STRUCTURE GEOTECHNICAL REPORT

Waldron Road F.A.U. 6184 over I-57 FAI - 57

Proposed S.N. 046-0153

F.A.U. ROUTE 6184 SECTION (46-3)6HBR KANKAKEE COUNTY, ILLINOIS JOB NO. P-93-014-10 CONTRACT NO. 66863 PTB 159/20 KEG NO. 11-1017.00

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EXHIBITS

- Exhibit A Location Map
- Exhibit B Type, Size, and Location Plan (TS&L)
- Exhibit C Boring Logs Exhibit D Subsurface Profile
- Exhibit E SLOPE- W Slope Stability Analysis Exhibit F IDOT Drilled Shaft Axial Capacity Spreadsheets

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 Waldron Road over I-57 and the associated retaining walls in Kankakee County, Illinois. The purpose of this report is to present design and construction recommendations for the proposed structure.

1.2 **Project Description**

The project consists of a complete replacement of an existing four- span structure with a new twospan structure located at Waldron Road over I-57, including construction of two retaining walls parallel to the outer lanes of I-57 in Kankakee County, Illinois. The general location of the structure is shown on Exhibit A, USGS Topographic 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 was originally constructed in 1953. The existing structure measures 234 ft. - 5.75 in. back- to- back of abutments, and has an out- to- out width of 32 ft. - 3 in. The two outside spans measure 50 ft. - 7 in., while the two inside spans measure 63 ft. - 3 in. The structure is skewed 54° - 5' right advance. The superstructure is a 7 in. reinforced concrete deck, supported by five, non- composite, continuous wide flange steel beams. The bridge rail is a post style curb mounted system with three horizontal pipes. Railing is mounted to an eight inch curb, set back 1 ft. - 10.5 in. from the vertical face of the curb. Newer curb mounted rail is flush with the face of the curb. The abutments consist of a beam bearing cap that is supported by 7 ft. concrete beam bearing caps that are supported by 5 rectangle concrete columns, which are supported by a crashwall on an 8 ft. wide spread footing on rock.

1.4 Proposed Bridge Information

The proposed structure is a two- span structure, with retaining walls near the pile supported abutments. The proposed structure measures 271 ft. - 7.25 in. back- to- back of abutments with 30 ft. - 0 in. bridge approach slabs on both side. The out- to- out width is 44 ft. - 9 in. The two spans measure 129 ft. - 10 in. from centerline- to- centerline of bearing. The structure will have a right- advanced skew at 35°- 53'- 30".

2.0 Site Investigation, Subsurface Exploration, and Generalized Subsurface Conditions

The site investigation plan was developed and performed by IDOT and KEG. A site visit was not performed by a KEG representative to observe all or part of the borings, or to make site observations relative to current conditions of the structure or immediate surroundings, including the soil samples retained during drilling.

Seventeen (17) Standard Penetration Test (SPT) borings were completed for this structure and walls. Seven (7) SPT borings, designated BH 56, BH 57, BH 59, BH 68, BH 69, BH 71, and BH 101 were drilled between March 27, 2010 and February 28, 2014. Ten (10) additional borings were drilled between September 7, 2017 and December 21, 2017. The borings are summarized

by structure in Table 2.1 - Boring Summary and are shown on Exhibit B, Type, Size, and Location plan (TS&L), as provided by Lochmueller Group. Detailed information regarding the nature and thickness of the soils encountered and the results of the field sampling and laboratory testing are shown on Exhibit C, Boring Logs. A soil profile can be found under Exhibit D, Subsurface Profile.

| Boring | Structure | Station | Offset | Ground Surface Elevation |
|--------|------------------|-----------|----------|-----------------------------|
| BH 101 | North Abutment | 229+13.97 | 82.1 RT | 657.19 |
| B 219 | North Abutment | 229+18.36 | 87.5 RT | 657.30 |
| BH 56 | Retaining Wall A | 227+83.54 | 32.6 RT | 633.35 |
| BH 57 | Retaining Wall A | 228+63.37 | 32.6 RT | 633.60 |
| BH 59 | Retaining Wall A | 230+91.82 | 36.1 RT | 632.79 |
| B 221 | Retaining Wall A | 235+00.78 | 44.1 RT | 630.55 |
| B 222 | Retaining Wall A | 233+55.44 | 46.2 RT | 630.64 |
| B 223 | Retaining Wall A | 232+07.62 | 33.5 RT | 632.47 |
| B 224 | Retaining Wall A | 227+30.00 | 148.0 RT | 650.69 |
| B 225 | Retaining Wall A | 225+99.00 | 121.0 RT | 646.82 |
| B 226 | Retaining Wall A | 224+53.00 | 123.0 RT | 664.59 |
| BH 68 | Center Pier | 230+00.99 | 9.2 LT | 632.86 |
| BH 69 | Center Pier | 231+04.30 | 2.2 LT | 632.74 |
| B 218 | Center Pier | 231+25.20 | 8.0 LT | 632.57 |
| B 220 | Retaining Wall B | 232+54.00 | 48.0 LT | 634.83 |
| BH 71 | South Abutment | 232+11.23 | 148.3 LT | 647.42 |
| B 217 | South Abutment | 232+12.99 | 133.4 LT | 648.76 |

Table 2.1 - Boring Summary

2.1 Subsurface Conditions

Boring BH 101 was drilled near the North Abutment and consisted of bituminous sand and gravel, and silty clay loam fill from ground surface (El. 657.19) to El. 654.69. A very stiff to hard silty loam/silty clay loam till fill with rock and concrete debris followed to El. 648.69. The driving resistance (N-values) for this material ranged from 9 to 11 blows per foot (bpf), with an unconfined compressive strength (Qu) value of 3.5 tsf, and moisture contents from 18 to 23 percent. A small layer of hard silty clay/silty clay loam followed to El. 647.19, with an N-value of 13 bpf, a Qu value of 4.3 tsf, and a moisture content of 22 percent. A hard silty clay loam till followed to El. 642.19, with N- values between 21 to 26 bpf, a Qu value of 8.2 tsf, and moisture contents from 17 to 19 percent. A very stiff silty loam till with silt layers followed to El. 637.69, with an N-value of 9 bpf, a Qu value of 3.0 tsf, and moisture contents from 18 to 20 percent. A hard silty clay/silty clay loam till followed to El. 632.19, with N- values between 12 and 13 bpf, Qu values from 4.0 to 4.6 tsf, and moisture contents from 19 to 22 percent. A hard silty clay loam till with large gravel pieces followed until auger refusal and boring termination at El. 629.69, with an N-value of 20 bpf, a Qu value of 4.0 tsf, and a moisture content of 12 percent. A dolostone surface was assumed to be encountered near the auger refusal depth, with an N-value of 100 blows per 1- inch and no recovery of sample.

Boring B 219 was located near the North Abutment and was not documented through the overburden to auger refusal at El. 624.80. Rock core was obtained below auger refusal in three 5- foot runs to a termination elevation of El. 609.80. The bedrock consisted of dense limestone with shale seams in the upper five feet with an RQD of 28 and Recovery of 97 percent. The dense limestone with tight horizontal fracturing then continued for the last two 5- foot runs to termination

at El. 609.80. The RQD of the last two runs of rock core ranged from 55 to 83 and Recovery was 100 percent. Rock unconfined compression strengths of the dense limestone ranged from 732.4 to 1359.7 tsf.

Boring BH 56 was drilled near Retaining Wall A and consisted of bituminous shoulder and silty clay loam till fill from ground surface (EI. 633.35) to EI. 630.9. A hard silty clay loam till followed to EI. 628.9, with a N-value of 19 bpf, a Qu of >4.5 tsf, and a moisture content of 12 percent. Dense limestone followed to boring termination at EI. 628.1, with an N-value of 100 blows per 3 inches and a moisture content of six percent.

Boring BH 57 was drilled near Retaining Wall A and consisted of bituminous shoulder and fill sand from ground surface (El. 633.60) to El. 631.10. A loose fill sand and concrete pieces of fill followed until boring termination at El. 629.60, with an N-value of 8 bpf and a moisture content of 16 percent. The boring was terminated due to hitting an unknown trench.

Boring BH 59 was drilled near Retaining Wall A and consisted of bituminous shoulder and weathered limestone/silt from ground surface (El. 632.79) to El. 630.29. A partially weathered limestone followed until boring termination at El. 629.71, with an N-value of 100 blows per 1 inch and a moisture content of seven percent.

Boring B 221 was drilled near Retaining Wall A and was not documented through the overburden to El. 628.55. From this elevation, the rock was augerable an additional 24- inches before encountering auger refusal at El. 626.55. Rock core was obtained below auger refusal in two 5-foot runs to a termination elevation of El. 616.55. The bedrock consisted of dense limestone with horizontal and vertical fractures and loose to tight joints. The RQD of the rock core ranged from 8 to 13 and Recovery was 92 to 100 percent. Rock unconfined compression strengths of the limestone ranged from 611.3 to 741.9 tsf.

Boring B 222 was drilled near Retaining Wall A and was not documented through the overburden to El. 628.64. From this elevation, the rock was augerable an additional 24- inches before encountering auger refusal at El. 626.64. Rock core was obtained below auger refusal in two 5-foot runs to a termination elevation of El. 616.64. The bedrock consisted of dense limestone with horizontal fractures and tight joints. The RQD of the rock core ranged from 13 to 75 and Recovery was 97 to 100 percent. Rock unconfined compression strengths of the limestone ranged from 734.6 to 832.1 tsf.

Boring B 223 was drilled near Retaining Wall A and was not documented through the overburden to auger refusal at El. 629.47. Rock core was obtained below auger refusal in two 5- foot runs to a termination elevation of El. 619.47. The bedrock consisted of dense limestone with some horizontal fractures. The RQD of the rock core was 37 and Recovery was 83 to 100 percent. Rock unconfined compression strengths of the limestone ranged from 585.6 to 872.1 tsf.

Boring B 224 was drilled near Retaining Wall A and consisted of 18- inches of topsoil with silty loam and timber from the ground surface to El. 649.19. Below the topsoil, hard silty clay was encountered to El. 642.69, with N- values of 24 to 35 bpf, pocket penetrometer readings of 4.5 tsf and moisture contents of 14 to 18 percent. Below the hard silty clay, hard silty clay till was encountered to El. 640.19, with an N-value of 31, pocket penetrometer value of 4.5 tsf and moisture content of 15 percent. Below the hard silty clay till, stiff clay till with trace gravel was encountered to El. 626.19. N- values of the clay were 12 to 20 bpf, with Q_u 's of 2.5 to 7 tsf and moisture contents of 12 to 21 percent. Below the stiff clay till, fractured and very weathered dolostone was encountered to auger refusal at El. 620.69. N –values of the weathered dolostone ranged from 50 blows per $\frac{1}{4}$ inch to 85 blows per inch and moisture contents were 4 to 5 percent.

Rock core was obtained below auger refusal in one 10- foot core run to termination at El. 610.69. The rock consisted of dolostone with shale partings with RQDs of 0 to 13 and Recovery of 100 percent. Rock unconfined compression strengths of the dolostone ranged from 235.0 to 796.0 tsf.

Boring B 225 was drilled near Retaining Wall A and consisted of very stiff to hard clay till with trace gravel to El. 626.82. N- values of the clay were 7 to 28 bpf, with Q_u's of 2.1 to 3.7 tsf and moisture contents of 10 to 23 percent. Below the clay till, fractured and very weathered rock was encountered to auger refusal at El. 615.82. N –values of the weathered rock ranged from 50 blows per ¼ inch to 100 blows per inch and moisture contents were 6 to 13 percent. A rock core was obtained below auger refusal in one 10- foot core run to termination at El. 605.82. The rock consisted of dolostone with thin joints and shale partings with an RQD of 37 and Recovery of 98 percent. Rock unconfined compression strengths of the dolostone ranged from 182.0 to 463.0 tsf.

Boring B 226 was drilled near Retaining Wall A and consisted of 12- inches of topsoil with silty clay from the ground surface to El. 663.59. Below the topsoil, silty clay/silty clay till was encountered to El. 649.09, with N- values of 11 to 27 bpf, Qu's and penetrometers ranged from 2.7 to 6.4 tsf with moisture contents of 14 to 23 percent. The soils were very stiff to hard. Below the silty clay, stiff clay and clay till was encountered to El. 624.09, with an N- values of 10 to 27, pocket Qu values of 2.3 to 5 tsf and moisture contents of 18 to 22 percent. The clay was very stiff. The clay till was hard. Below the clay till, dolostone was encountered to auger refusal at El. 624.09. N –values of the dolostone were 54 blows per inch. A rock core was obtained below auger refusal in one 10- foot core run to termination at El. 612.59. The rock consisted of dolostone with shale partings with an RQD of 30 and Recovery of 100 percent. Rock unconfined compression strengths of the dolostone ranged from 265.0 to 807.0 tsf.

Boring BH 68 was drilled near the Pier and consisted of bituminous shoulder and fill sand/gravel from ground surface (EI. 632.86) to EI. 630.36. A weathered dolomite followed to boring termination at EI. 630.19, with an N-value of 100 blows per 2- inches.

Boring BH 69 was drilled near the Pier and consisted of bituminous shoulder and weathered and reworked dolomite from ground surface (El. 632.74) to El. 630.24. A weathered dolomite followed until auger refusal and boring termination at El. 629.24, with an N-value of 100 blows per four inches and a moisture content of seven percent.

Boring B 218 was drilled near the Pier and was not documented through the overburden to El. 630.07. From this elevation, the rock was augerable an additional 30- inches before encountering auger refusal at El. 627.57. Rock core was obtained below auger refusal in three 5- foot runs to a termination elevation of El. 612.57. The bedrock consisted of dense limestone with horizontal fractures and loose joints in the upper five feet with an RQD of 26 and Recovery of 95 percent. The dense limestone with tight joints and horizontal fracturing then continued for the last two 5-foot runs to termination at El. 612.57. The RQD of the last two runs of rock core ranged from 45 to 87 and Recovery was 100 percent. Rock unconfined compression strengths of the limestone ranged from 535.5 to 1453.7 tsf.

Boring B 220 was drilled near Retaining Wall B and consisted of 6- inches of topsoil from the ground surface to El. 634.33. Below the topsoil, silty sandy gravel with clay was encountered to El. 630.33, with an N-value of 67 bpf and moisture content of 11 percent. Below the gravel, weathered fractured dolostone was encountered and was augerable to a refusal depth of El. 626.33. An N-value of 50 blows per 2- inches of penetration was recorded at the top of the weathered dolostone, with a moisture content of 8 percent. Rock core was obtained below auger refusal in one 10- foot core run to termination at El. 616.33. The rock consisted of dolostone with

an RQD of 68 and Recovery of 100 percent. Rock unconfined compression strengths of the dolostone ranged from 358.0 to 543.0 tsf.

Boring BH 71 was drilled near the South Abutment and consisted of shoulder stone and silty clay loam fill from ground surface (El. 647.42) to El. 644.92. A hard silty clay loam till fill followed to El. 639.92, with N- values ranging from 5 to 9 bpf, a Q_u value of 4.0 tsf, and moisture contents between 13 to 17 percent. A stiff to very stiff silty clay/silty clay loam followed to El. 637.92, with an N-value of 4 bpf, a Q_u value of 2.0 tsf, and a moisture content of 20 percent. A stiff to very stiff silty clay loam till followed to El. 634.92, with an N-value of 4 bpf, a Q_u value of 2.0 tsf, and a moisture content of 20 percent. A stiff to very stiff silty clay loam till followed to El. 634.92, with an N-value of 4 bpf, a Q_u value of 1.5 tsf, and a moisture content of 26 percent. A weathered and reworked dolomite surface followed until El. 632.42, with an N-value of 27 bpf and a moisture content of 9 percent. A dense dolomite followed until auger refusal and boring termination at El. 632.17, with an N-value of 100 blows per three inches.

Boring B 217 was drilled near the South Abutment and was not documented through the overburden to auger refusal at El. 632.76. Rock core was obtained below auger refusal in three 5- foot runs to a termination elevation of El. 617.76. The bedrock consisted of highly horizontally fractured and seam- filled weathered shale in the upper five feet with an RQD of 0 and Recovery of 90 percent. Dolostone with horizontal fracturing and loose joints then continued for the second run to El. 622.76. The RQD was 48 and Recovery was 90 percent. The last run consisted of limestone with some horizontal fracturing and vertical fracturing to termination at El. 617.76. The RQD was 22 and Recovery was 100 percent. Rock unconfined compression strengths of the dolostone ranged from 655.0 to 798.9 tsf. Rock unconfined compression strengths of the limestone ranged from 691.3 to 875.5 tsf.

2.2 Groundwater

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

3.0 Geotechnical Evaluations

3.1 Settlement

Based on the cross- sections provided for Waldron Road near the approaches to the North and South abutments, it is our understanding additional fill will be placed for raising and widening of the bridge cones. Fill depths of 1 to 3 feet will be added to raise and expand the cones. Therefore, settlement calculations were reviewed utilizing Borings BH 71 and B 224 near the North and South abutments, respectively. Based on the calculations, it is estimated the existing embankments will experience minimal settlements of less than 0.25 inches on each approach to the structure.

3.2 Slope Stability

The proposed construction will include retaining walls parallel to this section of the I- 57 corridor passing under the proposed bridge. Retaining Walls A and B, both have maximum heights of less than 22 feet. The retaining walls are proposed to have 1 Vertical to 3 Horizontal (1V:3H) slopes from the top of the walls to the existing grades. Slope stability analyses were performed near points of high wall elevation for each proposed wall or for locations with combinations of wall(s) and cut slope above the wall(s). 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 71, BH 101, B 217, B- 219, B 220, and B 224, 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 3.2. SLOPE- W program output from this analysis can be found in Exhibit E, SLOPE- W Slope Stability Analysis.

| Location | Station | Reference Boring(s) | Undrained Condition FOS |
|----------|--------------|---------------------|----------------------------|
| Wall A | 17+50 RT | BH 101, B 219 | 9.1 |
| Wall A | 229+00 RT | B 224 | 6.8 |
| Wall B | 21+50 LT | BH 71, B 217 | 2.9 |
| Wall B | 230+50 LT | BH 71, B 217 | 4.4 |
| Wall B | 232+50 LT | BH 71, B 220 | 7.4 |

 Table 3.2 - Slope Stability Critical FOS

The results of the analysis, as provided in Table 3.2, 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 (<u>http://earthquake.usgs.gov/</u>), 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 3.3 - Summary of Seismic Parameters

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

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

3.4 Scour

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

3.5 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, shallow foundations, driven piles or drilled shafts appear applicable for support of the bridge substructures, including wing- walls. Drilled soldier piles appear applicable for construction of the retaining walls. AASHTO LRFD Bridge Design Specifications Section 10.4.6.4 was utilized for shallow foundation recommendations and the Modified IDOT Static Method of Estimating Pile Length and the IDOT Drilled Shaft Axial Capacity in Limestone or Dolomite spreadsheet, as provided by IDOT BBS Foundations and Geotechnical Unit, were used to estimate the capacities of the driven piles or drilled shafts end bearing in competent bedrock.

Based on the plans provided by ABNA, we understand that Retaining Wall A will run along the I-57 southbound shoulder from approximate Station 227+50.00 to Station 237+50.00, passing under the proposed bridge. Retaining Wall B will run along the I- 57 northbound shoulder from approximate Station 230+50.00 to Station 233+50.00. The soldier pile wall design shall be in accordance with the AASHTO LRFD Bridge Design Specifications. Our recommendations are summarized below.

The preliminary design loads, as provided by ABNA Engineering, Inc. (ABNA) are provided in Table 4.1.

| Substructure Unit | Factored Reactions (kips) |
|-------------------|------------------------------|
| Abutments | 1868.0 |
| Pier | 6150.0 |

Table 4.1 - Preliminary Design Loads

Based off of the subsurface exploration, competent limestone and/or dolomite bedrock is generally encountered below elevation El. 625.0.

4.2 Shallow Foundations

The foundation supporting the proposed structures must provide sufficient support to resist dead, live, wind and collision loads, along with seismic loading. Based on the encountered subsurface conditions and the information available to date, the use of shallow foundations at the center pier bearing on limestone or dolostone is a viable foundation alternative. The factored load for the center pier was 6150.0 kips, as indicated in Table 4.1 above.

Boring logs B 68, B 69, and B 218 indicates competent dolostone/limestone material ranges from El. 630.0 to El. 627.5, with unconfined compressive strengths ranging from 535 tsf to 1,450 tsf. Based on AASHTO LRFD Bridge Design Specifications Section 10.6.2.6, Table C 10.6.2.6.1-1, and the unconfined compressive strength tests performed on representative samples of limestone from Boring B 218, we recommend a bearing resistance of 70 ksf (35 tsf) at the service limit state for footings bearing in the competent limestone.

4.3 Pile Supported Foundations

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

The loads were provided by ABNA. The abutments will each experience anticipated vertical factored loads of 1868 kips. The estimated pile lengths for the pile types considered are shown in Table 4.3. The Nominal Required Bearing (RN) represents the resistance the pile will experience during driving, and will assist the contractor in selecting a proper hammer size. The Factored Resistance Available (RF) documents the net long- term axial factored pile capacity available at the top of the pile to support factored substructure loadings.

Downdrag, scour, and liquefaction have not been considered at the abutment locations.

| Pile Type | Location | R _n Nominal Required Bearing (kips) | R _F Factored Resistance Available (LRFD) (kips) | Estimated Pile Length (ft.) | Assumed Pile Cut- off Elevation (ft.) |
|-----------|-------------------|---|--|-----------------------------------|--|
| 10 x 42 | North Abutment | 335 | 184 | 22 | 649.9 |
| | South Abutment | 335 | 184 | 16 | 644.9 |
| 12 x 53 | North Abutment | 418 | 230 | 22 | 649.9 |
| | South Abutment | 418 | 230 | 16 | 644.9 |
| 12 x 63 | North Abutment | 497 | 273 | 22 | 649.9 |
| 12 × 00 | South Abutment | 497 | 273 | 16 | 644.9 |
| 14 x 73 | North Abutment | 578 | 318 | 22 | 649.9 |
| 14 x 73 | South Abutment | 578 | 318 | 16 | 644.9 |
| 14 x 89 | North Abutment | 705 | 388 | 23 | 649.9 |
| 14 x 89 | South Abutment | 705 | 388 | 17 | 644.9 |

 Table 4.3 - Estimated Pile Lengths for North and South Abutments

In general, based on the boring logs, driving conditions are anticipated to change where the soil stratigraphy changes from cohesive soils into weathered limestone or dolostone bedrock, prior to competent bedrock. Therefore, pile shoes are recommended. In addition, a test pile should be considered at each abutment due to the results of the additional 2018 borings indicating that the thickness of the weathered bedrock zones are highly variable across the structure alignment and could vary from 3 to 8 feet of highly weathered bedrock, in addition to the current estimated top of rock elevation differences at each abutment.

4.4 Lateral Pile Response

Generally, the geotechnical engineer provides soil parameters to the structural engineer for use with an L- Pile program or other approved software for the lateral or displacement analysis of the foundations. Table 4.4 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.

| | Elev. | | Sho | ort- term | Lo | ng- term | | | | |
|----------|-----------------------------|-------|------|----------------|-----|----------------|------------|-----|------------------------------|-----------------|
| Boring | At Bottom of Layer | (pcf) | c' | Φ (degrees) | c' | Φ (degrees) | K (pci) | N | Assumed % fines < #200 | ² 50 |
| | 654.69 | 125 | 1500 | 0 | 100 | 26 | 500 | N/A | 70 | 0.007 |
| | 648.69 | 120 | 3500 | 0 | 100 | 26 | 1000 | 10 | 70 | 0.005 |
| BH- 101 | 647.19 | 120 | 4300 | 0 | 100 | 26 | 2000 | 13 | 70 | 0.005 |
| North | 642.19 | 120 | 8200 | 0 | 100 | 26 | 2000 | 24 | 70 | 0.004 |
| Abutment | 637.69 | 115 | 3000 | 0 | 100 | 28 | 1000 | 9 | 65 | 0.005 |
| | 632.19 | 120 | 4300 | 0 | 100 | 26 | 2000 | 13 | 70 | 0.005 |
| | 629.69 | 120 | 4000 | 0 | 100 | 26 | 2000 | 20 | 70 | 0.005 |
| | 644.92 | 125 | 1500 | 0 | 100 | 26 | 500 | N/A | 70 | 0.007 |
| BH- 71 | 639.92 | 120 | 4000 | 0 | 100 | 26 | 2000 | 7 | 70 | 0.005 |
| South | 637.92 | 120 | 2000 | 0 | 100 | 26 | 500 | 4 | 70 | 0.007 |
| Abutment | 634.92 | 120 | 1500 | 0 | 100 | 26 | 500 | 4 | 70 | 0.007 |
| B 217 | 627.76 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| BZII | 617.76 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| D 040 | 627.50 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| B 218 | 612.57 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| B 219 | 609.80 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| | 630.33 | 125 | 5000 | 0 | 250 | 28 | 2000 | 67 | 70 | 0.005 |
| B 220 | 626.33 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| | 616.33 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| B 221 | 624.55 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| D ZZ I | 616.55 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| B 222 | 626.64 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| D 222 | 616.64 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| B- 223 | 619.47 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| | 640.19 | 120 | 4500 | 0 | 250 | 26 | 2000 | 25 | 70 | .005 |
| B 224 | 626.19 | 125 | 5200 | 0 | 250 | 30 | 2000 | 14 | 80 | .004 |
| D 224 | 619.19 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| | 610.69 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| | 626.82 | 125 | 2500 | 0 | 100 | 26 | 1000 | 10 | 80 | .004 |
| B 225 | 615.82 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| | 605.82 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |
| | 628.09 | 125 | 2500 | 0 | 100 | 26 | 1000 | 10 | 80 | .004 |
| B 226 | 622.59 | 135 | N/A | 30 | N/A | 30 | N/A | N/A | N/A | N/A |
| | 612.59 | 150 | N/A | 45 | N/A | 45 | N/A | N/A | N/A | N/A |

Table 4.4 - Soil Parameters for Lateral Pile Load Analysis

4.5 Drilled Shaft Foundations

Based on the subsurface exploration, competent limestone and/or dolostone bedrock are generally encountered below elevation El. 627.0. Table 4.5 below lists Top of Rock and Top of Competent Rock, based off exploration and laboratory testing.

| Substructure Unit | Reference Boring(s) | Top of Rock Depth- bgs (Ft) | Top of Rock Elevation (Ft) | Top of Competent Rock Elevation (Ft) |
|----------------------|------------------------|-----------------------------------|----------------------------------|--|
| North Abutment | B 219 | 32.5 | 624.8 | 624.8 |
| Pier | B 218 | 2.5 | 630.0 | 627.5 |
| South Abutment | B 217 | 16 | 632.7 | 627.7 |

Table 4.5 - Estimated Bedrock Elevations

Recommendations for drilled shafts with sockets extending various depths into the underlying limestone or dolostone, developing capacity from tip <u>or</u> side resistance, are provided for support of the abutments. The provided capacities are based on boring information as summarized in Table 4.5 above, laboratory unconfined compressive strength tests performed on rock core samples from Borings B 217, B 218, and B 219 and utilizing the IDOT Drilled Shaft Axial Capacity in Limestone or Dolomite spreadsheet as provided by IDOT BBS Foundations and Geotechnical Unit. LRFD Resistance Factors of 0.55 for side resistance or 0.5 for tip resistance are incorporated into the factored capacities, respectively.

Tables 4.5.1 thru 4.5.4 - Drilled Shaft Axial Capacity below contain a summary of Factored Shaft Resistances available for various shaft diameters based on socket depths into the underlying limestone or dolostone for each abutment. IDOT Drilled Axial Capacity Input sheets and Design Tables are included in Exhibit F, for additional information.

| 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.) |
|----------------------------|--------------------------|--|---|---|--|---------------------------|
| North | 2 | 2513 | 1257 | | | 622.8 |
| Abutment B 219 | 4 | 2762 | 1381 | | | 620.8 |
| | 5 | 21748 | 10874 | | | 619.8 |
| South Abutment B 217 | 1 | 1781 | 890 | | | 626.7 |
| | 3 | 1847 | 924 | | | 624.7 |
| | 5 | | | 591 | 325 | 622.7 |

Table 4.5.2 - Estimated Drilled Shaft Axial Capacity for 42- inch Diameter Shaft

| 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.) |
|----------------------------|--------------------------|--|---|---|--|---------------------------|
| North | 2 | 3449 | 1725 | | | 622.8 |
| Abutment B 219 | 4 | 3698 | 1849 | | | 620.8 |
| | 5 | 3893 | 1947 | | | 619.8 |
| South Abutment B 217 | 1 | 2453 | 1227 | | | 626.7 |
| | 3 | 2479 | 1239 | | | 624.7 |
| | 5 | | | 689 | 379 | 622.7 |

Table 4.5.3 - Estimated Drilled Shaft Axial Capacity for 48- inch Diameter Shaft

| 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.) |
|----------------------|--------------------------|--|---|---|--|---------------------------|
| North | 2 | 4533 | 2266 | | | 622.8 |
| Abutment | 4 | 4845 | 2422 | | | 620.8 |
| B 219 | 5 | 5074 | 2537 | | | 619.8 |
| South | 1 | 3162 | 1581 | | | 626.7 |
| Abutment | 3 | | | 473 | 260 | 624.7 |
| B 217 | 5 | | | 788 | 433 | 622.7 |

| 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.) |
|----------------------|--------------------------|--|---|---|--|---------------------------|
| North | 2 | 7090 | 3545 | | | 622.8 |
| Abutment | 4 | 7412 | 3706 | | | 620.8 |
| B 219 | 5 | 7521 | 3761 | | | 619.8 |
| South | 1 | | | 197 | 108 | 626.7 |
| Abutment | 3 | | | 591 | 325 | 624.7 |
| B 217 | 5 | | | 985 | 542 | 622.7 |

Table 4.5.4 - Estimated Drilled Shaft Axial Capacity for 60- inch Diameter Shaft

Minimum center- to- center spacing of three times the shaft diameter is recommended. Shafts will also need to be designed for lateral loads, which may control socket embedment lengths using the L- Pile factors given in Table 4.4, above.

4.6 Wall Design Parameters

The soil and rock parameters presented in Table 4.6 below, are recommended to be used for the design of Walls A and B. These parameters were calculated according to the AASHTO LRFD Bridge Design Specifications and based on soil properties from Borings BH 71, BH 101, B 224, B 225, and B 225.

| | | | | Coł | nesive S | Soils | | | | | |
|------------------------|------------|------------|------------|------------|------------------------|-------------|-------|------|-------|------------|-------|
| Scenario | Ө (deg) | β (deg) | Ф (deg) | δ (deg) | γ Su g) (pcf) (psf) | | Ka K₀ | | K₽ | K (pci) | ٤ 50 |
| Interim Condition | 90 | 18.4 | 0 | 0 | 125 | 3,250 | 1 | 1 | 1 | 1000 | 0.005 |
| Permanent Condition | 90 | 18.4 | 30 | 26 | 125 | 250 | 0.33 | 0.50 | 3.0 | n/a | n/a |
| | | | | | Bedroc | k | | | | | |
| Scenario | Ө (deg) | β (deg) | Ф (deg) | δ (deg) | γ (pcf) | Su (psf) | Ka | K₀ | K₽ | K (pci) | ٤ 50 |
| Permanent Condition | 90 | 0 | 40 | 26 | 150 | 536,000 | n/a | n/a | 8,626 | n/a | 0.001 |

| Table 4.6 - Parameters | s for Soldier Pile Walls |
|------------------------|--------------------------|
|------------------------|--------------------------|

5.0 Construction Considerations

5.1 Construction Activities

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

5.2 Temporary Sheeting and Soil Retention

Temporary sheeting 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 4.5, 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, ABNA, 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 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, ABNA, and IDOT. They are specific only to the project described and are based on the subsurface information obtained by IDOT at seventeen boring locations within the bridge area between 2010 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

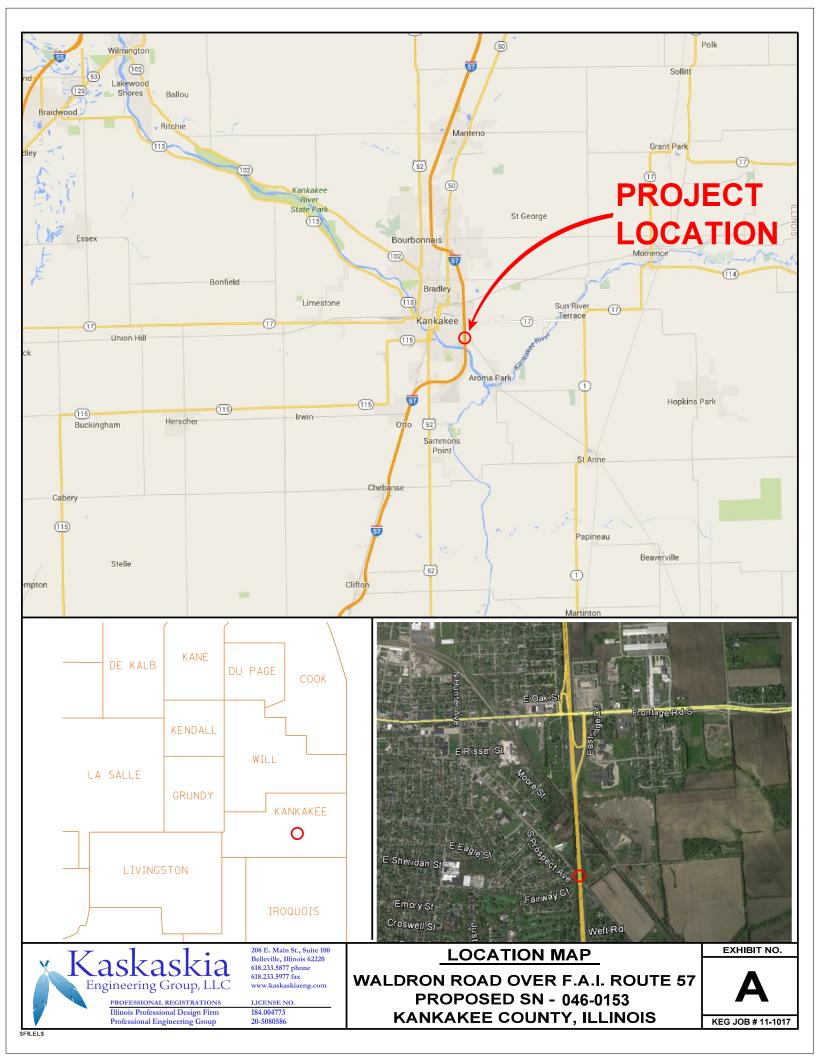
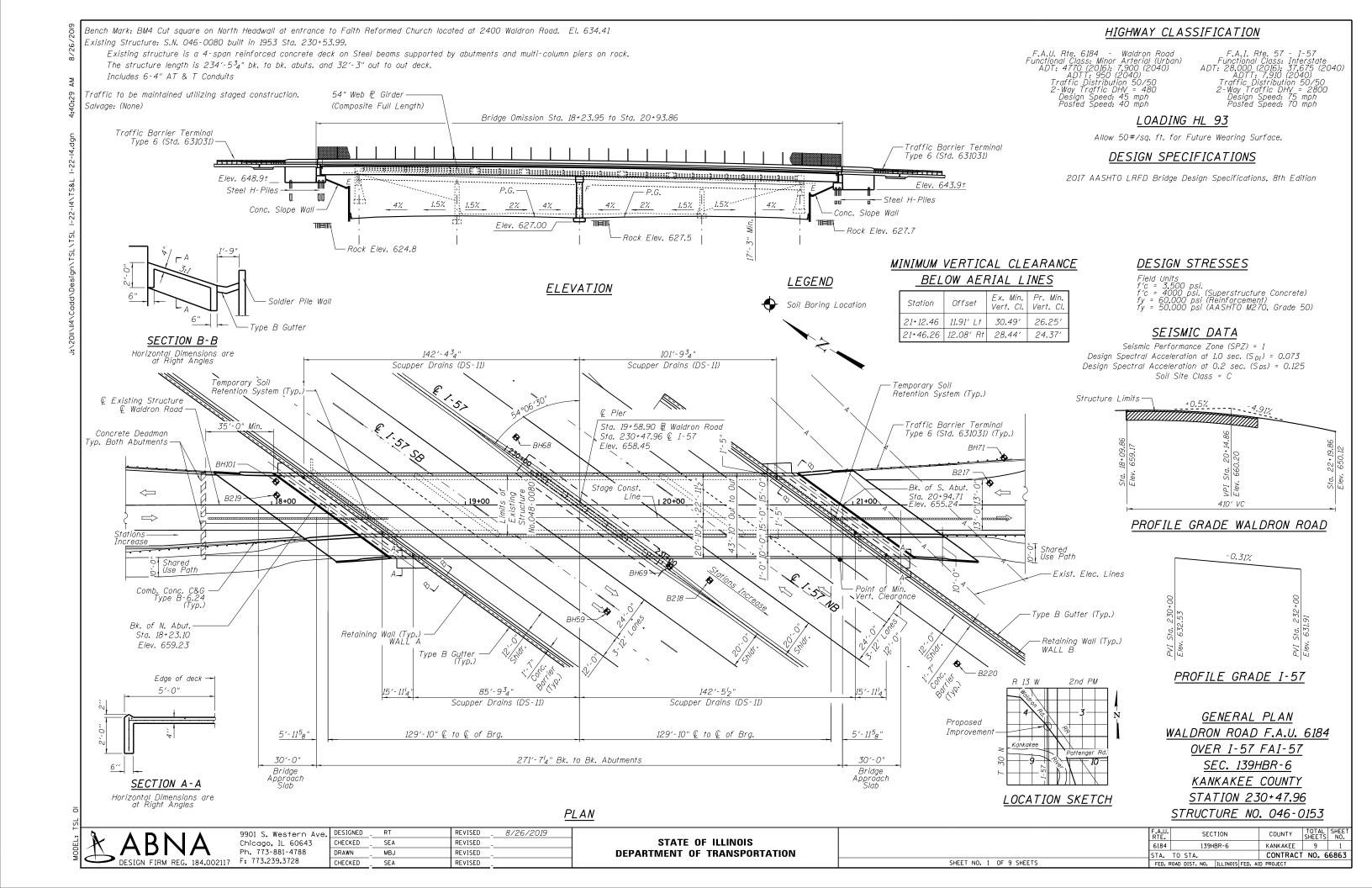
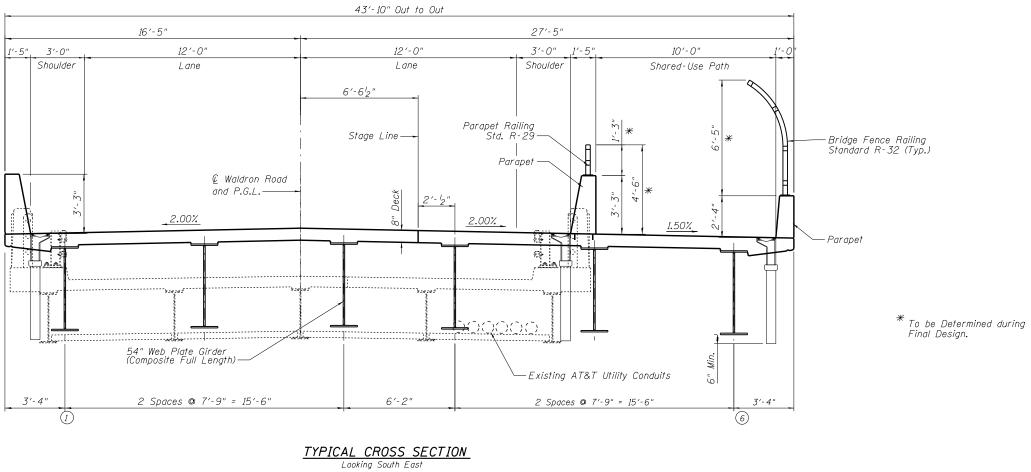


EXHIBIT B

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

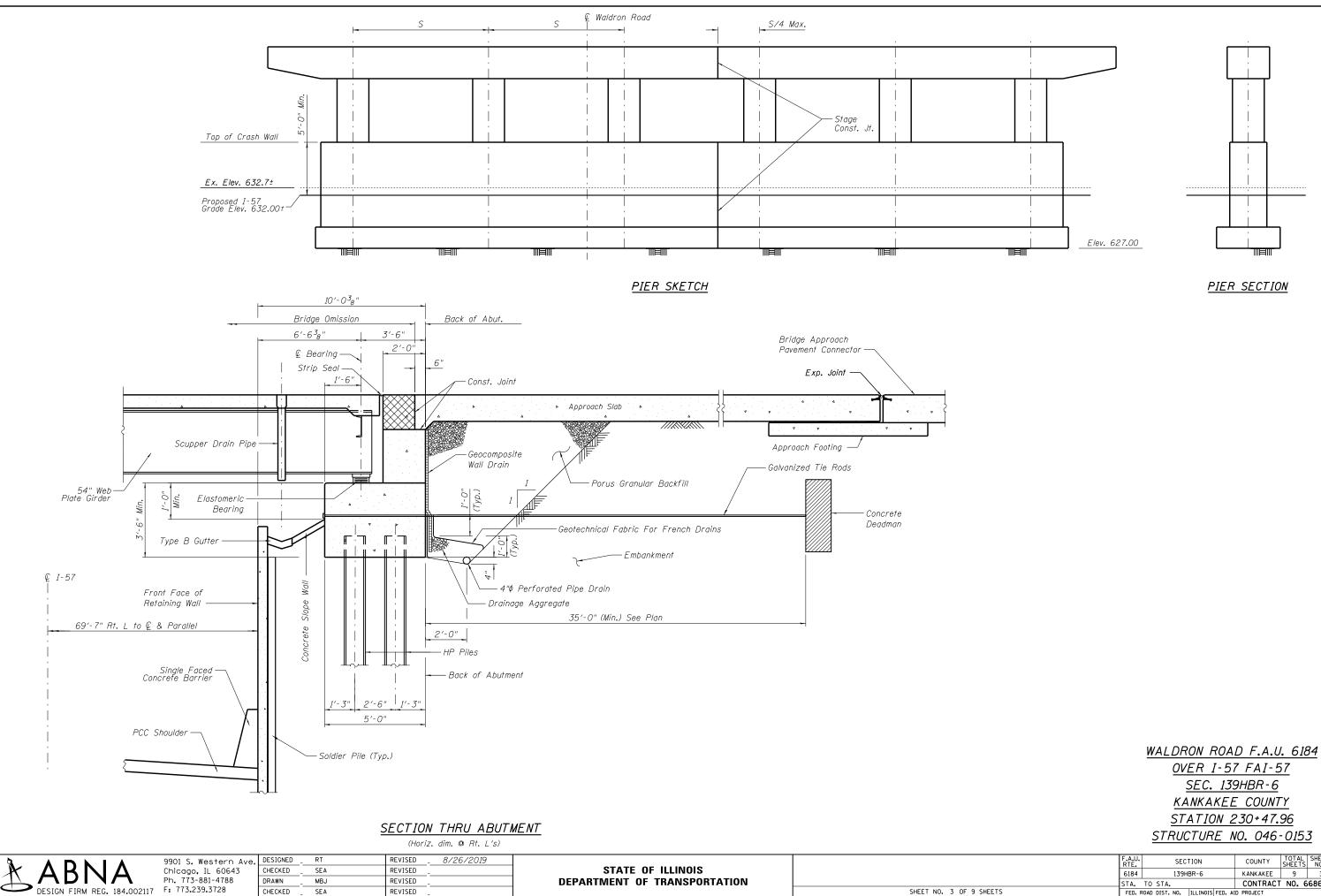




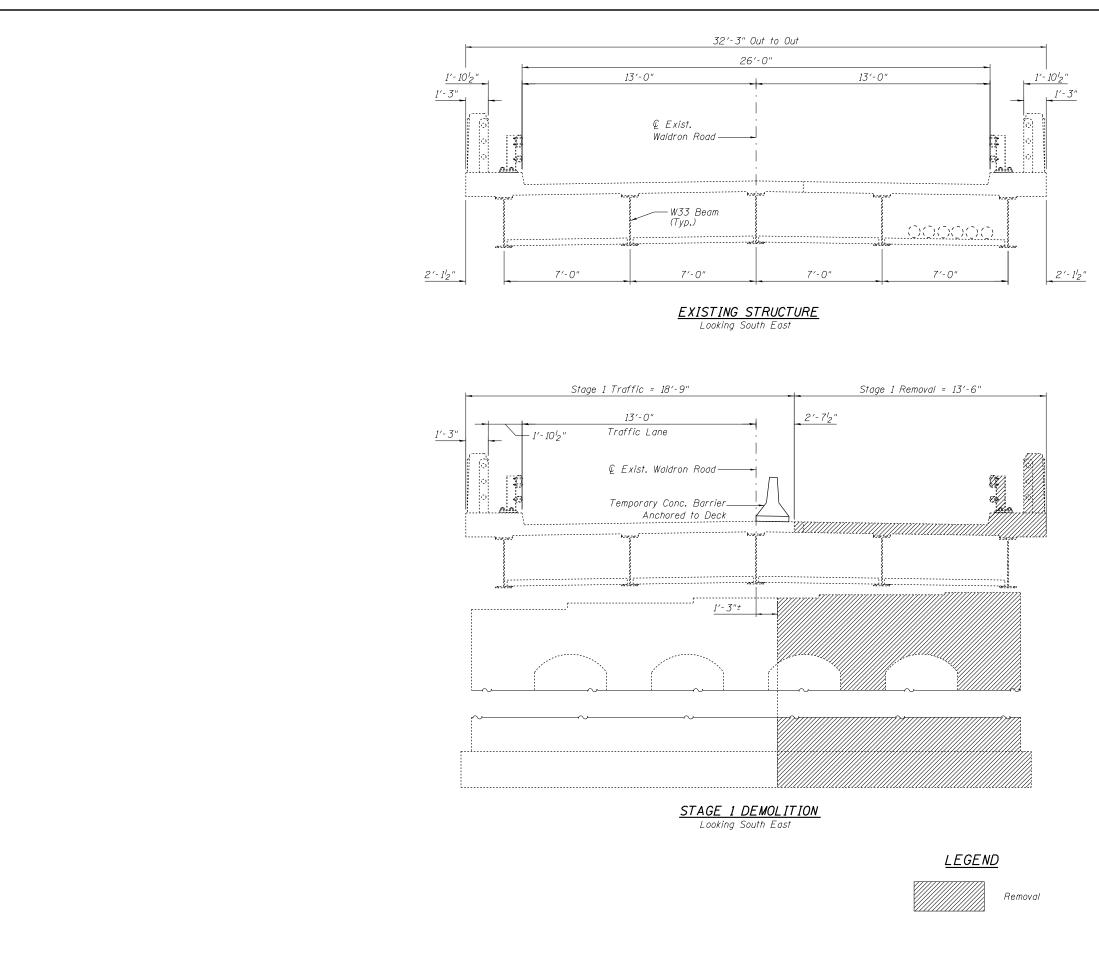
| 2 | | | | | | | | | | |
|-----------------------------|----------------------|------------|-----|---------|-----------|------------------------------|-------------------------|---------------|-------------------------|--------------------|
| | 9901 S. Western Ave. | DESIGNED _ | RT | REVISED | 8/26/2019 | | | F.A.U. RTF | SECTION | COUNTY TOTAL SHEET |
| | Chicago, IL 60643 | CHECKED _ | SEA | REVISED | | STATE OF ILLINOIS | | 6184 | 139HBR-6 | KANKAKEE 9 2 |
| | Ph. 773-881-4788 | DRAWN _ | JJE | REVISED | | DEPARTMENT OF TRANSPORTATION | | STA. TO ST | | CONTRACT NO. 66863 |
| DESIGN FIRM REG. 184.002117 | F: 773.239.3728 | CHECKED _ | SEA | REVISED | | | SHEET NO. 2 OF 9 SHEETS | FED. ROAD DIS | T. NO. ILLINOIS FED. AI |) PROJECT |

22

WALDRON ROAD F.A.U. 6184 <u>OVER I-57 FAI-57</u> <u>SEC. 139HBR-6</u> KANKAKEE COUNTY STATION 230+47.96 STRUCTURE NO. 046-0153



| | F.A.U. RTE. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|----------|----------------|---------------------------------|-----------|-----------------|--------------|
| | 6184 | 139HBR-6 | KANKAKEE | 9 | 3 |
| | STA. | TO STA. | CONTRACT | NO. 6 | 6863 |
| 9 SHEETS | FED. F | ROAD DIST. NO. ILLINOIS FED. AI | D PROJECT | | |

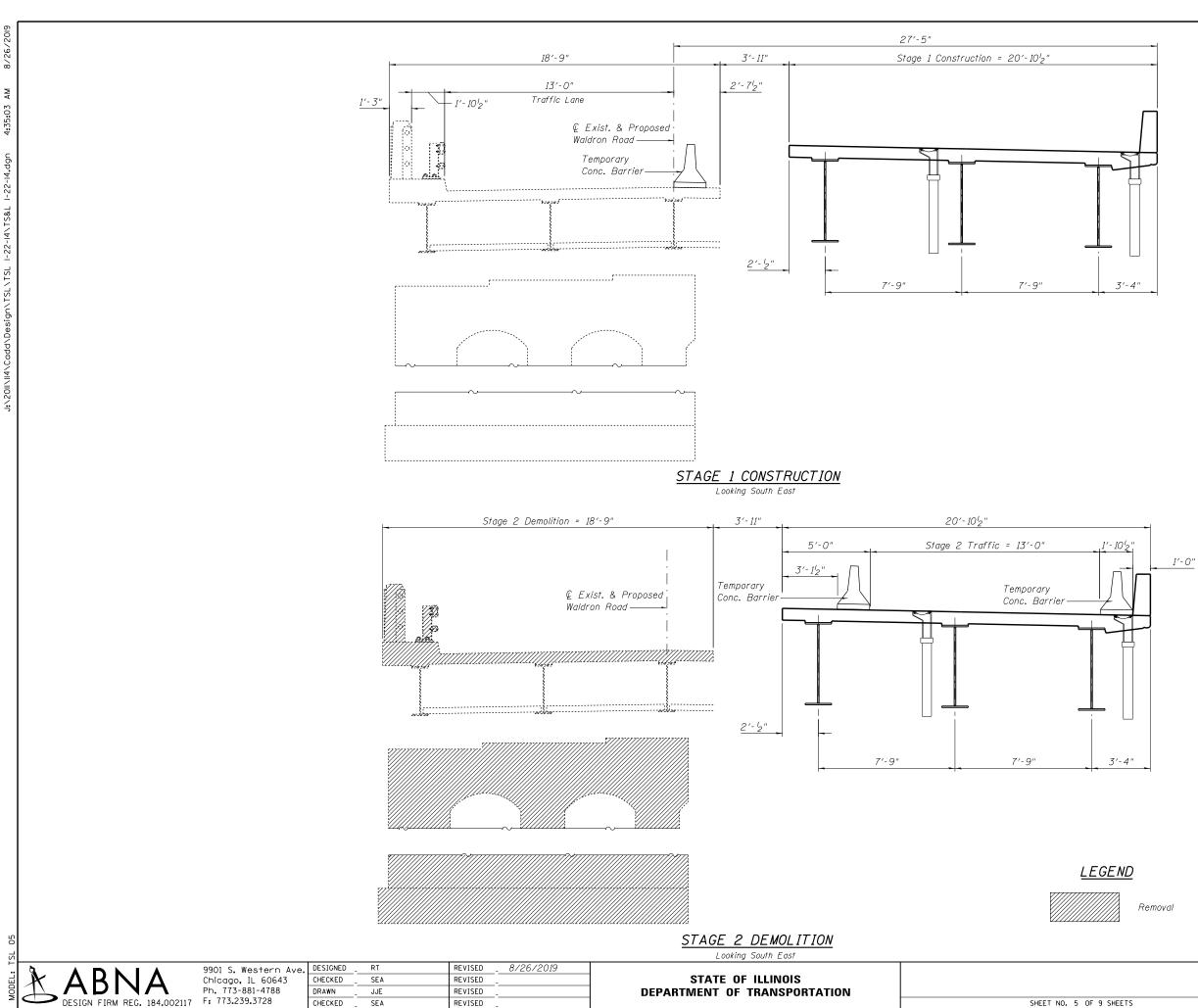


| | A D N I A | 9901 S. Western Ave. | DESIGNED _ | RT | REVISED | 8/26/2019 | | | F.A.U. RTE | SECTION | COUNTY TOTAL SHEET SHEETS NO. |
|----|-----------------------------|----------------------|------------|-----|---------|-----------|------------------------------|-------------------------|---------------|----------|----------------------------------|
| 딦 | X AKNIA | Chicago, IL 60643 | CHECKED _ | SEA | REVISED | - | STATE OF ILLINOIS | | 6184 | 139HBR-6 | KANKAKEE 9 4 |
| Š. | | Ph. 773-881-4788 | DRAWN _ | JJE | REVISED | - | DEPARTMENT OF TRANSPORTATION | | STA. TO | STA. | CONTRACT NO. 66863 |
| ٢ | DESIGN FIRM REG. 184.002117 | F: 773.239.3728 | CHECKED _ | SEA | REVISED | - | | SHEET NO. 4 OF 9 SHEETS | FED. ROAD | | D PROJECT |

STAGING NOTES

1) Install Temporary Traffic Signals. 2) Limit Stage 1 Traffic to East Side of Roadway 3) Conduct Stage 1 Removal

> <u>WALDRON ROAD F.A.U. 6184</u> <u>OVER I-57 FAI-57</u> <u>SEC. 139HBR-6</u> <u>KANKAKEE COUNTY</u> <u>STATION 230+47.96</u> <u>STRUCTURE NO. 046-0153</u>



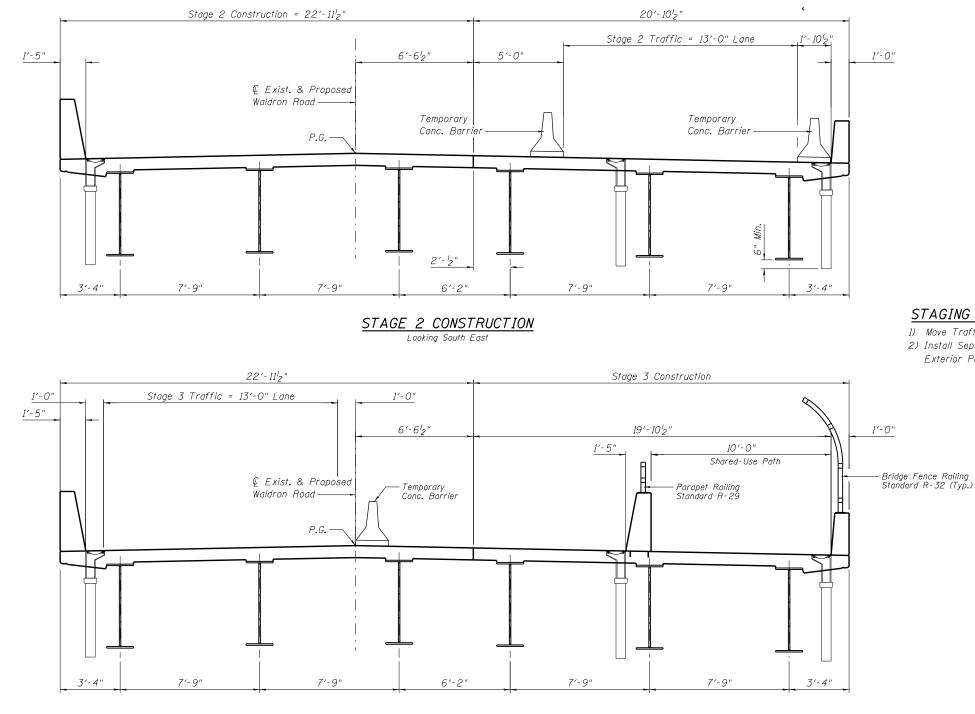
STAGING NOTES

1) Construct Stage 1.

2) Limit Stage 2 Traffic to West Side of Roadway.. 3) Conduct Stage 2 Removal

WALDRON ROAD F.A.U. 6184 OVER I-57 FAI-57 <u>SEC. 139HBR-6</u> KANKAKEE COUNTY STATION 230+47.96 STRUCTURE NO. 046-0153

| | F.A.U. RTE | | SEC | TION | | COUNTY | TOTAL SHEETS | SHEET NO. |
|-----|---------------|-----------|-------|----------|---------|-----------|-----------------|--------------|
| | 6184 | | 139H | BR-6 | | KANKAKEE | 9 | 5 |
| | STA. | TO STA | | | | CONTRACT | NO. 6 | 6863 |
| ETS | FED. | ROAD DIST | . NO. | ILLINOIS | FED. AI | D PROJECT | | |
| | | | | | | | | |



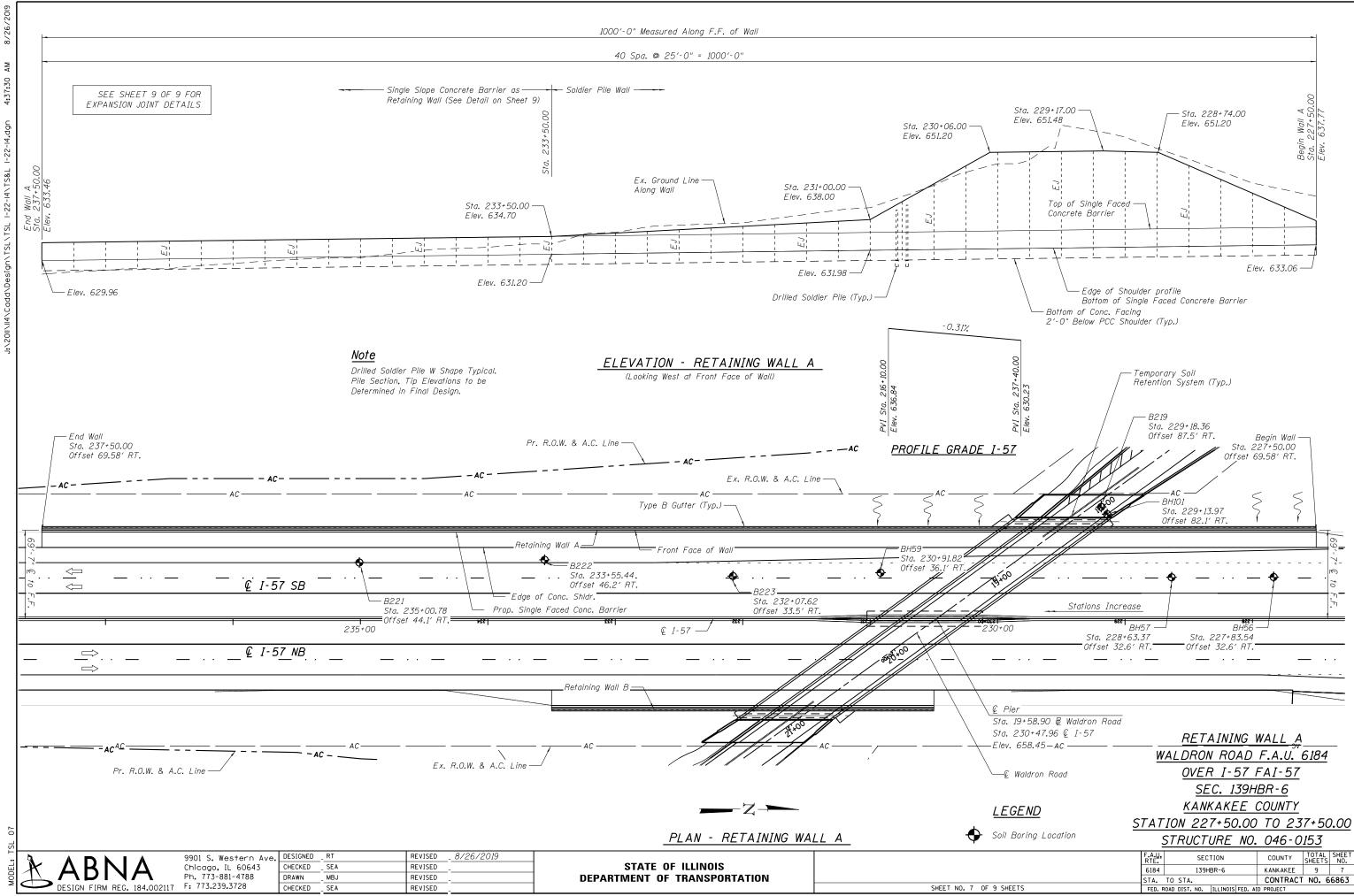
STAGE 3 CONSTRUCTION Looking South East

| - <u>-</u> b | | 9901 S. Western Ave. | DESIGNED | _ RT | REVISED | _ 8/26/2019 | | | F.A.U. | SECTION | COUNTY TOTAL SHEET |
|--------------|----------------------------|----------------------|----------|-------|---------|-------------|------------------------------|-------------------------|--------------|-------------------------|--------------------|
| 리 | ΑΚΝΙΔ | Chicago, IL 60643 | CHECKED | _ SEA | REVISED | | STATE OF ILLINOIS | | 6184 | 139HBR-6 | KANKAKEE 9 6 |
| - Ş | | | DRAWN | JJE | REVISED | | DEPARTMENT OF TRANSPORTATION | | STA. TO ST | ΓΑ. | CONTRACT NO. 66863 |
| | DESIGN FIRM REG. 184.00211 | 7 F: 773.239.3728 | CHECKED | _ SEA | REVISED | | | SHEET NO. 6 OF 9 SHEETS | FED. ROAD DI | ST. NO. ILLINOIS FED. A | ID PROJECT |

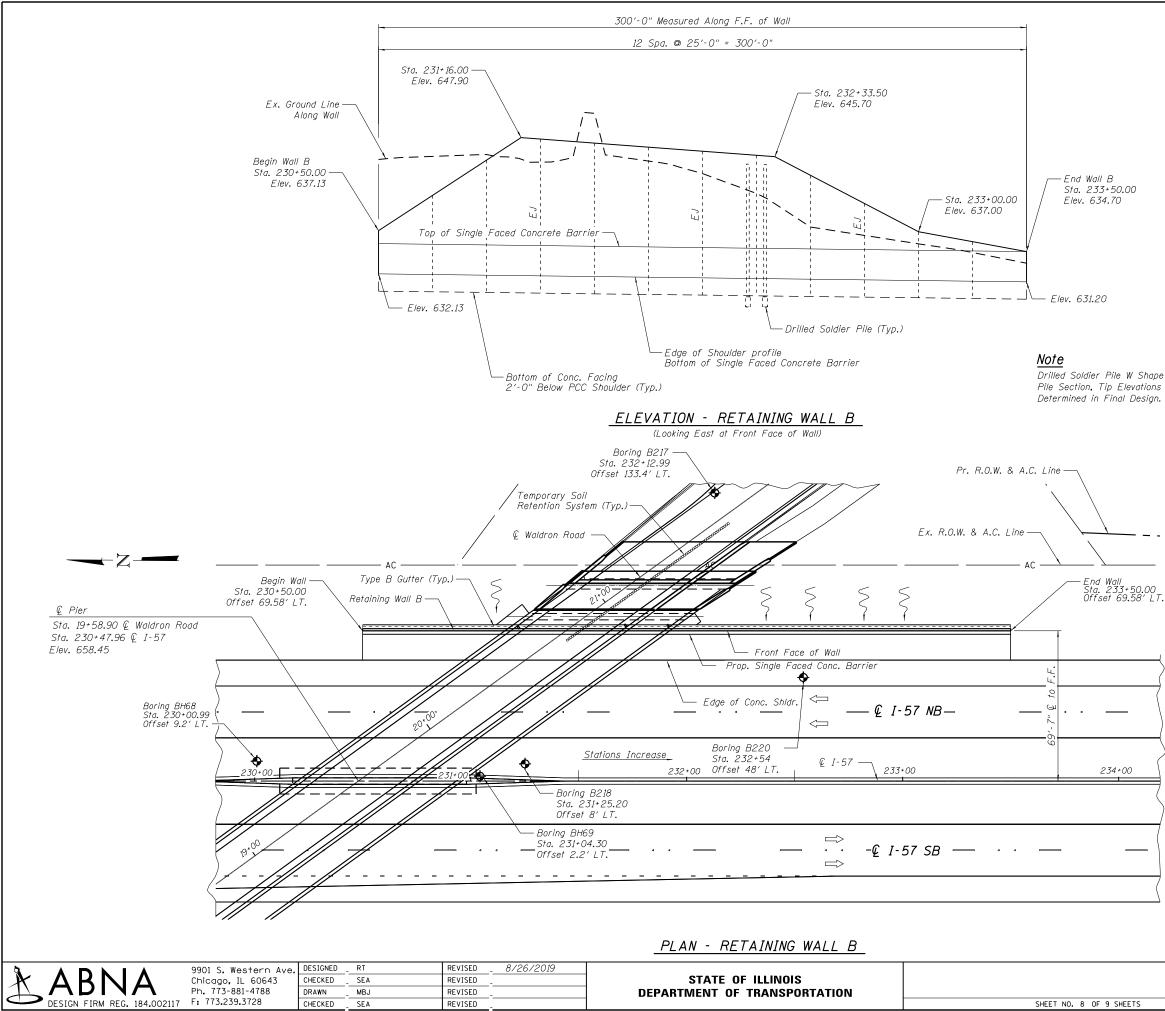
STAGING NOTES

1) Move Traffic for Stage 3 to Left Side of Roadway 2) Install Separation Barrier & Bridge Fence Railing to Exterior Parapet.

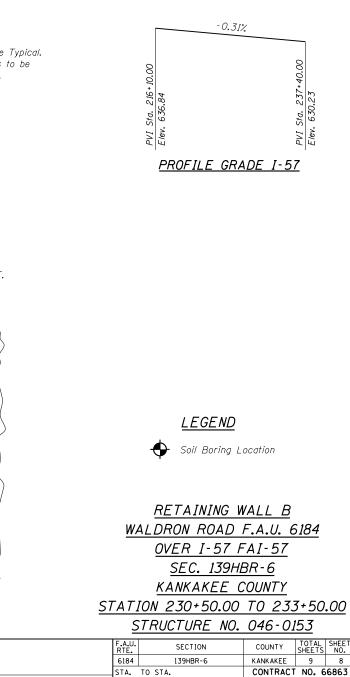
| WALDRON ROAD F.A.U. 6184 |
|-------------------------------|
| <u>OVER I-57 FAI-57</u> |
| <u>SEC. 139HBR-6</u> |
| <u>KANKAKEE COUNTY</u> |
| <u>STATION 230+47.96</u> |
| <u>STRUCTURE NO. 046-0153</u> |
| |



Z 4:37:30 I-22-



Drilled Soldier Pile W Shape Typical. Pile Section, Tip Elevations to be



FED. ROAD DIST. NO.

ILLINOIS FED. AID PROJECT

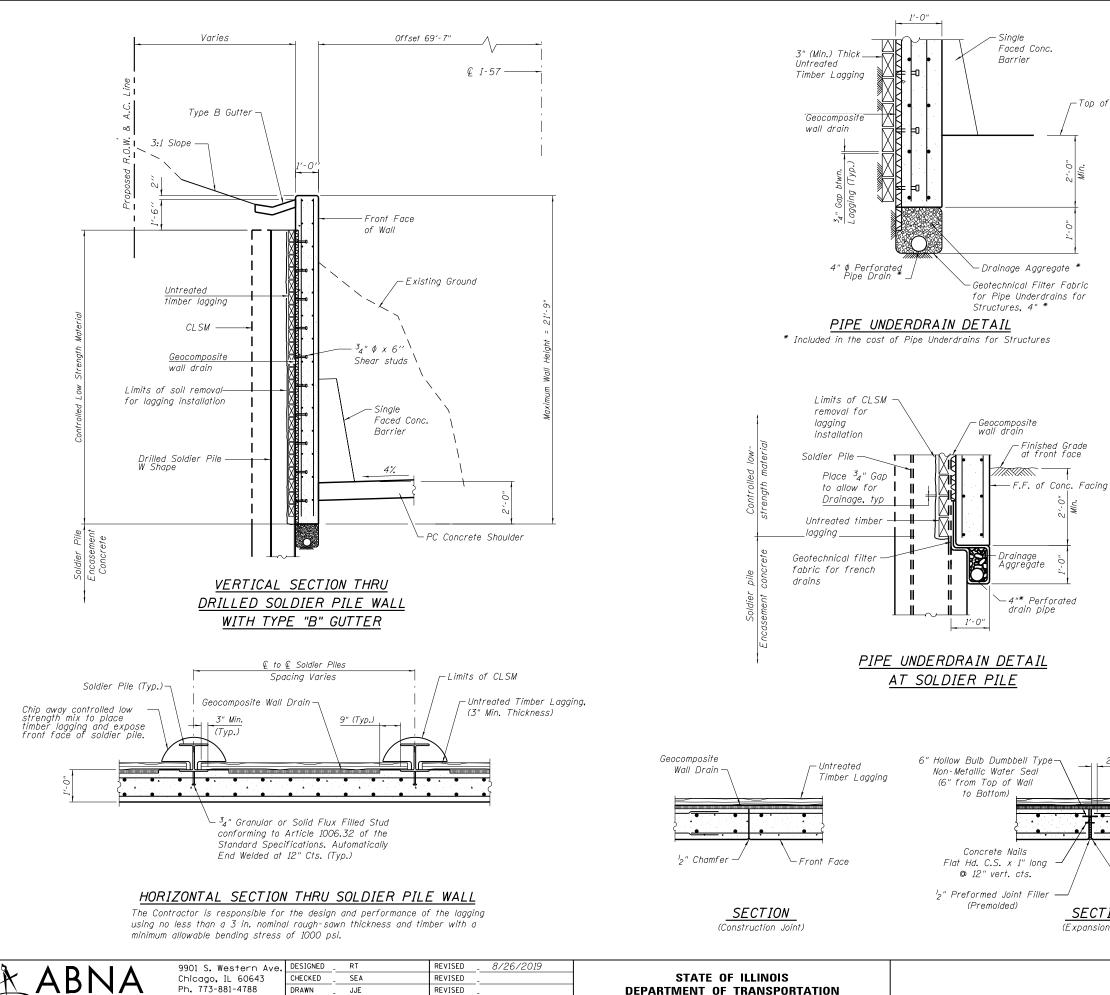


DESIGN FIRM REG. 184.002117 F: 773.239.3728

CHECKED

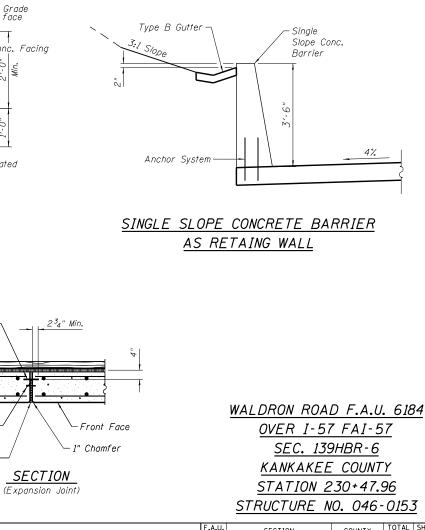
SEA

REVISED



SHEET NO. 9 OF 9 SHEETS

-Top of Shoulder



| F.A.U RTE | | SECTION | | | | | COUNTY | TOTAL SHEETS | SHEET NO. |
|--------------|------|---------|------|----------|------|-----|----------|-----------------|--------------|
| 6184 | | | 139H | BR-6 | | | KANKAKEE | 9 | 9 |
| STA. | TO | STA. | | | | | CONTRACT | NO. 6 | 6863 |
| FED. | ROAD | DIST. | NO. | ILLINOIS | FED. | AID | PROJECT | | |

EXHIBIT C

BORING LOGS

| Illinois Dep of Transpor | artm rtatio | ner on | nt | | SC | DIL BORIN | G LOG | Page <u>1</u> of <u>1</u> Date _ 2/28/14 |
|---|----------------|-----------------------|-----------------------|-------------------|-----------------------|---|--------------------------|---|
| ROUTE I-57 (FAI 57) | DES | CRI | PTION | Wa | aldron | Road over I-57, 3.4 mi 45/52 | les North of US | LOGGED BY Larry Myers |
| SECTION (46-3)R, HBK, 5HBR, | | | | | | | | |
| COUNTY Kankakee DR | RILLING | MET | THOD | | Hol | low Stem Auger | HAMMER TYPE | CME Automatic |
| STRUCT. NO. 046-0080 (Exist.) Station 230+53.99 (Exist.) BORING NO. BH 56 (West Wall) Station 227+82.54 |) | D E P T H | B L O W S | U C S Qu | M O I S T | Surface Water Elev. Stream Bed Elev. Groundwater Elev.: | ft | |
| Station 227+83.54 Offset 32.6 ft Rt. Ground Surface Elev. 633.35 | | | (/6'') | | | First Encounter Upon Completion After Hrs. | <u>Dryft</u> ft ft | |
| Augered Bituminous Shoulder, Brown & Gray Silty Clay Loam Till - Fill? | 630.9 | | | | | | | |
| Hard Gray Silty Clay Loam Till | | | 7 8 | >4.5 | 12 | | | |
| | 628.9 | | 11 | P | | | | |
| Dense Buff Limestone | 628.1 - | -5 | 100/3" | | 6 | | | |
| | - | | | | | | | |

| | Illinois Depa of Transport | rtme atior | nt | | | OIL BORING LOG | - | <u>1</u> of <u>1</u> 2/28/14 |
|--|--|--------------------------|-------------|----------------------------|------------------------------|--|-----------|---------------------------------|
| | ROUTE I-57 (FAI 57) | DESCR | | Wa | aldron | Road over I-57, 3.4 miles North of US 45/52 | LOGGED BY | Larry Myers |
| | | | | | Latitu | 4, SEC. 4, TWP. 30N, RNG. 13W, 2 nd PM , de 41.108625, Longitude -87.83535 low Stem Auger HAMMER TYPE | | utomatic |
| | STRUCT. NO. 046-0080 (Exist.) Station 230+53.99 (Exist.) BORING NO. BH 57 (West Wall) Station 228+63.37 Offset 32.6 ft Rt. Ground Surface Elev. 633.60 | _ H | S | U C S Qu (tsf) | M O I S T (%) | Surface Water Elev. ft Stream Bed Elev. ft Groundwater Elev.: ft First Encounter Dry Upon Completion Dry After Hrs. ft | | |
| | Augered Bituminous Shoulder, Brown Fill Sand | | - | | | | | |
| | Loose Brown Fill Sand, Concrete Pieces - Fill | <u>1.10</u> 29.60 | 3 4 4 | | 16 | | | |
| | Note: Stopped Boring at 4' due to unknown trench - moved twice and still in trench. No JULIE markings in area. | | - | | | | | |
| | | | - | | | | | |
| | | | - | | | | | |
| 4 | | | - | | | | | |
| DT.GDT 11/12/1 | | | - | | | | | |
| NGE.GPJ IL_D | | -15 | | | | | | |
| IL 17 INTERCH4 | | | - | | | | | |
| SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 11/12/14 | | | - | | | | | |
| SOIL | | -20 | ' | | | | | |

| | Illinois Departn of Transportati | ne on | nt | | | DIL BORING LOG | - | <u>1</u> of <u>1</u> 2/28/14 |
|--|--|----------------|-----------------|-------------|---------------|--|---|---------------------------------|
| | ROUTE I-57 (FAI 57) DES | SCR | PTION | VV a | aldron | Road over I-57, 3.4 miles North of US 45/52 | | arry Myers |
| | SECTION (46-3)R, HBK, 5HBR, 6HBR | | | | Latitu | de 41.107998, Longitude -87.835337 | | |
| | COUNTY Kankakee DRILLING | | | | | low Stem Auger HAMMER TYPE | | |
| | STRUCT. NO. 046-0080 (Exist.) Station 230+53.99 (Exist.) | D E P | B L O | U C S | M O I | Surface Water Elev. ft Stream Bed Elev. ft | | |
| | BORING NO. BH 59 (West Wall) Station 230+91.82 Offset 36.1 ft Rt. Ground Surface Elev. 632.79 ft | T H (ft) | W S (/6") | Qu (tsf) | S T (%) | Groundwater Elev.: First Encounter Dry ft Upon Completion Dry ft After Hrs. ft | | |
| | Augered Bituminous Shoulder & Buff Weathered Limestone/Silt | | | | | | | |
| | 630.29 | | | | | | | |
| | Buff Limestone - Weathered to 3' 629.71 | | 50 | | | | | |
| | End of Boring | | 100/1" | | 7 | | | |
| | | | | | | | | |
| | | -5 | - | | | | | |
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| DT 11 | | | | | | | | |
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| PJ F | | | | | | | | |
| IGE.GI | | -15 | | | | | | |
| RCHAN | | | | | | | | |
| 7 INTE | | | | | | | | |
| 8. IL 17 | | | 1 | | | | | |
| 3 1-57 | | | | | | | | |
| SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 11/12/14 | | | | | | | | |
| SOILE | | -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 Depa of Transpor | artm tatio | ent n | | | OIL BORING LOG | - | <u>1</u> of <u>1</u> <u>9/4/13</u> |
|--|---|------------------|-------------------------|-------------|------------------|---|-----------|---------------------------------------|
| | ROUTE I-57 (FAI 57) | _ DESC | RIPTIO | Wa N | aldron | Road over I-57, 3.4 miles North of US 45/52 | LOGGED BY | Larry Myers |
| | SECTION(46-3)R, HBK, 5HBR, 6 | 6HBR | LOCA | TION _ | SE 1/4 Latitu | 4, SEC. 4, TWP. 30N, RNG. 13W, 2 nd PM, de 41.108251, Longitude -87.835183 | | |
| | COUNTY Kankakee DRI | | IETHOD | · | Hol | low Stem Auger HAMMER TYPE | E CME A | utomatic |
| | STRUCT. NO. 046-0080 (Exist.) Station 230+53.99 (Exist.) | | | U C S | М О І | Surface Water Elev. ft Stream Bed Elev. ft | | |
| | BORING NO. BH 68 (Pier) Station 230+00.99 Offset 9.2 ft Lt. Ground Surface Elev. 632.86 | H | r W H S ft) (/6") | Qu | S T | Groundwater Elev.: First Encounter Dry Upon Completion Dry After Hrs. | | |
| | Augered Bituminous Shoulder & Brown Fill Sand/Gravel | | _ | | | | | |
| | | | _ | | | | | |
| | | 630.36 530.19 | 100/2 | , | | | | |
| | End of Boring | | | | | | | |
| | | | -5 | | | | | |
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| | | | | | | | | |
| | | | 10 | | | | | |
| | | | | | | | | |
| 1/12/14 | | | _ | | | | | |
| F.GDT 1 | | | | | | | | |
| J IL_DO | | | | | | | | |
| NGE.GP. | | | 15 | | | | | |
| TERCHA | | _ | | | | | | |
| 8 IL 17 IN | | — | | | | | | |
| NG 1-57 8 | | | | | | | | |
| SOIL BORING 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 11/12/14 | | | 20 | | | | | |

| | Illinois Dep of Transpo Division of Highways | | | | | DIL BORING LOG | - | <u>1</u> of <u>1</u> <u>9/4/13</u> |
|--|--|--------------------|--------|----------------------------|------------------------------|--|-----------|---------------------------------------|
| ROUT | re I-57 (FAI 57) | | | Wa | aldron | Road over I-57, 3.4 miles North of US 45/52 | LOGGED BY | Larry Myers |
| | | | | | Latitu | 4, SEC. 4, TWP. 30N, RNG. 13W, 2 nd PM, de 41.107967, Longitude -87.835197 low Stem Auger HAMMER TYPE | | utomatic |
| Stati BORI Stati Offs | ICT. NO. 046-0080 (Exist.) ion 230+53.99 (Exist.) NG NO. BH 69 (Pier) ion 231+04.30 et 2.2 ft Lt. und Surface Elev. 632.74 |) E P T H | | U C S Qu (tsf) | M O I S T (%) | Surface Water Elev. ft Stream Bed Elev. ft Groundwater Elev.: ft First Encounter Dry Upon Completion Dry After Hrs. ft | | |
| Auger Tan V Dolon | red Bituminous Shoulder & Veathered & Reworked nite | | - | | | | | |
| Dense | e Tan Weathered Dolomite | 630.24 | 100/4' | | 7 | | | |
| Soll BORING 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 11/12/14 | r Refusal @ 3.5' f Boring | | | | | | | |

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 Dep of Transpo | | | | | SC | DIL BORING LOG | i | • <u>1</u> of <u>1</u> 9/12/13 |
|-----------------------------|---|------------------|----------------|-----------------|-------------|---------------|---|-------------|-----------------------------------|
| | ROUTE I-57 (FAI 57) | DES | SCR | PTION | Wa | aldron | Road over I-57, 3.4 miles North of US 45/52 | _ LOGGED BY | Larry Myers |
| | SECTION (46-3)R, HBK, 5HBR | , 6HBR | _ เ | | | SE 1/4 | SEC. 4, TWP. 30N, RNG. 13W, 2 nd PI | М, | |
| | COUNTY Kankakee DF | RILLING | ME | THOD | | | de 41.107686, Longitude -87.834655 low Stem Auger HAMMER TY | | utomatic |
| | STRUCT. NO. 046-0080 (Exist.) Station 230+53.99 (Exist.) |) .) | D E P | B L O | U C S | M O I | Surface Water Elev 1 Stream Bed Elev 1 | ft ft | |
| | BORING NO. BH 71 (E. Abut.) Station 232+11.23 Offset 148.3 ft Lt. Ground Surface Elev. 647.42 | | T H (ft) | W S (/6") | Qu (tsf) | S T (%) | Groundwater Elev.: First Encounter Dry Upon Completion Dry After Hrs. | | |
| | Augered Shoulder Stone, Brown Silty Clay Loam Fill | | | | | | | | |
| | | | _ | | | | | | |
| | Hard Brown Silty Clay Loam Till Fill | 644.92 | | 3 4 5 | 4.0 P | 13 | | | |
| | | | -5 | 3 | 4.0 | 17 | | | |
| | | 639.92 | | 3 | Р | | | | |
| | Stiff to Very Stiff Brown Silty Clay/Silty Clay Loam | 637.92 | | 2 2 2 | 2.0 P | 20 | | | |
| | Stiff to Very Stiff Brown Silty Clay Loam Till | | -10 | 2 | 1.5 | 26 | | | |
| 12/14 | | | | 2 | Р | | | | |
| .GDT 11/ | Weathered & Reworked Dolomite Surface | 634.92 | | 30 15 12 | | 9 | | | |
| NGE.GPJ IL_DOT | Dense Tan/Orange Dolomite | 632.42 632.17 | | 100/3" | | | | | |
| 7 & IL 17 INTERCHAI | Auger Refusal End of Boring | | | | | | | | |
| SOIL BORING 1-57 & IL 17 IN | | | -20 | • | | | | | |

| | Illinois Dep of Transpo | oartn ortati | nei on | nt | | SC | OIL BORING LO | G | | Page | <u>1</u> | of <u>1</u> |
|--------------------------------|---|-----------------|-------------|-------------|-------------|-------------|--|--------------|-------------|-------------|-------------|-------------|
| | Division of Highways IDOT | | • | | | | | | | Date | 3/2 | 7/10 |
| | ROUTE I-57 (FAI 57) | DE | SCRI | PTION | N | aldror | n Road over I-57, Retaining Wall Soi Investigation | L0 | oggi | ED BY | Larry | Myers |
| | SECTION (46-3)R, HBK, 5HBR | , 6HBR | _ L | OCAT | ION _ | Latitu | de 41.108482, Longitude -87.8355 | | | | | |
| | COUNTY Kankakee D | RILLING | ME. | THOD | | Hol | low Stem Auger HAMMER | TYPE | | | utoma | tic |
| | STRUCT. NO. 046-0080 Station 230+53.99 (Exist) | .) | D E P | B L O | U C S | M O I | Surface Water Elev Stream Bed Elev | _ ft _ ft | D E P | B L O | U C S | М О І |
| | BORING NO. BH 101 (NW Quad Station 229+13.97 Offset 82.1 ft Rt. | <u>d.)</u> | T H | W S | Qu | S T | Groundwater Elev.: First Encounter Upon Completion | _ ft ft | T H | W S | Qu | S T |
| | Ground Surface Elev. 657.19 | ft | (ft) | (/6") | (tsf) | (%) | After Hrs | _ ft | (ft) | | (tsf) | (%) |
| | Augered Bituminous, Sand & Gravel & Black, Gray, Silty Clay Loam Fill | | | | | | Hard Brown to Gray Silty Clay/Silty Clay Loam Till (continued) | | | 5 6 7 | 4.6 S | 19 |
| | | 654.69 | | | | | | | | | | |
| | Very Stiff to Hard, Gray/Brown/Black, Silty Loam/Silty Clay Loam Till Fill with | | - <u> </u> | 4 5 6 | 3.5 P | 23 | | | | 3 5 7 | 4.0 S | 22 |
| | Rock & Concrete Debris | | | - | | | | 000.40 | | | | |
| | | | -5 | 3 | 3.5 | 18 | Hard Gray Silty Clay Loam Till with Large Gravel Pieces | 632.19 | -25 | 4 | 4.0 | 12 |
| | | | | 5 | P.0.0 | | | | | 12 | P | 12 |
| | | | | 3 | | | Assumed Dolostone Surface, | 629.69 | | 100/1" | No | |
| | | 648.69 | | 5 5 8 | 4.0 | 22 | Auger Refusal End of Boring | | | | ecove | ry |
| | Hard Gray & Brown Silty Clay/Silty Clay Loam | 647.19 | | 8 | 4.3 S | | | | -30 | | | |
| | Hard, Brown, Silty Clay Loam Till | 047.19 | - 10 | 8 12 | 8.2 | 17 | | | -30 | | | |
| /14 | | | | 14 | S | | | | | | | |
| | | | | 9 | | | | | | | | |
| IL_UUI.GUI | | | | 10 11 | 8.2 S | 19 | | | _ | | | |
| ביפרט | | 642.19 | -15 | | | | | | -35 | | | |
| SULANG | Very Stiff Brown Silty Loam Till with Silt Layers | | | 3 | 3.0 | 20 | | | | | | |
| | | | | 5 | Р | | | | | | | |
| -1 & IC | | | | 3 | 20 | 10 | | | | | | |
| OUL BURING 1-57 & IL 1/ IN LEF | | 637 60 | | 4 5 | 3.0 P | 18 | | | | | | |
| | | 637.69 | -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)

| (\mathbb{P}) | Illinois I of Trans | Departn sportati | nent on | t | | SC | IL BORIN | G LOG | Page <u>1</u> of _ |
|----------------------|---|---------------------|------------|----------|-------------|---------------|--|------------------------------|--------------------|
| BOUTE | Division of Highways Illinois Department of I-57 (FAI 57) | | | | Wale | dron | Road over I-57, 3.4 mile | es North of US | Date <u>9/8/17</u> |
| | | | | | N S | SF 1/4 | SEC. 4. TWP. 30N. R | NG. 13W. 2 nd PM. | |
| | Kankakee | | | | L | _atitu | de 41.107696, Longitu low Stem Auger | ide -87.83471 | CME Automatic |
| STRUCT. NO Station | 046-0080 230+53.99 | (EX) (EX) | E | L | U C S | M O I | Surface Water Elev. Stream Bed Elev. | ft ft | |
| Station Offset | <u>B 217 (S. A</u> 232+12.9 133.4 ft L face Elev. 64 | 99 _t | T H | w s (| Qu | S T (%) | Groundwater Elev.: First Encounter Upon Completion After Hrs. | ft | |
| Augered Mate | erial - Not | | _ | | | | | | |
| | | | | | | | | | |
| | | | _ | | | | | | |
| | | | _ | | | | | | |
| | | | -5 | | | | | | |
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| | | | -10 | | | | | | |
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| | | | | | | | | | |
| I | | | | | | | | | |
| | | | -15 | | | | | | |
| Porobala as- | tipuod with rock | 632.76 | 3 | | | | | | |
| Borehole con coring. | tinued with rock | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | -20 | | | | | | |

| | R |) Illinois I of Trans | Departm | nent | R | оск | COF | SE I | | G | | P | age <u>1</u> | of <u>1</u> |
|--|--------------------------|--|-------------------------------|--------------------------|--------------------------|----------------------------|------------|--------|----------------|----------------------------------|--------|------|--------------|----------------|
| | | Division of Highways Illinois Department of | f Transportation | 511 | | | | | | _ | | D | ate 🤤 | 9/8/17 |
| | ROUTE | I-57 (FAI 57) |) DES | CRIPTION | | Road over | 45/52 | | | | _ LO | GGED | BY Larr | y Myers |
| | SECTION | (46-3)R, HBK, 5 | 5HBR, 6HBR | | ON <u>SE 1/</u> Latit | 4, SEC. 4, T ude 41.107 | WP. 30N, | RNG. | 13W, -87,8; | 2 nd P 3471 | M, | | | |
| | COUNTY | Kankakee | | iethod _ | | | | | | | R E | R | CORE | S T |
| | STRUCT. N | IO . <u>046-0080</u> | <u>(EX)</u> C | ORING BAI | RREL TYPI | E & SIZE _ | N W/L | 2 | D | С | C O | Q | T | R E |
| | | 230+53.99 | | Core Diam | | 1.9 632.76 | | | E P | O R | VE | D | M | N G |
| | Station | O. <u>B 217 (S. A</u> 232+12. | 99 | Top of Roo Begin Core | | | ft | | T H | E | R Y | | | T H |
| | | 133.4 ft Surface Elev6 | | | | | | | (ft) | (#) | (%) | (%) | (min/ft) | (tsf) |
| | Tan Dolost Shale, Loo | one Highly Horizo se Joints | ntally Fracture | d with mos | t Seams Fi | lled with We | eathered | 632.76 | | 1 | 90 | 0 | 2.4 | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | -20 | | | | | |
| | Tan to Gra | y Dolostone - Hori | zontally Fractu | ured with Lo | oose Joints | , some Vert | tical | 627.76 | | 2 | 90 | 48 | 3 | 744.0 |
| | Fractures | | | | | | | | | | | | | 711.3 |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | 766.8 |
| | | | | | | | | | -25 | | | | | 761.6 655.0 |
| | | | | | | | | 622.76 | | | | | | 798.9 |
| | Gray Limes Horizontal | stone with some Lo Joints are Oxidize | oose Horizonta d Tan Color | al Fracturing | g and Heav | vy Vertical F | racturing, | | | 3 | 100 | 22 | 2.8 | |
| | | | | | | | | | | | | | | 075 5 |
| 2/5/18 | | | | | | | | | | | | | | 875.5 |
| T.GDT | | | | | | | | | | | | | | 691.3 |
| | | | | | | | | | -30 | | | | | |
| GE.GPJ | End of Bor | ing | | | | | | 617.76 | | | | | | |
| RCHAN | | - | | | | | | | | | | | | |
| 17 INTE | | | | | | | | | | | | | | |
| 57 & IL | | | | | | | | | | | | | | |
| ORE - | | | | | | | | | -35 | | | | | |
| ROCK CORE 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | | | | | | | | | | | | | | |

SN 046-0080, Waldron Road over I-57, S. Abut.

- (46-3)R, HBK, 5HBR, 6HBR
- FAI 57 (IL 57), Kankakee County
- Boring B-217, Box 1 of 2
- Station 232+12.99, 133.4 ft. Lt.
- **Ground Surface Elev. = 648.76**
- Top of Core = 16 ft. (632.76)
- Bottom of Core = 26 ft. (622.76)

Date of Core is 9/8/17



SN 046-0080, Waldron Road over I-57, S. Abut.

- (46-3)R, HBK, 5HBR, 6HBR
- FAI 57 (IL 57), Kankakee County
- Boring B-217, Box 2 of 2
- Station 232+12.99, 133.4 ft. Lt.
- **Ground Surface Elev. = 648.76**
- Top of Core = 26 ft. (622.76)
- Bottom of Core = 31 ft. (617.76)

Date of Core is 9/8/17



| | R | Illinois Dep of Transpo Division of Highways Illinois Department of Transp | rtation | | SC | | G LOG | | <u>1</u> of <u>1</u> 10/4/17 |
|--|---------------------------|---|------------------|-----------------------|-------------|--|---|--------------|---------------------------------|
| | ROUTE | | | ۷ | Valdron | Road over I-57, 3.4 mile 45/52 | | .OGGED BY La | arry Myers |
| | SECTION _ | (46-3)R, HBK, 5HBR | , 6HBR LO | CATION | SE 1/4 | , SEC. 4, TWP. 30N, R | NG. 13W, 2 nd PM , | | |
| | | Kankakee DI | RILLING METH | OD | | de 41.107926, Longitu low Stem Auger | | CME Auto | matic |
| | STRUCT. NO | 0. <u>046-0080 (EX)</u> 230+53.99 (EX) | E | BULC SS | M O I | Surface Water Elev Stream Bed Elev | ft ft | | |
| | Station Offset | . <u>B 218 (Pier)</u> 231+25.20 8.0 ft Lt. rface Elev. <u>632.57</u> | H | N S Qu 6") (tsf | | Groundwater Elev.: First Encounter _ Upon Completion _ After Hrs. | ft ft ft | | |
| | Augered Mar Documented | terial - Not | | | | | | | |
| | | | | | | | | | |
| | | proximately 30" into | 630.07 | | | | | | |
| | Rock Before | Starting Core | | | | | | | |
| | | | | | | | | | |
| | | ntinued with rock | 627.57 -5 | | | | | | |
| | coring. | | | | | | | | |
| | | | | | | | | | |
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| | | | | | | | | | |
| | | | -10 | | | | | | |
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| T 2/5/18 | | | | | | | | | |
| OT.GD | | | | | | | | | |
| | | | | | | | | | |
| ANGE.G | | | 15 | | | | | | |
| TERCH/ | | | | | | | | | |
| IL 17 IN | | | | | | | | | |
| I-57 & | | | | | | | | | |
| SOIL BORING 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | | | — — | | | | | | |
| SOIL B | | | -20 | | | | | | |

| | Illinois Department of Transportation Division of Highways Illinois Department of Transportation | G | | | age <u>1</u> ate 1 | |
|--|--|-----------------------------------|-----------------------------------|-------------|------------------------------|--|
| | ROUTE I-57 (FAI 57) DESCRIPTION Waldron Road over I-57, 3.4 miles North of 45/52 | of US | _ LO | | BY Larr | |
| | SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, Latitude 41.107926, Longitude -87.83 COUNTY Kankakee CORING METHOD Split Barrel Wire Line | 2 nd P 35174 | R | | CORE | S |
| | STRUCT. NO. 046-0080 (EX) D Station 230+53.99 (EX) CORING BARREL TYPE & SIZE N W/L 2 BORING NO. B 218 (Pier) Core Diameter 1.9 in Station 231+25.20 Offset 630.07 ft Offset 8.0 ft Lt. Begin Core Elev. 627.57 ft H (ft) | C O R E (#) | E C V E R Y (%) | R Q D | T I M E (min/ft) | T R E N G T H (tsf) |
| | Dense Gray & Tan Limestone, Horizontal Fractures with Loose Joints 627.57 | 1 | 95 | 26 | 2.4 | 535.5 891.7 |
| | 622.57 -10 Dense Gray Limestone with Tight Joints, Oxidized Tan Color, Horizontal Fractures | 2 | 100 | 45 | 3.2 | 839.7 770.5 696.5 |
| | 617.57 -15 Dense Gray Limestone, some Horizontal Fractures with Tight Joints | 3 | 100 | 87 | 2.8 | 817.2 1453.7 1077.7 1022.4 866.7 1086.6 |
| ROCK CORE 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | End of Boring | | | | | |

SN 046-0080, Waldron Road over I-57, Pier (46-3)R, HBK, 5HBR, 6HBR FAI 57 (IL 57), Kankakee County Boring B-218, Box 1 of 2 Station 231+25.20, 8.0 ft. Lt. Ground Surface Elev. = 632.57 Top of Core = 5 ft. (627.57) Bottom of Core = 15 ft. (617.57) **Date of Core is 10/4/17**

I-57 Waldron Rd (Center Pier) Boring: B218 Depth 5 Ft to 10 Ft Box 105.2 10-4-17

ari

CONTRACTOR OF THE



SN 046-0080, Waldron Road over I-57, Pier (46-3)R, HBK, 5HBR, 6HBR FAI 57 (IL 57), Kankakee County Boring B-218, Box 2 of 2 Station 231+25.20, 8.0 ft. Lt. Ground Surface Elev. = 632.57 Top of Core = 15 ft. (617.57)Bottom of Core = 20 ft. (612.57) **Date of Core is 10/4/17**



| Illinois Depart of Transport | rtment ation | SC | DIL BORING LOG | - | <u>1</u> of <u>1</u> 9/7/17 |
|--|-----------------|------------|---|-----------|--------------------------------|
| ROUTE I-57 (FAI 57) | | | Road over I-57, 3.4 miles North of US 45/52 | LOGGED BY | |
| | | | 4, SEC. 4, TWP. 30N, RNG. 13W, 2 nd PM | | |
| COUNTY Kankakee DRIL | | Latitu | Ide 41.108486, Longitude -87.835544 Iow Stem Auger HAMMER TYF | | utomatic |
| STRUCT. NO046-0080 (EX) | DB | UM | Surface Water Elev fi | | UM |
| Station 230+53.99 (EX) | E L P O | C O S I | Stream Bed Elev ff | • _ . | C O S I |
| BORING NO. <u>B 219 (N. Abut.)</u> Station 229+18 36 | T W H S | Qu T | Groundwater Elev.: First Encounter ft | TW | Qu T |
| Station 229+18.36 Offset 87.5 ft Rt. Ground Surface Elev. 657.30 | - | (tsf) (%) | First Encounter ft Upon Completion ft After ft | t | (tsf) (%) |
| Augered Material - Not | <u> </u> | | Augered Material - Not | | |
| Documented | | | Documented (continued) | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | -5 | | | -25 | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | -10 | | | -30 | |
| | | | | | |
| m | _ | | | _ | |
| IT 2/5/18 | | | 62 Borehole continued with rock | 24.80 | |
| DOT.GL | | | coring. | | |
| | 15 | | | -35 | |
| ANGER | -15 | | | | |
| TERC | | | | | |
| & IL 17 INTERCHANGE.GPJ IL_DOT.GDT | | | | | |
| <u>G 1-57 2</u> | | | | | |
| SOIL BORING 1-57 | | | | | |
| solt | -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)

| | (W) | Illinois De | epartm | ent | | ROCK | | DEI | | | | Ρ | age <u>1</u> | of <u>1</u> |
|--|-------------------------|---|--------------|--|------------------|------------------------------|---|-------------|-------------------------------|-----------------------------------|-----------------------------------|--------|-------------------------|-------------------------------------|
| | | J of Transp Division of Highways Illinois Department of Tra | | n | - | | | | | - | | D | ate 🤤 | 9/7/17 |
| | ROUTE _ | I-57 (FAI 57) | DES | CRIPTION | vvaid | ron Road ove | er I-57, 3.4 45/52 | miles N | orth c | or US | _ LO | GGED | BY Lan | y Myers |
| | SECTION | (46-3)R, HBK, 5HE | BR, 6HBR | | ION <u>SE</u> | 1/4, SEC. 4 atitude 41.10 | , TWP. 301 08486. Lo r | N, RNG. | <u>13W,</u> -87.83 | 2 nd P 35544 | M , | | | |
| | | Kankakee | CORING M | ETHOD _ | | arrel Wire Lir | | J | | | R E | R | CORE | S T |
| | Station _ Offset | 230+53.99 (E 0. <u>B 219 (N. Abu</u> 229+18.36 | it.) | ORING BA Core Diam Top of Roo Begin Cor | eter ck Elev. | | in ft | <u>/L 2</u> | D E P T H (ft) | C O R E (#) | C O V E R Y (%) | Q D | T I E (min/ft) | R E N G T H (tsf) |
| [| Dense Gra | y Limestone with Ger | | t Horizonta | al Fractu | res, Interbed | ded Thin | 624.80 | | 1 | 97 | 28 | 2.2 | () |
| | | ns in top 6" ite Crystal Vug Fill | | | | | | | | | | | | |
| | | | | | | | | | -35 | | | | | 895.1 |
| | | | | | | | | | | | | | | 822.2 |
| | | | | | | | | | | | | | | 732.4 |
| | | y Limestone with Tigl ite Crystal Vug Fill | ht Horizonta | al Fracturin | g | | | 619.80 | <u> </u> | 2 | 100 | 55 | 1.6 | 1359.7 |
| | | | | | | | | | | | | | | 1354.8 |
| | | | | | | | | | -40 | | | | | |
| | | | | | | | | | | | | | | 1156.4 |
| | | | | | | | | | | | | | | |
| | Dense Gra Minor Calc | y Limestone with Tigl ite Crystal Vug Fill | ht Horizonta | al Fracture | S | | | 614.80 | <u> </u> | 3 | 100 | 83 | 3.2 | |
| | | | | | | | | | | | | | | 1005.9 |
| 2/5/18 | | | | | | | | | -45 | | | | | 1198.5 |
| OT.GDT | | | | | | | | | | | | | | 598.8 |
| PJ IL_D | | | | | | | | <u></u> | | | | | | 809.0 |
| ANGE.G | End of Bori | ing | | | | | | 609.80 | | | | | | |
| NTERCH | | | | | | | | | | | | | | |
| 8 IL 17 II | | | | | | | | | -50 | | | | | |
| RE I-57 | | | | | | | | | | | | | | |
| ROCK CORE 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | | | | | | | | | | | | | | |

SN 046-0080, Waldron Road over I-57, N. Abut. (46-3)R, HBK, 5HBR, 6HBR FAI 57 (IL 57), Kankakee County Boring B-219, Box 1 of 2 Station 229+18.36, 87.5 ft. Rt. Ground Surface Elev. = 657.30 Top of Core = 32.5 ft. (624.80)

Bottom of Core = 41.5 ft. (615.80)

Date of Core is 9/7/17



SN 046-0080, Waldron Road over I-57, N. Abut. (46-3)R, HBK, 5HBR, 6HBR FAI 57 (IL 57), Kankakee County Boring B-219, Box 2 of 2 Station 229+18.36, 87.5 ft. Rt. Ground Surface Elev. = 657.30 Top of Core = 41.5 ft. (615.80)

Bottom of Core = 47.5 ft. (609.80)

Date of Core is 9/7/17





Solutions You Can Build On

3705 Progress Blvd Peru, II 61354 815 780-8486

| SOIL BORING LOG |
|-----------------|
|-----------------|

Retaining wall east of I-57, south of Waldron FAI 57 DESCRIPTION LOGGED BY TMR ROUTE Road SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.107577, Longitude -87.835013 COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic В U Μ D STRUCT. NO. Surface Water Elev. ft Е L С 0 Station Stream Bed Elev. ft Ρ S ο L т BORING NO. <u>B-22</u>0 W S Groundwater Elev.: Station н S Qu т 232+54 First Encounter dry ft Offset 48.0 ft Lt. Upon Completion _dry__ft (%) (ft) (/6") (tsf) Ground Surface Elev. 634.83 ft After Hrs. ft 634.33 6" Brown Silty Clay Topsoil Dense Light Brown Silty Sandy Gravel w/ trace Clay 11 46 11 21 26 23 8 630.33 _ 50/2" Weathered fractured Dolostone -5 626.33 Borehole continued with rock coring. -10 -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)

Date 12/21/17

| M ^c Cleary | |
|-----------------------|--|
| 10 | |
| Cngineering | |

Solutions You Can Build On

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ROCK CORE LOG

Retaining wall east of I-57, south of Waldron

| ROUTE | FAI 57 | DESCRIPTION | | Road | - Traid | | _ LO | GGED | BY | TMR |
|---------------|--------------------------------|---------------------------------|-------------------|-----------------|----------------------|--------------------------|------------------|--------|------------------|------------------|
| | (46-3)R,HBK,5HBR,6H | BR LOCATION | SE 1/4, SEC. 4, 1 | TWP. 30N, RNG. | <u>13W,</u> | 2 nd P | M , | | | |
| | Kankakee COR | ING METHOD Wi | | 7577, Longitude | | 35013 | R E | R | CORE | S T |
| Station | | Core Diameter | | in | D E P | C O R | C O V E | Q D | T I M E | R E N G |
| Station | B-220 232+54 48.0 ft Lt. | Top of Rock E Begin Core Ele | | | T H | E | R Y | • | | T H |
| Ground Surf | face Elev. 634.83 | ft | | | (ft) | (#) | (%) | | (min/ft) | (tsf) |
| Gray Dolostor | 16 | | | 626.33 | -10 | 1 | 100 | 68 | 1.65 | 543.0 |
| Brown Dolosto | one | | | | | | | | | |
| Gray Dolostor | ne, Crystal solution void | @ 12.66' 3/4" W x 1 | /2" H | 622.3 | <u>3</u> | | | | | 489.0 |
| | | | | 616.3 | | | | | | 358.0 |
| End of Boring | | | | | | | | | | 398.0 |

Color pictures of the cores Yes Cores will be stored for examination until

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

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

Date 12/21/17

FAI 57 (IL 57)

- (46-3)R, HBR, 5HBR, 6HBR
- **Kankakee County**
- Boring B-220, Box 1 of 1
- Station 232+50, 52 ft. Lt.
- Ground Surface Elev. =631.04 ft.
- Top of Core = 8.5 ft. (622.54 ft.)
- Bot. of Core = 18.5 ft. (612.54 ft.)

Date of Core is 12/21/17



| | Illinois Depa of Transpor | artn tati | ne on | nt | | SC | DIL BORING LOG | - | <u>1</u> of <u>1</u> |
|--|---|--------------|-------------|-------------|-------------|-------------|--|------------------|------------------------|
| | Division of Highways Illinois Department of Transpor ROUTE I-57 (FAI 57) | | SCR | IPTION | Ret | aining | Wall South of Waldron Road over I-57 on West side of I-57 | Date OGGED BY | 9/25/17 Larry Myers |
| | SECTION(46-3)R, HBK, 5HBR, (| 6HBR | _ I | | ION _ | SE 1/4 | , SEC. 4, TWP. 30N, RNG. 13W, 2 nd PM , de 41.106892, Longitude -87.835321 | | |
| | | | | | | | low Stem Auger HAMMER TYPE | CME Au | itomatic |
| | STRUCT. NOStation | _ | D E P | B L O | U C S | M O I | Surface Water Elev ft Stream Bed Elev ft | | |
| | BORING NO. B 221 Station 235+00.78 Offset 44.1 ft Rt. Ground Surface Elev. 630.55 | ft | T H | W S | Qu (tsf) | S T | Groundwater Elev.: First Encounter ft Upon Completion ft After Hrs ft | | |
| | Augered Material - Not Documented | | | - | | | | | |
| | | 628.55 | | | | | | | |
| | Rock encountered @ approximately 2' and Augered to 4' | | | - | | | | | |
| | Borehole continued with rock coring. | 626.55 | -5 | - | | | | | |
| | | | | - | | | | | |
| | | | | - | | | | | |
| | | | -10 | - | | | | | |
| | | | | - | | | | | |
| 2/5/18 | | | | - | | | | | |
| DOT.GDT | | | | - | | | | | |
| GE.GPJ IL | | | -15 | | | | | | |
| TERCHANC | | | | - | | | | | |
| & IL 17 IN ⁻ | | | | - | | | | | |
| SOIL BORING 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | | | | | | | | | |
| SOIL BOF | | | -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)

| | R |) Illinois of Trans | Departn sportati | nent on | R | оск | COR | ELC |)G | | Ρ | age <u>1</u> | of <u>1</u> |
|--|--------------------------|--|-----------------------|--------------|-------------------------|--|---------------------------|-------------------------|------------------------------------|-----------------------|--------|------------------|-----------------------|
| | | Division of Highways Illinois Department of | s f Transportation | | | | | - | | 7 | D | ate 9 | /25/17 |
| | ROUTE | I-57 (FAI 57 |) DES | CRIPTION | | on Wes | st side of I-5 | 57 | | _ LO | GGED | BY Larr | y Myers |
| | SECTION | (46-3)R, HBK, \$ | 5HBR, 6HBR | | ON <u>SE 1</u> Latit | /4, SEC. 4, T ude 41.1068 | WP. 30N, R 392, Longit | NG. 13W | <u>, 2nd P</u> 33532 | ν Μ , 1 | | | |
| | | Kankakee | | METHOD _ | | | | | | RE | R | CORE | S T |
| | Station _ | IOB 221 0B 221 235+00. 44.1 ft F | | Core Diame | eter _ k Elev | E & SIZE 1.9 628.55 626.55 | _ in _ ft | E P T | C O R E | C O V E R | Q D | T I M E | R E N G T |
| | Offset | 44.1 ft F urface Elev. 6 | Rt. ff | C | | | | H (ft | | Y (%) | (%) | (min/ft) | H (tsf) |
| | Dense Gra | y & Tan Limeston | e with some V | | C | | 6 | 26.55 _ { 24.55 _ | 1 | 92 | 8 | 2.2 | 711.5 |
| | Dense Gra Oxidized Ta | y Limestone with I an | Horizontal Fra | cturing & Lo | ose Joint: | s, some Joint | Faces | 21.55 | - | | | | |
| | Dense Gra | y Limestone, Tigh | t Joints and N | umerous Ve | ertical Frac | ctures | | | 2 | 100 | 13 | 2.4 | 611.3 |
| | | | | | | | | | - | | | | 741.9 |
| ROCK CORE 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | End of Bori | ng | | | | | 6 | | | | | | |

Retaining Wall South of Waldron Road (46-3)R, HBK, 5HBR, 6HBR FAI 57 (IL 57), Kankakee County **Boring B-221, Box 1 of 1** Station 235+00.78, 44.1 ft. Rt. Ground Surface Elev. = 630.55 Top of Core = 4 ft. (626.55) Bottom of Core = 14 ft. (616.55) **Date of Core is 9/25/17**

9-25-17 Waldron Rd Ret. Wall Boring # BZZI Depth 4' to 14' Box 1 of 1 1 SAMPLE HA 11 15 .9 .3 100THSET .4 .8 .6 .7



| i | Illinois Dep of Transpor | artn rtati | ne on | nt | | SC | DIL BORING LOG | - | <u>1</u> of <u>1</u> |
|--|---|---------------|-------------|-------------|-------------|-------------|--|-------|------------------------|
| | Division of Highways Illinois Department of Transpo ROUTE I-57 (FAI 57) | | SCR | IPTION | Ret | aining | Wall South of Waldron Road over I-57 on West side of I-57 | Date | 9/25/17 Larry Myers |
| | | | | | ION | SE 1/4 | SEC. 4. TWP. 30N. RNG. 13W. 2 nd PM . | | |
| | COUNTY Kankakee DR | ILLING | 6 ME | THOD | | | ide 41.10729, Longitude -87.835345 llow Stem Auger HAMMER TYPE | CME A | utomatic |
| | STRUCT. NO Station | | D E P | B L O | U C S | M O I | Surface Water Elev ft Stream Bed Elev ft | | |
| | BORING NO. B 222 Station 233+55.44 Offset 46.2 ft Rt. Ground Surface Elev. 630.64 | ft | T H | W S | Qu | S T | Groundwater Elev.: First Encounter ft Upon Completion ft After Hrs ft | | |
| | Augered Material - Not Documented | | | | | | | | |
| | | 628.64 | | - | | | | | |
| | Rock encountered @ approximately 2' and Augered to 4' | | | | | | | | |
| | Borehole continued with rock coring. | 626.64 | -5 | - | | | | | |
| | | | | - | | | | | |
| | | | | - | | | | | |
| | | | -10 | | | | | | |
| | | | | - | | | | | |
| T 2/5/18 | | | | | | | | | |
| L_DOT.GD | | | | - | | | | | |
| NGE.GPJ 1 | | | -15 | | | | | | |
| INTERCHA | | | | - | | | | | |
| 1-57 & IL 17 | | | _ | | | | | | |
| SOIL BORING 1-57 & 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)

| | Illinois Department of Transportation ROCK CORE I | LO | G | | | age <u>1</u> | |
|--|--|---------------------|----------------------------------|------------------|------------------|--------------------------------|-------------|
| | Division of Highways Illinois Department of Transportation Retaining Wall South of Waldron Road ROUTE I-57 (FAI 57) DESCRIPTION | d ove | er I-57 | , _ LO | | ate <u>9</u> BY <u>Larr</u> | |
| | SECTION(46-3)R, HBK, 5HBR, 6HBRLOCATIONSE 1/4, SEC. 4, TWP. 30N, RNG. ^ Latitude 41.10729, Longitude -8 | <u>13W,</u> 7.83 | 2 nd P 5345 | | | 0005 | |
| | COUNTY Kankakee CORING METHOD Split Barrel Wire Line STRUCT. NO. CORING BARREL TYPE & SIZE N W/L 2 | | | R E C | R | CORE T | S T R |
| | Station Core Diameter1.9 in | D E P | C O R | O V E | Q D | I M E | E N G |
| | Station 233+55.44 Begin Core Elev. 626.64 ft Offset 46.2 ft Rt. 626.64 626.64 ft | T H | E | R Y | • | _ | т Н |
| | Ground Surface Elev. 630.64 ft Dense Gray Limestone, some Tan Oxidation at Joints, Horizontal Fractures & 626.64 Relatively Tight Joints | | (#) | (%) 97 | (%) 13 | (min/ft) 2 | (tsf) |
| | | 5 | | | | | 770.3 |
| | | | | | | | 770.5 |
| | | | | | | | |
| | 621.64 Dense Gray Limestone with some Tan Oxidation at Joints, Horizontal Fractures with | | 2 | 100 | 75 | 2.8 | 749.7 |
| | Relatively Tight Joints | -10 | _ | 100 | 70 | 2.0 | 832.1 |
| | | | | | | | |
| | | | | | | | 734.6 |
| | 616.64 | | | | | | 765.4 |
| | End of Boring | -15 | | | | | |
| 5/18 | | | | | | | |
| T.GDT 2/ | | | | | | | |
| PU IL_DO | | | | | | | |
| CHANGE.G | | -20 | | | | | |
| 17 INTERC | | | | | | | |
| 1-57 & IL · | | | | | | | |
| ROCK CORE 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | | | | | | | |
| Я | | | | | | | |

Retaining Wall South of Waldron Road (46-3)R, HBK, 5HBR, 6HBR FAI 57 (IL 57), Kankakee County **Boring B-222, Box 1 of 1** Station 233+55.44, 46.2 ft. Rt. Ground Surface Elev. = 630.64 Top of Core = 4 ft. (626.64) Bottom of Core = 14 ft. (616.64) **Date of Core is 9/25/17**



SAMPLE HZ

Charles and a

sample as

| | R | / ot] | nois De Fransp | ortat | ne ion | nt | | SC | DIL BORING LOG | _ | <u>1</u> of <u>1</u> |
|--|---|---------------|---|-------|-------------|-----------------------|-------------|--------------------|---|-----------|-------------------------------|
| | ROUTE | | of Highways epartment of Tra (FAI 57) | | SCR | PTION | Ret | aining | Wall South of Waldron Road over I-57 on West side of I-57 | LOGGED BY | <u>9/13/17</u> Larry Myers |
| | | | | | | | ION | SE 1/4 | 4 , SEC. 4, TWP. 30N, RNG. 13W, 2 nd PM , | | |
| | | | | | | | | Latitu | Ide 41.107697, Longitude -87.835316 | | utomatic |
| | STRUCT. I Station | 10 | | | D E P | BL | U C S | M O | Surface Water Elev ft Stream Bed Elev ft | | |
| | BORING N Station Offset Ground S | O | B 223 232+07.62 33.5 ft Rt. ev632. | 47 ft | T H | O W S (/6'') | Qu | I S T (%) | Groundwater Elev.: First Encounterft Upon Completionft AfterHrsft | | |
| | Augered M Documente | laterial - N | | | | | | | | | |
| | | | | | _ | | | | | | |
| | | | | 629.4 | 7 | | | | | | |
| | Borehole c coring. | ontinued v | with rock | | | | | | | | |
| | | | | | -5 | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | - | | | | | |
| | | | | | _ | | | | | | |
| | | | | | -10 | | | | | | |
| | | | | | _ | | | | | | |
| 8 | | | | | _ | | | | | | |
| DT 2/5/1 | | | | | | | | | | | |
| DOT.GI | | | | | | | | | | | |
| GPJ IL | | | | | -15 | | | | | | |
| CHANGE | | | | | | | | | | | |
| 7 INTER | | | | | | | | | | | |
| SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | | | | | |] | | | | | |
| RING I-6 | | | | | |] | | | | | |
| SOIL BO | | | | | -20 | | | | | | |

| | Illinois Department of Transportation ROCK CORE I | | G | | P | age <u>1</u> | of <u>1</u> |
|--|---|-------------------------------|--------------------------|-----------------------------------|---------------|-------------------------|-------------------------------------|
| | Division of Highways Illinois Department of Transportation Retaining Wall South of Waldron Road | d ove | er I-57 | , | | ate9/ | |
| | ROUTE I-57 (FAI 57) DESCRIPTION on West side of I-57 SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 1 | 13W, | 2 nd P | М, | GGED | BY Larr | y Myers |
| | COUNTY Kankakee CORING METHOD Split Barrel Wire Line | | 35316 | R E | R | CORE | S T |
| | STRUCT. NO. | D E P T H (ft) | C O R E (#) | C O V E R Y (%) | Q D (%) | T I E (min/ft) | R E N G T H (tsf) |
| | Tan to Gray Limestone with some Horizontal Fracturing, Joint Faces Oxidized Tan 629.47 Color 629.47 | | 1 | 83 | 37 | 2.6 | 744.9 585.6 |
| | 624.47 | | | 100 | | | 807.1 |
| | Gray Limestone with some Horizontal Fracturing, Joint Faces Oxidized Tan Color | 10 | 2 | 100 | 37 | 2.8 | 872.1 |
| | 619.47 | | | | | | 803.2 771.2 |
| ROCK CORE 1-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 2/5/18 | End of Boring | 15 15 | | | | | 746.6 |

Retaining Wall South of Waldron Road (46-3)R, HBK, 5HBR, 6HBR FAI 57 (IL 57), Kankakee County **Boring B-223, Box 1 of 1** Station 232+07.62, 33.5 ft. Rt. Ground Surface Elev. = 632.47 Top of Core = 3 ft. (629.47) Bottom of Core = 13 ft. (619.47) **Date of Core is 9/13/17**

I.57 Kankakee Ret. Wall B223 Box 1 of 1 Depth 3' to 13' .7 1F.8 1F.9 1F 9 1F 10 1F 11 **1 -1** 1F -2 1F -3 1F -4 1F -5 1F -6 1F - **1 -1** 1F 2 1F 3 1F 4 1F 5 1F 6 1F 7 1F 8 1 25 2 25 5 Lufkin 6 -6 7 1F .7 24 09/28/2017



Solutions You Can Build On

3705 Progress Blvd Peru, II 61354 815 780-8486

SOIL BORING LOG

Page <u>1</u> of <u>1</u>

Date 12/18/17

| ROUTE FAI 57 | DE | Retaining wall west of I-57, south of K B & S DESCRIPTION Railroad Crossing | | | | LC | LOGGED BY | | | _M | |
|--|--------------------|--|---|--|----------------------|--|-----------|----------------|-----------------|----------------------|---------------|
| SECTION (46-3)R,HBK,5HB | R,6HBR | BR LOCATION <u>SE 1/4</u> , SEC. 4, TWP. 30N, RNG. 13W, 2 nd PM Latitude 41.108997, Longitude -87.835784 | | | PM , 84 | | | | | | |
| COUNTY Kankakee | DRILLING | B ME | THOD | | | low Stem Auger HAMMER 1 | | <u> </u> | CME A | utoma | tic |
| STRUCT. NO Station | | D E P | B L O | U C S | M O I | Surface Water Elev Stream Bed Elev | ft ft | D E P | B L O | U C S | M O I |
| BORING NO. B-224 Station 227+30 Offset 148.0 ft Rt. Ground Surface Elev. 650.0 | | T H (ft) | W S (/6") | Qu (tsf) | S T (%) | Groundwater Elev.: First Encounter dry Upon Completion dry After Hrs. | ft | T H (ft) | W S (/6") | Qu (tsf) | S T (%) |
| Brown Topsoil, Silty Loam Timbe Soil, moist | er | | | | | Very stiff gray Clay (continued) | | | | | |
| Hard brown & gray Silty Clay, dr | <u>649.19</u> y | | 4 10 14 | 4.5 P | 18 | Hard drilling, hard gray Clay Till, gravel pieces > 1/2" in dia. | 629.19 | | 3 6 8 | 2.5 B 4.5 P | 12 |
| | | -5 | 7 11 18 | 4.5 P | 16 | Fractured and very weathered | 626.19 | -25 | 6 18 94 | 5.2 B | 5 |
| Hard brown Silty Clay, dry | 645.19 | | 9 15 20 | 4.5 P | 14 | brown & gray Dolostone | | | 85/1" | | 5 |
| Hard brown & dark gray Silty Cla Till | 642.69 ay | | 7 | 4.5 | 15 | | | | 50/.25' | , | 4 |
| Hard gray Clay, trace fine grave | 640.19 I | -10 | 19 5 | Р | | Borehole continued with rock coring. | 620.69 | -30 | | | |
| Very stiff gray Clay | 635.19 | 15 | 9 11 5 5 9 3 3 5 8 3 5 7 | 7.0 B 4.7 B 3.1 B 2.9 B | 18 17 19 21 | | | | | | |

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)

| MC | leary |
|-------|---------|
| 10 | |
| Cngir | reering |

3705 Progress Blvd Peru, II 61354 815 780-8486

ROCK CORE LOG

| Page | 1 | of | 1 |
|------|---|----|---|
| | | | |
| | | | |

| Soluti | ions You Can Build On | | | | | | D | ate 12 | 2/18/17 |
|--|---|--|---|--|-------------------------------------|----------------------------------|------|----------|---------|
| ROUT | E FAI 57 | DESCRIPTION | Retaining wall west Railroa | of I-57, south of ad Crossing | K B & : | s lC | GGED | BY | TLM |
| SECTI | ON (46-3)R,HBK,5HBF | R,6HBR LOCATIO | N SE 1/4, SEC. 4, TV Latitude 41.1089 | VP. 30N, RNG. 1 97, Longitude -{ | <u>3W, 2^r 87.835</u> | ^{id} PM , 784 | | | |
| COUN | TY Kankakee (| | A /: | · · | | R | R | CORE | S T |
| STRU(| CT. NO | | REL TYPE & SIZE | NQ | | c c | Q | T | R E |
| | IG NO B-224 | Core Diame | | _in _ft | P I | 0 V R E | D | M E | N G |
| Statio | on 227+30 et 148.0 ft Rt. | | | ft | T H | E R Y | • | | Т Н |
| Grou | nd Surface Elev. 650.6 | | | | (ft) (| #) (%) | (%) | (min/ft) | (tsf) |
| Brown | & gray fractured Dolostone | e with Shale partings | | 620.69 | _ | 1 100 | 0 | 4 | |
| | | | | 619.19 | | | | | |
| 2" wide | Dolostone with frequent & the x 0.5" tall & 1.5" deep. So | hin Shale partings. Cry ome pyrite present in v | /stal lined void approxi oid. Void is 2.92' down | mately i from | | 2 100 | 13 | 2 | |
| top of | rock. | | | | | | | | |
| | | | | | _ | | | | |
| | | | | | | | | | 769.0 |
| | | | | | -35 | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | _ | | | | 796.0 |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | 610.69 | -40 | | | | 235.0 |
| End of | Boring | | | | _ | | | | |
| | | | | | | | | | |
| ~ | | | | | | | | | |
| 2/1/18 | | | | | | | | | |
| T.GDT | | | | | _ | | | | |
| | | | | | -45 | | | | |
| .GPJ | | | | | -45 | | | | |
| NALLS | | | | | | | | | |
| ROCK CORE 1-57 RETAINING WALLS.GPJ IL_DOT.GDT 2/1/18 | | | | | | | | | |
| RETAI | | | | | \neg | | | | |
| E 1-57 | | | | | | | | | |
| COR | | | | | | | | | |
| ROCK | | | | | -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-224, Box 1 of 1** Station 228+00, 120 ft. Rt. Ground Surface Elev. = 656.00 ft. Top of Core = 30 ft. (626.00 ft.) Bot. of Core = 40 ft. (616.00 ft.)

Date of Core is 12/18/17





3705 Progress Blvd Peru, II 61354 815 780-8486

SOIL BORING LOG

Date 12/18/17

| Solutions Y | ou Can Build On | | | | | | | | | Date | 12/ | 18/17 |
|----------------|---------------------------------|--------|--------|----------|----------|----------|--|------------|--------|---------|--------|--------|
| ROUTE | FAI 57 | DE | SCR | IPTION | F | Retainir | ng wall west of I-57, south of K B & S Railroad Crossing | | OGG | ED BY | T | LM |
| SECTION | (46-3)R,HBK,5HBR | ,6HBR | I | | | SE 1/4 | , SEC. 4, TWP. 30N, RNG. 13W, 2 nd | PM, | | | | |
| | Kankakee D | | | | | Latitu | de 41.109359, Longitude -87.8357 low Stem Auger HAMMER | 02 | (| CME A | utoma | tic |
| | | | | | | | | | ` | | | |
| STRUCT. NO | | | D E | B | U C | M O | Surface Water Elev Stream Bed Elev | _ ft ft | D E | BL | U C | M O |
| | | | P T | o W | S | I S | | _ " | P T | o W | S | l S |
| Station | B-225 225+99 | | н | S | Qu | T | Groundwater Elev.: First Encounter dry | ft | H H | S | Qu | T |
| Offset | 121.0 ft Rt. face Elev646.82 | | (ft) | (/6") | (tsf) | (%) | Upon Completion dry After Hrs. | ft | (ft) | (/6'') | (tsf) | (%) |
| Very stiff gra | y Clay with | | . , | . , | | | Weathered rock, no recovery | | . , | | . , | |
| occasional p | ieces of gravel, moist | | | 4 | | | | | | 50/.25' | , | |
| | | | | 5 | 3.7 | 17 | | | | 007.23 | | 13 |
| | | | | 7 | В | | | | _ | | | |
| | | | | | | | | | | | | |
| | | | | 3 5 | 2.9 | 18 | No recovery | | | 100/1" | | 9 |
| | | | -5 | - | B | | | 621.82 | -25 | | | Ŭ |
| Very stiff ara | | 641.32 | | - | | | | | | | | |
| | y Clay, moist | | | 3 | | | White/gray Dolostone augered up | | 1 | 00/1.2 | 5" | |
| | | | | 3 4 | 2.5 B | 19 | | | | | | 6 |
| | | | | | | | | | | | | |
| | | | | 2 | | | | | | | | |
| | | | | 4 | 2.5 | 22 | | | | | | |
| | | | -10 | 5 | B | | | | -30 | | | |
| | | | | | | | | 615.82 | | | | |
| | | | | 3 5 | 2.1 | 23 | Borehole continued with rock coring. | | | | | |
| | | 000.00 | | 6 | В | | | | | | | |
| Very stiff gra | y Clay, moist | 633.82 | | - | | | | | | | | |
| | - | | | 3 5 | 2.7 | 22 | | | | | | |
| | | | -15 | 8 | 2.7 B | | | | -35 | | | |
| | ndy Clay Loam with | 631.32 | | | | | | | | | | |
| gravel pieces | s, moist | | | 9 | | | | | | | | |
| Hard gray Cl | ay with .5" layers of | 629.82 | | 17 11 | 3.5 B | 10 | | | | | | |
| fine sand at 3 | 3" intervals, moist | | | | | | | | | | | |
| | | | | 8 | | | | | | | | |
| | | | | 10 | 4.0 | 14 | | | | | | |
| | | 626.82 | -20 | 15 | P | | | | -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)

| M ^c Cleary | |
|-----------------------|--|
| 10 | |
| Cngineering | |

3705 Progress Blvd Peru, II 61354 815 780-8486

ROCK CORE LOG

| Page | <u> </u> | of | 1 |
|------|----------|----|---|
| | | | |

| Date | 12/18/17 |
|-----------|----------|
| _ | |
| LOGGED BY | TLM |

| Solutions Y | You Can Build On | | Deteinin | | - 6 1 5 7 - | | • • | | D | ate <u>12</u> | 2/18/17 |
|---------------|--|--------------------------|-----------------|-------------------|-------------|------------------|--------------------------|------------------|--------|------------------|------------------|
| ROUTE | FAI 57 | _ DESCRIPTION _ | Retainin | Railroa | ad Crossi | outh of K B | α 5 | _ LO | GGED | BY | TLM |
| SECTION _ | (46-3)R,HBK,5HBR,6 | HBR LOCATIO | N <u>SE 1/4</u> | , SEC. 4, T | WP. 30N, | RNG. 13W, | 2 nd P | M , | | | |
| | Kankakee CO | | | de 41.1093 | | jitude -87.83 | 35704 | R E | R | CORE | S T |
| Station | 0 | Core Diamet | er | 2 | _ in | D E P | C O R | C O V E | Q D | T I M E | R E N G |
| Station | D. B-225 225+99 121.0 ft Rt. | Top of Rock Begin Core | | | | Т Н | Е | R Y | | | т Н |
| | Irface Elev. 646.82 | ft | | | | (ft) | (#) | (%) | (%) | (min/ft) | (tsf) |
| Gray thin joi | nted Dolostone with thir | n Shale partings | | | | 615.82 | 1 | 98 | 37 | 1.2 | |
| | | | | | | | | | | | 253.0 |
| | | | | | | 35 | | | | | |
| | | | | | | | - - - | | | | 182.0 |
| Light brown | | | | | | 608.82 | | | | | |
| Gray thin joi | nted Dolostone with thir | n Shale partings. | | | | 608.32 | | | | | |
| Small void (I | Kerst) at 7.25' down, vo evident on the back of | oid is 1" wide x .5" tal | l & .5" dee | ep. The crys | tals in | -40 | | | | | |
| | | | | | | 605.82 | | | | | |
| End of Borin | ng | | | | | | | | | | 463.0 |
| | | | | | | | | | | | |
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| | | | | | | -45 | | | | | |
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| | | | | | | -50 | | | | | |
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| | | | | | | | | | | | |

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-225, Box 1 of 1** Station 226+10, 117 ft. Rt. Ground Surface Elev. = 653.00 ft. Top of Core = 31 ft. (622.00 ft.) Bot. of Core = 41 ft. (612.00 ft.) Date of Core is 12/18/17

FAI 57 (IL 57) (46-3)R, HBR, 5HBR, 6HBR Kankakee County Boring B-225, Box 1 of 1 Station 226+10, 117 ft. Rt. Ground Surface Elev. = 653.00 ft. Top of Core = 31 ft. (622.00 ft.) Bot. of Core = 41 ft. (612.00 ft.) Date of Core is 12/18/17

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Solutions You Can Build On

3705 Progress Blvd Peru, II 61354 815 780-8486

SOIL BORING LOG

Date 12/19/17

Retaining wall west of I-57, south of K B & S FAI 57 DESCRIPTION Railroad Crossing LOGGED BY TMR ROUTE SECTION (46-3)R,HBK,5HBR,6HBR LOCATION SE 1/4, SEC. 4, TWP. 30N, RNG. 13W, 2nd PM, Latitude 41.109759, Longitude -87.835725 COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE **CME** Automatic В U Μ D В U Μ D STRUCT. NO. Surface Water Elev. ft Ε Е L С 0 L С 0 Stream Bed Elev. Station ft Ρ S Ρ S ο L 0 L т W S т W S BORING NO. B-226 Groundwater Elev.: н S Qu Т н S Qu т Station _____ 224+53 dry First Encounter ft Offset 123.0 ft Rt. Upon Completion dry ft (%) (ft) (%) (ft) (/6") (tsf) (/6") (tsf) Ground Surface Elev. 664.59 ft After Hrs. ft Black Silty Clay Topsoil Very Stiff Gray Clay (continued) 663.59 3 3 Very stiff Brown Silty Clay 5 5 2.7 23 3.1 19 6 6 S В 661.59 Hard Brown/gray Silty Clay Till 5 3 11 15 19 4.5 5 3.3 16 Р 7 В -5 -25 7 3 10 4 4.5 15 2.3 20 12 6 S В 6 3 8 6.4 17 5 2.3 20 10 5 S В -30 -10 654.09 Hard Gray Silty Clay 7 10 14 4.5 11 Ρ 5 3 19 22 6 4.5 7 3.9 7 В 9 В -35 -15 649.09 Very Stiff Gray Clay 4 628.09 4 2.3 18 Hard Gray Clay Till 7 В 3 5 4 2.5 18 11 5.0 17 6 В 16 В -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)



Solutions You Can Build On

3705 Progress Blvd Peru, II 61354 815 780-8486

Page <u>2</u> of <u>1</u>

Date 12/19/17

| | FAI 57 | DES | SCR | IPTION | R | Retainir | ng wall west of I-57, sou Railroad Crossing | th of K B & S | LOGGED BY | TMR |
|-------------------------------|--|----------|----------------|-----------------|-------------|---------------|--|---|-----------|--------|
| SECTION _ | (46-3)R,HBK,5HB | R,6HBR | _ เ | | | SE 1/4 | 4, SEC. 4, TWP. 30N, RI | NG. 13W, 2 nd PM , | | |
| | Kankakee | DRILLING | ME | THOD | | | i de 41.109759, Longitu llow Stem Auger | | ECME Aut | omatic |
| STRUCT. NO | D | | D E P | B L O | U C S | M O I | Surface Water Elev Stream Bed Elev | ft ft | | |
| Station Offset | B-226 224+53 123.0 ft Rt. rface Elev664.9 | | T H (ft) | W S (/6") | Qu (tsf) | S T (%) | Groundwater Elev.: First Encounter Upon Completion | dry ft | | |
| Ground Su | | 624.09 | | , | () | (/0) | After Hrs | n | | |
| Gray Dolosto thin Shale pa | one w/frequent and artings | | | 54/1" | | | | | | |
| Borehole con coring. | ntinued with rock | | | | | | | | | |
| | | | _ | | | | | | | |
| | | | -45 | - | | | | | | |
| | | | | - | | | | | | |
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| | | | | - | | | | | | |
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| | | | -55 | | | | | | | |
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| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | -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)

| M ^c Cleary | |
|-----------------------|--|
| 10 | |
| Cngineering | |

3705 Progress Blvd Peru, II 61354 815 780-8486

ROCK CORE LOG

Date 12/19/17

| Solutions Yo | ou Can Build On | | Dotoini | ng wall west | of 57 oo | uth of K D | 00 | | U | | 19/17 |
|--|---------------------------------|---|----------------|-----------------------------|-------------------|--------------------------|--------------------------|-------------|--------|------------------|----------------------------|
| ROUTE | FAI 57 | | Retaini | Railroa | ad Crossin | g | α Ο | _ LO | GGED | BY | TMR |
| SECTION | (46-3)R,HBK,5HBR, | ,6HBR LOCATION | N <u>SE 1/</u> | 4, SEC. 4, T ude 41.1097 | NP. 30N, F | RNG. 13W, | 2 nd P | M , | | | |
| | Kankakee Co | | Vireline | | oo, Long i | | | R E | R | CORE | S T |
| Station BORING NO. Station Offset | B-226 224+53 123.0 ft Rt. | Core Diamete Top of Rock Begin Core E | er Elev | 2 624.09 622.59 | | 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 |
| | face Elev. 664.59 | | | | | (ft) | (#) | (%) | | (min/ft) | (tsf) |
| Gray Dolosto | ne w/frequent and thi | in Shale partings <i>(cont</i> | tinued) | | | | 1 | 100 | 30 | 1.58 | |
| | | | | | | 45 | | | | 1.4 | 265.0 |
| | | | | | | | | | | | 200.0 |
| Brown Dolost | tone with open joints : | with gouge < 2 mm (1/ | (20") | | | | | | | 1.58 | 807.0 |
| A crystal line | void (0.5" x 0.5") exis | sts at 9.5' | 52) | | r | 6 <u>13.09</u> 612.59 | | | | | |
| Gray Dolosto | | | | | (| | | | | | |
| End of Boring |) | | | | | | | | | | |

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-226, Box 1 of 1** Station 224+10, 115 ft. Lt. Ground Surface Elev. = 663.20 ft. Top of Core = 42 ft. (621.20 ft.) Bot. of Core = 52 ft. (611.20 ft.) Date of Core is 12/19/17

FAI 57 (IL 57) (46-3)R, HBR, 5HBR, 6HBR **Kankakee** County Boring B-226, Box 1 of 1 Station 224+10, 115 ft. Lt. Ground Surface Elev. = 663.20 ft. Top of Core = 42 ft. (621.20 ft.) Bot. of Core = 52 ft. (611.20 ft.) Date of Core is 12/19/17

EXHIBIT D

SUBSURFACE PROFILE

| | 685 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 685 |
|---|------------------------------|--|--|---|---|--|--------|---|------------------------------|--|--|------------|----------------|---|------------------------|--|---|---|---|--|---------------------------------|--|---|---------------------------------------|-----------------------|---------------------------|-------|---|-------|
| | 680 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 680 |
| μ | 675 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 675 |
| DATE | 670 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 670 |
| Ξ Ξ | 665 | 229+1 87.50 | B 219 8.36 (FAI 57) RT (FAI 57) | | Bi 229+13 82 10 4 | H 101 <u>97 (FAI 57)</u> 17 (FAI 57) | | | | | | | | | | | | | | | | | | | | | | | 665 |
| HECKED CHECKED AME | 660 | <u>ND SURF EL 657.3</u> | 30- | 60'-0" BORING OFF | | | | | | PROPOSE | D PROFILE GRAI | DE - | ¢ I-57 | | | | | | | | | | | | | | | | 660 |
| SURVEYED SURVEYED PLOTTED OK RT OF WAY CADD FILE M | 655 | Augered Materi. - Not Documente | -+ | Augered Bit Cl | . Gray STILY ay Loam Fill erv Stiff to- | N Qu 11 3.5P | w% | | | | | | | | | | | | | 232+1 133.40 | B 217 2.99 (FAI 0 LT (FAI | I 57) 57) | BH : 232+11.23 148.30 LT | 71 (FAI 57) (FAI 57) | | | | | 655 |
| PLAN NOTE BO | 650 | | | Hard, Clay L | Bŕown Silty dam Till Fill | 9 3.5P 1 | | + "\$ = 1 1 = 1 1 = 1 1 = 1 = 1 = | | | | | | + | | | | | = GND SUI | IRF <u>EL 648.7</u> | | 40'-0" BORING OFFS | ET 647.4 | | | | | | 650 |
| | 645 | | | Hard Gr Silt Hard, Cl | ay & Brown- y Clay Loam Brown, Silty- ay Loam Till | 26 8.25 21 8.25 | | | | | | | | | | = | | | | iered Materi, bt Documente | ial— ed A | Augered Shld Brown S Ha | lr. Stone, Silty Clay Loam Fill d Brown | | · | | | | 645 |
| | 640 | | | Very Sil | Stiff Brown- ly Loam Till | | 0.4 | | · `` | | ВН 68 | | | 231+04 | BH 69 4.30 (FAI 57) | | , | | | | | | illy Clay 1 Till Fill <u>to Very</u> | 5 4.0P 16.7 <u>4 2.0P 19.6</u> | | | | | 640 |
| | 635 | | | c, | Hard Brown - • Gray Silty ay Loam Till | 13 4.65 12 4.05 | | | | ND SURF E | 230+00.99 (FAI 57 9.20 LT (FAI 57) 4 632.9 | 7) 1 W% | lill | 2.20 i URF EL 632.7 Ted Bit Shidr | 4T (FAI 57) | ↓ 231+ ↓ 80 ₩ [%] 25'-0' ↓ BORIN OFF\$E | | ↓ ↓ └_ ↓ : F E 632.57 | | | | Stiff to V Brown S | / | 4 1.5P 25.5 | | | | | 635 |
| DATE | 630 | | | Har Cl | d Gray Silty - ay Loam Till Dolostone - | 20 4.0P | | | Dense | Augered Bi & Bro Sand Weathered D | I I L | | FR- | Dense Tan ered Dolomite | BTM EL | | Augered – Not Do | Material cumented v Approximate Rock Before Core | Tan Dold Horizonta vith most with Weat | ostone High ally Fracture Seams Fille athered Shal Loose Joint | nly ed ed le, its | Weathered Dense Ta | | -BTM EL 632 | 2 | | | | 630 |
| B | 625 | nse Gray Limestor | 20- | | | | | <u> </u> | | | | | | | | | Starting — Dense G Limestor Fracture Loose Jo | Core ray & Tan e, Horizonta s with <u>ints</u> | a/ | | son | n to Gray Dol rizontally Fr. h Loose Joint ne Vertical retures | ostone actured ts, | | | | | | 625 |
| CKED OTATINS CHIKD | 620 Dec | nse Gray Limestor with Generally Tigl orizontal Fracture bedded Thin Sha ams in top 6" Mino ite Crystal Vug Fi nse Gray Limestor he Tigh Wariaant | nt s, le or ill e | | | | | | | | | | | | | | —Dense G with Tig Oxidized Horizont with son | ray Limeston ht Joints, Tan Color, al Fractures ne Vertical | 2 | | Gra Loo and Hor Tan | y Limestone Se Horizonta Heavy Vert izontal Joint Color | with some al Fracturing ical Fracturi s are Oxidiz | ng, zed | | | | | 620 |
| E SURVEYED DK PLOTTED DK GRADES CHEC B.M. NOTED STRUCTURE N | E UIJ | nse Gray Limestor th Tight Horizont Fracturing Mino Calcite Cryst Vug Fi nse Gray Limestor | | | | | | | | | | | | | | | Fracturr | ny rav Limeston | | TM EL 617.8 | .8_1 | | | | | | | | 615 |
| PROFILE SURVI PLOTT NOTE BOOK GRAD NO. STRUC | 610 | nse Gray Limestor th Tight Horizont. Fractures Minc Calcite Cryst. Vug Fi BTM EL 609. | | | | | | | | | | | | | | | L _{BTM EL} | 612.6 | | | | | | | | | | | 610 |
| | 605 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 605 |
| | 600 | | | | | | | | | | | | | | | | | | | | | | | | | | | | 600 |
| | Interchange with IL 17+00 | 1 | 17+40 | 17 | +80 | 18 | +20 | 18 | +60 | 19- | +00 | 19+40 | 1 | 9+80 | 20+ | 20 | 20+60 | | 21+00 | | 21- | +40 | 21+ | +80 | 22+20 | | 22+60 | 23+00 | 0 |
| -1 - | 101-11/1 | | | | | | | | | 65D | | | | | | | | | | | | | | | TE AU L | | | | SHEET |
| MODEL: PP_57 | FILE NAME: P | | PLOT SC | ME = bbb ALE = 40.0000 ' TE = 6/15/2018 | | DRAV | KED - | | REVI REVI REVI REVI | SED - SED - | | ſ | ST DEPARTME | ATE OF | | TATION | sc | ALE: | SHEE | SOIL | L BORIN | AD OVER F NG PROFILI HEETS STA | | TO STA. | F.A.U. RTE 6184 | SECTI 139-HB- : 1 | -HF-1 | COUNTY TOTAL SHEETS KANKAKEE CONTRACT NO. 6 PROJECT | |

| | | · · · · · · · · · · · · · · · · · · · | · · · | | | I | | | , | | | 1 | | | 1 | | | | | | T | 1 | |
|---|---|---------------------------------------|-------|---------|------------------------------------|------------------------|---|--|----------------|-----------------------------|--|--------------------|----------------------------|----------------------------|----------------------------------|----------|------|--------|-------|------------|------------|-----------------------------|---------|
| | | 690 | | | | | | | | | | | | | | | | | | | | | |
| | | 685 | | | | | | | | | | | | | | | | | | | | | |
| | | 680 | | | | | | | | | | | | | | | | | | | | | |
| DATE | | 675 | | | | | | | | | | | | | | | | | | | | | |
| BY | | 670 | | | | | | | | | | | | | | | | | | | | | |
| ECKED | leckep | 665 | | | | | | | | | | | | | | | | | | | | | |
| PLAN SURVEYED NOTE BROOK ALIGNMENT CHECKED | CADD FILE NAV | 660 | | | | | | | | | | | | | | | | | | | | | |
| PLAN NOTE BOD | NO | 655 | | | | | | | | | | | | | | | | | | | | | |
| | | 650 | | | | | | то | P OF WALL | \mathbf{r} | | | WALDRO | N ROAD | | | | | | | | | |
| | | 645 | | | | | | | | | | | | | | | | | | | | | |
| | | 640 | | | | | BF | 4 56 | | | | | | | | | | | | | | | |
| DATE | | 635 | | | DSED PROFIL | | URF EL 633.4- | 4 56 +83.54 60 RT 60'-0" BORING 0FF SET | | 3H 57 8+63.37 2.60 RT | VRF EL 633. | 6 | CND SURE | BH 5 230+9 36.10 | | | | | / PF | ROPOSED PI | ROFILE GRA | ADE | |
| BY | | 630 | | | | Auger Brown Clay | ed Bit. Shldr,- & Gray Silty Loam Till Fill | N QU W% | 8 16.2 | Loose | d Bit. Shldr Fill Sand Brown Fill S te Pieces | , Weat. and, | Augered Bi hered Limest | t. Shldr.— • one/Silt • | N QU W% 2 100/1 7.0 BTM EL 629.7 | | | | | | | | |
| | AT'NS CH'KD | 625 | | | | | na Gray Shry Clay Loam Till nse Limestone | 6.2 ^E BTM EL 628.1 | 3TM EL 629.0 | 5 U | | | | | BIM EL 629.7 | | | | EXIST | ING PROFIL | .E GRADE | | |
| PROFILE SURVEYED PLOTTED MOTE BOOV GRADES CHECKED | B.M. NOTED STRUCTURE NOTA onrd_wallA1.dgn | 620 | | | | | | | | | | | | | | | | | | | | | |
| PROFILE | NO. DO. | 615 | | | | | | | | | | | | | | | | | | | | | |
| | teets\D366863-shi | 610 | | | | | | | | | | | | | | | | | | | | | |
| | 10_CAD/CADD SH | 605 | | | | | | | | | | | | | | | | | | | | | |
| | change with IL17∖ | | | | | | | | | | | | | | | | | | | | | | |
| | . 157 inter | 224+00 | 225- | +00 | 226 | +00 | 227+00 | 228 | 3+00 | 229 | 9+00 | 230 | 0+00 | 231 | +00 | 232+00 | 233- | +00 | 234 | +00 | 235 | +00 | 236+00 |
| | 7_4 :\11-1017 | | | LICED N | AME = bbb | | DESIGNED | | REVIS | FD | | | | | | | | 1 | | | | | |
| | EL: PP_5 NAME: P | | | | | / in | DRAWN | - | REVIS | ED - | | | DC- | STA | ATE OF ILLINO | | | | W | | | ER FAI 57 – WA G PROFILE | LL A |
| | MOD | | | | CALE = 100.0000 ATE = 6/15/2018 | 7.005 | CHECKED DATE | - | REVIS REVIS | | | | DEP | AKIWEN | IT OF TRANSF | UKIAIIUN | | SCALE: | S | | | IEETS STA. | TO STA. |

| N | | OIL BORIN | ER FAI 57 G PROFILI | | A to sta. | | A.U. TE. 184 1 | SECTION 39-HB-1-HF-1 | KAN | KAKEE ITRACT NO. | AL SHEET TS NO. 66863 |
|--------|------------|------------|------------------------|-----|--------------|-----|----------------------|-------------------------|-----|-----------------------|-----------------------------|
| 234 | +00 | 235 | +00 | 236 | +00 | 237 | +00 | 238 | +00 | | |
| | | | | | | | | | | | 605 |
| | | | | | | | | | | | 610 |
| | | | | | | | | | | | 615 |
| | | | | | | | | | | | 620 |
| -EXIST | ING PROFIL | .E GRADE | | | | | | | | | 625 |
| / | | | | | | | | | | | 630 |
| /- PF | ROPOSED P | ROFILE GRA | ADE | | | | | | | | 635 |
| | | | | | | | | | | | 640 |
| | | | | | | | | | | | 645 |
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| | | | | | | | | | | | 655 |
| | | | | | | | | | | | 665 660 |
| | | | | | | | | | | | 670 |
| | | | | | | | | | | | 675 |
| | | | | | | | | | | | 680 |
| | | | | | | | | | | | 685 |
| | | | | | | | | | | | 690 |
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| | 690 | | | | | | | | | | 690 |
|---|----------------------|---|---|--|--------|---------------------------------|--------|--|---|--|--|
| | 685 | | | | | | | | | | 685 |
| [w]]]]]]] | 680 | | | | | | | | | | 680 |
| DA | 675 | | | | | | | | | | 675 |
| 6 | 670 | B-226 | | | | | | | | | 670 |
| HECKED MECKED | 665 | B-1226 224-53 123.00 RT GND SURF EL 664.59 Black Silty Chay Topsoil N Qu W% | | | | | | | | | 665 |
| PLAN SUBVEYED NOTE BOOK RT. OF WAY CHECKED NO. CADD FILE NAME | 660 | Black Silty Clay Topsoil - N GU W% Very stiff Brown Silty Clay 11 2.75 23 Hard Brown/gray - Silty Clay Till 27 4.5P 15 | | | | | | | | | 660 |
| PLAN NOTE BO | 655 | 22 4.55 15 18 6.45 17 | | B-224 227-430 48.00 RT | | | | | | | 655 |
| | 650 | Hard Gray Silty Clay - 21 4.5P 14 13 4.5B 19 | В-225 2254-99 N QU и 121.00 RT | ¹⁰ GND SURF EL 650.69 Brown Topsoil, Silty Loam | WALL | | | | | | 650 |
| | 645 | Very Stiff Gray Clay — GND SURF 11 2.3B 18 Very stiff 10 2.5B 18 pieces of | ray Clay N Qu w% 29 4.5P 1 casional f gravel, 12 3.7B 17 | Hard brown Silty Clay, dry | | | | | | | 645 |
| | 640 | 11 3.1B 19 | 10 2.98 18 iff gray – 31 4.5P 1 ay, moist 7 2.5B 19 | 5 Hard brown & dark gray 5 Silty Clay Till Hard gray Clay, trace | | | | | | | 640 |
| DATE | 635 | 10 2.3B 20 10 2.3B 20 | 20 7.08 1 9 2.58 22 14 4.78 1 11 2.18 23 | 7 — Very stiff gray Clay | | | | B 223 233+07.62 33.50 RT GND SURF EL 632.42 | B 221 235-100-70 44.10 R7 | B 222 233155.44 46 D0 BT | 635 |
| B | 630 | Very s Very st Clay Loam w 16 3.9B 22 pied Hard With .5" Hard Gray Clay Till – Wasta Wasta | iff gray <u>13 3.18 1</u> ay, moist <u>13 2.78 22</u> if Sandy <u>12 2.98 2</u> is, moist <u>28 3.58 10</u> ay Clay <u>28 3.58 10</u> | 21 | | PROFILE GRADE | | N Qu w% — Augered Material - Not Documented | GND SURF EL 630.55- | GND SURF EL 630.64 | 630 |
| (ED TAT'NS CH'KD | 625 | 27 5.0B 17 no | recovery 50/0.25" 13 | weathered brown & | | | | Tan to Gray Limestone with some Horizontal Fracturing, Joint Fates Oxidized Tan Color | Rock encountered @ approximately 2' and Augered to 4' Dense Gray & Tan Limeștone with some Vertical Fracturing – Lopse Joints | Rock endountered @ approvimately 2' and Augered to 4' Dense Gray Limestone, some Tah Oxidation at Joints, Horizontal Fractures & Relatively Tight Jaints | 625 |
| E SURVEYED PLOTTED C GRADES CHECK B.M. NOTED STRUCTURE NO | dround walla2.dg | Gray Dolostone → w/fr∉quent and thin Shale partings ad | 0/05tone 100/1" 9 100/1.25" 50/0.25" 4 | Brown & gray fractured | | | | Gray Lithestone with some Horizontal Fracturing, Joint Faces Oxidized Tan Color | Dense Gray Limestone with Horizontal Fratturing & Lobse Joints, some Joint Faces 0xidized Tan Dense Gray Limestone, Tight Joints and Numerous Vertical Fractures | — Dense Gray Limestore with some Tan Oxidation | 620 |
| PROFILE NOTE BOO NO. | ^{wy-jou-hu} | | jointed – | Gray Dolostone with frequent & thin Shale partings. Crystal lined void approximately 2" wide x 0.5" tall & 1.5" deep. Some pyrite present in void. Void i 2.22" down | | | | • BTM EL 619.5 | BTM EL 616.6- | Fracture's with Relatively Tight Joints BTM EL 616.6 | 615 |
| | 610 | (0.5" x 0.5" exists at 9.5" Gray Dolostone BTM EL 612.6 | partings | BTM EL 610.7 | | | | | | | 610 |
| | 605 | light brown Gray thin jointed with thin Shale Small void (Kerst) at 7 void is It wide x 5 ² daon. The extrata | olostone partings. 5' down, Jl & 5'' | | | | | | | | 605 |
| | change with IL | deep. The crystals in the evident on the back of | the core. | | | | | | | | |
| | 223+00 | 0 224+00 225+00 | 226+00 227+00 | 228+00 | 229+00 | 230+00 | 231+00 | 232+00 233+00 | 234+00 235+00 | 236+00 237+00 | |
| MODEL: PP.57.4 | FILE NAME: P.(11-1 | USER NAME = bbb PLOT SCALE = 100.0000 ' / in. PLOT DATE = 6/15/2018 | DESIGNED - DRAWN - CHECKED - DATE - | REVISED - REVISED - REVISED - REVISED - REVISED - | | STATE OF ILLIN MENT OF TRANS | | SCALE: SHEET | DRON ROAD OVER FAI 57 – WALL A SOIL BORING PROFILE OF SHEETS STA. TO S | TA. | COUNTY TOTAL SHEETS NO. SHEETS NO. KANKAKEE CONTRACT NO. 66863 |

| | IDEL: PP_57_4 E_NAME: P/11-1 | | | F | USER NAME = bbb PLOT SCALE = 100.0 PLOT DATE = 6/15. | | DESIGNED DRAWN CHECKED DATE | - | REVISED - REVISED - REVISED - REVISED - | | DEI | ST/ PARTMEN | ATE OF NT OF T | ILLINOIS RANSPORTATIOI | N | | 5 | SOIL BORIN | ER FAI 57 – V IG PROFILE HEETS STA. | WALL B |
|--|--|------|------|--------|--|------------|--------------------------------------|----|--|--------|--------|----------------|-------------------|---------------------------|---|---|------------|------------|---|--------|
| 1 665 1< | 017 157 interch | 224- | 4+00 | 225+00 | I | 226+00 | 227+00 | 22 | 8+00 | 229+00 | 230+00 | 231 | +00 | 232+00 | 23: | 3+00 2 | 34+00 | 235 | +00 | 236+00 |
| 685 1 | ange with IL17 | | | | | | | | | | | | | | | | | | | |
| 685 | 110_CAD\CADD | 605 | | | | | | | | | | | | | | | | | | |
| 685 | Sheets\D366863- | 610 | | | | | | | | | | | | | | | | | | |
| 685 | NOTE BC | 615 | | | | | | | | | | | | | BTM EL | 616.3 | | | | |
| 685 680 1 <td>DOK PLOTTED - PLOTTED - SOK GRADES CH B.M. NOTED - STRUCTURE - valdronrd wallB.d.</td> <td>620</td> <td></td> <td>Brown E Gray Do solution 3/4" W</td> <td>Dplostone Nostone, Crystal Void @ 12.65 x 1/2" H</td> <td></td> <td></td> <td></td> <td></td> | DOK PLOTTED - PLOTTED - SOK GRADES CH B.M. NOTED - STRUCTURE - valdronrd wallB.d. | 620 | | | | | | | | | | | | | Brown E Gray Do solution 3/4" W | Dplostone Nostone, Crystal Void @ 12.65 x 1/2" H | | | | |
| 685 685 680 685 675 6 | I I I I I I I I I I I I I I I I I I I | 625 | | | | | | | | | | | | | | lostone | | | | |
| 685 90 | | 630 | | | | | | | | | | | | 67 - 11 50/2" - 8 | Brown S Sandy G w/ trace Weather fracture | ed V | TING PROFI | LE GRADE | | |
| 685 0< | | 635 | | | ROPOSED PRO | FILE GRADE | | | | | | | | | | | PROPOSED F | ROFILE GR | ADE | |
| 685 680 6 | | 640 | | | | | | | | | | | | | 32+54 00 T | | | | | |
| 685 680 680 680 680 680 675 675 670 655 60 665 60 665 660 655 60 655 60 60 | - | 645 | | | | | | | | | | | | | | | | | | |
| 685 | - | 650 | | | | | | | | | | | | | | | | | | |
| 685 0 | | 655 | | | | | | | | | WALDRO | N ROAD | | | | | | | | |
| 685 685 680 670 675 670 6 | | 660 | | | | | | | | | | | | | | | | | | |
| 685 685 680 6 | C C C C C C C C C C C C C C C C C C C | 665 | | | | | | | | | | | | | | | | | | |
| | | 670 | | | | | | | | | | | | | | | | | | |
| 685 | | 675 | | | | | | | | | | | | | | | | | | |
| | | 680 | | | | | | | | | | | | | | | | | | |
| | - | 685 | | | | | | | | | | | | | | | | | | |
| | - | 690 | | | | | | | | | | | | | | | | | | |

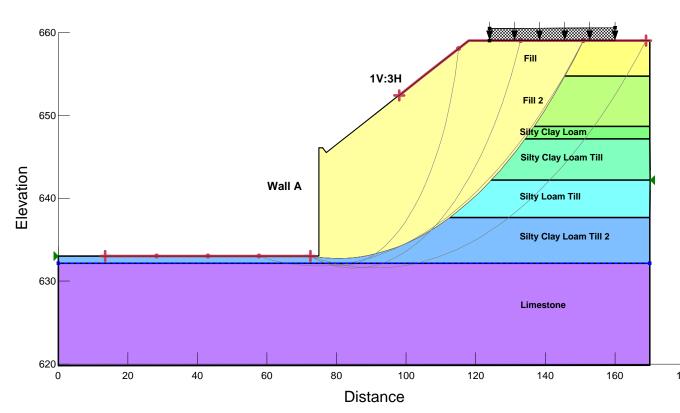
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| | | | | | | | | | | | 645 |
| | | | | | | | | | | | 640 |
| – Pl | ROPOSED P | ROFILE GR/ | ADE. | | | | | | | | 635 |
| | | | | | | | | | | | 630 |
| IST | ING PROFIL | .E GRADE | | | | | <u>+</u> ₽ | | | | 625 |
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| | | | | | | | | | | | |
| 234 | +00 | 235 | +00 | 236 | +00 | 23 | 7+00 | 238+ | 00 | 239 | +00 |
| | | | | | | | FAUL | 0.50 | | TOT | 1 SHEET |
| V | ALDRON/ | | ER FAI 57 G Profili | | 3 | | F.A.U. RTE 6184 | SECTION 139-HB-1-HF-1 | | UNTY SHEE | AL SHEET TS NO. |
| 5 | HEET | | IEETS STA. | - | TO STA. | | | ILLINOIS | CON | NTRACT NO. | 66863 |
| 1 | | 51 | 1 2 | | • | | | incline(1) | | | |

EXHIBIT E

SLOPE/W SLOPE STABILITY ANALYSIS

Waldron Road over I-57 Station 17+50 Wall A End of Construction (Undrained Condition)

<u>9.1</u>



Name: Fill Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 0 °

Name: Fill 2 Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 3,500 psf Phi': 0 °

Name: Silty Clay Loam Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 4,300 psf Phi': 0 °

Name: Silty Clay Loam Till Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 8,200 psf Phi': 0 °

Name: Silty Loam Till Model: Mohr-Coulomb Unit Weight: 115 pcf Cohesion': 3,000 psf Phi': 0 °

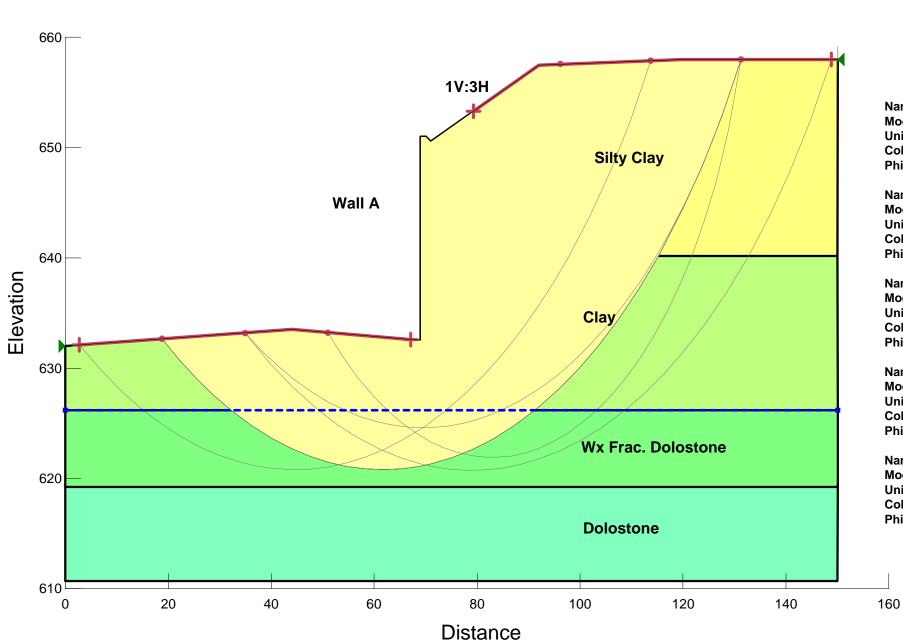
Name: Silty Clay Loam Till 2 Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion: 4,300 psf Phi': 0 °

180 Name: Limestone Model: Mohr-Coulomb Unit Weight: 150 pcf Cohesion': 20,000 psf Phi': 45 °

> Name: Concrete Model: Mohr-Coulomb Unit Weight: 150 pcf Cohesion': 20,000 psf Phi': 45 °

Waldron Road over I-57 Sta. 229+00 Wall A End of Construction (Undrained Condition)





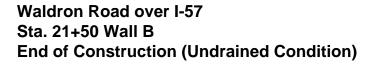
Name: Silty Clay Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 4,500 psf Phi': 0 °

Name: Clay Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 5,200 psf Phi': 0 °

Name: Wx Frac. Dolostone Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 0 psf Phi': 30 °

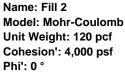
Name: Dolostone Model: Mohr-Coulomb Unit Weight: 150 pcf Cohesion': 20,000 psf Phi': 45 °

Name: Concrete Model: Mohr-Coulomb Unit Weight: 150 pcf Cohesion': 20,000 psf Phi': 45 °



Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 0 °

Name: Fill Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 0 °



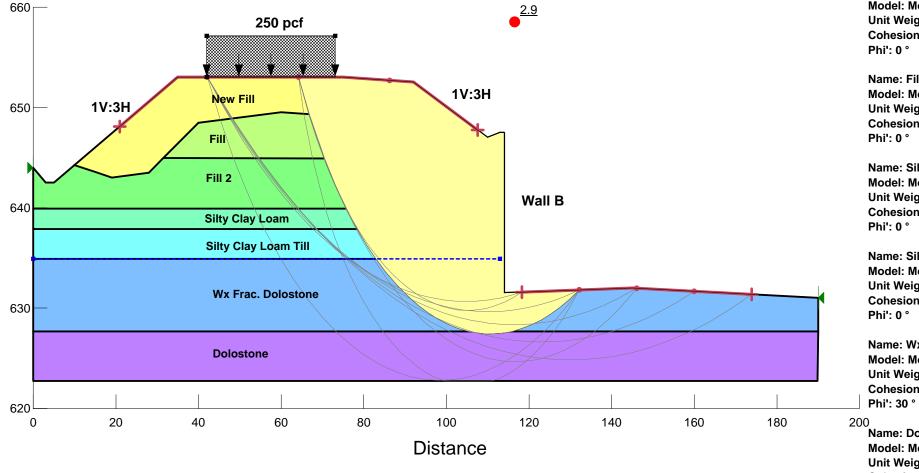
Name: Silty Clay Loam Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 2,000 psf Phi': 0 °

Name: Silty Clay Loam Till Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 1,500 psf Phi': 0 °

Name: Wx Frac. Dolostone Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 0 psf Phi': 30 °

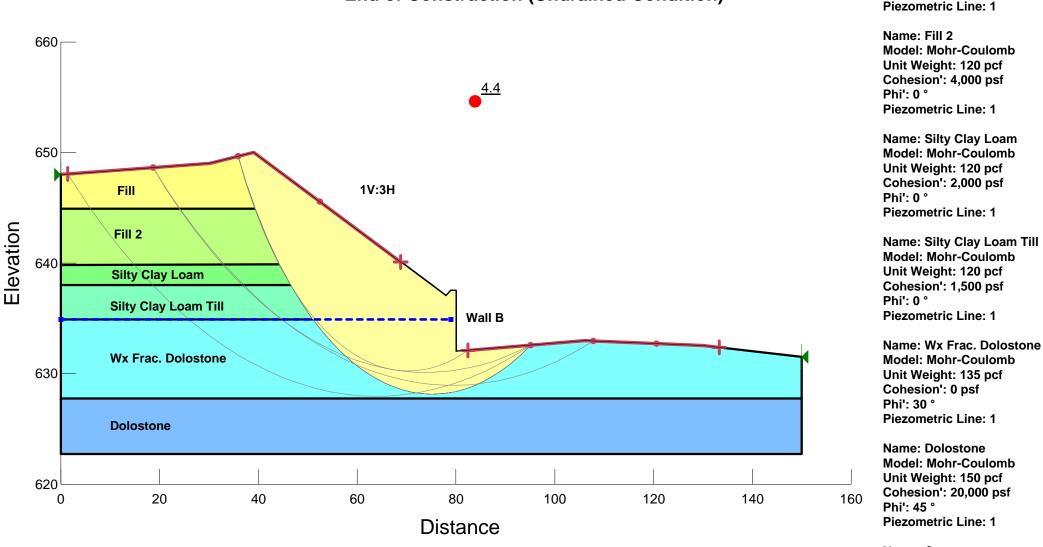
Name: Dolostone Model: Mohr-Coulomb Unit Weight: 150 pcf Cohesion': 0 psf Phi': 45 °

Name: Concrete Model: Mohr-Coulomb Unit Weight: 150 pcf Cohesion': 20,000 psf Phi': 45 °



Elevation

Waldron Road over I-57 Sta. 230+50 Wall B End of Construction (Undrained Condition)



Name: Concrete Model: Mohr-Coulomb Unit Weight: 150 pcf Cohesion': 20,000 psf Phi': 45 ° Piezometric Line: 1

Name: Fill

Phi': 0 °

Model: Mohr-Coulomb

Unit Weight: 125 pcf

Cohesion': 1,500 psf

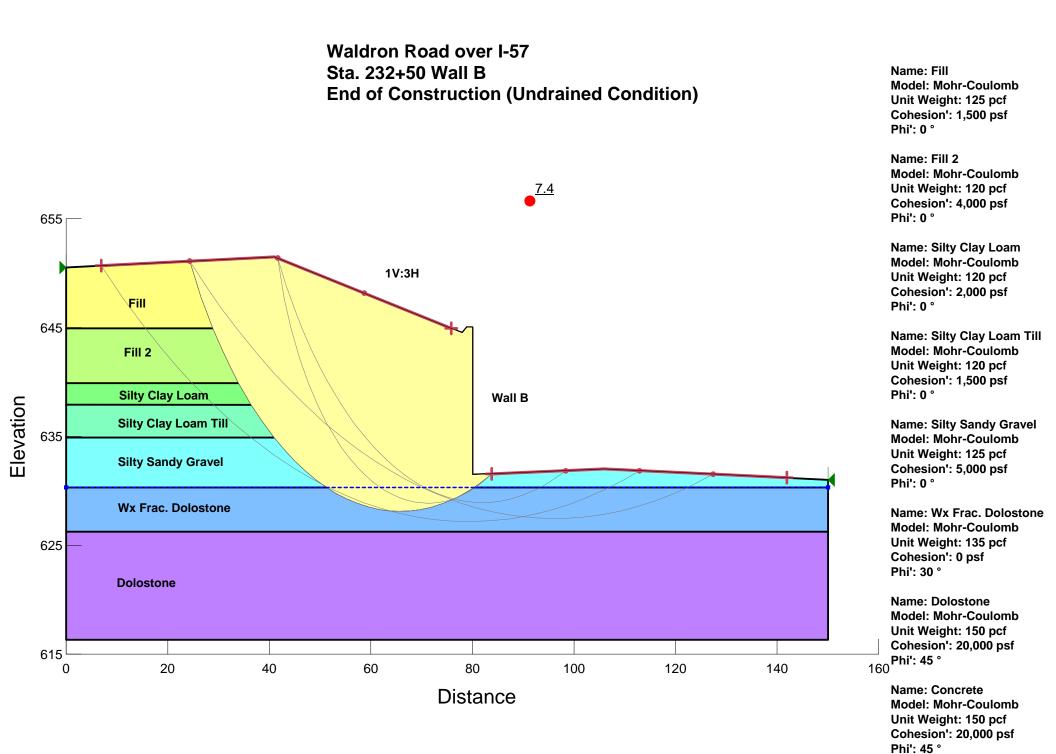


EXHIBIT F

IDOT DRILLED SHAFT AXIAL CAPACITY SPREADSHEETS



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

FOUNDATION REDUNDANCY ==== REDUNDANT

| STRUCTURE ==================================== | SN 046-0153 |
|---|---------------------------|
| SUBSTRUCTURE & REFERENCE BORING ======= | N. Abutment - Boring #219 |
| GROUND SURFACE ELEVATION ==================================== | 657.30 FT |
| GROUND WATER ELEVATION ============= | 0.00 FT |
| ESTIMATED TOP OF ROCK ELEVATION ======= | 624.80 FT |
| DRILLED SHAFT DIAMETER IN ROCK ========= | 36 IN. |
| FACTORED AXIAL LOAD ==================================== | 1868 KIPS |
| DRILLED SHAFT CONCRETE STRENGTH, f'c ====== | 3.5 KSI |

| | | | UNCONFINED | | | | | | ROCK | | SI | DE RESIST | TANCE | | | AVG.qu | TIP | RESISTAN | ICE | C | OMBINED | SIDE & T | IP RESIS | TANCI | = |
|--------|--------|--------|-----------------|----------|------------------|-----------|-----|--------|-----------|---------|---------|-----------|------------------------|-----------------|-----------------|------------|---------|----------|-----------------|-----------|---------|----------|------------------------|-----------------|-----------------|
| SOCKET | TIP | LAYER | COMPRESSIVE | ROCK | | ROCK | RQD | JOINT | INTACT OR | NOM. | Σ NOM. | Σ FACT. | SET | TLEME | ENT | W/IN 2 - | NOM. | FACT. | SETTL. | | NOM. | FACT. | SET | TLEME | NT |
| DEPTH | ELEV. | THICK. | STRENGTH (q u) | TYPE | GSI | CONDITION | | TYPE | TIGHTLY | RESIST. | RESIST. | RESIST. | Q _{C1} | W _{C1} | W _{Rn} | SHAFT DIA. | RESIST. | RESIST. | W _{Rn} | R_P/R_n | RESIST. | RESIST. | Q _{C1} | W _{C1} | W _{Rn} |
| (FT) | (FT) | (FT) | (KSF) | | | | (%) | | JOINTED? | (KIPS) | (KIPS) | (KIPS) | (KIPS) | (IN.) | (IN.) | (KSF) | (KIPS) | (KIPS) | (IN.) | | (KIPS) | (KIPS) | (KIPS) | (IN.) | (IN.) |
| 2.00 | 622.80 | 2.00 | 895.0 | Dolomite | 40 | Fractured | 28 | Closed | No | 196 | 196 | 108 | 227 | 0.068 | -0.026 | 1073.8 | 2513 | 1257 | 0.890 | 0.44 | 349 | 184 | 423 | 0.070 | 0.046 |
| 4.00 | 620.80 | 2.00 | 822.0 | Dolomite | 40 | Fractured | 28 | Closed | No | 196 | 392 | 216 | 447 | 0.116 | 0.027 | 1185.2 | 2762 | 1381 | 0.727 | 0.40 | 658 | 349 | 919 | 0.124 | 0.065 |
| 5.00 | 619.80 | 1.00 | 732.0 | Dolomite | | Fractured | 28 | Closed | No | 98 | 491 | 270 | 550 | | 0.050 | 1230.7 | 21748 | 10874 | 4.775 | 0.46 | 908 | 479 | 1215 | 0.143 | 0.087 |
| 6.00 | 618.80 | 1.00 | 1359.0 | Dolomite | <mark>6</mark> 0 | Fractured | 55 | Closed | Yes | 133 | 623 | 343 | 713 | 0.125 | 0.047 | 1203.8 | 21273 | 10637 | 4.728 | 0.33 | 925 | 494 | 1359 | 0.140 | 0.066 |
| 8.00 | 616.80 | 2.00 | 1354.0 | Dolomite | <mark>6</mark> 0 | Normal | 55 | Closed | Yes | 616 | 1239 | 682 | 1057 | 0.131 | 0.222 | 1087.0 | 19209 | 9604 | 4.402 | 0.38 | 2012 | 1068 | 1738 | 0.150 | 0.192 |
| 10.00 | 614.80 | 2.00 | 1156.0 | Dolomite | <mark>6</mark> 0 | Normal | 55 | Closed | Yes | 616 | 1856 | 1021 | 1388 | | 0.307 | | | | | | | | | | |
| 11.00 | 613.80 | 1.00 | 1005.0 | Dolomite | <mark>6</mark> 0 | Normal | 83 | Closed | Yes | 308 | 2164 | 1190 | | | 0.339 | | | | | | | | | | |
| 13.00 | 611.80 | 2.00 | 1198.0 | Dolomite | <mark>6</mark> 0 | Normal | 83 | Closed | Yes | 616 | 2780 | 1529 | 1917 | 0.160 | 0.378 | | | | | | | | | | 1 |
| 15.00 | 609.80 | 2.00 | 809.0 | Dolomite | <mark>6</mark> 0 | Normal | 83 | Closed | Yes | 616 | 3396 | 1868 | 2221 | 0.171 | 0.426 | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | | | | |



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

Drilled Shaft Design Table for N. Abutment - Boring #219 Estimated Top of Rock Elevation: 624.80

(Page 1 of 1)

| Estimated | Top of Roc | k Elevation: 624 | | | | <u>(</u> Pa | age 1 of 1) |
|-----------|------------|------------------|----------|---------|------------------------|-----------------|-----------------|
| | | NOMINAL | FACTORED | | SETT | LEMENT L | ΔΤΔ |
| SOCKET | TIP | SHAFT | SHAFT | RESIST. | | | |
| DEPTH | ELEV. | RESIST. | RESIST. | METHOD | Q _{C1} | W _{C1} | W _{Rn} |
| (FT) | (FT) | (KIPS) | (KIPS) | | (KIPS) | (IN.) | (IN.) |
| 36 | in. Diamet | er Drilled Shaft | | | | | |
| 2 | 622.8 | 2513 | 1257 | TIP | | | 0.890 |
| 4 | 620.8 | 2762 | 1381 | TIP | | | 0.727 |
| 5 | 619.8 | 21748 | 10874 | TIP | | | 4.775 |
| 6 | 618.8 | 21273 | 10637 | TIP | | | 4.728 |
| 8 | 616.8 | 19209 | 9604 | TIP | | | 4.402 |
| 10 | 614.8 | 1856 | 1021 | SIDE | 1388 | 0.140 | 0.307 |
| 11 | 613.8 | 2164 | 1190 | SIDE | 1546 | 0.145 | 0.339 |
| 13 | 611.8 | 2780 | 1529 | SIDE | 1917 | 0.160 | 0.378 |
| 15 | 609.8 | 3396 | 1868 | SIDE | 2221 | 0.171 | 0.426 |
| 42 | in. Diamet | er Drilled Shaft | | | | | |
| 2 | 622.8 | 3449 | 1725 | TIP | | | 1.000 |
| 4 | 620.8 | 3698 | 1849 | TIP | | | 0.814 |
| 5 | 619.8 | 3893 | 1947 | TIP | | | 0.742 |
| 6 | 618.8 | 28936 | 14468 | TIP | | | 5.439 |
| 8 | 616.8 | 25190 | 12595 | TIP | | | 4.863 |
| 10 | 614.8 | 2165 | 1191 | SIDE | 1594 | 0.148 | 0.349 |
| 11 | 613.8 | 2524 | 1388 | SIDE | 1772 | 0.152 | 0.386 |
| 13 | 611.8 | 3243 | 1784 | SIDE | 2187 | 0.167 | 0.429 |
| 15 | 609.8 | 3962 | 2179 | SIDE | 2525 | 0.176 | 0.482 |
| | | er Drilled Shaft | | | | | |
| 2 | 622.8 | 4533 | 2266 | TIP | | | 1.091 |
| 4 | 620.8 | 4845 | 2422 | TIP | | | 0.908 |
| 5 | 619.8 | 5074 | 2537 | TIP | | | 0.816 |
| 6 | 618.8 | 10195 | 5098 | TIP | | | 1.660 |
| 8 | 616.8 | 1653 | 909 | SIDE | 1383 | 0.147 | 0.278 |
| 10 | 614.8 | 2474 | 1361 | SIDE | 1801 | 0.155 | 0.390 |
| 11 | 613.8 | 2885 | 1587 | SIDE | 1999 | 0.159 | 0.432 |
| 13 | 611.8 | 3706 | 2039 | SIDE | 2458 | 0.173 | 0.480 |
| 15 | 609.8 | 4528 | 2490 | SIDE | 2830 | 0.182 | 0.539 |
| | | er Drilled Shaft | | | | | |
| 2 | 622.8 | 7090 | 3545 | TIP | | | 1.250 |
| 4 | 620.8 | 7412 | 3706 | TIP | | | 1.040 |
| 5 | 619.8 | 7521 | 3761 | TIP | | | 0.984 |
| 6 | 618.8 | 1039 | 571 | SIDE | 1169 | 0.151 | 0.042 |
| 8 | 616.8 | 2066 | 1136 | SIDE | 1709 | 0.159 | 0.331 |
| 10 | 614.8 | 3093 | 1701 | SIDE | 2216 | 0.169 | 0.469 |
| 11 | 613.8 | 3606 | 1983 | SIDE | 2453 | 0.173 | 0.521 |
| 13 | 611.8 | 4633 | 2548 | SIDE | 3002 | 0.186 | 0.580 |
| 15 | 609.8 | 5660 | 3113 | SIDE | 3441 | 0.194 | 0.652 |



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

FOUNDATION REDUNDANCY ==== REDUNDANT

| | | | UNCONFINED | | | | | | ROCK | | SI | DE RESIST | TANCE | | | AVG.q _u | TIP | RESISTAN | VCE | C | OMBINED | SIDE & T | IP RESIS | TANC | E |
|--------|--------|-------|-----------------|----------|-----|-----------|-----|--------|-----------|---------|---------|-----------|------------------------|-----------------|-----------------|--------------------|---------|----------|-----------------|-----------|---------|----------|------------------------|-----------------|-----------------|
| SOCKET | | | COMPRESSIVE | ROCK | | ROCK | RQD | JOINT | INTACT OR | NOM. | Σ NOM. | Σ FACT. | SET | TLEME | ENT | W/IN 2 - | NOM. | FACT. | SETTL. | | NOM. | FACT. | SET | TLEME | ENT . |
| DEPTH | ELEV. | THICK | STRENGTH (q ") | TYPE | GSI | CONDITION | | TYPE | TIGHTLY | RESIST. | RESIST. | RESIST. | Q _{C1} | W _{C1} | W _{Rn} | SHAFT DIA. | RESIST. | RESIST. | w _{Rn} | R_P/R_n | RESIST. | RESIST. | Q _{C1} | W _{C1} | w _{Rn} |
| (FT) | (FT) | (FT) | (KSF) | | | | (%) | | JOINTED? | (KIPS) | (KIPS) | (KIPS) | (KIPS) | (IN.) | (IN.) | (KSF) | (KIPS) | (KIPS) | (IN.) | | (KIPS) | (KIPS) | (KIPS) | (IN.) | (IN.) |
| 1.00 | 626.70 | 1.00 | 711.0 | Dolomite | 40 | Fractured | 48 | Closed | No | 118 | 118 | 65 | 97 | 0.016 | 0.155 | 788.0 | 1781 | 890 | 0.900 | 0.75 | 472 | 242 | 129 | 0.017 | 0.178 |
| 3.00 | 624.70 | | 762.0 | Dolomite | 40 | Fractured | 48 | Closed | No | 236 | 354 | 195 | 303 | | 0.206 | 795.0 | 1847 | 924 | 0.955 | 0.53 | 752 | 394 | 475 | 0.088 | 0.203 |
| 5.00 | 622.70 | | 727.0 | Dolomite | | Fractured | | Closed | No | 236 | 591 | 325 | | | 0.243 | | | | | | | | | | |
| 6.00 | 621.70 | | 875.0 | Dolomite | | Fractured | 22 | Closed | No | 92 | 683 | 376 | 623 | | 0.208 | | | | | | | | | | |
| 8.00 | 619.70 | | 875.0 | Dolomite | | Normal | 22 | Closed | No | 616 | 1299 | 714 | 860 | | 0.561 | | | | | | | | | | |
| 10.00 | 617.70 | 2.00 | 691.0 | Dolomite | 40 | Normal | 22 | Closed | No | 616 | 1915 | 1053 | 1067 | 0.181 | 0.815 | | | | | | | | | | |
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DRILLED SHAFT AXIAL CAPACITY IN ROCK DOLOMITE, LIMESTONE, SANDSTONE, AND HARD SHALE

Drilled Shaft Design Table for S. Abutment - Boring #217 Estimated Top of Rock Elevation: 627.70

(Page 1 of 1)

| Loumatou | NOMINAL FACTORED | | | | | (1 0 | age 1 of 1) |
|-------------------------------|------------------|---------|---------|---------|------------------------|-----------------|-----------------|
| SOCKET | TIP | SHAFT | SHAFT | RESIST. | SETTLEMENT DATA | | |
| DEPTH | ELEV. | RESIST. | RESIST. | METHOD | Q _{C1} | W _{C1} | W _{Rn} |
| (FT) | (FT) | (KIPS) | (KIPS) | | (KIPS) | (IN.) | (IN.) |
| 36 in. Diameter Drilled Shaft | | | | | | | |
| 1 | 626.7 | 1781 | 890 | TIP | | | 0.900 |
| 3 | 624.7 | 1847 | 924 | TIP | | | 0.955 |
| 5 | 622.7 | 591 | 325 | SIDE | 506 | 0.120 | 0.243 |
| 6 | 621.7 | 683 | 376 | SIDE | 623 | 0.136 | 0.208 |
| 8 | 619.7 | 1299 | 714 | SIDE | 860 | 0.163 | 0.561 |
| 10 | 617.7 | 1915 | 1053 | SIDE | 1067 | 0.181 | 0.815 |
| 42 in. Diameter Drilled Shaft | | | | | | | |
| 1 | 626.7 | 2453 | 1227 | TIP | | | 1.071 |
| 3 | 624.7 | 2479 | 1239 | TIP | | | 1.095 |
| 5 | 622.7 | 689 | 379 | SIDE | 589 | 0.127 | 0.272 |
| 6 | 621.7 | 797 | 438 | SIDE | 724 | 0.145 | 0.232 |
| 8 | 619.7 | 1515 | 834 | SIDE | 998 | 0.175 | 0.639 |
| 10 | 617.7 | 2234 | 1229 | SIDE | 1236 | 0.194 | 0.932 |
| 48 in. Diameter Drilled Shaft | | | | | | | |
| 1 | 626.7 | 3162 | 1581 | TIP | | | 1.207 |
| 3 | 624.7 | 473 | 260 | SIDE | 402 | 0.090 | 0.250 |
| 5 | 622.7 | 788 | 433 | SIDE | 671 | 0.133 | 0.300 |
| 6 | 621.7 | 910 | 501 | SIDE | 825 | 0.153 | 0.255 |
| 8 | 619.7 | 1732 | 953 | SIDE | 1136 | 0.185 | 0.715 |
| 10 | 617.7 | 2554 | 1404 | SIDE | 1405 | 0.206 | 1.047 |
| 60 in. Diameter Drilled Shaft | | | | | | | |
| 1 | 626.7 | 197 | 108 | SIDE | 0 | 0.000 | 0.200 |
| 3 | 624.7 | 591 | 325 | SIDE | 502 | 0.089 | 0.287 |
| 5 | 622.7 | 985 | 542 | SIDE | 836 | 0.142 | 0.351 |
| 6 | 621.7 | 1138 | 626 | SIDE | 1026 | 0.165 | 0.296 |
| 8 | 619.7 | 2165 | 1191 | SIDE | 1411 | 0.204 | 0.863 |
| 10 | 617.7 | 3192 | 1756 | SIDE | 1744 | 0.228 | 1.272 |