C Side Slope
LT Analysis
2.1
1V:6H
1V:3H
Structural Fill
Silty Clay
Silty Clay
Silty Clay
Silty Clay Till
Silty Clay
Silty Clay Loam/Silty Loam Till
Elevation
680.1
675.1
670.1
665.1
660.1
655.1
650.1
645.1
640.1
635.1
630.1
625.1
620.1
615.1
0
10
20
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40
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60
70
80
90
100
110
120
130
140
150
160
170
180
190
Distance
Name: Structural Fill
Unit Weight: 125 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay (2)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay (3)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay (4)
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °
Name: Silty Clay Loam/Silty Loam Till
Unit Weight: 120 pcf
Cohesion': 100 psf
Phi': 26 °

I-57 over IL 17, Kankakee, IL
Ramp C Side Slope
Seismic Analysis
PGA: 0.046 g

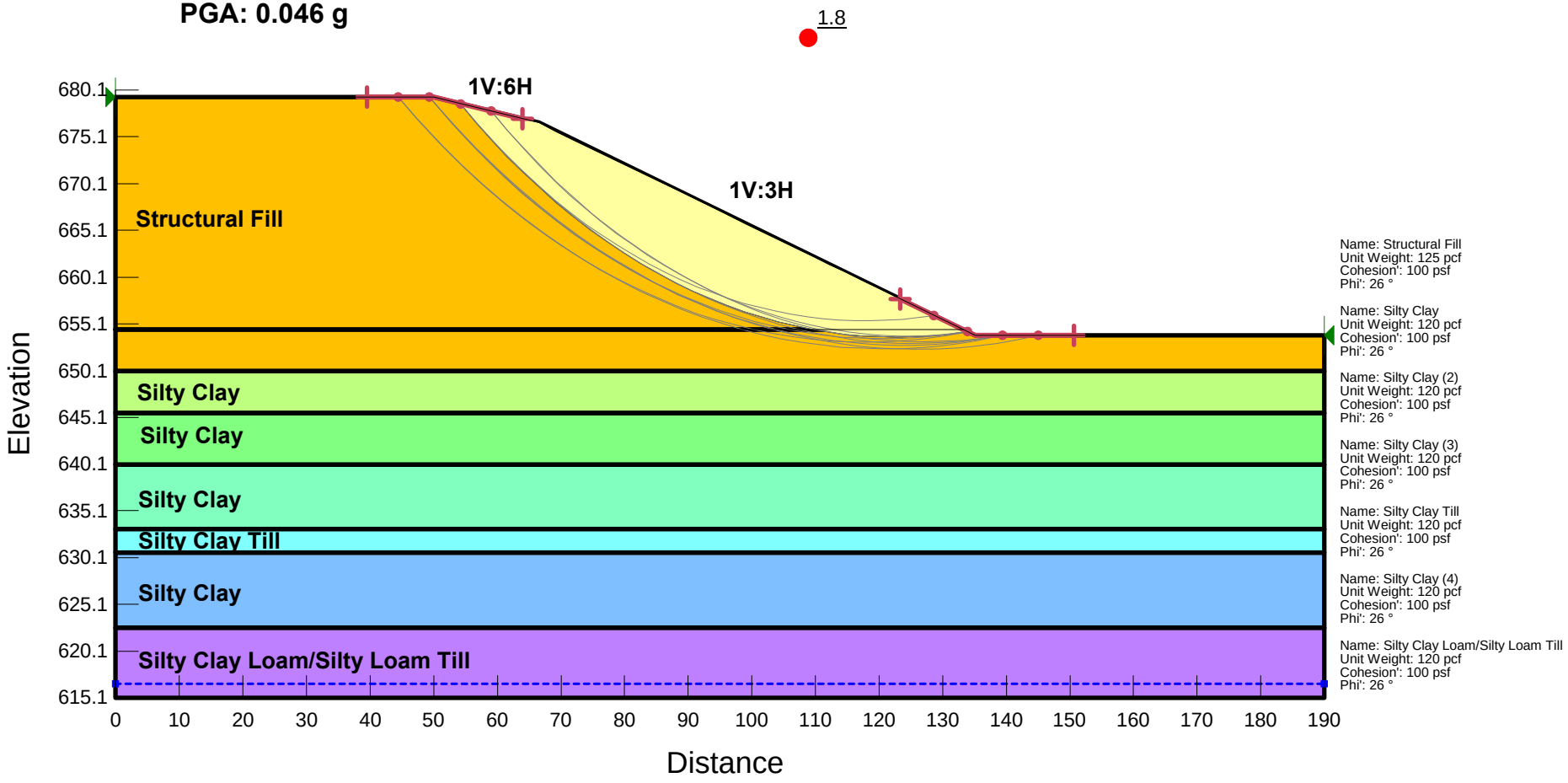

EXHIBIT F

PILE LENGTH/PILE TYPE

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified 10/18/2011

SUBSTRUCTURE========== North Abutment
REFERENCE BORING ========== BH 12
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 667.56 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 662.56 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ========= 3434 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE = 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 249.75 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 93.65 KIPS

PILE TYPE AND SIZE ========== Steel HP 14 X 102
Plugged Pile Perimeter========== 4.800 FT. Unplugged Pile Perimeter========== 7.058 FT.
Plugged Pile End Bearing Area========== 1.439 SQFT. Unplugged Pile End Bearing Area===== 0.208 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
810 KIPS	**810** KIPS	**445** KIPS	**56** FT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
660.06	2.50	2.50			16.2		76.7	23.8		***32.5***	33	0	0	18	8
658.56	1.50	3.00			11.0	60.5	87.7	16.2	8.8	***48.7***	49	0	0	27	9
657.16	1.40	3.00			10.3	60.5	71.4	15.1	8.8	***60.0***	60	0	0	33	10
654.66	2.50		14	Hard Till	1.8	34.0	98.4	2.7	4.9	***66.3***	66	0	0	36	13
652.16	2.50		22	Hard Till	2.9	59.2	79.8	4.2	8.6	***67.5***	67	0	0	37	15
650.16	2.00		14	Hard Till	1.5	37.6	94.0	2.2	5.4	***71.5***	71	0	0	39	17
647.66	2.50	2.50			16.2	50.4	110.9	23.8	7.3	***95.3***	95	0	0	52	20
645.16	2.50		19	Hard Till	2.5	51.1	121.4	3.7	7.4	***100.1***	100	0	0	55	22
642.66	2.50		22	Hard Till	2.9	59.2	110.9	4.2	8.6	***102.4***	102	0	0	56	25
640.16	2.50		17	Hard Till	2.2	45.7	118.5	3.3	6.6	***106.5***	106	0	0	59	27
637.66	2.50		19	Hard Till	2.5	51.1	112.9	3.7	7.4	***109.0***	109	0	0	60	30
635.16	2.50		16	Hard Till	2.1	43.0	115.0	3.1	6.2	***112.0***	112	0	0	62	32
632.66	2.50		16	Hard Till	2.1	43.0	117.1	3.1	6.2	***115.1***	115	0	0	63	35
630.16	2.50		16	Hard Till	2.1	43.0	124.5	3.1	6.2	***119.0***	119	0	0	65	37
627.66	2.50		18	Hard Till	2.4	48.4	***118.8***	3.5	7.0	121.3	119	0	0	65	40
625.16	2.50		15	Hard Till	2.0	40.3	155.7	2.9	5.8	***129.2***	129	0	0	71	42
622.66	2.50		28	Hard Till	3.7	75.3	137.9	5.4	10.9	***131.5***	131	0	0	72	45
621.16	1.50		20	Hard Till	1.6	53.8	139.5	2.3	7.8	***133.8***	134	0	0	74	46
619.66	1.50		20	Hard Till	1.6	53.8	180.5	2.3	7.8	***141.8***	142	0	0	78	48
617.16	2.50		26	Sandy Gravel	7.6	93.2	180.9	11.2	13.5	***152.0***	152	0	0	84	50
614.66	2.50		24	Sandy Gravel	6.8	86.0	460.2	10.1	12.5	***201.5***	202	0	0	111	53
614.16	0.50			Limestone	59.8	358.5	520.0	87.9	51.9	***289.4***	289	0	0	159	53.4
613.66	0.50			Limestone	59.8	358.5	579.8	87.9	51.9	***377.4***	377	0	0	208	53.9
613.16	0.50			Limestone	59.8	358.5	639.6	87.9	51.9	***465.3***	465	0	0	256	54.4
612.96	0.20			Limestone	23.9	358.5	663.5	35.2	51.9	***500.5***	500	0	0	275	54.6
612.76	0.20			Limestone	23.9	358.5	687.5	35.2	51.9	***535.6***	536	0	0	295	54.8
612.56	0.20			Limestone	23.9	358.5	711.4	35.2	51.9	***570.8***	571	0	0	314	55
612.36	0.20			Limestone	23.9	358.5	735.3	35.2	51.9	***606.0***	606	0	0	333	55.2
612.16	0.20			Limestone	23.9	358.5	759.2	35.2	51.9	***641.1***	641	0	0	353	55.4
611.96	0.20			Limestone	23.9	358.5	783.1	35.2	51.9	***676.3***	676	0	0	372	55.6
611.76	0.20			Limestone	23.9	358.5	807.0	35.2	51.9	***711.5***	711	0	0	391	55.8
611.56	0.20			Limestone	23.9	358.5	831.0	35.2	51.9	***746.7***	747	0	0	411	56
611.36	0.20			Limestone	23.9	358.5	854.9	35.2	51.9	***781.8***	782	0	0	430	56.2
611.16	0.20			Limestone	23.9	358.5	878.8	35.2	51.9	***817.0***	~~817~~	~~0~~	~~0~~	~~449~~	~~56.4~~
610.96	0.20			Limestone	23.9	358.5	902.7	35.2	51.9	***852.2***	~~852~~	~~0~~	~~0~~	~~469~~	~~56.6~~
610.76	0.20			Limestone	23.9	358.5	926.6	35.2	51.9	***887.3***	~~887~~	~~0~~	~~0~~	~~488~~	~~56.8~~
610.56	0.20			Limestone	23.9	358.5	950.5	35.2	51.9	***922.5***	~~923~~	~~0~~	~~0~~	~~507~~	~~57~~
610.36	0.20			Limestone		358.5			51.9						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified 10/18/2011

SUBSTRUCTURE========== North Abutment
REFERENCE BORING ========== BH 12
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 667.56 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 662.56 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ========= 3434 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE = 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 249.75 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 93.65 KIPS

PILE TYPE AND SIZE ========== Steel HP 14 X 117
Plugged Pile Perimeter========== 4.850 FT. Unplugged Pile Perimeter========== 7.117 FT.
Plugged Pile End Bearing Area========== 1.469 SQFT. Unplugged Pile End Bearing Area===== 0.239 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
929 KIPS	**929** KIPS	**511** KIPS	**57** FT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
660.06	2.50	2.50			16.3		78.1	24.0		***34.0***	34	0	0	19	8
658.56	1.50	3.00			11.1	61.8	89.2	16.3	10.0	***50.3***	50	0	0	28	9
657.16	1.40	3.00			10.4	61.8	72.6	15.2	10.0	***61.2***	61	0	0	34	10
654.66	2.50		14	Hard Till	1.9	34.7	100.1	2.7	5.6	***68.1***	68	0	0	37	13
652.16	2.50		22	Hard Till	2.9	60.4	81.0	4.3	9.8	***68.8***	69	0	0	38	15
650.16	2.00		14	Hard Till	1.5	38.4	95.6	2.2	6.2	***73.1***	73	0	0	40	17
647.66	2.50	2.50			16.3	51.5	112.6	24.0	8.4	***97.1***	97	0	0	53	20
645.16	2.50		19	Hard Till	2.5	52.2	123.3	3.7	8.5	***102.2***	102	0	0	56	22
642.66	2.50		22	Hard Till	2.9	60.4	112.5	4.3	9.8	***104.2***	104	0	0	57	25
640.16	2.50		17	Hard Till	2.2	46.7	120.2	3.3	7.6	***108.4***	108	0	0	60	27
637.66	2.50		19	Hard Till	2.5	52.2	114.5	3.7	8.5	***110.7***	111	0	0	61	30
635.16	2.50		16	Hard Till	2.1	43.9	116.6	3.1	7.1	***113.8***	114	0	0	63	32
632.66	2.50		16	Hard Till	2.1	43.9	118.8	3.1	7.1	***116.9***	117	0	0	64	35
630.16	2.50		16	Hard Till	2.1	43.9	126.4	3.1	7.1	***120.9***	121	0	0	67	37
627.66	2.50		18	Hard Till	2.4	49.4	***120.5***	3.5	8.0	123.1	121	0	0	66	40
625.16	2.50		15	Hard Till	2.0	41.2	158.2	2.9	6.7	***131.8***	132	0	0	72	42
622.66	2.50		28	Hard Till	3.7	76.9	139.9	5.4	12.5	***133.7***	134	0	0	74	45
621.16	1.50		20	Hard Till	1.6	54.9	141.5	2.3	8.9	***136.0***	136	0	0	75	46
619.66	1.50		20	Hard Till	1.6	54.9	183.4	2.3	8.9	***144.9***	145	0	0	80	48
617.16	2.50		26	Sandy Gravel	7.7	95.2	183.7	11.3	15.5	***155.0***	155	0	0	85	50
614.66	2.50		24	Sandy Gravel	6.9	87.9	468.9	10.1	14.3	***210.4***	210	0	0	116	53
614.16	0.50			Limestone	60.4	366.1	529.3	88.7	59.5	***299.0***	299	0	0	164	53.4
613.66	0.50			Limestone	60.4	366.1	589.7	88.7	59.5	***387.7***	388	0	0	213	53.9
613.16	0.50			Limestone	60.4	366.1	650.1	88.7	59.5	***476.3***	476	0	0	262	54.4
612.96	0.20			Limestone	24.2	366.1	674.3	35.5	59.5	***511.8***	512	0	0	281	54.6
612.76	0.20			Limestone	24.2	366.1	698.5	35.5	59.5	***547.3***	547	0	0	301	54.8
612.56	0.20			Limestone	24.2	366.1	722.6	35.5	59.5	***582.7***	583	0	0	320	55
612.36	0.20			Limestone	24.2	366.1	746.8	35.5	59.5	***618.2***	618	0	0	340	55.2
612.16	0.20			Limestone	24.2	366.1	771.0	35.5	59.5	***653.6***	654	0	0	360	55.4
611.96	0.20			Limestone	24.2	366.1	795.1	35.5	59.5	***689.1***	689	0	0	379	55.6
611.76	0.20			Limestone	24.2	366.1	819.3	35.5	59.5	***724.6***	725	0	0	399	55.8
611.56	0.20			Limestone	24.2	366.1	843.5	35.5	59.5	***760.0***	760	0	0	418	56
611.36	0.20			Limestone	24.2	366.1	867.6	35.5	59.5	***795.5***	795	0	0	438	56.2
611.16	0.20			Limestone	24.2	366.1	891.8	35.5	59.5	***830.9***	831	0	0	457	56.4
610.96	0.20			Limestone	24.2	366.1	916.0	35.5	59.5	***866.4***	866	0	0	477	56.6
610.76	0.20			Limestone	24.2	366.1	940.1	35.5	59.5	***901.9***	902	0	0	496	56.8
610.56	0.20			Limestone	24.2	366.1	964.3	35.5	59.5	***937.3***	~~937~~	~~0~~	~~0~~	~~516~~	~~57~~
610.36	0.20			Limestone		366.1			59.5						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== South Abutment
REFERENCE BORING ========== BH 21
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 669.76 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 664.76 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 3434 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 249.75 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 93.65 KIPS

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Borin	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
810 KIPS	**777** KIPS	**427** KIPS	**47** FT.

PILE TYPE AND SIZE ========== Steel HP 14 X 102
Plugged Pile Perimeter========== 4.800 FT. Unplugged Pile Perimeter========== 7.058 FT.
Plugged Pile End Bearing Area========== 1.439 SQFT. Unplugged Pile End Bearing Area===== 0.208 SQFT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
663.56	1.20		11	Hard Till	0.7		14.3	1.0		***3.0***	3	0	0	2	6
661.06	2.50		12	Hard Till	1.6	13.6	40.4	2.3	2.0	***8.8***	9	0	0	5	9
658.56	2.50		20	Hard Till	2.6	38.1	82.4	3.8	5.5	***18.4***	18	0	0	10	11
656.06	2.50		29	Hard Till	3.8	77.5	73.2	5.6	11.2	***22.1***	22	0	0	12	14
653.56	2.50		24	Hard Till	3.1	64.5	65.6	4.6	9.3	***25.1***	25	0	0	14	16
651.06	2.50		20	Hard Till	2.6	53.8	68.2	3.8	7.8	***29.0***	29	0	0	16	19
648.56	2.50		20	Hard Till	2.6	53.8	70.8	3.8	7.8	***32.8***	33	0	0	18	21
646.56	2.00		20	Hard Till	2.1	53.8	59.5	3.1	7.8	***34.0***	34	0	0	19	23
644.06	2.50		15	Hard Till	2.0	40.3	66.8	2.9	5.8	***37.6***	38	0	0	21	26
641.56	2.50		17	Hard Till	2.2	45.7	58.3	3.3	6.6	***39.4***	39	0	0	22	28
639.06	2.50		13	Hard Till	1.7	35.0	57.3	2.5	5.1	***41.5***	41	0	0	23	31
637.56	1.50		12	Hard Till	0.9	32.3	58.2	1.4	4.7	***42.8***	43	0	0	24	32
636.06	1.50		12	Hard Till	0.9	32.3	131.8	1.4	4.7	***54.7***	55	0	0	30	34
633.56	2.50		39	Hard Till	5.3	104.9	174.7	7.8	15.2	***68.0***	68	0	0	37	36
631.06	2.50		53	Hard Till	8.4	142.5	156.2	12.3	20.6	***76.4***	76	0	0	42	39
628.56	2.50		43	Hard Till	6.1	115.6	122.0	9.0	16.7	***79.6***	80	0	0	44	41
626.06	2.50		28	Hard Till	3.7	75.3	408.9	5.4	10.9	***126.0***	126	0	0	69	44
625.56	0.50			Limestone	59.8	358.5	468.6	87.9	51.9	***213.9***	214	0	0	118	44.2
625.06	0.50			Limestone	59.8	358.5	528.4	87.9	51.9	***301.8***	302	0	0	166	44.7
624.56	0.50			Limestone	59.8	358.5	588.2	87.9	51.9	***389.7***	390	0	0	214	45.2
624.36	0.20			Limestone	23.9	358.5	612.2	35.2	51.9	***424.9***	425	0	0	234	45.4
624.16	0.20			Limestone	23.9	358.5	636.1	35.2	51.9	***460.1***	460	0	0	253	45.6
623.96	0.20			Limestone	23.9	358.5	660.0	35.2	51.9	***495.2***	495	0	0	272	45.8
623.76	0.20			Limestone	23.9	358.5	683.9	35.2	51.9	***530.4***	530	0	0	292	46
623.56	0.20			Limestone	23.9	358.5	707.8	35.2	51.9	***565.6***	566	0	0	311	46.2
623.36	0.20			Limestone	23.9	358.5	731.7	35.2	51.9	***600.8***	601	0	0	330	46.4
623.16	0.20			Limestone	23.9	358.5	755.7	35.2	51.9	***635.9***	636	0	0	350	46.6
622.96	0.20			Limestone	23.9	358.5	779.6	35.2	51.9	***671.1***	671	0	0	369	46.8
622.76	0.20			Limestone	23.9	358.5	803.5	35.2	51.9	***706.3***	706	0	0	388	47
622.56	0.20			Limestone	23.9	358.5	827.4	35.2	51.9	***741.4***	741	0	0	408	47.2
622.36	0.20			Limestone	23.9	358.5	851.3	35.2	51.9	***776.6***	777	0	0	427	47.4
622.16	0.20			Limestone	23.9	358.5	875.2	35.2	51.9	***811.8***	~~812~~	~~0~~	~~0~~	~~446~~	~~47.6~~
621.96	0.20			Limestone	23.9	358.5	899.2	35.2	51.9	***847.0***	~~847~~	~~0~~	~~0~~	~~466~~	~~47.8~~
621.76	0.20			Limestone	23.9	358.5	923.1	35.2	51.9	***882.1***	~~882~~	~~0~~	~~0~~	~~485~~	~~48~~
621.56	0.20			Limestone	23.9	358.5	947.0	35.2	51.9	***917.3***	~~917~~	~~0~~	~~0~~	~~505~~	~~48.2~~
621.36	0.20			Limestone	23.9	358.5	970.9	35.2	51.9	***952.5***	~~952~~	~~0~~	~~0~~	~~524~~	~~48.4~~
621.16	0.20			Limestone	23.9	358.5	994.8	35.2	51.9	***987.6***	~~988~~	~~0~~	~~0~~	~~543~~	~~48.6~~
620.96	0.20			Limestone		358.5			51.9						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified 10/18/2011

SUBSTRUCTURE========== South Abutment
REFERENCE BORING ========== BH 21
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 669.76 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 664.76 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 3434 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 249.75 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 93.65 KIPS

PILE TYPE AND SIZE ========== Steel HP 14 X 117
Plugged Pile Perimeter========== 4.850 FT. Unplugged Pile Perimeter========== 7.117 FT.
Plugged Pile End Bearing Area========== 1.469 SQFT. Unplugged Pile End Bearing Area===== 0.239 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Borin	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
929 KIPS	**897** KIPS	**493** KIPS	**48** FT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
663.56	1.20		11	Hard Till	0.7		14.6	1.0		***3.3***	3	0	0	2	6
661.06	2.50		12	Hard Till	1.6	13.9	41.2	2.3	2.3	***9.7***	10	0	0	5	9
658.56	2.50		20	Hard Till	2.6	38.9	84.1	3.9	6.3	***20.1***	20	0	0	11	11
656.06	2.50		29	Hard Till	3.8	79.2	74.7	5.6	12.9	***23.6***	24	0	0	13	14
653.56	2.50		24	Hard Till	3.2	65.9	66.8	4.7	10.7	***26.4***	26	0	0	15	16
651.06	2.50		20	Hard Till	2.6	54.9	69.5	3.9	8.9	***30.3***	30	0	0	17	19
648.56	2.50		20	Hard Till	2.6	54.9	72.1	3.9	8.9	***34.2***	34	0	0	19	21
646.56	2.00		20	Hard Till	2.1	54.9	60.5	3.1	8.9	***35.1***	35	0	0	19	23
644.06	2.50		15	Hard Till	2.0	41.2	68.0	2.9	6.7	***38.9***	39	0	0	21	26
641.56	2.50		17	Hard Till	2.2	46.7	59.3	3.3	7.6	***40.4***	40	0	0	22	28
639.06	2.50		13	Hard Till	1.7	35.7	58.2	2.5	5.8	***42.5***	42	0	0	23	31
637.56	1.50		12	Hard Till	1.0	32.9	59.2	1.4	5.4	***43.8***	44	0	0	24	32
636.06	1.50		12	Hard Till	1.0	32.9	134.3	1.4	5.4	***57.3***	57	0	0	32	34
633.56	2.50		39	Hard Till	5.4	107.1	178.1	7.9	17.4	***71.4***	71	0	0	39	36
631.06	2.50		53	Hard Till	8.5	145.5	159.1	12.4	23.7	***79.4***	79	0	0	44	39
628.56	2.50		43	Hard Till	6.2	118.1	124.1	9.0	19.2	***81.7***	82	0	0	45	41
626.06	2.50		28	Hard Till	3.7	76.9	417.0	5.4	12.5	***134.2***	134	0	0	74	44
625.56	0.50			Limestone	60.4	366.1	477.4	88.7	59.5	***222.8***	223	0	0	123	44.2
625.06	0.50			Limestone	60.4	366.1	537.8	88.7	59.5	***311.5***	311	0	0	171	44.7
624.56	0.50			Limestone	60.4	366.1	598.2	88.7	59.5	***400.1***	400	0	0	220	45.2
624.36	0.20			Limestone	24.2	366.1	622.4	35.5	59.5	***435.6***	436	0	0	240	45.4
624.16	0.20			Limestone	24.2	366.1	646.5	35.5	59.5	***471.1***	471	0	0	259	45.6
623.96	0.20			Limestone	24.2	366.1	670.7	35.5	59.5	***506.5***	507	0	0	279	45.8
623.76	0.20			Limestone	24.2	366.1	694.9	35.5	59.5	***542.0***	542	0	0	298	46
623.56	0.20			Limestone	24.2	366.1	719.0	35.5	59.5	***577.5***	577	0	0	318	46.2
623.36	0.20			Limestone	24.2	366.1	743.2	35.5	59.5	***612.9***	613	0	0	337	46.4
623.16	0.20			Limestone	24.2	366.1	767.4	35.5	59.5	***648.4***	648	0	0	357	46.6
622.96	0.20			Limestone	24.2	366.1	791.5	35.5	59.5	***683.8***	684	0	0	376	46.8
622.76	0.20			Limestone	24.2	366.1	815.7	35.5	59.5	***719.3***	719	0	0	396	47
622.56	0.20			Limestone	24.2	366.1	839.9	35.5	59.5	***754.8***	755	0	0	415	47.2
622.36	0.20			Limestone	24.2	366.1	864.0	35.5	59.5	***790.2***	790	0	0	435	47.4
622.16	0.20			Limestone	24.2	366.1	888.2	35.5	59.5	***825.7***	826	0	0	454	47.6
621.96	0.20			Limestone	24.2	366.1	912.4	35.5	59.5	***861.1***	861	0	0	474	47.8
621.76	0.20			Limestone	24.2	366.1	936.5	35.5	59.5	***896.6***	897	0	0	493	48
621.56	0.20			Limestone	24.2	366.1	960.7	35.5	59.5	***932.1***	~~932~~	~~0~~	~~0~~	~~513~~	~~48.2~~
621.36	0.20			Limestone	24.2	366.1	984.9	35.5	59.5	***967.5***	~~968~~	~~0~~	~~0~~	~~532~~	~~48.4~~
621.16	0.20			Limestone	24.2	366.1	1009.0	35.5	59.5	***1003.0***	~~1003~~	~~0~~	~~0~~	~~552~~	~~48.6~~
620.96	0.20			Limestone		366.1			59.5						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 1
REFERENCE BORING ========== BH 15
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 648.70 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 644.70 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 12743 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 926.76 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 347.54 KIPS

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Borin	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
810 KIPS	**793** KIPS	**436** KIPS	**36** FT.

PILE TYPE AND SIZE ========== Steel HP 14 X 102
Plugged Pile Perimeter========== 4.800 FT. Unplugged Pile Perimeter========== 7.058 FT.
Plugged Pile End Bearing Area========== 1.439 SQFT. Unplugged Pile End Bearing Area===== 0.208 SQFT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
642.60	2.10		20	Hard Till	2.2		24.8	3.2		***6.5***	7	0	0	4	6
640.10	2.50		16	Hard Till	2.1	22.6	39.2	3.1	3.3	***11.4***	11	0	0	6	9
637.60	2.50		16	Hard Till	2.1	34.9	44.0	3.1	5.1	***14.8***	15	0	0	8	11
635.10	2.50		14	Hard Till	1.8	37.6	45.9	2.7	5.4	***17.5***	18	0	0	10	14
633.60	1.50		14	Hard Till	1.1	37.6	47.0	1.6	5.4	***19.1***	19	0	0	11	15
632.10	1.50		14	Hard Till	1.1	37.6	64.2	1.6	5.4	***23.1***	23	0	0	13	17
629.60	2.50		20	Hard Till	2.6	53.8	48.0	3.8	7.8	***24.2***	24	0	0	13	19
627.10	2.50		13	Hard Till	1.7	35.0	52.4	2.5	5.1	***27.1***	27	0	0	15	22
624.60	2.50		14	Hard Till	1.8	37.6	54.2	2.7	5.4	***29.8***	30	0	0	16	24
622.10	2.50		14	Hard Till	1.8	37.6	112.5	2.7	5.4	***40.7***	41	0	0	22	27
619.60	2.50		35	Hard Till	4.6	94.1	82.2	6.8	13.6	***42.4***	42	0	0	23	29
617.10	2.50		22	Hard Till	2.9	59.2	384.4	4.2	8.6	***90.0***	90	0	0	49	32
616.90	0.20			Limestone	23.9	358.5	408.3	35.2	51.9	***125.2***	125	0	0	69	31.8
616.70	0.20			Limestone	23.9	358.5	432.2	35.2	51.9	***160.3***	160	0	0	88	32
616.50	0.20			Limestone	23.9	358.5	456.2	35.2	51.9	***195.5***	196	0	0	108	32.2
616.30	0.20			Limestone	23.9	358.5	480.1	35.2	51.9	***230.7***	231	0	0	127	32.4
616.10	0.20			Limestone	23.9	358.5	504.0	35.2	51.9	***265.9***	266	0	0	146	32.6
615.90	0.20			Limestone	23.9	358.5	527.9	35.2	51.9	***301.0***	301	0	0	166	32.8
615.70	0.20			Limestone	23.9	358.5	551.8	35.2	51.9	***336.2***	336	0	0	185	33
615.50	0.20			Limestone	23.9	358.5	575.7	35.2	51.9	***371.4***	371	0	0	204	33.2
615.30	0.20			Limestone	23.9	358.5	599.7	35.2	51.9	***406.5***	407	0	0	224	33.4
615.10	0.20			Limestone	23.9	358.5	623.6	35.2	51.9	***441.7***	442	0	0	243	33.6
614.90	0.20			Limestone	23.9	358.5	647.5	35.2	51.9	***476.9***	477	0	0	262	33.8
614.70	0.20			Limestone	23.9	358.5	671.4	35.2	51.9	***512.0***	512	0	0	282	34
614.50	0.20			Limestone	23.9	358.5	695.3	35.2	51.9	***547.2***	547	0	0	301	34.2
614.30	0.20			Limestone	23.9	358.5	719.2	35.2	51.9	***582.4***	582	0	0	320	34.4
614.10	0.20			Limestone	23.9	358.5	743.2	35.2	51.9	***617.6***	618	0	0	340	34.6
613.90	0.20			Limestone	23.9	358.5	767.1	35.2	51.9	***652.7***	653	0	0	359	34.8
613.70	0.20			Limestone	23.9	358.5	791.0	35.2	51.9	***687.9***	688	0	0	378	35
613.50	0.20			Limestone	23.9	358.5	814.9	35.2	51.9	***723.1***	723	0	0	398	35.2
613.30	0.20			Limestone	23.9	358.5	838.8	35.2	51.9	***758.2***	758	0	0	417	35.4
613.10	0.20			Limestone	23.9	358.5	862.8	35.2	51.9	***793.4***	793	0	0	436	35.6
612.90	0.20			Limestone	23.9	358.5	886.7	35.2	51.9	***828.6***	~~829~~	~~0~~	~~0~~	~~456~~	~~35.8~~
612.70	0.20			Limestone	23.9	358.5	910.6	35.2	51.9	***863.8***	~~864~~	~~0~~	~~0~~	~~475~~	~~36~~
612.50	0.20			Limestone	23.9	358.5	934.5	35.2	51.9	***898.9***	~~899~~	~~0~~	~~0~~	~~494~~	~~36.2~~
612.30	0.20			Limestone	23.9	358.5	958.4	35.2	51.9	***934.1***	~~934~~	~~0~~	~~0~~	~~514~~	~~36.4~~
612.10	0.20			Limestone	23.9	358.5	982.3	35.2	51.9	***969.3***	~~969~~	~~0~~	~~0~~	~~533~~	~~36.6~~
611.90	0.20			Limestone		358.5			51.9						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 1
REFERENCE BORING ========== BH 15
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 648.70 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 644.70 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 12743 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 926.76 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 347.54 KIPS

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Borin	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
929 KIPS	**914** KIPS	**502** KIPS	**36** FT.

PILE TYPE AND SIZE ========== Steel HP 14 X 117
Plugged Pile Perimeter========== 4.850 FT. Unplugged Pile Perimeter========== 7.117 FT.
Plugged Pile End Bearing Area========== 1.469 SQFT. Unplugged Pile End Bearing Area===== 0.239 SQFT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
642.60	2.10		20	Hard Till	2.2		25.3	3.3		***7.0***	7	0	0	4	6
640.10	2.50		16	Hard Till	2.1	23.1	40.0	3.1	3.8	***12.2***	12	0	0	7	9
637.60	2.50		16	Hard Till	2.1	35.6	44.9	3.1	5.8	***15.7***	16	0	0	9	11
635.10	2.50		14	Hard Till	1.9	38.4	46.7	2.7	6.2	***18.4***	18	0	0	10	14
633.60	1.50		14	Hard Till	1.1	38.4	47.8	1.6	6.2	***20.1***	20	0	0	11	15
632.10	1.50		14	Hard Till	1.1	38.4	65.4	1.6	6.2	***24.4***	24	0	0	13	17
629.60	2.50		20	Hard Till	2.6	54.9	48.9	3.9	8.9	***25.1***	25	0	0	14	19
627.10	2.50		13	Hard Till	1.7	35.7	53.3	2.5	5.8	***28.1***	28	0	0	15	22
624.60	2.50		14	Hard Till	1.9	38.4	55.2	2.7	6.2	***30.8***	31	0	0	17	24
622.10	2.50		14	Hard Till	1.9	38.4	114.7	2.7	6.2	***42.9***	43	0	0	24	27
619.60	2.50		35	Hard Till	4.7	96.1	83.7	6.9	15.6	***44.0***	44	0	0	24	29
617.10	2.50		22	Hard Till	2.9	60.4	392.2	4.3	9.8	***97.9***	98	0	0	54	32
616.90	0.20			Limestone	24.2	366.1	416.4	35.5	59.5	***133.4***	133	0	0	73	31.8
616.70	0.20			Limestone	24.2	366.1	440.6	35.5	59.5	***168.9***	169	0	0	93	32
616.50	0.20			Limestone	24.2	366.1	464.7	35.5	59.5	***204.3***	204	0	0	112	32.2
616.30	0.20			Limestone	24.2	366.1	488.9	35.5	59.5	***239.8***	240	0	0	132	32.4
616.10	0.20			Limestone	24.2	366.1	513.1	35.5	59.5	***275.2***	275	0	0	151	32.6
615.90	0.20			Limestone	24.2	366.1	537.2	35.5	59.5	***310.7***	311	0	0	171	32.8
615.70	0.20			Limestone	24.2	366.1	561.4	35.5	59.5	***346.2***	346	0	0	190	33
615.50	0.20			Limestone	24.2	366.1	585.6	35.5	59.5	***381.6***	382	0	0	210	33.2
615.30	0.20			Limestone	24.2	366.1	609.8	35.5	59.5	***417.1***	417	0	0	229	33.4
615.10	0.20			Limestone	24.2	366.1	633.9	35.5	59.5	***452.6***	453	0	0	249	33.6
614.90	0.20			Limestone	24.2	366.1	658.1	35.5	59.5	***488.0***	488	0	0	268	33.8
614.70	0.20			Limestone	24.2	366.1	682.3	35.5	59.5	***523.5***	523	0	0	288	34
614.50	0.20			Limestone	24.2	366.1	706.4	35.5	59.5	***558.9***	559	0	0	307	34.2
614.30	0.20			Limestone	24.2	366.1	730.6	35.5	59.5	***594.4***	594	0	0	327	34.4
614.10	0.20			Limestone	24.2	366.1	754.8	35.5	59.5	***629.9***	630	0	0	346	34.6
613.90	0.20			Limestone	24.2	366.1	778.9	35.5	59.5	***665.3***	665	0	0	366	34.8
613.70	0.20			Limestone	24.2	366.1	803.1	35.5	59.5	***700.8***	701	0	0	385	35
613.50	0.20			Limestone	24.2	366.1	827.3	35.5	59.5	***736.2***	736	0	0	405	35.2
613.30	0.20			Limestone	24.2	366.1	851.4	35.5	59.5	***771.7***	772	0	0	424	35.4
613.10	0.20			Limestone	24.2	366.1	875.6	35.5	59.5	***807.2***	807	0	0	444	35.6
612.90	0.20			Limestone	24.2	366.1	899.8	35.5	59.5	***842.6***	843	0	0	463	35.8
612.70	0.20			Limestone	24.2	366.1	923.9	35.5	59.5	***878.1***	878	0	0	483	36
612.50	0.20			Limestone	24.2	366.1	948.1	35.5	59.5	***913.5***	914	0	0	502	36.2
612.30	0.20			Limestone	24.2	366.1	972.3	35.5	59.5	***949.0***	~~949~~	~~*0*~~	~~*0*~~	~~*522*~~	~~*36.4*~~
612.10	0.20			Limestone	24.2	366.1	996.4	35.5	59.5	***984.5***	~~984~~	~~*0*~~	~~*0*~~	~~*541*~~	~~*36.6*~~
611.90	0.20			Limestone		366.1			59.5						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 2
REFERENCE BORING ========== BH 18
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 649.13 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 645.13 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 12743 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 926.76 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 347.54 KIPS

PILE TYPE AND SIZE ========== Steel HP 14 X 102
Plugged Pile Perimeter========== 4.800 FT. Unplugged Pile Perimeter========== 7.058 FT.
Plugged Pile End Bearing Area========== 1.439 SQFT. Unplugged Pile End Bearing Area===== 0.208 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Borin	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
810 KIPS	**810** KIPS	**445** KIPS	**43** FT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
643.63	1.50		16	Hard Till	1.3		27.1	1.8		***5.6***	6	0	0	3	6
641.13	2.50		21	Hard Till	2.7	25.8	81.9	4.0	3.7	***17.2***	17	0	0	9	8
638.63	2.50		39	Hard Till	5.3	77.9	68.5	7.8	11.3	***22.3***	22	0	0	12	11
636.13	2.50		22	Hard Till	2.9	59.2	68.7	4.2	8.6	***26.1***	26	0	0	14	13
633.63	2.50		21	Hard Till	2.7	56.5	82.2	4.0	8.2	***31.7***	32	0	0	17	16
631.13	2.50		25	Hard Till	3.3	67.2	80.1	4.8	9.7	***35.8***	36	0	0	20	18
628.63	2.50		23	Hard Till	3.0	61.8	64.3	4.4	9.0	***37.5***	37	0	0	21	21
626.13	2.50		16	Hard Till	2.1	43.0	66.3	3.1	6.2	***40.5***	41	0	0	22	23
623.63	2.50		16	Hard Till	2.1	43.0	60.4	3.1	6.2	***42.4***	42	0	0	23	26
621.13	2.50		13	Hard Till	1.7	35.0	62.1	2.5	5.1	***44.9***	45	0	0	25	28
618.63	2.50		13	Hard Till	1.7	35.0	85.3	2.5	5.1	***50.6***	51	0	0	28	31
616.13	2.50		21	Hard Till	2.7	56.5	74.6	4.0	8.2	***52.6***	53	0	0	29	33
613.63	2.50		16	Hard Till	2.1	43.0	90.1	3.1	6.2	***57.7***	58	0	0	32	36
612.13	1.50		21	Hard Till	1.6	56.5	91.8	2.4	8.2	***60.1***	60	0	0	33	37
610.63	1.50		21	Hard Till	1.6	56.5	395.4	2.4	8.2	***106.2***	106	0	0	58	39
610.43	0.20			Limestone	23.9	358.5	419.4	35.2	51.9	***141.4***	141	0	0	78	38.7
610.23	0.20			Limestone	23.9	358.5	443.3	35.2	51.9	***176.6***	177	0	0	97	38.9
610.03	0.20			Limestone	23.9	358.5	467.2	35.2	51.9	***211.8***	212	0	0	116	39.1
609.83	0.20			Limestone	23.9	358.5	491.1	35.2	51.9	***246.9***	247	0	0	136	39.3
609.63	0.20			Limestone	23.9	358.5	515.0	35.2	51.9	***282.1***	282	0	0	155	39.5
609.43	0.20			Limestone	23.9	358.5	539.0	35.2	51.9	***317.3***	317	0	0	174	39.7
609.23	0.20			Limestone	23.9	358.5	562.9	35.2	51.9	***352.4***	352	0	0	194	39.9
609.03	0.20			Limestone	23.9	358.5	586.8	35.2	51.9	***387.6***	388	0	0	213	40.1
608.83	0.20			Limestone	23.9	358.5	610.7	35.2	51.9	***422.8***	423	0	0	233	40.3
608.63	0.20			Limestone	23.9	358.5	634.6	35.2	51.9	***457.9***	458	0	0	252	40.5
608.43	0.20			Limestone	23.9	358.5	658.5	35.2	51.9	***493.1***	493	0	0	271	40.7
608.23	0.20			Limestone	23.9	358.5	682.5	35.2	51.9	***528.3***	528	0	0	291	40.9
608.03	0.20			Limestone	23.9	358.5	706.4	35.2	51.9	***563.5***	563	0	0	310	41.1
607.83	0.20			Limestone	23.9	358.5	730.3	35.2	51.9	***598.6***	599	0	0	329	41.3
607.63	0.20			Limestone	23.9	358.5	754.2	35.2	51.9	***633.8***	634	0	0	349	41.5
607.43	0.20			Limestone	23.9	358.5	778.1	35.2	51.9	***669.0***	669	0	0	368	41.7
607.23	0.20			Limestone	23.9	358.5	802.0	35.2	51.9	***704.1***	704	0	0	387	41.9
607.03	0.20			Limestone	23.9	358.5	826.0	35.2	51.9	***739.3***	739	0	0	407	42.1
606.83	0.20			Limestone	23.9	358.5	849.9	35.2	51.9	***774.5***	774	0	0	426	42.3
606.63	0.20			Limestone	23.9	358.5	873.8	35.2	51.9	***809.7***	810	0	0	445	42.5
606.43	0.20			Limestone	23.9	358.5	897.7	35.2	51.9	***844.8***	~~845~~	*~~0~~*	*~~0~~*	*~~465~~*	*~~42.7~~*
606.23	0.20			Limestone	23.9	358.5	921.6	35.2	51.9	***880.0***	~~880~~	*~~0~~*	*~~0~~*	*~~484~~*	*~~42.9~~*
606.03	0.20			Limestone		358.5			51.9						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 2
REFERENCE BORING ========== BH 18
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 649.13 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 645.13 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 12743 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 110.00 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE 1
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 926.76 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 347.54 KIPS

PILE TYPE AND SIZE ========== Steel HP 14 X 117
Plugged Pile Perimeter========== 4.850 FT. Unplugged Pile Perimeter========== 7.117 FT.
Plugged Pile End Bearing Area========== 1.469 SQFT. Unplugged Pile End Bearing Area===== 0.239 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req.d Bearing of Borin	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
929 KIPS	**859** KIPS	**472** KIPS	**43** FT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
643.63	1.50		16	Hard Till	1.3		27.6	1.9		***6.1***	6	0	0	3	6
641.13	2.50		21	Hard Till	2.8	26.4	83.6	4.1	4.3	***18.9***	19	0	0	10	8
638.63	2.50		39	Hard Till	5.4	79.5	69.8	7.9	12.9	***23.7***	24	0	0	13	11
636.13	2.50		22	Hard Till	2.9	60.4	70.0	4.3	9.8	***27.5***	27	0	0	15	13
633.63	2.50		21	Hard Till	2.8	57.7	83.7	4.1	9.4	***33.3***	33	0	0	18	16
631.13	2.50		25	Hard Till	3.3	68.6	81.6	4.8	11.2	***37.3***	37	0	0	21	18
628.63	2.50		23	Hard Till	3.0	63.1	65.4	4.5	10.3	***38.6***	39	0	0	21	21
626.13	2.50		16	Hard Till	2.1	43.9	67.5	3.1	7.1	***41.7***	42	0	0	23	23
623.63	2.50		16	Hard Till	2.1	43.9	61.4	3.1	7.1	***43.5***	43	0	0	24	26
621.13	2.50		13	Hard Till	1.7	35.7	63.1	2.5	5.8	***46.0***	46	0	0	25	28
618.63	2.50		13	Hard Till	1.7	35.7	86.8	2.5	5.8	***52.1***	52	0	0	29	31
616.13	2.50		21	Hard Till	2.8	57.7	75.8	4.1	9.4	***53.9***	54	0	0	30	33
613.63	2.50		16	Hard Till	2.1	43.9	91.7	3.1	7.1	***59.3***	59	0	0	33	36
612.13	1.50		21	Hard Till	1.7	57.7	93.3	2.4	9.4	***61.7***	62	0	0	34	37
610.63	1.50		21	Hard Till	1.7	57.7	403.4	2.4	9.4	***114.3***	114	0	0	63	39
610.43	0.20			Limestone	24.2	366.1	427.6	35.5	59.5	***149.8***	150	0	0	82	38.7
610.23	0.20			Limestone	24.2	366.1	451.7	35.5	59.5	***185.2***	185	0	0	102	38.9
610.03	0.20			Limestone	24.2	366.1	475.9	35.5	59.5	***220.7***	221	0	0	121	39.1
609.83	0.20			Limestone	24.2	366.1	500.1	35.5	59.5	***256.2***	256	0	0	141	39.3
609.63	0.20			Limestone	24.2	366.1	524.2	35.5	59.5	***291.6***	292	0	0	160	39.5
609.43	0.20			Limestone	24.2	366.1	548.4	35.5	59.5	***327.1***	327	0	0	180	39.7
609.23	0.20			Limestone	24.2	366.1	572.6	35.5	59.5	***362.5***	363	0	0	199	39.9
609.03	0.20			Limestone	24.2	366.1	596.7	35.5	59.5	***398.0***	398	0	0	219	40.1
608.83	0.20			Limestone	24.2	366.1	620.9	35.5	59.5	***433.5***	433	0	0	238	40.3
608.63	0.20			Limestone	24.2	366.1	645.1	35.5	59.5	***468.9***	469	0	0	258	40.5
608.43	0.20			Limestone	24.2	366.1	669.2	35.5	59.5	***504.4***	504	0	0	277	40.7
608.23	0.20			Limestone	24.2	366.1	693.4	35.5	59.5	***539.9***	540	0	0	297	40.9
608.03	0.20			Limestone	24.2	366.1	717.6	35.5	59.5	***575.3***	575	0	0	316	41.1
607.83	0.20			Limestone	24.2	366.1	741.7	35.5	59.5	***610.8***	611	0	0	336	41.3
607.63	0.20			Limestone	24.2	366.1	765.9	35.5	59.5	***646.2***	646	0	0	355	41.5
607.43	0.20			Limestone	24.2	366.1	790.1	35.5	59.5	***681.7***	682	0	0	375	41.7
607.23	0.20			Limestone	24.2	366.1	814.2	35.5	59.5	***717.2***	717	0	0	394	41.9
607.03	0.20			Limestone	24.2	366.1	838.4	35.5	59.5	***752.6***	753	0	0	414	42.1
606.83	0.20			Limestone	24.2	366.1	862.6	35.5	59.5	***788.1***	788	0	0	433	42.3
606.63	0.20			Limestone	24.2	366.1	886.7	35.5	59.5	***823.5***	824	0	0	453	42.5
606.43	0.20			Limestone	24.2	366.1	910.9	35.5	59.5	***859.0***	859	0	0	472	42.7
605.93	0.50			Limestone	60.4	366.1	971.3	88.7	59.5	***947.7***	~~948~~	~~*0*~~	~~*0*~~	~~*521*~~	~~*43.2*~~
605.43	0.50			Limestone		366.1			59.5						

EXHIBIT G

MINE MAP

ILLINOIS STATE GEOLOGICAL SURVEY
PRAIRIE RESEARCH INSTITUTE

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

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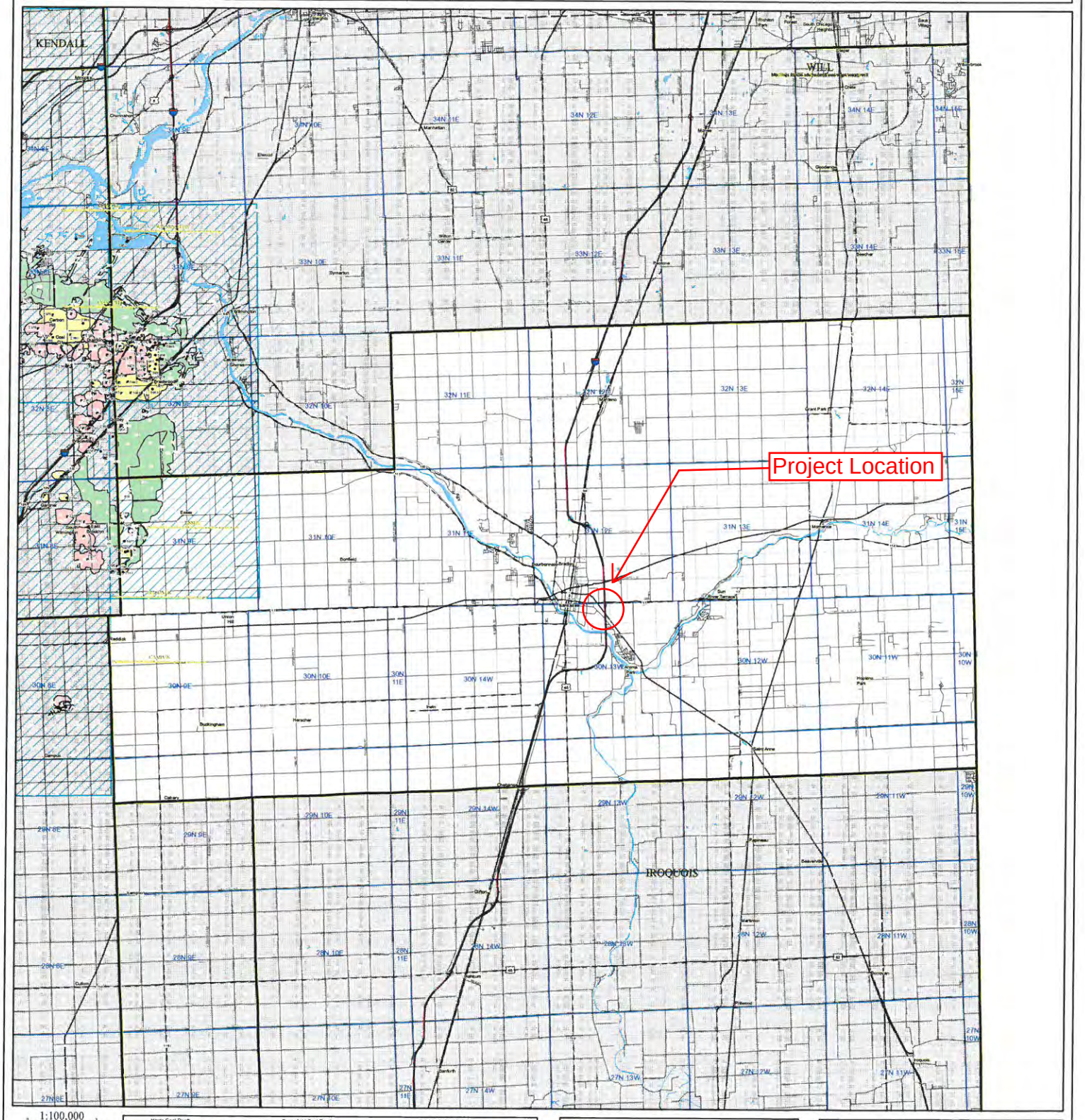
Coal Mines and Underground Industrial Mines
KANKAKEE
County

County Coal Map Series
ISGS Coal Section
Map construction: January 28, 2015

This product is under review and may not meet the standards of the Illinois State Geological Survey.

County coal maps and select quadrangle maps available as downloadable PDF files at http://www.isgs.illinois.edu/



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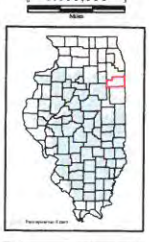

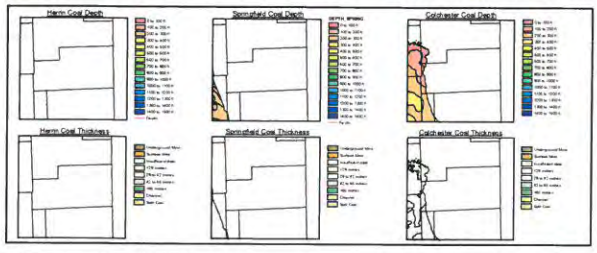

County
Township
Section
Quadrangle study (Available on Website)
Lake or river
Coal mine - active
Underground coal mine - abandoned
Surface coal mine - abandoned
Indefinite underground coal mine boundary - abandoned
Underground industrial mine and surrounding buffer region
Coal mine index number (polygon label, point label)

Opening type unknown
Uncertain location
Active surface tipple
Abandoned surface tipple
Active shaft
Abandoned shaft
Active slope
Abandoned slope
Active drift
Abandoned drift
Underground industrial mine entrance or general location

Map Explanation

This map accompanies the coal mines directory for this county. Please consult the directory for an explanation of the coal mine information shown on this map. Buffer regions for industrial minerals mines were incorporated into this map due to limited information regarding these mines. The size of the buffer region is dependent on the uncertainty or inaccuracy of the mine location. For more information regarding industrial mineral mines please contact the ISGS Industrial Minerals Section.

The maps and digital files used for this study were compiled from data obtained from a variety of public and private sources and have varying degrees of completeness and accuracy. They present reasonable interpretations of the geology of the area and are based on available data. These data were compiled and digitized at a scale of 1:62,500. Locations of some features may be offset by 500 feet or more due to errors in the original source maps, the compilation process, digitizing, or a combination of these factors.

These data are not intended for use in site-specific screening or decision-making. Data included in this map are suitable for use at a scale of 1:100,000.

Disclaimer

The Illinois State Geological Survey and the University of Illinois make no guarantee, expressed or implied, regarding the correctness of the interpretations presented in this data set and accept no liability for the consequences of decisions made by others on the basis of the information presented here.