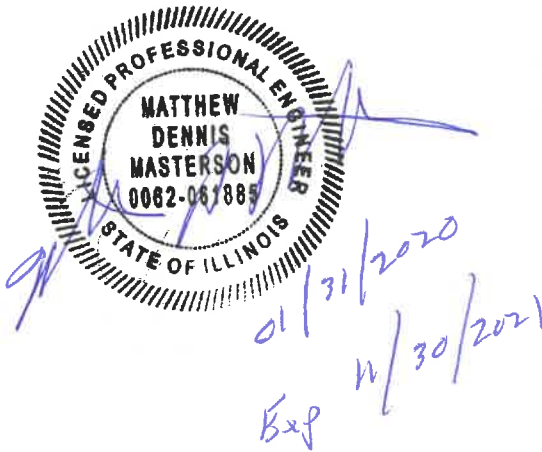


STRUCTURE GEOTECHNICAL REPORT

**KANKAKEE, BEAVERVILLE, & SOUTHERN
RR (KBSR) over I-57**

Proposed S.N. 046-9904

**F.A.I. ROUTE 57 (I-57)
SECTION (43) HB-5
KANKAKEE COUNTY, ILLINOIS
JOB NO. P-93-065-02
CONTRACT NO. 66863
PTB 159/20
KEG NO. 11-1017.00**



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EXECUTIVE SUMMARY

Kankakee, Beaverville & Southern RR (KBSR) over I-57

F.A.I. Route 57 (I-57)

Section (43) HB-5

Kankakee County, Illinois

Job No. P-93-065-02

PTB 159/20

Proposed Structure No. 046-9904

The project consists of a complete replacement of an existing two-span structure with a new two-span structure carrying KB & S Railroad over I-57. Along with the structure replacement will be the construction of two new soldier pile retaining walls and various cut-slopes along the proposed I-57 in Kankakee County, Illinois. This report summarizes the analysis of the proposed replacement structure, retaining walls and slopes.

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Exhibit A – Location Map
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1.0 PROJECT DESCRIPTION AND PROPOSED STRUCTURE INFORMATION

1.1 Introduction

The geotechnical study summarized in this report was performed for the proposed structure replacement for the Kankakee, Beaverville and Southern Railroad (KBSR) over I-57 and associated retaining walls in Kankakee County, Illinois. The purpose of this report is to present design and construction recommendations for the proposed structure and walls.

1.2 Project Description

The project consists of a complete replacement of an existing two-span structure with a new two-span structure carrying the KBSR over I-57. In addition to the structure, will be the construction of two retaining walls parallel to the outer lanes of I-57 on the east and west sides in Kankakee County, Illinois. The general location of the structure and walls are shown in Exhibit A, Location Map. The site lies within the limits of the Second Principal Meridian, (T. 30N R. 13W Section 4) within the Kankakee Plain of the Till Plains section of the Central Lowland Province.

1.3 Existing Structure

The existing structure (SN 046-0005) is a two-span structure, with a vertical clearance of 16 ft. - 3 in. over I-57. The existing structure is a continuous deck plate girder structure with a steel floor plate that supports ballast, timber ties, and tracks. It consists of two-spans at 65 ft. - 0.25 in. center to center of bearings. The out-to-out width is 20 ft., and the back-to-back of abutment length is 143 ft. Reinforced concrete parapets line the outside of the superstructure. The structure is skewed 56-19' right forward in respect to the railroad centerline. Closed abutment with concrete slope-walls were used at each abutment. The center pier is reinforced concrete bearing on a spread footing on rock. The abutments included 59 ft. long wing-walls which are aligned parallel with I-57. All of the substructure units are founded on spread footings.

1.4 Proposed Bridge Information

The proposed two-span structure, located at Station 13045+83.06 on the KBSR and Station 216+17.49 on I-57, will be built on a 45° skew from the centerline of the pier, and a 55° skew from the centerline of the northbound and southbound I-57 lanes. The structure will measure approximately 322 ft. - 4.75 in. back-to-back of the abutments. Each span will be approximately 150 ft.- 6.5 in., from centerline of abutment to centerline of pier with an overall width of 27 ft. Abutments and piers will be constructed on drilled shafts, and the retaining walls will be constructed as soldier pile walls. The proposed improvements are shown Exhibit B, Type, Size, and Location plan (TS&L).

2.0 SITE INVESTIGATION, SUBSURFACE EXPLORATION, AND GENERALIZED SUBSURFACE CONDITIONS

The site investigation plan was developed by Illinois Department of Transportation (IDOT) and Kaskaskia Engineering Group, LLC (KEG). All exploratory borings, site observations relative to current conditions of the structure, its surroundings and all soil sampling and testing was performed by IDOT.

Twenty-eight (28) Standard Penetration Test (SPT) borings were completed for this structure and walls. Ten (10) SPT borings, designated BH 42, BH 43, BH 46, BH 47, BH 49, BH 50, BH 51, BH

53, BH 54, and BH 55 were drilled between September 4, 2013 and February 19, 2014. Eighteen (18) additional borings designated B 201, B 202, B 203, B 204, B 205, B 205A, B 206, B 207, B 208, B 209, B 210, B 211, B 212, B 213, B 214, B 214A, B 215, B 216 were drilled between September 14, 2017 and December 21, 2017. The borings are summarized by structure location in Table 2.1 - Boring Summary and 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 in Exhibit C, Boring Logs. A soil profile can be found under Exhibit D, Subsurface Profile.

Table 2.1 - Boring Summary

Boring	Structure	Station	Offset	Ground Surface Elevation
B 205	East Abutment	216+74	60.0 LT	657.53
B 205A	East Abutment	217+09	56.0 LT	657.67
BH 51	Ramp C Wall	214+80.47	31.2 LT	638.19
BH 53	Ramp C Wall	216+96.85	28.6 LT	637.29
BH 54	Ramp C Wall	217+91.07	31.3 LT	636.62
BH 55	Ramp C Wall	218+84.08	32.9 LT	636.13
B 204	Ramp C Wall	218+80	120.0 LT	657.59
B 206	Ramp C Wall	215+49	55.0 LT	641.12
B 201	Ramp C Cut Slope	222+56	118.0 LT	646.00
B 202	Ramp C Cut Slope	221+07	115.0 LT	647.36
B 203	Ramp C Cut Slope	219+96	124.0 LT	652.33
BH 42	Pier	215+58.85	8.6 RT	637.67
BH 43	Pier	216+52.35	0.8 LT	637.52
B 207	Pier	215+76.97	5.3 LT	637.59
BH 46	Ramp D Wall	212+93.44	42.4 RT	641.67
BH 47	Ramp D Wall	213+77.83	39.3 RT	639.61
BH 49	Ramp D Wall	216+04.47	36.9 RT	637.21
BH 50	Ramp D Wall	216+84.43	39.7 RT	636.55
B 211	Ramp D Wall	218+03	113.0 RT	658.03
B 212	Ramp D Wall	217+28.22	32.7 RT	636.46
B 213	Ramp D Wall	216+26.76	32.0 RT	636.95
B 215	Ramp D Wall	213+91.80	33.3 RT	639.96
B 216	Ramp D Wall	212+98.75	34.6 RT	641.66
B 208	Ramp D Cut Slope	222+58	138.0 RT	663.03
B 209	Ramp D Cut Slope	221+11	134.0 RT	662.22
B 210	Ramp D Cut Slope	219+54	118.0 RT	662.85
B 214	West Abutment	215+18	77.0 RT	658.06
B 214A	West Abutment	214+97	68.0 RT	658.39

2.1 Subsurface Conditions

Borings BH 51, BH 53, BH 54, BH 55, B 201, B 202, B 203, B 204, B 205, B 205A and B 206 are all associated with the East Abutment, Ramp C retaining wall, and the Ramp C cut-slopes.

Boring B 205 was drilled near the East Abutment and consisted of stiff, sandy, clay loam till from the ground surface (El. 657.53) to El. 649.53, with a driving resistance (N-value) ranging from 5

to 10 blows per foot (bpf), penetrometer values of 2.0 to 2.5 tons per square foot (tsf) and moisture contents of 21 to 23 percent. A stiff to very stiff silty clay followed to El. 636.03, with N-values ranging from 8 to 11 bpf, unconfined compressive strength (Qu) values between 1.7 and 3.3 tsf, and moisture contents from 13 to 15 percent. A very stiff to hard clay loam till followed to El. 621.03 with N-values of 10 to 17 bpf, Qu's of 3.1 to 6.6 tsf and moisture contents of 14 to 23 percent. Very weathered limestone followed to auger refusal of the boring at El. 618.53, with an N-value of 100 blows/4.5-inches of penetration. The weathered limestone had a moisture content of 10 percent. A rock core was obtained below auger refusal to a termination elevation of El. 601.53. The bedrock consisted of dolostone with thin shale partings. RQD ranged from 5 to 40 and Recovery was 100 percent. Rock unconfined compression strengths of the dolostone ranged from 269 to 514 tsf.

Boring B 205A was drilled near the East Abutment and was not documented through the overburden to auger refusal at El. 619.17. This boring did not continue with rock coring.

Boring BH 51 was drilled near the Ramp C wall and consisted of bituminous shoulder and silty clay loam till from ground surface (El. 638.19) to El. 635.69. A very stiff silty clay till followed to El. 626.19, with N-values between 5 to 11 bpf, Qu values from 2.8 to 3.5 tsf, and moisture contents from 20 to 23 percent. A very stiff to hard silty clay loam till followed to El. 616.19, with N-values between 6 to 23 bpf, Qu values from 3.4 to 6.7 tsf, and moisture contents from 13 to 16 percent. A dense limestone that is weathered followed until boring termination at El. 615.44, with an N-value of 100 blows/3-in.

Boring BH 53 was drilled near the Ramp C wall and consisted of bituminous shoulder and silty clay loam fill from ground surface (El. 637.29) to El. 634.79. A small layer of very stiff silty clay loam fill followed until El. 633.29, with an N-value of 9 bpf, a Qu value of 2.5 tsf, and a moisture content of 12 percent. A very stiff to hard silty clay till followed to El. 625.79, with N-values between 9 to 12 bpf, Qu values from 3.1 to 4.3 tsf, and moisture contents from 21 to 22 percent. A hard silty clay loam till followed to El. 619.79, with N-values from 13 to 20 bpf, Qu values from 4.4 to 6.1 tsf, and moisture contents from 13 to 14 percent. A dense limestone that is fractured and weathered followed until boring termination at El. 618.87, with an N-value of 100 blows/5-in. and a moisture content of 11 percent.

Boring BH 54 was drilled near the Ramp C wall and consisted of bituminous shoulder and silty clay loam fill from ground surface (El. 636.62) to El. 634.12. A very stiff silty clay till followed until El. 626.62, with N-values ranging from 5 to 7 bpf, Qu values from 2.1 to 2.7 tsf, and moisture contents from 23 to 24 percent. A hard silty clay loam till followed until El. 619.12, with N-values ranging from 11 to 26 bpf, Qu values from 4.0 to 5.7 tsf, and moisture contents from 12 to 16 percent. Dense limestone, weathered at the surface, followed until boring termination at El. 618.37, with an N-value of 100 blow/3-in. and a moisture content of 8 percent.

Boring BH 55 was drilled near the Ramp C wall and consisted of bituminous shoulder and fill sand from ground surface (El. 636.13) to El. 631.13. A loose fill sand followed to El. 628.63, with an N-value of 5 bpf, and a moisture content of 22 percent. A very stiff silty clay till followed to El. 626.63, with an N-value of 7 bpf, a Qu value of 3.0 tsf, and a moisture content of 16 percent. A hard silty clay loam till followed to El. 621.13, with N-values ranging from 15 to 65 bpf, Qu values between 4.5 to 8.1 tsf, and moisture contents from 8 to 13 percent. A dense limestone was encountered until boring termination at El. 620.88, with an N-value of 100 blows/3-in. and a moisture content of 4 percent.

Boring B 204 was drilled near the Ramp C wall and consisted of 12-inches of topsoil from the ground surface (El. 657.59) to El. 656.59. A very stiff clay loam till followed to El. 651.09, with N-values ranging from 8 to 9 bpf, penetrometer values of 3.5 tsf and moisture contents of 23 to 24 percent. A very stiff silty clay/clay followed to El. 628.59, with N-values ranging from 7 to 18 bpf, Q_u values between 2.3 and 6.2 tsf, and moisture contents from 19 to 27 percent. A very stiff clay loam till followed to El. 623.59 with auger refusal on bedrock, with a N-value of 14 bpf, a penetrometer value of 4.5 tsf and a moisture content of 13 percent. The bedrock surface had an N-value of 50 blows/1-inch of penetration and a moisture content of 12 percent. Rock core was obtained below auger refusal in two runs to a termination elevation of El. 613.59. The bedrock consisted of dolostone with thin shale partings. RQD ranged from 14 to 21 and Recovery was 94 to 100 percent. Rock unconfined compression strengths of the dolostone ranged from 110 to 181 tsf.

Boring B 206 was drilled near the Ramp C wall and consisted of 6-inches of topsoil from the ground surface (El. 641.12) to El. 640.62. A stiff silty clay followed to El. 636.62, with N-values ranging from 6 to 7 bpf, Q_u values of 1.7 to 2.9 tsf and moisture contents of 21 percent. A very stiff clay followed to El. 625.62, with N-values ranging from 8 to 12 bpf, Q_u values between 2.9 and 3.3 tsf, and moisture contents from 20 to 23 percent. A stiff clay till followed to El. 620.62, with N-values of 15 to 16 bpf, a penetrometer reading of 2.0 tsf and a Q_u of 2.3 tsf and moisture contents of 15 percent. Layers of very weathered dolostone with silt and sand followed to El. 615.12. N-values ranged from 33 to 77 bpf, with moisture contents of 10 to 12 percent. The boring continued to auger refusal in bedrock at El. 613.62. Rock core was obtained below auger refusal in one run to a termination elevation of El. 602.62. The bedrock consisted of dense dolostone with closed joints. RQD was 58 and Recovery was 100 percent. Rock unconfined compression strengths of the dolostone ranged from 259 to 617 tsf.

Boring B 201 was drilled near the Ramp C cut-slope and consisted of 6-inches of crushed stone roadway from the ground surface (El. 646.00) to El. 645.50. A very stiff silty clay till followed to El. 643.00, with an N-value of 14 bpf, a Q_u of 4.1 tsf and a moisture content of 15 percent. A very stiff clay with a few rocks followed to El. 630.50, with N-values ranging from 7 to 11 bpf, Q_u values between 2.7 and 3.5 tsf, and moisture contents from 19 to 22 percent. A hard silty clay till followed to El. 628.00, with a N-value of 21 bpf, a Q_u of 7.0 tsf and a moisture content of 12 percent. Very weathered limestone followed to termination of the boring at El. 627.00, with an N-value of 75 blows/2-inches of penetration. The weathered limestone had a moisture content of 7 percent.

Boring B 202 was drilled near the Ramp C cut-slope and consisted of 6-inches of crushed stone roadway from the ground surface (El. 647.36) to El. 646.86. A very stiff silty clay till followed to El. 640.86, with N-values ranging from 9 to 12 bpf, Q_u values from 3.3 to 3.9 tsf, and moisture contents of 17 to 19 percent. A very stiff clay with a few rocks followed to El. 627.86, with N-values ranging from 8 to 11 bpf, Q_u values between 2.3 and 4.3 tsf, and moisture contents from 16 to 24 percent. A very stiff silty clay till followed to termination of the boring at El. 625.86, with N-values of 12 bpf to 57 blows per 1-inch of penetration, and a moisture content of 15 percent.

Boring B 203 was drilled near the Ramp C cut-slope and consisted of 12-inches of topsoil from the ground surface (El. 652.33) to El. 651.33. A very stiff silty clay with roots and organics followed to El. 646.83, with N-values ranging from 12 to 14 bpf, Penetrometer values of 2.5 to 4.5 tsf and moisture contents of 25 to 30 percent. A very stiff clay followed to El. 629.33, with N-values ranging from 7 to 13 bpf, Q_u values between 2.3 and 3.5 tsf, and moisture contents from 18 to 24 percent. A silty clay till followed to El. 625.33, with a N-value of 14 bpf, a penetrometer of 4 tsf and a moisture content of 12 percent. Unidentified bedrock followed to termination of the boring

at El. 623.33, with an N-values ranging from 50 blows/1 inch to 100 blows/5 inches of penetration. The bedrock had a moisture content of 6 percent.

Boring BH 42 was located near the Pier and consisted of bituminous shoulder from ground surface (El. 637.67) to El. 635.17. A stiff to very stiff sand fill and silty clay fill followed to El. 632.67, with a driving resistance (N-value) of 6 bpf, a Q_u of 2.0 tons per square foot (tsf), and a moisture content of 15 percent. A very stiff to hard silty clay loam/silty clay till followed to El. 625.67, with N-values between 6 to 13 bpf, Q_u values between 3.1 to 4.5 tsf, and moisture contents from 18 to 23 percent. A hard silty clay loam till with larger gravel pieces followed to El. 617.67, with N-values between 12 to 22 bpf, Q_u values between 4.9 to 7.3 tsf, and moisture contents from 14 to 15 percent. A weathered, reworked limestone followed until auger refusal at El. 616.25, with an N-value of 100 blows/5-inches of penetration and a moisture content of 9 percent.

Boring BH 43 was located near the Pier and consisted of bituminous shoulder and concrete, with silty clay loam fill from ground surface (El. 637.52) to El. 635.02. A very stiff silty clay/silty clay loam till followed to El. 625.52, with N-values between 7 to 11 bpf, Q_u values from 2.1 to 3.5 tsf, and with moisture contents from 17 to 20 percent. A very stiff to hard silty clay loam till with larger gravel pieces followed until El. 617.52, with N-values ranging from 13 to 61 bpf, Q_u values from 4.1 to 7.8 tsf, and with moisture contents from 12 to 14 percent. Weathered and reworked limestone followed until auger refusal at El. 615.52, with an N-value of 102 bpf and a moisture content of 11 percent.

Boring B 207 was located near the Pier and was not documented through the overburden to auger refusal at El. 615.59. A rock core was obtained below auger refusal in three 5-foot runs to a termination elevation of El. 600.59. The bedrock consisted of highly fractured dolomite in the upper four feet with an RQD of 0 and Recovery of 70 percent. The dolomite then transitioned to a dense limestone with vertical and horizontal fracturing and tight joints to termination. The RQD of the limestone ranged from 47 to 90 and Recovery was 100 percent for the last two 5-foot runs to termination. Rock unconfined compression strengths of the dense limestone ranged from 79 to 1,216 tsf.

Borings BH 46, BH 47, BH 49, BH 50, B 208, B 209, B 210, B 211, B 212, B 213, B 214, B 214A, B 215, and B 216 are all associated with the Ramp D retaining wall, Ramp D cut-slopes and the West Abutment of the bridge.

Boring BH 46 was drilled near the Ramp D wall and consisted of bituminous shoulder, silty clay/silty clay loam fill from ground surface (El. 641.67) to El. 639.17. A hard silty clay/silty clay loam fill followed to El. 636.67, with an N-value of 16 bpf and a moisture content of 25 percent. A stiff silty clay/clay followed to El. 627.17, with N-values ranging from 5 to 9 bpf, Q_u values from 1.5 to 2.0 tsf, and moisture contents from 22 to 33 percent. A very stiff clay till followed until El. 624.17, with an N-value of 10 bpf, a Q_u value 2.5 tsf, and a moisture content of 19 percent. A hard to very stiff sandy clay loam/sandy loam till with limestone fragments followed to El. 621.67, with an N-value of 12 bpf, a penetrometer value of 4.0 tsf, and a moisture content of 13 percent. Hard clay, silty clay, and silt followed to El. 611.17, with N-values ranging from 22 to 30 bpf, Q_u values between 4.9 and 6.7 tsf, and moisture contents from 16 to 18 percent. A limestone surface followed to boring termination at El. 610.92, with an N-value of 100blows/3 inches and a moisture content of 9 percent.

Boring BH 47 was drilled near the Ramp D wall and consisted of bituminous shoulder and silty clay loam fill from ground surface (El. 639.61) to El. 637.11. A hard to very stiff silty clay/clay followed to El. 625.11, with N-values ranging from 8 to 10 bpf, Q_u values between 3.4 to 4.6 tsf,

and moisture contents from 20 to 23 percent. A layer of very stiff sandy clay loam/sandy loam till followed until El. 622.61, with an N-value of 11 bpf, a Q_u value of 3.2 tsf, and a moisture content of 14 percent. A hard silty clay till with silty loam followed to El. 615.11, with N-values ranging from 26 to 45 bpf, Q_u values between 6.9 and 11.5 (max Rimac at 5 percent) tsf, and moisture contents from 16 to 19 percent. A hard clay, silty clay, silt, with till layers followed to El. 612.11, with an N-value of 33 bpf, a Q_u value of 7.1 tsf, and a moisture content of 14 percent. A rock assumed to be limestone, followed to boring termination at El. 611.94, with an N-value of 100 blows/2 inches.

Boring BH 49 was drilled near the Ramp D wall and consisted of bituminous shoulder and silty clay from ground surface (El. 637.21) to El. 634.71. A very stiff to hard silty clay/clay till followed to El. 622.71, with N-values ranging from 8 to 14 bpf, Q_u values from 3.4 to 4.1 tsf, and moisture contents from 17 to 20 percent. A hard silty clay loam till followed to El. 617.71, with N-values between 14 and 18 bpf, Q_u values from 4.0 to 4.1 tsf, and moisture contents from 13 to 15 percent. A small layer of loamy silt, gravel, and sand followed until El. 616.21. The limestone surface followed to boring termination at El. 616.04, with an N-value of 100 blows/2 inches and a moisture content of 8 percent.

Boring BH 50 was drilled near the Ramp D wall and consisted of bituminous shoulder and silty clay till from ground surface (El. 636.55) to El. 634.05. A hard to very stiff silty clay/clay till followed to El. 624.05, with N-values ranging between 7 and 8 bpf, Q_u values from 3.2 to 4.0 tsf, and moisture contents from 20 to 22 percent. A very stiff to hard silty clay loam till followed to El. 617.05, with N-values ranging between 7 to 11 bpf, Q_u values from 3.5 to 4.1 tsf, and moisture contents from 16 to 17 percent. Weathered and reworked dolomite/limestone followed to boring termination at El. 615.05, with an N-value of 102 bpf, and a moisture content of 14 percent.

Boring B 211 was drilled near the Ramp D wall and consisted of 12-inches of topsoil from the ground surface (El. 658.03) to El. 657.03. A very stiff silty clay loam followed to El. 650.03, with N-values ranging from 7 to 16 bpf, a penetrometer ready of 2.0 tsf and Q_u 's from 3.3 to 7.0 tsf and moisture contents of 22 percent. A very stiff clay/sandy clay till followed to El. 619.03 with N-values ranging from 6 to 16 bpf, Q_u 's of 1.2 to 7.6 tsf and moisture contents of 20 to 27 percent. Weathered/Fractured dolostone followed to termination of the boring at El. 618.03, with an N-value of 71 bpf and a moisture content of 4 percent.

Boring B 212 was drilled near the Ramp D wall and was not documented through the overburden to auger refusal at El. 616.46. A rock core was obtained below auger refusal in two 5-foot runs to a termination elevation of El. 606.46. The bedrock consisted of highly fractured limestone with loose joints. The RQD of the limestone ranged from 0 to 38 and Recovery was 87 to 100 percent. Rock unconfined compression strengths of the limestone ranged from 718.8 to 990.2 tsf.

Boring B 213 was drilled near the Ramp D wall and was not documented through the overburden to auger refusal at El. 613.95. A rock core was obtained below auger refusal to two 5-foot runs to a termination elevation of El. 603.95. The bedrock consisted of fractured limestone with loose joints. The RQD of the limestone ranged from 7 to 43 and Recovery was 80 to 100 percent. Rock unconfined compression strengths of the dense limestone ranged from 476.6 to 1,324.7 tsf.

Boring B 215 was drilled near the Ramp D wall and was not documented through the overburden to auger refusal at El. 612.96. A rock core was obtained below auger refusal in two 5-foot runs to a termination elevation of El. 602.96. The bedrock consisted of dense limestone with loose joints and shale. The RQD of the limestone was 13 and Recovery was 87 percent. The RQD of the shale was 58 and Recovery was 100 percent. Rock unconfined compression strengths of the

dense limestone ranged from 553.5 to 660.9 tsf. Rock unconfined compression strengths of the shale ranged from 544.0 to 913.1 tsf.

Boring B 216 was drilled near the Ramp D wall and was not documented through the overburden to auger refusal at El. 610.66. A rock core was obtained below auger refusal in two 5-foot runs to a termination elevation of El. 600.66. The bedrock consisted of dense limestone with loose joints and vertical fractures. The RQD of the limestone ranged from 22 to 41 and Recovery was 88 to 100 percent. Rock unconfined compression strengths of the dense limestone ranged from 824.5 to 1,086.2 tsf.

Boring B 208 was drilled near the Ramp D cut-slope and consisted of 18-inches of clay loam from the ground surface (El. 663.03) to El. 661.53. A very stiff silty clay followed to El. 655.03, with N-values ranging from 8 to 26 bpf, a penetrometer value of 4.5 tsf and Q_u 's of 2.3 to 3.3 tsf and moisture contents of 18 to 23 percent. A very stiff clay followed to El. 626.03, with N-values ranging from 9 to 20 bpf, Q_u values between 1.2 and 5.1 tsf, and moisture contents from 18 to 22 percent. A clay till followed to El. 621.53, with a N-value of 43 bpf, a penetrometer of 4.5 tsf and a moisture content of 15 percent. Weathered limestone followed to termination of the boring at El. 620.03, with an N-values of 50 blows per 1-inch of penetration.

Boring B 209 was drilled near the Ramp D cut-slope and consisted of 12-inches of topsoil from the ground surface (El. 662.22) to El. 661.22. A very stiff silty clay/clay followed to El. 639.22, with N-values ranging from 8 to 14 bpf, Q_u 's of 1.2 to 4.7 tsf and moisture contents of 15 to 20 percent. A very stiff clay till/clay followed to El. 621.22, with N-values ranging from 9 to 30 bpf, Q_u values between 2.5 and 4.3tsf, and moisture contents from 11 to 23 percent. Weathered bedrock followed to termination of the boring at El. 618.22, with an N-value of 50 blows/0.3 inches of penetration.

Boring B 210 was drilled near the Ramp D cut-slope and consisted of 12-inches of organic silty clay from the ground surface (El. 662.85) to El. 661.85. A very stiff silty clay/clay followed to El. 634.85, with N-values ranging from 7 to 15 bpf, Q_u 's of 1.2 to 4.7 tsf and moisture contents of 14 to 20 percent. A very stiff clay/sandy clay till followed to termination of the clay boring at El. 619.85 on bedrock. The clay had an N-value ranging from 10 to 12 bpf, Q_u 's of 1.7 to 4.1 tsf and a moisture content of 14 to 23 percent. The bedrock had an N-value of 54 blows/1.5-inches of penetration.

Boring B 214 was drilled near the West Abutment and consisted of 12-inches of topsoil with some cinders from the ground surface (El. 658.06) to El. 657.06. A very stiff to hard silty clay followed to El. 647.56, with N-values ranging from 8 to 20 bpf, Q_u values of 2.5 to 7.0 tsf and moisture contents of 17 to 22 percent. A very stiff clay followed to El. 626.06, with N-values ranging from 6 to 10 bpf, Q_u values between 1.7 and 4.5 tsf, and moisture contents from 19 to 27 percent. A very stiff to hard silty clay/till followed to El. 612.06 with N-values of 15 to 39 bpf, Q_u 's of 2.1 to 8.7 tsf and moisture contents of 10 to 12 percent. Weathered rock followed to auger refusal of the boring at El. 609.06, with an N-value of 50 blows/1.5 inches of penetration. The weathered limestone had a moisture content of 27 percent. Rock core was obtained below auger refusal in two runs to a termination elevation of El. 592.06. The bedrock consisted of dolostone with thin shale partings and closed joints. RQD ranged from 39 to 69 and Recovery was 100 percent. Rock unconfined compression strengths of the dolostone ranged from 396.0 to 773.0 tsf.

Boring B 214A was drilled near the West Abutment and was not documented through the overburden to auger refusal at El. 611.19, with an N-value of 55 blows per 1.5-inches of penetration. This boring did not continue with rock coring.

2.2 Groundwater

Groundwater was encountered in twelve of the twenty-eight borings. Table 2.2 shows the elevation that groundwater was encountered during drilling. It should be noted that the groundwater level is subject to seasonal and climatic variations. In addition, without extended periods of observation, measurement of true groundwater levels may not be possible.

Table 2.2 - Groundwater

Boring	First Encounter Elevation (ft.)	Upon Completion Elevation (ft.)
BH 42	Dry	617.7
BH 43	617.5	617.5
BH 47	615.6	618.6
BH 49	Dry	622.2
BH 50	616.6	620.6
BH 51	615.7	617.2
BH 53	619.8	621.3
BH 54	619.1	619.1
B 205A	--	620.7
B 210	620.9	620.9
B 214	609.6	609.6
B 214A	611.4	611.4

3.0 GEOTECHNICAL EVALUATIONS

3.1 Settlement

Since no significant grading or changes to the existing embankments are expected at the proposed structures, it is estimated that the existing embankments will experience settlements of less than 0.5 in. Therefore, no settlement calculations were performed for the proposed structure.

3.2 Slope Stability

The proposed construction will have retaining walls and cut slopes that face the highway along this section of the I-57 corridor passing under the proposed bridge. Retaining Walls C and D, both have maximum heights of less than 25 feet. The retaining walls and cut-slopes are all proposed to have 1 Vertical to 3 Horizontal (1V:3H) slopes on top of the walls up to the existing grades, or with no retaining walls and as cut slopes to the highway ditch grades. Slope stability analyses were performed near points of highest wall elevation for each proposed wall and for three of the highest cut-slope locations. SLOPE-W was used to analyze each case, along with the respective undrained soil properties near each wall or slope; and the wall and slope geometrics. Due to

subtle elevation differences, borings were combined in some cases near each area analyzed to develop the complete soil and rock stratigraphy profile for modeling purposes. In general, borings BH 47, B 203, B 204, B 205, B 210 B 211, B 212, B 214, and B 215, were all used to generate the profiles.

The end-of-construction (Undrained Condition) was analyzed for each wall and slope. A critical factor of safety (FOS) was calculated for each profile. According to current standards of practice, the target FOS is 1.5 for end-of-construction (Undrained Condition) for retaining wall stability and 1.7 for cut-slope stability based on field testing boring results.

In order to model the end-of-construction condition, undrained soil parameters were used with an internal friction angle of 0 degrees assumed for cohesive soils.

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 are shown in Table 3.1. SLOPE-W program output from this analysis can be found in Exhibit E, SLOPE-W Slope Stability Analysis.

Table 3.1 - Slope Stability Critical FOS

Location	Station	Reference Boring(s)	Undrained Condition FOS
Wall C	217+00 LT	B 205	5.8
Wall D	214+50 RT	BH 47, B 214, B 215	3.5
Cut-Slope Southbound I-57	218+50 RT	B 211, B 212	6.2
Cut-Slope Northbound I-57	220+00 LT	B 203, B 204	8.8
Cut-Slope Southbound I-57	220+00 RT	B 210, B 212	4.1

The results of the analysis, as provided in Table 3.1, indicate an acceptable FOS for the retaining walls and cut-slopes as currently proposed.

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. According to IDOT, seismic parameters and analyses are not necessary for structures in SPZ 1.

3.4 Scour

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

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 August 18, 2017, 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 Exhibit F, Illinois State Geological Survey Mine Map.

3.6 Liquefaction

A liquefaction analysis is not required to be performed since the project is in a Seismic Performance Zone 1 as per IDOT Bridge Manual and AGMU Memo 10.1-Liquefaction Analysis.

4.0 FOUNDATION EVALUATIONS AND DESIGN RECOMMENDATIONS

4.1 General Feasibility

Due to the depths to bedrock and anticipated foundation loads, drilled shafts appear applicable for support of the bridge substructures, including wing-walls. Drilled soldier piles appear

applicable for construction of the retaining walls. The IDOT Drilled Shaft Axial Capacity in Limestone or Dolomite spreadsheet, as provided by IDOT BBS Foundations and Geotechnical Unit, was used to estimate the capacities of drilled shafts of various diameters and socket depths, end bearing in competent bedrock.

Based on the plans provided by Lochmueller, we understand that the Ramp C retaining wall will run along the I-57 northbound shoulder from approximate Station 215+84.65 to Station 219+29.71, passing under the proposed bridge. The Ramp D retaining wall will run along the I-57 southbound shoulder from approximate Station 213+16.16 to Station 218+22.80. The soldier pile wall design shall be in accordance with the current applicable AASHTO Standard LRFD Specifications per IDOT. Tie-back reinforcement of portions of the soldier pile walls near the railroad bridge abutments, may be required due to potential impact of railroad surcharge loads, such as Cooper E-80 loads. Our recommendations are summarized below.

The preliminary design loads, as provided by Lochmueller are provided in Table 4.1.

Table 4.1 - Preliminary Design Loads

Substructure Unit	Factored Reactions (kips)
Abutments	3548.0
Pier	5047.0

4.2 Foundations on Drilled Shafts

The foundations supporting the proposed bridge must provide sufficient support to resist dead and live loads, including horizontal railroad forces.

Based off of the subsurface exploration, competent limestone and/or dolomite bedrock is generally encountered below elevation El. 609.0. Table 4.2 below lists Top of Rock and Top of Competent Rock, based off exploration and laboratory testing.

Table 4.2 - Estimated Bedrock Elevations

Substructure Unit	Reference Boring(s)	Top of Rock Depth-bgs (Ft)	Top of Rock Elevation (Ft)	Top of Competent Rock Elevation (Ft)
West Abutment	B 214	46	612.0	609.0
West Abutment	B 214A	47	611.2	--
Pier	B 207	22	615.6	610.6
Pier	BH 42	21.4	616.3	--
Pier	BH 43	22	615.5	--
East Abutment	B 205	36.5	621.0	611.5
East Abutment	B 205A	38.5	619.7	--

Recommendations for drilled shafts with varying sockets extending to various depths into the underlying competent limestone or dolostone, developing capacity from side and/or tip resistance, are provided for design support of the abutments and pier. The provided capacities are based on boring information as summarized in Table 4.2 above, laboratory unconfined compressive strength tests performed on rock core samples from Borings B 205, B 207, B 214 and utilizing the IDOT Drilled Shaft Axial Capacity in Limestone or Dolostone spreadsheet as provided by IDOT BBS Foundations and Geotechnical Unit. LRFD Resistance Factors of 0.55 for side resistance and 0.5 for tip resistance are incorporated into the allowable capacities, respectively.

Tables 4.3.1 thru 4.3.4 - Drilled Shaft Axial Capacity below contain a summary of Factored Shaft Resistances available for various socket diameters based on socket depths into the underlying limestone or dolomite for each substructure. IDOT Drilled Axial Capacity Input sheets and Design Tables are included in Exhibit G, for additional information.

Table 4.3.1 - Estimated Drilled Shaft Axial Capacity for 36-inch Diameter Socket

Substructure Unit	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips)	Factored Shaft Resistance Available (kips)	Nominal Shaft Resistance Available (kips)	Factored Shaft Resistance Available (kips)	Tip Elevation (ft.)
		TIP	TIP	SIDE	SIDE	
West Abutment B 214	5	2043	1021	616	339	607.0
	7	2231	1115	1232	678	605.0
	9	19356	9678	1848	1017	603.0
Pier B 207	7	2702	1351	131	72	608.6
	9	4221	2111	557	306	606.6
	11	4242	2121	1055	580	604.6
East Abutment B 205	11.5	1842	921	616	339	609.5
	13.5	2192	1096	1232	678	607.5
	15.5	18166	9083	1848	1017	605.5

Table 4.3.2 - Estimated Drilled Shaft Axial Capacity for 42-inch Diameter Socket

Substructure Unit	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE	Tip Elevation (ft.)
West Abutment B 214	5	2864	1432	719	395	607.0
	7	3254	1627	1438	791	605.0
	9	27640	13820	2157	1186	603.0
Pier B 207	7	3641	1820	153	84	608.6
	9	5763	2881	649	357	606.6
	11	5803	2902	1231	677	604.6
East Abutment B 205	11.5	2626	1313	719	395	609.5
	13.5	3042	1521	1438	791	607.5
	15.5	24726	12363	2157	1186	605.5

Table 4.3.3 - Estimated Drilled Shaft Axial Capacity for 48-inch Diameter Socket

Substructure Unit	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE	Tip Elevation (ft.)
West Abutment B 214	5	3823	1911	822	452	607.0
	7	4460	2230	1643	904	605.0
	9	5093	2547	2465	1356	603.0
Pier B 207	7	4769	2385	175	96	608.6
	9	7544	3772	742	408	606.6
	11	7609	3805	1407	774	604.6
East Abutment B 205	11.5	3547	1773	822	452	609.5
	13.5	4031	2015	1643	904	607.5
	15.5	4513	2257	2465	1356	605.5

Table 4.3.4 - Estimated Drilled Shaft Axial Capacity for 60-inch Diameter Socket

Substructure Unit	Socket Depth (ft.)	Nominal Shaft Resistance Available (kips) TIP	Factored Shaft Resistance Available (kips) TIP	Nominal Shaft Resistance Available (kips) SIDE	Factored Shaft Resistance Available (kips) SIDE	Tip Elevation (ft.)
West Abutment B 214	5	6607	3303	1027	565	607.0
	7	7424	3712	2054	1130	605.0
	9	8313	4156	3081	1694	603.0
Pier B 207	7	7483	3741	219	120	608.6
	9	11824	5912	928	510	606.6
	11	11954	5977	1758	967	604.6
East Abutment B 205	11.5	5794	2897	1027	565	609.5
	13.5	6423	3212	2054	1130	607.5
	15.5	7052	3526	3081	1694	605.5

It should be noted that as the diameter of the drilled shaft increases so does the potential for increased settlement.

4.4 Wall Design Parameters

The soil and rock parameters presented in Table 4.4 below, are recommended to be used for the design of Walls C and D. These parameters were calculated as per AASHTO Standard Specifications and were based on soil and rock properties from borings along the proposed walls.

Table 4.4 - Parameters for Soldier Pile Walls

Cohesive Soils											
Scenario	Θ (deg)	β (deg)	Φ (deg)	δ (deg)	γ (pcf)	S_u (psf)	K_a	K_o	K_p	K (pci)	ϵ_{50}
Interim Condition	90	18.4	0	0	125	3,250	1	1	1	1000	0.005
Permanent Condition	90	18.4	30	0	125	250	0.43	0.50	3.0	n/a	n/a
Bedrock											
Scenario	Θ (deg)	β (deg)	Φ (deg)	δ (deg)	γ (pcf)	S_u (psf)	K_a	K_o	K_p	K (pci)	ϵ_{50}
Permanent Condition	90	0	0	0	150	260,000	n/a	n/a	n/a	n/a	0.001

For design purposes the water table should be assumed to be at the bottom of the wall facing.

4.5 Lateral 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 4.5 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 4.5 - Soil Parameters for Lateral Pile Load Analysis

Boring	Elev. At Bottom of Layer	γ (pcf)	Short-term		Long-term		K (pci)	N	ϵ_{50}
			c'	Φ (deg)	c'	Φ (deg)			
BH 42 (Pier)	632.67	125	2000	0	100	26	500	6	0.007
	625.67	125	3833	0	100	28	1000	9	0.005
	617.67	125	5767	0	250	30	2000	17	0.004
BH 43 (Pier)	625.52	125	2875	0	100	28	1000	9	0.005
	617.52	125	5333	0	250	30	2000	30	0.004
BH 46 (West Wall)	636.67	125	2000	0	100	26	1000	16	0.005
	627.17	125	1750	0	100	26	500	8	0.007
	624.17	125	2500	0	250	30	1000	10	0.005
	621.67	125	4000	0	250	30	2000	12	0.005
	611.17	125	5800	0	250	30	2000	27	0.004
BH 47 (West Wall)	625.11	125	4000	0	100	26	1000	9	0.005
	622.61	125	3200	0	250	30	1000	11	0.005
	615.11	125	9633	0	250	30	2000	38	0.004
	612.11	125	7100	0	250	30	2000	33	0.004
BH 49 (West Wall)	622.71	125	3880	0	250	30	1000	12	0.005
	617.71	125	4050	0	250	30	2000	16	0.004
	616.21	120	0	30	0	30	N/A	100	N/A

Boring	Elev. At Bottom of Layer	γ (pcf)	Short-term		Long-term		K (pci)	N	ϵ_{50}
			c'	Φ (deg)	c'	Φ (deg)			
BH 50 (West Wall)	624.05	125	3525	0	100	28	1000	7	0.005
	617.05	125	3867	0	250	30	1000	9	0.005
BH 51 (East Wall)	626.19	125	3200	0	100	28	1000	7	0.005
	616.19	125	5225	0	250	30	2000	15	0.004
BH 53 (East Wall)	633.29	125	2500	0	100	26	1000	9	0.005
	625.79	125	3800	0	100	28	1000	11	0.005
	619.79	125	5250	0	250	30	2000	17	0.004
BH 54 (East Wall)	626.62	125	2433	0	100	28	1000	6	0.005
	619.12	125	4667	0	250	30	2000	18	0.004
BH 55 (East Wall)	628.63	110	0	32	0	32	25	5	N/A
	626.63	125	3000	0	100	28	1000	7	0.005
	621.13	125	6300	0	250	30	2000	40	0.004
B-201	643.00	125	4100	0	250	30	2000	14	0.004
	637.00	125	2900	0	100	26	1000	7	0.005
	630.50	125	3200	0	250	30	1000	10	0.005
	628.00	125	7000	0	250	30	2000	21	0.004
B-202	640.86	125	3400	0	100	26	1000	10	0.004
	627.86	125	3000	0	100	28	1000	9	0.004
	625.86	125	3100	0	100	28	1000	57	0.004
B-203	646.83	125	3500	0	100	28	1000	13	0.004
	641.83	125	2800	0	100	26	1000	8	0.005
	629.33	125	3300	0	100	26	1000	9	0.005
	625.33	125	4000	0	250	30	2000	14	0.004
B-204	651.09	125	3500	0	100	28	1000	8	0.005
	628.59	125	3500	0	100	28	1000	10	0.005
	623.59	125	4500	0	250	30	2000	14	0.004
	613.59	150	n/a	45	n/a	45	n/a	n/a	n/a
B-205	652.03	125	2250	0	100	28	1000	8	.005
	649.53	120	800	0	50	26	500	5	.007
	636.03	120	2200	0	100	26	500	10	.007
	626.03	125	3500	0	250	30	1000	14	.005
	621.03	125	6600	0	250	30	2000	17	.004
	610.53	150	n/a	45	n/a	45	n/a	n/a	n/a
B-206	636.62	120	2300	0	50	26	500	7	.007
	625.62	120	3000	0	100	26	500	9	.005
	620.62	125	2300	0	100	28	1000	15	.005
	613.62	135	n/a	30	n/a	30	n/a	n/a	n/a
	602.62	150	n/a	45	n/a	45	n/a	n/a	n/a
B-207	610.59	135	n/a	30	n/a	30	n/a	n/a	n/a
	600.59	150	n/a	45	n/a	45	n/a	n/a	n/a
	657.53	120	2300	0	100	26	1000	11	0.007

Boring	Elev. At Bottom of Layer	γ (pcf)	Short-term		Long-term		K (pci)	N	ϵ_{50}
			c'	Φ (deg)	c'	Φ (deg)			
B-208	645.03	125	4000	0	250	30	1000	17	0.005
	626.03	125	3000	0	250	30	1000	12	0.005
	621.50	125	4500	0	250	30	2000	43	0.004
B-209	654.22	120	3200	0	100	26	1000	10	0.005
	649.22	120	3200	0	100	26	1000	11	0.005
	639.22	125	2200	0	250	30	2000	11	0.005
	625.22	125	3400	0	100	28	2000	11	0.004
	621.22	125	4500	0	250	30	2000	30	0.004
B-210	649.85	125	3700	0	100	28	2000	11	0.005
	619.85	125	2400	0	100	28	1000	10	0.005
B-211	646.53	125	6000	0	250	30	2000	11	0.004
	619.03	125	2400	0	100	28	1000	10	0.005
B-212	611.46	135	n/a	30	n/a	30	n/a	n/a	n/a
	606.46	150	n/a	45	n/a	45	n/a	n/a	n/a
B-213	608.95	135	n/a	30	n/a	30	n/a	n/a	n/a
	603.95	150	n/a	45	n/a	45	n/a	n/a	n/a
B-214	647.56	120	5100	0	250	26	1000	10	0.005
	626.06	125	2600	0	100	28	1000	9	0.005
	612.06	125	5400	0	250	30	2000	28	0.004
B-214	609.06	135	n/a	30	n/a	30	n/a	n/a	n/a
	592.06	150	n/a	45	n/a	45	n/a	n/a	n/a
B-215	607.96	145	n/a	30	n/a	30	n/a	n/a	n/a
	602.96	135	n/a	45	n/a	45	n/a	n/a	n/a
B-216	605.66	150	n/a	45	n/a	45	n/a	n/a	n/a
	600.66	150	n/a	45	n/a	45	n/a	n/a	n/a

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 Sheet piling and Soil Retention

Temporary sheet piling will be required at the abutments during construction, as staged construction is anticipated for this project. The *IDOT Temporary Sheet Piling Design Guide and Charts* indicate that a Cantilevered Sheet Piling System is not feasible for the anticipated required retained heights due to the shallow depths of bedrock, as indicated above in Table 4.2, Estimated Bedrock Elevations.

A Temporary Soil Retention System will be required at each abutment. The Contractor will be required to obtain an Illinois- licensed structural engineer to seal the design of the Temporary Soil Retention System.

5.3 Site and Soil Conditions

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

5.4 Foundation Construction

Conventional pile-driving and drilled shaft equipment, along with 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 and KB&S 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.

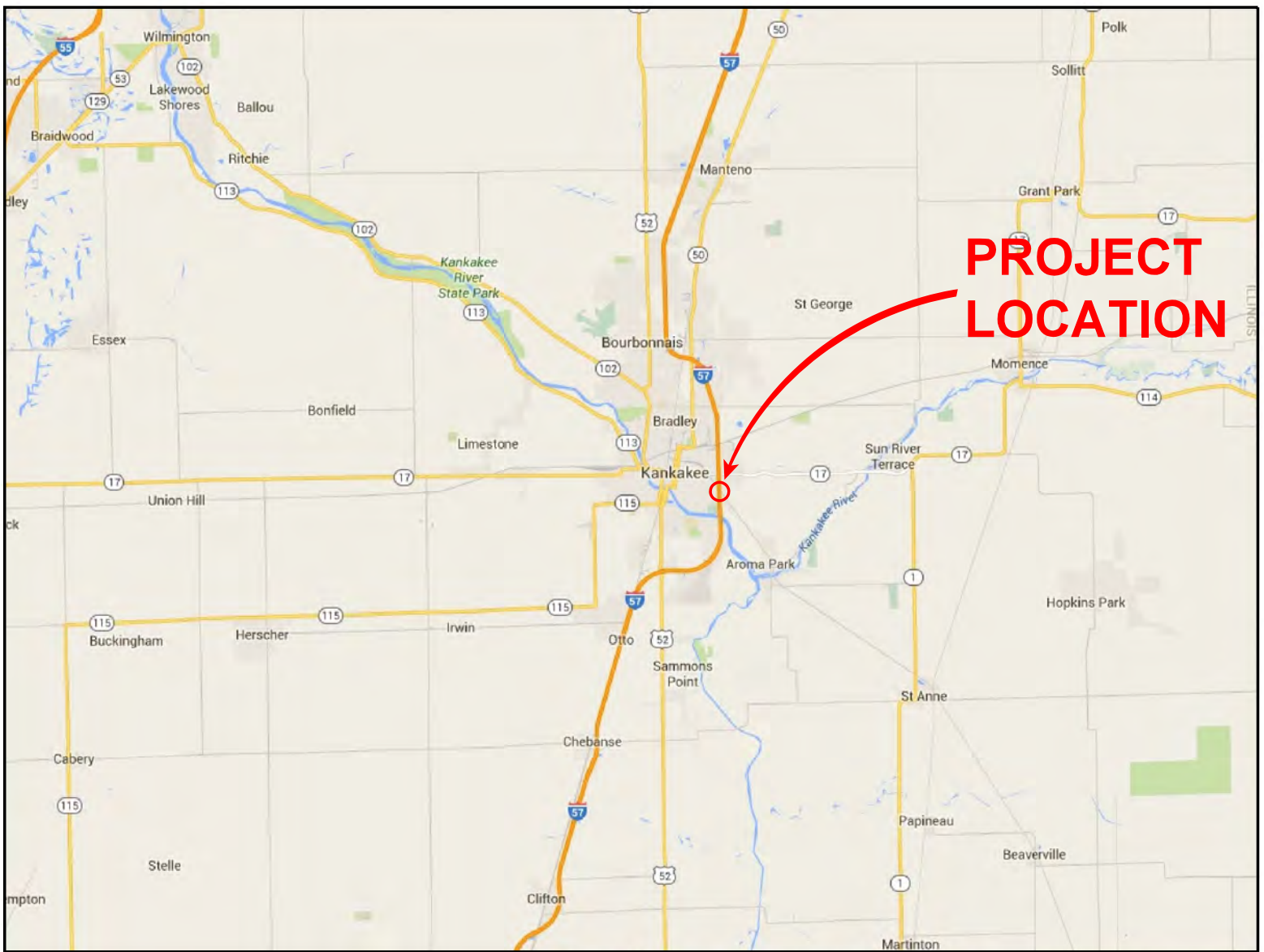
7.0 GEOTECHNICAL DATA

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

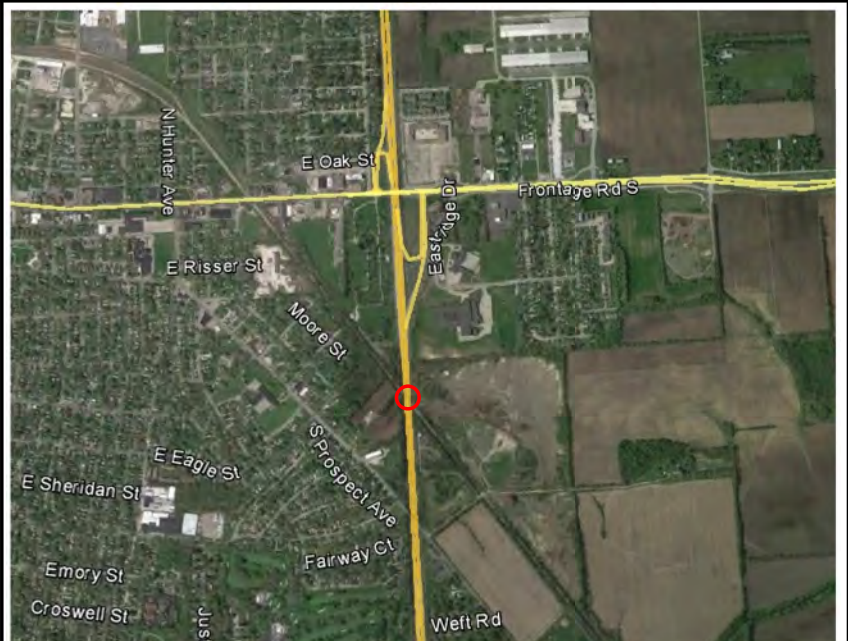
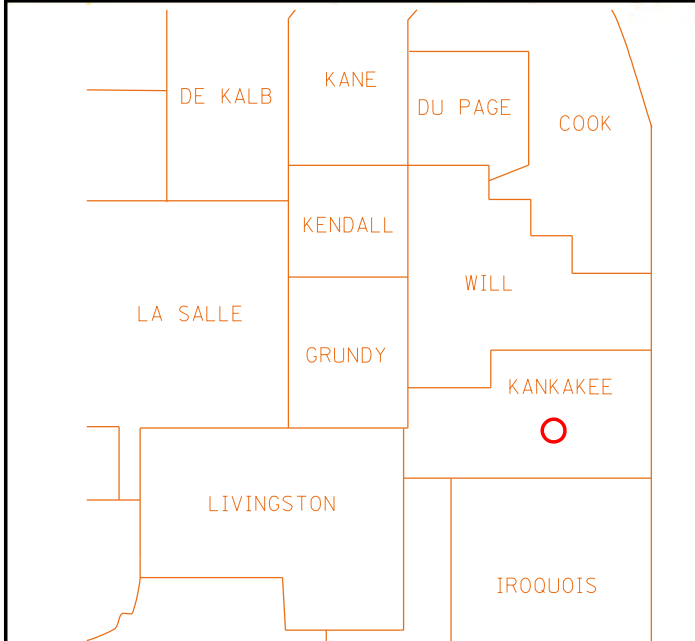
8.0 LIMITATIONS

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 28 boring locations within the bridge area in 2013, 2014 and 2017, 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
LOCATION MAP



**PROJECT
LOCATION**



Kaskaskia
Engineering Group, LLC

PROFESSIONAL REGISTRATIONS
Illinois Professional Design Firm
Professional Engineering Group

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

LICENSE NO.
184.004773
20-5080586

**KB&S RAILROAD OVER F.A.I. ROUTE 57
PROPOSED SN - 046-0005
KANKAKEE COUNTY, ILLINOIS**

EXHIBIT NO.

A

KEG JOB # 11-1017

EXHIBIT B

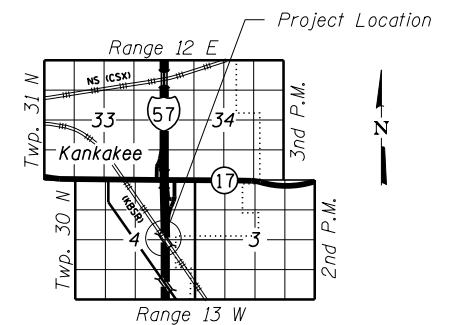
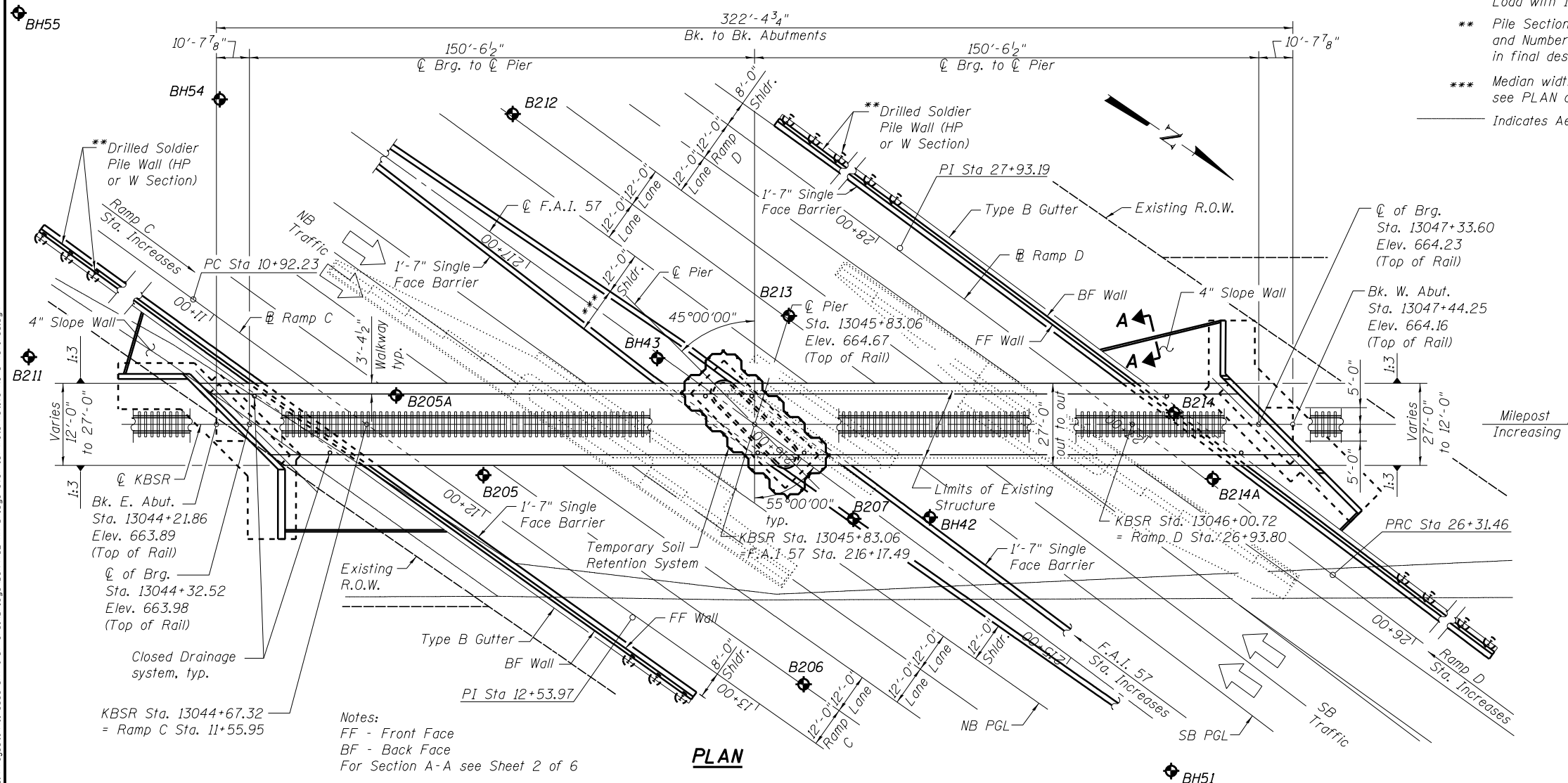
TYPE, SIZE, AND LOCATION PLAN (TS&L)

Salvage: No Salvage

F.A.I. Route 57 with Ramp C & D
Functional Class: Interstate
ADT: 22,680 (2016); 31,780 (2040)
ADTT: 6,350 (2016); 8,900 (2040)
DHV: 2,100 (2016); 3,100 (2040)
Design Speed: 75 m.p.h.
Posted Speed: 70 m.p.h.
2-Way Traffic
Directional Distribution: 50/50



— Indicates Aerial Utility

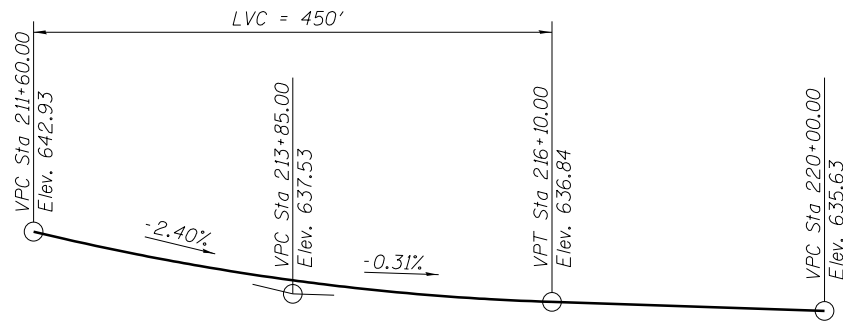


LOCATION SKETCH

GENERAL PLAN
KANKAKEE, BEAVERVILLE &
SOUTHERN RR (KBSR)
OVER INTERSTATE 57
F.A.I. ROUTE 57 SEC. (43)HB-5
STATION 216+17.49
STRUCTURE NO. 046-9904
KANKAKEE COUNTY



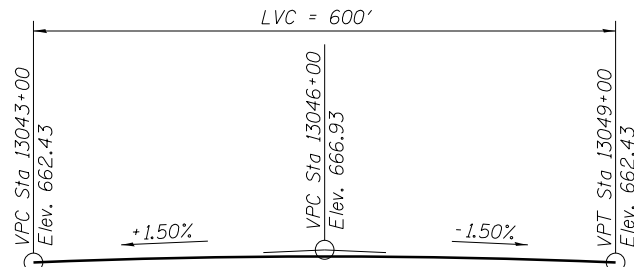
USER NAME = bseibel	DESIGNED - ACS	REVISED	
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PROFILE GRADE
PROPOSED F.A.I. 57, RAMP C AND RAMP D
 (Stationing along $\varnothing$ F.A.I. 57)

Station Equations: F.A.I. 57 Sta 227+74.21,
 50.50' Offset LT =
 $\varnothing$ Ramp C Sta. 1+00.00

F.A.I. 57 Sta 226+56.03,
 50.50' Offset RT =
 $\varnothing$ Ramp D Sta. 36+97.96



PROFILE GRADE
 $\varnothing$ PROPOSED TOP RAIL KBSR

HORIZONTAL CURVE DATA: F.A.I. 57

F.A.I. 57
Proposed Curve PR_57_9

P.I. Sta. = 221+05.20
 Δ = 1° 11' 49" (RT)
 D = 0° 17' 11"
 R = 20,000.00'
 T = 208.93'
 L = 417.84'
 E = 1.09'
 e = NC
 $T.R.$ = NA
 $S.E. Run$ = NA
 $P.C. Sta.$ = 218+96.28
 $P.T. Sta.$ = 223+14.11

Ramp C
Proposed Curve C.8

P.I. Sta. = 12+53.97
 Δ = 1° 09' 17" (LT)
 D = 0° 21' 25"
 R = 16,048.00'
 T = 161.74'
 L = 323.46'
 E = 0.81'
 e = NC
 $T.R.$ = NA
 $S.E. Run$ = NA
 $P.C. Sta.$ = 10+92.23
 $P.T. Sta.$ = 14+15.69

Ramp C
Proposed Curve C.5

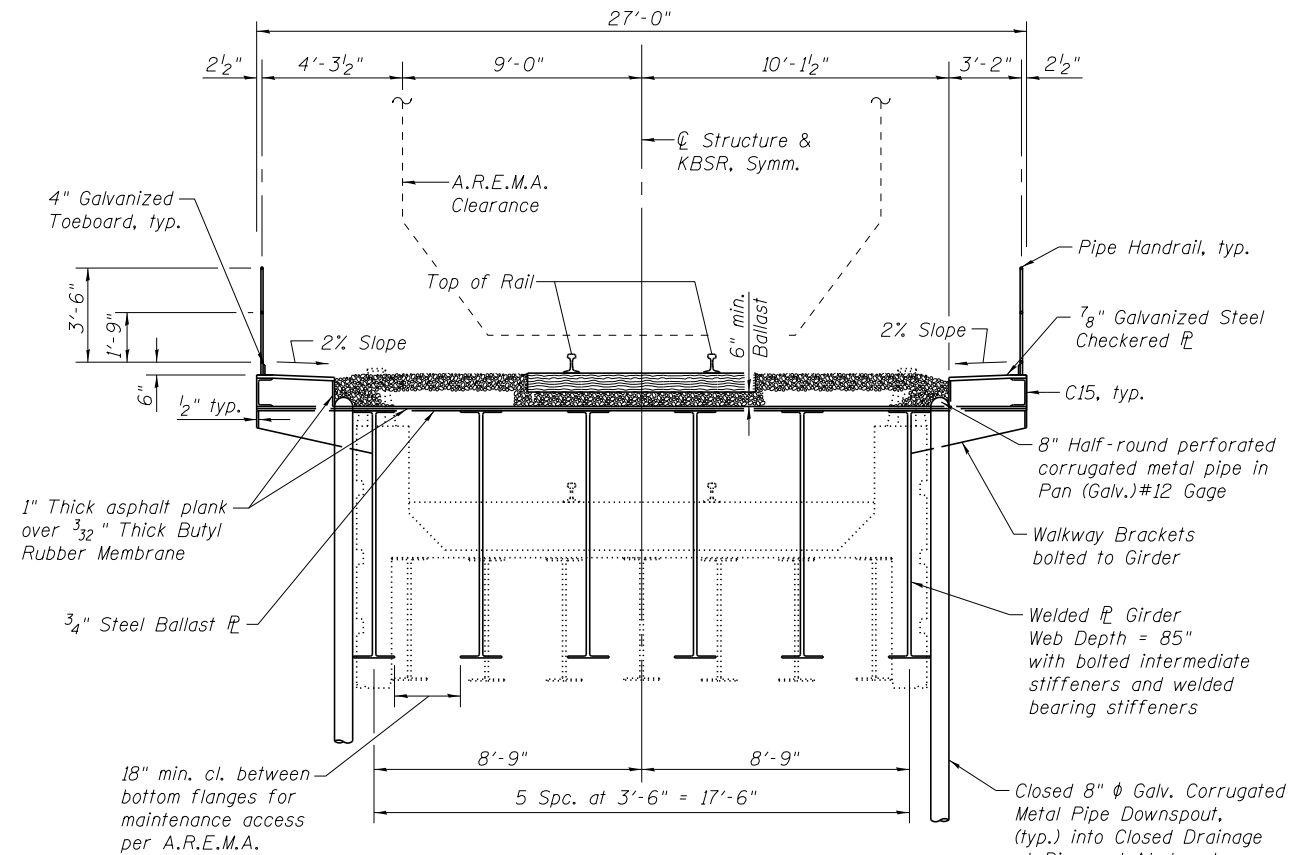
P.I. Sta. = 7+62.70
 Δ = 1° 11' 49" (RT)
 D = 0° 17' 15"
 R = 19,932.00'
 T = 208.22'
 L = 416.42'
 E = 1.09'
 e = NC
 $T.R.$ = NA
 $S.E. Run$ = NA
 $P.C. Sta.$ = 5+54.48
 $P.T. Sta.$ = 9+70.90

Ramp D
Proposed Curve D.11

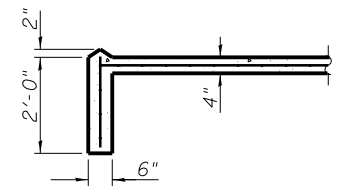
P.I. Sta. = 24+70.70
 Δ = 1° 09' 17" (RT)
 D = 0° 21' 33"
 R = 15,952.00'
 T = 160.77'
 L = 321.53'
 E = 0.81'
 e = NC
 $T.R.$ = NA
 $S.E. Run$ = NA
 $P.C. Sta.$ = 23+09.93
 $P.T. Sta.$ = 26+31.46

Ramp D
Proposed Curve D.12

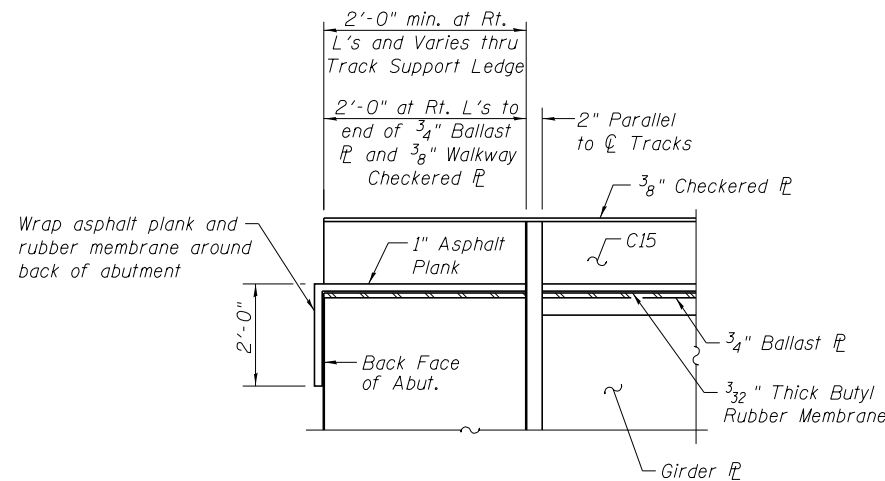
P.I. Sta. = 27+93.19
 Δ = 1° 9' 17" (LT)
 D = 0° 21' 25"
 R = 16,048.00'
 T = 161.74'
 L = 323.46'
 E = 0.81'
 e = NC
 $T.R.$ = NA
 $S.E. Run$ = NA
 $P.C. Sta.$ = 26+31.46
 $P.T. Sta.$ = 29+54.92



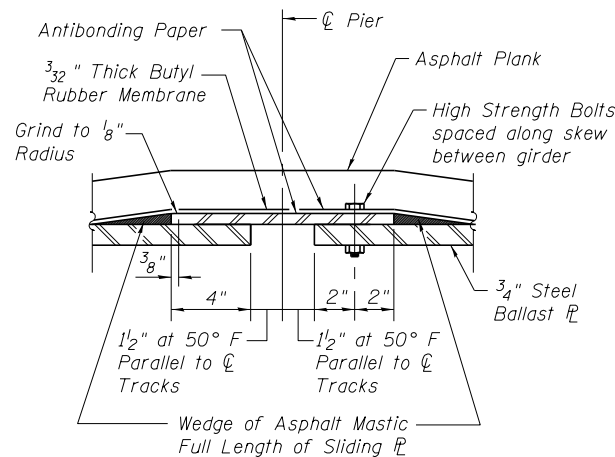
TYPICAL SECTION



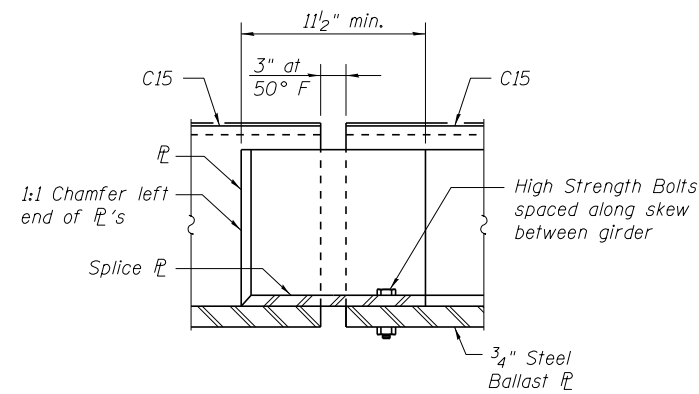
SECTION A-A
SLOPE WALL



WALKWAY FLOOR PLATES
AT ABUTMENTS



CLOSURE PLATES
OVER PIER



WALKWAY
CLOSURE PLATES AT PIER

BRIDGE DETAILS
KANKAKEE, BEAVERVILLE &
SOUTHERN RR (KBSR)
OVER INTERSTATE 57
F.A.I. ROUTE 57 SEC. (43)HB-5
STATION 216+17.49
STRUCTURE NO. 046-9904
KANKAKEE COUNTY

FILE NAME : S:\Projects\411-2005-04Y 1-57 Spur Bridge Over I-57\Alternative No 5 Refined.dgn



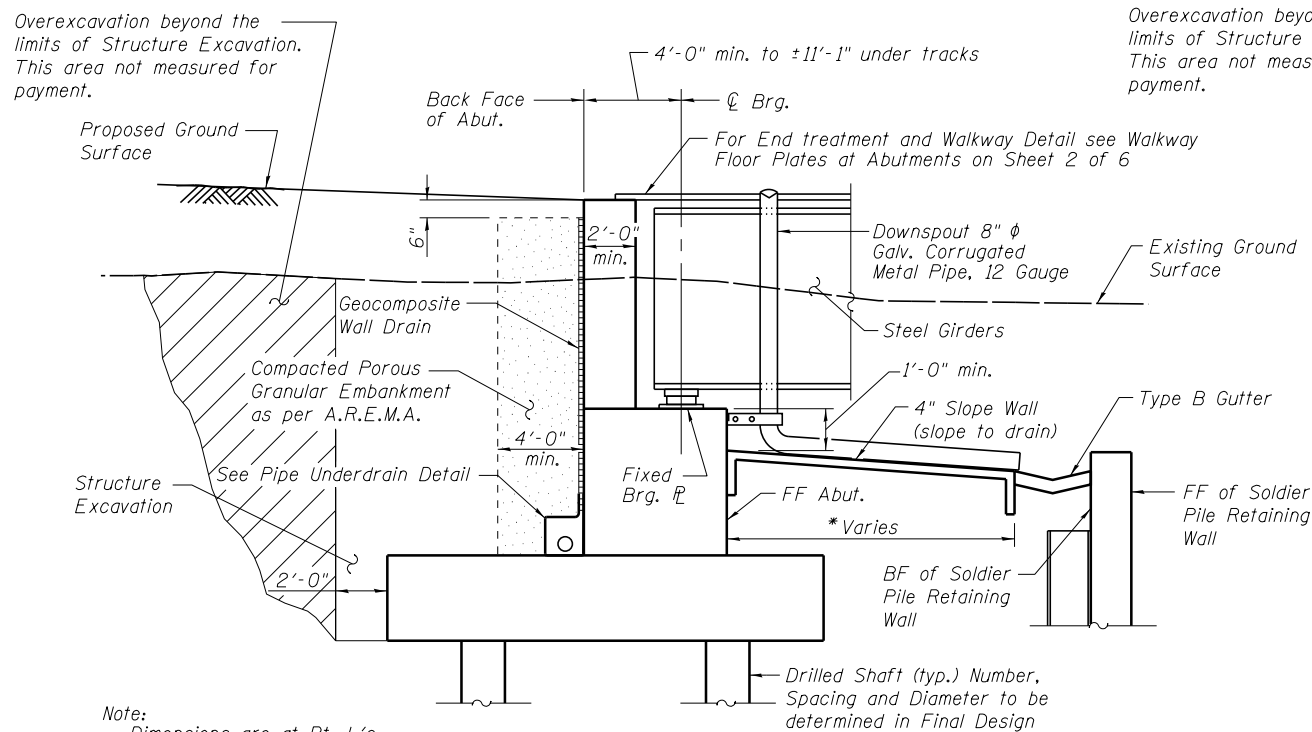
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	CHECKED -	REVISED
PLOT SCALE =	DRAWN - WS	REVISED
PLOT DATE = 12/10/2019	CHECKED -	REVISED

KANKAKEE, BEAVERVILLE & SOUTHERN
RAILROAD OVER I-57

SHEET NO. 2 OF 6 SHEETS

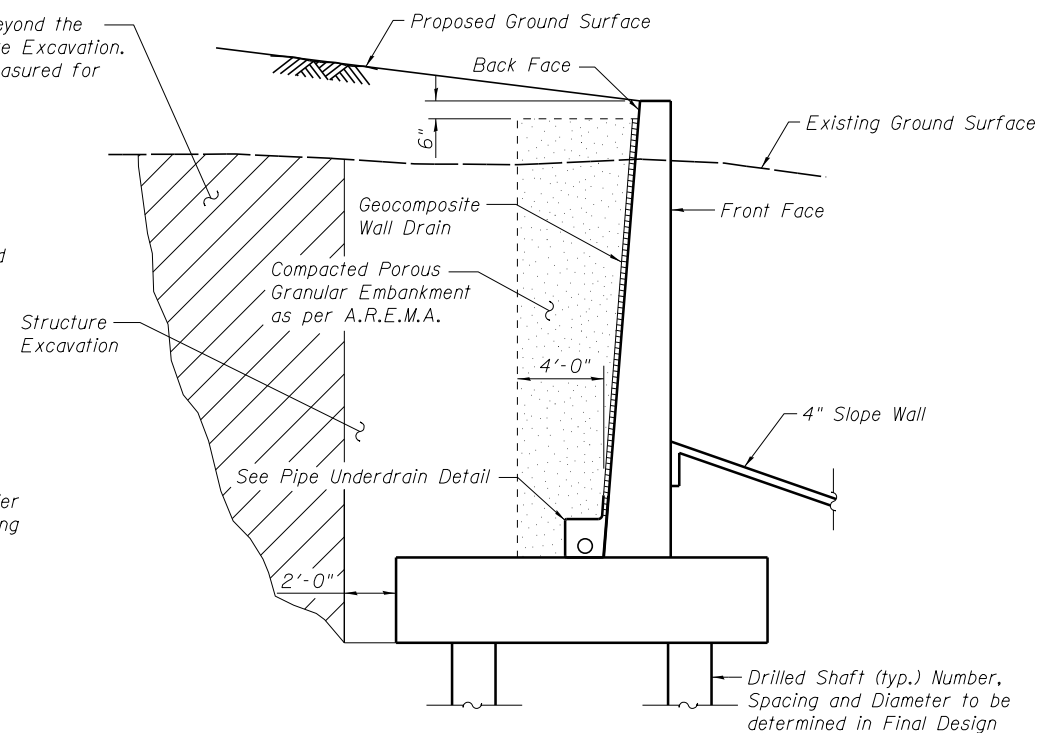
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HB-5	KANKAKEE		
	STRUCTURE NO. 046-9904	CONTRACT NO. 66863		

ILLINOIS FED. AID PROJECT

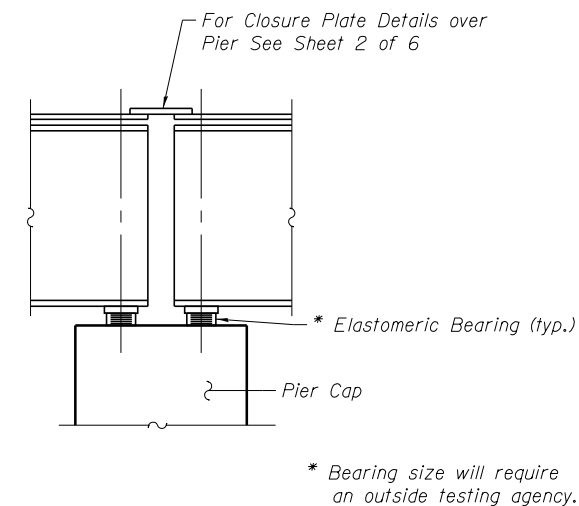


SECTION THRU ABUTMENT

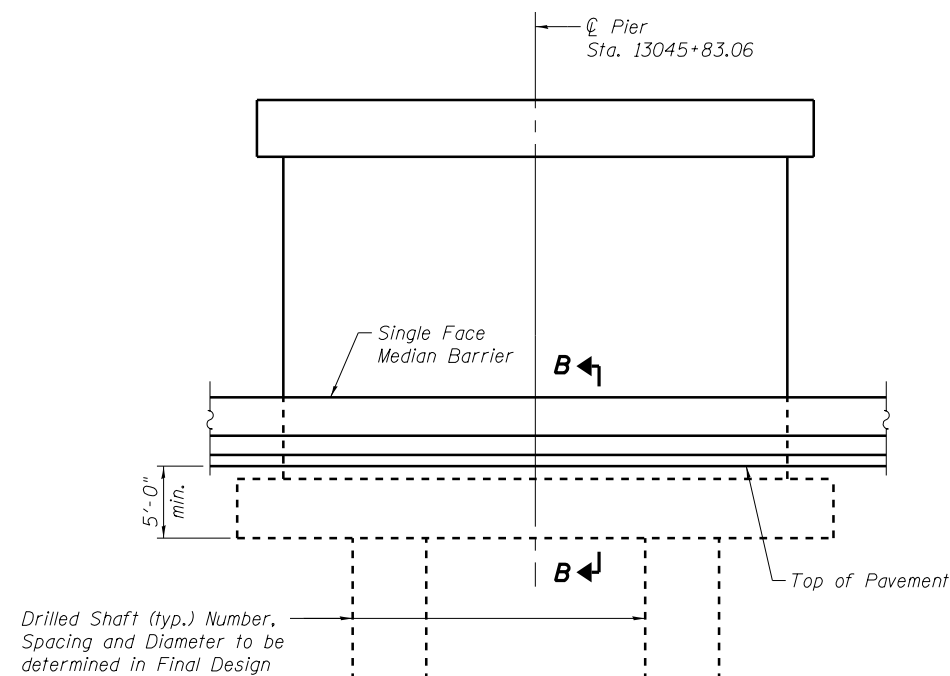
* E. Abut. varies ±5'-5" min. to ±10'-4" max.
W. Abut. varies ±8'-2" min. to ±12'-5" max.



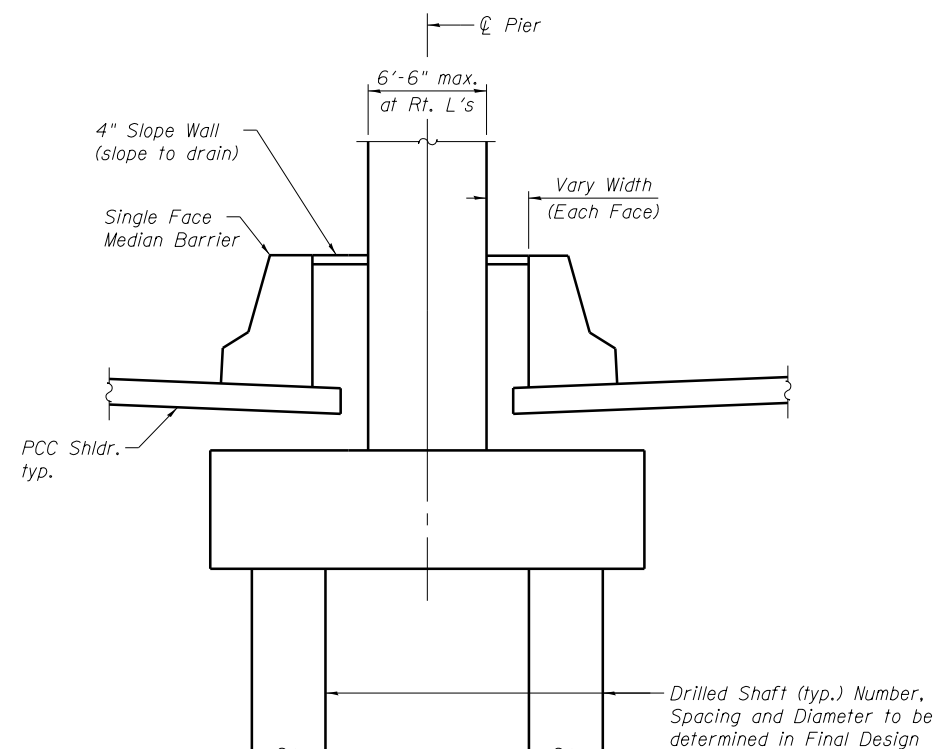
SECTION THRU WINGWALL



PIER CAP SECTION

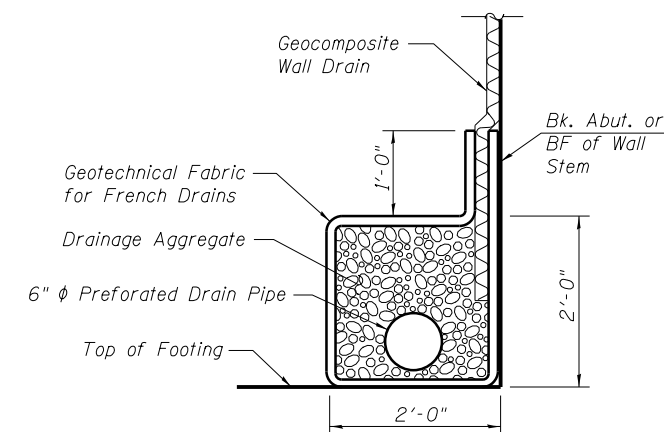


PIER SKETCH



SECTION B-B

Footing dimensions subject to revisions in final design.



PIPE UNDERDRAIN DETAIL

BRIDGE DETAILS
KANKAKEE, BEAVERVILLE &
SOUTHERN RR (KBSR)
OVER INTERSTATE 57
F.A.I. ROUTE 57 SEC. (43)HB-5
STATION 216+17.49
STRUCTURE NO. 046-9904
KANKAKEE COUNTY

FILE NAME : S:\Projects\411-0005-01\1-57 SPUI\Bridge\CONVSL RR Bridge Over I-57\Alternative No 5 Refined.dgn

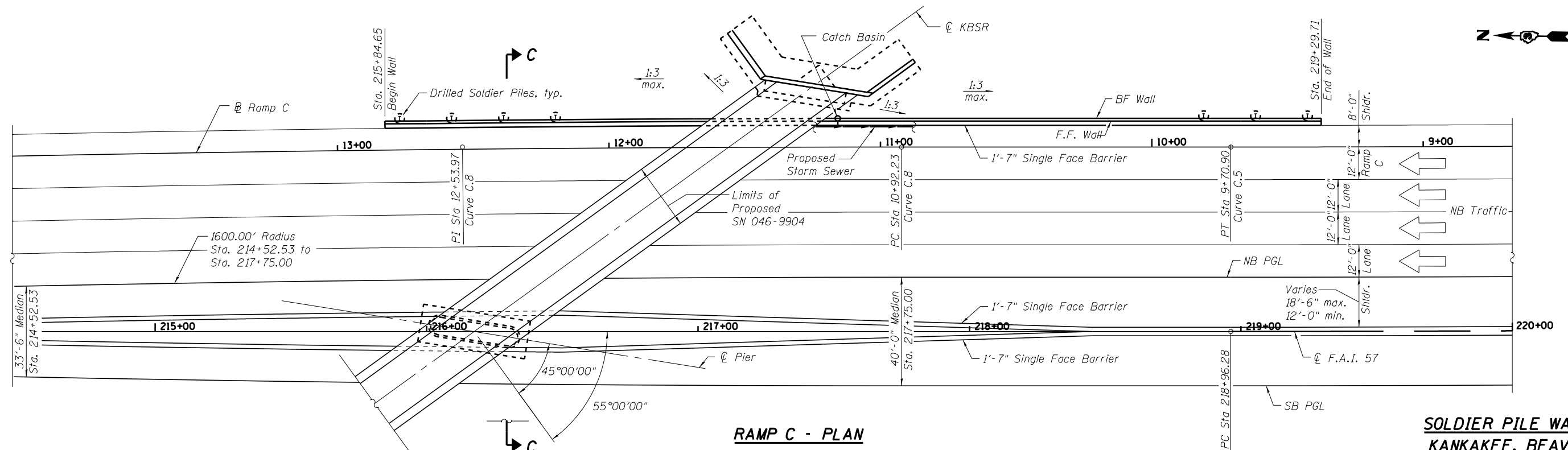
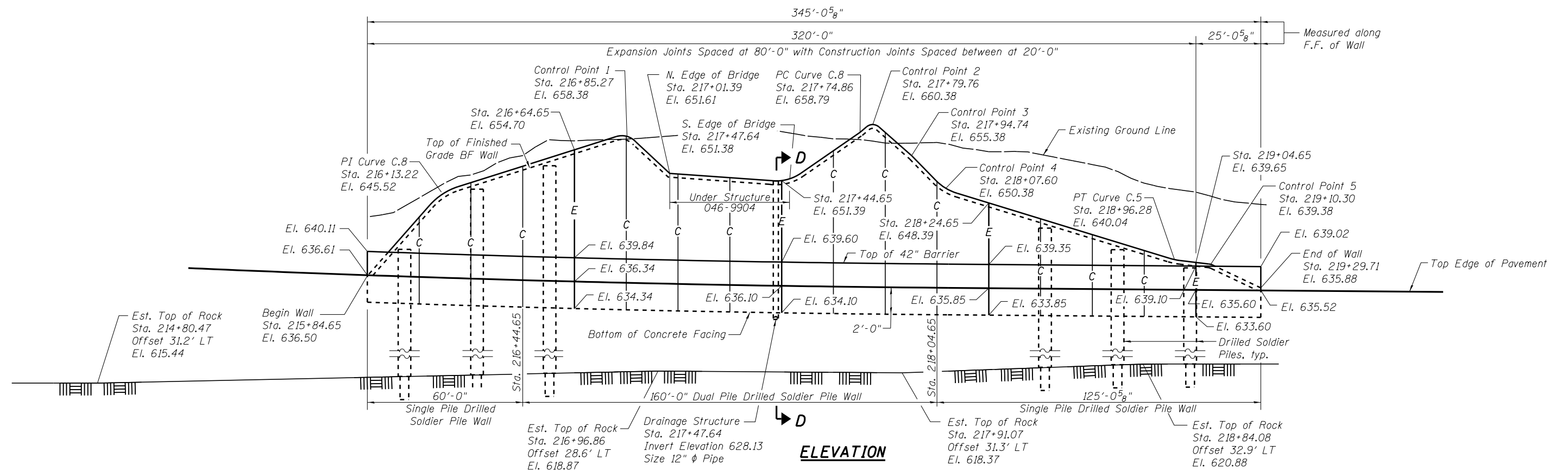


USER NAME : bseibel	DESIGNED - ACS	REVISED
PLOT SCALE :	CHECKED -	REVISED
PLOT DATE : 12/10/2019	DRAWN - WS	REVISED
	CHECKED -	REVISED

KANKAKEE, BEAVERVILLE & SOUTHERN
RAILROAD OVER I-57

SHEET NO. 3 OF 6 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HB-5	KANKAKEE		
STRUCTURE NO. 046-9904		CONTRACT NO. 66863		
ILLINOIS FED. AID PROJECT				



SOLDIER PILE WALL RAMP C
KANKAKEE, BEAVERVILLE &
SOUTHERN RR (KBSR)
OVER INTERSTATE 57
F.A.I. ROUTE 57 SEC. (43)HB-5
STATION 216+17.49
STRUCTURE NO. 046-9904
KANKAKEE COUNTY

Notes:

All Stations shown in Plan & Elevation for F.F. of Wall are from F.A.I. 57.
All offsets to the F.F. of Wall to Base Line Ramp C are 9.58' RT.
See Sheef 6 of 6 for Section C-C and F.A.I. 57 offsets to F.F. of Wall.
C denotes Construction Joints
E denotes Expansion Joints



USER NAME = bseibel	DESIGNED - ACS	REVISED
	CHECKED -	REVISED
PLOT SCALE =	DRAWN - WS	REVISED
PLOT DATE = 12/10/2019	CHECKED -	REVISED

KANKAKEE, BEAVERVILLE & SOUTHERN RAILROAD OVER I-57

SHEET NO. 4 OF 6 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HB-5	KANKAKEE		
STRUCTURE NO. 046-9904		CONTRACT NO. 66863		

FILE NAME : S:\Projects\411-2005-04Y 1-57 SPUIV-Bridge\DDNTSL RR Bridge Over I-57\Alternative No 5 Refined.dgn



USER NAME : bseibel	DESIGNED - ACS	REVISED
PLOT SCALE :	CHECKED -	REVISED
PLOT DATE : 12/10/2019	DRAWN - WS	REVISED
	CHECKED -	REVISED

RAMP D - PLAN

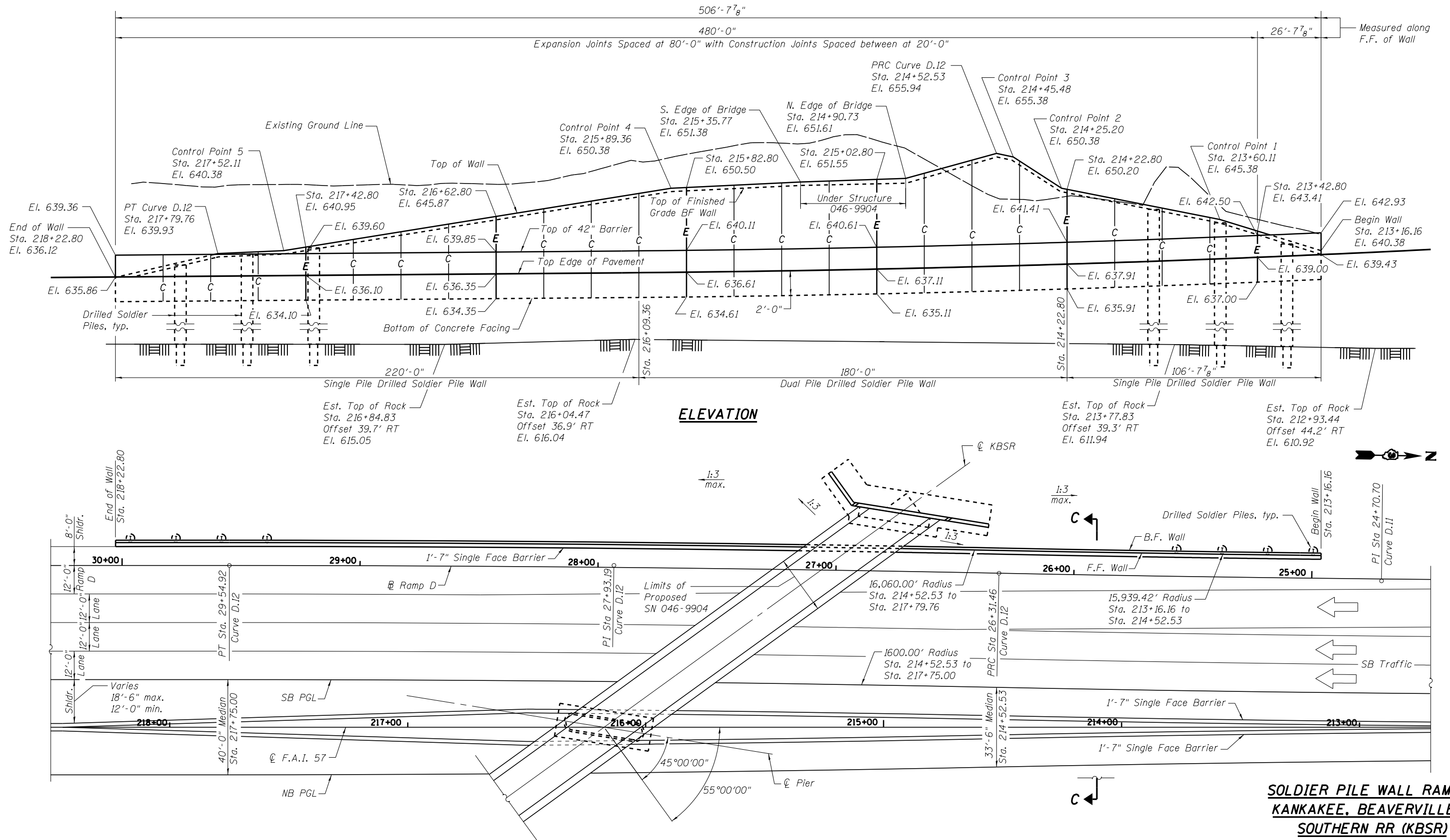
Notes:
All Stations shown in Plan & Elevation for F.F. of Wall are from F.A.I. 57.
All offsets to the F.F. of Wall to Base Line Ramp D are 9.58' RT.
See Sheet 6 of 6 for Section C-C and F.A.I. 57 offsets to F.F. of Wall.
C denotes Construction Joints
E denotes Expansion Joints

KANKAKEE, BEAVERVILLE & SOUTHERN RAILROAD OVER I-57

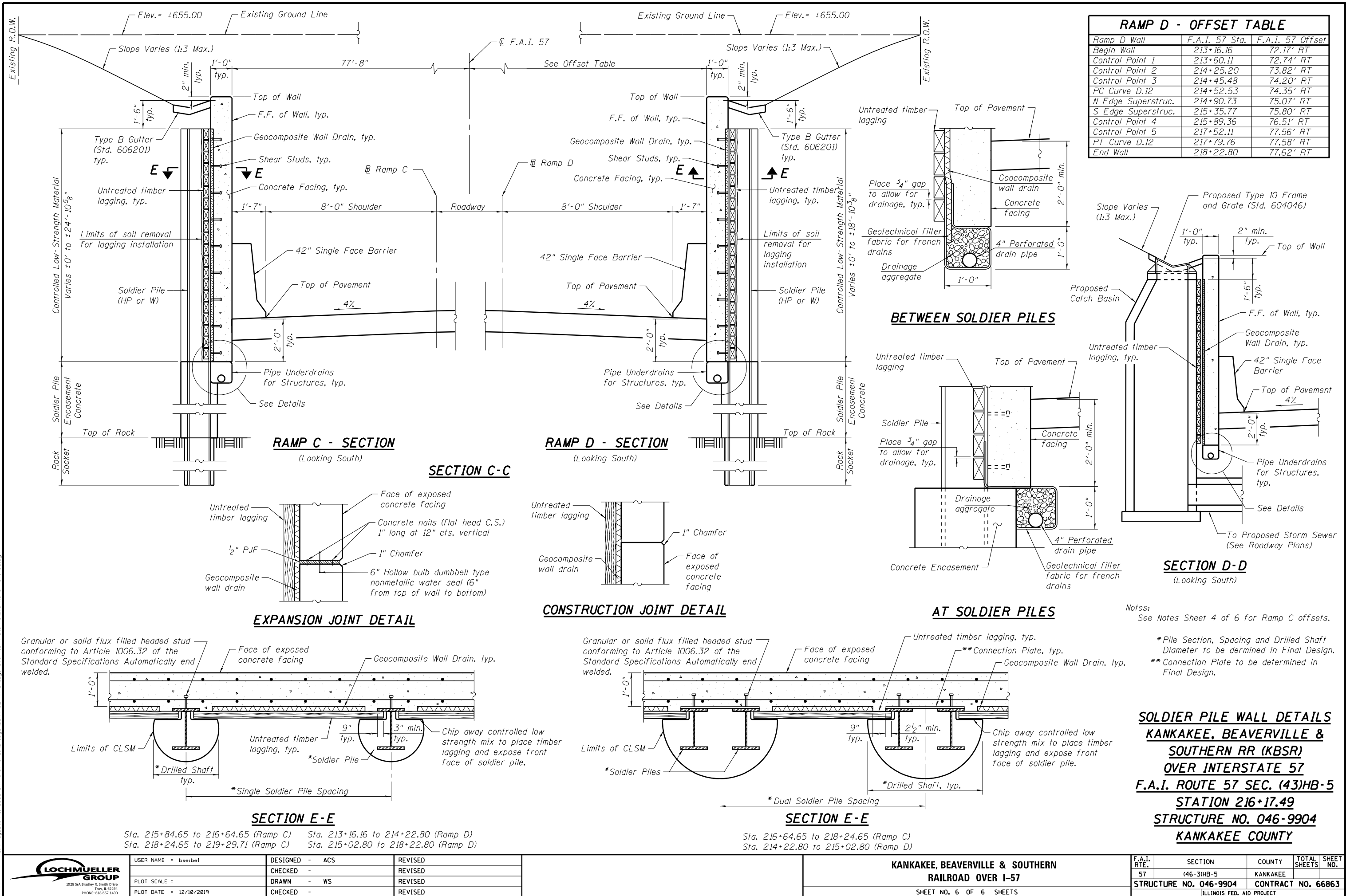
SHEET NO. 5 OF 6 SHEETS

SOLDIER PILE WALL RAMP D KANKAKEE, BEAVERVILLE & SOUTHERN RR (KBSR) OVER INTERSTATE 57 F.A.I. ROUTE 57 SEC. (43)HB-5 STATION 216+17.49 STRUCTURE NO. 046-9904 KANKAKEE COUNTY

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)HB-5	KANKAKEE		
	STRUCTURE NO. 046-9904	CONTRACT NO. 66863		
ILLINOIS FED. AID PROJECT				



FILE NAME : S:\Projects\411-2005-04Y 1-57 Spur Bridge Over I-57\Alternative No 5 Refined.dgn



USER NAME : bseibel
PLOT SCALE :
PLOT DATE : 12/10/2019

DESIGNED - ACS
CHECKED -
DRAWN - WS
CHECKED -

REVISED
REVISED
REVISED
REVISED

KANKAKEE, BEAVERVILLE & SOUTHERN
RAILROAD OVER I-57

SHEET NO. 6 OF 6 SHEETS

F.A.I. RTE. 57
SECTION (46-3)HB-5
COUNTY KANKAKEE
TOTAL SHEETS 6
SHEET NO. 6
STRUCTURE NO. 046-9904
CONTRACT NO. 66863
ILLINOIS FED. AID PROJECT

EXHIBIT C
BORING LOGS



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION K B & S Railroad over I-57, 3.7 miles North of US 45/52 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION NE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.112206, Longitude -87.835405

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. 046-0005 (Exist.)
Station 216+08 (Exist.)

BORING NO. BH 42 (Pier)
Station 215+58.85
Offset 8.6 ft Rt.
Ground Surface Elev. 637.67 ft

D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft Groundwater Elev.: First Encounter _____ Dry ft Upon Completion <u>617.7</u> ft After _____ Hrs. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
				Gray Weathered & Reworked Limestone	12			
					24			9
					616.25	100/5"		
				Auger Refusal @ 21.42' End of Boring				
635.17								
	3							
	3	2.0	15					
	3	P						
632.67	-5				-25			
	3							
	2	3.1	18					
	4	B						
	3							
	3	3.9	23					
	6	B						
-10					-30			
	4							
	5	4.5	21					
	8	B						
625.67								
	5							
	9	4.9	15					
	8	S						
-15					-35			
	4							
	5	5.1	14					
	7	S						
	8							
	10	7.3	15					
	12	S						
617.67	-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)



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION K B & S Railroad over I-57, 3.7 miles North of US 45/52 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION NE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.11195, Longitude -87.835363

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. 046-0005 (Exist.)
Station 216+08 (Exist.)

BORING NO. BH 43 (Pier)
Station 216+52.35
Offset 0.8 ft Lt.
Ground Surface Elev. 637.52 ft

D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft Groundwater Elev.: First Encounter <u>617.5</u> ft ▼ Upon Completion <u>617.5</u> ft ▼ After _____ Hrs. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
				Gray Weathered & Reworked Limestone	27			
					61			11
					41			
				615.52				
				Auger Refusal @ 22' End of Boring				
	2							
	3	3.5	17					
	4	P						
-5	2				-25			
	3	2.1	19					
	4	B						
	3							
	4	2.4	20					
	5	B						
-10	4				-30			
	5	3.5	20					
	6	B						
625.52								
	6							
	7	4.1	13					
	9	B						
-15	5				-35			
	6	4.1	14					
	7	B						
	12							
	21	7.8	12					
	40	S						
617.52 ▼ -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)



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION K B & S Railroad over I-57, 3.7 miles North of US 45/52 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION NE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.112934, Longitude -87.835541

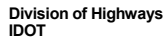
COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. 046-0005 (Exist.)
Station 216+08 (Exist.)

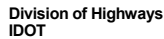
BORING NO. BH 46 (West Wall)
Station 212+93.44
Offset 42.4 ft Rt.
Ground Surface Elev. 641.67 ft

D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft Groundwater Elev.: First Encounter _____ Dry ft Upon Completion _____ Dry ft After _____ Hrs. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
				Hard Gray Clay, Silty Clay, Silt Interbedded		8		
						9	4.9	16
						18	S	
639.17						8		
	8					10	5.2	17
	9	Frozen	25			12	S	
	7							
Note: Frozen to 4.5'								
636.67	-5					-25		
	3					10		
	2	1.5	33			12	6.7	16
	3	P				18	S	
	3					10		
	4	1.7	26			14	6.4	18
	4	B				16	S	
-10						-30		
	3					34		
	4	1.8	22					
	5	B		Buff Limestone Surface	611.17	100/3"		9
				End of Boring	610.92			
	3							
	4	2.0	24					
	5	B						
627.17								
	3					-35		
	4	2.5	19					
	6	B						
624.17								
	3							
	6	4.0	13					
	6	P						
621.67	-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)

Date 2/19/14

BBS, form 137 (Rev. 8-99)

Date 2/19/14

BBS, form 137 (Rev. 8-99)

Page 1 of 1Date 2/19/14

ROUTE	DESCRIPTION	LOGGED BY
I-57 (FAI 57)	K B & S Railroad over I-57, 3.7 miles North of US 45/52	Larry Myers

SECTION	(46-3)R, HBK, 5HBR, 6HBR	LOCATION	SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.111859, Longitude -87.835507
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COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. 046-0005 (Exist.)
Station 216+08 (Exist.)

BORING NO.	<u>BH 50 (West Wall)</u>
Station	<u>216+84.43</u>
Offset	<u>39.7 ft Rt.</u>
Ground Surface Elev.	<u>636.55</u>

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

Surface Water Elev.	_____	ft
Stream Bed Elev.	_____	ft
Groundwater Elev.:		
First Encounter	616.6	ft ▼
Upon Completion	620.6	ft ▼
After Hrs.		ft

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

Augered Bituminous Shoulder, Gray Silty Clay Till				Buff Dolomite/Limestone - Weathered & Reworked in top 24" (continued)	16		
					21		14
					81		
				615.05			
				End of Boring			
634.05							
Hard to Very Stiff Gray Silty Clay/Clay Till		6					
		3	4.0	20			
		4	B				
	-5				-25		
		3					
		3	3.4	20			
		4	B				
		3					
		3	3.2	20			
		4	B				

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 11/12/14

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)

Page 1 of 1

Date 9/10/13

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

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

End of Boring

BBS, form 137 (Rev. 8-99)



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION K B & S Railroad over I-57, 3.7 miles North of US 45/52 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.11183, Longitude -87.835258

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. 046-0005 (Exist.)
Station 216+08 (Exist.)

BORING NO. BH 53 (East Wall)
Station 216+96.85
Offset 28.6 ft Lt.
Ground Surface Elev. 637.29 ft

D E P T H (ft)	B L O W S (/6")	U C S (tsf)	M O I S T (%)
-----------------------------------	------------------------------------	--------------------------	----------------------------------

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft
Groundwater Elev.:
First Encounter 619.8 ft ▼
Upon Completion 621.3 ft ▽
After _____ Hrs. _____ ft

Augered Bituminous Shoulder, Gray Silty Clay Loam Fill			
634.79			
Very Stiff Gray Silty Clay Loam Fill	3		
633.29	4	2.5	12
	5	P	
Very Stiff to Hard Gray Silty Clay Till			
-5	3		
	4	3.1	21
	5	B	
	4		
	5	4.0	22
	6	B	
-10	3		
	4	4.3	21
625.79	8	B	
Hard Gray Silty Clay Loam Till			
	4		
	6	4.4	14
	7	S	
-15	6		
▽	10	6.1	13
	10	S	
619.79 ▼			
Dense Gray Limestone - Fractured & Weathered at Surface 618.87	31		
	100/5"		11
End of Boring			
-20			

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

Page 1 of 1

Date 9/10/13

ROUTE I-57 (FAI 57) DESCRIPTION K B & S Railroad over I-57, 3.7 miles North of US 45/52 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.111572, Longitude -87.835238

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. 046-0005 (Exist.)
Station 216+08 (Exist.)

BORING NO. BH 54 (East Wall)
Station 217+91.07
Offset 31.3 ft Lt.
Ground Surface Elev. 636.62 ft

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft
Groundwater Elev.:
First Encounter 619.1 ft ▼
Upon Completion 619.1 ft ▼
After _____ Hrs. _____ ft

Augered Bituminous Shoulder,
Gray Silty Clay Loam Fill

634.12

Very Stiff Gray Silty Clay Till

3			
2	2.5	24	
3	P		

-5			
2			
2	2.1	23	
3	B		

3			
3	2.7	24	
4	B		

626.62 -10

Hard Gray Silty Clay Loam Till

5			
7	4.0	16	
10	P		

4			
5	4.3	14	
6	S		

-15			
5			
8	5.7	12	
18	S		

619.12 ▼

Dense Gray Limestone -
Weathered at the Surface

618.37

21			
100/3"		8	

End of Boring

-20

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 11/12/14

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

Page 1 of 1

Date 9/10/13

ROUTE I-57 (FAI 57) DESCRIPTION K B & S Railroad over I-57, 3.7 miles North of US 45/52 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.111317, Longitude -87.835222

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. 046-0005 (Exist.)
Station 216+08 (Exist.)

BORING NO. BH 55 (East Wall)
Station 218+84.08
Offset 32.9 ft Lt.
Ground Surface Elev. 636.13 ft

D E P T H (ft)	B L O W S (/6")	U C S (tsf)	M O I S T (%)
-----------------------------------	------------------------------------	--------------------------	----------------------------------

Surface Water Elev. _____ ft
Stream Bed Elev. _____ ft
Groundwater Elev.:
First Encounter _____ Dry ft
Upon Completion _____ Dry ft
After _____ Hrs. _____ ft

Augered Bituminous Shoulder,
Brown Fill Sand

631.13 -5

Loose Brown Fill Sand

628.63

Very Stiff Gray Silty Clay Till

626.63

Hard Gray Silty Clay Loam Till

621.13 -15

Dense Gray Limestone

620.88

End of Boring

-20

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 11/12/14

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)

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SOIL BORING LOG

Solutions You Can Build On

Date 12/21/17

ROUTE FAI 57 DESCRIPTION Retaining wall east of I-57, south of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.11032, Longitude -87.834873

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH (ft)	BLOW COUNT (/6")	UCS Qu (tsf)	MOIST CONTENT (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft Groundwater Elev.: First Encounter _____ dry ft Upon Completion _____ dry ft After _____ Hrs. _____ ft
6" Crushed Stone Roadway Very Stiff Gray Silty Clay Till	645.50 8 7 7	4.1 B	15		
Very stiff Gray Clay, few rocks	643.00 3 3 4 -5	2.9 B	19		
	2 4 4	2.9 B	19		
Very stiff Gray Clay	637.00 2 5 4 -10	2.7 B	22		
	3 5 6	3.5 B	20		
	3 4 7 -15	3.5 B	22		
Hard Gray Silty Clay Till	630.50 4 8 13	7.0 B	12		
Top of very weathered Limestone	628.00 627.00	75/2"	-	7	
End of Boring	-20				

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)



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SOIL BORING LOG

Date 12/20/17

Solutions You Can Build On

ROUTE FAI 57 DESCRIPTION Retaining wall east of I-57, south of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.110728, Longitude -87.834899

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. ft	Stream Bed Elev. ft	GROUNDWATER Elev.: First Encounter dry ft	Upon Completion dry ft	After Hrs. ft	DEPTH H	BLOW S	UCS Qu	MOIST T
	(ft)	(/6")	(tsf)	(%)						(ft)	(/6")	(tsf)	(%)
6" Crushed Stone "Roadway" 646.86													
Very Stiff Brown/Gray Silty Clay (Till?)		5											
		6	3.9	17									
		6	B										
		3											
		4	3.3	19									
	-5	5	S							-25			
		3											
640.86		4	3.3	17									
Very Stiff Gray Clay, occasional piece of rock		4	B										
		3											
		3	2.3	16									
	-10	5	B							-30			
		3											
		3	3.5	24									
		5	B										
		2											
		4	4.1	22									
	-15	5	B							-35			
		4											
		4	4.3	23									
		7	B										
		3											
627.86		4	3.1	15									
Very stiff Gray silty Clay Till	-20	8	B							-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)



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SOIL BORING LOG

Solutions You Can Build On

Date 12/19/17

ROUTE FAI 57 DESCRIPTION Retaining wall east of I-57, south of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.111351, Longitude -87.834906

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
BORING NO. B-204 Station 218+80 Offset 120.0 ft Lt. Ground Surface Elev. 657.59 ft	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
Dark Brown Silty Clay Topsoil 656.59					Very Stiff Gray Clay (continued)				
Very Stiff Brown/Gray Clay Loam Till	3					3			
	4	3.5	23			5	3.1	19	
	4	P				7	B		
	4					2			
	4	3.5	24			3	2.3	21	
	-5	5	P			-25	4	B	
	5					5			
651.09	7	6.2	22			6	4.1	23	
Very Stiff Gray Silty Clay	10	B				12	B		
649.59									
Very Stiff Gray Clay	4				628.59	5			
	4	4.1	25		Very Stiff Gray Clay Loam Till	7	4.5	13	
-10	6	B				7	P		
	2								
	4	3.3	27						
	4	B							
	2				Water on Rock				
	5	3.7	24		623.59	50/1"		12	
-15	5	B			Borehole continued with rock coring.	-35			
	3								
	5	3.5	26						
	6	B							
	3								
	4	3.5	21						
-20	5	B				-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)



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ROCK CORE LOG

Solutions You Can Build On

Date 12/19/17

ROUTE FAI 57 DESCRIPTION Retaining wall east of I-57, south of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.111351, Longitude -87.834906

COUNTY Kankakee CORING METHOD Wireline

STRUCT. NO. CORING BARREL TYPE & SIZE NQ
Station
BORING NO. B-204
Station 218+80
Offset 120.0 ft Lt.
Ground Surface Elev. 657.59 ft
Core Diameter 2 in
Top of Rock Elev. 623.59 ft
Begin Core Elev. 623.59 ft
DEPTH (ft) CORE (#) RECOVERY (%) R.Q.D. (%) CORE TIME (min/ft) STRENGTH (tsf)

Gray Dolostone with thin Shale partings	623.59	1	100	14	2.37	
	-35					
		2	94	21	2.43	
	-40					110.0
Visibly saw core barrel drop 2", 9.5'-9.7'						181.0
	613.59					
End of Boring	-45					
	-50					

Color pictures of the cores Yes

Cores will be stored for examination until

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-204, Box 1 of 1

Station 218+65, 115 ft. Lt.

Ground Surface Elev. = 652.5 ft.

Top of Core = 34 ft. (618.5 ft.)

Bot. of Core = 44 ft. (608.5 ft.)

Date of Core is 12/19/17

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-204, Box 1 of 1

Station 218+65, 115 ft. Lt.

Ground Surface Elev. = 652.5 ft.

Top of Core = 34 ft. (618.5 ft.)

Bot. of Core = 44 ft. (608.5 ft.)

Date of Core is 12/19/17





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SOIL BORING LOG

Solutions You Can Build On

Date 12/20/17

ROUTE FAI 57 DESCRIPTION East Abutment for K B & S Railroad over I-57, 3.8 miles north of US 45/52 LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.11191, Longitude -87.835149

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
BORING NO. B-205 Station 216+74 Offset 60.0 ft Lt. Ground Surface Elev. 657.53 ft	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
Stiff Brown/Gray Sandy Clay Loam Till	3				Stiff Gray Silty Clay (continued)				
	5	2.5	22			636.03	4		
	5	P			Very Stiff Gray Clay Till		7	3.7	20
							8	B	
	3						2		
	3	2.0	21				5	3.3	21
	3	P				-25	6	B	
652.03									
Medium stiff Brown/Gray Sandy Clay	2						3		
	2	0.8	23				4	3.1	23
	3	B					6	B	
649.53									
Very stiff Brown/Gray Silty Clay	4						4		
	6	3.3	14				7	3.9	20
	5	B				-30	8	B	
647.03									
Stiff Gray Silty Clay	3								
	4	2.5	14			626.03			
	5	B			Hard Gray Clay Till				
	3						5		
	3	2.1	15				7	6.6	14
	6	B				-35	10	S	
	4								
	4	2.3	15			621.03			
	5	B			Top of Fractured Weathered Limestone				
	2								
	4	1.7	13			618.53	100/4.5"		10
2" Fine Gray Sand Seam	4	B			Borehole continued with rock coring.				
637.53						-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)



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ROCK CORE LOG

Date 12/20/17

Solutions You Can Build On

ROUTE FAI 57 DESCRIPTION East Abutment for K B & S Railroad over I-57, 3.8 miles north of US 45/52 LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.11191, Longitude -87.835149

COUNTY Kankakee CORING METHOD Wireline

STRUCT. NO. CORING BARREL TYPE & SIZE NQ
Station
BORING NO. B-205
Station 216+74
Offset 60.0 ft Lt.
Ground Surface Elev. 657.53 ft
Core Diameter 2 in
Top of Rock Elev. 621.03 ft
Begin Core Elev. 618.53 ft
DEPTH (ft) CORE (#) RECOVERY (%) R.Q.D. (%) CORE TIME (min/ft) STRENGTH (tsf)

Gray Dolostone with Shale partings	618.53	1	100	5	1.62	
	-40					
	616.53					
Brown Dolostone with Shale partings	615.53					
Gray Dolostone with Shale partings	613.53					
Brown Dolostone with Shale partings with open joint with gouge thickness estimated to be 6 mm (1/4")	-45					
	610.53	2	100	40	1.53	
Gray Dolostone, joints appear to be closed with no gouge material	-50					269.0
	-55					
	601.53					514.0
End of Boring						

ROCK CORE I-57 RETAINING WALLS.GPJ IL_DOT.GDT 2/1/18

Color pictures of the cores Yes

Cores will be stored for examination until

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-205, Box 1 of 2

Station 217+55, 47 ft. Lt.

Ground Surface Elev. = 659.29 ft.

Top of Core = 39 ft. (620.29 ft.)

Bot. of Core = 56 ft. (603.29 ft.)

Date of Core is 12/20/17

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-205, Box 1 of 2

Station 217+55, 47 ft. Lt.

Ground Surface Elev. = 659.29 ft.

Top of Core = 39 ft. (620.29 ft.)

Bot. of Core = 56 ft. (603.29 ft.)

Date of Core is 12/20/17



FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-205, Box 2 of 2

Station 217+55, 47 ft. Lt.

Ground Surface Elev. = 659.29 ft.

Top of Core = 39 ft. (620.29 ft.)

Bot. of Core = 56 ft. (603.29 ft.)

Date of Core is 12/20/17

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-205, Box 2 of 2

Station 217+55, 47 ft. Lt.

Ground Surface Elev. = 659.29 ft.

Top of Core = 39 ft. (620.29 ft.)

Bot. of Core = 56 ft. (603.29 ft.)

Date of Core is 12/20/17

485

707 COMPANY
N. HALL NO.
INTERNAL
BOX
TO



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SOIL BORING LOG

Solutions You Can Build On

Date 12/21/17

ROUTE FAI 57 DESCRIPTION Retaining wall east of I-57, north of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.112254, Longitude -87.835181

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)	Surface Water Elev. Stream Bed Elev. Groundwater Elev.: First Encounter Upon Completion After Hrs.	ft ft ft dry ft dry ft ft	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
Brown Silty Clay Organic Topsoil 640.62					620.62					
Stiff Brown/Gray Silty Clay		2			Very weathered Brown/Gray Dolostone w/ Gray Silt	619.62	100/6"			
		3	1.7	21	6" Gray Silt Seam	619.12	77	-	10	
		4	B		Weathered Gray/White Dolostone	618.12				
		2			Brown Sand & very weathered Dolostone		8			
636.62		3	2.9	21		616.62	13	-	12	
Very Stiff Gray Clay	-5	3	B		Weathered Brown Dolostone	-25	20			
		3			Beginning of hard drilling	615.12				
		3	2.9	20						
		5	B			613.62				
		2			Borehole continued with rock coring.					
		3	3.1	23						
	-10	5	B			-30				
		3								
		5	3.3	21						
		7	B							
		2								
		4	2.9	21						
	-15	7	B			-35				
625.62		3								
Stiff Gray Clay Till		5	2.0	15						
		11	P							
		5								
		6	2.3	15						
	-20	9	B			-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)



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815 780-8486

ROCK CORE LOG

Date 12/21/17

Solutions You Can Build On

ROUTE FAI 57 DESCRIPTION Retaining wall east of I-57, north of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.112254, Longitude -87.835181

COUNTY Kankakee CORING METHOD Wireline

STRUCT. NO. CORING BARREL TYPE & SIZE NQ
Station
BORING NO. B-206
Station 215+49
Offset 55.0 ft Lt.
Ground Surface Elev. 641.12 ft
Core Diameter 2 in
Top of Rock Elev. 615.12 ft
Begin Core Elev. 613.62 ft
DEPTH (ft) CORE (#) RECOVERY (%) R.Q.D. (%) CORE TIME (min/ft) STRENGTH (tsf)

Dense Gray Dolostone, joints appear to be closed with no gouge material 613.62 1 100 58 1.65
259.0
423.0
617.0
602.62

End of Boring
-40
-45

Color pictures of the cores Yes

Cores will be stored for examination until

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-206, Box 1 of 2

Station 215+60, 53 ft. Lt.

Ground Surface Elev. = 643.77 ft.

Top of Core = 27.5 ft. (616.27 ft.)

Bot. of Core = 38.5 ft. (605.27 ft.)

Date of Core is 12/21/17

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-206, Box 1 of 2

Station 215+60, 53 ft. Lt.

Ground Surface Elev. = 643.77 ft.

Top of Core = 27.5 ft. (616.27 ft.)

Bot. of Core = 38.5 ft. (605.27 ft.)

Date of Core is 12/21/17

28.5



FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-206, Box 2 of 2

Station 215+60, 53 ft. Lt.

Ground Surface Elev. = 643.77 ft.

Top of Core = 27.5 ft. (616.27 ft.)

Bot. of Core = 38.5 ft. (605.27 ft.)

Date of Core is 12/21/17

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-206, Box 2 of 2

Station 215+60, 53 ft. Lt.

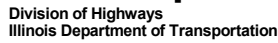
Ground Surface Elev. = 643.77 ft.

Top of Core = 27.5 ft. (616.27 ft.)

Bot. of Core = 38.5 ft. (605.27 ft.)

Date of Core is 12/21/17





Date 10/5/17

BBS, form 137 (Rev. 8-99)



Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation

ROCK CORE LOG

Page 1 of 1

Date 10/5/17

ROUTE I-57 (FAI 57) DESCRIPTION K B & S Railroad over I-57, 3.7 miles North of US 45/52 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.112173, Longitude -87.835357

COUNTY Kankakee CORING METHOD Split Barrel Wire Line

STRUCT. NO. 046-0005 (EX)
Station 216+08 (EX)

CORING BARREL TYPE & SIZE N W/L 2

BORING NO. B 207 (Pier)
Station 215+76.97

Core Diameter 1.9 in
Top of Rock Elev. 615.59 ft
Begin Core Elev. 615.59 ft

Offset 5.3 ft Lt.

Ground Surface Elev. 637.59 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
615.59	1	70	0	4	
-25					
611.59					
610.59					
	2	100	47	3	
					79.3
					950.9
-30					
					994.9
					1127.7
					1215.9
605.59					
	3	100	90	3.2	
					1059.8
					1183.4
					657.5
					984.9
-35					
					817.5
					967.1
600.59					1080.6
-40					

Gray to Tan Dolomite, Highly Fractured to the point of Rubblization

Dense Gray Limestone, Vertically Fractured in top 6"

Dense Gray Limestone - some Horizontal Fracturing with Tight Joints

No Water Recovery while Coring

Dense Gray Limestone with some Horizontal Fracturing & Tight Joints

No Water Recovery while Coring

End of Boring

Color pictures of the cores Yes

Cores will be stored for examination until Construction Complete

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

BBS, form 138 (Rev. 8-99)

ROCK CORE I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18

SN 046-0005, K B & S Railroad over I-57, Pier

(46-3)R, HBK, 5HBR, 6HBR

FAI 57 (IL 57), Kankakee County

Boring B-207, Box 1 of 2

Station 215+76.97, 5.3 ft. Lt.

Ground Surface Elev. = 637.59

Top of Core = 22 ft. (615.59)

Bottom of Core = 32 ft. (605.59)

Date of Core is 10/5/17

I-57 Railroad (Center Pier)

Boring # B207

Depth 22 FT to 32 FT

Box 1 of 2 10-5-17

22 ft



SAMPLE



SAMPLE

SAMPLE

SAMPLE



SAMPLE

B207
32 ft

10/19/2017



**SN 046-0005, K B & S Railroad over I-57, Pier
(46-3)R, HBK, 5HBR, 6HBR**

FAI 57 (IL 57), Kankakee County

Boring B-207, Box 2 of 2

Station 215+76.97, 5.3 ft. Lt.

Ground Surface Elev. = 637.59

Top of Core = 32 ft. (605.59)

Bottom of Core = 37 ft. (600.59)

Date of Core is 10/5/17

1-57 Railroad (Center Pier)

Boring # B207

Depth 32 Ft to 37 Ft

Box 2 of 2 10-5-17

SN 046-0005

Box 3
B207



SAMPLE 11

SAMPLE 11



SAMPLE 12

SAMPLE 13



Box 3
B207

10/19/2017



3705 Progress Blvd
Peru, IL 61354
815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 12/18/17

ROUTE FAI 57 DESCRIPTION Retaining wall west of I-57, south of K B & S Railroad Crossing LOGGED BY TLM TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.110696, Longitude -87.835804

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
	(ft)	(/6")	(tsf)	(%)		(ft)	(/6")	(tsf)	(%)
Topsoil 661.22					Very stiff gray Silty Clay to Clay, trace sand				
		3					4		
Very stiff to hard brown & gray Silty Clay, moist		4	2.1	17			6	3.7	17
		5	B				8	B	
					639.22				
		5			Very stiff gray Clay Till, some silt, moist		3		
		5	2.9	17			3	2.5	16
	-5	4	S			-25	6	B	
		4							
		5	4.7	18	635.22				
		7	B		Very stiff gray Clay, moist				
654.22									
Very stiff brown Clay, moist		3					3		
		4	3.7	20			5	4.3	22
	-10	6	S			-30	7	B	
651.72									
Very stiff brown & gray Silty Clay, moist with occasional silt seam		3							
		5	2.7	17					
		7	B						
649.22									
Stiff gray Silty Clay Loam w/occasional silt seams		3					3		
		6	1.9	15			5	3.3	23
	-15	7	B			-35	7	B	
		3							
		4	1.2	15	625.22				
		6	B		Hard gray Clay Till				
		3					11		
		3	2.1	17			12	4.5	11
642.22	-20	5	B			-40	18	P	

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)



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Peru, IL 61354
815 780-8486

SOIL BORING LOG

Date 12/18/17

Solutions You Can Build On

ROUTE FAI 57 DESCRIPTION Retaining wall west of I-57, south of K B & S Railroad Crossing LOGGED BY TLM TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.110696, Longitude -87.835804

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. _____ Station _____	D E P T H (ft)	B L O W S (/6")	U C S (tsf)	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft Groundwater Elev.: First Encounter _____ dry ft Upon Completion _____ dry ft After _____ Hrs. _____ ft
Hard gray Clay Till (<i>continued</i>) _____ 621.22					
Hard drilling at 41', possibly the top of weathered/fractured Bedrock _____ 50/.3"					
White rock dust in shoe, otherwise no recovery _____ 618.22					
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)



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815 780-8486

SOIL BORING LOG

Solutions You Can Build On

Date 12/19/17

ROUTE FAI 57 DESCRIPTION Retaining wall west of I-57, south of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.111128, Longitude -87.835762

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H S	BLOW W S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	ft ft	DEPTH H S	BLOW W S	UCS Qu	MOIST T
BORING NO. B-210 Station 219+54 Offset 118.0 ft Rt. Ground Surface Elev. 662.85 ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter 620.9 ft Upon Completion 620.9 ft After Hrs.	ft ft ft	(ft)	(/6")	(tsf)	(%)
Dark Brown Silty Clay, organic 661.85					Very stiff to stiff Gray Silty Clay (continued)					
Very stiff Brown Silty Clay, moist	3						4			
	3	2.5	17				5	2.1	15	
	5	B					6	B		
	4						2			
	7	4.5	14				4	1.2	17	
	8	P					3	B		
657.35	-5						-25			
Very stiff Brown/gray Silty Clay Till, moist	4						2			
	6	4.7	16				4	1.7	15	
	6	B					5	B		
654.85						634.85				
Very stiff Brown Clay	3				Very stiff Gray Clay		2			
	4	2.9	20				5	3.1	19	
	6	S					6	B		
	-10						-30			
	3									
	5	4.7	20							
	8	B								
649.85										
Very stiff to stiff Gray Silty Clay	3						2			
	5	3.3	15			628.35	6	4.1	23	
	6	B			Very stiff to stiff Gray Sandy Clay		4	B		
	-15						-35			
	2									
	3	2.1	16							
	4	B								
	4						3			
	4	1.5	17			623.35	4	1.7	14	
	6	P			Stiff Gray Sandy Clay Till		8	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)



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SOIL BORING LOG

Solutions You Can Build On

Date 12/19/17

ROUTE FAI 57 DESCRIPTION Retaining wall west of I-57, south of K B & S Railroad Crossing LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.111542, Longitude -87.835761

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)	Surface Water Elev. Stream Bed Elev. Groundwater Elev.: First Encounter Upon Completion After Hrs.	ft ft ft dry dry ft	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
Black Silty Clay Topsoil 657.03					Very stiff Gray Clay (continued)					
Very stiff to hard Brown/Gray Silty Clay Loam	3				636.53		3			
	3	2.0	22		Gray Silt Seam, 6"	636.03	3	1.9	27	
	4	P			Stiff Gray Clay		5	B		
	2						3			
	3	3.3	22				4	2.0	23	
	-5	5	S				-25	5	B	
	4						1			
	7	7.0	22				2	1.2	20	
	9	B					4	B		
650.03										
Hard Brown/Gray Clay	4						3			
	7	7.6	22				5	2.1	26	
	-10	9	B				-30	8	B	
646.53										
Very stiff Gray Clay	3				626.53					
	5	3.3	27		Medium stiff Gray Sandy Clay Till					
	5	B								
	3						3			
	4	2.9	25				4	0.8	14	
	-15	5	B				-35	5	B	
	3									
	5	2.9	21							
	5	B								
	2									
	3	2.5	24		619.03		15			
	6	B			V. Weath./Fract. Dolostone		22		4	
	-20				End of Boring	618.03	-40	49		

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)

SOIL BORING LOG

Date 9/22/17

ROUTE	<u>I-57 (FAI 57)</u>	DESCRIPTION	<u>I-57 on West side of I-57</u>	LOGGED BY	<u>Larry Myers</u>
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SECTION	(46-3)R, HBK, 5HBR, 6HBR	LOCATION	SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.111755, Longitude -87.835478
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COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. _____
Station _____

BORING NO.	B 212
Station	217+28.22
Offset	32.7 ft Rt.
Ground Surface Elev.	636.46

D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

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

Groundwater Elev.:
First Encounter _____ ft
Upon Completion _____ ft
After Hrs. _____ ft

Augered Material - Not Documented

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18

616.46 -20

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)

Retaining Wall South of K B & S Railroad

(46-3)R, HBK, 5HBR, 6HBR

FAI 57 (IL 57), Kankakee County

Boring B-212, Box 1 of 1

Station 217+28.22, 32.7 ft. Rt.

Ground Surface Elev. = 636.46

Top of Core = 20 ft. (616.46)

Bottom of Core = 30 ft. (606.46)

Date of Core is 9/22/17

9/22/17
I-57 R x R Ret. Wall
Boring # B212
Depth 20' to 30'
Box 1 of 1

core run
20'



SAMPLE #4

SAMPLE #5

SAMPLE #1

SAMPLE #2

core run #2
20'

09/28/2017



ROCK CORE WORKSHEET				
SN				
CONTRACT 6683				
ROUTE 157				
COUNTY Kanabek				
SAMPLE NUMBER		6	7	
SAMPLE DEPTH	FEET	38.95	39	
SAMPLE ELEVATION	FEET	0		
SAMPLE MASS	GRAMS	484.0		
TOP DIAMETER A	INCH	1.86		
TOP DIAMETER B	INCH	1.87		
BOTTOM DIAMETER A	INCH	1.8		
BOTTOM DIAMETER B	INCH			
AVERAGE DIAMETER	INCH			
AREA	SQ IN			
LENGTH A	INCH			
LENGTH B	INCH			
AVERAGE LENGTH				
LENGTH / DIAMETER				
RATIO				

SOIL BORING LOG

Date 9/19/17

ROUTE	<u>I-57 (FAI 57)</u>	DESCRIPTION	<u>I-57 on West side of I-57</u>	LOGGED BY	<u>Larry Myers</u>
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SECTION	(46-3)R, HBK, 5HBR, 6HBR	LOCATION	SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.112033, Longitude -87.835487
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COUNTY Kankakee **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO. _____ Station _____		D E P T H	B L O W S	U C S Qu	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S (tsf)	M O I S T (%)
BORING NO. _____ B 213 Station _____ 216+26.76 Offset _____ 32.0 ft Rt. Ground Surface Elev. _____ 636.95 ft		(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter _____ ft Upon Completion _____ ft After _____ Hrs. _____ ft	(ft)	(/6")	(tsf)	(%)
Augered Material - Not Documented		_____				Augered Material - Not Documented (<i>continued</i>)	_____			
		_____ 615.45				_____				
		_____				Augered Approximately 18" into Rock Before Starting Core	_____			
		_____ 613.95				_____				
		_____				Borehole continued with rock coring.	_____			
		_____ -5				_____ -25				
		_____					_____			
		_____				_____				
		_____					_____			
		_____				_____				
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		_____				_____				

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)

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18



Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation

ROCK CORE LOG

Page 1 of 1

Date 9/19/17

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall South of K B & S Railroad over I-57 on West side of I-57 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.112033, Longitude -87.835487

COUNTY Kankakee CORING METHOD Split Barrel Wire Line

STRUCT. NO. _____
Station _____

CORING BARREL TYPE & SIZE N W/L 2

BORING NO. B 213
Station 216+26.76
Offset 32.0 ft Rt.
Ground Surface Elev. 636.95 ft

Core Diameter 1.9 in
Top of Rock Elev. 615.45 ft
Begin Core Elev. 613.95 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
613.95	1	80	7	2.2	1324.7
-25					
608.95	2	100	43	4	768.6
-30					476.6
603.95					620.9
End of Boring					676.9
-35					
-40					

Color pictures of the cores Yes

Cores will be stored for examination until Construction Complete

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

BBS, form 138 (Rev. 8-99)

ROCK CORE I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18

Retaining Wall South of K B & S Railroad

(46-3)R, HBK, 5HBR, 6HBR

FAI 57 (IL 57), Kankakee County

Boring B-213, Box 1 of 1

Station 216+26.76, 32.0 ft. Rt.

Ground Surface Elev. = 636.95

Top of Core = 23 ft. (613.95)

Bottom of Core = 33 ft. (603.95)

Date of Core is 9/19/17

9-19-17
I-57 R x R Ret. Wall
Boring # B213
Depth 23' to 33'
Box 1 of 1

Boring #
23



09/28/2017

End Run 2
33'

COUNTY ROAD LOG			
COUNTY ROAD LOG			
SAMPLE NUMBER			
DEPTH	FEET		
SAMPLE ELEVATION	FEET		
SAMPLE MASS	GRAMS		
TOP DIAMETER A	INCH		
TOP DIAMETER B	INCH		
BOTTOM DIAMETER A	INCH		
BOTTOM DIAMETER B	INCH		
AVERAGE DIAMETER	INCH		
AREA	SQ IN		
LENGTH A	INCH		
LENGTH B	INCH		
AVERAGE LENGTH	INCH		
LENGTH / DIAMETER RATIO			
LENGTH / DIAMETER CORRECTION			
LOAD			
TEST METHOD			



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SOIL BORING LOG

Date 12/20/17

Solutions You Can Build On

West Abutment for K B & S Railroad over I-57,
3.8 miles north of US 45/52

ROUTE FAI 57 DESCRIPTION LOGGED BY TMR

SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM,
Latitude 41.112329, Longitude -87.83566

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station

BORING NO. B-214
Station 215+18
Offset 77.0 ft Rt.
Ground Surface Elev. 658.06 ft

D E P T H (ft)
B L O W S Qu (/6")
U C S (tsf)
M O I S T (%)

Surface Water Elev. ft
Stream Bed Elev. ft
Groundwater Elev.:
First Encounter 609.6 ft ▼
Upon Completion 609.6 ft ▼
After Hrs. ft

Hard Gray Silty Clay (continued)			
616.06			
Hard Gray Sandy Clay Till			
15			
19	-	10	
20			
-45			
612.06			
Top of weathered rock			
Auger refusal, water on rock	▼		
609.06	50/1.5*	27	
Borehole continued with rock coring.			
-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)

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-214, Box 1 of 2

Station 215+20, 90 ft. Rt.

Ground Surface Elev. = 658.04 ft.

Top of Core = 49 ft. (609.04 ft.)

Bot. of Core = 66 ft. (592.04 ft.)

Date of Core is 12/20/17

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-214, Box 1 of 2

Station 215+20, 90 ft. Rt.

Ground Surface Elev. = 658.04 ft.

Top of Core = 49 ft. (609.04 ft.)

Bot. of Core = 66 ft. (592.04 ft.)

Date of Core is 12/20/17



FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-214, Box 2 of 2

Station 215+20, 90 ft. Rt.

Ground Surface Elev. = 658.04 ft.

Top of Core = 49 ft. (609.04 ft.)

Bot. of Core = 66 ft. (592.04 ft.)

Date of Core is 12/20/17

FAI 57 (IL 57)

(46-3)R, HBR, 5HBR, 6HBR

Kankakee County

Boring B-214, Box 2 of 2

Station 215+20, 90 ft. Rt.

Ground Surface Elev. = 658.04 ft.

Top of Core = 49 ft. (609.04 ft.)

Bot. of Core = 66 ft. (592.04 ft.)

Date of Core is 12/20/17

T-20

Top

Bottom





Illinois Department of Transportation

Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Page 1 of 1

Date 9/18/17

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall North of K B & S Railroad over I-57 on West side of I-57 LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION NE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.112678, Longitude -87.835518

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. _____
Station _____

BORING NO. B 215
Station 213+91.80
Offset 33.3 ft Rt.
Ground Surface Elev. 639.96 ft

D E P T H (ft)	B L O W S (/6")	U C S (tsf)	M O I S T (%)
-----------------------------------	------------------------------------	--------------------------	----------------------------------

Surface Water Elev. _____ ft	Stream Bed Elev. _____ ft	Groundwater Elev.: First Encounter _____ ft	Upon Completion _____ ft	After _____ Hrs. _____ ft
------------------------------	---------------------------	--	--------------------------	---------------------------

D E P T H (ft)	B L O W S (/6")	U C S (tsf)	M O I S T (%)
-----------------------------------	------------------------------------	--------------------------	----------------------------------

Augered Material - Not Documented

Augered Material - Not Documented (*continued*)

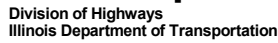
612.96

Borehole continued with rock coring.

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18

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)



Date 9/18/17

ROCK CORE I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18

Retaining Wall South of K B & S Railroad

(46-3)R, HBK, 5HBR, 6HBR

FAI 57 (IL 57), Kankakee County

Boring B-215, Box 1 of 1

Station 213+91.80, 33.3 ft. Rt.

Ground Surface Elev. = 639.96

Top of Core = 27 ft. (612.96)

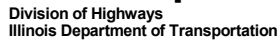
Bottom of Core = 37 ft. (602.96)

Date of Core is 9/18/17

Core Run #1
27

09/28/2017

SAMPLE NUMBER			
SAMPLE DEPTH	FEET		
SAMPLE ELEVATION	FEET	0	
SAMPLE MASS	GRAMS		
TOP DIAMETER A	INCH		
TOP DIAMETER B	INCH		
MID DIAMETER A	INCH		
MID DIAMETER B	INCH		
BASE DIAMETER	INCH		WDIVD
AREA	SQ IN		WDIVD
LENGTH A	INCH		
LENGTH B	INCH		
AVERAGE LENGTH	INCH		
LENGTH / DIAMETER RATIO			
LENGTH / DIAMETER CORRECTION			
LOAD	POUNDS		
TEST METHOD			
STRENGTH	PSI		
CORRECTED STRENGTH			



Date 9/14/17

BBS, form 137 (Rev. 8-99)

ROCK CORE LOG

Date 9/14/17

ROUTE	DESCRIPTION	LOGGED BY
I-57 (FAI 57)	Retaining Wall North of K B & S Railroad over I-57 on West side of I-57	Larry Myers

SECTION	(46-3)R, HBK, 5HBR, 6HBR	LOCATION	NE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.112933, Longitude -87.835533
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COUNTY	Kankakee	CORING METHOD	Split Barrel Wire Line	R	D	CORE	S
---------------	----------	----------------------	------------------------	----------	----------	-------------	----------

STRUCT. NO.	CORING BARREL TYPE & SIZE	N	W/L	2	D E P T H	C O R E	C O V E R Y	Q D	T I M E	R E N G T H
Station	Core Diameter	1.9	in							
BORING NO.	Top of Rock Elev.	610.66	ft							
Station	Begin Core Elev.	610.66	ft							
Offset					(ft)	(#)	(%)	(%)	(min/ft)	(tsf)
Ground Surface Elev.		641.66	ft							

Dense Gray Limestone with some Loose Horizontal Joints & Vertical Fracturing with Tight Joints	610.66	1	88	22	2	887.7 837.2 983.1
Dense Gray Limestone with some Horizontal Fracturing with Tight Joints, Vertical Fracturing stops @ Approximatly 37.5', some Minor Crystalline Vug Fills	605.66	2	100	41	3.2	891.9 824.5 816.6 1086.2
End of Boring	600.66					

Color pictures of the cores Yes

Cores will be stored for examination until Construction Complete

The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

BBS, form 138 (Rev. 8-99)

Retaining Wall North of K B & S Railroad

(46-3)R, HBK, 5HBR, 6HBR

FAI 57 (IL 57), Kankakee County

Boring B-216, Box 1 of 1

Station 212+98.75, 34.6 ft. Rt.

Ground Surface Elev. = 641.66

Top of Core = 31 ft. (610.66)

Bottom of Core = 41 ft. (600.66)

Date of Core is 9/14/17

9-14-17

I-57 R x R Ret. Wall

Boring # B216

Depth 31' - 41'

Box 1 of 1

Core 1
31'



09/28/2017

Core 2
41'

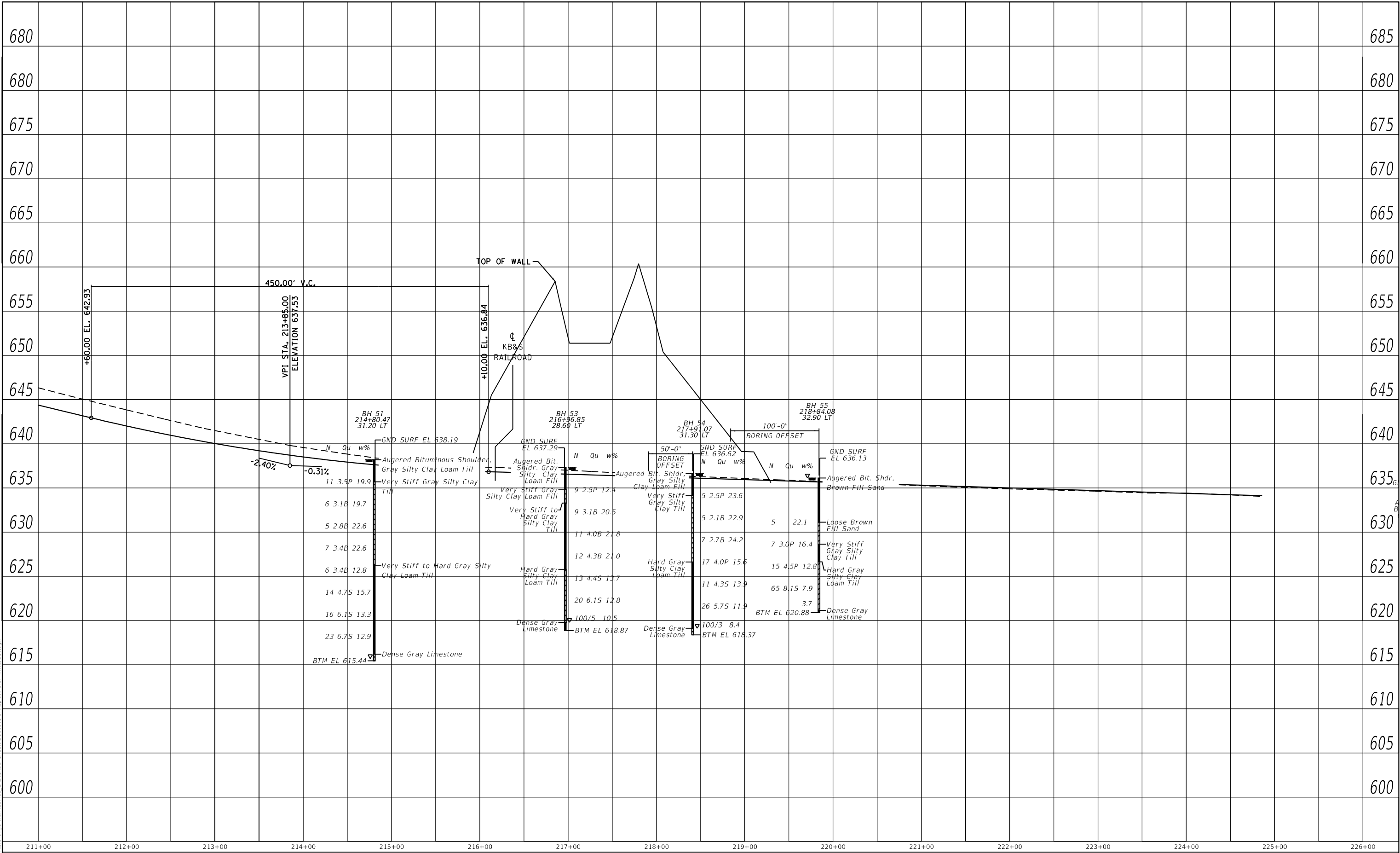
ROCK CORE LOG			
SN			
CONTRACT 65863			
ROUTE I-57			
COUNTY Kankakee			
SAMPLE NUMBER			
SAMPLE DEPTH	FEET		
SAMPLE ELEVATION	FEET	0	
SAMPLE MASS	GRAMS		
TOP DIAMETER A	INCH		
TOP DIAMETER B	INCH		
BOTTOM DIAMETER A	INCH		
BOTTOM DIAMETER B	INCH		
AVERAGE DIAMETER	INCH		
AREA	SQ IN		
LENGTH A	IN		
LENGTH B	IN		
AVERAGE LENGTH	IN		
LENGTH / DIAMETER RATIO			
LENGTH / DIAMETER			

EXHIBIT D
SUBSURFACE PROFILE

PLAN	SURVEYED	DATE
NO.	BY	
NOTE BOOK		
ALIGNMENT CHECKED		
AS BUILT		
CADD FILE NAME		

PROFILE	SURVEYED	DATE
NO.	BY	
NOTE BOOK		
GRADES CHECKED		
STRUCTURE NOTATIONS CHNG		

MODEL: PL_57_4
FILE NAME: P:\11-1017-157 Interchange with IL1710_CADD\CADD Sheets\ID36683-sht-pp-soil-pprd-drw\WallC1.dgn



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	DRAWN -	REVISED -
PLOT SCALE = 100.0000 ' / in.	CHECKED -	REVISED -
PLOT DATE = 6/15/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

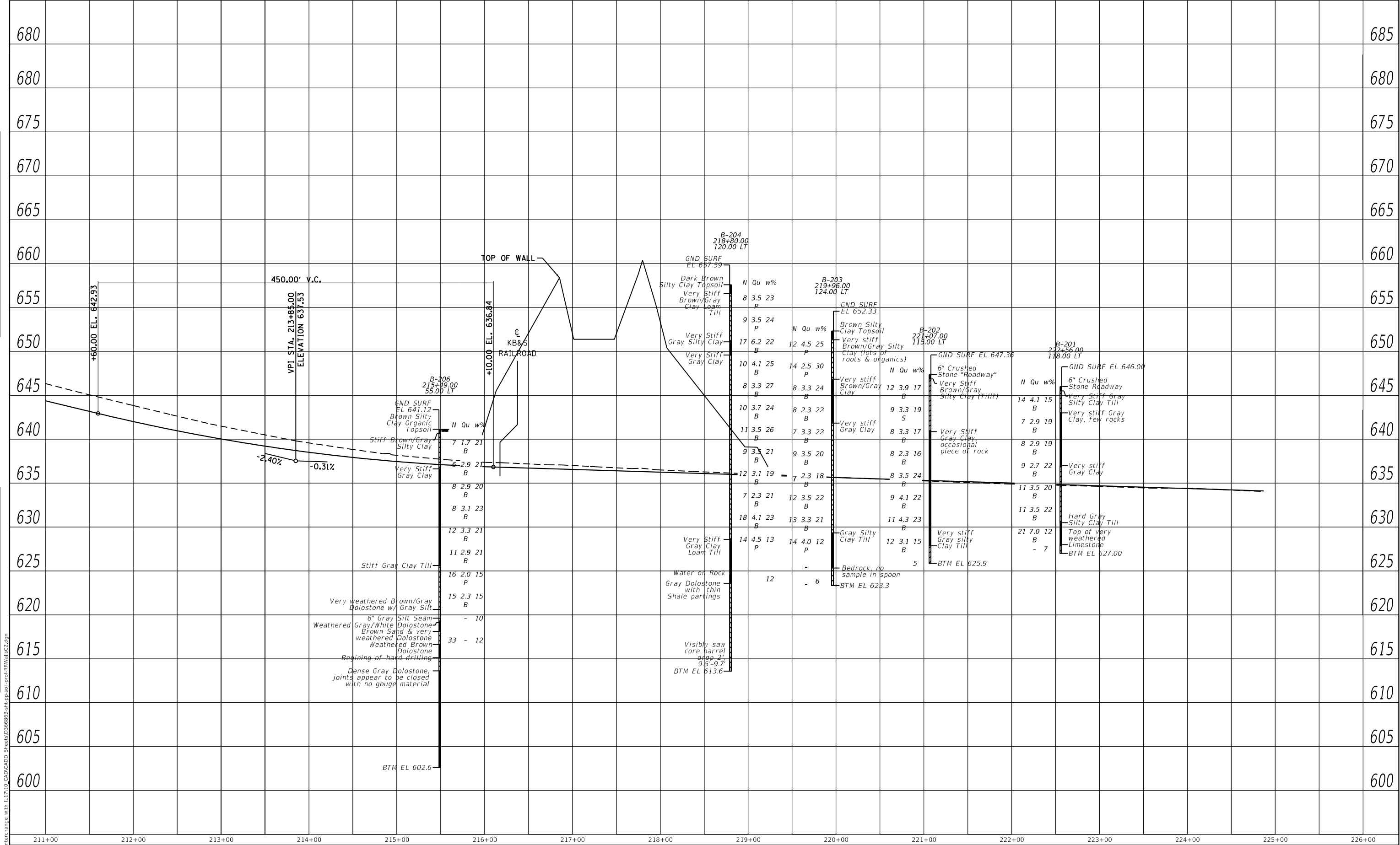
KSRB OVER INTERSTATE 57 - WALL C
SOIL BORING PROFILE

SCALE: SHEET OF SHEETS STA. TO STA.

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

PLAN	SURVEYED	BY	DATE
	PLOTTED		
	ALIGNMENT CHECKED		
	GRADE CHECKED		
	STRUCTURE NOTATIONS CHNG		
	NO.		

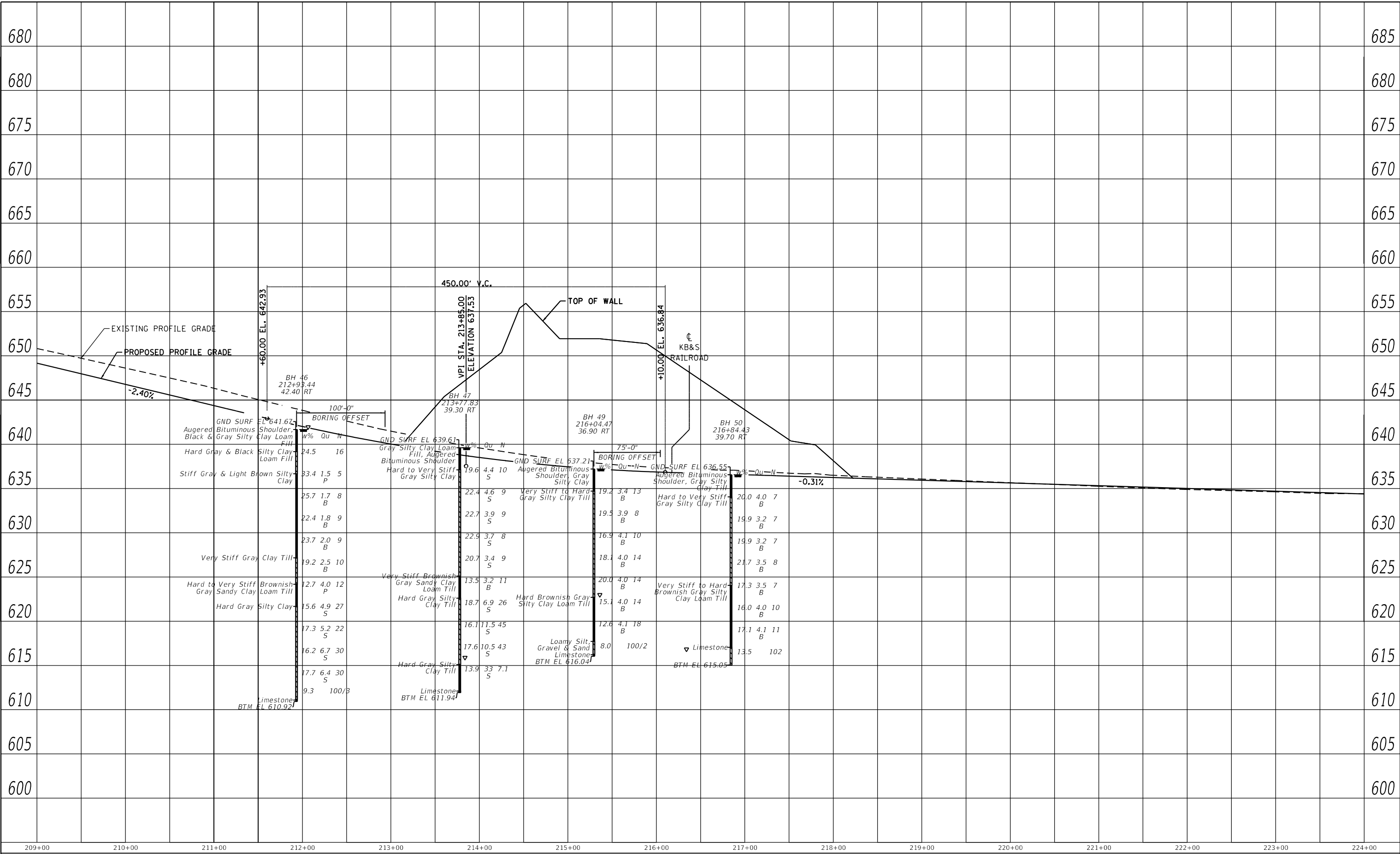
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	PLOTTED		
	GRADES CHECKED		
	STRUCTURE NOTATIONS CHNG		
	NO.		



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

PROFILE	SURVEYED	BY	DATE
	PLOTTED		
NOTE BOOK	GRADES CHECKED		
	STRUCTURE NOTATIONS CHNG		
NO.			

MODEL: PL_57_4
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USER NAME = bbb	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 100,0000 ' / in.	CHECKED -	REVISED -
PLOT DATE = 6/15/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

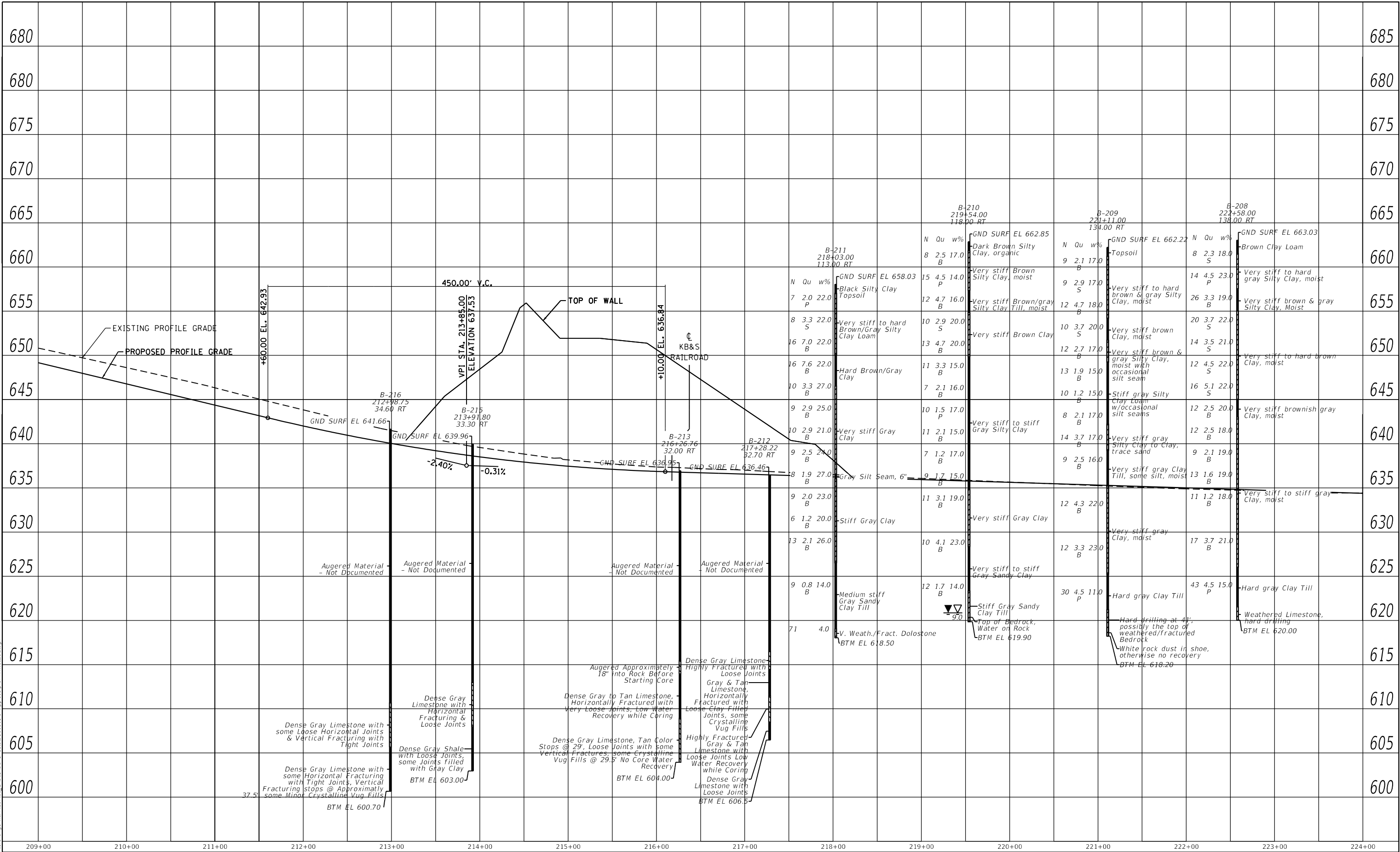
KBSR OVER INTERSTATE 57 – WALL D SOIL BORING PROFILE			
SCALE:	SHEET	OF	SHEETS
	STA.		TO STA.

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

PLAN	SURVEYED	DATE
BY		
NOTE BOOK		
NO.		

PROFILE	SURVEYED	DATE
BY		
NOTE BOOK		
NO.		

MODEL: PL_57_4
FILE NAME: P:\11-1017 157 Interchange with IL1710 CAD\CADD Sheets\ID36685-sht-cpp-soil-pro-d-rw\wallD7.dgn



USER NAME = bbb	DESIGNED -	REVISED -
	DRAWN -	REVISED -
PLOT SCALE = 100,0000 ' / in.	CHECKED -	REVISED -
PLOT DATE = 6/15/2018	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

KBSR OVER INTERSTATE 57 - WALL D
SOIL BORING PROFILE

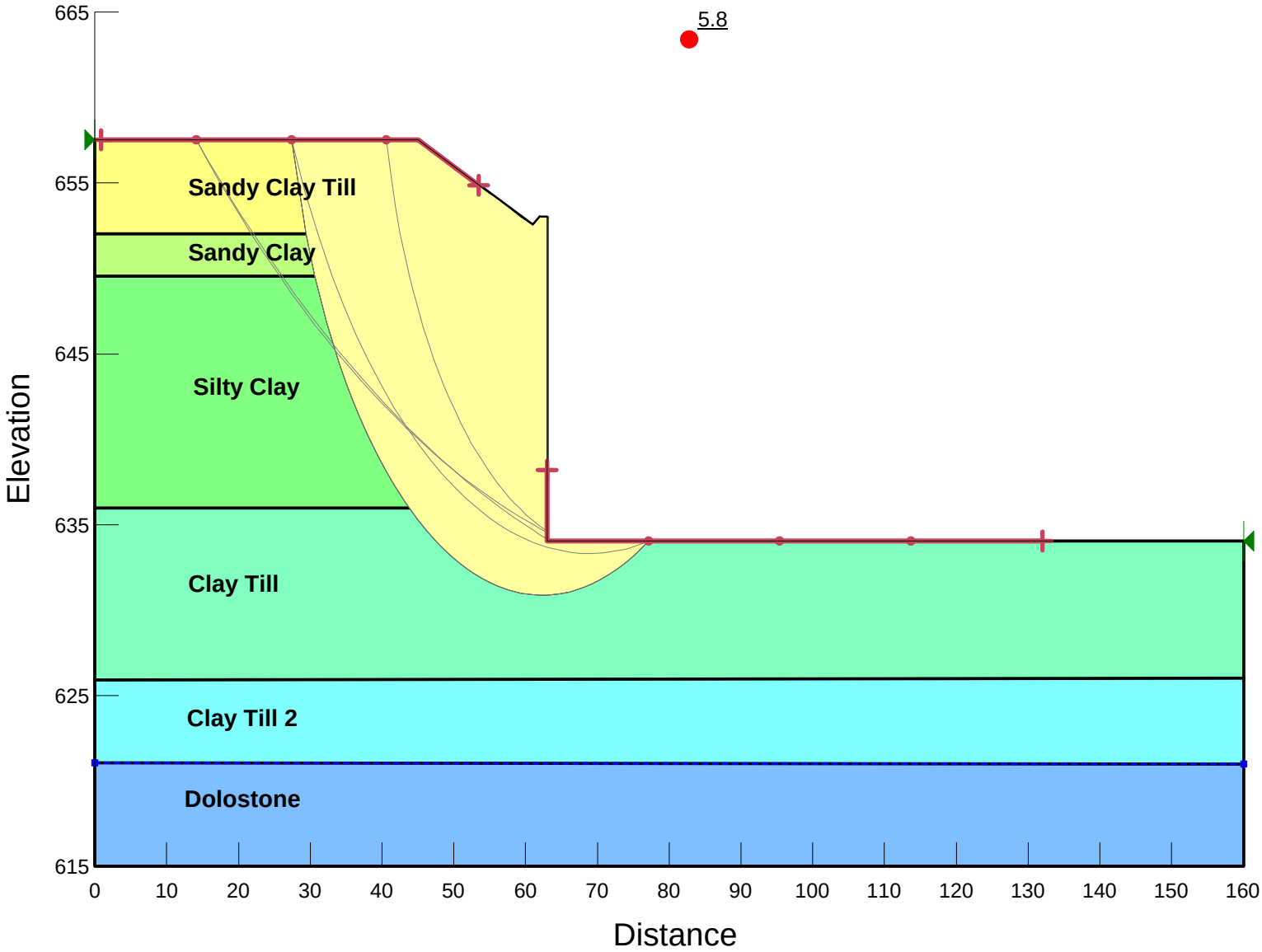
SCALE: SHEET OF SHEETS STA. TO STA.

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

EXHIBIT E

SLOPE/W SLOPE STABILITY ANALYSIS

**K B & S Railroad over I-57
Station 217+00 Wall C
End of Construction (Undrained Condition)**



Name: Sandy Clay Till
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 2,250 psf
Phi': 0 °

Name: Sandy Clay
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 800 psf
Phi': 0 °

Name: Silty Clay
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 2,200 psf
Phi': 0 °

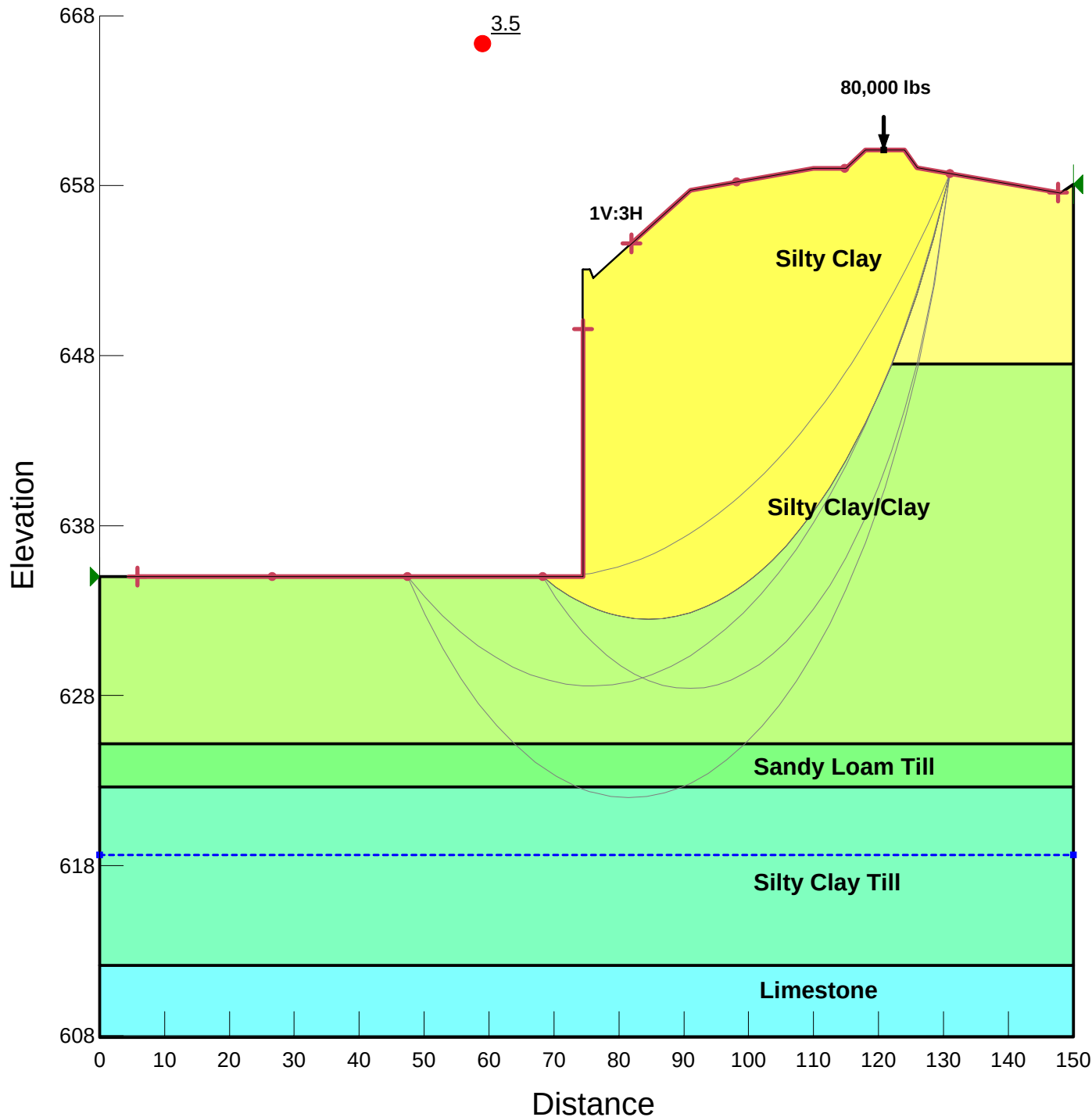
Name: Clay Till
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 3,500 psf
Phi': 0 °

Name: Clay Till 2
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 6,600 psf
Phi': 0 °

Name: Dolostone
Model: Mohr-Coulomb
Unit Weight: 150 pcf
Cohesion': 0 psf
Phi': 45 °

Name: Concrete
Model: Mohr-Coulomb
Unit Weight: 150 pcf
Cohesion': 45,000 psf
Phi': 45 °

**K B & S Railroad over I -57
Station 214+50 Wall D
End of Construction (Undrained Condition)**



Name: Silty Clay
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 5,100 psf
Phi': 0 °

Name: Silty Clay/Clay
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 4,000 psf
Phi': 0 °

Name: Sandy Loam Till
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 3,200 psf
Phi': 0 °

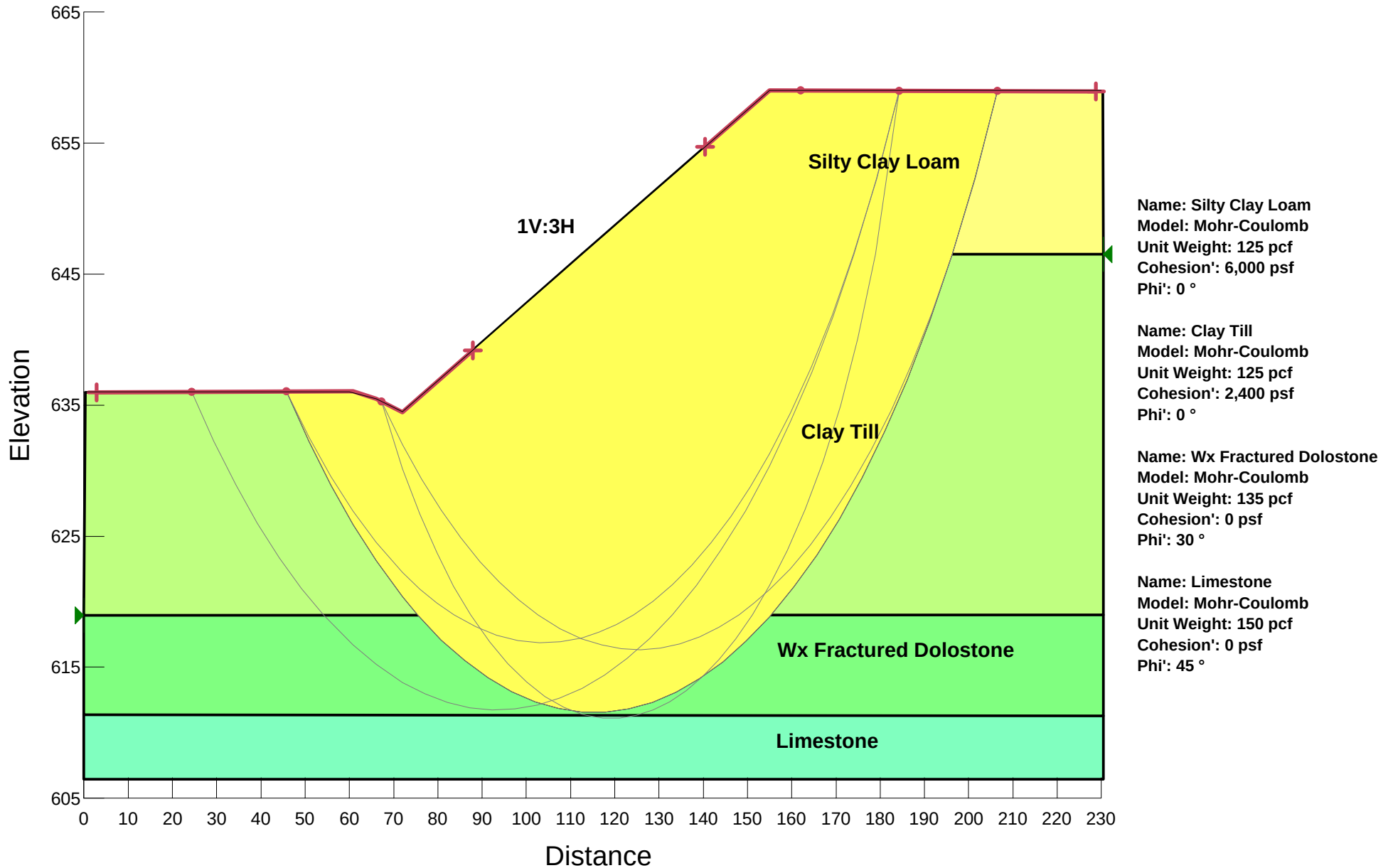
Name: Silty Clay Till
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 7,100 psf
Phi': 0 °

Name: Limestone
Model: Mohr-Coulomb
Unit Weight: 140 pcf
Cohesion': 30,000 psf
Phi': 45 °

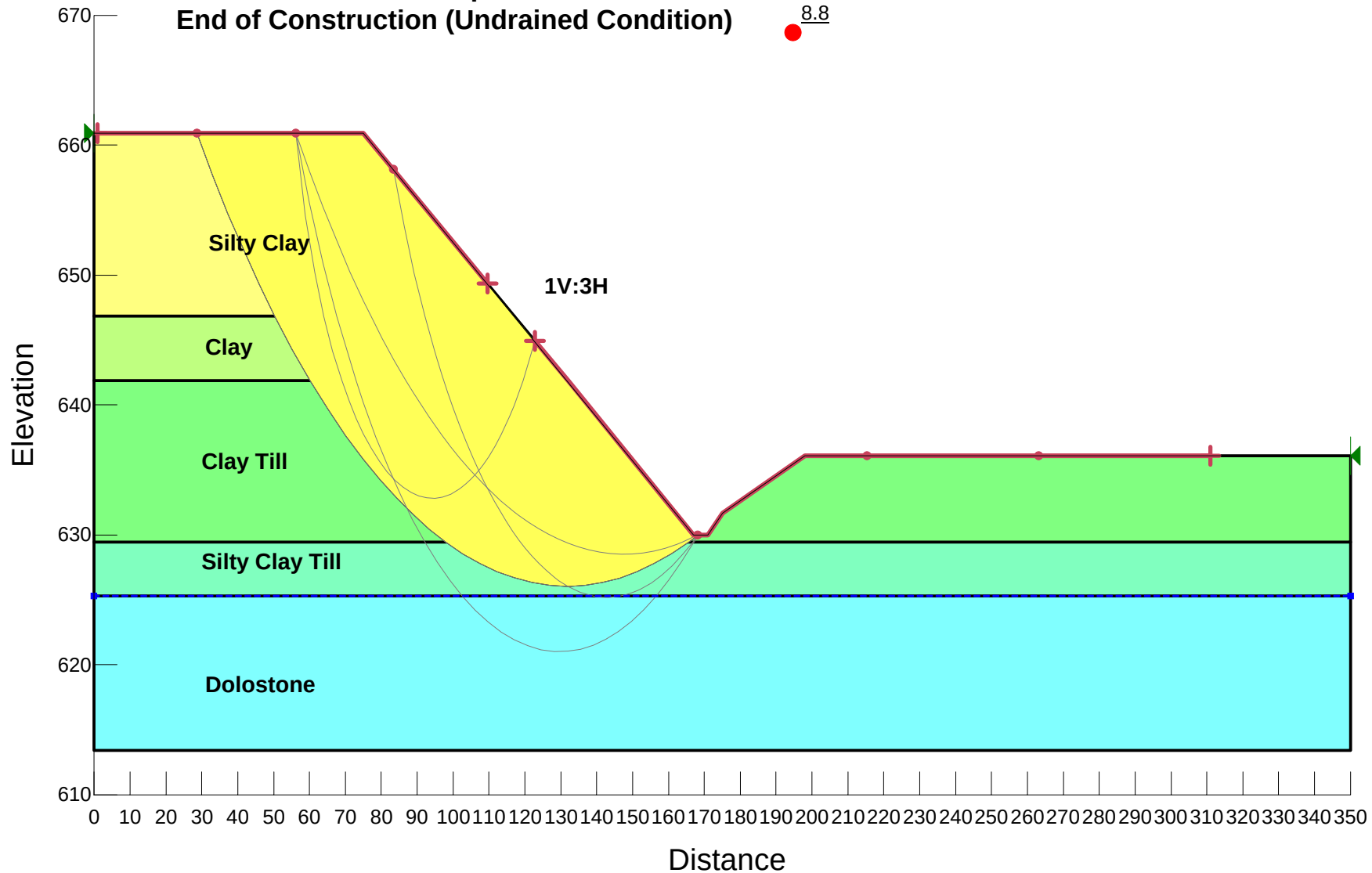
Name: Concrete
Model: Mohr-Coulomb
Unit Weight: 150 pcf
Cohesion': 10,000 psf
Phi': 45 °

**K B & S Railroad over I-57
Station 218+50 Cut Slope Southbound I-57
End of Construction (Undrained Condition)**

6.2



**K B & S Railroad over I-57
Station 220+00 Cut Slope Northbound I-57
End of Construction (Undrained Condition)**



Name: Silty Clay
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 3,500 psf
Phi': 0 °

Name: Clay
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 2,800 psf
Phi': 0 °

Name: Clay Till
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 3,300 psf
Phi': 0 °

Name: Silty Clay Till
Model: Mohr-Coulomb
Unit Weight: 125 pcf
Cohesion': 4,000 psf
Phi': 0 °

Name: Dolostone
Model: Mohr-Coulomb
Unit Weight: 150 pcf
Cohesion': 5,000 psf
Phi': 45 °

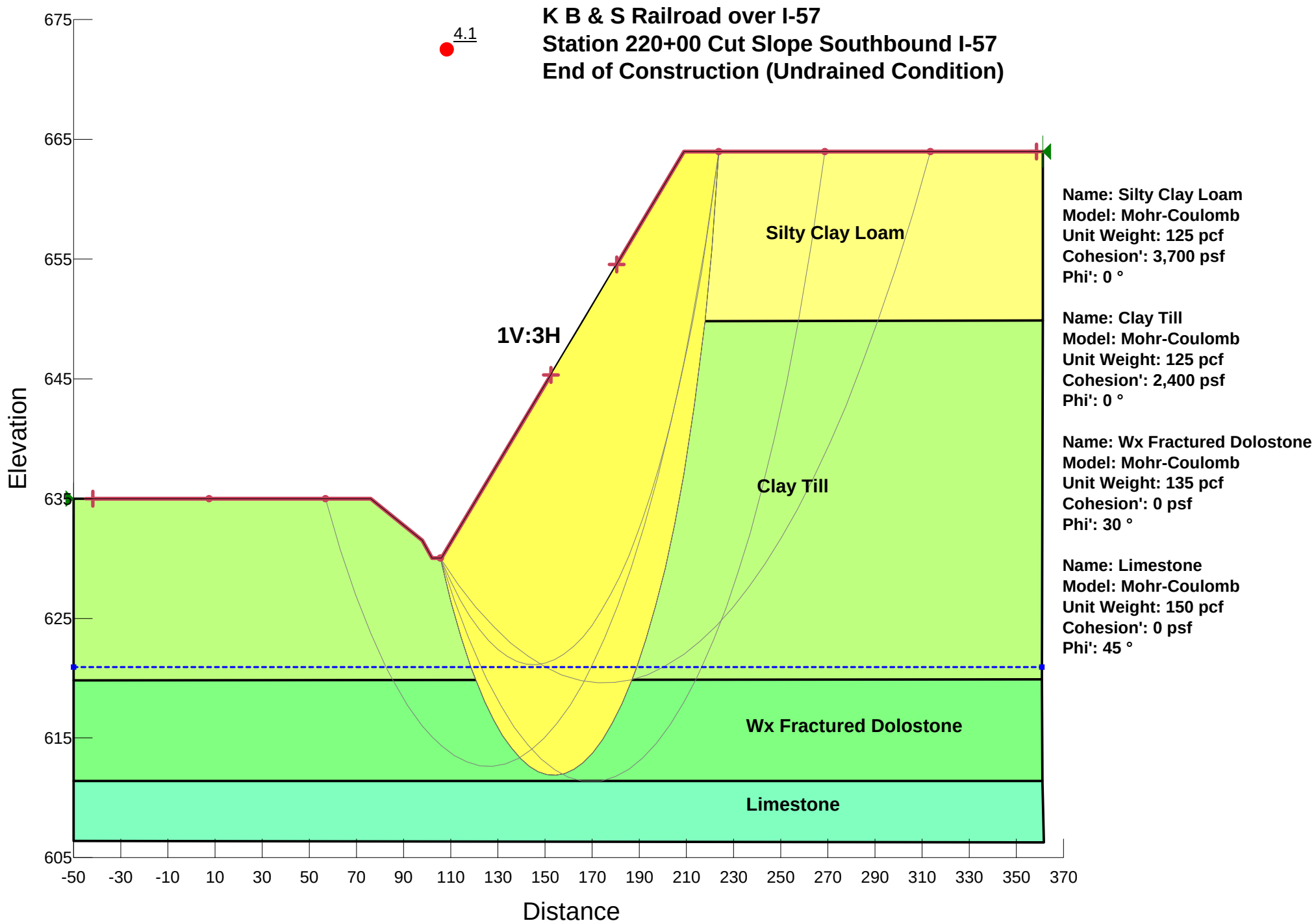
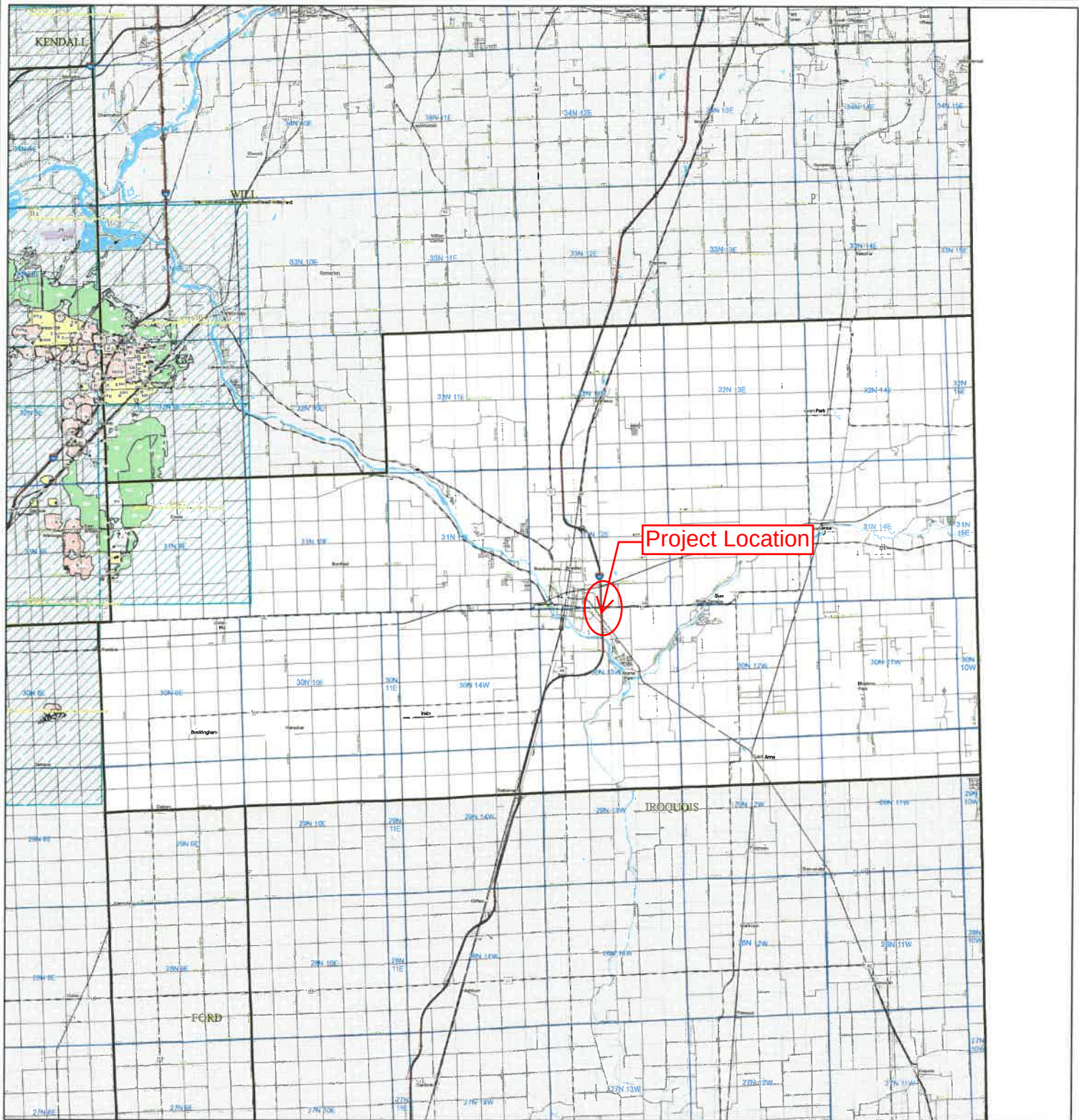


EXHIBIT F

ILLINOIS STATE GEOLOGICAL SURVEY MINE MAP

Coal Mines and Industrial Mineral Mines KANKAKEE County



Project Location

1:100,000

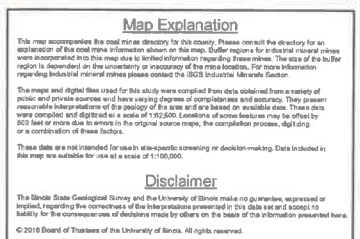
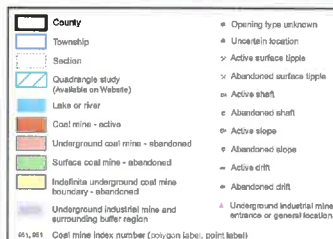
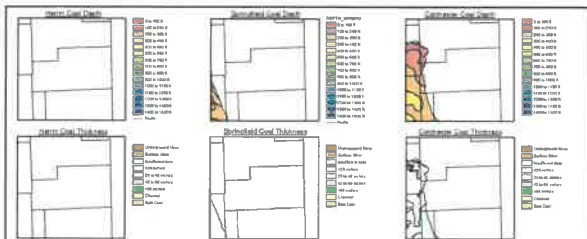


EXHIBIT G

IDOT DRILLED SHAFT AXIAL CAPACITY

SPREADSHEETS



DRILLED SHAFT AXIAL CAPACITY IN ROCK - DOLOMITE, LIMESTONE, SANDSTONE, AND HARD SHALE

STRUCTURE ===== SN 046-9904
 SUBSTRUCTURE & REFERENCE BORING ===== E. Abutment - Boring #205
 GROUND SURFACE ELEVATION ===== 644.50 FT
 GROUND WATER ELEVATION ===== 0.00 FT
 ESTIMATED TOP OF ROCK ELEVATION ===== 611.50 FT *SEE NOTE
 DRILLED SHAFT DIAMETER IN ROCK ===== 36 IN.
 FACTORED AXIAL LOAD ===== 3548 KIPS
 DRILLED SHAFT CONCRETE STRENGTH, f_c ===== 3.5 KSI

FOUNDATION REDUNDANCY ===== REDUNDANT

NOTE: Top of Competent Rock Elevation used in analysis

SOCKET DEPTH (FT)	TIP ELEV. (FT)	LAYER THICK. (FT)	UNCONFINED COMPRESSIVE STRENGTH (q _u) (KSF)	ROCK TYPE	GSI	ROCK CONDITION	RQD (%)	JOINT TYPE	ROCK INTACT OR TIGHTLY JOINTED?	SIDE RESISTANCE						AVG. q _u W/IN 2 - SHAFT DIA. (KSF)	TIP RESISTANCE			COMBINED SIDE & TIP RESISTANCE					
										NOM. RESIST. (KIPS)	Σ NOM. RESIST. (KIPS)	Σ FACT. RESIST. (KIPS)	SETTLEMENT				NOM. RESIST. (KIPS)	FACT. RESIST. (KIPS)	SETTL. w _{Rn} (IN.)	R _p /R _n	NOM. RESIST. (KIPS)	FACT. RESIST. (KIPS)	SETTLEMENT		
													Q _{C1} (KIPS)	w _{C1} (IN.)	w _{Rn} (IN.)								Q _{C1} (KIPS)	w _{C1} (IN.)	w _{Rn} (IN.)
2.00	609.50	2.00	538.0	Dolomite	40	Normal	40	Closed	Yes	616	616	339	161	0.048	1.924	701.3	1842	921	0.814	0.83	2219	1128	271	0.049	0.832
4.00	607.50	2.00	538.0	Dolomite	40	Normal	40	Closed	Yes	616	1232	678	325	0.084	2.041	864.7	2192	1096	0.859	0.75	2941	1508	547	0.087	0.874
6.00	605.50	2.00	538.0	Dolomite	40	Normal	40	Closed	Yes	616	1848	1017	492	0.107	2.106	1028.0	18166	9083	6.180	0.74	7212	3698	826	0.114	1.844
7.00	604.50	1.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	308	2157	1186	623	0.117	1.807	1028.0	18166	9083	6.260	0.68	6715	3465	986	0.125	1.592
9.00	602.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	2773	1525	893	0.135	1.508	1028.0	18166	9083	6.386	0.57	6490	3384	1308	0.146	1.345
11.00	600.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	3389	1864	1174	0.152	1.364	1028.0	18166	9083	6.511	0.49	6661	3500	1634	0.167	1.232
13.00	598.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	4005	2203	1464	0.170	1.283	1028.0	18166	9083	6.620	0.43	6990	3695	1965	0.188	1.174
15.00	596.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	4621	2542	1765	0.188	1.236	1028.0	18166	9083	6.763	0.38	7395	3929	2301	0.209	1.144
17.00	594.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	5237	2880	2076	0.207	1.208	1028.0	18166	9083	6.872	0.33	7843	4183	2643	0.231	1.131
19.00	592.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	5853	3219	2398	0.227	1.193	1028.0	18166	9083	6.989	0.30	8317	4451	2991	0.254	1.128
21.00	590.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	6470	3558	2731	0.248	1.187	1028.0	18166	9083	7.106	0.27	8808	4727	3344	0.277	1.134
23.00	588.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	7086	3897	3073	0.270	1.188	1028.0	18166	9083	7.241	0.24	9311	5010	3701	0.301	1.146
25.00	586.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	7702	4236	3425	0.293	1.195										
27.00	584.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	8318	4575	3787	0.317	1.207										
29.00	582.50	2.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	616	8934	4914	4156	0.342	1.223										
30.00	581.50	1.00	1028.0	Dolomite	50	Normal	40	Closed	Yes	308	9242	5083	4344	0.355	1.232										



DRILLED SHAFT AXIAL CAPACITY IN ROCK -
DOLOMITE, LIMESTONE, SANDSTONE, AND HARD SHALE

STRUCTURE ===== SN 046-9904
SUBSTRUCTURE & REFERENCE BORING ===== Pier - Boring #207
GROUND SURFACE ELEVATION ===== 628.62 FT
GROUND WATER ELEVATION ===== 0.00 FT
ESTIMATED TOP OF ROCK ELEVATION ===== 610.60 FT *SEE NOTE
DRILLED SHAFT DIAMETER IN ROCK ===== 36 IN.
FACTORED AXIAL LOAD ===== 5047 KIPS
DRILLED SHAFT CONCRETE STRENGTH, f_c ===== 3.5 KSI

FOUNDATION REDUNDANCY ===== REDUNDANT

NOTE: Top of Competent Rock Elevation used in analysis

SOCKET DEPTH (FT)	TIP ELEV. (FT)	LAYER THICK. (FT)	UNCONFINED COMPRESSIVE STRENGTH (q _u) (KSF)	ROCK TYPE	GSI	ROCK CONDITION	RQD (%)	JOINT TYPE	ROCK INTACT OR TIGHTLY JOINTED?	SIDE RESISTANCE						AVG. q _u W/IN 2 - SHAFT DIA. (KSF)	TIP RESISTANCE			COMBINED SIDE & TIP RESISTANCE					
										NOM. RESIST. (KIPS)	Σ NOM. RESIST. (KIPS)	Σ FACT. RESIST. (KIPS)	SETTLEMENT				NOM. RESIST. (KIPS)	FACT. RESIST. (KIPS)	SETTL. w _{Rn} (IN.)	R _p /R _n	NOM. RESIST. (KIPS)	FACT. RESIST. (KIPS)	SETTLEMENT		
													Q _{c1} (KIPS)	w _{c1} (IN.)	w _{Rn} (IN.)	Q _{c1} (KIPS)							w _{c1} (IN.)	w _{Rn} (IN.)	
2.00	608.60	2.00	158.6	Limestone	30	Fractured	47	Closed	No	131	131	72	71	0.015	0.365	2125.0	2702	1351	0.587	0.91	1457	735	137	0.015	0.297
3.00	607.60	1.00	1945.0	Limestone	40	Fractured	47	Closed	No	117	249	137	266	0.043	0.018	2123.2	4203	2102	0.955	0.43	438	231	467	0.045	0.040
4.00	606.60	1.00	2254.0	Limestone	40	Normal	47	Closed	No	308	557	306	489	0.066	0.118	2107.7	4221	2111	0.965	0.44	996	526	814	0.072	0.103
5.00	605.60	1.00	2430.0	Limestone	40	Normal	47	Closed	No	308	865	476	736	0.087	0.155	2062.8	4188	2094	0.997	0.38	1399	743	1181	0.098	0.131
6.00	604.60	1.00	2119.0	Limestone	40	Fractured	90	Closed	No	190	1055	580	972	0.104	0.138	2069.8	4242	2121	1.008	0.30	1510	808	1516	0.118	0.118
7.00	603.60	1.00	2367.0	Limestone	40	Fractured	90	Closed	No	190	1245	685	1239	0.122	0.124	2035.5	4224	2112	1.035	0.24	1633	879	1892	0.141	0.107
8.00	602.60	1.00	1635.0	Limestone	40	Fractured	90	Closed	No	190	1435	789	1458	0.134	0.127	2123.2	4413	2207	1.079	0.21	1815	979	2179	0.156	0.111
9.00	601.60	1.00	1934.0	Limestone	40	Fractured	90	Closed	No	190	1626	894	1713	0.148	0.126	2161.0	4518	2259	1.137	0.18	1980	1071	2519	0.175	0.111
10.00	600.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	1816	999	2001	0.164	0.123	2161.0	4557	2279	1.146	0.15	2139	1160	2905	0.197	0.110
11.00	599.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	2006	1103	2303	0.181	0.122	2161.0	4596	2298	1.188	0.13	2302	1251	3307	0.219	0.111
12.00	598.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	2196	1208	2620	0.198	0.122	2161.0	4634	2317	1.197	0.11	2467	1343	3727	0.242	0.112
13.00	597.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	2387	1313	2952	0.216	0.123	2161.0	4671	2336	1.223	0.09	2634	1436	4164	0.266	0.114
14.00	596.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	2577	1417	3301	0.234	0.124	2161.0	4708	2354	1.266	0.08	2801	1529	4620	0.290	0.116
15.00	595.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	2767	1522	3667	0.254	0.126	2161.0	4745	2372	1.292	0.07	2970	1623	5095	0.317	0.119
16.00	594.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	2957	1627	4051	0.275	0.128	2161.0	4780	2390	1.301	0.06	3139	1717	5591	0.344	0.123
17.00	593.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	3148	1731	4454	0.297	0.131	2161.0	4816	2408	1.327	0.05	3309	1812	6107	0.373	0.127
18.00	592.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	3338	1836	4877	0.320	0.135	2161.0	4851	2425	1.354	0.04	3478	1906	6644	0.403	0.131
19.00	591.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	3528	1940	5319	0.344	0.139	2161.0	4885	2442	1.372	0.03	3649	2001	7203	0.434	0.136
20.00	590.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	3718	2045	5783	0.370	0.143	2161.0	4919	2459	1.407	0.03	3819	2095	7784	0.467	0.141
21.00	589.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	3908	2150	6269	0.397	0.148	2161.0	4952	2476	1.417	0.02	3990	2190	8388	0.501	0.146
22.00	588.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	4099	2254	6776	0.425	0.153	2161.0	4985	2493	1.460	0.01	4161	2285	9013	0.537	0.152
23.00	587.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	4289	2359	7307	0.455	0.158	2161.0	5018	2509	1.479	0.01	4332	2380	9662	0.574	0.157
24.00	586.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	4479	2464	7862	0.486	0.164	2161.0	5050	2525	1.531	0.01	4503	2475	10332	0.613	0.163
25.00	585.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	4669	2568	8441	0.519	0.170										
26.00	584.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	4860	2673	9044	0.554	0.176										
27.00	583.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	5050	2777	9673	0.590	0.183										
28.00	582.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	5240	2882	10328	0.629	0.190										
29.00	581.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	5430	2987	11008	0.668	0.197										
30.00	580.60	1.00	2161.0	Limestone	40	Fractured	90	Closed	No	190	5621	3091	11715	0.710	0.204										



DRILLED SHAFT AXIAL CAPACITY IN ROCK - DOLOMITE, LIMESTONE, SANDSTONE, AND HARD SHALE

STRUCTURE ===== SN 046-9904
SUBSTRUCTURE & REFERENCE BORING ===== W. Abutment - Boring #214
GROUND SURFACE ELEVATION ===== 644.50 FT
GROUND WATER ELEVATION ===== 609.60 FT
ESTIMATED TOP OF ROCK ELEVATION ===== 609.06 FT *SEE NOTE
DRILLED SHAFT DIAMETER IN ROCK ===== 36 IN.
FACTORED AXIAL LOAD ===== 3548 KIPS
DRILLED SHAFT CONCRETE STRENGTH, f_c ===== 3.5 KSI

FOUNDATION REDUNDANCY ===== REDUNDANT

NOTE: Top of Competent Rock Elevation used in analysis

SOCKET DEPTH (FT)	TIP ELEV. (FT)	LAYER THICK. (FT)	UNCONFINED COMPRESSIVE STRENGTH (q _u) (KSF)	ROCK TYPE	GSI	ROCK CONDITION	RQD (%)	JOINT TYPE	ROCK INTACT OR TIGHTLY JOINTED?	SIDE RESISTANCE						AVG. q _u W/IN 2 - SHAFT DIA. (KSF)	TIP RESISTANCE			COMBINED SIDE & TIP RESISTANCE					
										NOM. RESIST. (KIPS)	Σ NOM. RESIST. (KIPS)	Σ FACT. RESIST. (KIPS)	SETTLEMENT				NOM. RESIST. (KIPS)	FACT. RESIST. (KIPS)	SETTL. w _{Rn} (IN.)	R _p /R _n	NOM. RESIST. (KIPS)	FACT. RESIST. (KIPS)	SETTLEMENT		
													Q _{C1} (KIPS)	w _{C1} (IN.)	w _{Rn} (IN.)								Q _{C1} (KIPS)	w _{C1} (IN.)	w _{Rn} (IN.)
2.00	607.06	2.00	792.0	Dolomite	40	Normal	39	Closed	Yes	616	616	339	209	0.063	1.384	792.0	2043	1021	1.032	0.79	2592	1323	334	0.064	1.051
4.00	605.06	2.00	792.0	Dolomite	40	Normal	39	Closed	Yes	616	1232	678	423	0.109	1.501	868.7	2231	1115	1.013	0.68	3259	1681	675	0.114	1.030
6.00	603.06	2.00	792.0	Dolomite	40	Normal	39	Closed	Yes	616	1848	1017	641	0.140	1.567	1095.3	19356	9678	7.791	0.65	5277	2731	1013	0.148	1.399
8.00	601.06	2.00	792.0	Dolomite	40	Normal	39	Closed	Yes	616	2465	1356	863	0.163	1.613	1322.0	23362	11681	8.109	0.62	6488	3367	1378	0.177	1.430
10.00	599.06	2.00	1022.0	Dolomite	50	Normal	39	Open	Yes	616	3081	1694	1139	0.174	1.414	1496.7	26448	13224	8.324	0.55	6899	3604	1755	0.193	1.253
12.00	597.06	2.00	1472.0	Dolomite	50	Normal	69	Closed	Yes	616	3697	2033	1505	0.198	1.240	1521.3	26884	13442	7.590	0.50	7334	3852	2308	0.226	1.100
14.00	595.06	2.00	1472.0	Dolomite	50	Normal	69	Closed	Yes	616	4313	2372	1887	0.222	1.143	1546.0	27320	13660	6.846	0.46	7980	4206	2939	0.264	1.015
16.00	593.06	2.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	616	4929	2711	2328	0.234	0.987	1546.0	27320	13660	7.018	0.38	7913	4203	3403	0.280	0.894
17.00	592.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	5237	2880	2560	0.242	0.936	1546.0	27320	13660	7.112	0.34	7974	4249	3654	0.290	0.855
18.00	591.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	5545	3050	2800	0.252	0.896	1546.0	27320	13660	7.207	0.31	8075	4315	3914	0.302	0.826
19.00	590.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	5853	3219	3048	0.262	0.865	1546.0	27320	13660	7.293	0.29	8204	4395	4184	0.315	0.804
20.00	589.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	6161	3389	3305	0.274	0.841	1546.0	27320	13660	7.396	0.26	8356	4486	4462	0.329	0.788
21.00	588.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	6470	3558	3571	0.287	0.822	1546.0	27320	13660	7.474	0.24	8526	4586	4748	0.344	0.775
22.00	587.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	6778	3728	3845	0.300	0.807	1546.0	27320	13660	7.585	0.22	8710	4694	5042	0.359	0.767
23.00	586.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	7086	3897	4128	0.315	0.795	1546.0	27320	13660	7.671	0.20	8904	4806	5343	0.375	0.761
24.00	585.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	7394	4067	4420	0.330	0.787	1546.0	27320	13660	7.791	0.19	9109	4924	5650	0.392	0.758
25.00	584.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	7702	4236	4720	0.346	0.782										
26.00	583.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	8010	4405	5029	0.362	0.778										
27.00	582.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	8318	4575	5347	0.380	0.777										
28.00	581.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	8626	4744	5673	0.398	0.777										
29.00	580.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	8934	4914	6007	0.417	0.779										
30.00	579.06	1.00	1546.0	Dolomite	60	Normal	69	Closed	Yes	308	9242	5083	6350	0.436	0.782										