
STRUCTURE GEOTECHNICAL REPORT

IL-171 over the Des Plaines River

IL-171 (First Avenue) from 47th Street to 55th Street

IDOT Job: D-91-191-10 (PTB 154, ITEM 014)

Existing SN 016-0483

Existing SN 016-0985

Cook County, Illinois

STRUCTURAL ENGINEER:

Mr. Kurt Naus, P.E., S.E.

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JOB NO. 10025

November 6, 2012



November 6, 2012

Alfred Benesch & Company
205 North Michigan Avenue
Suite 2400
Chicago, Illinois 60601

Attn: Mr. Kurt Naus, P.E., S.E.

Job No. 10025

Re: Structure Geotechnical Report – IL-171 over the Des Plaines River
IL-171 (First Avenue) from 47th Street to 55th Street
Existing SN 016-0483 & 016-0985
Cook County, Illinois
IDOT Job Number: D-91-191-10 (PTB 154, Item #014)

Dear Mr. Naus:

The following report presents the geotechnical analysis and recommendations for the widening of the existing bridge structures carrying IL-171 over the Des Plaines River. A total of ten (10) structural soil borings (SB-17 through SB-21 and SB-37 through SB-41) were completed. Copies of these boring logs, along with plan and profiles are included in this report.

If there are any questions regarding the information submitted herein, please do not hesitate to contact us.

Very truly yours,

GEO SERVICES, Inc.



Alex Barlan, P.E.
Project Engineer



Andrew J. Ptak, P.E.
Office Manager

enc.

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SECTION 01: INTRODUCTION

This report presents the results of the geotechnical investigation for the bridge widening of the IL-171 Bridges over the Des Plaines River for the IL-171 First Avenue from 47th Street to 55th Street Project, IDOT Job Number: D-91-191-10 (PTB 154, Item 014). The results of the ten (10) structure borings (SB-17 through SB-21 and SB-37 through SB-41) completed by Geo Services, along with plan and profile drawings, are included with this report.

Boring locations were selected by Geo Services, Inc. and were reviewed and approved by Alfred Benesch & Company (Benesch) and the Illinois Department of Transportation (IDOT). Boring locations were located in the field by Benesch and finalized in the field by Geo Services, Inc. personnel after review of accessibility and utility locations. Boring locations were surveyed in the field by Benesch surveyors, and drilled locations are illustrated on the boring location diagram in Appendix C.

This report includes recommendations pertaining to the design and construction of the new bridge, earth embankment, a description of soil and groundwater conditions, general construction considerations for the site, location diagram, soil profiles and boring logs.

SECTION 02: PROJECT DESCRIPTION

The existing bridges (SN 016-0483 and SN 016-0985) were built in 1963 and 1964 and are four-span, continuous welded plate girder structures. The overall length of the existing bridges (no skew) is 527'-9.5" measured from back of the abutments to the centerline of the multi-column piers 4 and 23. The out-to-out width of each bridge is 36'-0". Existing plan information indicates the use of steel H-piles for support of the abutments, spread footings for the support of the piers, and timber piles for the support of the approach slabs.

The existing bridges are proposed to be widened approximately 5 feet for the Northbound Structure (SN 016-0985) and widened with a varying width of 12 to 19 feet for the Southbound Structure (SN 016-0483). The estimated maximum service reactions at the foundation structures provided by Benesch are 16.7 kips/foot (DL+LL) at the abutments and 5.4 kips per square foot (DL+LL) at the piers. Currently, wing walls are proposed, surrounding the abutments. The proposed bottom of footing elevations are shown on the following tables 1 and 2.

Table 1 – Southbound Bottom of Footing Elevations (SN 016-0483)

Location	Elevation
Abutment	609.5
Pier 1	578.0
Pier 2	578.0
Pier 3	578.0
Pier 4	584.5

Table 2 – Northbound Bottom of Footing Elevations (SN 016-0985)

Location	Elevation
Abutment	609.5
Pier 20	578.0
Pier 21	578.0
Pier 22	578.0
Pier 23	584.5

SECTION 03: SUBSURFACE INVESTIGATION PROCEDURES

The borings were performed during the months of April and May, 2012, with a truck-mounted drilling rig. Borings performed near the abutments (SB-17 and SB-37) were advanced by means of hollow stem augers to 10 feet and continued with rotary drilling techniques. The remainder of the borings were performed on the bridge and were performed by drilling through the existing bridge decks and extended to the river bed or land below using hollow stem augers. Upon reaching the river bed or ground level, borings were advanced by means of hollow stem augers to 10 feet to stabilize the hole and by rotary drilling techniques to completion. Representative soil samples were obtained employing split spoon sampling procedures in accordance with AASHTO Method T-206. Samples obtained in the field were returned to our laboratory for further examination and testing. Bedrock cores were obtained in the bridge borings using a NX-size double tubed core barrel with a diamond impregnated bit.

Split spoon sampling involves driving a 2.0-inch outside diameter split-barrel sampler into the soil with a 140-pound weight falling freely through a distance of 30 inches. Blow counts are recorded at 6" intervals and the blow counts are shown on the boring logs. The number of blows required to advance the sampler the last 12 inches is termed the

Standard Penetration Resistance (N). The N value is an indication of the relative density of the soil.

SECTION 04: LAB TESTING PROGRAM

The test procedures were performed in accordance with test procedures discussed in the IDOT Geotechnical Manual. All split-spoon samples obtained from the drilling operation were visually classified in the field. Cohesive samples were tested for unconfined compressive strength using an IDOT modified RIMAC test device and/or calibrated penetrometer in the field.

The soil testing program included performing water content, density and either unconfined compression and/or calibrated penetrometer tests on the cohesive samples recovered. Water content tests were performed on the non-cohesive samples recovered. These tests were performed upon representative portions of the samples obtained in the field. The results of the above testing, along with a visual classification of the material based upon both the Illinois textural classification and the AASHTO Soil Classification System, are indicated on the boring logs.

SECTION 05: SUBSURFACE CONDITIONS

Boring SB-17 was drilled at the top of the embankment at roadway level. Pavement consisted of approximately 12 inches of asphalt and 2 feet of stone fill. Below the surficial pavement and subbase material, stiff to very stiff clay and clay loam soils were encountered to an approximate elevation of 594. Underlying these materials, the boring logs indicated dense to very dense loam soils, sands, gravels and fractured rock to an elevation of 583, overlying very dense silt to an elevation of 578. The soil stratigraphy transitioned to very dense silty clay loam with fractured rock to an approximate elevation of 561 where bedrock was encountered. The stiff to very stiff clay soils had moisture contents within the range of 13% to 19% with an average of 21%. The dense to very dense loam, sand and gravel soils had moisture contents within the range of 9% to 19% with an average of 13%. The rock core taken at this elevation indicated Silurian System, Niagaran Dolomite with an R.Q.D. of 69%.

Boring SB-37 was also drilled at the top of the embankment at roadway level. Pavement consisted of approximately 3 inches of asphalt overlying 9 inches of concrete. Underlying the pavement, stiff to hard clay and clay loam soils were encountered to an approximate elevation of 594. Underlying the clay soils, the boring logs indicated medium dense to dense crushed stone and loam soils to an elevation of 583. The soil stratigraphy transitioned to hard clay soils to an elevation of 575 overlying cobbles, boulders and fractured rock to an approximate elevation of 560 where bedrock was encountered. The stiff to very stiff clay soils had moisture contents within the range of 13% to 34% with an average of 18%. The medium dense to dense loam and gravel

soils had moisture contents within the range of 7% to 13% with an average of 11%. The rock core taken at this elevation indicated Silurian System, Niagaran Dolomite with an R.Q.D. of 49%.

The remainder of the borings were performed on the bridge deck, with hollow stem augers extending to the river/ground level below. The surface water was located around an elevation of 590 with the river bed varying from 587 to 583. Organic silty sands were encountered to an elevation of 581, where the soil stratigraphy changed from weaker to stronger soils. From elevation 581 to elevation 578, borings generally indicated very stiff to hard clay loam soil. Underlying these materials, dense to very dense loam, sand, gravel, stone and fractured rock were encountered to varying elevations of bedrock (ranging from approximate elevation of 563 to 561). The stiff to very stiff clay soils had moisture contents within the range of 12% to 21% the very dense loam, sand, gravel and fractured rock typically had moistures in the low teens. The rock cores taken indicated Silurian System, Niagaran Dolomite with an R.Q.D.s in the range of 49% to 85%.

SECTION 06: WATER TABLE CONDITIONS

Due to the nature of rotary-wash drilling, it is not possible to attain water levels below 10 feet of depth or after drilling. Water was not encountered for the abutment borings, SB-17 and SB-37, before switching to rotary drilling. Borings performed over the Des Plaines River indicated a top-of-river elevation of approximately 590 feet with a river bed elevation varying from 587 to 583. We estimate the long term water table around the elevation of 583 based on the coloration change in the soils of brown and gray to gray. Fluctuations in the amount of water accumulated and in the hydrostatic water table can be anticipated depending on variations in precipitation, surface runoff and the Des Plaines River.

SECTION 07: ANALYSIS

Mining Activity

According to readily available ISGS sources, there are no documented coal mining operations in near vicinity to the project site and seismic activity is noted to be very low.

Site Seismic Parameters

The site has a seismic acceleration coefficient of 0.04g, Seismic Category A and a Soil Profile Type I. Liquefiable layers and down drag are not expected to impact the design of the new bridge.

Scour

Existing piers 1 through 3 and 20 through 22 are located in the Des Plaines River. According to the IDOT Hydraulic Report for the Des Plaines River, the 500-yr scour event will result in 4.65 feet of scour.

As the worst case scenario at SB-39 (elevation of 582.2), scour elevation is at 575.5. The Hydraulic Report streambed profile indicates a higher streambed elevation than boring SB-39; it possible that the boring information for the streambed is lower due to the weight of auger pushing through the top soils (i.e. the auger sliding through the surface soils, giving a false lower streambed elevation reading because of “zero” resistance). However, due to the stiff clay soils, scour reduction calculations bring the scour elevation over 578. There are no scour issues with the bridge structures.

Settlement

Approximately 10 feet of fill is anticipated for the abutments over the stiff to very stiff clay soils at the abutments. Settlement is calculated to be less than 0.4 inches at the abutments. For the piers founded on very dense loams, sands, gravels and stones, using a static 5,000 psf of pressure on 16-ft wide footings, settlement is calculated to be 0.4 inches or less.

Slope Stability

The abutments will be pile supported and will resist slope failure. Pier spread footings will be founded below ground level on very dense loams, sands and gravels, hard clay soils or fractured rock. No slope stability issues are associated with the bridge structures.

SECTION 08: RECOMMENDATIONS

Abutment Deep Foundation Recommendations

Based on the results of the borings and type of structure and loading, we recommend a deep foundation system consisting of friction piles be used for the support of the proposed abutment structures and wing walls. Due to high loadings of the structure, stiff soils near the surface and anticipated new embankment (soil properties for new embankment are assumed to be stiff soils), the use of spread footings is not recommended for support of the bridge structure abutments. According to the borings,

stratums of hard clay soils are insufficient, inconsistent and sporadic; the use of drilled-shaft caissons is not recommended.

Steel shell piles and H-piles may be used for design of the deep foundation system. When using steel H-piles, H-piles shall be according to AASHTO M270 Grade 50. Due to the clay soils, end bearing capacity will be low per stratum for the H-piles. The majority of the pile capacity will be achieved through skin friction. With shell pile design, stronger end capacity soils are encountered 15 to 20 feet from the surface. . Pile data for H-piles and shell piles is included in Appendix E. Due to some stratums of hard clay, very dense granular soils, fractured rock and possible boulders, we anticipate hard driving to occur, and driving shoes are recommended to drive the piles.

Pile capacities and lengths were calculated to the piles' Maximum Nominal Required Bearing (NRB). Pile capacities have also been assumed to start friction calculation at the approximate elevation of 609.5 feet. Allowable Resistance Available (ARA) has been calculated and is shown on the pile design tables located in Appendix E. Selection of the pile type should be based on economic and construction considerations.

A modified IDOT static method was used to develop the SGR pile design tables. Nominal required bearing was calculated from ASD skin-friction (with pile type correction factors) and end-bearing calculations. A factor of safety of 3.0 was used in calculations for the Allowable Resistance Available (ARA). Pile lengths were picked with respect to the loadings and geometry of the proposed structures.

The pile tables, provided in Appendix E, are estimates and test piles should be used for final pile length selections. We recommend that a minimum of one test pile be performed at each abutment substructure unit. The piles should be driven until satisfactory driving resistance is developed in accordance with an appropriate pile driving formula. The test piles shall be driven to 110 percent of the Nominal Required Bearing indicated in the pile data information.

To provide adequate frost protection, we recommend that footing foundations be situated at a minimum depth of 4 feet below final grade.

Pier Shallow Foundation Recommendations

Based on the information obtained from the borings near the piers and the type of loadings anticipated for the proposed structures, the new bridge may be supported on conventional shallow spread footing foundations situated in the natural, dense to very dense, loam, sand, gravel and fractured rock or hard clay near an elevation of 578 for piers 1 through 3 and 20 through 22 and at an elevation of 584.5 for piers 4 and 23 with exception to the soils summarized in the following table.

Table 3 – Remedial Treatment of Soils at SN 016-0483

Pier (Boring)	Subgrade Description (water content)	Unconfined Compressive Strength (tsf)	Remedial Treatment Depth (feet) ¹	Reason for Remedial Treatment	Approximate Elevation to Suitable Soil	Remedial Treatment
Pier 2 (SB-19)	Silty Clay (18%)	2.7	2'	Low strength	576.0	Compacted Structural Fill
Pier 4 (SB-21)	Sandy Gravel and Silt (15%)	-	1'	Low strength, loose soil	583.5	Compacted Structural Fill

¹Remedial Treatment should be verified in field.

We recommend that spread footings supported on the natural soils as discussed previously, along with the recommended remedial treatments described in Table 2, be designed for a maximum gross allowable bearing of 7,000 pounds per square foot (psf).

Actual remedial treatments should be verified in the field at the time of construction by a licensed Geotechnical Engineer or his representative. If soils with less than adequate bearing strength are noted at the foundation level during footing construction, the weaker soils encountered at the base of the footings should be undercut to reach suitable bearing soils, and the undercut area filled with lean concrete or a suitable compacted crushed stone structural fill material. Suitable crushed stone fill materials include materials meeting the gradation requirements of IDOT CA-1, CA-7 and CA-6 or IDOT PGE, Subgrade.

Structural fill utilized to support footings should be extended at least 6 inches beyond the proposed footing limits and then one foot horizontally for each one foot of fill placed below the base of the footing. This new fill should consist of inorganic material free of debris and should be placed in maximum 9-inch loose lifts and compacted to a minimum of 98% of the maximum dry density obtained in accordance with ASTM Standard D-1557, modified Proctor method. If CA-1, CA-7 or IDOT PGE, Subgrade crushed stone materials are used, they can be compacted by tamping with a backhoe bucket. The moisture content of the fill should be controlled within +2% of the optimum moisture content.

To provide adequate frost protection, we recommend that footing foundations be situated at a minimum depth of 4 feet below final grade. For the evaluation of the resistance to sliding, from the NAVFAQ Design Manual 7.02, it is recommended that a friction factor of 0.35 be used.

Pier Deep Foundation Recommendations

As an alternative, straight-shaft caissons may be considered for design at the piers. We recommend that the straight-shaft caissons be either based on top of the sound bedrock or rock-socketed.

We recommend designing the shafts as end-bearing elements on top of sound rock. Sound bedrock varies from an elevation of 560 in the Des Plaines River to 575 near and outside the river bank. Considering the lowest strength core taken from the borings (SB-41 with 650 tsf), we recommend using an allowable end-bearing capacity of 50 tons per square foot for caissons (tsf) founded on the bedrock (to be checked against service loads). To the extent rock-socketing is provided, we recommend an allowable friction value (in addition to the end bearing) of 3.0 tsf/ft for side resistance for rock-socketed caissons over the depth of the rock-socket to resist vertical and uplift loads (this is an allowable value to be compared to service loads). From the AASHTO LRFD Bridge Manual 2012, “m” and “s” values were calculated as 0.575 and 0.00293 respectively; the bedrock is considered GOOD QUALITY. The Carter and Kulhawy equation was used to compute the bearing with a factor of safety of 3.0.

Based on the soil borings, saturated silty and sandy soils are to be encountered at all piers and the bridge abutment. We recommend that the contractor be informed that construction will require construction methods, such as the use of temporary casing and/or drilling slurry, to maintain the stability of the drilled shaft caisson side walls. As per section 516 of the IDOT Standard Specification for Road and Bridge Construction, it is the contractor’s responsibility to determine the method to construct the drilled shaft caisson to meet the requirements of the specifications and design.

Considering the piers are located in the river and after review of the boring and core logs, there is potential for water infiltration through the sandy soils and bedrock at isolated locations. We recommend that the plans alert the contractor to potential need to work under slurry during construction due to water. Use of a slurry would also require tremie methods of concrete placement, and will also require special cleanout procedures at the bottom of the hole (e.g. “airlift” technique) prior to concrete placement.

A minimum caisson shaft diameter of 2.5 feet is recommended. The concrete slump should be in the range of 5 to 7 inches. The recommended minimum 28-day compression strength of the concrete should be a minimum of 5,000 psi.

The decision to use straight-shaft caissons may also incur additional unforeseen costs. There is potential for boulders to be encountered in the granular soils above bedrock, creating the possibility for “hard-drilling” and increased costs. The contractor should be prepared for difficult drilling and have the appropriate tooling onsite during construction.

We estimate settlements of 1/4 inch or less (in addition to the elastic compression of the pile itself) for straight-shaft caissons founded on bedrock.

To provide adequate frost protection, we recommend that footing foundations be situated at a minimum depth of 4.0 feet below final grade per the IDOT Bridge Manual.

Lateral Resistance Recommendations

In the following tables are tabulations of lateral soil parameters to be used for design of piles at the abutments.

**Table 4 – Soil Parameters for Lateral Resistance
 SN 016-0483 and SN 016-0985**

Material (elevation, feet)	Unit Weight (pcf)	Drained Friction Angle (°)	Undrained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci)	Strain
Clay Loam Fill (Top to 594)	120	28	1,000	230	0.009
Dense to Very Dense Loam and Fractured Rock (594 to 561)	125	38	-	125	-

Values recommended for use in design from L-pile Software Manual.

**Table 5 – Bedrock Parameters for Lateral Resistance
 SN 016-0483 and SN 016-0985**

Material (elevation, feet)	Unit Weight (pcf)	Young's Modulus (psi)	Uniaxial Compressive Strength (psi)	RQD (%)	Strain (k _m)
Sound Bedrock (561-551)	150	2 x 10 ⁶	See Lab Data on Rock Core Logs	49% to 85%	0.0001

At the abutments, it is recommended that a lateral active earth pressure of 40 psf per foot of depth be used above the water table assuming a free-draining granular backfill is utilized. For non-yielding walls with granular backfill, a lateral at-rest pressure of 50 psf per foot should be used, assuming proper drainage. Allowances should be made for any surcharge loads adjacent to the retaining structure. According to the NAVFAQ Design Manual 7.02, a value of 0.34 may be used for the coefficient of friction between the concrete base and drained cohesive soils (this assumes a concrete base on the stiff cohesive soils). Drainage should be provided behind the abutment.

Approach Slab Recommendations

The new approach slab will be supported on either new or existing embankment fill. We recommend using an assumed CBR of 2.0 for the compacted fill for the embankment. Shallow footings should be designed for a maximum allowable bearing pressure of 2,000 psf situated on new embankment fill. The new fill should be compacted per IDOT specifications for earth embankment. Any organics or soft, yielding subgrade (if any) should be removed prior to new fill placement. A qualified geotechnical engineer should observe the subgrade prior to any base course is placed. Settlement is calculated on the order of less than 0.4 inches.

SECTION 09: GENERAL CONSTRUCTION CONSIDERATIONS

It is proposed that the IL-171 mainline will be open to the public during construction. MOT will be maintained by utilizing crossovers. For construction at the abutments if temporary soil retention is needed, the contractor will need to design and construct a temporary retaining wall. Due to sporadic hard clay stratum (+4.5 tsf) and high blow count loams, sands, gravels and stone, the IDOT Temporary Sheet Piling Design Charts may not be used. Lateral soil properties provided in **Section 08: Recommendations** may be used for temporary soil retention wall design.

During excavation for the proposed improvements, movement of adjacent soils into the excavation should be prevented. All excavations should be performed in accordance with the latest Occupational Safety and Health Administration (OSHA) requirements. Allowances should be made for any surcharge loads adjacent to the retaining structures.

For the piers, due to the Des Plaines River, the contractor will need to install a temporary cofferdam with dewatering wells to keep the site in the dry. The pier footings will be situated on approximately 15' to 20' of very dense loams, sands, gravels and stone followed by shallow bedrock. Proper embedment in the very dense soils may not be able to be achieved and the cofferdam will need to be internally braced. A licensed dewatering well contractor with at least 5 years of experience should be required. Type 2 cofferdam should be used for the piers, considering the bottom of footing to water level will be at 6 feet or higher.

At the pier footing excavations where the silt and sand soils are present, it is possible that a quick or semi-quick condition may occur at the base of the excavation following the release in confining overburden pressure and from construction activity. If such a condition is encountered, the excavation should be thoroughly dewatered and any soils loosened as a result of this quick or semi-quick condition should be removed and replaced with a compacted crushed stone as recommended above. Alternatively, the

contractor may install a mud slab or mud mat to create a working platform for the construction of the footings.

SECTION 10: GENERAL QUALIFICATIONS

The analysis and recommendations presented in this report are based upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations that may occur between borings or across the site. In addition, the soil samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations. The nature and extent of such variations may not become evident until construction. If variations appear evident, it will be necessary to reevaluate the recommendations of the report. In addition, it is recommended that Geo Services, Inc. be retained to perform construction observation and thereby provide a complete professional geotechnical engineering service through the observational method.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are intended or made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer. Also note that Geo Services, Inc. is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of the report's subsurface data or engineering analyses without the express written authorization of Geo Services, Inc.

FOR INFORMATION ONLY

APPENDIX A
GENERAL NOTES

GENERAL NOTES

CLASSIFICATION

American Association of State Highway & Transportation Officials (AASHTO) System used for soil classification.

Cohesionless Soils

<u>Relative Density</u>	<u>No. of Blows per foot N</u>
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	Over 50

TERMINOLOGY

Streaks are considered to be paper thick. **Lenses** are considered to be less than 2 inches thick. **Layers** are considered to be less than 6 inches thick. **Stratum** are considered to be greater than 6 inches thick.

Cohesive Soils

<u>Consistency</u>	<u>Unconfined Compressive Strength - qu (tsf)</u>
Very Soft	Less than 0.25
Soft	0.25 - 0.5
Medium Stiff	0.5 - 1.0
Stiff	1.0 - 2.0
Very Stiff	2.0 - 4.0
Hard	Over 4.0

DRILLING AND SAMPLING SYMBOLS

SS: Split Spoon 1-3/8" I.D., 2" O.D.	HS: Housel Sampler
ST: Shelby Tube 2" O.D., except where noted	WS: Wash Sample
AS: Auger Sample	FT: Fish Tail
DB: Diamond Bit - NX: BX: AX	RB: Rock Bit
CB: Carboly Bit - NX: BX: AX	WO: Wash Out
OS: Osterberg Sampler	

Standard "N" Penetration: Blows per foot of a 140 lb. hammer falling 30" on a 2" O.D. Split Spoon

WATER LEVEL MEASUREMENT SYMBOLS

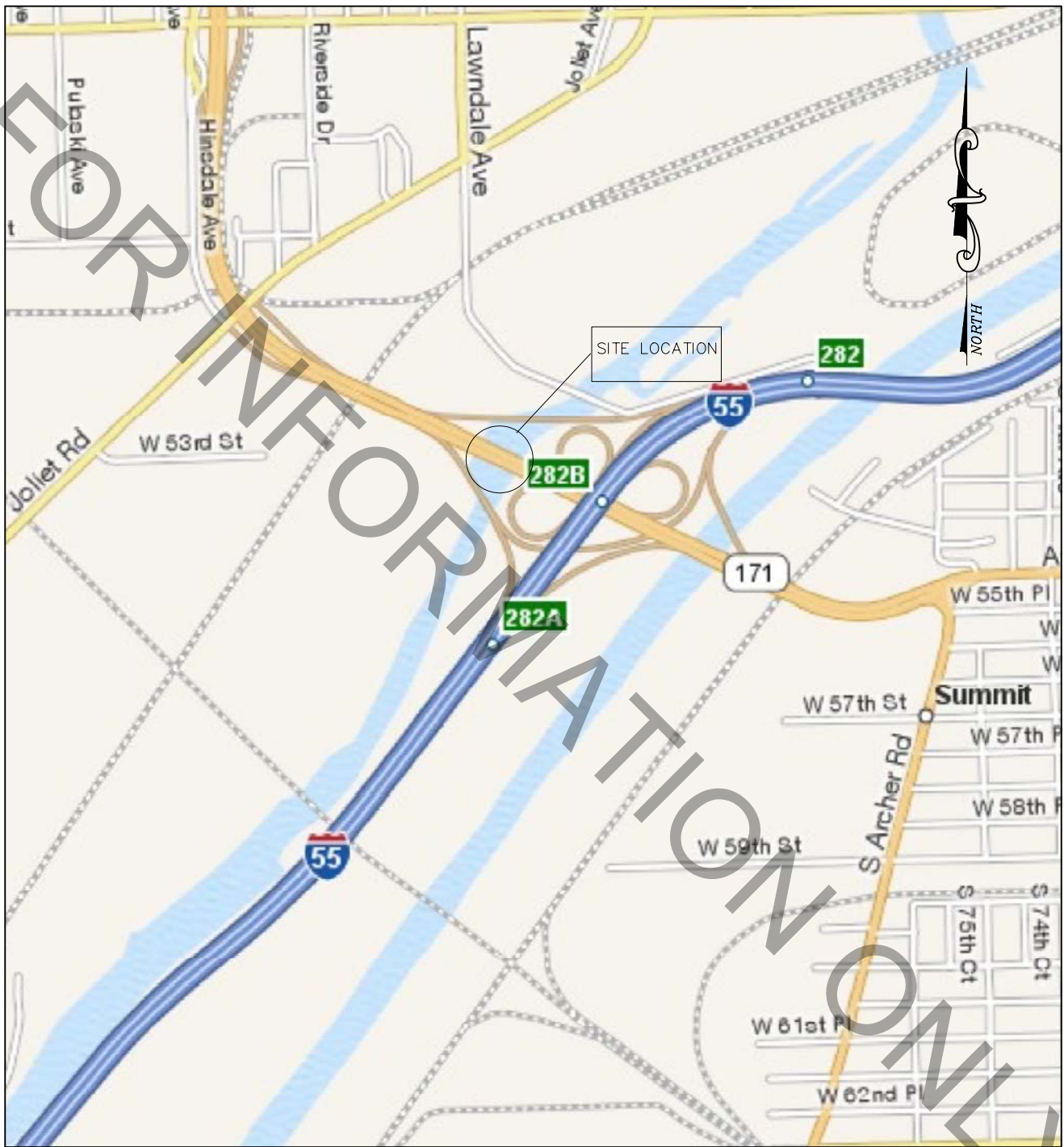
WL: Water	WD: While Drilling
WCI: Wet Cave In	BCR: Before Casing Removal
DCI: Dry Cave In	ACR: After Casing Removal
WS: While sampling	AB: After Boring

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils, the accurate determination of ground water elevations is not possible in even several days observation, and additional evidence on ground water elevations must be sought.

FOR INFORMATION ONLY

APPENDIX B

SITE LOCATION MAP



SITE LOCATION MAP

STRUCTURE GEOTECHNICAL REPORT
 IL-171 over the Des Plaines River
 IDOT Job # D-91-191-10, PTB# 154-14
 Existing SN 016-0483 & 016-0985
 Cook County, Illinois

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DRAWN BY	BT
APPROVED BY	AJP
DATE	November 6, 2012
CSI JOB No.	10025
SCALE	NTS

APPENDIX C

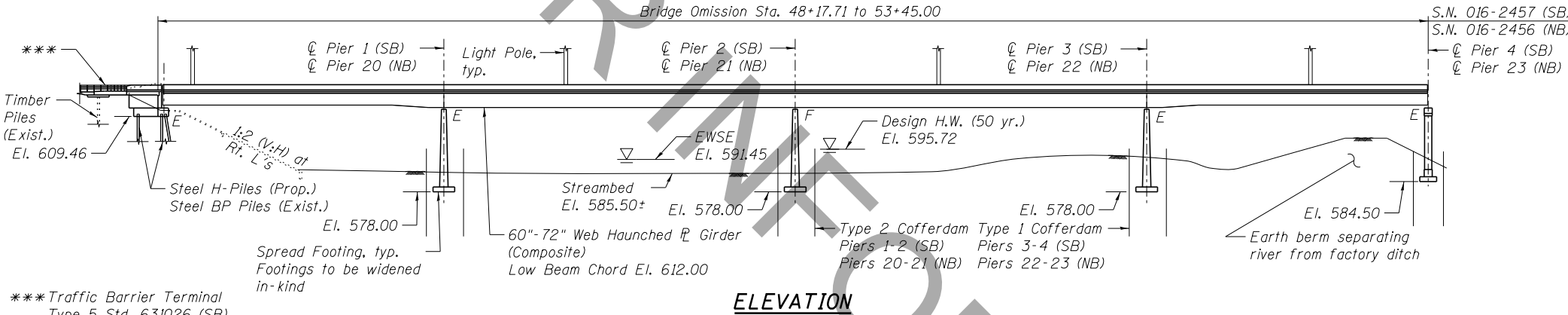
TS&L, SOIL BORING PLAN AND PROFILE

FOR INFORMATION ONLY

Bench Mark: Chiseled square at SW corner of SB IL-171 bridge over Des Plaines River. El. 622.14

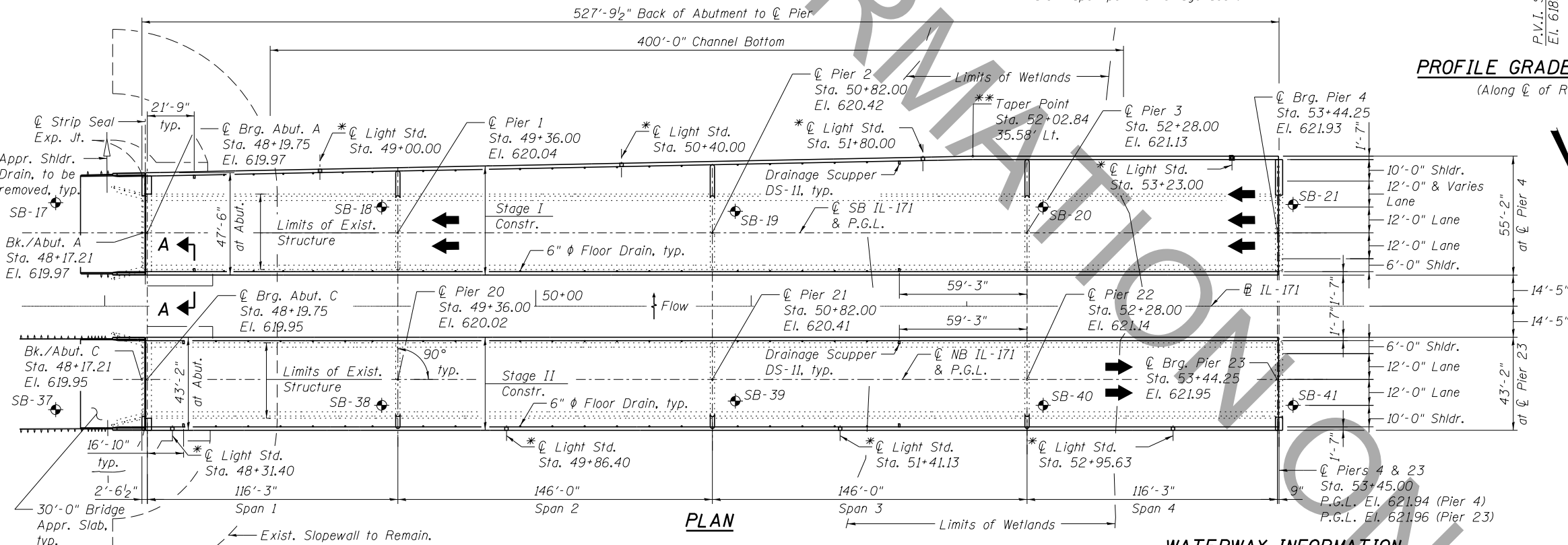
Existing Structures: S.N. 016-0483 (SB) and S.N. 016-0985 (NB) were built in 1964 as F.A.I. Rte. 55, Section 0707-613B at Sta. 50+80. Existing dual structures each consist of a four span reinforced concrete deck on five lines of continuous welded haunched plate girders. The reinforced concrete deck is 7 1/2" thick, including a 2" microsilica concrete overlay. The substructures consist of open stub abutments founded on steel piles at the downstation end, solid wall concrete piers founded on spread footings through the river, and multi-column piers founded on spread footings at the upstation end. Piers 23 and 4 are shared with S.N. 016-2456 (NB) and S.N. 016-2457 (SB), respectively. The structures are 527'-9 1/2" from back of abutment to centerline of Pier 4 and 23, with an out-to-out deck width of 36'-0" and no skew. Traffic is to be maintained utilizing crossovers.

No salvage.



***Traffic Barrier Terminal
Type 5 Std. 631026 (SB)
Type 6 Std. 631031 (NB)

**Splice location of new girders to match taper point of bridge deck.



*Location to be refined in final design.

DESIGN SCOUR ELEVATION TABLE (S.N. 016-0483)

Design Scour Elevation (ft.)	Abut. A	Pier 1	Pier 2	Pier 3	Pier 4
	609.46	582.30	580.30	584.60	585.30

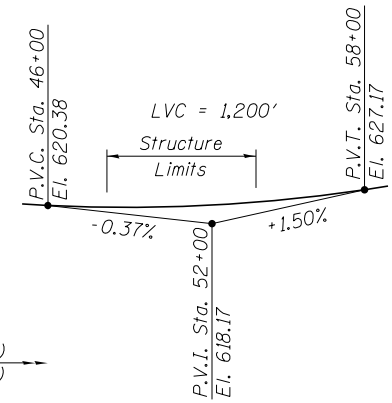
DESIGN SCOUR ELEVATION TABLE (S.N. 016-0985)

Design Scour Elevation (ft.)	Abut. C	Pier 20	Pier 21	Pier 22	Pier 23
	609.46	581.30	581.00	586.30	585.30

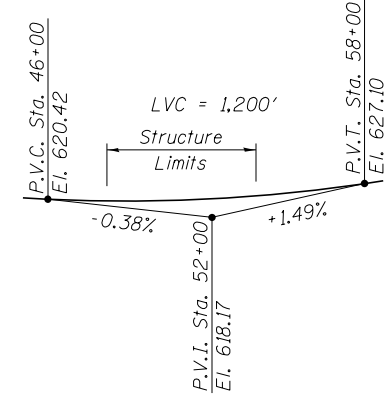
Design scour elevations estimated from existing data.

WATERWAY INFORMATION

Flood		Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist. Prop.	Nat. H.W.E.	Head - Ft. Exist. Prop.	Headwater El. Exist. Prop.
Design		50	7,370	3,182	3,182	0.59	0.59
Base		100	7,900	3,355	3,355	0.61	0.61
Overtopping		>500					
Max. Calc.		500	9,316	3,806	3,806	0.63	0.63



PROFILE GRADE NB IL-171
(Along C of Roadway)



PROFILE GRADE SB IL-171
(Along C of Roadway)

HIGHWAY CLASSIFICATION

Structure No. 016-0483
IL 171 SB (FAP 372)
Functional Class: Other Principal Arterial
ADT: 18,872 (2008); 19,000 (2030)
DHV: 1,833 (2030)
ADTT: 8.8%
Design Speed: 50 m.p.h.
Posted Speed: 50 m.p.h.

Structure No. 016-0985
IL 171 NB (FAP 372)
Functional Class: Other Principal Arterial
ADT: 25,490 (2008); 26,000 (2030)
DHV: 2,175 (2030)
ADTT: 11.1%
Design Speed: 50 m.p.h.
Posted Speed: 50 m.p.h.

LOADING HS20-44

Allow 25#/sq. ft. for future wearing surface.

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges

DESIGN STRESSES

FIELD UNITS (New Construction)

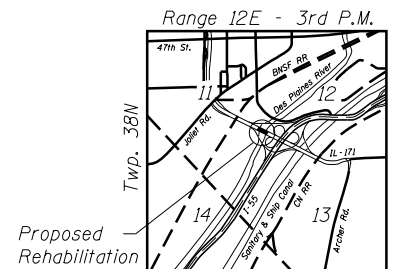
f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

FIELD UNITS (Exist. Construction)

f'c = 3,500 psi
fy = 40,000 psi (Reinforcement)
fy = 36,000 psi (Structural Steel)

SEISMIC DATA

Seismic Performance Category (SPC) = A
Bedrock Acceleration Coefficient (A) = 0.04g
Site Coefficient (S) = 1.0



LOCATION SKETCH

GENERAL PLAN
IL-171 OVER DES PLAINES RIVER
"PUBLIC WATER"

FAP 372 - SECTION 0707-608HB-R

COOK COUNTY

STATION 50+80.00

STRUCTURE NO. 016-0483 (SB)

STRUCTURE NO. 016-0985 (NB)

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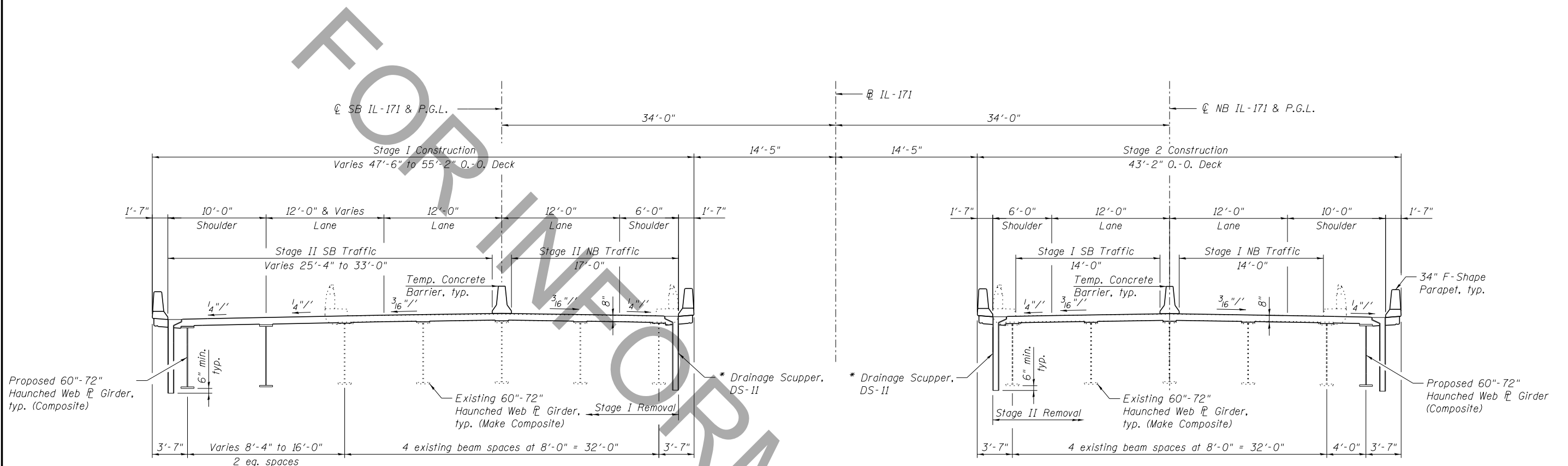
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		DRAWN - SCW	REVISOR -
		CHECKED - MRB	REVISOR -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. OF SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
372	0707-608HB-R	COOK	3	1
CONTRACT NO. 60J16				
ILLINOIS FED. AID PROJECT				

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CROSS SECTION
(Looking Upstation)

* Drainage scuppers shown, floor drains not shown for clarity. See Sheet 1 for location of drainage scuppers and floor drains.

Superstructure Notes:
Electrical conduit for roadway lighting is attached to the outside of the existing exterior parapet. Conduit to be removed and replaced as required for final roadway lighting configuration.

Two abandoned electrical conduits are attached to the inside of the exterior fascia girder of each structure. Abandoned conduit to be removed.

SCOPE OF WORK

1. Remove existing concrete deck and microsilica concrete overlay and replace with new 8" reinforced concrete deck.
2. Make new deck composite throughout by adding shear studs to all existing and proposed girders.
3. Remove and replace existing expansion joints and drainage scuppers.
4. Remove and replace existing backwalls.
5. Widen abutments and piers.
6. Remove and replace approach slabs and wingwalls as required for new deck width.
7. Repair spalls, delaminations and open cracks in substructure using formed concrete repair and epoxy crack injection. Replace failed slope wall panels at both structures.
8. Add one additional steel girder line to the NB structure and two additional steel girder lines to the SB structure.
9. Add elastomeric expansion bearings at the end supports, low profile fixed bearings at the interior fixed supports, and either elastomeric oHLMR expansion bearings at the interior expansion supports (to be determined in final design).
10. Remove wind bracing (bottom lateral angles and corresponding gusset plates) from the structures.
11. Clean, paint and re-use original steel bearings at intermediate supports.
12. Clean and paint all existing structural steel.
13. Perform miscellaneous repairs including fixing unseated anchor bolts, debris/vegetation removal, and lead paint disposal.

SECTIONS & DETAILS (1 OF 2)
IL-171 OVER DES PLAINES RIVER
"PUBLIC WATER"
FAP 372 - SEC. 0707-608HB-R
COOK COUNTY
STATION 50+80.00
STRUCTURE NO. 016-0483 (SB)
STRUCTURE NO. 016-0985 (NB)

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		CHECKED - MRB	REVISED -
		DRAWN - SCW	REVISED -
		CHECKED - MRB	REVISED -
PLOT SCALE =			
PLOT DATE = 11/2/2012			

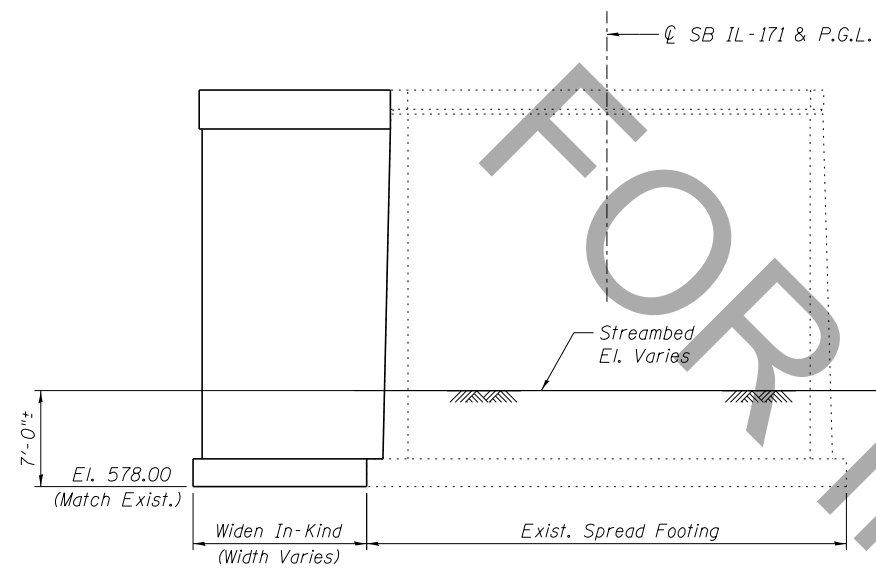
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. OF SHEETS

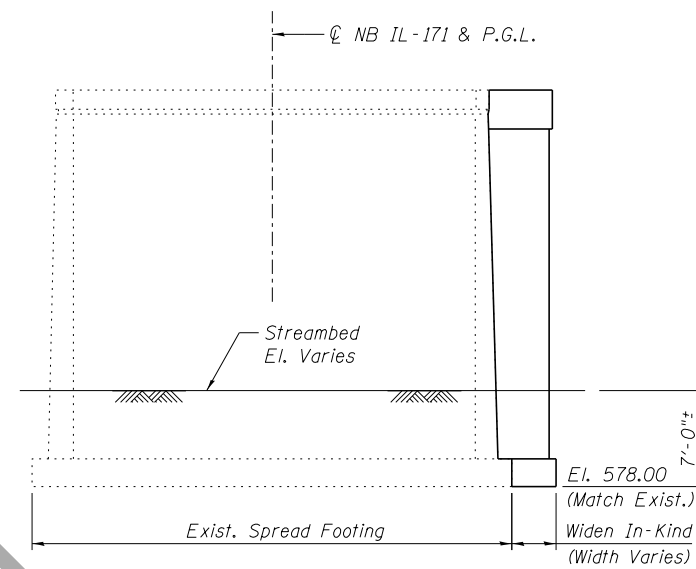
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
372	0707-608HB-R	COOK	3	2
			CONTRACT NO. 60J16	
ILLINOIS FED. AID PROJECT				

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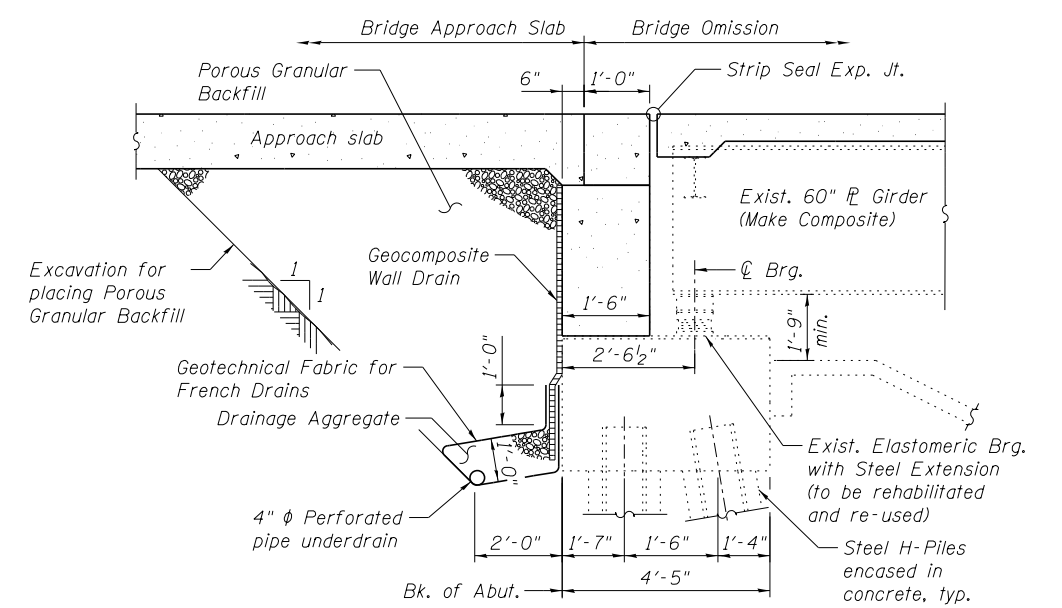
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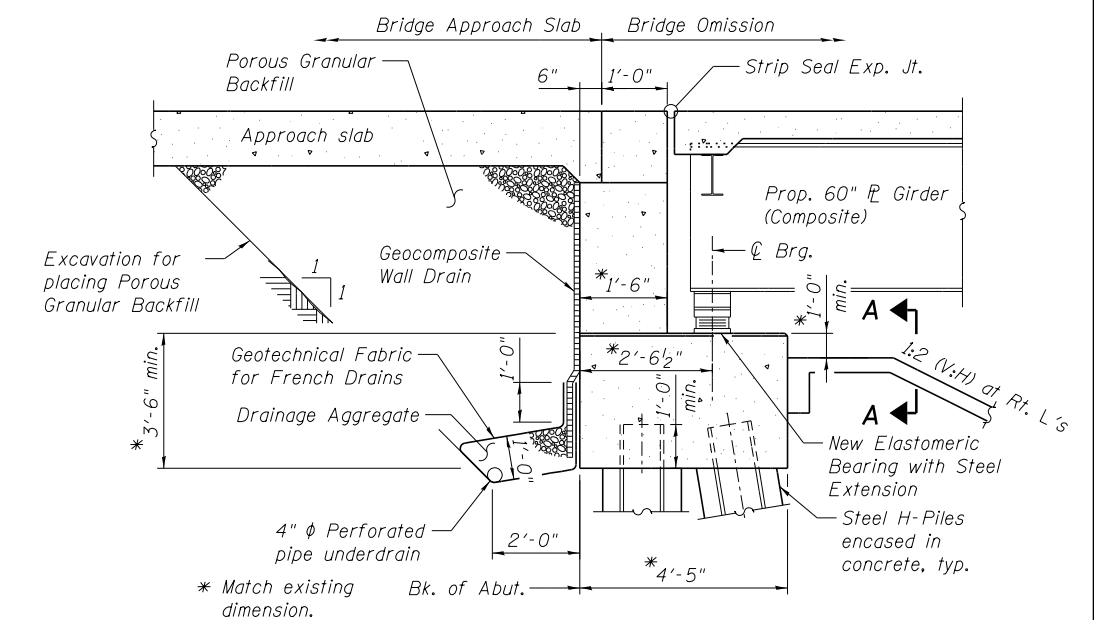
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(Piers 1 thru 3, Looking Upstation)



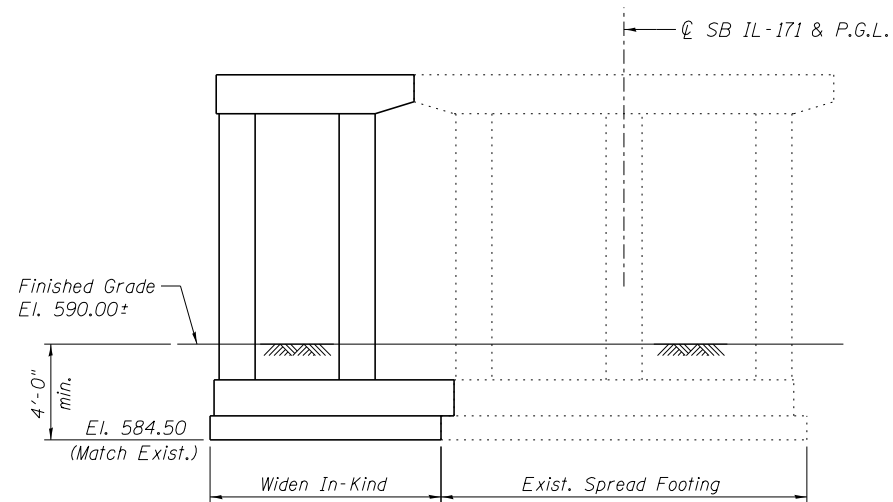
INTERMEDIATE PIER SKETCH
(Piers 20 thru 22, Looking Upstation)



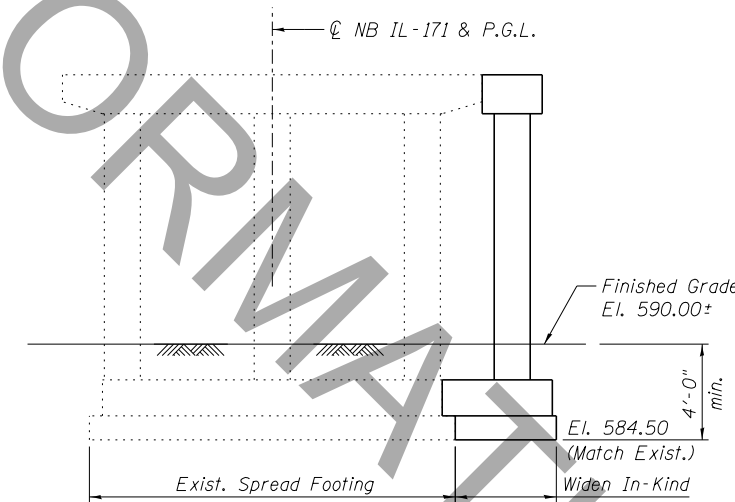
SECTION THRU EXIST. ABUTMENT



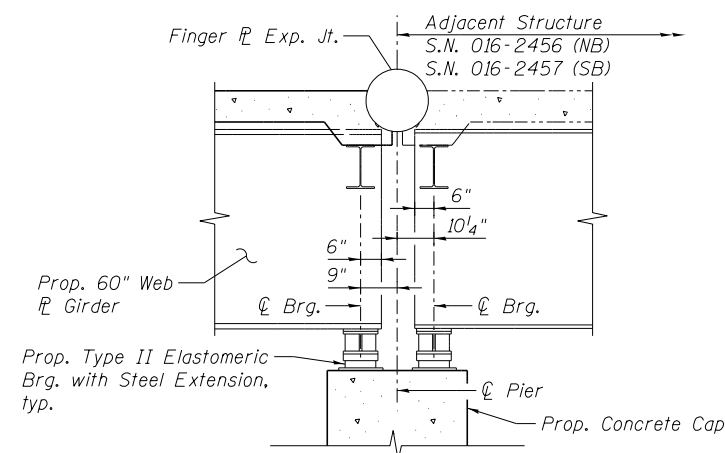
SECTION THRU ABUTMENT EXTENSION



PIER 4 SKETCH
(Looking Upstation)

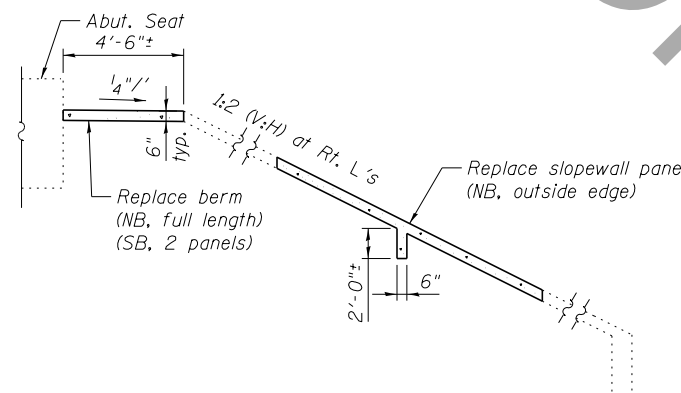


PIER 23 SKETCH
(Looking Upstation)

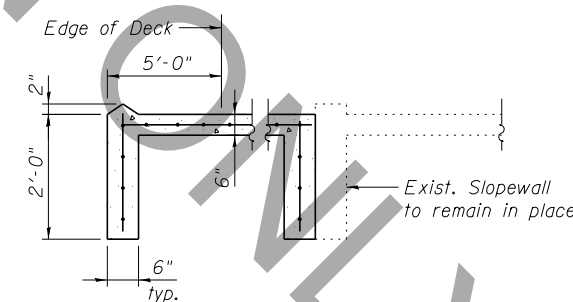


SECTION THRU PIERS 4 & 23

(Section thru widened pier cap shown, section thru existing similar)



**EXIST. SLOPE WALL
TYPICAL REPAIRS**



SECTION A-A

(2 locations as shown, 2 opposite hand)

NOTE:

Dimensions of existing elements to remain are taken from existing plans.

SECTIONS & DETAILS (2 OF 2)
IL-171 OVER DES PLAINES RIVER
"PUBLIC WATER"
FAP 372 - SEC. 0707-608HB-R
COOK COUNTY
STATION 50+80.00
STRUCTURE NO. 016-0483 (SB)
STRUCTURE NO. 016-0985 (NB)

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FILE NAME =	USER NAME = swojteczko	DESIGNED - SCW	REVISIONS
		CHECKED - MRB	REVISIONS
		DRAWN - SCW	REVISIONS
		CHECKED - MRB	REVISIONS
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**STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION**

SHEET NO. OF SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
372	0707-608HB-R	COOK	3	3
CONTRACT NO. 60J16			ILLINOIS FED. AID PROJECT	

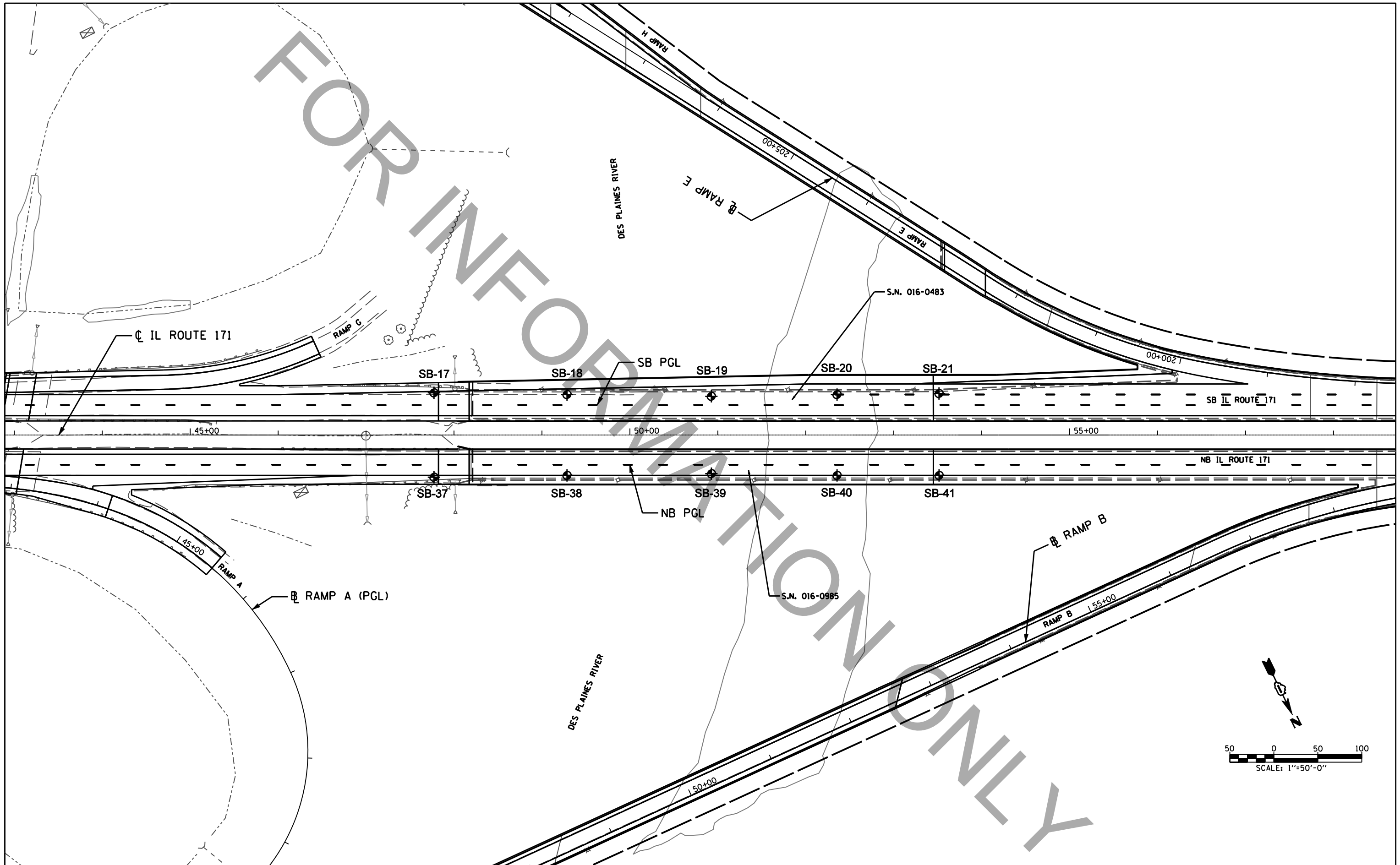
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PLAN	SUBMITTED	DATE
	PLOTTED	
	DESIGNED	
	CHECKED	
	BY	
	DATE	
	PROJECT NO.	
	FILE NAME	

PROFILE	SUBMITTED	DATE
	PLOTTED	
	DESIGNED	
	CHECKED	
	BY	
	DATE	
	PROJECT NO.	
	FILE NAME	



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 Naperville, Illinois 60565
 (630) 355-2836

USER NAME	DESIGNED - RWC	REVISED -
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PLOT SCALE	CHECKED - AJP	REVISED -
PLOT DATE	DATE - 10/16/2012	REVISED -

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

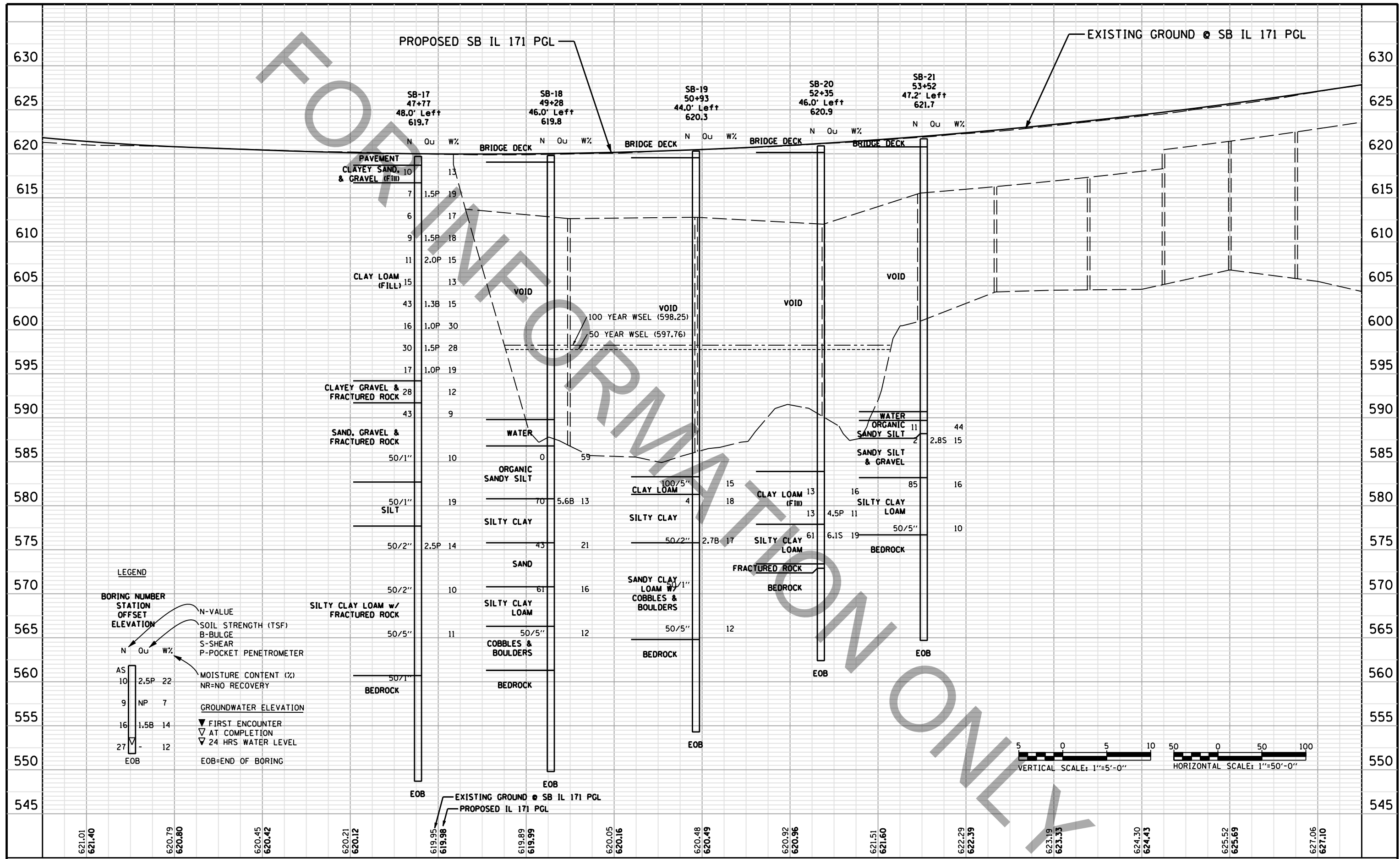
**ILLINOIS ROUTE 171
 SB BRIDGE (S.N. 016-0483) & NB BRIDGE (S.N. 016-0985)
 SOIL BORING PLAN**

SCALE: 1"=50' SHEET NO. 1 OF 1 SHEETS STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
372	XXX	COOK		
FED. ROAD DIST. NO.			ILLINOIS FED. AID PROJECT	
			CONTRACT NO. XXX	

DATE	
BY	
PLAN	SURVEYED
	PLOTTED
	GRADES CHECKED
	STRUCTURE NOTATIONS CHECKED
	NOTE BOOK NO.
	CADD FILE NAME

DATE	
BY	
PROFILE	SURVEYED
	PLOTTED
	GRADES CHECKED
	STRUCTURE NOTATIONS CHECKED
	NOTE BOOK NO.
	CADD FILE NAME



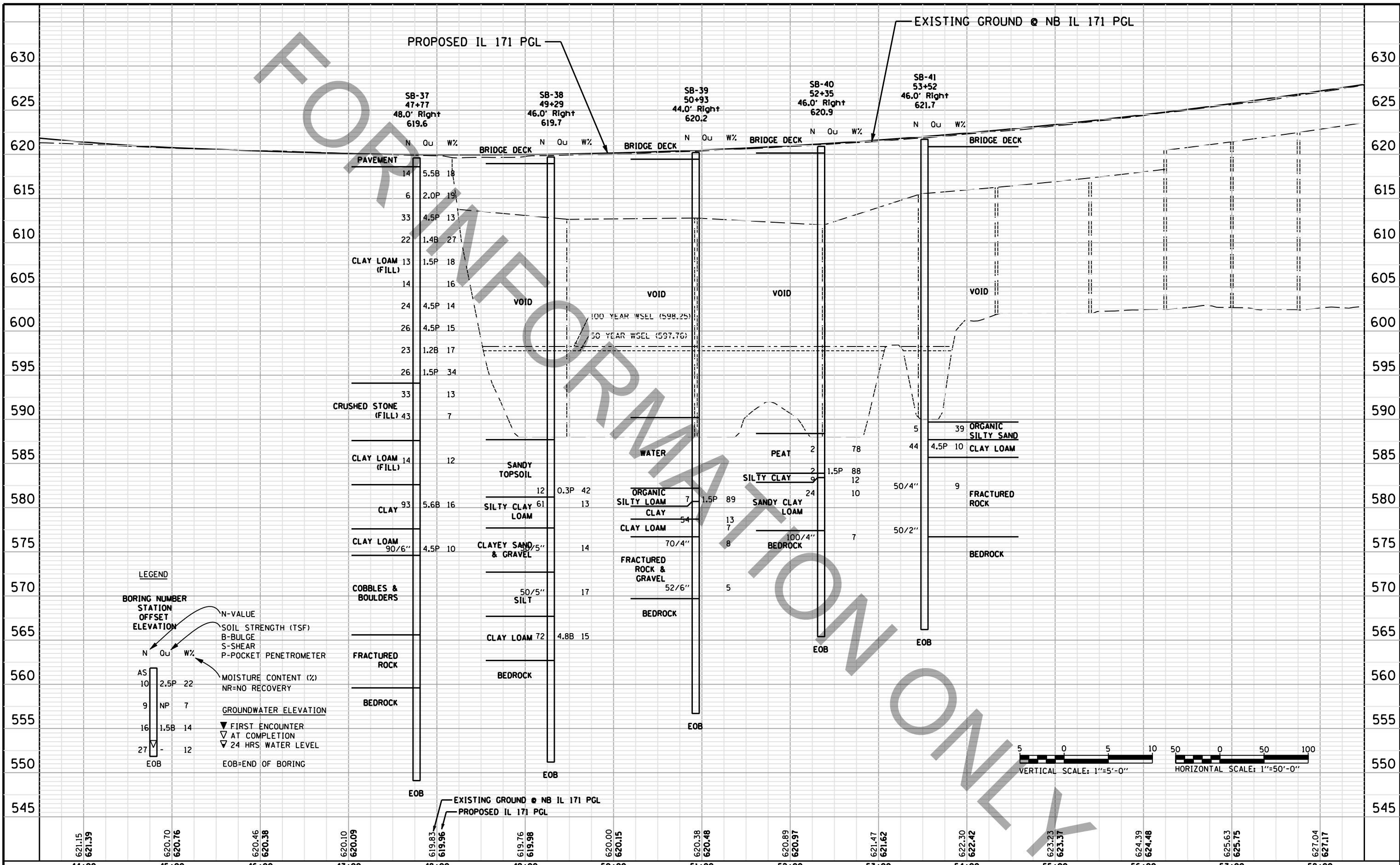
44+00	45+00	46+00	47+00	48+00	49+00	50+00	51+00	52+00	53+00	54+00	55+00	56+00	57+00	58+00
621.01 621.40	620.79 620.80	620.45 620.42	620.21 620.12	619.95 619.98	619.89 619.99	620.05 620.16	620.48 620.49	620.92 620.96	621.51 621.60	622.29 622.39	623.19 623.33	624.30 624.43	625.52 625.69	627.06 627.10

USER NAME =	DESIGNED - RWC	REVISED - 11/6/2012	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	ILLINOIS ROUTE 171 SB BRIDGE (S.N. 016-0483) SOIL BORING PROFILE			F.A.P. RTE. 372	SECTION XXX	COUNTY COOK	TOTAL SHEETS	SHEET NO. XXX	
PLOT SCALE =	DRAWN - RWC	REVISED -		SCALE: 1:5V 1:50H	SHEET NO. 1 OF 1 SHEETS	STA. TO STA.	FED. ROAD DIST. NO.	ILLINOIS FED. AID PROJECT	CONTRACT NO. XXX			
PLOT DATE =	CHECKED - AJP	REVISED -										
	DATE - 10/16/2012	REVISED -										

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PLAN	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	STRUCTURE NOTATIONS CHECKED	
	NOTE BOOK NO.	
	FILE NAME	

PROFILE	SURVEYED	DATE
	PLOTTED	
	GRADES CHECKED	
	STRUCTURE NOTATIONS CHECKED	
	NOTE BOOK NO.	
	FILE NAME	



44+00	45+00	46+00	47+00	48+00	49+00	50+00	51+00	52+00	53+00	54+00	55+00	56+00	57+00	58+00
621.15 621.39	620.70 620.76	620.46 620.38	620.10 620.09	619.83 619.96	619.76 619.98	620.00 620.15	620.38 620.48	620.89 620.97	621.47 621.62	622.30 622.42	623.23 623.37	624.39 624.48	625.63 625.75	627.04 627.17

USER NAME	DESIGNED - RWC	REVISED -
DRAWN - RWC	REVISED -	
CHECKED - AJP	REVISED -	
DATE - 10/16/2012	REVISED -	

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		ILLINOIS ROUTE 171 NB BRIDGE (S.N. 016-0985) SOIL BORING PROFILE	
SCALE: 1:5V 1:50H	SHEET NO. 1 OF 1 SHEETS	STA. TO STA.	FED. ROAD DIST. NO. ILLINOIS FED. AID PROJECT

F.A.P. RTE. 372	SECTION XXX	COUNTY COOK	TOTAL SHEETS	SHEET NO.
CONTRACT NO. XXX				

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Naperville, Illinois 60565
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FOR INFORMATION ONLY

APPENDIX D

BORING AND ROCK CORE LOGS



SOIL BORING LOG

Date 5/2/12

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. Station	016-0483 50+80	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev. Stream Bed Elev.	n/a n/a ft ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
BORING NO. Station Offset Ground Surface Elev.	SB-17 47+77 48.00ft Left 619.70					Groundwater Elev.: First Encounter Upon Completion After	Dry To 17.5 n/a ft ft Hrs.				
12.0" ASPHALT		618.70				CLAY LOAM-dark brown, gray & black-stiff to very stiff (Fill) <i>(continued)</i>			6		
Clayey SAND, GRAVEL & STONE-medium dense (Fill)			7 4 6		13.0				14 16	1.5 P	28.0
	616.70										
CLAY LOAM-dark brown, gray & black-stiff to very stiff (Fill)			3 3 -5	1.5 P	19.0				6 8 9	1.0 P	19.0
		594.20				Clayey GRAVEL & FRACTURED ROCK-gray-dense			9 10 18		12.0
		591.70				SAND, GRAVEL & FRACTURED ROCK-gray-dense to very dense			12 18 25		9.0
			3 4 -10	1.5 P	18.0				-30		
			3 5 6	2.0 P	15.0						
			4 6 -15		13.0				40 50/1"		10.0
			15 20 23	1.3 B	15.0				-35		
		582.70				SILT-gray-very dense					
			8 8 -20	1.0 P	30.0				51 50/1"		19.0

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



SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

Table with columns for STRUCT. NO., BORING NO., DEPTH, BLOW COUNTS, MOISTURE, and SOIL DESCRIPTION. Includes data for soil layers like SILTY CLAY LOAM and bedrock observations.

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)



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-17 Core Diameter 2 in
Station 47+77 Top of Rock Elev. 561.20 ft
Offset 48.00ft Left Begin Core Elev. 558.70 ft

Ground Surface Elev. 619.70 ft

Description	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Light gray mottled gray & fine grained dolomite bedrock with horizontal bedding. Some horizontal fractures throughout. Vertical fracture from -62.5' to -63.9'. 558.70		1	91	69		1139.0
End Of Boring @ -71.0'. Boring backfilled with cuttings. End of Boring						

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 5/1/2012

LOGGED BY RJ

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

BORING NO. **SB-17** Top of Rock Elev. 561.2

Station 42+77 Begin Core Elev. 558.7

Offset 48.0' Left

Ground Surface Elev. 619.7

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
	1	91.5	69.5	n/a	1139 @ -61.2'
-66					
-71					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-61.0' to -71.0')
 Light gray mottled gray, fine grained with horizontal bedding. Some horizontal fractures throughout. Vertical fracture from -62.5' to -63.9'.





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0483</u>	D E P T H	B L O W S	U C S Qu	M O I S T	Surface Water Elev. <u>589.80</u> ft
Station <u>50+80</u>					Stream Bed Elev. <u>586.80</u> ft
BORING NO. <u>SB-18</u>	H S	Qu	M O I S T	T	Groundwater Elev.:
Station <u>49+28</u>					First Encounter <u>n/a</u> ft
Offset <u>46.00ft Left</u>					Upon Completion <u>n/a</u> ft
Ground Surface Elev. <u>619.80</u> ft					After <u> </u> Hrs. <u> </u> ft

SILTY CLAY-gray-hard (continued)					
	575.80	20			
SAND-gray-dense		22		21.0	
		-45	21		
	570.80	22			
SILTY CLAY LOAM-gray-very dense		27		16.0	
		-50	34		
Some cobbles & boulders from -53.5' to to -58.5'.		50/5"		12.0	
		-55			
	561.30				
Drillers Observation: Apparent bedrock.					
	559.80	-60			

Borehole continued with rock
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)



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-18 Core Diameter 2 in
Station 49+28 Top of Rock Elev. 561.30 ft
Offset 46.00ft Left Begin Core Elev. 559.80 ft
Ground Surface Elev. 619.80 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
559.80	1	97	79		1202.0
-65					
549.80					
-70					
-75					
-80					

Light gray dolomite bedrock with horizontal bedding. Slightly porous to -66.0'. Some horizontal fractures throughout.

End Of Boring @ -70.0'. Boring backfilled with cuttings.
End of Boring

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 5/3/2012

LOGGED BY RJ

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

BORING NO. **SB-18** Top of Rock Elev. 561.3

Station 49+28 Begin Core Elev. 559.8

Offset 46.0' Left

Ground Surface Elev. 619.8

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
	1	97.0	79.5	n/a	1202 @ -60.0'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-60.0' to -70.0')
 Light gray with horizontal bedding. Slightly porous to -66.0'. Some horizontal fractures throughout.





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY NW

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO.	Station	D E P T H H	B L O W S S	U C S Qu	M O I S T T	Surface Water Elev.	Stream Bed Elev.	D E P T H	B L O W S	U C S Qu	M O I S T T
		(ft)	(/6")	(tsf)	(%)	ft	ft	(ft)	(/6")	(tsf)	(%)
016-0483	50+80					-	-				
SB-19	50+93										
	44.00ft Left										
	620.30										
9.0" CONCRETE BRIDGE DECK						VOID (continued)					
VOID						VOID					
619.55											
-5						-25					
-10						590.30 -30					
						Water					
-15						-35					
						583.30					
						CLAY LOAM-brown & gray-very dense					
						7					
						21					
						100/5"					
						581.30					
						SILTY CLAY-gray-stiff to very stiff					
						3					
-20						-40					
						2					
						18.0					

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)



SOIL BORING LOG

Date 5/4/12

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY NW

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0483</u> Station <u>50+80</u>	D E P T H	B L O W S	U C S Qu	M O I S T	Surface Water Elev. <u> </u> - ft Stream Bed Elev. <u> </u> - ft
BORING NO. <u>SB-19</u> Station <u>50+93</u> Offset <u>44.00ft Left</u> Ground Surface Elev. <u>620.30</u> ft					Groundwater Elev.: First Encounter <u> </u> n/a ft Upon Completion <u> </u> n/a ft After <u> </u> Hrs. <u> </u> ft

	(ft)	(/6")	(tsf)	(%)	
SILTY CLAY-gray-stiff to very stiff <i>(continued)</i>		2			
		20			
Boulders from -44.0' to -56.0'.	575.80	50/2"	2.7	17.0	
SANDY CLAY LOAM-gray-very dense	-45		B		
		50/1"			
	-50				
		50/5"			
	-55			12.0	
	564.80				
Drillers Observation: Apparent bedrock.	564.30				
Borehole continued with rock coring.					
	-60				



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY NW

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-19 Core Diameter 2 in
Station 50+93 Top of Rock Elev. 564.80 ft
Offset 44.00ft Left Begin Core Elev. 564.30 ft

Ground Surface Elev. 620.30 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
564.30	1	96	80		1226.0
Light gray & fine grained dolomite bedrock with horizontal bedding. Some horizontal fractures throughout.					
554.30					
End Of Boring @ -66.0'. Boring backfilled with cuttings.					
End of Boring					

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 5/4/2012

LOGGED BY DR

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

BORING NO. **SB-19** Top of Rock Elev. 564.8

Station 50+93 Begin Core Elev. 564.3

Offset 44.0' Left

Ground Surface Elev. 620.3

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
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SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-56.0' to -66.0')
 Light gray & fine grained with horizontal bedding. Some horizontal fractures throughout.

	1	96.0	80.5	n/a	1226 -56.2'
-61.0					
-66.0					





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0483</u>	D	B	U	M	Surface Water Elev. _____ - ft
Station <u>50+80</u>	E	L	C	O	Stream Bed Elev. _____ - ft
	P	O	S	I	
	T	W	S	S	
	H	S	Qu	T	Groundwater Elev.:
BORING NO. <u>SB-20</u>	(ft)	(/6")	(tsf)	(%)	First Encounter _____ n/a ft
Station <u>52+35</u>					Upon Completion _____ n/a ft
Offset <u>46.00ft Left</u>					After _____ Hrs. _____ ft
Ground Surface Elev. <u>620.90</u>					

	<u>580.40</u>				
CLAY LOAM-brown & gray-hard (Fill)		7			
		6	4.5	11.0	
		7	B		
<u>577.90</u>					
SILTY CLAY LOAM-gray-dense		18			
		24	6.1	19.0	
	-45	37	S		
<u>573.40</u>					
Drillers Observation: Fractured rock.	<u>572.90</u>				
Drillers Observation: Apparent bedrock.	<u>572.40</u>				
Borehole continued with rock coring.	-50				
	-55				
	-60				

FOR INFORMATION ONLY

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)



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-20 Core Diameter 2 in
Station 52+35 Top of Rock Elev. 572.90 ft
Offset 46.00ft Left Begin Core Elev. 572.40 ft
Ground Surface Elev. 620.90 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
572.40	1	98	60		
-50					915.0
-55					
562.40					
-60					
-65					

Light gray mottled gray dolomite bedrock with horizontal bedding. Porous with some vugs. Some horizontal & vertical fractures throughout.

End Of Boring @ -58.5'. Boring backfilled with cuttings.
End of Boring

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 5/3/2012

LOGGED BY JK

GSJ JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

BORING NO. **SB-20** Top of Rock Elev. 572.9

Station 52+35 Begin Core Elev. 572.4

Offset 46.0' Left

Ground Surface Elev. 620.9

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
	1	98.0	60.0	n/a	915 @ -50.7'
-53.5					
-58.5					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-48.5' to -58.5')
 Light gray mottled gray with horizontal bedding. Porous with some vugs. Some horizontal & vertical fractures throughout.





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0483
Station 50+80

BORING NO. SB-21
Station 53+52
Offset 47.20ft Left
Ground Surface Elev. 621.70 ft

D E P T H	B L O W S	U C S Qu	M O I S T T
(ft)	(/6")	(tsf)	(%)

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter n/a ft
Upon Completion n/a ft
After Hrs. ft

SILTY CLAY LOAM-gray-very dense (<i>continued</i>)			
	50/5"		10.0
576.70	-45	Drillers Observation: Apparent bedrock.	
574.70		Borehole continued with rock coring.	
-50			
-55			
-60			

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



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-21 Core Diameter 2 in
Station 53+52 Top of Rock Elev. 576.70 ft
Offset 47.20ft Left Begin Core Elev. 574.70 ft
Ground Surface Elev. 621.70 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
574.70	1	98	81		745.0
-50					
-55					
564.70					
-60					
-65					

Light gray dolomite bedrock with horizontal bedding. Slightly porous with some horizontal fractures.

End Of Boring @ -57.0'. Boring backfilled with cuttings.
End of Boring

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION - LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0483 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station - Core Diameter 2.0 in

BORING NO. SB-21 Top of Rock Elev. 576.7

Station 53+52 Begin Core Elev. 574.4

Offset 47.2' Left

Ground Surface Elev. 621.7

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
	1	98.0	81.5	n/a	745 -47.0'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-47.0' to -57.0')
 Light gray with horizontal bedding. Slightly porous with some horizontal fractures.





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO.	Station	D E P T H H	B L O W S	U C S Qu	M O I S T T	Surface Water Elev.	Stream Bed Elev.	D E P T H	B L O W S	U C S Qu	M O I S T T
		(ft)	(/6")	(tsf)	(%)	n/a	n/a	(ft)	(/6")	(tsf)	(%)
016-0985	50+80										
SB-37	47+77										
	48.00ft Right										
	619.60										
3.0" ASPHALT, 9.0" CONCRETE						CLAY LOAM-dark brown, gray & black-stiff to hard (Fill) (continued)					
	618.60										
CLAY LOAM-dark brown, gray & black-stiff to hard (Fill)											
		4						5			
		5	5.5	18.0				8	1.2	17.0	
		9	B					15	B		
		3						4			
		3	2.0	19.0				7	1.5	34.0	
		-5	3	P				-25	19	P	
							594.10				
CRUSHED STONE-dense (Fill)											
		7						7			
		20	4.5	13.0				15		13.0	
		13	P					18			
		8						18			
		11	1.4	27.0				31		7.0	
		-10	11	B				-30	12		
		9									
		6	1.5	18.0			587.60				
		7	P								
CLAY LOAM with Stone-brown & gray-medium dense (Fill)											
		2						9			
		5		16.0				7		12.0	
		-15	9					-35	7		
		10									
		11	4.5	14.0							
		13	P				582.60				
CLAY-gray-hard											
		7						14			
		12	4.5	15.0				44	5.6	16.0	
		-20	14	P				-40	49	B	

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



SOIL BORING LOG

Date 4/30/12

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0985
Station 50+80

BORING NO. SB-37
Station 47+77
Offset 48.00ft Right
Ground Surface Elev. 619.60 ft

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

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter Dry To 10.0' ft
Upon Completion n/a ft
After Hrs. ft

CLAY-gray-hard (continued)	577.60				
CLAY LOAM-gray-very dense	46				
	90/6"	4.5	10.0		
Borehole continued with rock coring.	574.60 -45				
	-50				
	-55				
	-60				

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



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-37 Core Diameter 2 in
Station 47+77 Top of Rock Elev. 559.60 ft
Offset 48.00ft Right Begin Core Elev. 574.60 ft
Ground Surface Elev. 619.60 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Cobbles & boulders with gravel & clay seams.	574.60	1	30			
Drillers Observation: Fractured & weathered rock.	565.60					
Drillers Observation: Apparent bedrock.	559.60					
Light gray dolomite bedrock with horizontal bedding. Slightly porous to -66.0'. Some horizontal & vertical fractures throughout.	559.10	2	86	49		1268.0

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 4/30/2012

LOGGED BY JK

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

BORING NO. SB-37 Top of Rock Elev. 559.6

Station 47+77 Begin Core Elev. 574.6

Offset 48.0' Right

Ground Surface Elev. 619.6

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI- ME (min /ft)	STRENGTH (tsf)
	1	30.0	n/a	n/a	n/a
-50					
-15					

RUN 1 (-45.0' to -54.0')
 Cobbles & boulders with gravel & clay seams.





**Illinois Department
of Transportation**

Division of Highways
Geo Services, Inc.

ROCK CORE LOG

Date 4/30/12

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0985
Station 50+80

CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Core Diameter 2 in

BORING NO. SB-37
Station 47+77

Top of Rock Elev. 559.60 ft

Begin Core Elev. 574.60 ft

Offset 48.00ft Right

Ground Surface Elev. 619.60 ft

DEPTH (ft)	CORE #	RECOVERY (%)	R-Q-D (%)	CORE TIME (min/ft)	STRENGTH (tsf)
-70					
549.10					
-75					
-80					
-85					

Light gray dolomite bedrock with horizontal bedding. Slightly porous to -66.0'. Some horizontal & vertical fractures throughout. *(continued)*

End Of Boring @ -70.5'. Boring backfilled with cuttings.
End of Boring

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 4/30/2012

LOGGED BY JK

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

BORING NO. **SB-37** Top of Rock Elev. 559.6

Station 47+77 Begin Core Elev. 559.1

Offset 48.0' Right

Ground Surface Elev. 619.6

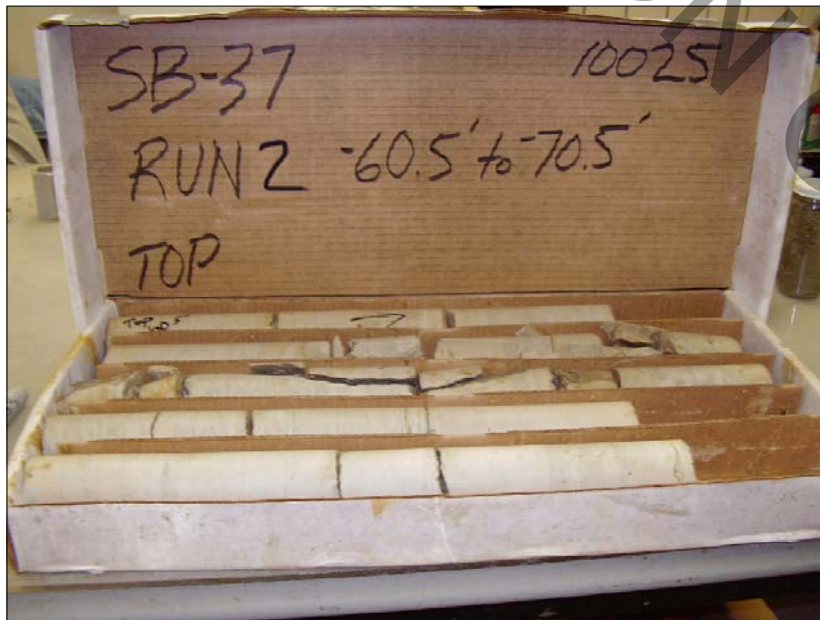
DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
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SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-60.5' to -70.5')

Light gray with horizontal bedding. Slightly porous to -66.0'. Some horizontal & vertical fractures throughout.

	2	86.5	49.5	n/a	1268 @ -60.6'
-65.5					
-70.5					





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY NW

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0985</u>	D E P T H	B L O W S	U C S Qu	M O I S T	Surface Water Elev. <u> </u> - ft
Station <u>50+80</u>					Stream Bed Elev. <u> </u> - ft
BORING NO. <u>SB-38</u>	H S	Qu	14.0	17.0	Groundwater Elev.:
Station <u>49+29</u>					First Encounter <u> </u> n/a ft
Offset <u>46.00ft Right</u>					Upon Completion <u> </u> n/a ft
Ground Surface Elev. <u>619.70</u> ft					After <u> </u> Hrs. <u> </u> ft

SILTY CLAY LOAM-gray-very dense (<i>continued</i>)					
577.70					
Clayey SAND & GRAVEL-gray-very dense					
	50/5"		14.0		
-45					
572.70					
SILT-gray-very dense					
	34				
	50/5"		17.0		
-50					
567.70					
CLAY LOAM-gray-hard					
	28				
	32	4.8	15.0		
	40	B			
-55					
562.70					
Drillers Observation: Apparent bedrock.					
561.20					
Borehole continued with rock coring.					
-60					

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



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY NW

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-38 Core Diameter 2 in
Station 49+29 Top of Rock Elev. 562.70 ft
Offset 46.00ft Right Begin Core Elev. 561.20 ft
Ground Surface Elev. 619.70 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
561.20	1	98	82		
-60					1264.0
-65					
551.20					
-70					
-75					

Light gray & fine grained dolomite bedrock with horizontal bedding. Highly fractured from -58.5' to -59.6'. 1/4" clay parting @ -66.7'.

End Of Boring @ -68.5'. Boring backfilled with cuttings.
End of Boring

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 5/1/2012

LOGGED BY DR

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

Top of Rock Elev. 562.7

BORING NO. **SB-38** Begin Core Elev. 561.2

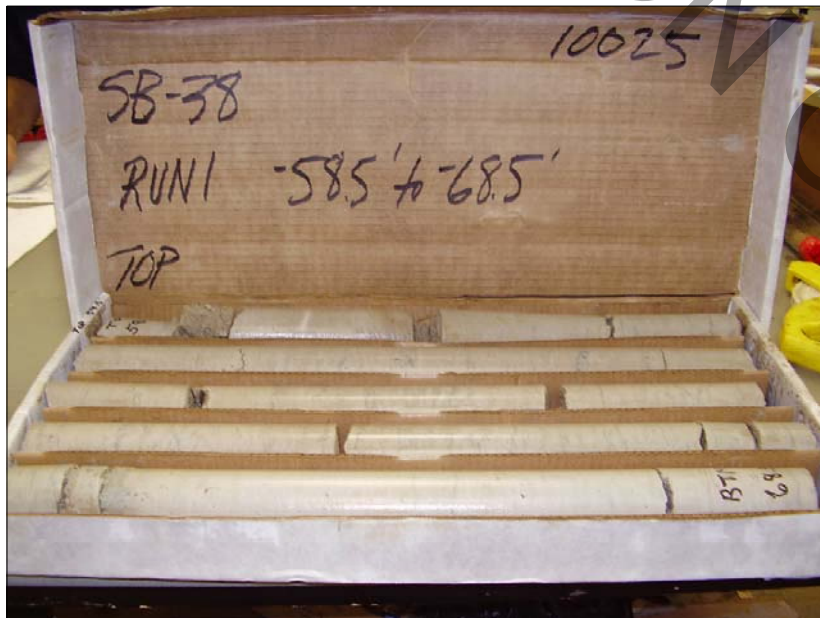
Station 49+29

Offset 46.0' Right

Ground Surface Elev. 619.7

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
	1	98.5	82.0	n/a	1264 @ -60.5'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-58.5' to -68.5')
 Light gray & fine grained with horizontal bedding. Highly fractured from -58.5' to -59.6'.
 1/4" clay parting @ -66.7'.





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO.	Station	DEPTH H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Surface Water Elev.	Stream Bed Elev.	Groundwater Elev.:	First Encounter	Upon Completion	After _____ Hrs.
016-0985	50+80					590.20	582.20		n/a	n/a	
SB-39	50+93										
	44.00ft Right										
	620.20										
CLAY-gray-stiff (<i>continued</i>)				P							
		578.70	6		13.0						
CLAY LOAM with Fractured Rock-gray-dense			21								
		576.70	33		7.0						
FRACTURED ROCK & GRAVEL-gray-very dense											
			19		8.0						
		-45	70/4"								
			3								
		569.70	52/6"		4.5						
Drillers Observation: Apparent bedrock.											
		566.70									
Borehole continued with rock coring.											
		-55									
		-60									

The Unconfined Compressive Strength (UCS) Failure Mode is indicated by (B-Bulge, S-Shear, P-Penetrator)
 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)



ROCK CORE LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-39 Core Diameter 2 in
Station 50+93 Top of Rock Elev. 569.70 ft
Offset 44.00ft Right Begin Core Elev. 566.70 ft

Ground Surface Elev. 620.20 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
Light gray & fine grained dolomite bedrock with horizontal bedding. Some horizontal fractures.	566.70	1	100	85		1275.0
	-55					
	-60					
	556.70					
End Of Boring @ -63.5'. Boring backfilled with cuttings. End of Boring	-65					
	-70					

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 5/1/2012

LOGGED BY JK

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

Top of Rock Elev. 569.7

BORING NO. **SB-39** Begin Core Elev. 566.7

Station 50+93

Offset 44.0' Right

Ground Surface Elev. 620.2

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
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SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-53.5' to -63.5')
 Light gray & fine grained with horizontal bedding. Some horizontal fractures.

	1	100.0	85.0	n/a	1275 -54.0'
-58.5					
-63.5					





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0985</u>	D E P T H	B L O W S	U C S Qu	M O I S T	Surface Water Elev. _____ - ft
Station <u>50+80</u>					Stream Bed Elev. _____ - ft
BORING NO. <u>SB-40</u>	ft (ft)	(1/6")	(tsf)	(%)	Groundwater Elev.:
Station <u>52+35</u>					First Encounter _____ n/a ft
Offset <u>46.00ft Right</u>					Upon Completion _____ n/a ft
Ground Surface Elev. <u>620.90</u>					After _____ Hrs. _____ ft

SANDY CLAY LOAM with Fractured Rock-gray-medium dense to very dense (continued)		15			
	577.40				
Drillers Observation: Apparent bedrock.		42	100/4'	7.0	
	575.90	-45			
Borehole continued with rock coring.					
		-50			
		-55			
		-60			

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



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RR

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-40 Core Diameter 2 in
Station 52+35 Top of Rock Elev. 575.90 ft
Offset 46.00ft Right Begin Core Elev. 575.90 ft

Ground Surface Elev. 620.90 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
575.90	1	94	64		
					1103.0
565.90					
-55					
-60					
-65					

Light gray to gray dolomite bedrock with horizontal bedding. Slightly porous with some light rust staining. Highly fractured to -47.9'. Horizontal fractures throughout.

End Of Boring @ -55.5'. Boring backfilled with cuttings.
End of Boring

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION — LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station — Core Diameter 2.0 in

BORING NO. SB-40 Top of Rock Elev. 575.9

Station 52+35 Begin Core Elev. 575.9

Offset 46.0' Right

Ground Surface Elev. 620.9

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
	1	94.0	64.5	n/a	1103 -48.9'
-50					
-55					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-45.0' to -55.0')
 Light gray to gray with horizontal bedding. Slightly porous with some light rust staining.
 Highly fractured to -47.9'. Horizontal fractures throughout.





SOIL BORING LOG

ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY NW

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/ROTARY HAMMER TYPE CME Automatic

STRUCT. NO.	<u>016-0985</u>	D E P T H H	B L O W S	U C S Qu	M O I S T	Surface Water Elev.	<u>n/a</u>	ft	D E P T H H	B L O W S	U C S Qu	M O I S T	
Station	<u>50+80</u>					Stream Bed Elev.	<u>n/a</u>	ft					
BORING NO.	<u>SB-41</u>												
Station	<u>53+52</u>												
Offset	<u>46.00ft Right</u>												
Ground Surface Elev.	<u>621.70</u>	ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.:						
							First Encounter	<u>n/a</u>	ft				
							Upon Completion	<u>n/a</u>	ft				
							After	<u> </u>	Hrs.	ft			

DEPTH (ft)	SOIL DESCRIPTION	BLOW COUNT (/6")	UCS (tsf)	MOIST (%)	DEPTH (ft)	BLOW COUNT (/6")	UCS (tsf)	MOIST (%)
0.0	10.0" CONCRETE BRIDGE DECK				VOID (continued)			
620.87	VOID							
-5								
-10								
-15					590.70			
					Water			
					589.70			
					Organic SILTY SAND-black-loose	7		
						4		39.0
						1		
					587.70			
					CLAY LOAM-gray-hard	13		
						20	4.5	10.0
						24	P	
					585.70			
					FRACTURED ROCK-very dense			
						50/4"		
								9.0
-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)



ROUTE IL Route 171, F.A.P. 372 DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY NW

SECTION 0707-608HB-R LOCATION SE 1/4, SEC. 11, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
Station 50+80

BORING NO. SB-41 Core Diameter 2 in
Station 53+52 Top of Rock Elev. 576.70 ft
Offset 46.00ft Right Begin Core Elev. 576.20 ft
Ground Surface Elev. 621.70 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
576.20	1	100	80		650.0
Light gray mottled gray dolomite bedrock with horizontal to wavy bedding. Slightly porous with some vugs. Some horizontal fractures throughout.					
566.20					
End Of Boring @ -55.5'. Boring backfilled with cuttings. End of Boring					

Color pictures of the cores Yes

Cores will be stored for examination until 5 yrs after const.

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

ROCK CORE LOG

PAGE 1 of 1

DATE 5/2/2012

LOGGED BY DR

GSI JOB No. 10025

FAP Rte. 171 (1st Avenue) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION - LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. SN016-0985 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station - Core Diameter 2.0 in

Top of Rock Elev. 576.7

BORING NO. **SB-41** Begin Core Elev. 576.2

Station 53+52

Offset 46.0' Right

Ground Surface Elev. 621.7

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
	1	100.0	80.0	n/a	650 @ -45.5'
-50.5					
-55.5					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-45.5' to -55.5')
 Light gray mottled gray with horizontal to wavy bedding. Slightly porous with some vugs.
 Some horizontal fractures throughout.



FOR INFORMATION ONLY

APPENDIX E
PILE DESIGN TABLES

Boring SB-17 Abutment (Elevation 609.5 Begin Friction, 610.5 for Pile Cutoff)												
Estimated Pile Length (ft.)	HP 8x36		HP 10x42		HP 12x53		HP 14x73		Metal Shell 12"		Metal Shell 14"	
	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)
3	4	12	5	15	6	17	7	21	8	24	10	31
6	7	20	8	25	10	30	12	37	12	35	14	43
8	8	25	11	33	14	42	17	51	14	43	17	52
11	11	33	14	43	18	53	22	65	19	56	23	68
13	12	37	16	47	19	58	24	72	21	64	25	76
16	19	56	23	69	28	83	34	101	67	202	88	263
18	22	65	27	81	32	97	40	119	84	254	137	413
21	27	81	33	100	40	120	49	146				
23	36	107	44	132	53	159	65	195				
26	58	175	72	217	87	260	106	318				
28	79	238	99	297	118	355	144	431				
31	85	255	108	323	129	386	156	468				
33	90	269	111	335	139	418	169	506				
36	95	286					181	543				
38							192	578				

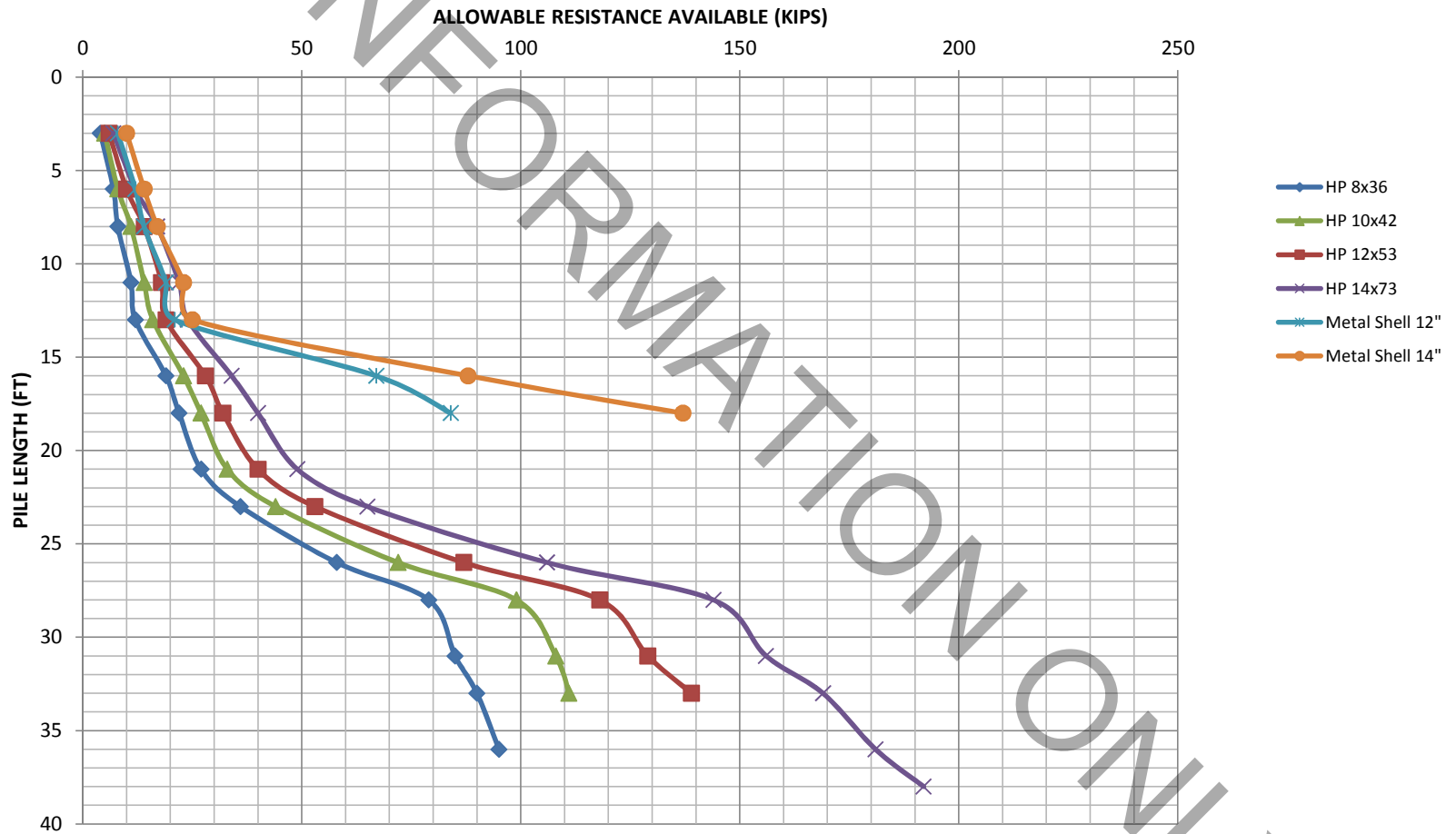
Note: Piles reach max NRB through soil stratum

ONLY

PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

SN 016-0483 Abutment; BORING SB-17

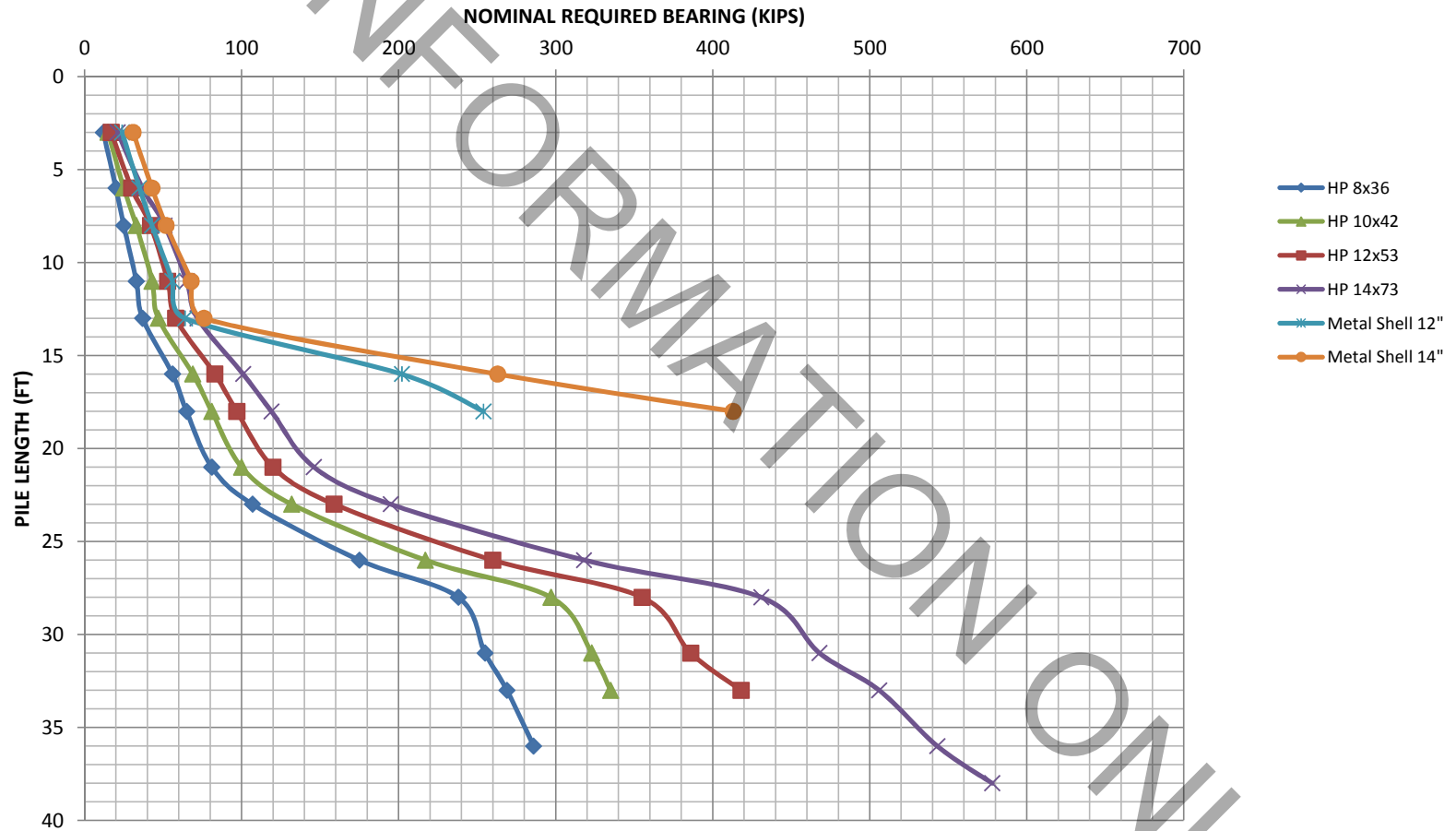
Elevation 609.5 Begin Friction, 610.5 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

SN 016-0483 Abutment; BORING SB-17

Elevation 609.5 Begin Friction, 610.5 for Pile Cutoff (pile length = 0.0 feet)



Boring SB-37 Abutment (Elevation 609.5 Begin Friction, 610.5 for Pile Cutoff)												
Estimated Pile Length (ft.)	HP 8x36		HP 10x42		HP 12x53		HP 14x73		Metal Shell 12"		Metal Shell 14"	
	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)	Allowable Resistance Available, ARA (Kips)	Nominal Required Bearing, NRB (Kips)
3	4	11	4	13	5	16	6	19	8	24	10	31
6	8	23	9	28	11	34	14	42	21	62	27	80
8	14	43	18	54	21	64	26	78	29	87	37	110
11	16	48	20	61	25	76	31	94	28	85	34	101
13	19	56	24	71	30	89	37	110	32	97	39	116
16	27	82	34	102	41	122	50	149	84	254	111	334
18	31	93	39	116	46	139	56	169			137	413
21	37	110	45	136	54	163	66	198				
23	31	94	39	118	49	146	60	179				
26	32	95	40	119	49	148	60	181				
28	45	134	55	166	66	199	81	243				
31	51	152	63	189	75	226	92	276				
33	57	171	71	213	85	255	103	310				
36	66	197	81	244	98	293	119	357				
38	95	286	111	335	139	418	160	479				
41							192	578				

Note: Piles reach max NRB through soil stratum

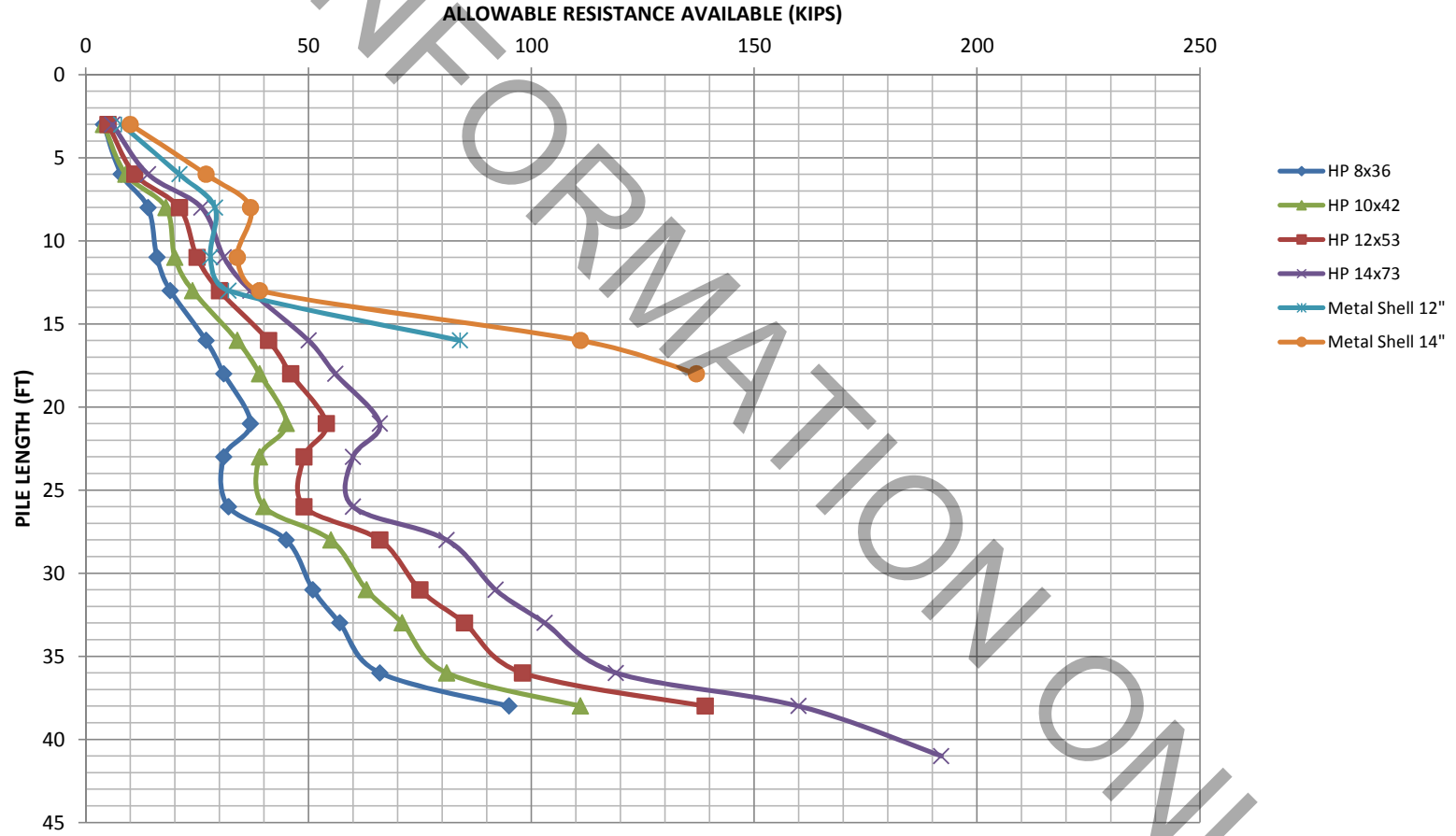
ONLY

FOR INFORMATION ONLY

PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

SN 016-0985 Abutment; BORING SB-37

Elevation 609.5 Begin Friction, 610.5 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

SN 016-0985 Abutment; BORING SB-37

Elevation 609.5 Begin Friction, 610.5 for Pile Cutoff (pile length = 0.0 feet)

