STRUCTURE GEOTECHNICAL REPORT

PHASE 1 B GEOTECHNICAL REPORT
NEW I-74 BRIDGE OVER MISSISSIPPI RIVER
MOLINE, ILLINOIS TO BETTENDORF, IOWA
ILLINOIS VIADUCT STRUCTURES
SECTION 81 - 1HVB
ROCK ISLAND COUNTY, ILLINOIS

PROPOSED STRUCTURE NO'S. 081-0177 (WB) AND 081-0178 (EB)
EXISTING SN'S. 081-0111, 081-0112, 081-0113, 081-0114, 081-0143, AND 081-0142

PREPARED FOR

IOWA DEPARTMENT OF TRANSPORTATION
AND
ILLINOIS DEPARTMENT OF TRANSPORTATION

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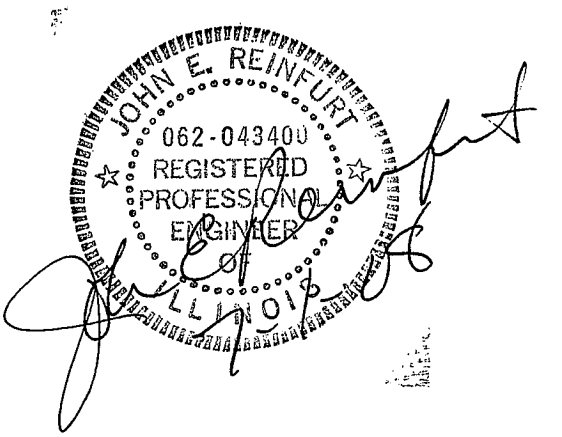
Attachments: Figures 1 – 4
Boring Logs
Laboratory Test Results
Rock Core Photographs
Elastic Moduli and RMR Table
Existing Viaduct Ramp Plan and Elevation
SGR Responsibility Checklist



1.0 PROJECT INFORMATION

Introduction

A study for a new Moline Viaduct, a section of the proposed I-74 crossing of the Mississippi River at the Quad Cities, was conducted by CH2M HILL/JACOBS. The study results are presented in a Technical Memorandum titled "I-74 Iowa-Illinois Corridor Study-Moline Viaduct & Ramps, Proposed Span Arrangement, dated June 21, 2007. Figure 1 shows the structure location. Figure 2, Location Map, shows the overall Quad Cities area and Figure 3, Boring Location Plan, shows the alignment of both the existing and proposed I-74 Illinois Viaduct. The structure is located in Sections 32 and 33, Township 18N, Range 1 West.

Purpose

This Structural Geotechnical Report (SGR) presents the results of the Phase 1B geotechnical investigation performed for the Moline Viaduct structures 081-0177 (WB) and 081-0178 (EB) in Moline, Illinois. This report deals only with the land based substructure units that will be designed and constructed in Moline, Illinois. Five other reports will deal with the recommendations for the piers in the Mississippi River, the land based piers on the Bettendorf, Iowa side of the river, the 19th Street Bridge, Ramp 6th-C, and Ramp 6th-D in Moline, Illinois. The purpose of this investigation was to determine the nature and condition of the subsurface materials, to describe the general site characteristics, and to formulate conclusions and recommendations for the preliminary design and construction of the viaduct pier foundations and other subsurface related components of the proposed bridge structures.

Scope

The scope of this investigation includes reviewing available subsurface information for the project area, obtaining the required field and laboratory test data, performing the necessary engineering analyses, and formulating the conclusions and recommendations presented in this report. These conclusions and recommendations have been prepared considering the nature of the proposed project as presently planned and described in this report.

2.0 PROJECT DESCRIPTION

Site Description

The new Moline Viaduct is located in Moline, Illinois, extending from River Drive (Third Avenue) southward to a proposed abutment location just south of 7th Avenue. The alignment continues southward and will encompass a new I-74 overpass of 19th Street. Ground surface in the floodplain adjacent to the river and extending southwards towards River Drive is at approximate El. 565 to El. 569 ft and gently rises to the south. The floodplain continues to gently rise to the south, with ground at about El. 573 ft at 4th Avenue, at about El. 575 ft at 5th Avenue, at about El. 580 ft near 6th Avenue, and at

about El. 585 ft near the existing intersection of I-74 and 7th Avenue. From 7th Avenue southward, the floodplain continues to gently rise to the intersection with the soil-covered bluff line along the Mississippi River Valley which then steeply rises to the south. 19th Street extends south/southeastward from 7th Avenue and crosses at-grade beneath the I-74 overpass approximately ¼ mile south of the intersection of 7th Avenue and 19th Street. The ground elevation rises southward from about El. 605 to El. 614 ft along the roadway beneath the I-74 overpass.

The proposed alignment is located just east (upstream) of the existing I-74 alignment through downtown Moline. The alignment begins on the north side of River Drive and continues southward across a grassy park area, over the existing on and off ramps of I-74 to River Drive, and then crosses the BNSF Railroad and adjacent 4th Avenue. From there, the alignment starts to curve southwestward towards the existing I-74 alignment, cutting across the John Deere parking lot between 4th and 5th Avenue, across private properties between 5th and 6th Avenue before tying back into the existing alignment at 7th Avenue. There are a number of properties along or adjacent to the northern half of the alignment which have been identified as potentially contaminated sites because of existing or prior use which includes the old Frank Foundries Corp. properties located north of River Drive, the Riverside Products property, the Deere and Co. parking lot between 4th and 5th Avenues and Brannen's Auto Works at 2100 5th Avenue.

Potentially Contaminated Sites

A Preliminary Environmental Site Assessment (PESA) was completed on the Illinois side of the new I-74 project corridor in August, 2002 by the Illinois State Geological Survey (ISGS).

The North Abutment to the proposed Moline Viaduct Structure is located very near the south boundary of the former Frank Foundries Corporation site, 2020 River Drive, Moline, IL. In the final Environmental Impact Statement (FEIS), it was identified that the PESA stated that this site was found to be contaminated by VOC's from LUST's, UST's, and machine and tool shops, oil houses, metals from the former foundry sites and machine shops, and PCBs in the former transformer and drum-storage areas. Any excavation or grading at the former Frank Foundries Corp. site will require the management of special waste.

According to the FEIS, the Former Frank Foundries Corp. in Moline, Illinois was enrolled in the Illinois EPA Site Remediation Program; a No Further Remediation letter was issued in 1992. The property subsequently experienced a leaking underground storage tank event in 1996 and after over-excavation of the site, a second No Further Remediation letter was issued in 1998 indicating the land was authorized for residential or industrial/commercial uses. The No Further Remediation Letter appears to be in conflict with the PESA. This issue needs to be resolved during final design.

In addition, some of the proposed piers for the Moline Viaduct Structure will be located at other potentially contaminated sites identified in the FEIS. In particular, Pier Nos. 4 and 5 will be located within the Deere & Co. parking lot (former industrial site) located

between 4th and 5th Avenues and 21st Street and the existing I-74 viaduct, and the Riverside Products (industrial site) site at 400 21st Street.

Pier 7EB is located within the property referred to as Brannen's Auto Works at 2100 5th Avenue. PESA stated this site was found to be contaminated and any excavation or grading below a depth of 6 feet will require management of special waste.

The Ramp 6th-D footprint will cross over the property identified as Riverside Products, 400 21st Street, Moline, IL and be located just east of the Deere & Co. parking lot located between 4th and 5th Avenues and 21st Street to the existing I-74 viaduct. In the FEIS, the Riverside Products property was identified as a site contaminated by VOC's and metals from the machine shop and that any excavation or grading below 6 feet within 50 feet of soil boring 1314-15 would require the management of special waste. The Deere & Co. parking lot was found to be contaminated by VOC's and metals from machine shops and metals from the blacksmith and grinding facilities of a former industrial site and that any excavation or grading will require the management of special waste.

To our knowledge, a final Environmental Site Assessment has not been conducted for these sites.

Proposed Moline Viaduct Structures (Eastbound and Westbound)

The proposed Moline Viaduct is approximately 1,951 feet long extending from the south end of the plug fill near River Drive to a touchdown just south of 7th Avenue. Figure 3 is a general plan view of the viaduct area. The viaduct crosses numerous existing and proposed infrastructure features. Starting at the north and moving southward, these include 3rd Avenue (River Drive), existing Ramps 3-N and N-3, the BNSF railroad line, 4th Avenue, proposed Ramp 6th-C, 6th Avenue and 7th Avenue. Existing Ramps 3-N and N-3 will be removed after construction of the new I-74 Mainline structure.

The abutments and bents of the Moline Viaduct will all have the same orientation which is approximately parallel to the city streets that run from the northeast to the southwest. This results in the abutments and piers having a 15 degree-30 minute right ahead skew.

The proposed I-74 Moline Viaduct is comprised of 11 eastbound and westbound spans. The proposed pier/span arrangement for the mainline of the Moline Viaduct is shown on Figure 3. The approach span piers are spaced at approximately 185 to 230-ft centers. A three column frame pier is proposed for all substructure units. The columns are planned to be oblong roughly 4.5 ft by 9.5 ft in plan dimension. A steel girder superstructure having a constant structure depth of approximately 8 ft is planned.

It should be noted that 5th Avenue will be abandoned so that Pier 6W can be constructed in the middle of the roadway.

The abutment fill heights at the North Abutment and South Abutment are approximately 25 and 31 feet, respectively. The south abutment at 7th Avenue will be set behind

typical IDOT MSE wrap-around wall sections. The South Abutment global stability/design information is being reported under a separate SGR (Reference 14) for the corresponding wall. The north abutment at River Drive will be a typical stub abutment with a spill slope.

Preliminary AASHTO LRFD Load Combination Limit States foundation loadings for two typical Illinois Viaduct foundations (WB South Abutment and Pier 10 WB exterior column) were calculated and are presented in Tables 1 and 2. The loads shown are service loads. The loads shown are potentially governing load cases and represent only a small percentage of all the load cases investigated. All of the loads are at the bottom of the footing and include an allowance for the dead load of the footing and 2-ft soil overburden on top of the footing. Additional load cases, as well as all piers, will be analyzed during final design. Final design analyses will also be performed according to the 2007 AASHTO LRFD Specifications with the 2008 Interim Specifications.

Table 1 – Preliminary End Bent Loading Case – WB South Abutment

South Abutment Sta. 48+91	P (kips)	M_X (ft-kips)	M_Z (ft-kips)	V_X (ft)
Service I	-1,892	-1,366	-283	24
Service I	-1,829	-1,304	-5,021	24
Service II	-1,987	-1,461	58	0
Service II	-1,905	-1,380	-6,101	0

Table 2 – Preliminary Approach Bent Loading Case – Pier 10 WB

Pier 10 WB	P (kips)	M_X (ft-kips)	M_Z (ft-kips)	V_X (ft-kips)	V_Z (ft-kips)
Service I	-1,943	-12,240	-2,883	304	-507
Service I	-1,942	-10,225	3,526	-325	-322
Service I	-1,901	-9,689	5,785	-262	-348
Service II	-2,001	-12,205	-3,402	339	-510
Service II	-1,947	-9,716	5,991	-242	-359

Existing Bridges

The Moline approaches to the existing river crossing structures are continuous steel girders supported on 26 bents/abutment spaced 87 feet to 237 feet from the Moline anchorage to 7th Avenue. The bents are generally supported on driven pile or spread footing foundations beneath each pier column. Existing drawings indicate the spread footings were sized based upon an allowable bearing pressure of 3.2 to 3.6 tsf. Six bents are supported on driven steel 8BP36, 10BP42 and 10BP57 piles. The piles were designed for an allowable load of 9 ksi on the steel section (56 tons). The piles vary in length from 12 to 25 feet. Battered piles were used to resist lateral loads. Table 3

shows the foundation types and bottom of footing elevations by bent numbers. Spread footing sizes varied from 12 ft by 15 ft to 12 ft by 51 ft. Pile caps were typically on the order of 9.5 ft by 24 ft.

Table 3 - Existing Bridge Foundation Types

Existing Bent No.	Foundation Type	Bearing Pressure, (TSF)	Bottom of Footing El. (ft)	Pile Length (ft)
Pier L	Spread Footing		557.0	
Pier 1	Piles – 8BP36		557.5	13
Pier 2	Spread Footing	3.5	554.0	
Pier 3	Spread Footing	3.4	554.0	
Pier 4	Spread Footing	3.4	552.0	
Pier 5	Spread Footing	3.3	553.0	
Pier 6	Spread Footing	3.5-3.6	551.5	
Pier 7	Spread Footing	3.2-3.5	557.0	
Pier 8	Spread Footing	3.5	557.0	
Pier 9	Spread Footing	3.3-3.5	559.0	
Pier 10	Spread Footing	3.5	560.0	
Pier 11	Spread Footing	3.5	560.0	
Pier 12	Piles - 10BP57/8BP36			11
Pier 13	Piles –10BP42/8BP36			11
Pier 14	Piles – 10BP42			12
Pier 15	Spread Footing	2.4-3.4		
Pier 16	Piles – 8BP36/10BP42			10
Pier 17	Piles – 8BP36			13-14
Pier 18	Piles – 8BP36			16
Pier 19	Piles – 10BP42			20
Pier 20	Piles – 8BP36			19
Pier 21	Piles – 8BP36/10BP42			13-15
Pier 22	Piles – 8BP36			13-16
Pier 23	Piles - 8BP36			17-25
Pier 24	Piles – 10BP57			19
Pier 25	Piles – 10BP57			20
Abut C	Spread Footing	3.75	585.5	

The existing viaduct was designed by DeLeuw Cather & Company, Chicago, Illinois around the period 1972 and a plan and elevations of those drawings are attached.

3.0 SUBSURFACE INVESTIGATION

Phase 1A

A subsurface investigation was conducted during Phase 1A of this project from October 2005 through December 2005 to assist in the conceptual study/selection of feasible

foundation types. Nineteen borings were drilled along the proposed Illinois Approach structural alignment between the River Road and 7th Avenue: Borings VIAIL-01, VIAIL-02, and MR-021P along the proposed main viaduct structure; borings RW-1401, -1403, -1001, -1501, -1503, -1504, -1506, and -403 for various retaining walls; borings RB-1030, RB-1031, RB-1032, and SB-1030 for roadways, and borings PRMPD-01 through PRMPD-03 and PRMPC-01 for Ramps C and D, respectively. The VIAIL and MR series boring logs are included in the Appendix as a part of this viaduct report.

Phase 1B

To determine the nature and condition of the subsurface materials along the proposed structure alignment, a total of 22 borings were drilled at pier locations selected by Jacobs personnel. The number of borings selected for this preliminary phase was based upon input and approvals from Iowa DOT and CH2M Hill. Originally, the number of borings planned for this segment of the work totaled 24 borings; however, two borings (VIAIL-116 and -117) were not drilled because of inability to gain access to private property during the drilling program. The locations of the borings are shown on the Boring Location Plan, Figure 3 (Sheets 1 & 2). The borings were located in the field by using a hand held GPS unit or, where necessary, taped measurements off of existing structures. The GPS unit was sometimes ineffective adjacent to the existing viaduct and other surrounding structures. In those cases, coordinates were estimated by scaling from known reference points. Elevations were interpolated from project .tin files. Datum for the boring locations was the Iowa South State Plane Coordinate System 1402 and NAVD 88.

The borings were drilled between August 27, 2007 and September 14, 2007 by Terracon Consultants Inc. of Naperville, Illinois. The borings were drilled using either a CME 55 truck rig or a CME 550 ATV rig owned and operated by Terracon. A Jacobs engineer provided on-site supervision throughout the boring operations, and prepared the boring logs found in the Appendix to this report.

A summary of the Phase 1A/1B boring program is presented in Table 4. The total depth of each boring was contingent upon location along the proposed structure, encountered conditions and anticipated foundation depths. The approach spans were typically extended a minimum of 25 feet into bedrock. The total depth of borings ranged from 37 to 56 feet below ground surface. The column "Weathered/Soft Rock Thickness" is generally the thickness of shale or weathered sandstone that was able to be augered prior to auger refusal.

In all of the borings, the drilling method included advancing the borehole through the overburden soils to top of bedrock using 3-3/4 inch inner diameter hollow stem augers and then advancing the hole to a minimum depth of 25 feet into bedrock using NQ-wireline rock coring methods.

Where applicable, Standard Penetration Resistance Tests (ASTM D1586) were conducted in the overburden materials of each boring using standard split-spoon samplers and a CME automatic drive hammer. In general, SPT's were conducted at

2.5-foot intervals in the upper 30 feet of boring (or to refusal, whichever occurred first) and at 5-foot intervals thereafter to bedrock or bottom of boring. The samples obtained were placed in plastic bags and delivered to Terracon's laboratory. In addition, relatively undisturbed samples (Shelby tube samples) were obtained of some of the cohesive soil layers where applicable. Core samples (NQ size) of the underlying bedrock were obtained and placed in wooden boxes for later laboratory testing. The core boxes were removed each day from the site and delivered to Terracon's office in Bettendorf, IA. All recovered rock core samples were photographed each day in order to provide a permanent record. Photographs of the rock cores collected are found in the Appendix.

Samples of cohesive soils encountered in the borings were typically tested for strength using both a pocket penetrometer and a Rimac Spring Tester. Test results are included in the boring logs.

Logs of the borings, showing visual descriptions of the various subsurface strata encountered, as well as all field sampling and test data, are attached to this report. Boring Legends are also presented to assist in the interpretation of the boring logs.

As part of the Phase 1B test drilling program, Jacobs provided field personnel to operate a photoionization detector (PID) to detect the presence of any volatile organic compounds (VOC's) in soil obtained from the geotechnical borings at levels requiring segregation and drummed storage of auger cuttings pending sampling and analysis or other method to determine appropriate disposition. To that end, a PID was used for headspace analysis of soil during drilling operations; scanning split spoon samples to identify any anomalous zones; sampling the borehole opening between split spoon sampling and coring runs as a general indication of the presence of VOC's; and measuring of VOC concentrations in the breathing zone during drilling/coring operations. In addition, a triple gas meter was used to scan for combustible gases at the top of the auger space during drilling operations.

Table 4 - SUMMARY – PHASE 1A/1B ILLINOIS LAND BASED BORING PROGRAM

Boring No.	Pier No.	Date Drilled	Ground Elev.	Soil Thickness (ft)	Weathered/Soft Rock Thickness (ft)	Top of Rock Core Depth (ft)	Top of Rock Core Elev (ft)	Bottom of Hole Depth (ft)	Bottom of Hole Elev (ft)
Phase 1A									
MR021P	Pier 8	11/10/2005	580.1	16.0	13.0	29.0	551.1	21.5	529.6
VIAIL01	Pier 2	10/3/2005	569.6	14.1	-	14.1	555.5	19.4	536.1
VIAIL02	Pier 5	11/2/2005	576.1	15.0	4.0	19.0	557.1	20.0	537.7
PRMPD-01	Pier 2 WB	10/31/2005	569.9	11.0	5.0	16.0	553.9	18.0	535.9
Phase 1B									
VIAIL-103	North Abutment WB	8/28/2007	568.5	14.2	5.3	19.5	549.0	46.0	522.5
VIAIL-104	North Abutment EB	8/28/2007	568.2	11.3	2.7	14.0	554.2	40.5	527.7
VIAIL-105	Pier 1 WB	8/28/2007	569.3	11.0	2.8	13.8	555.5	43.8	525.5
VIAIL-106	Pier 1 EB	8/27/2007	569.3	9.4	2.1	11.5	557.8	37.9	531.4
VIAIL-107	Pier 1 EB	8/28/2007	569.0	11.3	2.8	14.1	554.9	40.8	528.2
VIAIL-108	Pier 2 EB	8/30/2007	570.7	12.0	2.1	14.1	556.6	39.1	531.6
VIAIL-109	Pier 3 WB	8/31/2007	579.4	21.0	3.2	24.2	555.2	49.0	530.4
VIAIL-110	Pier 3 EB	8/30/2007	583.2	24.5	1.9	26.4	556.8	52.8	530.4
VIAIL-111	Pier 4 WB	9/5/2007	573.1	14.3	1.6	15.9	557.2	43.7	529.4
VIAIL-112	Pier 4 EB	9/4/2007	576.0	17.5	1.5	19.0	557.0	45.8	530.2
VIAIL-113	Pier 5 WB	9/7/2007	575.4	13.8	1.1	14.9	560.5	40.0	535.4
VIAIL-114	Pier 5 EB	9/6/2007	575.8	15.2	1.3	16.5	559.3	41.0	534.8
VIAIL-115	Pier 6 W	9/6/2007	575.3	16.3	2.6	18.9	556.4	45.6	529.7
VIAIL-118	Pier 7 E	9/7/2006	578.5	13.5	2.6	16.1	562.4	42.9	535.6
VIAIL-119	Pier 8 WB	9/10/2007	579.2	13.5	2.7	16.2	563.0	41.1	538.1
VIAIL-120	Pier 8 EB	9/6/2007	580.0	18.5	2.6	21.1	558.9	45.7	534.3
VIAIL-121	Pier 9 WB	9/10/2007	581.0	18.3	2.7	21.0	560.0	51.0	530.0
VIAIL-122	Pier 9 EB	9/14/2007	590.0	26.0	2.8	28.8	561.2	55.9	534.1
VIAIL-123	Pier 10 WB	9/12/2007	584.5	21.5	4.4	25.9	558.6	51.0	533.5
VIAIL-124	Pier 10 EB	9/13/2007	586.5	24.1	1.5	25.6	560.9	50.6	535.9
VIAIL-125	South Abutment WB	9/13/2007	585.8	21.3	6.2	27.5	558.3	55.9	529.9
VIAIL-126	South Abutment EB	9/12/2007	586.4	23.5	2.5	26.0	560.4	51.0	535.4

Laboratory Testing

The laboratory testing program was directed toward establishing the classification and evaluating the general engineering properties of the subsurface materials. The testing was conducted by Terracon Consultants of Bettendorf, IA, and their subsidiary H.C. Nutting Company of Cincinnati, Ohio, in accordance with ASTM specifications. Laboratory tests were performed to determine the physical and engineering characteristics of selected split-spoon and NQ size rock core samples obtained during

the subsurface investigation program. The testing program included moisture content determinations, Atterberg limits, grain size analyses on soil samples, and unconfined compression tests, dry density determinations, Moh's Hardness, and Atterberg Limits on selected rock core samples.

The results of all laboratory tests have been summarized and are included in the Appendix to this report.

4.0 SUBSURFACE CONDITIONS

Subsurface Materials

The results of the subsurface investigations conducted at the proposed bridge site are summarized herewith and presented in detail in the Boring Logs presented in the Appendix. Jacobs legends for boring logs and soil and rock classification systems are also included to assist in interpreting the logs. All elevations referenced in the text and in the boring logs are given in feet relative to NAVD 1988 datum. Two subsurface profiles along the Illinois Approach structural alignment are presented in the report as Figure 4 (Sheets 1 through 5).

In general, areas of similar subsurface conditions along the Illinois approach can be identified in two geographic sections: the lower floodplain area extending from River Road southward to about midway between 4th and 5th Avenues, and the upper floodplain area extending from approximately 5th Avenue to 7th Avenue.

River Road to Alley Between 4th and 5th Avenues

A total of 13 borings were drilled in this section of the proposed Illinois approach during the subsurface investigation for this phase of the project as follows: Borings VIAIL-103 through VIAIL-112, and Boring PRMPC-01.

Subsurface conditions encountered along this section of the proposed alignment are characterized by a relatively thin (typically 10 to 18 feet thick) layer of overburden soils underlain by Pennsylvanian-aged shales and sandstone.

Overburden soils consisted of fill materials, silt, clayey silt, silty clay, and silty sand. A section of the large undeveloped area of land along the alignment between the river and River Drive contains widespread piles of clean and miscellaneous fill material. During the course of the drilling program, it was observed that active dumping was occurring in the area approximately 300 feet north of the proposed north bridge abutment area. At several boring locations, the soil column included a layer of loose saturated black fine to coarse silty or clayey sand located either directly above the sandstone bedrock or, at boring locations near the river, overlying a 3 to 5-foot thick layer of very soft dark gray silty clay containing trace wood and organics which was in turn underlain by either shale or sandstone.

Soil thickness along the alignment ranged from approximately 11.5 feet to 21.5 feet thick. Borings VIAIL-109 and -110 encountered soil columns ranging up to 26.5 feet thick but these were drilled through a highway ramp embankment.

The primary rock type encountered in this section of the alignment consisted of Pennsylvanian-aged sandstone. The sandstone units were typically light brownish gray to gray with varying amounts of thin black banding, fine-grained, or nearly uniform grain size (well-sorted), porous, and generally moderately- to well-cemented and only occasionally friable. The sandstone was soft to very soft, with unconfined compressive strengths ranging from approximately 1,600 to 4,250 psi and most test samples in the range of 2,000 to 3,300 psi. Drill times in the sandstone typically measured about one linear foot per minute. Fracturing within the sandstone was typically along non-descript horizontal beds at thin to medium and occasionally thick-bedded spacing, although the actual bedding thickness may be thick to massive and the observed horizontal fractures caused by the drilling operations. The fracture surfaces were typically planar and sandy rough. Only where the fractures occurred along the black banding/parting layers were they readily identifiable as bedding. High angle joint fractures in the sandstone were generally minimal. It should be noted that the sandstone was readily penetrated with a hollow stem auger to a depth of about 2 feet deep before switching over to rock coring operations.

As shown on the subsurface profile along the length of the Illinois approach structure in Figure 4, elevations of the top of sandstone within this section of the alignment were fairly uniform, ranging from approximate El. 545 to El. 558 ft. The sandstone surface appeared to dip to the east and to rise gently to the south. A 3- to 7-foot thick layer of medium to dark gray sandy shale ranging from hard clay-like to very soft rock-like in consistency was found to overlie the sandstone unit in Borings VIAIL-103, -105, and in PRMPD-01 (Phase 1A boring).

It should be noted that there was a strong petroleum odor and free product in the soil sample collected from a saturated zone in Boring PRMPC-03 (located in the John Deere parking lot near proposed abutment for Ramp 6th-C) at a depth of 13.5 to 15 feet below ground surface. For more details refer to the SGR for Ramp 6th-C.

Alley Between 4th and 5th Avenues to 7th Avenue

A total of 13 borings were drilled in this section of the alignment, which extends from proposed Pier No. 6 (Station 38+56) to Abutment 12 (Station 48+91). Test borings drilled in this area included Borings VIAIL-113 through VIAIL-126 and Boring PRMPD-05.

This area is characterized by approximately 14 to 24 feet of soil cover overlying Devonian-aged limestone. At two boring locations (Borings VIAIL-115 and -120), a 10- to 12-foot thick layer of sandstone overlies the limestone. Review of the subsurface profiles along the alignment (Figure 4) suggests that these two locations occupy erosion channels in the underlying limestone bedrock that have been in-filled with Pennsylvanian sandstone deposits.

Soils encountered in these borings consisted of black to dark brown to orange-brown clayey silts to silty clays and occasional layers of silty or clayey sand, along with some fill materials. In general, the soils were typically medium stiff to stiff, of slight to medium plasticity, and moist. Pocket penetrometer readings and Rimac test results typically indicated unconfined compressive strengths on the order of 0.5 to 2 tsf. Sands or sandy clay were frequently encountered immediately above the underlying limestone bedrock.

The primary bedrock unit(s) encountered in the test borings consisted of Devonian-aged limestone which typically extended for full depth of boring. The limestone could be further divided into identifiable beds based on rock color and/or texture. In general, the bedrock consisted of an upper 20 to 25-foot thick layer of light gray to brownish gray fine-grained limestone underlain by an intermediate layer of medium gray limestone containing numerous small pits and the "birdseye" texture described in the local literature, and a second fine grained limestone layer.

The upper limestone unit was typically fine grained, hard to moderately hard, locally stylolitic, and contained occasional to some green shale partings and thin seams. The limestone was thin to medium bedded, with the dominant fracture pattern occurring along the horizontal to near-horizontal bedding planes and the secondary fractures occurring along mid to high angle fracture planes. Some of the fractures exhibited slight weathering near the top of the rock column, but overall was considered to be slightly weathered to fresh. The rock was generally slightly weathered in the upper Rock core recovery and rock quality designations (RQD's) in the upper limestone layer were generally high, with core recoveries typically in the 95 to 100 percent range and RQD's ranging from 35 to 40 percent for the first core run but rapidly transitioning to 70 to 95 percent with increasing depth. Laboratory test results indicate unconfined compressive strengths of the limestone ranged from 3,500 to 12,965 psi and averaged about 7,880 psi.

The medium gray limestone layer which formed an identifiable bed in nearly all of the borings was typically fine to medium grained, medium bedded, moderately hard, and contained minor pitting and occasional local vugs. Core recoveries were typically on the order of 95 to 100 percent, and RQD's predominantly ranged from 80 to 95 percent, indicative of good to excellent quality rock.

Since Borings VIAIL-116 and -117 were not drilled during this phase of the work, it is not known whether bedrock conditions encountered at Pier No. 8 (Station 41+60, WB and Station 42+31, EB) will consist completely of limestone or if there is a sandstone layer overlying the limestone. The location of the pier(s) are in a transitional area where Borings VIAIL-115 and VIAIL-120 were located in erosional troughs within the limestone surface which had been in-filled with Pennsylvanian-aged sandstone, whereas adjacent Borings VIAIL-118, and -119 encountered only limestone.

Borings VIAIL-121, -123, -125 and -126, all drilled within one block of the intersection of I-74 and 7th Avenue, encountered a 2.5- to 9-foot thick layer of medium to dark gray, very soft, clay-like to soft rock-like shale above the limestone, typically extending

between approximate El. 563 ft downward to the top of limestone. At all locations, hollow stem augers and standard penetration tests were used to advance the boring through the shale unit.

Areas Requiring Additional Investigation

For final design, it is recommended that borings be drilled for Pier 4 WB, Pier 6 EB and for Pier 7 WB once permission to gain access to the properties are obtained and the building is demolished. Pier 7 WB is located within Brannen's Auto Works at 2100 5th Avenue and according to the PESA this site is contaminated. Pier 4 WB is within the Riverside Products property and according to the PESA the site is contaminated by VOC's.

In addition, an Environmental Investigation needs to be performed to determine the extent of contamination at the Deere & Co. parking lot, Riverside Products and Brannen's Auto Works as well as other areas identified in the FEIS report. The issues between the PESA and No Further Remediation Letter for the Frank Foundries Corp. site needs to be resolved. The FEIS states "If excavation or additional right-of-way is required at any of these sites, further soil testing is recommended to determine the extent and nature of contamination." This investigation should address the quantity of contaminated material to be excavated; disposal methods and available landfills; special hauling requirements, certifications and permits; water treatment method from water collected from excavations; site monitoring requirements during construction; and requirements for personnel protection and monitoring.

Groundwater Levels

Groundwater levels were noted from water on drill rods during the course of the Phase 1B drilling operations. In general, water levels noted during drilling in the borings located between River Road and 5th Avenue ranged from approximate El. 560 to El. 564 ft and average about El. 562 ft. In contrast, the borings drilled between 5th Avenue and 7th Avenue ranged from approximate El. 566 to El. 574 ft and averaged about El. 570 ft.

During the course of the drilling program, the Mississippi River level ranged from approximate El. 560.9 ft to El. 561.1 ft. The river levels are controlled by the downstream Mississippi River Lock and Dam No.15 at Rock Island, Illinois. The important water elevations for this project are:

Table 5- Important Mississippi River Water Elevations

Case	Elevation (NGVD 1912)
Normal Pool	561.0
Cessation of Navigation	562.5
2% Flowline	563.5
100-Year Flood	569.6
500-Year Flood	572.2
High Water of Record	569.7

Note: The following conversions apply to the project location:
NGVD 1929 = NGVD 1912 - 0.510 ft
NAVD 88 = NGVD 1912 - 0.727 ft

Groundwater rises when the adjacent Mississippi River rises. Construction of Piers 1 through 3 can be influenced by river levels if spread footings are used to support the proposed viaduct structure.

Seismicity

Seismic loads will not be considered in preliminary design due to the low seismicity of the project area. For final design, seismic forces will be computed and applied in accordance with AASHTO LRFD for Seismic Performance Zone 1 (per IDOT Seismic Design Guide p. 3.15-82).

The Illinois Viaduct profile is considered Site Class C per AASHTO (2008 Interim Revisions), Section 3.10.3.1, because of the shallow depth to bedrock. At Piers 1-3, 5, and 7, Site Class B could be considered since the piers will be founded directly on bedrock. The acceleration coefficient, A, to be used in the application of AASHTO LRFD criteria is 3.5 percent for a 1,000 year return period according to Figure 3.10.2.1-3 in the AASHTO LRFD (2008 Interim Revisions).

Scour

Scour is not applicable at these structures.

Mining Activity

A review of the Illinois State Geologic Survey (ISGS) maps indicate no past mining activities in the area of the proposed I-74 Illinois Viaduct Structures 081-0177 (WB) and 081-0178 (EB).

5.0 BRIDGE FOUNDATIONS

Limitations

These recommendations have been developed to aid in the preliminary design and construction of the viaduct foundations affected by the subsurface materials. These recommendations are limited to the scope of work and understanding of the proposed structures as detailed in this report. Significant changes in the anticipated project scope may invalidate these conclusions and recommendations. If, during construction, subsurface conditions different from those encountered in the borings are observed, or appear to be present beneath excavations, Jacobs should be advised at once so that Jacobs can review these conditions and reconsider these recommendations, when necessary. It should be noted that preliminary design was performed using ASD while final design will be LRFD.

Rock Mass Strength

The rock cores obtained from the exploration program were classified using the rock mass rating system (RMR) and a summary of the RMR's are presented in the Appendix. The RMR classification system is a widely used procedure for determining rock mass quality. This system considers the properties and conditions of the rock/rock mass. The RMR is calculated as the sum of the individual ratings for each of the five parameters minus an adjustment made for joint orientation. In general, the rock classified as Class III, Fair Rock to Class II, Good Rock per Table 10.4.6.4-3 of 2006 AASHTO LRFD.

The shear strength of the fractured rock masses was evaluated using the Hoek and Brown criteria as suggested by 2006 AASHTO LRFD. The estimated range of shear strength parameters are presented in Table 6.

Table 6 - Shear Strength Parameters

Material	Friction Angle (degs)	Cohesion (ksf)
Shale	38	1.5
Sandstone	40-53	1.3-7
Limestone	47-53	2-22

Rock Mass Deformation

Elastic moduli were determined or estimated from intact modulus of rock core samples, and from the RMR rating per 2006 AASHTO LRFD. Engineering judgment was used to determine which moduli to use in settlement computations. Elastic moduli estimated from the RMR system and unconfined compression tests for all test borings are included in the Appendix. For Final Design of all pier foundations, the designer must carefully consider the range of moduli estimated for the softer rocks.

Spread Footings

After a review of the boring logs, a target footing elevation for Piers 1 through 3 and Piers 5 and 7 was selected where bedrock was at a reasonable depth. Generally the footing elevation is approximately 13 to 15 feet below grade. Where competent rock is more than 15 feet below existing grade a deep foundation system is recommended. These elevations can be used to perform preliminary analysis. The elevations selected are presented in Table 7.

Table 7 - Spread Footing Elevations

Pier No.	Station	Target Elevation (ft)		Depth of Excavation, (ft)	Foundation Material
		WB	EB		
1	30+90	555.5	556.0	13 to 13.5	Sandstone
2	33+20	555.5	555.5	14.5	Sandstone
3	34+77.50	555.4	557.0	13 to 14.6	Sandstone
5	38+56	560.5	559.3	15 to 16.5	Limestone
7	41+60/42+31	562.4	562.4	16	Limestone

The competency of the rock mass below the two approach piers (Piers 19 and 29) that were investigated during preliminary design were based upon the procedures using the RMR rating system and applying the estimated shear strength parameters to the general bearing capacity formula. The nominal bearing resistance or ultimate bearing capacity for various footing widths was calculated by the methodology presented in the 2006 AASHTO LRFD (10.6.3.1.2a-1 to 10.6.3.1.2a-9).

The nominal bearing resistance of rock foundations is extremely high as would be expected for footings founded on bedrock. Depending on footing dimensions (ranged from 10 ft by 10 ft to 20 ft by 25 ft), the calculated bearing resistance ranged from 445 to 1,600 ksf. It should be noted that the effect of eccentricity was taken into account by using a reduced effective footing area. AASHTO requires that when factored loads are used that the eccentricity be less than 3/8 of the footing dimension in any direction for footings founded on cohesionless materials or rock.

The elastic settlement of spread footings founded on the underlying jointed/fractured bedrock formations was estimated with 2006 AASHTO LRFD Equation 10.6.2.4.4-1 using appropriate values of rock mass modulus, E_m. The elastic settlements are minimal and are in the range of 0.01 to 0.03 inches. It is estimated the elastic settlement of the rock mass beneath Piers 1, 2, 3, 5 and 7 will be less than 0.25 inches for the range of bearing pressures that will be applied to the underlying rock mass.

To evaluate the ultimate sliding resistance of the footings cast on the underlying limestone and sandstone bedrock, a friction factor, tan δ, of 0.70 should be used

because limestone typically breaks along bedding planes when excavated and can be quite smooth. Unless the footing is cast neat against the rock excavation sidewalls, it is recommended that passive resistance not be considered.

For preliminary design, it is recommended that an allowable net bearing pressure of 25 ksf be used to size the foundations. However, the structural designers indicate bearing pressures may not exceed 10 ksf due to a stability standpoint (stay within Kern area) according to their preliminary analysis. It is anticipated the individual column footing sizes will be on the order of 20 ft by 20 ft. For final design, resistance factors from AASHTO LRFD Table 10.5.5.2.2-1 should be used.

Driven Piles

Several bents and abutments are recommended to be founded on driven H-piles bearing on the underlying bedrock. Driven steel piling (8BP36, 10BP42 and 10BP57) was used on several bents of the existing viaduct where the depth to bedrock was greater than 15 feet.

For preliminary design, the initial pile layout should be based upon using the IDOT Pile Data Guidelines for 2007 Standard Specifications dated November 17, 2006. Steel HP piles (AASHTO M270 Grade 50) driven to their maximum nominal required bearing should be used. Metal Shell Piles, Precast Concrete Piles and Timber Piles would not be considered viable options due to the damage potential during driving as bedrock approaches. Pile shoes should be used to protect the piles when driving into the weathered rock zone. Typical pile capacities for ASD and LRFD design are:

Table 8 - Pile Capacities

Pile Section	Pile Area (sq. in.)	Maximum Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available (Kips)	Maximum Factored Resistance Available (Kips)
HP10X42	12.4	335	112	167
HP10X57	16.8	454	151	227
HP 12X53	15.5	419	139	209
HP12X63	18.4	497	165	248
HP 12X74	21.8	589	196	294
HP12X84	24.6	664	221	332
HP 14X73	21.5	578	192	289
HP 14X89	26.1	705	235	352

For pile foundations which specify a Nominal Required Bearing above 600 kips, in lieu of hammer selection criteria and use of the FHWA Modified Gates formula specified in Section 512 of the Standard Specifications, the contractor shall conduct a wave equation analysis to establish driving criteria. However, since the piles are so short

and the driving time is minimal, the use of HP14X89 piles or larger is not cost effective to warrant a wave equation analysis.

The maximum nominal required bearing (NRB) and factored resistance available (FRA) are determined as per IDOT LRFD Pile Design Guides.

$$NRB = 0.54xF_YA_S$$

$$FRA = NRB\,(\phi_G) - (DD+Scour+Liq.)x(\phi_G)x(\lambda_G) - DDx(\gamma_p)$$

Maximum Factored Resistance Available (FRA) for the south abutment piles should be reduced for downdrag force. See discussion later in this report regarding South Abutment Stability and Settlement. The downdrag force is determined by multiplying the values given in the tables below by the perimeter of the corresponding pile. The Load factor γ_p applied to the downdrag force shall be as recommended by IDOT or as per AASHTO (Table 3.4.1-2).

Table 9 – Downdrag Force for I-74 West Bound

North Abutment (Boring VIAIL-103)		South Abutment (Boring VIAIL-125)	
Depth El., ft	**Downdrag Force, kips/ft**	**Depth El., ft**	**Downdrag Force, kips/ft**
*582.1 to 568.5	12.4	**603.6 to 585.8	12.3
		585.5 to 567.0	12.8

Table 10 – Downdrag Force for I-74 East Bound

North Abutment (Boring VIAIL-104)		South Abutment (Boring VIAIL-126)	
Depth El., ft	**Downdrag Force, kips/ft**	**Depth El., ft**	**Downdrag Force, kips/ft**
*582.3 to 568.5	12.6	**603.7 to 586.4	12.5
568.5 to 561.0	22.9	586.4 to 567.0	15.4

* Embankment fill material assumed to be cohesive with undrained shear strength of 1,000 psf.

** MSE selected fill material with $\phi = 34^o$, and unit weight of 125 pcf.

The downdrag force is significant and will reduce the maximum FRA. As discussed under the SGR for the MSE wall at the south abutment, staged construction, ground improvement, removal/replacement of compressible soils and/or lightweight fill of the embankment will be required to minimize settlements along the south abutment MSE wrap around wall. During final design, it should be determined if there is sufficient FRA

and the number of piles at the abutment are reasonable prior to determining if improvements in coordination with the design of the MSE wall needs to be made to the underlying soils to limit the settlement to less than 0.4 inches.

For the north abutment, it should be assumed that staged construction will be used along with soil improvement to improve the stability and reduce the settlement of the plug fill section and abutment. Thus downdrag on the north abutment piles does not need to be considered. If the stage construction/ground improvement assumptions change during final design then the need to account for downdrag forces needs to be reconsidered.

Anticipated tip elevations are:

Table 11 - Pile Tip Elevations

Pier No.	Station	Tip Elev .(ft)	
		WB	EB
North Abutment	29+40	549.0	554.0
4	36+67	557.0	556.6
6	40+00/40+41	556.5	556.5
8	43+48	563.0	558.9
9	44+81	558.5	561.2
10	46+66	558.6	560.9
South Abutment	48+91	558.3	560.4

Lateral load analysis should be performed on these bents using GROUP 6.0/7.0 or FB MultiPier. The short piles at Piers 4, 6, 8, 9, and 10 may not have adequate embedment to develop fixity. These piles may need to be set in rock as specified in Bridge Manual 3.10.1.10 or driven on a batter. Piles for the existing viaduct were driven on a batter.

Drilled Shafts

As an alternate to driven piles and spread footings, drilled shafts can be considered at Piers 1 through 10. AASHTO specifies that drilled shafts be designed to have adequate axial and structural resistances, tolerable settlements, and tolerable lateral displacements.

A single, two and four shaft layout under each column should be evaluated during final design. Where fixed piers are used resulting in high moments due to thermal movements, two to four shafts may be needed to resist the applied loadings. If a single shaft is used beneath the planned oblong pier column, a shaft diameter on the order of 9 to 10 feet may be required. For a two shaft supported column, drilled shafts on the order of 4 to 6 foot diameter are expected. A four shaft supported column would have shafts on the order of 3 to 4 foot diameter. Rock socket lengths would typically be on the order of 2 to 3 times the shaft diameter.

A mono column/drilled shaft substructure presents some benefits, namely:

a. Minimal contaminated soil and water disposal as compared to spread footings and driven pile groups.
b. No sheeting or shoring is required.
c. No pile caps or large footing is required.
d. Minimizes or eliminates conflicts with existing foundations.
e. Required limited space and provides maximum flexibility for construction staging.
f. No intensive handwork as required by spread footings.
g. Reduced uncertainty - final depth to quality rock determined during construction, quantity of manual preparation of rock surface, quantity of contaminated soil, groundwater level, dewatering, time for construction, etc.

Axial resistances of drilled shafts socketed into bedrock were evaluated using the methodology presented in 2006 AASHTO LRFD for determining side and tip resistance (Equations 10.8.3.5.4b-1, 10.8.3.5.4c-a, and 10.8.3.5.4c-2). The following ultimate side and tip resistances were calculated and are presented below for several pier locations.

Table 12 - Drilled Shaft Unit Side and Unit Tip Resistance

Pier	Material Type	qs (psi)	qp (psi)
1	Sandstone	150	350
6/7	Limestone	250	830

Note: qs – ultimate skin resistance
qp – ultimate tip resistance

The resistances vary significantly due to the variation in the RMR of the rock core run and whether sandstone or limestone was encountered. If drilled shafts are considered further during final design the design parameters will need to be evaluated at every pier column where shafts are considered. Also, if drilled shafts are preferred, a cost analysis should be conducted for comparison with spread footings and driven piles.

Horizontal movements and stresses induced by lateral loads and applied moments should be evaluated using the methods in GROUP 6.0/7.0 or FB MultiPier software packages. Determination of whether a rock socket is necessary should be evaluated in final design. The effects of group interaction should be accounted for when analyzing the drilled shaft group horizontal response. Hyperbolic p-y curves can be developed for the rock formations using criterion proposed by Ke Yang (Reference 4) that uses theoretical derivations and numerical analysis results.

Abutment Earth Pressures

The proposed North and South Abutments (Eastbound and Westbound) are partially restrained at the top with MSE wall straps. However, the stub abutments will probably

develop active pressure. The following parameters should be used to determine the static earth pressure on the abutment wall:

Table 13 - Abutment Earth Pressure Parameters

Parameter	Recommended Value
Unit Weight	125 pcf
Angle of Internal Friction, φ	34
Angle of Wall Friction, δ	17

Backfill behind the walls should be granular fill according to the latest Illinois DOT standard details.

Abutment Fill Slopes

Preliminary plans indicate the spill slopes at the North Abutment will be constructed at an inclination of 2.5 H : 1 V. The stability of the abutment slopes was evaluated using SLIDE 5.0. We assumed the compacted embankment material would have an undrained shear strength of 1,000 psf, a value commonly used on IDOT projects. Per the results of SPT and Rimac Spring Tester data of the soil column, a weak cohesive layer underlies the upper fill/debris layer westbound abutment area. Our analysis indicates the global factor of safety is on the order of 1.28. In order to raise the safety factor to around 1.5, the underlying very soft sandy silt should be improved to around 750 psf.

The shear strength can be improved by using staged construction and/or by using an appropriate ground improvement technique such as stone columns, rammed aggregate piers or low modulus concrete columns. The method chosen should be further evaluated during final design such that the technique chosen is compatible with methods that may be used on adjoining contracts for the "Plug Fill" embankment section of the project.

For preliminary design it should be assumed that a staged construction technique will be used to safely construct the "Plug Fill" and abutment fill. A minimum of two stages should be planned with an additional surcharge of 2 to 4 feet of fill. Embankment slopes should be temporarily flattened to around 3.5 H : 1 V. The ramp fills should be constructed first to act as stabilizing berms for the plug fill embankment. A surcharge period of 4 to 6 months should be anticipated.

South Abutment Stability and Settlement

In CH2M Hill's report titled "Structure Geotechnical Report I-74 Mainline Retaining Wall Structure Number 081-6014" dated April, 2008 (Reference 14), the results of global stability and settlement analyses are discussed for the area which encompasses the South Abutment.

Retaining Wall 081-6014 is planned to retain soil supporting the I-74 mainline immediately south of the Illinois viaduct. For analyses purposes, the wall alignment was divided into three segments: Wall 1 - Station 48+65 to 59+17.32 on the I-74 mainline, supporting westbound I-74 lanes; this portion of the wall separates Ramp 7A and westbound I-74 between the Illinois viaduct and the 19th Street Overpass; Wall 2 - Station 49+77.94 to 50+00 on the I-74 mainline; this is a portion of the "U" Wall supporting soil under the south abutment of the Illinois Viaduct; and "Wrap-Around" Wall – 130 feet of wall under the south abutment of the Illinois Viaduct, connecting Walls 1 and 2. The "wrap-around" wall will retain on the order of 31 feet of fill.

The bridge abutment will be independently supported on a deep foundation system and will not impose vertical or lateral pressure on retaining wall 081-6014.

The results of the analyses for the "Wrap-Around" Wall are presented below in the sections titled "Global and External Stability of the MSE Wall – South Abutment" and "Settlement – South Abutment".

Global and External Stability of the MSE Wall – South Abutment.

Stability analyses were performed on models developed using available subsurface data and geometry from proposed cross sections of the retaining walls. The analyses involved evaluation of the wall resistance against sliding (safety factor of 1.25), overturning (safety factor of 2.0), global failure (safety factor of 1.3) and bearing failure (safety factor of 2.5), and were performed in general accordance with FHWA manual on MSE walls (Reference 15). The models for the northern section (stations 7012+30, 49+00) indicate reinforced lengths considerably longer than 0.7 times the height of the wall are necessary, and in the case of station 49+00 (east wall), the required reinforced length is greater than the distance between the two opposing "U-Walls". Results of global stability analyses and external stability analyses (sliding, overturning, bearing) are presented in Tables 14 and 15, respectively, for the east face of the U-Wall (49+00) and Abutment, U-Wall, north face (7012+30).

TABLE 14 – GLOBAL STABILITY ANALYSES RESULTS FOR MSE WALL SECTIONS

Location of Slope Analyzed	Loading Case	Failure Mode	FS with Recommended Shear Strength & Full MSE Section	B_{MSE} (ft)	B_{MSE}/H_{MSE} (%)
49+00 (U-Wall (east face), Northern Section)	Undrained	Circular	See Footnote C		
		Block			
	Drained	Circular			
		Block			
		Block	1.7	12	70
	Drained	Circular	2.1	12	70
		Block	1.7	12	70
7012+30[A] (Abutment, U-Wall (north face), Northern Section)	Undrained	Circular	1.7	35	152
		Block	1.5	35	152
	Drained	Circular	1.7	35	152
		Block	1.5	35	152

[A] B_{MSE} = Width of Reinforced Zone
[B] H_{MSE} = Height of MSE Wall Section (Including Embedment)

TABLE 15 - EXTERNAL STABILITY ANALYSES RESULTS FOR MSE WALL SECTIONS

Wall Station Analyzed	Height (ft)	Embed-ment (ft)	H_{MSE} (ft)	B_{MSE} (ft)	B_{MSE}/H_{MSE} (%)	Bearing F.S.	Sliding F.S.	Overturning F.S.
49+00 (U-Wall (east face), Northern Section)	32	4	36	See Footnote C				
7012+30[A] (Abutment, U-Wall (north face), Northern Section)	19	4	23	35[B]	152	4.6	1.9	7.2

[A] Stationing is with respect to 7th Avenue alignment
[B] Length controlled by global analysis
[C] Adequate global stability not attainable (required reinforcement length greater than distance between opposing "U-Walls")

In addition to the above-described calculations, walls bearing on cohesive soils were also examined for local shear (lateral squeeze) failure. Results of our analyses indicate that the soils in the northern section of the alignment do not, in

their current state, have adequate strength against local shear failure. This necessitates that the poor soils will either need to be removed or improved, as discussed in Reference 14.

Settlement – South Abutment

Soils in the northern section of the alignment are moderately compressible. However, when subjected with the proposed 30 to 32 feet of fill, the estimated settlement ranged from 12 to 20 inches. This settlement is excessive for a conventional CIP wall or precast-faced MSE wall. Therefore, as presented in Reference 14, it is recommended that either the soils be improved, removed, or the wall constructed with lightweight fill or staged construction.

When settlement is greater than 0.4 inches, it must be accounted for as downdrag or negative skin friction for pile foundations. The downdrag geotechnical loss will account for the loss of maximum factored resistance available as well as the additional soil load.

Conclusions and Recommendations

Based on the analyses and subsurface conditions, conclusions and recommendations are summarized as follows:

- Parameters and capacities are provided for the analyses and design of spread footings, drilled shafts and driven piles.
- The South Abutment piling will experience downdrag forces due to settlement and will have an impact on the maximum FRA.
- Additional geotechnical investigations are recommended for Final Design as discussed in this report.

6.0 CONSTRUCTION CONSIDERATIONS

Foundation Construction

The foundation types and bearing elevations closely match the foundations employed when constructing the existing viaduct. In general, the foundation construction and excavation and backfill should follow the plans and Illinois DOT Standard Specifications/Supplemental Specifications.

Construction of the south abutment at 7th Avenue will require staging techniques using cantilever sheeting as well as soil retention of the MSE wall select fill.

Spread Footing Construction

The foundations shall be excavated to the lines and approximate depths indicated on the Plans or to such depths determined in the field by the Engineer. It appears that the recommended embedded depths of the foundations are on the order of 13 to 16 feet.

Excavated material should be removed from the site and legally disposed of by the Contractor. Excavation should be performed according to the Section 502 of the Illinois DOT Standard Specifications for Road and Bridge Construction.

Special provisions will be required to specify that the final rock bearing surface shall be prepared by barring, picking or wedging, or similar hand methods to remove loose wedges and unsound rock so as to leave the foundation in an entirely sound and unshattered condition with a clean bonding surface. Seepage water is expected to be present at foundation level in Piers 1, 2 and 3, and it must be directed to a sump in one corner of the excavation and removed by pumping or air lift. Borings at Piers 1, 2 and 3 encountered sand layers generally below groundwater level.

The following note should be added to the plans:

> *The bottom of footing elevation shall be adjusted to ensure a minimum embedment of 6 inches in non-weathered rock. The rock excavation shall be made with near-vertical sides at the plan dimensions to allow the sides and base of the embedded portion of the footing to be cast against undisturbed rock surfaces.*

It is anticipated that the soils at the site can be excavated using conventional excavation equipment. For all temporary excavations, space permitting, slopes in soil should be excavated to an inclination no steeper than 2 Horizontal : 1 Vertical. Temporary slopes may experience some sloughing and the Contractor should take caution and follow the appropriate OSHA regulations. Where space is limited, shoring will need to be installed. At Pier 1, River Drive could be impacted while at Pier 3 the existing Ramps may need to remain in service during construction. Access to the alley between 5th and 6th Avenue could be impacted if an open cut excavation with side slopes is made.

Groundwater is expected to enter the excavations and should be able to be handled with sumps and pumps. Water infiltration may be more prevalent at Piers 1 EB, 2 EB, 3 EB and 10 EB where porous granular material was encountered in the borings. Sheeting may need to be considered at these piers to minimize infiltration into the excavation.

Further environmental investigations should be conducted to determine whether the materials excavated in the areas identified in the FEIS will need to be disposed in special landfills.

Driven Pile Construction

As stated in 2006 AASHTO LRFD, care should be taken in driving piles to hard rock to avoid tip damage. The piles on this project will be relatively short. Piles should have a minimum yield strength of 50 ksi. Pile tips should be protected using a cast steel pile shoe. A relatively small hammer should be used to minimize the risk of pile damage. A hammer with a rated energy of around 15,000 ft-lb per blow would be appropriate.

Since the piles are so short, dynamic testing is not recommended. Piles should be driven in accordance with Illinois Department of Transportation Standard Specifications. The specifications utilize the FHWA Modified Gates formula.

Test piles should be driven at each abutment and bent where piles are specified.

Drilled Shaft Construction

The performance of drilled shafts is sensitive to the installation methods. Drilled shaft construction should follow the applicable sections of the Illinois DOT Standard Specifications for Concrete Drilled Shafts (SS-01032). The following are issues to be considered during final design in preparing the specifications and contract documents should drilled shafts be selected:

- Editing the Standard Specification for drilled shaft construction may be required.
- CSL tubes should be installed properly in each drilled shaft so the Resident Engineer can select shafts to be integrity tested using Crosshole Sonic Logging (CSL) methodology. The number of tubes and locations should be incorporated into the contract drawings.
- All CSL tubes should be filled with water within two hours of concrete placement, in order to prevent debonding between the CSL tubes and the surrounding concrete. CSL tubes should be covered after being filled with water to keep debris from blocking the tubes.
- Either the State or Contractor should hire a qualified CSL testing company to perform and interpret the results of the CSL testing.
- It is anticipated that the shafts will be installed using soil augers and rock core barrels/rock augers. Temporary casing will need to be installed within the soil overburden. Water infiltration into the shaft excavation should be anticipated.
- Further environmental investigations should be conducted to determine whether the materials excavated from the shafts in areas identified in the FEIS should be disposed in special landfills.

Drilled Shaft Testing

CSL testing is the preferred testing method during construction to ensure the shaft concrete is free of defects and the bottom of the shaft is sound.

Temporary Construction Support

The construction of the new I-74 at the south abutment will include removal of the existing structures and replacing with new structures. In order to maintain the traffic flow during construction, stage construction is proposed. To achieve this, a temporary

support system will be required at the north and south abutments. Based on the subsurface conditions as shown in borings VIAIL-125 and VIAIL-126 the bedrock is relatively shallow and use of simple cantilevered temporary sheetpile as a temporary earth support system is not feasible since adequate embedment will not be attained. The contractor shall design the temporary earth support system as per IDOT Bridge Manual Section 3.13.

7.0 FINAL DESIGN CONSIDERATIONS

Final design will be performed using 2007 AASHTO LRFD specifications. The information presented in this report can easily be incorporated into LRFD for strength and service limits. Resistance factors for design of shallow and drilled shaft foundations should be selected from AASHTO LRFD Tables 10.5.5.2.2-1 and 10.5.5.2.4-1. For driven piles, References 10 and 11 provide guidance.

As recommended elsewhere in this report, additional subsurface explorations should be conducted during final design at Pier 6 Eastbound and Pier 7 Westbound once access is available.

Environmental investigations will be required at the contaminated areas (Deere & Co. parking lot, Riverside Products, and Brannen's Auto Works sites) identified in this report and in other areas identified in the FEIS. Contaminated areas may have a major impact on project construction, cost and schedule. Disposal methods, material quantities, permitting, treatment and disposal of water from excavations, site monitoring activities and personnel protection will need to be evaluated during final design.

A detailed constructability comparison of the three foundation system alternatives should be conducted during final design to ensure the selected foundation system is compatible with the proposed staging phases. This comparison should include but not be limited to construction time, traffic impacts, safety, and risk/uncertainty.

8.0 REFERENCES

1. Technical Memorandum, I-74 Iowa-Illinois Corridor Study – Moline Viaduct & Ramps Span Arrangements for I-74 Mainline, dated June 21, 2007.

2. AASHTO LRFD Bridge Design Specifications, 2006 Interim Revisions, Third Edition.

3. AASHTO LRFD Bridge Design Specifications, 2008 Interim Revisions, 4th Edition, 2007.

4. AASHTO Standard Specifications for Highway Bridges, 17th Edition, 2002

5. Analysis of Laterally Loaded Drilled Shafts in Rock, A Dissertation Presented to The Graduate Faculty of The University of Akron, In Partial Fulfillment for the Degree Doctor of Philosophy, by Ke Yang, May 2006.

6. JACOBS Technical Memorandum, I-74 Iowa-Illinois Corridor Study, Bridge Design Criteria, dated November 14, 2005.

7. GROUP 6.0/7.0 for Windows, Analysis of a Group of Piles Subjected to Axial and Lateral Loading, Ensoft, Inc., February 2003/February 2006.

8. LPILE 5.0 for Windows, a Program for the Analysis of Piles and Drilled Shafts Under Lateral Loads, July 2004.

9. FB-MultiPier, Bridge Software Institute.

10. 2007 Illinois DOT Standard Specifications for Roadway and Bridge Construction.

11. IDOT Pile Data Guidelines for 2007 Standard Specifications, Bridge Memorandum 06.2, November 17, 2006.

12. IDOT Bridge Manual, May 2008.

13. Interstate 74 Quad Cities Corridor Study, Scott County, Iowa and Rock Island County, Illinois, Final Environmental Impact Statement and Section 4(f) Statement, Review Draft Copy.

14. CH2M Hill, Structure Geotechnical Report, I-74 Mainline Retaining Wall, Structure Number 081-6014, I-74 Iowa to Illinois Corridor Study, FAI Route 74, Section 81-1-2, Station 49+77.94 (EB) to 59+17.32 (WB), Rock Island County, Illinois, P-92-032-01, April 2008. Prepared for Illinois Department of Transportation.

15. "Mechanically Stabilized Earth Walls and Reinforced Soil Slopes – Design and Construction Guidelines", FHWA-NH-00-043, March 2001.

Appendix

Figures

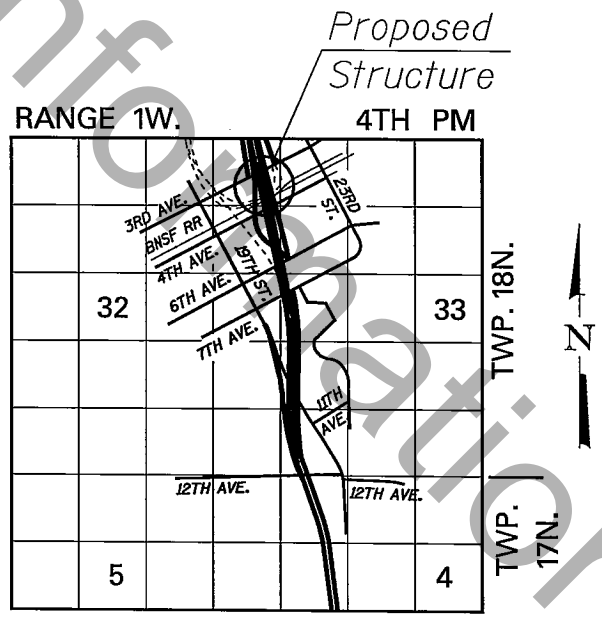


Figure 1
Viaduct Location Map
I-74 Iowa-Illinois Corridor Study
Map of Township 18N, Range 1W
Section 32 & 33

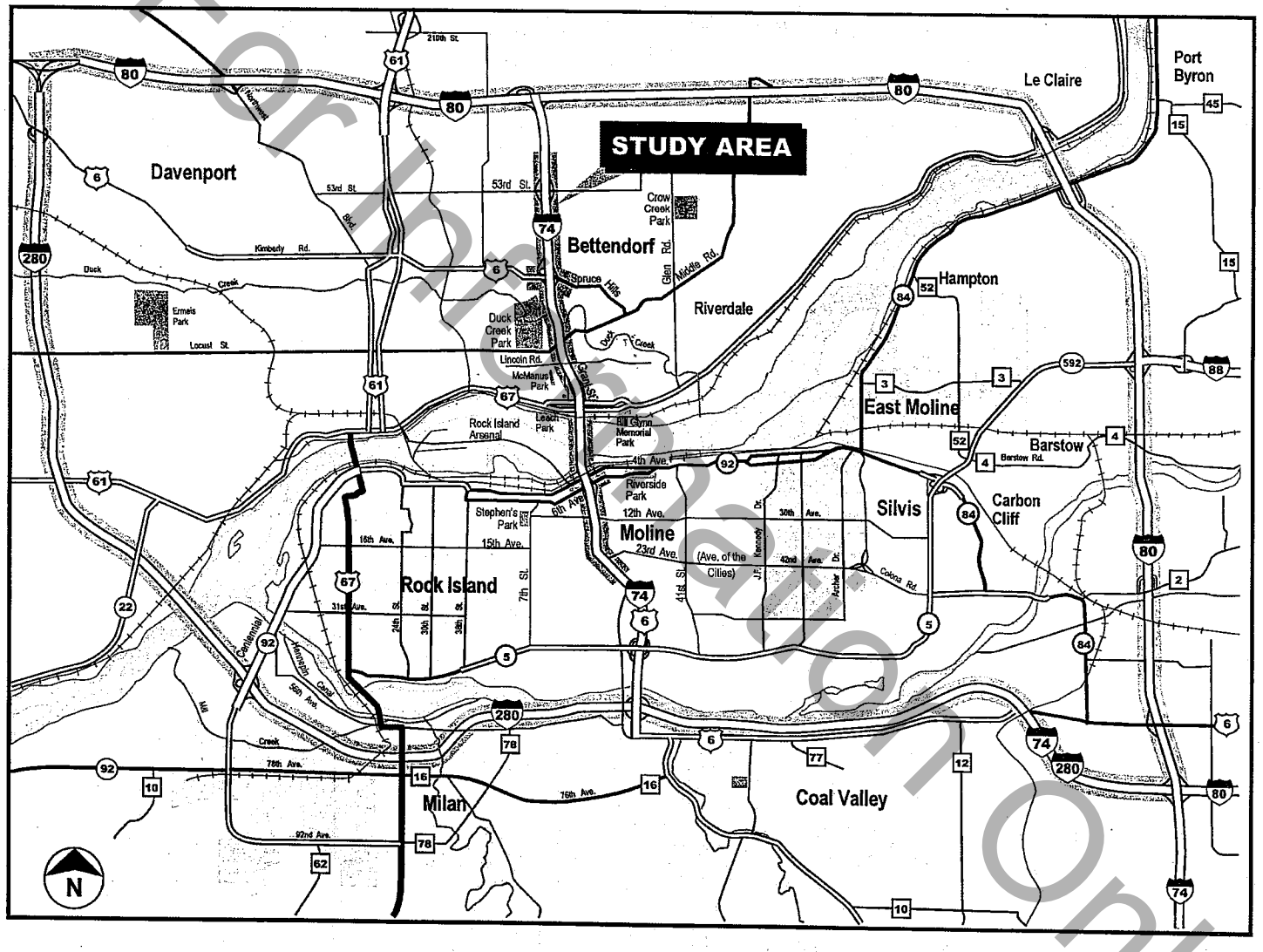
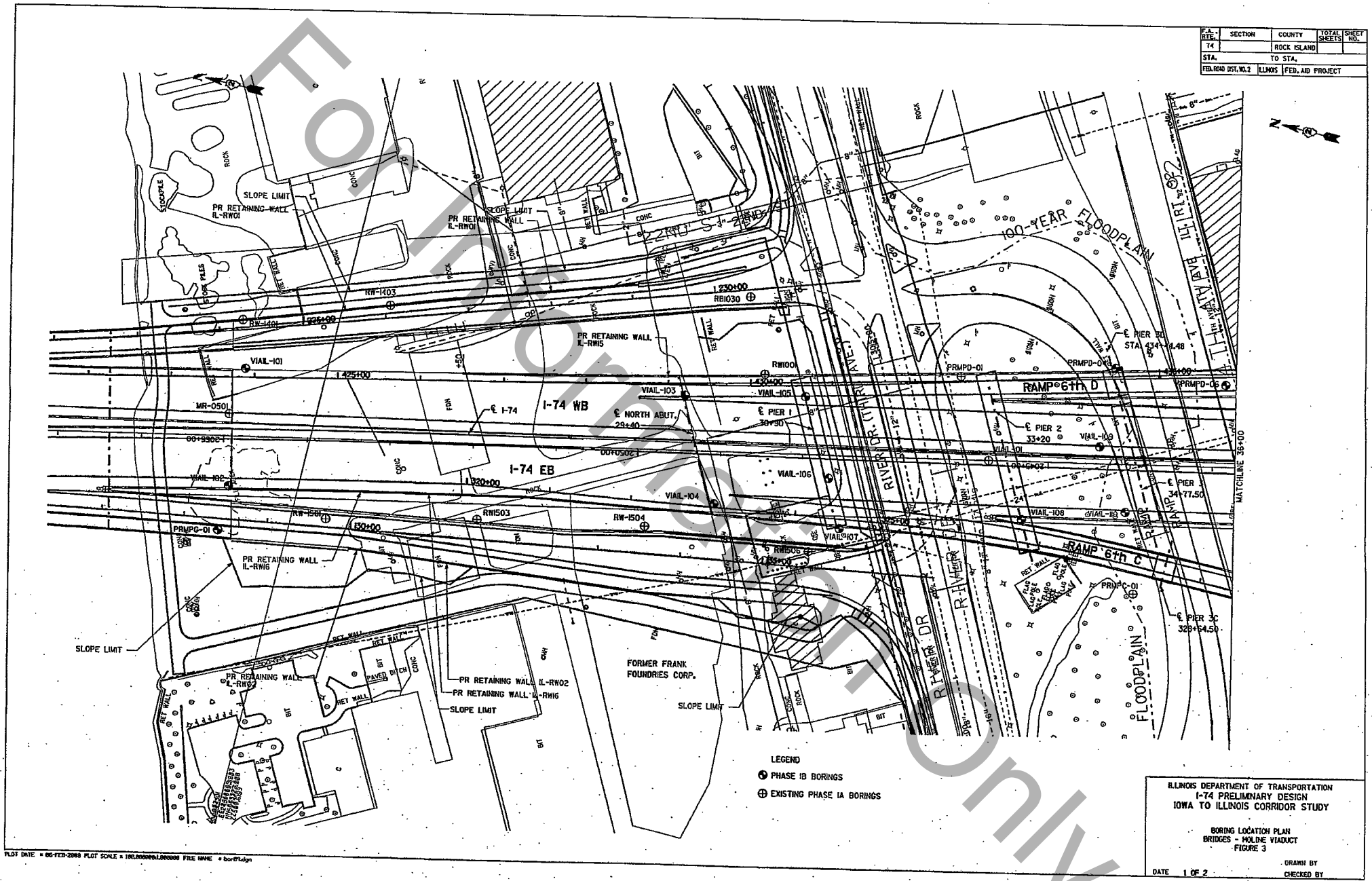


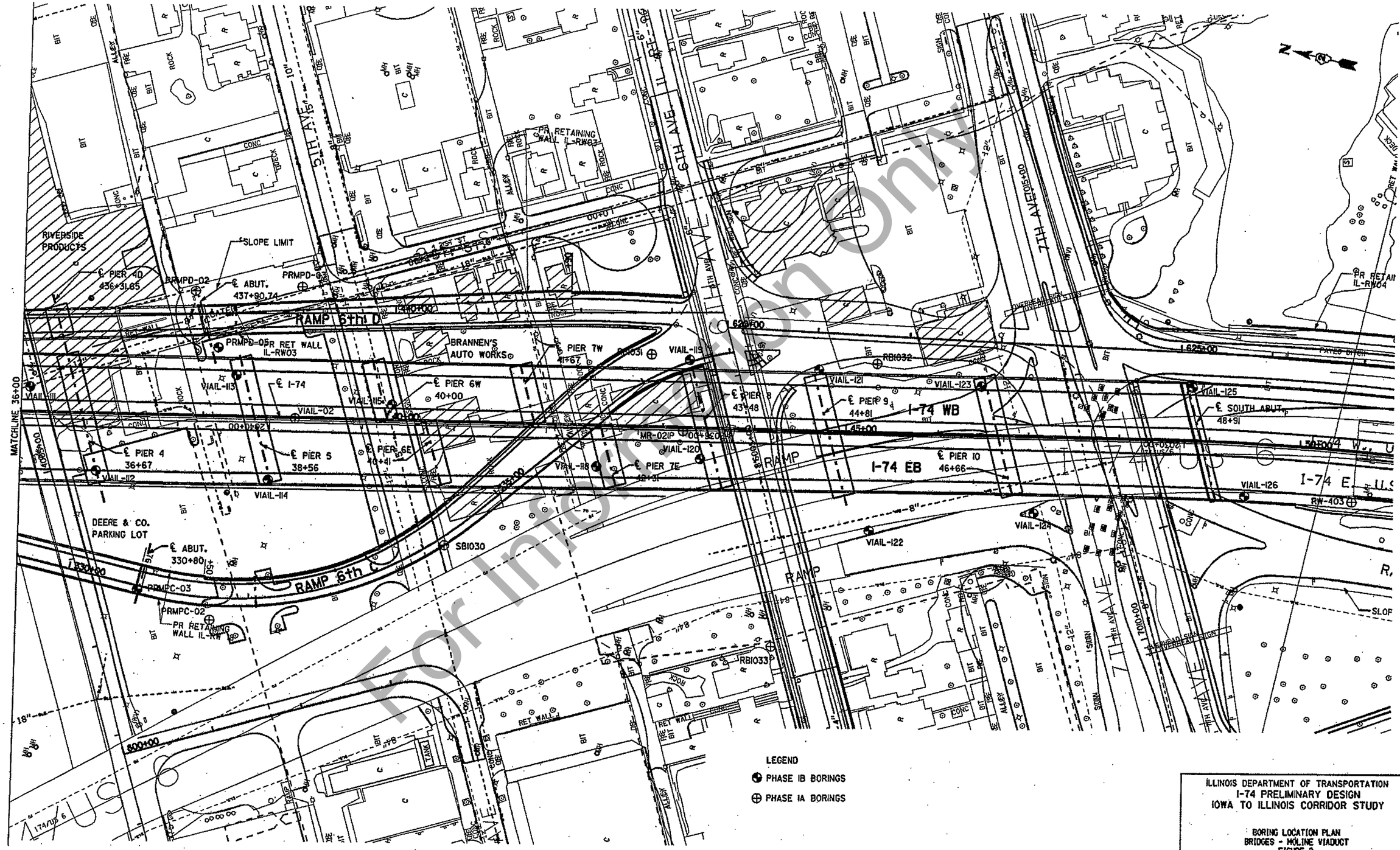
Figure 2
I-74 Iowa - Illinois Corridor Study
Location Map

Figure 1 I-74 Iowa-Illinois Corridor Study
Location Map

T158835.AA.ES.06 Fig 3-2(Loc_Map) 3-19-03 lg



F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
74		ROCK ISLAND		
STA.		TO STA.		
FED. ROAD DIST. NO. 2	ILLINOIS	FED. AID PROJECT		



LEGEND

- PHASE IB BORINGS
- PHASE IA BORINGS

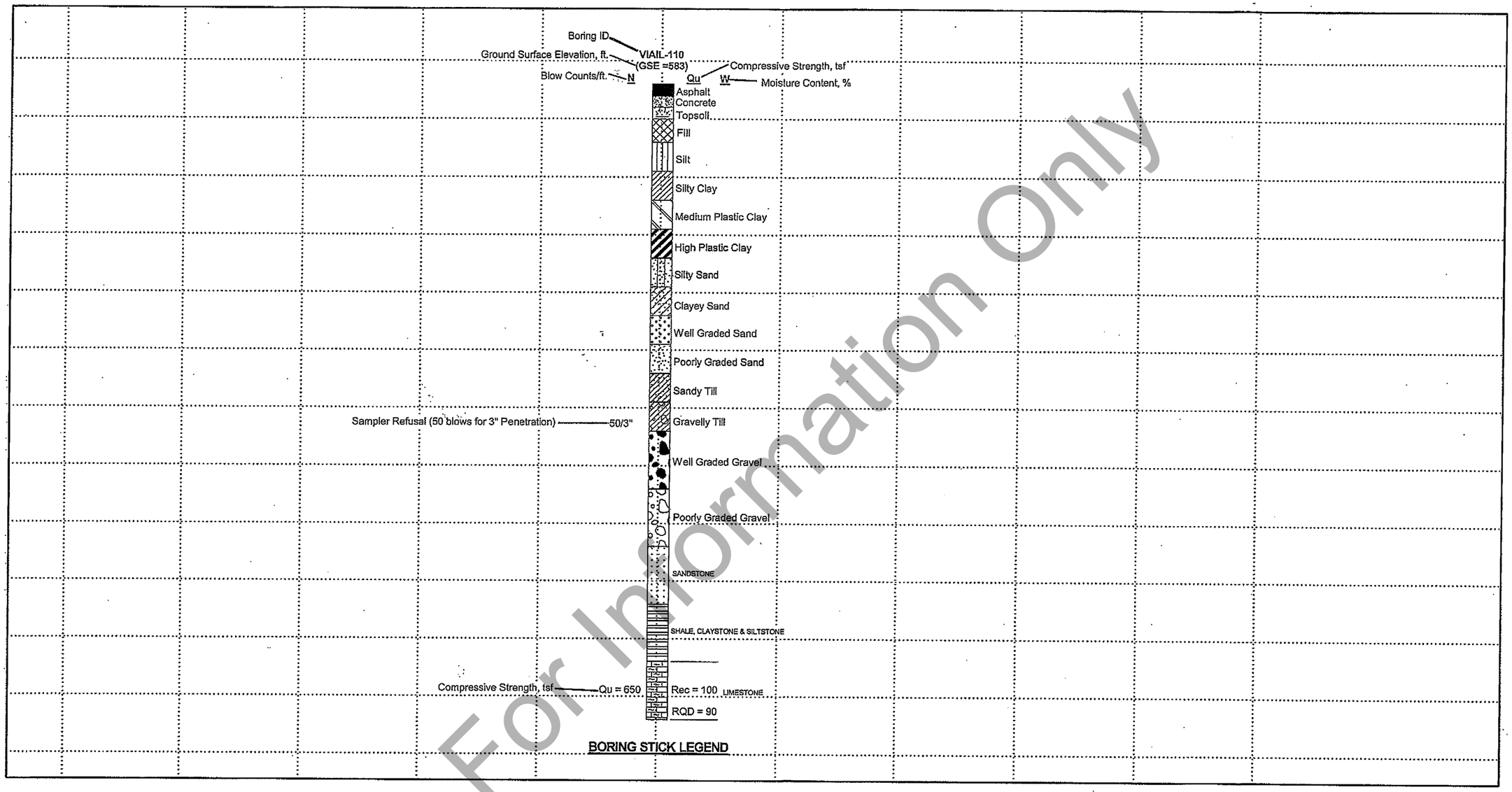
ILLINOIS DEPARTMENT OF TRANSPORTATION
I-74 PRELIMINARY DESIGN
IOWA TO ILLINOIS CORRIDOR STUDY

BORING LOCATION PLAN
BRIDGES - MOLINE VIADUCT
FIGURE 3

DRAWN BY

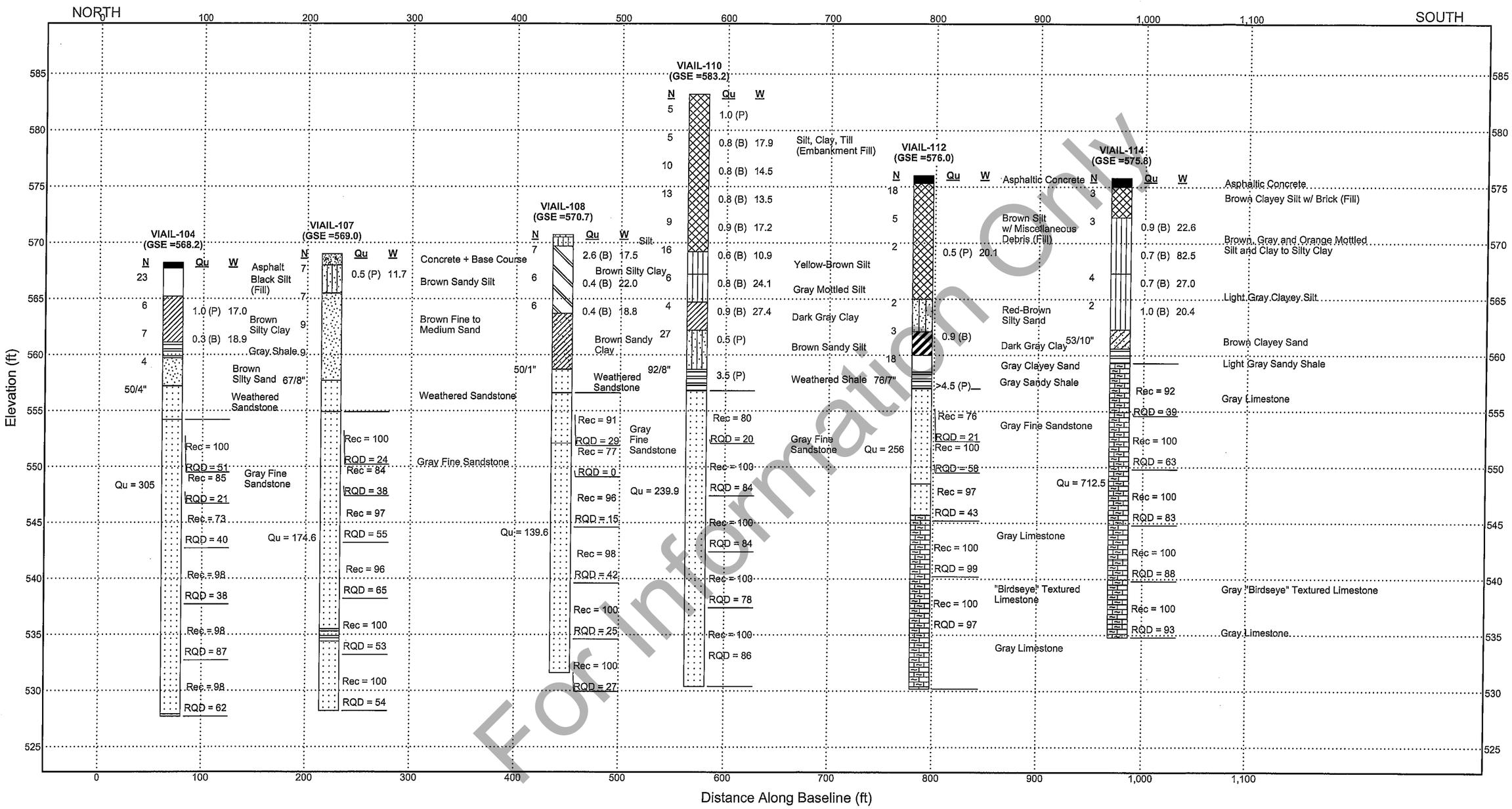
DATE 2 OF 2 CHECKED BY

PLOT DATE = 06-FEB-2008 PLOT SCALE = 100.000000:1.000000 FILE NAME = bor1B.dgn



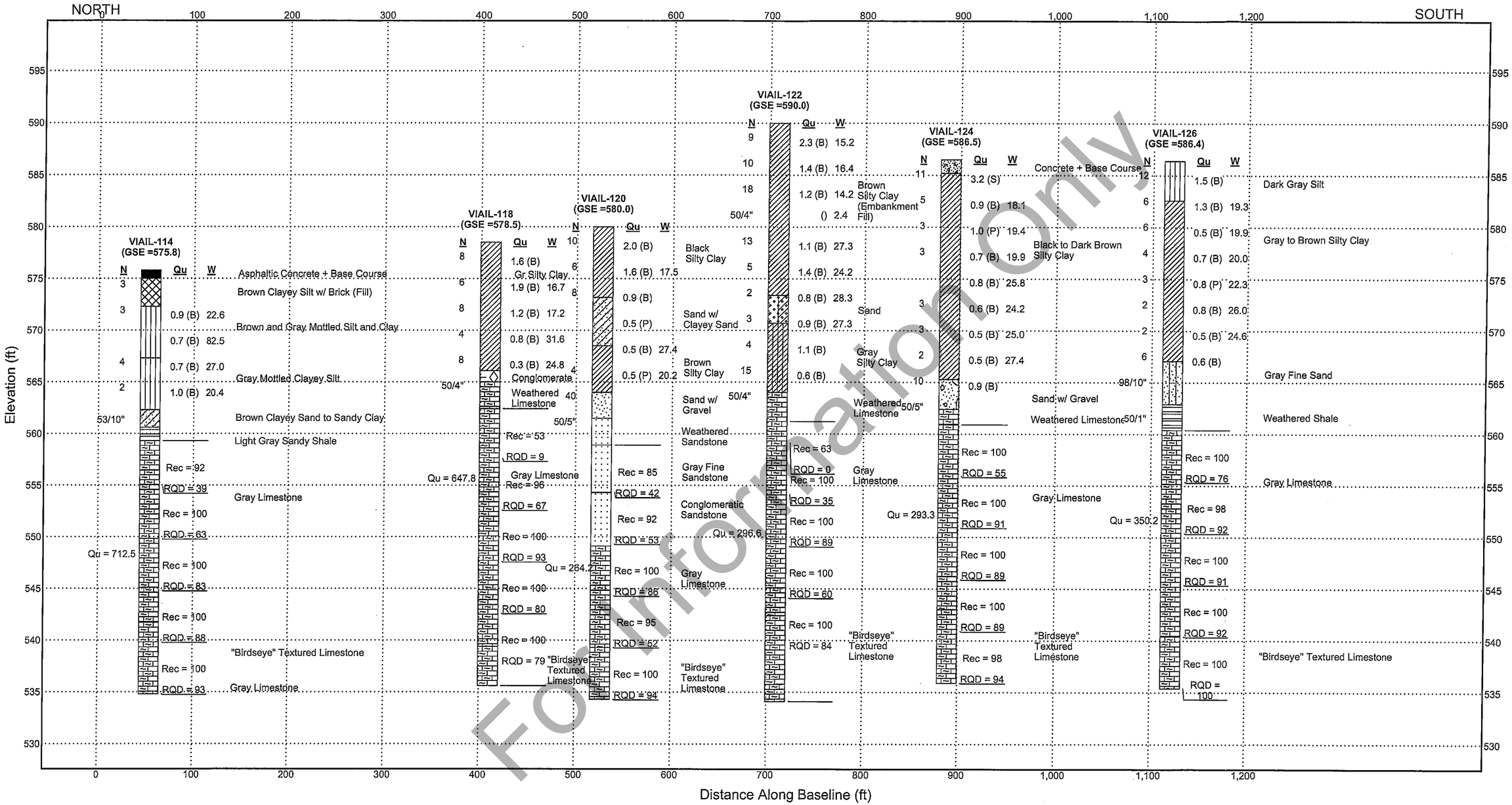
SUBSURFACE PROFILE: BORING STICK LEGEND

FIGURE 4: Sheet 1 of 5



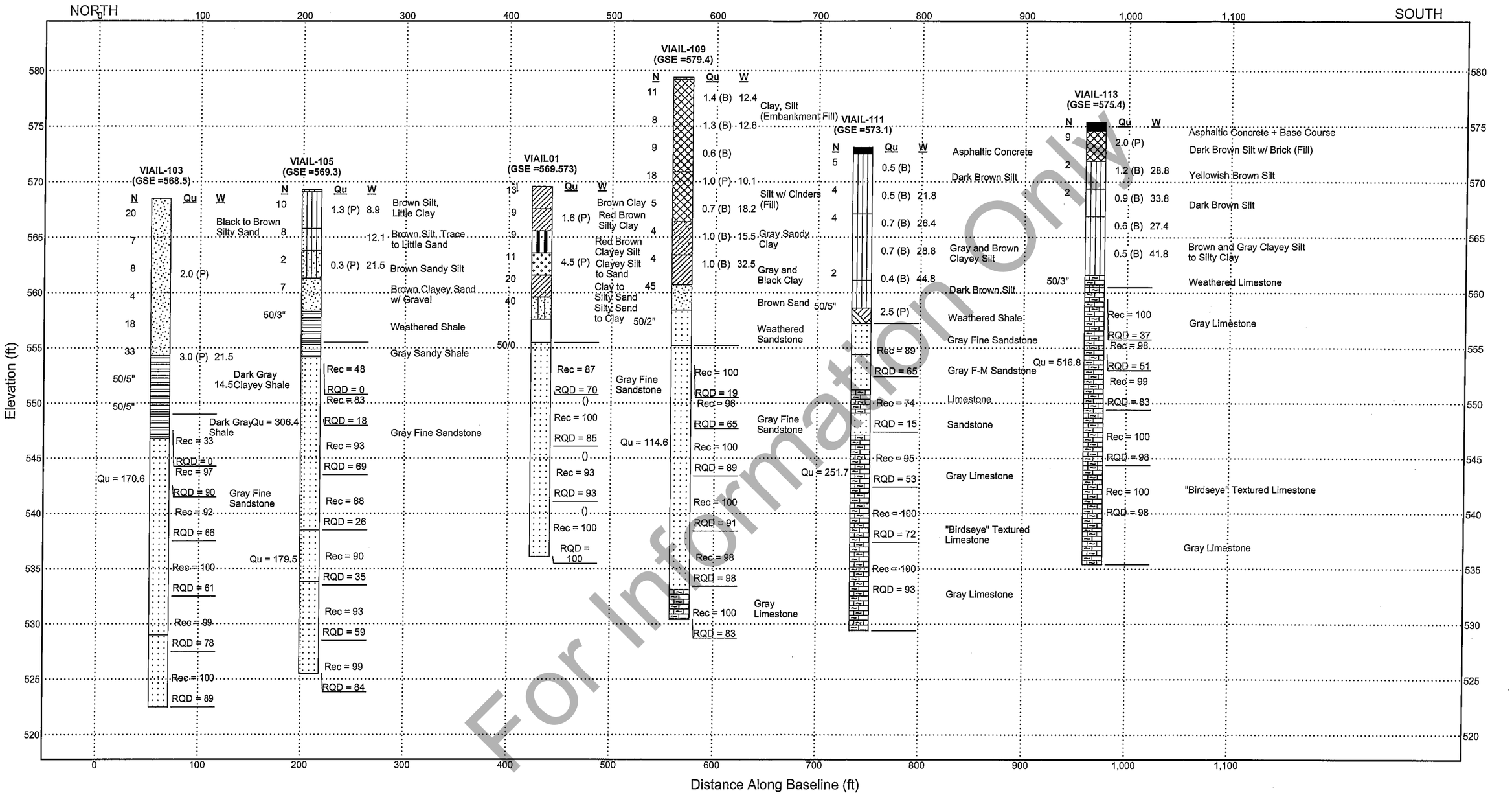
SUBSURFACE PROFILE: I-74 EAST BOUND PROFILE 1 OF 2

FIGURE 4: Sheet 2 of 5



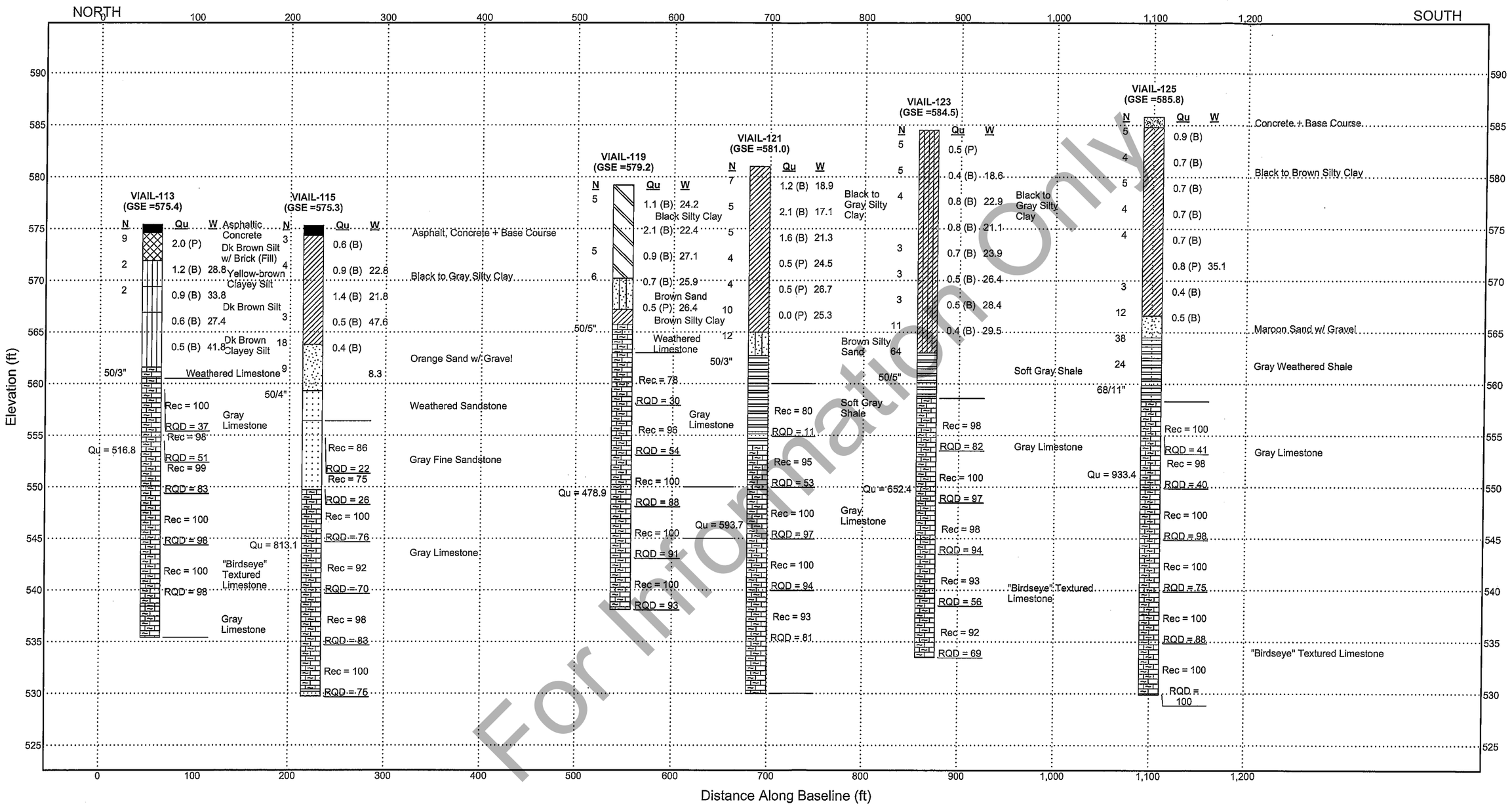
SUBSURFACE PROFILE: I-74 EAST BOUND PROFILE 2 OF 2

FIGURE 4: Sheet 3 of 5



SUBSURFACE PROFILE: I-74 WEST BOUND PROFILE 1 OF 2

FIGURE 4: Sheet 4 of 5



SUBSURFACE PROFILE: I-74 WEST BOUND PROFILE 2 OF 2

FIGURE 4: Sheet 5 of 5

BORING LOGS

GRAIN SIZE IDENTIFICATION

Name	Size Limits	U.S. Sieve Size
BOULDERS	12" or greater	
COBBLES	3" to 12"	
GRAVEL		
COARSE	3/4" to 3"	3/4" to 3"
FINE	3/16" to 3/4"	No. 4 to 3/4"
SAND		
COARSE	2.00 mm to 4.75 mm	No. 10 to No. 4
MEDIUM	0.42 mm to 2.00 mm	No. 40 to No. 10
FINE	0.07 mm to 0.42 mm	No. 200 to No. 40
SILT	0.002 mm to 0.07 mm	
CLAY	less than 0.002 mm	

RELATIVE PROPORTIONS OF SECONDARY COMPONENTS

Trace	0% to 10%
Little	10% to 20%
Some	20% to 35%
And	35% to 50%

PLASTICITY

Term	PI
Non–plastic	0–3
Slightly plastic	4–15
Medium plastic	16–30
Highly plastic	>30

RELATIVE DENSITY OF GRANULAR SOILS

SPT N–value (blows/ft)	Relative Density
0–4	Very loose
5–10	Loose
11–30	Medium dense
31–50	Dense
>50	Very dense

STRENGTH AND CONSISTENCY OF COHESIVE SOILS

SPT N–value (blows/ft)	Unconfined Compressive Strength (tons/ft^2)	Consistency
0–2	0.00–0.25	Very soft
3–4	0.25–0.50	Soft
5–8	0.50–1.00	Medium stiff
9–15	1.00–2.00	Stiff
16–30	2.00–4.00	Very stiff
>30	>4.00	Hard

Soil classifications shown on boring logs are determined by visual inspection of samples and from laboratory tests where available.

Split spoon samples are obtained by driving a 2" O.D. sampler 18" with a 140–pound hammer free–falling 30".
(Standard penetration test or "SPT", ASTM 1586)

Numbers shown next to split spoon symbol represent the number of hammer blows for the corresponding penetration (blows/inches).

LEGEND FOR BORING LOGS AND SOIL CLASSIFICATION SYSTEM

JE JACOBS

PHYSICAL PROPERTIES OF ROCK

Texture
- dense
- fine
- medium
- coarse
- crystalline

Bedding Characteristics

	Spacing
very thin	less than 2 in.
thin	2 in. to 1 ft.
medium	1 ft. to 3 ft.
thick	3 ft. to 10 ft.
massive	greater than 10 ft.

Hardness

	Compressive Strength (tsf)
very soft	10 – 250
soft	250 – 500
hard	500 – 1,000
very hard	1,000 – 2,000
extremely hard	> 2,000

Degree of Weathering

	Description
fresh	unweathered
very slight	rock fresh, joints stained
slight	rock fresh, discoloration may extend 1 in. into rock
moderate	significant portions show discoloration
moderately severe	all rock except quartz discolored
severe	rock fabric clear but reduced to soil strength
very severe	rock fabric discernible but mass reduced to soil
complete	rock reduced to soil, fabric not discernible

Lithologic Charactheristics
- clayey
- shaly
- calcareous
- siliceous
- sandy
- silty

Structure

Bedding Orientation
- gently dipping bedding
- steeply dipping bedding

Fractures
- scattered fractures
- closely spaced fractures
- cemented fractures
- tight fractures
- open fractures
- brecciated (fragmented)

Joints

	Spacing
very close	less than 2 in.
close	2 in. to 1 ft.
moderately close	1 ft. to 3 ft.
wide	3 ft. to 10 ft.
very wide	greater than 10 ft.

Miscellaneous
- slickensided

Solution and Void Conditions
- vuggy (pitted)
- vesicular (igneous)
- porous
- cavities
- cavernous

Miscellaneous
- swelling
- slaking

ROCK CORE PROPERTIES

Recovery (REC) is defined as the length of rock core recovered divided by the length of the core run (in percent).

Rock Quality Designator (RQD) is defined as the total length of rock core pieces greater than 4 in. long divided by the length of the core run (in percent).

RQD (%)	Diagnostic Description
90 – 100	Excellent
75 – 90	Good
50 – 75	Fair
25 – 50	Poor
0 – 25	Very Poor

LEGEND FOR BORING LOGS AND ROCK CLASSIFICATION SYSTEM

JE JACOBS

Boring Logs
Phase 1 B

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION LOCATION (N=564892.331, E=2459310.415), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO.
Station 29+40

BORING NO. VIAIL-103
Station
Offset
Ground Surface Elev. 568.50 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 561.5 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	6			SAND - brown to black, fine to medium grained, some silt, loose, moist.
	13			
	7			
	5			- angular limestone gravel fill at 1.8'-3'
	3			
-5	4			
	4			- saturated at 6'
▼	4	2.0		- 6" layer of dark brown to black clayey silt at 6.0'-6.5'
	4	P		
	3			
	2			
-10	2			
	4			- (Note: driller added water to augers to control sand blow-in starting at 11' depth)
	6			- fine to medium grained, trace to some silt at 11'-13.5'
	12			
	6			
554.30				
	8	3.0	21.5	- conglomerate with gravel to 1/2 inch at 14'
-15	25	P		
	11			SHALE - dark gray, clayey, medium plastic, decreasing plastic and increasingly friable with depth, severely weathered.
	50/5"		14.5	
	50/5"			
549.00				
-20				Borehole continued with rock coring.

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

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=564892.331, E=2459310.415), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 29+40

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 554.30 ft
Begin Core Elev. 549.00 ft

BORING NO. VIAIL-103
Station _____
Offset _____
Ground Surface Elev. 568.50 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SHALE - dark gray, very soft, medium plastic, severely weathered. - clay-like at 19.5'	549.00 -20	Run 1	33	0	4.7	
SANDSTONE - light brown gray to light gray, soft to very soft, with green to black shale parting and seams, occasional black banding, horizontal planar to slightly irregular fractures, smooth on shale partings to sandy rough, locally abundant shale clasts, slightly weathered. - conglomeratic at 22.8'-23.6'	546.80 -25	Run 2	97	90		170.6
	-30	Run 3	92	66		
- occasional shale partings from 31.0'-36.0'	-35	Run 4	100	61	1.2	
- dark gray shale partings and seams at 38.4'-39.5'	529.00	Run 5	99	78	0.8	

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=564892.331, E=2459310.415), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 29+40

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 554.30 ft
Begin Core Elev. 549.00 ft

BORING NO. VIAIL-103
Station _____
Offset _____
Ground Surface Elev. 568.50 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - medium gray and brown gray, fine grained, some black banding, occasional shale partings, horizontal planar to slightly irregular sandy rough fractures at thin to medium bedded spacing, fresh to slightly weathered.					
- greenish gray shale seam at 41.0'-41.5'	Run 6	100	89	2	
522.50 End of Boring					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=564827.741, E=2459192.07), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 29+40

BORING NO. VIAIL-104
Station _____
Offset _____
Ground Surface Elev. 568.20 ft

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

Groundwater Elev.:
First Encounter 559.7 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
ASPHALT + BASE COURSE - (3" to 6" thick) 567.70				
SILT - black, sandy, and gravel, moist (FILL)		3		
		11		
		12		
565.20				
CLAY - reddish brown to greenish brown, silty, medium plastic, medium stiff to soft, moist.		3		
		3	1.0	17.0
	-5	3	P	
		3		
		3	0.3	18.9
561.10		4	B	
SHALE - medium gray, with sand partings, friable, stiff.				
559.70 ▼				
SAND - medium brown, fine to medium, some silt, loose, saturated.		3		
		2		
	-10	2		
- moderately well consolidated in 2" seam at 10'				
557.20				
SANDSTONE - moderate to severely weathered.		50/4"		
- augered through 11.3' to 14'				
554.20				
Borehole continued with rock coring.	-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)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=564827.741, E=2459192.07), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 29+40

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 557.20 ft
Begin Core Elev. 554.20 ft

BORING NO. VIAIL-104
Station _____
Offset _____
Ground Surface Elev. 568.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
554.20 SANDSTONE - light to medium gray, with numerous shale partings with fracture at partings, soft to very soft, moderately well cemented, non-distinct bedding at thin to occasionally medium bedded spacing, fractures at partings are horizontal to 10° planar and smooth, fractures in sandstone are planar to slightly irregular and sandy rough, localized high angle to vertical fractures, fresh to slightly weathered.	Run 1	100	51	2.7	
-15	Run 2	85	21	1.2	305.0
- near-vertical fracture in sandstone at 19.7', sandy rough					
-20 - thin beds of medium to dark gray shale with numerous sand partings at 20.3'-21.5'	Run 3	73	40	1.6	
-25	Run 4	98	38	1.2	
-30 - medium to dark gray shale with numerous sand partings at 30.5'-32.5'	Run 5	98	87	1	
- occasional shale partings from 32.5' to 35.5'					

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=564827.741, E=2459192.07), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 29+40

BORING NO. VIAIL-104
Station _____
Offset _____
Ground Surface Elev. 568.20 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 557.20 ft
Begin Core Elev. 554.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - light to medium gray, with numerous shale partings with fracture at partings, soft to very soft, moderately well cemented, non-distinct bedding at thin to occasionally medium bedded spacing, fractures at partings are horizontal to 10° planar and smooth, fractures in sandstone are planar to slightly irregular and sandy rough, localized high angle to vertical fractures, fresh to slightly weathered. *(continued)*					
-35					
- brownish gray with occasional shale clasts, increasing to numerous clast at 40.0' - 40.3', rough horizontal fractures with localized 70° rough fracture at 39.9'	Run 6	98	62	0.6	
-40					
527.90 ~~527.70~~ SHALE - medium to dark gray.					
End of Boring					
-45					
-50					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564749.647, E=2459344.727), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

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

STRUCT. NO. _____
Station 30+90

BORING NO. VIAIL-105
Station _____
Offset _____
Ground Surface Elev. 569.30 ft

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

Groundwater Elev.:
First Encounter 560.8 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				TOPSOIL - 2-inch thick, roots. 569.10
	4			SILT - brown, trace sand, trace to little clay, slightly plastic, stiff, moist.
	6	1.3	8.9	
	4	P		
				565.80
	3			SILT - brown, trace to little fine sand, grading downwards to some fine sand, trace clay, crumbly, moist.
	3		12.1	
-5	5			
				563.80
	2			SILT - brown, sandy, little to some sand, trace clay, very soft to loose, wet.
	1	0.3	21.5	[Sample at 6'-7.5' had free water in soil but outside of spoon was not wet until sample at 8.5'-10.0']
	1	P		561.30
	2			SAND - reddish brown, clayey, fine to medium sand with gravel, loose, saturated.
	2			
-10	5			
				558.30
	50/3"			WEATHERED SHALE - augered through
				555.50
				Borehole continued with rock coring.
-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)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564749.647, E=2459344.727), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 30+90

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 558.30 ft
Begin Core Elev. 555.50 ft

BORING NO. VIAIL-105
Station _____
Offset _____
Ground Surface Elev. 569.30 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SHALE - medium gray, sandy, laminated chips, rock-like to clay-shale, hard clay to very soft rock, dry. 555.50 [Drilling produced alternating light gray (sandstone) and dark gray (shale or coal) drill water return.] 554.20	Run 1	48	0	1.5	
SANDSTONE - light brownish gray to gray, fine grained, uniform, well sorted, well rounded, soft, porous, moderately well to moderately cemented, generally not friable when wet, with black banding, non-distinct horizontal planar sandy rough fractures at thin to medium bedding spacing, no high angle fractures encountered, slightly to locally moderately weathered. -15 - 8" thick layer of friable, iron-stained sandstone at 17.1' to 17.8'. -20	Run 2	83	18		306.4
-25	Run 3	93	69	0.6	
- a series of thin (1/8" to 1/2" thick) interporous black or brown staining within the sandstone at 22.5', 23.6', 24.4'-24.7', and 27.8'. [Inexplicable core loss (typically 4" to 6") in Run 3 to Run 6. Drilled steadily throughout. No seams noted, no change in drill water return color; must have been poorly cemented and washed away or ground up] -30	Run 4	88	26	0.8	
538.50					179.5
SANDSTONE - light gray, fine to medium grained, trace coarse grained, soft, moderately well cemented, few thin black bands, non-distinct bedding at thin bedded spacing, fresh.	Run 5	90	35	1.2	

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564749.647, E=2459344.727), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 30+90

BORING NO. VIAIL-105
Station _____
Offset _____
Ground Surface Elev. 569.30 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 558.30 ft
Begin Core Elev. 555.50 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - light gray, fine to medium grained, trace coarse grained, soft, moderately well cemented, few thin black bands, non-distinct bedding at thin bedded spacing, fresh. *(continued)*					
533.80					
SANDSTONE - light gray, fine grained, trace black banding, trace gray shale pods, porous, soft, slightly friable, moderately cemented, horizontal non-distinct planar sandy rough fractures at thin to medium bedded spacing, fresh.	Run 6	93	59	0.8	
	Run 7	99	84	0.7	
525.50					
End of Boring					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/27/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564699.203, E=2459256.422), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

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

STRUCT. NO. _____
Station 30+90

BORING NO. VIAIL-106
Station _____
Offset _____
Ground Surface Elev. 569.30 ft

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

Groundwater Elev.:
First Encounter 563.3 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
TOPSOIL - roots (2" thick) 569.10				
SILT - brown, little fine sand, trace clay, moist 568.30	3			
SAND - reddish brown, fine, silty, non-plastic, loose, moist	2 1		8.1	
	2			
-5	3 3			
563.30 ▼				
SAND - reddish brown, fine, trace silt, well sorted, well rounded, loose, saturated	3 4 4			
[Sand blow-in after SPT performed at 8.5'-9.4']	17			
559.90	50/5"			
-10 WEATHERED/SOFT SANDSTONE - augered through				
557.80				
Borehole continued with rock coring.				
-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)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/27/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564699.203, E=2459256.422), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 30+90

BORING NO. VIAIL-106
Station _____
Offset _____
Ground Surface Elev. 569.30 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 559.90 ft
Begin Core Elev. 557.80 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
557.80 SANDSTONE - brownish gray, fine grained, uniform, well-sorted, well-rounded, porous, soft, moderately well to well cemented, with thin black banding, horizontal planar sandy rough fractures, non-distinct bedding with horizontal fractures at thin to medium bedded spacing, occasional low (10° to 30°) angle fractures, slightly weathered	Run 1	58	47	0.7	
-15 [Core loss in Run 1 likely due to washing away poorly cemented material. No seams noted by driller]	Run 2	99	87	1.2	226.2
-20	Run 3	99	87	1.2	
-25	Run 4	100	90	0.8	
-30 538.90 SANDSTONE - brownish gray, medium to fine grained, trace to little coarse sand, soft, moderately well cemented, slightly weathered to fresh					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/27/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564699.203, E=2459256.422), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 30+90

BORING NO. VIAIL-106
Station _____
Offset _____
Ground Surface Elev. 569.30 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 559.90 ft
Begin Core Elev. 557.80 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - brownish gray, medium to fine grained, trace to little coarse sand, soft, moderately well cemented, slightly weathered to fresh *(continued)*					
535.20					
SANDSTONE - light brownish gray, very fine grained, uniform, well sorted, well cemented, soft, contains black shale and coal partings with depth, horizontal fractures at medium to thin bedded spacing, fresh to slightly weathered					
-35					
	Run 5	98	72	1.5	
- several very thin black shale and coal partings in sandstone at 36.8'-37.3'					
531.40					
End of Boring					
-40					
-45					
-50					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564672.846, E=2459200.272), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

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

STRUCT. NO. _____
Station 30+90

BORING NO. VIAIL-107
Station _____
Offset _____
Ground Surface Elev. 569.00 ft

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

Groundwater Elev.:
First Encounter 563.0 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
CONCRETE - 9" thick pavement + base course				
568.00				
SILT - brown, little to some fine sand, trace clay, medium stiff, crumbles readily, moist		5		
		4	0.5	11.7
		3	P	
565.50				
SAND - reddish brown to brown, fine to medium sand, trace coarse sand, trace silt, loose, moist to saturated below 6' depth		2		
		3		
	-5	4		
▼		3		
		5		
		4		
		2		
		3		
	-10	6		
- [sand blow-in occurred at 10'-11' depth])				
557.70		3		
WEATHERED SANDSTONE - augered through		17		
		50/2"		
554.90				
Borehole continued with rock coring.	-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)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564672.846, E=2459200.272), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 30+90

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 557.70 ft
Begin Core Elev. 554.90 ft

BORING NO. VIAIL-107
Station _____
Offset _____
Ground Surface Elev. 569.00 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
554.90 SANDSTONE - brownish gray to gray, fine grained, with minor thin black banding, porous, moderately to well cemented, soft, non-distinct horizontal planar fractures at thin to medium bedding spacing, occasional shale seams, slightly weathered to fresh	Run 1	100	24		
-15					
	Run 2	84	38		
- possible 9" core loss at 15.8' to 16.6'. Driller reported black water return (shale?) at top of run					
-20					
[Driller reported no voids/seams in Run 2. Loss could be due to wash out of poorly cemented material]	Run 3	97	55	0.6	174.6
- shale partings at 18.3' (1/3"), 22.9' (1/4"), 24.0' (1/3")					
-25					
- iron-stained layer at 25.8'-25.9'	Run 4	96	65	1.4	
- iron-stained gray fine sandstone with black seams and limestone clasts at 29.0'-29.3'					
- numerous black shale partings at 29.3'-30.1'					
-30					
	Run 5	100	53	1.6	
535.50 SHALE - dark gray to black shale with light gray sandstone partings (transtional zone)					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/28/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564672.846, E=2459200.272), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 30+90

BORING NO. VIAIL-107
Station _____
Offset _____
Ground Surface Elev. 569.00 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 557.70 ft
Begin Core Elev. 554.90 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
534.40					
SANDSTONE - light brownish gray, fine grained with black "needle" inclusions and occasional gray shale pods, soft, well cemented with some healed vertical joints, fresh	Run 6	100	54	1	
-35					
-40					
528.20					
End of Boring					
-45					
-50					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/30/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564459.202, E=2459256.895, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 33+20

BORING NO. VIAIL-108
Station _____
Offset _____
Ground Surface Elev. 570.70 ft

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

Groundwater Elev.:
First Encounter 563.7 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
TOPSOIL - (grass roots, silt) 2" thick 570.50				
SILT - brown to dark brown, little to some clay, moist 569.70		2		
CLAY - reddish brown, little grading to and silt, trace fine sand grading to sandy clay, medium to high plastic, very stiff to soft, moist		4 3	2.6 B	17.5
		2		
	-5	3 3	0.4 B	22.0
[Upon completion, offset 7' and drilled to 4' depth for Shelby tube sample.]		2		
563.70 ▼		2 4	0.4 B	18.8
CLAY - reddish brown, sandy, saturated, grading downward to clayey sand with gravel				
[shelby tube recovery unsuccesful at 8.5'-10']	-10			
[driller reported sand blow-in after pulling out the shelby tube] 558.70		25		
WEATHERED SANDSTONE - augered through		50/1"		
556.60				
Borehole continued with rock coring.	-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)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/30/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564459.202, E=2459256.895, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 33+20

BORING NO. VIAIL-108
Station _____
Offset _____
Ground Surface Elev. 570.70 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 558.70 ft
Begin Core Elev. 556.60 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - brownish gray to mostly red brown, fine grained, iron-pigmented, uniform, well sorted, soft, moderately well cemented, non-distinct bedding at very thin to thin bedded spacing, horizontal fractures, slightly to moderately weathered 556.60	Run 1	91	29	1	
-15	Run 2	77	0	1.2	
SANDSTONE - gray, fine grained, with occasional light gray shale pods and localized bandings, uniform, well sorted, porous, moderately well to well cemented, soft, non-distinct bedding with primarily horizontal sandy planar to slightly undulating fractures ranging from very thin to thin bedded spacing, fresh 552.10					
-20	Run 3	96	15	0.8	139.6
-25	Run 4	98	42	1.2	
-30	Run 5	100	25	1.2	

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/30/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564459.202, E=2459256.895, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 33+20

BORING NO. VIAIL-108
Station _____
Offset _____
Ground Surface Elev. 570.70 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 558.70 ft
Begin Core Elev. 556.60 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - gray, fine grained, with occasional light gray shale pods and localized bandings, uniform, well sorted, porous, moderately well to well cemented, soft, non-distinct bedding with primarily horizontal sandy planar to slightly undulating fractures ranging from very thin to thin bedded spacing, fresh *(continued)*					
-35					
	Run 6	100	27	1	
531.60					
End of Boring					
-40					
-45					
-50					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/31/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** KJB/SL

SECTION _____ **LOCATION** (N=564386.963, E=2459373.735), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **DRILLING METHOD** HSA, CME 550X **HAMMER TYPE** CME AUTOMATIC

STRUCT. NO. _____
Station 34+77.5

BORING NO. VIAIL-109
Station _____
Offset _____
Ground Surface Elev. 579.40 ft

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

Groundwater Elev.:
First Encounter 560.9 ft ▼
Upon Completion _____ ft
After _____ **Hrs.** _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
0				TOPSOIL - (roots) 2" thick 579.20
	4			EMBANKMENT FILL - mixture of brown, yellowish brown, and gray clay with little to some silt, and Silt with little clay, slightly to medium plastic, stiff to medium stiff, moist (FILL)
	6 5	1.4 B	12.4	
	5			
	4 4	1.3 B	12.6	
-5				
	3			
	3 6	0.6 B		- medium stiff to very stiff
				570.90
	6			SILT - yellowish brown and black, little clay, with black cinders or slag, granular, trace brick, medium plastic, medium stiff, moist (FILL)
	12 6	1.0 P	10.1	
-10				
	3			
	2 3	0.7 B	18.2	
				566.40
	2			CLAY - gray and brown, sandy, little to some fine to medium sand, medium stiff to stiff, moist
	2 2	1.0 B	15.5	
-15				
				563.40
	1			CLAY - greenish gray and gray and black, mottled, little to some silt, medium plastic, stiff, moist
	1 3	1.0 B	32.5	
				560.70 ▼
	7			SAND - brown, fine to medium, trace silt, trace clay grading to clayey sand and gravel, saturated
	20			
-20	25			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				558.40
	50/2"			WEATHERED SANDSTONE - augered through
				555.20
-25				Borehole continued with rock coring.
-30				
-35				
-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)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/31/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB/SL

SECTION _____ LOCATION (N=564386.963, E=2459373.735), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 34+77.5

BORING NO. VIAIL-109
Station _____
Offset _____
Ground Surface Elev. 579.40 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 558.40 ft
Begin Core Elev. 555.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - gray to pinkish gray, fine grained, uniform grain size, well sorted, porous, moderately to well cemented, soft, with occasional shale seams, partings or pods, minor black banding, non-distinct massive bedding with core pieces broken at thin to medium bedded spacing, primarily horizontal sandy rough planar to slightly irregular fractures with only occasional low (10°) to mid (30°-45°) angled fractures, no high angle fractures, primarily fresh to occasionally slightly weathered 555.20	Run 1	100	19	1.7	
-25					
	Run 2	96	65	1.2	
- 12" thick layer of gray and brown splotched sandstone at 26'-27'					
-30					114.6
	Run 3	100	89	0.8	
- concentrated shale pods in sandstone between 32.3' and 33.8'					
- thin 1/4" to 1" shale seams at 24.5' (1/4"), 25.5' (1/2"), 34.4' (1/2"), 37.2' (1"), 40.5' (1/2")					
-35					
	Run 4	100	91	0.8	
-40					
	Run 5	98	98	0.8	

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/31/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB/SL

SECTION _____ LOCATION (N=564386.963, E=2459373.735), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 34+77.5

BORING NO. VIAIL-109
Station _____
Offset _____
Ground Surface Elev. 579.40 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 558.40 ft
Begin Core Elev. 555.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
-45					
533.10					
LIMESTONE - gray, fine to coarse, clastic, dense, hard, thin to medium bedded, with mid angle (40° to 45°) fractures, fresh - 40° planar fracture without tight fit with overlying sandstone at 46.3'	Run 6	100	83	2.3	
530.40					
End of Boring					
-50					
-55					
-60					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 8/30/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB/SL

SECTION _____ LOCATION (N=564338.777, E=2459305.083), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 34+77.5

BORING NO. VIAIL-110
Station _____
Offset _____
Ground Surface Elev. 583.20 ft

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

Groundwater Elev.:
First Encounter 562.2 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	2			EMBANKMENT FILL - layers of brown and yellowish brown Silt, little to some clay, with occasional roots, to yellowish brown Clay, some silt with trace coarse sand and pea-size gravel (till), to dark gray Clay and Silt, trace coarse sand and pebbles (till), medium plastic, medium stiff to stiff, moist (FILL)
	3 2	1.0 P		
	2			
-5	2 3	0.8 B	17.9	
	3			
	4 6	0.8 B	14.5	
	3			
-10	6 7	0.8 B	13.5	
	3			
	4 5	0.9 B	17.2	
	3			- 5" thick layer of asphalt and black silt at 13.5'-14.0' 569.20
-15	6 10	0.6 B	10.9	SILT - yellowish brown, little clay, trace fine sand, medium stiff to very stiff, moist 567.20
	3			SILT - gray and black mottled, little clay, trace fine sand layers, crumbly, medium stiff, slight to medium plastic, moist
	3 3	0.8 B	24.1	
	2			CLAY - dark gray, little to some silt, trace fine sand, medium plastic, medium stiff, moist 564.70
-20	2 2	0.9 B	27.4	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				562.20 ▼
	2			SILT - reddish brown, little clay, crumbly, with wet sand layers
	16 11	0.5 P		
	13			558.70
-25	42 50/2"	3.5 P		WEATHERED SANDY SHALE - augered through.
				556.80
-30				Borehole continued with rock coring.
-35				
-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)

BBS, from 137 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/30/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB/SL

SECTION _____ LOCATION (N=564338.777, E=2459305.083), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 34+77.5

BORING NO. VIAIL-110
Station _____
Offset _____
Ground Surface Elev. 583.20 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 558.70 ft
Begin Core Elev. 556.80 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - light gray, fine grained, uniform, well sorted, moderately well to well cemented, soft, non-distinct bedding with fractures at thin to medium bedded spacing, primarily horizontal sandy rough planar fractures throughout, very few mid to high angle fractures, slightly weathered to fresh 556.80	Run 1	80	20	1.1	
-30					
- 1.3' thick layer of light gray, fine grained sandstone with numerous medium to dark gray shale pods at 26.9' to 28.2'	Run 2	100	84	0.6	239.9
-35					
[Low RQD in Run 1 is due to thin to very thin spaced bedding fractures and not due to highly fractured rock]	Run 3	100	84	0.6	
-40					
	Run 4	100	78	0.8	
-45					
	Run	100	86	1.4	

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 8/30/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB/SL

SECTION _____ LOCATION (N=564338.777, E=2459305.083), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 34+77.5

BORING NO. VIAIL-110
Station _____
Offset _____
Ground Surface Elev. 583.20 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 558.70 ft
Begin Core Elev. 556.80 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - light gray, fine grained, uniform, well sorted, moderately well to well cemented, soft, non-distinct bedding with fractures at thin to medium bedded spacing, primarily horizontal sandy rough planar fractures throughout, very few mid to high angle fractures, slightly weathered to fresh *(continued)*	5				
-50					
530.40 End of Boring					
-55					
-60					
-65					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/5/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL/KJB

SECTION _____ LOCATION (N=564219.363, E=2459424.945), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

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

STRUCT. NO. _____
Station 36+67

BORING NO. VIAIL-111
Station _____
Offset _____
Ground Surface Elev. 573.10 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 (%)	
PAVEMENT - asphalt concrete 572.50				
SILT - dark brown, some to little clay, medium plastic, medium stiff, moist	4			
	3 2	0.5 B		
	2			
-5	2 2	0.5 B	21.8	
567.10				
SILT - light gray with dark brown and orange mottling, some to and clay, medium to high plastic, medium stiff to soft, moist	WOH			
	2 2	0.7 B	26.4	
- highly plastic **- [Dry unit weight = 89.9 pcf]**		0.7 B	28.8	
-10	WOH			
561.10	1 1	0.4 B	44.8	
SILT - dark brown, little clay, slightly to medium plastic, soft, moist				
558.60	6			
-15 WEATHERED SANDY SHALE AND SANDSTONE - augered through 557.20	50/5"	2.5 P		
Borehole continued with rock coring.				
-20				

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/5/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** SL/KJB

SECTION _____ **LOCATION** (N=564219.363, E=2459424.945), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **CORING METHOD** NQ Core

STRUCT. NO. _____
Station 36+67

BORING NO. VIAIL-111
Station _____
Offset _____
Ground Surface Elev. 573.10 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 558.60 ft
Begin Core Elev. 557.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - gray, fine grained, uniform grain size, well sorted, moderately well cemented, soft, horizontal sandy rough fractures, slightly weathered 557.20	Run 1	89	65	0.8	
SANDSTONE - gray, fine to medium grained, porous, very soft, very weak, poorly to moderately cemented, moderately weathered 554.40					
-20	Run 2	74	15	0.8	
LIMESTONE - gray, fine grained to clastic, with some green gray shale seams and infilling, hard, thin to medium bedded, slightly weathered 551.20					
SANDSTONE - brown and gray, fine to medium to some coarse grained, very soft, poorly cemented, moderately weathered to weathered. (Possible 15" core loss - probably washed away during drilling). 549.10					
-25	Run 3	95	53	1.2	251.7
LIMESTONE - gray, fine, stylolitic, several small clastic collapse zones, moderately hard, strong to moderately strong, horizontal fractures with some mid to high angle fractures, fresh to slightly weathered 547.10					
-30	Run 4	100	72	1	
- near-vertical joint at 31.3'-32.2' with 1/2 "birdseye" texture limestone and 1/2 gray fine limestone 540.90					
LIMESTONE - medium gray, fine grained, "birdseye" texture, moderately hard, thin to medium bedded, horizontal to 45° fractures, planar to irregular, slightly rough to rough, fresh to slightly weathered					
-35					

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/5/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL/KJB

SECTION _____ LOCATION (N=564219.363, E=2459424.945), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 36+67

BORING NO. VIAIL-111
Station _____
Offset _____
Ground Surface Elev. 573.10 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 558.60 ft
Begin Core Elev. 557.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium gray, fine grained, "birdseye" texture, moderately hard, thin to medium bedded, horizontal to 45° fractures, planar to irregular, slightly rough to rough, fresh to slightly weathered *(continued)*	Run 5	100	93	1	
535.60					
LIMESTONE - gray to pinkish gray, fine to coarse, dense to clastic, with some shale bands, hard, thin bedded, primarily horizontal to 30° planar to irregular fractures, closely fractured with several healed fractures, moderately strong rock, slightly weathered to fresh					
-40					
529.40					
End of Boring					
-45					
-50					
-55					

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

Illinois Department of Transportation

Division of Highways
JCI

SOIL BORING LOG

Date 9/4/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564128.095, E=2459352.373), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

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

STRUCT. NO. _____
Station 36+67

BORING NO. VIAIL-112
Station _____
Offset _____
Ground Surface Elev. 576.00 ft

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

Groundwater Elev.:
First Encounter 565.0 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	
PAVEMENT - asphalt concrete and base course (8" thick) 575.30				
SILT - dark brown and light brown, trace to little clay, with bricks, gravel, glass, metal, crumbly, slight to medium plastic, stiff, dry to moist (FILL)	9			
	10 8			
	5			
-5	3 2			
	2			
	1 1	0.5 P	20.1	
-10				
- brown silt with brick and yellowish brown silty sand 565.00 ▼	1			
SAND - reddish brown, silty, clayey fine sand, very loose, saturated	1 1			
562.10	1			
CLAY - dark gray, little silt, trace coarse sand, medium to highly plastic, soft to medium stiff, wet	1	0.9		
-15	2	B		
560.00				
SAND - greenish gray, fine grained, clayey, some limestone gravel, saturated	7			
558.50	10 8			
SHALE - light greenish gray, sandy, no laminations, dry to slightly moist	23			
557.00	26	>4.5		
Borehole continued with rock coring.	50/1"	P		
-20				

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/4/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564128.095, E=2459352.373), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 36+67

BORING NO. VIAIL-112
Station _____
Offset _____
Ground Surface Elev. 576.00 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 558.50 ft
Begin Core Elev. 557.00 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - brownish gray, fine grained, uniform grain size, well sorted, with minor black banding and localized light gray shale pods and shale seams, moderately well cemented, soft, primarily horizontal fractures, non-distinct massive bedding at thin bedded fracture spacing, localized mid angle (45°-50°) fractures between 23' and 25' 557.00	Run 1	76	21	1.1	
-20					
	Run 2	100	58	1	256.0
-25					
	Run 3	97	43	1.6	
548.50 SANDSTONE - grayish brown, fine grained with shale and clastic seams, soft to very soft, weak rock, slightly to moderately weathered					
-30					
545.70 LIMESTONE - gray, fine grained, stylolitic, hard, thin to thick bedded, sub-horizontal rough to slightly rough fractures, occasional vugs and minor pitting, occasional mid angle (45°-60°) fractures, fresh except at vugs	Run 4	100	99	1.8	
-35					
-minor "birdseye" texture limestone at 36.0' to 40.8'	Run 5	100	97	1.9	

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/4/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564128.095, E=2459352.373), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 36+67

BORING NO. VIAIL-112
Station _____
Offset _____
Ground Surface Elev. 576.00 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 558.50 ft
Begin Core Elev. 557.00 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - gray, fine grained, stylolitic, hard, thin to thick bedded, sub-horizontal rough to slightly rough fractures, occasional vugs and minor pitting, occasional mid angle (45°-60°) fractures, fresh except at vugs *(continued)*					
-40					
-45					
530.20					
End of Boring					
-50					
-55					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/7/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564002.901, E=2459488.588), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

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

STRUCT. NO. _____
Station 38+56

BORING NO. VIAIL-113
Station _____
Offset _____
Ground Surface Elev. 575.40 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 (%)	
PAVEMENT - asphaltic concrete (4" thick) and base course 574.60				
SILT - dark brown, with brick, trace to little clay, slightly plastic, soft, crumbly, dry to moist (FILL)	4			
	5 4	2.0 P		
571.90	2			
SILT - yellowish brown and dark brown mottled, little to some clay, slightly to medium plastic, stiff, crumbly, moist	1 1	1.2 B	28.8	
-5				
569.40	WOH			
SILT - dark brown, little clay, organic odor, medium plastic, medium stiff, moist	1 1	0.9 B	33.8	
566.90	WOH			
SILT - dark brown and green-gray, some to and clay to silty Clay, medium plastic, medium stiff, rubbery texture, moist	WOH WOH	0.6 B	27.4	
-10				
	WOH			
	WOH WOH	0.5 B	41.8	
561.60				
WEATHERED LIMESTONE - augered through	40			
560.50	50/3"			
-15				
Borehole continued with rock coring.				
-20				

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/7/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=564002.901, E=2459488.588), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 38+56

BORING NO. VIAIL-113
Station _____
Offset _____
Ground Surface Elev. 575.40 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 561.60 ft
Begin Core Elev. 560.50 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - light gray, fine grained, hard, locally stylolitic, thin to medium bedded, primarily horizontal to subhorizontal slightly rough to very rough fractures, occasional brown staining on fractures, occasional near-vertical fractures, slightly weathered to fresh	560.50	Run 1	100	37	3.6	
		Run 2	98	51	3	
-localized vugs at 16', 20.2', 27.2'-27.5'	-20					516.8
-moderately pitted "birdseye" texture layer with green shale infillings at 21.2'-21.6'		Run 3	99	83	2.8	
	-25					
		Run 4	100	98	2.6	
	-30					
LIMESTONE - medium gray, fine to medium grained, "birdseye" texture, minor pitting, moderately hard, thick bedded, slightly weathered with localized vugs at 34.1' and 35.2'	544.40	Run 5	100	98	2	

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/7/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** KJB

SECTION _____ **LOCATION** (N=564002.901, E=2459488.588), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **CORING METHOD** NQ Core

STRUCT. NO. _____
Station 38+56

BORING NO. VIAIL-113
Station _____
Offset _____
Ground Surface Elev. 575.40 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 561.60 ft
Begin Core Elev. 560.50 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium gray, fine to medium grained, "birdseye" texture, minor pitting, moderately hard, thick bedded, slightly weathered with localized vugs at 34.1' and 35.2' *(continued)* -soft, crumbly, partially solutioned weak limestone at 35.8'-36.1'						
538.40						
LIMESTONE - gray, fine grained, hard, dense, thin to medium bedded, fresh to vuggy -pitted and vuggy limestone layer at 39.4'-39.8						
535.40	-40					
End of Boring	-45					
	-50					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=563942.061, E=2459385.563), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

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

STRUCT. NO. _____
Station 38+56

BORING NO. VIAIL-114
Station _____
Offset _____
Ground Surface Elev. 575.80 ft

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

Groundwater Elev.:
First Encounter 562.3 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
PAVEMENT - asphaltic concrete (4" thick) and base course 575.00				
SILT - brown and dark brown, little to some clay, with brick, soft, moist (FILL)		3 2 1		
572.30		1		
SILT - brown, dark brown, gray and orange, mottled, and clay to silty Clay, medium plastic, medium stiff to stiff, moist	-5	1 2	0.9 B	22.6
		WOH		
		WOH 2	0.7 B	82.5
567.30		1		
SILT - light gray with orange mottles and iron-staining, and clay, medium plastic, rubbery texture, medium stiff, moist (MODIFIED LOESS)	-10	2 2	0.7 B	27.0
		1		
		1 1	1.0 B	20.4
562.30 ▼				
SAND - brown, fine to medium grained, clayey, to sandy Clay, loose, saturated		2		
560.60	-15	3 50/4"		
SHALE - light gray, sandy, hard (clay), dry				
559.30				
Borehole continued with rock coring.				
	-20			

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=563942.061, E=2459385.563), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 38+56

BORING NO. VIAIL-114
Station _____
Offset _____
Ground Surface Elev. 575.80 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 560.60 ft
Begin Core Elev. 559.30 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - light gray, fine grained, stylolitic, hard, dense, with minor black banding, primarily rough subhorizontal fractures, thin to medium bedded, some closely to medium spaced mid angle (30° to 60°) to high angle (60° to 90°) fractures, occasional thin green shale partings and thin seams, slightly weathered to fresh 559.30	Run 1	92	39	2.4	
-20					
	Run 2	100	63	2.4	
-pock-marked pitted limestone layer with green shale infilling at 23.3' to 23.9'					712.5
-25					
-brown staining on fractures at 25.5', 31.3', 31.4', 32.5', 32.6', 32.7'					
	Run 3	100	83	2.2	
-30					
	Run 4	100	88	1.8	
541.70					
LIMESTONE - medium gray, fine to medium grained, "birdseye" texture, minor pitting, medium bedded, horizontal fractures, fresh to slightly weathered to locally vuggy at 38.0' to 38.2'					
-35					
	Run	100	93	2	

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY KJB

SECTION _____ LOCATION (N=563942.061, E=2459385.563), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 38+56

BORING NO. VIAIL-114
Station _____
Offset _____
Ground Surface Elev. 575.80 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 560.60 ft
Begin Core Elev. 559.30 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium gray, fine to medium grained, "birdseye" texture, minor pitting, medium bedded, horizontal fractures, fresh to slightly weathered to locally vuggy at 38.0' to 38.2' *(continued)*	5				
536.00					
LIMESTONE - gray, fine, hard, dense, medium bedded, fresh					
534.80					
End of Boring					
-40					
-45					
-50					
-55					

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

Illinois Department of Transportation

Division of Highways
JCI

SOIL BORING LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563831.028, E=2459496.962), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 40+00

BORING NO. VIAIL-115
Station _____
Offset _____
Ground Surface Elev. 575.30 ft

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

Groundwater Elev.:
First Encounter 563.3 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
PAVEMENT - asphalt, concrete and base course 574.30				
CLAY - black, some silt, medium to highly plastic, medium stiff, moist		2		
		1 2	0.6 B	
-dark green gray to black, little silt		0		
	-5	2 2	0.9 B	22.8
- slightly plastic **- [Dry unit weight = 101.6 pcf]**			1.4 B	21.8
-orange to greenish gray, soft		0		
	-10	1 2	0.5 B	47.6
- soft 563.80		2		
SAND - orange, medium to coarse grained, conglomeratic with fine grained gravel, loose, damp to wet ▼		9 9	0.4 B	
		6		
	-15	7 2		8.3
-conglomeratic with gravel (1-inch minus), mixed rock types (subrounded to subangular limestone and gravel pieces) 559.30		50/4"		
WEATHERED SANDSTONE - augered through 556.40				
Borehole continued with rock coring.	-20			

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563831.028, E=2459496.962), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 40+00

BORING NO. VIAIL-115
Station _____
Offset _____
Ground Surface Elev. 575.30 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 559.30 ft
Begin Core Elev. 556.40 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - medium to dark gray, fine grained, black banding, silty, moderately well cemented, soft, occasional shale parting with fractures along partings; thin to medium bedded, horizontal to very low angle fractures, smooth to sandy rough, fresh (Transition).	556.40	Run 1	86	22	1.8	
- (desiccation cracks in shale layers at 20.6' and 21' upon drying)	-20	Run 2	75	26	1.2	
- swirled to mottled, 45° shale laminates with bedding offsets; deformed bedding at 22.0'-25.6'	-25					
LIMESTONE - gray, fine grained, locally stylolitic, hard, very thin to thin bedded, horizontal to low angle fractures, fractures at stylolites are planar to slightly irregular and slightly rough to rough, fractures in limestone are horizontal to very low angle, smooth, and planar to slightly irregular, fresh.	549.70	Run 3	100	76	1.2	813.1
- fine to medium grained, occasional stylolites	-30	Run 4	92	70	1	
- minor pitting, very occasional "birdseye" texture, occasional clay-like shale partings	-35	Run 5	98	83	1	

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563831.028, E=2459496.962), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 40+00

BORING NO. VIAIL-115
Station _____
Offset _____
Ground Surface Elev. 575.30 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 559.30 ft
Begin Core Elev. 556.40 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - gray, fine grained, locally stylolitic, hard, very thin to thin bedded, horizontal to low angle fractures, fractures at stylolites are planar to slightly irregular and slightly rough to rough, fractures in limestone are horizontal to very low angle, smooth, and planar to slightly irregular, fresh. *(continued)*					
-40					
- 4" thick dark gray calcarenite bed at 40.3'-40.6'	Run 6	100	75	1.2	
- light brownish gray limestone with several soft green clay-like shale partings, stringers, and occasional shale clasts					
- 6" thick layer of green soft rock-like shale at 42.5'-43'					
530.40 -45					
SHALE - dark gray, rock-like, soft, thin bedded, horizontal to very low angle smooth planar fractures, fresh with some moderate weathering. 529.70					
End of Boring					
-50					
-55					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/7/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563600.167, E=2459483.23), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 42+31

BORING NO. VIAIL-118
Station _____
Offset _____
Ground Surface Elev. 578.50 ft

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

Groundwater Elev.:
First Encounter 567.5 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	3			CLAY - dark greenish gray, with some orange brown clay, some silt, slightly to medium plastic, stiff to medium stiff, moist
	4 4	1.6 B		
	3			-brown orange
-5	3 3	1.9 B	16.7	
	3			-brown orange to green gray
	4 4	1.2 B	17.2	
	2			-little silt
-10	2 2	0.8 B	31.6	
▼	1			-some sand, slightly plastic, soft, saturated
566.10	2 6	0.3 B	24.8	
565.00				CONGLOMERATE - red brown, poorly sorted with sand, silty clay and gravel (0.5 inch minus)
	50/4"			WEATHERED LIMESTONE - augered through
-15				
562.40				Borehole continued with rock coring.
-20				

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/7/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563600.167, E=2459483.23), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 42+31

BORING NO. VIAIL-118
Station _____
Offset _____
Ground Surface Elev. 578.50 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 565.00 ft
Begin Core Elev. 562.40 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - grayish brown, fine to medium grained, with occasional to some green shale partings and clasts, hard to moderately hard, thin to medium bedded, primarily horizontal planar fractures, occasional stylolites, smooth to slightly rough, slightly to moderately weathered in upper 6' grading to fresh to slightly weathered. (Note: core loss in Run #1 assumed to be between 16.1' and 19.5' in fractured limestone containing abundant shale clasts). - 6-inch clay seam at 16.1'-16.7', moderately weathered - highly fractured with abundant green gray shale and partings to 19.5'	562.40	Run 1	53	9	2.1	
-20						647.8
- fine to coarse grained, with several clay-like green shale partings at 20.9'-21.6'		Run 2	96	67	1.2	
- minor pitting, occasional stylolites						
-25						
- very minor pitting, fractures primarily along smooth horizontal planar surfaces		Run 3	100	93	1	
- abundant pitting, with several green clay-like shale clasts ranging up to 2" in length						
-30						
- light to medium gray, fine grained, occasional stylolites		Run 4	100	80	1	
-35						

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/7/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563600.167, E=2459483.23), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 42+31

BORING NO. VIAIL-118
Station _____
Offset _____
Ground Surface Elev. 578.50 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 565.00 ft
Begin Core Elev. 562.40 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - grayish brown, fine to medium grained, with occasional to some green shale partings and clasts, hard to moderately hard, thin to medium bedded, primarily horizontal planar fractures, occasional stylolites, smooth to slightly rough, slightly to moderately weathered in upper 6' grading to fresh to slightly weathered. (Note: core loss in Run #1 assumed to be between 16.1' and 19.5' in fractured limestone containing abundant shale clasts). *(continued)* - abundant stylolites, very thinly bedded	Run 5	100	79	1.4	
539.40					
LIMESTONE - light to medium gray, fine to medium grained, minor to abundant pitting, "birdseye" texture, occasional stylolites, moderately hard, medium to thick bedded, horizontal rough jagged fractures, fresh to slightly weathered.					
-40					
535.60					
End of Boring					
-45					
-50					
-55					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/10/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563527.191, E=2459618.972), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 43+48

BORING NO. VIAIL-119
Station _____
Offset _____
Ground Surface Elev. 579.20 ft

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

Groundwater Elev.:
First Encounter 565.7 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
CLAY - black, some silt, medium to highly plastic, medium stiff, moist.		2		
		2 3	1.1 B	24.2
-[Dry unit weight = 100.6 pcf]				
- orange brown	-5		2.1 B	22.4
		1		
		2 3	0.9 B	27.1
- reddish brown to green-gray				
570.20		1		
SAND - brown orange, very fine to fine, some silt, trace clay, loose, moist.	-10	2 4	0.7 B	25.9
567.20			0.5 P	26.4
CLAY - red brown, some silt, slightly to medium plastic, soft, moist.				
-[Dry unit weight = 99.5 pcf] 565.70 ▼				
WEATHERED LIMESTONE		43		
		50/5"		
	-15			
563.00				
Borehole continued with rock coring.				
	-20			

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/10/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** SL

SECTION _____ **LOCATION** (N=563527.191, E=2459618.972), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **CORING METHOD** NQ Core

STRUCT. NO. _____
Station 43+48

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 565.70 ft
Begin Core Elev. 563.00 ft

BORING NO. VIAIL-119
Station _____
Offset _____
Ground Surface Elev. 579.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
563.00	Run 1	78	30	5.5	
-20	Run 2	96	54	0.8	
-25	Run 3	100	88	1.2	478.9
-30	Run 4	100	91	1.4	
-35					

LIMESTONE - light to medium brownish gray, fine to medium grained, very thin to thin bedded, occasional stylolites, several vertical fractures at 16.2'-17.5', otherwise most fractures are horizontal, planar and slightly rough, occasional shale clasts and partings, moderately weathered to fresh.

- highly fractured (partially mechanical) at 16.2'-17.7' and at 17.9'-18.2'

- moderately weathered at 16.2'-17.0'; fresh below 17.0'

[Note: lost drill water circulation at 18'; core barrel jammed at 19.5']

- occasional stylolites, minor pitting, fractures primarily along stylolites

- very thin bedded, no pitting or stylolites

- fractures are horizontal to 20°, planar to slightly irregular, smooth to slightly rough, clay-like shale seam at 25.4'

- locally minor pitting, occasional stylolite, fractures locally to 45°, clay-like shale clasts at 29.6'

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/10/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** SL

SECTION _____ **LOCATION** (N=563527.191, E=2459618.972), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **CORING METHOD** NQ Core

STRUCT. NO. _____
Station 43+48

BORING NO. VIAIL-119
Station _____
Offset _____
Ground Surface Elev. 579.20 **ft**

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 **in**
Top of Rock Elev. 565.70 **ft**
Begin Core Elev. 563.00 **ft**

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - light to medium brownish gray, fine to medium grained, very thin to thin bedded, occasional stylolites, several vertical fractures at 16.2'-17.5', otherwise most fractures are horizontal, planar and slightly rough, occasional shale clasts and partings, moderately weathered to fresh. *(continued)*	Run 5	100	93	1.4	
- fine to coarse grained, minor pitting, "birdseye" texture at 40.2'-41.1'					
538.10 End of Boring					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563488.913, E=2459524.119), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 43+48

BORING NO. VIAIL-120
Station _____
Offset _____
Ground Surface Elev. 580.00 ft

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

Groundwater Elev.:
First Encounter 566.5 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
	3			CLAY - black, some silt, medium to high plastic, stiff, moist
	5 5	2.0 B		
	2			
-5	3 3	1.6 B	17.5	-medium gray, medium plastic
	3			
573.20	4 4	0.9 B		-medium brown to black, silty, slightly to medium plastic SAND - medium brown, fine to coarse, with clayey sand layers, loose, moist
-10		0.5 P		- sandy clay at 9.5'
568.50	WOH			-fine to medium grained, some clay
	WOH WOH	0.5 B	27.4	CLAY - greenish brown to red brown, some silt, trace sand with thin sand seams, highly to medium plastic, very soft to medium stiff, moist to wet
▼	1			
-15	2 2	0.5 P	20.2	
564.00	6			SAND - brown, fine to coarse grained, conglomeratic with gravel, saturated
	16 24			
561.50	50/5"			WEATHERED SANDSTONE - augered through
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
558.90				WEATHERED SANDSTONE - augered through *(continued)* Borehole continued with rock coring.
-25				
-30				
-35				
-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
JCI

ROCK CORE LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563488.913, E=2459524.119), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 43+48

BORING NO. VIAIL-120
Station _____
Offset _____
Ground Surface Elev. 580.00 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 561.50 ft
Begin Core Elev. 558.90 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SANDSTONE - light to medium gray with some brown coloration, fine grained, soft, thin to medium bedded, horizontal fractures, planar to slightly irregular, sandy rough, occasional black bandings and staining, slightly weathered	558.90	Run 1	85	42	1.1	
	-25					
SANDSTONE - medium gray to brown, fine to coarse, conglomeratic with abundant grayish green clay-like shale clasts and some limestone clasts, soft, moderately well cemented, thin to medium bedded, slightly weathered	554.30	Run 2	92	53	1	264.2
	-30					
LIMESTONE - light to medium brownish gray, occasional pitting, hard to soft, thin to medium bedded, horizontal planar to slightly irregular, smooth to rough fractures, occasional stylolites, mostly fresh with localized slightly weathered layers	549.10	Run 3	100	86	1	
	-35					
-medium grayish brown, locally minor pitting		Run 4	95	52	2	
- very soft, weathered rock-like shale seam at 39.3'-39.5'						
-fine to coarse, pitted, soft, slightly weathered	-40					
	539.30	Run	100	94	1.6	

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/6/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563488.913, E=2459524.119), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 43+48

BORING NO. VIAIL-120
Station _____
Offset _____
Ground Surface Elev. 580.00 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 561.50 ft
Begin Core Elev. 558.90 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium gray to brownish gray, fine to medium grained, pitted with "birdseye" texture, moderately hard, medium to thick bedded, occasional stylolite with fractures along stylolite, rough and jagged, occasional vugs *(continued)*	5				
-45					
534.30 End of Boring					
-50					
-55					
-60					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/10/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563387.138, E=2459641.783), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 44+81

BORING NO. VIAIL-121
Station _____
Offset _____
Ground Surface Elev. 581.00 ft

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

Groundwater Elev.:
First Encounter 569.5 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	3			CLAY - black to greenish gray, little to some silt, slightly to medium plastic, stiff, moist.
	3 4	1.2 B	18.9	
	3			
	2 3	2.1 B	17.1	
-5				
	2			
	2 3	1.6 B	21.3	
	2			
	2 2	0.5 P	24.5	- greenish gray, silty, slightly plastic clay, with a 2" thick sand seam at 8.9'-9.1'
-10				
▼	1			
	2 2	0.5 P	26.7	- medium stiff clay at 11'-11.4'; brown, fine to medium grained sand seam, loose, saturated at 11.4'-12.1'
	0			- red brown conglomerate seam at 13.4'-13.6'
	2 8	0.0 P	25.3	- red brown, medium plastic, soft clay
-15				
565.00				
	2			SAND - red brown, fine grained, some silt, trace black organic matter, loose to medium dense, saturated.
	4 8			
562.70				- brown, fine to medium grained, clean, loose
	40			
	50/3"			WEATHERED SHALE - medium gray, severely weathered.
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
560.00				WEATHERED SHALE - medium gray, severely weathered. *(continued)*
				Borehole continued with rock coring.
-25				
-30				
-35				
-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
JCI

ROCK CORE LOG

Date 9/10/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563387.138, E=2459641.783), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 44+81

BORING NO. VIAIL-121
Station _____
Offset _____
Ground Surface Elev. 581.00 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 562.70 ft
Begin Core Elev. 560.00 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
560.00 SHALE - medium gray to greenish gray, alternating hard clay-like to soft rock-like, occasional clasts, locally black organic material, thin to medium bedded, horizontal to 45° fractures, fractures are planar to slightly irregular, smooth to slightly rough, severely to moderately weathered. Shale is typically clay-like from 18.3'-22.5', rock-like from 22.5'-25', and clay-like to soft rock-like with several clasts at 25'-27'.	Run 1	80	11	2.2	
-25					
554.00 LIMESTONE - medium brownish gray, fine to medium grained, hard, localized pitting, locally stylolitic, thin to medium bedded, fractures range from predominantly horizontal to occasionally 80°, fracture surfaces are slightly irregular to planar and smooth to moderately rough, fresh to very slightly weathered.	Run 2	95	53	1.2	
- 80° jagged fracture with pyrite at 28.1'-28.9'					
-30					
- minor pitting at 29.0'-31.5'	Run 3	100	97	1	593.7
-35					
- 45° planar, smooth to rough fracture at 36.3'	Run 4	100	94	1	
- 65° fracture along shale parting at 39.3'-39.6'					
-40					
- moderately pitted with "birdseye" texture at 40'-41'					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/10/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563387.138, E=2459641.783), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 44+81

BORING NO. VIAIL-121
Station _____
Offset _____
Ground Surface Elev. 581.00 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 562.70 ft
Begin Core Elev. 560.00 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium brownish gray, fine to medium grained, hard, localized pitting, locally stylolitic, thin to medium bedded, fractures range from predominantly horizontal to occasionally 80°, fracture surfaces are slightly irregular to planar and smooth to moderately rough, fresh to very slightly weathered. *(continued)*	Run 5	93	81	1.1	
- medium to coarse grained, moderately pitted limestone with occasional shale partings and low (20°) to medium (50°) angled fractures at 41.0'-47.2'					
-45					
- medium grayish brown vuggy limestone with slightly irregular to planar horizontal to 20° fractures at 48.1'-49.8'					
-50					
- clastic limestone with shale partings and seams at 49.8'-50.3'					
530.00 End of Boring					
-55					
-60					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/14/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563292.754, E=2459483.427, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 44+81

BORING NO. VIAIL-122
Station _____
Offset _____
Ground Surface Elev. 590.00 ft

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

Groundwater Elev.:
First Encounter 573.4 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	4			CLAY - black to orange-brown and greenish gray, little to some silt, variable amounts of gravel, slightly to medium plastic, stiff to very stiff, moist (Embankment Fill)
	4 5	2.3 B	15.2	
	3			
-5	5 5	1.4 B	16.4	
	3			
	6 12	1.2 B	14.2	
				- limestone chips and gravel at 7.3'-10.5'
	50/4"		2.4	
-10				
	10			- medium plastic
	10 3	1.1 B	27.3	
	1			- orange brown to greenish gray clay, little to some silt, medium plastic
	2 3	1.4 B	24.2	
-15				
573.40 ▼	1			
	1 1	0.8 B	28.3	SAND - orange brown, fine to coarse grained, varies from conglomeratic with fine gravel to fine gravel with a silt and clay matrix.
	1			
570.70				
	1 2	0.9 B	27.3	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	1			CLAY - medium gray, some to and silt, slightly plastic, medium stiff, moist. *(continued)*
	1 3	1.1 B		- medium plastic
	1			
-25	5 10	0.6 B		- maroon, medium to highly plastic clay with conglomeratic sand at 24.3'
564.00				
	30			WEATHERED LIMESTONE -
	50/4"			
561.20				
				Borehole continued with rock coring.
-30				
-35				
-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
JCI

ROCK CORE LOG

Date 9/14/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563292.754, E=2459483.427, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 44+81

BORING NO. VIAIL-122
Station _____
Offset _____
Ground Surface Elev. 590.00 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 564.00 ft
Begin Core Elev. 561.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
561.20					
LIMESTONE - grayish brown, fine to medium grained, stylolitic, locally minor pitting/vugs, very occasional "birdseye" texture, occasional green clay-like shale partings along fractures, moderately hard to hard, thin to medium bedded, locally very thin bedded, predominantly horizontal to very low angle fractures with some to 30°, planar to slightly irregular, smooth to rough, fresh to slightly weathered.	Run 1	63	0	2.4	
-30					
- highly fractured zone with some vertical fractures (possibly mechanically induced) at 28.8'-30.9'	Run 2	100	35	1	
-35					
	Run 3	100	89	1.2	296.6
- prominently pitted limestone with "birdseye" texture at 37.4'-38.1'					
- minor pitting, occasional stylolites, primarily medium bedded at 38.1'					
-40					
- abundant stylolites, locally closely spaced, with fractures across stylolites at 40.9'-43.3'	Run 4	100	60	1.6	
-45					
	Run 5	100	84	1.3	
542.40					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/14/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563292.754, E=2459483.427, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 44+81

BORING NO. VIAIL-122
Station _____
Offset _____
Ground Surface Elev. 590.00 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 564.00 ft
Begin Core Elev. 561.20 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium gray, fine to coarse, pitted, "birdseye" texture, occasional green clay-like shale partings, moderately hard, medium bedded, fractures oriented generally horizontal to 20°, slightly irregular, smooth to slightly rough, fresh to very slightly weathered. *(continued)*					
-50					
fine to medium grained, highly vuggy with some voids spanning core diameter at 54.5' - 55.9'					
-55					
534.10 End of Boring					
-60					
-65					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/12/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563211.417, E=2459665.249), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 46+66

BORING NO. VIAIL-123
Station _____
Offset _____
Ground Surface Elev. 584.50 ft

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

Groundwater Elev.:
First Encounter 572.4 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	3			CLAY - black, some to and silt, occasional sand seams, non to medium plastic, medium stiff, slightly moist.
	2 3	0.5 P		
	1			- green gray to brown, medium plastic, moist
	2 3	0.4 B	18.6	
-5				
	2			- medium to highly plastic
	2 2	0.8 B	22.9	
		0.8 B	21.1	**- [Dry unit weight = 107.2 pcf]**
-10				
	0			
▼	1 2	0.7 B	23.9	- sand seams at 11.6' and 13.5'; medium gray to brown orange, fine grained, wet
	0			
	1 2	0.5 B	26.4	
-15				
	0			- greenish gray to reddish brown/maroon, high plasticity
	1 2	0.5 B	28.4	
	1			
	3 8	0.4 B	29.5	
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
563.00	15			
	26 38			SHALE - medium to dark gray, rock-like
				- medium gray, very soft rock-like, severely weathered
	13			
	50/5"			
-25				
558.60				Borehole continued with rock coring.
-30				
-35				
-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
JCI

ROCK CORE LOG

Date 9/12/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563211.417, E=2459665.249), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 46+66

BORING NO. VIAIL-123
Station _____
Offset _____
Ground Surface Elev. 584.50 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 563.00 ft
Begin Core Elev. 558.60 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium brownish gray, fine to medium grained, hard, thin to medium bedded, occasional stylolites, occasional to abundant pitting, isolated "birdseye" texture, occasionally vuggy, several green clay-like shale partings, fractures including those along shale partings are horizontal, planar and slightly rough, slightly weathered to fresh. 558.60	Run 1	98	82	1.2	
-30					
	Run 2	100	97	1	652.4
-35					
	Run 3	98	94	1	
544.90					
LIMESTONE - medium gray, fine to medium grained, hard, thin to medium bedding, occasional stylolites, numerous "birdseye" texture, occasionally vuggy, several green clay-like shale partings, fractures are horizontal, irregular and rough to jagged, fresh to slightly weathered.					
-40					
	Run 4	93	56	1.4	
- gray-green clay-like to very soft rock-like shale interbed with limestone inclusions at 42.1'-43.2'					
-45					

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/12/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563211.417, E=2459665.249), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 46+66

BORING NO. VIAIL-123
Station _____
Offset _____
Ground Surface Elev. 584.50 ft

CORING BARREL TYPE & SIZE NQ Wireline
Core Diameter 1.8 in
Top of Rock Elev. 563.00 ft
Begin Core Elev. 558.60 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium gray, fine to medium grained, hard, thin to medium bedding, occasional stylolites, numerous "birdseye" texture, occasionally vuggy, several green clay-like shale partings, fractures are horizontal, irregular and rough to jagged, fresh to slightly weathered. *(continued)* - vuggy with occasional green shale in-filling of voids at 47.6'-50.2'	Run 5	92	69	1	
-50					
533.50 End of Boring					
-55					
-60					
-65					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/13/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563122.181, E=2459544.529), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 46+66

BORING NO. VIAIL-124
Station _____
Offset _____
Ground Surface Elev. 586.50 ft

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

Groundwater Elev.:
First Encounter 572.0 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
CONCRETE - 2.5" concrete plus base course (sand & gravel). 585.20			
	1		
CLAY - black to dark brown, some silt, medium plastic, soft to medium stiff, slightly moist to moist.	5	3.2	
	6	S	
- very stiff to hard at 1'-2.5'	2		
	2	0.9	18.1
-5	3	B	
	2		
	1	1.0	19.4
	2	P	
- greenish gray to orange brown	1		
	1	0.7	19.9
-10	2	B	
- slightly plastic			
- [Dry unit weight = 100.6 pcf]		0.8	25.8
		B	
- slightly to medium plastic	1		
▼	1	0.6	24.2
-15	2	B	
- medium gray, wet			
- greenish gray to orange brown	0		
- medium gray, little silt	1	0.5	25.0
	2	B	
- soft	0		
	0	0.5	27.4
-20	2	B	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
- reddish brown to maroon, and sand, very soft 565.30			
	4		
SAND - brown, fine to coarse grain, conglomeratic with gravel (1/2-inch minus, subrounded to subangular), loose, wet.	5	0.9	
	5	B	
	4		
562.40			
WEATHERED LIMESTONE	50/5"		
-25			
560.90			
Borehole continued with rock coring.			
-30			
-35			
-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
JCI

ROCK CORE LOG

Date 9/13/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563122.181, E=2459544.529), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 46+66

BORING NO. VIAIL-124
Station _____
Offset _____
Ground Surface Elev. 586.50 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 562.40 ft
Begin Core Elev. 560.90 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
560.90					
LIMESTONE - medium brownish gray, fine to medium grained, hard, occasional pitting, occasional stylolites with some fractures along stylolites, locally vuggy with green clay-like shale infilling, occasional clay-like shale seams with fractures along seams, thin to medium bedded, fractures are horizontal to low angle planar to slightly irregular, smooth to slightly rough, occasional mid to high angle fractures, fresh.	Run 1	100	55	1.2	
-30					
- medium gray, fine grained, stylolites locally closely spaced, interbedded with "clean" limestone with only very occasional stylolites.	Run 2	100	91	1	293.3
-35					
	Run 3	100	89	0.8	
-40					
	Run 4	100	89	1.6	
543.00					
LIMESTONE - medium grayish brown, fine to medium grain, moderately hard, abundant pitting and "birdseye" texture, medium bedded, fractures are horizontal to very low angle, planar, smooth moderately irregular, rough to jagged, fresh to very slightly weathered.					
-45					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/13/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=563122.181, E=2459544.529), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 46+66

BORING NO. VIAIL-124
Station _____
Offset _____
Ground Surface Elev. 586.50 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 562.40 ft
Begin Core Elev. 560.90 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium grayish brown, fine to medium grain, moderately hard, abundant pitting and "birdseye" texture, medium bedded, fractures are horizontal to very low angle, planar, smooth moderately irregular, rough to jagged, fresh to very slightly weathered. *(continued)*	Run 5	98	94	1	
-50					
535.90 End of Boring					
-55					
-60					
-65					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/13/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=562983.081, E=2459718.225), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 48+91

BORING NO. VIAIL-125
Station _____
Offset _____
Ground Surface Elev. 585.80 ft

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

Groundwater Elev.:
First Encounter 573.8 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				CONCRETE + Base Course
				584.80
	4			CLAY - black to dark brown, some silt, slightly to medium plastic, medium stiff to very stiff, moist
	3	0.9		
	2	B		
	2			
	2	0.7		
-5	2	B		
	2			- brownish orange to greenish gray, with a black clay seam at 8.5'
	2	0.7		
	3	B		
	2			
	2	0.7		
-10	2	B		
	1			
▼	2	0.7		
	2	B		- orange brown fine grained sand interbed in a silt and clay matrix, saturated at 12.3'
				- slightly plastic
		0.8	35.1	
-15		P		
	0			
	2	0.4		
	1	B		
	1			
				- maroon, little silt, medium plastic
	5	0.5		566.60
-20	7	B		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				SAND - maroon to bright greenish yellow, fine to medium grained, conglomeratic with fine gravel. *(continued)*
				564.50
	13			- olive, fine grained sand, moist at 21'
	25			
	13			WEATHERED SHALE - medium gray, clay-like to soft rock-like, severely weathered.
	13			
	11			
-25	13			
	15			
	18			
	50/5"			
				558.30
				Borehole continued with rock coring.
-30				
-35				
-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
JCI

ROCK CORE LOG

Date 9/13/07

ROUTE I-74 **DESCRIPTION** New I-74 Bridge Over Mississippi River - Illinois Approach **LOGGED BY** SL

SECTION _____ **LOCATION** (N=562983.081, E=2459718.225), **SEC.** 32, **TWP.** 18N, **RNG.** 1W, 4th **PM**

COUNTY Rock Island **CORING METHOD** NQ Core

STRUCT. NO. _____
Station 48+91

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 564.50 ft
Begin Core Elev. 558.30 ft

BORING NO. VIAIL-125
Station _____
Offset _____
Ground Surface Elev. 585.80 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
558.30	Run 1	100	41	1.5	
-30	Run 2	98	40	1.2	933.4
-35	Run 3	100	98	1.2	
-40	Run 4	100	75	1.2	
-45	Run 5	100	88	0.8	

LIMESTONE - medium to light brownish gray, occasional pitting and locally vuggy, with partings, seams, and clasts of green clay-like shale, hard to moderately hard, thin to medium bedded, primarily horizontal to very low angle fractures with localized high angle fractures, fracture surfaces are planar to irregular and slightly rough to rough, fresh to slightly weathered.

- clay-like shale interbed at 30.9'-31.7'

- mixed shale and limestone layer with high angle to vertical fractures at 31.9' - 33.4'

- light to medium gray, locally pitted and vuggy at 33.3', clay-like to soft rock-like green shale partings and inclusions in irregular patterns at 45° to vertical at 36.4' -36.9'

- light gray, stylolitic

- very light gray, fine grained, fresh, very minor pitting and occasional stylolites

- very thin bedded, occasional shale partings, moderate pitting and vuggy at 44.3'-45.9'

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/13/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=562983.081, E=2459718.225), SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 48+91

BORING NO. VIAIL-125
Station _____
Offset _____
Ground Surface Elev. 585.80 ft

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 564.50 ft
Begin Core Elev. 558.30 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
537.60					
LIMESTONE - medium gray, fine to medium, pitted, "birdseye" texture, occasional shale partings, medium bedded, fractures range from medium (45°) to high (80°) angled, fresh to slightly weathered. Pitting and "birdseye" texture diminish with depth.					
-50					
	Run 6	100	100	0.8	
-55					
529.90					
End of Boring					
-60					
-65					

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 9/12/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=562900.26, E=2459617.358, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island DRILLING METHOD HSA, CME 550X HAMMER TYPE CME AUTOMATIC

STRUCT. NO. _____
Station 48+91

BORING NO. VIAIL-126
Station _____
Offset _____
Ground Surface Elev. 586.40 ft

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

Groundwater Elev.:
First Encounter 572.4 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	5			SILT - dark gray, some clay, non to slightly plastic, stiff, slightly moist.
	6	1.5		
	6	B		
	3			- slightly to medium plastic
582.60				
-5	3	1.3	19.3	CLAY - greenish gray to orange brown, some silt, sand seams, slightly to medium plastic, stiff to medium stiff, moist.
	3	B		
	2			- slightly plastic
	3	0.5	19.9	
	3	B		
	2			
	2	0.7	20.0	
-10	2	B		
	1			[Upon completion of boring, offset 10' south, augered to 11' depth, and took Shebly tube sample at 11'-13']
	1	0.8	22.3	
	2	P		
	1			- medium gray, medium to highly plastic, with brown fine grained sand seams at 9.2', 11.3' and 13.7
▼				- some silt, saturated
	1	0.8	26.0	
-15	1	B		
	0			[Note: attempted Shelby tube sample at 16'-18'; no recovery; followed-up with SPT sample]
	1	0.5	24.6	
	1	B		
	1			- vertical fracture at 47.3'-47.9'
				- red brown to maroon, medium to highly plastic
567.10				
	2	0.6		
-20	4	B		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
	31			SAND - medium gray, fine grained, trace to little silt, trace fine to medium coarse gravel (1/2 inch minus), loose, saturated. *(continued)*
	48			
	50/4"			
562.90				
-25	50/1"			WEATHERED SHALE - light gray, clay-like to soft rock-like, severely weathered.
560.40				
				Borehole continued with rock coring.
-30				
-35				
-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
JCI

ROCK CORE LOG

Date 9/12/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=562900.26, E=2459617.358, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 48+91

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 562.90 ft
Begin Core Elev. 560.40 ft

BORING NO. VIAIL-126
Station _____
Offset _____
Ground Surface Elev. 586.40 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
560.40 LIMESTONE - medium to light brown gray, fine to medium grained, hard, thin to medium bedding, occasional pitting, fractures are primarily horizontal, planar to slightly irregular, smooth to slightly rough, fresh to very slightly weathered except at vugs.	Run 1	100	76	1.4	
- occasional pitting at 26'-27.5'; vuggy at 27.6'-28.3' with pits to 2" length					
-30					
-from 31' to 45': occasionally vuggy with clay-like shale fillings in voids, occasional stylolites, pitting, very thin to thin bedded	Run 2	98	92	1	350.2
-35					
	Run 3	100	91	1	
-40					
	Run 4	100	92	0.8	
-45					
540.40					

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 9/12/07

ROUTE I-74 DESCRIPTION New I-74 Bridge Over Mississippi River - Illinois Approach LOGGED BY SL

SECTION _____ LOCATION (N=562900.26, E=2459617.358, SEC. 32, TWP. 18N, RNG. 1W, 4th PM

COUNTY Rock Island CORING METHOD NQ Core

STRUCT. NO. _____
Station 48+91

CORING BARREL TYPE & SIZE NQ Wireline

Core Diameter 1.8 in
Top of Rock Elev. 562.90 ft
Begin Core Elev. 560.40 ft

BORING NO. VIAIL-126
Station _____
Offset _____
Ground Surface Elev. 586.40 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
LIMESTONE - medium brownish gray, fine to medium grained, pitted, "birdseye" texture, moderately hard, horizontal and slightly irregular, rough fracture.	Run 5	100	100	1	
- vertical fracture at 47.3'-47.9' with 1/2 "birdseye" texture and 1/2 gray fine limestone					
-50					
535.40 End of Boring					
-55					
-60					
-65					

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

Boring Logs
Phase 1A

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 11/10/05

ROUTE I-74 DESCRIPTION _____ LOGGED BY L. Hunt

SECTION _____ LOCATION VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island DRILLING METHOD CME-550 HOLLOW STEM AUGER HAMMER TYPE _____

STRUCT. NO. _____
Station _____

BORING NO. MR021P
Station _____
Offset _____
Ground Surface Elev. 580.07 ft

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

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

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
	5			**Clay (CL)** Clay, few gravel, trace sand, dark brown, mottled orange brown, dry to moist, stiff to very stiff, homogeneous.
	6 8 9	3.3 P		
	6			Clay, trace sand and gravel, dark brown, mottled orange brown, dry to moist, stiff to very stiff, homogeneous.
	7 8 7	>4.5 P		
	3			Clay, trace sand and gravel, dark brown, mottled orange brown, dry to moist, stiff to very stiff, homogeneous.
-5	4 6 4	>4.5 P	15.0	
	3			At about 5.5' dark red brown brick lense.
	5 5 4	1.8 P		Clay, trace sand, dark brown, mottled orange brown and gray brown, dry to moist, medium stiff to stiff, homogeneous.
572.07				
	3			**Silty Clay(CL)** Silty Clay, gray brown, mottled dark brown and orange brown, dry to moist, medium stiff, homogeneous.
	5 6 5	2.5 P		
-10	4			Silty Clay, gray brown to light brown, mottled orange brown, moist, soft to medium stiff, lensed and homogeneous.
	3 3 3	0.7 P		At about 11.5' 3" of fine to medium grained sand. ▼
	Push			Water at 12' while drilling
		0.6 P	26.0	
566.07				
	2			**Clay (CL)** Clay, gray brown, mottled orange brown to dark brown, moist, very soft to soft, homogeneous.
-15	1 5 8	0.6 P		
564.07				15.67' fine grained sand for 4".
560.07				
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
	7			**Shale** Shale, gray, moist, stratified.
	13 17 17			
-25				No Sample.
	50/3			
551.07				
				Borehole continued with rock coring.
-30				
-35				
-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
JCI

ROCK CORE LOG

Date 11/10/05

ROUTE I-74 DESCRIPTION _____ LOGGED BY L. Hunt

SECTION _____ LOCATION VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island CORING METHOD NQ DOUBLE BARREL DIAMOND TIP

STRUCT. NO. _____
Station _____

BORING NO. MR021P
Station _____
Offset _____
Ground Surface Elev. 580.07 ft

CORING BARREL TYPE & SIZE _____
Core Diameter _____ in
Top of Rock Elev. 551.07 ft
Begin Core Elev. 536.07 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
551.07					
-30					
-35					
-40					
-45	R4	100	68		548.0

Limestone Limestone, light gray, fine to medium grained, slightly to moderately weathered, strong rock, thin to medium beds. Auger refusal at 29' at 11:19; begin rock coring at 29' at 12:34 Horizontal fractures, extremely fractured to sound, extremely close to moderate discontinuity, rough undulating to smooth planar joints, tightly healed (<1/4" thick) to soft clay mineral coatings with >1/4" thick rock wall separation.
Drilling water loss significant; 45 minutes of coring for R-1.
R-1: Vugs present (<1/2" diameter).

Limestone, light gray, fine to medium grained, unweathered to slightly weathered, strong rock, laminated to medium beds, 1 vug per foot. Lost all circulation at 36.5', water loss of about 400 gallons; stopped for half an hour to get water. Horizontal fractures, extremely fractured to sound, extremely close to moderate discontinuity, rough undulating to smooth planar joints, tightly healed (<3/4" thick) to slightly altered with >1/4" thick rock wall separation; at 36.3' gap at joint with very little dark brown to black soft clay mineral in joint, mostly space most likely path of water loss.

Limestone, gray, fine to medium grained, slightly to moderately weathered, weak to medium strength, laminated to medium beds. R-3: Drilling water loss of 400 gallons during coring. Horizontal fractures and 45 degree angle fractures, extremely fractured to sound, extremely close to moderate discontinuity, rough undulating to smooth planar joints, tightly healed (<1/4" thick) to very soft clay mineral coatings with <1/4" thick rock wall separation; at 39.75' dark mineral coatings in joints.

Limestone, gray, fine to medium grained, moderately to highly weathered, strong rock, medium to thin beds, vugs present (<1" diameter). R-4: Drilling water loss of 400 gallons during coring. Horizontal fractures, extremely fractured to sound, extremely close to moderate discontinuity, rough to smooth (undulating - planar) joints, tightly healed (<1/4" thick) to soft clay mineral coatings with >1/4" thick rock wall separation; at about 48' (last 10" of core) highly fractured and many vugs.

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 11/10/05

ROUTE I-74 DESCRIPTION _____ LOGGED BY L. Hunt

SECTION _____ LOCATION VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island CORING METHOD NQ DOUBLE BARREL DIAMOND TIP

STRUCT. NO. _____
Station _____

CORING BARREL TYPE & SIZE _____

Core Diameter _____ in
Top of Rock Elev. 551.07 ft
Begin Core Elev. 536.07 ft

BORING NO. MR021P
Station _____
Offset _____
Ground Surface Elev. 580.07 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
	R5	100	89		
-50					
529.57					

Limestone, gray, fine to medium grained, slightly to moderately weathered, medium strong, thin to medium beds. R-5: Drilling water loss significant; stopped when water ran out. Horizontal fractures, extremely fractured to sound, extremely close to moderate discontinuity, rough joints, very stiff clay mineral coatings with >1/4" thick rock wall separation.

End of rock coring at 50.5'.
End of Boring

-55
-60
-65

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

Illinois Department of Transportation
Division of Highways
JCI

SOIL BORING LOG

Date 10/31/05

ROUTE I-74 DESCRIPTION _____ LOGGED BY L. Hunt

SECTION _____ LOCATION VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island DRILLING METHOD CME-550 HOLLOW STEM AUGER HAMMER TYPE _____

STRUCT. NO. _____
Station _____

BORING NO. VIAIL01
Station _____
Offset _____
Ground Surface Elev. 569.57 ft

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

Groundwater Elev.:
First Encounter 561.6 ft ▼
Upon Completion _____ ft
After _____ Hrs. _____ ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Clay (CL) Clay, little sand, red brown, mottled dark brown and brown, dry to moist, homogeneous.		4 7 6		
567.57		6		
Silty Clay (CL-ML) Silty Clay, red brown, dry to moist, homogeneous.		6 4 5	 1.6 P	
565.57		4		
Clayey Silt (MH) Clayey Silt, trace sand and gravel, red brown, dry to moist, homogeneous.		10 5 4		
563.57	-5	5		
Clayey Silt to Sand (MH - SW) Clayey Silt to Sand, trace gravel, ed brown to brown, moist to wet, stratified.		5 6 5	 4.5 P	
Water at 7.5' - 8'. 561.57 ▼		6		
Clay to Silty Sand (CL - SM) Clay to Silty Sand, few gravel, brown, wet, stratified.		5 5 15		
559.57	-10	9		
Silty Sand to Clay (SM - CL) Silty Sand to Clay, some gravel, brown, wet, stratified.		6 15 25		
557.57		50/4		
No Sample.		50/4		
555.47		50/0		
Auger refusal at 14'; begin rock coring at 14' at 08:21 Horizontal fractures, extremely fractured to sound, extremely close to moderate discontinuity, smooth to rough (planar) joints, tightly healed to very stiff clay mineral coatings with >1/4" thick rock wall separation.	-15			
Borehole continued with rock coring.	-20			

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 10/31/05

ROUTE I-74 **DESCRIPTION** _____ **LOGGED BY** L. Hunt

SECTION _____ **LOCATION** VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island **CORING METHOD** NQ DOUBLE BARREL DIAMOND TIP

STRUCT. NO. _____
Station _____

CORING BARREL TYPE & SIZE _____

Core Diameter _____ in
Top of Rock Elev. 555.47 ft
Begin Core Elev. 555.47 ft

BORING NO. VIAIL01
Station _____
Offset _____
Ground Surface Elev. 569.57 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
555.47 **Sandstone** Sandstone, gray, fine to medium grained, slightly to moderately weathered, weak to very weak rock, laminated to medium beds. Each core run takes about 20 minutes. Coring rate was smooth and fast; no rod drops.	R1	87	70		
-15					
Sandstone, gray, fine to medium grained, slightly weathered, very weak rock, medium bedding. Horizontal fractures, extremely fractured to sound, extremely close to wide discontinuity, smooth to rough (planar) joints, tightly healed to very stiff clay mineral coatings with <1/4" thick rock wall separation.	R2	100	85		
-20					
Sandstone, gray, fine to medium grained, unweathered, very weak rock, massive bedding, sample completely intact and unfractured prior to placement in rock core box. R-3: Busted 2 times from placement in rock core box. Horizontal breaks at ends of core sample, sound, very wide discontiuity, no joints or fractures throughout sample.	R3	93	93		
-25					
Sandstone, gray, fine to medium grained, unweathered, very weak rock, massive bedding. R-4: Busted 1 time from placement in rock core box. 1 fracture in sample, horizontal, smooth-planar, unaltered.	R4	100	100		
-30					
536.07 End of core run at 33.5'.					

End of Boring

Color pictures of the cores _____

Cores will be stored for examination until _____

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation

Division of Highways
JCI

SOIL BORING LOG

Date 11/2/05

ROUTE I-74 DESCRIPTION _____ LOGGED BY L. Hunt

SECTION _____ LOCATION VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island DRILLING METHOD CME-550 HOLLOW STEM AUGER HAMMER TYPE _____

STRUCT. NO. _____
Station _____

BORING NO. VIAIL02
Station _____
Offset _____
Ground Surface Elev. 576.06 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(SC) Clayey Sand, few gravel, dark brown, dry to moist, somewhat loose, homogeneous. 1' of concrete, pavement, and gravel on top of sediment.		9		
		4		
		3		
573.06		5		
Clayey Sand to Silty Clay (SC-CL) Clayey Sand to Silty Clay, trace gravel and sand, dark brown, dry to moist, loose to soft, stratified.		4		
		3		
		3		
571.06	-5	4		
Clay (CL) Clay, trace sand and gravel, dark brown, dry to moist, soft, homogeneous.		1		
		2	0.1	
		2	P	
		3		
Clay, trace sand, gray brown, mottled orange brown and dark brown, dry to moist, soft, homogeneous.		1		
		2	0.5	
		3	P	
		3		
Clay, gray brown, mottled orange brown and dark brown, moist, soft, lensed. Clayey Sand lense at 10'.		WOH		
	-10	2	1.9	
		2	P	
565.06		4		
Silty Clay to Clayey Sand to Clayey Silt(CL-SC-ML) Silty Clay to Clayey Sand to Clayey Silt, trace gravel, gray brown, mottled orange brown and dark brown, moist, soft to medium dense, stratified.		WOH		
		2		
		2		
563.06		1		
		8		
Silty to Sandy Clay(CL) Silty to Sandy Clay, few gravel, gray brown and brown, moist, soft, stratified. Goes to Shale at bottom of sample (gray, dry to moist, hard).		12		
		7		
561.06	-15	6		
557.06				
Borehole continued with rock coring.	-20			

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

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 11/2/05

ROUTE I-74 **DESCRIPTION** _____ **LOGGED BY** L. Hunt

SECTION _____ **LOCATION** VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island **CORING METHOD** NQ DOUBLE BARREL DIAMOND TIP

STRUCT. NO. _____
Station _____

BORING NO. VIAIL02
Station _____
Offset _____
Ground Surface Elev. 576.06 ft

CORING BARREL TYPE & SIZE _____
Core Diameter _____ in
Top of Rock Elev. 557.06 ft
Begin Core Elev. 557.06 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Limestone Limestone, light gray, fine to medium grained, slightly to moderately weathered, medium to strong rock, laminated to thin beds, vugs present. Auger refusal at 19'; begin rock coring at 19' at 08:24 Horizontal fractures, extremely fractured to slightly fractured, extremely close to close discontinuity, rough to smooth (planar and undulating), tightly healed to rock wall separation of >1/4" thick with firm clay mineral coatings and sand and gravel, stylolites present.	557.06	R1	83	53		
	-20					
Limestone, light gray, fine to medium grained, unweathered to slightly weathered, medium strength, no apparent bedding (thick to massive), not many vugs present. Horizontal fractures, extremely fractured to sound, extremely close to moderate discontinuity, rough undulating to smooth planar joints, tighlty healed to very stiff clay mineral coatings with no rock wall separation, stylolites present, hard mineral growth in some joints, black in color.	-25	R2	100	87		
Limestone, light gray, fine to medium grained, unweathered to slightly weathered, medium strength, thick bedding, not many vugs present. Lost water from 29 - 31.5'. Horizontal fractures, extremely fractured to sound, extremely close to moderate discontinuity, rough to smooth (planar and undulating) joints, tighlty healed to firm clay mineral coatings with <1/4" thick rock wall separation, stylolites present, stains in unaltered joints. At 31.5' Water ran dark for a few seconds.	-30	R3	100	83		
Limestone, light gray, fine to medium grained, slightly to moderately weathered, medium strength, no apparent bedding (medium to massive), vugs present (<1/8" diameter). Horizontal fractures, slightly fractured to sound, close to wide discontinuity, rough undulating joints, tighlty healed to sandy particles in joints, (some slanted joints not quite 45 degree angle).	-35	R4	100	97		
	537.06					

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

BBS, form 138 (Rev. 8-99)

Illinois Department of Transportation
Division of Highways
JCI

ROCK CORE LOG

Date 11/2/05

ROUTE I-74 DESCRIPTION _____ LOGGED BY L. Hunt

SECTION _____ LOCATION VIADUCT, MAINLINE, SEC., TWP., RNG.

COUNTY Rock Island CORING METHOD NQ DOUBLE BARREL DIAMOND TIP

STRUCT. NO. _____
Station _____

BORING NO. VIAIL02
Station _____
Offset _____
Ground Surface Elev. 576.06 ft

CORING BARREL TYPE & SIZE _____

Core Diameter _____ in
Top of Rock Elev. 557.06 ft
Begin Core Elev. 557.06 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
End of rock coring at 39'. End of Boring					

-40
-45
-50
-55

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

Laboratory Test Results

SUMMARY OF LABORATORY TEST RESULTS FOR SOIL

PROJECT NO: C1X13500
PROJECT: I-74 River Crossing, Bettendorf-Moline
Illinois Land Based Borings

Boring	Sample No.	Depth From	Depth To	Moisture Content %	Dry Unit Weight pcf	Atterberg Limits LL %	Atterberg Limits PL %	Atterberg Limits PI %	Grain Size Passing 4 %	Grain Size Passing 10 %	Grain Size Passing 40 %	Grain Size Passing 200 %	Compressive Strength tsf
VIAIL-103	SS-4	8.5	10.0						100	100	87	28	
	SS-6	13.5	15.0	21.5									
	SS-7	16.0	16.9	14.5									
VIAIL-104	SS-2	8.5	10.0	17.0									
	SS-3	13.5	15.0	18.9		31	12	19					
	SS-4	16.0	16.9						100	100	73	34	
VIAIL-105	SS-1	1.0	2.5	8.9									
	SS-2	3.5	5.0	12.1									
	SS-3	6.0	7.5	21.5									
VIAIL-106	SS-1	1.0	2.5	8.1									
	SS-3	6.0	7.5						100	100	69	8	
VIAIL-107	SS-1	1.0	2.5	11.7									
VIAIL-108	SS-1	1.0	2.5	17.5									
	SS-2	3.5	5.0	22.0		24	16	8					
	SS-3	6.0	7.5	18.8									
VIAIL-109	SS-1	1.0	2.5	12.4									
	SS-2	3.5	5.0	12.6									
	SS-4	8.5	10.0	10.1									
	SS-5	11.0	12.5	18.2									
	SS-6	13.5	15.0	15.5		22	13	9					
	SS-7	16.0	17.5	32.5									
	SS-8	18.5	20.0						100	86	43	18	
VIAIL-110	SS-2	3.5	5.0	17.9									
	SS-3	6.0	7.5	14.5									
	SS-4	8.5	10.0	13.5									
	SS-5	11.0	12.5	17.2									
	SS-6	13.5	15.0	10.9									
	SS-7	16.0	17.5	24.1									
	SS-8	18.5	20.0	27.4									
VIAIL-111	SS-2	3.5	5.0	21.8									
	SS-3	6.0	7.5	26.4									
	ST-1	8.5	10.5	28.8	90	57	22	35					0.75
	SS-4	11.0	12.5	44.8									

SUMMARY OF LABORATORY TEST RESULTS FOR SOIL

Boring	Sample No.	Depth From	Depth To	Moisture Content %	Dry Unit Weight pcf	Atterberg Limits LL %	Atterberg Limits PL %	Atterberg Limits PI %	Grain Size Passing 4 %	Grain Size Passing 10 %	Grain Size Passing 40 %	Grain Size Passing 200 %	Compressive Strength tsf
VIAIL-112	SS-3	6.0	7.5	20.1									
	SS-4	11.0	12.5						100	99	97	18	
VIAIL-113	SS-2	3.5	5.0	28.8									
	SS-3	6.0	7.5	33.8									
	SS-4	8.5	10.0	27.4									
	SS-5	11.0	12.5	41.8									
VIAIL-114	SS-2	3.5	5.0	22.6									
	SS-3	6.0	7.5	82.5	Note: Moisture Content is questionable								
	SS-4	8.5	10.0	27.0		27	21	6					
	SS-5	11.0	12.5	20.4									
VIAIL-115	SS-2	3.5	5.0	22.8									
	ST-1	6.0	8.0	21.8	102	32	19	13					1.38
	SS-3	8.5	10.0	47.6									
	SS-5	13.5	15.0	8.3					81	63	15	10	
VIAIL-118	SS-2	3.5	5.0	16.7									
	SS-3	6.0	7.5	17.2									
	SS-4	8.5	10.0	31.6									
	SS-5	11.0	12.5	24.8									
VIAIL-119	SS-1	1.0	2.5	24.2									
	ST-1	3.5	5.5	22.4	101								2.07
	SS-2	6.0	7.5	27.1									
	SS-3	8.5	10.0	25.9									
	ST-2	11.0	13.0	26.4	100								
VIAIL-120	SS-2	3.5	5.0	17.5									
	ST-1	8.5	10.5	5.0					64	33	6	2	
	SS-4	8.5	10.0	27.4									
	SS-5	13.5	15.0	20.2									
VIAIL-121	SS-1	1.0	2.5	18.9									
	SS-2	3.5	5.0	17.1									
	SS-3	6.0	7.5	21.3									
	SS-4	8.5	10.0	24.5		29	19	10					
	SS-5	11.0	12.5	26.7									
	SS-6	13.5	15.0	25.3									
VIAIL-122	SS-1	1.0	2.5	15.2									
	SS-2	3.5	5.0	16.4									
	SS-3	6.0	7.5	14.2									
	SS-4	8.5	10.0	2.4									
	SS-5	11.0	12.5	27.3		45	18	27					

SUMMARY OF LABORATORY TEST RESULTS FOR SOIL

Boring	Sample No.	Depth			Moisture Content	Dry Unit Weight	Atterberg Limits			Grain Size Passing				Compressive Strength
		From	To		%	pcf	LL %	PL %	PI %	4 %	10 %	40 %	200 %	tsf
	SS-6	13.5	15.0		24.2									
	SS-9	21.0	22.5		28.3									
	SS-10	23.5	25.0		27.3									
VIAIL-123	SS-2	3.5	5.0		18.6									
	SS-3	6.0	8.0		22.9									
	ST-1	8.5	10.5		21.1	107	26	17	9					0.80
	SS-4	11.0	12.5		23.9									
	SS-5	13.5	15.0		26.4									
	SS-6	16.0	17.5		28.4									
	SS-7	18.5	20.0		29.5									
VIAIL-124	SS-2	3.5	5.0		18.1									
	SS-3	6.0	7.5		19.4									
	SS-4	8.5	10.0		19.9									
	ST-1	11.0	13.0		25.8	101	29	22	7					0.84
	SS-5	13.5	15.0		24.2									
	SS-6	16.0	17.5		25.0									
	SS-7	18.5	20.0		27.4									
VIAIL-125	SS-2	3.5	5.0		20.4									
	SS-3	6.0	7.5		18.9									
	SS-4	8.5	10.0		23.1									
	SS-5	11.0	12.5		23.3									
	ST-1	13.5	15.5		35.1		29	23	6					
	SS-6	16.0	17.5		29.9									
	SS-8	21.0	22.5		14.2									
	SS-9	23.5	25.0		18.2									
VIAIL-126	SS-2	3.5	5.0		19.3									
	SS-3	6.0	7.5		19.9		25	21	4					
	SS-4	8.5	10.0		20.0									
	SS-5	11.0	12.5		22.3									
	SS-6	13.5	15.0		26.0									
	SS-7	16.0	17.5		24.6									
	SS-9	21.0	22.5							96	92	35	10	

H.C. Nutting Company
611 Lunken Park Dr.
Cincinnati, Ohio 45226

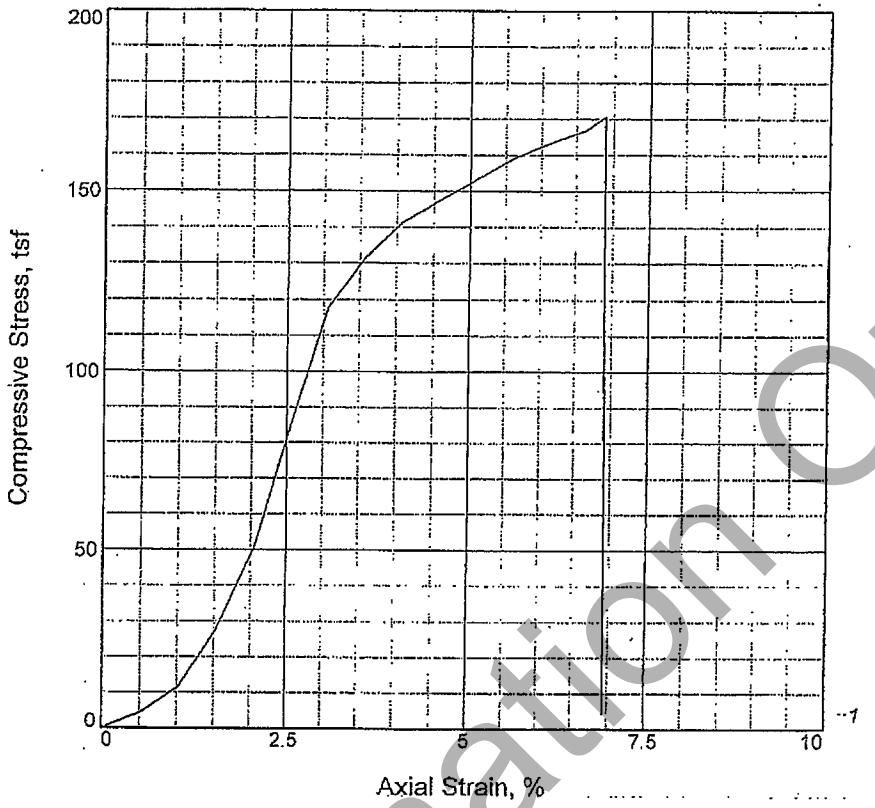
Terracon
I-74 Crossing-Bettendorf-Moline (Job #07045052)
Baettendorf, Iowa
HCN W.O. #19636 [illegible]

TABLE: TABULATION OF UNDISTURBED DATA

Lab No.	Boring No.	Sample No.	Depth (ft.)	Unconfined Strength (tsf)	Material Description	Moh's Hardness	Failure Strain (%)	Dry Density (pcf)	Water Content (%)
~~9976~~	~~VIAIL-101~~	~~RUN 3~~	~~22.2-22.5~~	~~141.1~~		~~5~~	~~2.1~~	~~137.8~~	~~6.4~~
9977	VIAIL-103	RUN 2	22.2-22.7	170.6	Shaly Sandstone	6.5	6.9	152.5	0.8
9978	VIAIL-104	RUN 2	16.7-17.2	305.0	Shaly Sandstone	5	1.3	152.7	0.8
9979	VIAIL-105	RUN 2	18-18.4	306.4	Sandstone	1	1.3	114.9	5.2
9980	VIAIL-105	RUN 4	30.2-30.8	179.5	Sandstone	1	1.0	117.6	3.3
9981	VIAIL-106	RUN 2	17.7-18.8	226.2	Sandstone	4	4.2	122.5	0.6
9982	VIAIL-107	RUN 3	22-22.8	174.6	Sandstone	4	0.8	123.0	1.2
9983	VIAIL-108	RUN 3	23.4-23.8	139.6	Sandstone	3	0.9	128.7	1.0
9984	VIAIL-109	RUN 2	29.8-30.2	114.6	Sandstone	3	3.4	122.3	4.5
9985	VIAIL-110	RUN 3	32-32.8	239.9	Sandstone	1	0.2	116.6	0.2
~~9986~~	~~PRMPG-01~~	~~RUN 4~~	~~27.4-28~~	~~190.8~~	Sandy Shale	~~4~~	~~2.1~~	~~141.6~~	~~2.4~~

Un table 9-13-07

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	170.6253			
Undrained shear strength, tsf	85.3126			
Failure strain,	6.9			
Strain rate, in./min.	0.500			
Water content, %	0.8			
Wet density, pcf	153.6			
Dry density, pcf	152.5			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.870			
Specimen height, in.	1.960			
Height/diameter ratio	1.05			

Description: SHALY SANDSTONE (MOH'S 6.5)

LL =	PL =	PI =	GS=	Type: Sandstone

Project No.: 19636.040
Date: 9-14-07

Remarks:
Lab No. 9977

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

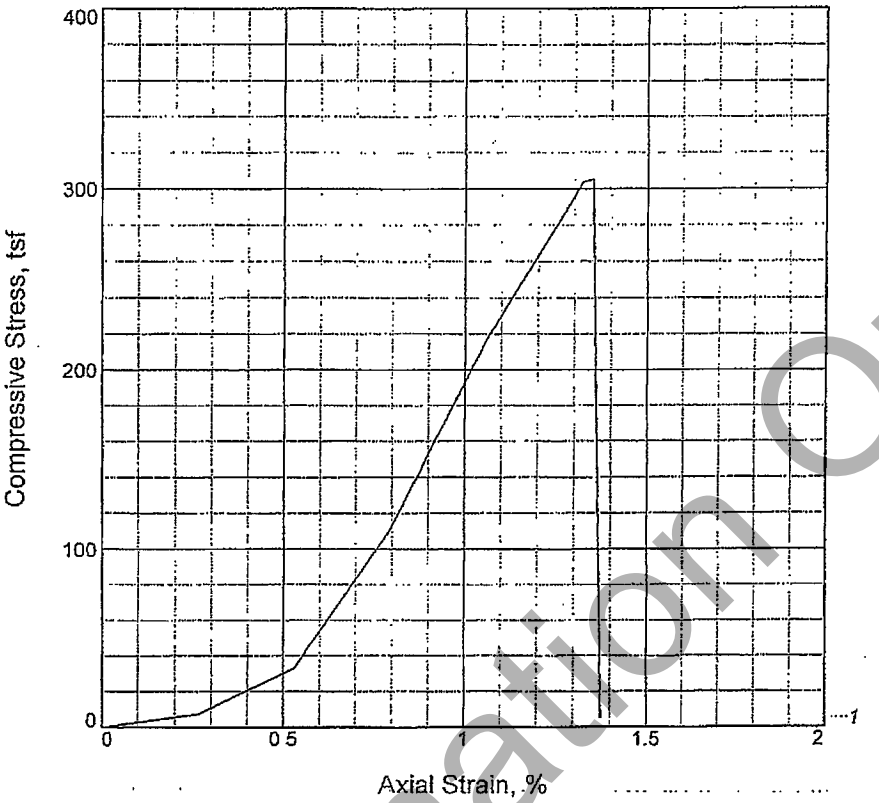
Source of Sample: VIAIL-103 **Depth:** 22.2-22.7'
Sample Number: RUN-2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	305.0098			
Undrained shear strength, tsf	152.5049			
Failure strain,	1.3			
Strain rate, in./min.	0.500			
Water content, %	0.8			
Wet density, pcf	153.9			
Dry density, pcf	152.7			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.860			
Specimen height, in.	3.780			
Height/diameter ratio	2.03			

Description: SHALY SANDSTONE (MOH'S - 5)

LL =	PL =	PI =	GS=	Type: Sandstone

Project No.: 19636.040

Date: 9-14-07

Remarks:
Lab No. 9978

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

Source of Sample: VIAIL-104 **Depth:** 16.7-17.2'

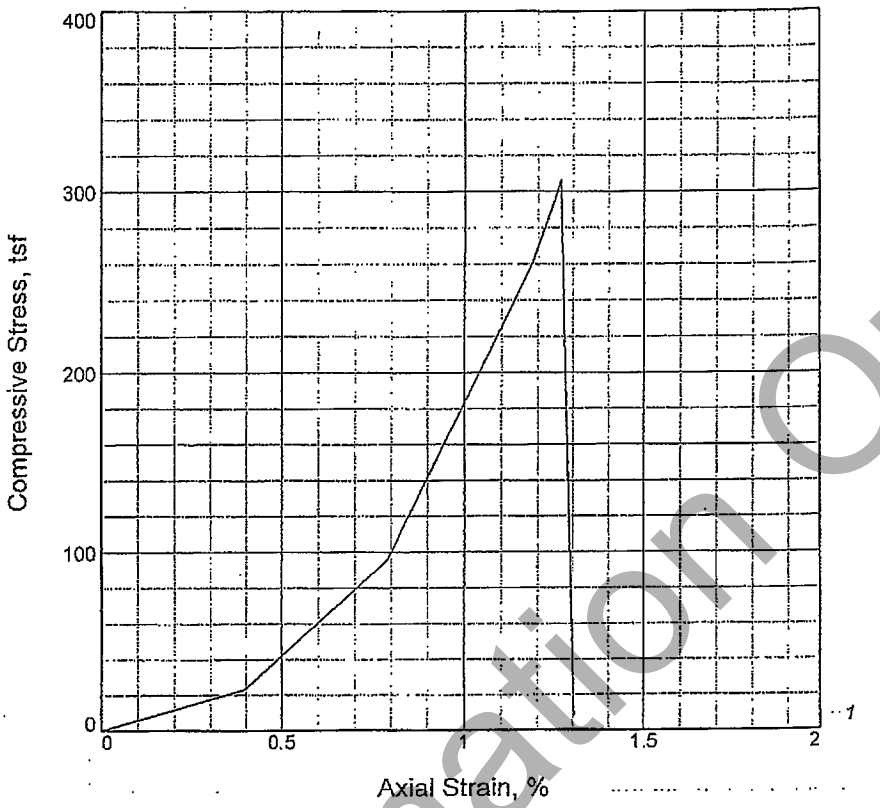
Sample Number: RUN-2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	306.3695			
Undrained shear strength, tsf	153.1848			
Failure strain,	1.3			
Strain rate, in./min.	0.500			
Water content, %	5.2			
Wet density, pcf	120.9			
Dry density, pcf	114.9			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.860			
Specimen height, in.	2.530			
Height/diameter ratio	1.36			

Description: SANDSTONE (MOH'S - 1)

LL =	PL =	PI =	GS=	**Type:** Sandstone

Project No.: 19636.040
Date: 9-14-07
Remarks:
Lab No. 9979

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

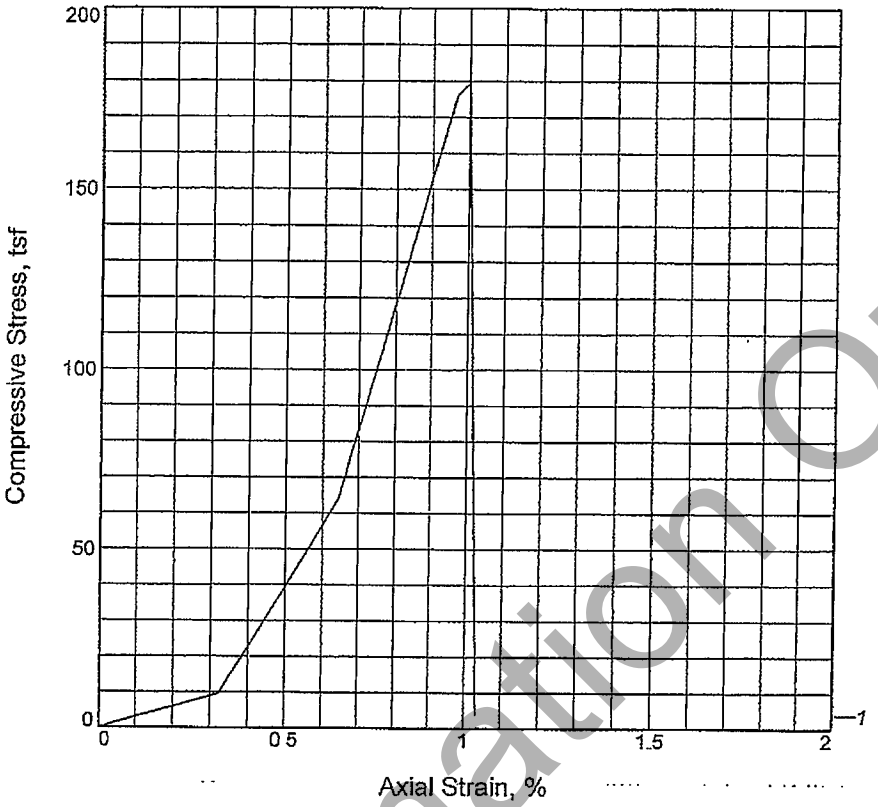
Source of Sample: VIAIL- 105 **Depth:** 18.0-18.4'
Sample Number: RUN-2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	179.4712			
Undrained shear strength, tsf	89.7356			
Failure strain,	1.0			
Strain rate, in./min.	0.500			
Water content, %	3.3			
Wet density, pcf	121.5			
Dry density, pcf	117.6			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	3.100			
Height/diameter ratio	1.68			

Description: SANDSTONE (MOH'S - 1)

LL =	PL =	PI =	GS=	Type:

Project No.: 19636.040
Date: 9-14-07

Remarks:
Lab No. 9980

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

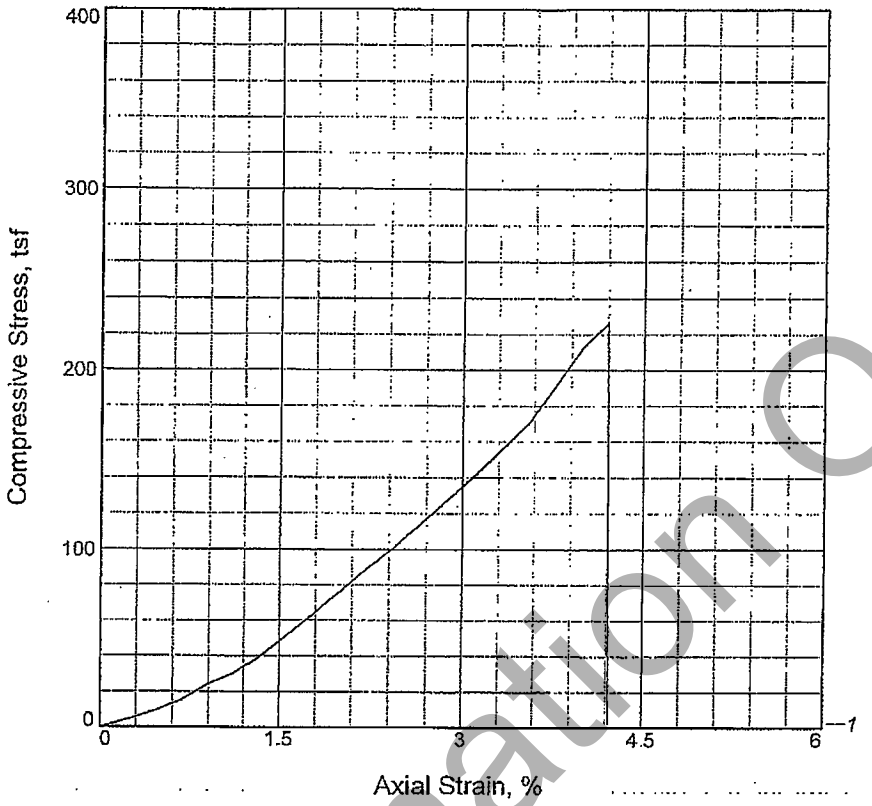
Source of Sample: VIAIL- 105 **Depth:** 30.2-30.8'
Sample Number: RUN-4

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	226.1919			
Undrained shear strength, tsf	113.0959			
Failure strain,	4.2			
Strain rate, in./min.	0.500			
Water content, %	0.6			
Wet density, pcf	123.3			
Dry density, pcf	122.5			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.880			
Specimen height, in.	4.500			
Height/diameter ratio	2.39			

Description: SANDSTONE (MOH'S - 4)

LL =	PL =	PI =	GS=	**Type:** Sandstone

Project No.: 19636.040
Date: 9-14-07
Remarks:
Lab No. 9981

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

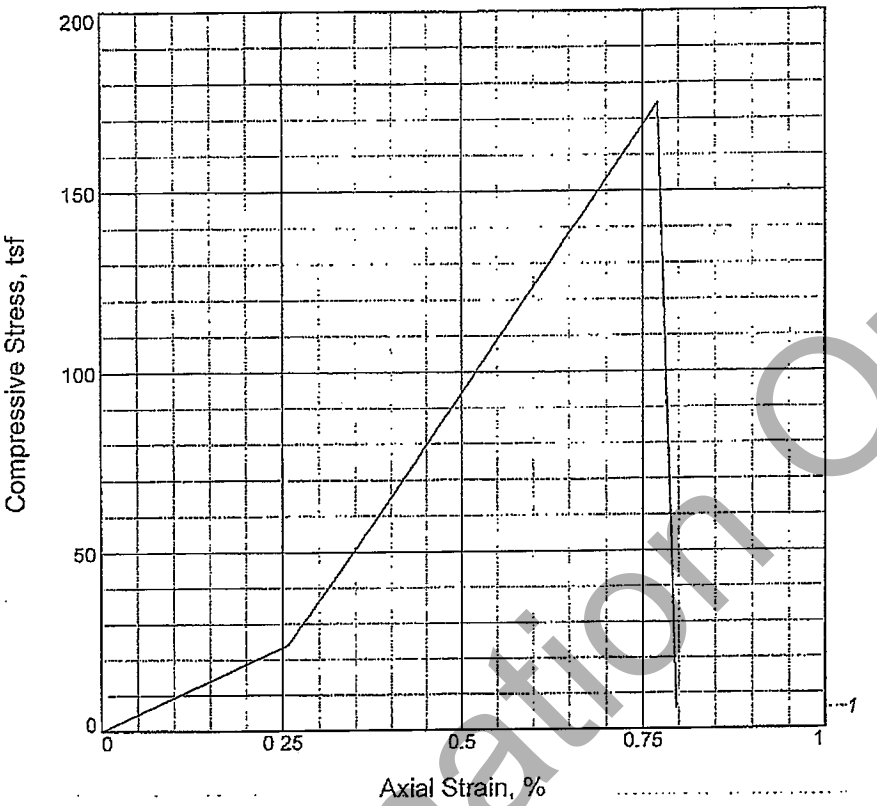
Source of Sample: VIAIL-106 **Depth:** 17.7-18.8'
Sample Number: RUN-2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	174.5702			
Undrained shear strength, tsf	87.2851			
Failure strain,	0.8			
Strain rate, in./min.	0.500			
Water content, %	1.2			
Wet density, pcf	124.5			
Dry density, pcf	123.0			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	3.890			
Height/diameter ratio	2.10			

Description: SANDSTONE (MOH'S - 4)

LL =	PL =	PI =	GS=	**Type:** Sandstone

Project No.: 19636.040
Date: 9-14-07
Remarks:
Lab No. 9982

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

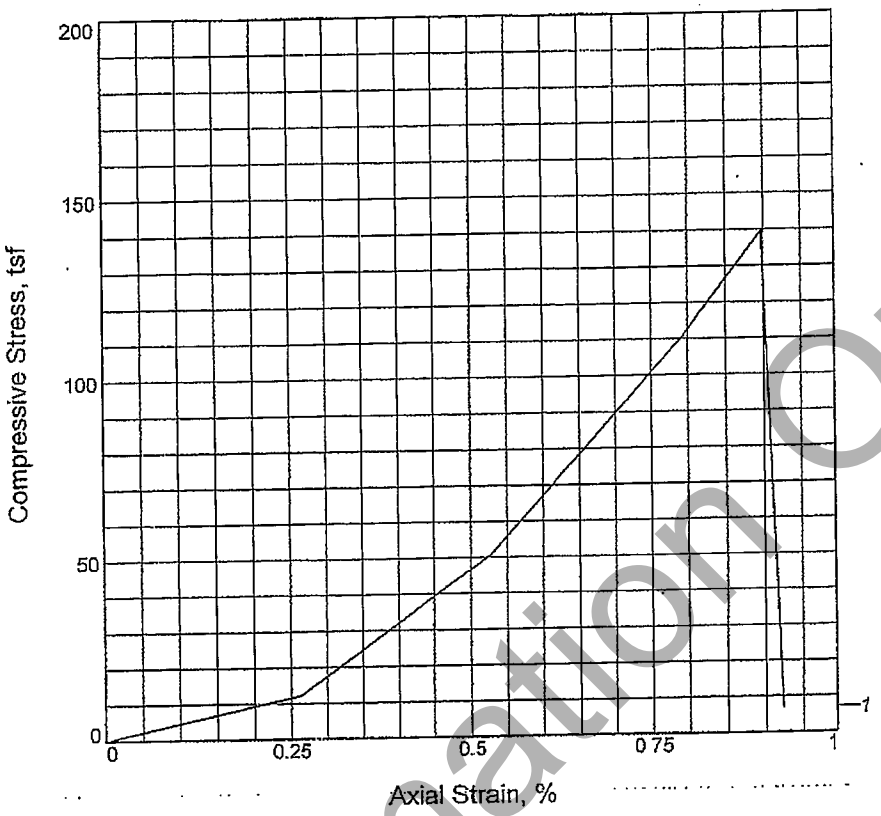
Source of Sample: VIAIL-107 **Depth:** 22-22.8'
Sample Number: RUN-3

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	139.5745			
Undrained shear strength, tsf	69.7873			
Failure strain,	0.9			
Strain rate, in./min.	0.500			
Water content, %	1.0			
Wet density, pcf	129.9			
Dry density, pcf	128.7			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	3.790			
Height/diameter ratio	2.05			

Description: SANDSTONE (MOH'S - 3)

LL =	PL =	PI =	GS=	Type:

Project No.: 19636.040
Date: 9-14-07
Remarks:
Lab No. 9983

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

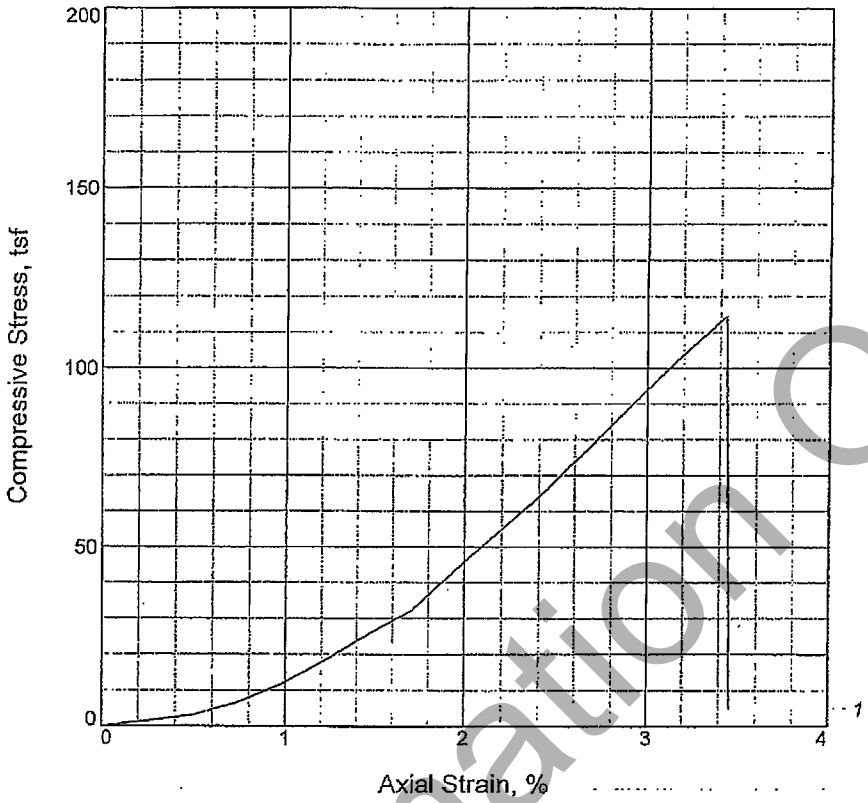
Source of Sample: VIAIL-108 **Depth:** 23.4-23.8'
Sample Number: RUN-3

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	114.6349			
Undrained shear strength, tsf	57.3174			
Failure strain,	3.4			
Strain rate, in./min.	0.500			
Water content, %	4.5			
Wet density, pcf	127.8			
Dry density, pcf	122.3			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.840			
Specimen height, in.	4.110			
Height/diameter ratio	2.23			

Description: SANDSTONE (MOH'S - 2)

LL =	PL =	PI =	GS=	Type: Sandstone

Project No.: 19636.040
Date: 9-14-07
Remarks:
Lab No.9984

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

Source of Sample: VIAIL- 109 **Depth:** 29.8-30.2'
Sample Number: RUN-2

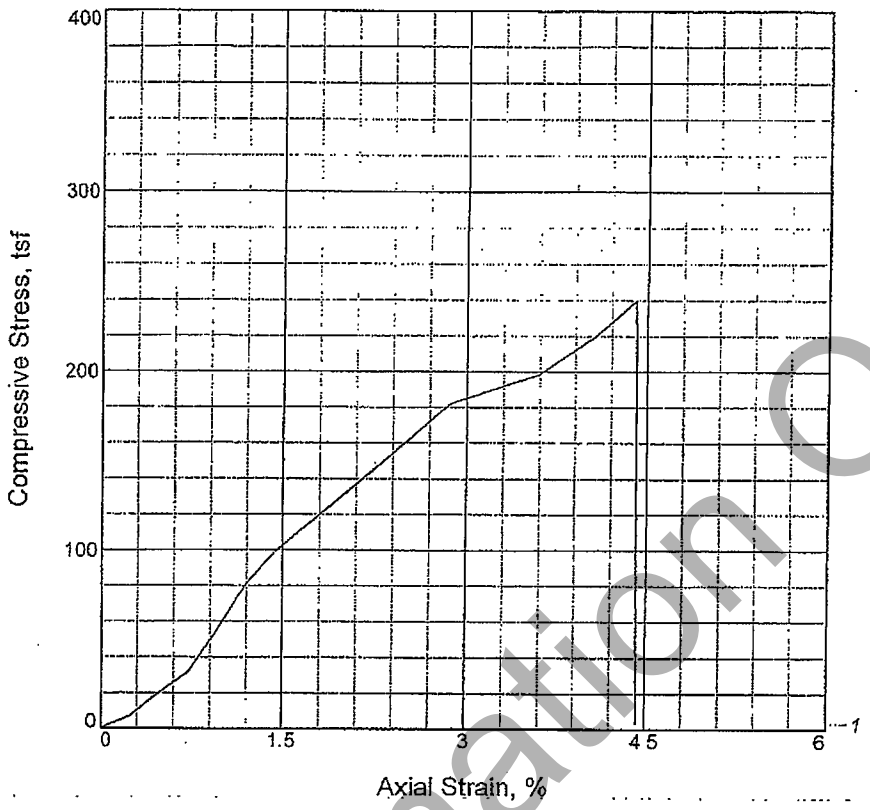
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: JB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	239.8807			
Undrained shear strength, tsf	119.9403			
Failure strain,	4.4			
Strain rate, in./min.	0.500			
Water content, %	0.2			
Wet density, pcf	116.8			
Dry density, pcf	116.6			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	4.180			
Height/diameter ratio	2.26			

Description: SANDSTONE (MOH'S - 1)

LL =	PL =	PI =	GS=	Type: Sandstone

Project No.: 19636.040
Date: 9-14-07
Remarks:
Lab No. 9985

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

Source of Sample: VIAIL- 110 **Depth:** 32-32.8'
Sample Number: RUN-3

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: JB **Checked By:** GS

H.C. Nutting Company
611 Lunken Park Dr.
Cincinnati, Ohio 45226

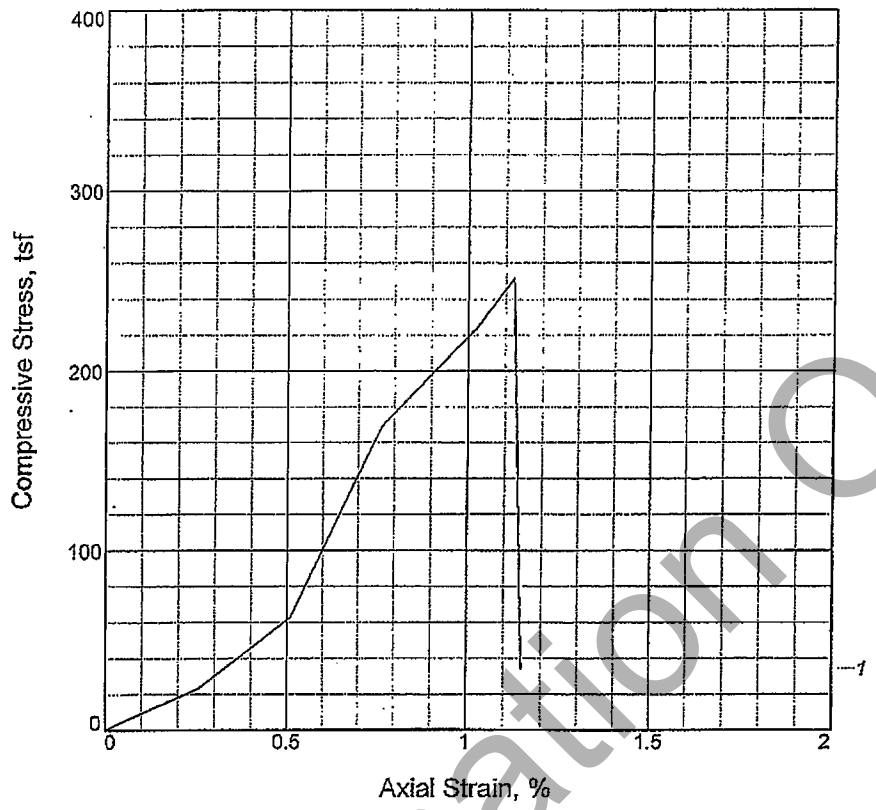
Terracon
I-74 Crossing-Bettendorf-Moline (Job #07045052)
Baettendorf, Iowa
HCN W.O. #19636.040

TABLE II: TABULATION OF UNDISTURBED DATA

Lab No.	Boring No.	Sample No.	Depth (ft.)	Unconfined Strength (tsf)	Material Description	Moh's Hardness	Failure Strain (%)	Dry Density (pcf)	Water Content (%)	Remarks
10167	RW165-02	T3	17-19	---	Sandy lean clay (bott)			87.0	34.1	Cv
10168	RW165-04	T2	7-9	---	Silty clay			107.0	18.7	Cv
10163	SC1002A	T1	11-13	---	Silty clay with sand			104.6	23.8	Cv
10164	SC1009	T2	11-13	---	Silty clay			106.5	25.6	Cv
10165	SC1001	T1	5-7	---	Sandy lean clay tr/gravel			111.4	18.0	Cv
10166	SC1008	T4	19-21	---	Silty clay			108.5	20.7	Cv
10292	VIAIL-111	Run 3	26-27	251.7	Limestone	7	1.1	159.7	1.6	Unc
10293	VIAIL-112	Run 2	21-22	256.0	Sandstone	4	1.2	119.3	7.1	Unc
10294	VIAIL-113	Run 2	19-20	516.8	Limestone	6	1.3	161.4	0.0	Unc
10295	VIAIL-114	Run 2	24-25	712.5	Limestone	7	1.5	161.6	0.1	Unc
10296	VIAIL-115	Run 3	27-28	813.1	Limestone	7	1.8	164.9	0.0	Unc
10298	VIAIL-118	Run 1	18-20	647.8	Limestone	7	1.2	164.7	0.4	Unc
10297	VIAIL-120	Run 2	29-30	264.2	Sandstone	4	1.2	148.7	1.5	Unc
10299	PRMPD-04	Run 2	23-24	321.8	Sandstone	2	1.4	119.4	9.1	Unc
10300	PRMPD-05	Run 3	26-27	1084.2	Limestone	8	1.2	166.2	0.0	Unc
10301	PRMPD-06	Run 3	22-23	792.6	Limestone	7	1.3	163.4	0.1	Unc

2tb 9-21-07

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	251.7116			
Undrained shear strength, tsf	125.8558			
Failure strain,	1.1			
Strain rate, in./min.	0.500			
Water content, %	1.6			
Wet density, pcf	162.2			
Dry density, pcf	159.7			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	3.920			
Height/diameter ratio	2.12			

Description: LIMESTONE (MOH'S - 7)

LL =	PL =	PI =	GS=	**Type:** Limestone

Project No.: 19636.040
Date: 9-21-07
Remarks:
Lab No. 10292

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

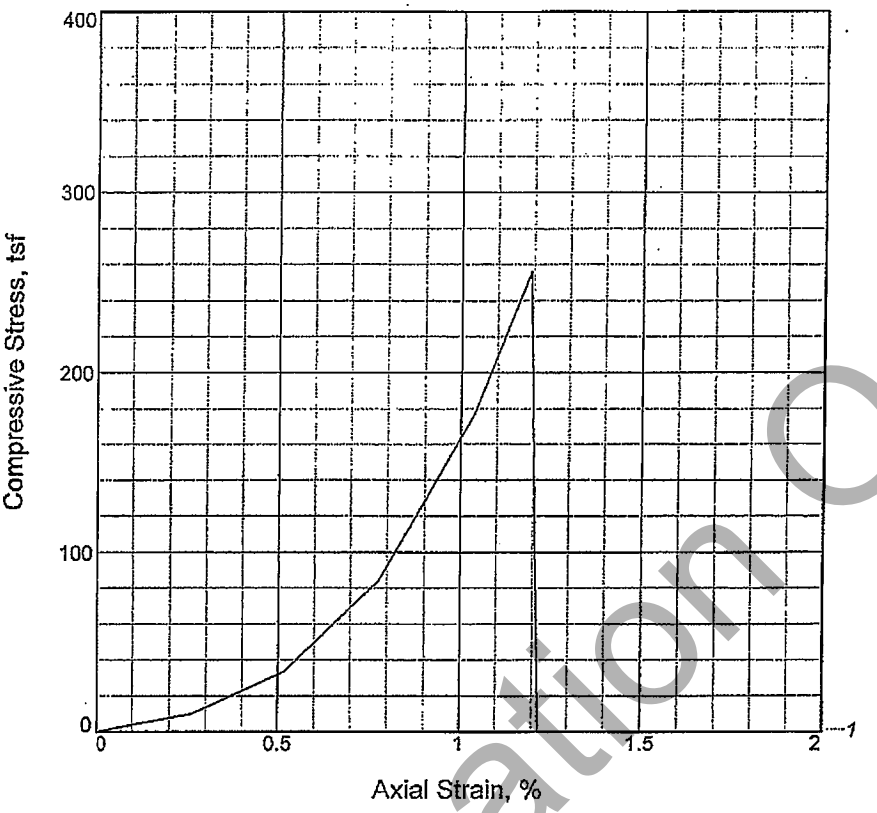
Source of Sample: VIAIL-111 **Depth:** 26.4-26.8'
Sample Number: RUN-3

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: SV **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	256.0119			
Undrained shear strength, tsf	128.0059			
Failure strain,	1.2			
Strain rate, in./min.	0.500			
Water content, %	7.1			
Wet density, pcf	127.8			
Dry density, pcf	119.3			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.860			
Specimen height, in.	3.860			
Height/diameter ratio	2.08			

Description: SANDSTONE (MOH'S - 4)

LL =	PL =	PI =	GS=	Type: Sandstone

Project No.: 19636.040
Date: 9-21-07
Remarks:
Lab No. 10293

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

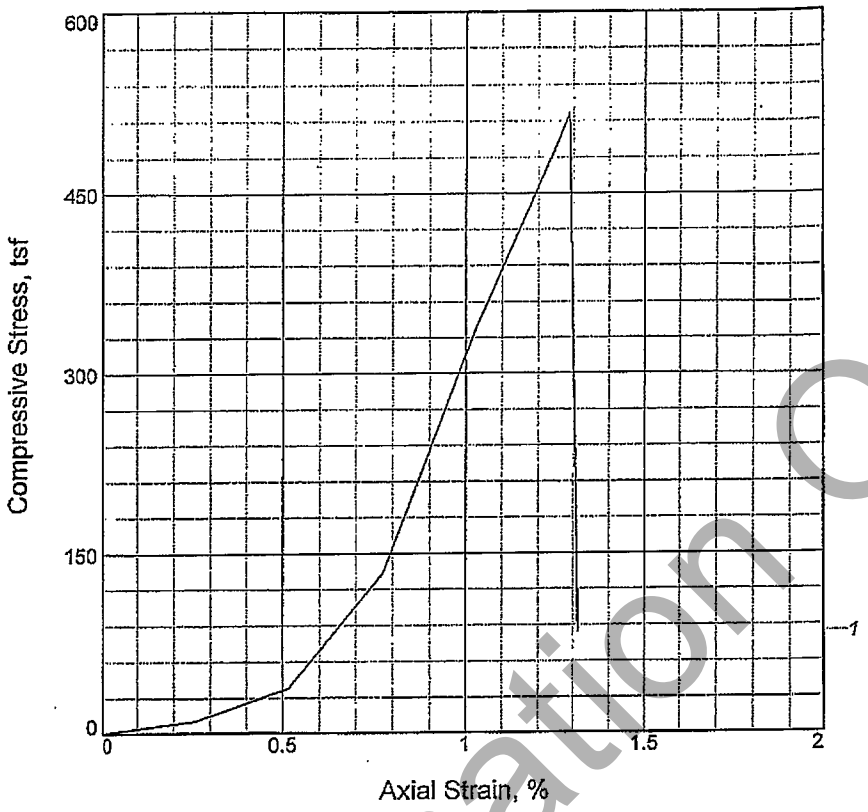
Source of Sample: VIAIL-112 **Depth:** 21.3-21.8'
Sample Number: RUN-2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: SV **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	516.7786			
Undrained shear strength, tsf	258.3893			
Failure strain,	1.3			
Strain rate, in./min.	0.500			
Water content, %	0.0			
Wet density, pcf	161.5			
Dry density, pcf	161.4			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.870			
Specimen height, in.	3.880			
Height/diameter ratio	2.07			

Description: LIMESTONE (MOH'S - 6)

LL =	PL =	PI =	GS=	**Type:** Limestone

Project No.: 19636.040
Date: 9-21-07
Remarks:
Lab No. 10294

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

Source of Sample: VIAIL-113 **Depth:** 18.4-19'
Sample Number: RUN-2

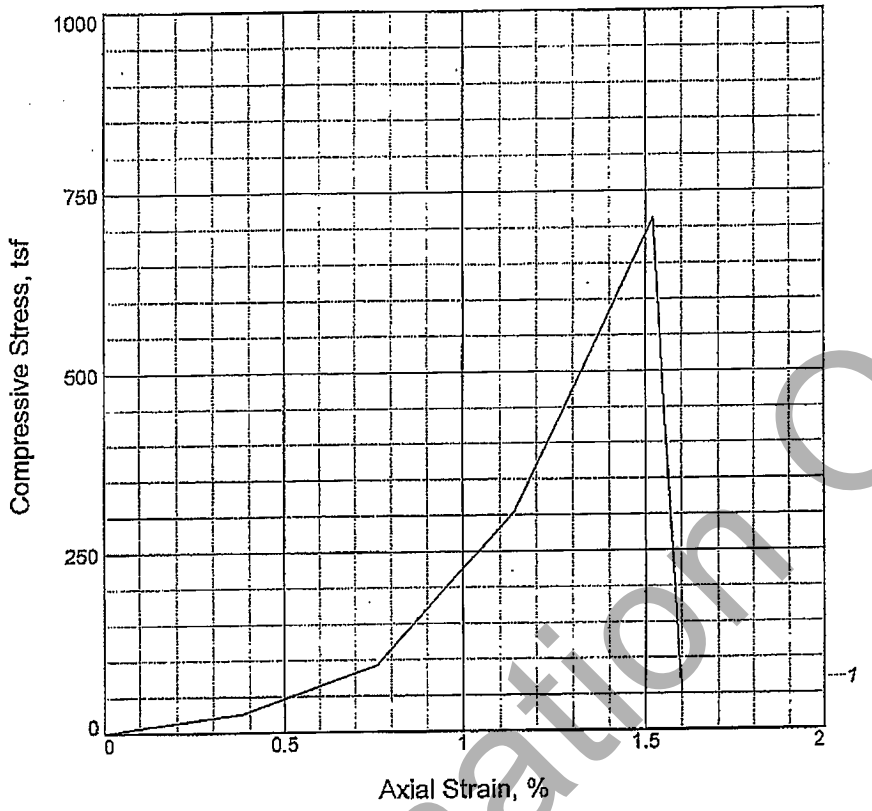
UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Figure _____

Tested By: SV **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	712.5453			
Undrained shear strength, tsf	356.2727			
Failure strain,	1.5			
Strain rate, in./min.	0.500			
Water content, %	0.1			
Wet density, pcf	161.7			
Dry density, pcf	161.6			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.870			
Specimen height, in.	2.630			
Height/diameter ratio	1.41			

Description: LIMESTONE (MOH'S - 7)

LL =	PL =	PI =	GS=	**Type:** Limestone

Project No.: 19636.040
Date: 9-21-07
Remarks:
Lab No. 10295

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

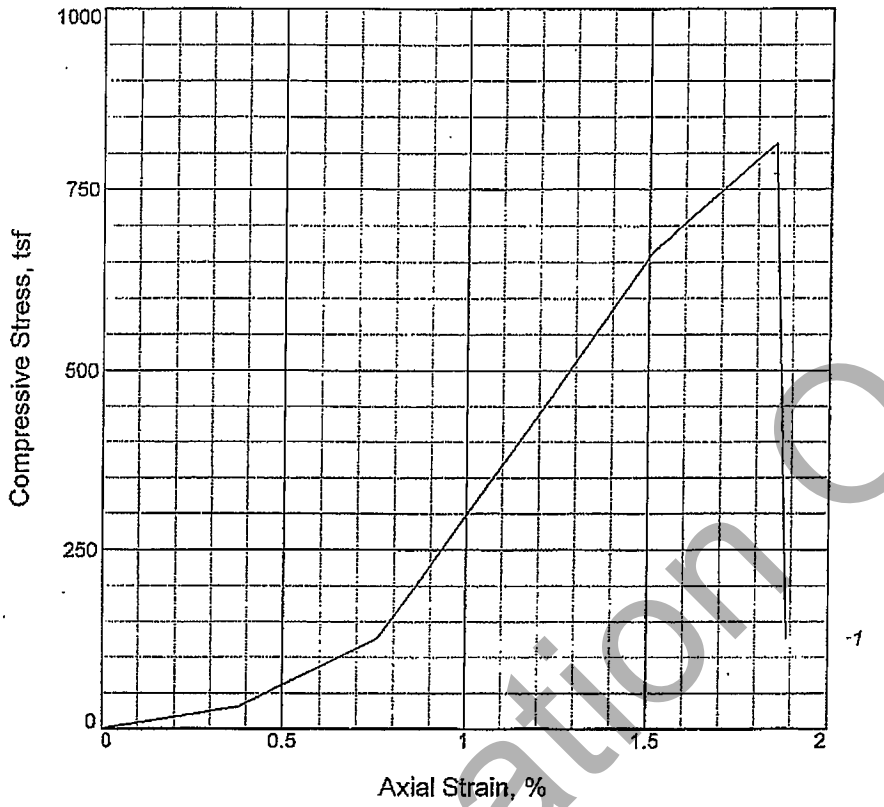
Source of Sample: VIAIL-114 **Depth:** 23.8-24.6'
Sample Number: RUN-2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: SV **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	813.1291			
Undrained shear strength, tsf	406.5646			
Failure strain,	1.8			
Strain rate, in./min.	0.500			
Water content, %	0.0			
Wet density, pcf	165.0			
Dry density, pcf	164.9			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	2.650			
Height/diameter ratio	1.43			

Description: LIMESTONE (MOH'S - 7)

LL =	PL =	PI =	GS=	Type: Limestone

Project No.: 19636.040
Date: 9-21-07
Remarks:
Lab No. 10296

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

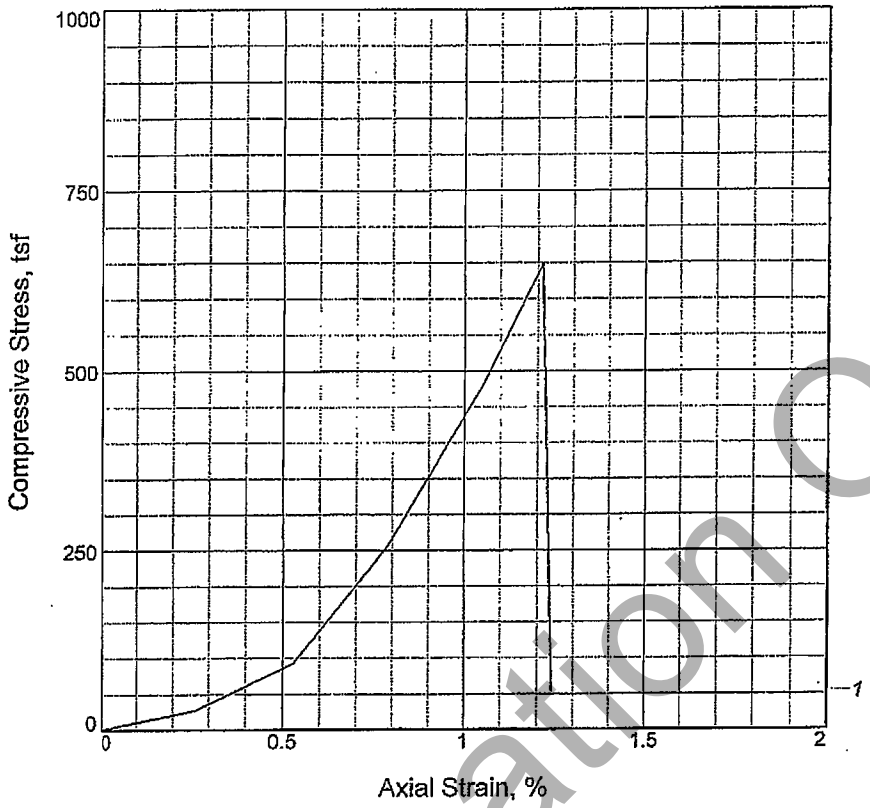
Source of Sample: VIAIL-115 **Depth:** 27.25-28.4'
Sample Number: RUN-3

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: SV **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	647.8549			
Undrained shear strength, tsf	323.9274			
Failure strain,	1.2			
Strain rate, in./min.	0.500			
Water content, %	0.4			
Wet density, pcf	165.3			
Dry density, pcf	164.7			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.840			
Specimen height, in.	3.790			
Height/diameter ratio	2.06			

Description: LIMESTONE (MOH'S - 7)

LL =	PL =	PI =	GS=	Type: Limestone

Project No.: 19636.040
Date: 9-21-07
Remarks:
Lab No. 10298

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

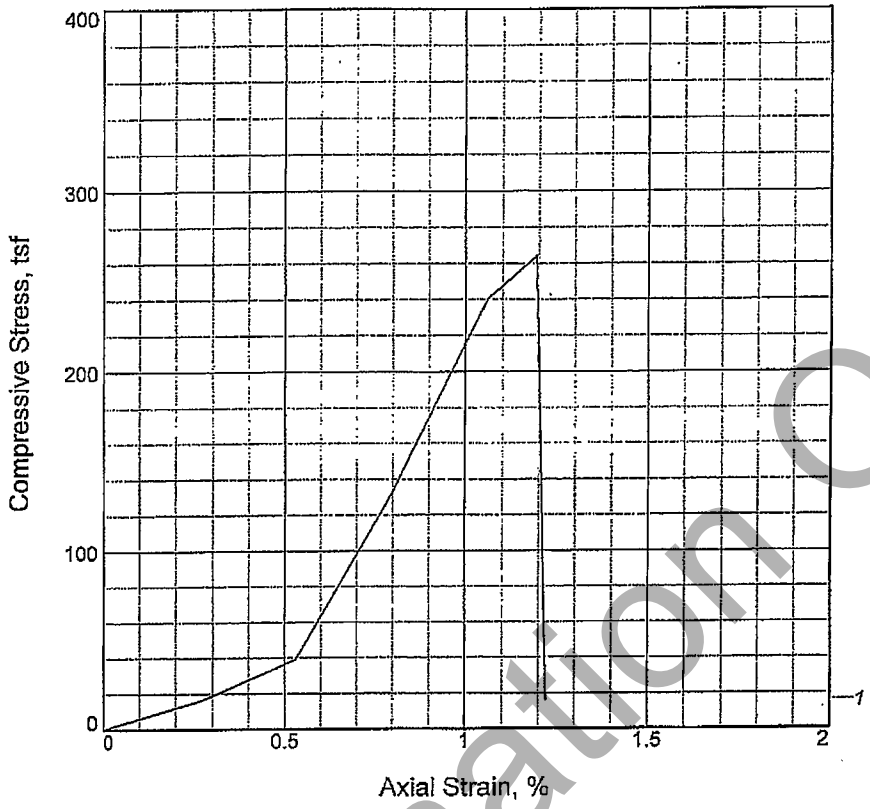
Source of Sample: VIAIL-118 **Depth:** 19.5-19.9'
Sample Number: RUN-1

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: SV **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	264.2512			
Undrained shear strength, tsf	132.1256			
Failure strain,	1.2			
Strain rate, in./min.	0.500			
Water content, %	1.5			
Wet density, pcf	150.9			
Dry density, pcf	148.7			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.840			
Specimen height, in.	3.770			
Height/diameter ratio	2.05			

Description: SANDSTONE (MOH'S - 4)

LL =	PL =	PI =	GS=	**Type:** Sandstone

Project No.: 19636.040
Date: 9-21-07
Remarks:
Lab No. 10297

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

Source of Sample: VIAIL-120 **Depth:** 29.5-30'
Sample Number: RUN-2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

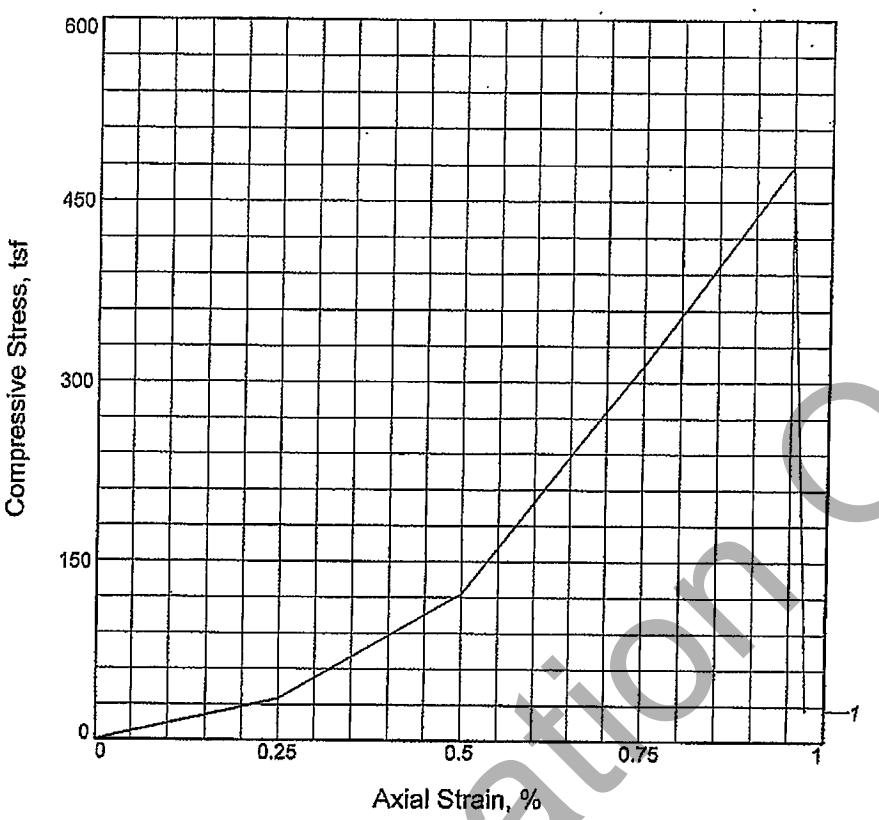
Tested By: SV **Checked By:** GS

C1X13500: Illinois Land Based Borings
Summary of Strength Lab Test Results

11/28/2007
By: KKC

Bore Hole	Sample Number	Depth	Compressive Strength, q_u		Moh's Hardness	Dry Density	Water Content	Comments
		(ft)	(tsf)	(psi)		(pcf)	(%)	
VIAIL-119	RC-3	28.8'-30.7'	478.9	6,652	7 - 8	162.8	0.2	Limestone
VIAIL-121	RC-2	31.0'-31.7'	593.7	8,245	7 - 8	166.2	0.5	Limestone
VIAIL-122	RC-3	38.0'-38.6'	296.6	4,119	7 - 8	162.9	0.4	Limestone
VIAIL-123	RC-2	32.0'-33.0'	652.4	9,060	7 - 8	166.4	0.2	Limestone
VIAIL-124	RC-2	32.2'-32.9'	293.3	4,074	7 - 8	164.9	0.1	Limestone
VIAIL-125	RC-2	35.0'-35.9'	933.4	12,964	4	159.0	0.6	Limestone
VIAIL-126	RC-2	32.5'-33.1'	350.2	4,863	7 - 8	166.4	0.1	Limestone

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	478.9376			
Undrained shear strength, tsf	239.4688			
Failure strain,	0.9			
Strain rate, in./min.	0.500			
Water content, %	0.2			
Wet density, pcf	163.2			
Dry density, pcf	162.8			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	4.000			
Height/diameter ratio	2.16			

Description: LIMESTONE (Moh's - 7-8)

LL =	PL =	PI =	GS=	**Type:** Limestone

Project No.: 19636.040
Date: 11-16-07
Remarks:
Lab No. 12744

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

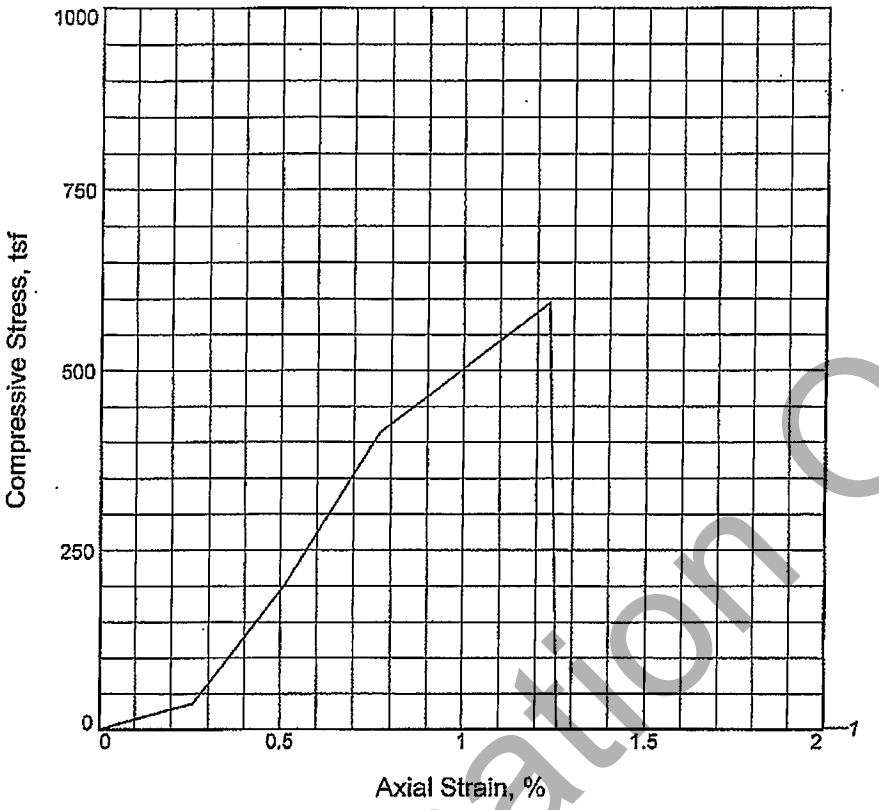
Source of Sample: VIAIL-119 **Depth:** 28.8-30.7'
Sample Number: 3

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: DB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	593.6755			
Undrained shear strength, tsf	296.8377			
Failure strain,	1.2			
Strain rate, in./min.	0.500			
Water content, %	0.5			
Wet density, pcf	167.0			
Dry density, pcf	166.2			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	3.890			
Height/diameter ratio	2.10			

Description: LIMESTONE (Moh's - 7-8).

LL =	PL =	PI =	GS=	Type: Limestone

Project No.: 19636.040
Date: 11-16-07
Remarks:
Lab No. 12745

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

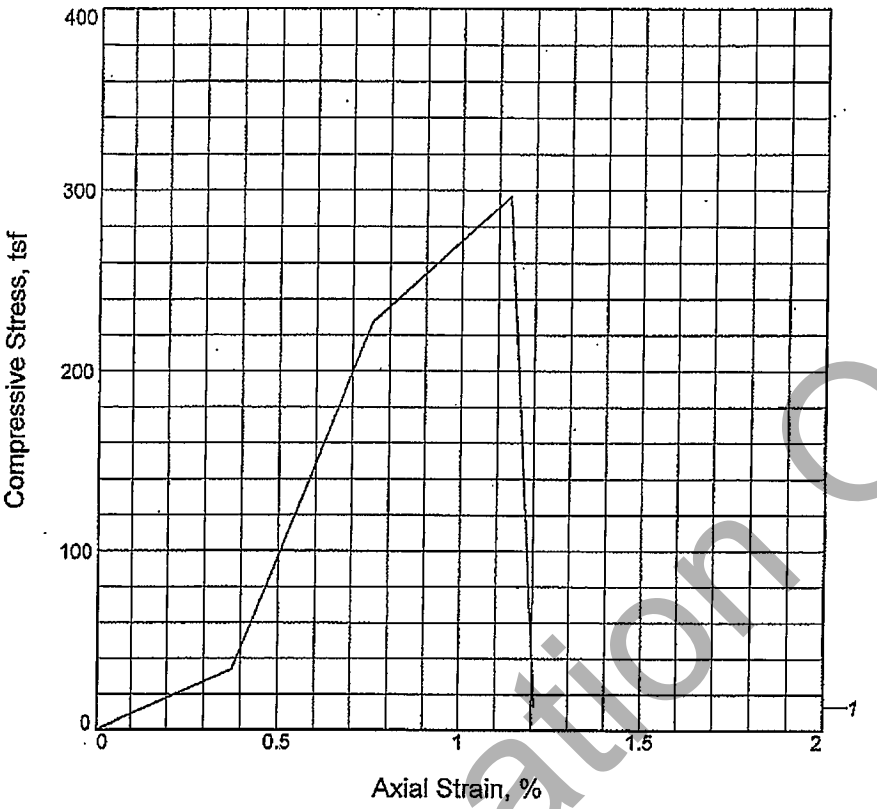
Source of Sample: VIAIL-121 **Depth:** 31-31.7'
Sample Number: 2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: DB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	296.6010			
Undrained shear strength, tsf	148.3005			
Failure strain,	1.1			
Strain rate, in./min.	0.500			
Water content, %	0.4			
Wet density, pcf	163.5			
Dry density, pcf	162.9			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	2.650			
Height/diameter ratio	1.43			

Description: LIMESTONE (Moh's - 7-8)

LL =	PL =	PI =	GS=	Type: Limestone

Project No.: 19636.040
Date: 11-16-07
Remarks:
Lab No. 12746

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

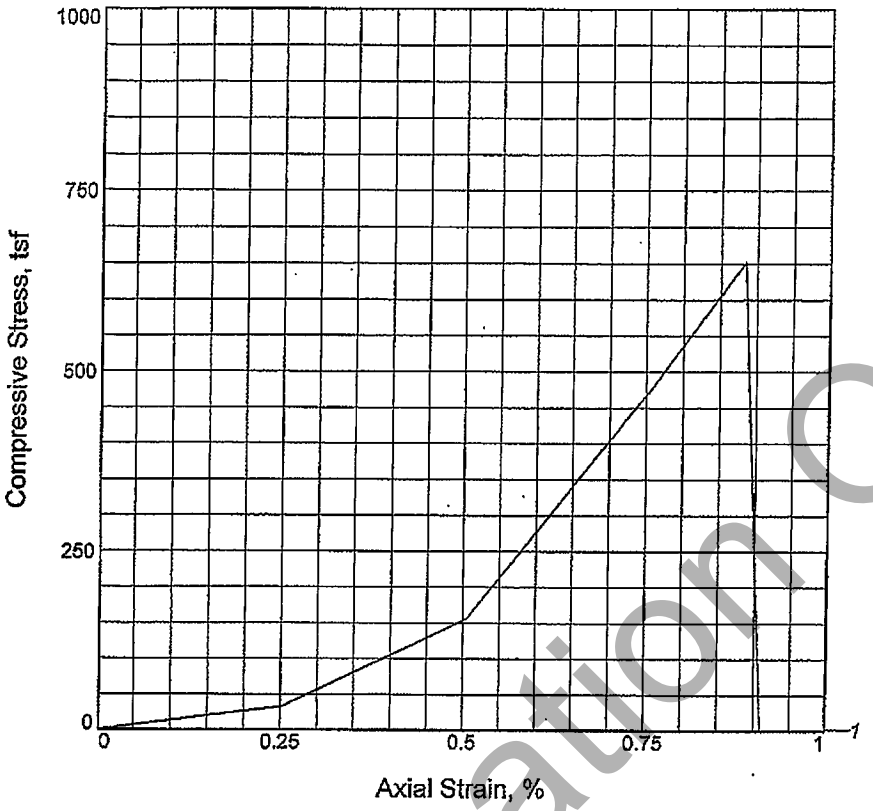
Source of Sample: VIAIL-122 **Depth:** 38-38.6'
Sample Number: 3

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: DB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	652.3532			
Undrained shear strength, tsf	326.1766			
Failure strain,	0.9			
Strain rate, in./min.	0.500			
Water content, %	0.2			
Wet density, pcf	166.8			
Dry density, pcf	166.4			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.840			
Specimen height, in.	3.960			
Height/diameter ratio	2.15			

Description: LIMESTONE (Moh's - 7-8)

LL =	PL =	PI =	GS=	Type: Limestone

Project No.: 19636.040
Date: 11-16-07
Remarks:
Lab No. 12747

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

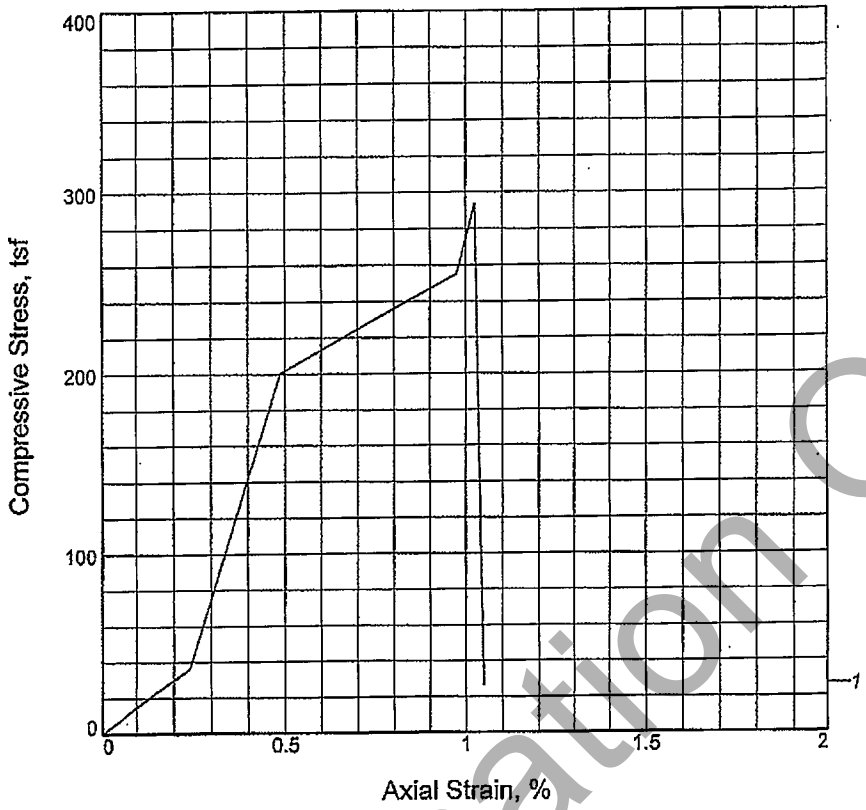
Source of Sample: VIAIL-123 **Depth:** 32-33'
Sample Number: 2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: DB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	293.3185			
Undrained shear strength, tsf	146.6593			
Failure strain,	1.0			
Strain rate, in./min.	0.500			
Water content, %	0.1			
Wet density, pcf	165.2			
Dry density, pcf	164.9			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	4.100			
Height/diameter ratio	2.22			

Description: LIMESTONE (Moh's - 7-8)

LL =	PL =	PI =	GS=	Type: Limestone

Project No.: 19636.040
Date: 11-16-07
Remarks:
Lab No. 12748

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

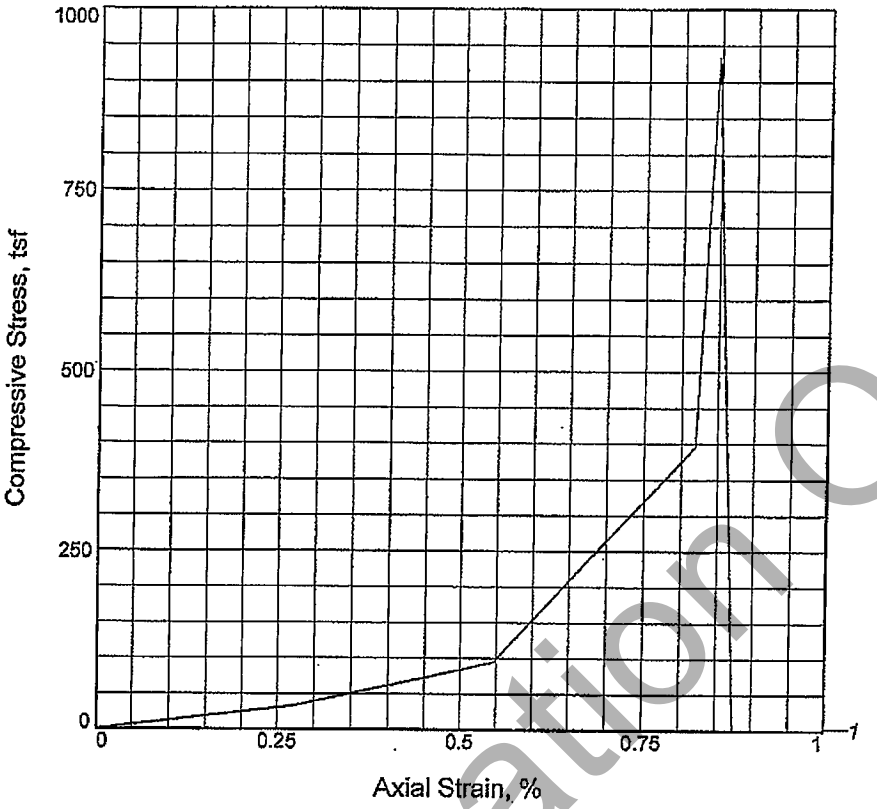
Source of Sample: VIAIL-124 **Depth:** 32.2-32.9'
Sample Number: 2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: DB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	933.3995			
Undrained shear strength, tsf	466.6998			
Failure strain,	0.8			
Strain rate, in./min.	0.500			
Water content, %	0.6			
Wet density, pcf	160.0			
Dry density, pcf	159.0			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.840			
Specimen height, in.	3.660			
Height/diameter ratio	1.99			

Description: LIMESTONE (Moh's - 4)

LL =	PL =	PI =	GS=	Type: Limestone

Project No.: 19636.040
Date: 11-16-07
Remarks:
Lab No. 12749

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

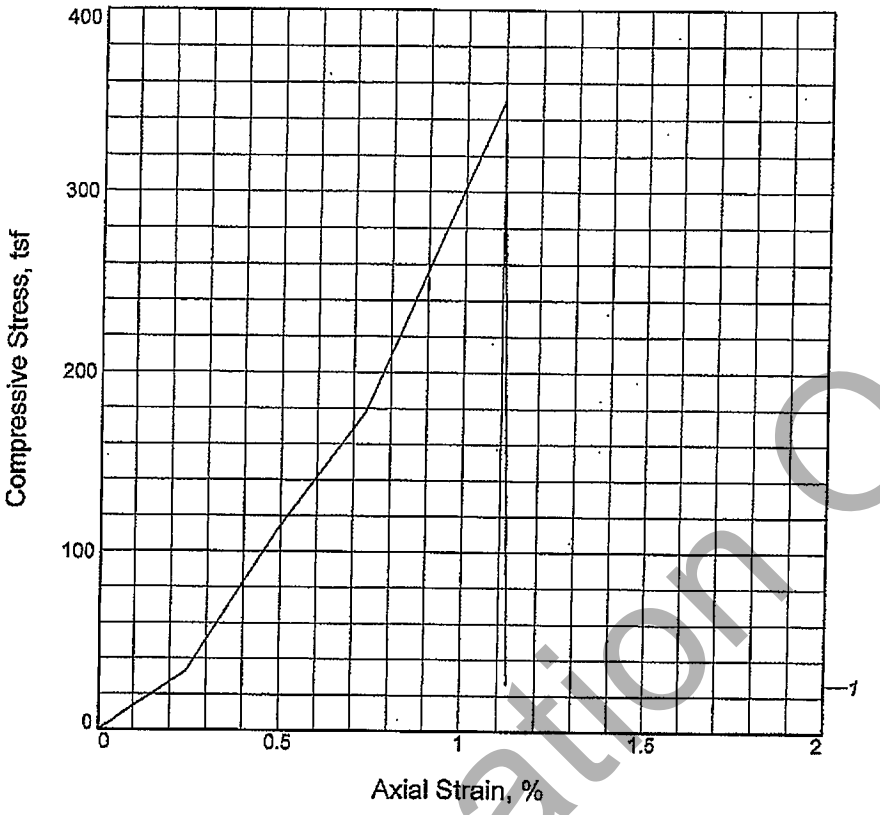
Source of Sample: VIAIL-125 **Depth:** 35-35.9'
Sample Number: 2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

Tested By: DB **Checked By:** GS

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	350.1548			
Undrained shear strength, tsf	175.0774			
Failure strain,	1.1			
Strain rate, in./min.	0.500			
Water content, %	0.1			
Wet density, pcf	166.6			
Dry density, pcf	166.4			
Saturation, %	N/A			
Void ratio	N/A			
Specimen diameter, in.	1.850			
Specimen height, in.	4.090			
Height/diameter ratio	2.21			

Description: LIMESTONE (Moh's - 7-8)

LL =	PL =	PI =	GS=	**Type:** Limestone

Project No.: 19636.040
Date: 11-16-07
Remarks:
Lab No. 12750

Figure _____

Client: TERRACON (#07045052)

Project: I-74 CROSSING-BETTENDORF-MOLINE

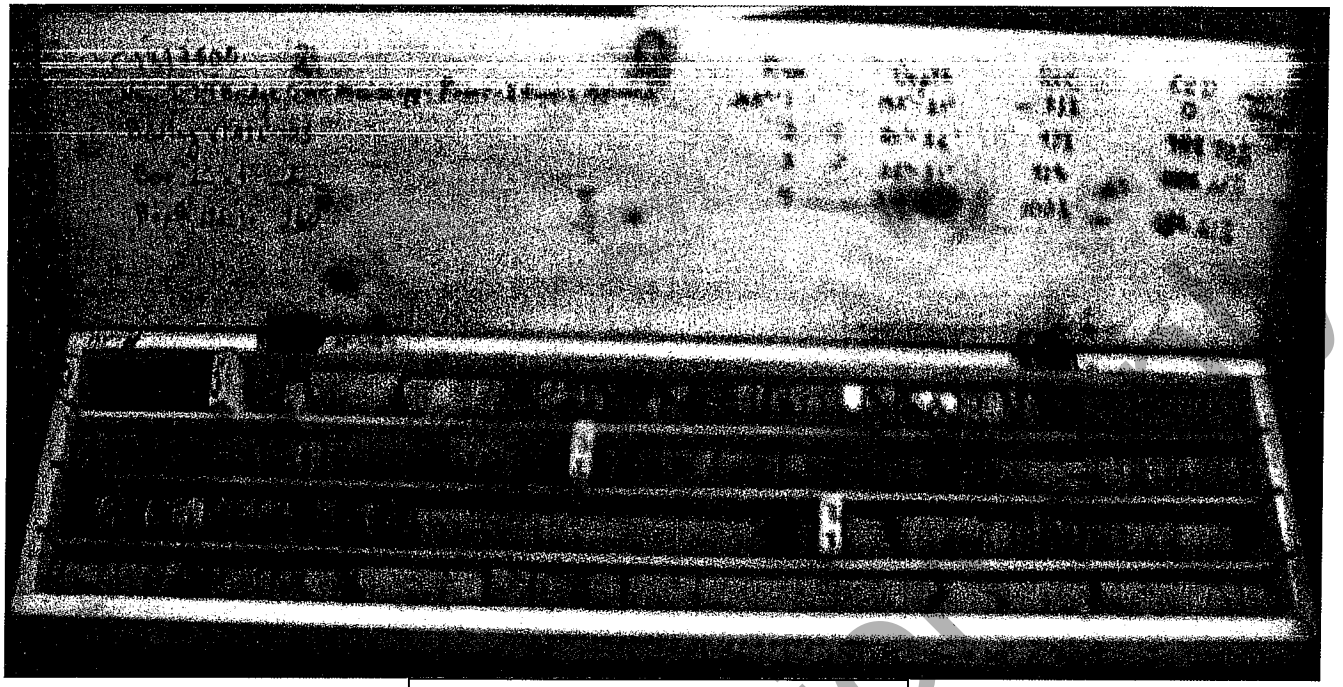
Source of Sample: VIAIL-126 **Depth:** 32.5-33.1'
Sample Number: 2

UNCONFINED COMPRESSION TEST

H. C. NUTTING COMPANY

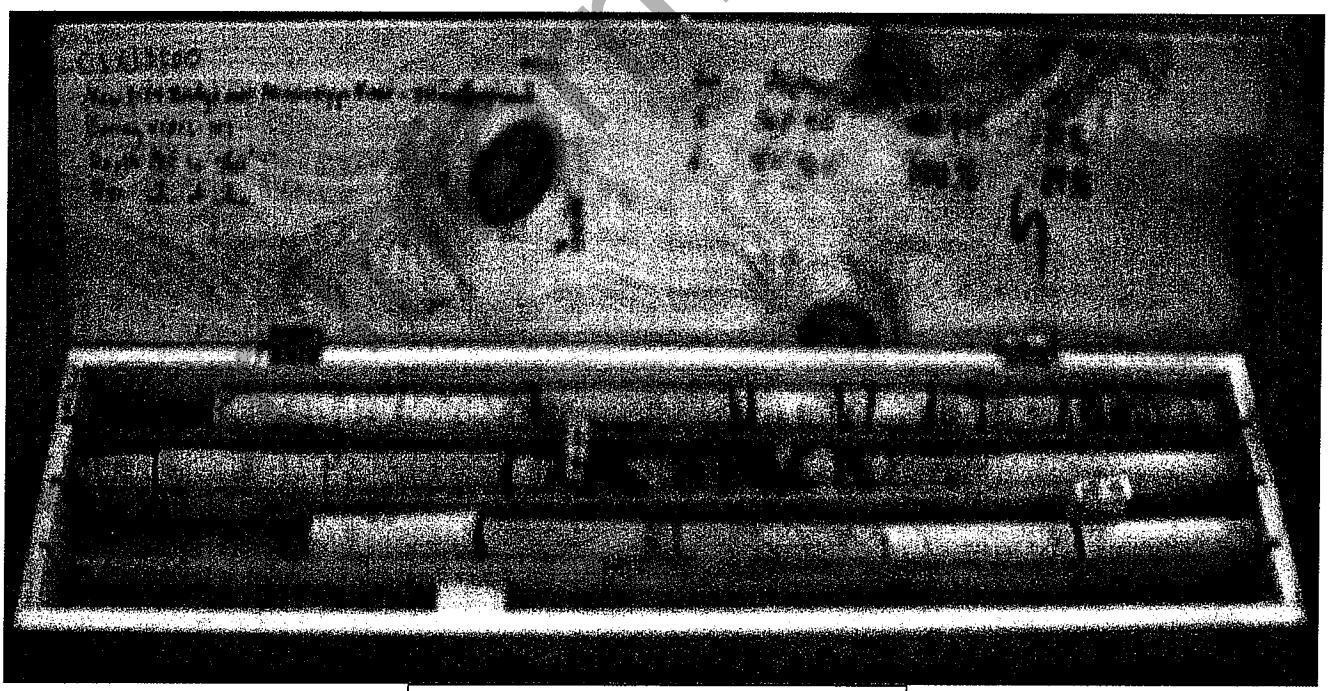
Tested By: DB **Checked By:** GS

ROCK CORE PHOTOGRAPHS



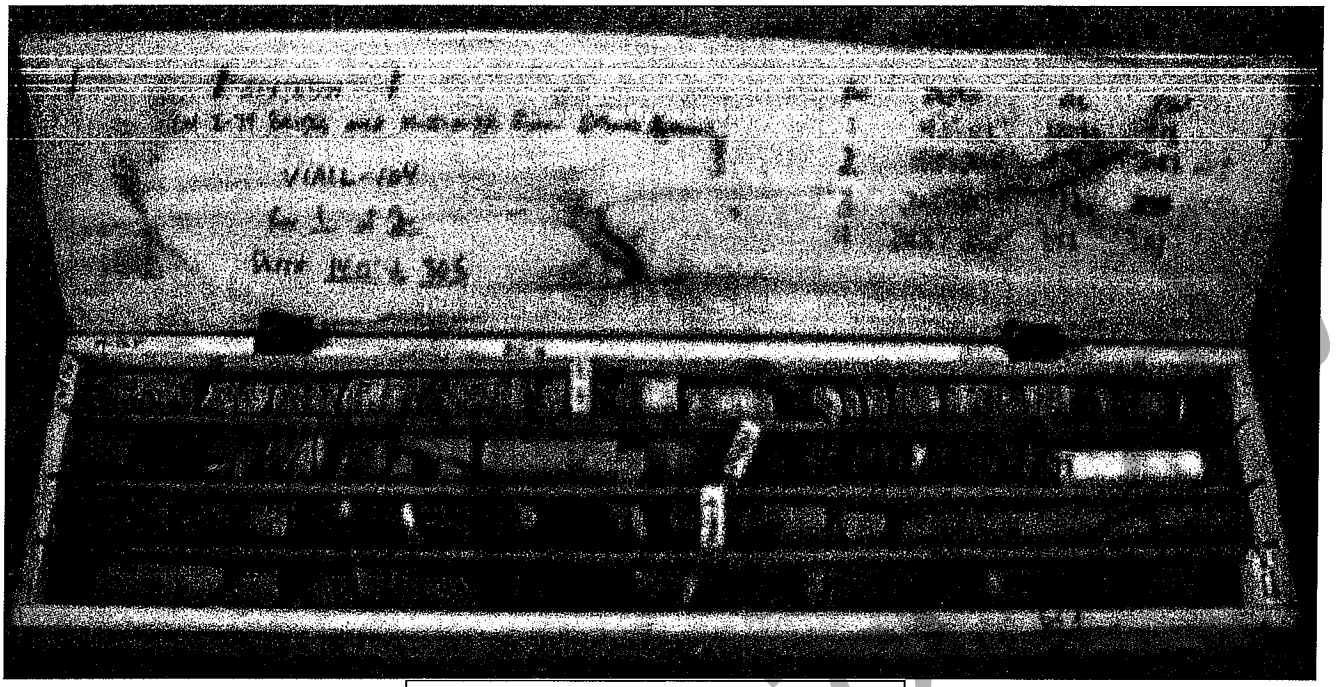
Boring VIAIL-103

Run	Depth (ft)	REC (%)	RQD (%)
1	19.5 – 21.0	33	0
2	21.0 – 26.0	97	90
3	26.0 – 31.0	92	66
4	31.0 – 36.0	100	61



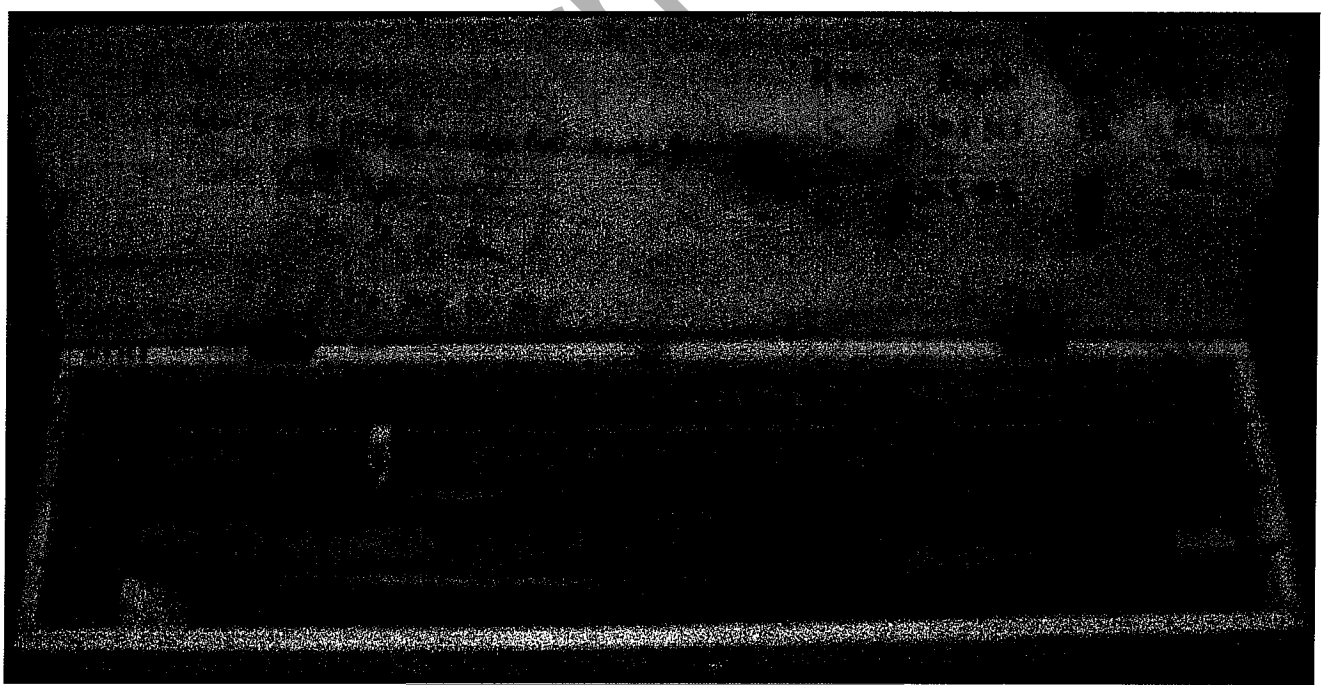
Boring VIAIL-103

Run	Depth (ft)	REC (%)	RQD (%)
5	36.0 – 41.0	99	78
6	41.0 – 46.0	100	89



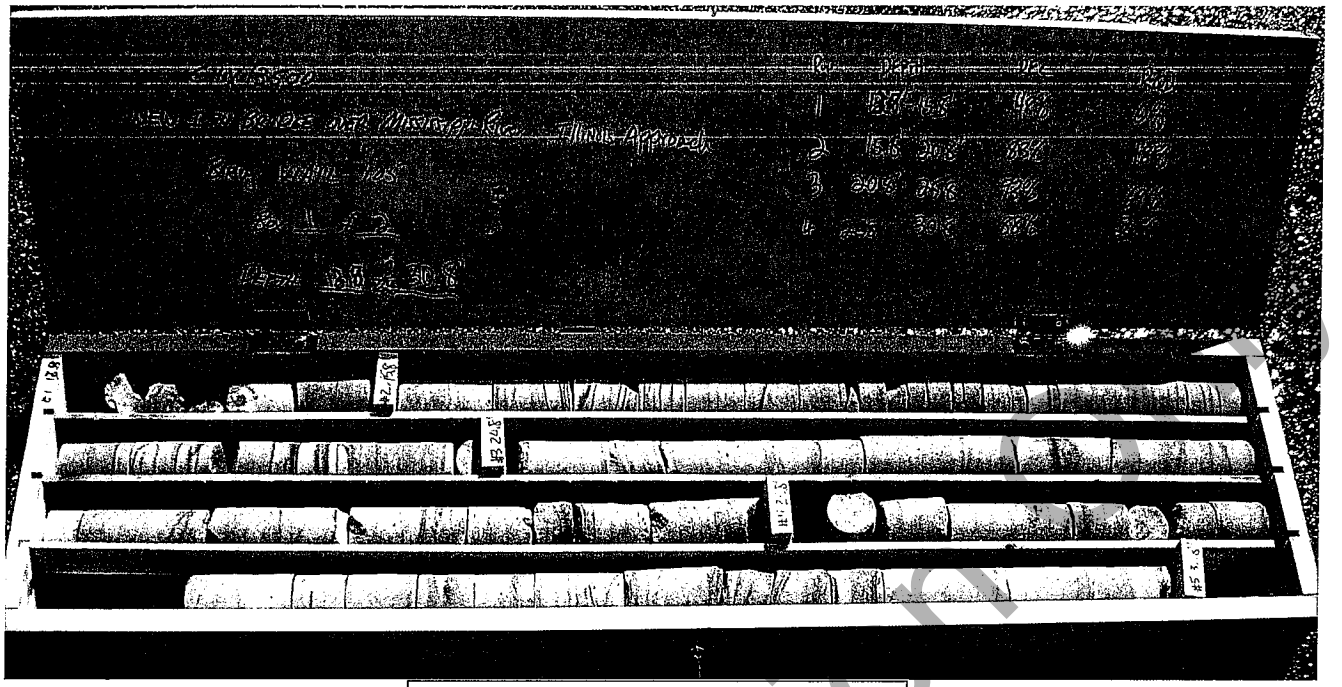
Boring VIAIL-104

Run	Depth (ft)	REC (%)	RQD (%)
1	14.0 – 15.5	100	51
2	15.5 – 20.5	85	21
3	20.5 – 25.5	73	40
4	25.5 – 30.5	98	38



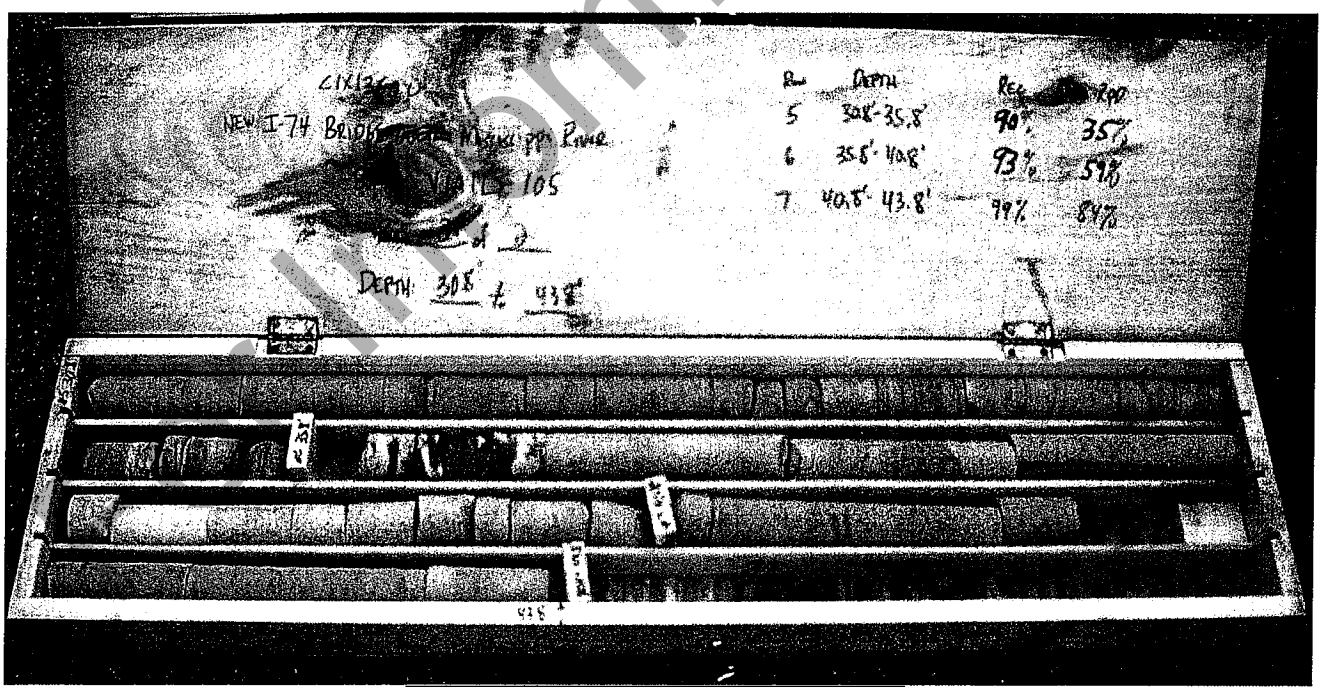
Boring VIAIL-104

Run	Depth (ft)	REC (%)	RQD (%)
5	30.5 – 35.5	98	87
6	35.5 – 40.5	98	62



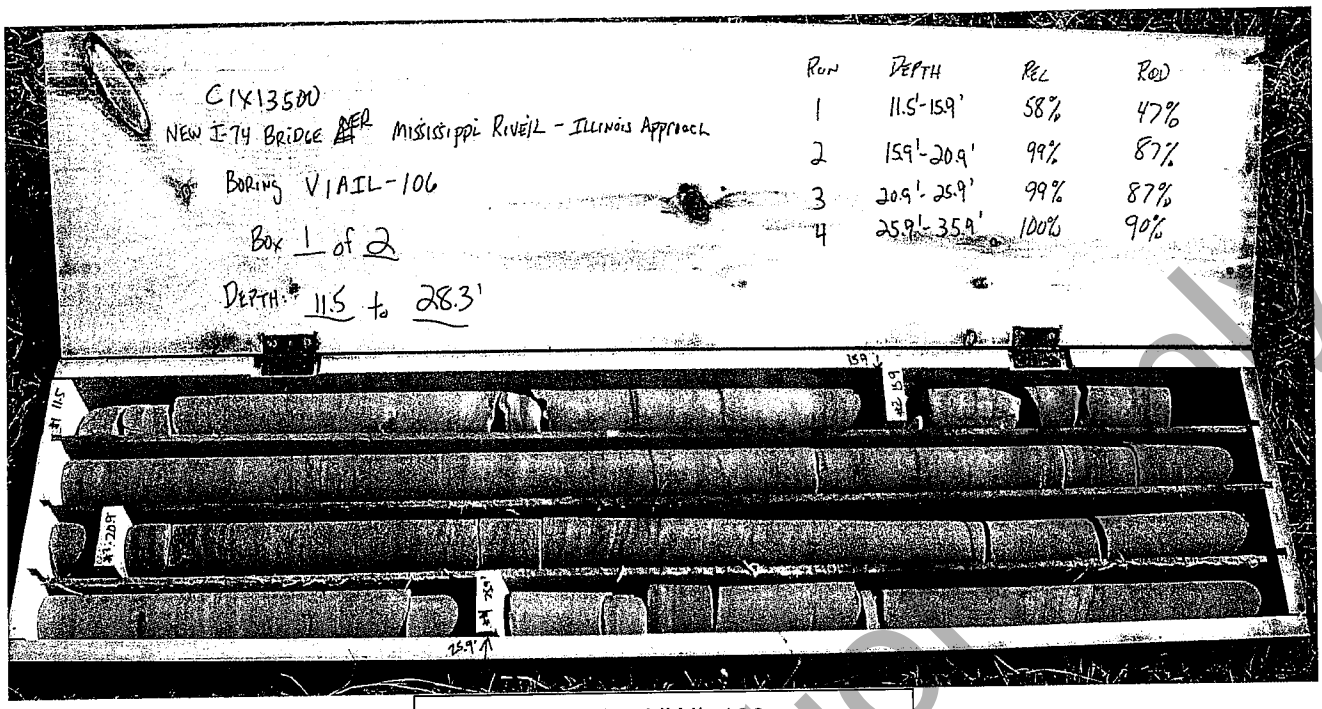
Boring VIAIL-105

Run	Depth (ft)	REC (%)	RQD (%)
1	13.8 – 15.8	48	0
2	15.8 – 20.8	83	18
3	20.8 – 25.8	93	69
4	25.8 – 30.8	88	26



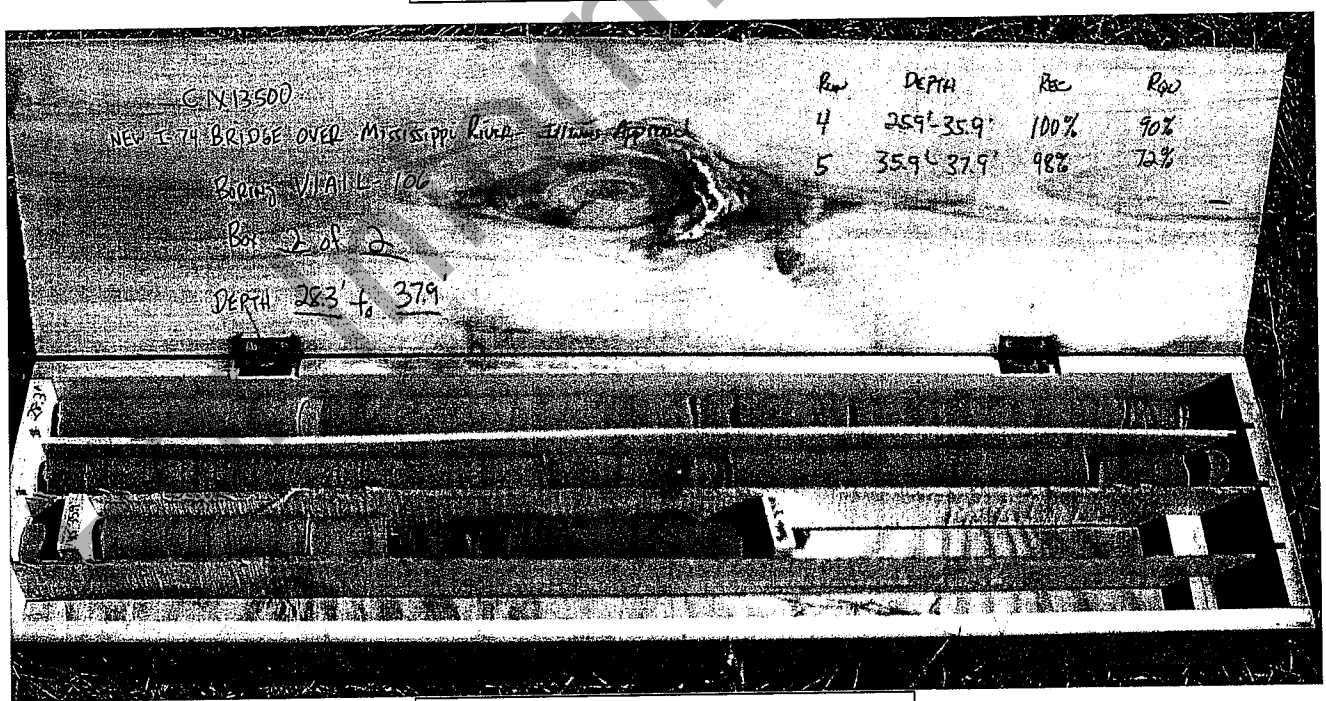
Boring VIAIL-105

Run	Depth (ft)	REC (%)	RQD (%)
5	30.8 – 35.8	90	35
6	35.8 – 40.8	93	59
7	40.8 – 43.8	99	84



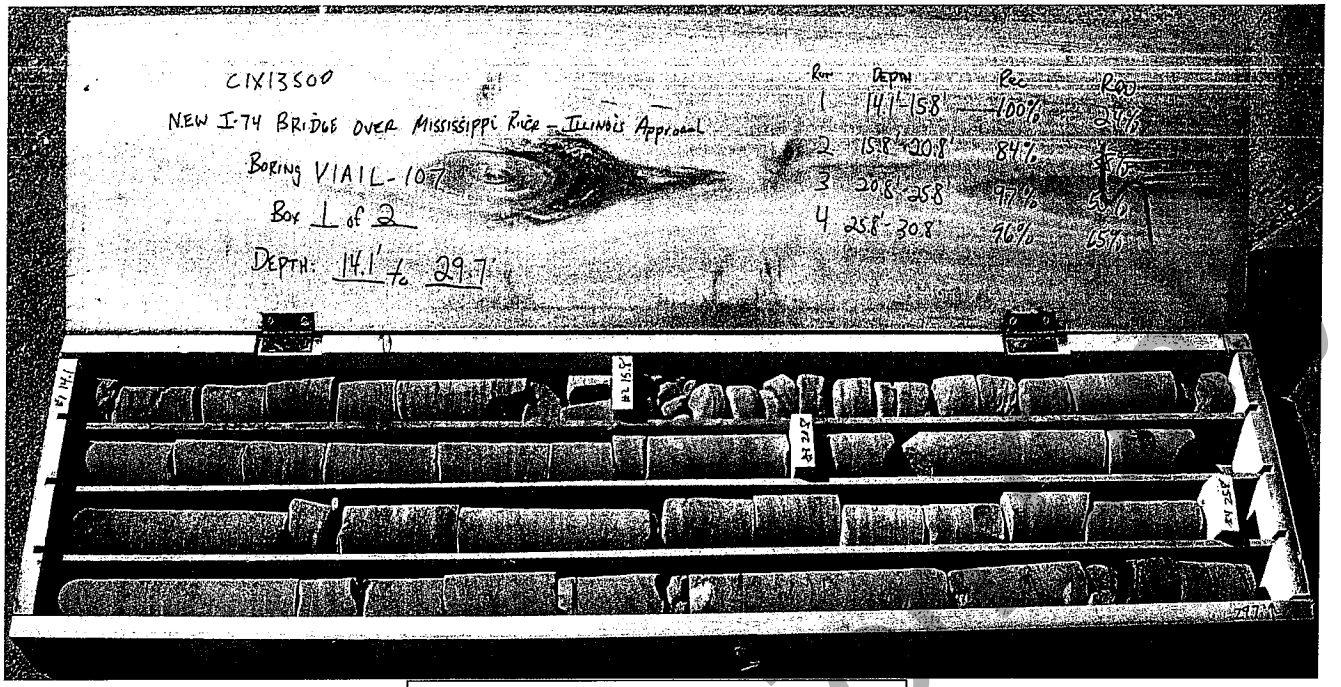
Boring VIAIL-106

Run	Depth (ft)	REC (%)	RQD (%)
1	11.5 – 15.9	58	47
2	15.9 – 20.9	99	87
3	20.9 – 25.9	99	87
4	25.9 – 35.9	100	90



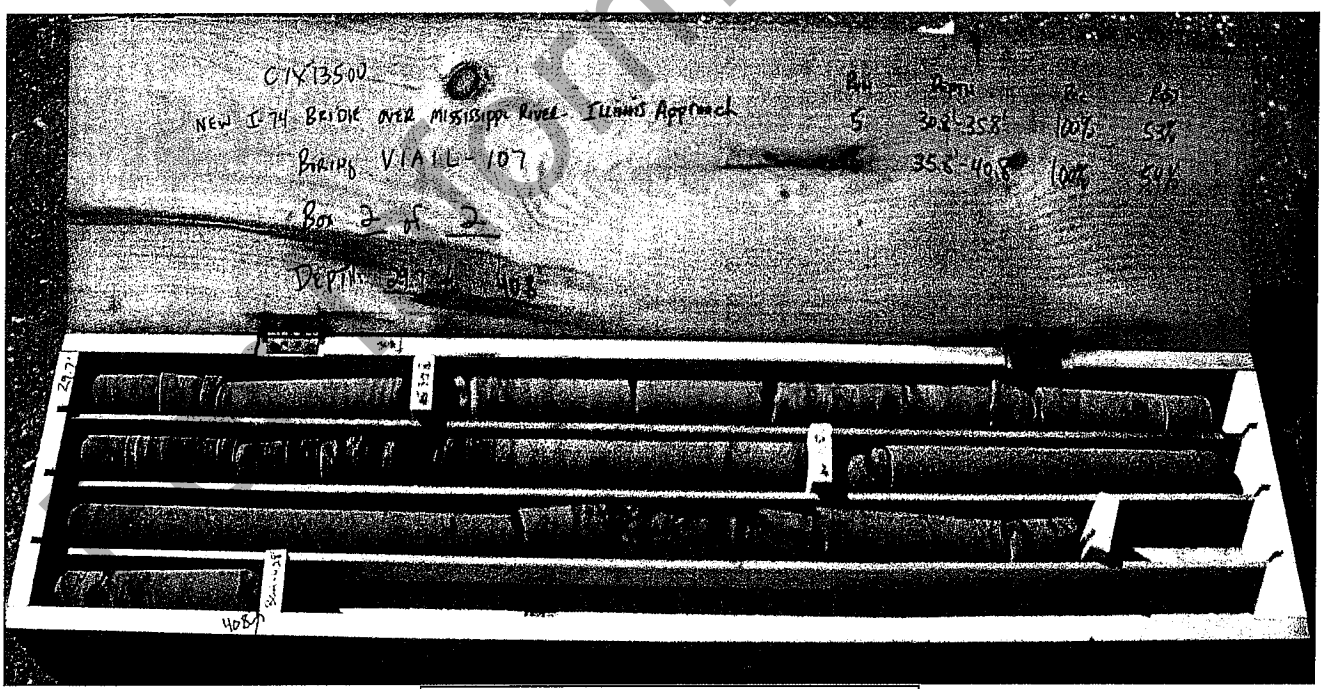
Boring VIAIL-106

Run	Depth (ft)	REC (%)	RQD (%)
5	35.9 – 37.6	98	72



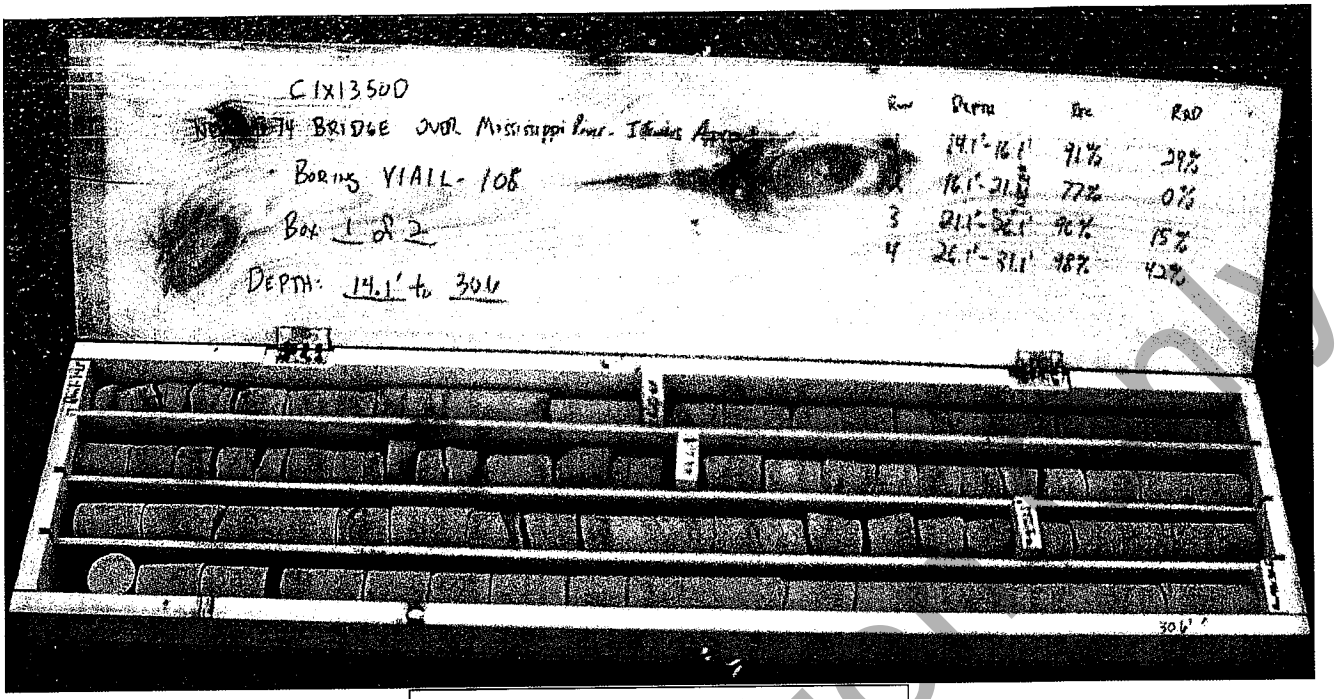
Boring VIAIL-107

Run	Depth (ft)	REC (%)	RQD (%)
1	14.1 – 15.8	100	24
2	15.8 – 20.8	84	38
3	20.8 – 25.8	97	55
4	25.8 – 30.8	96	65



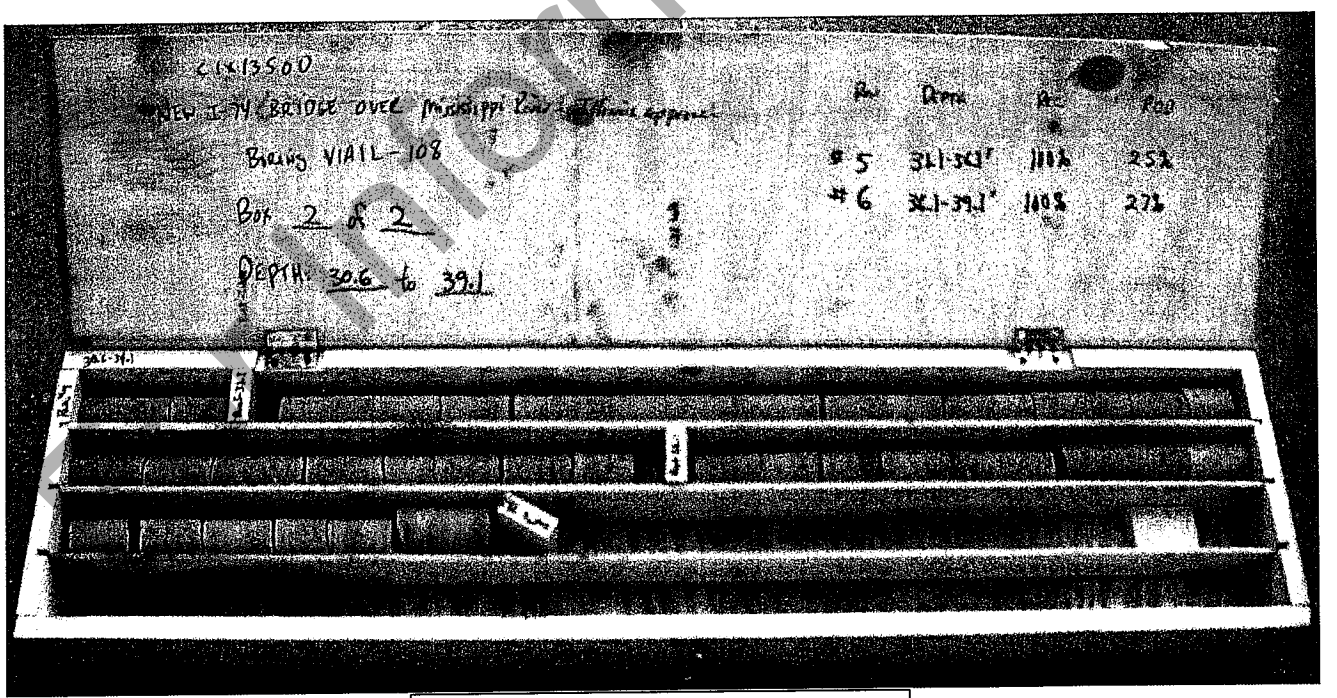
Boring VIAIL-107

Run	Depth (ft)	REC (%)	RQD (%)
5	30.8 – 35.8	100	53
6	35.8 – 40.8	100	54



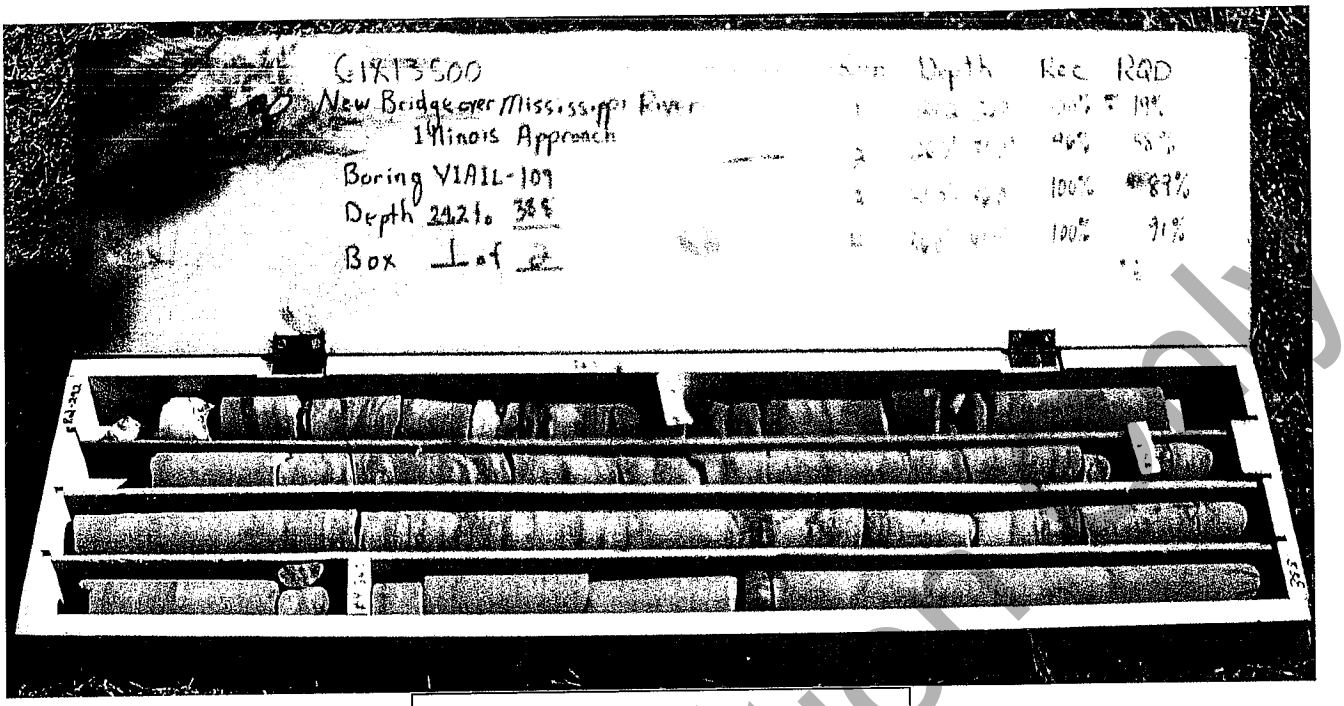
Boring VIAIL-108

Run	Depth (ft)	REC (%)	RQD (%)
1	14.1 – 16.1	91	29
2	16.1 – 21.1	77	0
3	21.1 – 26.1	96	15
4	26.1 – 31.1	98	42



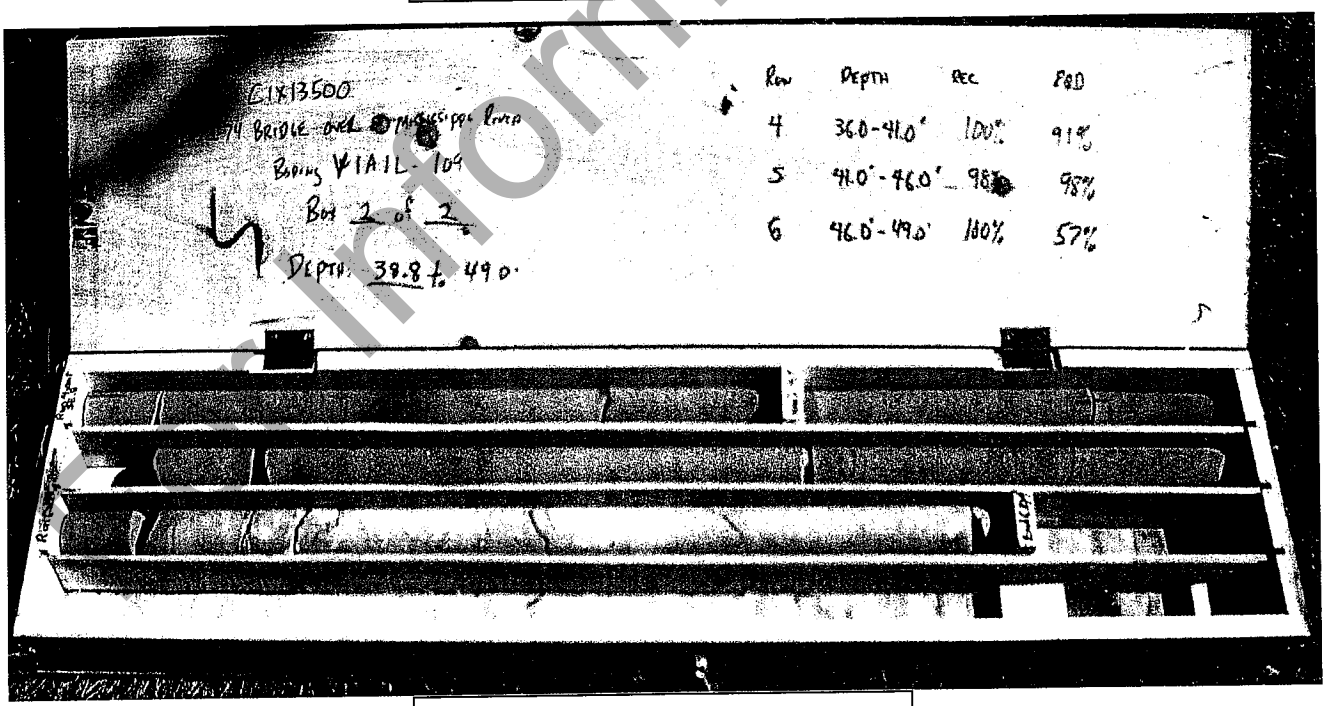
Boring VIAIL-108

Run	Depth (ft)	REC (%)	RQD (%)
5	31.1 – 36.1	100	25
6	36.1 – 39.1	100	27



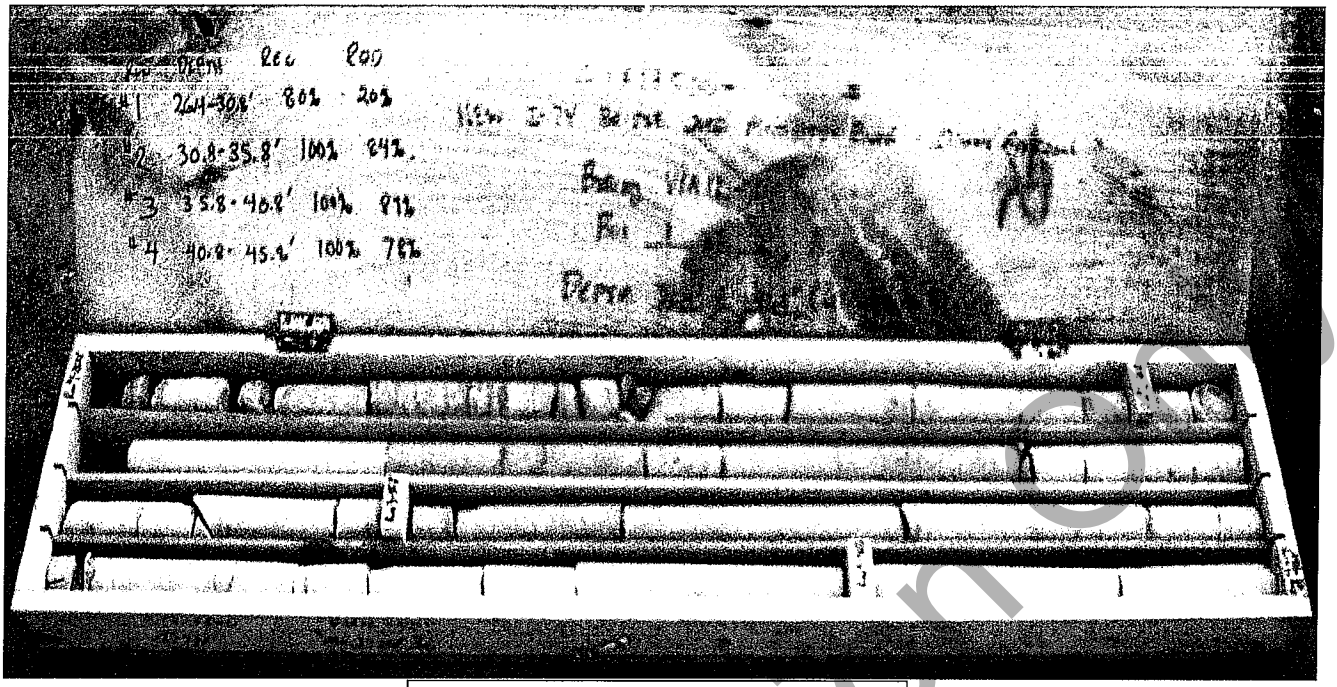
Boring VIAIL-109

Run	Depth (ft)	REC (%)	RQD (%)
1	24.2 – 26.0	100	19
2	26.0 – 31.0	96	65
3	31.0 – 36.0	100	89
4	36.0 – 41.0	100	91



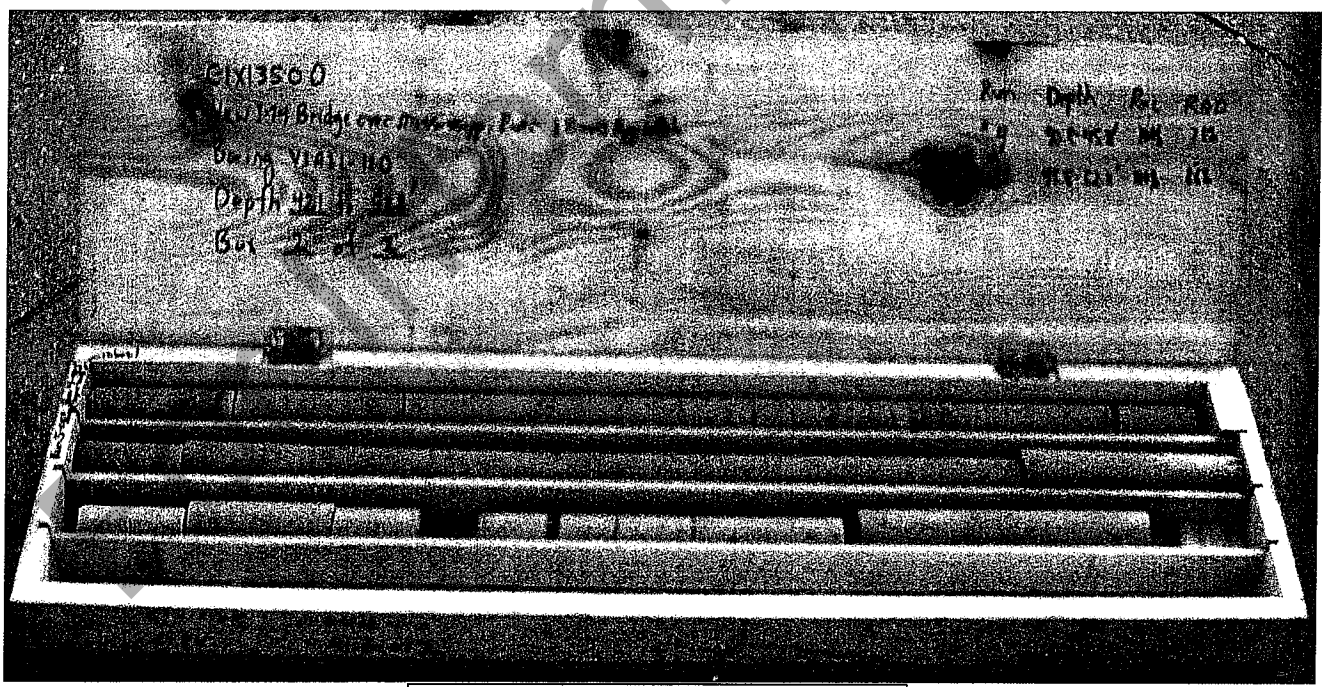
Boring VIAIL-109

Run	Depth (ft)	REC (%)	RQD (%)
5	41.0 – 46.0	98	98
6	46.0 – 49.0	100	83



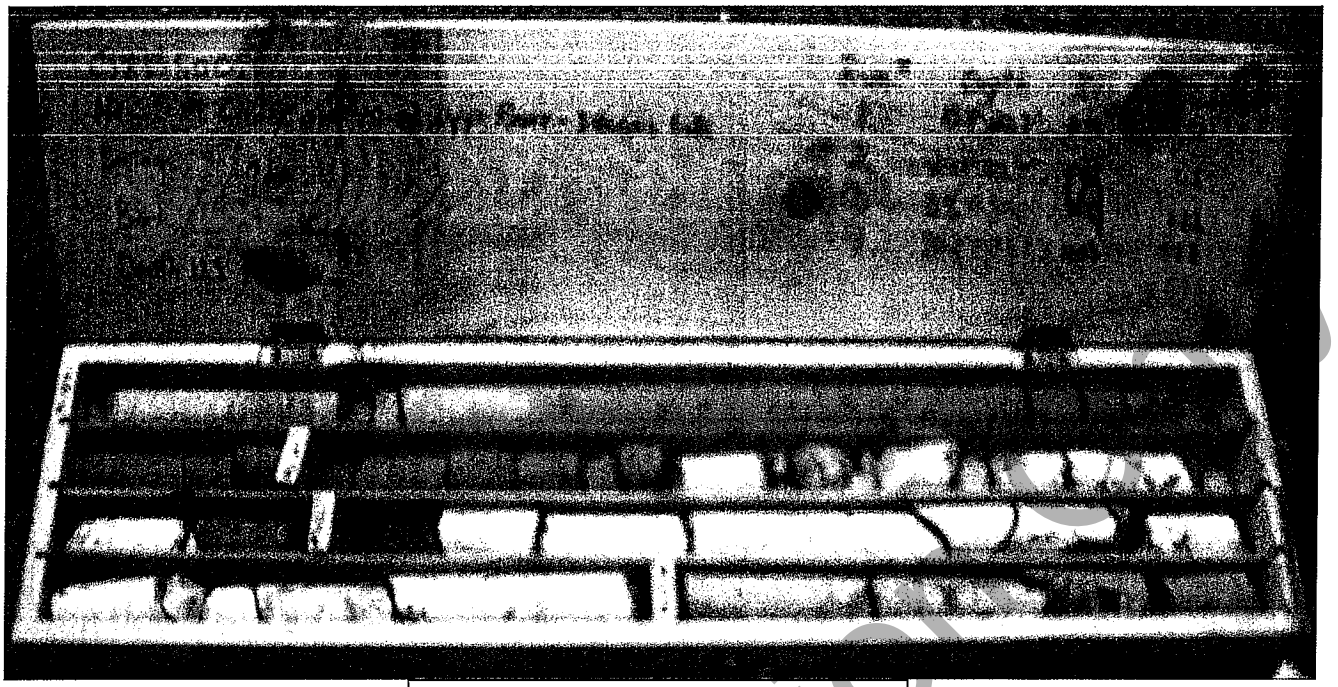
Boring VIAIL-110

Run	Depth (ft)	REC (%)	RQD (%)
1	26.4 – 30.8	80	20
2	30.8 – 35.8	100	84
3	35.8 – 40.8	100	84
4	40.8 – 45.8	100	78



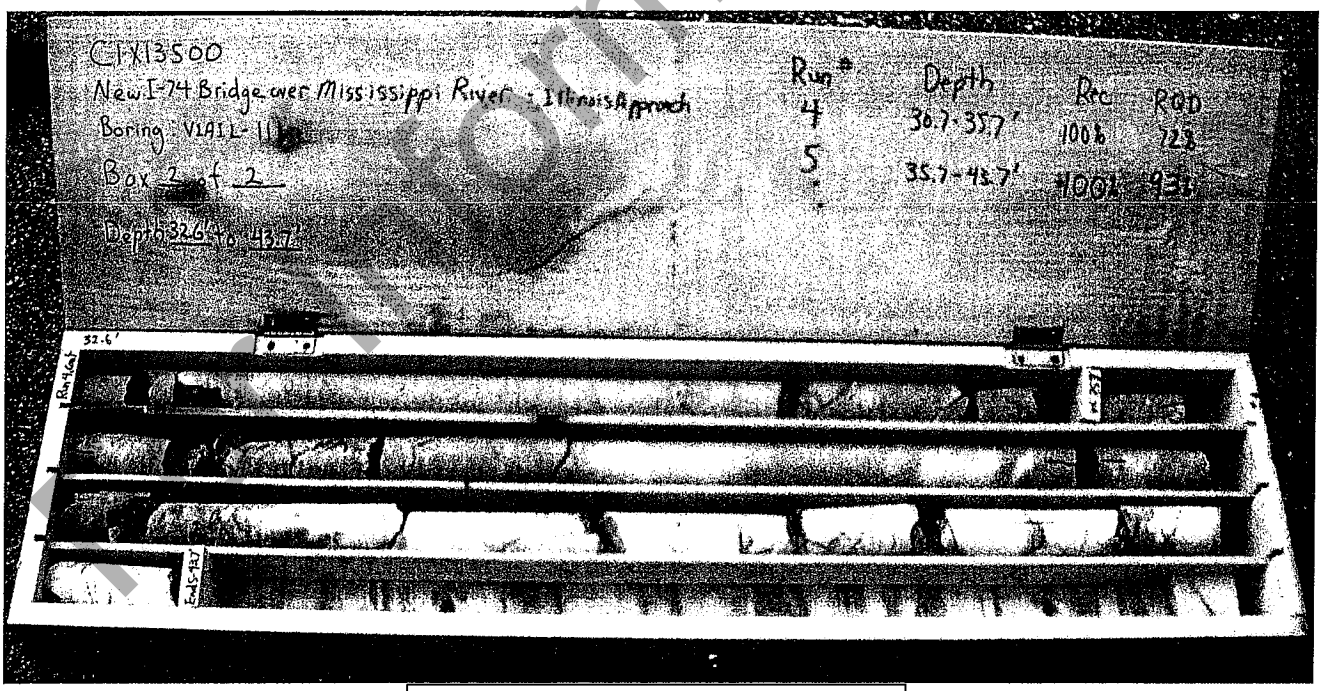
Boring VIAIL-110

Run	Depth (ft)	REC (%)	RQD (%)
5	45.8 – 52.8	100	86



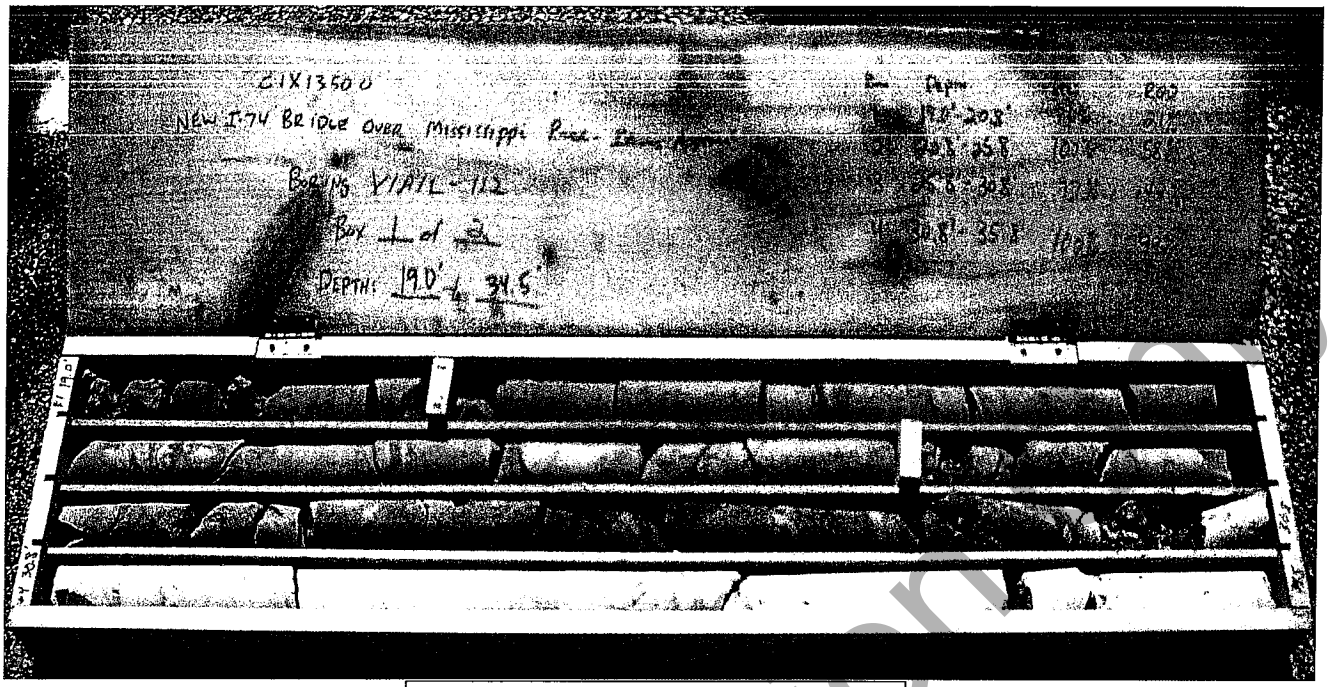
Boring VIAIL-111

Run	Depth (ft)	REC (%)	RQD (%)
1	15.9 – 20.7	89	65
2	20.7 – 25.7	74	15
3	25.7 – 30.7	95	53
4	30.7 – 35.7	100	72



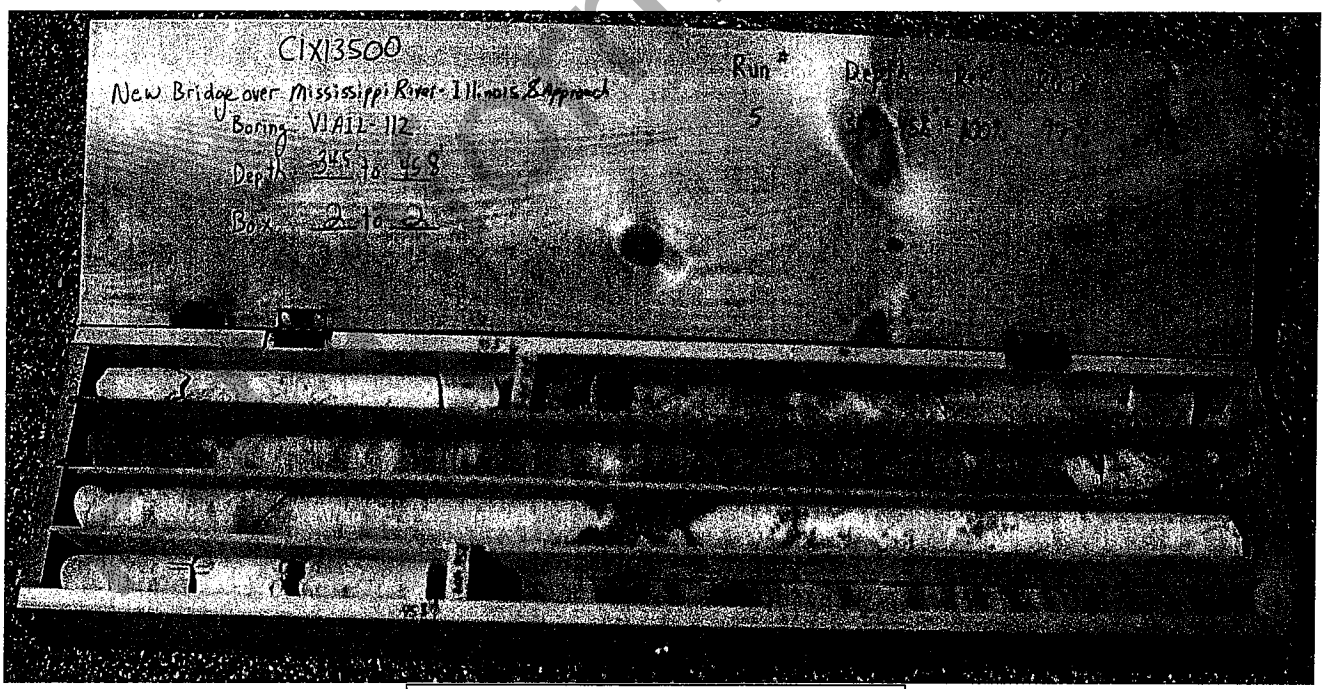
Boring VIAIL-111

Run	Depth (ft)	REC (%)	RQD (%)
5	35.7 – 43.7	100	93



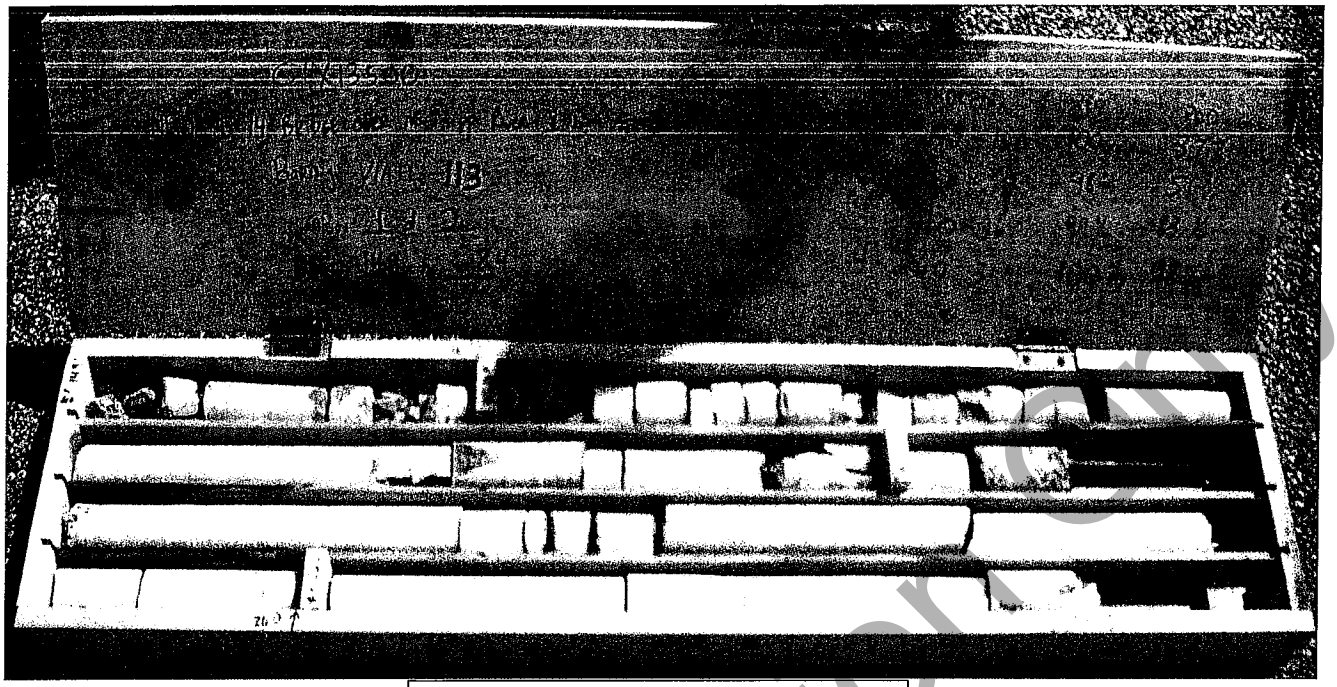
Boring VIAIL-112

Run	Depth (ft)	REC (%)	RQD (%)
1	19.0 – 20.8	76	21
2	20.8 – 25.8	100	58
3	25.8 – 30.8	97	43
4	30.8 – 35.8	100	99



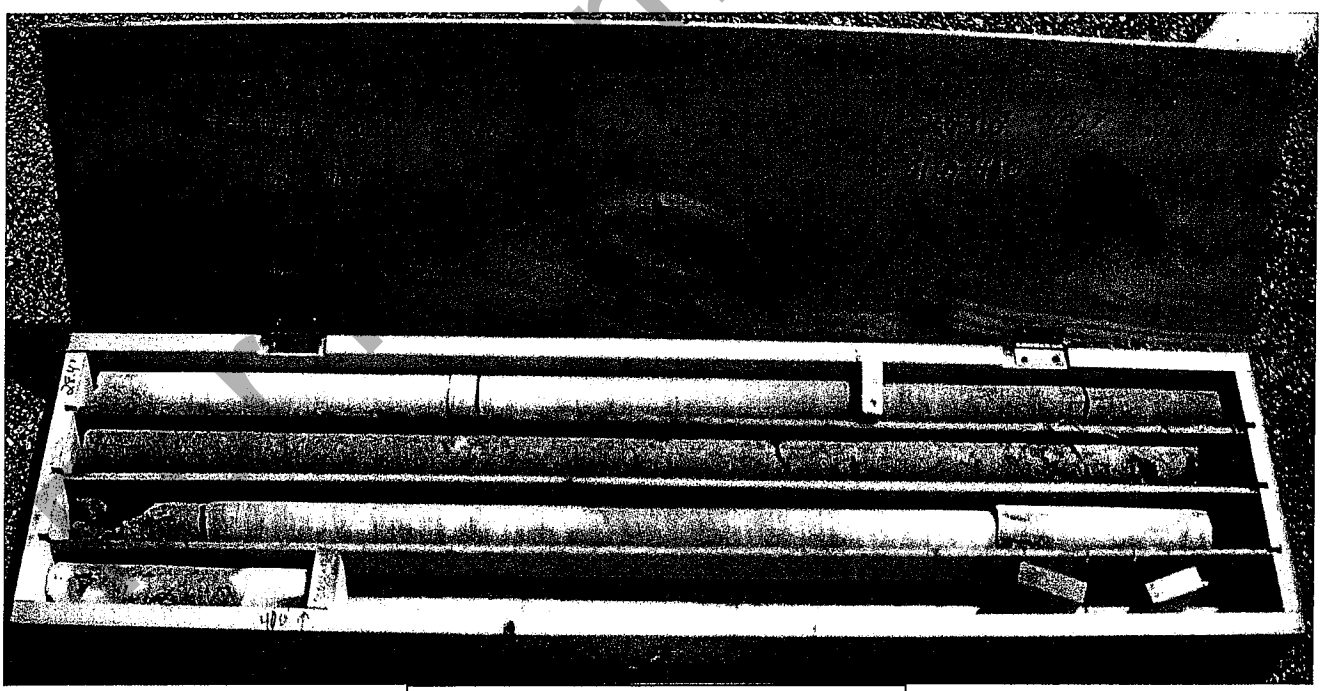
Boring VIAIL-112

Run	Depth (ft)	REC (%)	RQD (%)
5	35.8 – 45.8	100	97



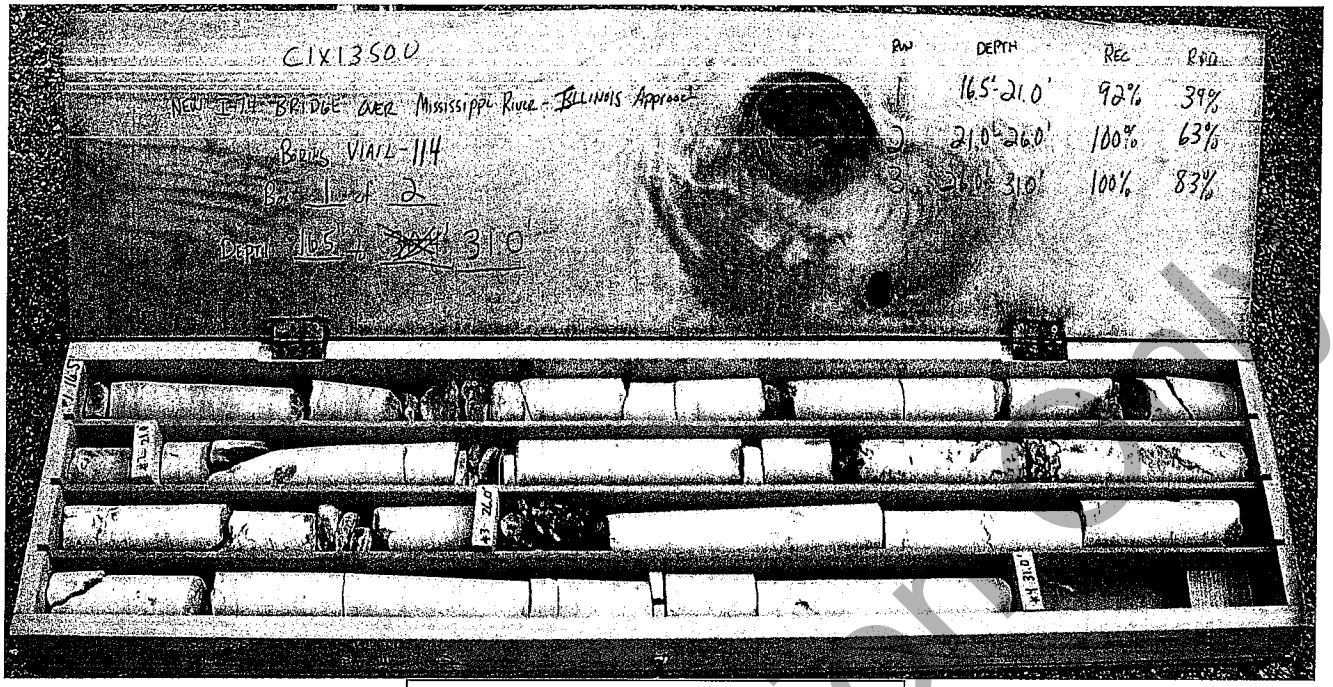
Boring VIAIL-113

Run	Depth (ft)	REC (%)	RQD (%)
1	14.9 – 16.0	100	37
2	16.0 – 21.0	98	51
3	21.0 – 26.0	99	83
4	26.0 – 31.0	100	98



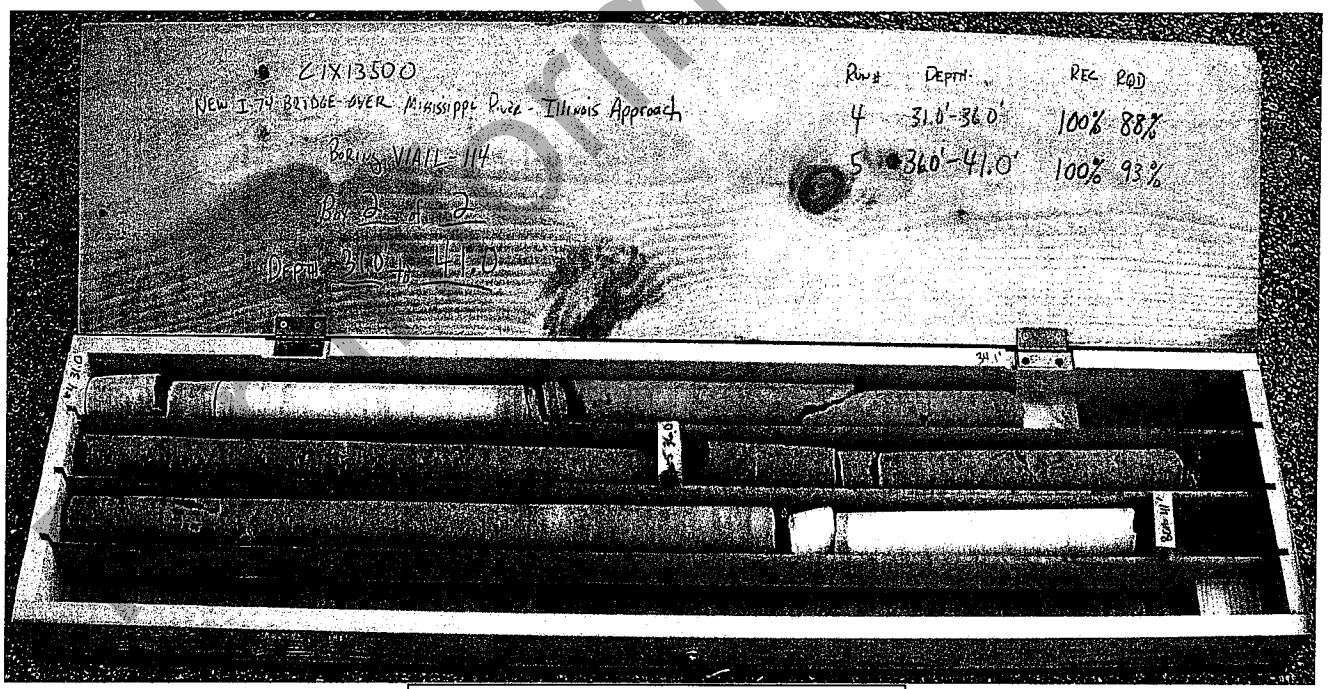
Boring VIAIL-113

Run	Depth (ft)	REC (%)	RQD (%)
5	31.0 – 40.0	100	98



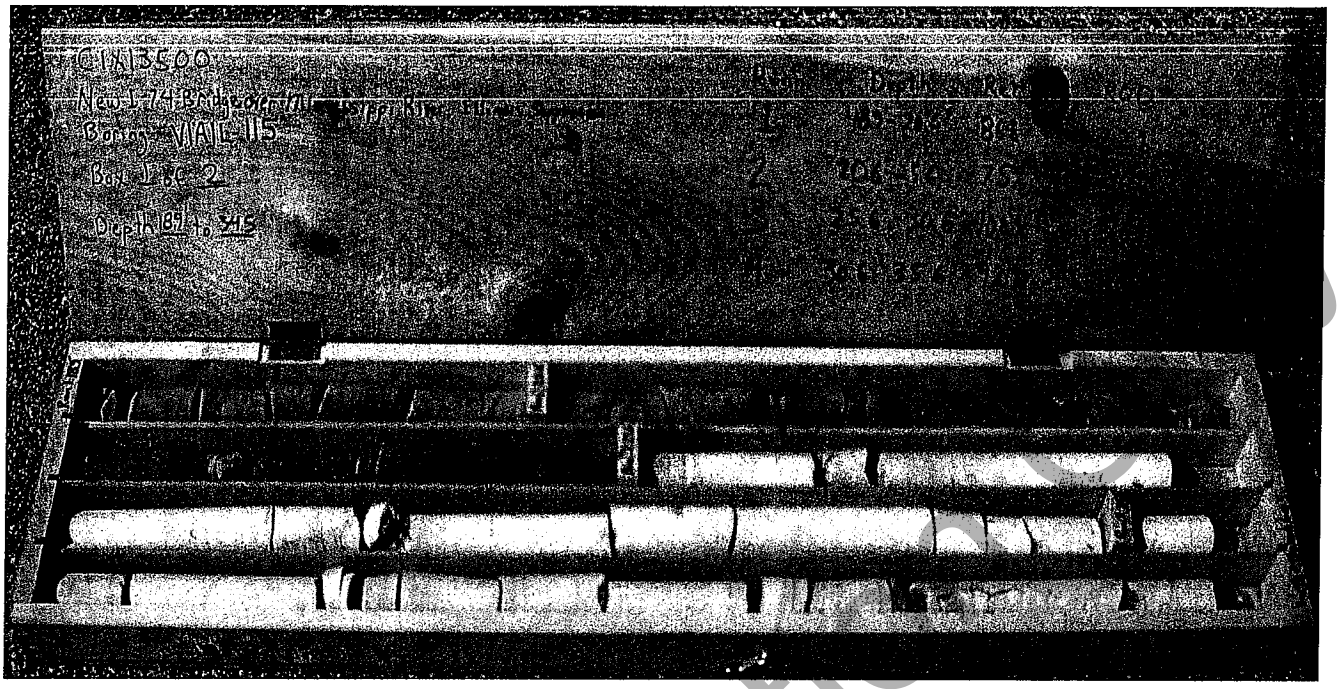
Boring VIAIL-114

Run	Depth (ft)	REC (%)	RQD (%)
1	16.5 – 21.0	92	39
2	21.0 – 26.0	100	63
3	26.0 – 31.0	100	83



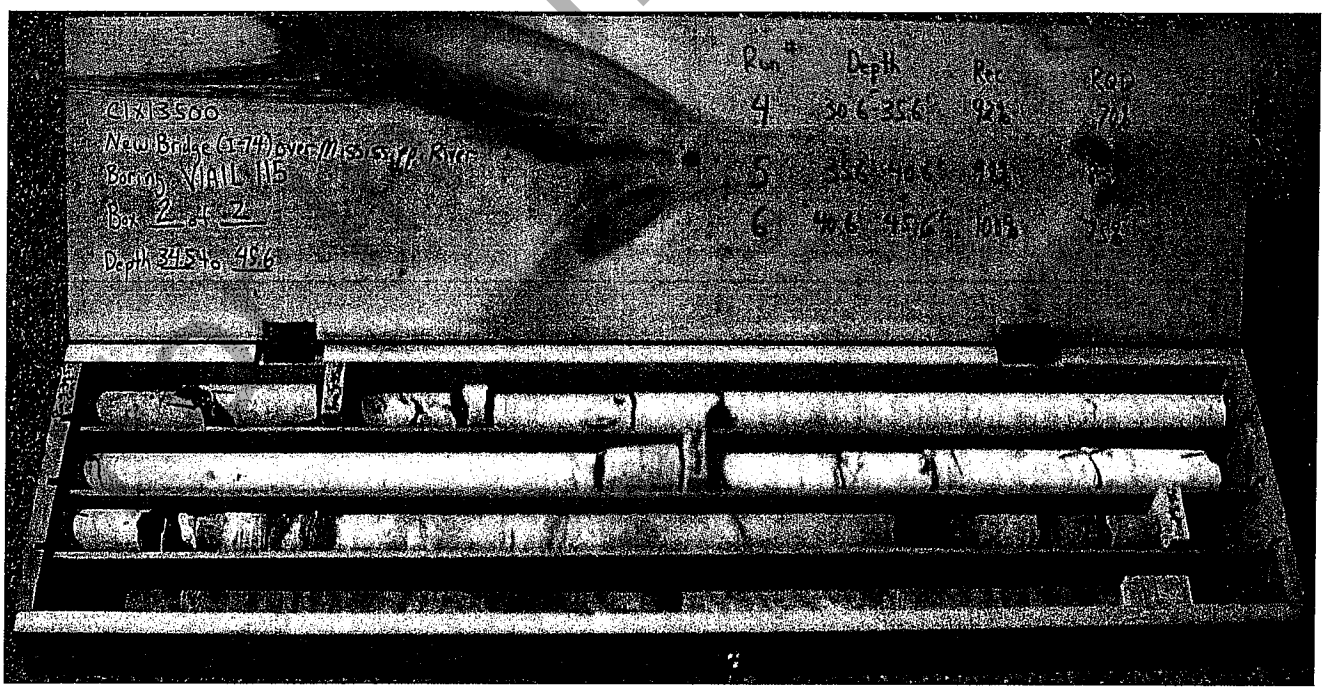
Boring VIAIL-114

Run	Depth (ft)	REC (%)	RQD (%)
4	31.0 – 36.0	100	88
5	36.0 – 41.0	100	93



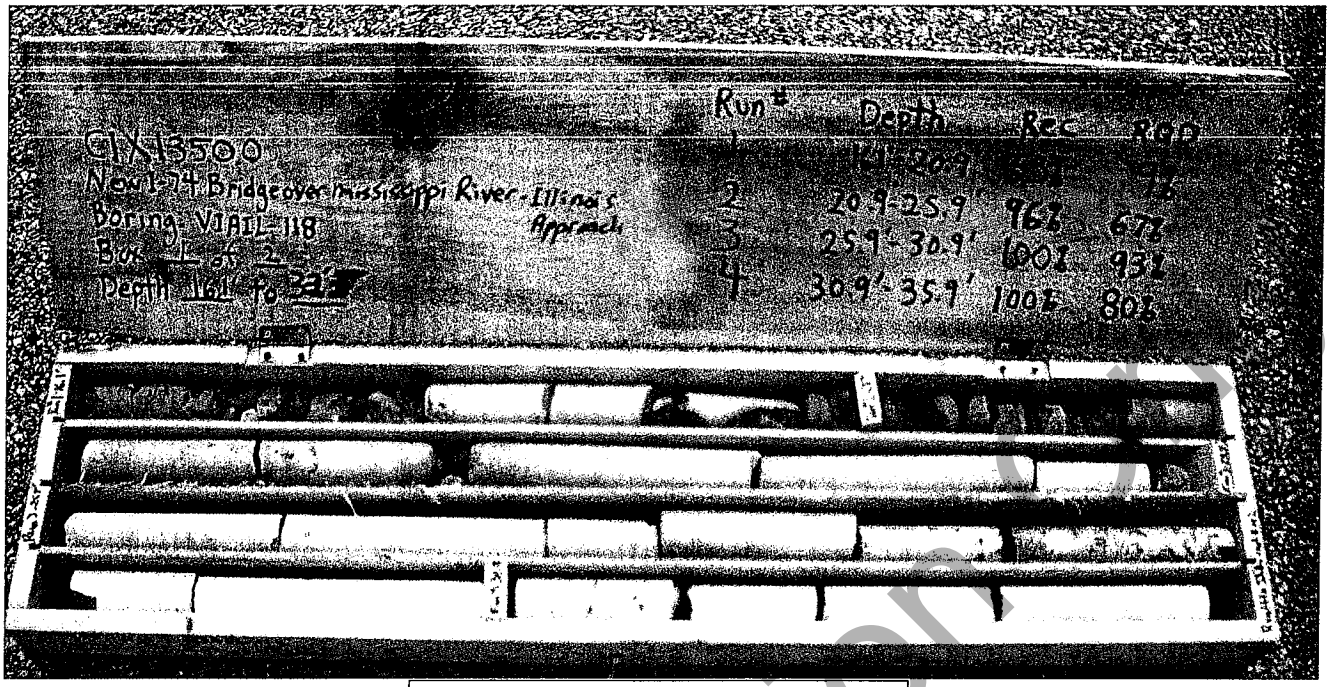
Boring VIAIL-115

Run	Depth (ft)	REC (%)	RQD (%)
1	18.9 – 20.6	86	22
2	20.6 – 25.6	75	26
3	25.6 – 30.6	100	76
4	30.6 – 35.6	92	70



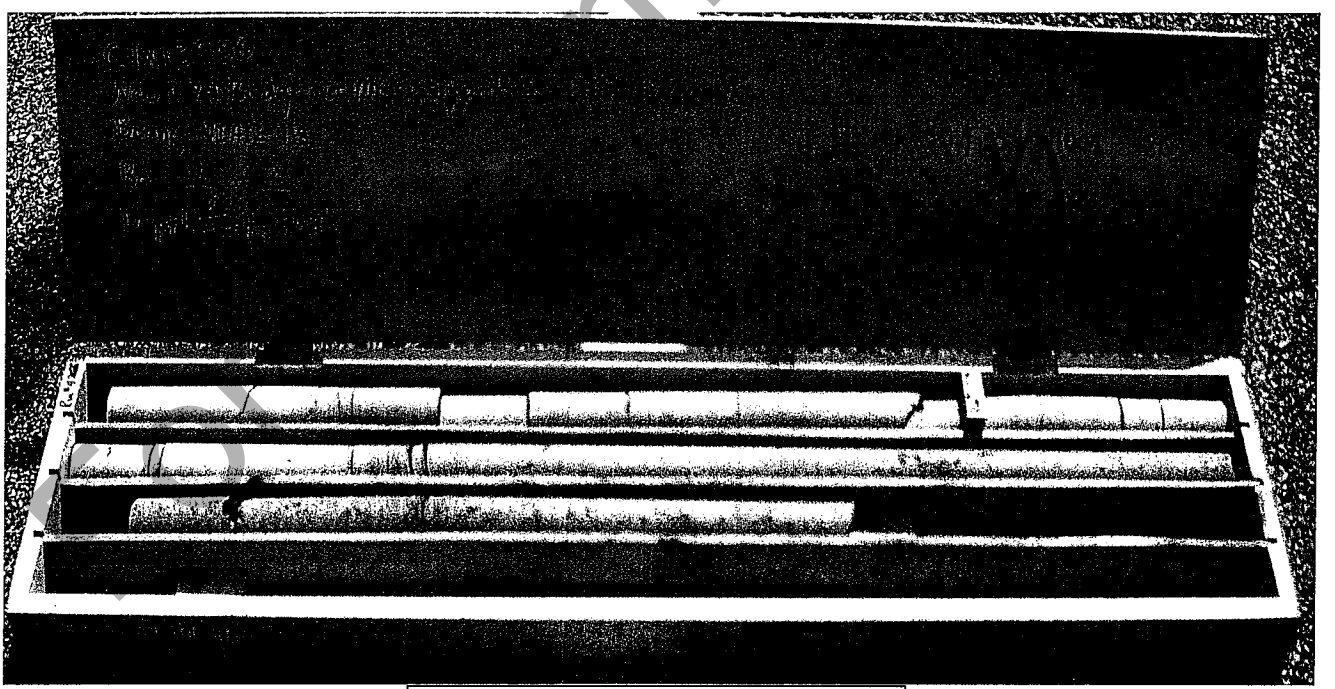
Boring VIAIL-115

Run	Depth (ft)	REC (%)	RQD (%)
5	35.6 – 40.6	98	83
6	40.6 – 45.6	100	75



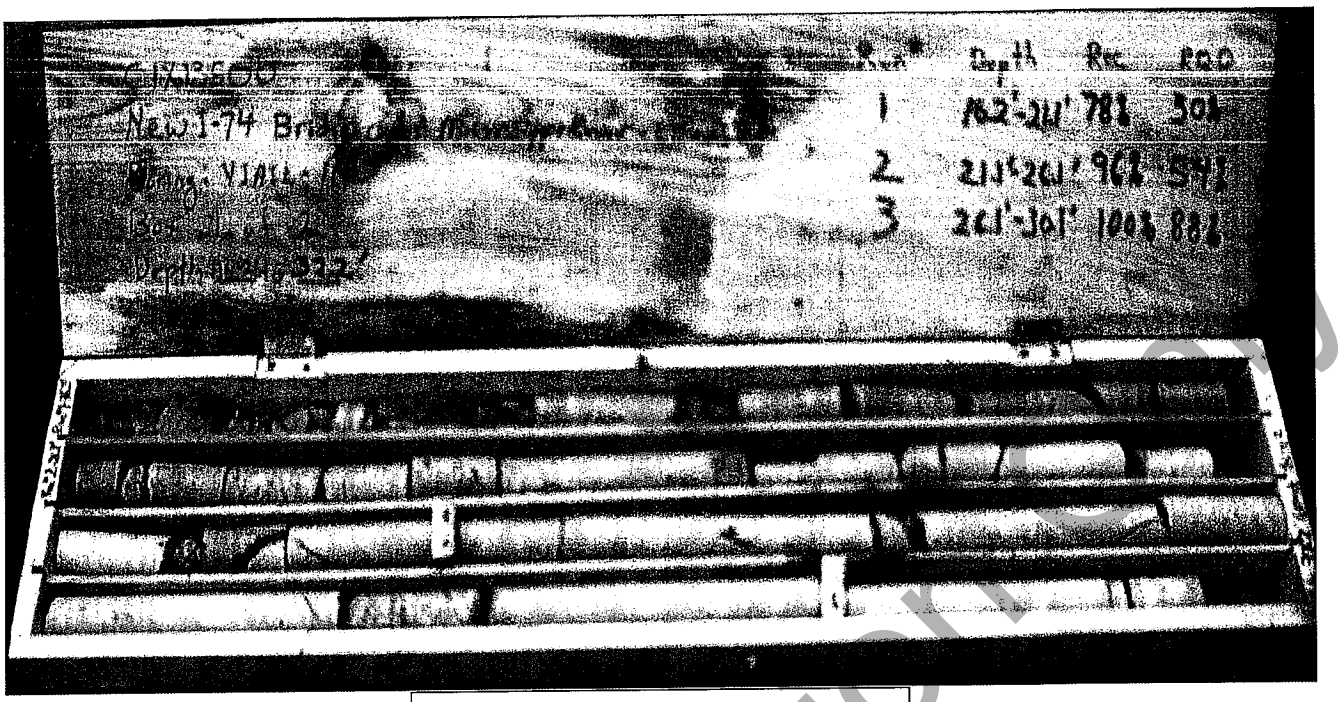
Boring VIAIL-118

Run	Depth (ft)	REC (%)	RQD (%)
1	16.1 – 20.9	53	9
2	20.9 – 25.9	96	67
3	25.9 – 30.9	100	93
4	30.9 – 35.9	100	80



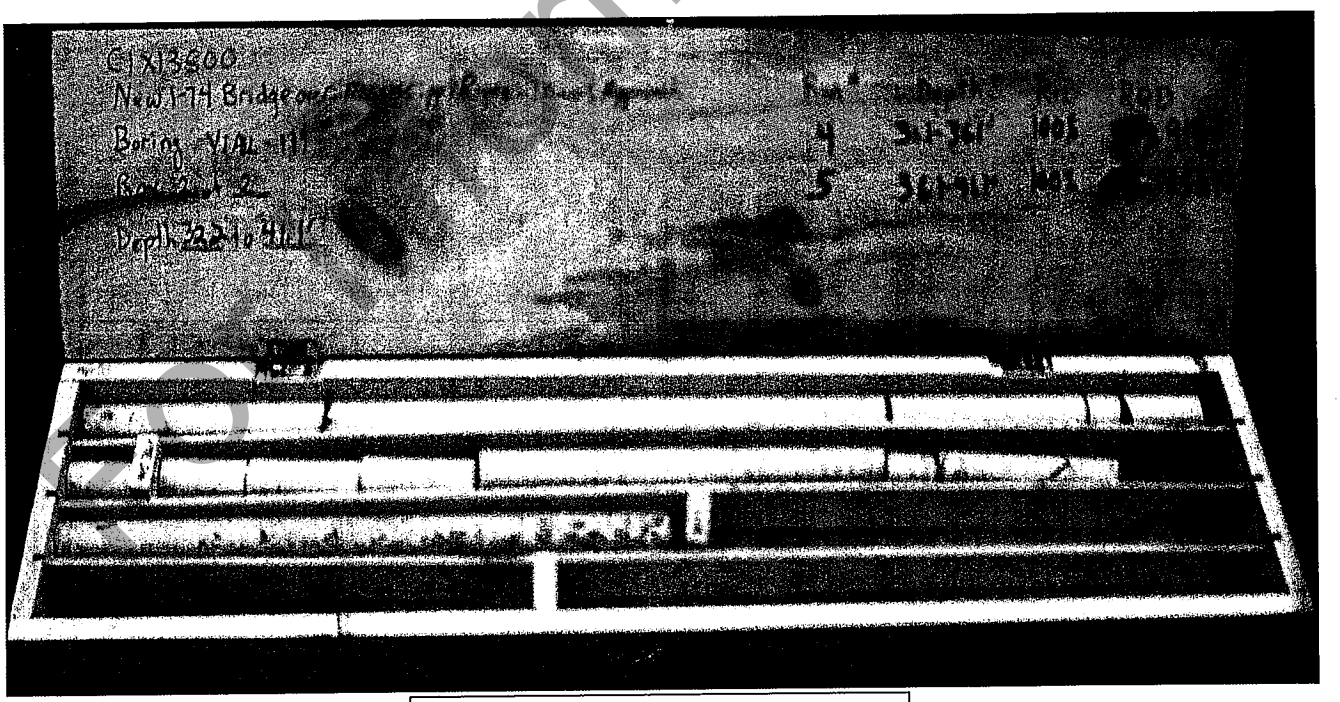
Boring VIAIL-118

Run	Depth (ft)	REC (%)	RQD (%)
5	35.9 – 42.9	100	79



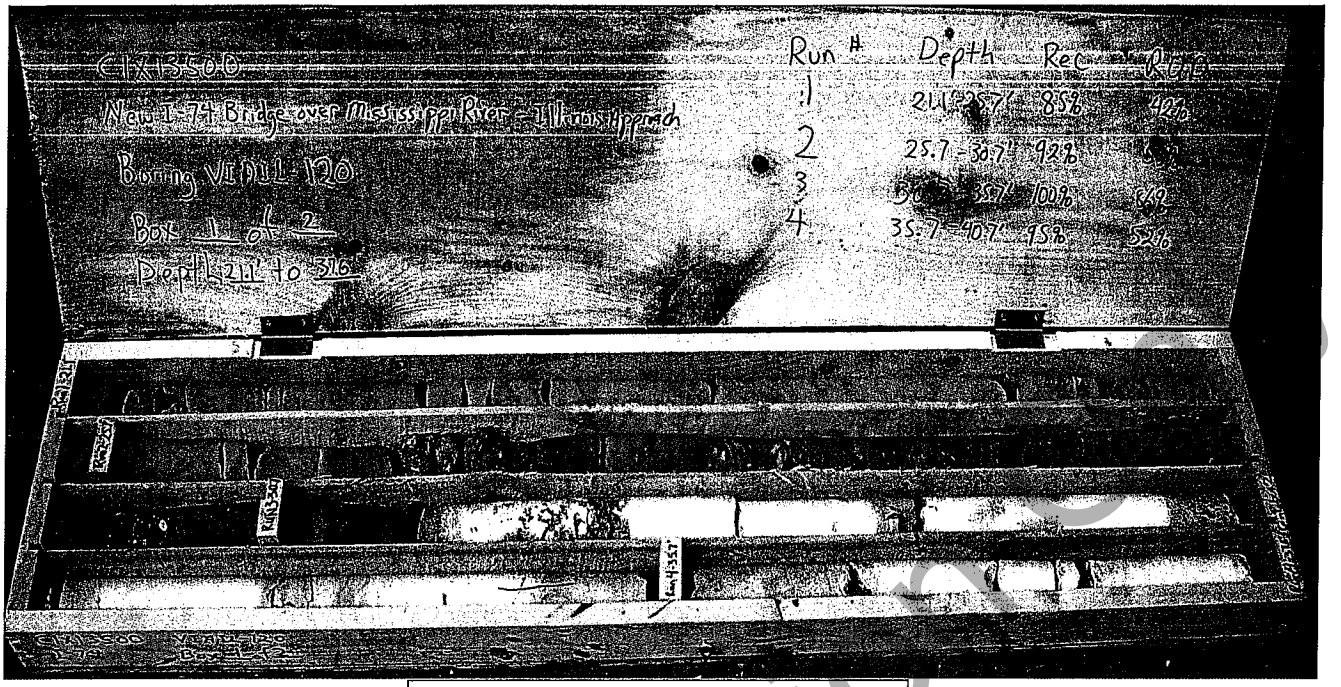
Boring VIAIL-119

Run	Depth (ft)	REC (%)	RQD (%)
1	16.2 – 21.1	78	30
2	21.1 – 26.1	96	54
3	26.1 – 31.1	100	88



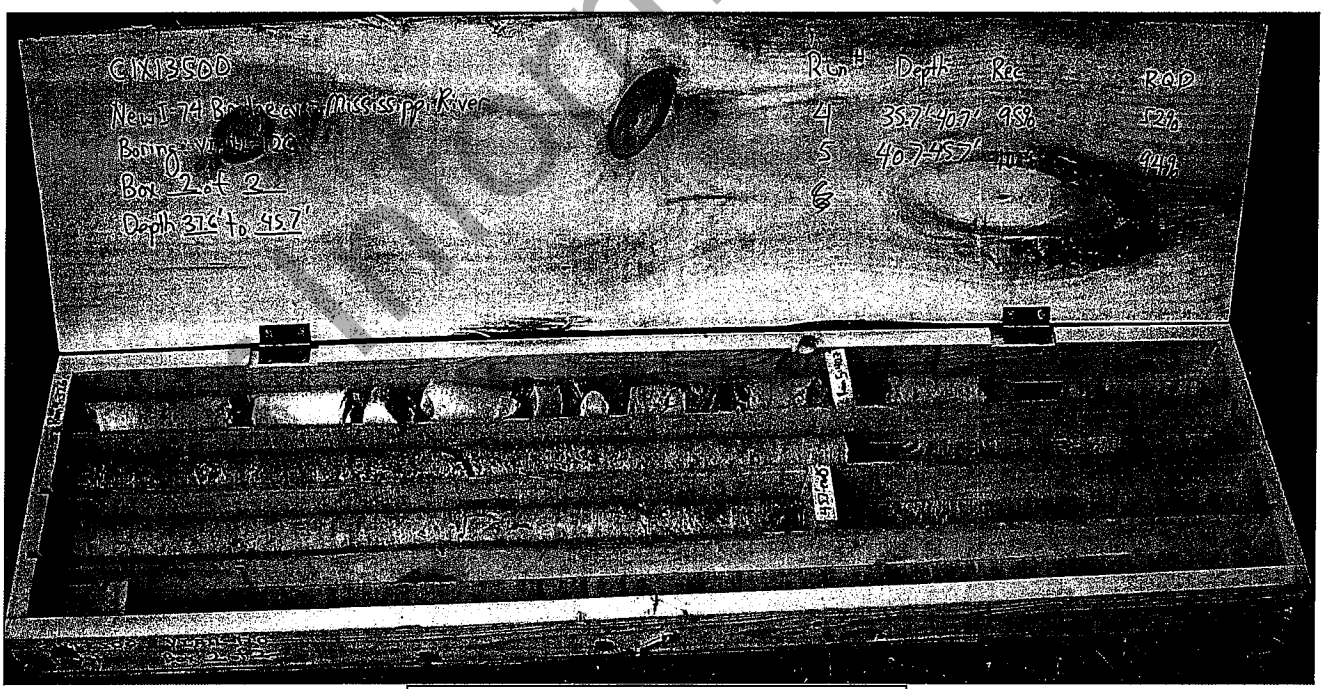
Boring VIAIL-119

Run	Depth (ft)	REC (%)	RQD (%)
4	31.1 – 36.1	100	91
5	36.1 – 41.1	100	93



Boring VIAIL-120

Run	Depth (ft)	REC (%)	RQD (%)
1	21.1 – 25.7	85	42
2	25.7 – 30.7	92	53
3	30.7 – 35.7	100	86
4	35.7 – 40.7	95	52

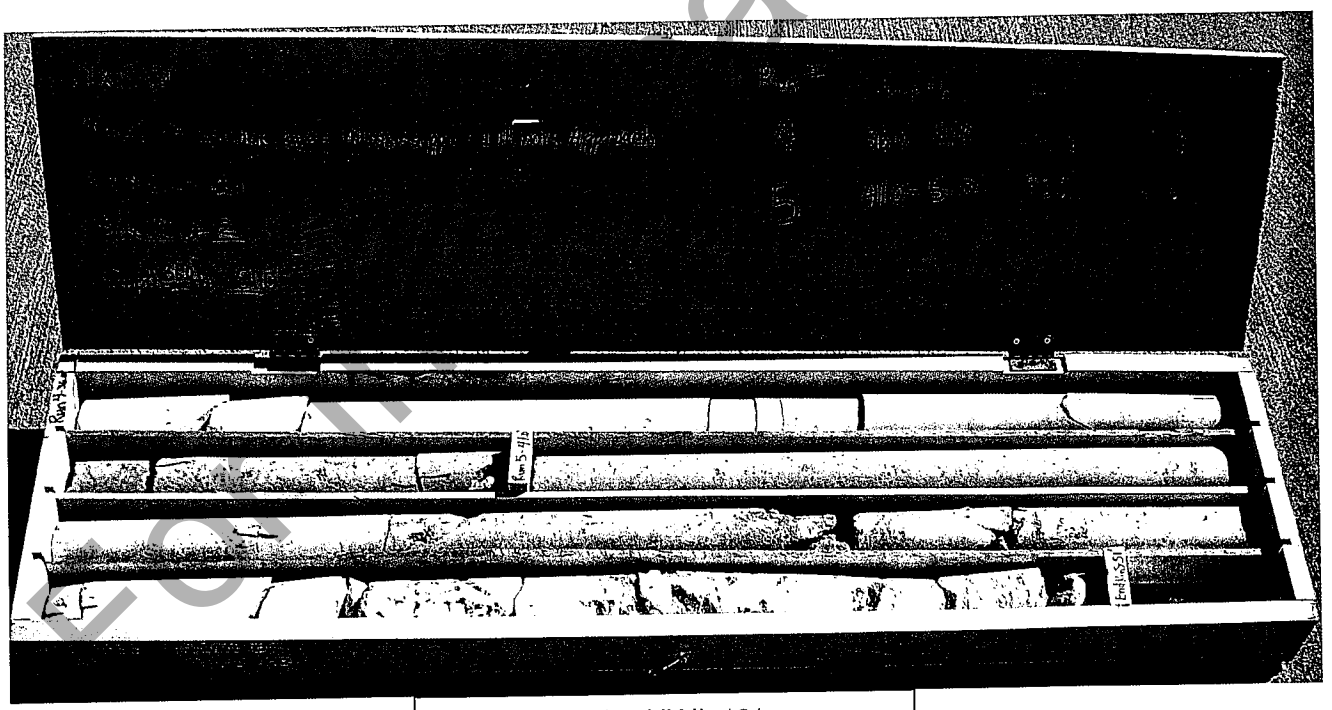


Boring VIAIL-120

Run	Depth (ft)	REC (%)	RQD (%)
5	40.7 – 45.7	100	94

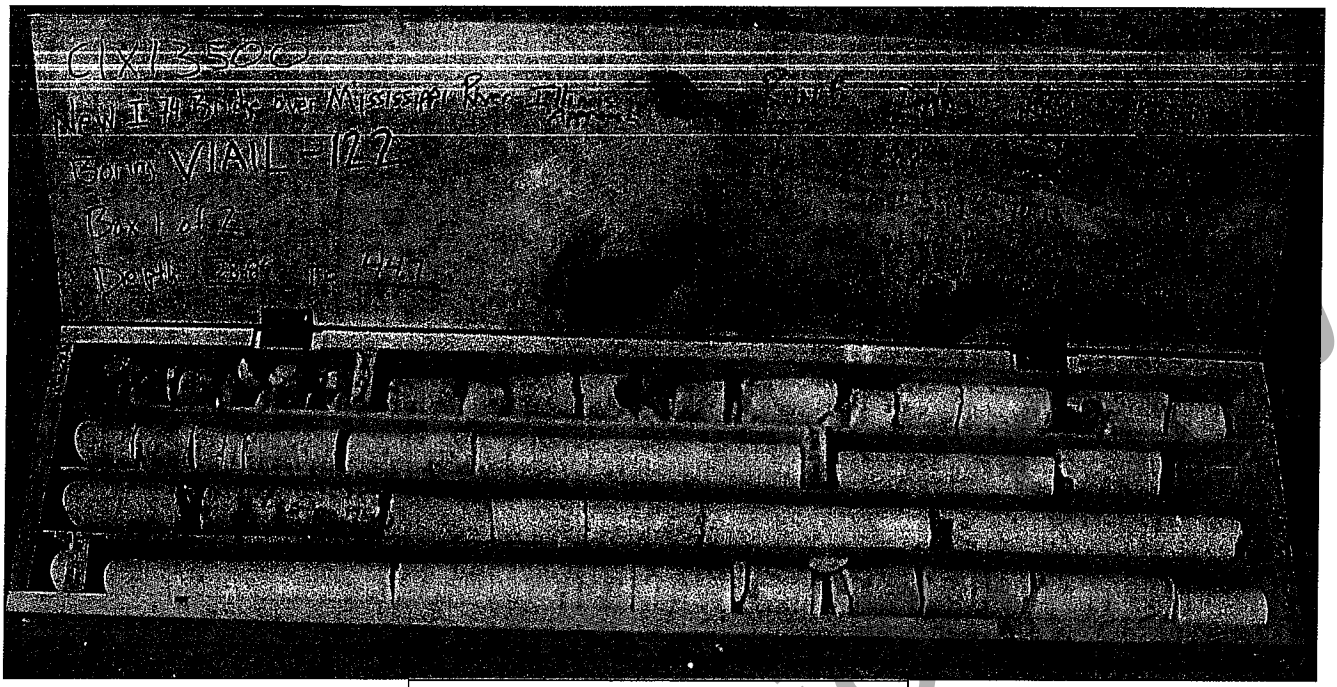
Boring VIAIL-121

Run	Depth (ft)	REC (%)	RQD (%)
1	21.0 – 26.0	80	11
2	26.0 – 31.0	95	53
3	31.0 – 36.0	100	97



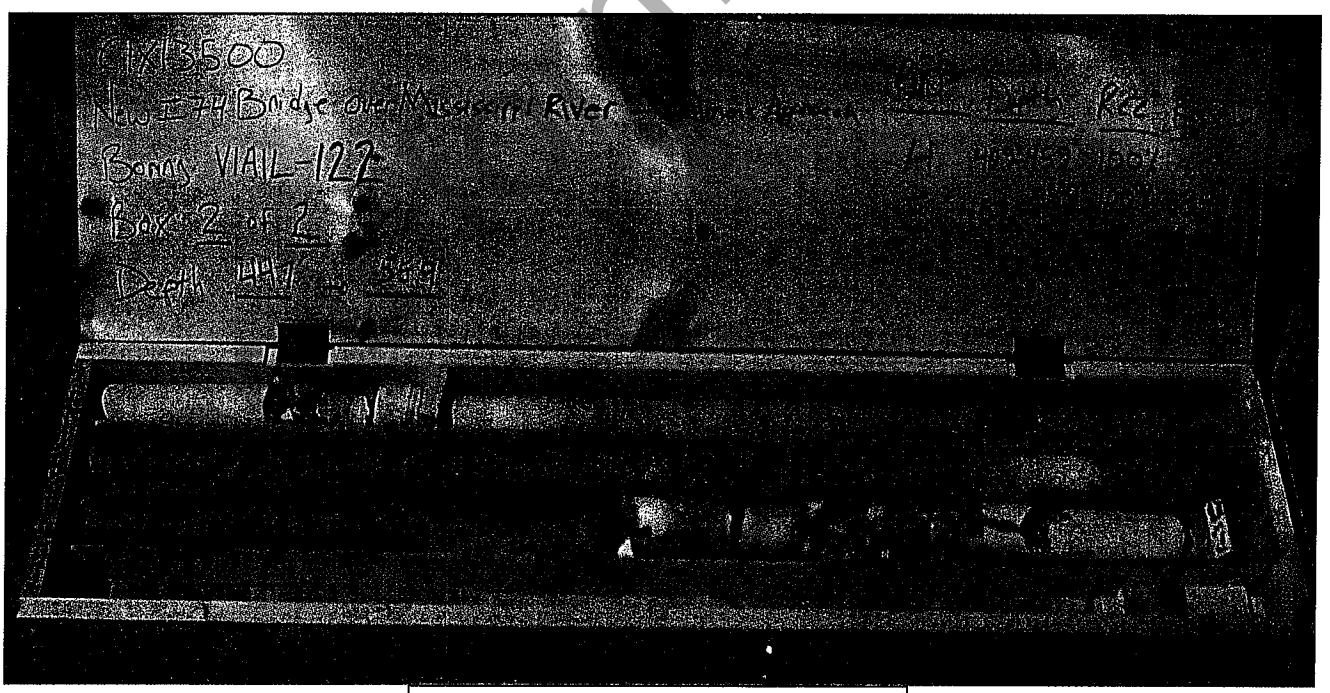
Boring VIAIL-121

Run	Depth (ft)	REC (%)	RQD (%)
4	36.0 – 41.0	100	94
5	41.0 – 51.0	93	81



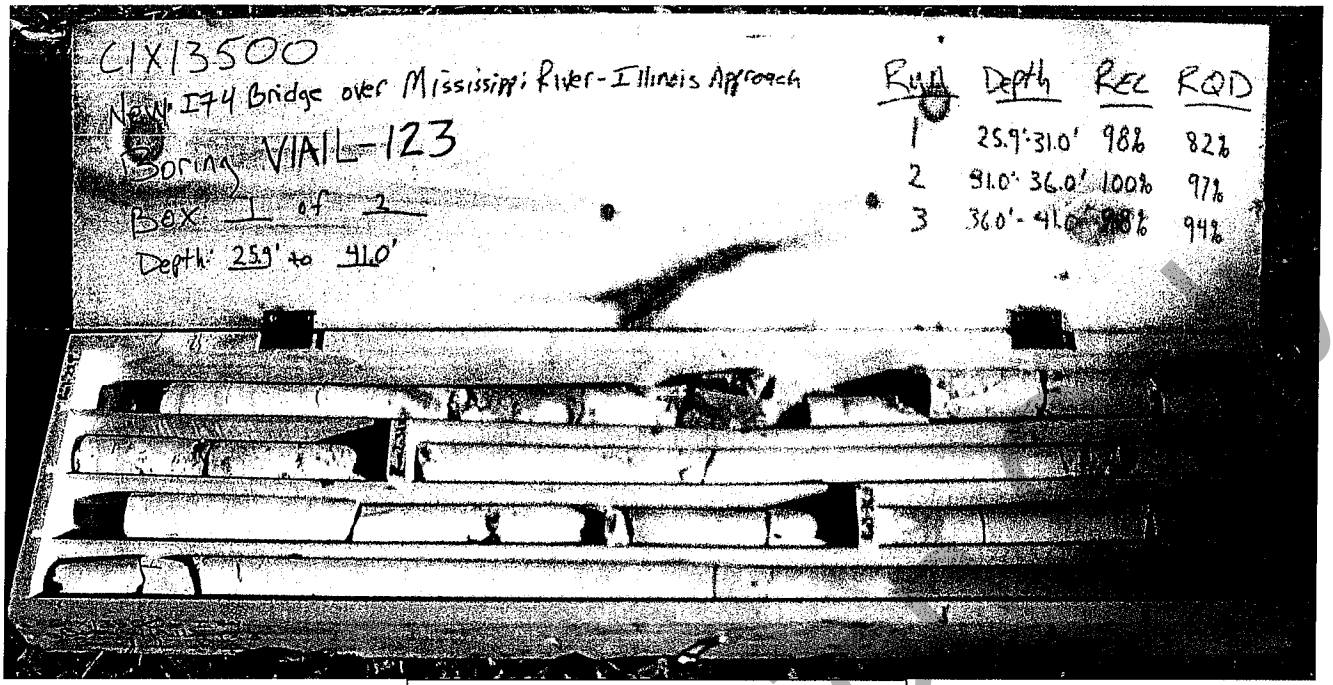
Boring VIAIL-122

Run	Depth (ft)	REC (%)	RQD (%)
1	28.8 – 30.9	63	0
2	30.9 – 35.9	100	35
3	35.9 – 40.9	100	89
4	40.9 – 45.9	100	60



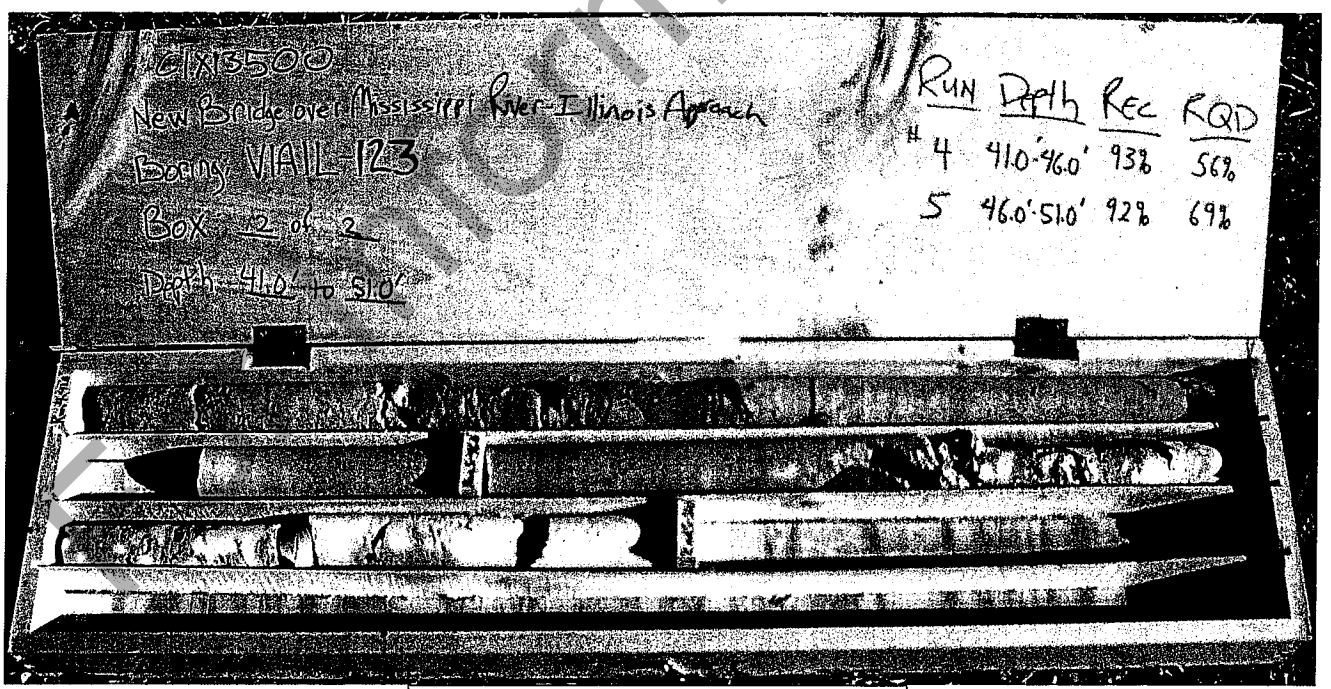
Boring VIAIL-122

Run	Depth (ft)	REC (%)	RQD (%)
5	45.9 – 55.9	100	84



Boring VIAIL-123

Run	Depth (ft)	REC (%)	RQD (%)
1	25.9 – 31.0	98	82
2	31.0 – 36.0	100	97
3	36.0 – 41.0	98	94



Boring VIAIL-123

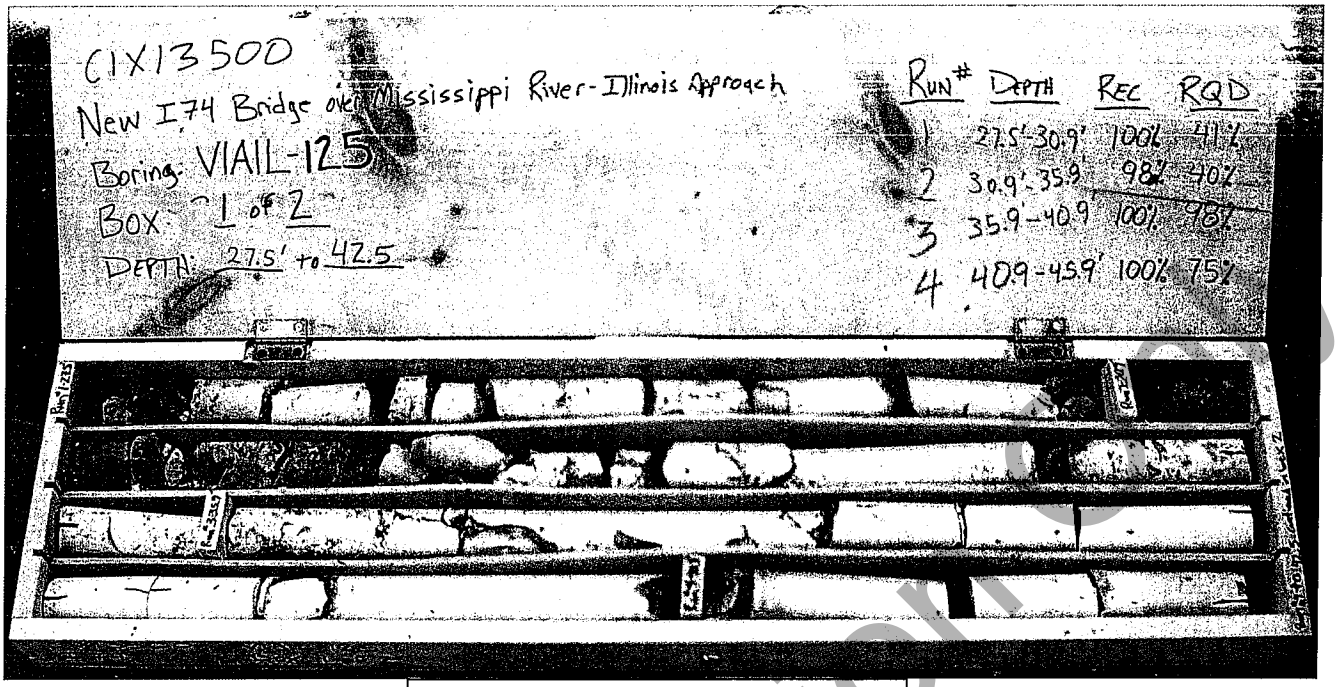
Run	Depth (ft)	REC (%)	RQD (%)
4	41.0 – 46.0	93	56
5	46.0 – 51.0	92	69

Boring VIAIL-124

Run	Depth (ft)	REC (%)	RQD (%)
1	25.6 – 30.6	100	55
2	30.6 – 35.6	100	91
3	35.6 – 40.6	100	89

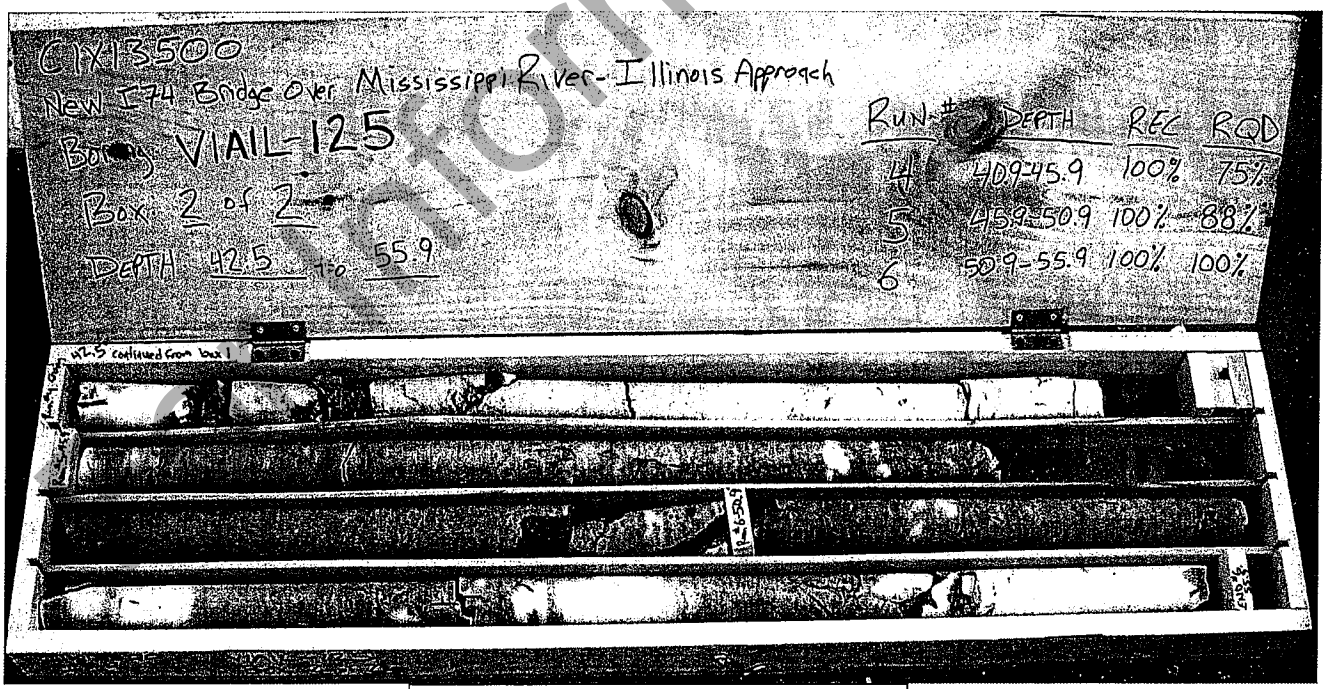
Boring VIAIL-124

Run	Depth (ft)	REC (%)	RQD (%)
4	40.6 – 45.6	100	89
5	45.6 – 50.6	98	94



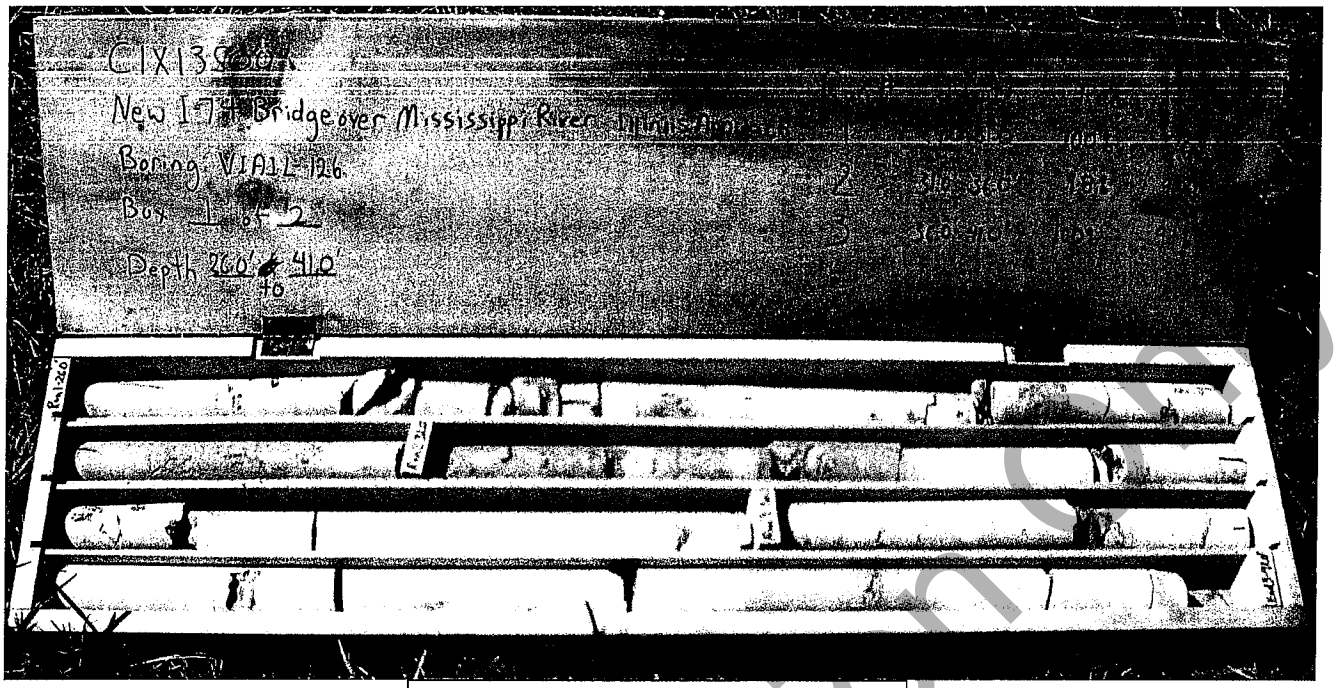
Boring VIAIL-125

Run	Depth (ft)	REC (%)	RQD (%)
1	27.5 – 30.9	100	41
2	30.9 – 35.9	98	40
3	35.9 – 40.9	100	98
4	40.9 – 45.9	100	75



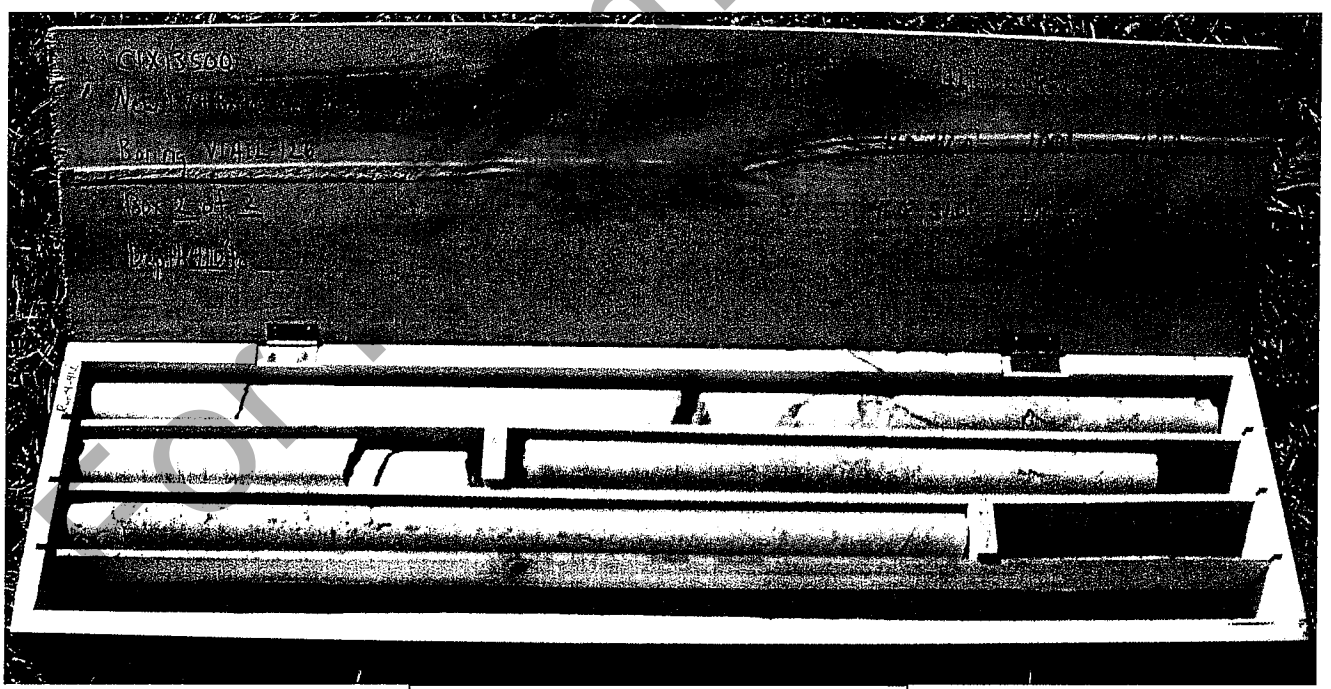
Boring VIAIL-125

Run	Depth (ft)	REC (%)	RQD (%)
5	45.9 – 50.9	100	88
6	50.9 – 55.9	100	100



Boring VIAIL-126

Run	Depth (ft)	REC (%)	RQD (%)
1	26.0 – 31.0	100	76
2	31.0 – 36.0	98	92
3	36.0 – 41.0	100	91



Boring VIAIL-126

Run	Depth (ft)	REC (%)	RQD (%)
4	41.0 – 46.0	100	92
5	46.0 – 51.0	100	100

Summary of RMR and Elastic Moduli

SUMMARY OF ROCK MASS RATING (RMR) AND ELASTIC MODULI

Pier	Boring No.	Run No.	REC (%)	RQD (%)	RMR (Lower)	RMR (Upper)	RMR (Ave.)	Em (ksi)	Ei (ksi)
29+40 North Abut	VIAIL-103	1	33	0	38	41	40	792.3	
		2	97	90	55	61	58	2298.1	37
		3	92	66	49	55	52	1626.9	
		4	100	61	49	52	51	1492.3	
		5	99	78	51	58	55	1878.7	
		6	100	89	47	50	49	1330.1	
	VIAIL-104	1	100	51	41	43	42	914.9	
		2	85	21	46	52	49	1368.9	496
		3	73	40	39	46	43	941.6	
		4	98	38	42	49	46	1119.1	
		5	98	87	46	54	50	1450.0	
		6	98	62	48	55	52	1580.8	
30+90 Pier 1	VIAIL-105	1	48	0	37	42	40	792.3	
		2	83	18	39	45	42	914.9	400
		3	93	69	50	53	52	1580.8	
		4	88	26	42	48	45	1087.3	370
		5	90	35	45	49	47	1220.0	
		6	93	59	50	57	54	1773.7	
		7	99	84	55	60	58	2232.9	
	VIAIL-106	1	58	47	46	51	49	1330.1	
		2	99	87	55	64	60	2505.3	84
		3	99	87	54	63	59	2365.2	
		4	100	90	57	63	60	2578.5	
		5	98	72	51	56	54	1773.7	
	VIAIL-107	1	100	24	42	47	45	1056.5	
		2	84	38	40	49	45	1056.5	
		3	97	55	47	52	50	1408.9	417
		4	96	65	47	54	51	1492.3	
		5	100	53	48	54	51	1535.9	
		6	100	54	48	55	52	1580.8	
33+20 Pier 2	VIAIL-108	1	91	29	43	45	44	1026.5	
		2	77	0	35	42	39	747.9	
		3	96	15	41	44	43	941.6	269
		4	98	42	45	51	48	1292.3	
		5	100	25	43	48	46	1119.1	
		6	100	27	43	47	45	1087.3	
34+77.50 Pier 3	VIAIL-109	1	100	19	41	45	43	969.1	
		2	96	65	50	58	54	1825.4	61
		3	100	89	57	62	60	2505.3	
		4	100	91	57	63	60	2578.5	
		5	98	98	60	64	62	2893.1	
		6	100	83	57	58	58	2232.9	
	VIAIL-110	1	80	20	40	47	44	997.4	
		2	100	84	56	64	60	2578.5	
		3	100	87	55	60	58	2232.9	78
		4	100	78	53	60	57	2108.0	
		5	100	86	54	63	59	2365.2	
	PRMPD-04	1	99	73	51	57	54	1825.4	
		2	94	49	46	53	50	1408.9	612
		3	85	78	50	58	54	1825.4	
		4	100	100	60	66	63	3064.6	
		5	100	96	60	64	62	2893.1	
36+67 Pier 4	VIAIL-111	1	89	65	46	57	52	1580.8	
		2	74	15	37	46	42	888.9	
		3	95	53	48	54	51	1535.9	374
		4	100	72	53	61	57	2169.5	
		5	100	93	59	66	63	2977.6	
	VIAIL-112	1	76	21	41	43	42	914.9	
		2	100	58	47	54	51	1492.3	446
		3	97	43	44	51	48	1255.6	
		4	100	99	66	69	68	3970.7	
		5	100	97	65	75	70	4585.3	
	PRMPD-06	1	87	33			0	81.5	
		2	91	51	48	56	52	1626.9	
		3	100	72	53	59	56	2048.2	1357
		4	100	83	58	62	60	2578.5	
		5	90	79	55	63	59	2434.3	
		6	99	83	56	62	59	2434.3	

Em: Elastic Modulus of Rock Mass
Ei: Elastic Modulus of Intact Rock from Test

SUMMARY OF ROCK MASS RATING (RMR) AND ELASTIC MODULI

Pier	Boring No.	Run No.	REC (%)	RQD (%)	RMR (Lower)	RMR (Upper)	RMR (Ave.)	Em (ksi)	Ei (ksi)
38+56 Pier 5	VIAIL-113	1	100	37	48	52	50	1450.0	
		2	98	51	49	57	53	1723.3	842
		3	99	83	58	67	63	2977.6	
		4	100	98	63	68	66	3538.9	
		5	100	98	64	75	70	4455.2	
	VIAIL-114	1	92	39	47	53	50	1450.0	
		2	100	63	50	59	55	1878.7	1149
		3	100	83	57	64	61	2653.8	
		4	100	88	57	65	61	2731.3	
		5	100	93	60	68	64	3246.1	
	PRMPD-05	1	82	23	38	48	43	969.1	
		2	100	95	58	68	63	3064.6	
		3	97	87	58	66	62	2893.1	1917
		4	100	100	74	74	74	5772.6	
		5	100	84	56	65	61	2653.8	
40+00 Pier 6	VIAIL-115	1	86	22	38	43	41	839.2	
		2	75	26	38	46	42	914.9	
		3	100	76	56	62	59	2434.3	1025
		4	92	70	54	64	59	2434.3	
		5	98	83	57	65	61	2731.3	
		6	100	75	55	65	60	2578.5	
42+31 Pier 7	VIAIL-118	1	53	9	37	47	42	914.9	1123
		2	96	67	51	60	56	1990.1	
		3	100	93	54	60	57	2169.5	
		4	100	80	55	60	58	2232.9	
		5	100	79	58	64	61	2731.3	
43+48 Pier 8	VIAIL-119	1	78	30	41	49	45	1087.3	
		2	96	54	51	57	54	1825.4	
		3	100	88	59	63	61	2731.3	1123
		4	100	91	60	68	64	3246.1	
		5	100	93	61	66	64	3154.0	
	VIAIL-120	1	85	42	43	50	47	1185.4	
		2	92	53	45	52	49	1330.1	508
		3	100	86	56	63	60	2505.3	
		4	95	52	48	55	52	1580.8	
		5	100	94	64	68	66	3642.2	
44+81 Pier 9	VIAIL-121	1	80	11	27	37	32	514.5	
		2	95	53	50	59	55	1878.7	1123
		3	100	97	60	67	64	3154.0	
		4	100	94	60	67	64	3154.0	
		5	93	81	59	68	64	3154.0	
	VIAIL-122	1	63	0	36	42	39	769.8	
		2	100	35	46	54	50	1450.0	
		3	100	89	58	64	61	2731.3	1123
		4	100	60	53	59	56	2048.2	
		5	100	84	57	67	62	2893.1	
46+66 Pier 10	VIAIL-123	1	98	82	55	63	59	2434.3	
		2	100	97	60	70	65	3438.5	1123
		3	98	94	62	66	64	3246.1	
		4	93	56	41	49	45	1087.3	
		5	92	69	49	59	54	1825.4	
	VIAIL-124	1	100	55	47	56	52	1580.8	
		2	100	91	59	64	62	2811.0	1123
		3	100	89	60	65	63	2977.6	
		4	100	89	60	66	63	3064.6	
		5	98	94	60	67	64	3154.0	
48+91 South Abut	VIAIL-125	1	100	41	46	52	49	1368.9	
		2	98	40	38	49	44	997.4	1123
		3	100	98	60	69	65	3340.9	
		4	100	75	57	62	60	2505.3	
		5	100	88	61	66	64	3154.0	
		6	100	100	62	70	66	3642.2	
	VIAIL-126	1	100	76	55	64	60	2505.3	
		2	98	92	58	65	62	2811.0	1123
		3	100	91	60	65	63	2977.6	
		4	100	92	59	68	64	3154.0	
		5	100	100	68	71	70	4455.2	

Em: Elastic Modulus of Rock Mass
Ei: Elastic Modulus of Intact Rock from Test

Existing Viaduct Plan and Elevations

HORIZONTAL CURVE DATA				
ITEM	CURVE 3A	CURVE N2	CURVE S1	CURVE 3K
Δ	113°-23'-09.880"	36°-05'-52.136"	35°-51'-15.213"	21°- 30'-00"
D	4°-30 00"	4°-20'-00"	3°-45'-00"	3°-30'-00"
R	1273.2395'	1322.2103'	1527.8875'	1637.0223'
T	506.5044'	430.8603'	495.0293'	355.4324'
L	954.1351'	833.0265'	957.4460'	700.0000'
L.C.	941.2649'	819.3174'	941.8571'	694.6792'
P.C.STA.	351+87.7235	252+04.8789	250+83.1701	150+84.5737
P.I.STA.	356+94.2279	255+35.7392	255+78.1994	154+40.0061
P.T.STA.	361+51.8586	260+37.9054	260+40.6161	157+84.5737

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HVB	ROCK ISLAND	298	63-A
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-1-A

DENOTES FLOOR DRAIN

DENOTES LIGHT STANDARD

FOR DRAIN DETAILS (TYPE 'A' DRAIN) SEE DWG. D-1.

BASELINE #	STATION	TOP OF RAIL ELEVATION		
		TRACK #1	TRACK #2	TRACK #3
1	11+00	565.90	566.25	-
1	12+00	565.81	-	-
2	11+00	-	-	556.89
2	12+00	-	566.52	566.99
1	13+00	565.75	-	-
2	13+00	-	566.83	567.25

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY E.S.M.
DRAWN BY G.P.A.
CHECKED T.C.D.
IN CHARGE E.S. MARTINS
APPROVED W.G. HORN

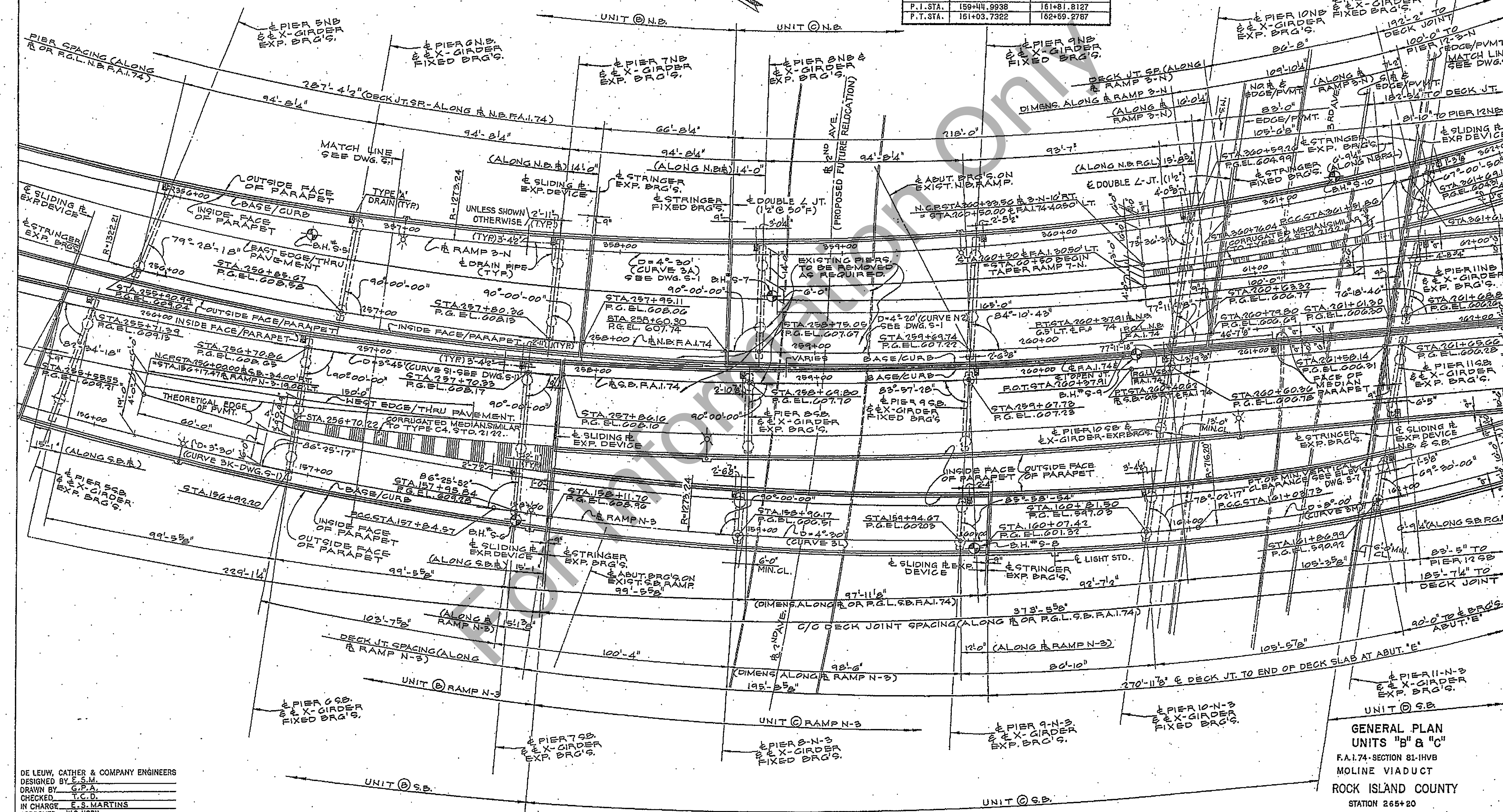
GENERAL NOTES:
ALL DIMENSIONS SHOWN ARE BETWEEN POINTS ON A HORIZONTAL PLANE AT A TEMPERATURE OF 50°F.

DESIGN NOTES:
LOADING-HS 20-44 & ALT.
f_c = 1200 P.S.I. SLAB; f_c = 1400 P.S.I. {CURB & PARAPET}
f_c = 1000 P.S.I. SUBSTRUCTURE.
f_s = 20,000 P.S.I. REINF. BARS & STRUCT. STL. (A-36)
v = 75 P.S.I. MAX. ALLOW. SHEAR IN FOOTINGS.
n = 10.
ALLOWABLE L.L. DEFLECTION - $\frac{1}{1200}$ (COMPOSITE CONSTRUCTION THRU OUT.)

GENERAL PLAN - UNIT "A"
F.A.I. 74 - SECTION 81-1HVB
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20
SCALE: 1"=20'-0"
DATE: REVISED: JULY 28, 1972

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HVB	ROCK ISLAND	298	64
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-2



HORIZONTAL CURVE DATA		
ITEM	CURVE 3L	CURVE 3M
Δ	14°-21'-43.656"	12°-26'-37.431"
D	4°-30'-00"	8°-00'-00"
R	1273.2395'	716.1972'
T	160.4200'	78.0805'
L	319.1684'	155.5466'
L.C.	318.3235'	155.2411'
P.C.STA.	157+84.5738	161+03.7322
P.I.STA.	159+44.9938	161+81.8127
P.T.STA.	161+03.7322	162+59.2787

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY E.S.M.
DRAWN BY G.P.A.
CHECKED T.C.D.
IN CHARGE E.S. MARTINS
APPROVED W.G. HORN

GENERAL PLAN
UNITS "B" & "C"
F.A.I. 74-SECTION 81-1HVB
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20
SCALE: 1" = 20'-0" DATE:

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HVB	ROCK ISLAND	298	65
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-3

HORIZONTAL CURVE DATA					
ITEM	CURVE 3N	CURVE 3B	CURVE 3C	CURVE 3F	CURVE 3G
Δ	53°-06'-57.046"	11°-47'-02.870"	44°-30'-51.540"	13°-29'-58.425"	12°-49'-21"
D	16°-00'-00"	9°-00'-00"	22°-00'-00"	13°-00'-00"	5°-00'-00"
R	358.0986'	636.6198'	260.4354'	440.7368'	1145.9156'
T	178.9936'	65.6991'	106.6849'	52.1629'	128.7629'
L	331.9740'	130.9348'	202.3378'	103.8428'	256.4500'
L.C.	320.2134'	130.7041'	197.2872'	103.6028'	255.9152'
P.C.STA.	162+59.2787	361+51.8586	362+82.7934	364+86.1310	365+88.9738
P.I.STA.	164+38.2733	362+17.5577	363+89.3783	365+37.2939	367+17.7367
P.T.STA.	165+91.2627	362+82.7933	364+86.1312	365+88.9738	368+45.4238

HORIZ. CURVE DATA-SO. EDGE OF PAV'T.		
ITEM	CURVE 1	CURVE 2
Δ	12°-48'-39"	3°-09'-08"
D	9°-32'-57"	2°-00'-33"
R	600.00'	2851.79'
T	67.36'	78.47'
L	134.16'	156.90'
L.C.	133.88'	156.88'
P.C. STA.	365+07.58 RT. 15.01	366+37.82 RT. 15.01
P.I. STA.	365+73.11 RT. 20.06'	-
P.T. STA.	366+37.82 RT. 15.01'	-

DE LEUW, CATHER & COMPANY ENGINEERS	
DESIGNED BY	T.C.D.
DRAWN BY	G.P.A.
CHECKED	F.S.M
IN CHARGE	F.S.MARTINS
APPROVED	W.G. HORN

TOP OF RAIL ELEVATION							
			CRIEP R.R.				
℄ STATION	MAIN TRACK	TRACK 27	MAIN LINE WB	MAIN LINE EB	TRACK #19	TRAFK #21	TRACK #22
12+00	574.25	574.48	574.59	574.87	571.57	575.08	574.92
13+00	574.09	574.30	574.33	574.60	574.16	574.43	574.22
14+00	573.88	574.11	574.11	574.26	573.99	—	573.83

DENOTES LIGHT STANDARD

DENOTES FLOOR DRAIN FOR DETAILS (TYPE 'A' DRAIN) SEE DWG. D-1.

NOTE "A"
SEE APPROACH SLAB SHEETS FOR DETAILS AND QUANTITIES OF APPROACH SLABS AND PILE DATA, WHERE APPLICABLE.

GENERAL PLAN UNITS "D" & "E"

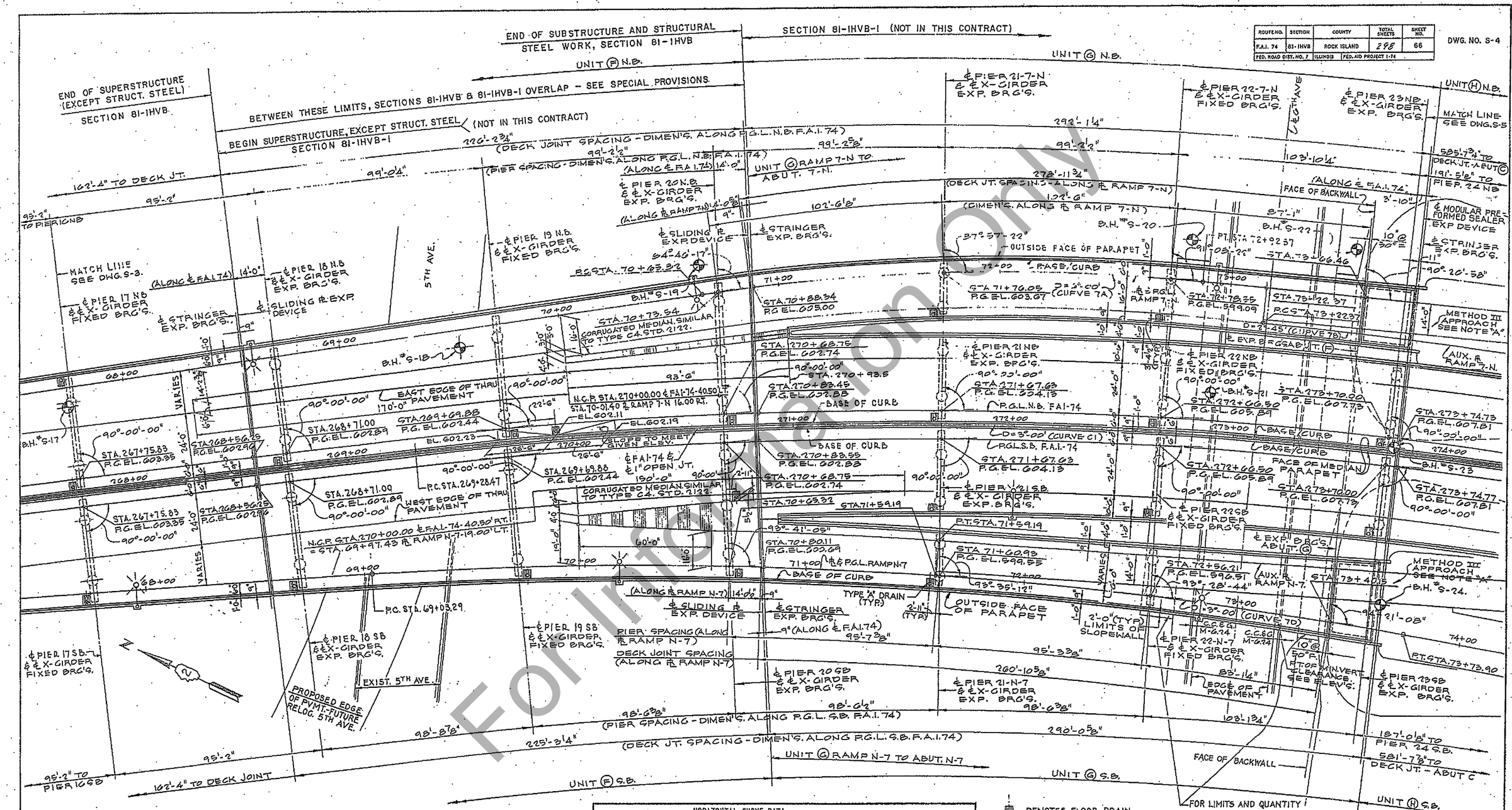
F.A.I. 74 - SECTION 81-1HVB
MOLINE VIADUCT

ROCK ISLAND COUNTY
STATION 265+20

SCALE: 1" = 20'-0" DATE:

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-IHVB	ROCK ISLAND	298	66
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-4



HORIZONTAL CURVE DATA				
ITEM	CURVE C1	CURVE 7A	CURVE 7D	CURVE 7B
Δ	39°-24'-28.213"	13°-35'-35.466"	14°-07'-05.421"	5°-31'-24.953"
D	3°-00'-00"	6°-00'-00"	3°-00'-00"	2°-45'-00"
R	1909.8593'	954.9297'	1909.8593'	2083.4829'
T	683.9760'	113.8109'	236.5007'	100.5069'
L	1313.8948'	226.5531'	470.6058'	200.8581'
L.C.	1287.8550'	226.0221'	469.4161'	200.7803'
P.C. STA.	269+28.4725	70+65.8189	69+03.2841	73+22.3720
P.I. STA.	276+12.4485	71+79.6298	71+39.7948	74+22.8788
P.T. STA.	282+42.0671	72+92.3720	73+73.8998	75+23.2301

NOTE "A"

SEE APPROACH SLAB SHEETS FOR DETAILS AND QUANTITIES OF APPROACH SLABS AND PILE DATA WHERE APPLICABLE.

DENOTES FLOOR DRAIN

DENOTES LIGHT STANDARD

FOR DRAIN DETAILS (TYPE "A" DRAIN) SEE DWG. D-1.

FOR TYPE OF JOINTS AT ABUTMENTS SEE DWG. S-165.

FOR LIMITS AND QUANTITY OF SLOPEWALL, SEE ROADWAY PLAN AND PROFILE SHEETS.

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY T.C.D.
DRAWN BY G.P.A.
CHECKED R.D.K.
IN CHARGE E.S. MARTINS
APPROVED W.G. HORN

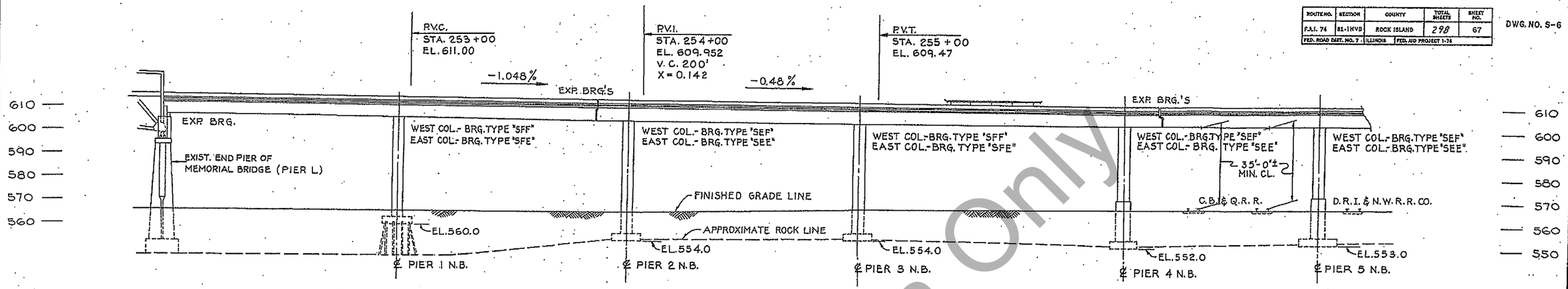
GENERAL PLAN UNITS "F" & "G"

F.A.I. 74 - SECTION 81-IHVB
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20

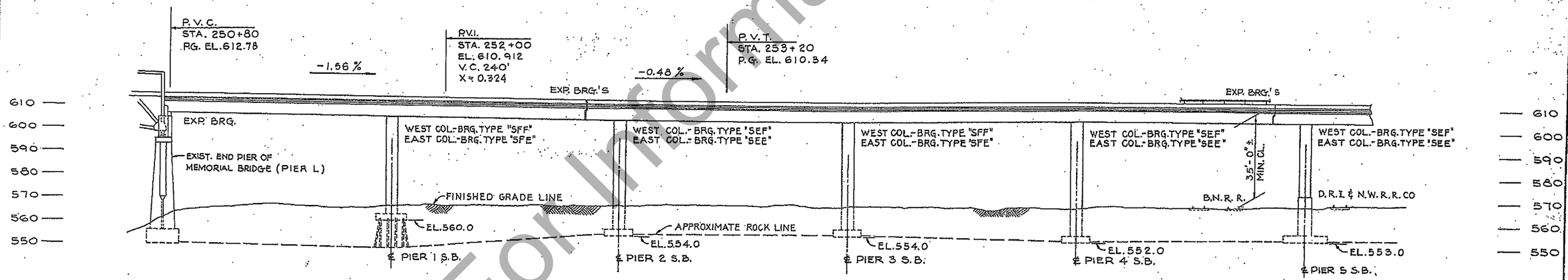
SCALE: 1" = 20'-0" DATE:

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HVB	ROCK ISLAND	298	67
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT 1-74		

DWG. NO. S-6



ELEVATION — N.B. ROADWAY
1" = 20'



ELEVATION — S.B. ROADWAY
1" = 20'

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY T.C.D.
DRAWN BY A.B. & M.V.
CHECKED T.C.D.
IN CHARGE E.S. MARTINS
APPROVED W.G. HORN

ELEVATION – N.B. & S.B. RDWAY
EXISTING PIER TO PIER 5

F.A.I. 74-SECTION 81-1HVB
MOLINE VIADUCT

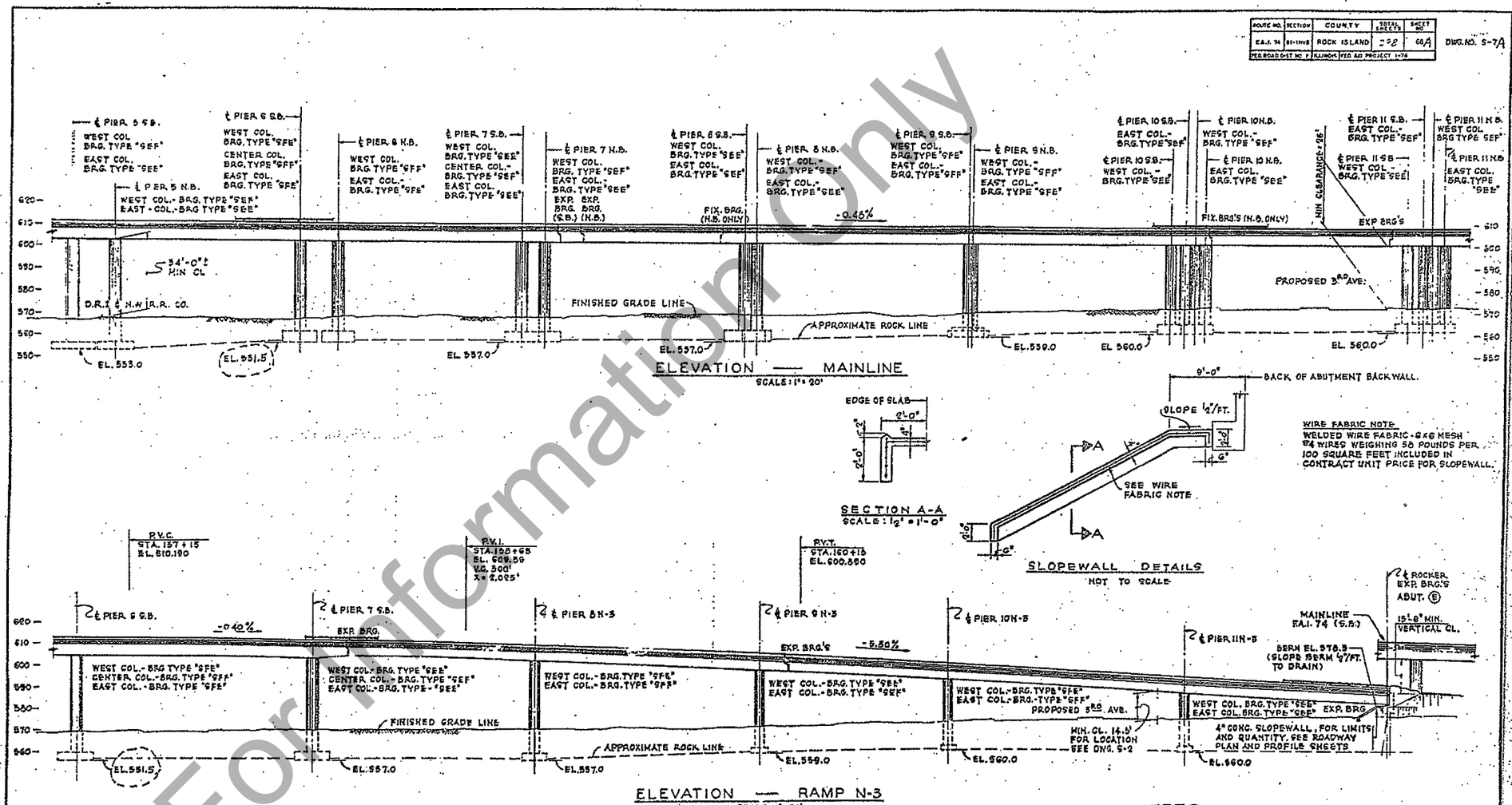
ROCK ISLAND COUNTY
STATION 265+20

SCALE: AS NOTED DATE:

FE 10 3155 6-73

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HVB	ROCK ISLAND	252	68A
FED.ROAD DIST NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-7A



ELEVATION — MAINLINE
SCALE: 1" = 20'

SECTION A-A
SCALE: 1/2" = 1'-0"

WIRE FABRIC NOTE
WELDED WIRE FABRIC - 6x6 MESH
#4 WIRES WEIGHING 58 POUNDS PER 100 SQUARE FEET INCLUDED IN CONTRACT UNIT PRICE FOR SLOPEWALL.

SLOPEWALL DETAILS
NOT TO SCALE

ELEVATION — RAMP N-3
SCALE: 1" = 20'

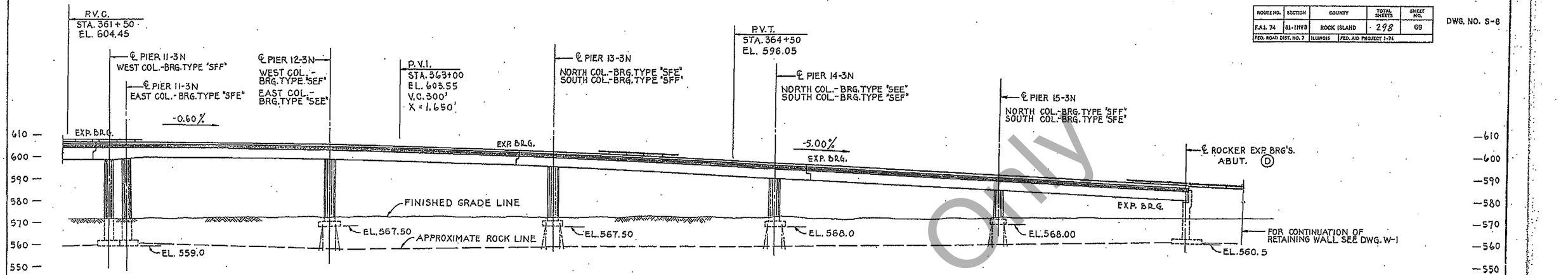
AS REVISED Jan. 18, 1974

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY T.C.J.
DRAWN BY E.E.B. M.V.
CHECKED T.C.J.
IN CHARGE C.L. MARTINS
APPROVED W.S. HORN

ELEVATIONS
MAINLINE - PIER 5 TO PIER 11
RAMP N-3 - PIER 6 S.B. TO ABUT. (E)
F.A.I. 74 - SECTION 81-1HVB
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20
SCALE: AS NOTED DATE:

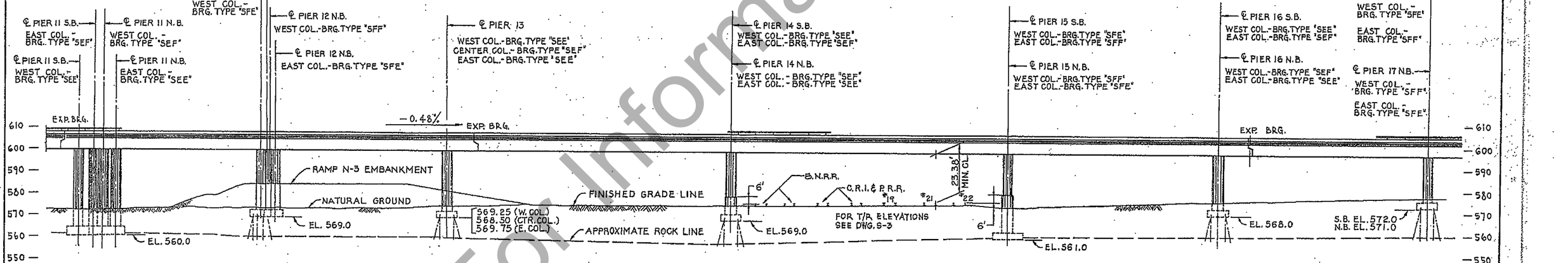
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HVB	ROCK ISLAND	298	69
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-8



ELEVATION — RAMP 3-N

SCALE: 1"=20'



ELEVATION — MAINLINE

SCALE: 1"=20'

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY T.C.D.
DRAWN BY A.B.
CHECKED T.C.D.
IN CHARGE E.S. MARTINS
APPROVED W.G. HORN

ELEVATIONS
RAMP 3-N – PIER 11 TO ABUT. (D)
MAINLINE – PIER 11 TO PIER 17

F.A.I. 74-SECTION 81-1HVB
MOLINE VIADUCT.

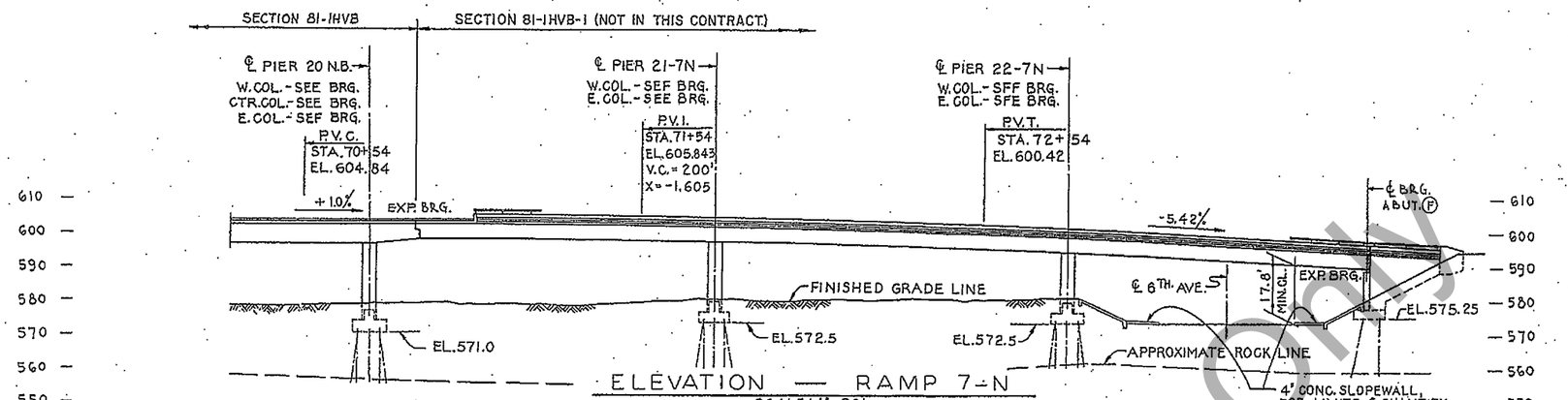
ROCK ISLAND COUNTY

STATION 265+20

SCALE: AS NOTED DATE:

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-IHVB	ROCK ISLAND	298	70
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

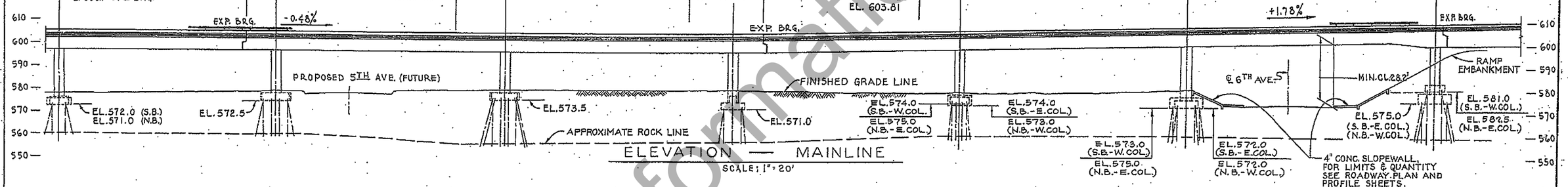
DWG. NO. S-9



ELEVATION — RAMP 7-N

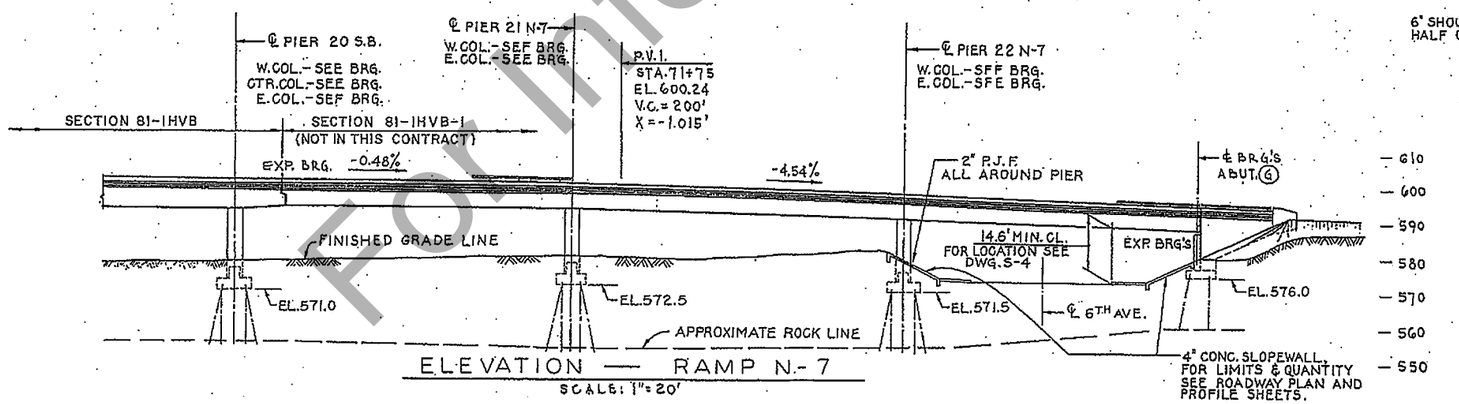
SCALE: 1"=20'

NOTE "A" - WORK BREAKDOWN IN OVERLAP AREA:
SECTION 81-IHVB-1 SUPERSTRUCTURE EXCEPT STRUCTURAL STEEL.
SECTION 81-IHVB SUBSTRUCTURE & STRUCTURAL STEEL.



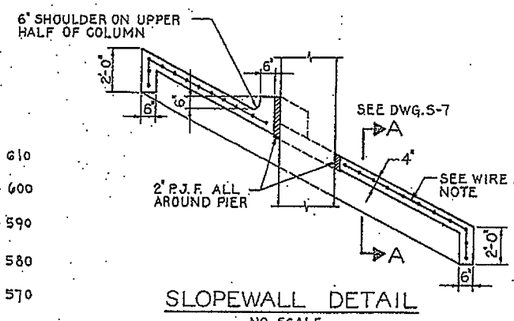
ELEVATION — MAINLINE

SCALE: 1"=20'



ELEVATION — RAMP N-7

SCALE: 1"=20'



SLOPEWALL DETAIL

NO SCALE

WIRE FABRIC NOTE:
WELDED WIRE FABRIC 6×6 MESH #4 WIRES WEIGHING 58 POUNDS PER 100 SQUARE FEET INCLUDED IN CONTRACT UNIT PRICE FOR SLOPE WALL.

ELEVATIONS
RAMP 7-N - PIER 20 N.B. TO ABUT.
S.B. RDWAY. - PIER 17 TO PIER 23
RAMP N-7 - PIER 20 S.B. TO ABUT.

F.A.I. 74 - SECTION 81-IHVB
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20

SCALE: AS NOTED DATE:

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY T.C.D.
DRAWN BY A.B.
CHECKED T.C.D.
IN CHARGE E.S.MARTINS
APPROVED W.G. HORN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-IHVB	ROCK ISLAND	389	151
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-5

DENOTES LIGHT STANDARD (BY OTHERS)

FOR DRAIN DETAILS (TYPE 'B' DRAIN) SEE DWG. D-1.

DENOTES FLOOR DRAIN.

UNIT (H) N.B.

UNIT (G) N.B.

℄ PIER 23NB & ℄ X-GIRDER EXP. BRG'S.

MATCH LINE SEE DWG. S-4

℄ PIER 24NB & ℄ X-GIRDER FIXED BRG'S.

℄ PIER 25NB & ℄ X-GIRDER EXP. BRG'S.

℄ EXP. BRG'S. ABUT. (E)

585'-7¾" (DECK JOINT SPACING - ALONG P.G.L. N.B. F.A.I. 74)

23'-2⅝" (DIMENS. ALONG P.G.L. N.B. F.A.I. 74)

159'-9½"

298'-11¼" TO DECK JT.

103'-10¼" TO PIER 23NB

3'-10"

℄ MODULAR PREFORMED SEALER EXP. DEVICE & STRINGER EXP. BRG'S.

B.H. #S-22

191'-5⅛"

ON-RAMP TO F.A.I. 74 (7-N RAMP)

D = 7°-45' (CURVE 7B)

B.C.C. STA. 75+28.23

AUX. ℄

OFF-RAMP FROM F.A.I. 74 (S-7 RAMP)

OUTSIDE FACE OF PARAPET

BASE OF CURB

9-9⅜ MIN. CL.

STA. 275+59.32

FACE OF MEDIAN PARAPET

P.G.L. N.B. F.A.I. 74

76°-20'-49"

STA. 275+60.78 P.G. EL. 611.12

8'-4¾" MIN. CL.

4'-9"

STA. 277+96.44

STA. 277+97.19 P.G. EL. 615.33

83°-20'-52"

METHOD II APPROACH SEE NOTE "A"

FOR CONTINUATION OF WALL, SEE DWG. W-4.

STA. 279+50.44 P.G. EL. 618.17

BACK/ABUT. STA. 279+54.50

90°-00'-00"

20'-0"

℄ EXP. BRG'S. ABUT. F

STA. 273+70.00 P.G. EL. 607.73

STA. 273+74.73 P.G. EL. 607.81

BASE/CURB

B.H. #S-23

STA. 275+57.65 P.G. EL. 611.07

76°-20'-49"

8-3¼' MIN. CL.

D = 3°-00' (CURVE C) SEE DWG. S-4

℄ F.A.I. 74 & ℄ 1" OPEN JT.

℄ P.G.L.S.B. F.A.I. 74

2'-4"

B.H. #S-25

B.H. #S-26

83°-20'-52"

8'-9" MIN. CL.

STA. 277+95.68 P.G. EL. 615.31

℄ TYPE 'B' DRAIN (TYP.) (SEE DWG. D-1)

STA. 279+56.44 P.G. EL. 618.17

APPROACH SLAB

10 @ 5 SPACES @ 4'-5" MAX. (TYP.)

℄ EXP. BRG'S. ABUT. G

P.C. STA. 75+75.79

POINT OF MIN. VERT. CLEARANCE; SEE DWG. S-10.

B.H. #S-24

P.T. STA. 73+73.90

OFF-RAMP FROM F.A.I. 74 (N-7 RAMP)

187'-0⅛"

581'-7⅝"

237'-2⅝"

160'-2⅝"

B.H. #S-27

1'-0" @ 50° R

℄ FINGER EXP. DEVICE.

FOR CONTINUATION OF WALL, SEE DWG. W-9

103'-1¾" TO PIER 22SB

290'-0⅝" TO DECK JT.

℄ PIER 24 SB & ℄ X-GIRDER FIXED BRG'S.

℄ PIER 23 SB & ℄ X-GIRDER EXP. BRG'S.

℄ PIER 25 SB & ℄ X-GIRDER EXP. BRG'S.

(DIMENSIONS ALONG P.G.L. S.B. F.A.I. 74) (DECK JT. SP. ALONG P.G.L. S.B. F.A.I. 74)

ON-RAMP TO F.A.I. 74 (7-S RAMP)

UNIT (H) S.B.

UNIT (G) S.B.

7TH AVENUE

NOTE "A"

SEE APPROACH SLAB SHEETS FOR DETAILS AND QUANTITIES OF APPROACH SLABS AND PILE DATA, WHERE APPLICABLE.

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY E.S.M.
DRAWN BY G.P.A.
CHECKED T.C.D.
IN CHARGE E.S. MARTINS
APPROVED W.G. HORN

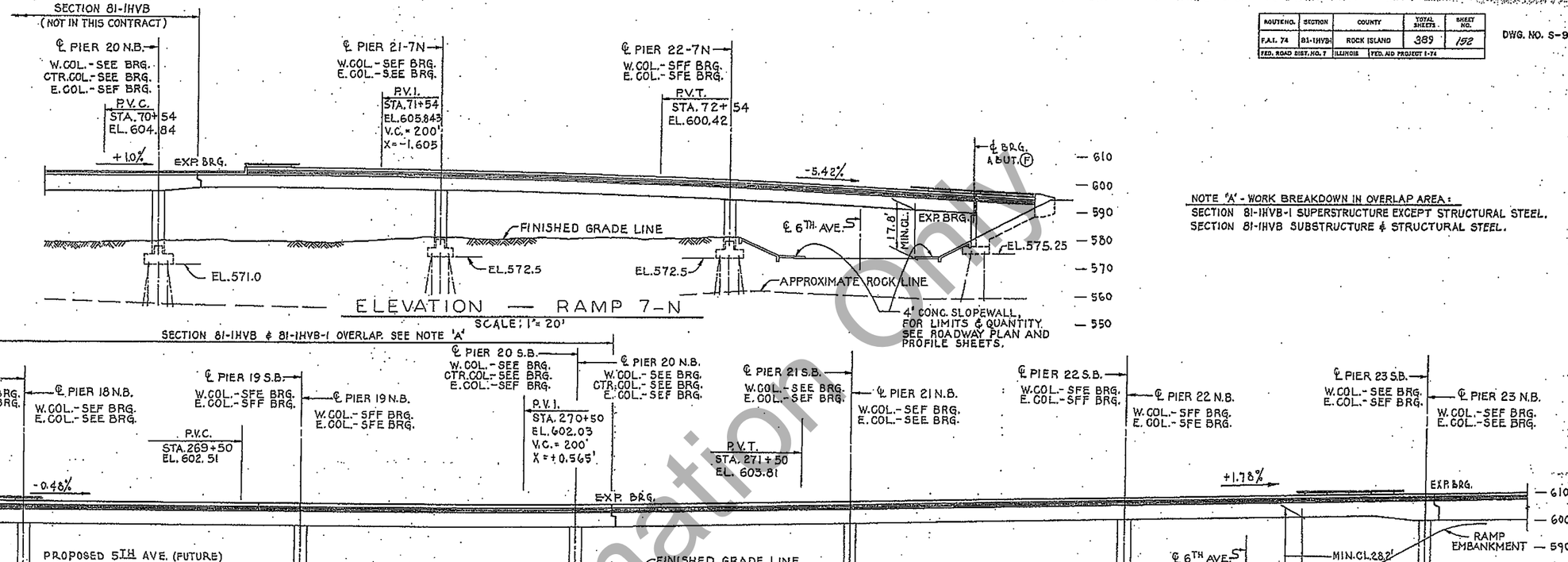
GENERAL PLAN - UNIT "H"

F.A.I. 74 - SECTION 81-IHVB-1
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20

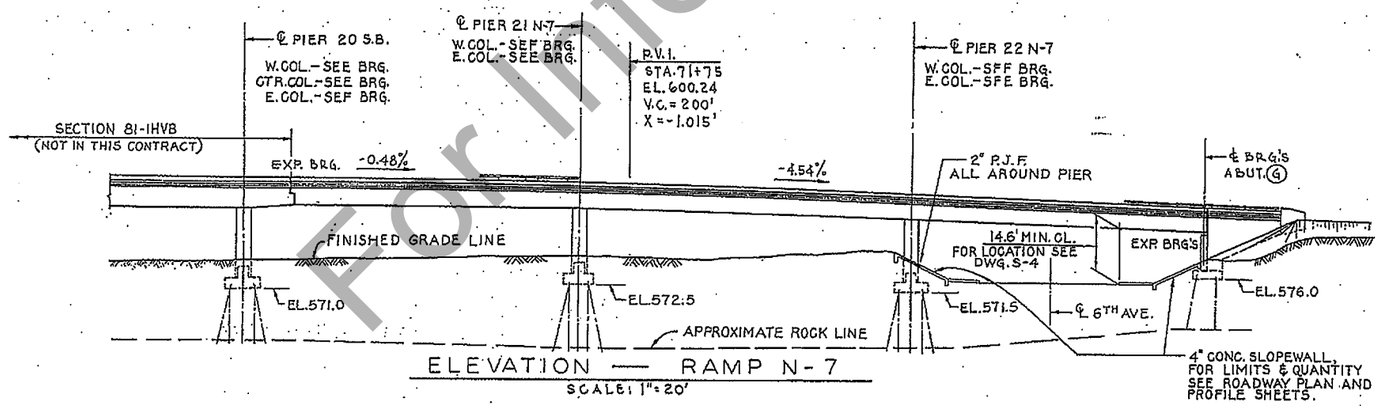
SCALE: 1" = 20'-0" DATE:

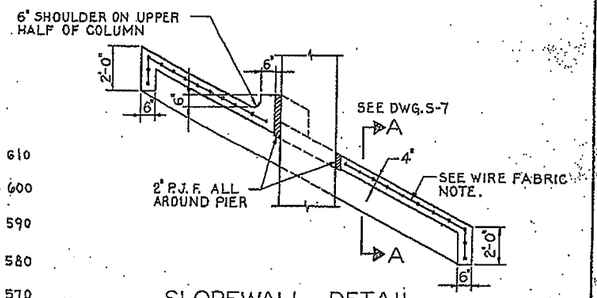
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-1HVB	ROCK ISLAND	389	152
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-9



NOTE 'A' - WORK BREAKDOWN IN OVERLAP AREA:
SECTION 81-1HVB-1 SUPERSTRUCTURE EXCEPT STRUCTURAL STEEL.
SECTION 81-1HVB SUBSTRUCTURE & STRUCTURAL STEEL.





SLOPEWALL DETAIL
NO SCALE

WIRE FABRIC NOTE:
WELDED WIRE FABRIC 6x6 MESH #4 WIRES WEIGHING 58 POUNDS PER 100 SQUARE FEET INCLUDED IN CONTRACT UNIT PRICE FOR SLOPE WALL.

ELEVATIONS
RAMP 7-N - PIER 20 N.B. TO ABUT.
S.B. RDWAY. - PIER 17 TO PIER 23
RAMP N-7 - PIER 20 S.B. TO ABUT.

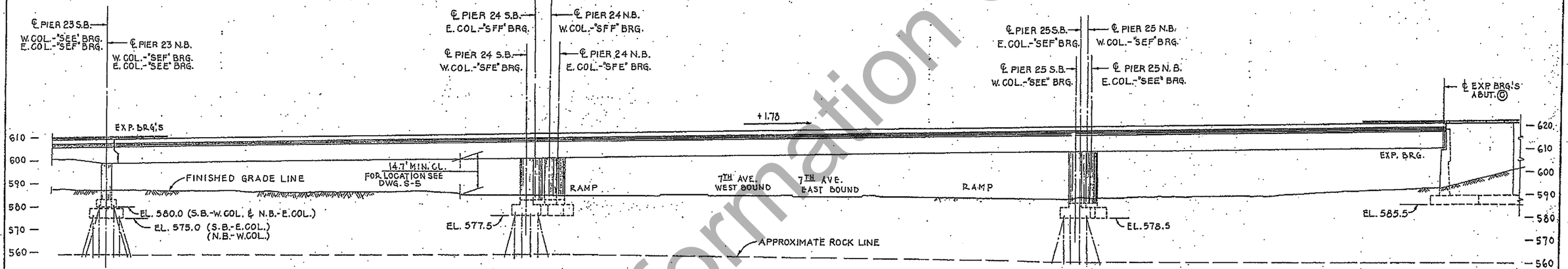
F.A.I. 74 - SECTION 81-1HVB-1
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20

SCALE: AS NOTED DATE:

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY T.C.D.
DRAWN BY A.B.
CHECKED T.C.D.
IN CHARGE E.S.MARTINS
APPROVED W.G. HORN

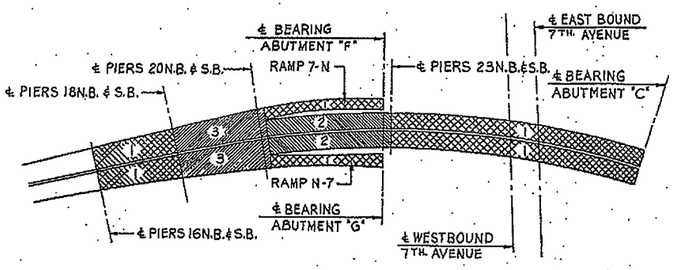
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 74	81-IHVB	ROCK ISLAND	389	183
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT I-74		

DWG. NO. S-10



ELEVATION — MAINLINE

SCALE: 1" = 20'



SLAB POURING SEQUENCE

AREAS SHADED [1] MUST BE POURED BEFORE ANY ADJACENT AREAS SHADED [2] OR [3] ARE POURED.

AREAS SHADED [2] MUST BE POURED BEFORE ANY ADJACENT AREAS SHADED [3] ARE POURED.

AREAS SHADED [3] MAY NOT BE POURED UNTIL ALL ADJACENT AREAS SHADED [1] OR [2] ARE IN PLACE.

DE LEUW, CATHER & COMPANY ENGINEERS
DESIGNED BY T.C.D.
DRAWN BY A.B.
CHECKED T.D.C.
IN CHARGE E.S. MARTINS
APPROVED W.G. HORN

ELEVATION -- MAINLINE
PIER 23 TO ABUT. ©
F.A.I. 74 - SECTION 81-IHVB-1
MOLINE VIADUCT
ROCK ISLAND COUNTY
STATION 265+20
SCALE: AS NOTED DATE:

Illinois Department of Transportation

Structure Geotechnical Report Responsibility Checklist

Structure Number: 081-0177 (prop.) 081-0111 (exist.) Contract Number: _____ Date: 6/26/2008

Route: I-74 Section: Illinois Viaduct County: Rock Island

TSL plans by: Jacobs

Structure Geotechnical Report and Checklist by: Jacobs

IDOT Structure Geotechnical Report Approval Responsibility : ☒ Qualified District Geotechnical Personnel ☐ BBS Central Geotechnical Unit

	Yes	No	N/A
Geotechnical Data, Subsurface Exploration and Testing			
All pertinent existing boring data, pile driving data, site inspection information included in the report?	☒	☐	☐
Are the preliminary substructure locations, foundation needs, and project scope discussions between Geotechnical Engineer and Structure Planner included in the report?	☒	☐	☐
All ground and surface water elevations shown on all soil borings and discussed in the report?	☒	☐	☐
Has all existing and new exploration and test data been presented on a subsurface data profile?	☒	☐	☐
Is the exploration and testing in accordance with the IDOT Geotechnical Manual policy?	☐	☒	☐
Are the number, locations, depths, sampling, testing, and subsurface data adequate for design?	☐	☒	☐
Geotechnical Evaluations			
Have structure or embankment settlement amounts and times been discussed in report?	☒	☐	☐
Does the report provide recommendations/treatments to address settlement concerns?	☒	☐	☐
Has the critical factor of safety against slope instability been identified and discussed in the report?	☒	☐	☐
Does the report provide recommendations/treatments to address stability concerns?	☒	☐	☐
Is the seismic design data (PGA, amplification, category, etc.) noted in the report?	☒	☐	☐
Have the vertical and horizontal limits of any liquefiable layers been identified and discussed?	☐	☐	☒
Has seismic stability been discussed and have any slope deformation estimates been provided?	☐	☒	☐
Has the report discussed the proximity of ISGS mapped mines or known subsidence events?	☒	☐	☐
Has scour been discussed, any Hydraulics Report depths reported & soil type reductions made?	☐	☐	☒
Do the Factors of Safety meet AASHTO and IDOT policy requirements?	☒	☐	☐
Geotechnical Analyses and Design Recommendations			
When spread footings are recommended, has a bearing capacity and footing elevation been provided for each substructure or footing region?	☒	☐	☐
Has footing sliding capacity been discussed?	☒	☐	☐
When piles are recommended, does the report include a table indicating estimated pile lengths vs. a range of feasible required bearings and design capacities for each pile type recommended?	☒	☐	☐
Have any downdrag, scour, and liquefaction reductions in pile capacity been addressed?	☒	☐	☐
Will piles have sufficient embedment to achieve fixity and lateral capacity?	☒	☐	☐
Have the diameters & elevations of any pile pre-coring been specified (when recommended)?	☐	☐	☒
Has the need for test piles been discussed and the locations specified (when recommended)?	☒	☐	☐
Has the need for metal shoes been discussed and specified (when recommended)?	☒	☐	☐
When drilled shafts are recommended, have side friction and/or end-bearing values been provided?	☒	☐	☐
Has the feasibility of using belled shafts been discussed when terminating above rock, or have estimated top of rock elevations been provided when extending into rock?	☐	☒	☐
Have shaft fixity, lateral capacity, and min. embedment been discussed?	☒	☐	☐
When retaining walls are required, has feasibility and relative costs for various wall types been discussed?	☐	☐	☒
Have lateral earth pressures and backfill drainage recommendations been discussed?	☒	☐	☐
Has ground modification been discussed as a way to use a less expensive foundation or address feasibility concerns?	☒	☐	☐
Have any deviations from IDOT Geotechnical Manual or Bridge Manual policy been recommended?	☐	☒	☐
Construction Considerations			
Has the need for cofferdams, seal coat, or underwater structure excavation protection been discussed?	☐	☐	☒
Has stability of temporary construction slopes vs. the need for temporary walls been discussed?	☒	☐	☐
Has the feasibility of cantilevered sheeting vs. a temporary soil retention system been discussed?	☒	☐	☐
Has the feasibility of using a geotextile wall vs. a temp. MSE for any temp fill retention been noted?	☐	☐	☒

"In order to aid in determining the level of departmental review, please attach additional documentation or reference specific portions of the SGR to clarify any checklist responses that reflect deviation from IDOT policy/practice."

I-74 Illinois Viaduct Structure Geotechnical Report Responsibility Checklist Notes:

1. Soil classification based upon Jacobs Soil and Rock classification System per previous agreement with Iowa DOT and CH2M Hill.

2. For Illinois Viaduct, additional borings are recommended for final design where access was not available.

3. Lateral capacities using GROUP 7.0 or Florida Multi Pier should be performed during final design once the pile/drilled shaft layouts are made and group reduction factors can be applied. There are short piles that may not provide the required fixity necessitating the need to batter piles or to be set in rock.