
STRUCTURE GEOTECHNICAL REPORT

IL-171 over the CN Railroad

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

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

SN 016-0488 (Contract: 60J16)

SN 016-0489 (Contract: 60W75)

Cook County, Illinois

STRUCTURAL ENGINEER:

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

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JOB NO. 10025

September 5, 2013



June 4, 2013
Revised September 5, 2013

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 CN Railroad
IL-171 (First Avenue) from 47th Street to 55th Street
SN 016-0488 (Contract: 60J16) & 016-0489 (Contract: 60W75)
Cook County, Illinois
IDOT Job Number: D-91-191-10 (PTB 154, Item #014)

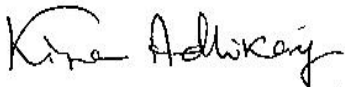
Dear Mr. Naus:

The following report presents the geotechnical analysis and recommendations for the widening of the existing bridge structures carrying IL-171 over the Canadian National Rail Road. A total of eight (8) structural soil borings (SB-62 through SB-69) 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.



Kiran Adhikary, P.E., LEED AP
Senior 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 and rehabilitation of the IL-171 Bridges over the Canadian National Railroad 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 eight (8) structure borings (SB-62 through SB-69) 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 016-0488 and SN 016-0489) were built in 1963. The existing each structure consist of three continuous span reinforced concrete decks on eight steel 30" WF beams in all three spans. The overall length of the existing bridges per existing plans is 166'-6" measured from back of the abutments. The out-to-out width of each bridge is 48'-0". The width of SN 016-0489 (NB) varies to 48'-9" in span 3. Both structures have a 12^o-42'-19" skew. Existing plan information indicates the use of steel H-piles for support of the abutments and piers, and timber piles for the support of the approach slabs.

The existing bridges are proposed to be widened approximately 4 feet, each for the Northbound Structure (SN 016-0489) and the Southbound Structure (SN 016-0488). The contract number for Southbound Structure (SN 016-0488) is 60J16 and the contract number for Northbound Structure (SN 016-0489) is 60W75. The overall length of the proposed NB and SB bridges per survey is 166'-6" measured from back of the abutments. The out-to-out widths of the NB and SB bridges are 56'-2" and 55'-2". The estimated maximum service reactions at the foundation structures provided by Benesch are as shown on the following Table 1.

Table 1 – Service Load (SN 016-0488 and SN 016-0488)

Location	Total Service Load (DL+SDL+LL), Kips
East Abutment	360.20
Pier 1	817.40
Pier 2	817.40
West Abutment	360.20

Currently, semi-integral abutments with dog-ear wing walls are proposed. The proposed bottom of footing elevations are shown on the following tables 2 and 3.

Table 2 – Southbound Bottom of Footing Elevations (SN 016-0488)

Location	Elevation
East Abutment	618.90
Pier 1	593.74
Pier 2	593.71
West Abutment	619.67

Table 3 – Northbound Bottom of Footing Elevations (SN 016-0489)

Location	Elevation
East Abutment	618.67
Pier 1	593.74
Pier 2	593.71
West Abutment	619.59

SECTION 03: SUBSURFACE INVESTIGATION PROCEDURES

The borings were performed during the months of December, 2012 and January and March, 2013, with a truck-mounted drilling rig. Borings performed near the abutments (SB-62, SB-65, SB-66 and SB-69) 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 ground below using 4-inch casing. Upon reaching the

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

Abutment borings SB-62, SB-65, SB-66, and SB-69 were drilled at the top of the embankment at roadway level. Pavement in borings SB-62 and SB-66 consisted of approximately 12 to 16 inches of concrete and 1¾ to 2 feet of stone fill. Pavement in boring SB-65 consisted of approximately 3 inches of asphalt overlying 14 inches of concrete and about 2 feet of stone fill. Pavement in boring SB-69 consisted of approximately 10 inches of asphalt and about 12 inches of stone fill. Below the surficial pavement and subbase material in borings, fill material mainly consisting of soft to hard clay loam and was encountered to an approximate elevation in the range of 569 to 584. In boring SB-62, medium stiff organic silty clay was encountered from an approximate elevation of 584 to elevation 579. Below the fill and organic soils, stiff to hard clay/clay loam, and medium dense to very dense silty clay loam/silty loam/silt soils were generally

generally encountered to elevations ranging from 544 and 556. Underlying these materials, the boring logs indicated cobbles and boulders and fractured rock to approximate elevations ranging from 542 to 546 where bedrock was encountered. The stiff to hard clay soils had moisture contents within the range of 9% to 27% with an average of 13%. The medium dense to very dense silt and loam soils had moisture contents within the range of 14% to 21% with an average of 16%. The rock core taken at these elevations indicated Silurian System, Niagaran Dolomite with the R.Q.D.s in the range of 77% to 84%.

The remainder of the borings (SB-63, SB-64, SB-67, and SB-68) were performed on the bridge deck, with 4-inch casings extending to the ground level below. The bridge deck was cored prior to advancing the borings. The borings encountered approximately 4 to 10 inches of concrete (slope wall) to elevations in the range of 612 to 617. Below the concrete in boring SB-64, fill material mainly consisting of stiff clay to clay loam was encountered to an approximate elevation of 600. Underneath the concrete in borings SB-63, SB-67, and SB-68, fill material mainly consisting of stiff to very stiff clay loam and clay to clay loam was encountered to the approximate elevations in the range of 580 to 581. Below the fill material, stiff to hard clay/clay loam and medium dense to very dense sandy clay loam/silty loam/silty clay loam soils were generally encountered to the approximate elevations ranging from 553 to 559. Underlying these soils, dense to very dense clayey sand, gravel, cobbles and boulders, and fractured rock were encountered to varying elevations of bedrock (ranging from approximate elevation of 543 to 547). The stiff to hard clay soils had moisture contents within the range of 10% to 29% with an average of 15%. The medium to very dense loam, sand, gravel and fractured rock typically had moistures in the teens with an average of 11%. The rock cores taken indicated Silurian System, Niagaran Dolomite with the R.Q.D.s in the range of 66% to 84%. However, the rock core obtained in boring SB-67 from 547 to 543 had the R.Q.D of 0%.

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-62, SB-65, SB-66, and SB-69, before switching to rotary drilling at a depth of 10 feet. We estimate the long term water table around the elevation of 581 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 Sanitary & Ship Canal.

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.

Settlement

Approximately 4 feet of widening and 2 feet of embankment 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 embankment. The abutments and piers will be supported on piles, for the structures supported on piles settlement will be less than 0.4 inches.

Slope Stability

The abutments and piers will be pile supported and will resist slope failure. No slope stability issues are associated with the bridge structures.

SECTION 08: RECOMMENDATIONS

Based on the presence of apparent clay fill to fairly deep depth at both the abutment and pier locations anticipated high loads for the proposed structures, it is not recommended to support the new bridge on conventional shallow spread footing foundations. Therefore, shallow footing foundation recommendations are not provided in the report.

Driven Steel H-Piles

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, wing walls, and piers. Due to high loadings of the structure, the use of spread footings is not recommended for support of the bridge structure abutments and piers.

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. Pile data for H-piles and shell piles is included in Appendix E. Due to some stratum 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 594 feet for piers and at the approximate elevation of 619 feet for abutments. 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.

Abutment and Deep Pier Foundations

Straight shaft caissons to bedrock are considered feasible for construction, however due to the presence of numerous cobbles boulders and fractured rock above bedrock below approximate elevation 560 (100% drilling fluid loss was noted drilling through stratum at borings SB-63 and SB-68), difficulties would be expected during caisson installation and lead to greater construction cost uncertainty than driven piles.

Straight-shaft caissons may be considered for design at the abutments and piers. We recommend that the straight-shaft caissons be either based on top of the sound bedrock or rock-socketed. Drilled shafts extending into rock should be designed utilizing only end bearing or side resistance, whichever is larger per FHWA-NHI-10-016.

We recommend designing the shafts as end-bearing elements on top of sound rock. Sound bedrock varies from an elevation of 542 to 544. Considering the lowest strength core taken from the borings (SB-63 with 365 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). Our recommendation for end bearing is based on the 2002 ASHTO Standard specification, 17th Edition. 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).

The bedrock elevations encountered in borings are shown on the following table 4.

Table 4 – Bedrock Elevations

Boring No.	Boulder/Cobble/Fractured Rock Elevation	Weathered Bedrock Elevation	“Sound” Bedrock Elevation
SB-62	553	545	541
SB-63	559	--	543
SB-64	556	545	544
SB-65	--	545	544
SB-66	556	549	542
SB-67	555	546	No sound rock was encountered to elevation 543
SB-68	--	553	545
SB-69	556	--	544

Based on the soil borings, saturated silty and sandy soils are to be encountered at all piers and 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 bridge is located close to 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 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.

Lateral Resistance Recommendations

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

**Table 4 – Soil Parameters for Lateral Resistance
 SN 016-0488 and SN 016-0489**

Material (elevation, feet)	Unit Weight (pcf)	Drained Friction Angle (°)	Undrained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci)	Strain
Clay Loam Fill (Top to 580)	120	28	1,000	230	0.009
Dense to Very Dense Loam and Fractured Rock (580 to 544)	125	38	-	125	-

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

**Table 5 – Bedrock Parameters for Lateral Resistance
 SN 016-0488 and SN 016-0489**

Material (elevation, feet)	Unit Weight (pcf)	Young's Modulus (psi)	Uniaxial Compressive Strength (psi)	RQD (%)	Strain (k_m)
Sound Bedrock (542-532)	150	2×10^6	See Lab Data on Rock Core Logs	66% to 84%	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. Based on the results of the borings, temporary sheet piling is feasible for the project. For construction at the abutments if temporary soil retention is needed, IDOT Temporary Sheet Piling Design Charts may be used. Lateral soil properties provided in **Section 08: Recommendations** may be used for temporary sheet pile 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.

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

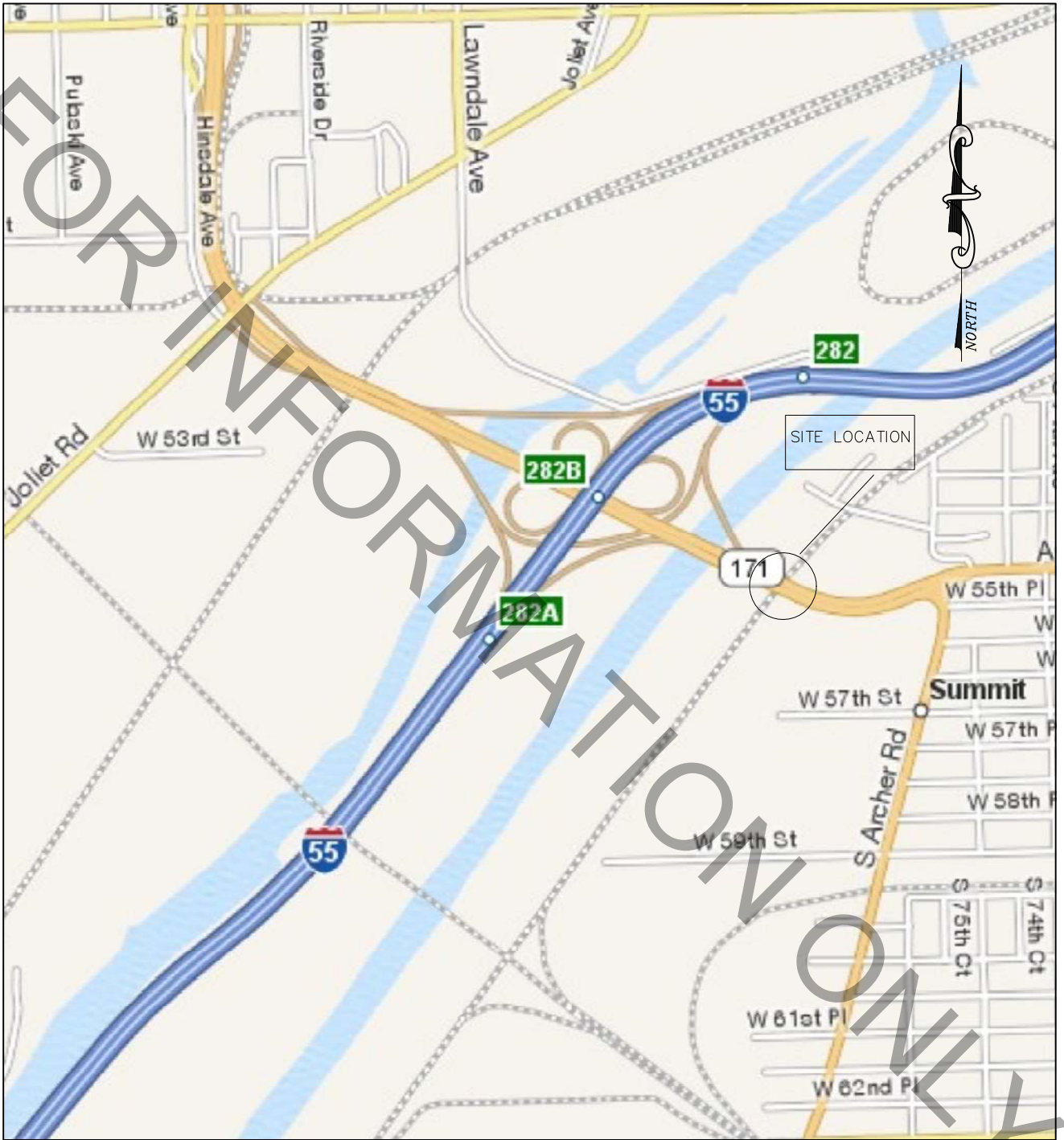
WL: Water	WD: While Drilling
WCI: Wet Cave In	BCR: Before Casing Removal
DCI: Dry Cave In	ACR: After Casing Removal
WS: While sampling	AB: After Boring

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

Chicago Sanitary and Shipping Canal
 IL-171 and I-55
 IDOT Job # D-91-191-10, PTB# 154-14
 Vilage of McCook, IL

Geo Services, Inc.
 Geotechnical, Environmental & Civil Engineering
 805 Amherst Court, Suite 204
 Naperville, Illinois 60565
 (630) 355-2838

DRAWN BY	BT
APPROVED BY	AJP
DATE	December 3, 2012
GSI JOB No.	10025
SCALE	NTS

APPENDIX C

TS&L, SOIL BORING PLAN AND PROFILE

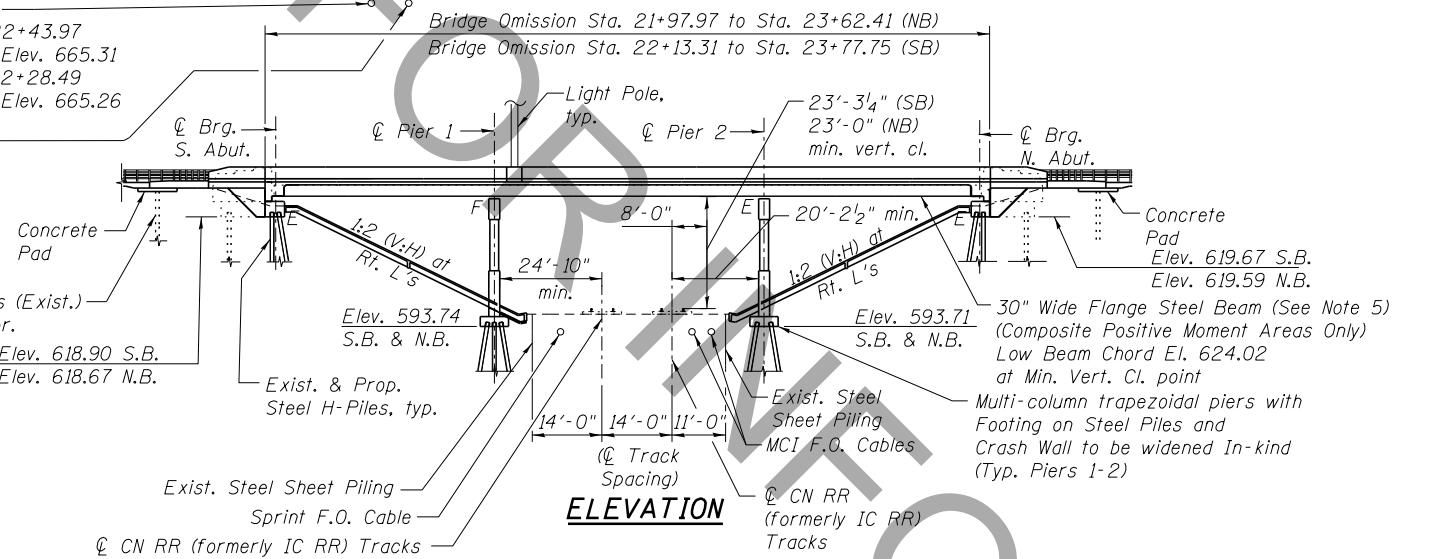
FOR INFORMATION ONLY

Bench Marks: Chiseled square on SW corner of SB IL-171 bridge wing wall over CN RR (formerly IC RR) El. 629.23.
 Chiseled square on NE corner of NB IL-171 bridge wing wall over CN RR (formerly IC RR) El. 630.58.
 Existing Structure: S.N. 016-0488 (SB) and S.N. 016-0489 (NB) were built in 1963 as F.A. Rte. 133, Section 0707-617 VB at Sta. 22+90.24. Existing dual structures each consist of three continuous span reinforced concrete decks on eight steel 30" WF beams in all three spans. The reinforced concrete deck is 8" thick, including a 2" microsilica concrete overlay. The abutments are reinforced concrete stub abutments founded on steel H-piles. Each pier is reinforced concrete consisting of a cap beam, multiple trapezoidal columns on a crashwall supported by a continuous spread footing on steel piles. The structures are 166'-6" back-to-back of abutments and the out-to-out deck width is 48'-0". The width of S.N. 016-0489 (NB) varies to 48'-9" in span 3. Both structures have a 12° 42' 19" skew. Traffic will be maintained utilizing crossovers.

No salvage.
 O.H. Wire
 SB Sta. 22+43.97
 Low Wire Elev. 665.31
 NB Sta. 22+28.49
 Low Wire Elev. 665.26

O.H. Wire
 SB Sta. 22+52.46
 Low Wire Elev. 665.81
 NB Sta. 22+37.03
 Low Wire Elev. 665.88

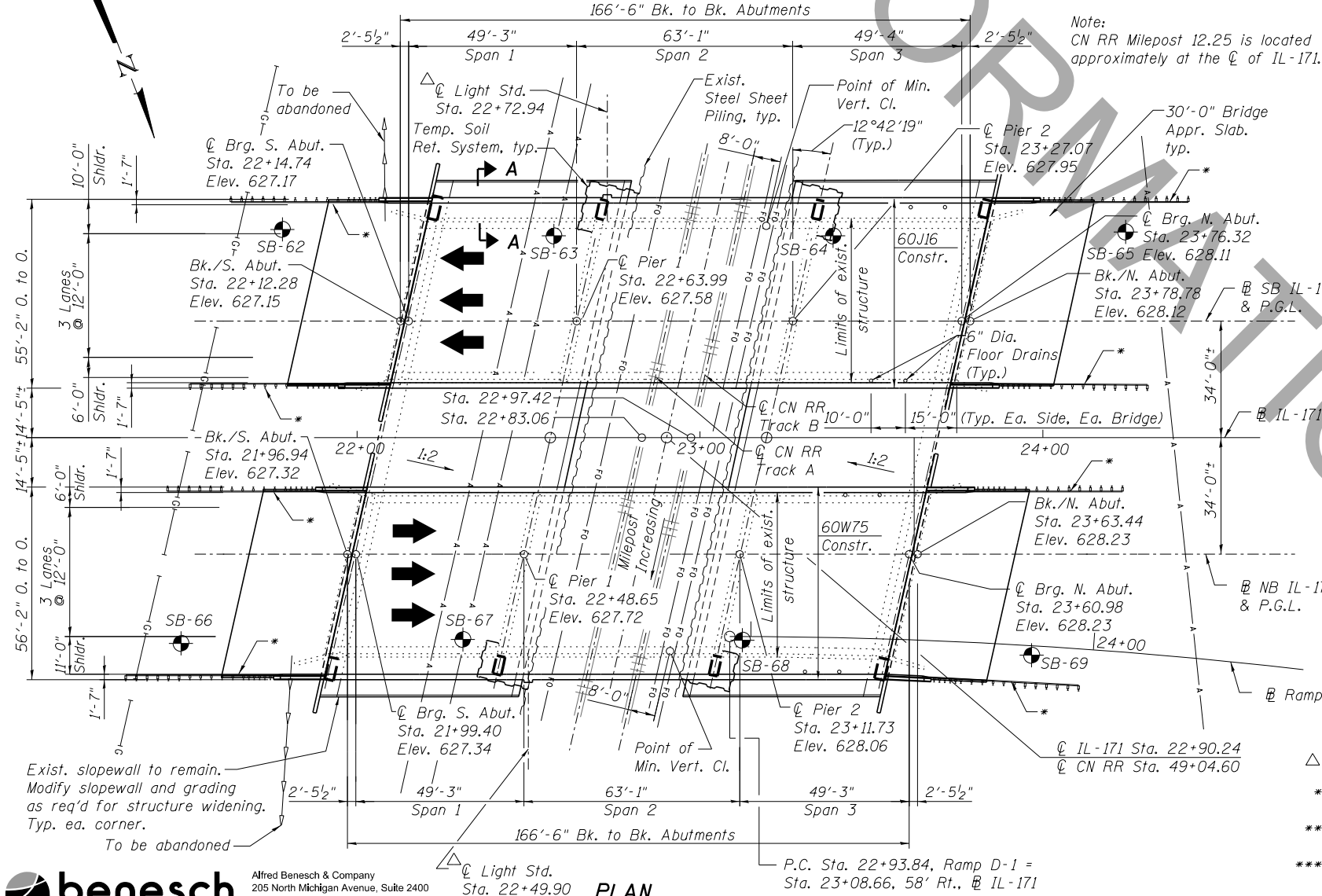
Timber Piles (Exist.)
 Typ. @ Appr.
 Elev. 618.90 S.B.
 Elev. 618.67 N.B.



ELEVATION

30" Wide Flange Steel Beam (See Note 5)
 (Composite Positive Moment Areas Only)
 Low Beam Chord El. 624.02
 at Min. Vert. Cl. point
 Multi-column trapezoidal piers with
 Footing on Steel Piles and
 Crash Wall to be widened In-kind
 (Typ. Piers 1-2)

Note:
 CN RR Milepost 12.25 is located
 approximately at the Cl of IL-171.



PLAN

SCOPE OF WORK

1. Remove the existing concrete deck and microsilica concrete overlay and replace with new 8" reinforced concrete deck.
2. Widen abutments, piers, and slopewalls to the outside.
3. Remove and replace approach slabs and wingwalls as required for new deck width and semi-integral abutments.
4. Add one additional steel beam line to outside of both structures.
5. Repair spalls, delaminations and open cracks in substructures using formed concrete repair and epoxy crack injection. Replace failed slopewall panels at both structures.
6. Remove and replace existing roadway lighting.
7. Retrofit cover plates on the top and bottom flanges of steel beams.
8. Perform miscellaneous repairs including fixing unseated anchor bolts and debris/vegetation removal.
9. Re-set the steel expansion rocker bearings at Pier 2.
10. Remove existing backwalls and convert abutments to semi-integral.
11. Painting of existing and new beams is included in separate painting contracts.

HIGHWAY CLASSIFICATION

Structure No. 016-0488
 IL 171 SB (FAP 373)
 Functional Class: Other Principal Arterial
 ADT: 26,845 (2008); 27,000 (2030)
 DHV: 2,372 (2030)
 ADTT: 12.3%
 Design Speed: 50 m.p.h.
 Posted Speed: 50 m.p.h.
 Structure No. 016-0489
 IL 171 NB (FAP 373)
 Functional Class: Other Principal Arterial
 ADT: 25,342 (2008); 26,000 (2030)
 DHV: 2,236 (2030)
 ADTT: 11.8%
 Design Speed: 50 m.p.h.
 Posted Speed: 50 m.p.h.

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

LOADING HS20-44

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

DESIGN SPECIFICATIONS

2002 AASHTO Standard Specifications for Highway Bridges

CURVE DATA RAMP D-1

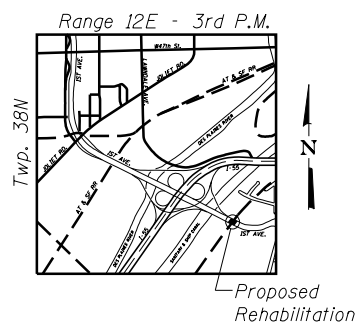
P.I. Sta. 24+31.17
 $\Delta = 10^\circ 48' 56''$ (RT)
 $D = 3^\circ 56' 58''$
 $R = 1,450.69'$
 $T = 137.33'$
 $L = 273.84'$
 $E = 6.49'$
 $e = 4.6\%$
 P.C. Sta. = 22+93.84
 P.C.C. Sta. = 25+67.68

NOTES:

1. All existing dimensions and details are taken from existing plans. The Contractor shall field verify existing dimensions and details affecting new construction.
2. No freefall drains will be permitted in the span over the tracks or within 10 ft. of cross arms of a railroad pole line.
3. Electrical conduit for roadway lighting is attached to the outside of the existing exterior parapets and along the inside face of the exterior fascia beams. Conduit to be removed and replaced as required for final roadway lighting configuration.
4. Track spacing and horizontal clearances are at right angles to Cl Tracks.
5. The stiffness of the new beams must match the stiffness of the existing beams.

EXISTING UTILITY LEGEND

- U- Underground Storm Sewer
- A- Aerial Electric Line
- G- Underground Gas Line
- FO- Underground Fiber Optic



LOCATION SKETCH

GENERAL PLAN
IL-171 OVER CN RR

FAP 373 - SECTION 2013-037B-R (NB)
FAP 373 - SECTION 2013-038B-R (SB)

COOK COUNTY
STATION 22+90.24

STRUCTURE NO. 016-0488 (SB)
STRUCTURE NO. 016-0489 (NB)

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 Alfred Benesch & Company
 205 North Michigan Avenue, Suite 2400
 Chicago, Illinois 60601
 312-565-0450 Job No. 10093

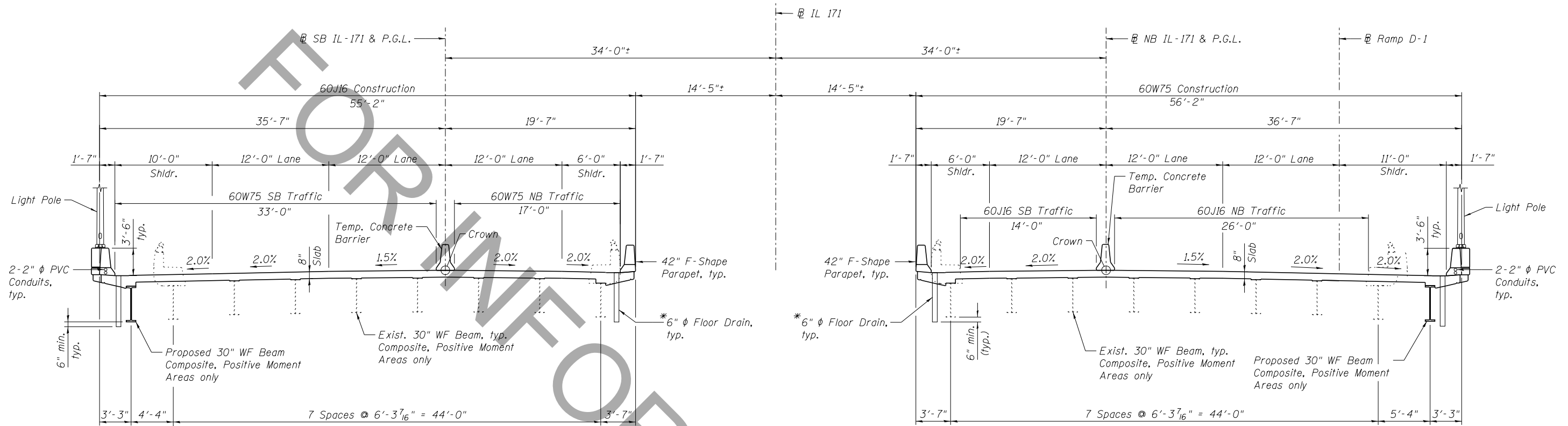
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	8/28/2013

DESIGNED - CMK	REVISÉ -
CHECKED - JAW	REVISÉ -
DRAWN - CMK	REVISÉ -
CHECKED - JAW	REVISÉ -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 1 OF 3 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
373	***	COOK		
CONTRACT NO. **				



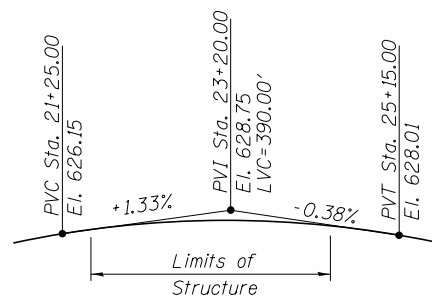
CROSS SECTION
(Looking Upstation)

CROSS SECTION
(Looking Upstation)

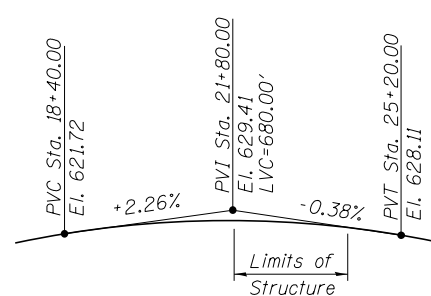
- * See Sheet 1 for location of Floor Drains.
- ** 60W75 (NB) or 60J16 (SB)
- *** 2013-037B-R (NB) or 2013-038B-R (SB)

NOTE:

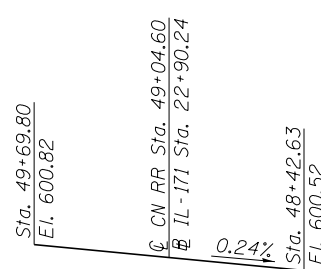
Existing roadway lighting is attached to the East parapet of the Northbound structure and the West parapet of the Southbound structure. Roadway lighting shall be removed with the existing deck and replaced with the proposed deck.



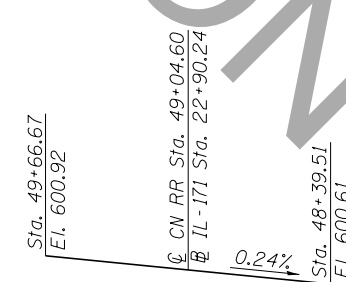
PROFILE GRADE SB IL-171
(Along @ SB IL-171)



PROFILE GRADE NB IL-171
(Along @ NB IL-171)



TOP OF RAIL PROFILE
CN RR-TRACK A



TOP OF RAIL PROFILE
CN RR-TRACK B

SECTIONS AND DETAILS
IL-171 OVER CN RR
FAP-373 - SECTION 2013-037B-R (NB)
FAP-373 - SECTION 2013-038B-R (SB)
COOK COUNTY
STATION 22+90.24
STRUCTURE NO. 016-0488 (S.B.)
STRUCTURE NO. 016-0489 (N.B.)

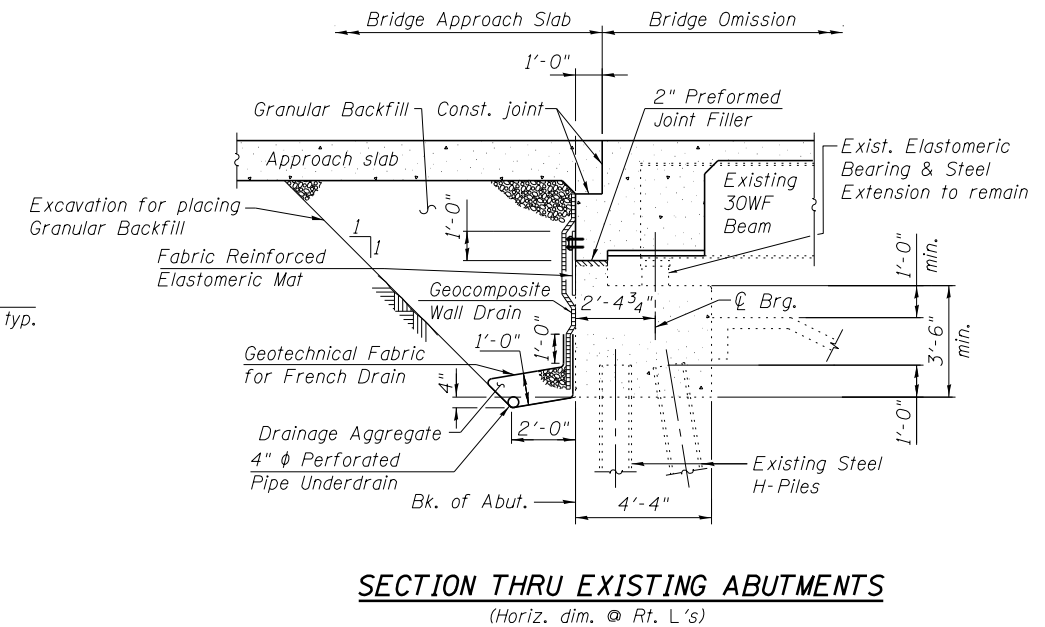
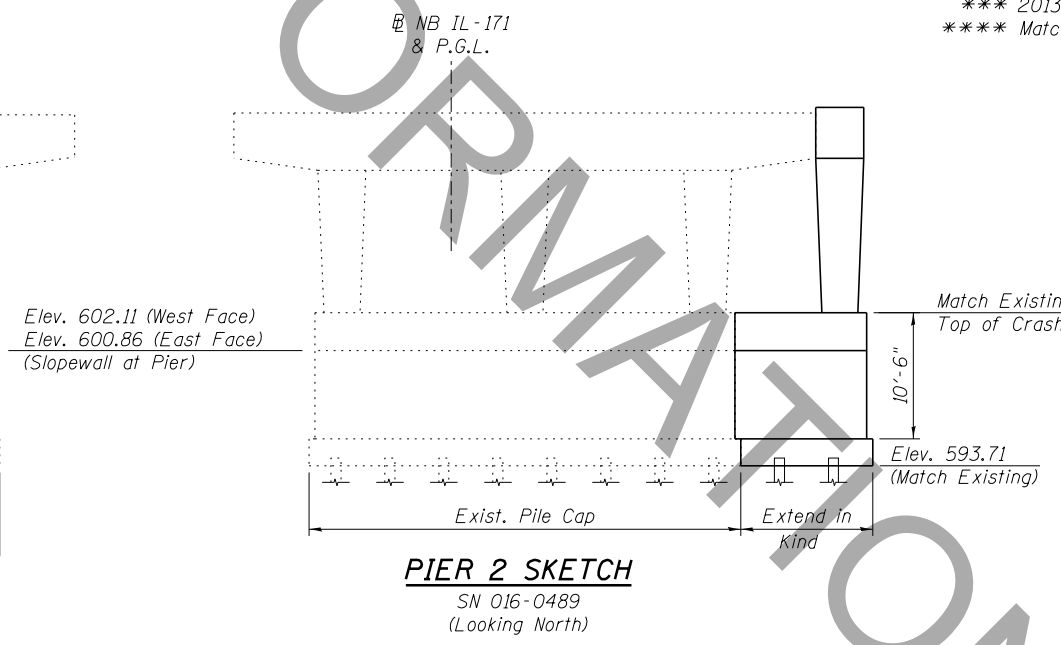
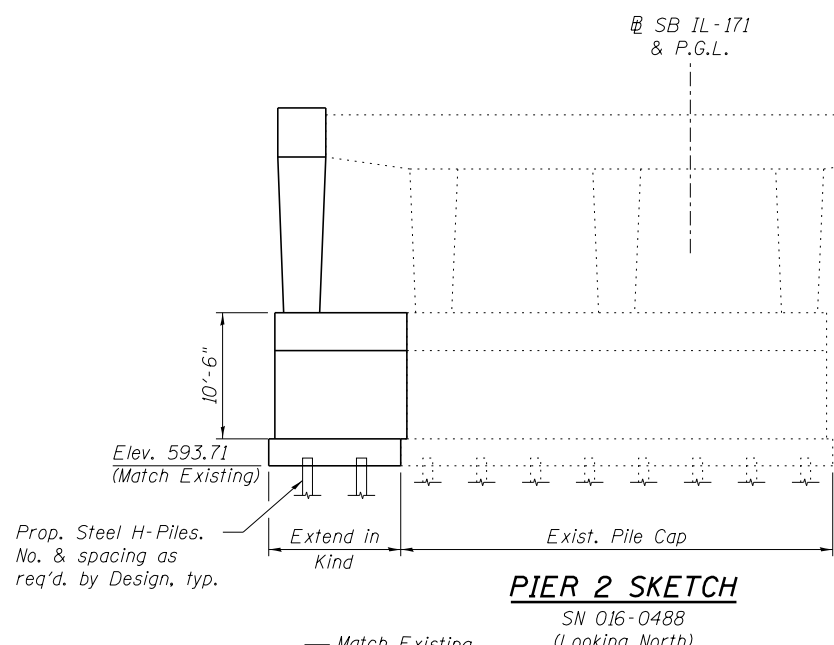
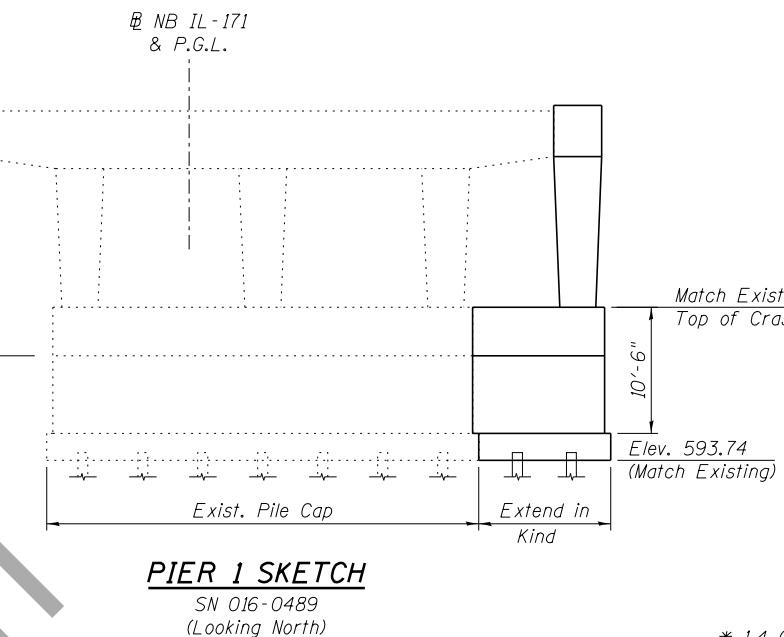
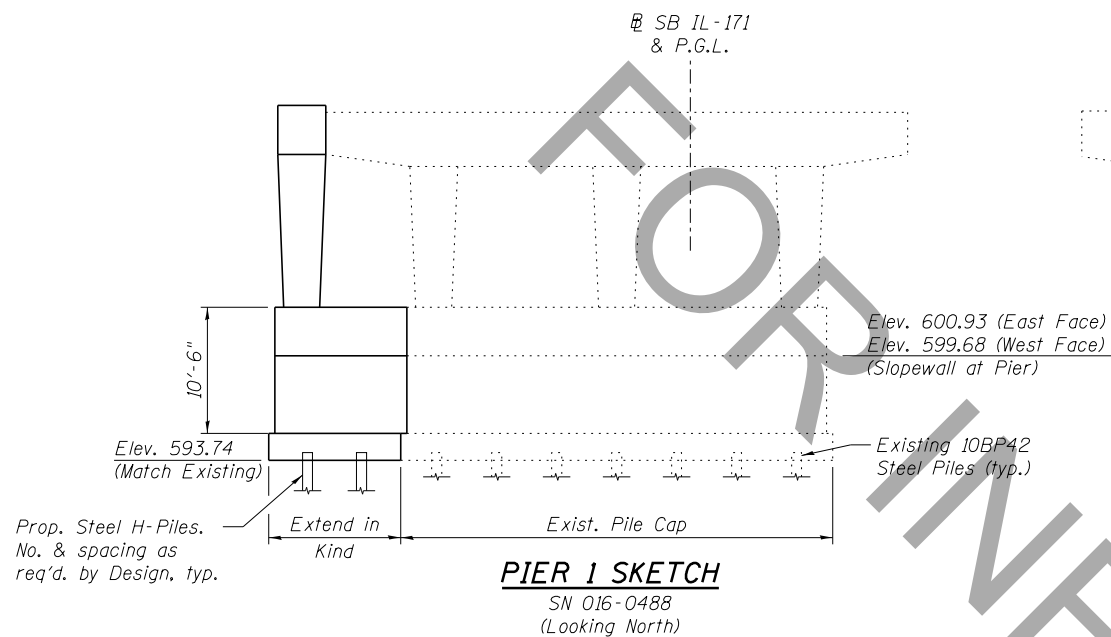
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205 North Michigan Avenue, Suite 2400
Chicago, Illinois 60601
312-565-0450 Job No. 10093

FILE NAME =	USER NAME = rgr:mm	DESIGNED - CMK	REVISED -
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	PLOT DATE = 8/28/2013	CHECKED - JAW	REVISED -

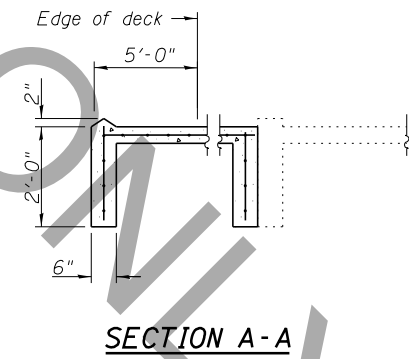
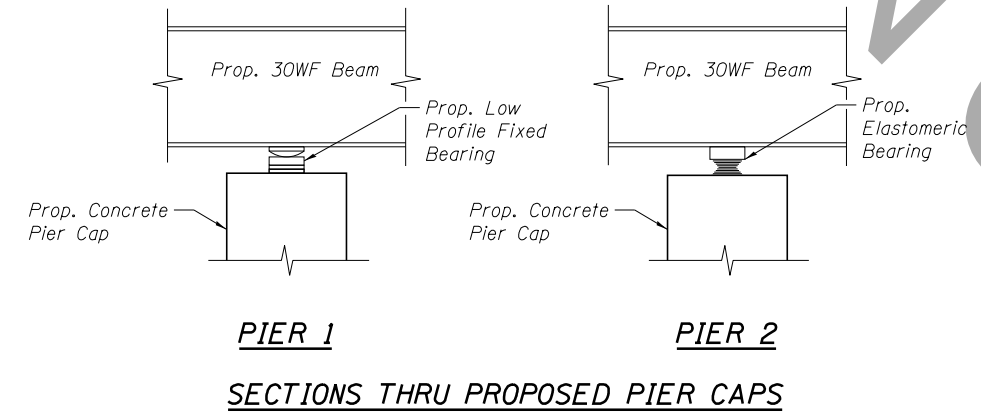
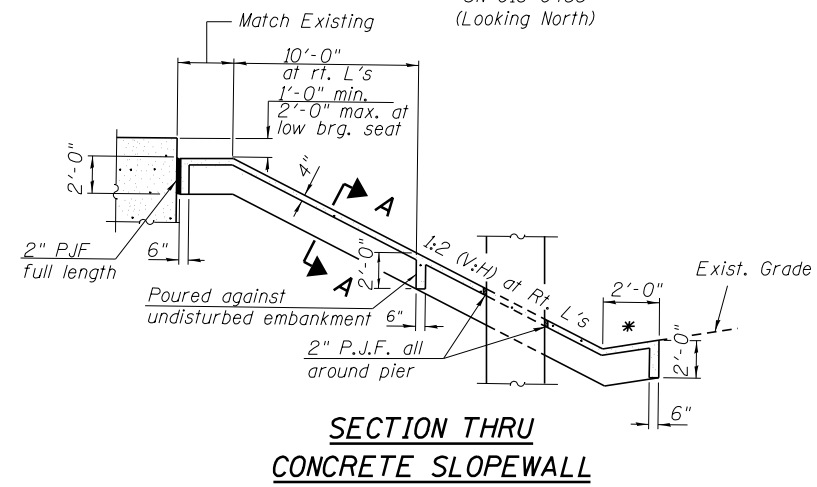
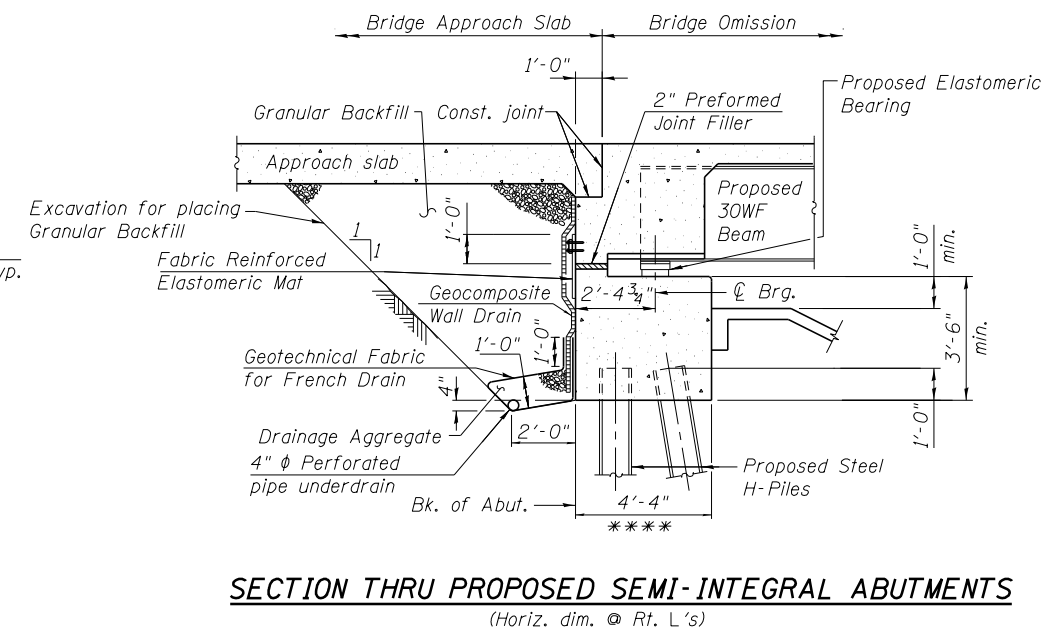
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 2 OF 3 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
373	***	COOK		
CONTRACT NO. **				
ILLINOIS FED. AID PROJECT				



- * 1:4 (V:H)
- ** 60W75 (NB) or 60J16 (SB)
- *** 2013-037B-R (NB) or 2013-038B-R (SB)
- **** Match existing dimension.



SECTIONS AND DETAILS
IL-171 OVER CN RR
FAP-373 - SECTION 2013-037B-R (NB)
FAP-373 - SECTION 2013-038B-R (SB)
COOK COUNTY
STATION 22+90.24
STRUCTURE NO. 016-0488 (S.B.)
STRUCTURE NO. 016-0489 (N.B.)

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FILE NAME =	USER NAME = rgr:mm	DESIGNED - CMK	REVISED -
		CHECKED - JAW	REVISED -
		DRAWN - CMK	REVISED -
		CHECKED - JAW	REVISED -
PLOT SCALE =			
PLOT DATE = 8/28/2013			

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 3 OF 3 SHEETS

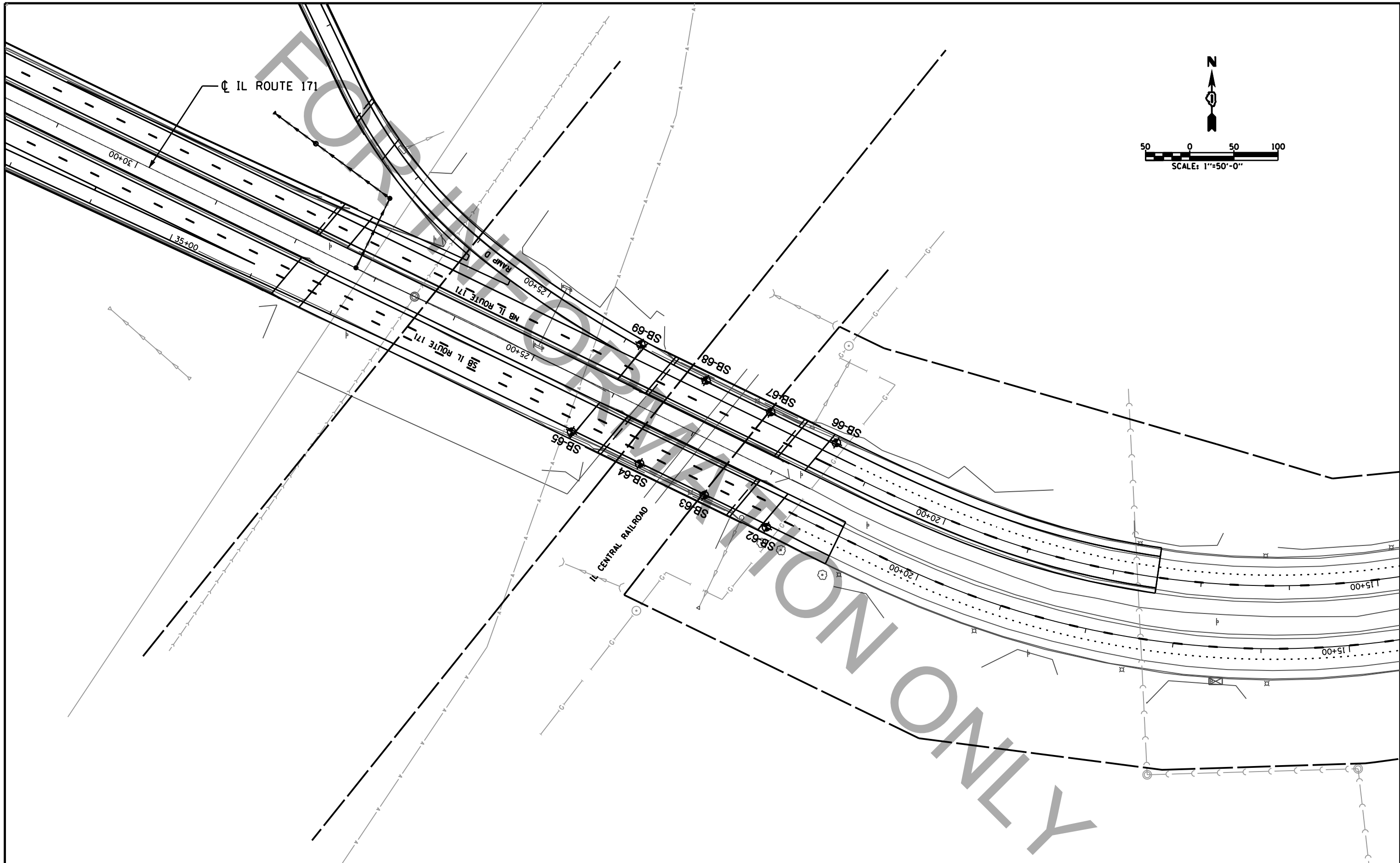
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
373	***	COOK		
CONTRACT NO. **				

ILLINOIS FED. AID PROJECT

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PLAN	SURVEYED	BY	DATE
	PLOTTED		
	CHECKED		
	AT		
	FILE NAME		
	FILE NO.		

PROFILE	SURVEYED	BY	DATE
	PLOTTED		
	CHECKED		
	AT		
	NOTATIONS		
	FILE NO.		



Geo Services, Inc.
 Geotechnical, Environmental & Civil Engineering
 805 Anthony Court, Suite 204
 Naperville, Illinois 60565
 (630) 355-2836

USER NAME =	DESIGNED - RWC	REVISED -
	DRAWN - RWC	REVISED -
PLOT SCALE =	CHECKED - AJP	REVISED -
PLOT DATE =	DATE - 6/4/2013	REVISED -

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

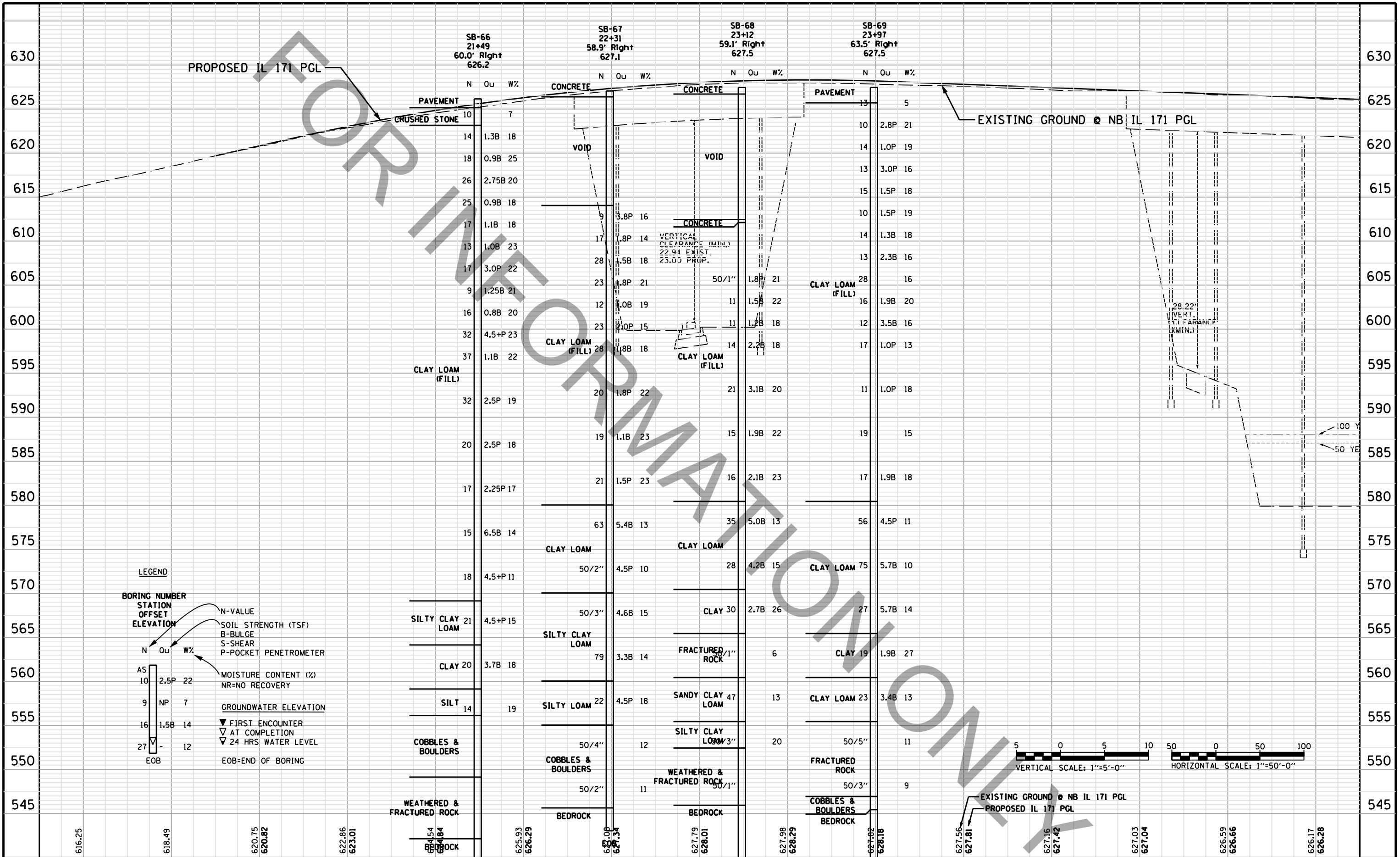
**ILLINOIS ROUTE 171 OVER CNRR
 SN 016-0489 (NB) 016-0488 (SB)
 SOIL BORING PLAN**

SCALE: 1"=50' SHEET NO. 1 OF 1 SHEETS STATION 22+90.20

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
373 (NB)	2013-0378-R (NB)	COOK	1	3
373 (SB)	2013-0388-R (SB)			
FED. ROAD DIST. NO.		ILLINOIS FED. AID PROJECT		

PLAN	SURVEYED	DATE
	PLOTTED	BY
	GRADES CHECKED	
	STRUCTURE NOTATIONS OK'D	
	NOTE BOOK NO.	
	FILE NAME	

PROFILE	SURVEYED	DATE
	PLOTTED	BY
	GRADES CHECKED	
	STRUCTURE NOTATIONS OK'D	
	NOTE BOOK NO.	
	FILE NAME	



LEGEND

BORING NUMBER
STATION OFFSET
ELEVATION

N - N-VALUE
 Ou - SOIL STRENGTH (TSF)
 W% - MOISTURE CONTENT (%)
 NR - NO RECOVERY

AS - FIRST ENCOUNTER
 10 - AT COMPLETION
 9 - 24 HRS WATER LEVEL
 NP - GROUNDWATER ELEVATION
 16 -
 27 -
 EOB - EOB-END OF BORING

▼ - FIRST ENCOUNTER
 ▽ - AT COMPLETION
 ▽ - 24 HRS WATER LEVEL

Geo Services, Inc. Geotechnical/Environmental/Civil Engineering 805 Amherst Court, Suite 204 Naperville, Illinois 60565 (630) 355-2836	USER NAME =	DESIGNED - RWC	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	NB ILLINOIS ROUTE 171 OVER CNRR SN 016-0489 SOIL BORING PROFILE			F.A.P. RTE. = 373	SECTION = 2013-037B-R	COUNTY = COOK	TOTAL SHEETS = 2	SHEET NO. = 3
	PLOT SCALE =	CHECKED - AJP	REVISED -		SCALE: 1:5V 1:50H	SHEET NO. 1 OF 1 SHEETS	STA. 21+98.20 TO STA. 23+62.42	ILLINOIS FED. AID PROJECT				
	PLOT DATE =	DATE - 6/4/2013	REVISED -		CONTRACT NO. 60W75							

FOR INFORMATION ONLY

APPENDIX D

BORING AND ROCK CORE LOGS

SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO.	Station	DEPTH	BLOWS	UCS	MOIST	Surface Water Elev.	Stream Bed Elev.	GROUNDWATER ELEV.	DEPTH	BLOWS	UCS	MOIST
		(ft)	(/6")	(tsf)	(%)	ft	ft		(ft)	(/6")	(tsf)	(%)
016-0488						n/a	n/a					
SB-62	21+78											
	60.70ft Left											
	626.40											
16.0" CONCRETE												
	625.07											
CRUSHED STONE-loose			3		5					3		
			3							6		28
	623.40		3							9		
CLAY LOAM-dark brown & gray spotted black-soft to very stiff (Fill)			3									
			3	0.5	12					4		
			9	P						8	1.0	20
		-5								9	P	
			5									
			4	0.4	18					3		
			4	B						5	1.4	15
										8	B	
			3									
			3	1.2	23					6		
		-10	6	B						7	1.3	19
										8	P	
			5									
			4	0.6	19							
			6	B								
			3							7		
			5	1.4	18					7	2.4	19
		-15	7	B						11	S	
			2									
			6	0.6	26							
			6	B								
			3							4		
			4	0.7	30					7	1.2	16
		-20	6	B						11	B	

Z:\PROJECTS\2010\10025 BENESCH, IL-171 FIRST AVE. (IDOT PTB 154, ITEM 14)\10025 BORING LOGS\10025_LOG.GPJ 6/7/13

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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO.	Station	DEPTH	BLOW	UCS	MOIST	Surface Water Elev.	Stream Bed Elev.	GROUNDWATER ELEV.	DEPTH	BLOW	UCS	MOIST
		(ft)	(/6")	(tsf)	(%)	ft	ft	ft	(ft)	(/6")	(tsf)	(%)
016-0488						n/a	n/a					
SB-62	21+78											
	60.70ft Left											
	626.40											
CLAY LOAM-dark brown & gray spotted black-soft to very stiff (Fill) (continued)						SILT-gray-dense to very dense (continued)						
	584.40											
ORGANIC SILTY CLAY-gray-medium stiff												
		1								15		
		2	0.9	54						20		15
		14	B							35		
		-45								-65		
	579.40											
CLAY LOAM-gray-hard												
		11								14		
		20	9.8	14						17		21
		34	S							30		
		-50								-70		
	553.40											
		30										
		34	9.8	9								
		50/5"	S									
		-55								-75		
	569.40											
SILT-gray-dense to very dense												
		16								27		
		33		14						30		5
		33								50/2"		
		-60								-80		

Z:\PROJECTS\2010\10025 BENESCH, IL-171 FIRST AVE. (IDOT PTB 154, ITEM 14)\10025 BORING LOGS\10025_LOG.GPJ 6/7/13

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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0488
 Station _____

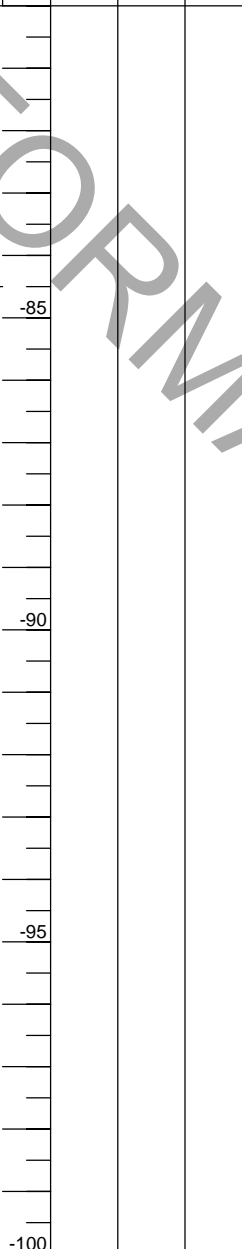
BORING NO. SB-62
 Station 21+78
 Offset 60.70ft Left
 Ground Surface Elev. 626.40 ft

DEPTH (ft)	BLOWS (/6")	UCS (tsf)	MOIST (%)
---------------	----------------	--------------	--------------

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

COBBLES & BOULDERS-very dense (continued)

Borehole continued with rock coring.



Z:\PROJECTS\2010\10025\BENESCH, IL-171 FIRST AVE. (IDOT PTB 154, ITEM 14)\10025 BORING LOGS\10025_LOG.GPJ 6/7/13

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)

ROCK CORE LOG

PAGE 1 of 1

DATE 1/31/2013

LOGGED BY DR

GSI JOB No. 10025

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-038B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

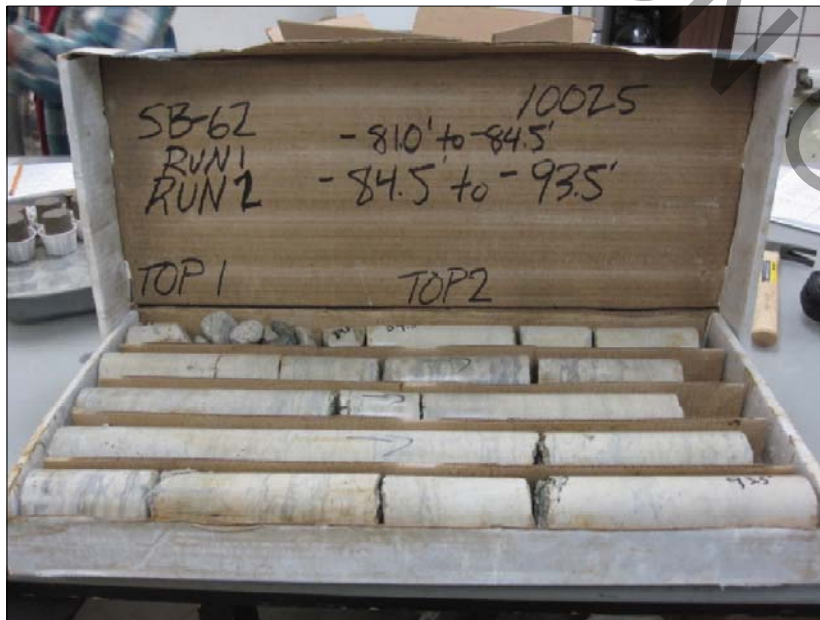
COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0488 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station Core Diameter 2.0 in

BORING NO. **SB-62** Top of Rock Elev. 541.5
 Station 21+78 Begin Core Elev. 545.4
 Offset 60.7' Left
 Ground Surface Elev. 626.4

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORRECTION (min/ft)	STRENGTH (tsf)
---------------	-------------	-----------------	---------------	------------------------	-------------------

RUN 1 (-81.0' to -84.5') Cobbles & boulders.	84.5	1			n/a
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE RUN 2 (-84.5' to -93.5') Light gray mottled gray & fine grained dolomite bedrock with horizontal bedding. Horizontal fractures @ -85.0', -85.3', -86.0', -86.2', -86.5', -87.0', -87.5', -88.2', -88.5', -89.2', -90.6', -91.5' & -92.1'.	88.5	2	96.7	81.1	n/a
	93.5				1115 @ -84.5'



SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0488</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	B L O W S	U C S Qu	M O I S T
Station _____					Stream Bed Elev. <u>n/a</u> ft				
BORING NO. <u>SB-63</u>	ft (ft)	(/6")	(tsf)	(%)	Groundwater Elev.:	ft (ft)	(/6")	(tsf)	(%)
Station <u>22+57</u>					First Encounter <u>n/a</u> ft				
Offset <u>58.90ft Left</u>					Upon Completion <u>n/a</u> ft				
Ground Surface Elev. <u>627.10</u>					After _____ Hrs. _____ ft				

DEPTH (ft)	BLOW COUNT (/6")	UCS (tsf)	MOISTURE (%)	Soil Description	DEPTH (ft)	BLOW COUNT (/6")	UCS (tsf)	MOISTURE (%)
9.0"				CONCRETE BRIDGE DECK				
VOID				CLAY to CLAY LOAM-brown & gray-stiff to very stiff (Fill) (continued)				
626.35						5		
						5	1.0	21
						6	B	
						4		
						5	1.5	18
-5					-25	6	P	
						3		
						4	1.1	20
						5	B	
617.60				10.0" CONCRETE SLOPE WALL				
616.77				CLAY to CLAY LOAM-brown & gray-stiff to very stiff (Fill)	-30	6	B	18
						4		
						5	2.1	18
						6	B	
						8		
			18			9	2.0	25
			15			11	B	
-15			16		-35			
			3					
			3	1.0				
			5	B	590.10			
				SILTY CLAY LOAM-gray-medium dense (Apparent Fill)				
			4			8		
			4	2.5		11		20
-20			5	P	-40	12		

Z:\PROJECTS\2010\10025 BENESCH, IL-171 FIRST AVE. (IDOT PTB 154, ITEM 14)\10025 BORING LOGS\10025_LOG.GPJ 6/7/13

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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0488
 Station _____

BORING NO. SB-63
 Station 22+57
 Offset 58.90ft Left
 Ground Surface Elev. 627.10 ft

D E P T H	B L O W S	U C S Qu	M O I S 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

CLAYEY SAND, GRAVEL & FRACTURED ROCK (continued)

543.10

Borehole continued with rock coring.

-85

-90

-95

-100

Z:\PROJECTS\2010\10025 BENESCH, IL-171 FIRST AVE. (IDOT PTB 154, ITEM 14)\10025 BORING LOGS\10025_LOG.GPJ 6/7/13

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)

ROCK CORE LOG

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-038B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0488 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft

Station Core Diameter 2.0 in

BORING NO. SB-63 Top of Rock Elev. 543.1

Station 22+57 Begin Core Elev. 543.1

Offset 58.9' Left

Ground Surface Elev. 627.1

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
---------------	-------------	-----------------	---------------	------------------------------------	-------------------

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-84.0' to -94.0')

Light gray to gray with horizontal to wavy bedding. Slightly porous with some thin clay partings. Horizontal fractures @ -84.8', -85.2', -85.6', -86.1', -86.4', -87.1' & -87.6'. Transverse fractures @ -88.2' & -88.8'. Horizontal fractures @ -89.5', -89.8', -90.1', -90.5', -91.2', -91.8', -92.0' & -92.5'.

	1	87.0	66.0	n/a	365 @ -84.1'
-89.0					
-94.0					



SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0488</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	B L O W S	U C S Qu	M O I S T
Station _____					Stream Bed Elev. <u>n/a</u> ft				
BORING NO. <u>SB-64</u>	ft (ft)	(/6")	(tsf)	(%)	Groundwater Elev.:	ft (ft)	(/6")	(tsf)	(%)
Station <u>23+39</u>					First Encounter <u>n/a</u> ft				
Offset <u>58.90ft Left</u>					Upon Completion <u>n/a</u> ft				
Ground Surface Elev. <u>627.50</u>					After _____ Hrs. _____ ft				

CLAY-brown & gray-stiff to very stiff (continued)					CLAY-gray-stiff (continued)				
					565.50				
					SANDY CLAY LOAM-gray-dense				
		4					8		
		4	2.4	23			14	4.5	14
		8	B				24	P	
		-45					-65		
					580.50				
CLAY LOAM-gray-hard					CLAY-gray-hard				
		17					9		
		30	4.5	12			13	5.4	20
		23	P				24	B	
		-50					-70		
					575.50				
CLAY-gray-stiff					CLAYEY SAND, GRAVEL & FRACTURED ROCK				
		13					50/4"		
		17	2.0	18					12
		24	P				-75		
		-55							
		21					50/1"		
		24	2.8	29					2
		24	B						
		-60					-80		

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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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0488</u> Station _____	D E P T H	B L O W S	U C S	M O I S T	Surface Water Elev. <u> </u> n/a ft
					Stream Bed Elev. <u> </u> n/a ft
BORING NO. <u>SB-64</u> Station <u>23+39</u> Offset <u>58.90ft Left</u>					Groundwater Elev.:
Ground Surface Elev. <u>627.50</u> ft (ft)					First Encounter <u> </u> n/a ft
					Upon Completion <u> </u> n/a ft
					After <u> </u> Hrs. <u> </u> ft

CLAYEY SAND, GRAVEL & FRACTURED ROCK <i>(continued)</i>									
	544.50								
Drillers Observation: Apparent Bedrock.	544.00								
Borehole continued with rock coring.	-85								
	-90								
	-95								
	-100								

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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)

ROCK CORE LOG

PAGE 1 of 1

DATE 3/25/2013

LOGGED BY JK

GSI JOB No. 10025

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-038B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0488 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____ Core Diameter 2.0 in

BORING NO. **SB-64** Top of Rock Elev. 544.5
 Station 23+39 Begin Core Elev. 544.0

Offset 58.9' Left
 Ground Surface Elev. 627.5

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
	1	97.0	84.0	n/a	833 @ -83.6'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-83.5' to -93.5')
 Light gray to gray with horizontal to wavy bedding. Slightly porous with some thin clay partings. Horizontal fractures @ -84.4', -85.2', -85.5', -85.8', -86.0', -86.1', -86.5', -86.6', -86.7', -87.3', -88.0', -88.1', -88.6', -89.4', -90.2', -90.9', -91.6', -92.0', -92.4', -93.0' & -93.1'.



SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0488
 Station _____
 BORING NO. SB-65
 Station 24+24
 Offset 60.00ft Left
 Ground Surface Elev. 627.50 ft

D E P T H H	B L O W S	U C S Qu	M O I S T
(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

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

3.0" ASPHALT, 14.0" CONCRETE				CLAY LOAM-dark brown & gray-medium stiff to very stiff (Fill) (continued)				
	626.08	1				3		
SANDY CLAY LOAM with Gravel-black-medium dense (Fill)		4	11			4	1.3	18
		9				7	B	
	624.50							
CLAY LOAM-dark brown & gray-medium stiff to very stiff (Fill)		3				6		
		3	1.1	20		11	0.8	29
		-5	4	B		-25	8	S
		3				2		
		3	1.2	18		5	1.6	16
		6	B			5	B	
		3				7		
		5	4.9	14		7	2.3	23
	-10	7	B			-30	39	P
		6						
		6	2.4	16				
		8	S					
		3				6		
		4	1.2	21		6	1.5	23
	-15	4	B			-35	7	B
		3						
		5	1.4	20				
		6	B					
		2				5		
		4	1.2	18		6	2.1	18
	-20	6	B			-40	8	S

Z:\PROJECTS\2010\10025 BENESCH, IL-171 FIRST AVE. (IDOT PTB 154, ITEM 14)\10025 BORING LOGS\10025_LOG.GPJ 6/7/13

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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0488
 Station _____
 BORING NO. SB-65
 Station 24+24
 Offset 60.00ft Left
 Ground Surface Elev. 627.50 ft

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. _____ n/a ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
				Stream Bed Elev. _____ n/a ft				
				Groundwater Elev.:				
				First Encounter <u>Dry to 10.0'</u> ft				
				Upon Completion _____ n/a ft				
				After _____ Hrs. _____ ft				

CLAY LOAM-dark brown & gray-medium stiff to very stiff (Fill) (continued)				CLAY LOAM-gray-very stiff to hard (continued)				
				565.50				
				SILTY CLAY LOAM-gray-dense				
	4					9		
	8	1.4	22			13	1.0	21
-45	11	B			-65	18	B	
				581.50				
CLAY LOAM-gray-very stiff to hard				CLAY LOAM-gray-hard				
				560.50				
	20					11		
	19	4.2	11			17	8.1	10
-50	26	B			-70	26	B	
				555.50				
				SILTY LOAM-gray-dense				
	13					20		
	50/5"	2.3	13			25		21
-55		B			-75	25		
				550.50				
				SILTY CLAY LOAM-gray-dense				
	11					18		
	16	5.5	13			22	10.0	14
-60	23	B			-80	28	S	

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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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-038B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0488
 Station _____

BORING NO. SB-65
 Station 24+24
 Offset 60.00ft Left
 Ground Surface Elev. 627.50 ft

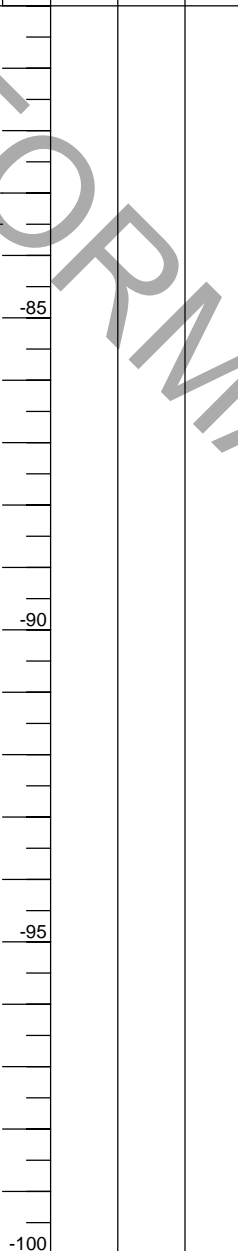
D E P T H	B L O W S	U C S Qu	M O I S T
(ft)	(/6")	(tsf)	(%)

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

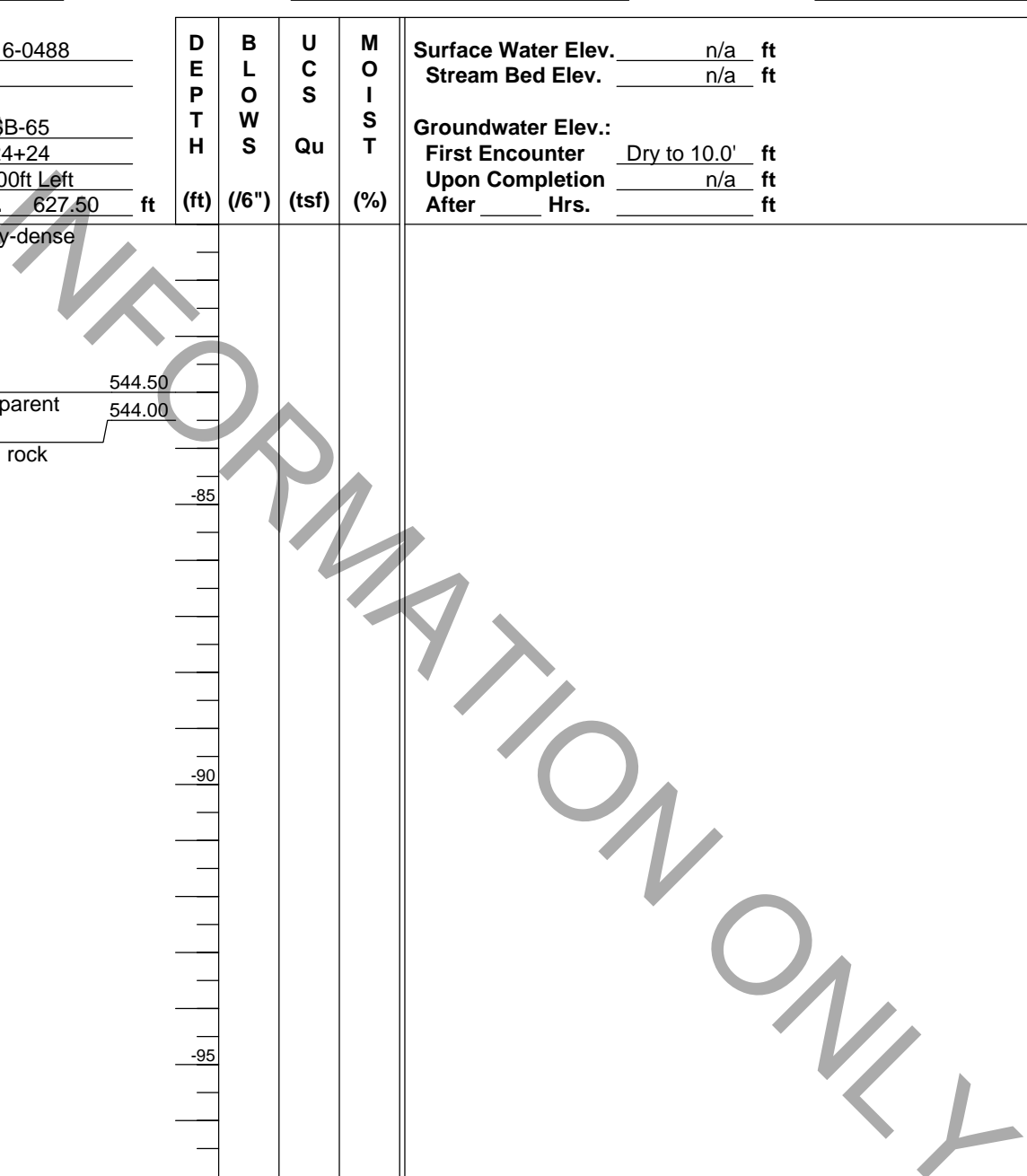
SILTY CLAY LOAM-gray-dense
 (continued)

544.50
 Drillers Observation: Apparent bedrock 544.00

Borehole continued with rock coring.



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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)

ROCK CORE LOG

PAGE 1 of 1

DATE 1/11/2013

LOGGED BY DR

GSI JOB No. 10025

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-038B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0488 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station Core Diameter 2.0 in

BORING NO. SB-65 Top of Rock Elev. 544.5
 Station 24+24 Begin Core Elev. 544.0

Offset 60.0' Left
 Ground Surface Elev. 627.5

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
	1	95.0	83.0	n/a	1003 -83.7'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-83.5' to -93.5')
 Light gray becoming mottled gray @ -85.3'. Fine grained with horizontal bedding.
 Horizontal fractures @ -84.4', -84.9', -85.3', -86.2', -86.9', -87.5', -87.7', -88.2',
 -89.1', -89.3', -89.7', -91.6', -62.1' & -92.5'.



SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RP

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0489
 Station _____

BORING NO. SB-66
 Station 21+49
 Offset 60.00ft Right
 Ground Surface Elev. 626.20 ft

DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
--------------------	--------------------	--------------------	-------------------

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

DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
--------------------	--------------------	--------------------	-------------------

12.0" CONCRETE				CLAY LOAM-dark brown & gray-medium stiff to hard (Fill) (continued)			
625.20							
CRUSHED STONE-medium dense (Fill)	3				3		
	4		7		5	1.2	21
623.20	6				4	B	
CLAY LOAM-dark brown & gray-medium stiff to hard (Fill)	4				6		
	6	1.3	18		7	0.8	20
	8	B			9	B	
					-25		
	6						
	8	0.9	25		10		
	10	B			15	4.5	23
					17	P	
	10						
	12	2.7	20		12		
	14	B			16	1.1	22
					21	B	
					-30		
	10						
	11	0.9	18				
	15	B					
	6						
	8	1.1	18		13		
	9	B			14	2.5	19
					18	P	
					-35		
	3						
	6	1.0	23				
	7	B					
	4						
	8	3.0	22		8		
					9	2.5	18
	9	P			11	P	
					-40		

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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

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RP

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0489
 Station _____

BORING NO. SB-66
 Station 21+49
 Offset 60.00ft Right
 Ground Surface Elev. 626.20 ft

DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)	Surface Water Elev. _____ n/a ft	Stream Bed Elev. _____ n/a ft	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
--------------------	--------------------	--------------------	-------------------	----------------------------------	-------------------------------	--------------------	--------------------	--------------------	-------------------

CLAY LOAM-dark brown & gray-medium stiff to hard (Fill) (continued)

SILTY CLAY LOAM-dark gray & black-medium dense (continued)
 564.20

CLAY-gray-very stiff
 4 5
 7 2.3 17
 9 3.7 18
 10 P 11 B

SILT-gray-medium dense
 559.20
 3 4
 6 6.5 14
 9 B 8
 556.20 -70

Drillers Observation: Cobbles & boulders.
 4 8 4.5 11
 10 P
 -55 -75

SILTY CLAY LOAM-dark gray & black-medium dense
 569.20

Drillers Observation: Weathered & fractured rock.
 549.20
 6 9 4.5 15
 12 P
 -60 -80

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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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RP

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0489
 Station _____

BORING NO. SB-66
 Station 21+49
 Offset 60.00ft Right
 Ground Surface Elev. 626.20 ft

DEPTH (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
---------------	--------------------------------	--------------------------------	----------------------------------

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

Drillers Observation: Weathered & fractured rock. (continued)

542.20

Borehole continued with rock coring.

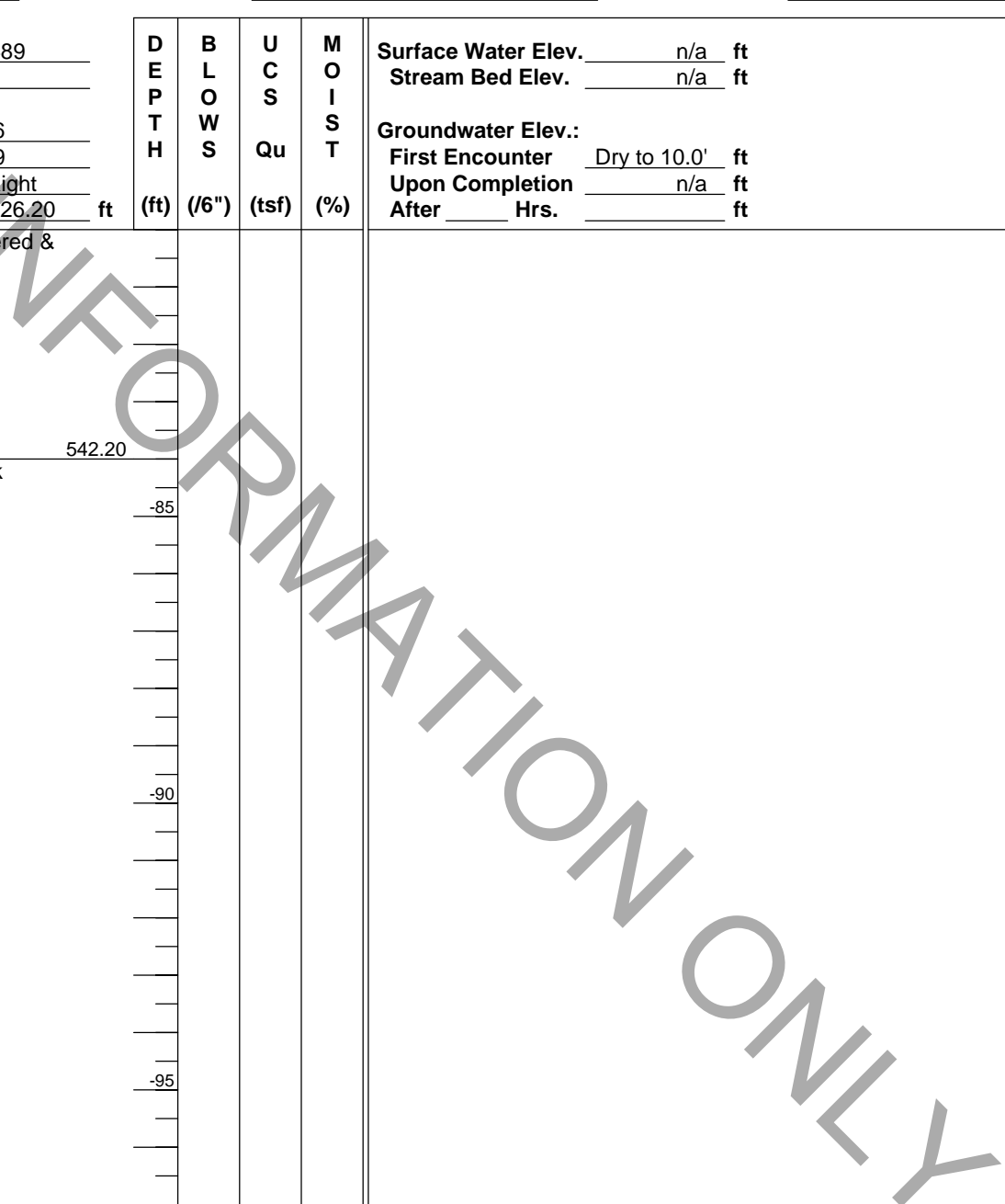
-85

-90

-95

-100

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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)

ROCK CORE LOG

PAGE 1 of 1

DATE 12/24/2012

LOGGED BY JK

GSI JOB No. 10025

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-037B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0489 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____ Core Diameter 2.0 in

BORING NO. **SB-66** Top of Rock Elev. XX
 Station 21+49 Begin Core Elev. 542.2

Offset 60.0' Right
 Ground Surface Elev. 626.2

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE RETI ME (min /ft)	STRENGTH (tsf)
	1	100.0	76.5	n/a	1194 @ -84.0'
-89					
-94					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-84.0' to -94.0')
 Light gray with horizontal bedding. Some stylonitic fractures. Horizontal fractures @ -84.8',
 -84.9', -85.1', -85.2', -85.6' & -86.7'. 1/2" clay parting @ -87.3'. Horizontal fracture
 @ -87.5'. Vertical fracture from -87.7' to -88.0'. Horizontal fractures @ -88.6', -89.2',
 -89.8', -90.9', -92.8', -93.0', -93.6' & -93.8'.



SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0489</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	B L O W S	U C S Qu	M O I S T
Station _____					Stream Bed Elev. <u>n/a</u> ft				
BORING NO. <u>SB-67</u>	D E P T H H	B L O W S	U C S Qu	M O I S T	Groundwater Elev.:	D E P T H	B L O W S	U C S Qu	M O I S T
Station <u>22+31</u>					First Encounter <u>n/a</u> ft				
Offset <u>58.90ft Right</u>					Upon Completion <u>n/a</u> ft				
Ground Surface Elev. <u>627.10</u> ft					After _____ Hrs. _____ ft				

DEPTH (ft)	BLOW S	UCS (tsf)	MOIST (%)	DESCRIPTION	DEPTH (ft)	BLOW S	UCS (tsf)	MOIST (%)
8.0"				CONCRETE BRIDGE DECK				
VOID								
626.43						8		
						10	1.8	21
						13	P	
						4		
						5	1.0	19
-5						7	B	
						5		
						14	2.0	15
						9	P	
						8		
						13	1.8	18
-10						15	B	
614.10								
6.0" CONCRETE SLOPE WALL						14		
613.60						9	1.8	22
CLAY LOAM-brown & gray-stiff to very stiff (Fill)	4	3.8	16			11	P	
	5	P						
	4							
	7	1.8	14					
	10	P						
	11					6		
	13	1.5	18			8	1.1	23
	15	B				11	B	
-20								

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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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY JZ

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0489
 Station _____
 BORING NO. SB-67
 Station 22+31
 Offset 58.90ft Right
 Ground Surface Elev. 627.10 ft

DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
--------------------	--------------------	--------------------	-------------------

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

DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
--------------------	--------------------	--------------------	-------------------

CLAY LOAM-brown & gray-stiff to very stiff (Fill) (continued)

SILTY CLAY LOAM-gray-very dense (continued)

8			
9	1.5	23	
12	P		
-45			
580.10			

27			
39	3.3	14	
40	B		
-65			
560.10			

CLAY LOAM-gray-hard

SILTY LOAM-gray-medium dense

19			
28	5.4	13	
35	B		
-50			

6			
9	4.5	18	
13	P		
-70			

COBBLES, BOULDERS & FRACTURED ROCK

28			
39	4.5	10	
50/2"	P		
-55			

50/4"			
-75			
12			

SILTY CLAY LOAM-gray-very dense

29			
43	4.6	15	
50/3"	B		
-60			

50/2"			
-80			
11			

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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)

ROCK CORE LOG

PAGE 1 of 1

DATE 3/28/2013

LOGGED BY JK

GSI JOB No. 10025

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-037B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0489 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____ Core Diameter 2.0 in

BORING NO. **SB-67** Top of Rock Elev. 545.8
 Station 22+31 Begin Core Elev. 547.1

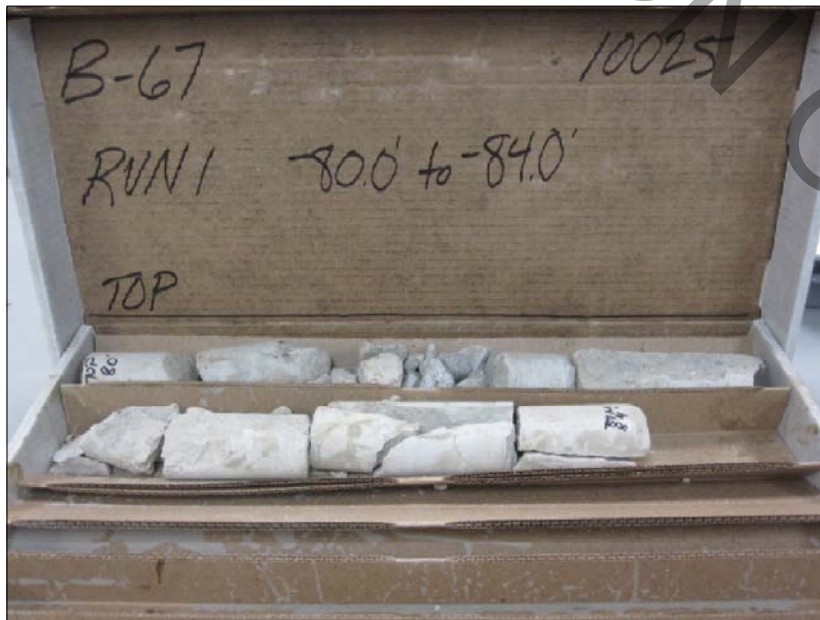
Offset 58.9' Right
 Ground Surface Elev. 627.1

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
---------------	-------------	-----------------	---------------	--------------------------	-------------------

RUN 1 (-80.0' to -81.4') Cobbles & boulders. 1 - - -

RUN 1 (-81.4' to -84.0')
 SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 Light gray with horizontal bedding to wavy bedding. Highly fractured throughout with numerous intersecting horizontal & vertical fractures. 1 78.4 0.0 n/a

-84.0





SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0489</u> Station _____	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
BORING NO. <u>SB-68</u> Station <u>23+12</u> Offset <u>59.10ft Right</u>					Stream Bed Elev. <u>n/a</u> ft				
Ground Surface Elev. <u>627.50</u> ft					Groundwater Elev.: First Encounter <u>n/a</u> ft Upon Completion <u>n/a</u> ft After _____ Hrs. _____ ft				

DEPTH (ft)	SOIL DESCRIPTION	DEPTH (ft)	BLOW COUNT	UCS (tsf)	MOISTURE (%)
0 - 0.5	9.0" CONCRETE BRIDGE DECK				
0.5 - 612.75	VOID				
612.75 - 612.17	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	19	50/1"	1.8 P	21
612.17 - 612.50	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	4	5	1.5 B	22
612.50 - 612.17	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	5	6	1.2 B	18
612.17 - 612.50	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	8	8	2.2 B	18
612.50 - 612.17	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	8	10	3.1 B	20
612.17 - 612.50	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	6	11	B	
612.50 - 612.17	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	5	6	1.9 B	22
612.17 - 612.50	CLAY LOAM-dark brown & gray-stiff to very stiff (Fill)	6	9	B	

Z:\PROJECTS\2010\10025 BENESCH, IL-171 FIRST AVE. (IDOT PTB 154, ITEM 14)\10025 BORING LOGS\10025_LOG.GPJ 6/7/13

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

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0489</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	B L O W S	U C S Qu	M O I S T
Station _____					Stream Bed Elev. <u>n/a</u> ft				
BORING NO. <u>SB-68</u>	D E P T H H	B L O W S	U C S Qu	M O I S T	Groundwater Elev.:	D E P T H	B L O W S	U C S Qu	M O I S T
Station <u>23+12</u>					First Encounter <u>n/a</u> ft				
Offset <u>59.10ft Right</u>					Upon Completion <u>n/a</u> ft				
Ground Surface Elev. <u>627.50</u> ft					After _____ Hrs. _____ ft				

Soil Description	Depth (ft)	Blows (/6")	UCS (tsf)	Moist (%)	Soil Description	Depth (ft)	Blows (/6")	UCS (tsf)	Moist (%)
CLAY LOAM-dark brown & gray-stiff to very stiff (Fill) (continued)					CLAY-gray-very stiff (continued)				
						565.50			
					FRACTURED ROCK-gray-very dense				
	5						35		
	7	2.1	23				21		6
	9	B				-65	50/1"		
	-45								
						580.50			
CLAY LOAM-gray-hard					SANDY CLAY LOAM with Gravel-gray-dense				
						560.50			
	12						40		
	14	5.0	13				28		13
	21	B				-70	19		
	-50								
						555.50			
					SILTY CLAY LOAM-gray-very dense				
	12						15		
	13	4.2	15		100.0% water loss between -73.5' & -75.0.		26		20
	15	B				552.50	50/3"		
	-55								
					Drillers Observation: Fractured /weathered rock.				
						570.50			
CLAY-gray-very stiff									
	10						50/1"		
	12	2.7	26						
	18	B				-80			
	-60								

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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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY KD

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0489
 Station _____

BORING NO. SB-68
 Station 23+12
 Offset 59.10ft Right
 Ground Surface Elev. 627.50 ft

DEPTH (ft)	BLOW S (/6")	UCS (tsf)	MOIST (%)
---------------	--------------------	--------------	--------------

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

Drillers Observation: Fractured /weathered rock. (continued)

546.00

Drillers Observation: Apparent bedrock.

545.50

Borehole continued with rock coring.

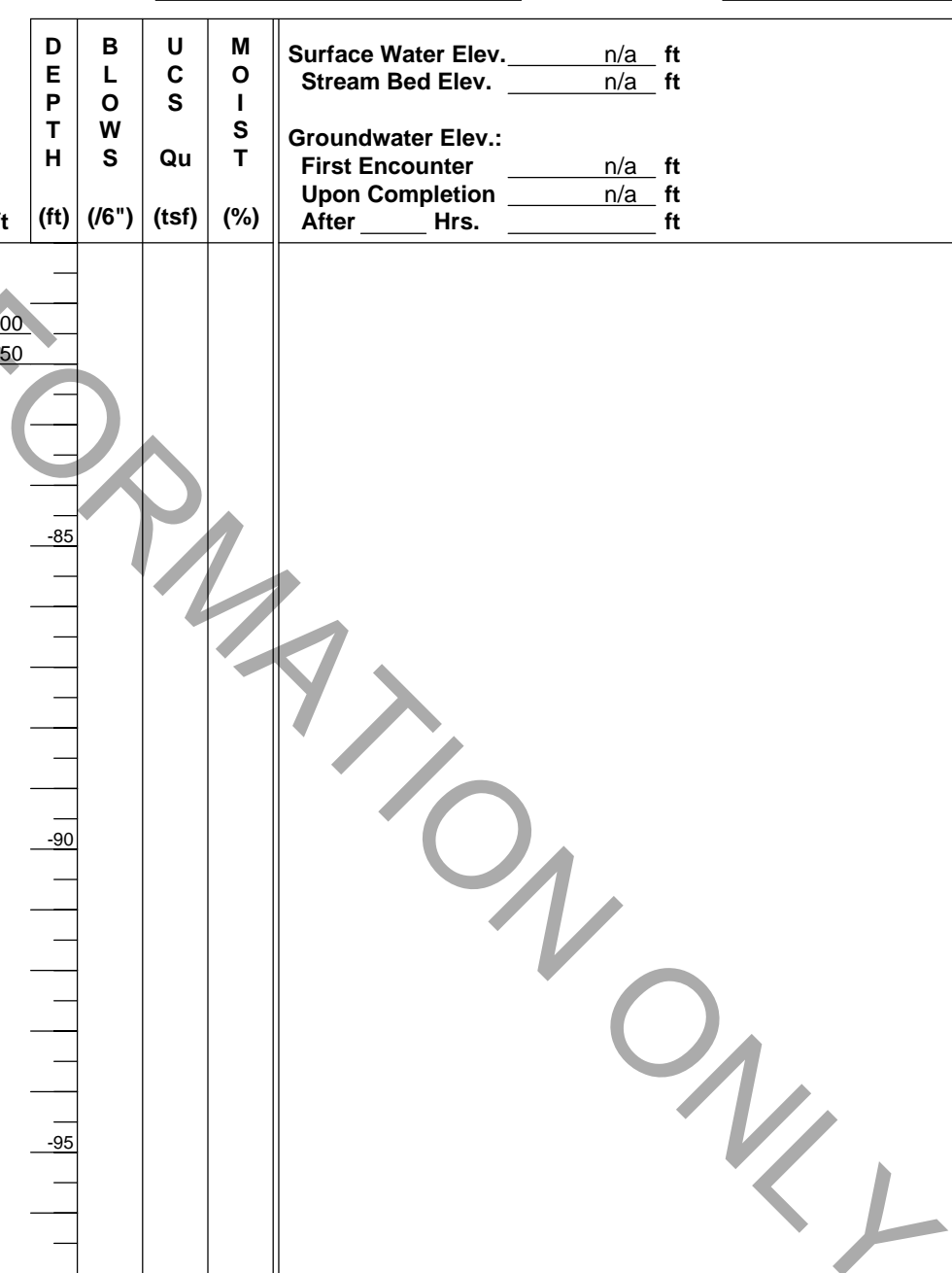
-85

-90

-95

-100

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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)

ROCK CORE LOG

PAGE 1 of 1

DATE 3/28/2013

LOGGED BY DR

GSI JOB No. 10025

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-037B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0489 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station Core Diameter 2.0 in

BORING NO. SB-68 Top of Rock Elev. 546.0
 Station 23+12 Begin Core Elev. 545.5

Offset 59.1' Right
 Ground Surface Elev. 627.5

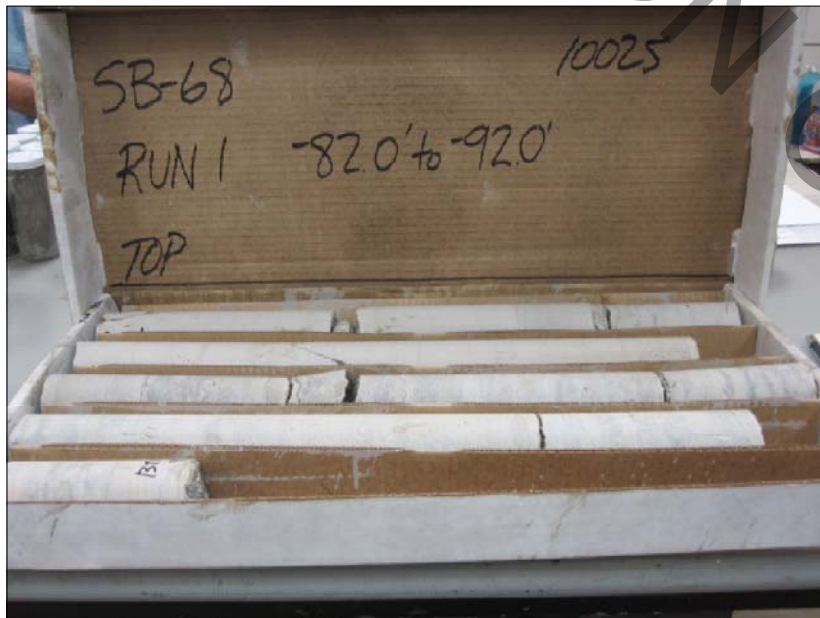
DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
---------------	-------------	-----------------	---------------	-----------------------	-------------------

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-82.0' to -92.0')

Light gray & fine grained with horizontal to wavy bedding becoming mottled gray @ -85.8'. Horizontal fractures @ -82.7' & -82.8'. Horizontal fracture w/ 1/4" clay parting @ -83.6'. Transverse fracture @ -84.7'. Horizontal fractures @ -85.8', -86.5', -86.6', -87.4', -87.9', -89.1' & -89.7'.

	1	81.0	77.0	n/a	716 @ -82.9'
-87.0					
-92.0					



SOIL BORING LOG

ROUTE FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RT

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. 016-0489
 Station _____

BORING NO. SB-69
 Station 23+97
 Offset 63.50ft Right
 Ground Surface Elev. 627.50 ft

D E P T H H	B L O W S	U C S Qu	M O I S T
(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

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

10.0" ASPHALT, 11.0" CRUSHED STONE			
	13		
625.75	8		5
CLAY LOAM-brown & gray-stiff to very stiff (Fill)	5		
	3		
	5	2.8	21
	5	P	
	3		
	5	1.0	19
	9	P	
	6		
	6	3.0	16
	7	P	
	2		
	7	1.5	18
	8	P	
	8		
	5	1.5	19
	5	P	
	6		
	6	1.3	18
	8	B	
	6		
	6	2.3	16
	7	B	

CLAY LOAM-brown & gray-stiff to very stiff (Fill) (continued)			
	5		
	5		16
	13		
	7		
	10	1.9	20
	6	B	
	4		
	4	3.5	16
	8	B	
	4		
	7	1.0	13
	10	P	
	4		
	4	1.0	18
	7	P	
	4		
	10		15
	9		

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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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RT

SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0489</u>	D E P T H H	B L O W S	U C S Qu	M O I S T 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 T
Station _____					Stream Bed Elev. <u>n/a</u> ft				
BORING NO. <u>SB-69</u>	D E P T H H	B L O W S	U C S Qu	M O I S T T	Groundwater Elev.:	D E P T H H	B L O W S	U C S Qu	M O I S T T
Station <u>23+97</u>					First Encounter <u>Dry to 10.0'</u> ft				
Offset <u>63.50ft Right</u>					Upon Completion <u>n/a</u> ft				
Ground Surface Elev. <u>627.50</u> ft					After _____ Hrs. _____ ft				
	(ft)	(/6")	(tsf)	(%)		(ft)	(/6")	(tsf)	(%)

Soil Description	Depth (ft)	Blows (/6")	UCS (tsf)	Moisture (%)	Soil Description	Depth (ft)	Blows (/6")	UCS (tsf)	Moisture (%)
CLAY LOAM-brown & gray-stiff to very stiff (Fill) (continued)					CLAY LOAM-gray-hard (continued)				
						565.50			
					CLAY-gray-stiff				
	5						6		
	8	1.9		18			8	1.9	27
	9	B				-65	11	B	
	-45								
						580.50			
CLAY LOAM-gray-hard					CLAY LOAM-gray-very stiff				
						560.50			
	18						7		
	27	4.5		11			11	3.4	13
	29	P				-70	12	B	
	-50								
						555.50			
					FRACTURED ROCK-gray-very dense				
	15						50/5"		
	25	5.7		10					11
	50	B				-75			
	-55								
	9						32		
	11	5.7		14			50/3"		9
	16	B				-80			
	-60								

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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 FAP 373 (IL 171) DESCRIPTION IL Route 171 from 47th St. to 55th St. LOGGED BY RT

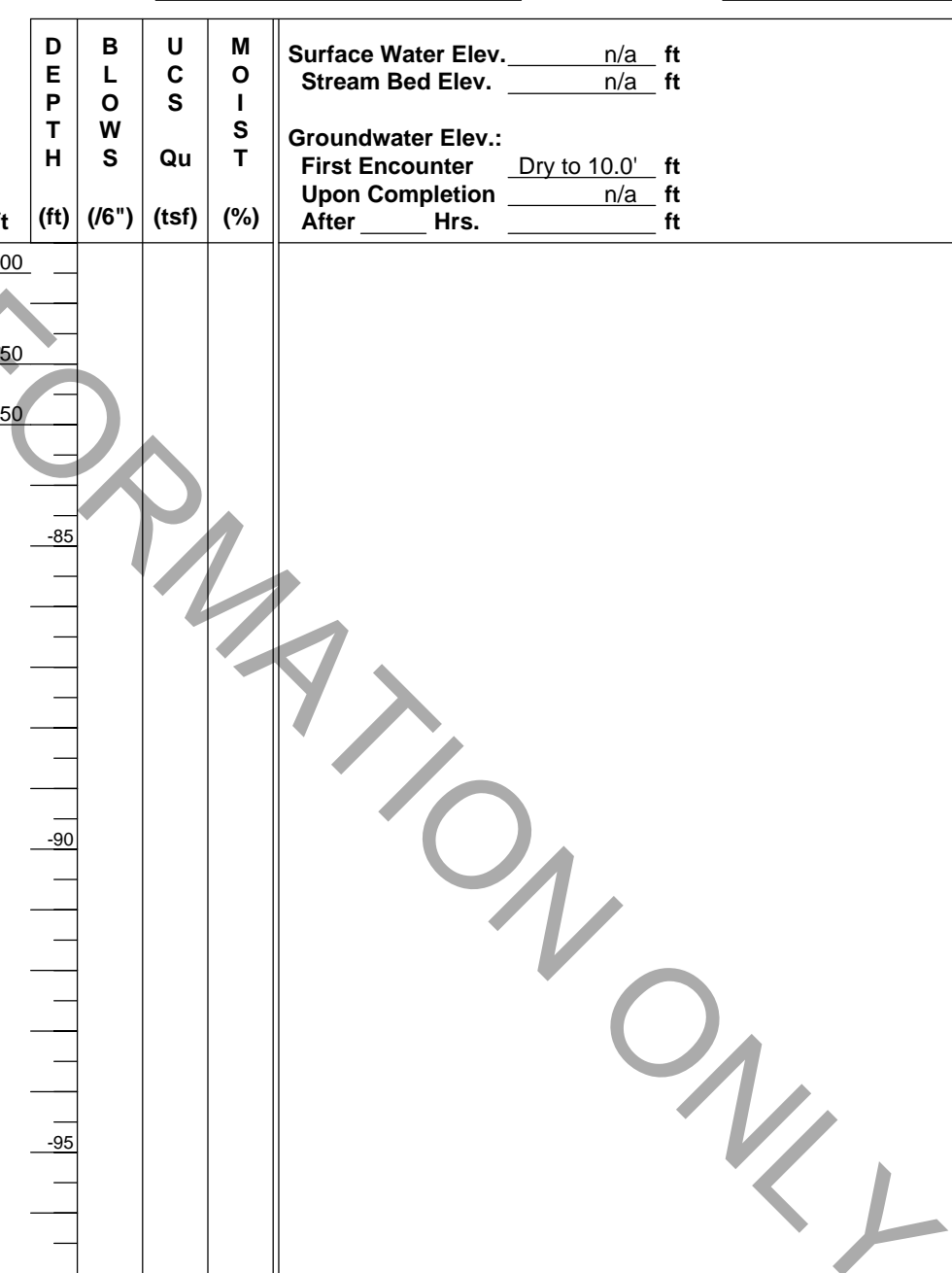
SECTION 2013-037B-R LOCATION NW 1/4, SEC. 13, TWP. T38N, RNG. R12E, 3rd PM

COUNTY Cook DRILLING METHOD HSA/MUD ROTARY HAMMER TYPE CME Automatic

STRUCT. NO. <u>016-0489</u> Station _____	D E P T H (ft)	B L O W S (/6")	U C S (tsf)	M O I S T (%)	Surface Water Elev. <u>n/a</u> ft
BORING NO. <u>SB-69</u> Station <u>23+97</u> Offset <u>63.50ft Right</u>					Stream Bed Elev. <u>n/a</u> ft
Ground Surface Elev. <u>627.50</u> ft					Groundwater Elev.:
					First Encounter <u>Dry to 10.0'</u> ft
					Upon Completion <u>n/a</u> ft
					After _____ Hrs. _____ ft

547.00	Drillers Observation: Cobbles & boulders.				
545.50	Drillers Observation: Apparent bedrock.				
544.50	Borehole continued with rock coring.				
-85					
-90					
-95					
-100					

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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)

ROCK CORE LOG

FAP Rte. 373 (IL 171) DESCRIPTION 1st Ave. Bridge Rehabilitation & Replacement, 47th St. to 55th St.

SECTION 2013-037B-R LOCATION SEC 11, 12, 13 & 14 T 38 N, R 12 E, 3rd PM

COUNTY Cook CORING METHOD Rotary Wash

STRUCT. NO. 016-0489 CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station Core Diameter 2.0 in

BORING NO. SB-69 Top of Rock Elev. 547.0
 Station 23+97 Begin Core Elev. 544.5
 Offset 63.5' Right
 Ground Surface Elev. 627.5

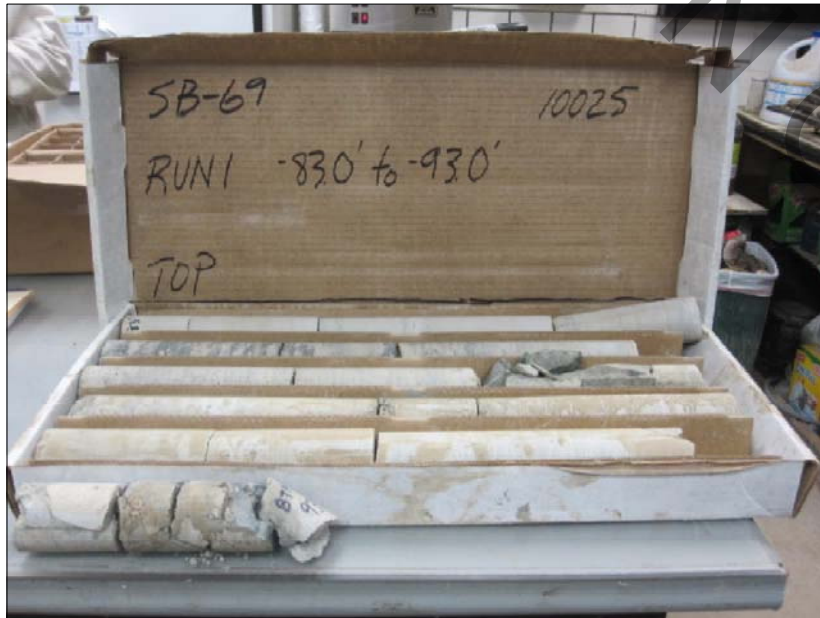
DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
---------------	-------------	-----------------	---------------	-----------------------	-------------------

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-83.0' to -93.0')

Light gray fine grained with horizontal bedding, becoming mottled from -85.1' to -86.1'.
 Horizontal fractures @ -83.2', -83.7', -84.5', -85.1', -85.7', -86.1', -86.9' & -87.6'.
 Highly fractured from -88.2' to -88.7'. Horizontal fractures @ -89.85', -90.1' & -92.7'.
 Highly fractured with clay partings from -92.7' to -93.0'.

	1	100.0	84.0	n/a	1060 -84.6'
-88					
-93					



FOR INFORMATION ONLY

APPENDIX E

PILE DESIGN TABLES

SB 171 East Abutment Boring SB-62 (Elevation 619.0 Begin Friction, 621.0 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)
5	3	9	4	11	4	13	5	16	5	15	6	19
7	5	14	6	17	7	21	8	25	9	28	12	35
10	6	19	8	24	10	30	12	37	11	32	13	39
12	7	22	10	29	12	36	15	45	13	39	15	46
15	9	26	11	33	14	41	17	51	15	45	18	54
17	10	31	13	40	17	51	21	63	18	54	22	65
20	13	39	17	50	21	63	26	79	22	66	27	80
22	15	44	19	56	24	71	29	88	26	77	31	92
25	19	57	25	74	31	94	38	113	32	97	39	117
30	22	67	28	84	35	104	42	127	40	119	47	141
35	25	76	32	95	39	116	47	140	45	136	54	161
40	41	122	51	152	61	182	73	220				
45	46	138	57	171	68	205	83	249				
50	53	158	66	197	79	236	95	286				
55	57	170	74	221	92	276	111	334				
60	59	178	76	229	96	289	120	361				
65	71	214	93	279	112	336	136	407				
70	85	254	110	329			170	511				

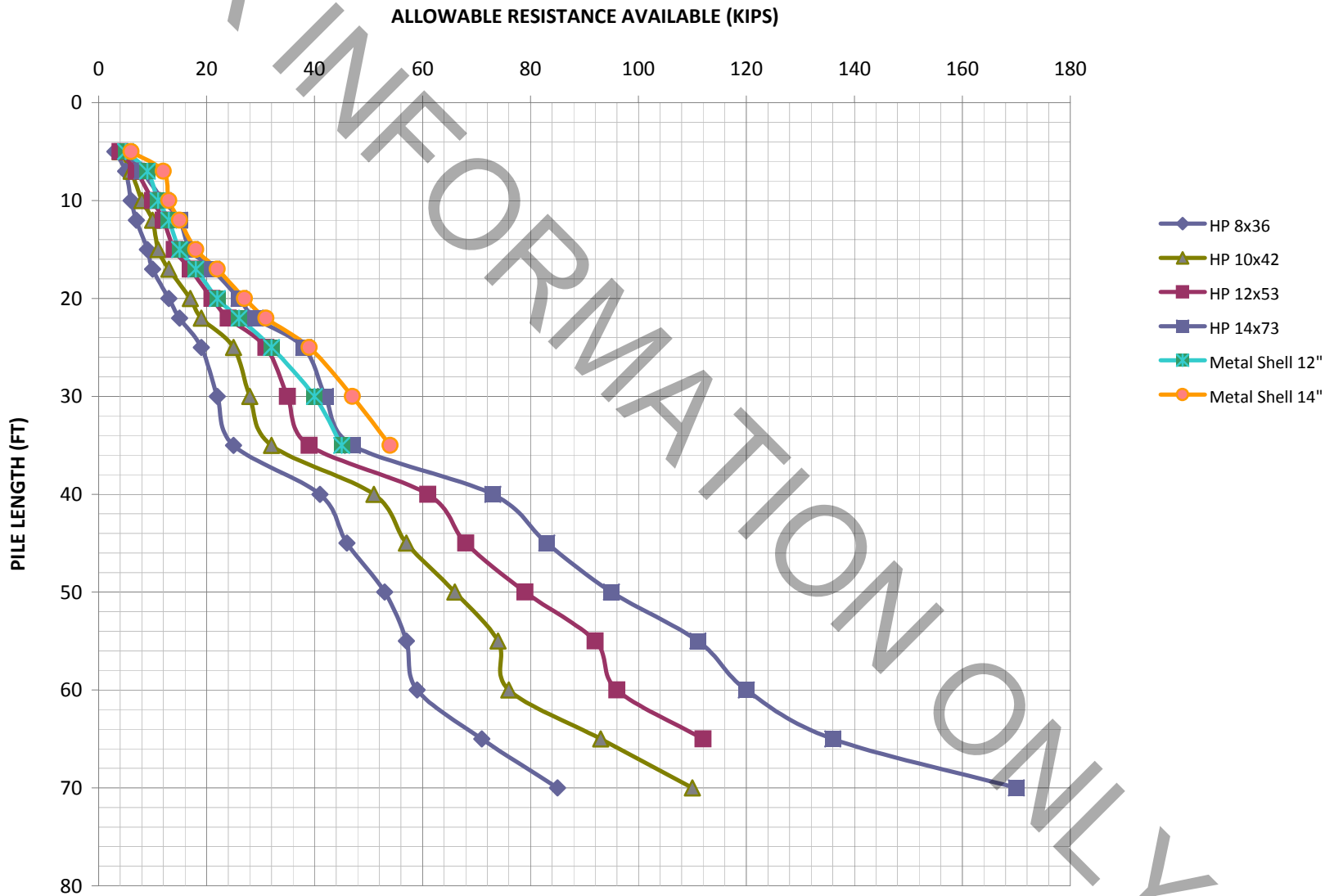
Note: Piles reach max NRB through soil stratums

ONLY

PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

SB 171 East Abutment; BORING SB-62

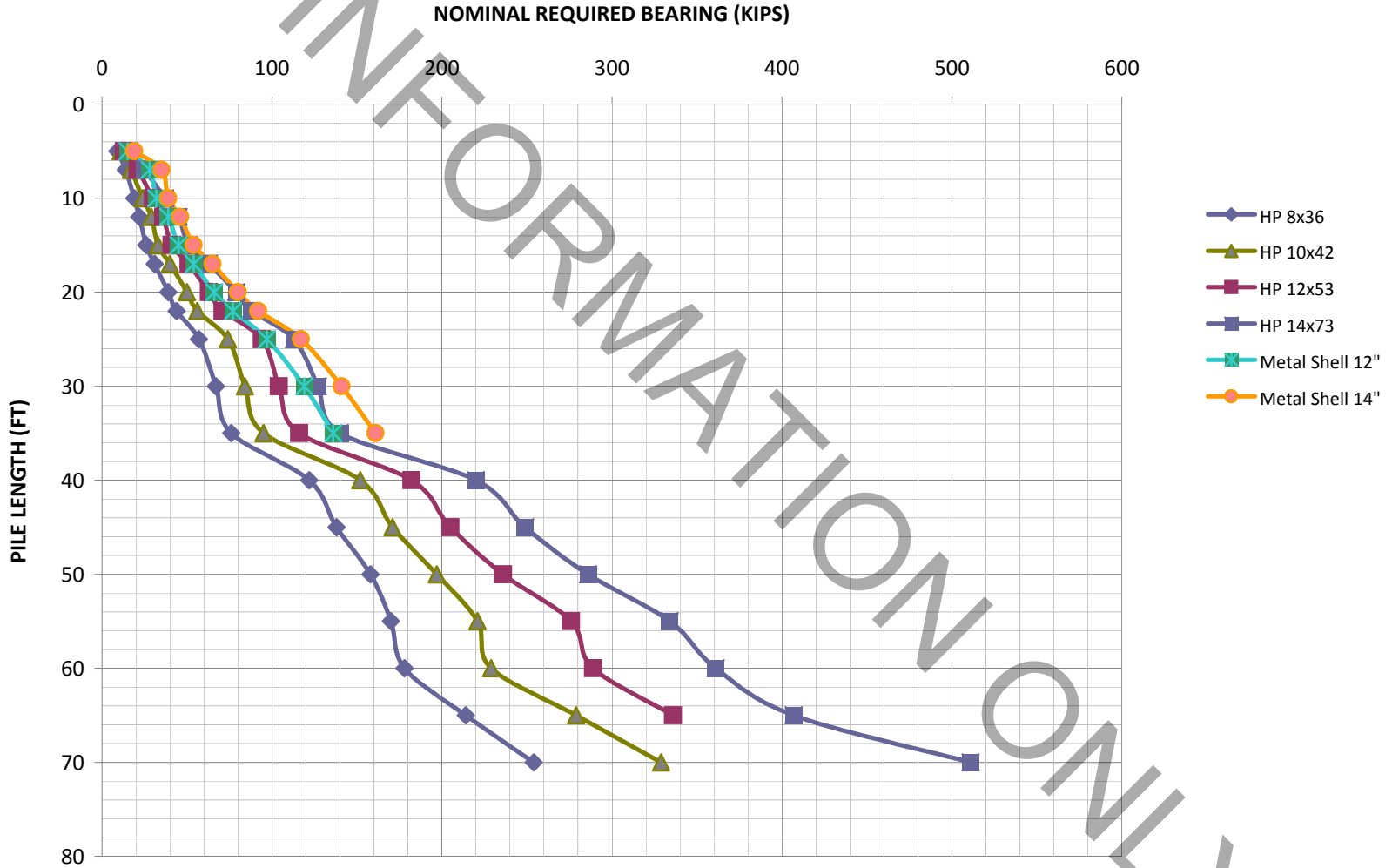
Elevation 619.0 Begin Friction, 621.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

SB 171 East Abutment; BORING SB-62

Elevation 619.0 Begin Friction, 621.0 for Pile Cutoff (pile length = 0.0 feet)



SB 171 Pier 1 Boring SB-63 (Elevation 594.0 Begin Friction, 596.0 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)
5	5	14	6	18	7	22	9	26	33	100	39	116
10	6	18	7	22	9	26	11	32	25	75	32	95
15	9	26	1	32	13	39	16	49	84	251	111	334
20	14	43	18	53	21	64	27	80				
25	21	64	26	79	32	95	39	116				
30	25	75	31	93	37	112	45	136				
35	30	90	37	115	45	134	55	164				
40	51	154	64	191	76	229	93	278				
45	70	211	90	270	108	324	131	392				
50	85	255	110	331			169	506				

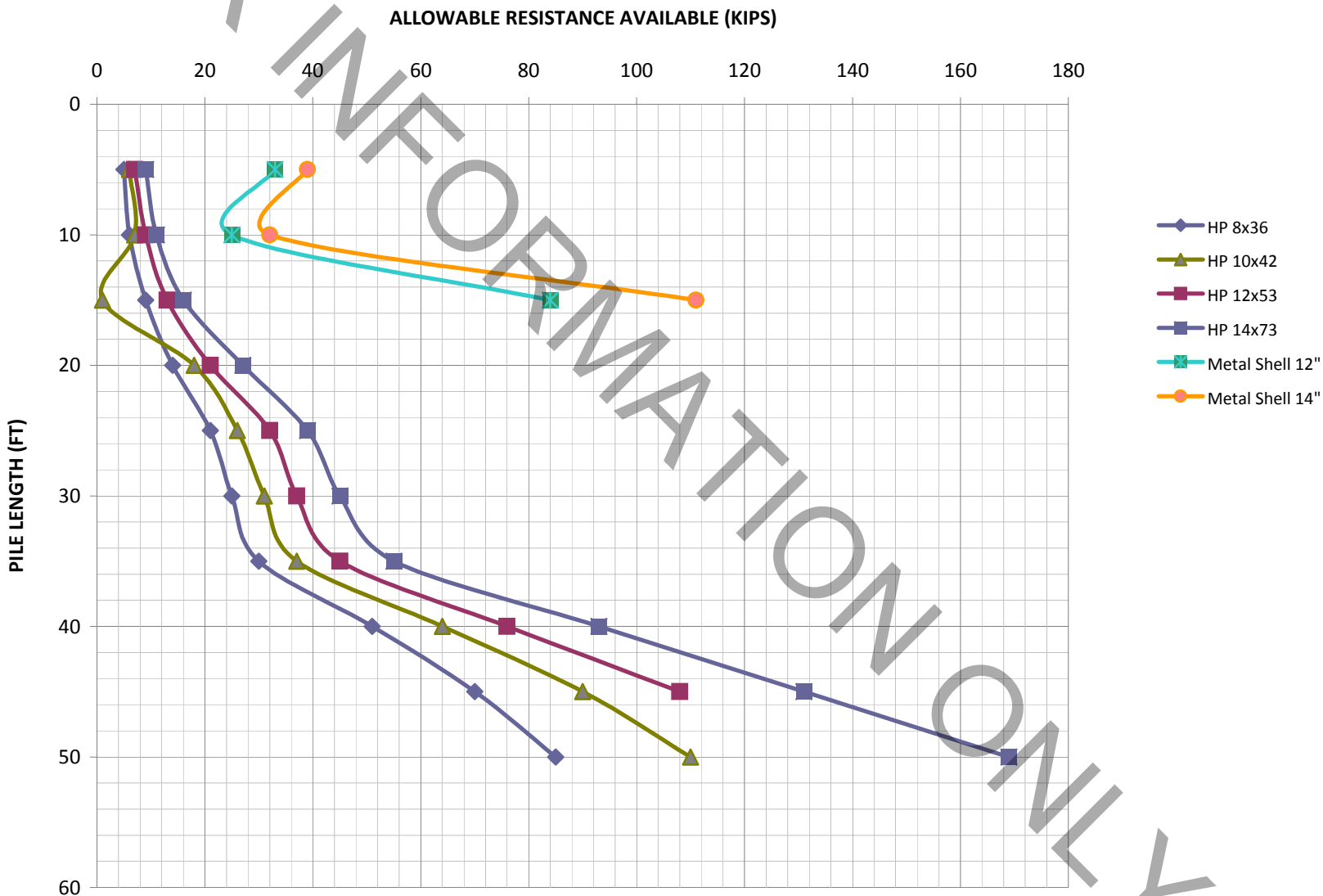
Note: Piles reach max NRB through soil stratum

ONLY

PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

SB 171 Pier 1; BORING SB-63

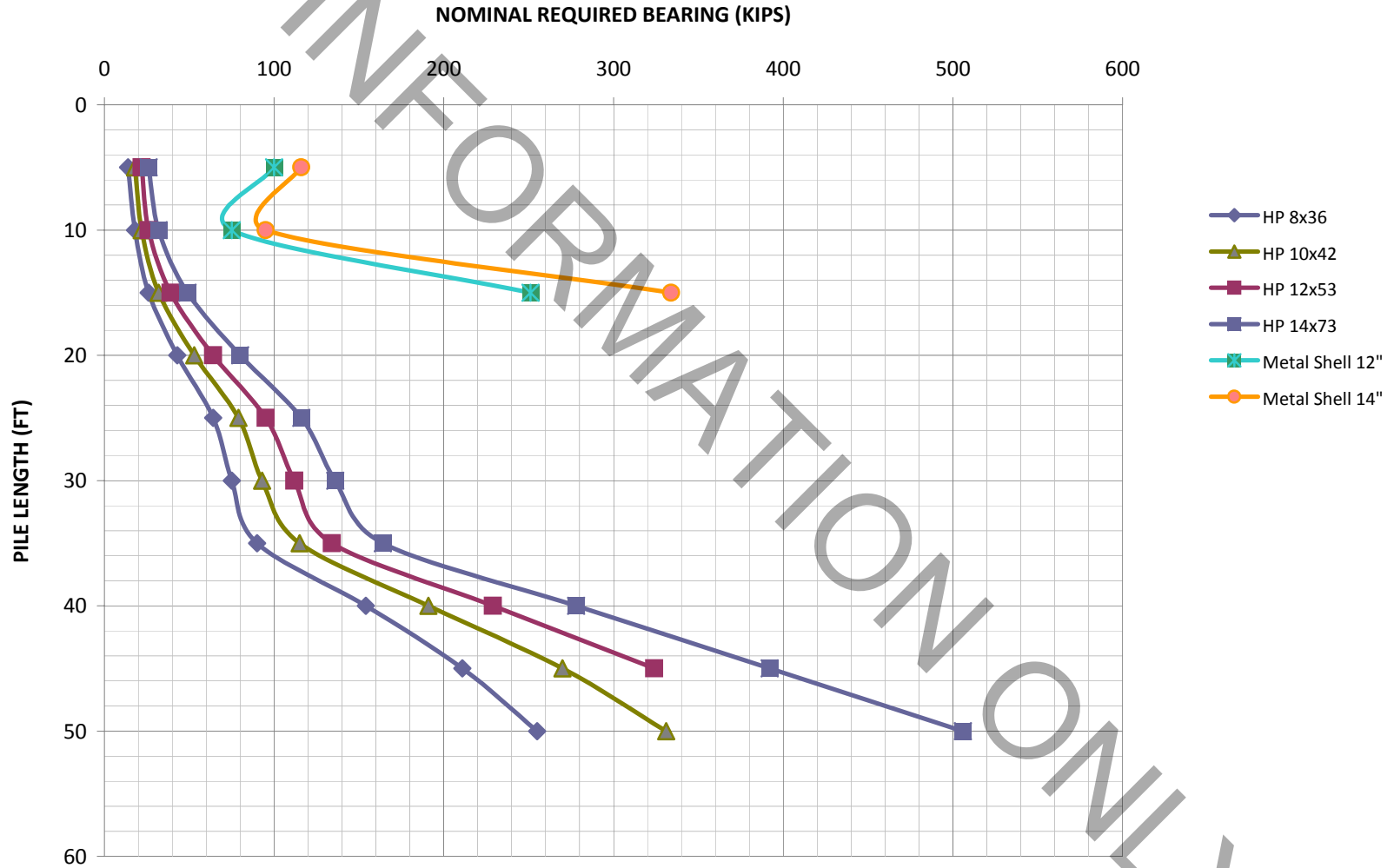
Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

SB 171 Pier 1; BORING SB-63

Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



SB 171 Pier 2 Boring SB-64 (Elevation 594.0 Begin Friction, 596.0 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)
5	5	15	6	18	7	22	9	27	5	29	12	37
10	11	34	14	43	17	51	21	62	10	61	25	75
15	22	65	27	80	32	96	39	117			117	352
20	21	62	26	79	33	100	41	124	20	145	58	173
25	28	83	35	106	45	134	56	167	25	181	72	215
30	39	117	51	152	63	189	76	229				
35	41	122	52	157	67	201	81	244				
40	50	149	62	186	74	222	90	270				
45	69	208	88	265	106	317	128	384				
50	84	252	109	327	137	412	166	498				
52							186	559				

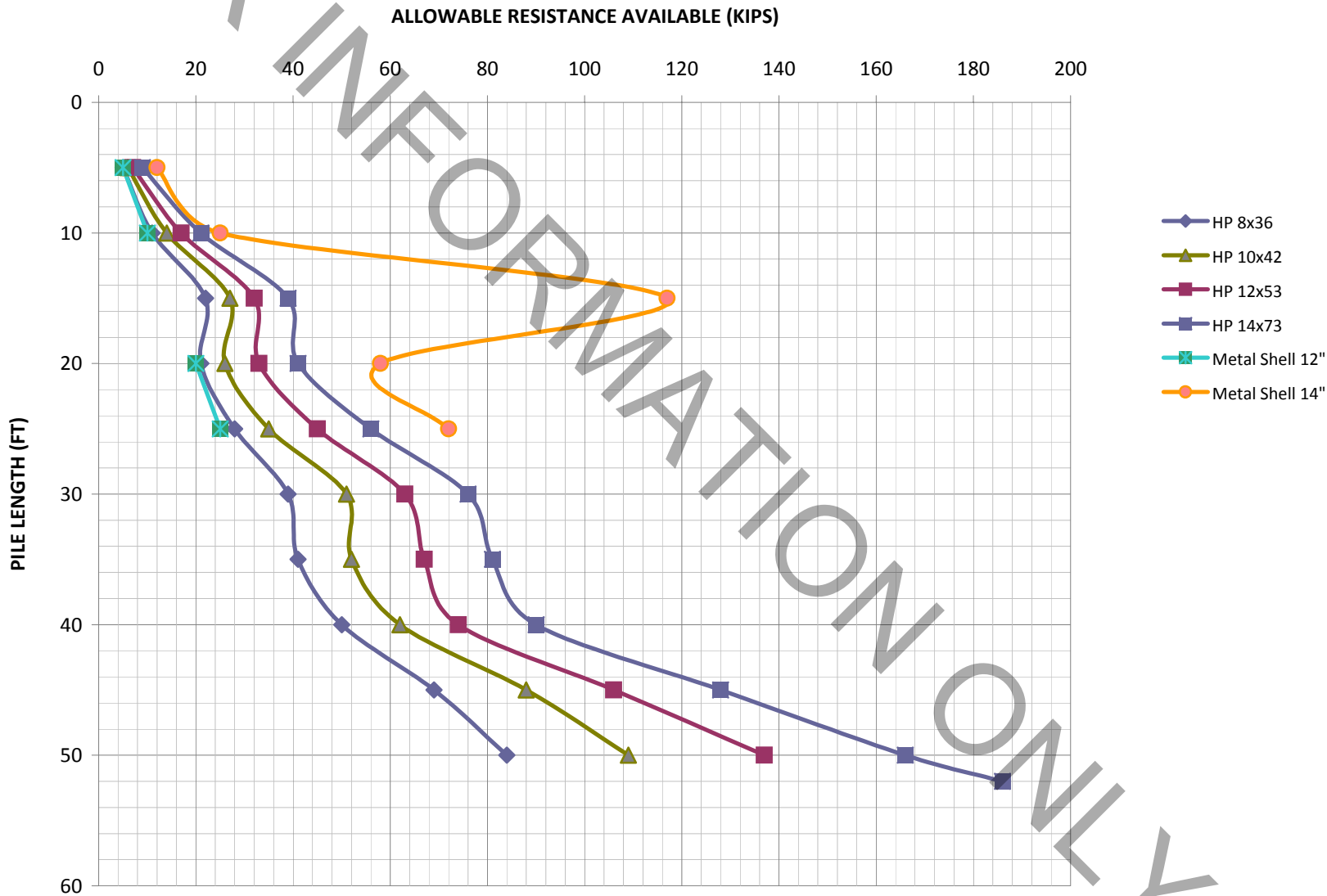
Note: Piles reach max NRB through soil stratums

ONLY

PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

SB 171 Pier 2; BORING SB-64

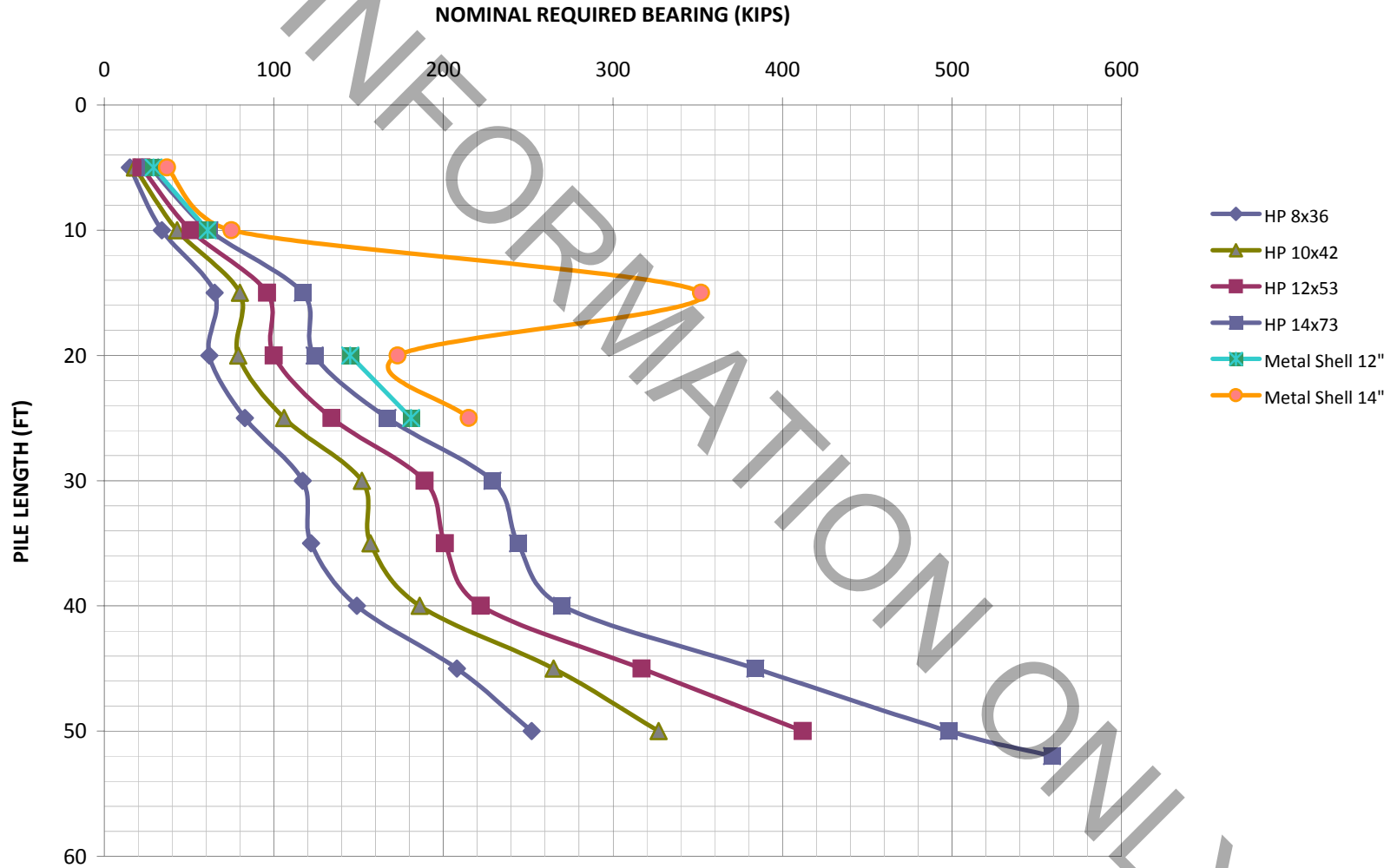
Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

SB 171 Pier 2; BORING SB-64

Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



SB 171 West Abutment Boring SB-65 (Elevation 620.0 Begin Friction, 622.0 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)
5	1	4	1	4	2	6	2	7	9	26	11	34
7	5	15	6	19	8	23	9	28	11	32	13	39
10	8	23	10	29	12	35	14	42	14	43	18	53
12	10	29	13	38	16	48	19	58	18	53	21	64
15	12	35	15	45	19	58	24	72	21	64	26	77
17	13	38	16	48	20	59	24	73	23	70	28	83
20	16	47	20	60	25	76	32	95	28	84	34	101
22	19	58	25	75	32	96	39	117	34	103	41	124
25	21	62	26	78	32	97	40	120	37	112	44	133
30	26	78	33	100	42	125	51	154	47	140	56	167
35	30	90	38	113	46	139	56	169	55	164	65	194
40	44	132	57	172	70	211	85	255				
45	51	152	64	192	76	229	93	278				
50	49	146	62	187	79	237	99	297				
55	42	125	52	155	63	188	75	226				
60	55	164	70	211	89	267	111	334				
65	59	177	76	229	97	290	121	363				
70	63	190	81	244	103	309	129	386				
75	66	198	85	254	107	321	134	401				
78	84	251	104	312	124	373	151	454				

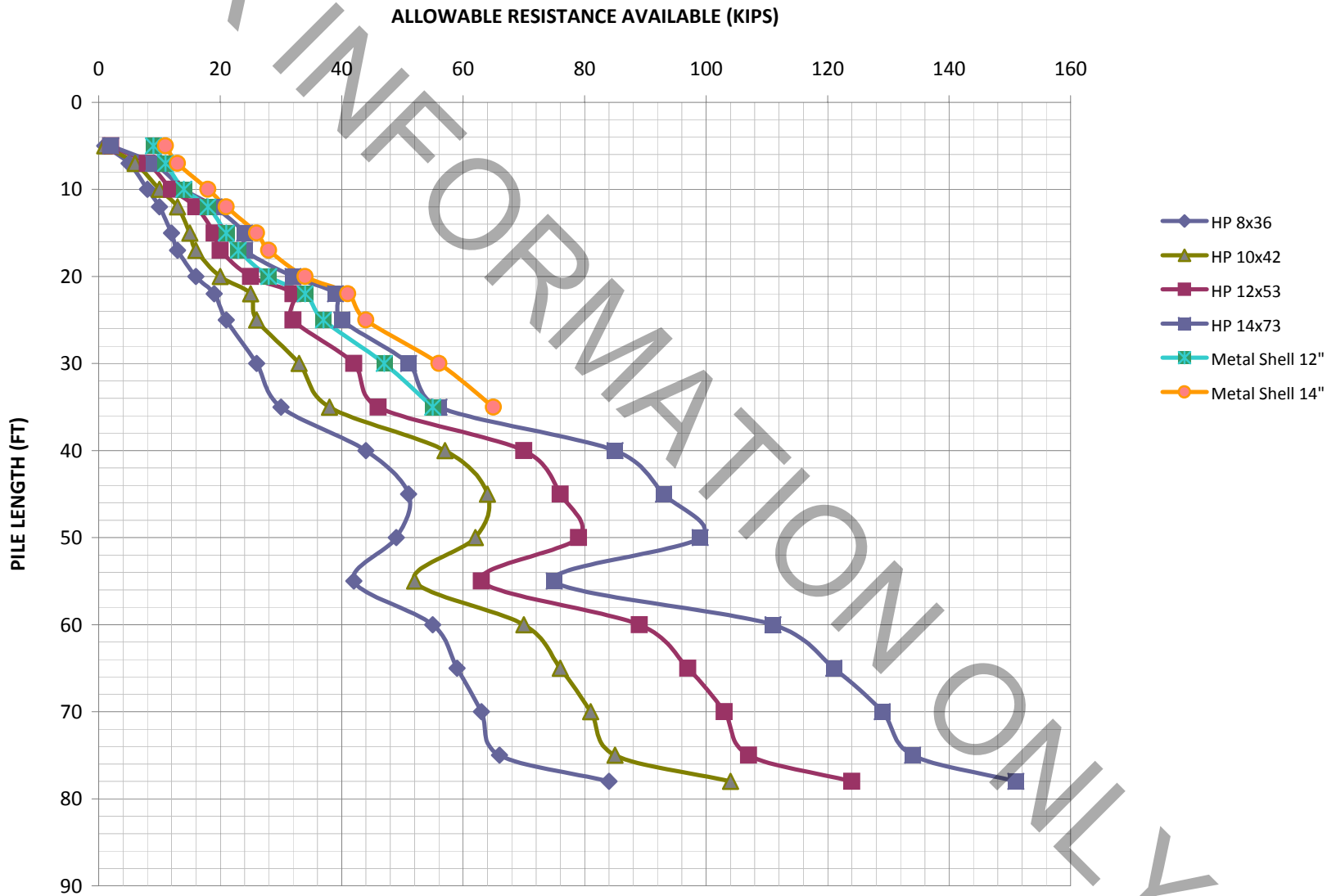
Note: Piles reach max NRB through soil stratum

ONLY

PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

SB 171 West Abutment; BORING SB-65

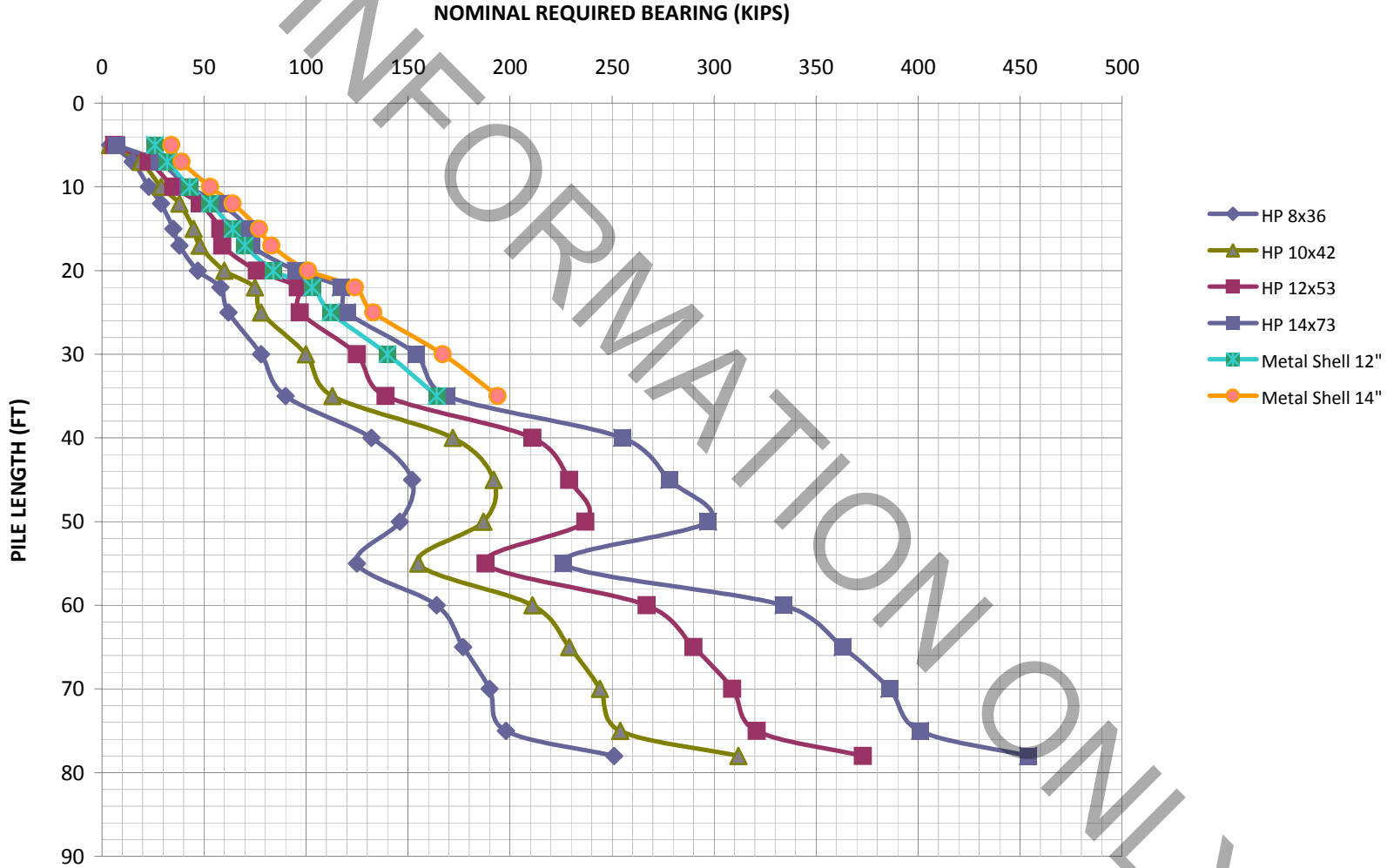
Elevation 620.0 Begin Friction, 622.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

SB 171 West Abutment; BORING SB-65

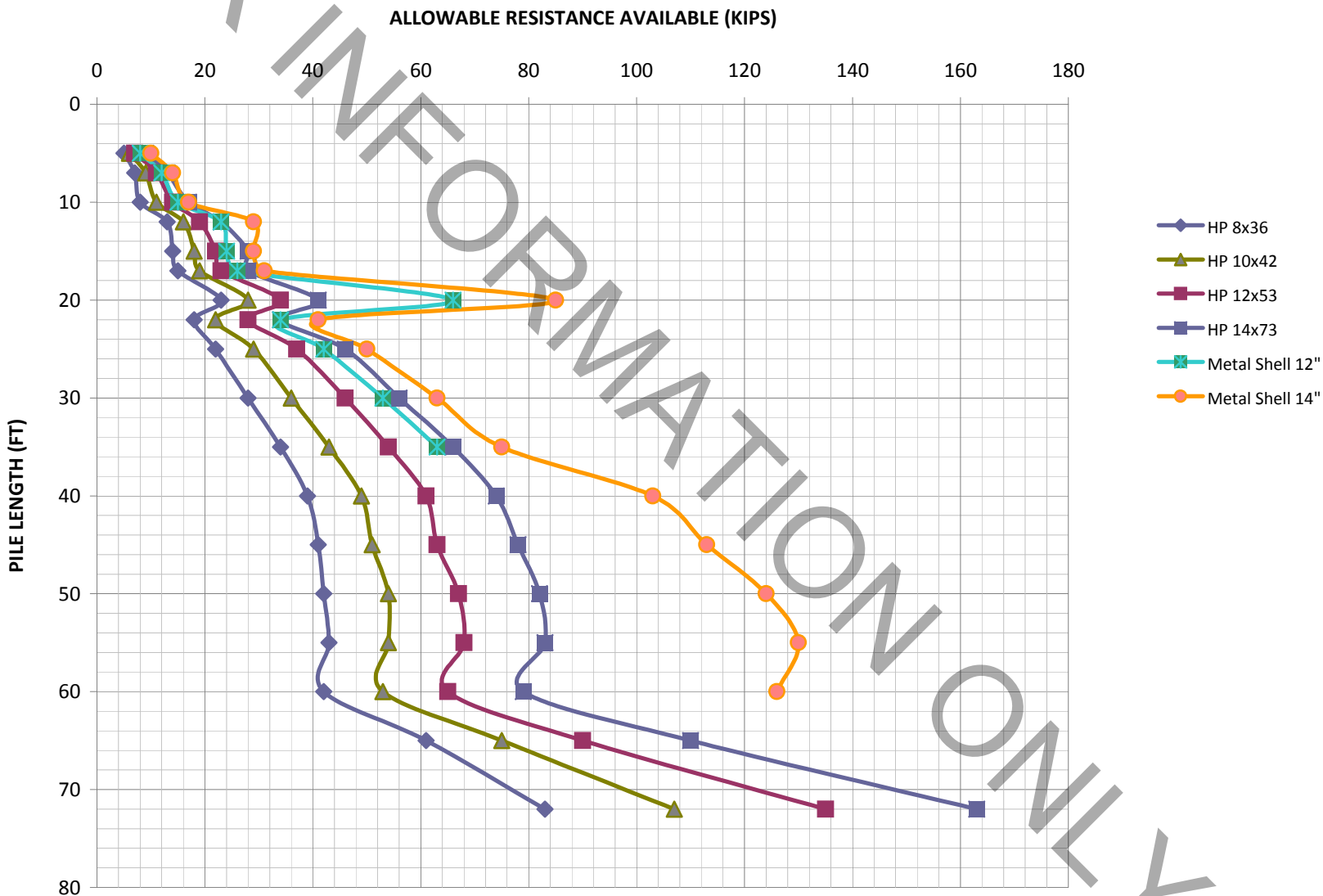
Elevation 620.0 Begin Friction, 622.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

NB 171 East Abutment; BORING SB-66

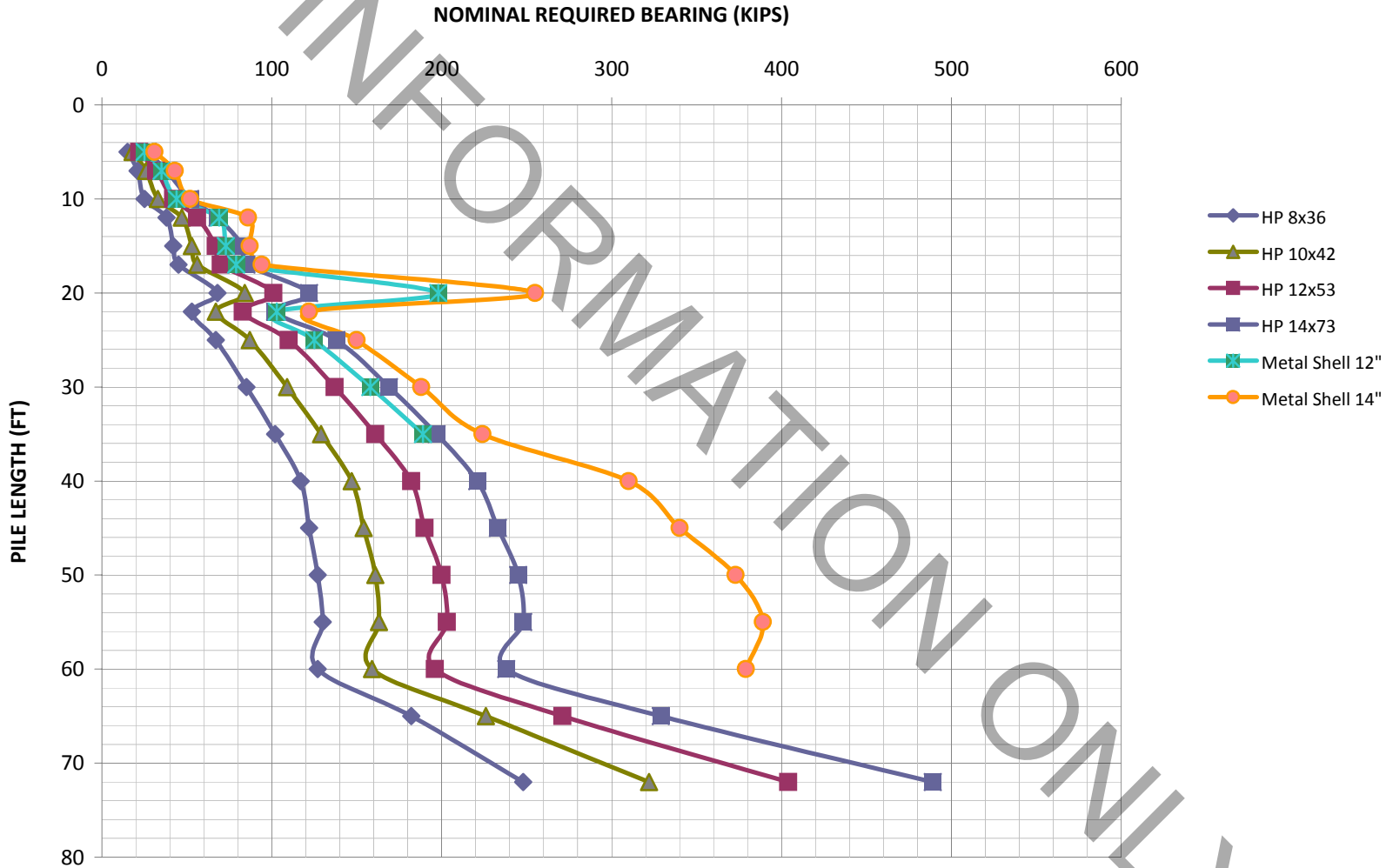
Elevation 619.0 Begin Friction, 621.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

NB 171 East Abutment; BORING SB-66

Elevation 619.0 Begin Friction, 621.0 for Pile Cutoff (pile length = 0.0 feet)



NB 171 Pier 1 Boring SB-67 (Elevation 594.0 Begin Friction, 596.0 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)
4	3	10	4	12	5	14	6	17	7	20	8	25
9	8	25	10	31	12	37	15	45	14	42	17	52
14	17	51	21	63	25	75	31	93			127	380
19	24	72	30	89	36	108	44	133				
24	36	107	44	132	53	159	65	194				
29	47	141	59	176	70	210	85	256				
34	42	127	53	160	66	199	81	244				
39	58	175	72	217	84	260	105	316				
44	75	225	98	295	118	355	143	430				
49							186	559				

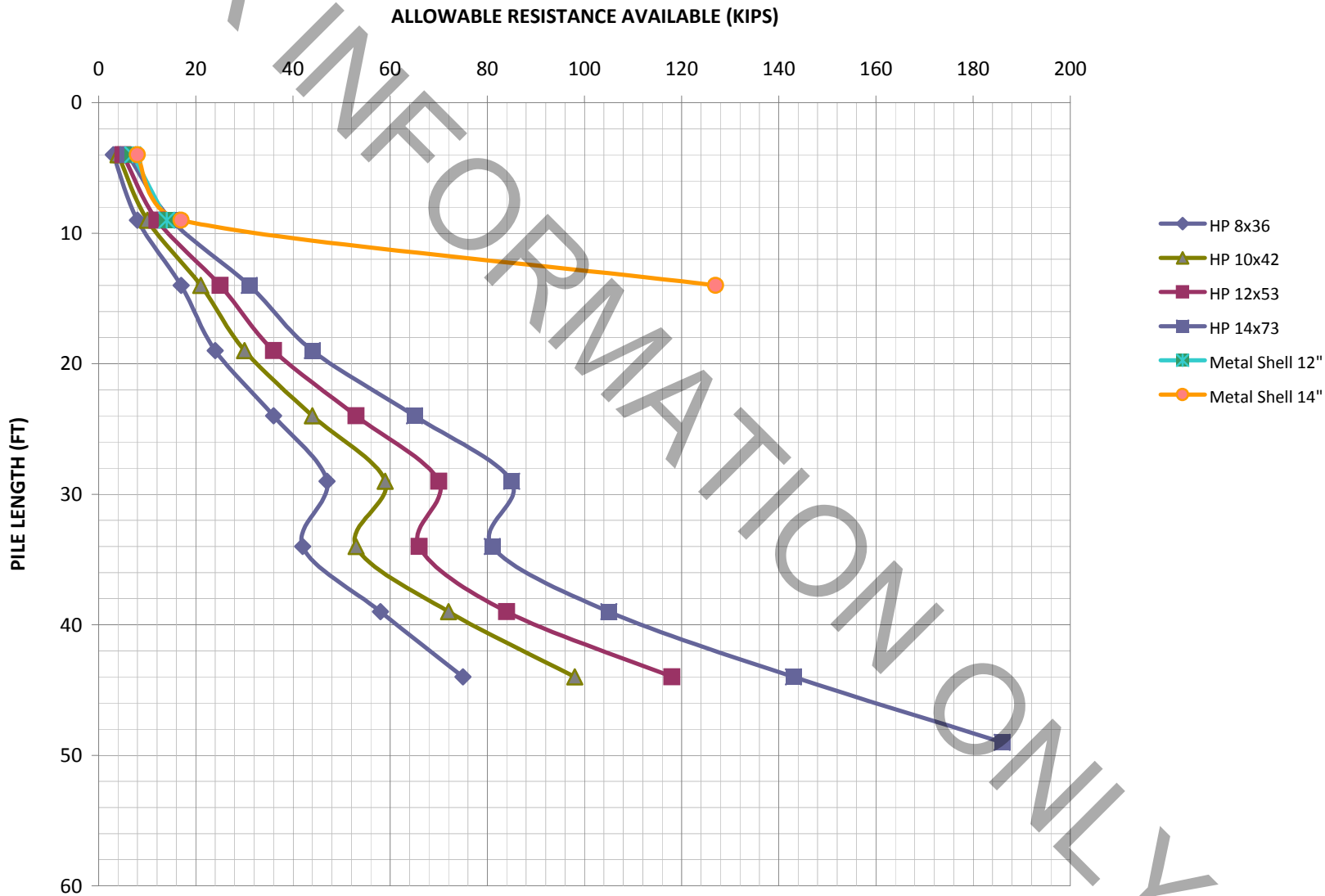
Note: Piles reach max NRB through soil stratum

ONLY

PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

NB 171 Pier 1; BORING SB-67

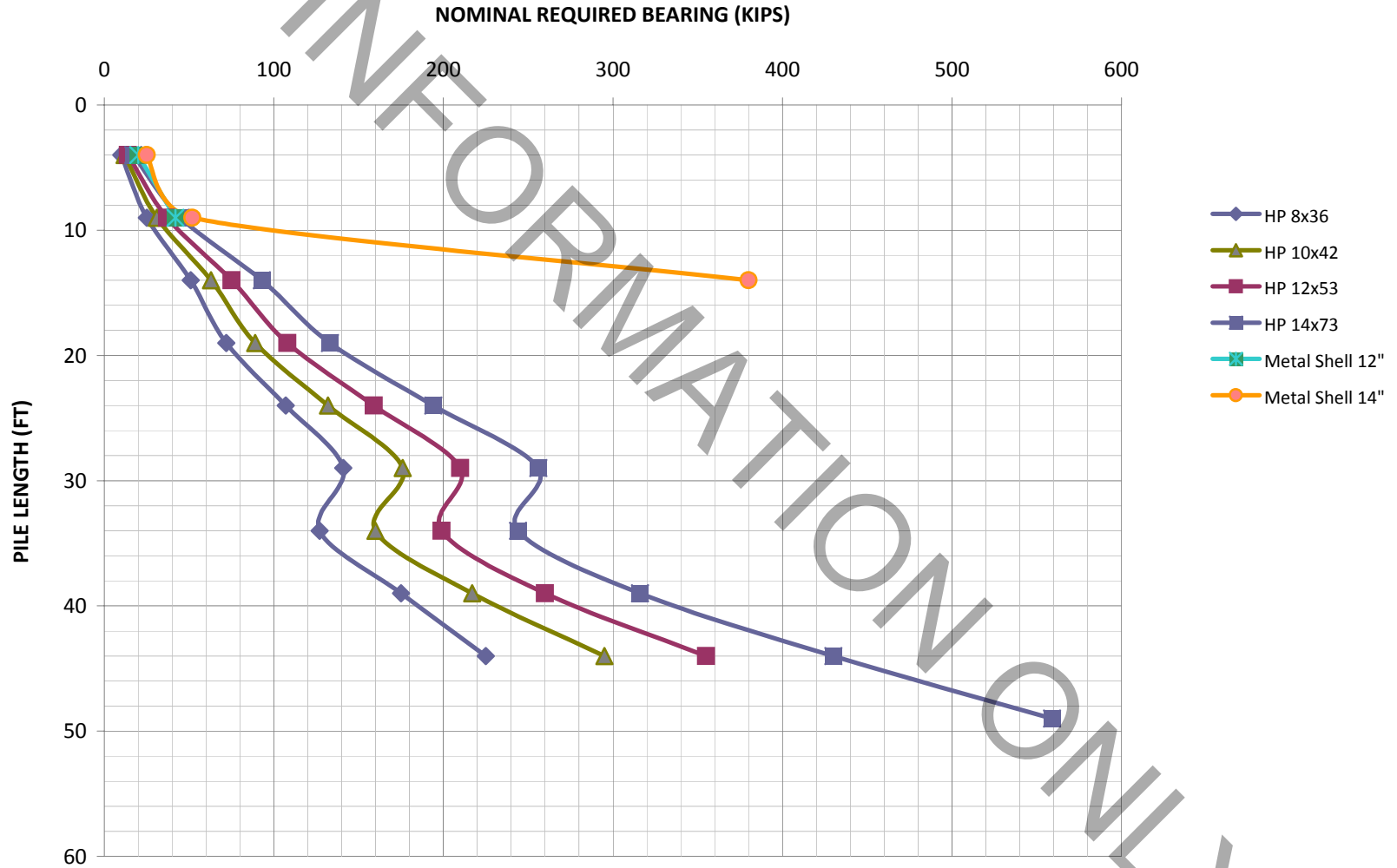
Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

NB 171 Pier 1; BORING SB-67

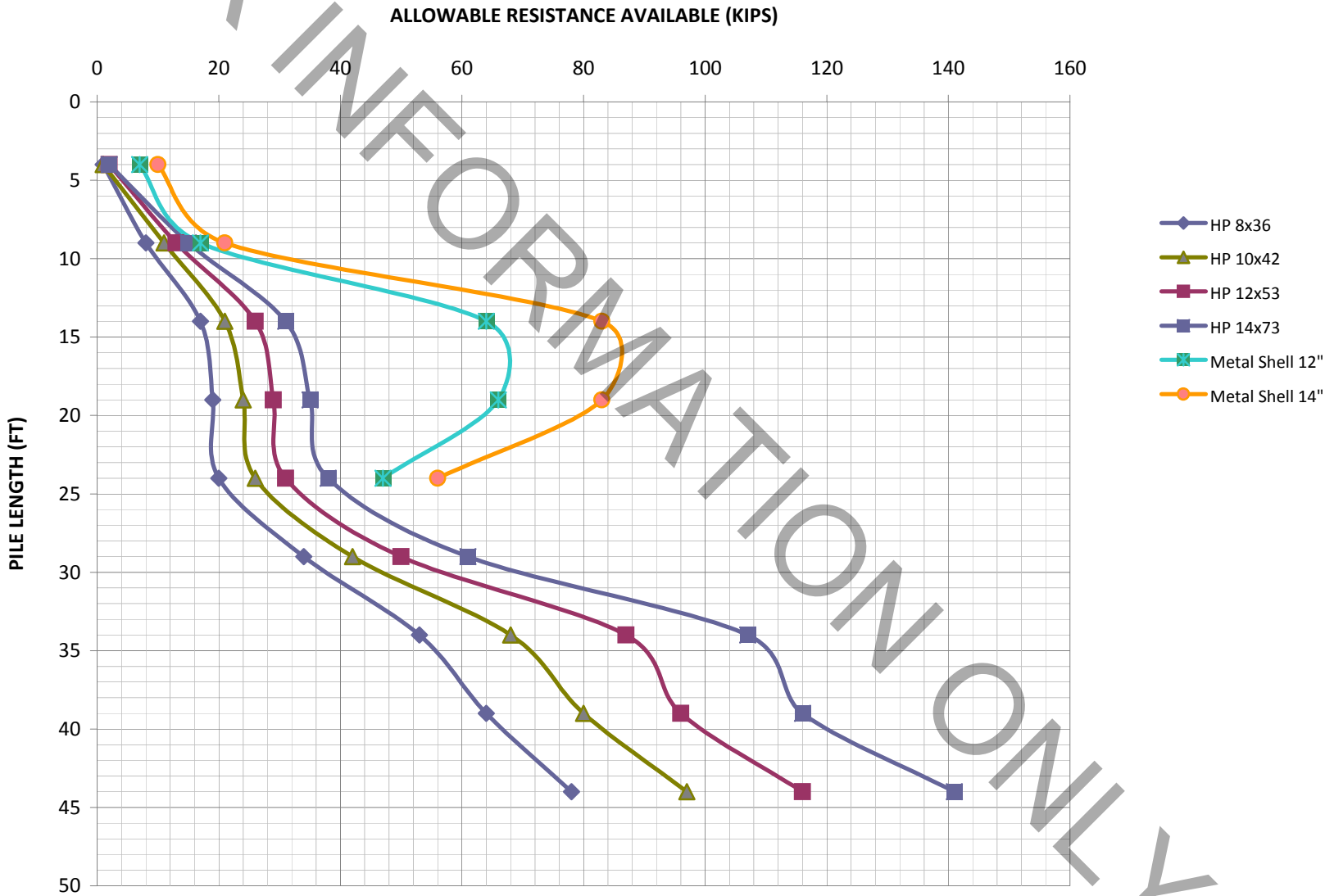
Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

NB 171 Pier 2; BORING SB-68

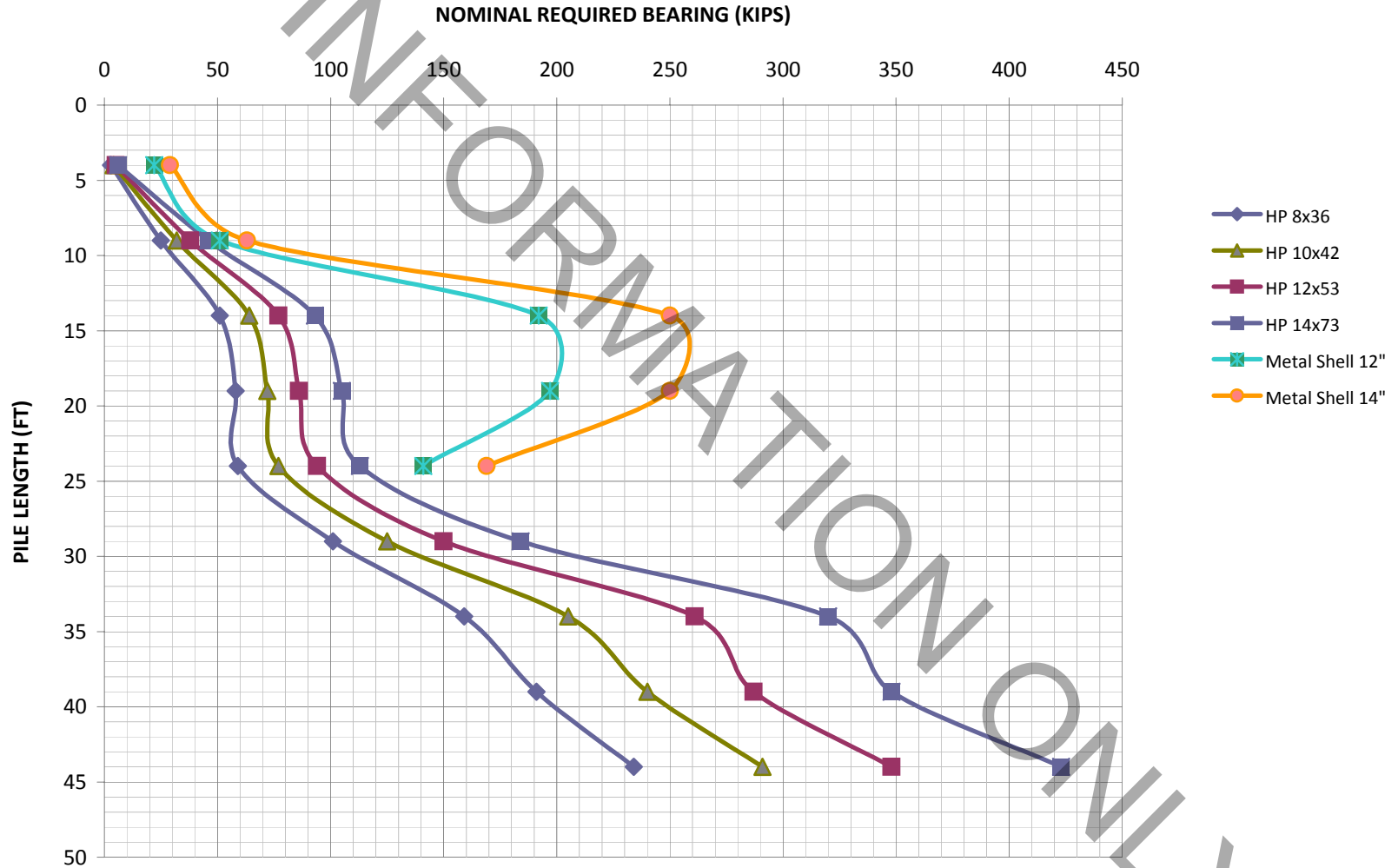
Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

NB 171 Pier 2; BORING SB-68

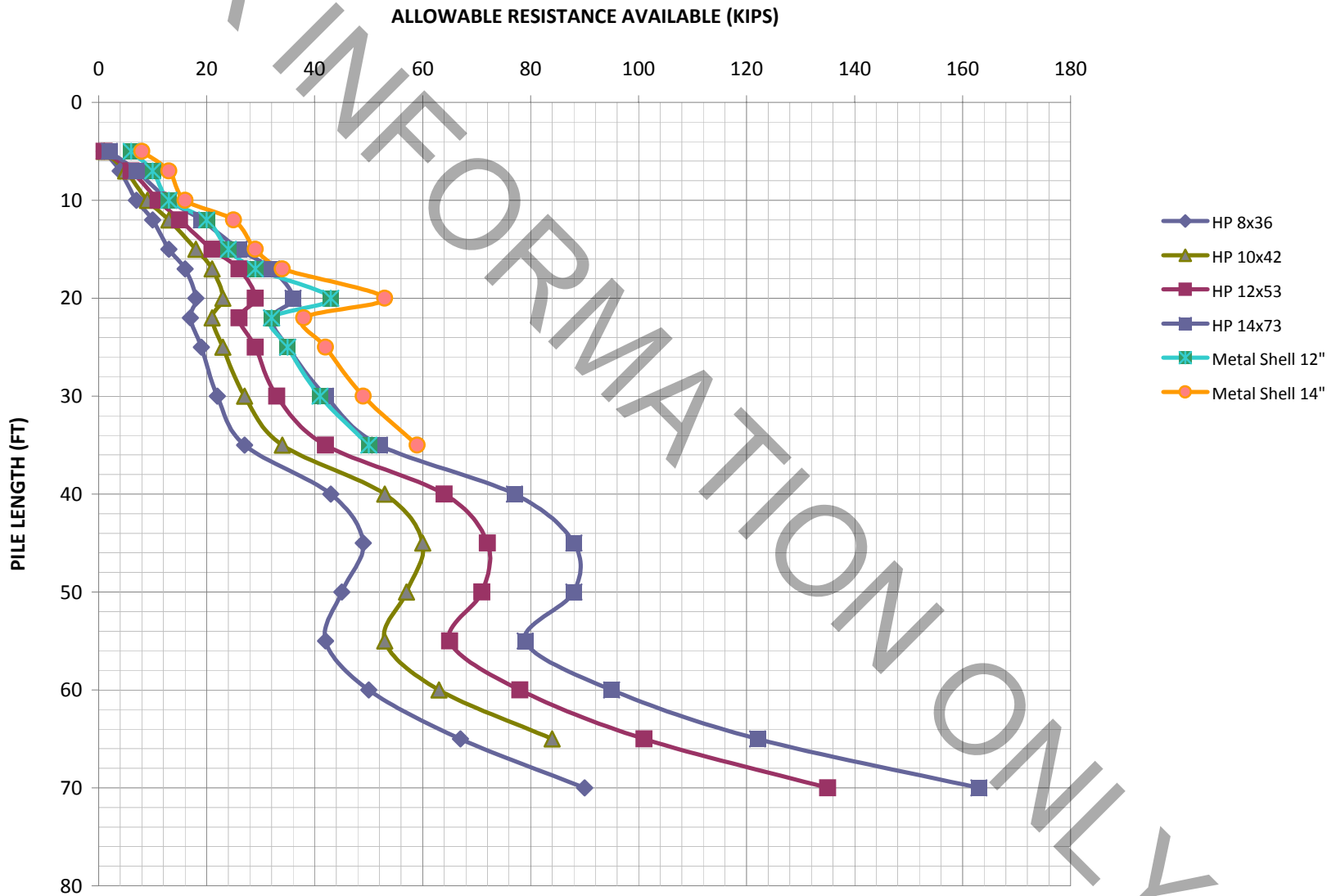
Elevation 594.0 Begin Friction, 596.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (ARA) VS. ESTIMATED PILE LENGTH

NB 171 West Abutment; BORING SB-69

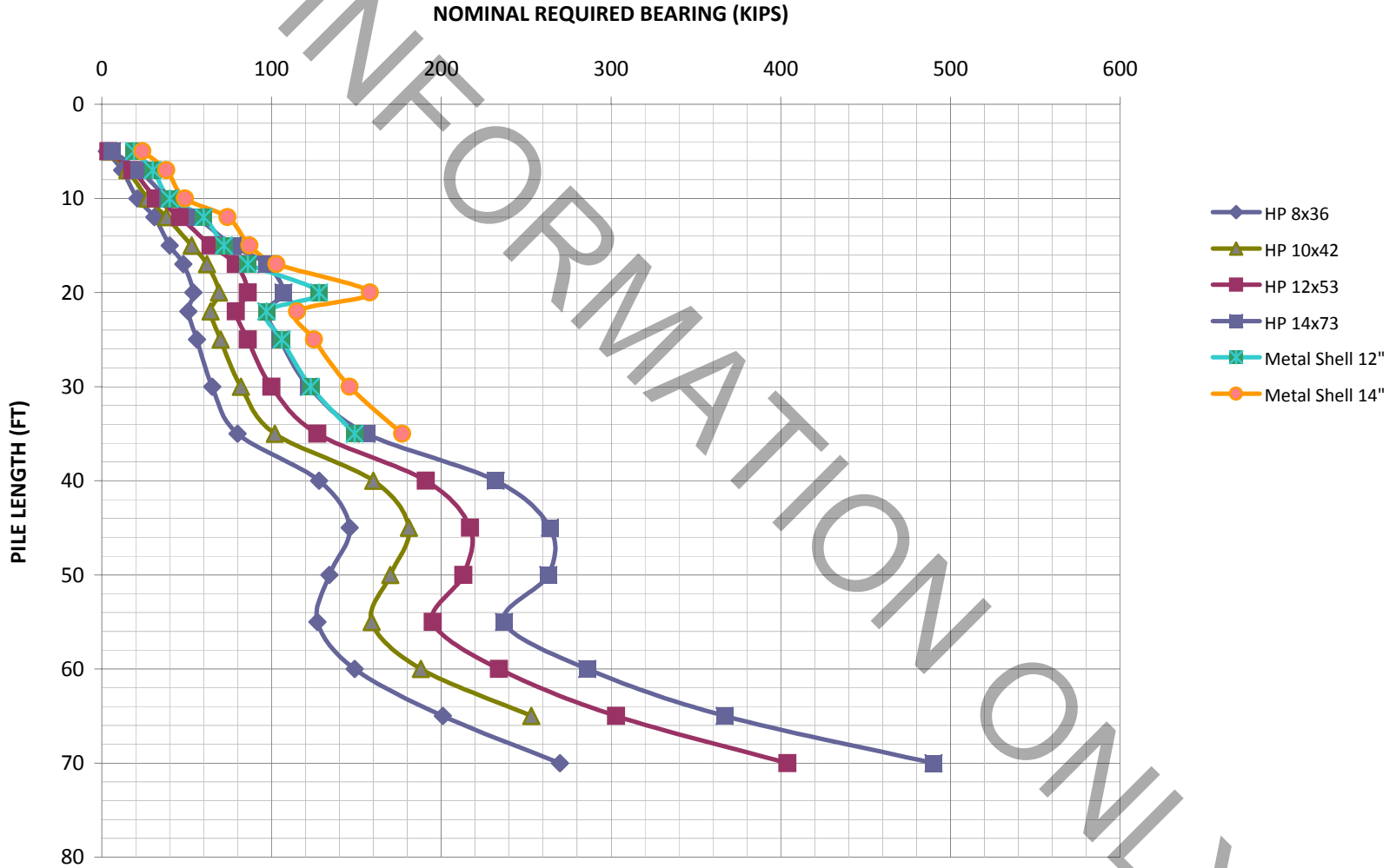
Elevation 620.0 Begin Friction, 622.0 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

NB 171 West Abutment; BORING SB-69

Elevation 620.0 Begin Friction, 622.0 for Pile Cutoff (pile length = 0.0 feet)



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APPENDIX F

DISPOSITION OF COMMENTS

Project Title: IL-171 over the CN Railroad
 Job No.: 10025 Project No.: D-91-191-10
 SN 016-0488 (Contract: 60J16) & 016-0489 (Contract: 60W75)
 Comments by: **IDOT** Dated: July 30, 2013
Geo Services SGR Report (dated 06/04/2013)
DISPOSITION OF COMMENTS

Comment No.	SGR Page No.	IDOT Comments	Responses
1		<p>Settlement Examination of the boring location on the Plan View of the TSL Plans shows that no borings were taken in the area that will be used for the widening of the structure. It is for this reason that our Unit would like the SGR author to validate their statement that less than 0.4 in. of settlement is to be expected.</p>	<p><i>Settlement</i> <i>The 10 feet of embankment fill stated on the Settlement Section of SGR was a typographical error. Two (2) feet of embankment fill is anticipated. SGR is revised accordingly. The embankment settlement is calculated to be less than 0.4 in.</i></p>
2		<p>Foundation Recommendations Driven Steel H-piles</p> <p>i. It is our recommendation that the section on Page 7 be titled Driven Steel H-piles</p> <p>ii. The SGR mentions that the starting elevation from the pile capacity was calculated for the abutments is Elev. 619.0 ft. We note that in the settlement section the SGR calls for a fill height of between 4.0 and 10 ft in order to facilitate widening. It is our Unit's opinion that unless the SGR author can discount any settlement of the in-situ soils and within the newly place embankment, that the pile capacity at the abutments be calculated from the existing ground line in the location of the widening. The SGR author should then call for the pre-coring of the abutment piles to the existing ground elevation, with the holes filled with dry loose sand per Article 512.09 (c) of the Standard Specifications. The SGR author also has the option to start the calculations for friction at Elev. 619.0 ft but taking into account any settlement-induced downdrag forces on the piles.</p> <p>iii. The pile design tables should be adjusted as necessary to reflect the SGR author's recommendations based on the preceding comments.</p>	<p><i>Foundation Recommendations</i></p> <p>a) <i>We agree with the comment (i). The title on page 7 of SGR is revised as "Driven Steel H-Piles".</i></p> <p>b) <i>The 10 feet of embankment fill stated on the Settlement Section of SGR was a typographical error. Two (2) feet of embankment fill is anticipated. SGR is revised accordingly. As the embankment settlement is expected to be less than 0.4 in. no downdrag is expected.</i></p> <p>c) <i>Since no downdrag is expected, the pile design tables contained on SGR remain still valid.</i></p>

Project Title: IL-171 over the CN Railroad
 Job No.: 10025 Project No.: D-91-191-10
 SN 016-0488 (Contract: 60J16) & 016-0489 (Contract: 60W75)
 Comments by: **IDOT** Dated: July 30, 2013
Geo Services SGR Report (dated 06/04/2013)
DISPOSITION OF COMMENTS

Comment No.	SGR Page No.	IDOT Comments	Responses
3		<p>Abutment and Pier Deep Foundations</p> <ul style="list-style-type: none"> i. Please change the name of the section to read Abutment and Deep Pier Foundations. ii. Paragraph 3.10.2.1 of the 2012 BM states that drilled shafts extending into rock should be designed utilizing only end bearing or side resistance, whichever is larger which is in agreement with FHWA-NHI-10-016 (page 13-24). The reason for this is that the full value of side and tip resistance cannot be used in design due to the inherent nature of the relationship between the two. <p>Please refer to pages 252, 253, 262, and 263 of publication FHWA-IF-99-025 for general information of relationship between side resistance and tip resistance for drilled shafts or the correspondent paragraph in the 2002 AASHTO.</p> <ul style="list-style-type: none"> iii. The recommendations for end bearing should be based on the 2002 AASHTO Standard Specification, 17th Edition instead of the 2012 AASHTO LRFD Manual. iv. The recommendations for the concrete slump as well as the minimum 28-day strength of the concrete should be eliminated since this is not required from an SGR. 	<p><i>Abutment and Deep Pier Foundations</i></p> <ul style="list-style-type: none"> <i>a) We agree with the comment (i). The name of the section has been changed to read Deep Pier Foundations.</i> <i>b) We agree with the comment (ii). Drilled shaft recommendations on SGR have been revised to be in agreement with FHWA-NHI-10-016.</i> <i>c) We agree with the comment (iii). The recommendations for end bearing is based on 2002 AASHTO Standard Specification, 17th Edition.</i> <i>d) We agree with comment (iv). The recommendations for concrete slump and concrete strength have been removed from the revised SGR.</i>
4		<p>General Construction Considerations</p> <p>The SGR should clearly indicate whether or not Temporary Sheet Piling is feasible based on the use of the appropriate Temporary Sheet Piling Design Chart Tables and Design Guide 3.13.1. If Temporary Sheet Piling is deemed not feasible then the SGR should clearly indicate that a Temporary Soil Retention System will have to be provided by the Contractor.</p>	<p><i>General Construction Considerations</i></p> <p><i>The revised SGR indicates based on the results of soil borings, temporary sheet piling is feasible and appropriate Temporary Sheet Piling Chart Tables and Design Guides 3.13.01 can be used.</i></p>

GEO SERVICES, INC.
 DATE: September 5, 2013

Project Title: IL-171 over the CN Railroad
 Job No.: 10025 Project No.: D-91-191-10
 SN 016-0488 (Contract: 60J16) & 016-0489 (Contract: 60W75)
 Comments by: **IDOT** Dated: July 30, 2013
Geo Services SGR Report (dated 06/04/2013)
DISPOSITION OF COMMENTS

Comment No.	SGR Page No.	IDOT Comments	Responses
5		<p>Section 4.4.8 Drilled Shaft Construction This Section should be eliminated as Section 516 of the Special Provisions provides guidance in regards to the construction of drilled shafts.</p>	<p><i>Drilled Shaft Construction The SGR did not include Section 4.4.8 Drilled Shaft construction. We have included recommendations for potential need to work under slurry during pier construction due to potential water infiltration. We believe this recommendation should remain in the SGR.</i></p>
By: Kiran Adhikary			Date: September 5, 2013

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