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Structure Geotechnical Report

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

June 2012



Table of Contents

1. Project Description	3
2. Location	3
3. Proposed Structure	3
4. Site Investigation	4
5. Laboratory Investigation	4
5. Subsurface Profile	5
7. Geotechnical Evaluations	6
8. Design Recommendations	7
9. Construction Considerations	7
References	8
Appendix	9

Tables

Table 6.1	Groundwater Elevations	.5
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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 report supersedes the structure geotechnical report prepared by CH2M HILL in September 2009.

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+92.00 and 1928+18.00. The wall separates I-74 and Ramp 7th-A on the high side from 19th Street on the low side.

3. Proposed Structure

The general structure widths and span arrangements of the bridges over 19th Street were determined during the previous Phase I design completed by another consultant. After further geotechnical analyses and a detailed study of the project staging, the previously proposed full-height MSE abutment configurations were determined to be unfeasible. The bridge abutments were changed to a conventional, closed configuration. Retaining Wall IL-RW07, located in front of the north abutment, was shifted closer to 19th Street and significantly reduced in height. Retaining Wall IL-RW06, previously located in front of the south abutment, was terminated at the west end of the abutment.

Retaining Wall IL-RW07 is now a soldier pile and lagging wall following the outside edge of the sidewalk along 19th Street. Most of the wall is in a cut configuration, where the grade in front of the wall will be lowered from its current elevation. A small length of the wall, located under the proposed Ramp 7th-A Bridge, is in a fill configuration. The ground behind the wall generally slopes up at 1V:2H. Under the bridges, the existing 1V:2H bridge end slope intersects the top of the wall. East of the bridges, the existing natural slope typically intersects the wall a few feet below the top. Fill sloped at 1V:4H to 1V:10H will be placed between the existing hillside and the back of the wall. This fill is used to smooth the top of wall profile and facilitate surface drainage. The wall will have an exposed height, measured from the finished grade line in front to the top of wall, between 0.4 and 7.9 feet.

The proposed bridges will be constructed in stages in order to allow traffic on I-74 and 19th Street throughout the construction period. The middle portion of the bridges, located in the current I-74 median, will be constructed first, followed by the east side (WB I-74 and Ramp 7th-A), then the west side (EB I-74). The wall construction follows a similar sequence. The first stage of the wall construction is required to allow a temporary detour for 19th Street in the area of the current abutment end slope. The second stage is required to place the embankment fill for Ramp 7th-A.



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 three phases. The first two phases were completed in December 2005 and October 2007 to March 2008 by other consultants. IDOT provided the data collected from those two phases. 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. A representative from Hanson logged the boring and performed a general site reconnaissance during the third phase.

Six borings were drilled in the first two phases and one boring was drilled in the third phase. Locations of the borings were selected to avoid the numerous obstructions currently occupying the site. The maximum spacing between borings was approximately 260 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 tests, and consolidation tests are indicated on the subsurface data profile.



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 two of the borings drilled for this structure. The bedrock surface varies from Elev. 559.5 at the west end of the structure to Elev. 585.5 near the east end. 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.

Boring No.	During Drilling	At End of Boring	24-hour Reading
ILR0701	581.3	-	-
ILR0803	-	-	-
ILR1401	-	-	-
ILR1402	-	-	-
ILR1405	-	-	-
RW401	-	-	-
RW07-1	-	599.1	-

Table 6.1 Groundwater Elevations



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

Further analysis of the previously proposed full-height MSE abutment wall determined that configuration to be impracticable at this site. Ground improvement or removal and replacement of the softer alluvial soils would be required to meet overall stability and bearing capacity criteria. Very tall temporary shoring would be needed to excavate for the reinforced soil mass of the first phase construction. Full-height temporary MSE walls would be needed to retain the first phase reinforced soil mass during excavation for the second and third phases. One of these temporary MSE walls would have an internally reinforced bin wall configuration due to the severe skew of the structure. The cost of the ground improvement and temporary structures eliminate the typical economic advantage of the MSE abutments.

It was determined that constructing new partial-height closed abutments on the existing bridges' end slope was a better alternative. A top-down wall configuration (IL-RW07) constructed across the existing end slope will allow the bottom of the end slope to be excavated without affecting the existing and proposed bridge abutments located at the top of the slope. The area in front of Retaining Wall IL-RW07 will be used for temporary 19th Street traffic during construction of the bridge pier. This configuration eliminates the overall stability and bearing capacity deficiencies. It also results in a significant reduction in excavation and temporary wall quantities.

The grading between the Ramp 7th-A Bridge and the hillside to the east was reworked to connect the former Retaining Wall IL-RW14 to this wall. Raising the grade in that low area allows a shorter, conventional wingwall on the north abutment of the Ramp 7th-A Bridge and also presents a uniform appearance along 19th Street. Retaining Wall IL-RW07 now extends for 926 feet along 19th Street from south of I-74 to the intersection with 11th Avenue A.

Soil nail walls can be constructed in a top-down sequence, but they are not feasible when fill is required. Semigravity and MSE walls would require significant excavations in the existing steep slopes. A soldier pile and lagging wall can be constructed without disturbing the existing slope and bridge substructures located behind the proposed wall. A soldier pile wall can also be constructed in a bottom-up configuration where needed. For the low heights retained by this structure, tiebacks are not cost-effective.

Driven soldier pile walls are typically constructed with H-piles as the structural elements. When soldier piles are set in drilled holes, larger and more-efficient shapes may be used. The encasement concrete also increases the effective width of the soldier piles and allows for slightly smaller beams to be used. The equipment used for installing drilled soldier piles is typically more compact and mobile than the pile-driving equipment used for driven soldier piles. The drilling equipment will be used for another structure, Retaining Wall IL-RW04, in the same construction contract.

A slope stability analysis of the wall's critical section was completed to determine the overall stability of the wall. Results of this analysis are included in the Appendix. The 2.97 factor of safety satisfies AASHTO requirements.

Insignificant settlement is anticipated for most of the wall because no new fill will be placed. The estimated total settlement under the weight of the proposed fill in front of the proposed Ramp 7^{th} -A abutment is 0.5 inch at the back of the wall.



8. Design Recommendations

A cantilever, drilled soldier pile and lagging retaining wall is recommended for the proposed structure. Design earth pressure coefficients are 0.54 for active conditions and 5.10 for passive conditions. These coefficients assume a 1V:2H slope behind the wall and level ground in front of the wall. A 130 pcf unit weight should be used for the fill and glacial till. Due to the possibility of perched groundwater, buoyant unit weights should be used for soils more than five feet below the 19th Street grade. A geocomposite drain and underdrain should be used to prevent the buildup of hydrostatic pressures behind the wall. The design of the wall should consider the temporary condition where the front face of the wall is excavated to the bottom of the facing.

In areas where fill will be placed behind the proposed wall, the soldier piles and lagging should be installed prior to placing any fill. The fill should be granular material within 5 feet of the back of facing. Use of the granular material will minimize the earth pressures from compacting around the soldier piles and against the lagging.

9. Construction Considerations

The construction of soldier pile and lagging walls is not covered by the IDOT Standard Specifications. Guide Bridge Special Provision No. 42, Drilled Soldier Pile Retaining Wall (Revised: October 15, 2011) should be included in the construction documents.

It is anticipated that a portion of the proposed wall may need to be constructed under the existing I-74 bridges. The clearance from existing grade to the bottom of the structures is approximately 16 feet. Drilling rigs capable of working within this space are readily available. Setting the soldier piles in the drilled holes will be the most difficult part of the construction. The sequence of wall construction relative to the removal of the existing bridge decks should be carefully considered. Provisions for splicing some of the soldier beams may be required.



References

- American Association of State Highway and Transportation Officials (2010). ASHTO LRFD Bridge Design Specifications, Fifth Edition.
- CH2M HILL (2009, September). Structure Geotechnical Report I-74 Mainline Retaining Wall Structure Number 081-6015.
- CH2M HILL (2009, September). Structure Geotechnical Report I-74 Mainline Retaining Wall Structure Number 081-6016.
- Hanson Professional Services Inc. (2012, June). Structure Geotechnical Report, I-74 & Ramp 7th-A Over 19th St. Bridges, Structure Nos. 081-0179, 081-0180, and 081-0181.
- Hanson Professional Services Inc. (2012, June). Structure Geotechnical Report, Retaining Wall IL-RW07, Structure Number. 081-6016.
- Illinois Department of Transportation (2012). Bridge Manual.
- Illinois Department of Transportation (1999). Geotechnical Manual.
- Illinois Department of Transportation (2012). Standard Specifications for Road and Bridge Construction.
- Illinois State Geological Survey, Rock Island County coal data, Retrieved February 27, 2012 from <u>http://www.isgs.illinois.edu/maps-data-pub/coal-maps/counties/rockisland.shtml.</u>
- Jacobs Civil Inc. (2008, June). Phase 1B Geotechnical Report New I-74 Bridges Over 19th Street, Proposed Structure No's. 081-0179, 081-0180 and 081-0181.



Appendix

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





	ILR07 Sta. 56+20,	701					
	57a. 56+20, 629.30	<u>N</u> <u>Qu</u> <u>w%</u>					
	628.70	12	7" Thick ACC followed by gravel subbase to 1.0' Silty Sandy Clay with Gravel, greenish brown, moist, low plasticity, stiff, with subangular to subrounded gravel embedded throughout, fill/subbase				
	625.30—	9 3.0P_to	Sandy Clay Trace Gravel, dark gray, frozen, stiff, with subangular to subrounded fine to coarse gravel embedded throughout, fill				
	621.30	<u>12 4.0P</u> 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)				
	615.80	1.5P	(LL=32 PI=14)				
		5 2.0P 16.0	Sandy Lean Clay Trace Gravel, gray, moist, stiff, medium plasticity, fill or disturbed till (LL=30 PI=14)				
RW401 Sta. 55+34, 96' RT 609.50 <u>N Qu w%</u>	610.80	11	Same As Above, turning grayish brown at bottom 3", piece of wood embedded, possible fill				
605.50 Sandy Clay (CL) - Brown, dry, very stiff, with angular-subangular gravel pieces, fill 607.50 I6 Sandy Clay, Trace Gravel (CL) - Brown, dry, very hard, subrounded-subangular gravel,		11	piece of wood embedded, possible fill	RW07-1 Sta. 58+77, 1	5' DT		
605.50 28 fine to coarse, fill Fill - Coporete rubble pieces	605.80	10 7 00	Sandy Lean Clay Trace Gravel, brown, moist, stiff, low plasticity, possible weathered till	605.10	<u>N Qu w%</u>		
603.50 9 Silty Clay (CL) - Brown gray, moist, soft, low plasticity, fill		12 3.0P	plasticity, possible weathered till	604.70	15 14 1675 13	<u>CONCRETE</u> FILL - Brown, moist, very stiff, clayey SILT with trace sand	
9 Dark brown, moist, soft, low plasticity, rounded-subrounded, fine to medium gravel 5 throughout, fill	600.80	2.5P to	Same As Above, gray, then brown, split in almost vertical with reddish brown surface, weathered till	600.10 599.10 0h	1.67S 13 0.90B 20 1.95S 13	Brown, wet, silty, clayey, fine-grained SAND with trace grave	
No recovery possible due to piece of coarse gravel stuck in shoe		15 3.5P 15.0	vertical with reddish brown surface, weathered till	599.10	5 0.42B 21 1.25P 19	R Dark brown, moist, soft to stiff, clayey SILT	;/
7 Dark brown, stiff, low plasticity	595.80	2.5P to 12 3.0P	Sandy Lean Clay Trace Gravel aray, moist stiff, low	596.10	16	C Brown, wet, silty, clayey, fine-grained SAND with gravel	
12 Similar to above with fine to medium, rounded-subrounded gravel, fill		12 3.0P	Sandy Lean Clay Trace Gravel, gray, moist, stiff, low plasticity, unweathered till	594.10	22 2.30P 13	Brown, moist, very stiff, clayey SILT with trace sand and gravel	
591.50 Sandy Clay (CL) - Light brown, moist, stiff, with clay seams, fine to medium, rounded-				591.60	3.11B 16 3.04B 15	grave, moist, very stiff, silty CLAY with trace sand and gravel	
subroundéd gravel embedded throughout, possible gumbotil 11		15 2.5P			19 2.19B 14 2.93B 13 4.43B 13 3.50P 13		
				585.10	4.43B 13 3.50P 13		
583.50 Similar to above, dark reddish brown	DD					Bottom of hole = 20.0 feet	
¹⁵ Sandy Lean Clay Trace Gravel (CL) - Gray, moist, stiff, fine to medium rounded-subrounde gravel embedded throughout, glacial clay	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				
15	579.30⊥	28	Bottom of hole = 50.0 feet				
18							
			LEGEND				
559.50 Sandy Shale - Dark gray, dry, hard, weathered shale with coal and sand seams			N Standard Penetration Test N (blows/ft) Qu Unconfined Strength (tsf)				
557.50 66 556.50 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			w%. Natural Moisture Content (%)				
			 Unconsolidated Undrained Triaxial Test Consolidated Undrained Triaxial Test 				
552.50 Rec. = 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			C Consolidation Test				
Rec. = 0% RQD = 0% Sandstone - No recovery, possibly sandstone, brown, fine grained sandstone piece in bit			DD Water Surface Elevation Encountered in Boring 558.10	ng			
			24h = 24 hours after completion			SUBSURFACE DATA PROFILE	
Rec. = 0% RQD = 0%						STRUCTURE NO. 081-6016	
542.50 Bottom of hole = 67.0 feet			PROFESSIONAL DESIGN FIRM LICENSE #184-0010	084			
			© Copyright Hanson Professional Services Inc.	™. <i>3h0120E</i> Sheet			NO.
				3 SH	IEETS	4 81-1-2 ROCK ISLAND _ CONTRACT NO. 640	<u>`08</u>
				/30/12		D. ROAD DIST. NO ILLINOIS FED. AID PROJECT	

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IL R080. Sta. 630+15,	11′ RT		ILRI Sta. 1925+7 616.50		' LT <u>Qu</u>	<u>w%</u>	Clay (CL) - gray, moist, stiff, moderate plasticity, trace of sand	ILR1 Sta. 1926++ 615.48_	1402 49,48 <u>N</u>	'LT <u>Qu</u>	<u>w%</u>	
614.67	<u>N</u> <u>Qu w%</u> 8 6.7S	Silt With Trace Sand (ML) - yellowish brown, slightly moist, medium stiff, fine to coarse grained, low plasticity very stiff		15 11 11	2.0P 1.3S 1.0P		of sand stiff stiff	609.48-	12 21	2.5P	10	C C V (
608.67	29 4.0P	Bottom of hole = 6.0 feet		11 4 4	0.5P	16	soft, trace of coarse sand no recovery, possibly due to gravel at the tip	605.48-	9 8	2.25	12	S m n
			604.50– 602.50–	7 7	6.1S	6	Silty Sand (SM) - reddish brown, slightly moist, loose, fine to coarse grained, low plasticity fines Clay with Trace of Sand (CL) - brown, slightly moist, firm, fine to medium grained, moderate plasticity		5 6 12	1.5P 1.0P 6.6S	20	С Р Г (, Е
					4.5P		hard (LL=33 PI=14)		13	2.5P	13	g (,
				28 50/2			very stiff		22	3.0P		v
			586.50 L				Bottom of hole = 30.0 feet	585.48-	24			и Е

<u>LEGEND</u>

- N Standard Penetration Test N (blows/ft)
- Qu Unconfined Strength (tsf)
- w% Natural Moisture Content (%)
- Image: Optimized state
 Unconsolidated
 Undrained
 Triaxial
 Test
 Test

 Test</
- R Consolidated Undrained Triaxial Test
- C Consolidation Test

558**.**10

DD Water Surface Elevation Encountered in Boring DD = during drilling 24h = 24 hours after completion





Clay (CL) - dark gray, slightly moist, stiff, fine to coarse grained, low plasticity very stiff, trace of broken brick fragments

(LL=31 PI=18)

Silt with Sand (ML) - gray, slightly moist, stiff, fine to medium grained, low plasticity, trace of coarse sand no recovery (LL=31 PI=16)

Clay (CL) - dark brown, slightly moist, firm, low plasticity, trace of coarse sand and chipped gravel firm, no gravel observed (LL=36 PI=18) brown, stiff

gray, stiff, trace of coarse sand (LL=29 PI=14)

very stiff, trace of rounded gravel, <1/2"

wet, very stiff, Shale on the tip Bottom of hole = 30.0 feet

SUBSURFACE DATA PROFILE STRUCTURE NO. 081-6016

NO. 2	F.A.I RTE.	SECT	ION	CO	UNTY	TOTAL SHEETS	SHEET NO.	
	74	81-1	1-2		ROCK	ISLAND	-	
EETS					CON	TRACT	NO. 64	C08
	FED. RC	DAD DIST. NO	ILLINOIS	FED. AI	D PROJ	ECT		

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION

ILR. Sta . 1928+	1405 00. 48'	ĹŢ	
617.28_	N	Qu	w%.
616.28-	9	4.50	Grass Matter - followed by brown silty sand, moist, non plastic, topsoil. Hole offset 12.0' Northeast of proposed boring location
613.58-	7	4.5P 4.0P	Silty Clay with Sand (CL-ML) - medium brown with olive gray, dry, non plastic, stiff, few coarse to fine sands, strong cementation, some medium to fine sands at top 4 inches of sample, possible fill
611.28-	, '	4.07	Sandy Silt with Gravel (ML) - dark brown, dry, crumbly, stiff to medium stiff, trace medium to fine subangular to subrounded gravel silt with medium to fine sands, possible fill
609.28-	11		Silty Clay with Sand and Gravel (CL-ML) - brown, dry, non plastic, stiff, silty clay with few medium to fine subangular to subrounded gravels, possible fill
606.28-	6	3 . 5P	Sandy Silty Clay (CL-ML) - mingled brown, dry, non plastic, medium stiff, slightly crumbly silty clay and medium to fine sands, little medium to fine angular to flat gravels, possible hardened sand and clay particles mottled, occasional root and wood matter, possible old topsoil (LL=28 PI=14)
	7		particles mottled, occasional root and wood matter, possible old topsoil (LL=28 PI=14)
604.28 🗸	.DD' 15		Poorly Graded Sand with Silt (SP-SM) - medium brown, moist to wet, loose, medium to fine sands with silt, trace coarse sands, possible old alluvium deposits. Gradual transition from soil above, medium dense, medium brown, wet, medium to fine sands with little coarse sands, little silt, possible old alluvium deposits. Encountered water at 13.0' while sampling.
599.28-	1.4	1.00	Leap Clay with Sand (CL) - uniform any dry to maist medium to low placticity, stiff to very stiff, little
	14	1.8P	Lean Clay with Sand (CL) - uniform gray, dry to moist, medium to low plasticity, stiff to very stiff, little to few coarse to fine sands, strong cementation, unweathered, possible glacial till (LL=37 PI=25)
594.28-	20	2.2	Sandy Lean Clay trace Gravel (CL) - uniform gray, very stiff, few coarse to fine sands, trace medium to fine subangular to subrounded gravels, strong cementation, unweathered glacial till
	20	4.5P	uniform gray, dry, very stiff, strong cementation, few coarse to fine sands, trace gravels, brown silty seam at center of sample, possible unweathered glacial till
584.28-	50/2		Silty Clay with Sand (CL-ML) - greenish gray mottled with brown, dry, non plastic, crumbly, hard, silt with clay and few medium to fine sands, oxidized, possible residual soil
583.58-			Bottom of hole = 33.7 feet

<u>LEGEND</u>

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

PROFESSIONAL DESIGN FIRM LICENSE #184-001084



SUBSURFACE DATA PROFILE STRUCTURE NO. 081-6016

NO.3	F.A.I RTE.			SEC	TION		СО	UNTY	TOTAL SHEETS	SHEET NO.
	74			81-	1-2		ROCK	ISLAND	-	
HEETS							CON	TRACT	NO. 64	C08
	FED. F	ROAD	DIST.	NO	ILLINOIS	FED. A	ID PROJ	ECT		

SOIL BORING LOG

Date 3/28/08

Page 1 of 3

DESCRIPTION I-74 SB Near 7th Avenue LOGGED BY B. Karnik ROUTE I-74 I-74 Bridge over Mississippi River LOCATION (N=562235.7741, E=2459668.0033), SEC. 32, TWP. 18N, RNG. 1W SECTION COUNTY Rock Island DRILLING METHOD HSA, CME 55 HAMMER TYPE CME AUTOMATIC D в U D В U Μ Μ STRUCT. NO. _____ Surface Water Elev. ft Е L С Е ο L С Ο Stream Bed Elev. _____ ft Station Ρ S Ρ S Ο 0 Т Т т BORING NO. ILR0701 W S т W S Groundwater Elev.: н S Qu Т н S Qu т First Encounter ____581.3 ft ┸ Station _____ Offset Upon Completion _____ ft (%) Ground Surface Elev. 629.30 ft (ft) (/6") (tsf) (ft) (/6") (%) Hrs. (tsf) After ft 7" Thick ACC followed by gravel 628.70 Same As Above, turning grayish subbase to 1.0' brown at bottom 3", piece of wood embedded, possible fill (continued) Silty Sandy Clay with Gravel, 2 greenish brown, moist, low 2 plasticity, stiff, with subangular to 10 605.80 subrounded gravel embedded Sandy Lean Clay Trave Gravel, brown, moist, stiff, low plasticity, 5 625.30 throughout, fill/subbase 4 6 3.0 Sandy Clay Trace Gravel, dark possible weathered till 5 Ρ gray, frozen, stiff, with subangular 6 -25 to subrounded fine to coarse 4 gravel embedded throughout, fill 5 3 5 3.0 6 to 6 4.0 621.30 Silty Clay with Gravel, gray, moist, 2 Р 600.80 soft to medium stiff, high plasticity, 2 2.0 15.5 Same as Above, gray, then brown, 6 trace gravel, possible fill split in almost vertical with reddish 3 Р 7 2.5 15.0 brown surface, weathered till 3 8 to -10 -30 3.5 Ρ 1.5 Ρ 615.80 595.80 Sandy Lean Clay Trace Gravel, 3 Sandy Lean Clay Trace Gravel, 4 gray, moist, stiff, medium gray, moist, stiff, low plasticity, 2 2.0 16.0 6 2.5 plasticity, fill or disturbed till unweathered till 3 Ρ 6 to 3.0 Р 610.80 Same As Above, turning gravish 3 5 brown at bottom 3", piece of wood 4 2.5 6 embedded, possible fill 7 Ρ 9 -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)

Division of Highways CH2M HILL

Illinois Department of Transportation

SOIL BORING LOG

Illinois Department of Transportation

Division of Highways CH2M HILL Date <u>3/28/08</u>

Page 2 of 3

ROUTE				IPTIO	N		I-74 SB Near 7th Aven	ue	L(DGG	ED BY	′ <u>В.</u> К	Carnik
SECTION _	I-74 Bridge over N River	lississippi	I			(N=56	2235.7741, E=2459668.	0033), SEC.	32, TW	P. 18	3N, RN	IG. 1W	1
COUNTY _	Rock Island	DRILLIN	g me	THOD)	ŀ	HSA, CME 55	HAMMER	TYPE	CI	ME AU	ΤΟΜΑ	TIC
Station _	0 0ILR0701		D E P T	B L O W	U C S	M O I S	Surface Water Elev Stream Bed Elev Groundwater Elev.:		_ ft _ ft	D E P T	B L O W	U C S	M O I S
Station Offset			H	S	Qu	T	First Encounter _ Upon Completion		ft	H	S	Qu	T
Ground S	urface Elev. 629.		(ft)	(/6")	(tsf)	(%)	After Hrs.		_ ft	(ft)	(/6")	(tsf)	(%)
gray, moist,	Clay Trace Gravel, stiff, low plasticity, d till <i>(continued)</i>												
Bottom 12" i Sand, gray, fine to medi		579.30		12 16 12									
			-60	-						-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)

CH2M HILL ROUTE I-74 I-74 Bridge over M	DESC	CRIPTIC	Ne	ew I-74	Bridge Over Mississipp Approach	i River - Illinois	Date <u>10/9/07</u>
SECTION River							
STRUCT. NO Station BORING NOILR0803 Station		D B E L P O T W H S	U C S Qu	M O I S T	Surface Water Elev. Stream Bed Elev. Groundwater Elev.: First Encounter	ft ft	
Offset Ground Surface Elev. 614.6 Silt With Trace Sand(ML) vellowish brown, slightly moist,	57 ft (ft) (/6")	(tsf)	(%)	Upon Completion _ After Hrs	ft	
nedium stiff, fine to coarse grained, low plasticity	_	2					
	_	4	6.7 S				
/ery stiff	_	2 -5 10 19	4.0 P				
End of Boring	-						

Illinois Department of Transportation	SOIL E
Division of Highways CH2M HILL	

BORING LOG

Date 10/5/07

Page $\underline{1}$ of $\underline{1}$

I-74 Bridge over Mississippi River LOCATION (N=561674.863, E=2459877.089), SEC. 32, TWP. 18N, RNG. 1W, 4 th PM COUNTY Rock Island DRILLING METHOD HSA, CME 55 HAMMER TYPE CME AUTOMATIC STRUCT. NO.	ROUTEI-74	DE	SCR	IPTIO	Ne N_	w I-74	New I-74 Bridge Over Mississippi River - Illinois DESCRIPTION Approach								
COUNTY Rock Island DRILLING METHOD HSA, CME 55 HAMMER TYPE CME AUTOMATIC STRUCT, NO.	I-74 Bridge over Mississ	sippi													
Dotation Image: marked base of the second seco															
BORING NO. ILR1401 T W Qu S Station	STRUCT. NO	_	D E	B L	U C	M O	Surface Water Elev	ft	D E	B L	U C	M O			
Clay (CL) Clay With Trace Of Sand(CL) Image: Clay With Trace Of Sand(CL) gray. moist, stiff, moderate - <t< td=""><td>Station Offset</td><td>_</td><td>Т Н</td><td>W S</td><td>Qu</td><td>S T</td><td>First Encounter Upon Completion</td><td> ft</td><td>Т Н</td><td>W S</td><td>Qu</td><td>S T</td></t<>	Station Offset	_	Т Н	W S	Qu	S T	First Encounter Upon Completion	ft	Т Н	W S	Qu	S T			
gray, moist, stiff, moderate plasticity, trace of sand		_ ft	(ft)	(/6")	(tsf)	(%)	After Hrs	ft	(ft)	(/6")	(tsf)	(%)			
stiff 5 P	gray, moist, stiff, moderate			3			brown, slightly moist, firm, f medium grained, moderate	ine to							
stiff stiff stiff stiff stiff stiff			_	10	2.0										
stiff 3 17 S stiff -5 5 1.3 -25 -26 </td <td></td> <td></td> <td></td> <td>5</td> <td>Р</td> <td></td> <td>very stiff</td> <td></td> <td></td> <td>-</td> <td></td> <td></td>				5	Р		very stiff			-					
stiff 5 5 1.3	ctiff			2											
stiff	Sun			-	1.3						3				
soft, trace of coarse sand - 4 1.0 - - 7 P - - 50/2" - 2 0.5 16.0 - 50/2" - no recovery, possibly due to gravel at the tip -10 - - - 586.50 -30 - - 0 - - - - - - 604.50 -<			0						-25						
soft, trace of coarse sand - 4 1.0 - - 7 P - - 50/2" - 2 0.5 16.0 - 50/2" - no recovery, possibly due to gravel at the tip -10 - - - 586.50 -30 - - 0 - - - - - - 604.50 -<															
soft, trace of coarse sand 7 P 2 0.5 16.0 2 P 50/2* no recovery, possibly due to gravel at the tip 0	stiff														
soft, trace of coarse sand 1 - - 50/2" - 1 - - 50/2" - 2 P - - 50/2" - 0 - - - - - - 0 - - - - - - - 0 -				-	-										
- 2 0.5 16.0 -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 - - -10 - - -10 - - -10 - - -160458 - - -160458 - - -16058 - - -15 2 - - -15 2 - - -15 2 - - -15 5 S - -15 2 - - -15 5 S - -15				/	Р										
- 2 0.5 16.0 -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 0 - -10 - - -10 - - -10 - - -10 - - -160458 - - -160458 - - -16058 - - -15 2 - - -15 2 - - -15 2 - - -15 5 S - -15 2 - - -15 5 S - -15	soft, trace of coarse sand			1						50/2"					
no recovery, possibly due to gravel at the tip -10 0 1 0 -0 -0 -0 -0 -4 -0 -0 -4 -0 604.50 -4 -0 604.50 -4 -0 604.50 -4 -0 602.50 -4 -0 10 -15 2 -15 4.5 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -15 -0 -0 -10 -0 -0 -15 14.0 -0					0.5	16.0				00/2					
no recovery, possibly due to gravel 0 0				2	Р										
at the tip 0 0 0 604.50 4 0 604.50 4 0 reddish brown, slightly moist, low plasticity fines 4 0 00se, fine to coarse grained, low plasticity fines 602.50 2 602.50 2 0 Clay With Trace Of Sand(CL) brown, slightly moist, firm, fine to medium grained, moderate plasticity 2 0 plasticity -15 2 6.1 6.0 -15 5 S 0 -35 plasticity -15 4.5 14.0 0			-10					586.50	-30						
604.50 4 604.50 4 reddish brown, slightly moist, loose, fine to coarse grained, low plasticity fines 4 602.50 2 Clay With Trace Of Sand(CL) brown, slightly moist, firm, fine to medium grained, moderate plasticity 2 -15 2 -15 5 -15 5 -15 5 -15 14 -15 14 -15 14 -15 14 -15 14 -15 14			_	-			End of Boring								
604.50 4 Silty Sand (SM) 4 reddish brown, slightly moist, 4 loose, fine to coarse grained, low 3 plasticity fines 602.50 602.50 2 brown, slightly moist, firm, fine to -15 plasticity 2 brown, slightly moist, firm, fine to -15 0.15 2 0.15 5 0.15 5 0.15 0.1 0.15 0.1 0.15 0.1 0.15 0.1 0.15 0.1 0.15 0.1 0.15 0.1 0.15 0.1 0.15 0.1 0.15 14.0				-											
Silty Sand (SM) 4		14 50													
loose, fine to coarse grained, low plasticity fines 3 - 602.50 2 - Clay With Trace Of Sand(CL) brown, slightly moist, firm, fine to medium grained, moderate plasticity 2 - -15 2 6.1 6.0 -15 5 S - plasticity - - - -15 2 6.1 6.0 -15 5 S - plasticity - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -	Silty Sand (SM)	J 4 .30		4											
plasticity fines 0	reddish brown, slightly moist,														
602.50 2				3											
brown, slightly moist, firm, fine to medium grained, moderate plasticity5 S5 S	60	02.50		2											
15 4.5 14.0	brown, slightly moist, firm, fine to medium grained, moderate		-15	2		6.0			-35						
15 4.5 14.0															
15 4.5 14.0															
15 4.5 14.0															
15 4.5 14.0															
	hard				4 5	44.0									
				1		14.0									
-20 -40									.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 SOIL BORING LOG

Division of Highways CH2M HILL

Date 10/5/07

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

New I-74 Bridge Over Mississippi River - Illinois	
Approach	

ROUTE	I-74	DE	SCR	IPTIO	NN		Approach	LC	OGG	ED BY	′ <u> </u>	(B
I-74	Bridge over Miss	sissippi										41-
SECTION	River		L	-OCA1		(N=56	1610.195, E=2459915.128), SEC. 32	, TWP.	18N,	RNG.	. 1W, 4	" PM
	ock Island DF	RILLING	g Me	THOD		ŀ	HSA, CME 55 HAMMER	TYPE	CN	<u>/IE AU</u>	TOMA	TIC
STRUCT. NO			D E	BL	U C	M O	Surface Water Elev Stream Bed Elev	_ ft _ ft	D E	B L	U C	M O
BORING NO Station	ILR1402		P T H	O W S	S Qu	I S T	Groundwater Elev.: First Encounter Upon Completion	_ ft	P T H	O W S	S Qu	I S T
Ground Surfac	e Elev. 615.48	ft	(ft)	(/6")	(tsf)	(%)	After Hrs	ft	(ft)	(/6")	(tsf)	(%)
Clay (CL) dark gray, slightly to coarse grained	v moist, stiff, fine I, low plasticity			3			Clay (CL) dark brown, slightly moist, firm, low plasticity, trace of coarse sand and chipped gravel (continued)	,				
fragments				4	2.5				_			
				8	P		very stiff, trace of rounded gravel,			5		
							<1/2"			9	3.0	
				4						13	Р	
			-5	7 14		10.0			-25			
		609.48										
Silt With Sand (M				2					_			
gray, slightly mois medium grained, trace of coarse sa	low plasticity,			3 6	2.2 S	12.0						
no recovery				2			wet, very stiff, Shale on the tip			2		
				4					_	9		
				4						15		
		605.48	-10					585.48	-30			
Clay (CL)				1								
plasticity trace of	tly moist, firm, low coarse sand and	/		2	1.5							
chipped gravel	bourbe build und			3	Р				_			
firm, No gravel of	sorved			1			End of Boring					
nini, No gravei ol	JSelveu			3	10	20.0			_			
				3	P	20.0						
									_			
brown, stiff				4								
			-15	5	6.6				-35			
				7	S							
									_			
									_			
gray, stiff, trace o	f coarse sand			4								
gray, sun, nace o				6	2.5	13.0			_			
				7	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)

-20

-40

Illinois Department of Transportation

Division of Highways CH2M HILL

SOIL BORING LOG

Date 10/9/07

ROUTEI-74	DE	SCR	IPTIO	Ne N	ew I-74	Bridge Over Mississippi Approach	River - Illinois	ີ LC	GG	ED BY	′ <u> </u>	breu
I-74 Bridge over Mis	sissippi	_ I			<u>(N=56</u>	1482.735, E=2459994.21	11), SEC. 32,	TWP.	18N	RNG	. 1W, 4	th PM
COUNTY Rock Island D	RILLING	g me	THOD)	ŀ	HSA, CME 55	HAMMER T		C	/IE AU	ΤΟΜΑ	TIC
STRUCT. NO Station		D E P	B L O	U C S	M O I	Surface Water Elev Stream Bed Elev		ft ft	D E P	B L O	U C S	M O I
BORING NO. ILR1405 Station Offset		T H	W S	Qu	S T	Groundwater Elev.: First Encounter Upon Completion		ft	T H	W S	Qu	S T
Ground Surface Elev. 617.28 Grass Matter	<u> </u>	(ft)	(/6")	(tsf)	(%)	After Hrs Lean Clay With Sand(ft	(ft)	(/6")	(tsf)	(%)
followed by brown silty sand, moist, non plastic, topsoil Hole offset 12.0' Northeast of proposed boring location Silty Clay With Sand(CL-ML) medium brown with olive gray, dry			5 4 5 6	4.5 P		uniform gray, dry to mo to low plasticity, stiff to little to few coarse to fin strong cementation, un possible glacial till (con	ist, medium very stiff, ne sands, weathered, <i>tinued</i>)					
non plastic, stiff, few coarse to fine	Э		4			Sandy Lean Clay Trac	e Gravel	594.28		4		
sands, strong cementation, some medium to fine sands at top 4 inches of sample, possible fill Sandy Silt With Gravel(ML)	613.58	- -5	3 4 7	4.0 P		(CL) uniform gray, very stiff, to fine sands, trace med subangular to subround	dium to fine		-25	8 12 14	2.2	
dark brown, dry, crumbly, stiff to medium stiff, trace medium to fine subangular to subrounded gravel silt with medium to fine sands,	611.28		3			strong cementation, un glacial till	weathered					
possible fill Silty Clay With Sand And Grave			5									
(CL-ML) brown, dry, non plastic, stiff, silty clay with few medium to fine sands, trace medium to fine subangular to subrounded gravels	609.28		6 3 3 3	3.5 P		uniform gray, dry, very cementation, few coars sands, trace gravels, br seam at center of samp	e to fine rown silty			4 8 12	4.5 P	
possible fill	,	-10	3			unweathered glacial till			-30	16		
Sandy Silty Clay(CL-ML) mingled brown, dry, non plastic, medium stiff, slightly crumbly silty clay and medium to fine sands, little medium to fine angular to flat gravels, possible hardened sand			1 3 4 5				F	584.28				
and clay particles mottled, occasional root and wood matter,			5			Silty Clay With Sand(CL-ML)	583.58		24		
possible old topsoil Poorly Graded Sand With Silt (SP-SM) medium brown, moist to wet,		-15	7 8 8			greenish gray mottled w dry, non plastic, crumbl with clay and few mediu sands, oxidized, possib	y, hard, silt um to fine		-35	50/2		
loose, medium to fine sands with silt, trace coarse sands, possible old alluvium deposits Gradual transition from soil above same as above, medium dense, medium brown, wet, medium to fine sands with little coarse sands little silt, possible old alluvium	, <u>599.28</u>		4			soil End of Boring						
deposits Encountered water at 13.0' while sampling		-20	6 8 10	1.8 S					-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)



PROJECT	NUMBE	R:
15883	5.AA.	GS.01

BORING NUMBER: 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				6" power auger, HSA, SPT with automatic hammer CME-50 START : 12/16/05 09:45 END : 1	2/16/	05 1	15:00 LOGGER : B. Karnik
			GRADE (ft)	STANDARD	SOIL DESCRIPTION			COMMENTS
	INTERV	AL (ft)		PENETRATION TEST RESULTS				
		RECOV	ERY (in)	LOT NEOULIS	SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR			DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND
			#TYPE	6"-6"-6"-6" (N)	CONSISTENCY, SOIL STRUCTURE, MINERALOGY			
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
-	4.0	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		×	
5 604.5_	6.0	1.0	S-3-SS	50/5 (50/5")	Fill Concrete rubble pieces			Ground frozen to approximately 4' deep
-	8.0	6.0	S-4-SS	7-5-4-3 (9)	Silty Clay (CL) Brown gray, moist, soft, low plasticity, fill			
- - - - - - - - - 	10.0	6.0	S-5-SS	3-2-3-5 (5)	Dark brown, moist, soft, low plasticity, rounded-subrounded, fine to medium gravel throughout, fill			_
599.5_ _ _	12.0		S-6-SS	4-13-11-6 (24)	No recovery possibly due to piece of coarse gravel stuck in shoe			
-	14.0	18.0	S-7-SS	4-3-4-4 (7)	Dark brown, stiff, low plasticity			
15 594.5	16.0	19.0	S-8-SS	3-5-7-8 (12)	Similar to above with fine to medium, rounded-subrounded gravel, fill			-
-								
	20.0				Sandy Clay (CL) Light brown, moist, stiff, with clay seams, fine to medium, rounded-subrounded gravel embedded throughout, possible gumbotil			_
589.5 _ _	22.0	21.0	S-9-SS	3-4-7-10 (11)				
-								
25 584.5	25.0	22.0	S-10-SS	4-7-8-10	Similar to above, dark reddish brown			-
-	27.0			(15)	Sandy Lean Clay Trace Gravel (CL) Gray, moist, stiff, fine to medium rounded-subrounded gravel embedded throughout, glacial clay			
-	29.0					1000 - 10000 - 10000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 - 1000 -		Start mud rotary at 29' after sampling
30				4-7-8-9			2	



PROJECT	NUMBE	R:
15883	5.AA.	GS.01

BORING NUMBER: **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

			20011			END : 12/1	6/05	15	
			GRADE (ft)		START : 12/16/05 09:45 SOIL DESCRIPTION	END. 12		10	::00 LOGGER : B. Karnik COMMENTS
	r			STANDARD PENETRATION			Ď	┝┯	
	INTERV			PENETRATION TEST RESULTS	SOIL NAME, USCS GROUP SYMBOL, C		Ч		DEPTH OF CASING, DRILLING RATE,
		RECOVI	ERY (in)		MOISTURE CONTENT, RELATIVE DENS	SITY OR	ЗÖГ	ç	DRILLING FLUID LOSS, TESTS, AND
			#TYPE	6"-6"-6"-6" (N)	CONSISTENCY, SOIL STRUCTURE, MINE	RALOGY	SYMBOLLIC LOG	Frozen	INSTRUMENTATION
579.5		23.0	S-11-SS	(15)		_			
	31.0					-)//		-
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35	-						<i>[]</i>]		
574.5	-					-)]_		_
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40 -	40.0					-	(I)		-
569.5	40.0						<i>[]</i>]		
	1	24.0	S-12-SS	5-8-10-12		-			-
-	42.0	24.0	0 12 00	(18)		-			-
	42.0					-	1)]		-
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45						-	$\langle \rangle \rangle$		-
564.5	-					-	<i>41</i>		-
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						-)}}		
	-					-	ŰH,		-
						-	Űb)		-
	1					_			
50	50.0					-	(A)		-
559.5	50.0				Sandy Shale				—
	1	12.0	S-13-SS	9-16-50/6	Dark gray, dry, hard, weathered shale with co	al and			-
-	52.0	12.0		(66/12")	sand seams	-			Spoon refusal at 51' end drilling at 11:50 am, start rock coring at 52' at 1:37 pm
	52.0				Begin Rock Coring at 52.0 ft below ground su	urface		╟┼	am, start fock coning at 52 at 1.37 pm
	1				See the next sheet for the rock core log				-
	4					-			-
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55 554.5	1					-			
554.5	4					-			-
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PROJECT NUMBER: 158835.AA.GS.01 BORING NUMBER: RW401

SHEET 3 OF 3

ORIENTATION : VERTICAL

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

WATER LEVELS : START : 12/16/05 09:45 END: 12/16/05 15:00 LOGGER : B. Karnik DISCONTINUITIES LITHOLOGY COMMENTS 0 0 CORE RUN, LENGTH, AND RECOVERY (%) NON (#) FRACTURES PER FOOT DESCRIPTION ROCK TYPE COLOR SYMBOLLIC DEPTH BELO SURFACE (fi SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS R Q D (%) DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS DROPS, TEST RESULTS, ETC. CHARACTERISTICS Shale 52.0 Shale: horizontal joints, possibly caused during 1 core retrieval, no staining, smooth, planar joint surfaces, 2" thick soft, silty infilling at shale Gray, very fine grain, soft, slightly weathered, very weak, sound rock, 5 sandstone interface very sandy R-1-NQ Limestone: horizontal joints, black staining, Limestone 5 ft 23 X rough, undulating surfaces, very close to close 55 Dark gray, fine to coarse grained, 45% 554.5 spaced discontinuities, joints are open appearance is a mixture of fine sand and gravel, rutted texture, moderately weathered, weak to medium strong, moderately fractured to extremely 57.0 fractured Rate of coring: 5 minutes for Sandstone?? 5', very poor recovery No recovery, possibly sandstone, brown, fine grained sandstone piece in R-2-NQ bit 5 ft 0 60 0% 549.5 62.0 Rate of coring: 6 minutes for 5', rock piece stuck in bit plugged up barrel R-3-NQ 5 ft 0 65 0% 544.5 67.0 Bottom of Boring at 67.0 ft below No recovery between 62' to ground surface on 12/16/05 15:00 67' driller could not figure out what was wrong, abandoned drilling at 67' at 3:00pm, coring rate 7 70 minutes for 5' 539.5 75 534.5 80 529.5



SOIL BORING LOG

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

								Date 6/22/10
ROUTE F.A.I. 74	DE	SCR	IPTION	۱		I-74 Over Mississippi F	River LO	GGED BY JMB
SECTION81-1-2	<u> </u>	_ I			SW1⁄4	of SEC. 33, TWP. 18N,	, RNG. 1W, 4th P.M.	
COUNTY Rock Island		S ME	THOD		Ho	llow Stem Auger	_ HAMMER TYPE _	Auto
STRUCT. NO. 081-6011 Station BORING NORW 07-1	6	D E P	B L O	U C S	M O I	Surface Water Elev. Stream Bed Elev.		
Station 58+77 Offset 15' Rt.		T H	W S	Qu	S T	Groundwater Elev.: First Encounter	ft	
Ground Surface Elev. 60						Upon Completion	599.1 ft ∑	
		(ft)	(/6")	(tsf)	(%)	After Hrs.	ft	
CONCRETE FILL - Brown, moist, very stiff,	604.70		-					
clayey SILT with trace sand			4		14			
		2—	8					
		2	7					
				1.67S	13			
		-		0.90B				
		4		1.95S	13			
	600.10		-					
Brown, wet, silty, clayey, fine-grained SAND with trace	F00 40		-					
gravel	<u>599.10</u>	- ₩	2	0.42B	21	-		
Dark brown, moist, soft to stiff clayey SILT	,		2 3			-		
		8—		1.25P	19			
	596.10				16			
Brown, wet, silty, clayey, fine-grained SAND with grave		- 10—						
	594.10							
Brown, moist, very stiff, clayey SILT with trace sand and grav	el	- 12— -	5 15 7	2.30P	13			
	591.60			3.11B	16			
Gray, moist, very stiff, silty CL	AY			3.04B				
with trace sand and gravel		14 — 	-					
		- 16—	1					
			6 8 11	2.19B	14			
		18—		2.93B	13			
		-		4.43B		-		
		_		3.50P				
End of Boring	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)



TEST BORING NO, S-31 STATION 286+24 - 70' LT.		TEST BORING NO. S-32 DN 285+52 - 30' RT. €	TEST BOR(NG NO. 5-33 STATION 286+20 - 32' RT. G	TEST BORING NO. 5-34 STATION 287+00 - 53' RT. Q	TEST BORING NO. 5-35 STATION 286+48 - 118' RT. G
ELEV. N Q _u W(\$) 655	615	N Q _u W(3)	N (%)	N Q ₂ H(K)	N Q _U W(%)
652.0' Hard Mott'ed Brown-black SiLT - 29 1:03 645 646.0 - 30 8:0 11	613.5' 610. 607.5	Very Stiff Crumoly Brown SILT 22 2:25 10 5 9.0 10 8		603.5 ¹	603.0
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u>600</u> 595	Hard 32 5.9 12 to 23 5.0 12 6 Very Stiff 15 3.5 14 Brown 4,10 16 8 Grey 23 15	601.51 Very Stiff -13 2,75 14	602-5 Soft Brown SiLTY 5 0.8 15 CLAY 8 0.5 17 B	601.5 Black SLLTY CLAY Very Soft Brown 5 1,0 20 SILTY CLAY 593.5 Medium Brown
$\begin{array}{c} 630 \\ (7:11) \\ \hline \\ 8 \\ \hline \\ 625 \\ \hline \\ 625 \\ \hline \\ 626.0 \\ \hline \\ \hline \\ 18 \\ 3 \\ 8 \\ \hline \\ 18 \\ 3 \\ 8 \\ 5 \\ 13 \\ \hline \end{array}$	<u>590</u>	SILTY 14 10 15 CLAY 14 3.0 15 LOAM 8 13 2.5 15 Gravel 13 2.6 14 (Till) 8 14 14	Brown	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	591.0 GRAVEL 4 1.2 20 7 1.2 18 Stiff 1 2.3 19 B
$ \begin{array}{c} $	<u>580 580.5</u>		with16 2.7 14 Gravel14	СLAY ТILL III 2.6 I3 В 2.9 I5 576.5	to
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	<u>575.0 575.0 </u>	Brown SAND 32 Stiff Grey 28 1.75 21 CLAY LOAM 28 E with Gravel 3.00 16 (Till) 25 B	574.5 Hard Grey 4.58 CLAY with 31 5.8 17 Grevel 8	Stiff Grey CLAY TILL with Sand 571.5 571.5 CLAY TILL 10 1.4 15 S 18 2.9 15 B	$\begin{array}{c} CLAY \\ 13 & 2.8 \\ B \\ 15 & 2.8 \\ B \\ 15 & 2.8 \\ B \\ 14 & 2.1 \\ 14 & 2.1 \\ 14 & 2.1 \\ B \end{array}$
CLAY	570 569.0- 565	Dense Grey34 3.00 17 Wet SILTY30 SAND	569.0 (Tiil) 25 5.0 SILTY SAND 14 566.0 100+ 7.5 11	Hard Grey 26 5.1 15 CLAY TILL 23 4.0 13 566.5 Soft 100+ Black	568.0
600 Gravel	563.5 560 558.0	25 Very 60 Dense 150+ Grey 5AND 100+	-100+7.6 10 -100+7.5 9	562.0 SHALE BOTTOM OF BORING	Soft Grey SHALE drilled
$ \begin{array}{c} 595 \\ $	555	BOTTOM OF BORING	556.5 BOTICM OF BORING		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$					549.0 BOTTOM OF BORING
577.0 BOTTOM OF BORING B					

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

ROUTE NO.	BECTION	COUNTY	TOTAL SHRETS	SHEET NO.
F.A.L. 74	a1.;∺8	ROCK ISLAND	389	2.52
FED. ROAD D	IST. NO. 7	ILLINOIS FED. NO PI	ROJECT 1-74	

DWG. NO. 8-4

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20 18 15

17 15

14 18

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TEST BORINGS

F.A.I. 74 - SECTION 81- IHB F.A.L. 74 & RAMPS OVER RELOC. 19TH ST.

ROCK ISLAND COUNTY

STATION 289+23.09

SCALE: AS NOTED DATE:

ELEV. 620'	88+26 - 88' RT.Ç		ION 287+66 - 72	D' LT.	Ś	NO. 5-38 TATION 288+65 -	115' LT.	STATI	ION 288+62 - 1	2' RT. €	STATION 289+52 -	62' RT.
ELEV. 620'			104 201.00 11									
620'	N 0	622.0 -	2	N Q.	622.0 W(%)	Dr. I DO TH ALE	Y N Q _u W(%)			N Q ₀ ₩(%)		N Q _U W(
	N Q _u	W(2)	CE AY	16 A.U	W(%) 620.							D. addresses and the state of the state o
		617.5	LOAM			Soft Brown						
		01110		- 2,9	11 615.1	CLAY TILL	4 0.7 23					
615						Soft Brown	5 1,3 13					
			Very		12	SILTY CLAY	D					
610	a star (a many more and a constant and a star of registering a sign of a more and a field defined as		SLIFF		15 610.0		5 1.0 18				allendade allentification in a more consistent process and annually described and all process. Mo	
			Brown		-	Stiff Brown SILTY CLAY	ц 0,6 20					
			CLAY	В	607.0						606.0	
605			LOAM	13 2.9 B	14		5 1,2 22	604.0			Black SILTY CLAY LOA	44
604.0 Blac	R SILTY CLAY			-13 2.8	1 li			00110			Stiff	
602-5 St	iff Grey			-11 2.6		Stift	7 2.0 19 B		Medirum		Mottled Brown-Grey	
600	SILTY			8		Gray CLAY	13 2,3 16		Black to		CLAY	12 I.3 I5 B
597.0	CLAY 5 13	11 597.5 -		9 2,3	13	THE	20 1,6 16		Grey	5 0.7 H	LOAM	14 I.5 I5
S	oft Grey	FOG 0	Medium Brown SANDY LOAM				16 2.6 13	<u>Z</u>	SILTY CLAY	<u>5 0,6 23</u>		13 2,1 11
594.0 SA	NDY CLAY 4 S	595.0	Stiff Grey CLAY LOAM	-13 1,8		an a	19 2,7 15	595.0		A & 00		8
	+0 2,4	15 592.5 -	ULAT COACT							u 0,6 22	No. 10	14 2,6 14 B
590	2_4 16_B	14	Very Stiff	10 2,3	14 591.0		26 3.4 15		Stiff	5 1 16	Very	14 2,8 15
			Grey	10 2,6	and the second se	Medium Groy			Grey	5 0,8 18	Stíff	13 3.1 15 B
	Stiff Brown 17 2.4		CLAY TILL	14 2 <u>9</u>		FINE SAND			CLAY	I I2 I.6 I4	Grey	1.3 B
585	to Grey 19 B	<u> 4 585.0~</u>		B	585.0				TILL	B		
	CLAY 17 2.4	ş ż.ş	Hard		15	Stiff				LI 1.6 13	CLAY	17 3.2 12
500	TILL 17 2.8		Grey	18 4,3	15	Grey	19 3,9 20			32 7.9 16	TILL	
580	B	575.0	CLAY	11.11	10	CLAY						17 2.9 14 8
		15	TILL	18 4.4								16 3.0 14 B
575	2.6 15 B	14 675.0 -	4	23 5,9	11		29 4.0 21			<u>34 5,9 16</u> S		16 3.0 19 B
			Very Stiff		16	93 Wile #10	4 4 ₅ 9 20				Hard Brown CLAY	
	18 ² ,6	10	Brown-Grey CLAY	18 ⁴ .6		Al Walling and A	62 5.5 17			62 7.3	GLAF	29 6.0 18 S
570	2.5	11 570.0		10 B					Haro	5		75 9.0 16 S
569.0		18	Hard		10		58 6.0 18 S		Grey	76 9,1		
	Ÿ		Grey	56 ⁶ č ¹	10 M				CLAY	_	Hard	-
565	100 <u>8</u> .0 100 <u>\$</u>		CLAYEY			Haro	6.0.10		OL NI			52 IO.5 I6 B
	100		SHALE	66 6.0 S	10	Dark Grey	58 5,2 18		SHALE		Grey	
560	Hard	560.5-		160 6.5 \$	9	CLAY	100+ 7,3 14				CL AY	100
	Black	***	BOTTOM OF BORIN	G		SHALE				arillea	SHALE	drilled
	CLAY SHALE drilled					011110-0						
555	STALE STALE											
						La del este del mandela.	drilled				552 0	
								550.0			552.0 BOTTOM OF BORI	16
550			a a tarang na anana ka sa						OTTOM OF BORIN	3		
	-						Lauro de la constante de					
545.0												
BOLLO;	M OF BORING				5113 /	BOTTOM OF BORIN						

				·····
 ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	BHEET NG.
 F.A.I. 74	8 1- IHB	ROCK ISLAND	389	253
FED. ROAD D	ST. NO. 7	ILLINOIS FED. AID	PROJECT 1-74	

DWG. NO. 8-5

₩(%)

TEST BORINGS

F. A. I. 74 - SECTION 81- IHB F.A.I. 74 & RAMPS OVER RELOC. 19TH ST.

ROCK ISLAND COUNTY

STATION 289+23.09

SCALE: AS NOTED DATE:

STAT	TEST BORING NO. 5-41 TON 289+52 - 9	95' LT.		ST	TEST BORING NO. S-42 ATION 290+47 -			ST	TEST BORING NO. S-43 ATION 290+60				ST	TEST BORING NO. S-45 ATION 292+20 -				TEST BORIN NG. S-46 TATION 292+85	
ELEV. 6151		Ħ	Q ₀ ¥(%)			N Q	g 낢(홋)			hij Tu	Qu	₩(%)			n Q _u	₩(%)			
610											an a		609.0-				611.0 *	Stiff Black	
				607.0-	r	7		607.0 -	1				607.0	Brown SILTY CLAY			505 F -	SILTY CLAY LOAM	L
505	-	٦			Stiff			605.0	Brown CLAY	-	tanta ta seran ar ar ana a aiya ya			Stiff Mottle Brown and	0		606.5 -	Medium Brown Grey SILTY CLAY LOAM	-
	Hard Brown SILTY CLAY	60 3C #112			Mottled Brown and				Medium Brown	TANALAN WALLAND			602.5 4	Grey CLAY LOAM	8 1.5 B		604.0 -	Medium Grey CLAY	
00	LOAM with GRAVEL	26	8.30 I2 9	600.0	Grey CLAY		2 15		SILTY	5	0.6 B	23	602.0		B		601.5 -	Medium to	
598.6 ~	<u> </u>	- 24	7.00 8 B		4 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7		3 13		LOAM	- 5	0.7 B	25			-			Dense Brown	
		1	3.30 I3		Hard to Very Stiff	R	13	597.5 -		- 12	в			Very Stiff to	15 2.2 B		596.5 -	FINE SAND	+
95	Very Stiff Olive-Black	1		a la la construction de	Grey and				Medium Brown	12				Hard	<u> </u>				
	CLAY LOAM		3,40 15 B		Brown CLAY LOAM	15 2.0 B		761 A PR	SAND and GRAVEL	15				Brown and	15 3.4	16			mensionadar
90	with GRAVEL (Till)	18	2.75 13 8	590.0	· · •	16 ² .9	9 13	591.0 📡 590.0 🥆					1977 / 1975	Grey CLAY	17 3.4	13		Very	
		17	2,30 i3 8			28 4,3	3 7	587.5 -	Loose Brown SANDY GRAVEL	5				TILL	18 3.1	and the second s		Stiff	all of the local division of the local divis
	Very Stiff	24	2.3P 14 3.28 16			35 ⁴ .	9			18	3,5	13			28 7.3			Grey	
583.0 -	Sive CLAY	23	3,3 13 8			100+ 4.3	8		Very Stiff	20	3.6 8	14			10			CLAY	
582.0	Very Stiff SHALE-CLAY	-	3.5 21 S		Hard	100+ 6.			to Hard		8 4,5 6				35 6.3 B	12		TILL	
80 .0 、	Hard SHALE	1.	half life ha ja ayak ja shi shi sa a jahak si su ya sa jika (sys)		Grey	<u> 100+ s</u>			Grey CLAY	20	653		580.0	Very Dense					
	and	100+	s.u S		CLAYEY	100+ 6.2 \$			LÓAM	- 19	4.3 B	10	577.5 -	Brown GR&VEL	300		Adda any car a land		
75 576.0	L	J100+				100+ ⁶ .8	6				6.3 8	18		Medium					
BOTT	FOM OF BORING - Re	fusal			SHALE	100+		573.0 -						White LIMESTONE	85% Recove	ery	574.0 -	IOM OF BORING - R	 ef⊮
20						100+			Med um	622 Ro	covery		571.5-	3					
70									White					DOTTOP OF DURIN	10			n da manana na manana da manana na mana ma	
								567.0											
35		******	initialization desceloted			drilled		B	OTTOM OF BORIN	IG					n an the second s	an a she was the section of the sect		a 11 alle and and a state of the state of a state of the state of the	
50				560.5-															
				100	OTTOM OF BORING	G													
15																			

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

	ROUTE NO.	SECTION	cou	INTY	TOTAL BHEETS	sheet NG.
	F.A.I, 74	81·1HB	ROCK	SLAND	389	254
į	FED. ROAD D	ST. NO. 7	H.J. INCOM	FED. AND PR	IDURCE 1-74	

DWG. NO. B-6

- 80° LT.

N Q_u W(%)

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	L	- 9	1.3 B	22	
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		- 5	0.9 B	25	
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		5	0.8	22	
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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:





* Saturation is set to 100% for phase calculations.



muse colculations based on start of test.

* Saturation is set to 100% for phase calculations.

CONSOLIDATION TEST DATA SUMMARY REPORT



					Before Test	After Test	
Overburden Pressure: 0 tsf				Water Content, %	19.57	16.30	
Preconsoli	dation Pressure:	: 0 tsf		Dry Unit Weight, pcf	109.7	116.6	
Compression Index: 2.54639e-313				Saturation, %	102.19	103.07	
Diameter: 2.499 in		Height: 0.	995 in	Void Ratio	0.51	0.42	
LL: 0	PL: 0	PI: 0	GS: 2.65				

	Project: 174 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
C HANSON	Test No.: 1	Sample Type: Tube	Elevation: N/A
	Description: Brn. f. sandy silt /	so. clay, c. sand & sm. grave	sl.
	Remarks:		

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:

22									
	Applied	Final	Void	Strain		itting	Coeffic	cient of Con	solidation
	Stress	Displacement	Ratio	at End	Sq.Rt.	Log	Sq.Rt.	Log	Ave.
	tsf	in		90	min	min	in^2/sec	in^2/sec	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

