

STRUCTURE GEOTECHNICAL REPORT

**Northeast Ramp on I-57 over IL 17, Mechanical
Stabilized Earth (MSE) Wall at Ramp B**

New Structure: Proposed SN 046-8806

Kankakee County, Illinois

**F.A.I. ROUTE 57 (I-57)
SECTION (46-3)HBK
KANKAKEE COUNTY, ILLINOIS
JOB NO. P-93-065-02
PTB 200/021
KEG NO. 21-1086.00**



01/16/2026
Exp. 11/30/2027

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EXHIBITS

- Exhibit A – Location Map
- Exhibit B – Type, Size, and Location (TS&L) Plan
- Exhibit C – Boring Location Plan and Boring Logs
- Exhibit D – Subsurface Profile
- Exhibit E – SLOPE/W Global Stability Analysis
- Exhibit F – Laboratory Test Results
- Exhibit G – Laboratory Test Results
- Exhibit H – Bearing Resistance
- Exhibit I – Soil Parameters for Lateral Load Analysis and Wall Design Parameters

1.0 PROJECT DESCRIPTION AND PROPOSED STRUCTURE INFORMATION

1.1 Introduction

The geotechnical study summarized in this report was performed for the Mechanical Stabilized Earth (MSE) Retaining Wall at Ramp B in the northeast quadrant of a proposed single-point interchange at Interstate 57 (I-57) over Illinois Route 17 (IL 17) near the City of Kankakee in Kankakee County, Illinois. The purpose of this report is to present design and construction recommendations specifically for the Ramp B wall.

1.2 Project Description

This project involves constructing a MSE wall of precast panels for proposed Ramp B, as part of the future reconstruction of Interstate 57. The project is located at the interchange of IL 17 and I-57 in Kankakee, Illinois. The general location is shown on a USGS Topographic Location Map, Exhibit A. This portion of the overall I-57 and IL 17 project lies within the limits of the Third Principal Meridian, (Township 31 N, Range 12 E, Section 34) within the Kankakee Plain, of the Till Plains section, of the Central Lowland Province. The overall northern part of the project lies within the Third Principal Meridian (Township 31 N, Range 12 E, Sections 33 and 34), while the southern part of the project lies within the Second Principal Meridian (Township 30 N, Range 13 W, Sections 3 and 4).

1.3 Proposed Structure Information

The proposed structure (SN 046-W8806) is a precast panel MSE wall to be constructed near the proposed single-point interchange of I-57 and IL 17. The northeast wall will be a new construction project, situated where the existing lighting, frontage road, and parking lot are currently located. These items will be removed during construction. See the Type, Size, and Location (TS&L) Plan, Exhibit B.

The proposed structure starts at Sta. 6+90.00, 11.58' Rt. and ends at Sta. 13+50.00, 11.58' Rt. of proposed Ramp B for a total length of 660'-0". The elevation of the Top of Exposed Panel Line ranged from 653.64 feet (ft) at Sta. 6+90.00, 660.47 ft at Sta. 10+50.00, to 655.09 ft at Sta. 13+50.00. The minimum embedment depth to the top of the Leveling is 3'-6" ft. below finish grade.

2.0 EXISTING SITE INFORMATION

There is no existing retaining wall in this location currently.

3.0 SITE INVESTIGATION, SUBSURFACE EXPLORATION, AND GENERALIZED SUBSURFACE CONDITIONS

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

Ten standard penetration test (SPT) borings with some pushed samples, designated BH 01 through BH 10, were drilled between the dates of July 31, 2013, and August 23, 2013. These borings are for the retaining wall (Wall 1) located in the northeast quadrant of the I-57 and IL 17 interchange. The boring locations are shown on the Type, Size, and Location plan (TS&L), Exhibit

B, as provided by Lochmueller Group. Detailed information regarding the nature and thickness of the soils encountered and the results of the field sampling and laboratory testing are shown on the Boring Logs, Exhibit C. A soil profile can be found under Subsurface Profile, Exhibit D.

Table 3.1 – Boring Summary

Boring Location	Station	Offset	Ground Surface Elevation
BH 01	187+85.86	184.8 LT	651.57
BH 02	186+84.66	166.8 LT	652.09
BH 03	185+87.00	149.6 LT	652.06
BH 03A	186+08.26	154.1 LT	652.06
BH 04	185+04.01	138.0 LT	651.71
BH 05	183+91.02	123.8 LT	651.81
BH 06	182+87.00	116.1 LT	652.14
BH 07	181+91.43	125.1 LT	651.87
BH 08	180+94.97	99.2 LT	651.32
BH 09	179+98.39	77.4 LT	651.01
BH 10	178+97.45	80.1 LT	650.59

*Stationing and offsets are based off of I-57

3.1 Subsurface Conditions

Boring BH 01 consisted of bituminous parking lot from the ground surface (El. 651.57), underlain with silty clay loam till fill to El. 649.07. A very stiff silty clay followed to El. 646.57, with a driving resistance (N-value) of 7 blows per foot (bpf), an unconfined compressive strength (Q_u) value of 3.0 tons per square foot (tsf), and a moisture content of 27 percent. A hard silty clay followed to El. 639.07, with N-values ranging from 7 to 18 bpf, Q_u values between 4.5 to 6.8 tsf, and moisture contents from 22 to 24 percent. A hard to very stiff silty loam with silt layers followed to El. 634.57, with N-values ranging from 7 to 19 bpf, Q_u values between 3.5 and >4.5 tsf, and moisture contents from 20 to 24 percent. A very stiff silty clay/clay followed to El. 629.57, with N-values ranging from 6 to 7 bpf, a Q_u value of 3.0 tsf, and moisture contents from 27 to 28 percent. A medium fine sand to coarse gravel, loam with layers of clay loam followed to El. 624.07, with N-values ranging from 5 to 10 bpf, a Q_u value of 2.0 tsf, and moisture contents from 8 to 15 percent. A hard silty clay loam/silty loam till with limestone pieces followed to El. 618.07, with N-values ranging from 15 to 45 bpf, a Q_u value of >4.5 tsf, and moisture contents from 13 to 14 percent. The surface of limestone was encountered near boring termination at El. 617.90, with an N-value of 100/2 in. and a moisture content of 10 percent.

Boring BH 02 consisted of bituminous pavement, sand and gravel fill, and silty clay loam fill from ground surface (El. 652.09) to El. 650.59. A very stiff silty clay with organics followed to El. 648.59, with a Q_u value of 2.5 tsf and a moisture content of 23 percent. A very stiff to hard silty clay followed to El. 630.09, with N-values ranging from 17 to 22 bpf, Q_u values between >4.5 and 7.7 tsf, and moisture contents from 20 to 24 percent. A hard to very stiff silty clay followed to El. 625.09, with an N-value of 11 bpf, Q_u values between 3.7 and 4.1 tsf, and moisture contents from 22 to 23 percent. A hard silty clay loam till with silt and gravel pockets followed to boring termination at El. 618.59, with N-values ranging from 18 to 20 bpf, Q_u values between 4.4 and 4.7 tsf, and moisture contents from 11 to 14 percent. The surface of limestone was encountered roughly around boring termination and had an N-value of 100/0 inches.

Boring BH 03 was terminated at El. 647.06, due to an obstruction. Boring BH 03A was drilled 25 feet south of BH 03. Boring BH 03A encountered bituminous pavement and gravel fill from ground

surface (El. 652.06) to El. 650.56. A hard silty clay followed until El. 627.06, with N-values between 12 and 24 bpf, Q_u values from >4.5 to 7.4 tsf, and moisture contents between 21 to 25 percent. A hard silty clay loam till with sand and gravel pockets followed to El. 620.06, with N-values between 14 and 18 bpf, Q_u values from 4.4 to 4.7 tsf, and moisture contents from 9 to 17 percent. A loamy gravel followed to boring termination at El. 618.06, with an N-value of 72 bpf and a moisture content of 11 percent. The surface of limestone is assumed to be at the boring termination depth.

Boring BH 04 consisted of bituminous pavement and sand and gravel fill from ground surface (El. 651.71) to El. 649.71. A hard silty clay followed to El. 624.71, with N-values ranging from 13 to 24 bpf, Q_u values between >4.5 and 8.9 tsf, and moisture contents from 20 to 28 percent. A dense loamy fine sand to coarse gravel followed to El. 616.71, with N-values ranging from 44 to 45 bpf and moisture contents from 11 to 13 percent. Limestone followed until boring termination at El. 616.46, with an N-value of 100/3 inches and a moisture content of 9 percent.

Boring BH 05 consisted of bituminous pavement and sand and gravel fill from ground surface (El. 651.81) to El. 650.31. A hard silty clay till with silty loam pockets followed to El. 629.81, with N-values ranging from 11 to 21 bpf, Q_u values from 4.1 to 9.4 tsf, and moisture contents from 16 to 24 percent. A very stiff clay till followed to El. 624.81, with N-values ranging from 11 to 14 tsf, Q_u values from 3.4 to 3.6 tsf, and moisture contents from 24 to 27 percent. A hard silty clay loam till with limestone gravel pieces followed to El. 617.81, with N-values ranging from 20 to 67 bpf, a Q_u value of >4.5 tsf, and moisture contents from 8 to 14 percent. Dense limestone followed to boring termination at El. 616.56, with an N-value of 100/3 inches and a moisture content of 12 percent.

Boring BH 06 consisted of bituminous pavement, sand and gravel fill, and silty clay from ground surface (El. 652.14) to El. 650.64. A hard silty clay followed to El. 630.14, with N-values ranging from 13 to 20 bpf, Q_u values between 4.4 and 7.4 tsf, and moisture contents from 20 to 24 percent. A very stiff silty clay loam till followed to El. 625.14, with N-values ranging from 13 to 15 bpf, Q_u values from 3.4 to 3.7 tsf, and moisture contents from 20 to 24 percent. A hard silty loam till with limestone gravel pieces followed to El. 617.14, with N-values ranging from 22 to 52 bpf, a Q_u value of >4.5 tsf, and moisture contents from 11 to 15 percent. The assumed surface of limestone followed until boring termination at El. 616.97, with an N-value of 100/2 inches.

Boring BH 07 consisted of silty clay loam fill from ground surface (El. 651.87) to El. 650.37. A hard silty clay loam fill followed to El. 648.87. A hard silty clay followed to El. 634.87, with N-values ranging from 18 to 28 bpf, Q_u values between 4.0 to 10.9 (max Rimac) tsf, and moisture contents from 19 to 23 percent. A hard to very stiff silty clay followed to El. 624.87, with N-values ranging from 12 to 16 bpf, Q_u values from 3.1 to 6.6 tsf, and moisture contents from 14 to 25 percent. A hard silty loam till with loamy gravel layers followed to El. 619.87, with N-values ranging from 18 to 60 bpf, Q_u values between >4.5 and 5.1 tsf, and moisture contents from 10 to 15 percent. A dense silt with limestone/dolomite pieces, and a highly eroded and reworked limestone/dolomite surface followed to boring termination at El. 614.87, with N-values ranging from 68 to 115 bpf, a Q_u value of >4.5 tsf, and a moisture content of 14 to 23 percent. Auger refusal was at El. 614.87, with dense limestone noted as the material.

Boring BH 08 consisted of bituminous pavement with sand and gravel fill from ground surface (El. 651.32) to El. 649.82. A very stiff silty clay followed to El. 646.82, with a Q_u value of 2.0 tsf and a moisture content of 21 percent. A hard silty clay followed to El. 634.32, with N-values ranging from 11 to 20 bpf, Q_u values from 4.5 to 5.7 tsf, and moisture contents from 20 to 23 percent. A hard to very stiff silty clay followed to El. 626.32, with N-values ranging from 12 to 18 bpf, Q_u values from 3.4 to 5.1 tsf, and moisture contents from 22 to 24 percent. A very stiff to hard silty loam till with sand, silt, and loamy gravel layers followed to auger refusal and boring termination at El. 618.82. N-values for this material ranged from 8 to 49 bpf, with Q_u values between 2.5 to

>4.5 tsf, and moisture contents from 10 to 15 percent. Limestone was encountered near the auger refusal and boring termination depth, resulting in an N-value of 100/1 inch.

Boring BH 09 consisted of silty clay loam fill, sand and gravel fill, and silty clay loam topsoil from ground surface (El. 651.01) to El. 650.01. A very stiff silty clay followed to El. 648.01, with a Q_u value of 2.5 tsf and a moisture content of 20 percent. A hard silty clay loam till followed to El. 644.01, with a Q_u value of 4.5 tsf and a moisture content of 17 percent. A hard silty clay followed to El. 636.51, with N-values ranging from 12 to 19 bpf, Q_u values between 5.9 and 6.1 tsf, and moisture contents from 22 to 24 percent. A hard to very stiff silty clay followed to El. 624.51, with N-values between 12 to 16 bpf, Q_u values from 2.7 to 5.1 tsf, and moisture contents from 22 to 24 percent. A hard silty loam and silty clay loam till with silt and loamy gravel layers followed until El. 619.01, with N-values ranging from 17 to 58 bpf, a Q_u value of 4.5 tsf, and moisture contents from 11 to 14 percent. A dense shale with a weathered surface followed until boring termination at El. 618.09, with an N-value of 100/5 inches and a moisture content of 8 percent.

Boring BH 10 consisted of silty clay loam fill and silty clay loam topsoil from ground surface (El. 650.59) to El. 649.59. A hard silty clay loam till followed to El. 647.59, with a Q_u value of >4.5 tsf and a moisture content of 21 percent. A hard silty clay with layers of silt followed to El. 636.09, with N-values ranging from 13 to 18 bpf, Q_u values from 4.0 to 6.1 tsf, and moisture contents from 20 to 21 percent. A very stiff silty clay followed to El. 623.59, with N-values between 10 to 13 bpf, Q_u values from 3.1 to 3.6 tsf, and moisture contents from 22 to 24 percent. A hard gray silty loam/silty clay loam with silt and loamy gravel layers followed to El. 618.09, with N-values ranging from 23 to 36 bpf, a Q_u value of >4.5 tsf, and moisture contents from 9 to 15 percent. Limestone followed until boring termination at El. 617.92, with an N-value of 100/2 inches and a moisture content of 8 percent.

3.2 Bedrock

Table 3.2.1 shows the estimated elevations of apparent bedrock for the borings. Bedrock encountered in the borings was predominantly classified as limestone, however, weathered shale was encountered in Boring BH 09. In some cases, auger refusal was noted on some borings. Auger refusal is a designation applied to any material that cannot be further penetrated by the power auger without extraordinary effort and is indicative of a very hard or very dense material, usually bedrock.

Table 3.2.1 – Estimated Top of Rock Elevations

Boring	Estimated Top of Rock Elevation (ft.)
BH 01	618.07
BH 02	618.59
BH 03A	618.06
BH 04	616.71
BH 05	617.81
BH 06	617.14
BH 07	614.87
BH 08	618.82

BH 09	619.01
BH 10	618.09

3.3 Groundwater

Groundwater was encountered in almost all of the borings. Table 3.3.1 shows the elevations and the time of the readings. Without extended periods of observation, measurement of true groundwater levels may not be possible. It should be further noted that the groundwater level is subject to seasonal and climatic variations.

Table 3.3.1 – Groundwater

Boring	First Encounter Elevation (ft.)	Upon Completion Elevation (ft.)
BH 01	Dry	Dry
BH 02	Dry	622.1
BH 03A	622.1	628.1
BH 04	624.7	627.7
BH 05	619.8	621.8
BH 06	Dry	619.1
BH 07	Dry	Dry
BH 08	Dry	Dry
BH 09	Dry	618.1
BH 10	618.1	628.6

4.0 GEOTECHNICAL EVALUATIONS

4.1 Settlement

Settlement is expected to be minimal, as the soil encountered in the boring logs consisted of very stiff to hard, cohesive materials. However, settlement calculations were performed at Sta. 10+00.00 using Boring BH 05 and a wall height of 12.5 ft. Total settlement is 0.08 inches and a time-rate T90 of 56.57 days. Therefore, no performance issues are anticipated. (See Exhibit F – Settlement Calculations for more information).

4.2 Global Stability

Global stability was checked at Sta. 10+00.00 along the proposed precast panel MSE wall using SLOPE/W software, the soil properties from Boring BH 05, and the geometrics of the wall. Two conditions were modeled: end-of-construction (EOC), and long-term. In addition, a 250 psf vertical load simulating traffic was included in the stability model. A critical factor of safety (FOS) was calculated for each condition. According to the current standard of practice, the minimum FOS is

1.5 for EOC and long-term.

The Bishop Circular Method, which generates circular-shaped failure surfaces, was used to calculate the critical failure surfaces and FOS for the proposed conditions, as shown in Table 4.2.1. SLOPE/W program output from this analysis can be found in SLOPE/W Global Stability Analysis, Exhibit E.

Table 4.2.1 – Global Stability Critical FOS

Location	Estimated Ramp B Station	End-of-Construction (FOS)	Long-Term (FOS)	Wall Height (ft)
BH 05	10+00.00	12.1	1.8	12.5

Based on the assumptions used in the analysis, a FOS greater than minimum 1.5 was achieved at the modeled location under EOC and long-term conditions.

4.3 Seismic Considerations

As stated in the IDOT Geotechnical Manual, retaining walls are not typically designed for seismic loading, so seismic design parameters are not provided.

5.0 FOUNDATION EVALUATIONS AND DESIGN RECOMMENDATIONS

5.1 Bearing Resistance

Based on the plans provided by EXP, the proposed wall will be supported on a leveling pad, with a bottom footing at least 3.5 ft. below finished grade. The foundations supporting the proposed walls and fill embankments must provide sufficient support to resist dead and live loads. Based on the encountered subsurface conditions and the information available, the footing will be bearing consistently between the borings on a very stiff to hard silty clay layer, with an average drained cohesion of 100 psf. Factored Bearing Resistance was calculated per Terzaghi's Bearing Capacity Theory using drained conditions; $\Phi=26$ and a cohesion of 100 psf. The analysis provided an applied bearing pressure of 1.3 ksf and an ultimate bearing pressure of 8.4 ksf, giving us a Factor of Safety (FOS) of 6.3. For design recommendations, a FOS of 2.0 is sufficient, and a Factored Bearing Resistance of 4.2 ksf is recommended for the support of the proposed construction. See Exhibit H – Bearing Resistance for more information.

5.2 Wall Design Parameters

Table 5.2.1 provides recommended parameters for reinforced soil and backfill materials. Lateral earth pressure coefficients have been calculated using Rankine's Theory. These values are typical for coarse-grained, cohesionless soils such as sand, gravel, or crushed stone, with or without a minor admixture of fine particles and no shale, organic matter, or any other soft or low-durability particles.

Table 5.2.1 – Soil Parameters for Reinforced Soil and Backfill

Soil Type	γ (pcf)	c' (psf)	Φ (°)	K_a	K_p	K_o
Sand (Reinforced Soil)	125	0	34	0.28	3.54	0.44
Sand (Backfill)	120	0	32	0.31	3.25	0.47

Gravel/Crushed Stone (Backfill)	135	0	38	0.24	4.2	0.38
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The reinforced soil plasticity index (PI) should not exceed six and should not contain more than 15 percent of fines. The material's gradation must conform to the limits established by AASHTO T-27. When metallic or geosynthetic reinforcement is used, the soil's electrochemical properties must meet the requirements of AASHTO T-267. Regarding the retained backfill, the percentage of fines must be less than 50 percent, the liquid limit (LL) must be below 40, and the plasticity index (PI) must be under 20, in accordance with AASHTO T-90.

The backfill material should be compacted at its optimum moisture content to at least 95 percent of the maximum dry density, as determined by the AASHTO T-99 Standard Proctor Method. Compaction must be carried out in lifts that do not exceed 8 inches in loose thickness, following the IDOT Standard Specifications for Road and Bridge Construction.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Construction Activities

The 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.

No ground improvement methods are anticipated, as the existing subsurface soils are considered sufficiently stable to support the MSE wall. Prior to construction, all existing pavement, base course, and topsoil within the wall alignment should be completely removed to provide a suitable subgrade for the wall levelling pad and to ensure long-term structural stability. The storm sewer will not affect the global slope stability analysis; if any, it will increase the slope stability factor of safety. "Any unstable or unsuitable materials should be removed and replaced with compacted structural fill."

Unsuitable soils which are considered highly organic, frost susceptible, and high shrink and swell potential soils with liquid limits greater than 50% were not encountered in the soil borings. Leveling pad elevations will exceed the depth of frost penetration of 3.5 below the finished grade line. Unstable soils may not be unsuitable soils but have collapsible, weak structures, and low strength. Silt, silty loam, and very fine silty sand are considered unstable soils and tend to be of low strength. However, the silty loam, silt, silty loam till with sand, loamy gravel layers or limestone, silty clay tallich with silty loam pockets, and silty clay loam till with silt and gravel pockets soil layers encountered in the borings range from El. 650.31 to 614.87 ft and exhibit stiff to hard strength with Q_u values ranging from 2.5 to 9.4 tsf, and a mode of $Q_u > 4.5$ tsf with moisture content values ranging from 9 % to 24 %. Given that the groundwater elevations, upon completion, ranged from El. 618.1 to 628.1 ft, these stiff to hard silty type soils may become unstable when wet. Underdrains installation may help.

6.2 Temporary Sheet piling and Soil Retention

At this time, temporary shoring does not appear to be required. If temporary shoring is deemed necessary during final design, KEG should be contacted to determine the feasibility of utilizing the IDOT temporary sheet piling design charts.

If the design guide and charts do not apply, a temporary soil retention system will be required. An

Illinois-licensed structural engineer is required to seal the design of the temporary soil retention system, if deemed necessary.

6.3 Site and Soil Conditions

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

6.4 Foundation Construction

Conventional continuous or strip foundation methodologies should be assumed.

7.0 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.

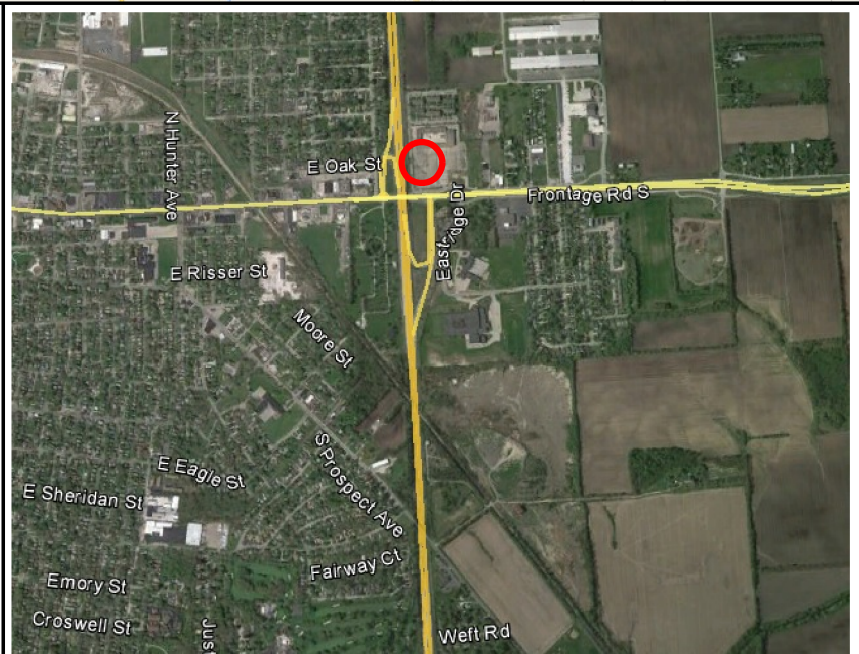
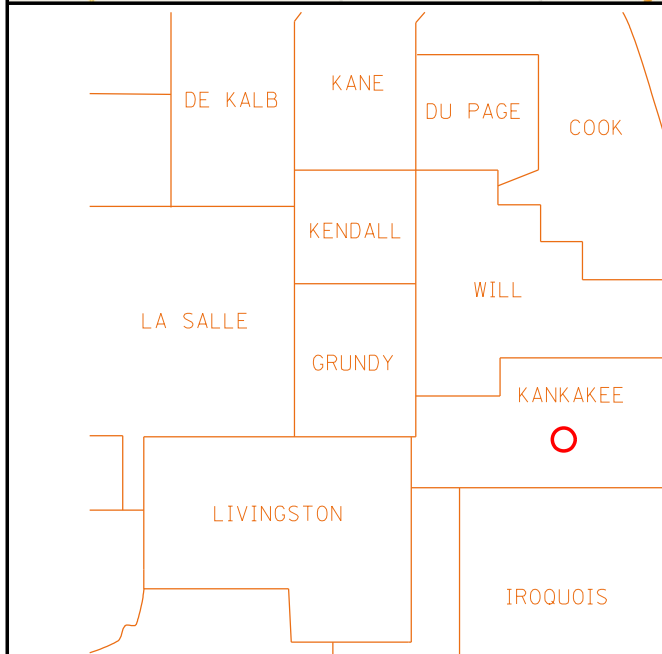
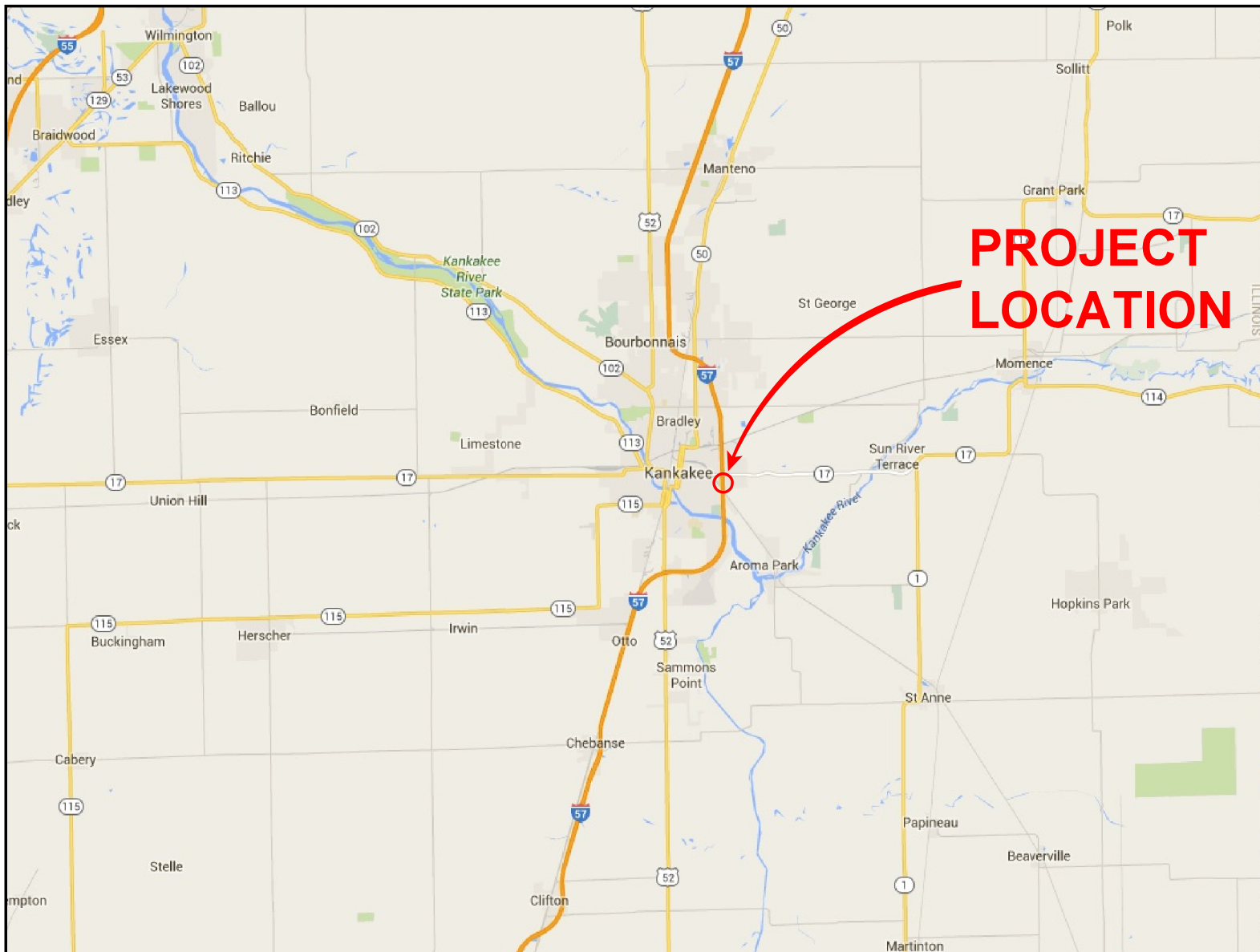
8.0 GEOTECHNICAL DATA

Soil borings can be found in Exhibit C. The Subsurface Profile can be found in Exhibit D. Laboratory test results can be found in Exhibit G. Soil parameters can be found in Exhibit I.

9.0 LIMITATIONS

The recommendations provided herein are for the exclusive use of EXP and IDOT. They are specific only to the project described and are based on subsurface information obtained at ten boring locations within the project area, 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



Kaskaskia
Engineering Group, LLC

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Belleville, Illinois 62220
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www.kaskaskiaeng.com

PROFESSIONAL REGISTRATIONS
Illinois Professional Design Firm
Professional Engineering Group

LICENSE NO.
184.004773
20-5080586

LOCATION MAP

**NORTHEAST RAMP ON I-57 OVER IL ROUTE 17
RETAINING WALL AT RAMP B
KANKAKEE COUNTY, ILLINOIS**

EXHIBIT NO.

A

KEG JOB # 11-1017

EXHIBIT B

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

No Salvage.

F.A.I. Route 57 Ramp B
Functional Class: Ramp
ADT: 4,100 (2016); 6,154 (2040)
ADTT: 820 (2016); 1231 (2040)
DHV: 431 (2040)
Design Speed: 35 m.p.h.
Posted Speed: 30 m.p.h.
1-Way Traffic
Directional Distribution: 100

2024 AASHTO LRFD Bridge Design
Specifications, 10th Edition

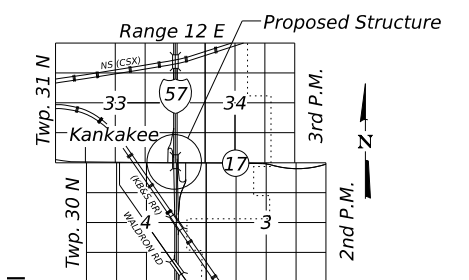
FIELD UNITS

$f'_c = 4,000 \text{ psi}$
 $f_y = 60,000 \text{ psi}$ (Reinforcement)
 $f_y = 50,000 \text{ psi}$ (Struct. Steel, M270 Grade 50,
 posts)

$f'_c = 4,500 \text{ psi}$
 $f_y = 60,000 \text{ psi}$ (Reinforcement)
 $f_y = 65,000 \text{ psi}$ (Welded Wire Reinforcement)

Allow 35 psf wind load for Structure Mounted Noise Wall.
Maximum Dead Load not to exceed 65 lb/sq.ft. of wall face area.
Traffic Impact per AASHTO LRFD: TL5. Approx. Noise Wall Height = 18'-0". Designed Service Weight of Noise Abatement Wall: 1.5 kips per linear foot of wall.

	AC	Prop. ROW
		Exist. ROW
		Prop. Storm Sewer
		Prop. Drainage Inlet
		Prop. Drainage Manhole
		Prop. Drainage Catch Basin
		Exist. Storm Sewer
		Soil Borings
	W	Exist. Underground Water Line
	G	Exist. Underground Gas Line
		Proposed Light Pole



STRUCTURE NO. 046-W8806

Station	Top of Exposed Panel Line
06+90.00	653.64
07+20.00	654.42
07+50.00	655.20
07+80.00	655.98
08+10.00	656.76
08+40.00	657.54
08+70.00	658.31
09+00.00	658.97
09+30.00	659.51
09+60.00	659.93
09+90.00	660.23
09+95.00	660.27
10+00.00	660.30
10+20.00	660.41
10+50.00	660.47
10+80.00	660.41
11+10.00	660.23
11+40.00	659.93
11+70.00	659.63
12+00.00	658.98
12+30.00	658.32
12+60.00	657.54
12+90.00	656.72
13+20.00	655.90
13+50.00	655.09

(Looking at Front Face of Wall)
(Stations from B.F.A.I. 57 - Ramp B)

PLAN

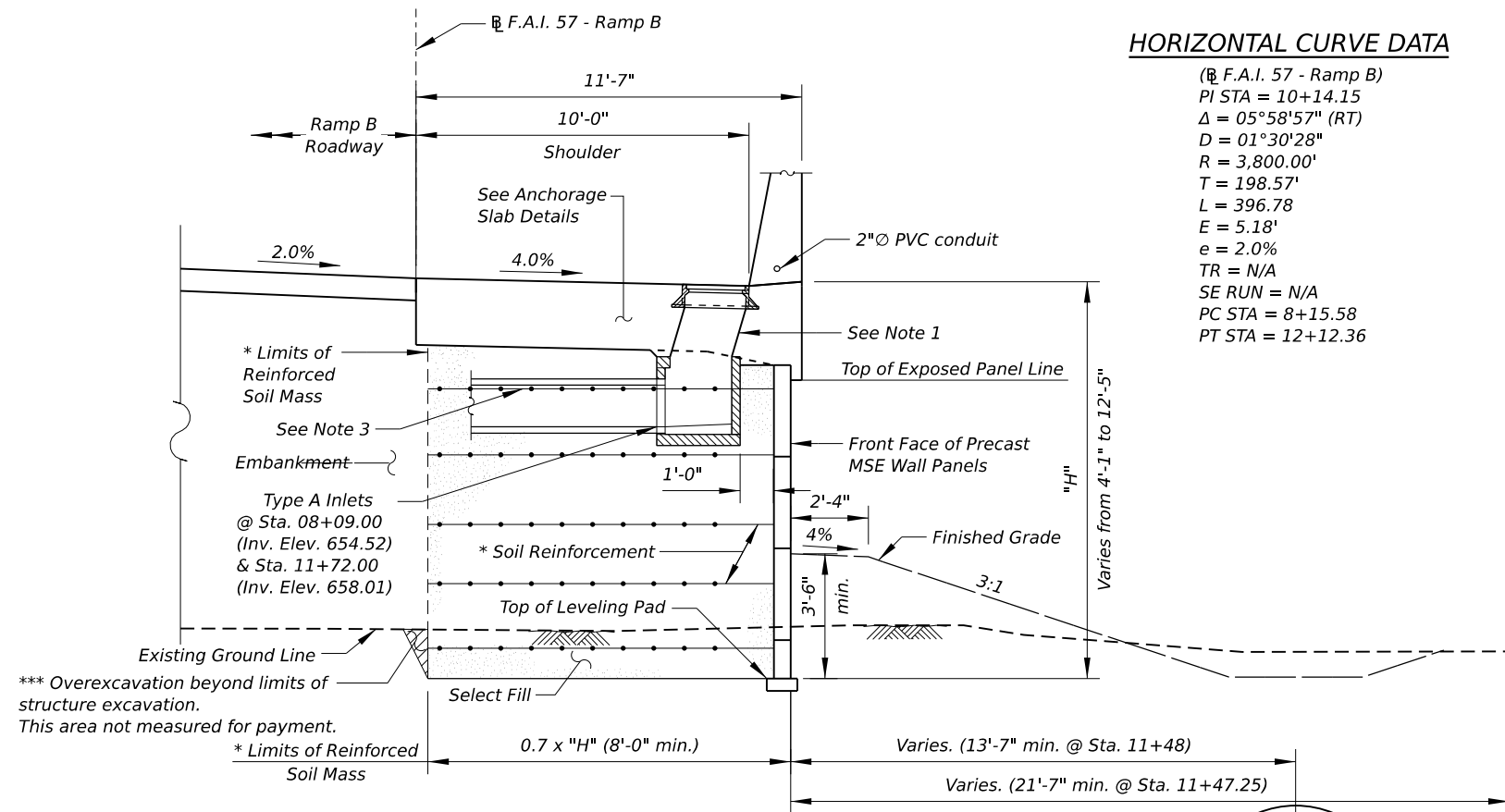
1. Wall Stations and Offsets are relative to B Prop. Ramp B along the front face of wall.
2. See Sheet 3 of 3 for Section A-A.

**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

SHEET 1 OF 3 SHEETS

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

MODEL: 2D SHEET 1
FILE NAME: C:\PWA\WORK\EXP\BENTLEY\COM\EXP\DWG\01\DD284891\SLD366663-SHT-02-CEN.DGN

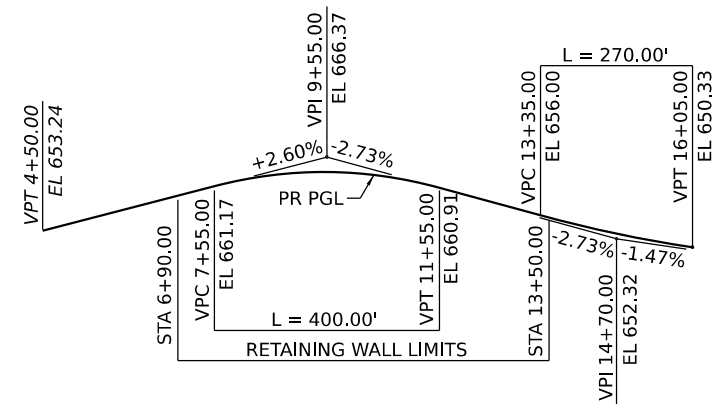


TYPICAL SECTION THRU MSE WALL

* The MSE wall supplier's internal stability design shall account for the anchorage slab's bearing pressure surcharge of 1.0 ksf and horizontal sliding force of 0.5 kips/ft of wall.

** See Plan on Sheet 1 of 3 for pipe locations.

*** Backfill overexcavation with same material as used for select fill.

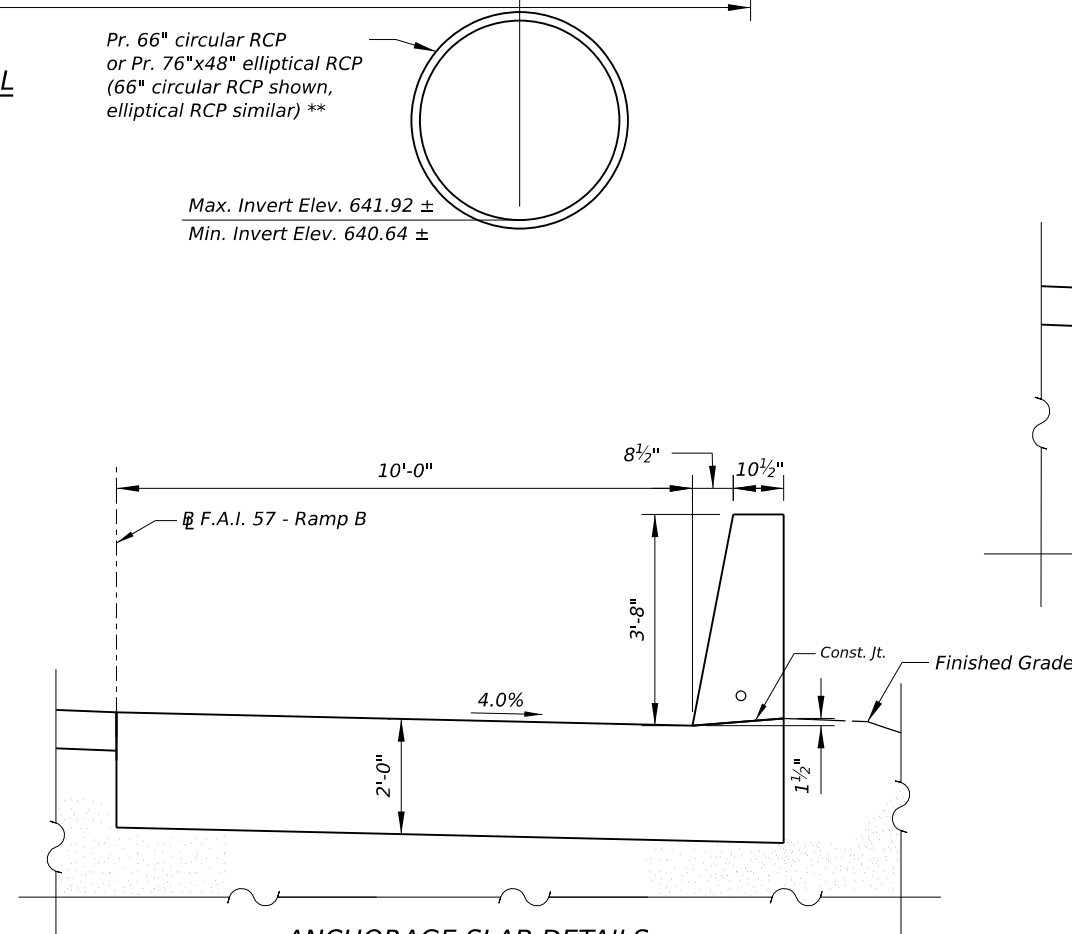


PROFILE GRADE

Along F.A.I. 57 - Ramp B

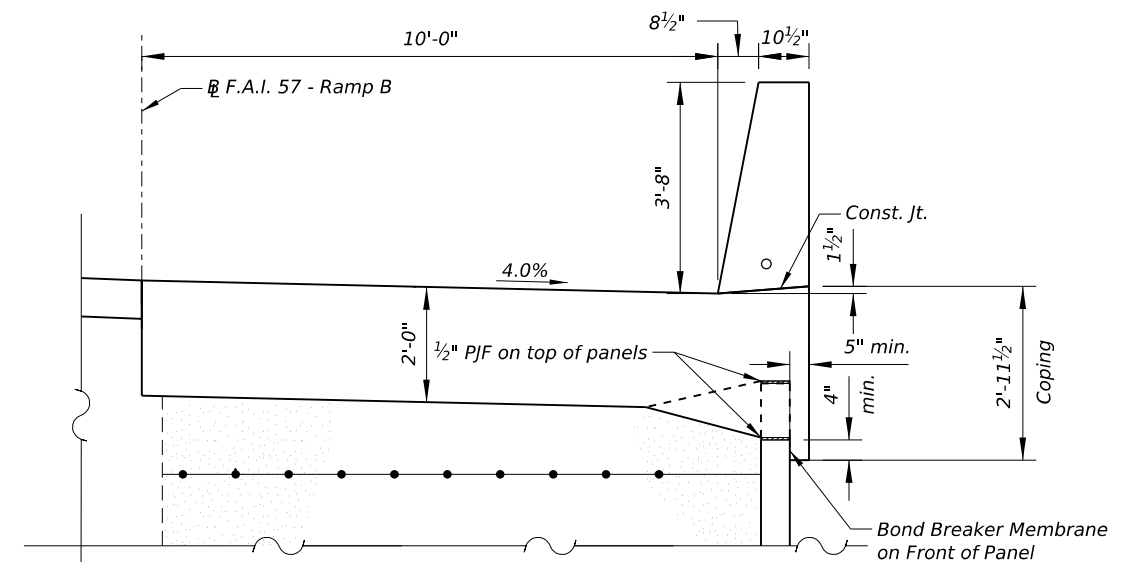
NOTES:

- Cast frame into moment slab and form opening to structure.
- Anchorage Slab design subject to refinement during final design.
- Load transfer system, typ. M.S.E. supplier to design load transfer system to accommodate storm sewers and Inlets. Cost included with Mechanically Stabilized Earth Retaining Wall.



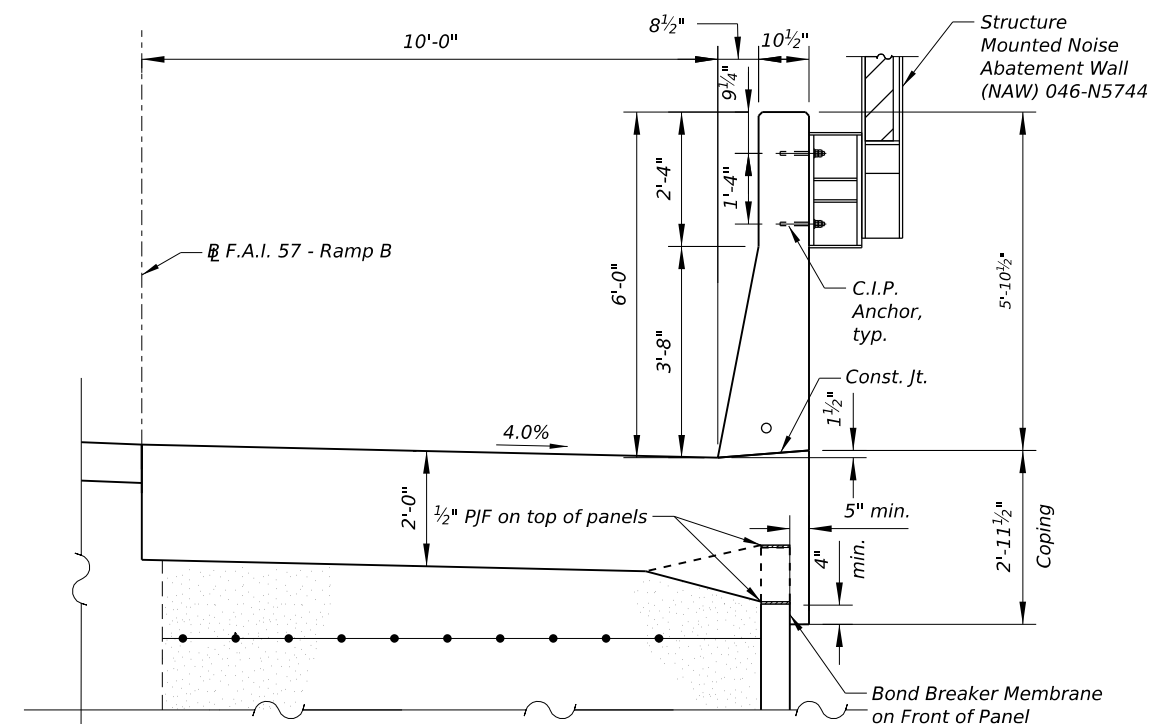
ANCHORAGE SLAB DETAILS

(Sta. 6+00.00 to Sta. 6+90.00)
(See Note 2)



ANCHORAGE SLAB DETAILS

(Sta. 6+90.00 to Sta. 9+90.00)
(See Note 2)



ANCHORAGE SLAB DETAILS

(Sta. 10+00.00 to Sta. 18+00.00)
(Parapet transition from Sta. 9+90.00 to 10+00.00 not shown for clarity. No Proposed MSE Wall from Sta. 13+50.00 to 18+00.00)
(See Note 2)

DETAILS I
RETAINING WALL AT RAMP B
(NORTHEAST RAMP ON I-57 OVER IL 17 AT SN 046-0154)
F.A.I. ROUTE 57 - SEC. (46-3)R,HBK-1&[(46-3)HB-5]HB-1
KANKAKEE COUNTY
STATION 6+90.00 to STATION 13+50.00
STRUCTURE NO. 046-W8806

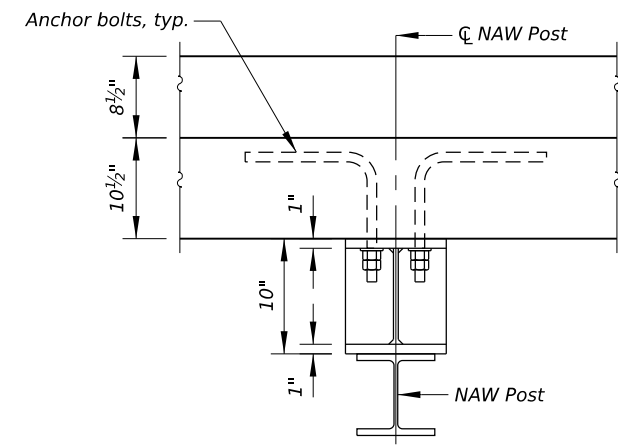


USER NAME = BASTOST	DESIGNED - TB	REVISED -
PLOT SCALE = 0.16666633" / IN.	APPROVED - MAF	REVISED -
PLOT DATE = 1/5/2026	DRAWN - TB	REVISED -
	CHECKED - MAF	REVISED -

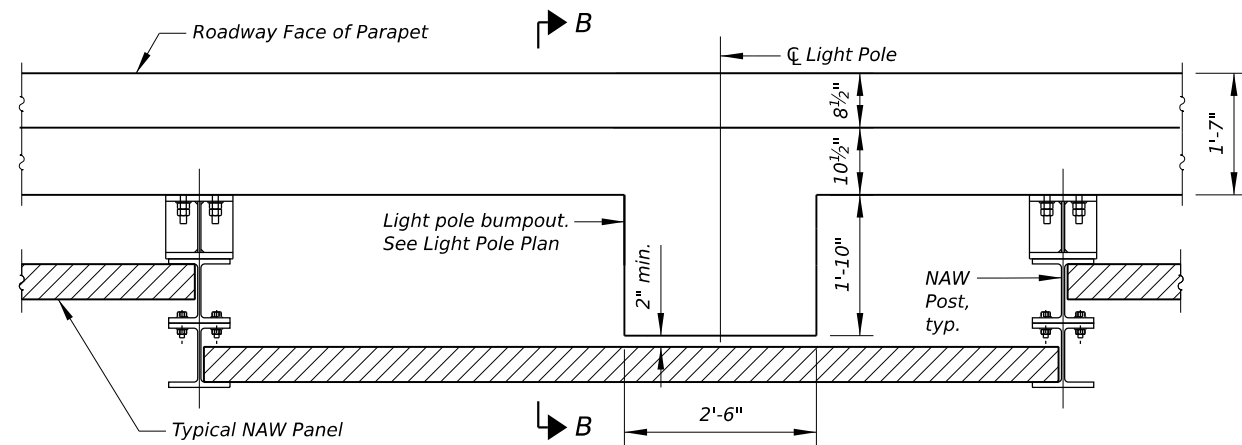
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET 2 OF 3 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
57	(46-3)R,HBK-1&[(46-3)HB-5]HB-1	KANKAKEE	3	2
CONTRACT NO. 66863				
ILLINOIS FED. AID PROJECT				

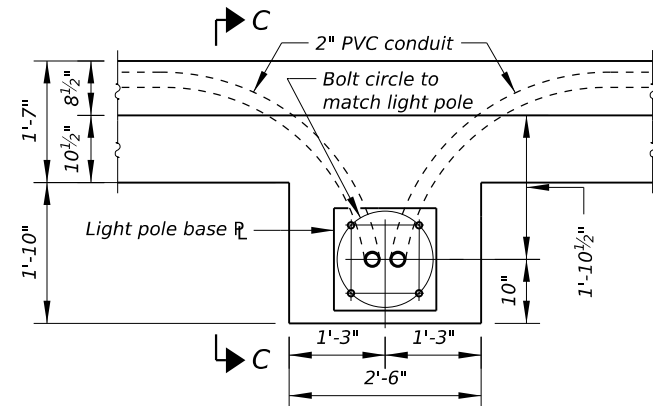


PLAN AT TYPICAL NAW POST

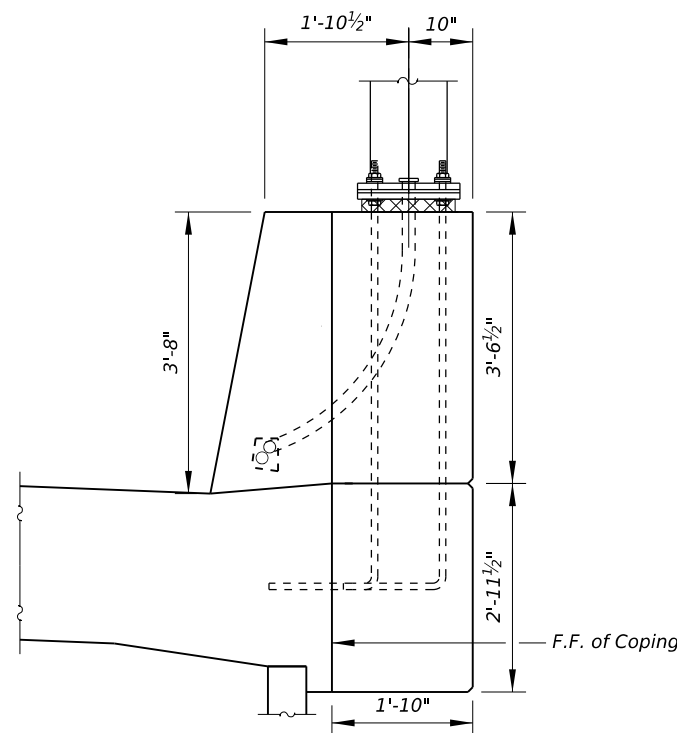


CONCEPT NAW PANEL DETAIL AT LIGHT POLE BUMPOUTS - PLAN

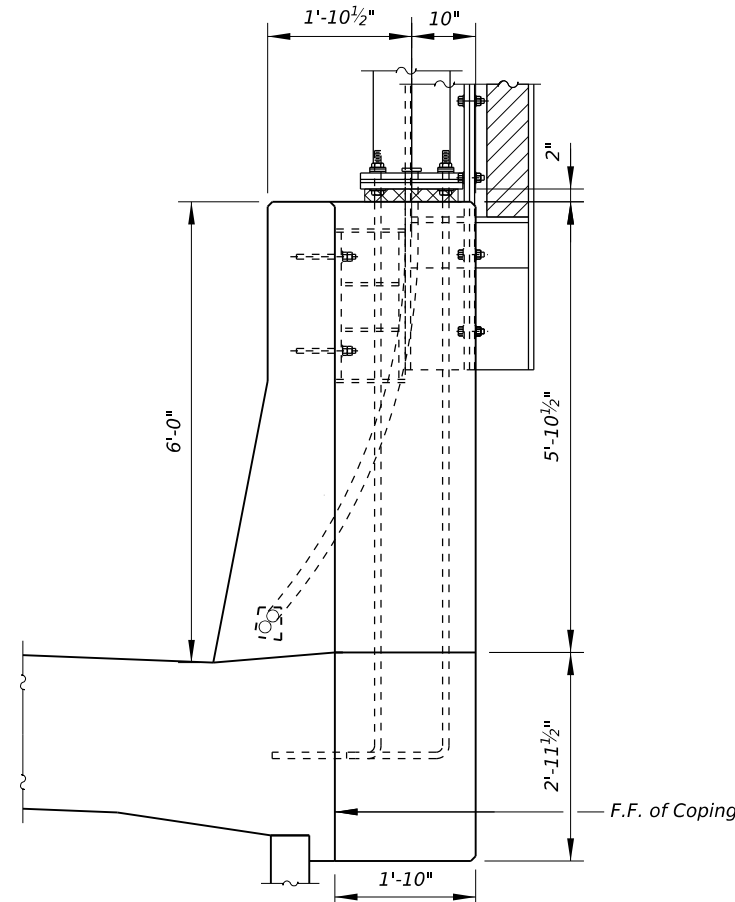
(Details to be refined in final design)



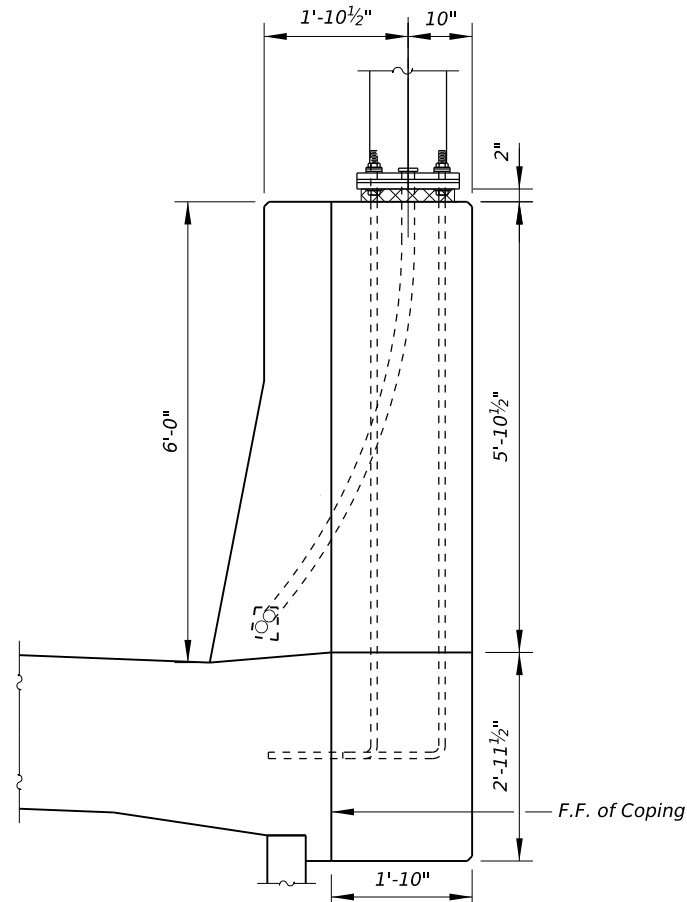
LIGHT POLE PLAN



SECTION A-A - LIGHT POLE MOUNTED ON WALL PARAPET



SECTION B-B - NAW POST BEHIND LIGHT POLE BUMPOUT



SECTION C-C - LIGHT POLE MOUNTED ON EXTENDED WALL PARAPET

DETAILS II
RETAINING WALL AT RAMP B
(NORTHEAST RAMP ON I-57 OVER IL 17 AT SN 046-0154)
F.A.I. ROUTE 57 - SEC. (46-3)R,HBK-1&[(46-3)HB-5]HB-1
KANKAKEE COUNTY
STATION 6+90.00 to STATION 13+50.00
STRUCTURE NO. 046-W8806

NOTES:

1. See Sheet 1 of 1 for Section A-A location.

MODEL: 2D SHEET 1
 FILE NAME: C:\P\WORK\EXP\BENTLEY\COM\EXP\DWG\01\02\284891\SLD\0366663-SHT-03-GEN.DGN



USER NAME = BASTOST	DESIGNED - TB	REVISED -
PLOT SCALE = 0.16666633' / IN.	APPROVED - MAF	REVISED -
PLOT DATE = 1/5/2026	DRAWN - TB	REVISED -
	CHECKED - MAF	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET 3 OF 3 SHEETS

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

EXHIBIT C
BORING LOGS

EXHIBIT C
BORING LOGS



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall in Northeast Quadrant of I-57 & IL 17 Interchange in Kankakee LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SW 1/4, SEC. 34, TWP. 31N, RNG. 12E, 3rd PM,
Latitude 41.119837, Longitude -87.834819

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
BORING NO. <u>BH 01</u> Station <u>187+85.86</u> Offset <u>184.8 ft Lt.</u> Ground Surface Elev. <u>651.57</u> ft	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
Augered Bituminous Parking Lot, Gray & Black Silty Clay Loam Till Fill					Very Stiff Gray Silty Clay/Clay (continued)	2			
						3	3.0	28	
						4	P		
649.07					629.57				
Very Stiff Gray Silty Clay	3			27	Medium Gray Fine Sand to Coarse Gravel - Loamy with Layers of Clay Loam	3			
	3	3.0				5		8	
	4	P				5			
646.57	-5								
Hard Brown & Gray Silty Clay	2					1			
	3	4.5	22			3	2.0	15	
	4	P				2	P		
					624.07				
	3				Hard Gray Silty Clay Loam/Silty Loam Till with Heavy Limestone Pieces	5			
	4	5.1	24			6	>4.5	14	
	5	S				9	P		
-10									
	5					5			
	7	6.8	23			15		13	
	11	S				30			
639.07									
Hard to Very Stiff Brown & Gray Silty Loam with Silt Layers	5					21			
	7	>4.5	20		618.07	37		10	
	12	P			617.90	100/2"			
-15					Assumed Rock Surface - Gray Limestone				
	2				End of Boring	-35			
	3	3.5	24						
	4	P							
634.57									
Very Stiff Gray Silty Clay/Clay	2								
	3	3.0	27						
	3	P							
-20									

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 1/20/17

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)

Page 1 of 1Date 7/31/13

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

STRUCT. NO. _____ Station _____		D E P T H	B L O W S	U C S Qu	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft	D E P T H	B L O W S	U C S Qu	M O I S T (%)
BORING NO. _____ BH 02 Station _____ 186+84.66 Offset _____ 166.8 ft Lt. Ground Surface Elev. _____ 652.09 ft		(ft)	(/6")	(tsf)	(%)		(ft)	(/6")	(tsf)	(%)
Augered Bituminous Pavement, White Sand & Gravel Fill, Gray Silty Clay Loam Fill		_____	_____	_____	_____	Very Stiff to Hard Brown & Gray Silty Clay	_____	3	_____	_____
		_____	_____	_____	_____		7	7.7	24	
Very Stiff Dark Gray & Black Silty Clay with Organics		_____	*	_____	_____	*Pushed Sample 4.5' - 7.5' (continued)	_____	11	S	_____
*Pushed Sample 1.5' - 4.5'		_____	_____	2.5	23	Hard to Very Stiff Gray Silty Clay	_____	4	_____	_____
		_____	_____	P	_____		_____	5	4.1	22
Very Stiff to Hard Brown & Gray Silty Clay		_____	_____	_____	_____		_____	6	B	_____
*Pushed Sample 4.5' - 7.5'		-5	*	_____	_____		-25	_____	_____	_____
		_____	_____	>4.5	23		_____	3	_____	_____
		_____	_____	P	_____		_____	5	3.7	23
		_____	_____	_____	_____		_____	6	B	_____
		_____	_____	_____	_____	625.09	_____	_____	_____	_____
		_____	_____	_____	_____	Hard Gray Silty Clay Loam Till with Silt & Gravel Pockets	_____	5	_____	_____
		_____	_____	8	_____		_____	7	4.7	14
		_____	_____	9	22		_____	11	B	_____
		_____	_____	13	_____		_____	_____	_____	_____
		-10	_____	_____	_____		▽ -30	6	_____	_____
		_____	_____	5	_____		_____	9	4.4	14
		_____	_____	8	23		_____	11	B	_____
		_____	_____	14	_____		_____	_____	_____	_____
		_____	_____	_____	_____		_____	3	_____	_____
		_____	_____	8	_____		_____	4	_____	11
		_____	_____	9	21		618.59	_____	100/0"	_____
		_____	_____	12	_____	Assumed Rock Surface - Gray Limestone	_____	_____	_____	_____
		-15	_____	_____	_____	End of Boring	-35	_____	_____	_____
		_____	_____	5	_____		_____	_____	_____	_____
		_____	_____	7	22		_____	_____	_____	_____
		_____	_____	10	_____		_____	_____	_____	_____
		_____	_____	_____	_____		_____	_____	_____	_____
		_____	_____	5	_____		_____	3	_____	_____
		_____	_____	7	20		_____	4	_____	_____
		_____	_____	10	_____		_____	_____	_____	_____
		-20	_____	_____	_____		-40	_____	_____	_____

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 1/20/17

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

BBS, form 137 (Rev. 8-99)



Illinois Department of Transportation

Division of Highways
IDOT

SOIL BORING LOG

Page 1 of 1

Date 8/1/13

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall in Northeast Quadrant of I-57 & IL 17 Interchange in Kankakee LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SW 1/4, SEC. 34, TWP. 31N, RNG. 12E, 3rd PM,
Latitude 41.120381, Longitude -87.834979

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. _____
Station _____

BORING NO. BH 03
Station 185+87.00
Offset 149.6 ft Lt.
Ground Surface Elev. 652.06 ft

D
E
P
T
H

B
L
O
W
S

U
C
S

M
O
I
S
T

(ft) (/6") (tsf) (%)

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

Obstruction at 5' - possible old building foundation. Moved rig and drilled boring BH 03A.

647.06 -5

End of Boring

-10

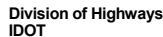
-15

-20

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 1/20/17

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

BBS, form 137 (Rev. 8-99)





SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall in Northeast Quadrant of I-57 & IL 17 Interchange in Kankakee LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SW 1/4, SEC. 34, TWP. 31N, RNG. 12E, 3rd PM,
Latitude 41.120608, Longitude -87.835036

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)	Surface Water Elev. Stream Bed Elev.	DEPTH (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
BORING NO. <u>BH 04</u> Station <u>185+04.01</u> Offset <u>138.0 ft Lt.</u> Ground Surface Elev. <u>651.71</u> ft					Groundwater Elev.: First Encounter <u>624.7</u> ft ▼ Upon Completion <u>627.7</u> ft ▼ After <u> </u> Hrs. <u> </u> ft				
Augered Bituminous Pavement, White Sand & Gravel Fill					Hard Brown & Gray Silty Clay		8		
							10	6.4	21
					*Pushed Samples 2.0' - 5.0' & 5.0' - 8.0' (continued)		14	S	
649.71		*					5		
Hard Brown & Gray Silty Clay			>4.5 P	20			8	6.1	27
*Pushed Samples 2.0' - 5.0' & 5.0' - 8.0'							10	S	
	-5								
		*					3		
			>4.5 P	21			7	6.1	20
							9	S	
					624.71 ▼				
					Dense Gray Loamy Fine Sand to Coarse Gravel		17		
							27		11
							18		
	-10								
		4					17		
		5	4.8	26			26		13
		8	S				18		
		4					17		
		5	5.1	28			22		12
		8	S				22		
	-15								
		5			616.71				
		6	6.3	20	616.46		100/3"		9
		9	S		Dense Gray Limestone				
					End of Boring				
		5							
		7	8.9	23					
		11	S						
	-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)

Page 1 of 1

Date 8/5/13

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

STRUCT. NO. _____ Station _____	D E P T H	B L O W S	U C S Qu	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft	D E P T H	B L O W S	U C S Qu	M O I S T (%)
BORING NO. _____ BH 05 Station _____ 183+91.02 Offset _____ 123.8 ft Lt. Ground Surface Elev. _____ 651.81 ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter _____ 619.8 ft ▼ Upon Completion _____ 621.8 ft ▽ After _____ Hrs. _____ ft	(ft)	(/6")	(tsf)	(%)
Augered Bituminous Pavement, Sand & Gravel Fill	_____	_____	_____	_____	_____	_____	4	_____	_____
_____ 650.31	_____	_____	_____	_____	_____	_____	4 9	4.1 S	23
Hard Brown & Gray Silty Clay Tillish with Silty Loam Pockets	_____	*	>4.5 P	18	_____ 629.81	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	4	_____	_____
_____	_____	_____	_____	_____	_____	_____	5 9	3.4 B	27
*Pushed Samples 1.5' - 4.5' & 4.5' - 7.5'	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	-5	*	_____	_____	_____	-25	_____	_____	_____
_____	_____	_____	>4.5 P	20	_____	_____	3	_____	_____
_____	_____	_____	_____	_____	_____	_____	4 7	3.6 B	24
_____	_____	_____	_____	_____	_____ 624.81	_____	_____	_____	_____
_____	_____	6	_____	_____	_____	_____	6	_____	_____
_____	_____	8 12	6.8 S	21	_____	_____	8 12	4.5 S	14
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	-10	_____	_____	_____	_____	▽ -30	_____	_____	_____
_____	_____	5	_____	_____	_____	_____	10	_____	_____
_____	_____	9 12	9.4 S	20	_____	_____	15 22	>4.5 P	8
_____	_____	_____	_____	_____	_____	▼	_____	_____	_____
_____	_____	4	_____	_____	_____	_____	15	_____	_____
_____	_____	6 9	4.9 S	16	_____	_____	25 42	>4.5 P	12
_____	_____	_____	_____	_____	_____ 617.81	_____	_____	_____	_____
_____	-15	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	4	_____	_____	_____ 616.56	-35	_____	_____	_____
_____	_____	5 9	5.6 S	24	_____	_____	100/3"	_____	12
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	4	_____	_____	_____	_____	_____	_____	_____
_____	_____	4 7	4.2 S	24	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	-20	_____	_____	_____	_____	-40	_____	_____	_____

BBS, form 137 (Rev. 8-99)

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 1/20/17



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall in Northeast Quadrant of I-57 & IL 17 Interchange in Kankakee LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SW 1/4, SEC. 34, TWP. 31N, RNG. 12E, 3rd PM,
Latitude 41.121202, Longitude -87.835158

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
BORING NO. <u>BH 06</u> Station <u>182+87.00</u> Offset <u>116.1 ft Lt.</u> Ground Surface Elev. <u>652.14</u> ft	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
Augered Bituminous Pavement, White Sand & Gravel Fill, Gray Silty Clay	650.64				Hard Brown & Gray Silty Clay	4			
						5	5.6	24	
		*			*Pushed Samples 1.5' - 4.5' & 4.5' - 7.5' (continued)	12	S		
Hard Brown & Gray Silty Clay					630.14				
			>4.5	20	Very Stiff Gray Silty Clay Loam Till	4			
			P			5	3.7	24	
*Pushed Samples 1.5' - 4.5' & 4.5' - 7.5'						10	B		
	-5	*				-25			
			>4.5	22		4			
			P			5	3.4	20	
						8	B		
					625.14				
		7			Hard Gray Silty Loam Till with Heavy Limestone Gravel Pieces	10			
		9	6.6	22		12	>4.5	15	
		11	S			10	P		
	-10	4				-30	9		
		6	4.4	23			10	>4.5	11
		8	S				14	P	
		4					15		
		5	6.1	22			21	>4.5	12
		8	S				31	P	
	-15	4				-35			
		5	7.4	22	Assumed Limestone Surface	617.14	100/2"		
		9	S		End of Boring	616.97			
		4							
		6	6.3	23					
		10	S						
	-20					-40			

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



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall in Northeast Quadrant of I-57 & IL 17 Interchange in Kankakee LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SW 1/4, SEC. 34, TWP. 31N, RNG. 12E, 3rd PM,
Latitude 41.121466, Longitude -87.835146

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
BORING NO. <u>BH 07</u> Station <u>181+91.43</u> Offset <u>125.1 ft Lt.</u> Ground Surface Elev. <u>651.87</u> ft	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
Augered Brown & Gray Silty Clay Loam Fill	650.37	*			Hard to Very Stiff Gray Silty Clay (continued)	5			
						7	6.6	14	
						9	S		
Hard Gray & Brown Silty Clay Loam Fill			4.0	22					
*Pushed Sample 1.5' - 4.5'	648.87		P			3			
Hard Brown & Gray Silty Clay						5	3.1	25	
						7	B		
*Pushed Samples 1.5' - 4.5' & 4.5' - 7.5'	-5	*				-25			
			>4.5	20		4			
			P			5	3.3	23	
						7	B		
					624.87				
	8				Hard Gray Silty Loam Till with Loamy Gravel Layers	5			
	12	7.4	21			7	5.1	15	
	16	S				11	S		
	-10					-30			
	8					15			
	11	10.9	19			30	>4.5	10	
	15	S**				30	P		
**Max Rimac @ 10%					619.87				
	7				Dense Gray & Tan Silt with Limestone/Dolomite Pieces - Highly Eroded & Reworked Limestone/Dolomite Surface	14			
	9	8.1	22			31	>4.5	23	
	11	S				37	P		
	-15					-35			
	4					31			
	7	6.1	23			42	>4.5	14	
	11	S				73	P		
634.87					614.87				
Hard to Very Stiff Gray Silty Clay		4			Dense Gray Limestone - Auger Refusal @ 37'				
		5	5.0	22	End of Boring				
		9	S						
	-20					-40			

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



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall in Northeast Quadrant of I-57 & IL 17 Interchange in Kankakee LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SW 1/4, SEC. 34, TWP. 31N, RNG. 12E, 3rd PM,
Latitude 41.121726, Longitude -87.835261

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft Groundwater Elev.: First Encounter _____ Dry ft Upon Completion _____ Dry ft After _____ Hrs. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
BORING NO. <u>BH 08</u> Station <u>180+94.97</u> Offset <u>99.2 ft Lt.</u> Ground Surface Elev. <u>651.32</u> ft									
Augered Bituminous Pavement & Tan Sand & Gravel Fill					Hard to Very Stiff Gray Silty Clay (continued)		5		
							8	4.4	22
	649.82						10	S	
Very Stiff Gray & Brown Silty Clay		*							
*Pushed Sample 1.5' - 4.5'			2.0	21			4		
			P				5	3.4	22
							7	B	
	646.82								
Hard Brown & Gray Silty Clay	-5	*				626.32	-25		
*Pushed Sample 4.5' - 7.5'			4.5	20	Very Stiff to Hard Gray Silty Loam Till with Sand & Silt Layers & Loamy Gravel Layers		2		
			P				4	2.5	15
							4	P	
		5					6		
		8	5.7	23			6	>4.5	13
		10	S				14	P	
	-10								
		6					9		
		9	5.7	23			16	>4.5	10
		11	S				33	P	
		5				618.82			
		5	5.1	22	Assumed Dense Gray Limestone - Auger Refusal @ 32.5' End of Boring		100/1"		
		6	S						
	-15								
		5							
		6	4.7	23					
		8	S						
	634.32								
Hard to Very Stiff Gray Silty Clay		4							
		5	5.1	24					
		8	S						
	-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)



SOIL BORING LOG

ROUTE I-57 (FAI 57) DESCRIPTION Retaining Wall in Northeast Quadrant of I-57 & IL 17 Interchange in Kankakee LOGGED BY Larry Myers

SECTION (46-3)R, HBK, 5HBR, 6HBR LOCATION SW 1/4, SEC. 34, TWP. 31N, RNG. 12E, 3rd PM,
Latitude 41.121987, Longitude -87.835361

COUNTY Kankakee DRILLING METHOD Hollow Stem Auger HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
BORING NO. <u>BH 09</u> Station <u>179+98.39</u> Offset <u>77.4 ft Lt.</u> Ground Surface Elev. <u>651.01</u> ft	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
Black Silty Clay Loam Fill, Tan Sand & Gravel Fill, Black Silty Clay Loam Topsoil	650.01		2.5 P	20	Hard to Very Stiff Gray Silty Clay (continued)		4 5 7		
*Pushed Sample 0' - 3.0'									
Very Stiff Brown & Gray Silty Clay	648.01						4 5 7		
*Pushed Sample 0' - 3.0'								3.1 B	24
Hard Brown & Gray Silty Clay Loam Till			4.5 P	17					
*Pushed Sample 3.0' - 6.0'									
	-5								
							4 5 7		
	644.01							2.7 B	23
Hard Brown & Gray Silty Clay		7			Hard Gray Silty Loam & Silty Clay Loam Till with Silt Layers & Loamy Gravel Layers		8 8 9		
		8 11	6.1 S	22				4.5 P	14
	-10	4							
		5 8	5.9 S	22			18 27 31		
								>4.5 P	11
		4							
		5 7	6.1 S	24					
	636.51								
Hard to Very Stiff Gray Silty Clay					Dense Gray Shale - Weathered Surface		100/5"		8
	-15	4			End of Boring				
		5 7	4.5 S	24					
		4							
		6 10	5.1 S	22					
	-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)

Page 1 of 1Date 8/23/13

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

STRUCT. NO. _____ Station _____		DEPTH (ft)	BLOWS (/6")	UCS (tsf)	MOIST (%)	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft		DEPTH (ft)	BLOWS (/6")	UCS (tsf)	MOIST (%)
BORING NO. _____ BH 10 Station _____ 178+97.45 Offset _____ 80.1 ft Lt. Ground Surface Elev. _____ 650.59 ft						Groundwater Elev.: First Encounter _____ 618.1 ft ▼ Upon Completion _____ 628.6 ft ▽ After _____ Hrs. _____ ft					
Black Silty Clay Loam Fill & Black Silty Clay Loam Topsoil		649.59	*	>4.5 P	21	Very Stiff Gray Silty Clay (continued)			3 5 7		
*Pushed Sample 0' - 3.0'								▽			
Hard Brown & Gray Silty Clay Loam Till		647.59							3 4 7		
*Pushed Sample 0' - 3.0'			*							3.4 B	22
Hard Brown & Gray Silty Clay with Layers of Silt @ 8.5'				>4.5 P	20						
*Pushed Sample 3.0' - 6.0'		-5						-25	4 5 8		
										3.6 B	22
						623.59					
			5 7 11	4.0 P	21	Hard Gray Silty Loam/Silty Clay Loam with Silt Layers & Loamy Gravel Layers			8 9 14		
										4.5 P	15
		-10						-30			
			5 5 8		20				16 18 18		
				6.1 S						>4.5 9	9
			5 7 9		21	Dense Gray Limestone		618.09 ▼ 617.92			
				5.7 S		End of Boring			100/2"		8
Very Stiff Gray Silty Clay		-15									
			3 4 6		24						
			3 4 7		24						
				3.4 B							
		-20									

SOIL BORING I-57 & IL 17 INTERCHANGE.GPJ IL_DOT.GDT 1/20/17

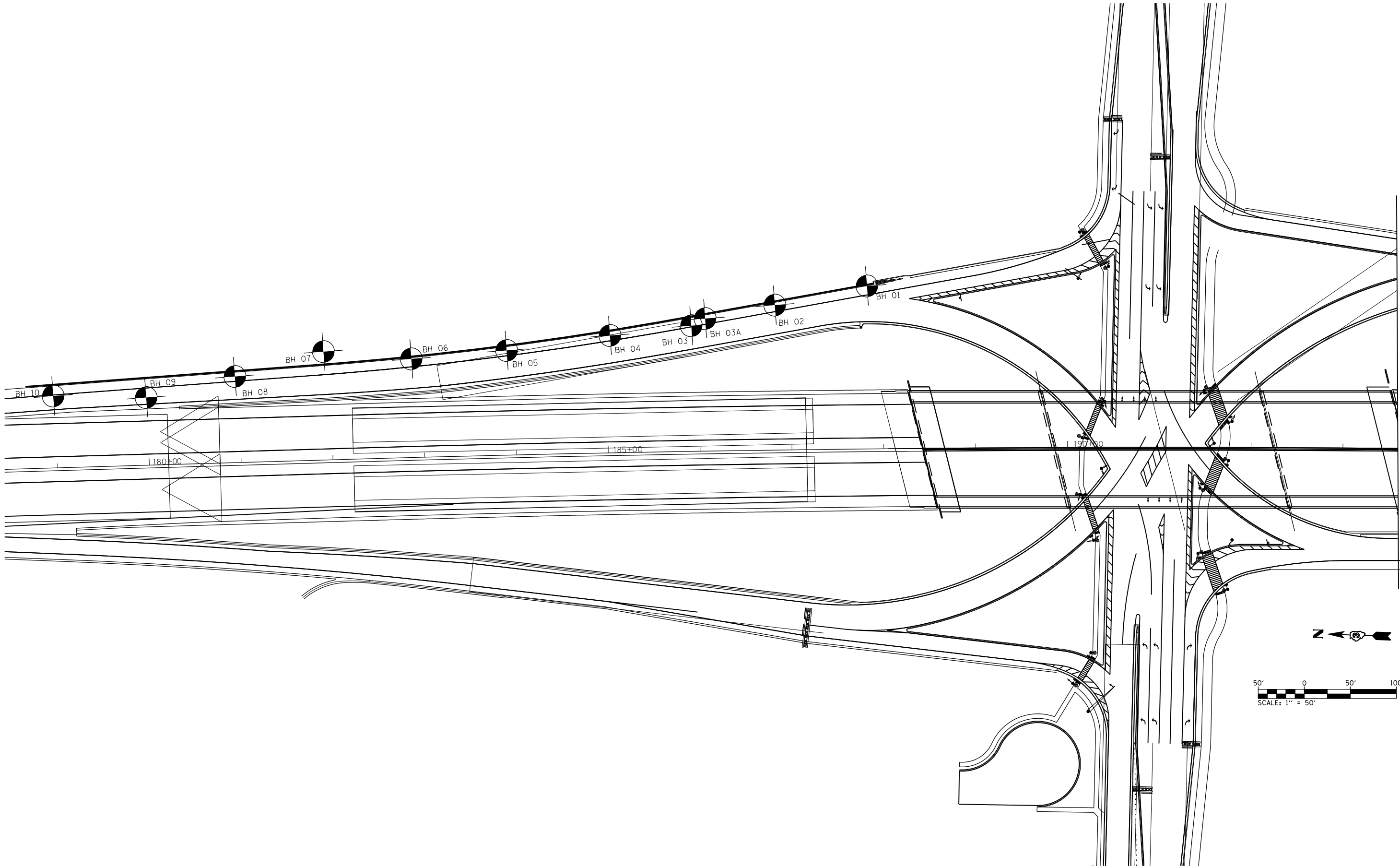
The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

BBS, form 137 (Rev. 8-99)

EXHIBIT D
SUBSURFACE PLAN
AND PROFILE

PLAN	SURVEYED	CHECKED	DATE
NOTE BOOK NO.	PLOTTED	AT	
	FILE NAME		

PROFILE	SURVEYED	CHECKED	DATE
NOTE BOOK NO.	GRADES	STRUCTURE	
	NOTATIS	CHKO	



FILE NAME = \$FILEL\$

PREPARED BY:



Kaskaskia

Engineering Group, LLC

PROFESSIONAL ENGINEERING

Professional Engineering Group

201 West Main Street, Suite 100

St. Louis, MO 63103

636.337.7777

636.337.7777

636.337.7777

636.337.7777

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

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERSTATE 57 RETAINING WALLS			
PLAN AND PROFILE			
SCALE: 1"=50'	SHEET 1 OF	SHEETS	STA 176+00 to STA 190+00

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

PLAN

SURVEYED
PLOTTED
ALIGNED
CHECKED
NOTED
FILE NAME

BY

DATE

NO.

NO.

NO.

PROFILE

SURVEYED
PLOTTED
GRADES
CHECKED
STRUCTURE
NOTATIONS CHKD

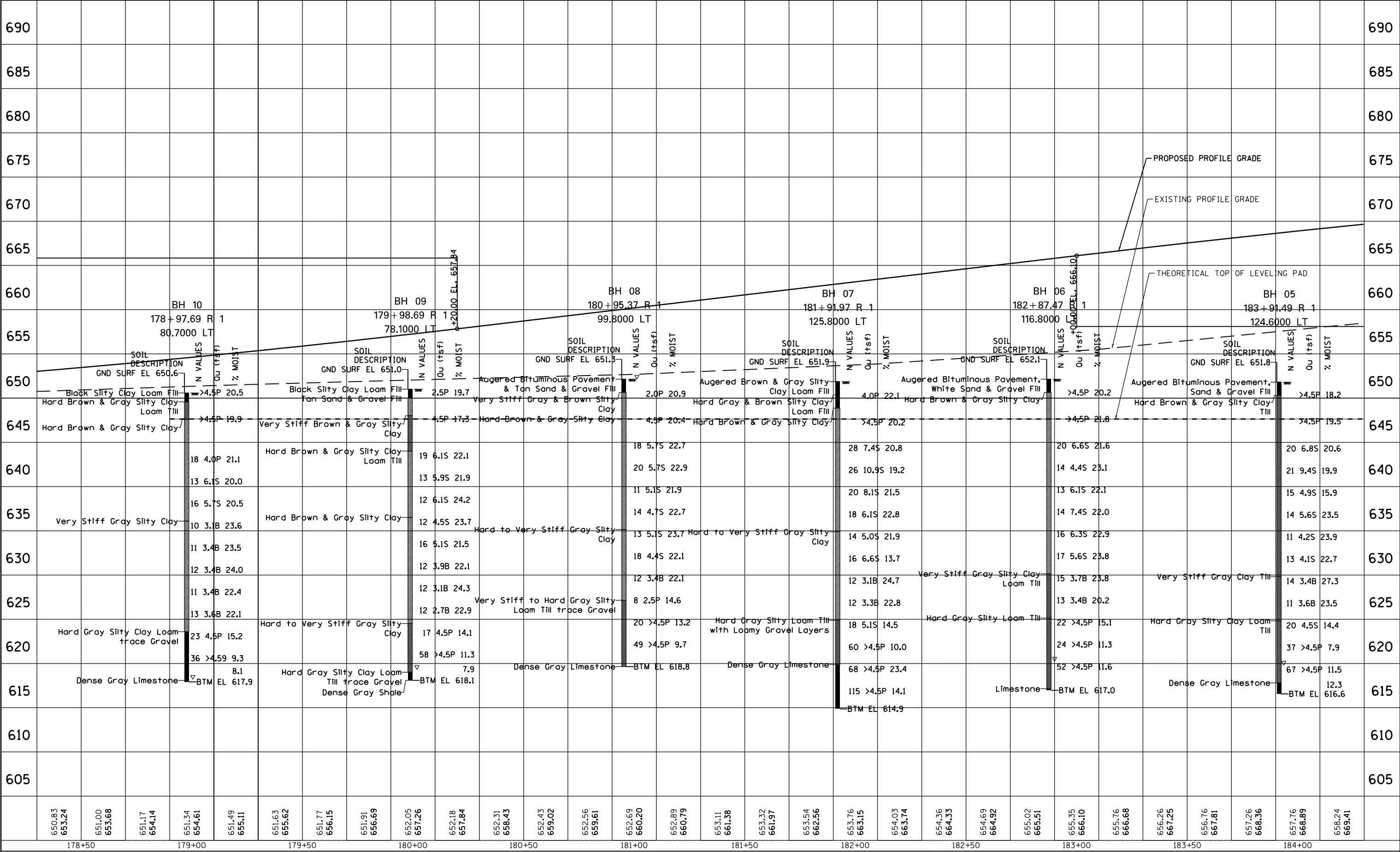
BY

DATE

NO.

NO.

NO.



PRELIMINARY – NOT FOR CONSTRUCTION

FILE NAME =
FILES

USER NAME = *USER*

DESIGNED -
DRAWN -
CHECKED -
DATE -

REVISED -
REVISED -
REVISED -
REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

INTERSTATE 57 RETAINING WALLS
PLAN AND PROFILE

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

F.A.P.
RTE.
57

SECTION
(46-3) HBK

COUNTY
KANKAKEE

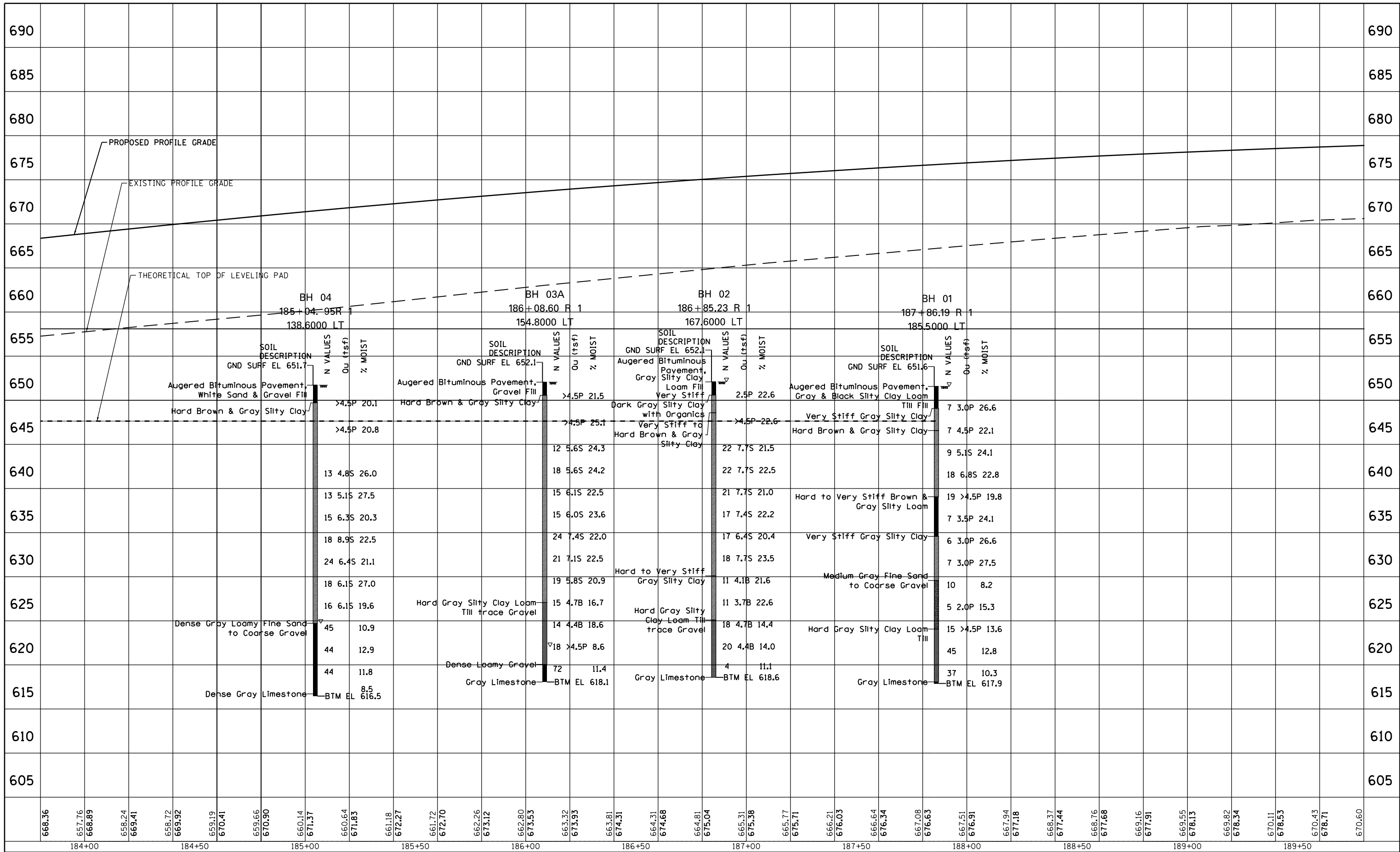
TOTAL
SHEETS
\$TOTAL

SHEET
NO.
CONTRACT NO. 66863

ILLINOIS FED. AID PROJECT

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

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



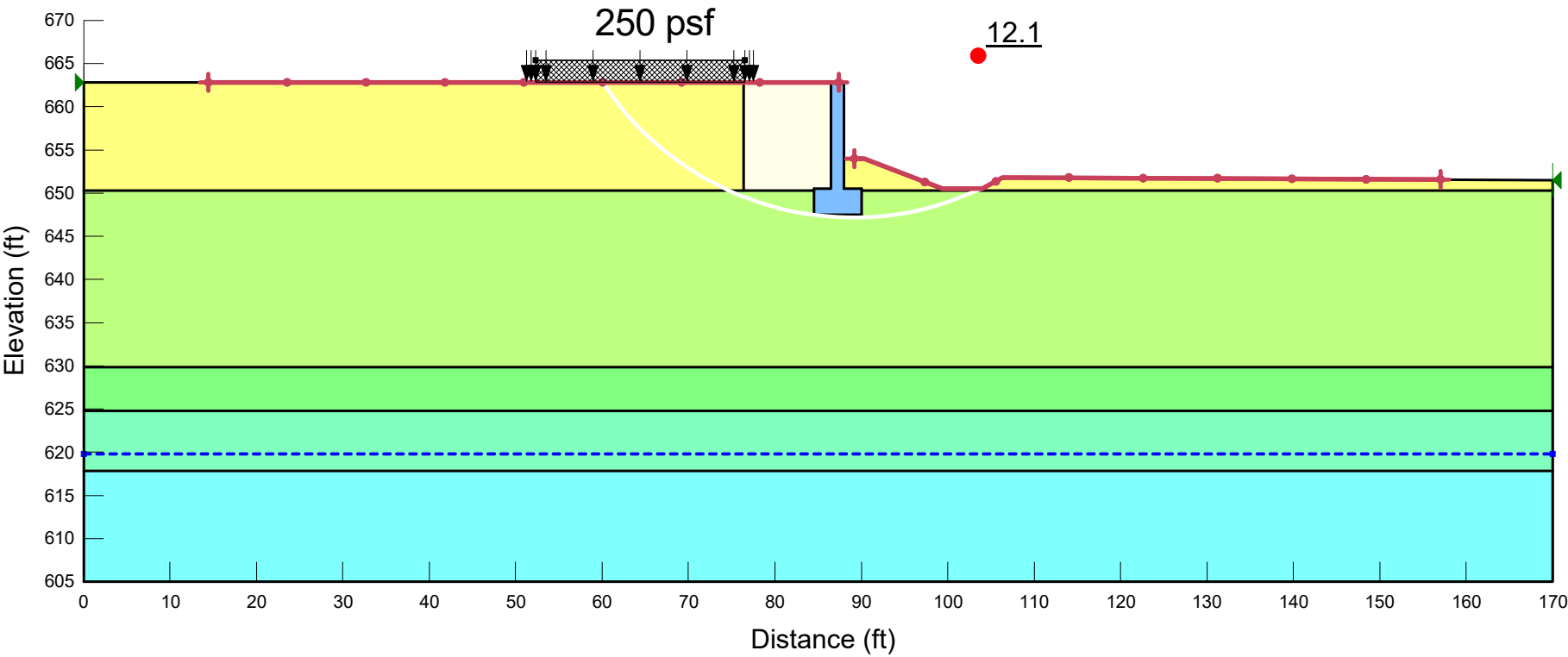
PRELIMINARY – NOT FOR CONSTRUCTION

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

EXHIBIT E
SLOPE/W STABILITY
ANALYSIS

I-57 over IL 17
Ramp B - (Sta. 10+00) MSE Wall
Reference Boring: BH 05
Kankakee, Illinois
End of Construction (Undrained Analysis)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Undrained Shear Strength (psf)	Piezometric Surface
	1 - Fill	Undrained (Phi=0)	125	1,000	1
	2 - Silty Clay	Undrained (Phi=0)	120	5,500	1
	3 - Clay Till	Undrained (Phi=0)	125	3,500	1
	4 - Silty Clay Loam Till	Undrained (Phi=0)	125	4,500	1
	5 - Limestone	Undrained (Phi=0)	150	0	1
	Concrete	High Strength	150		1
	Reinforced Soil	Undrained (Phi=0)	125	0	1



I-57 over IL 17
Ramp B - (Sta. 10+00) MSE Wall
Reference Boring: BH 05
Kankakee, Illinois
End of Construction (Drained Analysis)

Color	Name	Slope Stability Material Model	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)	Piezometric Surface
	1 - Fill	Mohr-Coulomb	125	100	26	1
	2 - Silty Clay	Mohr-Coulomb	120	100	26	1
	3 - Clay Till	Mohr-Coulomb	125	100	30	1
	4 - Silty Clay Loam Till	Mohr-Coulomb	125	100	30	1
	5 - Limestone	Mohr-Coulomb	150	100	36	1
	Concrete	High Strength	150			1
	Reinforced Soil	Mohr-Coulomb	125	0	34	1

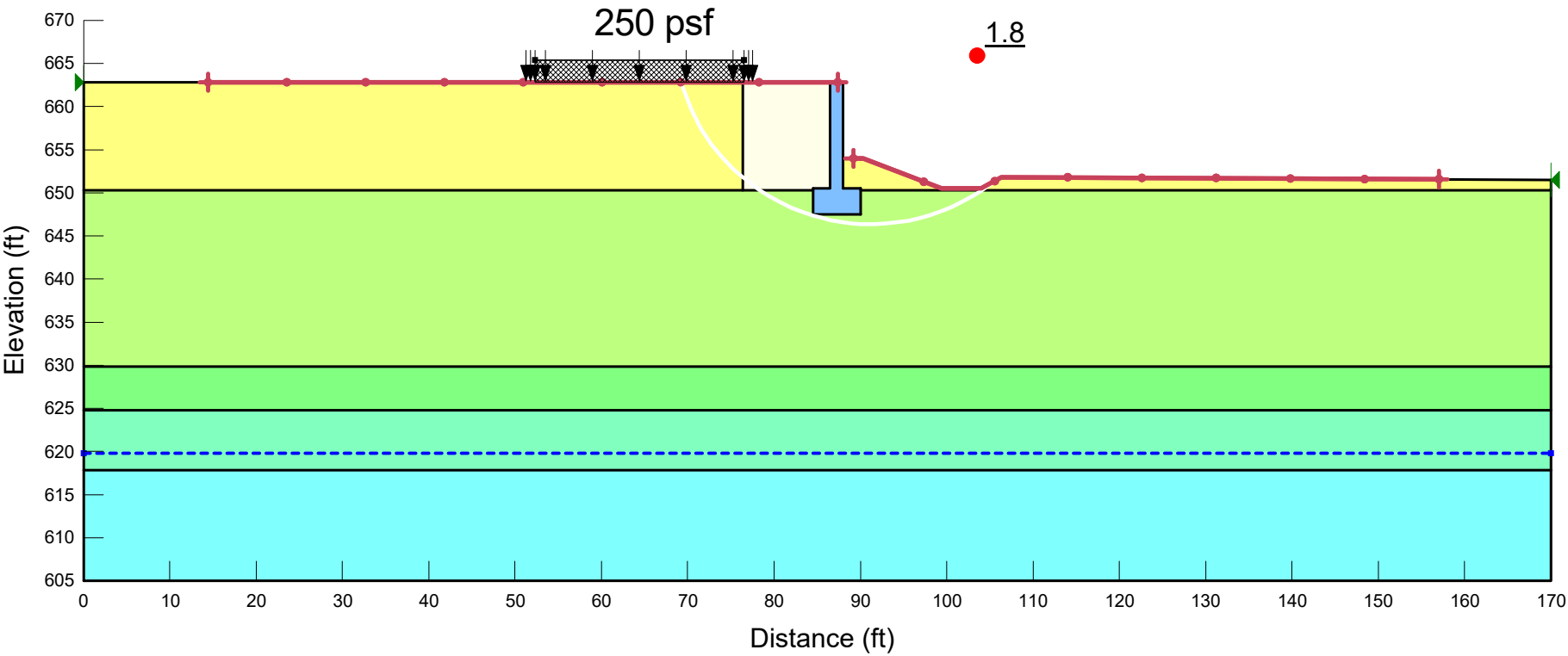


EXHIBIT F
SETTLEMENT ANALYSIS
RESULTS

I-57 over IL 17 MSE Wall at Ramp B 3 Settlement Analysis

☒ MSE Wall
☐ Embankment

Embankment Geometry
h1(ft)= 12.5
h2(ft)= 12.5

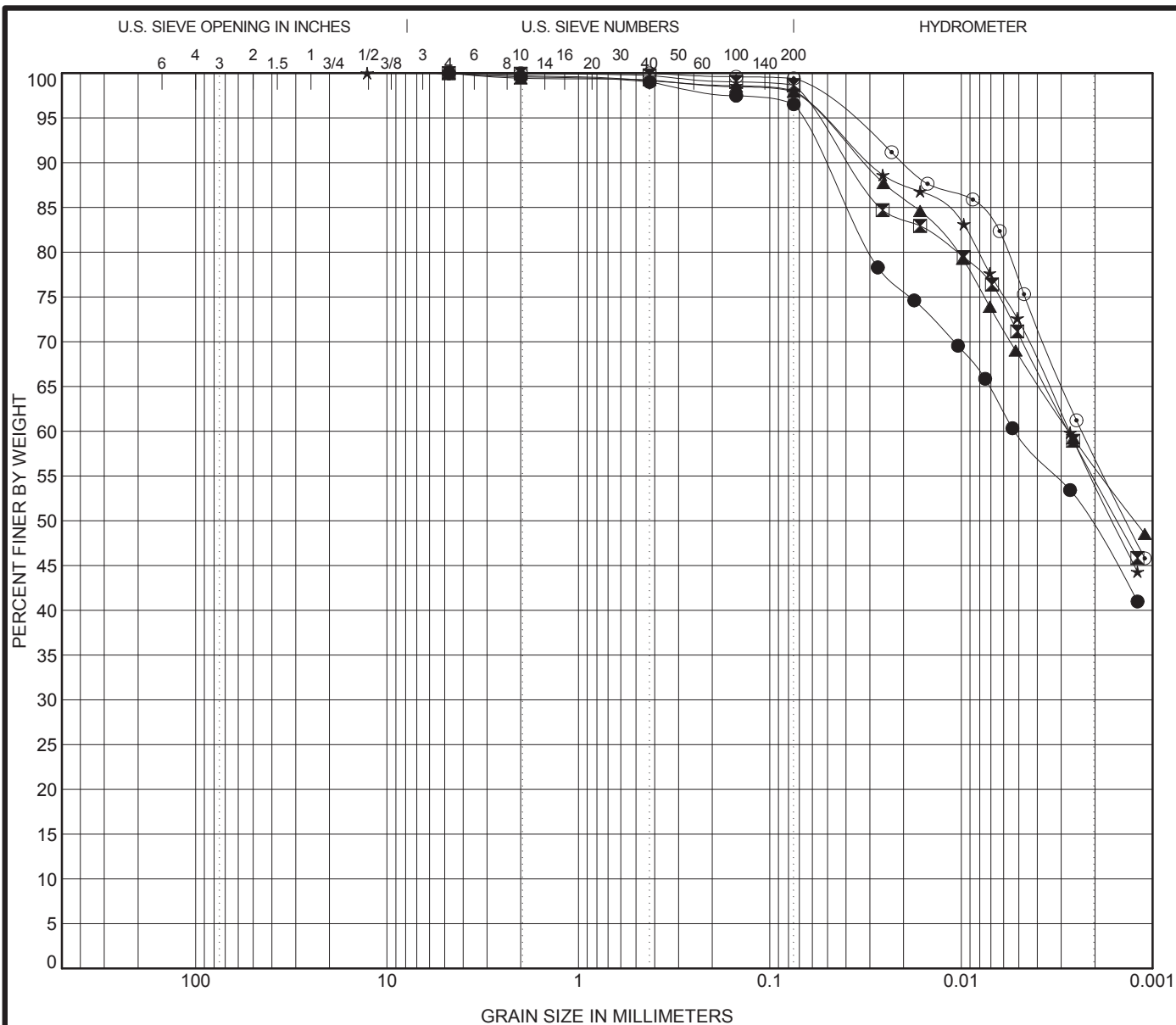
B(ft)= 0.67
L(ft)= 350

Soil Properties of Fill
γ (pcf)= 125

Settlement Analysis

Layer #	H (ft)	Soil Description	zcl (ft)	γ (pcf)	MC or LL(%)	p'o (psf)	ΔP (psf)	p'o + ΔP (psf)	eo	Cc	Cr	N	Assumed OCR	Assumed p'c (psf)	Si (in)*
1	20.49	Silty Clay	10.245	120	21	1229.4	93.18	1322.58	0.567	0.099	0.0099	16	3.19	3927.30	0.05
2	5.00	Sandy Clay Till	22.99	125	26	2771.3	41.52	2812.82	0.702	0.144	0.0144	13	1.00	2771.30	0.03
3	7.00	Silty Clay Till	28.99	125	11	3521.3	32.60	3553.90	0.297	0.009	0.0009	41	1.00	3521.30	0.00
4															
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15															
														Total Si (in)	0.08

EXHIBIT G
LABORATORY TESTING
RESULTS



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	BH 01	2.50	A-7-6 (32) CLAY			49.1	18.9	30.2		
☒	BH 01	5.00	A-7-6 (27) CLAY			45.4	20.0	25.4		
▲	BH 02	1.50	A-7-6 (33) CLAY			47.9	17.2	30.7		
★	BH 02	3.50	A-7-6 (21) CLAY			41.2	21.4	19.8		
◎	BH 03A	1.50	A-6 (20) CLAY			38.9	19.6	19.3		
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 01	2.50	4.75	0.005			0.4	3.1	47.7	48.8
☒	BH 01	5.00	4.75	0.003			0.1	1.3	44.2	54.5
▲	BH 02	1.50	4.75	0.003			0.6	1.5	42.0	56.0
★	BH 02	3.50	12.7	0.003			0.3	1.7	43.9	54.1
◎	BH 03A	1.50	4.75	0.002			0.0	0.6	42.4	57.0



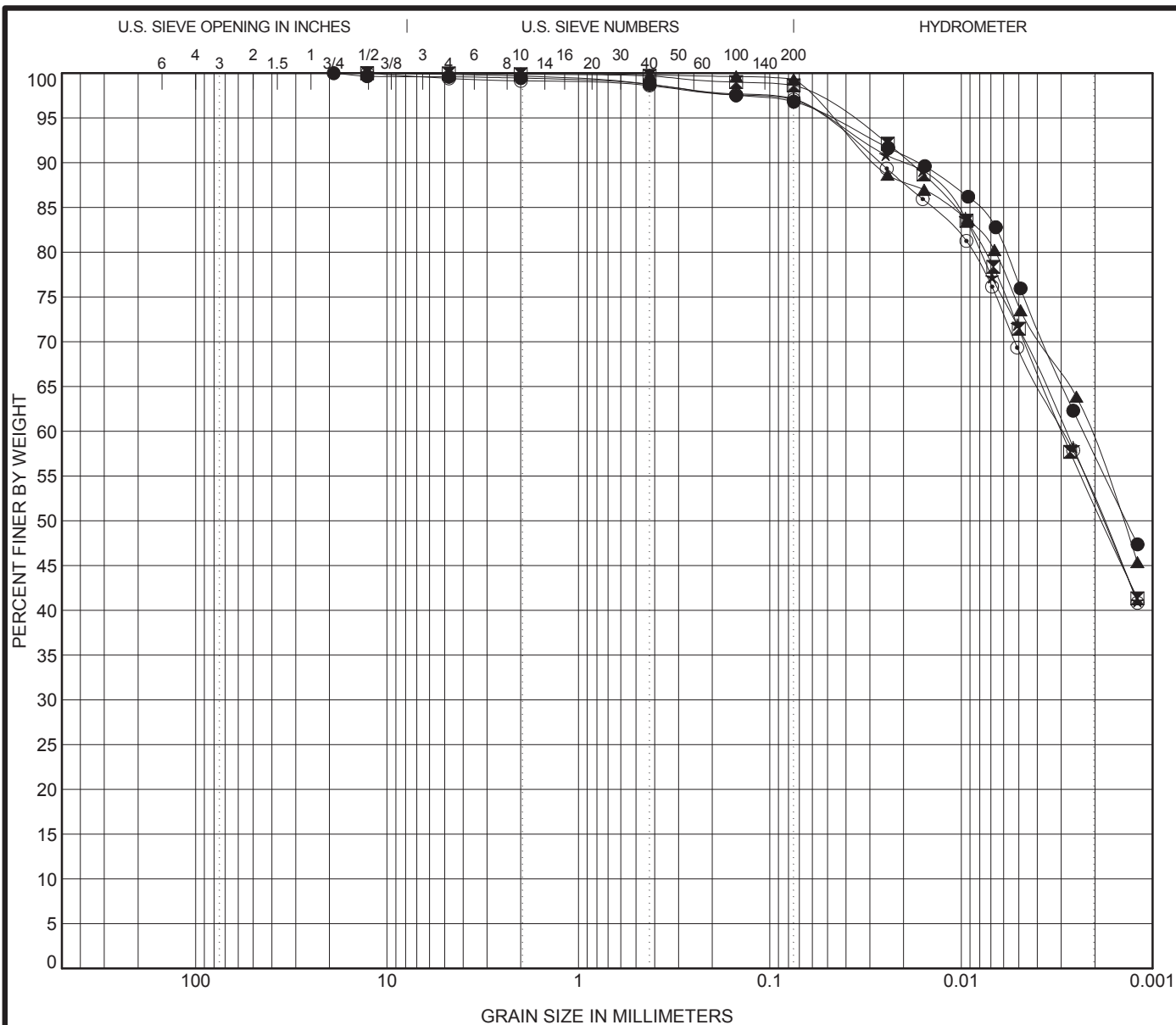
**Illinois Department
of Transportation**
Division of Highways
IDOT

IDH GRAIN SIZE DISTRIBUTION

Route: I-57 (FAI 57)

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

County: Kankakee



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	BH 03A	4.50	A-6 (22) CLAY			39.9	18.1	21.8		
⊠	BH 04	2.00	A-6 (20) CLAY			38.9	19.9	19.0		
▲	BH 04	5.00	A-6 (20) CLAY			38.9	20.3	18.6		
★	BH 05	1.50	A-6 (20) CLAY			40.4	20.7	19.7		
⊙	BH 05	4.50	A-6 (19) CLAY			38.4	19.2	19.2		
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 03A	4.50	19	0.002			0.6	2.6	39.6	57.2
⊠	BH 04	2.00	12.7	0.003			0.1	1.2	47.0	51.6
▲	BH 04	5.00	4.75	0.002			0.0	0.7	41.1	58.2
★	BH 05	1.50	12.7	0.003			0.3	2.5	44.8	52.4
⊙	BH 05	4.50	12.7	0.003			0.9	2.1	45.0	52.1



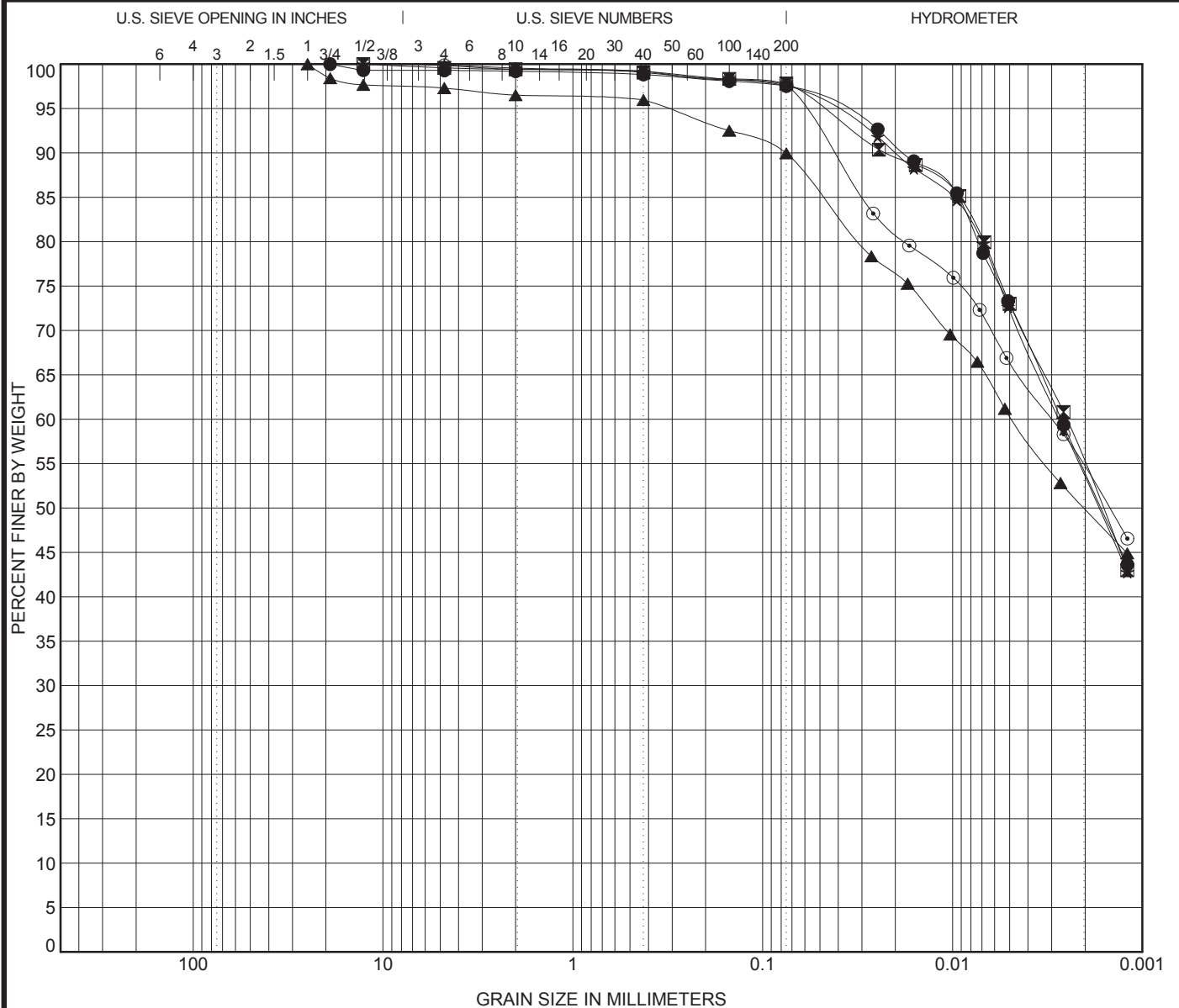
Illinois Department of Transportation
Division of Highways
IDOT

IDH GRAIN SIZE DISTRIBUTION

Route: I-57 (FAI 57)

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

County: Kankakee



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	BH 06	1.50	A-7-6 (21) CLAY			40.6	21.2	19.4		
☒	BH 06	4.50	A-6 (20) CLAY			39.3	20.4	18.9		
▲	BH 07	1.50	A-7-6 (39) CLAY			59.1	19.0	40.1		
★	BH 07	3.00	A-7-6 (26) CLAY			44.9	21.1	23.8		
◎	BH 08	1.50	A-7-6 (41) CLAY			57.8	21.0	36.8		
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 06	1.50	19	0.003			0.8	1.7	43.5	54.0
☒	BH 06	4.50	12.7	0.003			0.6	1.6	43.0	54.8
▲	BH 07	1.50	25	0.005			3.5	6.6	40.1	49.9
★	BH 07	3.00	12.7	0.003			0.5	2.0	44.2	53.4
◎	BH 08	1.50	12.7	0.003			0.6	1.7	43.4	54.3



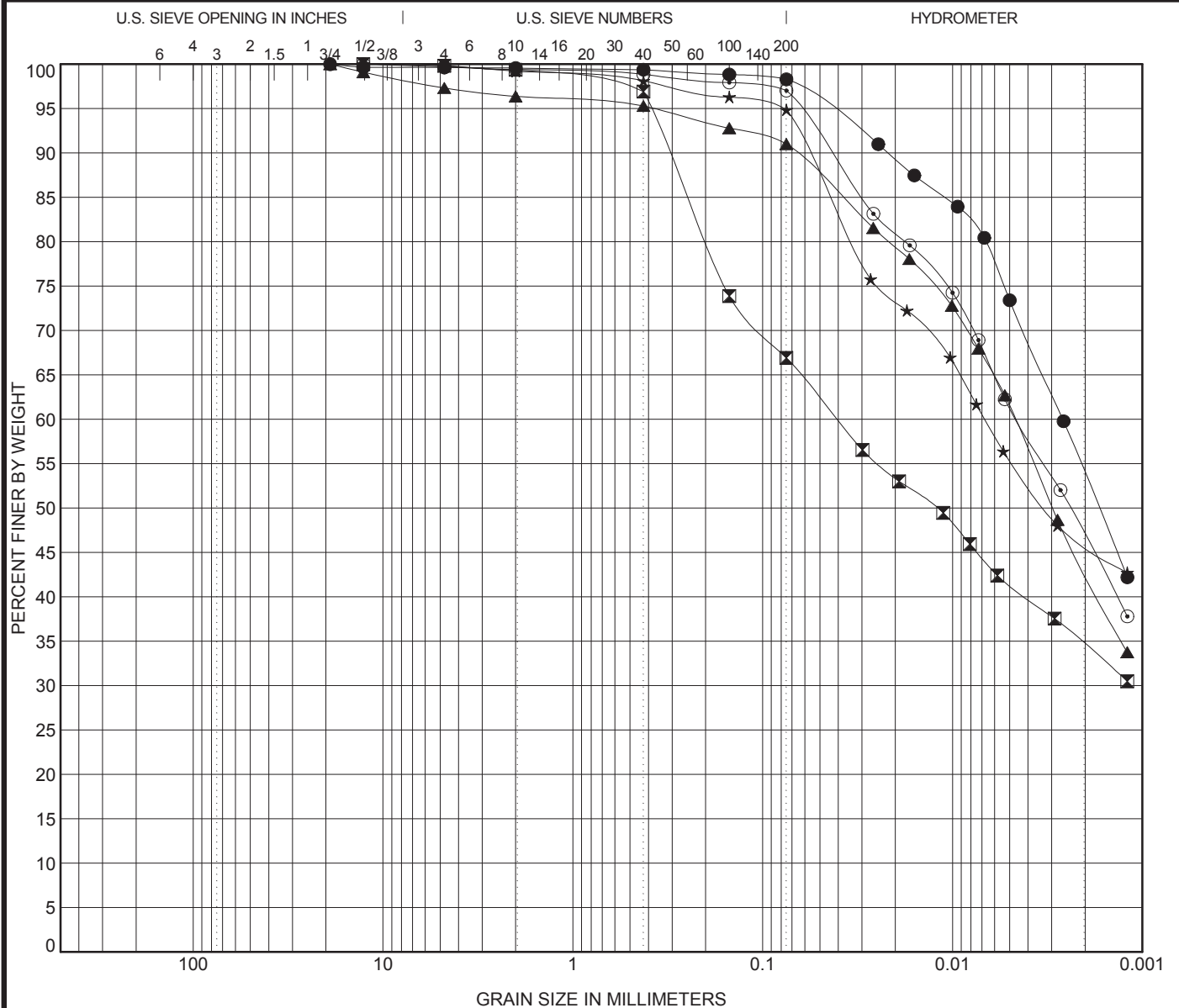
Illinois Department of Transportation
Division of Highways
IDOT

IDH GRAIN SIZE DISTRIBUTION

Route: I-57 (FAI 57)

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

County: Kankakee



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

Specimen Identification			Classification			LL	PL	PI	Cc	Cu
●	BH 08	4.50	A-7-6 (25) CLAY			44.9	21.5	23.4		
⊠	BH 09	1.00	A-6 (12) CLAY			36.7	14.5	22.2		
▲	BH 09	3.00	A-6 (15) CLAY			35.6	20.2	15.4		
★	BH 10	1.00	A-7-6 (21) CLAY			40.7	19.9	20.8		
⊙	BH 10	3.00	A-6 (16) SILTY CLAY			37.0	21.1	15.9		
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	BH 08	4.50	19	0.003			0.4	1.3	44.5	53.8
⊠	BH 09	1.00	12.7	0.041			0.6	32.5	32.3	34.6
▲	BH 09	3.00	19	0.005			3.6	5.4	48.2	42.7
★	BH 10	1.00	12.7	0.007			0.8	4.3	48.9	45.9
⊙	BH 10	3.00	12.7	0.005			0.6	2.4	50.3	46.8



**Illinois Department
of Transportation**
Division of Highways
IDOT

IDH GRAIN SIZE DISTRIBUTION

Route: I-57 (FAI 57)

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

County: Kankakee

EXHIBIT H

BEARING RESISTANCE ANALYSIS

Diagram illustrating the forces and dimensions for a gravity retaining wall. The wall has a total height H and base width B . The reinforced soil mass on the left has a height A and a base width L . The retained fill on the right has a height H and a base width B . The diagram shows the following forces and dimensions:

- Reinforced Soil Mass:**
 - Height: A
 - Base width: L
 - Soil pressure: $V_1 \cdot \gamma \cdot H_L$
 - Surcharge: $V_3 \cdot \gamma \cdot H_L$
 - Active earth pressure: $F_1 = \frac{1}{2} \gamma_f h^2 K_a$
 - Dimensions: $L/2$, $L/6$, $L/3$
- Retained Fill:**
 - Height: H
 - Base width: B
 - Soil pressure: $V_2 \cdot \frac{(h-H) \gamma}{2}$
 - Active earth pressure: $F_1 = \frac{1}{2} \gamma_f h^2 K_a$
 - Dimensions: $H/3$, $L/3$
- Forces and Dimensions:**
 - Horizontal force: F_{TV}
 - Vertical force: F_{TH}
 - Dimensions: $L/2$, $L/6$, $L/3$, $H/3$

Wall Dimensions

L=	8.14 ft	H=	4.083 ft
B=	8.69 ft	h=	12.417 ft
		β=	0 °

yr (pcf)	$\phi r(^{\circ})$	cr (psf)
125	34	0

γb (pcf)	φb(°)	cb (psf)	Ka
125	30	0	0.333

yb (pcf)	$\phi b(^{\circ})$	cb (psf)	Ka	h (ft)	Ft (psf)
125	30	0	0.333	12.417	3212.12
Total=				12.417	3212.12

yf(pcf)	φf(°)	cf (psf)	Nc	Ny
120	26	100	22.25	12.54

Force	Value (lb/ft)	Moments arm at Point A (ft)	Moment	Moment at Point A lb-ft/ft
V1=	4154.45	4.07	MV1=	16909
V2=	4239.92	5.43	MV2=	23009
Ftv=	0.00	8.14	Mftv=	0
Total=	8394.38		Total=	39917

Force	Value (lb/ft)	Moments arm at Point A (ft)	Moment	Moment at Point A lb- ft/ft
Fth=	3212.1	4.14	MFth=	13295

a=	3.17 ft	
Limiting e=	1.36 ft	
e=	0.90 ft	ok

σv=	1323.43	psf	
qult=	8349.54	psf	
FOS=	6.3		ok

Diagram illustrating the forces and dimensions for a gravity retaining wall. The wall has a total height H and base width B . The reinforced soil mass on the left has a height h and a base width L . The retained fill on the right has a height $h/3$. The soil mass is reinforced with a layer of length $L/2$ and a vertical spacing of $L/6$. The soil mass is labeled "Reinforced Soil Mass" with properties ϕ, γ, K . The retained fill is labeled "Retained Fill" with properties ϕ_r, γ_r, K_{er} . The forces acting on the wall are: F_1 (soil mass weight), F_{TV} (vertical component of active earth pressure), F_{TH} (horizontal component of active earth pressure), and F_r (soil mass weight). The dimensions are: L (base width of reinforced soil mass), $L/2$ (horizontal distance from wall face to reinforcement), $L/6$ (vertical spacing of reinforcement), $L-2e$ (distance from wall face to reinforcement), and $h/3$ (height of retained fill). The soil mass is labeled "Reinforced Soil Mass" with properties ϕ, γ, K . The retained fill is labeled "Retained Fill" with properties ϕ_r, γ_r, K_{er} . The forces acting on the wall are: F_1 (soil mass weight), F_{TV} (vertical component of active earth pressure), F_{TH} (horizontal component of active earth pressure), and F_r (soil mass weight). The dimensions are: L (base width of reinforced soil mass), $L/2$ (horizontal distance from wall face to reinforcement), $L/6$ (vertical spacing of reinforcement), $L-2e$ (distance from wall face to reinforcement), and $h/3$ (height of retained fill).

Wall Dimensions

L=	8.14 ft	H=	4.083 ft
B=	8.69 ft	h=	12.417 ft
		β=	0 °

γ_r (pcf)	φ_r(°)	c_r (psf)
125	34	0

γb (pcf)	φb(°)	cb (psf)	Ka
125	30	0	0.333

yb (pcf)	$\phi b(^{\circ})$	cb (psf)	Ka	h (ft)	Ft (psf)
125	30	0	0.333	12.417	3212.12
Total=				12.417	3212.12

yf(pcf)	φf(°)	cf (psf)	Nc	Ny
120	26	100	22.25	12.54

Force	Value (lb/ft)	Moments arm at Point A (ft)	Moment	Moment at Point A lb-ft/ft
V1=	4154.45	4.07	MV1=	16909
V2=	4239.92	5.43	MV2=	23009
Ftv=	0.00	8.14	Mftv=	0
Total=	8394.38		Total=	39917

Force	Value (lb/ft)	Moments arm at Point A (ft)	Moment	Moment at Point A lb- ft/ft
Fth=	3212.1	4.14	MFth=	13295

a=	3.17 ft	
Limiting e=	1.36 ft	
e=	0.90 ft	ok

σv=	1323.43 psf	
qult=	8349.54 psf	
FOS=	6.3	ok

EXHIBIT I

SOIL PARAMETERS FOR LATERAL LOADS

AND WALL DESIGN PARAMETERS

Soil Paramaters for Lateral Load Analysis

													Backslope Angle (°)			0											
													Rankine Theory Earth Pressure Coefficients														
Boring	Elevation	Soil Description	TP	GWT	Elev Bot. of Layer (ft)	Depth (ft)	Cr	N60	γ (pcf)	Short Term/Undrained Parameters		Long Term/Drained Parameters		Short Term			Long Term			N Value (Average)	Assumed% Fines < #200	K (pci)	ε50				
										c (psf)	Φ (deg.)	c (psf)	Φ (deg.)	Ka	Kp	Ko	Ka	Kp	Ko								
BH-01	651.57	Fill	C	A	649.07	2.50	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	639.07	12.50	0.85	9	120	4850	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	65	2000	0.004				
		Silty Loam	S	A	634.57	17.00	0.95	14	120	4000	31	-	31	0.32	3.12	0.48	0.32	3.12	0.48	13	65	90	-				
		Silty Clay	C	A	629.57	22.00	0.95	6	120	3000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	6	65	1000	0.005				
		Sand	S	A	624.07	27.50	1	8	115	1000	29	-	29	0.35	2.88	0.52	0.35	2.88	0.52	7	3	25	-				
		Silty Clay Loam	C	A	618.07	33.50	1	75	120	1500	0	150	28	1.00	1.00	1.00	0.36	2.77	0.53	65	65	500	0.007				
BH-02	652.09	Fill	C	A	650.59	1.50	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	625.09	27.00	1	7	120	5940	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	6	65	2000	0.004				
		Silty Clay Loam Till	C	A	622.10	29.99	1	21	125	4700	0	100	30	1.00	1.00	1.00	0.33	3.00	0.50	18	65	2000	0.004				
		Silty Clay Loam Till	C	B	618.59	33.50	1	14	125	2200	0	100	30	1.00	1.00	1.00	0.33	3.00	0.50	12	65	1000	0.005				
BH-03	652.06	Fill	C	A	650.56	1.50	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	627.06	25.00	0.95	14	120	5800	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	13	65	2000	0.004				
		Silty Clay Loam Till	C	A	622.10	29.96	1	16	125	4550	0	100	30	1.00	1.00	1.00	0.33	3.00	0.50	14	65	2000	0.004				
		Silty Clay Loam Till	C	B	620.06	32.00	1	21	125	4500	0	100	30	1.00	1.00	1.00	0.33	3.00	0.50	18	65	2000	0.004				
		Gravel	G	B	618.06	34.00	1	84	125	-	48	-	38	0.15	6.79	0.26	0.24	4.20	0.38	72	3	-	-				
BH-04	651.71	Fill	C	A	649.71	2.00	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	624.71	27.00	1	15	120	5800	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	13	65	2000	0.004				
		Sand	S	B	616.71	35.00	1	51	115	-	41	-	41	0.21	4.81	0.34	0.21	4.81	0.34	44	3	125	-				
																			1.00								
BH-05	651.81	Fill	C	A	650.31	1.50	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	629.81	22.00	0.95	12	120	5500	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	11	65	2000	0.004				
		Silty Clay Till	C	A	624.81	27.00	1	14	125	3500	0	100	30	1.00	1.00	1.00	0.33	3.00	0.50	12	65	1000	0.005				
		Silty Clay Loam Till	C	A	619.80	32.01	1	32	125	4500	0	150	30	1.00	1.00	1.00	0.33	3.00	0.50	28	65	2000	0.004				
		Sandy Loam Till	S	B	617.81	34.00	1	78	125	4500	47	-	47	0.16	6.44	0.27	0.16	6.44	0.27	67	35	125	-				
																			1.00								
BH-06	652.14	Fill	C	A	650.64	1.50	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	630.14	22.00	0.95	12	120	5675	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	11	65	2000	0.004				
		Silty Clay Loam Till	C	A	625.14	27.00	1	16	125	3500	0	100	30	1.00	1.00	1.00	0.33	3.00	0.50	14	65	1000	0.005				
		Silt	C	A	617.14	35.00	1	37	110	4500	0	150	26	1.00	1.00	1.00	0.39	2.56	0.56	32	85	2000	0.004				
BH-07	651.87	Fill	C	A	648.00	3.87	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	624.87	27.00	1	16	120	5900	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	14	65	2000	0.004				
		Silty Clay Loam Till	C	A	619.87	32.00	1	45	125	4800	0	150	30	1.00	1.00	1.00	0.33	3.00	0.50	39	65	2000	0.004				
		Silt	C	A	614.87	37.00	1	106	110	4500	0	150	26	1.00	1.00	1.00	0.39	2.56	0.56	91	85	2000	0.004				
BH-08	651.32	Fill	C	A	649.82	1.50	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay	C	A	626.32	25.00	0.95	14	120	4825	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	13	65	2000	0.004				
		Silty Loam	S	A	618.82	32.50	1	29	120	3800	35	-	35	0.27	3.69	0.43	0.27	3.69	0.43	25	65	90	-				
BH-09	651.01	Fill	C	A	650.01	1.00	0.75	8	125	2500	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	1000	0.005				
		Silty Clay	C	A	624.51	26.50	0.95	11	120	4440	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	65	2000	0.004				
		Silty Loam	S	A	619.01	32.00	1	43	120	4500	39	-	39	0.23	4.40	0.37	0.23	4.40	0.37	37	65	225	-				
BH-10	650.59	Fill	C	A	649.59	1.00	0.75	8	125	1000	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	10	0	100	0.01				
		Silty Clay Loam Till	C	A	647.59	3.00	0.75	0	125	4500	0	50	30	1.00	1.00	1.00	0.33	3.00	0.50	0	65	2000	0.004				
		Silty Clay	C	A	623.59	27.00	1	12	120	4100	0	100	26	1.00	1.00	1.00	0.39	2.56	0.56	11	65	2000	0.004				
		Silty Loam	S	A	618.09	32.50	1	35	120	4500	37	-	37	0.25	4.02	0.40	0.25	4.02	0.40	30	65	90	-				