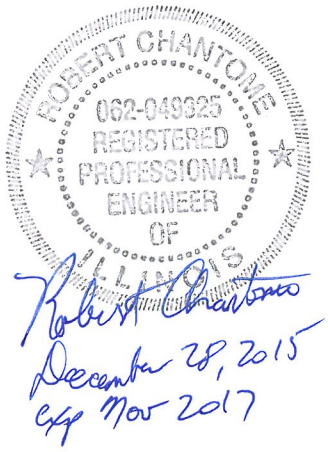

Geotechnical Design Memorandum

F.A.I. Route 74
Section 81-1-2
Rock Island County
Job No. P-92-032-01
Contract No. 64C08
PTB No. N/A
Retaining Wall IL-RW07
Structure Number 081-6016

March 2015
Revised December 2015

Prepared for:
Illinois Department of
Transportation, District 2
819 Depot Avenue
Dixon, Illinois 61021

Structure Designer:
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Table of Contents

Tables

Figures

1. Project Description

This report provides geotechnical data and recommendations for the proposed Retaining Wall IL-RW07, which is part of the Central Section of the I-74 over the Mississippi River Project. The project includes reconstruction of I-74 between 14th Avenue in Moline, Illinois and Lincoln Road in Bettendorf, Iowa. The retaining wall covered by this structure geotechnical report will be a new structure, constructed to retain existing embankment and the natural bluff line to the north abutments of 19th Street.

Nearby project features that have an impact on the design or construction of the proposed retaining wall include the I-74 and Ramp 7th A over 19th Street Bridges (S.N.'s 081-0179, 081-0180 and 081-0181), the south abutment retaining wall (IL-RW06, S.N. 081-6015), the I-74 roadway, and the 19th Street roadway. Geotechnical recommendations for the bridges and Retaining Wall IL-RW06 are presented in separate structure geotechnical reports prepared by Hanson Professional Services Inc. (Hanson). Geotechnical recommendations for the interstate and street will be contained in a soil survey report prepared by Hanson.

This memorandum supersedes the structure geotechnical reports prepared by CH2M HILL in September 2009 and Hanson Professional Services Inc. in June 2012. This memorandum has been prepared to address significant changes to the structure type and project staging.

2. Location

The proposed Retaining Wall IL-RW07 is located in the north central portion of Rock Island County, within Sections 32 and 33 of Township 18 North, Range 1 West. It is located between 19th Street Sta. 1918+42 and 1923+66. The wall separates I-74 and Ramp 7th-A on the high side from 19th Street on the low side.

3. Proposed Structure

The currently proposed structure is significantly different from earlier designs. A study (Modjeski and Masters, 2014) was completed to evaluate several alternative structure types for the I-74 over 19th Street grade separation. The new alternatives were selected to conform to the revised project staging. After coordination with IDOT, a preferred alternative was selected and developed further. General plan and elevation drawings for the proposed structures were prepared in August 2014.

The proposed grade separation consists of three separate three-span bridges supported on straddle column piers and individual stub abutments. All three bridges have 0° skews but the abutment locations are staggered by one span to accommodate the angled crossing. Mechanically stabilized earth (MSE) walls follow a zigzag path between the three abutments on both sides of 19th Street. The portions of the MSE walls perpendicular to the highway are mixed abutments where the MSE walls resist the horizontal earth pressures and piles support the vertical bridge loads. The portion of the MSE walls parallel to the highway function as wingwalls between the abutments. The wall on the north side of 19th Street is the subject of this memorandum.

Retaining Wall IL-RW07 starts at I-74 Sta. 54+95.00, following the right shoulder of the EB lanes, continues across the three bridge abutments, and then follows the right shoulder of Ramp 7th-A to the wall end at Sta. 631+12.94. The top of the proposed MSE wall is generally even with the proposed mainline or ramp pavement. The finished slope from 19th Street is generally 1V:3H in front of the wall with the toe of slope approximately 10 feet farther back from 19th Street compared to the existing condition. Due to the wall's widely variable offset from 19th Street, the total height of the slope in front of the wall ranges from 0 to approximately 25 feet.

A wall using precast panels with the minimum reinforced soil mass width is preferred for cost and construction schedule. The wall will have a height, measured from the theoretical top of leveling pad to the finished grade line, between 14 and 29 feet where it functions as a mixed abutment and between 5 and 37 feet along the remainder of the wall. With this range of heights, a typical MSE wall section would have an equivalent uniform bearing pressure varying from 1,200 to 4,700 psf across the abutments and 700 to 5,500 psf elsewhere.

The proposed wall will be constructed in stages in order to allow traffic on I-74 and 19th Street throughout the construction period. The portion of the wall supporting the Ramp 7th-A and WB I-74 bridges will be constructed in the first stage while maintaining I-74 traffic on the existing EB I-74 Bridge. The portion of the wall supporting the new EB I-74 Bridge and the portion along Ramp 7th-B will be constructed during the second stage with I-74 traffic on the new WB I-74 Bridge. The new bridge piers will generally be constructed sequentially from north to south with multiple lanes shifts along 19th Street. The stage line for the wall will be at the east end of the EB I-74 Bridge South Abutment.

Construction of the wall will be governed by a performance specification. The MSE wall supplier will be responsible for the internal stability of the reinforced soil mass. This report provides geotechnical recommendations for external stability and global stability, which are the responsibility of the wall designer.

4. Site Investigation

The project site is located in the steeply sloping terrain of the bluffs along the Mississippi River. 19th Street is situated in a natural ravine. There was extensive grading of the proposed bridge site during construction of the existing I-74 alignment. Along the current I-74 centerline, the base of the ravine once was between approximately Sta. 58+00 and Sta. 63+50. 19th Street was in the area where the current bridges' north abutment end slopes are located today. The existing bridges' north abutments generally were constructed on an existing hillside at or near the natural grade. The height from the toe of the bridge end slopes to the roadway grade is approximately 25 feet on the north side of 19th Street. Three existing bridge piers are located on the slope between the proposed wall and the existing bridge abutments. Presently, 19th Street slopes down to the northwest at approximately 3% grade, while I-74 slopes down to the north at approximately 3% to 6% grade.

Test boring data was shown on the existing structure plans. It is presumed that these borings were drilled in the early 1970's. Fifteen borings were drilled to depths between 30 and 79 feet below grade. Standard penetration tests were generally performed at 2.5-feet intervals until bedrock was encountered. Boring Numbers S-33, S-37, and S-38 were drilled near the north abutments of the proposed bridges. Although the soil strata logged in the upper part of these borings were disturbed by the original I-74 roadway and bridge construction, the data for the lower strata are useful for design of the new structures.

The field exploration that was completed specifically for the proposed structures was accomplished in five phases. The first two phases were completed in December 2005 and September 2007 to March 2008 by other consultants. IDOT provided the data collected from those two phases, logs for the borings drilled were provided to Hanson in May 2014. The third phase was completed in June 2010 by Hanson. The primary purpose of the third phase was to collect additional samples of the shallow, softer soils for strength and consolidation testing. The fourth phase was completed by IDOT during February to April 2011. The fifth phase was completed in June 2014 by Hanson. The purpose of the fifth phase was to gather additional data near revised pier and abutment locations. A representative from Hanson logged the borings and performed a general site reconnaissance during the third and fifth phases.

Four (4) borings total were drilled in the first two phases, one boring was drilled in the third phase, two borings were drilled during the fourth phase and two borings were drilled during the fifth phase. Locations of the borings were selected to avoid the numerous obstructions currently occupying the site. The maximum spacing between

borings was approximately 150 feet. Standard Penetration Test samples were collected at 2.5 ft. to 5.0 ft. intervals in all borings. Several Shelby tube samples were collected at representative locations in cohesive strata. The boring depths ranged from 6.0 ft. to 67.0 ft.

The boring locations are shown on the Boring Location Plan included in the Appendix. Boring logs are included in the Appendix.

5. Laboratory Investigation

Soil samples from the first and second phase borings were tested by others. Unconfined strength and moisture content tests were completed on split-spoon samples from approximately two-thirds of the borings. Index testing was completed on representative samples.

The soil samples obtained from the third phase borings were delivered to Hanson's soils laboratory and subjected to a testing program. Natural moisture content and visual classification tests were competed on all samples. Unconfined compressive strength tests, using a Rimac spring tester, were also completed when possible. One triaxial strength test and one consolidation test were performed on Shelby tube samples.

The locations of the index tests, triaxial test, and consolidation test are indicated on the subsurface data profile. The results of the triaxial test, consolidation test, and an unconfined compressive strength test with axial strain measurements are provided in the Appendix.

6. Subsurface Profile

A subsurface data profile is presented in the Appendix for use by the structure designer. The data profile includes all of the borings that were recently drilled near the proposed structure.

The subsurface profile consists of deposits of fill material, alluvial soils, and glacial till overlying bedrock. The fill is generally located in the approach embankments on both sides of the existing structures. Alluvial soils are found at shallow depths beneath 19th Street and to the southwest. Glacial till and bedrock are present at depth over the entire site. Strata elevations and depth were quite variable due to the site's location at the base of the bluff and the significant grading completed during construction of the existing structures.

Bedrock was encountered in four of the borings drilled for this structure. The bedrock surface varies from Elev. 552 to Elev. 577.5 with the higher elevations generally near the east end of the proposed wall. Based on other borings in the vicinity, the rock surface is erratic. Generally there is a layer of gray to black, very soft clay shale overlying a layer of white to gray, hard limestone.

Glacial till was encountered in all of the borings except ILR0803, which did not penetrate the existing fill. The top of this stratum was encountered between Elev. 591.5 and Elev. 605.8. It is typically brown to gray, very stiff to hard, silty clay with sand and gravel. Unconfined strengths generally were between 2.5 and 3.5 tsf, although softer, weathered zones were occasionally encountered near the top. Standard Penetration Test (SPT) values were typically between 11 and 20 blows per foot. Natural moisture contents ranged from 6 to 20 percent and averaged approximately 14 percent. Thin sand seams were encountered in a few locations within the otherwise clayey till.

Alluvial soils were encountered above the till in the borings east of the existing bridges. The alluvial stratum was between 4 and 7 feet thick, where it was encountered. These soils were typically brown to gray, soft to stiff, silty clays or loose sands. Unconfined strengths were 0.4 to 2.2 tsf, with an average of 0.8 tsf. SPT values were 4 to 15 blows per foot. Natural moisture contents ranged from 12 to 21 percent.

A 6 to 23.5 feet thick layer of fill was encountered in all of the borings. It extended from the ground surface to the top of the till or alluvium. The fill material was typically brown to gray, stiff to very stiff, sandy clay or silty clay with very small quantities of random debris.

The groundwater conditions encountered in the borings were not consistent across the site. The groundwater elevations recorded on the boring logs are summarized in Table 7.1. Stabilized readings were not taken in any of the borings. For comparison, the water level in the Mississippi River, approximately 0.7 miles to the north of the site, is usually about Elev. 561.0.

Table 6.1 Groundwater Elevations

Boring No.	During Drilling	At End of Boring	24-hour Reading
B-5 (2011)	568.1	-	-
B-7 (2011)	-	-	-
ILR0701	581.3	-	-
ILR0801	-	-	-
ILR0803	-	-	-
RW07-1	-	599.1	-
RW07-02	-	-	-
RW07-03	-	-	-
RW401	-	-	-

The Illinois State Geological Survey Directory of Coal Mines does not list any mines immediately beneath the site; however, the directory does indicate that past mining has occurred in the general vicinity. Shafts for the Zeigler, Poston, and Highland Mines were located approximately 1.5 miles to the southeast of the site. These room and pillar mines were operated in the early 1900's.

7. Geotechnical Evaluations

With the exception of the softer alluvial soils found in the lower ground near 19th Street, the native soils provide good foundation conditions for an MSE wall. The allowable bearing pressure where the alluvial soils is present is as low as 2,500 psf. Allowable bearing pressure in other areas is 5,700 psf. The proposed wall is configured so that the highest bearing pressures are applied at locations where the alluvial soils are most likely to be found and the lowest bearing pressures are applied where the alluvial soils are not present.

The applied pressures may exceed the allowable pressures for a portion of the wingwall and abutment face at each of the three bridges. The bearing capacity will be deficient only if the softer, alluvial soils are found beneath the wall. The unsuitable soils, if they are present, are expected to extend no more than 5 feet below the wall at the west end of the EB I-74 North Abutment to no more than 12 feet below the wall at the west end of the Ramp 7th-A North Abutment. Removal and replacement of the unsuitable soils is feasible.

Slope stability analyses were completed at several representative sections along the wall. These sections were located at 19th Street Sta. 1920+40, 1920+70, 1921+90, and 1923+40. Results of these analyses are included in the Appendix. The 2.00 to 3.67 factors of safety satisfy AASHTO requirements.

Relatively low settlements are expected. Along much of the wall, the proposed grades are similar to the existing condition. In areas with greater grade change, the bearing strata are relatively incompressible existing fill and glacial till. Estimated settlements are between ¼ and ¾ inch. Up to ½ inch of settlement is due to recompression

of the glacial till stratum, which could take up to 54 months to be 90 percent complete. The estimated magnitude and duration of settlement are considered acceptable for construction of an MSE wall.

Some differential settlement is anticipated near the proposed stage line. Theoretically, the subgrade soils within approximately 5 feet of the edge of a stage will consolidate 25% to 33% less than the central portion. When the adjacent stage is placed, the edge of the previous stage will settle to a level approximately equal to the central portion. This may be visible in the panel joints on the face of the wall. Due to the relatively small settlement magnitude, this is not expected to be a serious concern for this structure.

8. Design Recommendations

When designing for the external stability of the MSE wall, it should be assumed that the reinforced soil mass will be composed of a granular select backfill and the fill behind the reinforced soil mass will be embankment material as defined by the IDOT Standard Specifications. Both materials should be assumed to have a total unit weight of 125 pcf. The active earth pressure coefficient of the embankment fill could vary greatly depending on the actual material used, but should be assumed to be 0.33 for design. Near the wall corners, where the backfill will be the select material placed behind the other face, an active earth pressure coefficient of 0.28 may be used.

Removal and replacement is recommended for any soft cohesive soils that are located directly beneath the wall. Cohesive soils with an unconfined compressive strength that is less than the applied bearing pressure of the wall should be removed within the lateral limits shown in Figure 8.1. It is anticipated that these soft soils will be encountered at relatively shallow depths over a small portion of the wall's footprint. Backfill and fill placed below the reinforced soil mass should be with rock fill as shown in Figure 8.1. The select fill material used in the reinforced soil mass may be used as an alternative to rock fill.

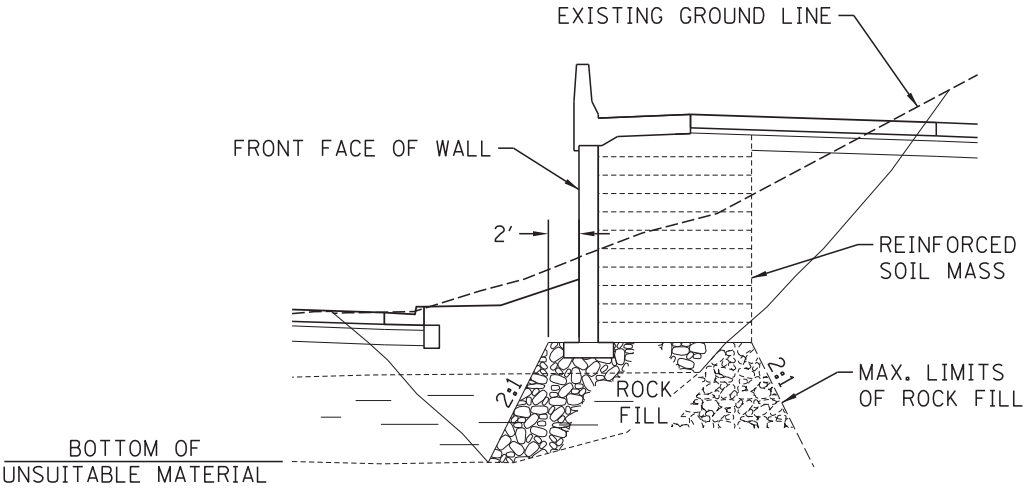

Figure 8.1 Lateral Limits of Unsuitable Material Removal and Replacement

Unsuitable soils should be assumed to be located near the toe of the existing embankment and at the base of a gully at the east end of wall. These soils, if encountered, should be removed and replaced with rock fill or select fill. Maximum removal limits should be as shown Figure 8.1. The unsuitable soils generally are not expected to extend to the back of the reinforced soil mass. For plan quantities, the estimated limits are 15 feet in each direction (along abutment and along wingwall) from the west corner of EB I-74 South Abutment to Elev. 593.6; 20 feet in each direction from west corner of WB I-74 South Abutment to Elev. 596.1; 20 feet in each direction

from west corner of Ramp 7th-A South Abutment to Elev. 595.3; and 10 feet west and 15 feet north from east corner of Ramp 7th-A South Abutment to Elev. 614.8.

During construction, a test pit should be started at the outside corner of the wall at each of the four suspected unsuitable locations. The adjacent footing excavations may be used as the test pits at WB I-74 and Ramp 7th-A. Each test pit should be expanded as required to remove any unsuitable soils encountered to the maximum limits shown in Figure 8.1. No further excavation is required if unsuitable soils are not encountered in the test pit.

With the removal and replacement of the unsuitable soils, a conventional precast panel MSE wall is feasible. The theoretical top of leveling pad or base of reinforced soil mass may be located at the minimum embedment required by IDOT (3.5 feet below finished grade). Walls should be configured with a 4-foot bench at the face as required by AASHTO 5.8.1. As an alternative in locations with slopewall, the base of the wall should be an extra 1.0 foot deeper. Any backfill or fill below the reinforced soil mass should be with either rock fill or select fill to the limits shown in Figure 8.1. Other material outside those limits may be embankment fill in accordance with the IDOT Standard Specifications.

Allowable bearing pressure is 5,700 psf for the entire length of wall. Sliding stability should be checked against a nominal undrained sliding resistance of 2,700 psf and a nominal drained sliding resistance of 0.53 times the effective vertical stress. The subgrade should be inspected before fill is placed. Any soft or otherwise unsuitable material should be removed and replaced with compacted porous granular embankment or select fill.

The external stability design should be completed using the parameters defined above. The minimum length to height ratio specified by AASHTO (0.70) will be acceptable for portions of the wall more than 80 feet from the centerline of 19th Street. A 0.80 length to height ratio is recommended for the taller portions of the wall closer to 19th Street. A minimum reinforcement length of approximately 15 feet will be required to meet sliding stability criteria of the walls under the bridge abutments.

The external stability design of the sections where the wall is blistered out for an abutment maskwall also should be completed using the parameters defined above. The length to height ratio should be no less than 0.80, where the height is measured from the top of leveling pad to the roadway grade and the length is measured from the front face of the lower wall. The reinforcement behind the upper wall panels should extend to no less than the back of the lower wall's reinforced soil mass and should be no less than 0.80 times the height of the upper wall.

9. Construction Considerations

The second stage of the proposed wall will require excavation to the north of the end of the permanent MSE wall along WB I-74. This excavation will require temporary support of approximately 15 feet of fill under WB I-74 while slopes are laid back under the proposed EB I-74 shoulder. A temporary MSE wall is suitable for this structure. The temporary wall should be designed using the same recommendations as the adjacent permanent wall.

The construction of MSE walls is not covered by the IDOT Standard Specifications. Guide Bridge Special Provisions No. 38, Mechanically Stabilized Earth Retaining Walls (Revised: July 26, 2013) and No. 57, Temporary Mechanically Stabilized Earth Retaining Walls (Revised: July 26, 2013) should be included in the construction documents. These special provisions require that the contractor take responsibility for the final design of much of the structure. The most recent versions of IDOT Guide Bridge Special Provisions No. 38 and No. 57 reference only the AASHTO LRFD Bridge Specifications for design of MSE walls. The previous versions as noted above should be used for this project, because the current wall design and plan details use the AASHTO Standard Specifications for Highway Bridges.

The piles for S.N. 081-0179, 081-0180 and 081-0181, which are located within the reinforced soil mass for this wall, will interfere with the placement and compaction of the select backfill. The piles must either be driven prior to placing the select fill or driven through sleeves after placing the select fill. Refer to the current geotechnical design memorandum for those structures for specific recommendations.

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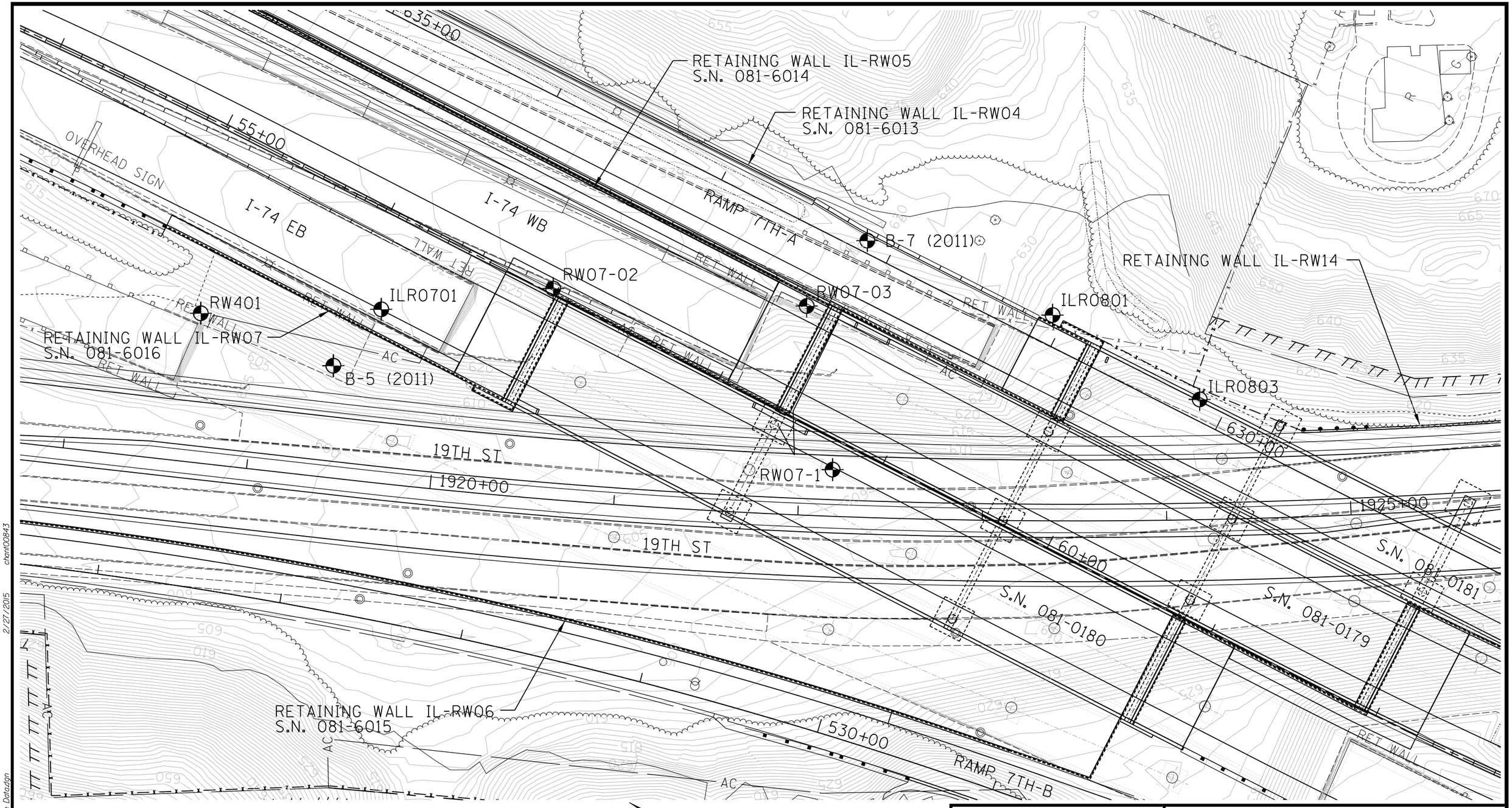
Appendix

Boring Location Plan
Subsurface Data Profile
Boring Logs
Soils Laboratory Test Results
Summary of Slope Stability Analyses



HANSON

BORING LOCATION PLAN

I-74 MAINLINE RETAINING WALL IL-RW07
S.N. 081-6016
ROCK ISLAND COUNTY, ILLINOIS

08H0120E 2/27/15

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RW401
Sta. 55+34, 96' RT

	N	Qu	w%	
609.50				
	16			Sandy Clay (CL) - Brown, dry, very stiff, with angular-subangular gravel pieces, fill
607.50				
	28			Sandy Clay, Trace Gravel (CL) - Brown, dry, very hard, subrounded-subangular gravel, fine to coarse, fill
605.50				
	50/5"			Fill - Concrete rubble pieces
603.50				
	9			Silty Clay (CL) - Brown gray, moist, soft, low plasticity, fill
	5			Dark brown, moist, soft, low plasticity, rounded-subrounded, fine to medium gravel throughout, fill
	24			No recovery possible due to piece of coarse gravel stuck in shoe
	7			Dark brown, stiff, low plasticity
	12			Similar to above with fine to medium, rounded-subrounded gravel, fill
591.50				
	11			Sandy Clay (CL) - Light brown, moist, stiff, with clay seams, fine to medium, rounded-subrounded gravel embedded throughout, possible gumbotil
				Similar to above, dark reddish brown
583.50				
	15			Sandy Lean Clay Trace Gravel (CL) - Gray, moist, stiff, fine to medium rounded-subrounded gravel embedded throughout, glacial clay
	15			
	18			
559.50				
				Sandy Shale - Dark gray, dry, hard, weathered shale with coal and sand seams
557.50	66			
556.50				
	Rec. = 45% ROD = 23%			Shale - gray, very fine grain, soft, slightly weathered, very weak, sound rock, very sandy; horizontal joints, possibly caused during core retrieval, no staining, smooth, planar joint surfaces, 2" thick soft, silty infilling at shale sandstone interface
552.50				
	Rec. = 0% ROD = 0%			Limestone - Dark gray, fine to coarse grained, appearance is a mixture of fine sand and gravel, rutted texture, moderately weathered, weak to medium strong, moderately fractured to extremely fractured; horizontal joints, black staining, rough, undulating surfaces, very close to close spaced dicontinuities, joints are open
				Sandstone - No recovery, possibly sandstone, brown, fine grained sandstone piece in bit
	Rec. = 0% ROD = 0%			
542.50				
				Bottom of hole = 67.0 feet

B-5(2011)
Sta. 56+11, 89' RT

	N	Qu	w%	
613.10				
		0.5P	13	MEDIUM light brown SILTY CLAY LOAM
	8	0.5P	15	MEDIUM light brown SILTY CLAY LOAM
	7	1.2B	17	STIFF gray/brown SILTY CLAY LOAM
	5	0.6P	20	MEDIUM gray SILTY CLAY LOAM
	13	5.4B	12	HARD tan CLAY LOAM
	9	1.1S	15	STIFF gray SILTY LOAM
	12	2.0B	20	STIFF brown SILTY CLAY LOAM
	8	0.8P	21	MEDIUM gray SILTY CLAY LOAM
593.60				
	13	2.7B	16	VERY STIFF tan CLAY LOAM TILL
	15	2.5B	15	VERY STIFF tan CLAY LOAM TILL
	14	2.7B	15	VERY STIFF tan/gray CLAY LOAM TILL
	15	2.5B	15	VERY STIFF gray CLAY LOAM TILL
	15	2.5B	15	VERY STIFF gray CLAY LOAM TILL
	16	2.1B	15	VERY STIFF gray CLAY LOAM TILL
	14	2.5B	16	VERY STIFF gray CLAY LOAM TILL
	26	5.4B	18	HARD gray CLAY LOAM TILL
	23	5.7B	18	HARD gray CLAY LOAM TILL
	21	3.1B	18	VERY STIFF gray CLAY LOAM TILL with SILTY SAND lens
569.10				
568.10 DD	12			MEDIUM gray clean medium coarse SAND
566.10				
	16	4.0P	12	MEDIUM gray clean medium coarse SAND with CLAY lens
563.60				VERY DENSE gray weathered SHALE with COAL lens
	100/8" 100/1"			Wash - VERY DENSE olive-green SANDSTONE with DOLOMITE fragments - Auger Refusal @ 52.5'
560.60				
				Bottom of hole = 52.5 feet

ILR0701
Sta. 56+20, 50' RT

	N	Qu	w%	
629.30				
628.70				7" Thick ACC followed by gravel subbase to 1.0'
	12			Silty Sandy Clay with Gravel, greenish brown, moist, low plasticity, stiff, with subangular to subrounded gravel embedded throughout, fill/subbase
625.30				
	9			Sandy Clay Trace Gravel, dark gray, frozen, stiff, with subangular to subrounded fine to coarse gravel embedded throughout, fill
	12	3.0P to 4.0P		
621.30				
	6	2.0P	15.5	Silty Clay with gravel, gray, moist, soft to medium stiff, high plasticity, trace gravel, possible fill (LL=38 PI=14)
		1.5P		(LL=32 PI=14)
615.80				
	5	2.0P	16.0	Sandy Lean Clay Trace Gravel, gray, moist, stiff, medium plasticity, fill or disturbed till (LL=30 PI=14)
610.80				
	11			Same As Above, turning grayish brown at bottom 3", piece of wood embedded, possible fill
605.80				
	12	3.0P		Sandy Lean Clay Trace Gravel, brown, moist, stiff, low plasticity, possible weathered till
600.80				
	15	2.5P to 3.5P	15.0	Same As Above, gray, then brown, split in almost vertical with reddish brown surface, weathered till
595.80				
	12	2.5P to 3.0P		Sandy Lean Clay Trace Gravel, gray, moist, stiff, low plasticity, unweathered till
	15	2.5P		
DD 581.30				
580.80				Top 3" is same as above; Bottom 12" is Poorly Graded Sand, gray, wet, medium dense, fine to medium sand seam followed by 3" of gray sandy lean clay, trace gravel, till
579.30	28			
				Bottom of hole = 50.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
[U]	Unconsolidated Undrained Triaxial Test
[R]	Consolidated Undrained Triaxial Test
[C]	Consolidation Test
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling 24h = 24 hours after completion

SUBSURFACE DATA PROFILE
STRUCTURE NO. 081-6016

PROFESSIONAL DESIGN FIRM LICENSE #184-001084

HANSON
Hanson Professional Services Inc.

JOB NO.	SHEET NO. 1	F.A.I RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
08H0120E		74	81-1-2	ROCK ISLAND	-	
DATE 2/27/15	3 SHEETS			CONTRACT NO. 64C08		
		FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

RW07-02
Sta. 56+98, 3' LT

	N	Qu	w%	
631.20				ASPHALT.
630.70	5	0.50P	15	FILL - Brown to light brown clayey SILT, trace gravel, trace sand.
	14	4.50P	10	
	23		14	- sand seam @ 7.0'.
622.20	12	3.00P	13	Brown and gray silty lean CLAY, trace sand, trace gravel.
		1.75B	14	
		3.88B	13	
		1.84B	14	
	14	2.70P	14	
615.20	19	4.30P	14	Gray moist, very stiff, silty lean CLAY, with trace sand and gravel.
	17	3.30P	15	
	15	2.70P	15	
	15	3.00P	14	
	12	1.70P	16	
	15	2.20P	16	
	19	2.30P	15	
	20	3.30P	14	
	19	2.70P	14	
	28	2.30P	14	
	54	3.30P	19	- coarse sand seam @ 64.3 to 65.0'.
563.70				Gray SHALE.
561.20	50/5"	4.50P	14	Bottom of hole = 70.0 feet

RW07-1
Sta. 58+77, 15' RT

	N	Qu	w%		
605.10					CONCRETE
604.70	15		14		FILL - Brown, moist, very stiff, clayey SILT with trace sand
		1.67S	13		
		0.90B	20		
		1.95S	13		
600.10					Oh Brown, wet, silty, clayey, fine-grained SAND with trace gravel
599.10	5	0.42B	21	R	Dark brown, moist, soft to stiff, clayey SILT
		1.25P	19		
			16	C	
596.10					Brown, wet, silty, clayey, fine-grained SAND with gravel
594.10	22	2.30P	13		Brown, moist, very stiff, clayey SILT with trace sand and gravel
		3.11B	16		
591.60		3.04B	15		Gray, moist, very stiff, silty CLAY with trace sand and gravel
	19	2.19B	14		
		2.93B	13		
		4.43B	13		
		3.50P	13		
585.10					Bottom of hole = 20.0 feet

RW07-03
Sta. 58+24, 57' LT

	N	Qu	w%	
629.10				
628.85				TOPSOIL.
	13	4.50P	12	FILL - Brown silty lean CLAY, trace sand, trace gravel, with limestone fragments.
	11	3.70P	11	
	13			
620.60		1.75B	14	Brown silty lean CLAY, little sand, trace small gravel.
		1.90B		
	5	3.70P	13	
			18	
		1.90B	17	
	18	4.65S	13	
	16	3.69B	12	
	16	3.10B	14	
603.10				Gray, moist, very stiff, silty lean CLAY, with trace sand and trace gravel.
	16	4.07B	14	
	19	3.88B	13	
594.10				Bottom of hole = 35.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
Q	Unconsolidated Undrained Triaxial Test
R	Consolidated Undrained Triaxial Test
C	Consolidation Test
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling 24h = 24 hours after completion

SUBSURFACE DATA PROFILE
STRUCTURE NO. 081-6016

PROFESSIONAL DESIGN FIRM LICENSE #184-001084

HANSON
Hanson Professional Services Inc.

JOB NO.	SHEET NO. 2	F.A.I RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
08H0120E		74	81-1-2	ROCK ISLAND	-	
DATE 2/27/15	3 SHEETS			CONTRACT NO. 64C08		
		FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

B-7(2011)
Sta. 58+37, 104' LT

	N	Qu	w%	
629.50				
		1.6P	13	STIFF tan LOAM
	19	2.5B	12	VERY STIFF tan LOAM
	15	2.3P	17	VERY STIFF light gray SILT
	17	3.5B	14	VERY STIFF tan LOAM
	17	2.7S	14	VERY STIFF tan LOAM
617.50				
	17	3.3B	14	VERY STIFF gray/tan LOAM/CLAY LOAM FILL
	15	2.3B	15	VERY STIFF tan CLAY LOAM TILL
	13	2.3B	15	VERY STIFF light gray CLAY LOAM TILL
	15	2.1B	15	VERY STIFF gray CLAY LOAM TILL with COAL fragments
	17	2.7B	15	VERY STIFF gray CLAY LOAM TILL
	14	2.5B	15	VERY STIFF gray CLAY LOAM TILL
	12	2.7B	15	VERY STIFF gray CLAY LOAM TILL
	16	3.1B	14	VERY STIFF gray CLAY LOAM TILL
	19	3.3B	15	VERY STIFF gray CLAY LOAM TILL
	23	3.7B	14	VERY STIFF gray CLAY LOAM TILL
	22	3.9B	14	VERY STIFF gray CLAY LOAM TILL
	19	3.1B	14	VERY STIFF gray CLAY LOAM TILL
	17	3.5B	14	VERY STIFF gray CLAY LOAM TILL
	32	5.4B	14	HARD gray CLAY LOAM TILL eith moist SAND lens
	24	5.9S	24	HARD gray CLAY TILL
	46	4.5S	18	HARD gray CLAY LOAM TILL
577.50				
	53		18	VERY DENSE tan/gray SHALEY CLAY

ILR0803
Sta. 630+15, 11' RT

	N	Qu	w%	
614.67				
	8	6.7S		Silt With Trace Sand (ML) - yellowish brown, slightly moist, medium stiff, fine to coarse grained, low plasticity
	29	4.0P		very stiff
608.67				
				Bottom of hole = 6.0 feet

ILR0801
Sta. 631+07, 16' RT

	N	Qu	w%	
623.02				
622.02				Grass Matter - followed by silty clay with sands and topsoil
	9			Silty Clay With Sand (CL-ML) - dark brown with brown, dry to moist, non plastic, little to few coarse to fine sands, strong cementation, occasional reddish brick fragements, possible fill
620.02				
	6			Lean Clay With Sand (CL) - medium brown, dry to moist, low plasticity, medium stiff, little to few coarse to fine sands, dark brown silty pocket at top of sample, possible fill
617.02				
	8	3.75-4.0P		Sandy Lean Clay (CL) - olive gray with medium brown and gray, dry to moist, medium stiff, few coarse to fine sands, trace fine subangular to subrounded gravels, dark gray with occasional root matter at bottom of sample
615.02				
	9	1.3		Sandy Lean Clay With Gravel (CL) - medium brown with gray, dry, strongly cemented, stiff, crumbly, few coarse to fine sands, little to trace of medium to fine gravels, occasional medium to fine sand seams scattered throughout, dark gray with heavy _____ matter at top 2" of sample, possible old topsoil followed by native soil; Rimac: Pu = 68 lbs
	8	4.3P		same as above, medium brown, dry to moist, stiff, strongly cemented, glacial till
	9	4.5P		same as above, medium brown to brown, stiff, strongly cemented, dry, glacial till
605.02				
	12	4.0-4.5P		Sandy lean Clay (CL) - medium brown with orange brown, dry, non plastic, stiff, few coarse to fine sands, frequent sand seams, approxomately 1/8"-1/4" thick at center and bottom of sample, sand seams of medium to fine sands, oxidized, possible weathered till with scattered sand seams
	12	1.9B		medium brown with gray, mottled with orange brown, dry, stiff, few coarse to fine sands, very oxidized, small pockets of dark gray to black coal like deposits in middle of sample, possible weathered glacial till; Rimac: Pu = 100 lbs
	11	3.8P		olive gray with light brown, dry to moist, slightly oxidized at top, stiff, possible unweathered glacial till
590.02				
	12	1.3		Lean Clay With Sand (CL) - uniform gray, dry to moist, stiff, little to few coarse to fine sands, scattered sand pockets, possible unweathered glacial till; Rimac: Pu = 70 lbs
				uniform gray, dry to moist, stiff, little to few coarse to fine sands, scattered sand pockets, possible unweathered glacial till
583.52	12			
583.02				Clayey Sand With Silt (SC) - gray, moist to wet, medium dense, clay with medium to fine sands, possible residual soil
				Bottom of hole = 40.0 feet

LEGEND

N	Standard Penetration Test N (blows/ft)
Qu	Unconfined Strength (tsf)
w%	Natural Moisture Content (%)
[U]	Unconsolidated Undrained Triaxial Test
[R]	Consolidated Undrained Triaxial Test
[C]	Consolidation Test
DD ▽ 558.10	Water Surface Elevation Encountered in Boring DD = during drilling 24h = 24 hours after completion

SUBSURFACE DATA PROFILE
STRUCTURE NO. 081-6016

PROFESSIONAL DESIGN FIRM LICENSE #184-001084

HANSON
Hanson Professional Services Inc.

JOB NO. 08H0120E
DATE 2/27/15

SHEET NO. 3
3 SHEETS

F.A.I RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
74	81-1-2	ROCK ISLAND	-	
		CONTRACT NO. 64C08		
FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 3/22/11

ROUTE FAI 74 DESCRIPTION 081-0099, 0100 P92-032-01 I-74 over 19th Street, north of 12th Avenue LOGGED BY W. Garza

SECTION 81-1HB LOCATION Moline Twp. - 32SE, SEC. , TWP. 18N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 081-0099, 0100
Station

BORING NO. B-5
Station 79+98
Offset 37.00ft Lt BL - SB Ramp
Ground Surface Elev. 613.1 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 568.1 ft ▼
Upon Completion Wash ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
MEDIUM light brown SILTY CLAY LOAM		0.5 P	13	VERY STIFF tan CLAY LOAM TILL	3 6 7	2.7 B	16
610.60				591.60			
MEDIUM light brown SILTY CLAY LOAM	2 4 4	0.5 P	15	VERY STIFF tan CLAY LOAM TILL	5 6 9	2.5 B	15
609.10				589.10			
-5				-25			
STIFF gray/brown SILTY CLAY LOAM	2 3 4	1.2 B	17	VERY STIFF tan/gray CLAY LOAM TILL	3 5 9	2.7 B	15
606.60				586.60			
MEDIUM gray SILTY CLAY LOAM	2 2 3	0.6 P	20	VERY STIFF gray CLAY LOAM TILL	4 6 9	2.5 B	15
604.10				584.10			
-10				-30			
HARD tan CLAY LOAM	7 6 7	5.4 B	12	VERY STIFF gray CLAY LOAM TILL	4 6 9	2.5 B	15
601.60				581.60			
STIFF gray SILTY LOAM	2 4 5	1.1 S	15	VERY STIFF gray CLAY LOAM TILL	4 6 10	2.1 B	15
599.10				579.10			
-15				-35			
STIFF brown SILTY CLAY LOAM	3 5 7	2.0 B	20	VERY STIFF gray CLAY LOAM TILL	4 5 9	2.5 B	16
596.60				576.60			
MEDIUM gray SILTY CLAY LOAM	3 3 5	0.8 P	21	HARD gray CLAY LOAM TILL	5 11 15	5.4 B	18
593.60				574.10			
-20				-40			

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

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 3/22/11

ROUTE FAI 74 DESCRIPTION 081-0099, 0100 P92-032-01 I-74 over 19th Street, north of 12th Avenue LOGGED BY W. Garza

SECTION 81-1HB LOCATION Moline Twp. - 32SE, SEC. , TWP. 18N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 081-0099, 0100
Station

BORING NO. B-5
Station 79+98
Offset 37.00ft Lt BL - SB Ramp
Ground Surface Elev. 613.1 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 568.1 ft ▼
Upon Completion Wash ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
HARD gray CLAY LOAM TILL		6 9 14	5.7 B	18
571.60				
VERY STIFF gray CLAY LOAM TILL with SILTY SAND lens		4 8 13	3.1 B	18
569.10				
	▼-45			
MEDIUM gray clean medium coarse SAND		0 5 7		
566.10				
MEDIUM gray clean medium coarse SAND with CLAY lens		3 5 11	4.0 P	12
563.60				
	-50			
VERY DENSE gray weathered SHALE with COAL lens		40 100/8"		
561.60				
560.60				
Wash VERY DENSE olive-green SANDSTONE with DOLOMITE fragments Auger Refusal @ 52.5' End of Boring		100/1"		
	-55			
	-60			

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

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 3/29/11

ROUTE FAI 74 DESCRIPTION 081-0099, 0100 P92-032-01 I-74 over 19th Street, north of 12th Avenue LOGGED BY W. Garza

SECTION 81-1HB LOCATION Moline Twp. - 32SE, SEC. , TWP. 18N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 081-0099, 0100
Station

BORING NO. B-7
Station 87+40
Offset 16.00ft Lt BL - NB Ramp
Ground Surface Elev. 629.5 ft

Surface Water Elev. ft
Stream Bed Elev. ft

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
		1.6 P	13	STIFF tan LOAM
627.00				
	5 8 11	2.5 B	12	VERY STIFF tan LOAM
625.50				
-5				
	3 6 9	2.3 P	17	VERY STIFF light gray SILT
623.00				
	3 7 10	3.5 B	14	VERY STIFF tan LOAM
620.50				
-10				
	4 7 10	2.7 S	14	VERY STIFF tan LOAM
617.50				
	4 7 10	3.3 B	15	VERY STIFF gray/tan LOAM/CLAY LOAM TILL
615.50				
-15				
	3 7 8	2.3 B	15	VERY STIFF tan CLAY LOAM TILL
613.00				
	3 5 8	2.3 B	15	VERY STIFF light gray CLAY LOAM TILL
610.50				
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	4 6 9	2.1 B	15	VERY STIFF gray CLAY LOAM TILL with COAL fragments
608.00				
	6 7 10	2.7 B	15	VERY STIFF gray CLAY LOAM TILL
605.50				
-25				
	3 6 8	2.5 B	15	VERY STIFF gray CLAY LOAM TILL
603.00				
	3 5 7	2.7 B	15	VERY STIFF gray CLAY LOAM TILL
600.50				
-30				
	3 6 10	3.1 B	14	VERY STIFF gray CLAY LOAM TILL
598.00				
	5 8 11	3.3 B	15	VERY STIFF gray CLAY LOAM TILL
595.50				
-35				
	5 10 13	3.7 B	14	VERY STIFF gray CLAY LOAM TILL
593.00				
	5 8 14	3.9 B	14	VERY STIFF gray CLAY LOAM TILL
590.50				
-40				

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

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 3/29/11

ROUTE FAI 74 DESCRIPTION 081-0099, 0100 P92-032-01 I-74 over 19th Street, north of 12th Avenue LOGGED BY W. Garza

SECTION 81-1HB LOCATION Moline Twp. - 32SE, SEC. , TWP. 18N, RNG. 1W

COUNTY Rock Island DRILLING METHOD Hollow Stem Auger HAMMER TYPE B-53 Diedrich Automatic

STRUCT. NO. 081-0099, 0100
Station

BORING NO. B-7
Station 87+40
Offset 16.00ft Lt BL - NB Ramp
Ground Surface Elev. 629.5 ft

Surface Water Elev. ft
Stream Bed Elev. ft

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	4			VERY STIFF gray CLAY LOAM TILL
	8	3.1	14	
588.00	11	B		
				VERY STIFF gray CLAY LOAM TILL
	2			
	7	3.5	14	
585.50	10	B		
-45				HARD gray CLAY LOAM TILL with moist SAND lens
	13			
	15	5.4	14	
583.00	17	B		
				HARD gray CLAY TILL
	6			
	11	5.9	24	
580.50	13	S		
-50				HARD gray CLAY LOAM TILL
	8			
	18	4.5	18	
	28	S		
577.50				
	30			VERY DENSE tan/gray SHALEY CLAY
	29		18	
575.50	24			
-55				VERY DENSE gray SHALE
	7			
	18			
573.00	45			
				VERY DENSE gray SHALE
	100/11"			
570.50				
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	16			VERY DENSE gray SHALE
	100/9"			
568.00				
				End of Boring
-65				
-70				
-75				
-80				

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

Illinois Department of Transportation
Division of Highways
CH2M HILL

SOIL BORING LOG

Date 3/28/08

ROUTE I-74 **DESCRIPTION** I-74 SB Near 7th Avenue **LOGGED BY** B. Karnik

SECTION I-74 Bridge over Mississippi River **LOCATION** (N=562235.7741, E=2459668.0033), **SEC.** 32, **TWP.** 18N, **RNG.** 1W

COUNTY Rock Island **DRILLING METHOD** HSA, CME 55 **HAMMER TYPE** CME AUTOMATIC

STRUCT. NO. _____
Station _____

BORING NO. ILR0701
Station _____
Offset _____
Ground Surface Elev. 629.30 ft

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

Groundwater Elev.:
First Encounter 581.3 ft ▼
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				7" Thick ACC followed by gravel subbase to 1.0'
628.70				
	2			Silty Sandy Clay with Gravel, greenish brown, moist, low plasticity, stiff, with subangular to subrounded gravel embedded throughout, fill/subbase
	2 10			
625.30	4			
-5	5 4 5 3			Sandy Clay Trace Gravel, dark gray, frozen, stiff, with subangular to subrounded fine to coarse gravel embedded throughout, fill
	5 6 6 2	3.0 to 4.0 P		
621.30				Silty Clay with Gravel, gray, moist, soft to medium stiff, high plasticity, trace gravel, possible fill
	2 3 3	2.0 P	15.5	
-10				
		1.5 P		
615.80	3			Sandy Lean Clay Trace Gravel, gray, moist, stiff, medium plasticity, fill or disturbed till
-15	2 3	2.0 P	16.0	
610.80	3			Same As Above, turning grayish brown at bottom 3", piece of wood embedded, possible fill
-20	4 7			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Same As Above, turning grayish brown at bottom 3", piece of wood embedded, possible fill *(continued)*
605.80	5			Sandy Lean Clay Trave Gravel, brown, moist, stiff, low plasticity, possible weathered till
-25	6 6	3.0 P		
600.80	6			Same as Above, gray, then brown, split in almost vertical with reddish brown surface, weathered till
-30	7 8	2.5 to 3.5 P	15.0	
595.80	4			Sandy Lean Clay Trace Gravel, gray, moist, stiff, low plasticity, unweathered till
-35	6 6	2.5 to 3.0 P		
	5			
-40	6 9	2.5 P		

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

Illinois Department of Transportation
Division of Highways
CH2M HILL

SOIL BORING LOG

Date 3/28/08

ROUTE I-74 **DESCRIPTION** I-74 SB Near 7th Avenue **LOGGED BY** B. Karnik

SECTION I-74 Bridge over Mississippi River **LOCATION** (N=562235.7741, E=2459668.0033), **SEC.** 32, **TWP.** 18N, **RNG.** 1W

COUNTY Rock Island **DRILLING METHOD** HSA, CME 55 **HAMMER TYPE** CME AUTOMATIC

STRUCT. NO. _____
Station _____

BORING NO. ILR0701
Station _____
Offset _____
Ground Surface Elev. 629.30 ft

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

Groundwater Elev.:
First Encounter 581.3 ft ▼
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Sandy Lean Clay Trace Gravel, gray, moist, stiff, low plasticity, unweathered till *(continued)*	-45			
	580.80 ▼			
Top 3" is same as above Bottom 12" is Poorly Graded Sand, gray, wet, medium dense, fine to medium sand seam followed by 3" of gray sandy lean clay, trace gravel, till	-50	12 16 12		
	579.30			
End of Boring	-55			
	-60			

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

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

Illinois Department of Transportation
Division of Highways
CH2M HILL

SOIL BORING LOG

Date 10/5/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** F. Abreu

SECTION I-74 Bridge over Mississippi River **LOCATION** (N=561907.847, E=2459825.874), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **DRILLING METHOD** HSA, CME 55 **HAMMER TYPE** CME AUTOMATIC

STRUCT. NO. _____
Station _____

BORING NO. ILR0801
Station _____
Offset _____
Ground Surface Elev. 623.02 ft

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

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Grass Matter
				followed by silty clay with sands and topsoil
622.02				
	4			**Silty Clay With Sand(CL-ML)**
	4			dark brown with brown, dry to
	5			moist, non plastic, little to few
	5			coarse to fine sands, strong
620.02				cementation, occasional reddish
	3			brick fragments, possible fill
	3			**Lean Clay With Sand(CL)**
	3			medium brown, dry to moist, low
-5	3			plasticity, medium stiff, little to few
				coarse to fine sands, dark brown
				silty pocket at top of sample,
617.02				possible fill
	1			
	3	3.75-4.0		**Sandy Lean Clay(CL)**
	5	P		olive gray with medium brown and
	6			gray, dry to moist, medium stiff,
615.02				few coarse to fine sands, trace fine
	3			subangular to subrounded gravels,
	4	1.3		dark gray with occasional root
	5			matter at bottom of sample
-10	6			**Sandy Lean Clay With Gravel (CL)**
				medium brown with gray, dry,
				strongly cemented, stiff, crumbly,
	2			few coarse to fine sands, little to
	3	4.3		trace of medium to fine gravels,
	5	P		occasional medium to fine sand
	7			seams scattered throughout, dark
				gray with heavy _____ matter at
	3			top 2" of sample, possible old
	4	4.5		topsoil followed by native
	5	P		soil Rimac: Pu = 68 lbs
-15	6			same as above, medium brown,
				dry to moist, stiff, strongly
				cemented, glacial till
				same as above, medium brown to
				brown, stiff, strongly cemented,
				dry, glacial till
605.02				
	3			
	5	4.0-4.5		
	7	P		
-20	10			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Sandy Lean Clay(CL)
				medium brown with orange brown,
				dry, non plastic, stiff, few coarse to
				fine sands, frequent sand seams,
				approximately 1/8"-1/4" thick at
				center and bottom of sample, sand
				seams of medium to fine sands,
	3			oxidized, possible weathered till
	5	1.9		with scattered sand seams
	7	B		*(continued)*
-25	10			medium brown with gray, mottled
				with orange brown, dry, stiff, few
				coarse to fine sands, very
				oxidized, small pockets of dark
				gray to black coal like deposits in
				middle of sample, possible
				weathered glacial till
				Rimac: Pu = 100 lbs
	3			olive gray with light brown, dry to
	5	3.8		moist, slightly oxidized at top, stiff,
	6	P		possible unweathered glacial till
-30	9			
590.02				
	3			**Lean Clay With Sand(CL)**
	5	1.3		uniform gray, dry to moist, stiff,
	7			little to few coarse to fine sands,
-35	9			scattered sand pockets, possible
				unweathered glacial till Rimac: Pu
				= 70 lbs
	2			uniform gray, dry to moist, stiff,
	4			little to few coarse to fine sands,
	8			scattered sand pockets, possible
583.52				unweathered glacial till
583.02 -40	12			

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

Illinois Department of Transportation
Division of Highways
CH2M HILL

SOIL BORING LOG

Date 10/5/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** F. Abreu

SECTION I-74 Bridge over Mississippi River **LOCATION** (N=561907.847, E=2459825.874), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **DRILLING METHOD** HSA, CME 55 **HAMMER TYPE** CME AUTOMATIC

STRUCT. NO. _____
Station _____

BORING NO. ILR0801
Station _____
Offset _____
Ground Surface Elev. 623.02 **ft**

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

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
				Clayey Sand With Silt(SC) gray, moist to wet, medium dense, clay with medium to fine sands, possible residual soil
				End of Boring
-45				
-50				
-55				
-60				

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

Illinois Department of Transportation
Division of Highways
CH2M HILL

SOIL BORING LOG

Date 10/9/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** Bose, Kaustav/SCO

SECTION I-74 Bridge over Mississippi River **LOCATION** (N=561816.075, E=2459820.033), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **DRILLING METHOD** HSA, CME 55 **HAMMER TYPE** CME AUTOMATIC

STRUCT. NO. _____
Station _____

BORING NO. ILR0803
Station _____
Offset _____
Ground Surface Elev. 614.67 **ft**

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

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Silt With Trace Sand(ML) yellowish brown, slightly moist, medium stiff, fine to coarse grained, low plasticity
	2			
	4 4	6.7 S		
	2			very stiff
-5	10 19	4.0 P		
608.67				End of Boring
-10				
-15				
-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)

PROJECT NUMBER:	BORING NUMBER:
158835.AA.GS.01	RW401 SHEET 1 OF 3

SOIL BORING LOG

PROJECT : I-74 Bridge over Mississippi River, Quad Cities IA/IL LOCATION : (562322.6 N, 2459622.9 E)

ELEVATION : 609.5 ft MSL DRILLING CONTRACTOR : Terracon

DRILLING METHOD AND EQUIPMENT : CME-550, 6" power auger, HSA, SPT with automatic hammer CME-50

WATER LEVELS : --- START : 12/16/05 09:45 END : 12/16/05 15:00 LOGGER : B. Karnik

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLLIC LOG	Frozen	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
609.5	0.0							
		14.0	S-1-SS	3-7-9-8 (16)	**Sandy Clay (CL)** Brown, dry, very stiff, with angular-subangular gravel pieces, fill			Hole offset to gps #50 adjacent to ramp abutment
	2.0							
		10.0	S-2-SS	9-13-15-50/1 (28)	**Sandy Clay, Trace Gravel (CL)** Brown, dry, very hard, subrounded-subangular gravel, fine to coarse, fill			
	4.0							
5					**Fill**			Ground frozen to approximately 4' deep
604.5		1.0	S-3-SS	50/5 (50/5")	Concrete rubble pieces			
	6.0							
		6.0	S-4-SS	7-5-4-3 (9)	**Silty Clay (CL)** Brown gray, moist, soft, low plasticity, fill			
	8.0							
		6.0	S-5-SS	3-2-3-5 (5)	Dark brown, moist, soft, low plasticity, rounded-subrounded, fine to medium gravel throughout, fill			
10	10.0							
599.5			S-6-SS	4-13-11-6 (24)	No recovery possibly due to piece of coarse gravel stuck in shoe			
	12.0							
		18.0	S-7-SS	4-3-4-4 (7)	Dark brown, stiff, low plasticity			
	14.0							
15								
594.5		19.0	S-8-SS	3-5-7-8 (12)	Similar to above with fine to medium, rounded-subrounded gravel, fill			
	16.0							
					Sandy Clay (CL) Light brown, moist, stiff, with clay seams, fine to medium, rounded-subrounded gravel embedded throughout, possible gumbotil			
20	20.0							
589.5		21.0	S-9-SS	3-4-7-10 (11)				
	22.0							
25	25.0							
584.5		22.0	S-10-SS	4-7-8-10 (15)	Similar to above, dark reddish brown			
	27.0				**Sandy Lean Clay Trace Gravel (CL)** Gray, moist, stiff, fine to medium rounded-subrounded gravel embedded throughout, glacial clay			
	29.0							
30				4-7-8-9				Start mud rotary at 29' after sampling

PROJECT NUMBER:	BORING NUMBER:	
158835.AA.GS.01	RW401	SHEET 2 OF 3

SOIL BORING LOG

PROJECT : I-74 Bridge over Mississippi River, Quad Cities IA/IL — LOCATION : (562322.6 N, 2459622.9 E)

ELEVATION : 609.5 ft MSL — DRILLING CONTRACTOR : Terracon

DRILLING METHOD AND EQUIPMENT : CME-550, 6" power auger, HSA, SPT with automatic hammer CME-50

WATER LEVELS : --- — START : 12/16/05 09:45 — END : 12/16/05 15:00 — LOGGER : B. Karnik

DEPTH BELOW EXISTING GRADE (ft)	INTERVAL (ft)	RECOVERY (in)	#TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	SYMBOLLIC LOG	Frozen	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION
579.5	31.0	23.0	S-11-SS	(15)				
35 574.5								
40	40.0							
569.5	42.0	24.0	S-12-SS	5-8-10-12 (18)				
45 564.5								
50	50.0							
559.5	52.0	12.0	S-13-SS	9-16-50/6 (66/12")	**Sandy Shale** Dark gray, dry, hard, weathered shale with coal and sand seams			Spoon refusal at 51' end drilling at 11:50 am, start rock coring at 52' at 1:37 pm
					Begin Rock Coring at 52.0 ft below ground surface See the next sheet for the rock core log			
55 554.5								
60								

PROJECT NUMBER:	BORING NUMBER:	
158835.AA.GS.01	RW401	SHEET 3 OF 3

ROCK CORE LOG

PROJECT : I-74 Bridge over Mississippi River, Quad Cities IA/IL — LOCATION : (562322.6 N, 2459622.9 E)

ELEVATION : 609.5 ft MSL — DRILLING CONTRACTOR : Terracon

CORING METHOD AND EQUIPMENT : CME-550, NQ DOUBLE BARREL DIAMOND TIP — ORIENTATION : VERTICAL

WATER LEVELS : --- — START : 12/16/05 09:45 — END : 12/16/05 15:00 — LOGGER : B. Karnik

DEPTH BELOW SURFACE (ft)	CORE RUN, LENGTH, AND RECOVERY (%)	R Q D (%)	FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	SYMBOLLIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
52.0			1	Shale: horizontal joints, possibly caused during core retrieval, no staining, smooth, planar joint surfaces, 2" thick soft, silty infilling at shale sandstone interface		**Shale** Gray, very fine grain, soft, slightly weathered, very weak, sound rock, very sandy	
			5				
55 554.5	R-1-NQ 5 ft 45%	23	2	Limestone: horizontal joints, black staining, rough, undulating surfaces, very close to close spaced discontinuities, joints are open		**Limestone** Dark gray, fine to coarse grained, appearance is a mixture of fine sand and gravel, rutted texture, moderately weathered, weak to medium strong, moderately fractured to extremely fractured	
57.0						**Sandstone??** No recovery, possibly sandstone, brown, fine grained sandstone piece in bit	Rate of coring: 5 minutes for 5', very poor recovery
60 549.5	R-2-NQ 5 ft 0%	0					
62.0							Rate of coring: 6 minutes for 5', rock piece stuck in bit plugged up barrel
65 544.5	R-3-NQ 5 ft 0%	0					
67.0						Bottom of Boring at 67.0 ft below ground surface on 12/16/05 15:00	No recovery between 62' to 67' driller could not figure out what was wrong, abandoned drilling at 67' at 3:00pm, coring rate 7 minutes for 5'
70 539.5							
75 534.5							
80 529.5							

HANSON

SOIL BORING LOG

Date 6/22/10

ROUTE F.A.I. 74 **DESCRIPTION** I-74 Over Mississippi River **LOGGED BY** JMB

SECTION 81-1-2 **LOCATION** SW¼ of SEC. 33, TWP. 18N, RNG. 1W, 4th P.M.

COUNTY Rock Island **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** Auto

STRUCT. NO. 081-6016
Station
BORING NO. RW 07-1
Station 58+77
Offset 15' Rt.
Ground Surface Elev. 605.1 ft

Surface Water Elev.
Stream Bed Elev.

Groundwater Elev.:
First Encounter ft
Upon Completion 599.1 ft ▽
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
CONCRETE 604.70			
FILL - Brown, moist, very stiff, clayey SILT with trace sand	4 8 7		14
2			
		1.67S	13
		0.90B	20
4		1.95S	13
600.10			
Brown, wet, silty, clayey, fine-grained SAND with trace gravel 599.10 ▽			
6	2 2 3	0.42B	21
Dark brown, moist, soft to stiff, clayey SILT			
8		1.25P	19
596.10			16
Brown, wet, silty, clayey, fine-grained SAND with gravel			
10			
594.10			
Brown, moist, very stiff, clayey SILT with trace sand and gravel	5 15 7	2.30P	13
12			
591.60		3.11B	16
Gray, moist, very stiff, silty CLAY with trace sand and gravel		3.04B	15
14			
16	6 8 11	2.19B	14
18		2.93B	13
		4.43B	13
		3.50P	13
585.10 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 6/23/14

ROUTE F.A.I. 74 **DESCRIPTION** I-74 Over Mississippi River **LOGGED BY** RPD

SECTION 81-1-2 **LOCATION** SE¼ of SEC. 32, TWP. 18N, RNG. 1W, 4th P.M.

COUNTY Rock Island **DRILLING METHOD** Continuous Flight Auger **HAMMER TYPE** Auto

STRUCT. NO. 081-6016
Station
BORING NO. RW 07-02
Station 57+08
Offset 14' Lt.
Ground Surface Elev. 631.2 ft

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				6" ASPHALT. 630.70
				FILL - Brown to light brown clayey SILT, trace gravel, trace sand.
2	1 2 3	0.50P	15	
4	5 6 8	4.50P	10	
6				
				- sand seam @ 7.0'.
8	6 8 15		14	
				622.20
				Brown and gray silty lean CLAY, trace sand, trace gravel.
10	4 5 7	3.00P	13	
		1.75B	14	
		3.88B	13	
12		1.84B	14	
14	3 5 9	2.70P	14	
				615.20
16				Gray moist, very stiff, silty lean CLAY, with trace sand and gravel.
18	5 7 12	4.30P	14	
20	3 5	3.30P	15	
				Gray moist, very stiff, silty lean CLAY, with trace sand and gravel. *(continued from previous page)*
22	12			
24	3 6 9	2.70P	15	
26				
28				
30	4 6 9	3.00P	14	
32				
34	3 5 7	1.70P	16	
36				
38				
40	3 6 9	2.20P	16	

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 6/23/14

ROUTE F.A.I. 74 **DESCRIPTION** I-74 Over Mississippi River **LOGGED BY** RPD

SECTION 81-1-2 **LOCATION** SE¼ of SEC. 32, TWP. 18N, RNG. 1W, 4th P.M.

COUNTY Rock Island **DRILLING METHOD** Continuous Flight Auger **HAMMER TYPE** Auto

STRUCT. NO. 081-6016
Station
BORING NO. RW 07-02
Station 57+08
Offset 14' Lt.
Ground Surface Elev. 631.2 ft

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Gray moist, very stiff, silty lean CLAY, with trace sand and gravel. *(continued from previous page)*
42				
44	6 7 12	2.30P	15	
46				
48				
50	5 8 12	3.30P	14	
52				
54	6 8 11	2.70P	14	
56				
58				
60	6 11 17	2.30P	14	
62				Gray moist, very stiff, silty lean CLAY, with trace sand and gravel. *(continued from previous page)*
64	14 22 32	3.30P	19	- coarse sand seam @ 64.3 to 65.0'.
66				
				563.70
68				Gray SHALE.
	24 50/5"	4.50P	14	
70				561.20 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 6/23/14

ROUTE F.A.I. 74 **DESCRIPTION** I-74 Over Mississippi River **LOGGED BY** RPD

SECTION 81-1-2 **LOCATION** SW¼ of SEC. 33, TWP. 18N, RNG. 1W, 4th P.M.

COUNTY Rock Island **DRILLING METHOD** Continuous Flight Auger **HAMMER TYPE** Auto

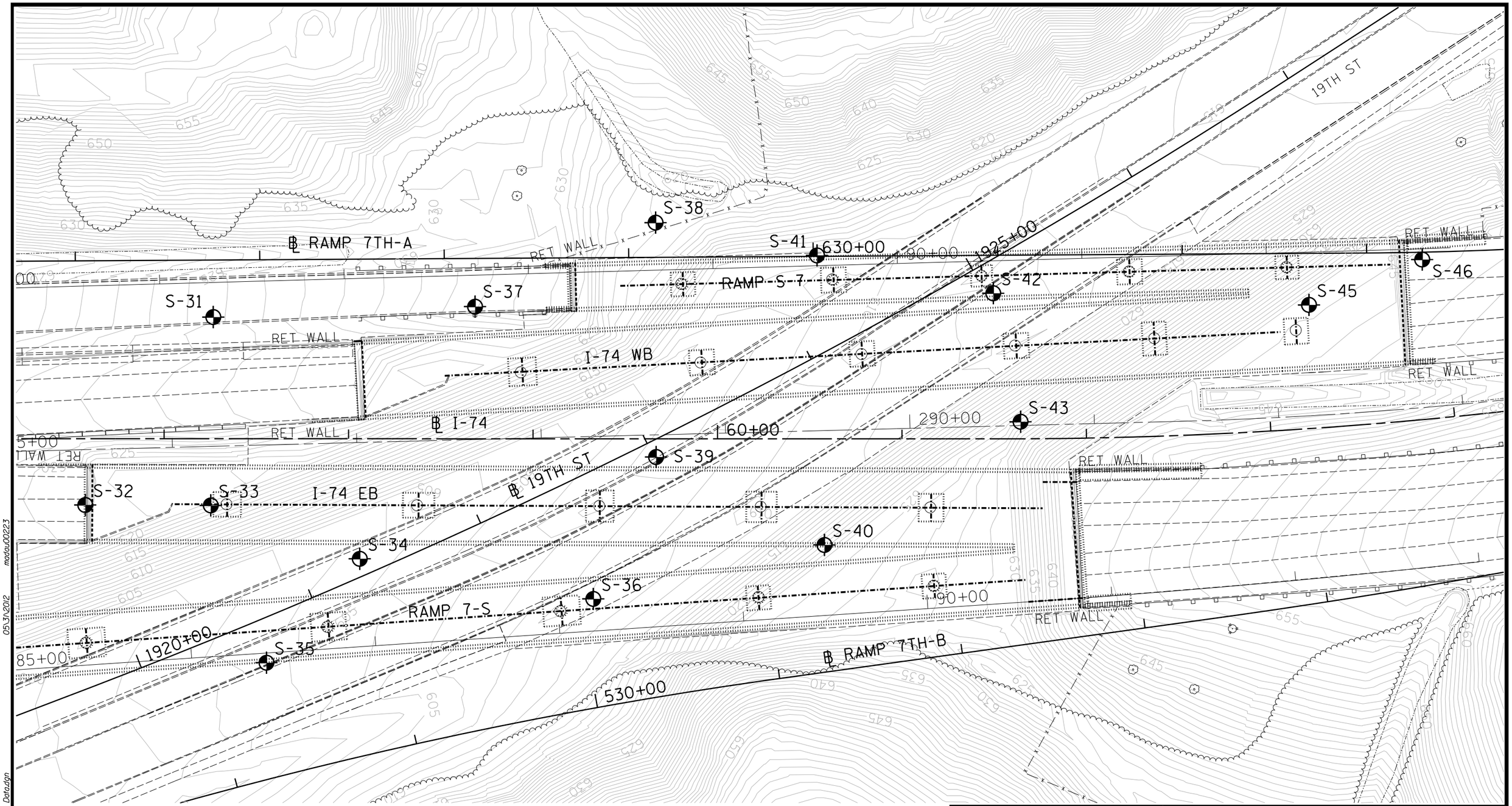
STRUCT. NO. 081-6016
Station
BORING NO. RW 07-03
Station 58+25
Offset 60' Lt.
Ground Surface Elev. 629.1 ft

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
628.85			
3.0" TOPSOIL.			
FILL - Brown silty lean CLAY, trace sand, trace gravel, with limestone fragments.			
2	4 6 7	4.50P	12
4	4 4 7	3.70P	11
6	3 5 8		
8			
620.60			
Brown silty lean CLAY, little sand, trace small gravel.			
		1.75B	14
		1.90B	14
10			
12	2 2 3	3.70P	13
14			18
		1.90B	17
16			
	4 7 11	4.65S	13
18			
	4 6	3.69B	12
20			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
	10		
Brown silty lean CLAY, little sand, trace small gravel. *(continued from previous page)*			
22			
24	4 6 10	3.10B	14
603.10			
26			
Gray, moist, very stiff, silty lean CLAY, with trace sand and trace gravel.			
28			
	4 6 10	4.07B	14
30			
32			
	6 8 11	3.88B	13
34			
594.10			
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)



LEGEND

RW600 BORING LOCATION

0 50 100
SCALE IN FEET

HANSON

BORING LOCATION PLAN

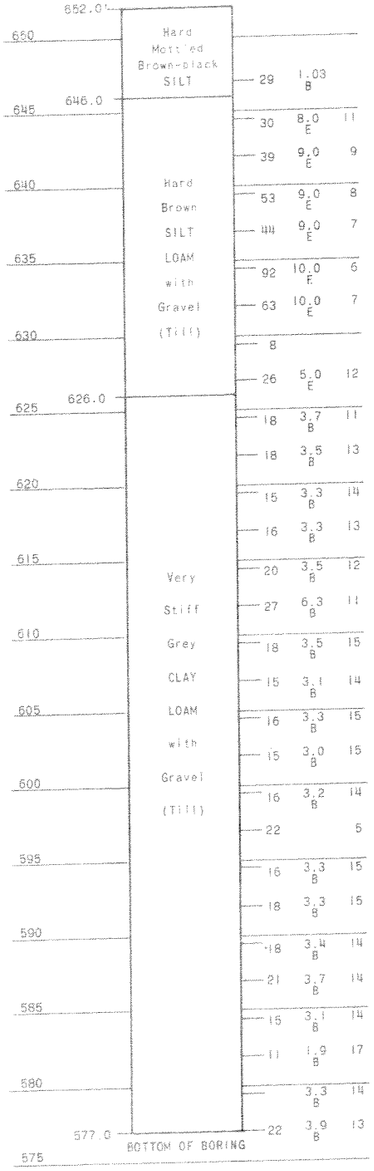
EXISTING I-74, RAMP 7-S, & RAMP S-7
OVER 19TH STREET
ROCK ISLAND COUNTY, ILLINOIS

08H0120E 5/30/12

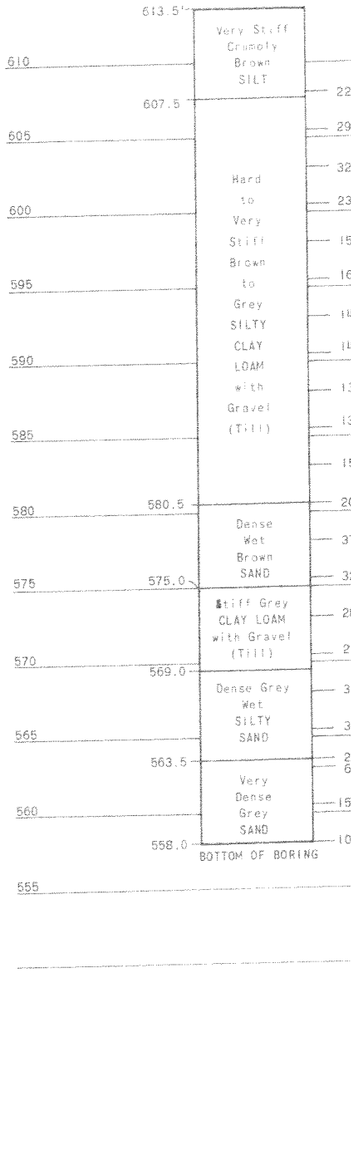
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HB	ROCK ISLAND	389	252
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. B-4

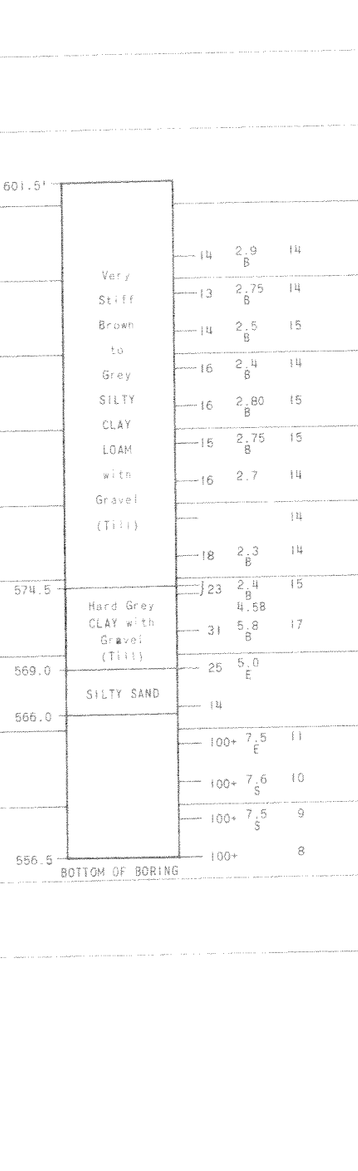
TEST BORING
NO. S-31
STATION 286+24 - 70' LT.



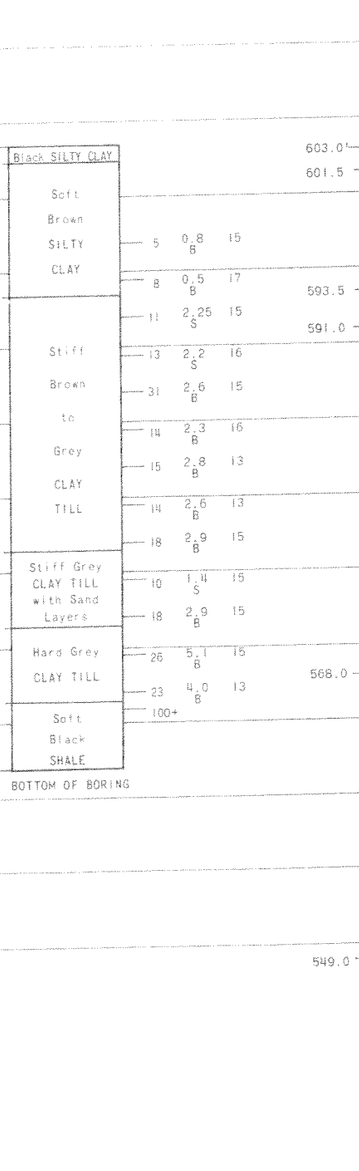
TEST BORING
NO. S-32
STATION 285+52 - 30' RT. ℄



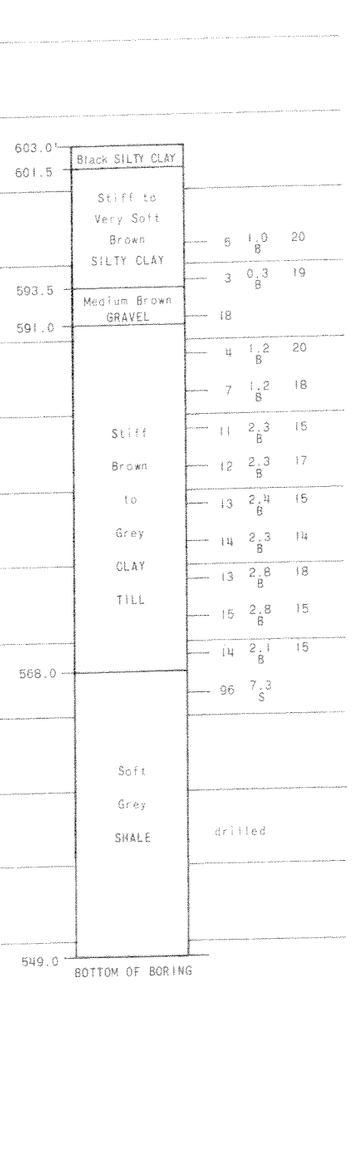
TEST BORING
NO. S-33
STATION 286+20 - 32' RT. ℄



TEST BORING
NO. S-34
STATION 287+00 - 63' RT. ℄



TEST BORING
NO. S-35
STATION 286+48 - 118' RT. ℄



DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY M. VADKERTY
DRAWN BY H. DE PERCZEL
CHECKED G. C. WAY
IN CHARGE E. S. MARTINS
APPROVED W.G. HORN

TEST BORINGS

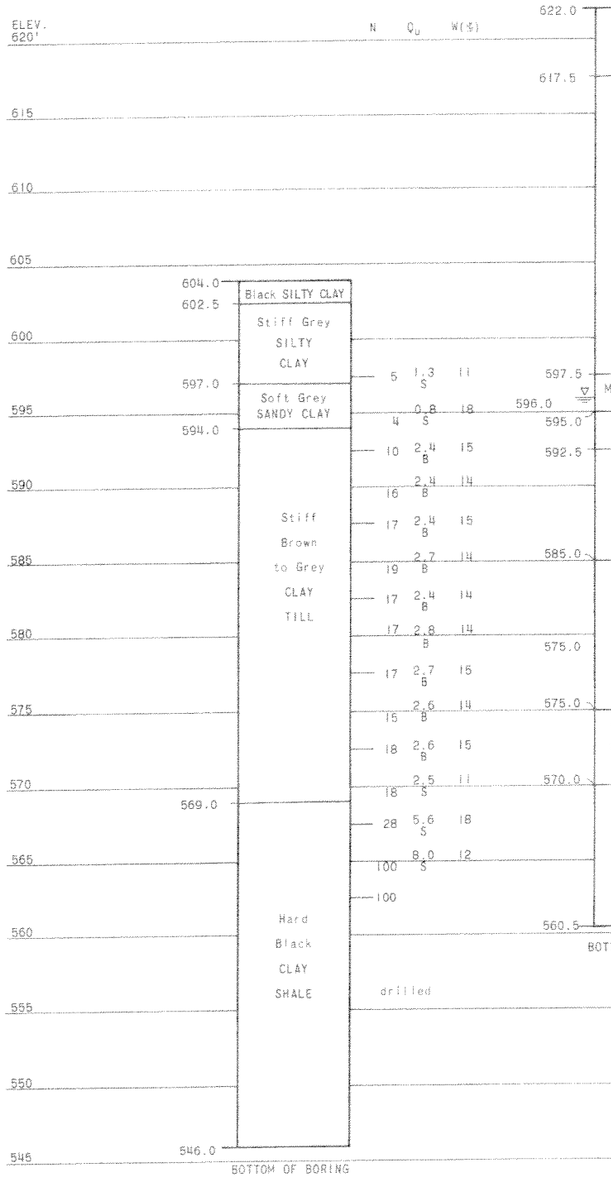
F.A.I. 74 - SECTION 81-1HB
F.A.I. 74 & RAMPS OVER RELOC. 19TH ST.
ROCK ISLAND COUNTY
STATION 289+23.09

SCALE: AS NOTED DATE:

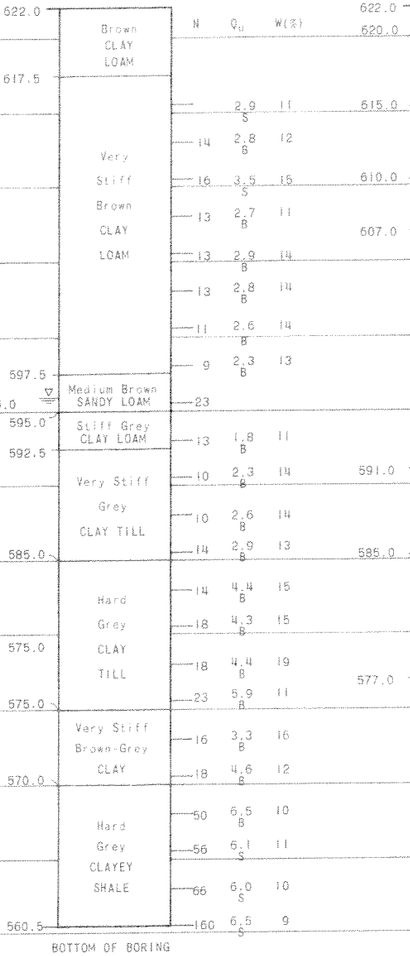
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HB	ROCK ISLAND	389	253
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. B-5

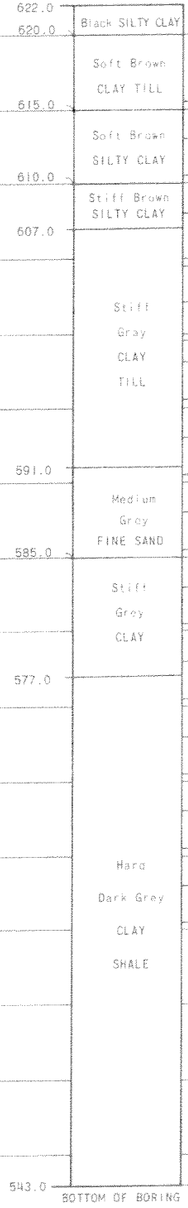
TEST BORING
NO. S-36
STATION 288+26 - 88' RT. ℄



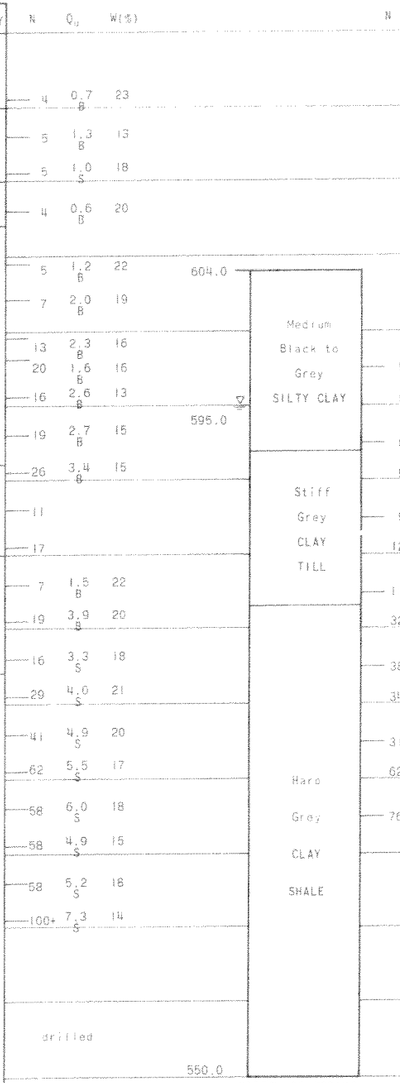
TEST BORING
NO. S-37
STATION 287+66 - 72' LT.



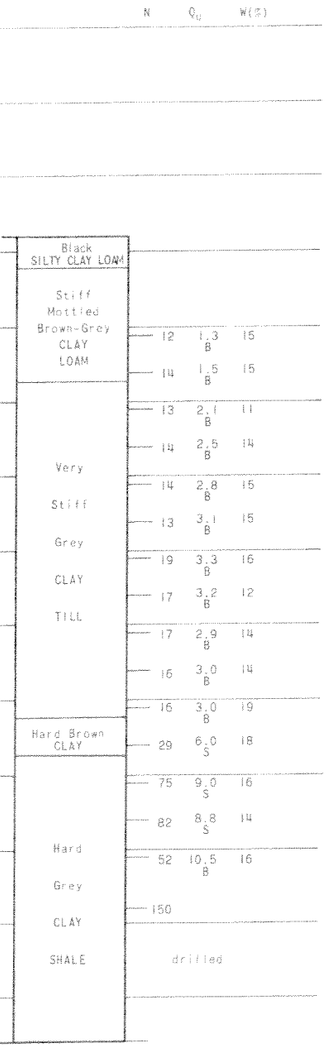
TEST BORING
NO. S-38
STATION 288+65 - 115' LT.



TEST BORING
NO. S-39
STATION 288+62 - 12' RT. ℄



TEST BORING
NO. S-40
STATION 289+52 - 62' RT.



DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY M. VADKERTY
DRAWN BY H. DE PERCZEL
CHECKED G. C. WAY
IN CHARGE E. S. MARTINS
APPROVED W.G. HORN

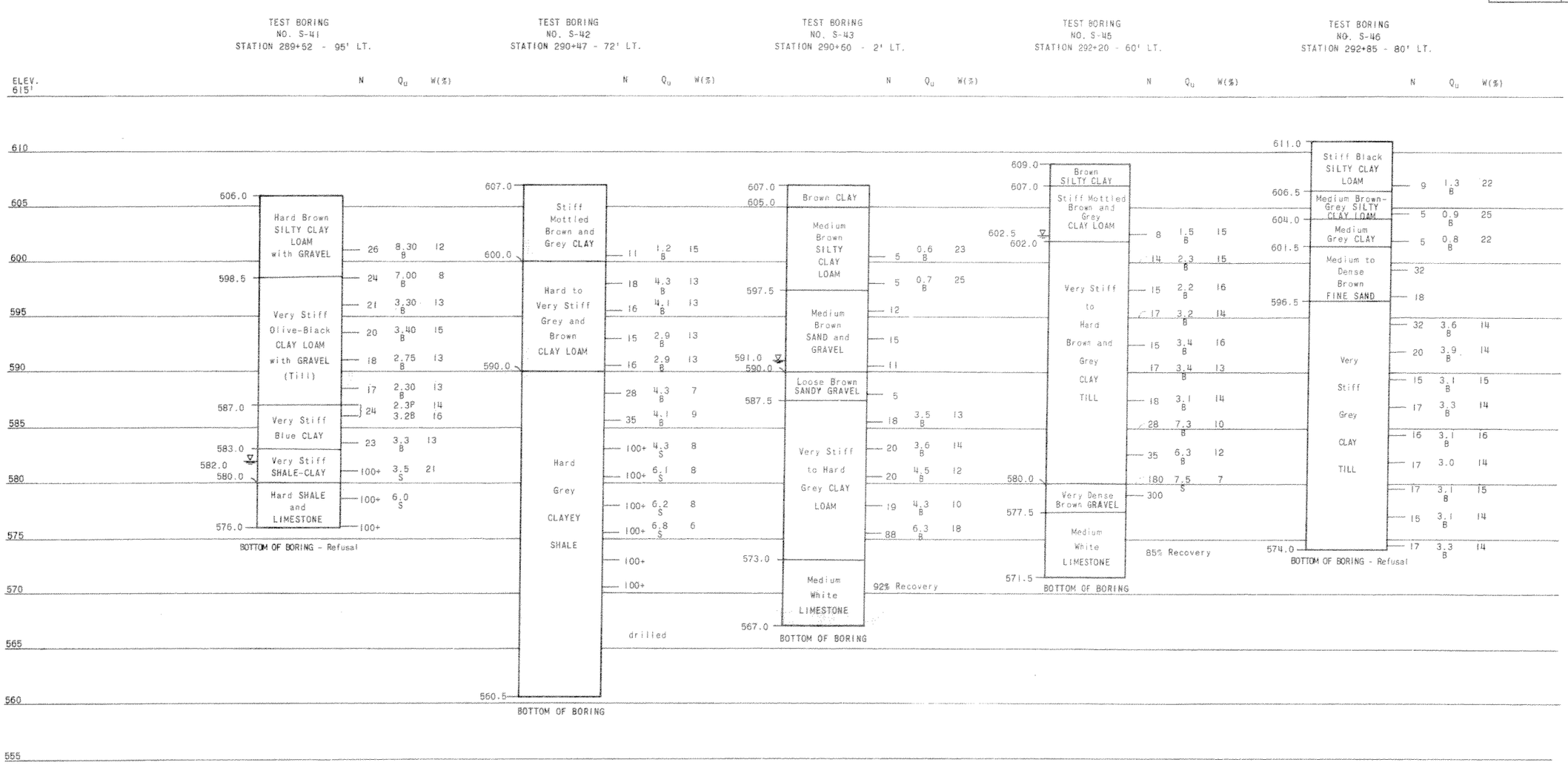
TEST BORINGS

F.A.I. 74 - SECTION 81-1HB
F.A.I. 74 & RAMPS OVER RELOC. 19TH ST.
ROCK ISLAND COUNTY
STATION 289+23.09

SCALE: AS NOTED DATE:

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HB	ROCK ISLAND	389	254
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. B-6



DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY M. VADKERTY
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TEST BORINGS

F. A. I. 74 - SECTION 81-1HB

F.A.I. 74 & RAMPS OVER RELOC. 19TH ST.

ROCK ISLAND COUNTY

STATION 289+23.09

SCALE: AS NOTED DATE:

Hanson Professional Services Inc.

Unconfined Compression Test Report (ASTM D2166)

Date 8/31/10

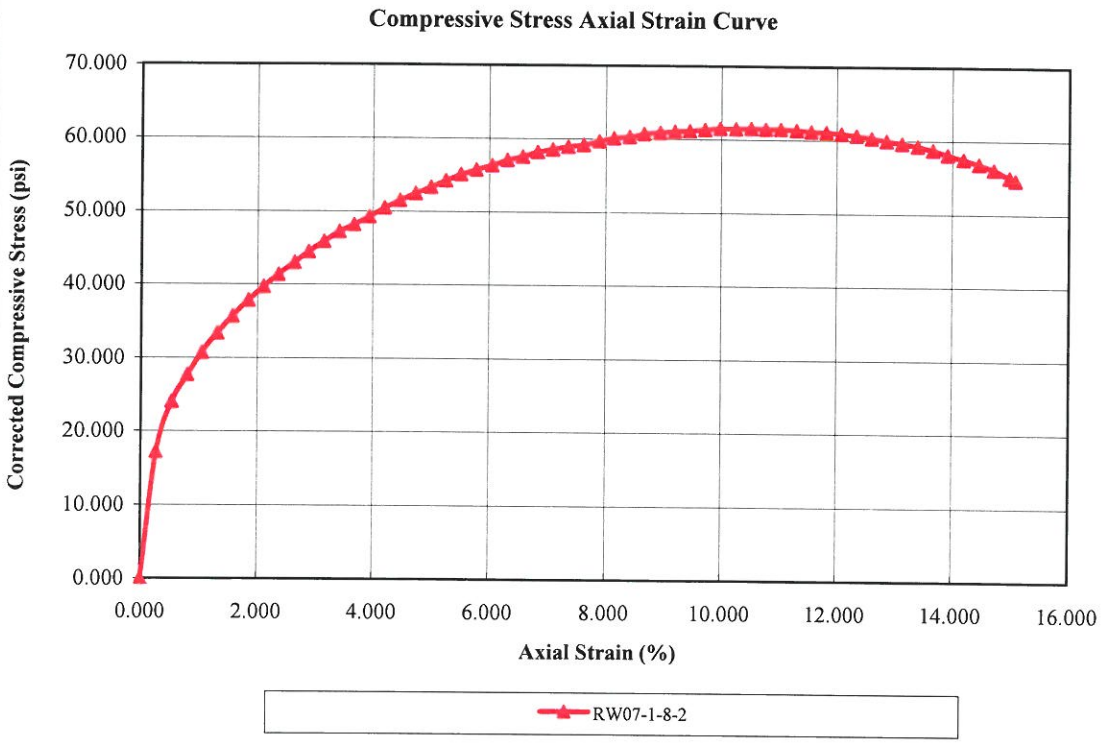
Checked By JCC

Date

Computed By

Date 8/12/10

Tested By Rin

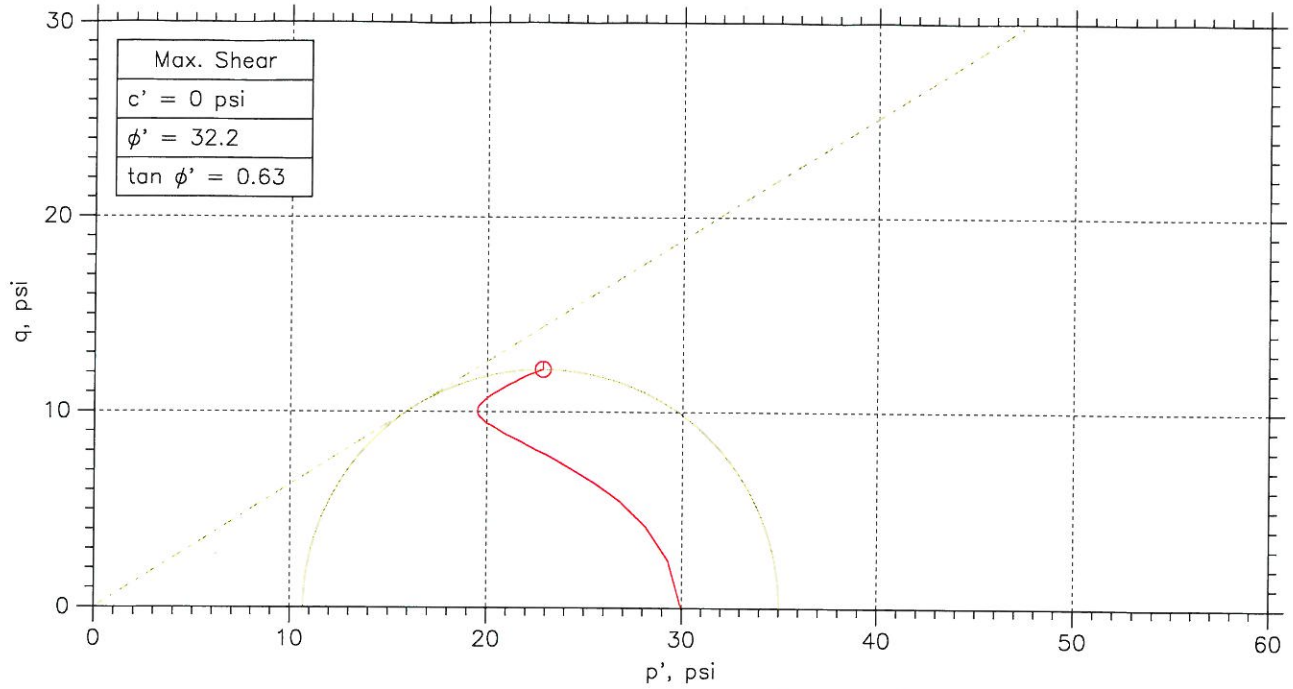


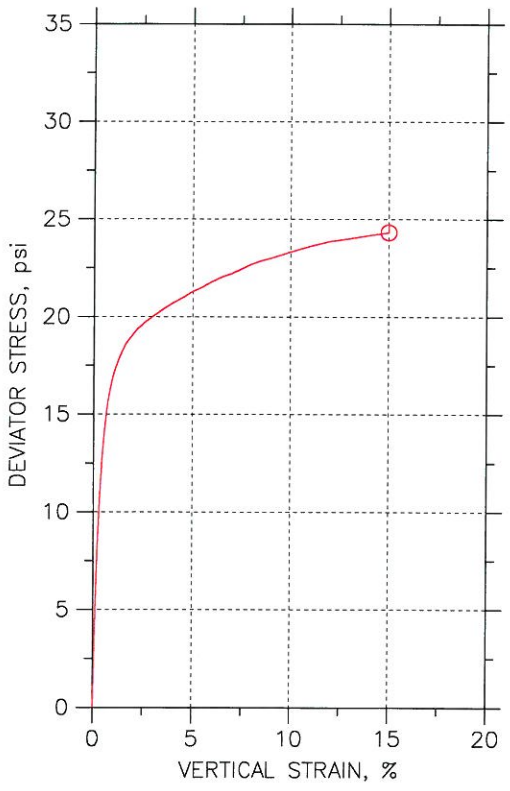
Before Test	Specimen A	B	C	D
Water Content (%)			13.00	
Dry Density (pcf)			122.989	
Saturation (%)			99.82	
Void Ratio			0.35	
Diameter (in)			2.863	
Height (in)			5.870	
Test Data	**A**	**B**	**C**	**D**
Unconfined Strength (psi)			61.539	
Undrained Shear Strength (tsf)			2.215	
Undrained Shear Strength (psi)			30.769	
Rate of Strain (in/min)			0.085000	
Strain at Failure (%)			10.52	
Description				

Project Information		Specimen Description	
Project Num	08H0120E		
Project	I-74 Mississippi River Bridge		
Depth	18.5-19.0	RW07-1-8-2	Brn. & gray vf-f. sandy clayey silt.
Sample #	8-2		
Client		**Test Variables**	
		Specific Gravity	2.65
		Liquid Limit:	
		Plastic Limit:	

Remarks

CONSOLIDATED UNDRAINED TRIAXIAL TEST





Symbol		⏲			
Sample No.		4-1			
Test No.		1			
Depth		8.0-8.5			
Initial	Diameter, in	2.862			
	Height, in	5.635			
	Water Content, %	18.8			
	Dry Density, pcf	107.6			
	Saturation, %	92.5			
	Void Ratio	0.538			
Before Shear	Water Content, %	16.8			
	Dry Density, pcf	114.4			
	Saturation*, %	100.0			
	Void Ratio	0.446			
	Back Press., psi	62.01			
Ver. Eff. Cons. Stress, psi		29.98			
Shear Strength, psi		12.16			
Strain at Failure, %		15			
Strain Rate, %/min		0.0625			
B-Value		0.96			
Estimated Specific Gravity		2.65			
Liquid Limit		0			
Plastic Limit		0			

HANSON

Project: I-74 Mississippi River Br

Location: Quad Cities

Project No.: 08H0120E

Boring No.: RW07-1

Sample Type: Tube

Description: Brn. f. sandy clayey silt / so. c. sand & sm. gravel.

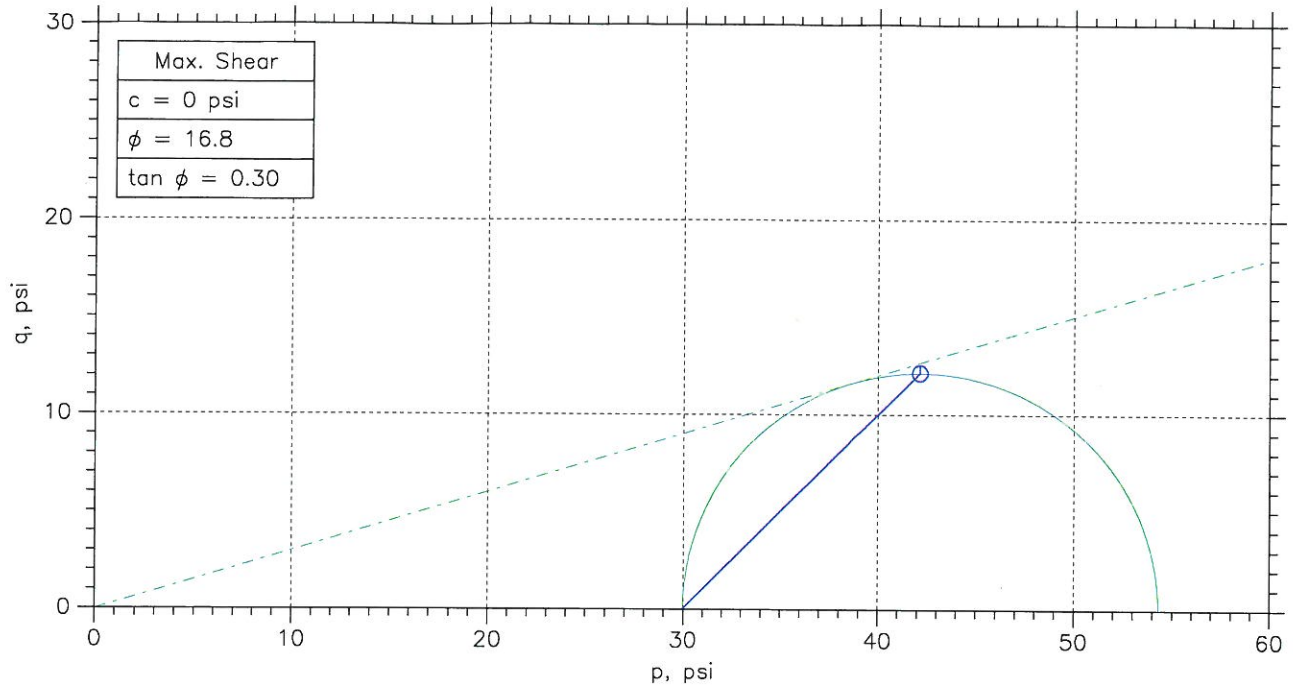
Remarks: 2500 # Load Cell Loadtrac II # 258112 FlowTrac II 13610 & 13610B & LVDT55306

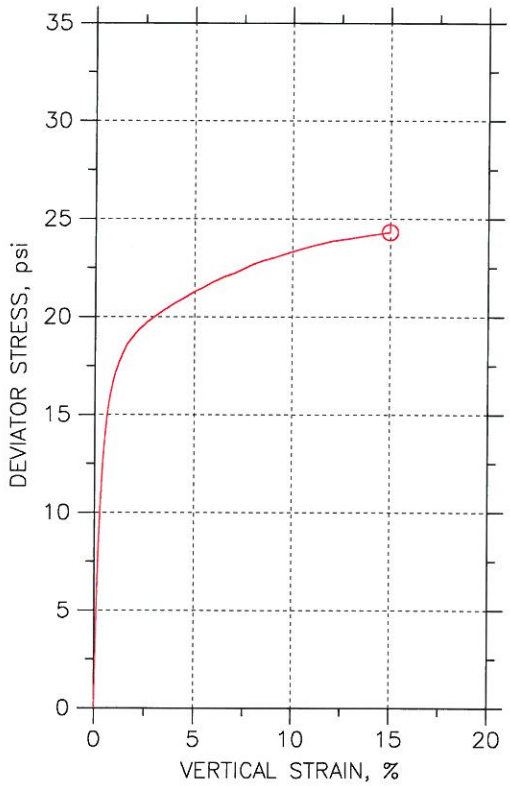
Phase calculations based on start of test.

Thu, 26-AUG-2010 10:41:55

* Saturation is set to 100% for phase calculations.

CONSOLIDATED UNDRAINED TRIAXIAL TEST





Symbol		⏲			
Sample No.		4-1			
Test No.		1			
Depth		8.0-8.5			
Initial	Diameter, in	2.862			
	Height, in	5.635			
	Water Content, %	18.8			
	Dry Density, pcf	107.6			
	Saturation, %	92.5			
	Void Ratio	0.538			
Before Shear	Water Content, %	16.8			
	Dry Density, pcf	114.4			
	Saturation*, %	100.0			
	Void Ratio	0.446			
	Back Press., psi	62.01			
Ver. Eff. Cons. Stress, psi		29.98			
Shear Strength, psi		12.16			
Strain at Failure, %		15			
Strain Rate, %/min		0.0625			
B-Value		0.96			
Estimated Specific Gravity		2.65			
Liquid Limit		0			
Plastic Limit		0			

HANSON

Project: I-74 Mississippi River Br

Location: Quad Cities

Project No.: 08H0120E

Boring No.: Rw07-1

Sample Type: Tube

Description: Brn. f. sandy clayey silt / so. c. sand & sm. gravel.

Remarks: 2500 # Load Cell Loadtrac II # 258112 FlowTrac II 13610 & 13610B & LVDT55306

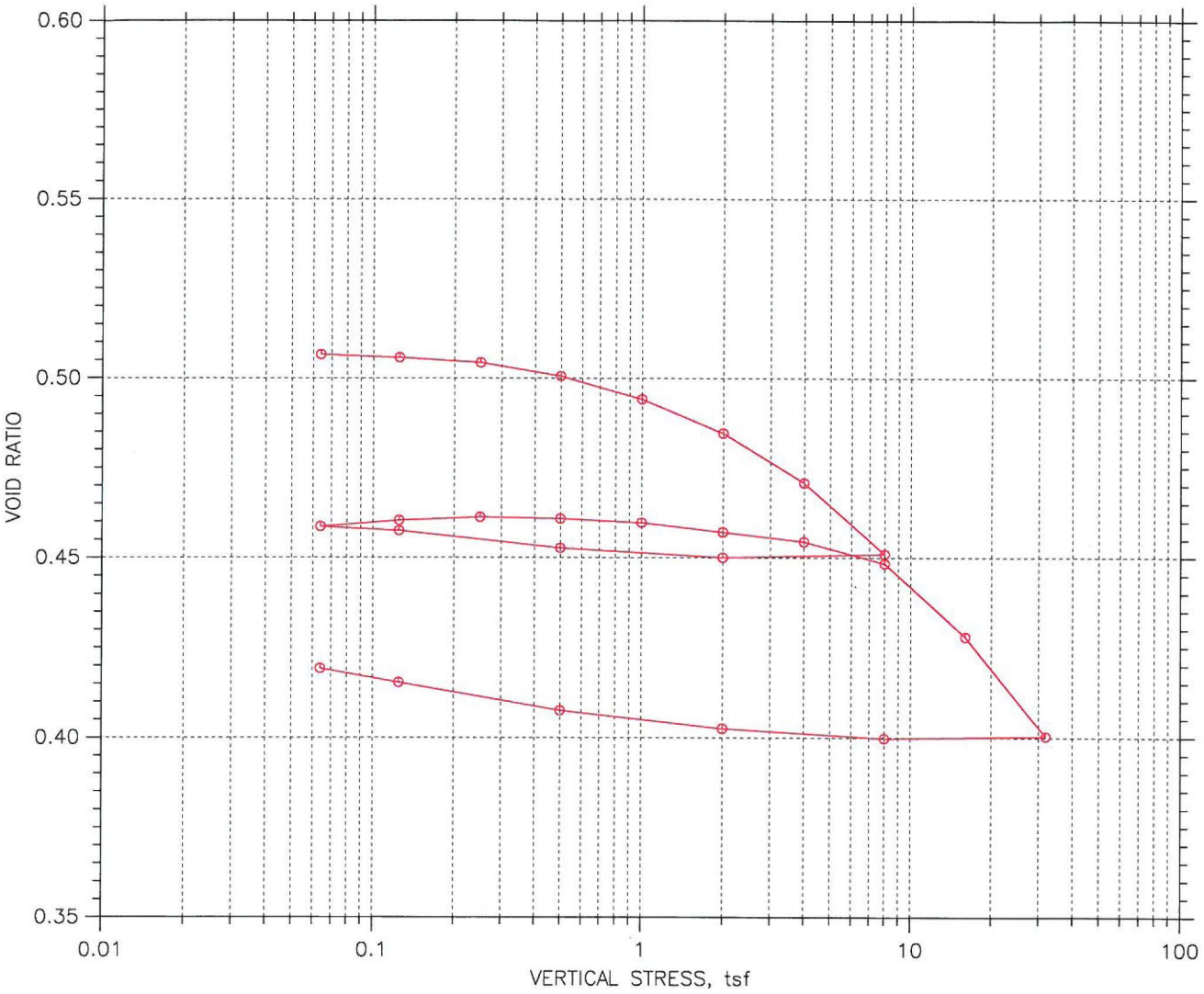
Thu, 26-AUG-2010 10:28:30

Phase calculations based on start of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATION TEST DATA

SUMMARY REPORT



					Before Test	After Test
Overburden Pressure:				Water Content, %	19.57	16.30
Preconsolidation Pressure:				Dry Unit Weight, pcf	109.7	116.6
Compression Index:				Saturation, %	102.19	103.07
Diameter: 2.499 in		Height: 0.995 in		Void Ratio	0.51	0.42
LL:	PL:	PI:	GS: 2.65			

HANSON	Project: I74 mississippi River	Location: Quad Cities	Project No.: 08H0120E
	Boring No.: RW07-1	Tested By: Rin	Checked By: JCC
	Sample No.: 4-2	Test Date: 8/24/10	Depth: 8.5-8.7
	Test No.: 1	Sample Type: Tube	Elevation: N/A
	Description: Brn. f. sandy silt / so. clay, c. sand & sm. gravel.		
	Remarks:		

Fri, 03-SEP-2010 10:12:00

CONSOLIDATION TEST DATA

Project: I74 mississippi River
Boring No.: RW07-1
Sample No.: 4-2
Test No.: 1

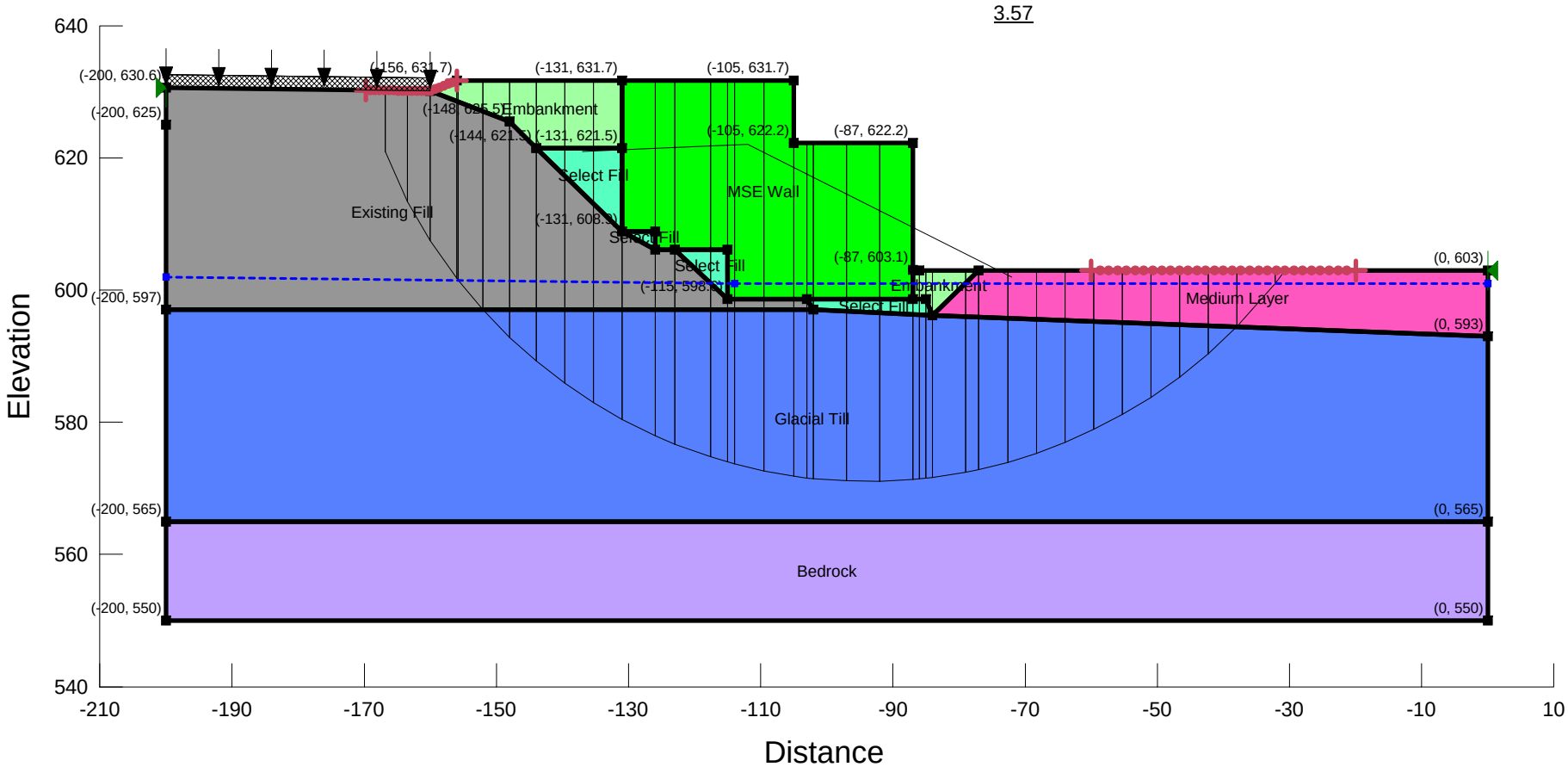
Location: Quad Cities
Tested By: Rin
Test Date: 8/24/10
Sample Type: Tube

Project No.: 08H0120E
Checked By: JCC
Depth: 8.5-8.7
Elevation: N/A

Soil Description: Brn. f. sandy silt / so. clay, c. sand & sm. gravel.
Remarks:

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	T50 Fitting Sq.Rt. min	T50 Fitting Log min	Coefficient of Consolidation Sq.Rt. in^2/sec	Coefficient of Consolidation Log in^2/sec	Coefficient of Consolidation Ave. in^2/sec
1	0.064	0.0006478	0.506	0.07	0.0	11.0	0.00e+000	7.42e-005	7.42e-005
2	0.125	0.001203	0.506	0.12	15.4	6.8	5.28e-005	1.20e-004	7.33e-005
3	0.25	0.002152	0.504	0.22	3.5	3.1	2.34e-004	2.58e-004	2.45e-004
4	0.5	0.004606	0.500	0.46	4.3	6.3	1.87e-004	1.28e-004	1.52e-004
5	1	0.008881	0.494	0.89	3.8	0.0	2.12e-004	0.00e+000	2.12e-004
6	2	0.0151	0.485	1.52	1.9	2.6	4.23e-004	3.09e-004	3.57e-004
7	4	0.02422	0.471	2.43	1.9	1.4	4.16e-004	5.70e-004	4.81e-004
8	8	0.03727	0.451	3.75	1.8	1.4	4.17e-004	5.47e-004	4.73e-004
9	2	0.03792	0.450	3.81	0.2	0.0	4.44e-003	0.00e+000	4.44e-003
10	0.5	0.03618	0.453	3.64	1.9	0.0	3.96e-004	0.00e+000	3.96e-004
11	0.125	0.03301	0.457	3.32	7.0	6.1	1.09e-004	1.25e-004	1.16e-004
12	0.064	0.03223	0.459	3.24	37.1	13.5	2.05e-005	5.64e-005	3.01e-005
13	0.125	0.0311	0.460	3.13	0.0	0.0	0.00e+000	0.00e+000	0.00e+000
14	0.25	0.03052	0.461	3.07	0.0	0.0	1.56e-002	1.64e-002	1.60e-002
15	0.5	0.03082	0.461	3.10	1.9	0.0	4.05e-004	0.00e+000	4.05e-004
16	1	0.03155	0.460	3.17	2.0	1.1	3.89e-004	6.93e-004	4.98e-004
17	2	0.03325	0.457	3.34	1.0	0.5	7.75e-004	1.46e-003	1.01e-003
18	4	0.03502	0.454	3.52	0.5	0.4	1.55e-003	1.94e-003	1.72e-003
19	8	0.03899	0.448	3.92	0.9	0.4	8.13e-004	1.99e-003	1.15e-003
20	16	0.05247	0.428	5.27	1.0	1.3	7.69e-004	5.51e-004	6.42e-004
21	32	0.07072	0.400	7.11	1.0	0.7	7.41e-004	1.03e-003	8.60e-004
22	8	0.07108	0.400	7.14	0.0	0.0	4.18e-002	5.45e+000	8.29e-002
23	2	0.0693	0.402	6.97	0.9	0.0	7.52e-004	0.00e+000	7.52e-004
24	0.5	0.06599	0.407	6.63	3.8	5.5	1.84e-004	1.30e-004	1.52e-004
25	0.125	0.06084	0.415	6.11	13.9	0.0	5.14e-005	0.00e+000	5.14e-005
26	0.064	0.05826	0.419	5.86	0.0	37.7	0.00e+000	1.91e-005	1.91e-005

3.57



SN 081-6016 IL-RW07
Sta 1920+40
File Name: RW07 1920+40.gsz
Last Edited By: Robert Chantome
Date: February 2015

FS = 3.57

Material Properties
Name: Glacial Till Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 2,520 psf Phi': 0 °
Name: MSE Wall Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,500 psf Phi': 34 °
Name: Medium Layer Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 650 psf Phi': 0 °
Name: Bedrock Model: Mohr-Coulomb Unit Weight: 145 pcf Cohesion': 10,000 psf Phi': 0 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 2,970 psf Phi': 0 °
Name: Embankment Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,000 psf Phi': 0 °
Name: Select Fill Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °

I-74 OVER THE MISSISSIPPI RIVER
CENTRAL SECTION FINAL DESIGN
ILLINOIS DEPARTMENT OF TRANSPORTATION
ROCK ISLAND COUNTY, ILLINOIS

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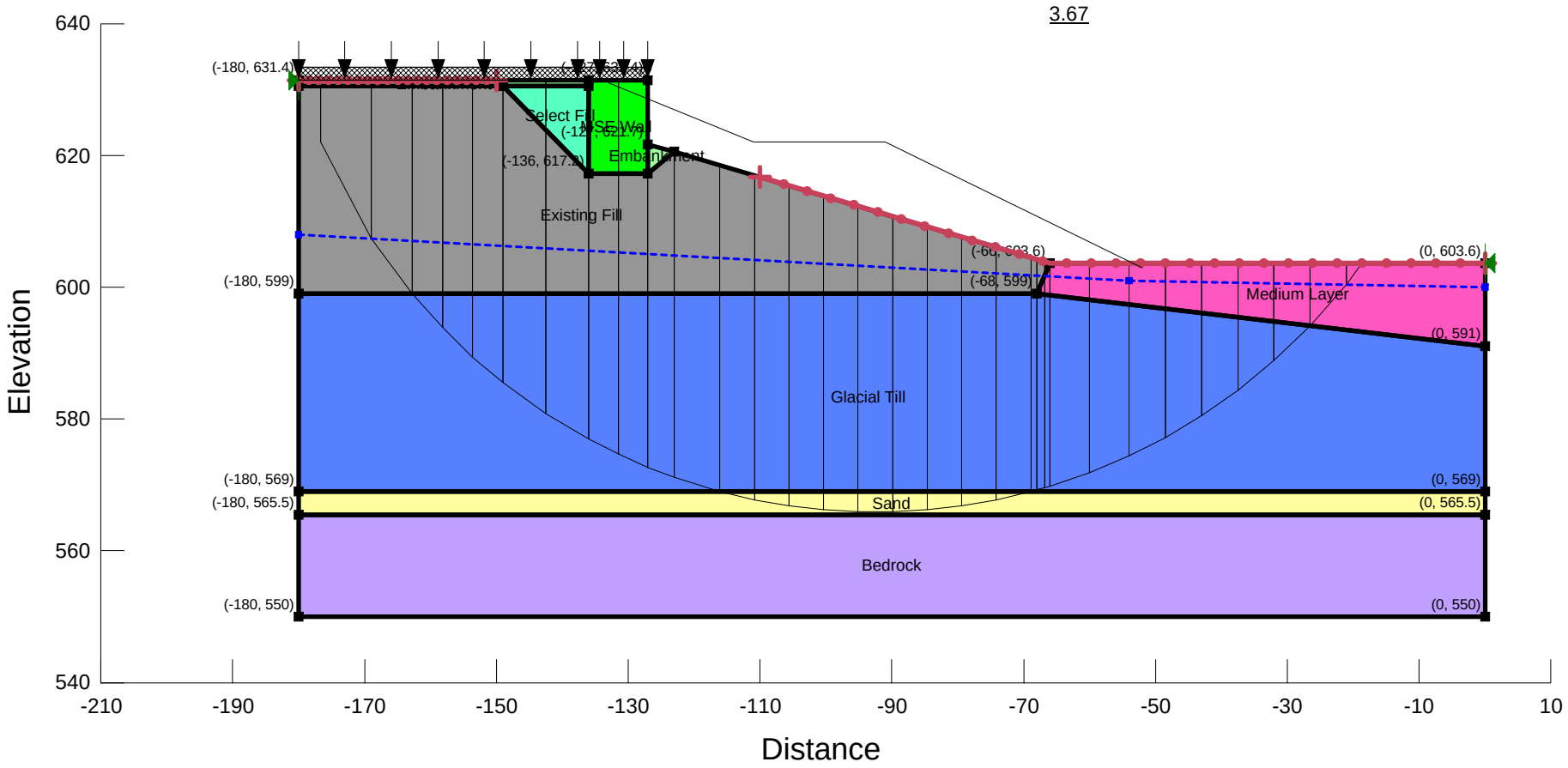

SN 081-6016 IL-RW07
Sta 1920+70
File Name: RW07 1920+70.gsz
Last Edited By: Robert Chantome
Date: February 2015

FS = 3.67

Material Properties
Name: Glacial Till Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 2,600 psf Phi': 0 °
Name: MSE Wall Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 4,500 psf Phi': 34 °
Name: Medium Layer Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 650 psf Phi': 0 °
Name: Bedrock Model: Mohr-Coulomb Unit Weight: 145 pcf Cohesion': 10,000 psf Phi': 0 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 2,900 psf Phi': 0 °
Name: Embankment Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,000 psf Phi': 0 °
Name: Select Fill Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Sand Model: Mohr-Coulomb Unit Weight: 115 pcf Cohesion': 0 psf Phi': 31 °

I-74 OVER THE MISSISSIPPI RIVER
CENTRAL SECTION FINAL DESIGN
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ROCK ISLAND COUNTY, ILLINOIS

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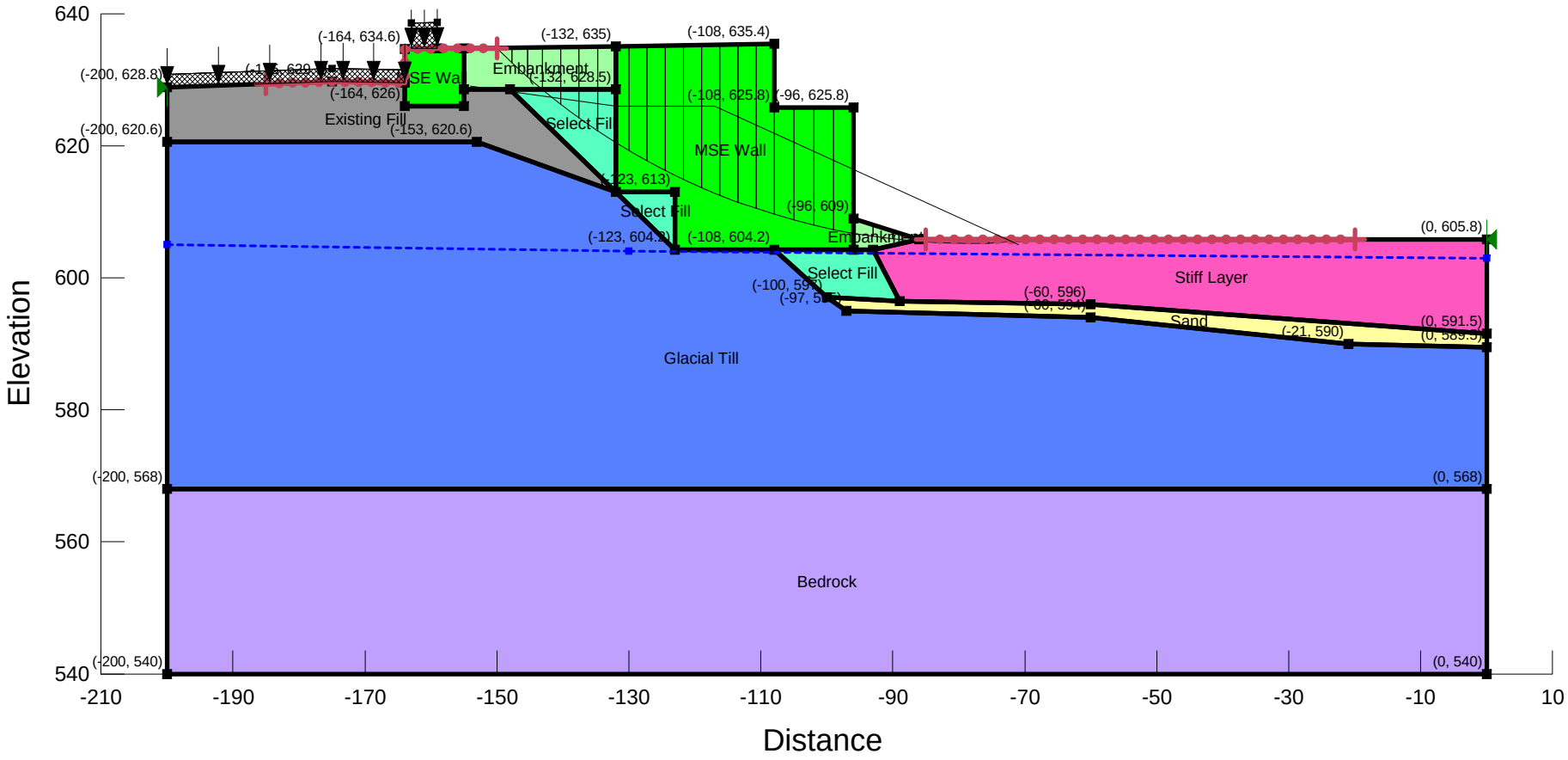
2.68



SN 081-6016 IL-RW07
Sta 1921+90
File Name: RW07 1921+90.gsz
Last Edited By: Robert Chantome
Date: February 2015

FS = 2.68

Material Properties
Name: Glacial Till Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 3,070 psf Phi': 0 °
Name: MSE Wall Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Stiff Layer Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 1,230 psf Phi': 0 °
Name: Bedrock Model: Mohr-Coulomb Unit Weight: 145 pcf Cohesion': 10,000 psf Phi': 0 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 2,930 psf Phi': 0 °
Name: Embankment Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,000 psf Phi': 0 °
Name: Select Fill Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Sand Model: Mohr-Coulomb Unit Weight: 110 pcf Cohesion': 0 psf Phi': 30 °

I-74 OVER THE MISSISSIPPI RIVER
CENTRAL SECTION FINAL DESIGN
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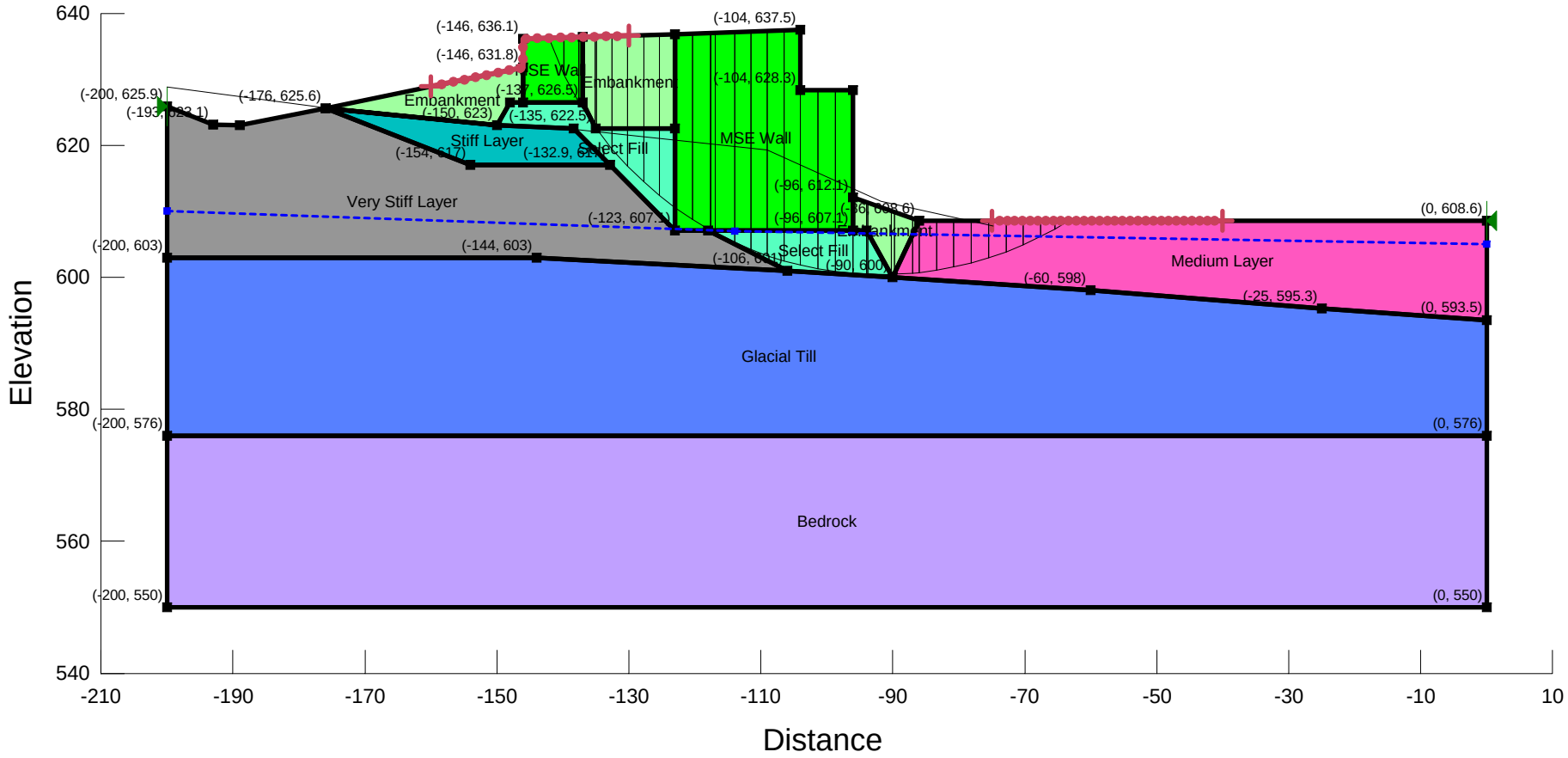
2.00



SN 081-6016 IL-RW07
Sta 1923+40
File Name: RW07 1923+40.gsz
Last Edited By: Robert Chantome
Date: February 2015

FS = 2.00

Material Properties
Name: Glacial Till Model: Mohr-Coulomb Unit Weight: 135 pcf Cohesion': 3,080 psf Phi': 0 °
Name: MSE Wall Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Medium Layer Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 750 psf Phi': 0 °
Name: Bedrock Model: Mohr-Coulomb Unit Weight: 145 pcf Cohesion': 10,000 psf Phi': 0 °
Name: Very Stiff Layer Model: Mohr-Coulomb Unit Weight: 130 pcf Cohesion': 2,800 psf Phi': 0 °
Name: Embankment Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 1,000 psf Phi': 0 °
Name: Select Fill Model: Mohr-Coulomb Unit Weight: 125 pcf Cohesion': 0 psf Phi': 34 °
Name: Stiff Layer Model: Mohr-Coulomb Unit Weight: 120 pcf Cohesion': 1,230 psf Phi': 0 °

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ILLINOIS DEPARTMENT OF TRANSPORTATION
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