Prepared for:
City of Springfield
300 South Seventh Street
Springfield, Illinois 62701

Structure Designer:
Hanson Professional Services Inc.
1525 South Sixth Street
Springfield, Illinois 62703
(217) 788-2450

Prepared By:
Hanson Professional Services Inc.
1525 South Sixth Street
Springfield, Illinois 62703
(217) 788-2450
rchantome@hanson-inc.com

Structure Geotechnical Report

F.A.U. Route 7972
Section 20-00492-00-BR
Sangamon County
Job No. ---
Contract No. ---
PTB No. N/A
UPRR Over North Grand Avenue
Structure No. 084-9972

February 2021

Table of Contents

Tables

1. Project Description

This report provides geotechnical data and recommendations for the proposed Union Pacific (UP) Railroad Bridge Over North Grand Avenue, which is part of the Springfield Rail Improvements Project. The project includes the relocation of the existing UP tracks from the 3rd Street corridor to the 10th Street corridor. The project includes modifications to four existing grade separations and nine new grade separations. The bridge and retaining walls covered by this structure geotechnical report will be new structures carrying the railroad over a lowered North Grand Avenue.

Nearby project features that have an impact on the design or construction of the proposed bridge and retaining walls include the North Grand Avenue roadway and the UP Railroad relocation. Geotechnical recommendations for the street and railroad alignments are contained in a geotechnical report prepared by Hanson Professional Services Inc. (Hanson).

2. Location

The proposed UPRR Over North Grand Avenue is located in the central portion of Sangamon County, within Sections 22 and 27 of Township 16 North, Range 5 West. It is located at Sta. 47694+11.95 along the UPRR Main 1 alignment. Structure Number 084-9972 carries the UPRR over North Grand Avenue at approximately Sta. 26+66.84.

3. Proposed Structures

The general structure configuration was determined from an informal type study as discussed later in this report. The proposed grade separation structure will be a two-span bridge with stub abutments and a multi-column bent-type pier. The superstructure of the bridge will be a steel plate ballast pan on W27 stringers. The abutments will be supported by new soldier pile retaining walls that will parallel North Grand Avenue along the outside of the sidewalks. The profile grade of North Grand Avenue will be lowered by up to 15 ft, allowing it to pass beneath the railroads. The low point of the underpass will be west of the railroad. Retaining walls will extend from Sta. 22+91, near 9th Street, to Sta. 28+82, near 11th Street.

The structures will be supported on drilled shaft and spread footing foundations. Based on information provided by the structure designer, vertical service loads of approximately 1,600 kips per abutment and 2,600 kips per pier will be applied to the foundations.

The proposed bridge will be constructed with North Grand Avenue closed to traffic between 9th Street and 11th Street. The substructures for the new bridges will be constructed in a down-top sequence. The railroad tracks will be relocated to the completed bridge superstructure after the final excavation for North Grand Avenue.

4. Site Investigation

The project site is located in a developed, urban area. The existing North Grand Avenue railroad crossing is at grade. Existing grade along the street ranges from approximately Elev. 603.8 to Elev. 606.6 with the highest point near 11th Street and the lowest point near 9th Street. Adjacent properties consist of residential and commercial properties.

Test borings were completed in August 2013 using a drill rig operated by Professional Services Industries, Inc. Twenty-one (21) borings were drilled at the location of the proposed structures. All borings were advanced using hollow stem augers. NQ-sized core samples were collected at two locations. Standard Penetration Test (SPT)

samples were generally collected at 2.5 ft intervals. All SPT samples were collected using an automatic hammer. The borings were advanced to depths between 5.0 and 49.0 ft.

The boring locations are shown on the Boring Location Plan included in the Appendix. Boring logs and rock core photos are also included in the Appendix.

5. Laboratory Investigation

Soil samples from the borings were tested in Hanson's soils laboratory. The laboratory analysis consisted of moisture content determinations, unconfined strength tests of SPT samples, and unconfined strength tests of rock core samples. The results of the tests are indicated on the subsurface data profile.

6. Subsurface Profile

Subsurface data profiles for the proposed bridge and retaining walls are presented in the Appendix for use by the structure designer. The data profiles include all of the borings that were drilled near the proposed structures. The general subsurface profile consists of deposits of fill material, loess, glacial till, and shale and sandstone bedrock.

Asphalt and concrete pavement between 0.72 and 1.4 ft. thick were encountered at the ground surface in all the boring locations.

A layer of fill was encountered at five (5) boring locations. The fill extended from the ground surface or base of pavement to the top of the loess. The fill material generally appeared to be composed of silty clay and gravel. SPT N-values between 4 and 15 blows per foot penetration were recorded for the fill materials. Measured unconfined strengths were between 1.00 and 1.53 tsf.

A 7.5 to 10.0 ft thick layer of sandy clayey silt, loessial soil was found in all borings. The top of this layer is generally below the base of the pavement to approximately 3.5 ft below the existing ground surface. The bottom elevation of this layer was generally encountered between 593 and 598. SPT N-values between 0 and 9 blows per foot penetration were recorded for the loess materials. Unconfined strengths were generally between 0.39 to 3.3 tsf.

The glacial till was encountered in most borings with a top elevation between 593 and 598 or between 8.5 and 11.0 ft below grade. N-values for the till were consistent around 4 to 12 blows per foot penetration. Unconfined strengths ranged from 0.29 to 4.5 tsf.

Below the till layer, a highly weathered clayey shale was encountered in most of the deeper borings and is believed to be present over the entire site. The top of this layer was encountered at approximately 16.0 to 18.5 ft below grade.

A stronger, sandy shale and/or interbedded shale and sandstone layer was encountered at three boring locations between Elev. 581 and 582, at 23.5 ft below grade. This stratum was cored in B-081 and B-091. Unconfined strengths measured in three tests on rock cores were between 27.6 and 140.2 tsf.

Groundwater was encountered during drilling in one boring, B-081, at 21.0 ft below grade. The borings were drilled during an unusually dry period.

The Illinois State Geological Survey Directory of Coal Mines does not list any mines in the immediate vicinity of these structures.

7. Geotechnical Evaluations

Several retaining wall and bridge configurations were considered for the proposed grade separation. A roadway overpass would extend the North Grand Avenue vertical curve into the 9th Street and 11th Street intersections due to the higher clearance needed over the railroads. An underpass requires the use of retaining walls along both sides of the street due to the narrow ROW and adjacent high value property. Soldier pile retaining walls are the best choice for the conditions at this site, because they can be constructed with minimal new ROW acquisition and the least disruption to the surrounding businesses.

ROW and/or permanent easements for tiebacks are not available. A substantial cantilevered structural member is required to support the temporary grade differences of up to 15 ft. Consequently, sheet pile and driven soldier pile walls are not feasible for the tallest sections of the wall. Drilled soldier pile walls with either wide-flange structural sections or reinforcement bars are feasible and could also directly support the bridge abutments.

A tiered configuration consisting of a short MSE wall in front of soldier pile wall was selected. The soldier pile wall will be constructed in a top-down sequence. The MSE wall will be constructed against the soldier piles after excavating to a level below the North Grand Avenue finish grade. The MSE wall will support the proposed sidewalk but will not be assumed to provide any direct lateral support to the soldier pile wall. The MSE wall reduces the height of the cast-in-place facing on the soldier pile wall and provides additional vertical confining stress on the soil in front of the tangent piles.

The relatively steep profile grade along North Grand Avenue results in rapidly varying wall heights. The proposed wall configuration was selected as a compromise between the minimum structural requirements and a consistent cross-section for ease of construction. Where the net grade difference is less than approximately 6 ft, and there is sufficient right of way for a temporary excavation behind the MSE wall, the permanent soldier pile wall will be discontinued, and a less than 2 ft tall semi-gravity wall will be constructed above the MSE wall.

Slope stability analyses were not necessary, because the finished grade in front of the proposed walls is level and the soils are stiff to very stiff clays. If the retaining walls are designed to satisfy AASHTO external stability and sliding requirements, they will also meet AASHTO and IDOT global stability requirements. Insignificant settlement following construction is anticipated because the proposed structures will not impose additional effective vertical stress when compared to the existing condition.

8. Design Recommendations

The proposed bridge substructures should be supported on drilled shaft foundations with the tips founded in the sandy shale and/or interbedded shale and sandstone. In order to provide a consistent bearing surface on the rock, the estimated tip elevations should be at least 1.0 ft below the top of Sandy Shale & Interbedded Shale & Sandstone elevations listed in Table 8.1. The shafts should be proportioned to resist the axial loads using only the tip resistance of the Sandy Shale & Interbedded Shale & Sandstone layer given in Table 8.2. Any side resistance contributed by the overlying, much softer layers above should be ignored. It is anticipated that the diameter and spacing of drilled shafts at the abutments may be governed by the lateral loadings.

Table 8.1 Top of Strata Elevations for Foundation Design

Location	Loess	Glacial Till	Highly Weathered Clayey Shale	Sandy Shale & Interbedded Shale & Sandstone
South Wall	605	595	588.5	581.7
Bridge Pier	---	---	587.0	582.4
North Wall	605	595	587.0	581.7

Table 8.2 Drilled Shaft Axial Load Design Parameters

Stratum	Nominal Side Resistance (ksf)	Resistance Factor φ_{stat}	Nominal Tip Resistance (ksf)	Resistance Factor φ_{stat}
Loess	0.69	0.45	11.25	0.40
Glacial Till	0.83	0.45	13.50	0.40
Highly Weathered Clayey Shale	1.10	0.45	18.00	0.40
Sandy Shale & Interbedded Shale & Sandstone	---	---	175	0.50[1]

[1] Use FS=2.5 for AREMA allowable stress design

Drilled shafts and/or drilled soldier piles that will serve as a retaining structure will require some means to prevent soil from spilling out between the structural elements during construction. Temporary timber lagging generally should be used (soldier pile and lagging wall). At locations where soldier piles are very closely spaced (tangent pile wall), the cohesive soils found at the site will arch across the openings for a short period allowing placement of the permanent wall facing. Temporary timber lagging may be replaced with a non-structural plywood back form where the theoretical gap between the CLSM encasement is less than 18 inches.

Spread footing foundations should be constructed with a bottom elevation of the foundation at the top of Sandy Shale & Interbedded Shale & Sandstone elevations listed in Table 8.1. Spread footings constructed according to the above recommendations may be proportioned for an allowable net bearing pressure of 12.0 ksf. The recommended allowable net bearing pressure includes a factor of safety of 3.0. The ultimate sliding resistance for spread footing foundations is 2.5 ksf. The factor of safety for resistance to sliding is 2.5.

Soldier pile walls should be designed for an active earth pressure of 40 pcf if drainage is provided along the face of the wall. Soldier piles for the underpass walls on either side of the bridge will not have significant vertical load and may be supported in either rock or soil as required by the wall heights. Table 8.1 provides design strata elevations for the various soil layers found along the walls. The structure designer should evaluate lateral resistance based on both soil and structure properties. Soil parameters for generating P-y curves with the LPile computer program are given in Table 8.3. Factored axial and factored lateral loads should be used for structural design of the soldier piles and drilled shafts. The P-multipliers in AASHTO Table 10.7.2.4-1 should be used in the analyses.

Table 8.2 provides geotechnical design parameters for axial resistance of drilled shafts and/or soldier piles. When drilled shafts are tipped in the Sandy Shale & Interbedded Shale & Sandstone, only the tip resistance should be

included in the axial strength. The resistance for axial loads should be neglected in the upper 5 ft of the drilled shaft due to seasonal difference in the moisture content of the local soils.

Table 8.3 LPILE Parameters

Stratum	LPILE Soil Type	Soil Parameters
Loess	stiff clay w/o water	c=1,250 psf γ'=58 pcf ε_{50}=0.007
Glacial Till	stiff clay w/o water	c=1,500 psf γ'=63 pcf ε_{50}=0.007
Highly Weathered Clayey Shale	stiff clay w/o water	c=2,000 psf γ'=72 pcf ε_{50}=0.005
Sandy Shale & Interbedded Shale & Sandstone	weak rock	q_u=450 psi γ'=72 pcf E_i=1,000 ksi RQD=56 k_{rm}=5x10^{-5}

Soldier pile retaining walls should be detailed to include geocomposite wall drain and an underdrain collector similar to that shown in Figures 3.11.3.2.1-2 and 3.11.3.2.1-3 of the IDOT Bridge Manual. In locations where secant lagging is used, horizontal drains that penetrate the secant lagging should be installed at not more than 12 ft horizontal and 6 ft vertical spacing over the full height of the secant lagging. The horizontal drains should have no less than 2.5 ft of 3 in. diameter slotted PVC well casing extending behind the secant lagging and should be plumbed to drain to the storm sewer system.

MSE walls located in front of the permanent soldier pile retaining walls should be designed as independent structures that do not rely on the soldier pile walls for support. The soil reinforcement should not be attached to the soldier piles and/or drilled shafts. It is recommended that the external stability of the proposed MSE wall be evaluated for the greater of the active pressure behind the soldier pile wall applied only through the gaps between the structural elements or 35 pcf applied to the back of the entire reinforced soil mass.

MSE walls that are not located in front of permanent soldier pile walls should be designed as independent structures that support the native soils. The external stability of these walls should be based on a soil unit weight of 125 pcf and an active earth pressure coefficient of 0.33. Any loadings applied to the reinforced soil mass by the short semi-gravity wall above should be included in the external stability analyses.

The select fill within the reinforced soil mass of all MSE walls should be assumed to have a unit weight of 125 pcf and an internal friction angle of 34°. Bearing resistance and sliding resistance design parameters are provided in Table 8.4. The strata elevations shown in Table 8.1 should be used for design. The theoretical top of leveling pad (base of reinforced soil mass) may be located as shallow as 2'-0" below finished grade, if the subgrade is over excavated to at least 3'-6" below finished grade and compacted, with non-frost-susceptible aggregate placed below the reinforced soil mass. The native soils should be inspected when the excavation reaches the base of the proposed wall. Any soft or otherwise unsuitable material should be removed and replaced with compacted aggregate subgrade improvement or select fill.

Table 8.4 MSE Wall Bearing and Sliding Resistance Design Parameters

Stratum	Nominal Bearing Resistance (ksf)	Resistance Factor φ_b	Nominal Sliding Resistance (ksf)	Resistance Factor φ_τ
Loess	6.4	0.65	1.25	1.00
Glacial Till	7.7	0.65	1.50	1.00
Highly Weathered Clayey Shale	12.8	0.65	2.50	1.00

The project is located in a region of low seismic activity, which is caused primarily by earthquakes in the New Madrid Fault Zone, 225 miles south of the site. The subsurface profile to a depth of 100 feet consists of up to 15 feet of stiff clayey silt and silty clay, overlying very stiff clay shale, and shale bedrock. This profile is indicative of Soil Type C. Seismic design parameters obtained from the 2019 AREMA Seismic Design for Railway Structures Specifications are listed in Table 8.5. The soils found at the site are not liquefaction-susceptible for the design earthquakes.

Table 8.5 Seismic Design Parameters

Ground Motion Level	PGA	F_{pga}	S_s	F_a	S_1	F_v
Level 1 (100 year)	0.010	1.20	0.025	1.20	0.005	1.70
Level 2 (475 year)	0.040	1.20	0.090	1.20	0.035	1.70
Level 3 (2475 year)	0.100	1.20	0.220	1.20	0.100	1.70

9. Construction Considerations

The construction of MSE walls is covered by the IDOT Standard Specifications (Section 522). The external stability of the MSE walls is the responsibility of the design engineer.

Some of the borings encountered highly weathered clayey shale to shaley clay with a consistency ranging from soil-like to weak rock. Depending on the degree of weathering along the proposed structures, it should be anticipated that portions of this material would be considered rock as defined in Section 516.09 of the Standard Specifications. To account for the varying degree of weathering within the highly weathered clayey shale layer, for preliminary plans, a "top of rock elevation" of 584.0 feet should be used. If construction overages are undesirable an additional quantity for rock drilling may be added to the plans or the estimated rock elevation may be adjusted at some soldier pile locations. The application of Article 522.08(b)(1) should also be considered during final design and plan preparation.

With North Grand Street closed to traffic during construction, temporary slopes can be used to construct a spread footing foundation at the pier. Temporary shoring would not be necessary.

The sandy shale bearing stratum for the center pier is susceptible to softening when exposed to water. It should be protected with a 6" thick, minimum, mud slab. The recommended construction sequence is to excavate to a level, relatively uniform surface at least 6 inches into the sandy shale and at least 12 inches beyond the plan limits of the footing. Immediately after confirmation of the bearing surface by the Engineer, fill this rock excavation with seal coat concrete. The following note should be included in the final plans. "*The footing excavation shall be undercut by 6 in. and immediately filled with seal coat concrete to prevent degradation of the exposed bedrock surface. Do not allow water to collect in the excavation*."

References

American Railway Engineering and Maintenance-of-Way Association (2019). *AREMA Design Specifications.*

American Association of State Highway and Transportation Officials (2020). *ASHTO LRFD Bridge Design Specifications, 9th Edition.*

Chenoweth, C.A., Bargh, M.H., & Treworgy, C.G. (2009). *Directory of Coal Mines in Illinois, 7.5-Minute Quadrangle Series, Springfield East & West Quadrangles, Sangamon County.* Champaign, Illinois: Illinois State Geological Survey

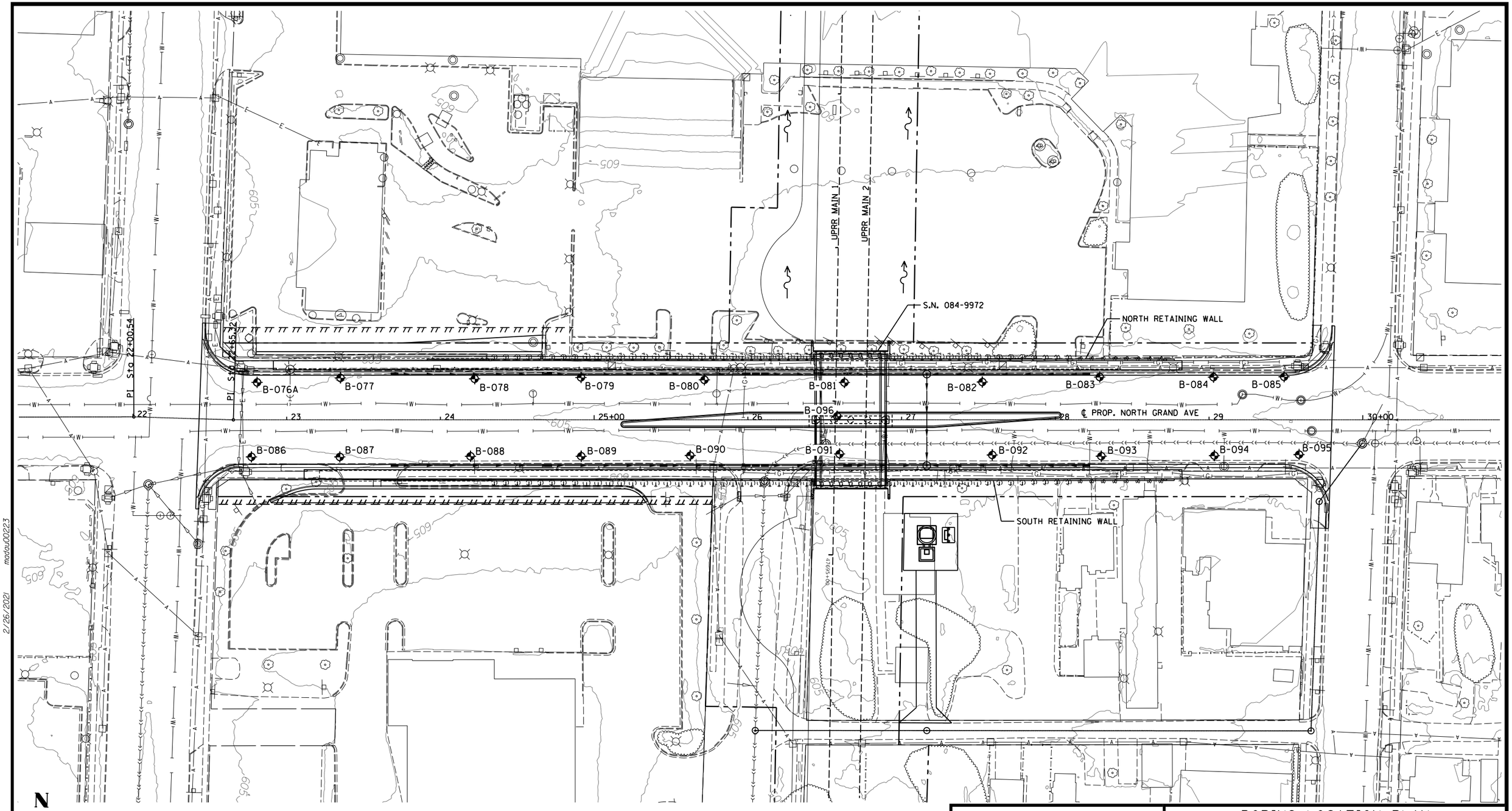
Illinois Department of Transportation (2012). *Bridge Manual*.

Illinois Department of Transportation (2015). *Geotechnical Manual*.

Illinois Department of Transportation (2016). *Standard Specifications for Road and Bridge Construction*.

Appendix

Boring Location Plan
Subsurface Data Profile
Boring Logs
Rock Core Photographs



madau00223
2/26/2021
084-9972-SGR-004

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BORING LOCATION PLAN

UPRR OVER NORTH GRAND AVENUE
S.N. 084-9972
SPRINGFIELD, ILLINOIS

09L0179B 2/26/21

B-091
Sta. 26+60, 22' RT

	N	Qu	w%	
605.2				
604.89				ASPHALT.
604.39	5	1.77B	30	CONCRETE.
601.72	5	1.50P	25	Yellow-brown and gray very fine sandy silty CLAY.
	4	1.60S	27	Yellow-brown and gray very fine sandy SILT, some clay.
596.72	5	2.72B	23	Brown and gray very fine sandy clayey SILT.
	4	0.78B	24	
591.72	4	1.03B	24	Brown and gray very fine sandy silty CLAY.
	6	0.99S	23	
586.72	7	1.28S	26	Brown and gray very fine sandy silty CLAY, trace shale fragments.
581.72	71	4.50P	9	Dark gray and gray micaceous fine sandy SHALE.
575.22				Rec. = 93% RQD = 63%
	140.2			Gray-black interbedded sandy SHALE/shaley SANDSTONE, micaceous - weathered.
				Rec. = 82% RQD = 70%
				Rec. = 81% RQD = 68%
	38.9			Rec. = 99% RQD = 81%
556.22				Bottom of Hole = 49.0 feet

B-096
Sta. 26+58, 2' LT

	N	Qu	w%	
605.9				
605.44				ASPHALT.
604.78	15		7	CONCRETE.
602.36	5	1.32B	26	Tan and gray crushed LIMESTONE - FILL.
599.86	7		24	Brown and gray very fine sandy SILT, some clay.
597.36	7	1.50P	21	Brown and gray very fine sandy SILT, trace large gravel.
594.86	5	1.12B	21	Brown and gray very fine sandy SILT, some clay.
	4	1.36B	23	Brown and gray very fine sandy clayey SILT.
589.96	6	0.97B	32	Brown, gray and black very fine sandy silty CLAY.
587.36	10	3.50P	24	Brown and gray shaley CLAY.
582.36	50/2"	3.50P	11	Brown and gray micaceous fine sandy SHALE - highly weathered.
	50/2"		12	
575.86				Bottom of Hole = 30.0 feet

B-081
Sta. 26+63, 24' LT

	N	Qu	w%	
605.3				
604.93				ASPHALT.
604.43	8		29	CONCRETE.
601.76	4	1.36B	25	Black very fine sandy silty CLAY, some small to large gravel - FILL.
599.26	4	0.62B	28	Brown and gray very fine sandy clayey SILT.
	5	1.05S	26	Brown and gray very fine sandy SILT, some clay.
594.26	4	1.20B	25	Brown very fine sandy clayey SILT, trace small gravel.
591.76	5	1.15B	22	Brown very fine sandy silty CLAY, trace fine sand.
589.26	15	1.83S	20	Brown and gray clayey SHALE, trace sandstone fragments - highly weathered.
586.76	DD 50	4.50P	11	Reddish-brown and gray clayey SHALE - highly weathered.
584.3 ▽				
581.76	50/5"	3.69S	19	Gray and black micaceous fine sandy SHALE.
580.26				Gray-black interbedded sandy SHALE/shaley SANDSTONE, micaceous - weathered.
	27.6			Rec. = 82% RQD = 22%
				Rec. = 93% RQD = 31%
				Rec. = 100% RQD = 47%
				Rec. = 100% RQD = 68%
561.26				Bottom of Hole = 44.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling Oh = at completion 24h = 24 hours after completion

DESIGNED	EJM	11/01/13
DRAWN	EJM	11/01/13
REVIEWED	RGC	11/10/13

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USER NAME = madau00223	DESIGNED - EJM	REVISED -	
	CHECKED - RGC	REVISED -	
PLOT SCALE =	DRAWN - EJM	REVISED -	
PLOT DATE = 02/02/21	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
STRUCTURE NO. 084-9972
SHEET NO. OF SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7972	20-00492-00-BR	SANGAMON	5	1
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

B-076A
Sta. 22+81, 24' LT

	N	Qu	w%	
604.0				
603.55				ASPHALT.
602.97				CONCRETE.
601.47	6	1.53B	27	Dark brown and brown-gray very fine sandy silty CLAY - FILL.
598.97				Old abandoned Gas Line.
				Bottom of Hole = 5.0 feet

B-077
Sta. 23+35, 27' LT

	N	Qu	w%	
604.1				
603.75				ASPHALT.
603.00				CONCRETE.
	5	1.50P	30	Brown and dark brown very fine sandy silty CLAY.
600.58				
	5	1.40B	24	Brown and gray very fine sandy SILT, some clay.
596.58				
	4	1.00P	37	Bottom of Hole = 7.5 feet

B-078
Sta. 24+22, 27' LT

	N	Qu	w%	
604.4				
604.06				ASPHALT.
603.22				CONCRETE.
	5	1.85B	30	Dark brown and brown very fine sandy silty CLAY.
600.89				
	4	0.82B	29	Brown and gray very fine sandy SILT, some clay.
	3		32	
595.89				
	4	1.03B	25	Brown and gray very fine sandy silty CLAY.
593.39				
591.89	4	1.03B	22	Brown very fine sandy clayey SILT.
				Bottom of Hole = 12.5 feet

B-079
Sta. 24+91, 28' LT

	N	Qu	w%	
604.5				
604.21				ASPHALT.
603.37				CONCRETE.
	4	1.11S	28	Dark brown and brown very fine sandy silty CLAY.
601.04				
	5	1.11B	26	Brown and gray very fine sandy SILT, some clay.
	4	0.44S	26	
596.04				
	5	1.57B	22	Brown-gray very fine sandy clayey SILT, trace fine sand.
593.54				
	4	0.82B	24	Brown very fine sandy silty CLAY, trace fine sand and small gravel.
	5	1.82B	24	Brown very fine sandy silty CLAY and yellow-brown and gray clayey SHALE, highly weathered.
588.54				
	7	1.30P	22	Brown and gray micaceous sandy SHALE, highly weathered.
586.04				
584.54	39	3.50P	14	Bottom of Hole = 20.0 feet

LEGEND

N — Standard Penetration Test N (blows/ft)

Qu — Unconfined Strength (tsf)

w% — Natural Moisture Content (%)

DD ▽ 558.10 — Water Surface Elevation Encountered in Boring
DD = during drilling
Oh = at completion
24h = 24 hours after completion

DESIGNED	EJM	11/01/13
DRAWN	EJM	11/01/13
REVIEWED	RGC	2/26/21

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HANSON

USER NAME = madau00223	DESIGNED - EJM	REVISED -
	CHECKED - RGC	REVISED -
PLOT SCALE =	DRAWN - EJM	REVISED -
PLOT DATE = 02/02/21	CHECKED - RGC	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
NORTH GRAND AVENUE RETAINING WALL

SHEET NO. OF SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7972	20-00492-00-BR	SANGAMON	5	2
		CONTRACT NO.		
	ILLINOIS	FED. AID PROJECT		

B-080
Sta. 25+72, 26' LT

	N	Qu	w%	
604.9				
604.50				ASPHALT.
603.50				CONCRETE.
602.42	3	0.97B	33	Blue-gray very fine sandy silty CLAY.
	5	1.50P	28	Gray and olive very fine sandy SILT, some clay.
	4	1.00P	26	
596.42				
	6	1.50P	21	Brown and gray fine sandy clayey SILT.
593.92				
	5	4.50P	12	Brown-gray fine sandy silty CLAY.
591.42				
	6	0.89S	25	Brown and brown-gray very fine sandy silty CLAY, trace fine sand pockets.
588.92				
	12	2.02B	23	Brown and gray very fine sandy silty CLAY.
586.42				
	34	1.98S	24	Brown and gray micaceous fine sandy SHALE, highly weathered.
579.92	50/4"	2.50P	14	

Bottom of Hole = 25.0 feet

B-081
Sta. 26+63, 24' LT

	N	Qu	w%	
605.3				
604.93				ASPHALT.
604.43				CONCRETE.
	8		29	Black very fine sandy silty CLAY, some small to large gravel - FILL.
601.76				
	4	1.36B	25	Brown and gray very fine sandy clayey SILT.
599.26				
	4	0.62B	28	Brown and gray very fine sandy SILT, some clay.
	5	1.05S	26	
594.26				
	4	1.20B	25	Brown very fine sandy clayey SILT, trace small gravel.
591.76				
	5	1.15B	22	Brown very fine sandy silty CLAY, trace fine sand.
589.26				
	15	1.83S	20	Brown and gray clayey SHALE, trace sandstone fragments - highly weathered.
586.76				
DD ▽				
584.3	50	4.50P	11	Reddish-brown and gray clayey SHALE - highly weathered.
581.76				
	50/5"	3.69S	19	Gray and black micaceous fine sandy SHALE.
580.26				
	27.6			Gray-black interbedded sandy SHALE/shaley SANDSTONE, micaceous - weathered.
	Rec. = 82%			
	ROD = 22%			
	Rec. = 93%			
	ROD = 31%			
	Rec. = 100%			
	ROD = 47%			
	Rec. = 100%			
	ROD = 68%			
561.26				

Bottom of Hole = 44.0 feet

B-082
Sta. 27+53, 25' LT

	N	Qu	w%	
605.7				
605.30				ASPHALT.
604.47				CONCRETE.
	4	1.00P	30	Black and brown very fine sandy silty CLAY, trace cinders - FILL.
602.22				
	5	1.11S	25	Brown and gray very fine sandy clayey SILT.
	9	2.18S	22	
	5	3.30B	24	
594.72				
	5	1.16B	23	Brown very fine sandy clayey SILT, trace small gravel.
592.22				
	4	1.28S	22	Brown very fine sandy silty CLAY, trace small gravel.
589.72				
	8	2.47S	21	Brown and gray shaley CLAY, some shale fragments - highly weathered SHALE.
587.22				
	18	1.01B	28	Brown and gray micaceous fine sandy silty CLAY - highly weathered SHALE.
585.72				

Bottom of Hole = 20.0 feet

B-083
Sta. 28+29, 28' LT

	N	Qu	w%	
606.0				
605.64				ASPHALT.
604.80				CONCRETE.
	7	2.50P	27	Dark brown and brown very fine sandy silty CLAY.
602.47				
	8	1.75S	22	Yellow-brown and gray silty CLAY.
599.97				
	6	1.24S	26	Brown and gray very fine sandy SILT.
597.47				
	5	1.51B	21	Brown very fine sandy clayey SILT.
593.47	5	0.80P	23	

Bottom of Hole = 12.5 feet

B-084
Sta. 29+03, 28' LT

	N	Qu	w%	
606.4				
605.98				ASPHALT.
605.23				CONCRETE.
	4	1.66B	23	Black and dark brown very fine sandy silty CLAY.
602.90				
	6	0.95B	27	Brown and gray very fine sandy clayey SILT.
600.40				
	8	2.47S	23	Olive and gray very fine sandy SILT.
598.90				

Bottom of Hole = 7.5 feet

B-085
Sta. 29+49, 28' LT

	N	Qu	w%	
606.6				
606.22				ASPHALT.
605.22				CONCRETE.
	5	2.02B	28	Black and dark brown very fine sandy silty CLAY.
603.05				
	5	1.11B	25	Brown and gray very fine sandy SILT, some clay.
601.55				

Bottom of Hole = 5.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling Oh = at completion 24h = 24 hours after completion

DESIGNED	EJM	11/01/13
DRAWN	EJM	11/01/13
REVIEWED	RGC	2/26/21

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HANSON

USER NAME = madau00223	DESIGNED - EJM	REVISED -	
	CHECKED - RGC	REVISED -	
PLOT SCALE =	DRAWN - EJM	REVISED -	
PLOT DATE = 02/02/21	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
NORTH GRAND AVENUE RETAINING WALL

SHEET NO. OF SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7972	20-00492-00-BR	SANGAMON	5	3
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

B-095
Sta. 29+59, 23' RT

	N	Qu	w%	
606.6				
606.37				ASPHALT.
605.54				CONCRETE.
604.42	4		5	Light gray crushed LIMESTONE - FILL.
601.62	4	1.50P	24	Brown and gray very fine sandy SILT, trace clay.
				Bottom of Hole = 5.0 feet

B-094
Sta. 29+03, 23' RT

	N	Qu	w%	
606.4				
606.14				ASPHALT.
605.64				CONCRETE.
602.89	6	2.05S	27	Black and gray very fine sandy clayey SILT.
600.39	7	1.44S	23	Brown and gray very fine sandy clayey SILT.
598.89	6	1.00P	24	Brown and gray very fine sandy SILT, some oxidized spots.
				Bottom of Hole = 7.5 feet

B-093
Sta. 28+30, 24' RT

	N	Qu	w%	
606.0				
605.72				ASPHALT.
605.14				CONCRETE.
602.47	4	1.50P	29	Dark brown and gray very fine sandy silty CLAY.
	4	1.32B	26	Brown and gray very fine sandy SILT, some clay.
	4	1.05S	24	
597.47	5	1.63B	21	Brown and gray very fine sandy clayey SILT.
594.97	5	0.78S	22	Brown very fine sandy clayey SILT.
593.47				Bottom of Hole = 12.5 feet

B-092
Sta. 27+59, 23' RT

	N	Qu	w%	
605.6				
605.30				ASPHALT.
604.88				CONCRETE.
602.13	4	1.98B	25	Black very fine sandy silty CLAY.
599.63	5	1.00P	26	Brown and gray very fine sandy silty CLAY.
597.13	6	1.24S	25	Yellow-brown, gray and black very fine sandy SILT.
594.63	6	1.75B	23	Reddish-brown and gray very fine sandy clayey SILT and silty CLAY, trace oxidized spots.
592.13	5	0.93B	23	Brown and gray very fine sandy clayey SILT.
	4	1.24B	26	Brown and gray very fine sandy silty CLAY, trace fine sandy silt seams.
586.63	4	0.29B	39	Brown and gray very fine sandy CLAY (highly weathered SHALE).
585.63	21	2.06S	18	Bottom of Hole = 20.0 feet

LEGEND

N — Standard Penetration Test N (blows/ft)

Qu — Unconfined Strength (tsf)

w% — Natural Moisture Content (%)

DD ▽ 558.10 — Water Surface Elevation Encountered in Boring
DD = during drilling
Oh = at completion
24h = 24 hours after completion

DESIGNED	E.J.M.	11/01/13
DRAWN	E.J.M.	11/01/13
REVIEWED	R.G.C.	2/26/21

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HANSON

USER NAME = madau00223	DESIGNED - EJM	REVISED -	
	CHECKED - RGC	REVISED -	
PLOT SCALE =	DRAWN - EJM	REVISED -	
PLOT DATE = 02/02/21	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
NORTH GRAND AVENUE RETAINING WALL

SHEET NO. OF SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7972	20-00492-00-BR	SANGAMON	5	4
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

B-091
Sta. 26+60, 22' RT

	N	Qu	w%	
605.2				
604.89				ASPHALT.
604.39	5	1.77B	30	CONCRETE.
601.72	5	1.50P	25	Yellow-brown and gray very fine sandy silty CLAY.
	4	1.60S	27	Yellow-brown and gray very fine sandy SILT, some clay.
596.72	5	2.72B	23	Brown and gray very fine sandy clayey SILT.
	4	0.78B	24	
591.72	4	1.03B	24	Brown and gray very fine sandy silty CLAY.
	6	0.99S	23	
586.72	7	1.28S	26	Brown and gray very fine sandy silty CLAY, trace shale fragments.
581.72	71	4.50P	9	Dark gray and gray micaceous fine sandy SHALE.
575.22				
	Rec. = 93% RQD = 63% 140.2			Gray-black interbedded sandy SHALE/shaley SANDSTONE, micaceous - weathered.
	Rec. = 82% RQD = 70%			
	Rec. = 81% RQD = 68%			
	38.9 Rec. = 99% RQD = 81%			
556.22				Bottom of Hole = 49.0 feet

B-090
Sta. 25+63, 23' RT

	N	Qu	w%	
604.9				
604.54				ASPHALT.
604.04	4	1.50P	29	CONCRETE.
601.37	6	0.39S	30	Brown and dark brown very fine sandy silty CLAY.
598.87	4		29	Yellow-brown and gray very fine sandy clayey SILT.
	4	0.43B	30	Brown and gray very fine sandy clayey SILT.
	5	0.97B	24	
591.37	5	1.16B	22	Brown and gray very fine sandy silty CLAY, trace small gravel.
	11	1.44S	19	
586.37	45	0.96B	19	Reddish-brown and gray fine sandy SILT and silty CLAY (Weathered SANDSTONE and SHALE).
581.37				
579.87	50/1"			Gray SHALE fragments.
				Bottom of Hole = 25.0 feet

B-089
Sta. 24+92, 24' RT

	N	Qu	w%	
604.6				
604.28				ASPHALT.
603.78	4	1.22B	29	CONCRETE.
	1	1.00P	31	Black, dark gray and olive very fine sandy silty CLAY, trace small gravel and roots.
	WOH		39	
596.11	5	1.90B	21	Brown and gray fine sandy SILT.
	4	0.82S	22	
591.11	5	1.75S	25	Brown and gray fine sandy clayey SILT.
588.61	19	1.00P	18	Brown and gray very fine sandy silty CLAY and brown and gray micaceous fine sandy clayey SHALE.
586.11	43	3.50P	18	Brown micaceous fine sandy SHALE - highly weathered.
584.61				Bottom of Hole = 20.0 feet

B-088
Sta. 24+20, 24' RT

	N	Qu	w%	
604.3				
604.09				ASPHALT.
603.51	5	1.57B	30	CONCRETE.
600.84	5	1.85B	25	Dark gray and gray very fine sandy silty CLAY.
598.34	4	0.58B	30	Brown and gray very fine sandy SILT, trace clay.
595.84	6	1.50P	23	Olive and gray very fine sandy SILT.
593.34	6	1.36B	22	Brown, gray and black very fine sandy SILT and silty CLAY.
591.84				Brown very fine sandy clayey SILT.
				Bottom of Hole = 12.5 feet

B-087
Sta. 23+35, 24' RT

	N	Qu	w%	
604.1				
603.81				ASPHALT.
603.31	2	0.58B	30	CONCRETE.
600.56	3	0.82B	30	Dark gray and gray very fine sandy silty CLAY.
	3	0.50P	39	Brown and gray very fine sandy SILT.
596.56				Bottom of Hole = 7.5 feet

B-086
Sta. 22+77, 24' RT

	N	Qu	w%	
603.8				
603.56				ASPHALT.
603.06	6	1.75B	30	CONCRETE.
598.81	6	1.50P	28	Dark brown and brown very fine sandy silty CLAY.
				Bottom of Hole = 5.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling Oh = at completion 24h = 24 hours after completion

DESIGNED	EJM	11/01/13
DRAWN	EJM	11/01/13
REVIEWED	RGC	2/26/21

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HANSON

USER NAME = madau00223	DESIGNED - EJM	REVISED -	
	CHECKED - RGC	REVISED -	
PLOT SCALE =	DRAWN - EJM	REVISED -	
PLOT DATE = 02/02/21	CHECKED - RGC	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SUBSURFACE DATA PROFILE
NORTH GRAND AVENUE RETAINING WALL

SHEET NO. OF SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
7972	20-00492-00-BR	SANGAMON	5	5
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

HANSON SOIL BORING LOG

Date 8/1/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-076A
Station 22+81
Offset 24' LT
Ground Surface Elev. 604.0 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 603.55				
CONCRETE. 602.97				
Dark brown and brown-gray very fine sandy silty CLAY - FILL.	2	2 2 4	1.53B	27
601.47				
Old abandoned Gas Line.	4			
598.97				
End of 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)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-077
Station 23+35
Offset 27' LT
Ground Surface Elev. 604.1 **ft**

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 603.75				
CONCRETE. 603.00				
Brown and dark brown very fine sandy silty CLAY.	2	2 2 3	1.50P	30
600.58				
Brown and gray very fine sandy SILT, some clay.	4	3 2 3	1.40B	24
	6	3 2 2	1.00P	37
596.58				
End of 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)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-078
Station 24+22
Offset 27' LT
Ground Surface Elev. 604.4 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 604.06				
CONCRETE. 603.22				
Dark brown and brown very fine sandy silty CLAY.	2	2 2 3	1.85B	30
600.89				
Brown and gray very fine sandy SILT, some clay.	4	2 2 2	0.82B	29
	6	1 2 1		32
595.89	8			
Brown and gray very fine sandy silty CLAY.		1 2 2	1.03B	25
593.39	10			
Brown very fine sandy clayey SILT.		woh 2 2	1.03B	22
591.89	12			
End of 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)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-079
Station 24+91
Offset 28' LT
Ground Surface Elev. 604.5 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 604.21				
CONCRETE. 603.37				
Dark brown and brown very fine sandy silty CLAY.	2	1 2 2	1.11S	28
601.04				
Brown and gray very fine sandy SILT, some clay.	4	2 2 3	1.11B	26
	6	2 2 2	0.44S	26
596.04	8			
Brown-gray very fine sandy clayey SILT, trace fine sand.		2 2 3	1.57B	22
593.54	10			
Brown very fine sandy silty CLAY, trace fine sand and small gravel.	12	2 2 2	0.82B	24
	14	2 2 3	1.82B	24
588.54	16			
Brown very fine sandy silty CLAY and yellow-brown and gray clayey SHALE, highly weathered.		3 3 4	1.30P	22
586.04	18			
Brown and gray micaceous sandy SHALE, highly weathered.		11 17 22	3.50P	14
584.54	20			

End of 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)

BBS, from 137 (Rev. 8-99)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-080
Station 25+72
Offset 26' LT
Ground Surface Elev. 604.9 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 604.50				
CONCRETE. 603.50				
Blue-gray very fine sandy silty CLAY. 602.42	2	woh 1 2	0.97B	33
Gray and olive very fine sandy SILT, some clay.	4	1 2 3	1.50P	28
	6	2 2 2	1.00P	26
596.42	8			
Brown and gray fine sandy clayey SILT.	10	2 3 3	1.50P	21
593.92				
Brown-gray fine sandy silty CLAY.	12	2 2 3	4.50P	12
591.42				
Brown and brown-gray very fine sandy silty CLAY, trace fine sand pockets.	14	2 2 4	0.89S	25
588.92	16			
Brown and gray very fine sandy silty CLAY.		3 4 8	2.02B	23
586.42	18			
Brown and gray micaceous fine sandy SHALE, highly weathered.	20	10 15 19	1.98S	24

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown and gray micaceous fine sandy SHALE, highly weathered. *(continued from previous page)*	22			
	24	23 50/4"	2.50P	14
579.92				
End of 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)

BBS, from 137 (Rev. 8-99)

HANSON SOIL BORING LOG

Date 8/1/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-081
Station 26+63
Offset 24' LT
Ground Surface Elev. 605.3 ft

Surface Water Elev. _____
Stream Bed Elev. _____

Groundwater Elev.:
First Encounter 584.3 ft ▼
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALt. 604.93 / CONCRETE. 604.43			
Black very fine sandy silty CLAY, some small to large gravel - FILL.	3 2 6		29
601.76			
Brown and gray very fine sandy clayey SILT.	1 2 2	1.36B	25
599.26			
Brown and gray very fine sandy SILT, some clay.	2 2 2	0.62B	28
	2 2 3	1.05S	26
594.26			
Brown very fine sandy clayey SILT, trace small gravel.	1 1 3	1.20B	25
591.76			
Brown very fine sandy silty CLAY, trace fine sand.	2 2 3	1.15B	22
589.26			
Brown and gray clayey SHALE, trace sandstone fragments - highly weathered.	3 6 9	1.83S	20
586.76			
Reddish-brown and gray clayey SHALE - highly weathered.	15 21 29	4.50P	11

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Reddish-brown and gray clayey SHALE - highly weathered. *(continued from previous page)* ▼			
581.76			
Gray and black micaceous fine sandy SHALE.	50/5"	3.69S	19
580.26			
see Rock Core log.			

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)

HANSON

ROCK CORE LOG

Date 8/1/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **CORING METHOD** _____

STRUCT. NO. _____
Station _____

BORING NO. B-081
Station 26+63
Offset 24' LT
Ground Surface Elev. 605.26

CORING BARREL TYPE & SIZE _____
Core Diameter _____ in
Top of Rock Elev. 581.76 ft
Begin Core Elev. 580.26 ft

		DEPTH (ft)	CORE (#)	RECOVERY (%)	RQD (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Gray and black micaceous fine sandy SHALE.	581.76	24	9	100			3.7
	580.26						
Gray-black interbedded sandy SHALE / shaley SANDSTONE, micaceous - weathered.		26	Run 1	82	22		28.0
		28					
		30	Run 2	93	31		
		32					
		34					
		36	Run 3	100	47		
		38					
		40	Run 4	100	68		
		42					
	561.26	44					
End of Boring							

Color pictures of the cores _____
Cores will be stored for examination until _____
The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-082
Station 27+53
Offset 25' LT
Ground Surface Elev. 605.7 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 605.30				
CONCRETE. 604.47				
Black and brown very fine sandy silty CLAY, trace cinders - FILL.	2	1 2 2	1.00P	30
602.22				
Brown and gray very fine sandy clayey SILT.	4	2 2 3	1.11S	25
	6	5 5 4	2.18S	22
	8			
		3 2 3	3.30B	24
594.72	10			
Brown very fine sandy clayey SILT, trace small gravel.	12	2 2 3	1.16B	23
592.22				
Brown very fine sandy silty CLAY, trace small gravel.	14	2 1 3	1.28S	22
589.72				
Brown and gray shaley CLAY, some shale fragments - highly weathered SHALE.	16	3 3 5	2.47S	21
587.22	18			
Brown and gray micaceous fine sandy silty CLAY - highly weathered SHALE.		3 3 15	1.01B	28
585.72	20			

End of 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)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-083
Station 28+29
Offset 28' LT
Ground Surface Elev. 606.0 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 605.64				
CONCRETE. 604.80				
Dark brown and brown very fine sandy silty CLAY.	2	4 2 5	2.50P	27
602.47				
Yellow-brown and gray silty CLAY.	4	4 3 5	1.75S	22
599.97	6			
Brown and gray very fine sandy SILT.		5 3 3	1.24S	26
597.47	8			
Brown very fine sandy clayey SILT.	10	3 2 3	1.51B	21
		2 2 3	0.80P	23
593.47	12			
End of 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)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-084
Station 29+03
Offset 28' LT
Ground Surface Elev. 606.4 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 605.98				
CONCRETE. 605.23				
Black and dark brown very fine sandy silty CLAY.	2	3 1 3	1.66B	23
602.90				
Brown and gray very fine sandy clayey SILT.	4	4 2 4	0.95B	27
600.40				
Olive and gray very fine sandy SILT.	6	5 4 4	2.47S	23
598.90				
End of 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)

HANSON SOIL BORING LOG

Date 8/2/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** SE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-085
Station 29+49
Offset 28' LT
Ground Surface Elev. 606.6 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 606.22				
CONCRETE. 605.22		2	2.02B	28
Black and dark brown very fine sandy silty CLAY.	2	2 3		
603.05				
Brown and gray very fine sandy SILT, some clay.	4	3 2 3	1.11B	25
601.55				
End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-086
Station 22+77
Offset 24' RT
Ground Surface Elev. 603.8 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
ASPHALT. 603.56 / CONCRETE. 603.06				
Dark-brown and brown very fine sandy silty CLAY.	4 2 4	1.75B	30	
2				
4	3 3 3	1.50P	28	
598.81				
End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-087
Station 23+35
Offset 24' RT
Ground Surface Elev. 604.1 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 603.81 / CONCRETE. 603.31			
Dark gray and gray very fine sandy silty CLAY.	1 1 2 — 1	0.58B	30
600.56			
Brown and gray very fine sandy SILT.	woh 4 — 2 1	0.82B	30
	6 — 2 1 2	0.50P	39
596.56			
End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-088
Station 24+20
Offset 24' RT
Ground Surface Elev. 604.3 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 604.09 CONCRETE 603.51				
Dark gray and gray very fine sandy silty CLAY.	2	2 2 3	1.57B	30
600.84				
Brown and gray very fine sandy SILT, trace clay.	4	3 2 3	1.85B	25
598.34	6			
Olive and gray very fine sandy SILT.		3 2 2	0.58B	30
595.84	8			
Brown, gray and black very fine sandy SILT and silty CLAY.		2 3 3	1.50P	23
593.34	10			
Brown very fine sandy clayey SILT.		3 3 3	1.36B	22
591.84	12			
End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-089
Station 24+92
Offset 24' RT
Ground Surface Elev. 604.6 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 604.28 / CONCRETE. 603.78				
Black, dark gray and olive very fine sandy silty CLAY, trace small gravel and roots.	2	1 2 2	1.22B	29
	4	woh woh 1	1.00P	31
	6	woh woh woh		39
596.11	8			
Brown and gray fine sandy SILT.	10	2 2 3	1.90B	21
	12	2 2 2	0.82S	22
591.11				
Brown and gray fine sandy clayey SILT.	14	2 2 3	1.75S	25
588.61	16			
Brown and gray very fine sandy silty CLAY and brown and gray micaceous fine sandy clayey SHALE.	18	6 7 12	1.00P	18
586.11				
Brown micaceous fine sandy SHALE - highly weathered.		12 21 22	3.50P	18
584.61	20			

End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-090
Station 25+63
Offset 23' RT
Ground Surface Elev. 604.9 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
604.54				ASPHALT.
604.04				CONCRETE.
	3 2 2	1.50P	29	Brown and dark brown very fine sandy silty CLAY.
2				
601.37				
	3 2 4	0.39S	30	Yellow-brown and gray very fine sandy clayey SILT.
4				
598.87				
	3 2 2		29	Brown and gray very fine sandy clayey SILT.
6				
8				
	2 2 2	0.43B	30	
10				
	2 3 2	0.97B	24	
12				
591.37				
	3 2 3	1.16B	22	Brown and gray very fine sandy silty CLAY, trace small gravel.
14				
16				
	3 6 5	1.44S	19	
18				
586.37				
	29 20 25	0.96B	19	Reddish-brown and gray fine sandy SILT and silty CLAY (weathered SANDSTONE and SHALE).
20				
				Reddish-brown and gray fine sandy SILT and silty CLAY (weathered SANDSTONE and SHALE). *(continued from previous page)*
22				
581.37				
				Gray SHALE fragments.
24				
579.87				
	50/1"			End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-091
Station 26+60
Offset 22' RT
Ground Surface Elev. 605.2 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 604.89 / CONCRETE. 604.39			
Yellow-brown and gray very fine sandy silty CLAY.	2 2 3	1.77B	30
601.72			
Yellow-brown and gray very fine sandy SILT, some clay.	2 2 3	1.50P	25
	3 2 2	1.60S	27
596.72			
Brown and gray very fine sandy clayey SILT.	3 2 3	2.72B	23
	2 2 2	0.78B	24
591.72			
Brown and gray very fine sandy silty CLAY.	2 2 2	1.03B	24
	2 2 4	0.99S	23
586.72			
Brown and gray very fine sandy silty CLAY, trace shale fragments.	4 3 4	1.28S	26

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown and gray very fine sandy silty CLAY, trace shale fragments. *(continued from previous page)*			
581.72			
Dark gray and gray micaceous fine sandy SHALE.	21 50	4.50P	9
575.22			
see Rock Core log.			

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)

HANSON

ROCK CORE LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **CORING METHOD** NQ Core

STRUCT. NO. _____
Station _____

BORING NO. B-091
Station 26+60
Offset 22' RT
Ground Surface Elev. 605.22

CORING BARREL TYPE & SIZE NQ
Core Diameter 1.874 in
Top of Rock Elev. 575.22 ft
Begin Core Elev. 575.22 ft

		DEPTH (ft)	CORE (#)	RECOVERY (%)	RQD (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Gray-black interbedded sandy SHALE / shaley SANDSTONE, micaceous - weathered.	575.22	32	Run 1	93	63		140.2
		34					
		36	Run 2	82	70		
		38					
		40	Run 3	81	68		38.9
		42					
		44					
		46	Run 4	99	81		
		48					
	556.22						
End of Boring							

Color pictures of the cores _____
Cores will be stored for examination until _____
The "Strength" column represents the uniaxial compressive strength of the core sample (ASTM D-2938)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-092
Station 27+59
Offset 23' RT
Ground Surface Elev. 605.6 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 605.30 / CONCRETE. 604.88			
Black very fine sandy silty CLAY.	woh 2 2	1.98B	25
602.13			
Brown and gray very fine sandy silty CLAY.	2 3 2	1.00P	26
599.63			
Yellow-brown, gray and black very fine sandy SILT.	3 3 3	1.24S	25
597.13			
Reddish-brown and gray very fine sandy clayey SILT and silty CLAY, trace oxidized spots.	2 2 4	1.75B	23
594.63			
Brown and gray very fine sandy clayey SILT.	2 2 3	0.93B	23
592.13			
Brown and gray very fine sandy silty CLAY, trace fine sandy silt seams.	2 2 2	1.24B	26
	2 2 2	0.29B	39
586.63			
Brown and gray very fine sandy CLAY (highly weathered SHALE).	2 6 15	2.06S	18
585.63			

End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-093
Station 28+30
Offset 24' RT
Ground Surface Elev. 606.0 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 605.72 / CONCRETE. 605.14				
Dark brown and gray very fine sandy silty CLAY.	2	3 2 2	1.50P	29
602.47				
Brown and gray very fine sandy SILT, some clay.	4	2 1 3	1.32B	26
	6	3 2 2	1.05S	24
597.47	8			
Brown and gray very fine sandy clayey SILT.	10	2 2 3	1.63B	21
594.97				
Brown very fine sandy clayey SILT.	12	2 2 3	0.78S	22
593.47				
End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-094
Station 29+03
Offset 23' RT
Ground Surface Elev. 606.4 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 606.14 CONCRETE. 605.64				
Black very fine sandy silty CLAY.	2	5 2 4	2.05S	27
602.89				
Brown and gray very fine sandy clayey SILT.	4	3 3 4	1.44S	23
600.39				
Brown and gray very fine sandy SILT, some oxidized spots.	6	4 3 3	1.00P	24
598.89				
End of 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)

HANSON SOIL BORING LOG

Date 7/31/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 27, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-095
Station 29+59
Offset 23' RT
Ground Surface Elev. 606.6 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT. 606.37				
CONCRETE. 605.54				
Light gray crushed LIMESTONE - FILL. 604.42	2	3 2 2		5
Brown and gray very fine sandy SILT, trace clay.				
	4	3 2 2	1.50P	24
601.62				
End of 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)

HANSON SOIL BORING LOG

Date 8/5/13

ROUTE _____ **DESCRIPTION** Springfield Rail Improvements Project **LOGGED BY** ARP

SECTION _____ **LOCATION** NE ¼ of SEC. 22, TWP. 16N, RNG. 5W, 3rd P.M.

COUNTY Sangamon **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. _____
Station _____
BORING NO. B-096
Station 26+58
Offset 2' LT
Ground Surface Elev. 605.9 ft

Surface Water Elev. _____
Stream Bed Elev. _____

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
605.44				ASPHALT.
604.78				CONCRETE.
2	10 10 5		7	Tan and gray crushed LIMESTONE - FILL.
602.36				
4	4 2 3	1.32B	26	Brown and gray very fine sandy SILT, some clay.
599.86				
6	5 3 4		24	Brown and gray very fine sandy SILT, trace large gravel.
597.36				
8	3 3 4	1.50P	21	Brown and gray very fine sandy SILT, some clay.
594.86				
10				
12	2 2 3	1.12B	21	Brown and gray very fine sandy clayey SILT.
14	2 2 2	1.36B	23	
589.86				
16	1 2 4	0.97B	32	Brown, gray and black very fine sandy silty CLAY.
587.36				
18				
20	3 2 8	3.50P	24	Brown and gray shaley CLAY.
22				Brown and gray shaley CLAY. *(continued from previous page)*
582.36				
24	38 50/2"	3.50P	11	Brown and gray micaceous fine sandy SHALE - highly weathered.
26				
28				
30	50/2"		12	
575.86				End of Boring

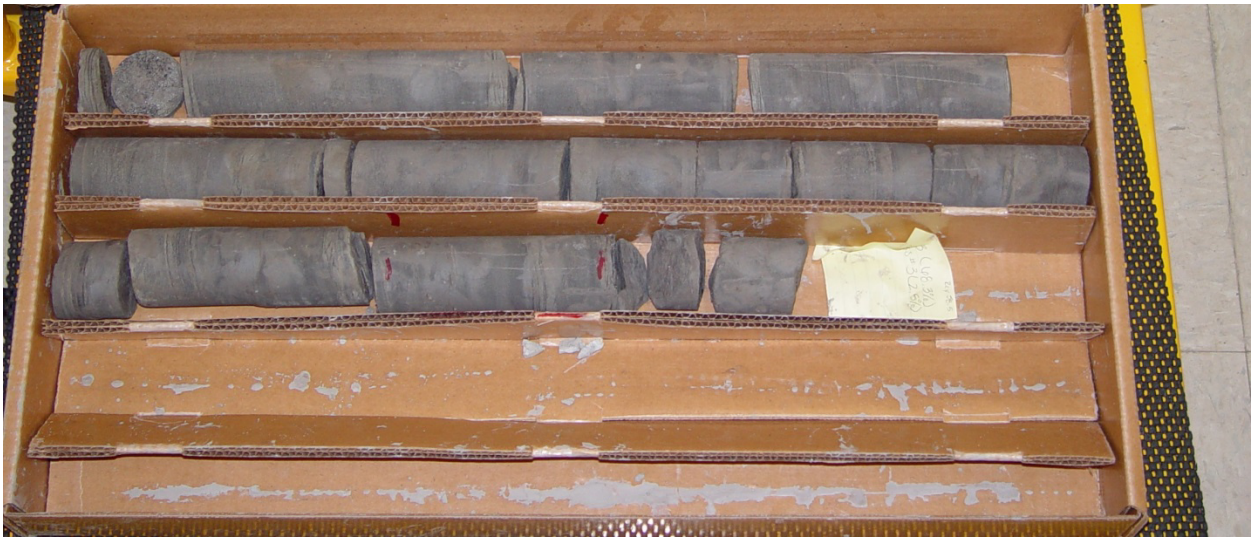
The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrometer)
The SPT (N value) is the sum of the last two blow values in each sampling zone (AASHTO T206)

Boring B-081 25.0 - 34.0 ft.			
Run	Depth (ft)	REC (%)	RQD (%)
1	25.0 - 29.0	82	22
2	29.0 - 34.0	93	31

Boring B-081 34.0 - 43.0 ft.			
Run	Depth (ft)	REC (%)	RQD (%)
3	34.0 - 39.0	100	47
4	39.0 - 43.0	100	68

Boring B-081 43.0 - 44.0 ft.			
Run	Depth (ft.)	REC (%)	RQD (%)
4	43.0 - 44.0	100	68

Boring B-091 30.0 - 39.0 ft.			
Run	Depth (ft.)	REC (%)	RQD (%)
1	30.0 - 34.0	93	63
2	34.0 - 39.0	82	70



Boring B-091 39.0 - 44.0 ft.			
Run	Depth (ft)	REC (%)	RQD (%)
3	39.0 - 44.0	81	68

Boring B-091 44.0 - 49.0 ft.			
Run	Depth (ft)	REC (%)	RQD (%)
4	44.0 - 49.0	99	81