
STRUCTURE GEOTECHNICAL REPORT
Interstate 80 Bridge over Rowell Avenue & WCL RR
Section 2013-008B & 2013-009B, Station 760+85.00
IDOT Job Number D-91-061-09 (PTB 152, Item 004)
Existing SN 099-0066 (EB) & 099-0067 (WB)
Proposed SN 099-0904 (EB) & 099-0905 (WB)
Joliet, Will County, Illinois

Submitted to:

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GSI Job No. 13125

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One South Wacker Drive, Suite 900
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Attn: Mr. Dan Filice, P.E., S.E.
Bowman, Barrett and Associates, Inc.

Job No. 13125

Re: Structure Geotechnical Report
Interstate 80 Bridge over Rowell Avenue & WCL RR
Section 2013-008B & 2013-009B, Station 760+85.00
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Joliet, Will County, Illinois
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Dear Mr. Filice:

The following report presents the geotechnical analysis and recommendations for the reconstruction and widening of the existing bridge structures carrying Interstate 80 Bridge over Rowell Avenue & WCL RR. A total of nineteen (19) structural soil borings (BSB-33 through BSB-51) 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,

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SECTION 01: INTRODUCTION

This report presents the results of the geotechnical investigation for the bridge replacement and widening of the Interstate 80 over Rowell Avenue & WCL RR Project, IDOT Job Number: D-91-061-09 (PTB 152, Item 004). The results of the nineteen (19) structure borings (BSB-33 through BSB-51) 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 HBP Illinois Partners, JV (HBP), and the Illinois Department of Transportation (IDOT). Boring locations were marked in the field by Geo Services, Inc. (GSI) personnel after review of accessibility and utility locations. Estimated ground surface elevations at the as-drilled boring locations were taken from the topographic and cross-section drawings provided by HBP. The as-drilled locations for the borings are shown on the Boring Location Diagram found in Appendix C section of the report.

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

SECTION 02: PROJECT DESCRIPTION

The existing bridges S.N. 099-0066 carrying I-80 Eastbound and S.N. 099-0067 carrying I-80 Westbound over Rowell Avenue and WCL Railroad was originally constructed in 1965 as FAI Route 80, Section 99-4-1VB. The eight-span EB structure is approximately 559' back to back of abutment, and consists of two continuous span units separated by a single span. Unit 1 consists of a three-span continuous wide flange beam and reinforced concrete deck and the single span unit is similar. Unit 2 consists of a four-span continuous plate girder and reinforced concrete deck. The nine-span WB structure is approximately 634' back to back of abutment, and consists of two continuous span units separated by a single span. Unit 1 consists of a four-span continuous wide flange beam and reinforced concrete deck and the single span unit is similar. Unit 2 consists of a four span continuous plate girder and reinforced concrete deck. The existing bridge decks are 36 feet out to out and consist of 6'-1/4" reinforced concrete composite slab with 2'-3/4" latex concrete overlay. The superstructures are supported on concrete stub abutments on piles and 2-column piers on spread footings and piles. The skew is 10°04'00" forward right Unit 1 and 34°05'00" forward left Unit 2. The decks were repaired in 1999 and 2011. The existing structure shall be removed.

There is an existing small pond between piers 1 and 2. The natural water level for this pond is estimated at 567.4 feet.

It is intended to remove and replace the bridge structure. The bridges are proposed to be widened at each side of the median lanes/shoulders to approximately ± 63 feet for the eastbound structure, and ± 63 feet for the westbound structure.

The new bridges (SN 099-0904 EB and SN 099-0905 WB) will be 5-span bridge structures and will have an overall width of approximately 126 feet, out to out with an approximate length of 593 feet, back-to-back abutments. The new bridges are proposed to be supported on stub-type abutments. A “wrap-around” MSE wall structure is also proposed at the East Abutment section of the bridge to support the widened sections of the bridge. The proposed substructure pile cap and foundation footing elevations were provided by HBP and are shown on the following Table 1.

Table 1 – Proposed Bridge Substructure Elevations

Substructure	Approximate Station based on I-80 centerline	Proposed bottom of pile cap/foundation elevation (feet)
West Abutment	Sta. 759+96	595.30 ¹
Pier 1	Sta. 761+15	See note 2
Pier 2	Sta. 762+31	See note 2
Pier 3 ²	Sta. 763+39	See note 2
Pier 4 ²	Sta. 764+59	See note 2
East Abutment	Sta. 765+76	613.40 ¹

Notes: 1. Piles assumed to be embedded 1.0-ft into the pile cap.
 2. Drilled shafts will be used at the Piers as proposed. See table estimated end-bearing of drilled shaft elevations in Table 5 of this report

Based on the foundation loads provided by HBP, the total service loads at the top of foundation are shown on the following Table 2 - Preliminary Loads for the Substructures:

Table 2 – Preliminary Loads for the Bridge Substructures

Location	Total Strength I (kips)		Total Service (kips)	
	Eastbound	Westbound	Eastbound	Westbound
West Abutment	2,032.12	2,127.11	1,444.76	1,516.19
Pier 1	4,657.08	4,890.45	3,361.44	3,536.53
Pier 2	3,696.26	4,351.90	2,648.16	3,113.86
Pier 3	4,406.36	5,074.67	3,199.86	3,692.79
Pier 4	5,131.51	5,280.04	3,732.83	3,844.08
East Abutment	2,128.37	2,233.36	1,521.52	1,602.98

SECTION 03: SUBSURFACE INVESTIGATION PROCEDURES

The borings were performed during the months of November, 2013, and January to April, 2014 with a truck-mounted drilling rig. Borings performed near the abutments (BSB-33, BSB-34, BSB-50 and BSB-51), along Rowell Avenue (BSB-35 and BSB-36), and outside EJ&E RR below the bridge structure (BSB-46 thru BSB-49) were advanced by means of hollow stem augers and continued with rotary drilling techniques. The remainder of the borings (BSB-37 thru BSB-45) were performed from the top of the bridge deck down to ground surface along Interstate 80 (over Rowell Avenue & EJ&E RR) using steel casing thru the bridge deck to the ground surface and continued with rotary drilling techniques. Representative soil samples were obtained employing split spoon sampling procedures in accordance with AASHTO Method T-206. Bedrock cores were obtained in the bridge structure borings using an NX-size double tube core barrel with a diamond impregnated bit. Samples obtained in the field were returned to our laboratory for further examination and testing.

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. In addition, unconfined compressive testing was performed on rock cores obtained from the field and are indicated on the rock core logs.

The results of the above testing, along with a visual classification of the material based upon both the Illinois textural classification and the AASHTO Soil Classification System, are indicated on the boring logs.

SECTION 05: SUBSURFACE CONDITIONS

Boring logs can be found in Appendix C. The stratification lines shown on the boring logs represent the approximate boundary between soil types, and the actual transition may be gradual.

Surface conditions at the boring locations taken along the roadway or shoulder areas of Interstate 80 consist of existing asphalt and/or concrete pavement to crushed stone to underlying dense to very dense sand, gravel and crushed stone fill materials (ranging from 1 to 3 feet deep) for borings performed at the existing abutments. Below the Interstate 80 bridge along Rowell Avenue and EJ&E RR where borings BSB-35, BSB-36, BSB-46 to BSB-49 were drilled, surface conditions vary from existing asphalt to underlying crushed stone, sand, cinders and stone fill to depths of approximately 1 to 3 feet. Beneath the surficial materials, interstratified layers of medium dense sand and gravel, stiff to hard stiff clay loam, organic loam fill and peat were encountered to varying depths of 10 to 55 feet below ground surface. Peat and/or organic loams were encountered at borings BSB-35 (EL. 562 to 569), BSB-41 (EL. 573 to 577), and BSB-44 (EL. 577 to 579).

The fill soils had moisture contents within the range of 2% to 23% with an average of 19%. Moisture contents of the cohesive soils are within the range of 15% to 24% with an average of 18%. The medium dense to very dense granular fill soils had moisture contents within the range of 5% to 18% with an average of 7%. Peat and organic soils had moisture contents within the range 27% to 87%.

Below the surface and fill materials, bedrock was encountered at varying elevations from 541 to 579. The rock cores obtained indicated Silurian System, Niagaran Dolomite. A summary of the bedrock information obtained during our exploration is tabulated in Table 3.

Table 3 – Bedrock Information Summary

Boring (Run)	Station	Offset	RQD	Approximate Elevation of Qu Test (feet)	Unconfined Compressive Strength, Qu (tsf)
BSB-33 (Run 1)	Sta. 759+80	22.4' Left	94.5%	542.7	1,184
BSB-34 (Run 1)	Sta. 759+51	58.2' Right	95.0%	539.9	1,037
BSB-35 (Run 1)	Sta. 760+71	76.0' Left	85.0%	558.2	957
BSB-36 (Run 1)	Sta. 760+81	6.4' Right	69.0%	559.4	1,171
BSB-37 (Run 1)	Sta. 761+21	56.5' Left	31.0%	559.1	888
BSB-38 (Run 1)	Sta. 761+37	31.4' Right	67.0%	561.6	644
BSB-39 (Run 1)	Sta. 762+85	56.6' Left	49.0%	565.0	578
BSB-40 (Run 1)	Sta. 762+57	34.0' Left	36.0%	562.1	1,092
BSB-41 (Run 1)	Sta. 762+84	31.3' Right	29.0%	562.7	832
BSB-42 (Run 1)	Sta. 762+03	53.3' Right	42.5%	523.9	710
BSB-43 (Run 1)	Sta. 764+04	56.7' Left	30.0%	564.1	940
BSB-44 (Run 1)	Sta. 763+56	37.7' Left	35.0%	564.9	1,119
BSB-45 (Run 1)	Sta. 731+16	53.1' Right	13.3%	568.0	593
BSB-45 (Run 2)	Sta. 763+16	53.1' Right	64.0%	521.7	946
BSB-46 (Run 1)	Sta. 765+12	66.7' Left	38.0%	567.5	1,172
BSB-47 (Run 1)	Sta. 764+65	7.2' Right	43.0%	567.1	1,566
BSB-48 (Run 1)	Sta. 765+02	20.2' Left	39.0%	566.6	1,450
BSB-49 (Run 1)	Sta. 764+48	62.0' Right	60.0%	570.4	564
BSB-50 (Run 1)	Sta. 766+69	55.4' Left	16.0%	570.2	906
BSB-51 (Run 1)	Sta. 765+96	26.4' Right	34.0%	574.7	900

SECTION 06: WATER TABLE CONDITIONS

Groundwater was encountered before switching to rotary drilling techniques in 3 of the borings at elevations approximately 621 feet for the abutment borings (BSB-50), and elevations ranging from approximately 564 to 566 feet for the borings drilled below the bridge (BSB-35 and BSB-36). Due to the nature of rotary-wash drilling, it was not possible to obtain accurate water levels after drilling. Perched water levels may occur within granular layers above the rock. Fluctuations in the amount of water accumulated and in the hydrostatic water table can be anticipated depending on variations in precipitation and surface runoff.

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

For LFRD design, according to the AASHTO LRFD Bridge Design Specification 2012 (with 2013 Interims), the project site has a horizontal Response Spectral Acceleration of 0.040 at a period of 1.0 second and 5% critical dampening (S_1). The site also has a horizontal Response Spectral Acceleration of 0.104 at a period of 0.2 seconds and 5% critical dampening (S_s). The following table shows recommended seismic design data in accordance to the AASHTO LRFD Bridge Design Specification 2012 (with 2013 Interims).

Table 4 – Seismic Design Data

Seismic Performance Zone (SPZ)	1
Spectral Acceleration at 1 second (S_{D1})	0.068
Design Spectral Acceleration at 0.2 seconds (S_{Ds})	0.125
Soil Site Class	C

The project site is considered to be in a low seismic area and is considered a non-extreme event. Liquefiable layers are not expected to impact the design of the new bridge.

Settlement

Based on the TSL/cross-sections, the proposed bridge profile will be raised an estimated height of 1 to 2 feet from the top of the bridge abutment. In addition, the widened section of the bridge will be supported by an MSE wall with estimated maximum new fill heights of 20 feet at the eastbound I-80 and 23 feet at the westbound I-80. For this purpose, we estimate approximately 23 feet of maximum new fill is anticipated for the abutments over the stiff to hard clay to clay loam fill soils at the abutments. Settlement is calculated to be less than 0.4 inches at the abutments. For the piers founded on very dense granular soils, structural fill or shallow bedrock, settlement is estimated to be less than 0.4 inches. No settlement issues are expected for the bridge structure.

Slope Stability (for the retaining wall)

A “wrap-around” MSE retaining wall is proposed at the East Abutment as part of the new bridge structure. A maximum wall height of approximately 23 feet and a 2:1 horizontal to vertical geometry were used for slope stability calculations. Using the worst case scenario at boring BSB-50 with portion of the embankment as new fill, we calculate a Factor of Safety (FOS) of over 1.5 for undrained (short-term) and drained (long-term) condition, which satisfies the Factor of Safety requirement ($FOS \geq 1.5$) per IDOT slope stability criteria. No slope stability issues were identified at the rest of the abutment areas.

SECTION 08: FOUNDATION RECOMMENDATIONS

Foundation Recommendations

Based on the results of the borings, type of structure, and proposed loading, feasible foundations for support include a deep foundation system consisting of driven H-piles or drilled shafts at both abutments section of the bridges, and shallow spread footings or drilled shafts for the piers. Metal Shells are not recommended since the tip elevation will experience hard driving as reaches close to top of bedrock, which may cause damage the Metal Shell piles.

Shallow spread footings may be used for the piers where bedrock is approximately 10 feet or less below ground surface. For bedrock deeper than 10 feet below ground surface, the use of drilled shafts may be considered for the piers. However, axial/vertical and lateral loads will dictate the sizes and depths of the footing or drilled shafts required.

We recommend that analysis for each foundation option presented below be considered before choosing a foundation system for the design.

H-Pile Recommendations at the Abutments

Based on the results of the borings and proposed foundation loadings, driven H-piles may be used for the support of the proposed abutments.

The selection of pile type should be determined by economic considerations if either pile types are feasible for the design of the bridge. Pile data for H-piles is included in Appendix E. Pile capacities and lengths were calculated to the piles' Maximum Nominal Required Bearing and Factored Resistance Available, based on a LRFD resistance factor of 0.55. We anticipate hard driving to occur at approximate elevation 558 feet at the West Abutment, and 578 feet at the East Abutment, and driving shoes are required to prevent damage to H-piles while driving into the dense sand, gravel and fractured rock.

For the new driven piles at the abutment areas, it is estimated settlement of $\frac{1}{4}$ inch or less excluding the elastic shortening of the pile due to loading.

Tables and graphs for estimated pile lengths for various pile sizes and pile capacities at each substructure unit are summarized in the Appendix E.

Pile Foundations Considerations

As per the IDOT Design Guide AGMU Memo 10.2, dated August 2011, the Washington State DOT (WSDOT) formula has replaced the FHWA Gates Formula as the standard method of construction verification. A modified IDOT static method was used to develop the SGR pile design tables. Nominal required bearing was calculated from LRFD skin-friction (with pile type correction factors) and end-bearing calculations. A value of 1.04 is used for Bias Factor Ratio (I_G). A geotechnical resistance factor (Φ_G) of 0.55 was used in calculations for the factored resistance available (FRA). Pile lengths were picked with respect to the loadings and geometry of the proposed structures.

When Steel H-piles are used, the Steel H-piles shall be according to AASHTO M270 Grade 50.

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 substructure unit. The piles should be driven until satisfactory driving resistance is developed in accordance with an appropriate pile driving formula. Some variation in pile lengths should be expected due to the variable depths to bedrock. The test piles shall be driven to 110 percent of the Nominal Required Bearing indicated in

the pile data information. The pile size and capacity selected should be based on economic considerations and the loads imposed on the structures.

Drilled Shafts Recommendations at the Abutments and Piers

The foundations at the abutment sections of the proposed bridge may be constructed using end-bearing, drilled straight-shafts founded in very dense top of bedrock at approximate elevation ranges of 565 to 560 feet at the West Abutment and 575 to 578 feet at the East Abutment.

At the bridge piers where bedrock is deeper than 10 feet below ground surface, the foundations may be constructed using end-bearing, drilled straight-shafts rock-socketed to bedrock. A factored end-bearing unit resistance of 140 ksf is recommended for design for drilled shafts socketed 3 feet into sound bedrock. From the AASHTO LRFD Bridge Design Specifications Manual Table 10.4.6.4-1, the bedrock is considered fair to good quality. The Carter and Kulhawy equation was used to compute the bearing and an $\Phi_b=0.50$ was used for the factor of safety. To the extent rock-socketing is provided, a factored friction value of 6.0 ksf/ft for side resistance can be used for rock-socketed shafts over the depth of the rock-socket to resist uplift loads. A minimum diameter of 24 inches for the rock-socket size is recommended.

An experienced, geotechnical engineer should be present during excavation to check that suitable sound rock has been reached. A permanent casing or removable forms may be used in lieu of a temporary cofferdam, and should be extended beneath the granular strata to top of bedrock elevation ranging at approximately 540 to 543 feet at the West Abutment, 575 to 578 feet at the East Abutment, and 560 to 575 feet at the Piers.

For the unit skin friction at the upper strata of the borings, the stiff to very stiff clay loam fill and medium dense to dense sand and gravel will have estimated factored resistances of 700 and 500 psf per foot, respectively. Note that the overburden side resistances in soil should be ignored due to temporary casing and drilling used for drilled shaft installation in rock (per Bridge Manual Section 3.10.2.1).

The following table is a summary of the approximate elevation of sound bedrock for foundation support.

Table 5- Approximate Elevation of Sound Bedrock

Substructure	Boring(s)	Bottom of Estimated End-bearing Elevation (feet)	Top of Bedrock Elevation (feet) ¹
West Abutment WB ²	BSB-33	543.0	544.6
West Abutment EB ²	BSB-34	539.5	541.2
Pier 1 WB	BSB-35 and BSB-37	559.5	560.9 (BSB-35) & 563.7 (BSB-37)
Pier 1 EB	BSB-36 and BSB-38	561.5	563.5 (BSB-36) & 565.8 (BSB-38)
Pier 2 WB	BSB-39 and BSB-40	562.5	568.7 (BSB-39) & 567.9 (BSB-40)
Pier 2 EB	BSB-41 and BSB-42	562.5	569.2 (BSB-41) & 567.4 (BSB-42)
Pier 3 WB	BSB-43 and BSB-44	564.0	571.9 (BSB-43) & 568.9 (BSB-44)
Pier 3 EB	BSB-41 and BSB-45	564.0	569.2 (BSB-41) & 568.5 (BSB-45)
Pier 4 WB	BSB-46 and BSB-48	568.0	574.3 (BSB-46) & 572.1 (BSB-48)
Pier 4 EB	BSB-47 and BSB-49	570.0	571.8 (BSB-47) & 575.1 (BSB-49)
East Abutment WB ³	BSB-50	570.0	574.9
East Abutment EB ³	BSB-51	573.5	576.6

- Note: 1. Verify in field.
 2. Proposed Bottom of Pile Cap Elevation at West Abutment is approximately 595.3 feet.
 3. Proposed Bottom of Pile Cap Elevation at East Abutment is approximately 613.4 feet.

Note that the bedrock had some vertical and horizontal fractures and the transition from the fractured and/or weathered rock to the sound bedrock may not be pronounced. It is strongly recommended that an experienced geotechnical engineer be onsite during the foundation excavation to check that suitable sound rock has been reached.

Based on the estimated bearing pressures and the magnitude of the loads expected, we estimate a maximum settlement of 0.40 inches or less for rock-socketed shafts foundations supported on bedrock as described above. Differential settlements would be dependent on the adjacent loads but is typically 1/2 to 2/3 of the total settlement. It should be noted that these settlement values are for compression of the bearing materials only and that elastic compression of the concrete shaft should be added to these values.

For the drilled shaft caps, we recommend that shaft caps be situated at a minimum depth of 2.5 feet below final grade to provide frost protection with the exception that if pressure grouting of the bedrock is performed below the cap to “seal” the fractured bedrock from water infiltration, then minimum embedment to prevent frost heave may not need to be adhered to for design.

Shallow Spread Footing Recommendations at the Piers

Based on the information obtained from the borings and proposed high loads anticipated for the new bridge piers, shallow spread footing may be used for foundation support where bedrock depths about less than 10 feet below grade. Due to the variation of the bedrock elevation, piers may need to extend the foundations to bear on sound bedrock material. The spread footing foundations may be socketed into the sound bedrock at elevations tabulated in Table 5 – Approximate Elevation of Sound Bedrock, and can be designed for a factored bearing resistance of 140 ksf.

If materials with less than adequate bearing strength are noted at the foundation level during footing construction, the weaker material encountered at the base of the footings should be undercut to reach suitable rock, and the undercut area filled with lean concrete.

To provide adequate frost protection, we recommend that footing foundations be situated at a minimum depth of 4 feet below final grade with the exception that if pressure grouting of the bedrock is performed beneath the footing foundations to “seal” the fractured bedrock from water infiltration, then minimum embedment to prevent frost heave may not need to be adhered to for design.

Approach Slab Recommendations

The new approach slab will be supported on either new or existing embankment fill. Shallow footings for the “sleeper” below the slab should be designed for a maximum factored bearing resistance of 2.0 ksf 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 of the approach slab is calculated on the order of less than 0.4 inches.

SECTION 09: LATERAL SOIL PROPERTIES

The soil and bedrock parameters for lateral resistance shown in Tables 6 and 7 may be used for design of temporary retention system, as well as for the design of the drilled shafts.

Table 6 – Soil Parameters for Lateral Resistance

Material	Unit Weight (pcf)	Drained Friction Angle (°)	Undrained Cohesion (psf)	Lateral Modulus of Subgrade Reaction (pci)	Strain
Clay Loam Fill	125	30	2,000	750	0.006
Stiff Silty Clay	125	28	1,500	500	0.006
Medium Dense Loams, Sand, Cinders and Gravel	125	30	-	100	-
Dense Sand, Stone, Gravel and Crushed Concrete	125	32	-	150	0.004
Loose Peat ²	80	10	-	10	0.020
Organic Silty Clay and Silty Loam ³	100	20	-	30	0.020
Very Stiff Clay	125	32	2,500	800	0.005
Dense to Very Dense Loams, Sand, Gravel & Fractured Rock	132	34	-	250	-

Notes: 1. Values recommended for use in design from L-pile Software Manual.
 2. Encountered at boring BSB-44 only.
 3. Encountered at borings BSB-35 and BSB-41.

Table 7 – Bedrock Parameters for Lateral Resistance

Material	Unit Weight (pcf)	Young's Modulus (psi)	Uniaxial Compressive Strength (psi)	RQD (%)	Strain (k_m)
Bedrock	150	2 x 10 ⁶	See Lab Data on Rock Core Logs	13.3% to 95.0%	0.0001

All soils which become softened or loosened at the base of foundation excavation areas or subgrade areas should be carefully recompacted or removed prior to placement of foundation concrete or fill material. No foundation concrete or structural fill should be placed in areas of ponded water or frozen soil.

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 CONSTRUCTION CONSIDERATIONS

Traffic will be maintained utilizing staged construction. Lateral soil properties provided in Tables 6 and 7 may be used for temporary soil retention system design.

At the bridge abutments, upper soil stratigraphy mainly consist of stiff to very stiff clay loam fill material. The use of the IDOT Temporary Sheet Piling Design Charts at the West Abutment is feasible. However, due to the fill nature of the retention at the East Abutment, and high blow count loams, sands, gravels, stone, and shallow bedrock at the proposed Piers 1 thru 4 locations, IDOT Temporary Sheet Piling Design Charts are not feasible for stage construction, and the contractor will likely need to design and install a temporary soil retention system.

Cofferdam Recommendations for Spread Footing Foundations

Based on the temporary cofferdams criteria stated in Sections 2.3.6.4.2 and 3.13.3 of the IDOT Bridge Manual (2012) and GBSP No. 73 (Article 502.06b), the following cofferdam criteria are summarized as follows:

- Bottom elevation of footing excavation that is less than 6 below the water surface elevation will typically require Type 1 Cofferdam.
- Bottom elevation of footing excavation that is six feet or greater below the water surface elevation will typically require Type 2 Cofferdam.

For the spread footing foundations at the piers, excavation at near the proposed Pier 1 location (approximate elevation 559.5 feet), and proposed Pier 2 location (approximate elevation 562.5 feet) are to be below the estimated water surface elevation (approximate elevation 567.4 feet) of the existing pond. When a seal coat is required to provide a working platform for construction of the proposed Piers 1 and 2 locations, a Type 2 Cofferdam shall be used. A minimum factor of safety of buoyancy of 1.2 is required by IDOT. Pump and pit procedures are needed to keep the site "in the dry" during construction.

As alternative to cofferdams at Piers 1 and 2, the contractor may also explore the use of sandbag temporary cofferdam system with dewatering wells where shallow bedrock is present to keep the site “in the dry” during construction.

Cofferdam Recommendations for Drilled Shaft Foundations

For the drilled shaft construction, excavation at near the proposed Pier 1 location (drilled shaft cap elevation estimated at 559.5 feet), are to be below the estimated water surface elevation (approximate elevation 567.4 feet) of the existing pond. A Type 2 Cofferdam may be necessary during construction of the proposed Pier 1 location.

For the proposed Pier 2, the use of permanent casing or other removable forms may be used to eliminate the need for a cofferdam.

Pump and pit procedures are needed at the piers to keep the site “in the dry” during construction. A seal coat will be needed for the cofferdam to provide a working platform for construction as well. A minimum factor of safety of buoyancy of 1.2 is required by IDOT.

SECTION 11: 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.

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: Carboloy 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

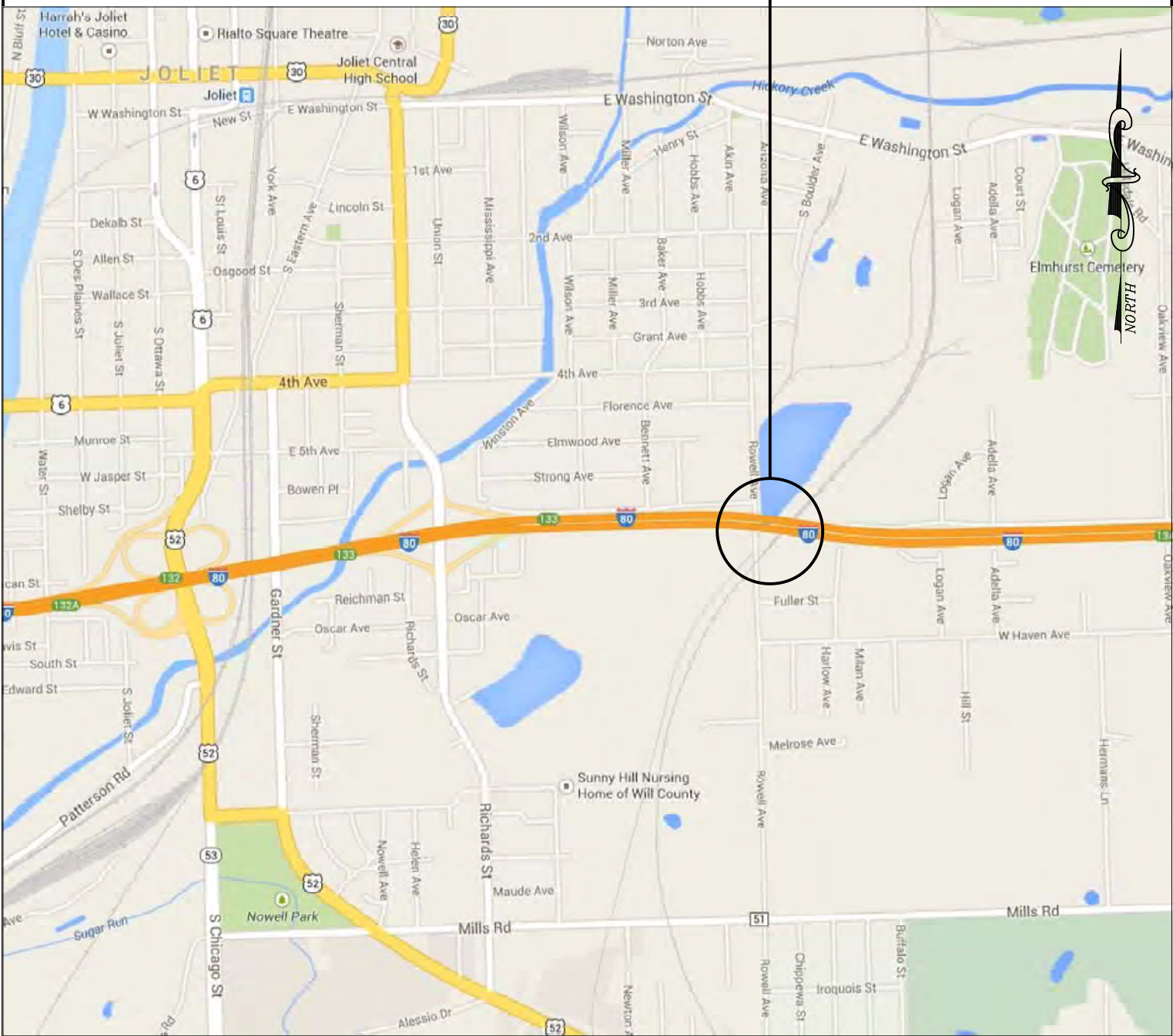
WATER LEVEL MEASUREMENT SYMBOLS

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.

APPENDIX B
SITE LOCATION MAP

PROJECT SITE LOCATION



SITE LOCATION MAP

Structure Geotechnical Report
 Interstate 80 Bridge over Rowell Avenue & WCL RR
 Section 2013-008B & 2013-009B, Station 760+85.00
 Proposed SN 099-0904 (EB) and 099-0905 (WB)
 Existing SN 099-0066 (EB) and 099-0067 (WB)
 Joliet, Will County, Illinois
 IDOT Job Number: D-91-196-09 (PTB 152, Item 004)


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

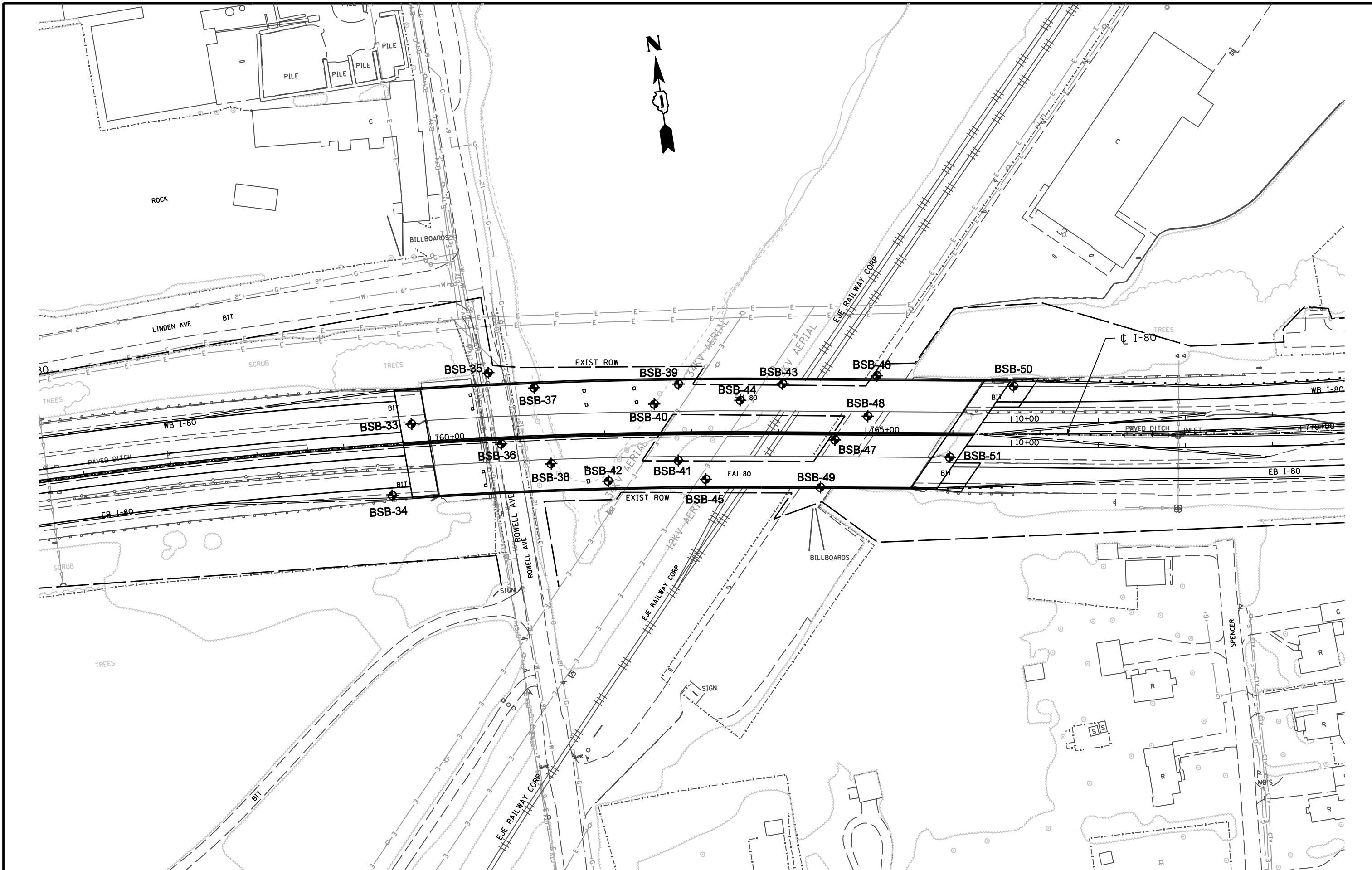
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APPROVED BY	AJP
DATE	June 27, 2014
GSJ JOB No.	13125
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APPENDIX C

SOIL BORING LOCATION PLAN & PROFILE

PLAN	SURVEYED	DATE
NOTE BOOK NO.	PLOTTED	BY
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	AT CONVEYANCE	
	FILE NAME	
	FILE NO.	

PROFILE	SURVEYED	DATE
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	STRUCTURE NOTATIONS OK'D	



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 Geotechnical, Environmental & Civil Engineering
 805 Amherst Court, Suite 204
 Naperville, Illinois 60565
 (630) 355-2938

USER NAME *	DESIGNED - RWC	REVISED - 6/27/2014
	DRAWN - RWC	REVISED -
PLOT SCALE *	CHECKED - AJP	REVISED -
PLOT DATE *	DATE - 5/2/2014	REVISED -

**STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION**

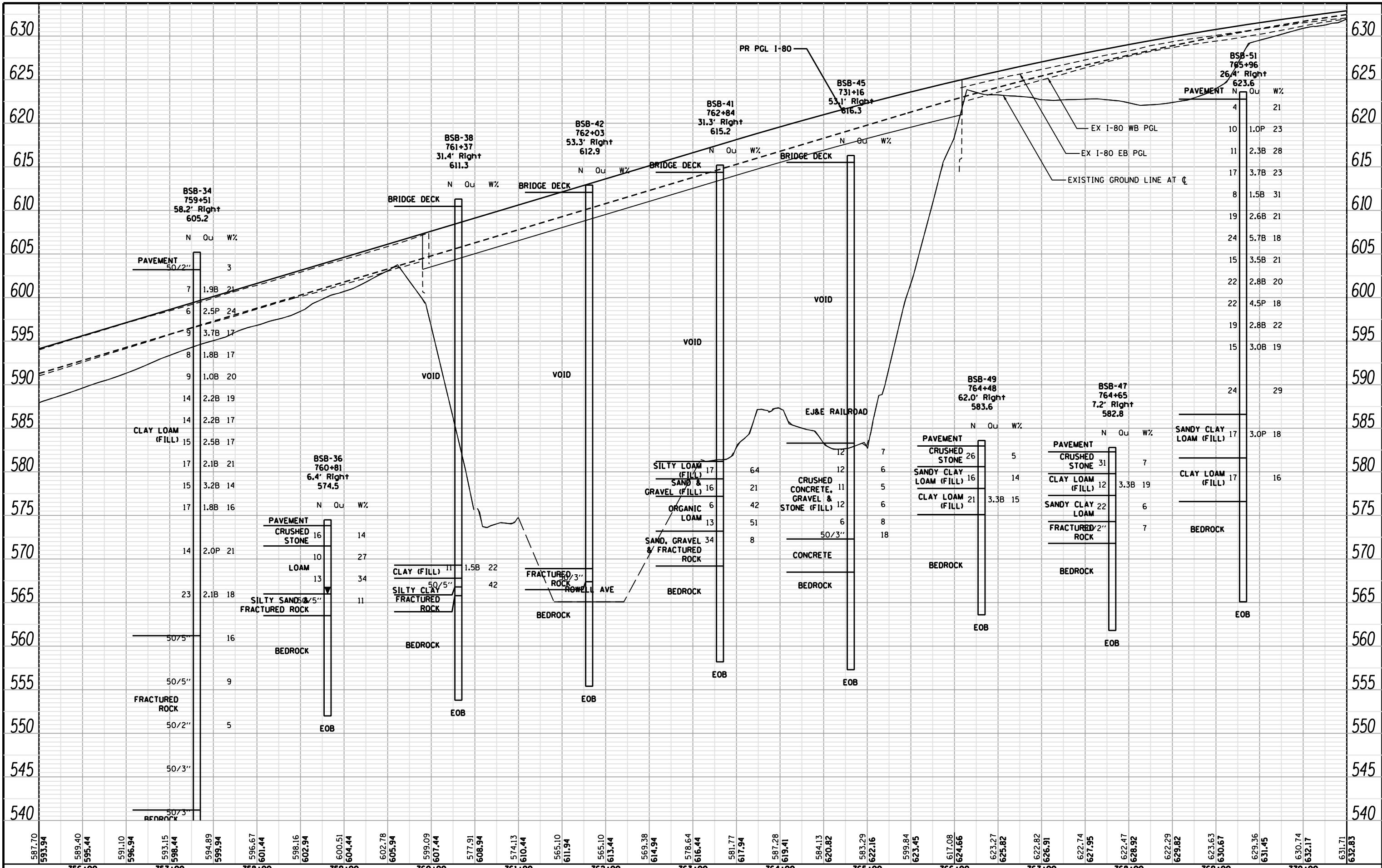
**INTERSTATE 80 OVER ROWELL AVE./ EJE CN RR
 EXISTING STRUCTURE NO. 099-0066 (EB) AND 099-0067 (WB)
 SOIL BORING PLAN**

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
80		WILL	1	3
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

SCALE: 1"=50' SHEET NO. 1 OF 1 SHEETS STA. 730+57.48

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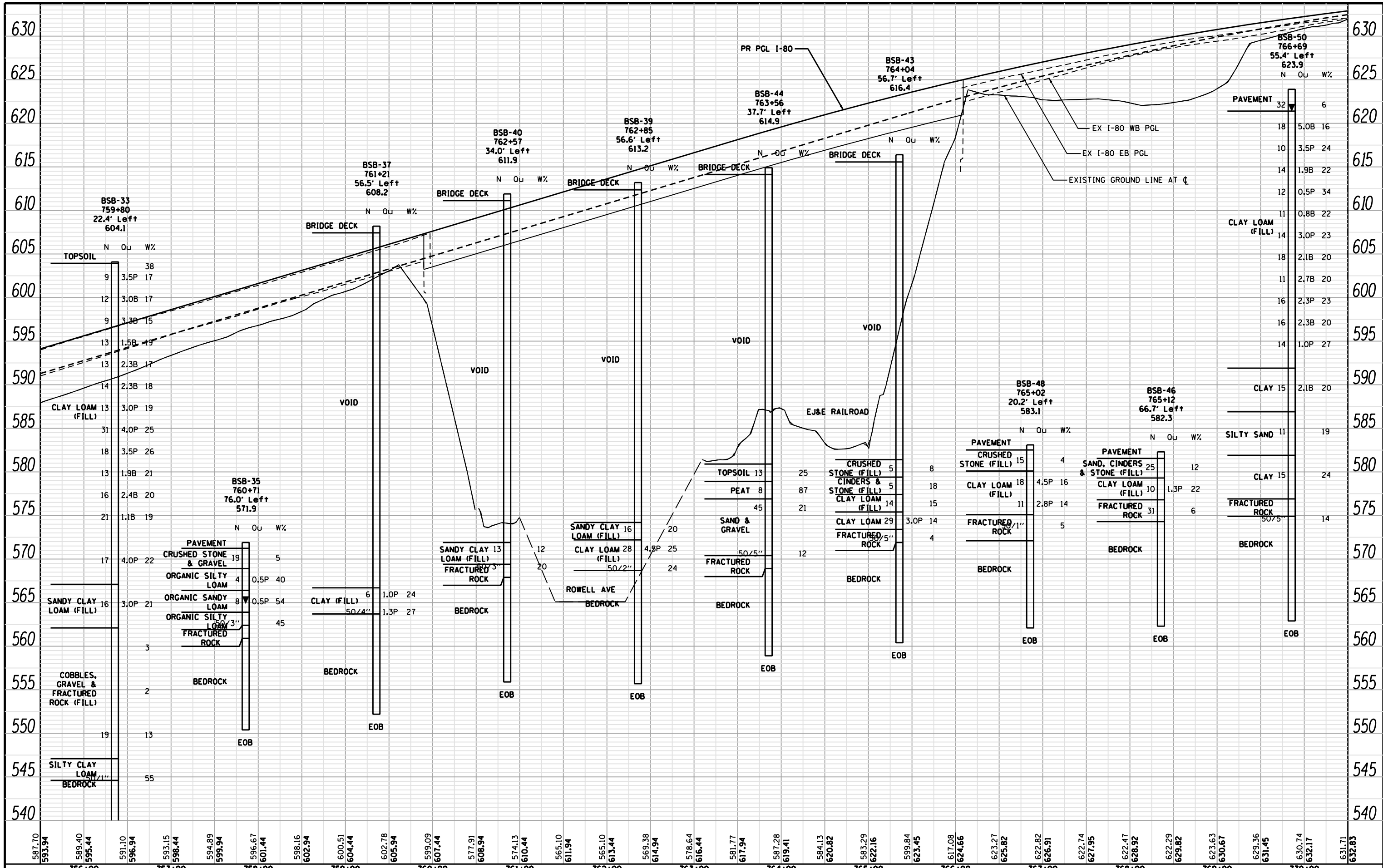
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587.70	593.94	589.40	595.44	591.10	596.94	593.15	598.44	594.89	599.94	596.67	601.44	598.16	602.94	600.51	604.44	602.78	605.94	599.09	607.44	577.91	608.94	574.13	610.44	565.10	611.94	565.10	613.44	569.38	614.94	578.64	616.44	581.77	617.94	587.28	619.41	584.13	620.82	583.29	622.16	599.84	623.45	617.08	624.66	623.27	625.82	622.82	626.91	622.74	627.95	622.47	628.92	622.29	629.82	623.63	630.67	629.36	631.45	630.74	632.17	631.71	632.83
756+00		757+00		758+00		759+00		760+00		761+00		762+00		763+00		764+00		765+00		766+00		767+00		768+00		769+00		770+00																																	

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756+00	757+00	758+00	759+00	760+00	761+00	762+00	763+00	764+00	765+00	766+00	767+00	768+00	769+00	770+00																	

Geo Services, Inc.
Geotechnical Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2938

USER NAME	DESIGNED - RWC	REVISED - 6/27/2014
DRAWN - RWC	CHECKED - AJP	REVISED -
DATE - 5/2/2014		

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

WB INTERSTATE 80 OVER ROWELL AVE./ EJE CN RR
EXISTING STRUCTURE NO. 099-0067 (WB)
SOIL BORING PROFILE

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
80		WILL	3	3
SCALE: 1"=50'H 1"=5'V		SHEET NO. 1 OF 1 SHEETS		STA. 730+57.48
ILLINOIS FED. AID PROJECT			CONTRACT NO.	

APPENDIX D
BORING & ROCK CORE LOGS

SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)	Surface Water Elev. Stream Bed Elev.	Groundwater Elev.: First Encounter Upon Completion After Hrs.	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
2.0" TOPSOIL-black CLAY LOAM-brown-stiff to hard (Fill)	603.94			38	n/a n/a	Dry to 10.0' n/a				
	4						6			
	4	3.5		17			7	3.5	26	
	5	P					11	P		
	4						4			
	5	3.0		17			5	1.9	21	
	-5	7	B				-25	8	B	
	3						4			
	6	3.3		15			6	2.4	20	
	3	B					10	B		
	3						5			
	6	1.5		19			8	1.1	19	
	-10	7	B				-30	13	B	
	4									
	5	2.3		17						
	8	B								
	3						4			
	7	2.3		18			7	4.0	22	
	-15	7	B				-35	10	P	
	4									
	5	3.0		19						
	8	P								
	4									
	23	4.0		25				7	3.0	21
	-20	8	P				-40	9	P	
						567.11				
						SANDY CLAY LOAM-brown-very stiff (Fill)				

Z:\PROJECTS\2013\13125 HNTB, I-80 PHASE II (NEAR TERM)\13125 BORING LOGS\13125_LOG.GPJ 4/2/15

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 F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. _____ n/a ft	Stream Bed Elev. _____ n/a ft	DEPTH H	BLOW S	UCS Qu	MOIST T
BORING NO. _____ BSB-33 Station _____ 759+80 Offset _____ 22.40ft Left Ground Surface Elev. _____ 604.11 ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter _____ Dry to 10.0' ft Upon Completion _____ n/a ft After _____ Hrs. _____ ft	(ft)	(/6")	(tsf)	(%)	
SANDY CLAY LOAM-brown-very stiff (Fill) (continued)	562.11				Drillers Observation: Apparent Bedrock (continued) 543.61					
				3	Borehole continued with rock coring.					
	-45									-65
COBBLES, GRAVEL, FRACTURED ROCK-medium dense (Fill)				2						
	-50									-70
		13								
		6		13						
	-55	13								-75
	547.11									
SILTY CLAY LOAM-brown-very loose (A-6)										
		2								
	544.61	2		30						
	-60	50/1"								-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 3/13/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-33 Core Diameter 2 in
 Station 759+80 Top of Rock Elev. 544.61 ft
 Offset 22.40ft Left Begin Core Elev. 543.61 ft

Ground Surface Elev. 604.11 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
543.61	1	100	95		1184.0
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal bedding. Varved from -62.0' to -62.5'. Horizontal fractures at -61.3', -62.0', -62.8', -63.5', -65.8', -67.6', -67.8', -68.5', -68.9', -69.5' & -69.8'.					
533.61					
End Of Boring @ -70.5'. Boring backfilled with cuttings.					
-70					
-75					
-80					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE 3/13/2014

LOGGED BY MD

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 15, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-33** Top of Rock Elev. 544.6

Station 759+80 Begin Core Elev. 543.6

Offset 22.4' Left

Ground Surface Elev. 604.11

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
	1	100.0	94.5	n/a	1184 @ -61.4'
-65.5					
-70.5					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-60.5' to -70.5')

Light gray to gray with horizontal bedding. Varved from -62.0' to -62.5'. Horizontal fractures at -61.3', -62.0', -62.8', -63.5', -65.8', -67.6', -67.8', -68.5', -68.9', -69.5' & -69.8'.



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)	Surface Water Elev. Stream Bed Elev.	DEPTH H (ft)	BLOW S (/6")	UCS Qu (tsf)	MOIST T (%)
					n/a ft n/a ft				
BORING NO. <u>BSB-34</u> Station <u>759+51</u> Offset <u>58.20ft Right</u> Ground Surface Elev. <u>605.22</u> ft					Groundwater Elev.: First Encounter <u>Dry to 10.0'</u> ft Upon Completion <u>n/a</u> ft After <u> </u> Hrs. <u> </u> ft				
8.0" ASPHALT, 4.0" CRUSHED STONE, 6.0" CRUSHED ASPHALT, 6.0" CRUSHED STONE		50/2"			CLAY to CLAY LOAM-brown & gray-stiff to very stiff (Fill) (continued)		3		
	603.22			3			6	2.5	17
CLAY to CLAY LOAM-brown & gray-stiff to very stiff (Fill)							9	B	
		2					5		
		3	1.9	21			7	2.1	21
	-5	4	B			-25	10	B	
		2					6		
		3	2.5	24			7	3.2	14
		3	P				8	B	
		3					4		
		5	3.7	17			6	1.8	16
	-10	4	B			-30	11	B	
		3							
		4	1.8	17					
		4	B						
		3					6		
		4	1.0	20			6	2.0	21
	-15	5	B			-35	8	P	
		6							
		7	2.2	19					
		7	B						
		3					7		
		5	2.2	17			9	2.1	18
	-20	9	B			-40	14	B	

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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 F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW W S	UCS Qu	MOIST S T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW W S	UCS Qu	MOIST S T
	(ft)	(/6")	(tsf)	(%)	n/a ft n/a ft	(ft)	(/6")	(tsf)	(%)
BORING NO. <u>BSB-34</u> Station <u>759+51</u> Offset <u>58.20ft Right</u> Ground Surface Elev. <u>605.22</u> ft					Groundwater Elev.: First Encounter <u>Dry to 10.0'</u> ft Upon Completion <u>n/a</u> ft After <u> </u> Hrs. <u> </u> ft				
CLAY to CLAY LOAM-brown & gray-stiff to very stiff (Fill) (continued)					FRACTURED ROCK-gray-very dense (continued)				
	561.22	18				541.22	6		
FRACTURED ROCK-gray-very dense	-45	50/5"		16	Drillers Observation: Apparent Bedrock	540.22	50/3"		
					Borehole continued with rock coring.				
		25							
	-50	50/5"		9		-70			
		50/2"		5					
	-55					-75			
		50/3"							
	-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 3/20/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-34 Core Diameter 2 in
 Station 759+51 Top of Rock Elev. 541.22 ft
 Offset 58.20ft Right Begin Core Elev. 540.22 ft
 Ground Surface Elev. 605.22 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
540.22	1	100	95		1037.0
-70					
530.22	-75				
-80					
-85					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 Light gray with horizontal bedding. Some horizontal fractures throughout.

End Of Boring @ -75.0'. Boring backfilled with cuttings.

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE 3/21/2014

LOGGED BY JK

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 15, T35N, R10E, SE 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

Top of Rock Elev. 541.2

BORING NO. **BSB-34** Begin Core Elev. 540.2

Station 759+51

Offset 58.2' Right

Ground Surface Elev. 605.22

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-65.0' to -75.0')

Light gray with horizontal bedding. Some horizontal fractures throughout.

	1	100.0	95.0	n/a	1037 -65.3'
-70					
-75					



SOIL BORING LOG

ROUTE F.A.I.R.TE. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. _____ Station _____	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
					Stream Bed Elev. _____ n/a ft
BORING NO. _____ BSB-35 Station _____ 760+71 Offset _____ 76.00ft Left Ground Surface Elev. _____ 571.92 ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)	Groundwater Elev.:
					First Encounter _____ 564.9 ft ▼
					Upon Completion _____ n/a ft
					After _____ Hrs. _____ ft

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8.0" ASPHALT	571.25				
CRUSHED STONE & GRAVEL-brown-medium dense		8			
		9		5	
		10			
	568.92				
ORGANIC SILTY LOAM-black-very loose (A-7)		2			
		2	0.5	40	
		-5	P		
	566.42				
ORGANIC SANDY LOAM-dark brown-medium stiff (A-8)		2			
		5	0.5	54	
		3	P		
	563.92				
ORGANIC SILTY LOAM-gray-medium dense (A-7)		3			
	562.42	20		45	
Drillers Observation: Fractured Rock	-10	50/3"			
	560.92				
Drillers Observation: Apparent Bedrock	560.42				
Borehole continued with rock coring.					
	-15				
	-20				

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



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 11/5/13

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-35 Core Diameter 2 in
 Station 760+71 Top of Rock Elev. 560.92 ft
 Offset 76.00ft Left Begin Core Elev. 560.42 ft

Ground Surface Elev. 571.92 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
560.42	1	100	85		
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray with horizontal bedding. Fine grained with few chert nodules. Some horizontal fractures throughout.					
-15					957.0
-20					
550.42					
End Of Boring @ -21.5'. Boring backfilled with cuttings.					
-25					
-30					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE --- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION --- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station --- Core Diameter 2.0 in

Top of Rock Elev. 560.9

BORING NO. **BSB-35** Begin Core Elev. 560.4

Station 760+71

Offset 76.0' Left

Ground Surface Elev. 571.92

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-11.5' to -21.5')

Light gray with horizontal bedding. Fine grained with few chert nodules. Some horizontal fractures throughout.

	1	100.0	85.0	n/a	957 -13.7
-16.5					
-21.5					





GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 11/5/13

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-36 Core Diameter 2 in
 Station 760+81 Top of Rock Elev. 563.52 ft
 Offset 6.40ft Right Begin Core Elev. 562.02 ft
 Ground Surface Elev. 574.52 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
562.02	1	100	69		
-15					1171.0
-20					
-22.5					
552.02					
-25					
-30					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 Light gray with horizontal bedding. Fine grained with few chert nodules. Some horizontal fractures throughout.

End Of Boring @ -22.5'. Boring backfilled with cuttings.

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-36** Top of Rock Elev. 563.5

Station 760+81 Begin Core Elev. 562.0

Offset 6.4' Right

Ground Surface Elev. 574.52

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min /ft)	STRENGTH (tsf)
	1	100.0	69.0	n/a	1171 -15.1'
-17.5					
-22.5					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-12.5' to -22.5')
 Light gray with horizontal bedding. Fine grained with few chert nodules. Some horizontal fractures throughout.





GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 1/13/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY RP

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-37 Core Diameter 2 in
 Station 761+21 Top of Rock Elev. 563.66 ft
 Offset 56.50ft Left Begin Core Elev. 562.16 ft

Ground Surface Elev. 608.16 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal bedding. Highly fractured with numerous horizontal fractures throughout.	562.16	1	99	31		888.0
End Of Boring @ -56.0'. Boring backfilled with cuttings.	552.16					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE 1/14/2014

LOGGED BY JK

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

Top of Rock Elev. 563.7

BORING NO. **BSB-37** Begin Core Elev. 562.2

Station 761+21

Offset 56.5' Left

Ground Surface Elev. 608.16

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-46.0' to -56.0')

Light gray to gray with horizontal bedding. Highly fractured with numerous horizontal fractures throughout.

	1	99.0	31.0	n/a	888 @ -49.1'
-51					
-56					



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
10.0" CONCRETE BRIDGE DECK 610.48					VOID (continued)				
VOID									
	-5					-25			
	-10					-30			
	-15					-35			
	-20					-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)



GSI Job No. 13125

ROCK CORE LOG

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Date 3/26/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-38 Core Diameter 2 in
 Station 761+37 Top of Rock Elev. 565.81 ft
 Offset 31.40ft Right Begin Core Elev. 563.81 ft

Ground Surface Elev. 611.31 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
563.81	1	100	67		
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with some rust staining. Horizontal bedding with numerous horizontal fractures throughout.					
-50					644.0
-55					
553.81					
End Of Boring @ -57.5'. Boring backfilled with cuttings.					
-60					
-65					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-38** Top of Rock Elev. 565.8

Station 761+37 Begin Core Elev. 563.8

Offset 31.4' Right

Ground Surface Elev. 611.31

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORRECTION TIME (min/ft)	STRENGTH (tsf)
	1	100.0	67.0	n/a	644 @ -49.7'
-52.5					
-57.5					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-47.5' to -57.5')
 Light gray to gray with some rust staining. Horizontal bedding with numerous horizontal fractures throughout.



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY RP

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
10.0" CONCRETE BRIDGE DECK 612.35					VOID (continued)				
VOID									
	-5					-25			
	-10					-30			
	-15					-35			
					574.18				
					SANDY CLAY LOAM-dark brown & black-medium dense (Fill)		7		
	-20					-40	8		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 F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY RP

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft
BORING NO. Station Offset Ground Surface Elev. _____ ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter _____ ft Upon Completion _____ ft After _____ Hrs. _____ ft
SANDY CLAY LOAM-dark brown & black-medium dense (Fill) (continued) 572.18	8				
CLAY LOAM-dark brown-medium dense (Fill)	13	4.5	25		
	15	P			
	13				
568.68	50/2"		24		
Drillers Observation: Apparent Bedrock	-45				
565.68					
Borehole continued with rock coring.					
	-50				
	-55				
	-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 1/5/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY RP

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-39 Core Diameter 2 in
 Station 762+85 Top of Rock Elev. 568.68 ft
 Offset 56.60ft Left Begin Core Elev. 565.68 ft

Ground Surface Elev. 613.18 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
565.68	1	100	49		578.0
-50					
-55					
555.68					
-60					
-65					

End Of Boring @ -57.5'. Boring backfilled with cuttings.

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-39** Top of Rock Elev. 568.7

Station 762+85 Begin Core Elev. 565.7

Offset 56.6' Left

Ground Surface Elev. 613.18

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORRECTION (min/ft)	STRENGTH (tsf)
	1	100.0	49.0	n/a	578 @ -48.2'
-52.5					
-57.5					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-47.5' to -57.5')
 Light gray to gray with horizontal bedding. Weathered with numerous horizontal fractures throughout. 1/4" clay parting @ -56.7'.



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft
BORING NO. Station Offset Ground Surface Elev. _____ ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter _____ ft Upon Completion _____ ft After _____ Hrs. _____ ft
SANDY CLAY LOAM with GRAVEL & STONE-dark brown-medium dense to very dense (Fill) 569.43	2				
	8			12	
	5				
	6				
Drillers Observation: Fractured Weathered Rock 567.93	50/3"			20	
Drillers Observation: Apparent Bedrock -45 565.93					
Borehole continued with rock coring.					
	-50				
	-55				
	-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 3/14/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-40 Core Diameter 2 in
 Station 762+57 Top of Rock Elev. 567.93 ft
 Offset 34.00ft Left Begin Core Elev. 565.93 ft

Ground Surface Elev. 611.93 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray with horizontal bedding. Weathered & cherty with rust staining to -50.0'. Numerous horizontal fractures throughout with some intersecting vertical fractures.	565.93	1	95	36		1092.0
End Of Boring @ -56.0'. Boring backfilled with cuttings.	555.93					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-40** Top of Rock Elev. 567.9

Station 762+57 Begin Core Elev. 565.9

Offset 34.0' Left

Ground Surface Elev. 611.93

DEPTH (ft)	CORE RUN (#)	RECOVER Y (%)	R Q D (%)	C O R E T I M E (min /ft)	S T R E N G T H (tsf)
	1	95.0	36.0	n/a	1092 @ -49.8'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-46.0' to -56.0')
 Light gray with horizontal bedding. Weathered & cherty with rust staining to -50.0'.
 Numerous horizontal fractures throughout with some intersecting vertical fractures.



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft
BORING NO. Station Offset Ground Surface Elev. _____ ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter _____ ft Upon Completion _____ ft After _____ Hrs. _____ ft
ORGANIC LOAM-dark brown to black-medium dense (A-7) <i>(continued)</i>	3 3 4 9			51	
573.22					
SAND, GRAVEL & FRACTURED ROCK-brown-dense	8 10 15 19			8	
	-45				
569.22					
Drillers Observation: Apparent bedrock 100.0% water loss @ -46.5'	568.22				
Borehole continued with rock coring.					
	-50				
	-55				
	-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)



GSI Job No. 13125

ROCK CORE LOG

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Date 3/25/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-41 Core Diameter 2 in
 Station 762+84 Top of Rock Elev. 569.22 ft
 Offset 31.30ft Right Begin Core Elev. 568.22 ft

Ground Surface Elev. 615.22 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
568.22	1	98	29		
					832.0
558.22					
560					
555					
550					
545					
540					
535					
530					
525					
520					
515					
510					
505					
500					
560					
555					
550					
545					
540					
535					
530					
525					
520					
515					
510					
505					
500					

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

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE 3/25/2014

LOGGED BY JK

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-41** Top of Rock Elev. 569.2

Station 762+84 Begin Core Elev. 568.2

Offset 31.3' Right

Ground Surface Elev. 615.22

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min /ft)	STRENGTH (tsf)
	1	98.0	29.0	n/a	832 @ -52.5'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-47.0' to -57.0')

Light gray to gray with horizontal bedding. Weathered with rust staining to -52.0'. Numerous horizontal fractures throughout.

-52.0

-57.0



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. _____	D E P T H	B L O W S	U C S	M O I S T	Surface Water Elev. _____ n/a ft
Station _____					Stream Bed Elev. _____ n/a ft
BORING NO. <u>BSB-42</u>					Groundwater Elev.: _____
Station <u>762+03</u>					First Encounter _____ n/a ft
Offset <u>53.30ft Right</u>					Upon Completion _____ n/a ft
Ground Surface Elev. <u>612.91</u> ft	(ft)	(/6")	(tsf)	(%)	After _____ Hrs. _____ ft

VOID (continued)					
	568.91				
FRACTURED ROCK		2			
	-45	4		15	
	567.41	25			
Drillers Observation: Apparent bedrock		50/3"			
	565.41				
Borehole continued with rock coring.					
	-50				
	-55				
	-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 3/31/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-42 Core Diameter 2 in
 Station 762+03 Top of Rock Elev. 567.41 ft
 Offset 53.30ft Right Begin Core Elev. 565.41 ft
 Ground Surface Elev. 612.91 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
565.41	1	94	43		710.0
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray & fine grained with horizontal bedding. Some light rust staining with numerous horizontal fractures throughout.					
-50					
-55					
555.41					
End Of Boring @ -57.5'. Boring backfilled with cuttings.					
-60					
-65					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-42** Top of Rock Elev. 567.4

Station 762+03 Begin Core Elev. 565.4

Offset 53.3' Right

Ground Surface Elev. 612.91

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-47.5' to -57.5')

Light gray to gray & fine grained with horizontal bedding. Some light rust staining with numerous horizontal fractures throughout.

	1	94.0	42.5	n/a	710 -41.5'
-52.5					
-57.5					



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
10.0" CONCRETE BRIDGE DECK 615.65					VOID (continued)				
VOID									
	-5					-25			
	-10								
	-15				581.44	-35	3		8
					CRUSHED STONE-loose (Fill)		3		
					579.44		2		
					CINDERS & STONE-black-loose (Fill)		3		18
							2		
					577.44		3		
					CLAY LOAM with Stone-brown & gray-medium dense (Fill)		3		
	-20					-40	2		15

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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 F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. _____ ft Stream Bed Elev. _____ ft
BORING NO. Station Offset Ground Surface Elev. _____ ft	(ft)	(/6")	(tsf)	(%)	Groundwater Elev.: First Encounter _____ ft Upon Completion _____ ft After _____ Hrs. _____ ft
CLAY LOAM with Stone-brown & gray-medium dense (Fill) (continued) 575.44	5 9				
CLAY LOAM-brown-dense 573.44	7 18 18 11	3.0 P	14		
FRACTURED ROCK 571.94	4 39 50/5"		4		
Drillers Observation: Apparent bedrock -45					
Borehole continued with rock coring. 570.44					
	-50				
	-55				
	-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 4/17/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY JB

SECTION 2013-008B & 2013-009B LOCATION SE 1/4, SEC. 15, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-43 Core Diameter 2 in
 Station 764+04 Top of Rock Elev. 571.94 ft
 Offset 56.70ft Left Begin Core Elev. 570.44 ft

Ground Surface Elev. 616.44 ft

DEPT H (ft)	CORE (#)	RECOVER Y (%)	R . Q . D . (%)	CORE TIME (min/ft)	S T R E N G T H (tsf)
570.44	1	99	30		
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal to wavy bedding. Highly fractured & weathered with numerous chert nodules to -50.2'. Numerous horizontal fractures throughout.					
560.44					940.0
End Of Boring @ -56.0'. Boring backfilled with cuttings.					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE 4/17/2014

LOGGED BY JK

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

Top of Rock Elev. 571.9

BORING NO. **BSB-43** Begin Core Elev. 570.4

Station 764+04

Offset 56.7' Left

Ground Surface Elev. 616.44

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min /ft)	STRENGTH (tsf)
	1	99.0	30.0	n/a	940 @ -52.3'
-51					
-56					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-46.0' to -56.0')

Light gray with horizontal to wavy bedding. Highly fractured & weathered with numerous chert nodules to -50.2'. Numerous horizontal fractures throughout.



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO.	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. _____ ft	D E P T H (ft)	B L O W S (/6")	U C S Qu (tsf)	M O I S T (%)
Station _____					Stream Bed Elev. _____ ft				
BORING NO. <u>BSB-44</u>					Groundwater Elev.: _____ ft				
Station <u>763+56</u>					First Encounter _____ ft				
Offset <u>37.70ft Left</u>					Upon Completion _____ ft				
Ground Surface Elev. <u>614.94</u> ft					After _____ Hrs. _____ ft				
9.5" CONCRETE BRIDGE DECK	614.15				VOID (continued)				
VOID									
	-5								
	-10								
	-15				580.94		7		
					TOPSOIL-black		11		25
							7		
					578.94		6		
					PEAT-black-loose		3		
							4		87
							4		
					576.94		4		
					SAND & GRAVEL-brown-very dense		5		
							8		21
							17		
	-20						28		

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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 F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW W S	UCS Qu	MOIST S T	Surface Water Elev. <u>n/a</u> ft Stream Bed Elev. <u>n/a</u> ft Groundwater Elev.: First Encounter <u>n/a</u> ft Upon Completion <u>n/a</u> ft After <u> </u> Hrs. <u> </u> ft
BORING NO. <u>BSB-44</u> Station <u>763+56</u> Offset <u>37.70ft Left</u> Ground Surface Elev. <u>614.94</u> ft	(ft)	(/6")	(tsf)	(%)	
SAND & GRAVEL-brown-very dense (<i>continued</i>)					
		50/5"			
	570.44			12	
Drillers Observation: Weathered & fractured rock	-45				
	568.94				
Borehole continued with rock coring.					
	-50				
	-55				
	-60				

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GSI Job No. 13125

ROCK CORE LOG

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Date 3/13/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-44 Core Diameter 2 in
 Station 763+56 Top of Rock Elev. 568.94 ft
 Offset 37.70ft Left Begin Core Elev. 568.94 ft

Ground Surface Elev. 614.94 ft

DEPT H (ft)	CORE (#)	RECOVER Y (%)	R . Q . D . (%)	CORE TIME (min/ft)	S T R E N G T H (tsf)
568.94	1	98	35		
					1119.0
-50					
-55					
558.94					
-60					
-65					

End Of Boring @ -56.0'. Boring backfilled with cuttings.

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE 3/13/2014

LOGGED BY JK

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

Top of Rock Elev. 568.9

BORING NO. **BSB-44** Begin Core Elev. 568.9

Station 763+56

Offset 37.7' Left

Ground Surface Elev. 614.94

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min /ft)	STRENGTH (tsf)
	1	98.0	35.0	n/a	1119 @ -50.0'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-46.0' to -56.0')

Light gray with horizontal to wavy bedding. Weathered with rust staining & numerous horizontal fractures throughout. Numerous chert nodules to -47.0'.



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Mud Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	DEPTH H	BLOW S	UCS Qu	MOIST T	Surface Water Elev. Stream Bed Elev.	DEPTH H	BLOW S	UCS Qu	MOIST T
	(ft)	(/6")	(tsf)	(%)	ft	(ft)	(/6")	(tsf)	(%)
9.5" CONCRETE BRIDGE DECK 615.51					VOID (continued)				
VOID									
	-5					-25			
	-10					-30			
					583.30				
					CRUSHED CONCRETE, GRAVEL & STONE-loose to medium dense (Fill)		3		
							4		7
							6		
	-15					-35	6		
							8		
							7		6
							6		
							6		
							8		
							6		5
							6		
							6		
							5		
	-20					-40			6

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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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 4/24/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-45 Core Diameter 2 in
 Station 763+16 Top of Rock Elev. 568.50 ft
 Offset 53.10ft Right Begin Core Elev. 572.30 ft
 Ground Surface Elev. 616.30 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
CONCRETE	572.30 -45	1				
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal bedding. Weathered with rust staining. Numerous horizontal fractures throughout.	568.50 -50	1	97	13		593.0
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal bedding. Some horizontal fractures throughout.	562.30 -55	2	100	64		946.0
End Of Boring @ -59.0'. Boring backfilled with cuttings.	557.30 -60					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW1/4

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-45** Top of Rock Elev. 568.5

Station 731+16 Begin Core Elev. 572.3

Offset 53.1' Right

Ground Surface Elev. 616.30

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORRECTION (min/ft)	STRENGTH (tsf)
	1	96.7	13.3	n/a	593 @ -48.3'
-49					
-54					

RUN 1 (-44.0' to -54.0')
 (-44.0 to -47.8') CONCRETE
 (-47.8' to -54.0') SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 Light gray to gray with horizontal bedding. Weathered with rust staining. Numerous horizontal fractures throughout.



ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW1/4

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-45** Top of Rock Elev. 568.5

Station 731+16 Begin Core Elev. 572.3

Offset 53.1' Right

Ground Surface Elev. 616.30

DEPTH (ft)	CORE RUN (#)	RECOVER Y (%)	R Q D (%)	C O R E T I M E (min /ft)	S T R E N G T H (tsf)
-59	2	100.0	64.0	n/a	946 @ -94.6'

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 2 (-54.0' to -59.0')
 Light gray to gray with horizontal bedding. Some horizontal fractures throughout.



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(630) 355-2828

GSI Job No. 13125

SOIL BORING LOG

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Date 11/1/13

ROUTE F.A. RTE. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	D E P T H (ft)	B L O W S (/6")	U C S Qu	M O I S T (%)	Surface Water Elev.
					ft
					<u>n/a</u>
					<u>n/a</u>
BORING NO. BSB-46 Station 765+12 Offset 66.70ft Left Ground Surface Elev. 582.31 ft					Groundwater Elev.: First Encounter <u>Dry to 9.5'</u> ft Upon Completion <u>n/a</u> ft After _____ Hrs. _____ ft
9.0" ASPHALT	581.56				
SILTY SAND, CINDERS & STONE-dark brown & black-medium dense (Fill)		10			
		16		12	
		11			
579.31					
CLAY LOAM with STONE-brown-stiff (Fill)		3			
		4	1.3	22	
		6	P		
-5					
576.81					
FRACTURED ROCK-brown-dense		8			
		9		6	
		22			
574.31					
Drillers Observation: Apparent Bedrock					
572.31	-10				
Borehole continued with rock coring.					
	-15				
	-20				

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ROCK CORE LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-46 Core Diameter 2 in
 Station 765+12 Top of Rock Elev. 574.31 ft
 Offset 66.70ft Left Begin Core Elev. 572.31 ft
 Ground Surface Elev. 582.31 ft

DESCRIPTION	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray, fine grained with horizontal to wavy bedding. Numerous horizontal fractures throughout with some chert replacement nodules.	572.31	1	100	38		
	-15					1172.0
	562.31	-20				
End Of Boring @ -20.0'. Boring backfilled with cuttings.						
	-25					
	-30					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE --- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION --- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station --- Core Diameter 2.0 in

Top of Rock Elev. 574.3

BORING NO. **BSB-46** Begin Core Elev. 572.3

Station 765+12

Offset 66.7' Left

Ground Surface Elev. 582.31

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-10.0' to -20.0')

Light gray to gray, fine grained with horizontal to wavy bedding. Numerous horizontal fractures throughout with some chert replacement nodules.

	1	100.0	38.0	n/a	1172 -14.8'
-15					
-20					





GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 11/1/13

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-47 Core Diameter 2 in
 Station 764+65 Top of Rock Elev. 571.81 ft
 Offset 7.20ft Right Begin Core Elev. 571.81 ft

Ground Surface Elev. 582.81 ft

DEPT H (ft)	CORE (#)	RECOVER Y (%)	R . Q . D . (%)	CORE TIME (min/ft)	S T R E N G T H (tsf)
571.81	1	100	43		
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray, fine grained with horizontal to wavy bedding. Numerous horizontal fractures throughout numerous some chert replacement nodules.					
-15					1566.0
-20					
561.81					
End Of Boring @ -21.0'. Boring backfilled with cuttings.					
-25					
-30					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE November 1, 2013

LOGGED BY JK

GSI JOB No. 13125

ROUTE --- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION --- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station --- Core Diameter 2.0 in

BORING NO. **BSB-47** Top of Rock Elev. 571.8

Station 764+65 Begin Core Elev. 571.8

Offset 7.20' Right

Ground Surface Elev. 582.81

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min /ft)	STRENGTH (tsf)
	1	100.0	43.0	n/a	1566 -15.7
-16					
-21					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-11.0' to -21.0')

Light gray to gray, fine grained with horizontal to wavy bedding. Numerous horizontal fractures throughout numerous some chert replacement nodules.





GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 11/4/13

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-48 Core Diameter 2 in
 Station 765+02 Top of Rock Elev. 572.08 ft
 Offset 20.20ft Left Begin Core Elev. 572.08 ft

Ground Surface Elev. 583.08 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
572.08	1	100	39		
SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE Light gray to gray with horizontal to wavy bedding. Numerous horizontal fractures & chert replacement nodules throughout.					
-15					1450.0
-20					
562.08					
End Of Boring @ -21.0'. Boring backfilled with cuttings.					
-25					
-30					

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE November 4, 2013

LOGGED BY JK

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

Top of Rock Elev. 572.1

BORING NO. **BSB-48** Begin Core Elev. 572.1

Station 765+02

Offset 20.2' Left

Ground Surface Elev. 583.08

DEPTH (ft)	CORE RUN (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min /ft)	STRENGTH (tsf)
	1	100.0	39.0	n/a	1450 -16.5'
-16					
-21					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 RUN 1 (-11.0' to -21.0')
 Light gray to gray with horizontal to wavy bedding. Numerous horizontal fractures & chert replacement nodules throughout.





GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 11/4/13

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY TZ

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-49 Core Diameter 2 in
 Station 764+48 Top of Rock Elev. 575.14 ft
 Offset 62.00ft Right Begin Core Elev. 573.64 ft

Ground Surface Elev. 583.64 ft

DEPT H (ft)	CORE (#)	RECOVER Y (%)	R . Q . D . (%)	CORE TIME (min/ft)	S T R E N G T H (tsf)
573.64	1	100	60		
					564.0
-15					
563.64	-20				
-25					
-30					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 Light gray to gray with horizontal to wavy bedding. Numerous horizontal fractures & chert replacement nodules throughout.

End Of Boring @ -20.0'. Boring backfilled with cuttings.

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE November 4, 2013

LOGGED BY JK

GSI JOB No. 13125

ROUTE --- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION --- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station --- Core Diameter 2.0 in

BORING NO. **BSB-49** Top of Rock Elev. 575.1

Station 764+48 Begin Core Elev. 573.6

Offset 62.0' Right

Ground Surface Elev. 583.64

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-10.0' to -20.0')

Light gray to gray with horizontal to wavy bedding. Numerous horizontal fractures & chert replacement nodules throughout.

	1	100.0	60.0	n/a	564 -13.2'
-15					
-20					



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. Station	D E P T H H S	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
BORING NO. <u>BSB-50</u> Station <u>766+69</u> Offset <u>55.40ft Left</u> Ground Surface Elev. <u>623.94</u> ft	(ft)	(/6")	(tsf)	(%)	Stream Bed Elev. <u>n/a</u> ft	(ft)	(/6")	(tsf)	(%)
12.0" CONCRETE, 18.0" CRUSHED STONE									
	12						3		
	19			6			5	2.7	20
	13						6	B	
CLAY to CLAY LOAM-brown, gray & spotted black-medium stiff to hard (Fill)	621.44 ▼								
	3						6		
	10	5.0	16				6	2.3	23
	-5	8	B			-25	10	P	
	3						8		
	4	3.5	24				9	2.3	20
	6	P					7	B	
	4						4		
	6	1.9	22				4	1.0	27
	-10	8	B			-30	10	P	
	3								
	4	0.5	34						
	8	P				591.94			
	4						4		
	4	0.8	22				8	2.1	20
	-15	7	B			-35	7	B	
	3								
	6	3.0	23						
	8	P				586.94			
	6						3		
	8	2.1	20				4		19
	-20	10	B			-40	7		

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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 F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. _____ Station _____	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
					Stream Bed Elev. _____ n/a ft
BORING NO. <u>BSB-50</u> Station <u>766+69</u> Offset <u>55.40ft Left</u> Ground Surface Elev. <u>623.94</u> ft					Groundwater Elev.:
					First Encounter <u>621.4</u> ft ▼
					Upon Completion <u>n/a</u> ft
					After _____ Hrs. _____ ft

SILTY SAND-brown-medium dense (continued)					
581.94					
CLAY-brown & gray-medium dense					
	4				
	6		24		
	9				
-45					
576.94					
FRACTURED ROCK-very dense					
574.94	50/5"				
Drillers Observation: Apparent Bedrock			14		
-50					
572.94					
Borehole continued with rock coring.					
-55					
-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 1/13/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-50 Core Diameter 2 in
 Station 766+69 Top of Rock Elev. 574.94 ft
 Offset 55.40ft Left Begin Core Elev. 572.94 ft
 Ground Surface Elev. 623.94 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
572.94	1	99	16		
					906.0
-55					
-60					
562.94					
-65					
-70					

End Of Boring @ -61.0'. Boring backfilled with cuttings.

Color pictures of the cores Yes

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

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

ROCK CORE LOG

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

Top of Rock Elev. 574.9

BORING NO. **BSB-50** Begin Core Elev. 572.9

Station 766+69

Offset 55.4' Left

Ground Surface Elev. 623.94

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-51.0' to -61.0')

Light gray to gray & varved with horizontal bedding. Weathered with some chert replacement. Numerous horizontal fractures throughout.

	1	99.0	16.0	n/a	906 @ -53.7'
-56					
-61					



SOIL BORING LOG

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO.	D E P T H (ft)	B L O W S (/6")	U C S (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 (tsf)	M O I S T (%)
Station					Stream Bed Elev.	n/a	ft				
BORING NO.					Groundwater Elev.:						
Station					First Encounter	Dry to 10.0'	ft				
Offset					Upon Completion	n/a	ft				
Ground Surface Elev.	623.63	ft			After		ft				

10.0" ASPHALT					CLAY to CLAY LOAM-brown & gray-stiff to hard (Fill) (continued)						
622.80											
CLAY to CLAY LOAM-brown & gray-stiff to hard (Fill)		3						6			
		2		21				9	2.8	20	
		2						13	B		
		3						9			
		4	1.0	23				9	4.5	18	
	-5	6	P					13	P		
		4						7			
		5	2.3	28				9	2.8	22	
		6	B					10	B		
		5						9			
		9	3.7	23				7	3.0	19	
	-10	8	B					8	B		
		3									
		4	1.5	31							
		4	B								
		6						5			
		9	2.6	21				10		29	
	-15	10	B					14			
		7									
		10	5.7	18							
		14	B				586.63				
		6			SANDY CLAY LOAM-brown & gray-medium dense (Apparent Fill)						
		6						8			
		6	3.5	21				7	3.0	18	
	-20	9	B					10	P		

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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 F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will DRILLING METHOD Hollow Stem Auger/Rotary HAMMER TYPE CME Automatic

STRUCT. NO. _____ Station _____	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
					Stream Bed Elev. _____ n/a ft
BORING NO. <u>BSB-51</u> Station <u>765+96</u> Offset <u>26.40ft Right</u> Ground Surface Elev. <u>623.63</u> ft					Groundwater Elev.:
					First Encounter <u>Dry to 10.0'</u> ft
					Upon Completion _____ n/a ft
					After _____ Hrs. _____ ft

SANDY CLAY LOAM-brown & gray-medium dense (Apparent Fill) (continued)					
581.63					
CLAY LOAM w/ Gravel-brown-stiff (Apparent Fill)					
	3				
	8			16	
	9				
-45					
576.63					
Drillers Observation: Apparent Bedrock					
575.13					
Borehole continued with rock coring.					
-50					
-55					
-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)



GSI Job No. 13125

ROCK CORE LOG

Page 1 of 1

Date 4/1/14

ROUTE F.A.I.R.T.E. 80 DESCRIPTION I-80 Phase II (Near Term) LOGGED BY NW

SECTION 2013-008B & 2013-009B LOCATION SW 1/4, SEC. 14, TWP. T35N, RNG. R10E, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

STRUCT. NO. _____ CORING BARREL TYPE & SIZE NX Double Swivel-10 ft
 Station _____

BORING NO. BSB-51 Core Diameter 2 in
 Station 765+96 Top of Rock Elev. 576.63 ft
 Offset 26.40ft Right Begin Core Elev. 575.13 ft
 Ground Surface Elev. 623.63 ft

DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
575.13	1	100	34		900.0
-50					
-55					
565.13					
-60					
-65					

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE
 Light gray to gray with horizontal to wavy bedding. Weathered & cherty with numerous horizontal fractures throughout.

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

Color pictures of the cores Yes

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

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

ROCK CORE LOG

PAGE 1 of 1

DATE 4/1/2014

LOGGED BY JK

GSI JOB No. 13125

ROUTE -- DESCRIPTION I-80 Reconstruction (Near Term Phase 2)

SECTION -- LOCATION SEC 14, T35N, R10E, SW 1/4, 3rd PM

COUNTY Will CORING METHOD Rotary Wash

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

Station -- Core Diameter 2.0 in

BORING NO. **BSB-51** Top of Rock Elev. 576.6

Station 765+96 Begin Core Elev. 575.1

Offset 26.4' Right

Ground Surface Elev. 623.63

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

SILURIAN SYSTEM, NIAGARAN SERIES DOLOMITE

RUN 1 (-48.5' to -58.5')

Light gray to gray with horizontal to wavy bedding. Weathered & cherty with numerous horizontal fractures throughout.

-53.5

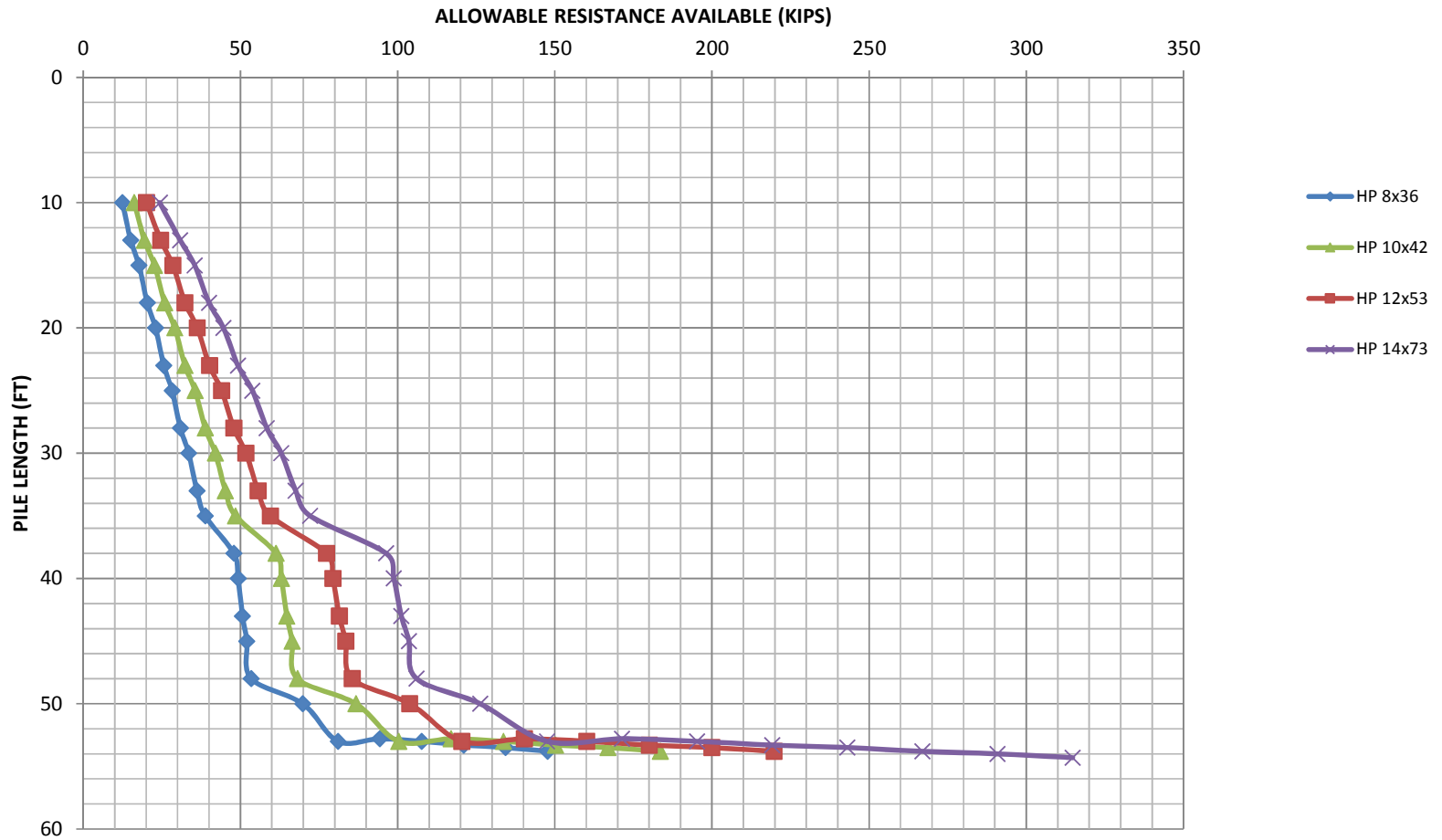
-58.5

	1	100.0	34.0	n/a	900 @ -48.9'
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APPENDIX 9
PILE CAPACITY & LENGTH TABLES

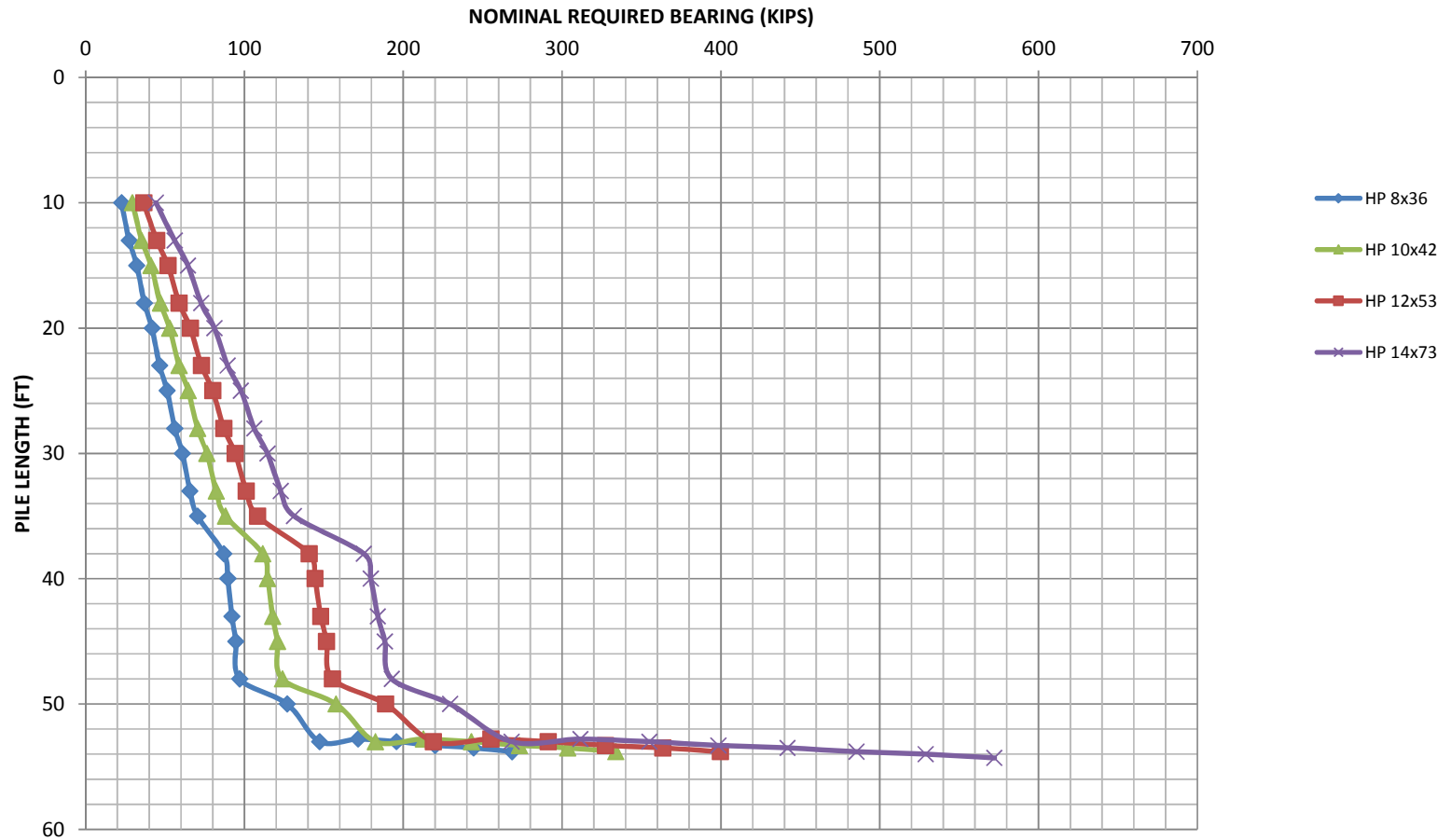
PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH
BORING BSB-33 West Abut. Sta. 759+64
Elevation 596.0 Begin Friction, 597.5 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

BORING BSB-33 West Abut. Sta. 759+64

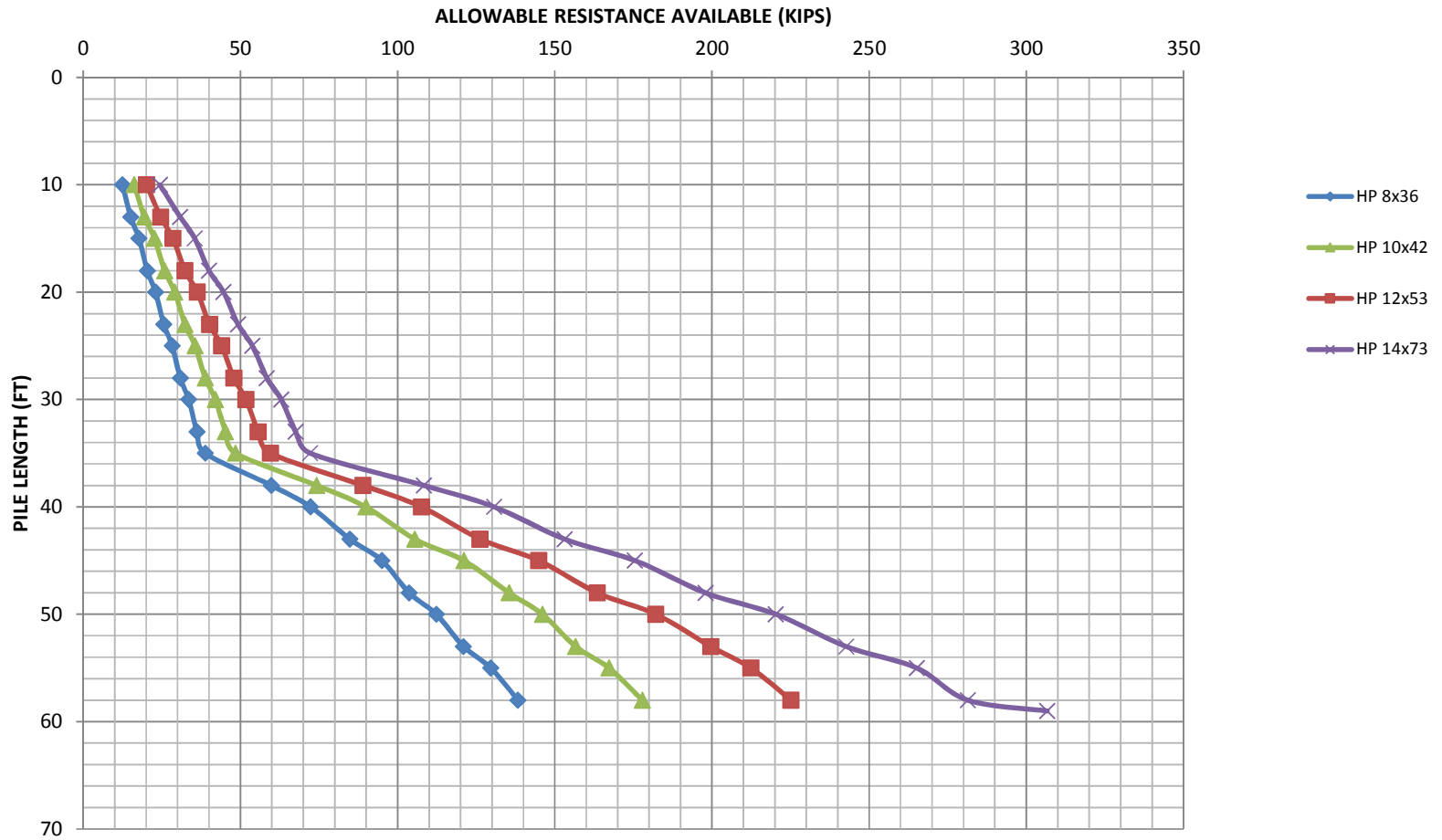
Elevation 596.0 Begin Friction, 597.5 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH

BORING BSB-34 East Abut. Sta. 759+64

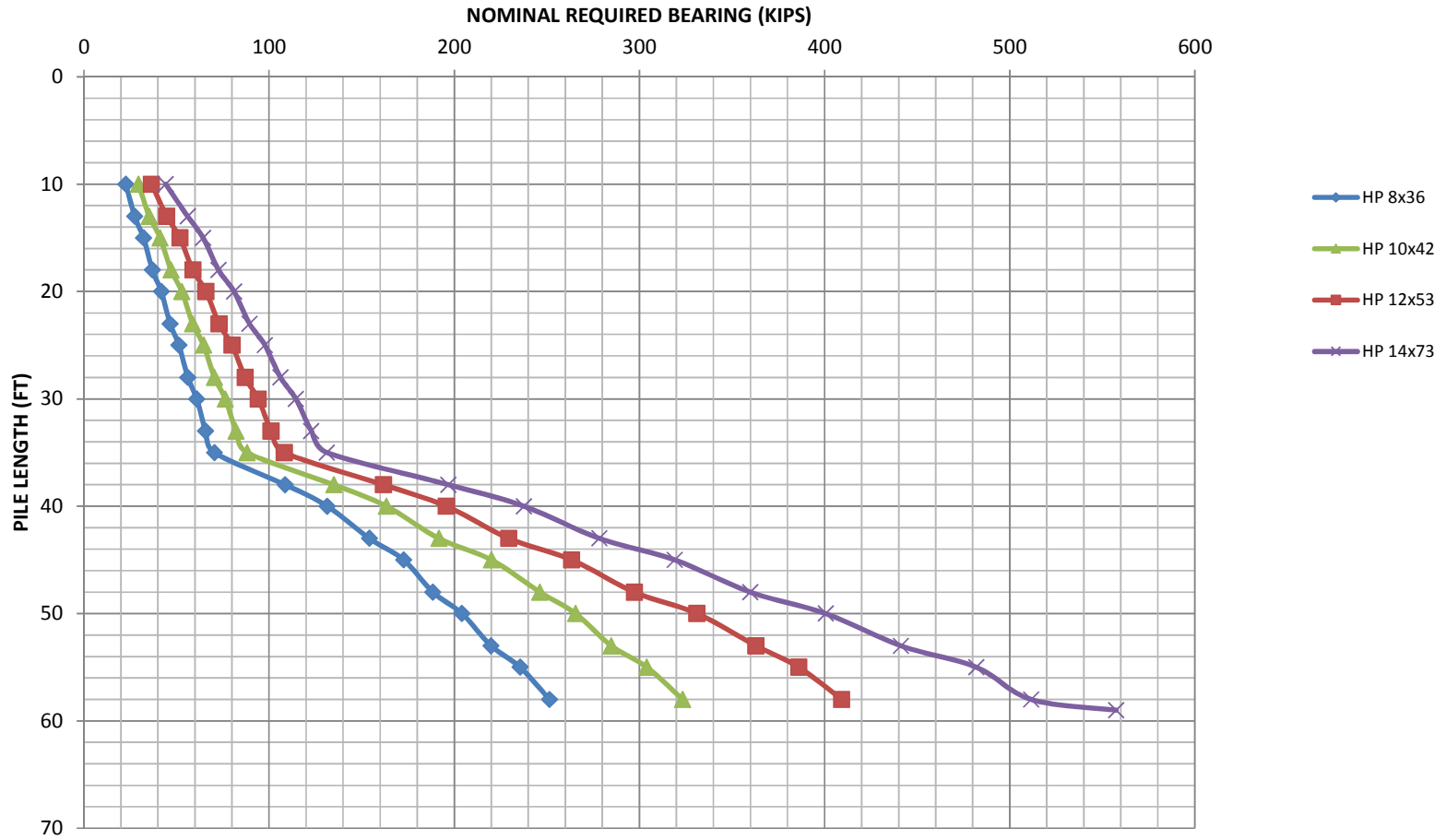
Elevation 598.7 Begin Friction, 600.2 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

BORING BSB-34 East Abut. Sta.759+64

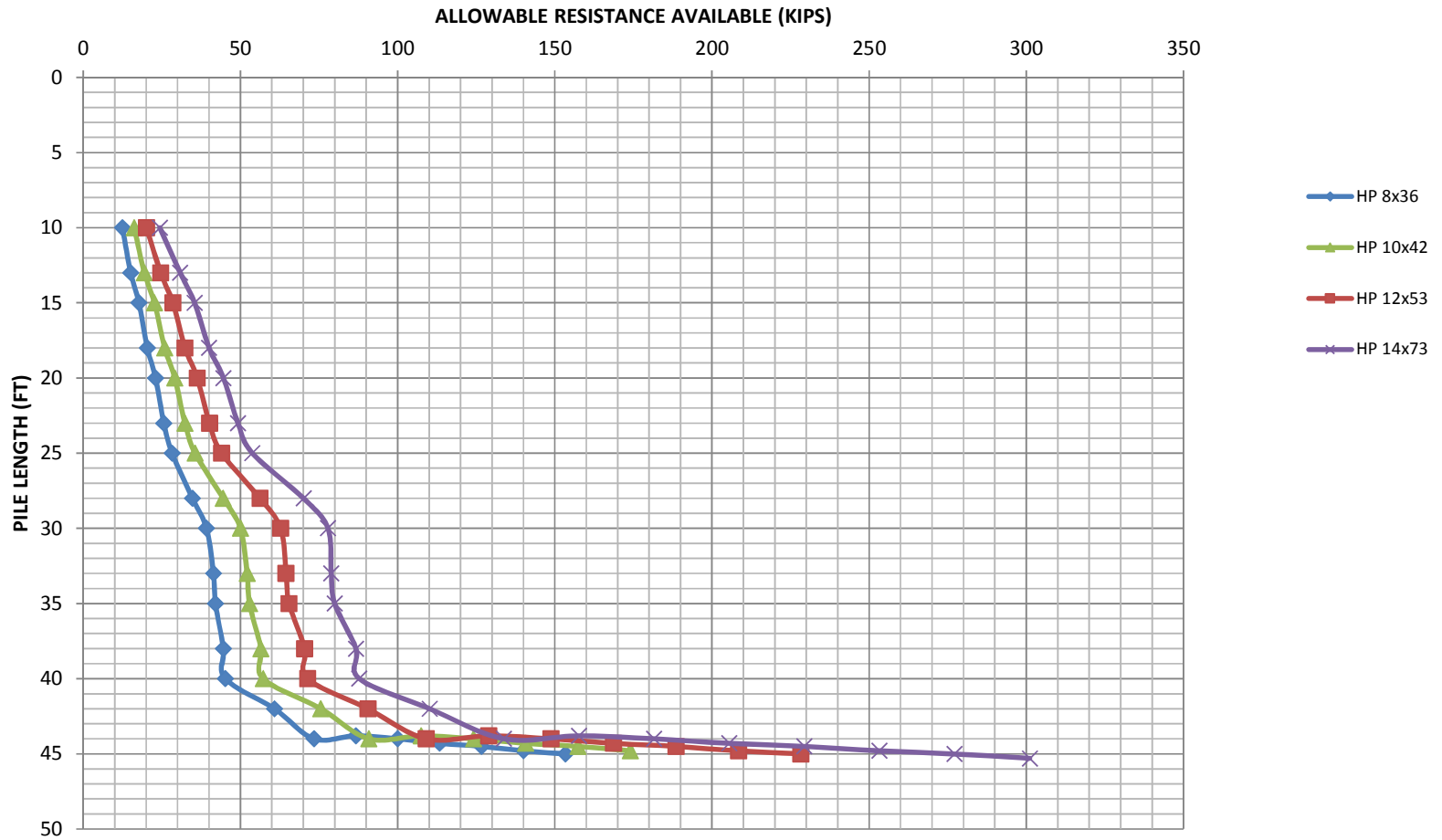
Elevation 598.7 Begin Friction, 600.2 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH

BORING BSB-50, East Abut. Sta. 759+64

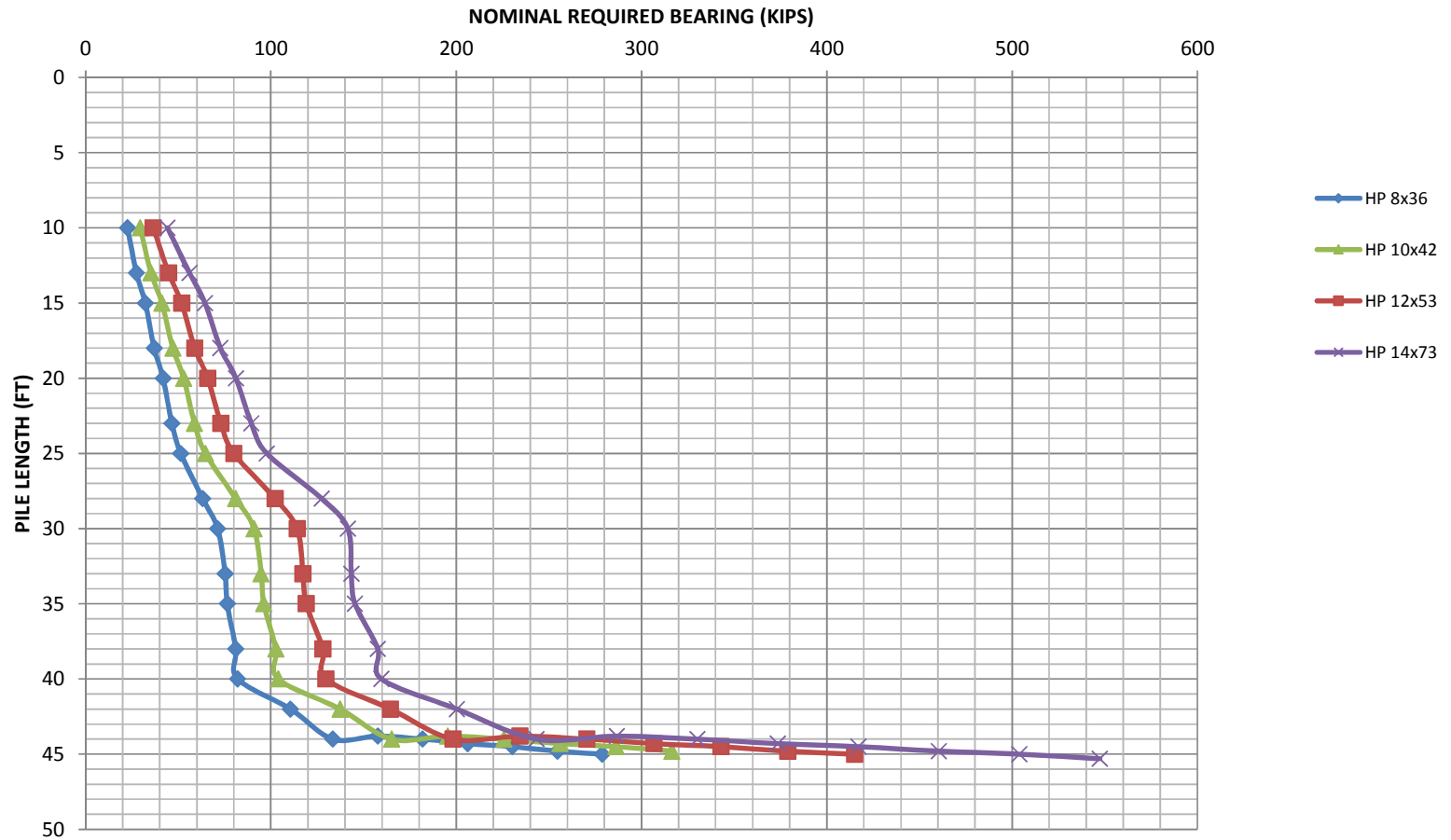
Elevation 616.6 Begin Friction, 618.1 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

BORING BSB-50 East Abut. Sta. 759+64

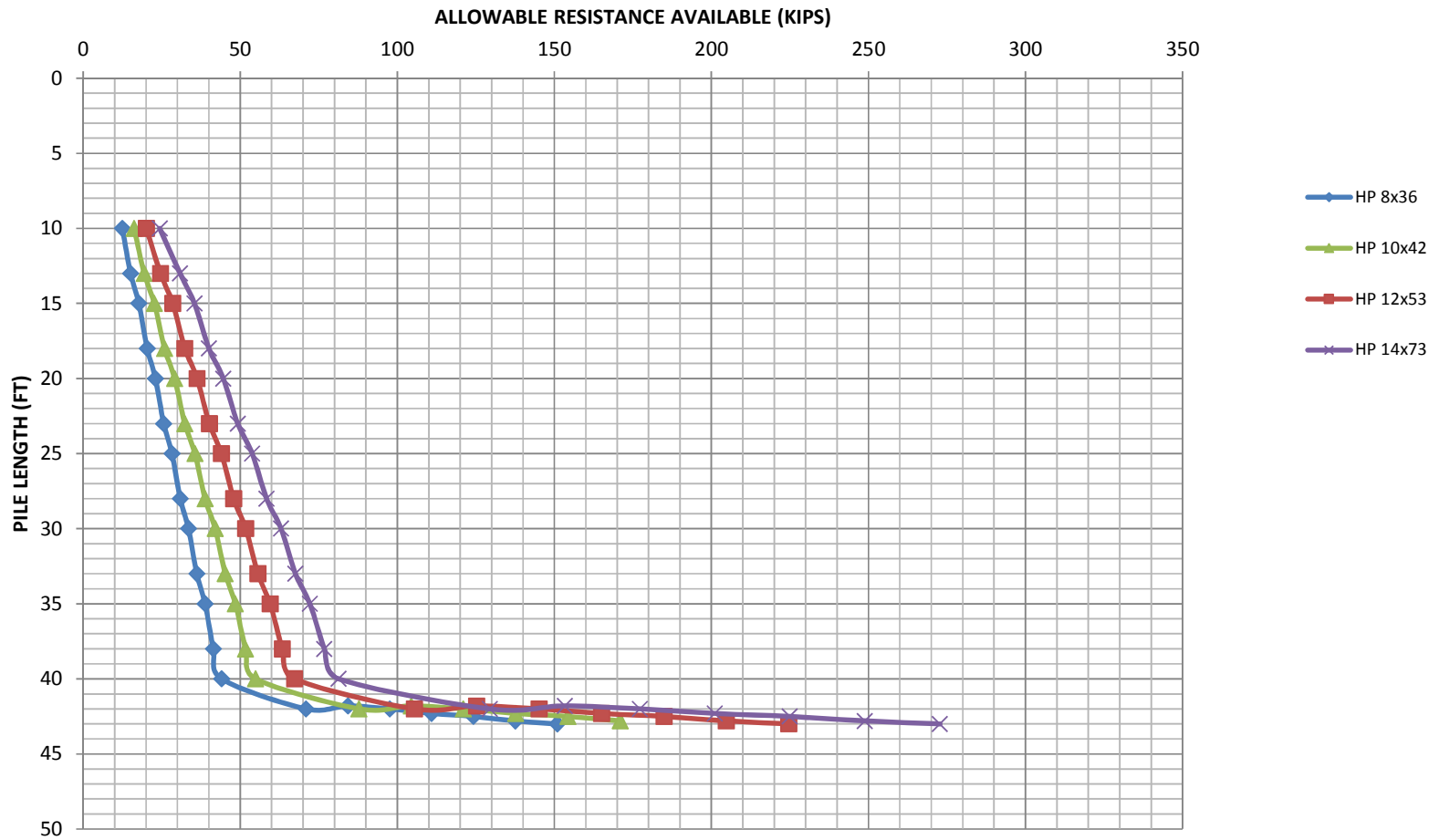
Elevation 616.6 Begin Friction, 618.1 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (FRA) VS. ESTIMATED PILE LENGTH

BORING BSB-51 East Abut. Sta. 759+64

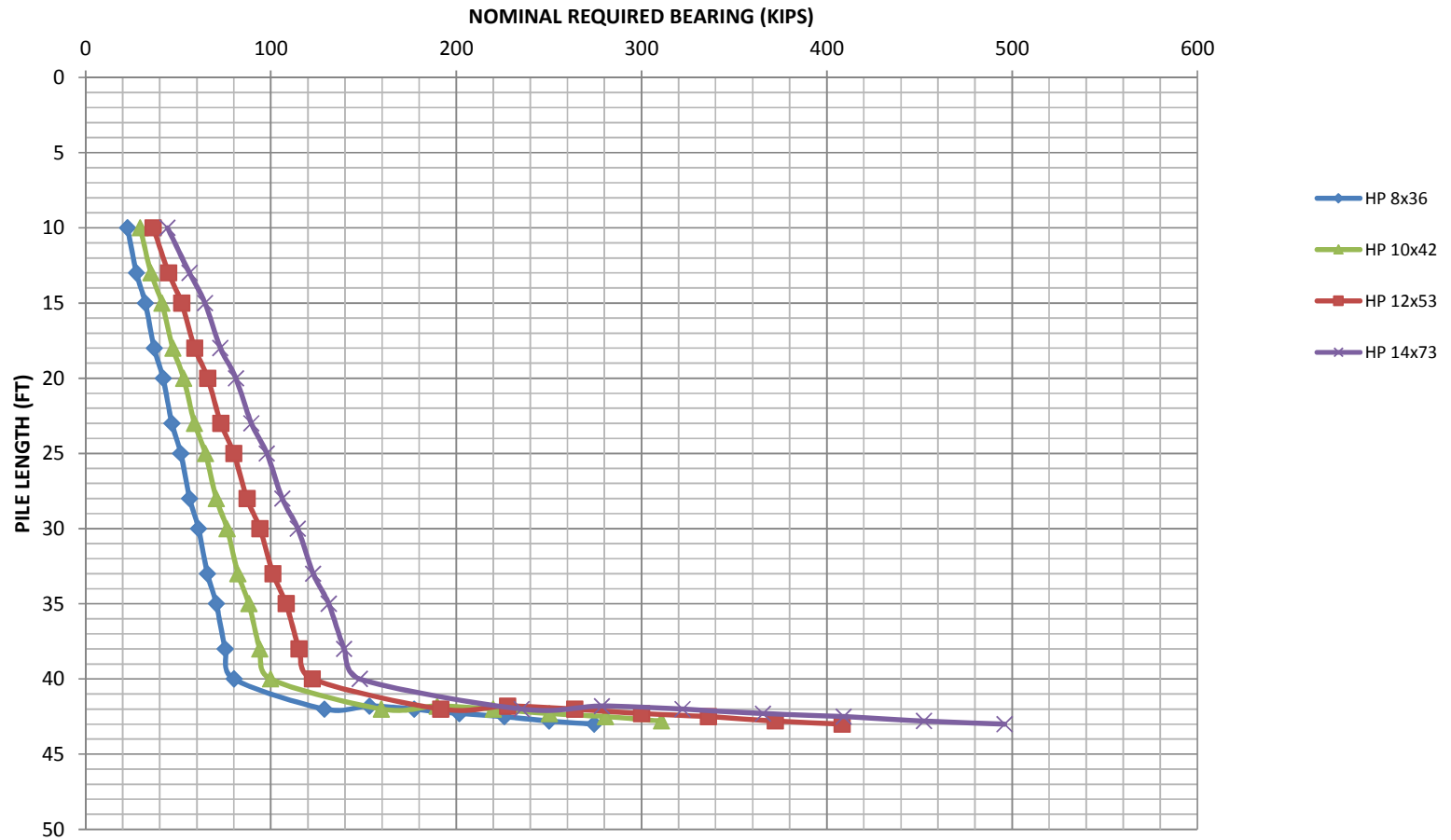
Elevation 617.4 Begin Friction, 618.9 for Pile Cutoff (pile length = 0.0 feet)



PILE BEARING (NRB) VS. ESTIMATED PILE LENGTH

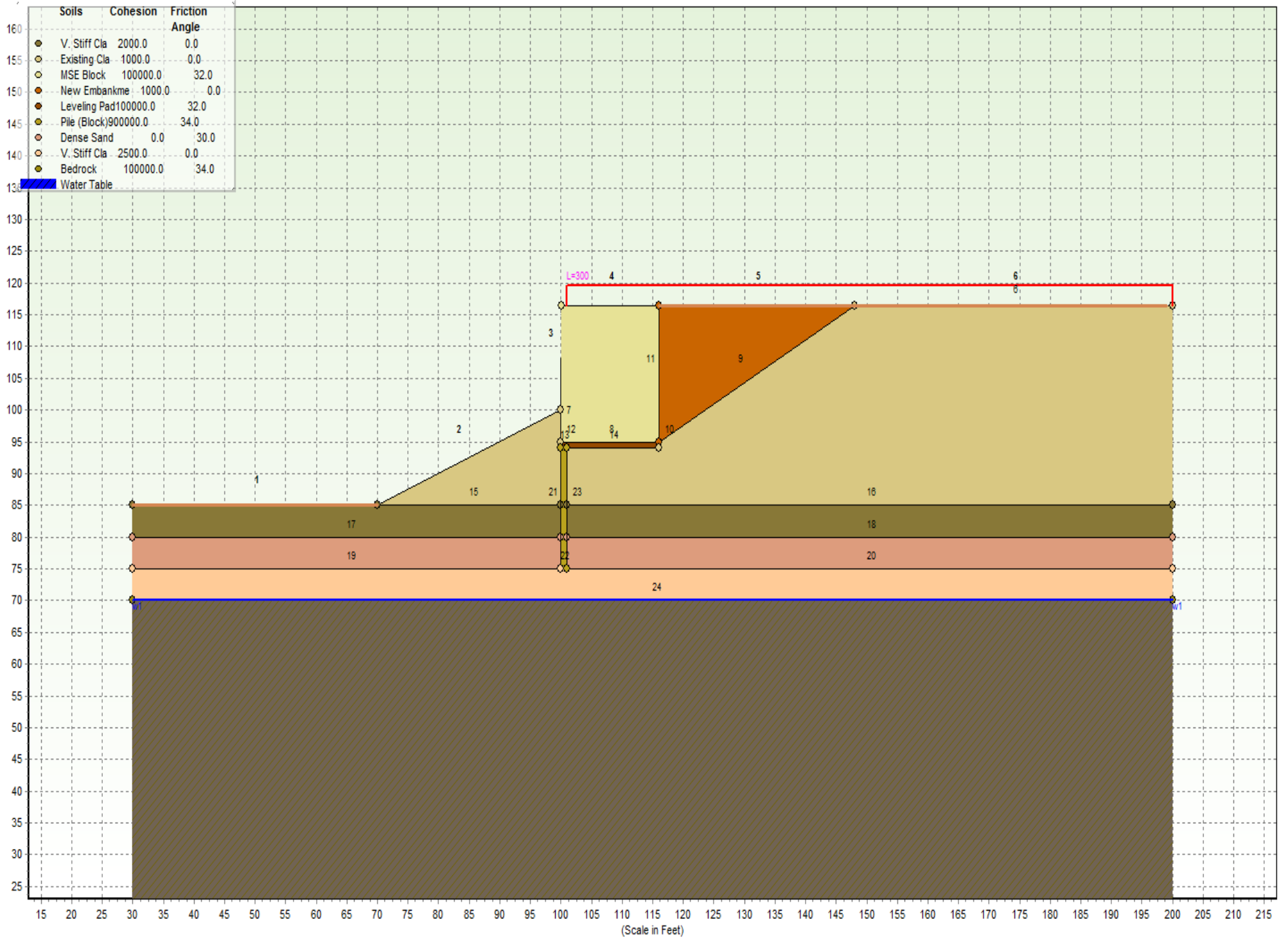
BORING BSB-51 East Abut. Sta. 759+64

Elevation 617.4 Begin Friction, 618.9 for Pile Cutoff (pile length = 0.0 feet)

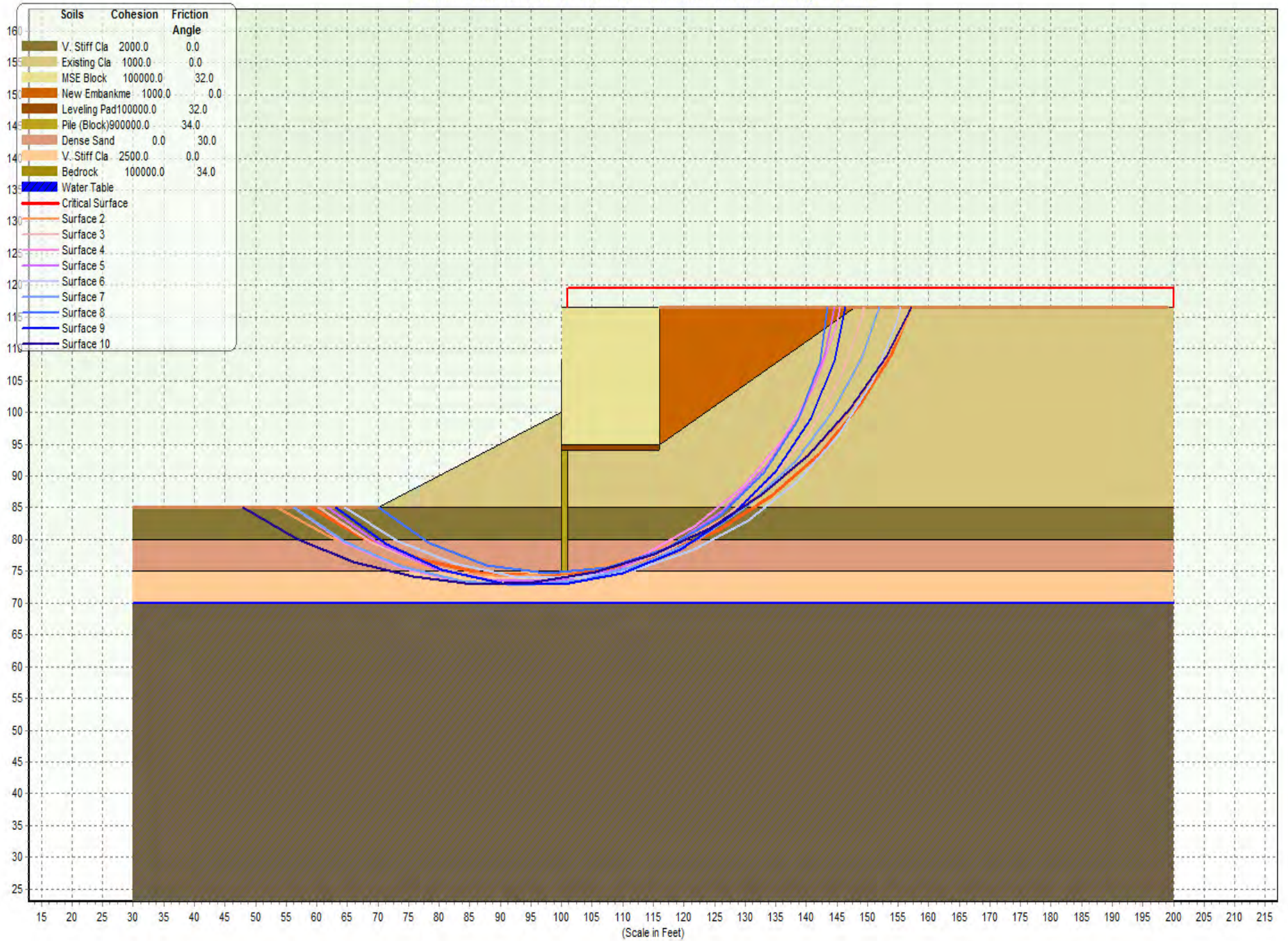


APPENDIX F
SLOPE STABILITY (STABL) RESULTS

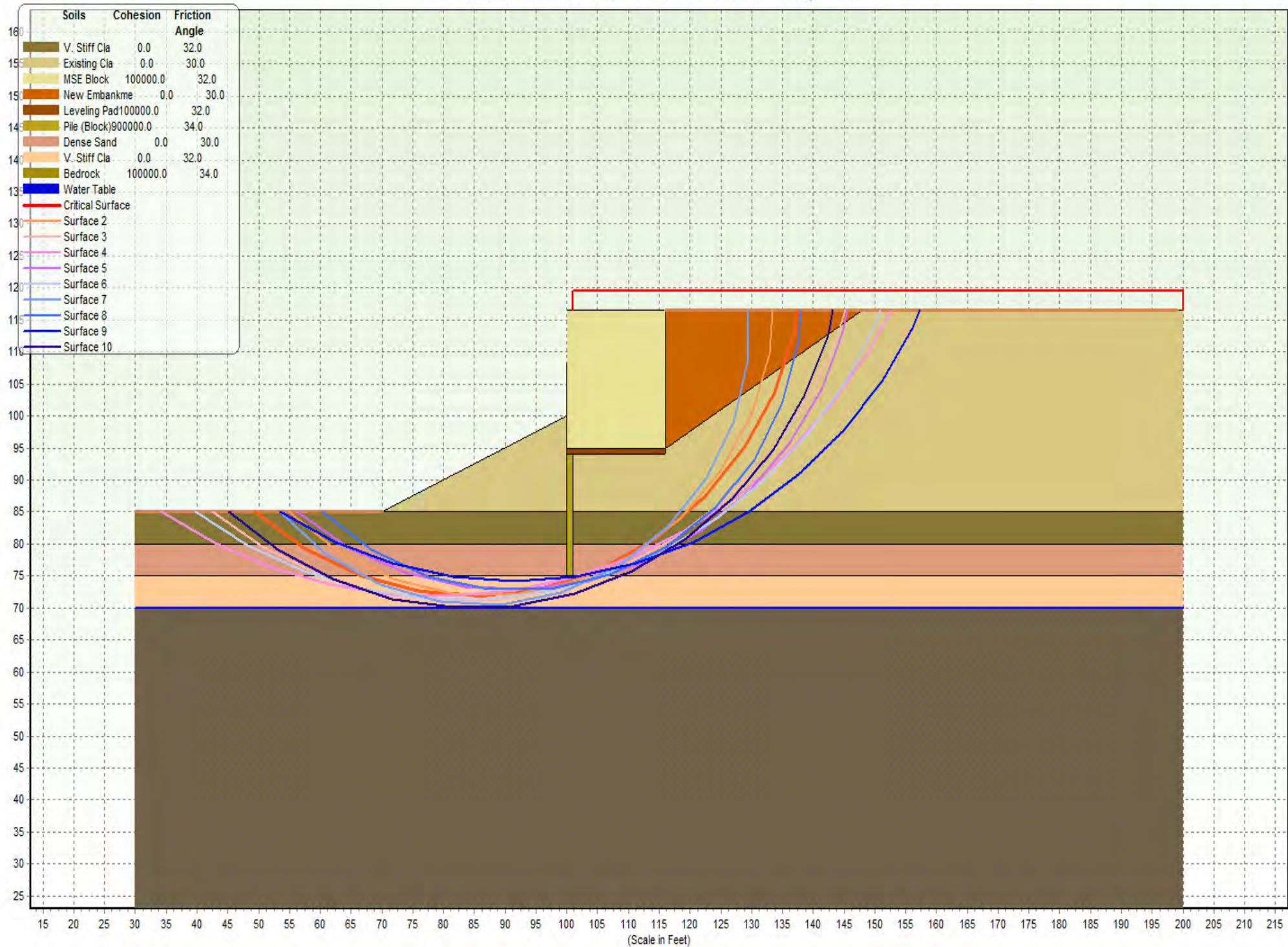
Problem: I-80 over Rowell BSB-50 Undrained



Problem: I-80 over Rowell BSB-50 Undrained - FS Min- Bishop = 2.355



Problem: I-80 over Rowell BSB-50 Drained - FS Min- Bishop = 1.878



APPENDIX G
LAB TESTING DATA

Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 AASHTO T89/T90

Project Name I-80 Phase II

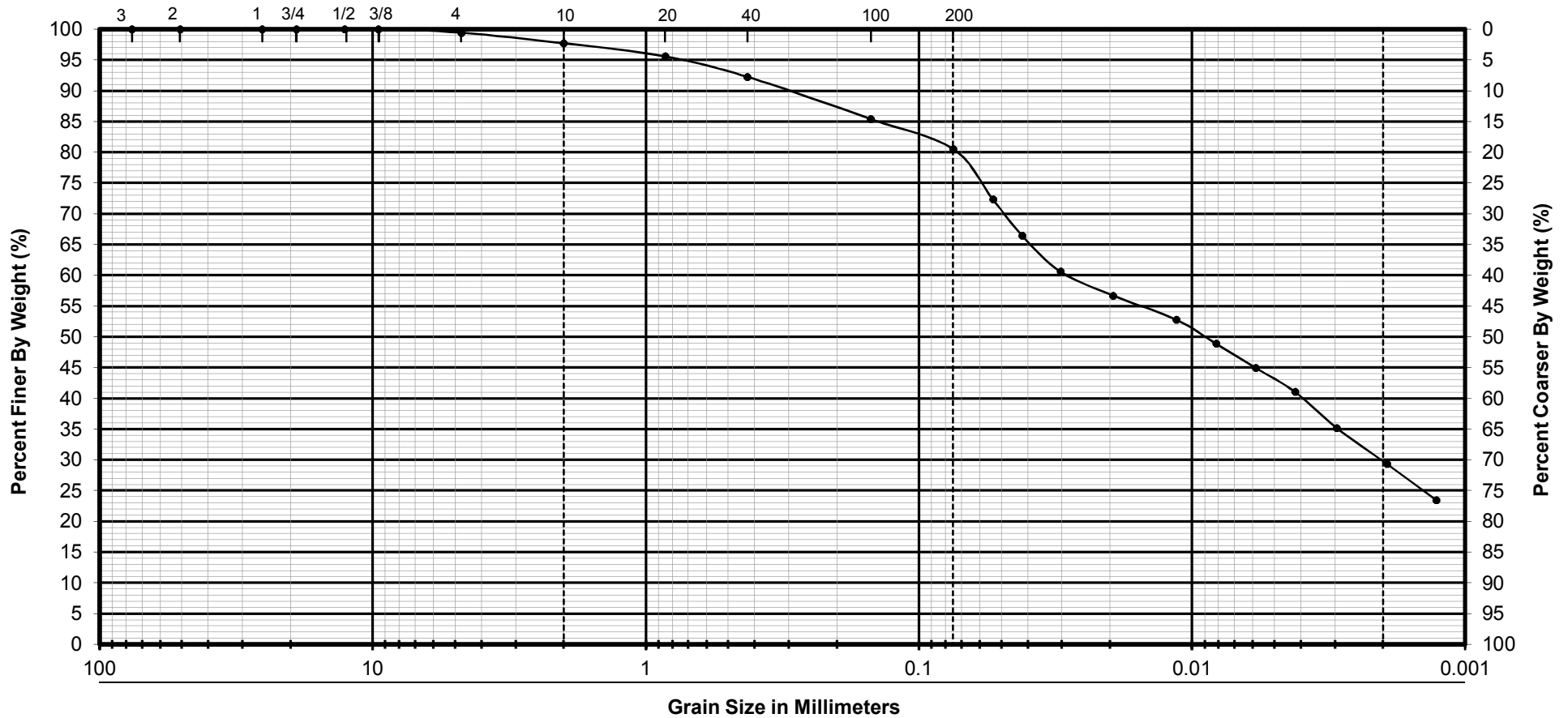
Job No 13125

Location Will County, Illinois


Date 5/8/14

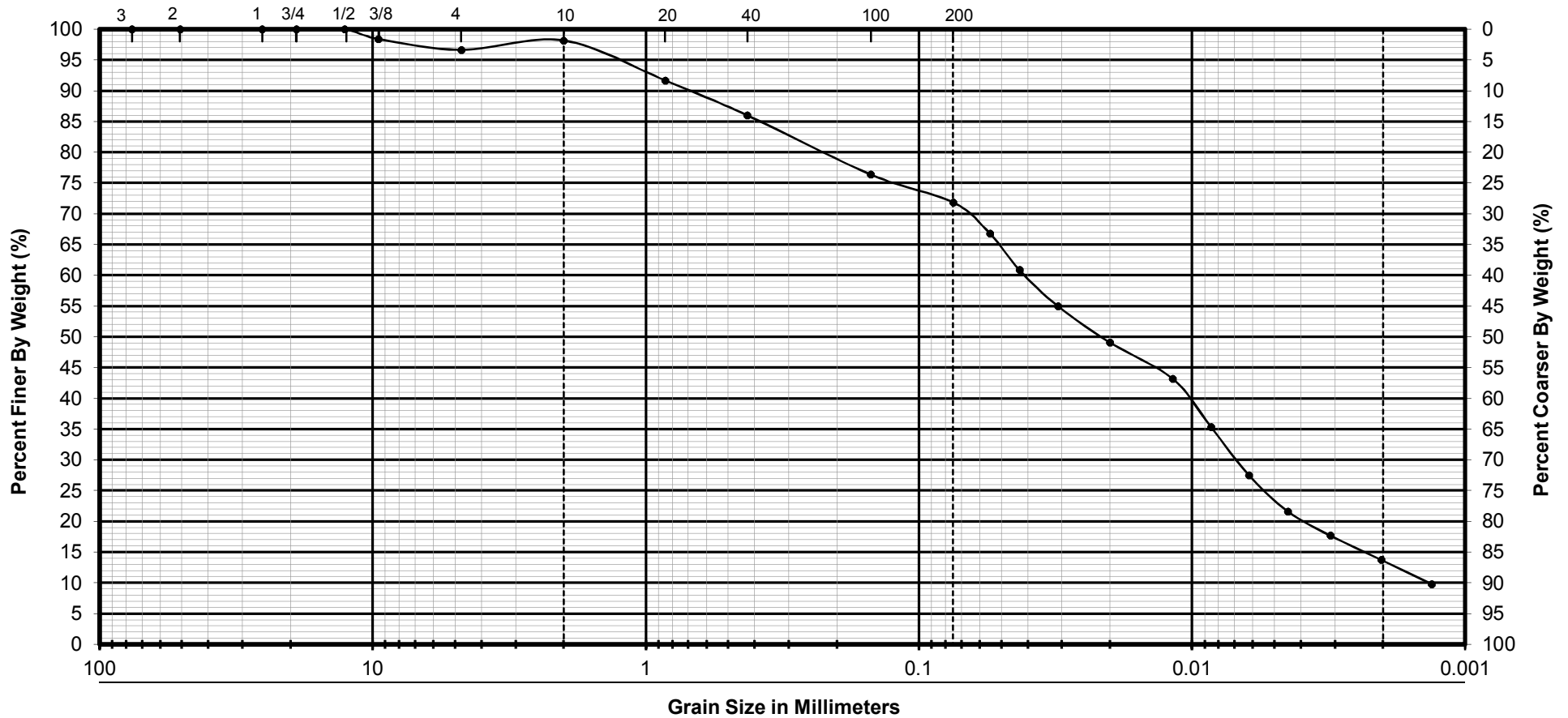
SAMPLE NO.	BSB-35	BSB-36					
DEPTH	5.0'-8.0'	6.0'-7.5'					
LIQUID LIMIT (LL)	43	58					
PLASTIC LIMIT (PL)	52	56					
PLASTICITY INDEX (PI)	2	2					

Test by JE




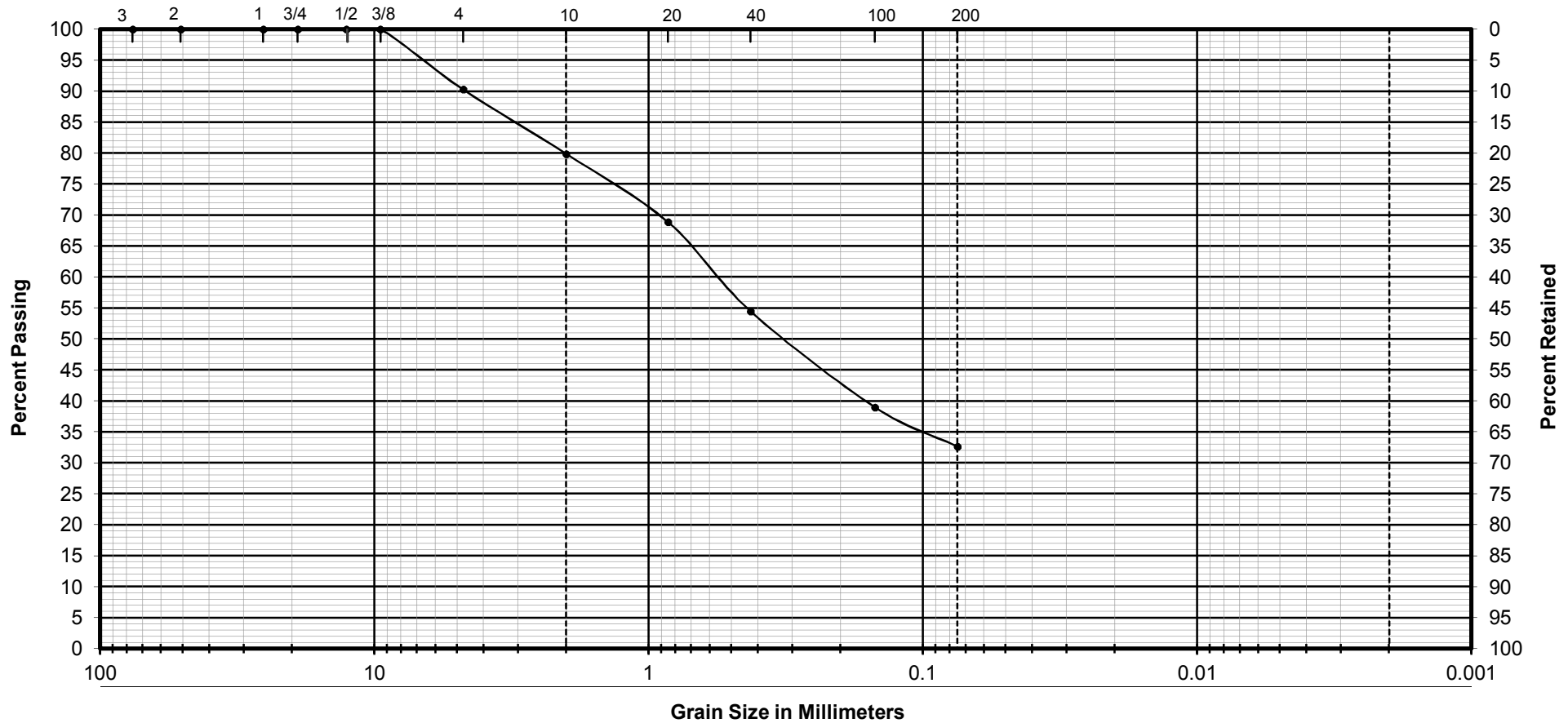
GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-33	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	24 & 25	SILTY CLAY LOAM A-6 brown Group Index 8 % Gravel 2.3 % Sand 17.2 % Silt 51.2 % Clay 29.3	I-80 Phase II Will County, Illinois  Geo Services, Inc. <small>Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm</small> 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	57.5'-60.0'		
Liquid Limit	30		
Plastic Limit	18		
Plasticity Index	12		
Test By	CC/NOB		
Date	6/17/14		
Reviewed By	RR		
Job No	13125		




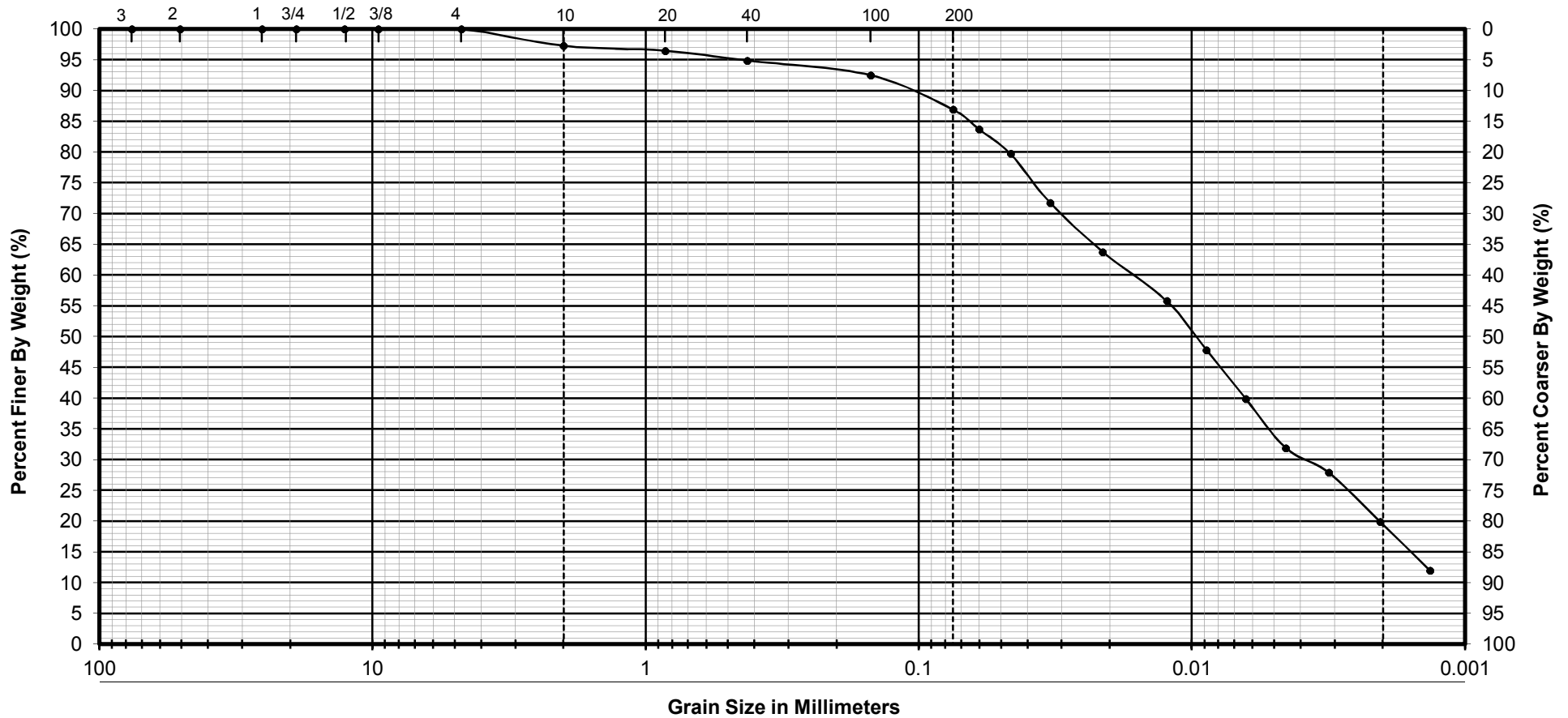
GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-35	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	3	ORGANIC SILTY LOAM A-7 dark brown Group Index 8 % Gravel 1.8 % Sand 26.3 % Silt 58.1 % Clay 13.7	I-80 Phase II Will County, Illinois  Geo Services, Inc. <small>Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm</small> 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	3.5'-5.0'		
Liquid Limit	41		
Plastic Limit	30		
Plasticity Index	11		
Test By	CC/NOB		
Date	6/17/14		
Reviewed By	RR		
Job No	13125		




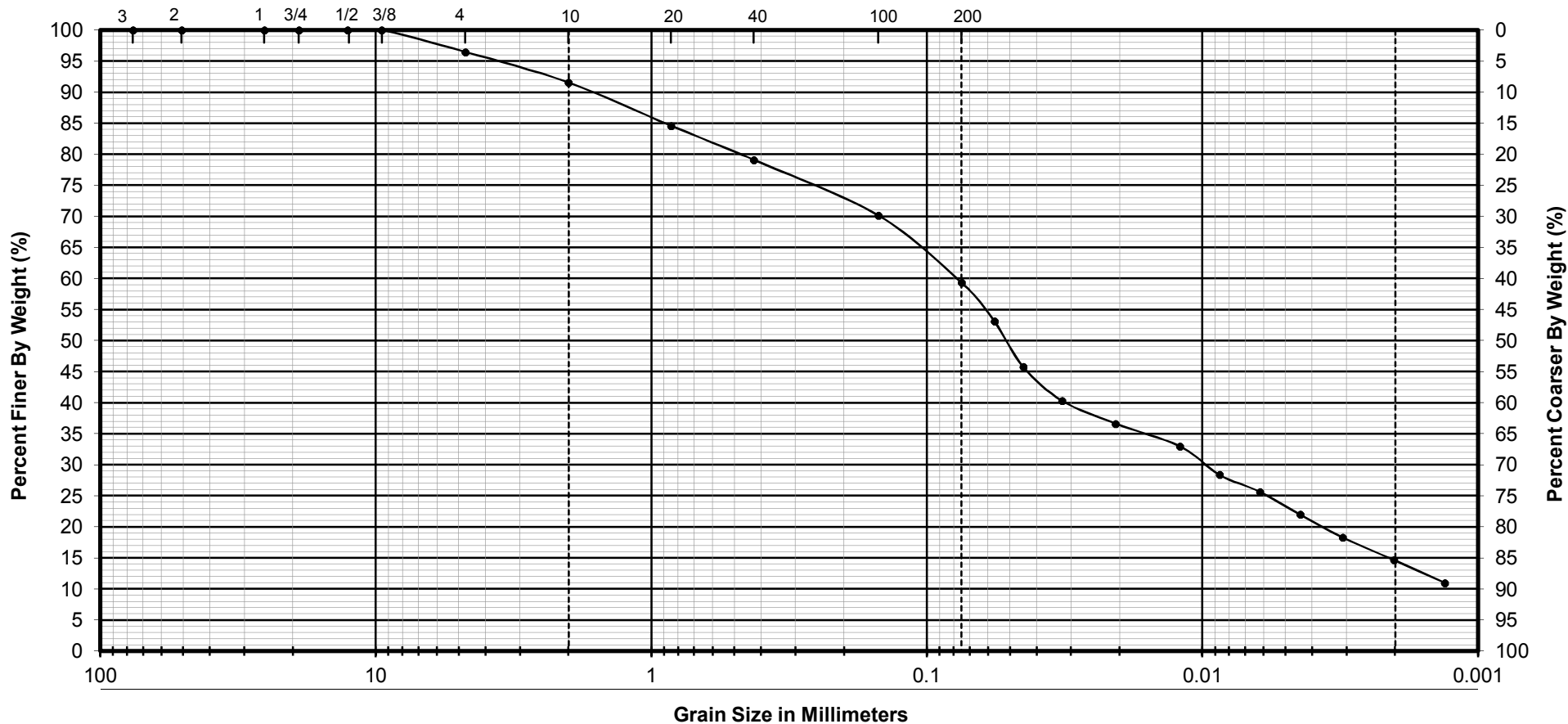
GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-35	CLASSIFICATION	GRAIN-SIZE ANALYSIS-AASHTO T 311
Sample No.	3 & 4	ORGANIC SANDY LOAM A-8 dark brown Group Index 0 % Gravel 20.1 % Sand 47.2 % Silt / Clay 32.6	I-80 Phase II Will County, Illinois  Geo Services, Inc. <small>Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm</small> 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	5.0'-8.0'		
Liquid Limit	-		
Plastic Limit	-		
Plasticity Index	-		
Test By	JE/CC		
Date	6/19/14		
Reviewed By	RR		
Job No	13125		




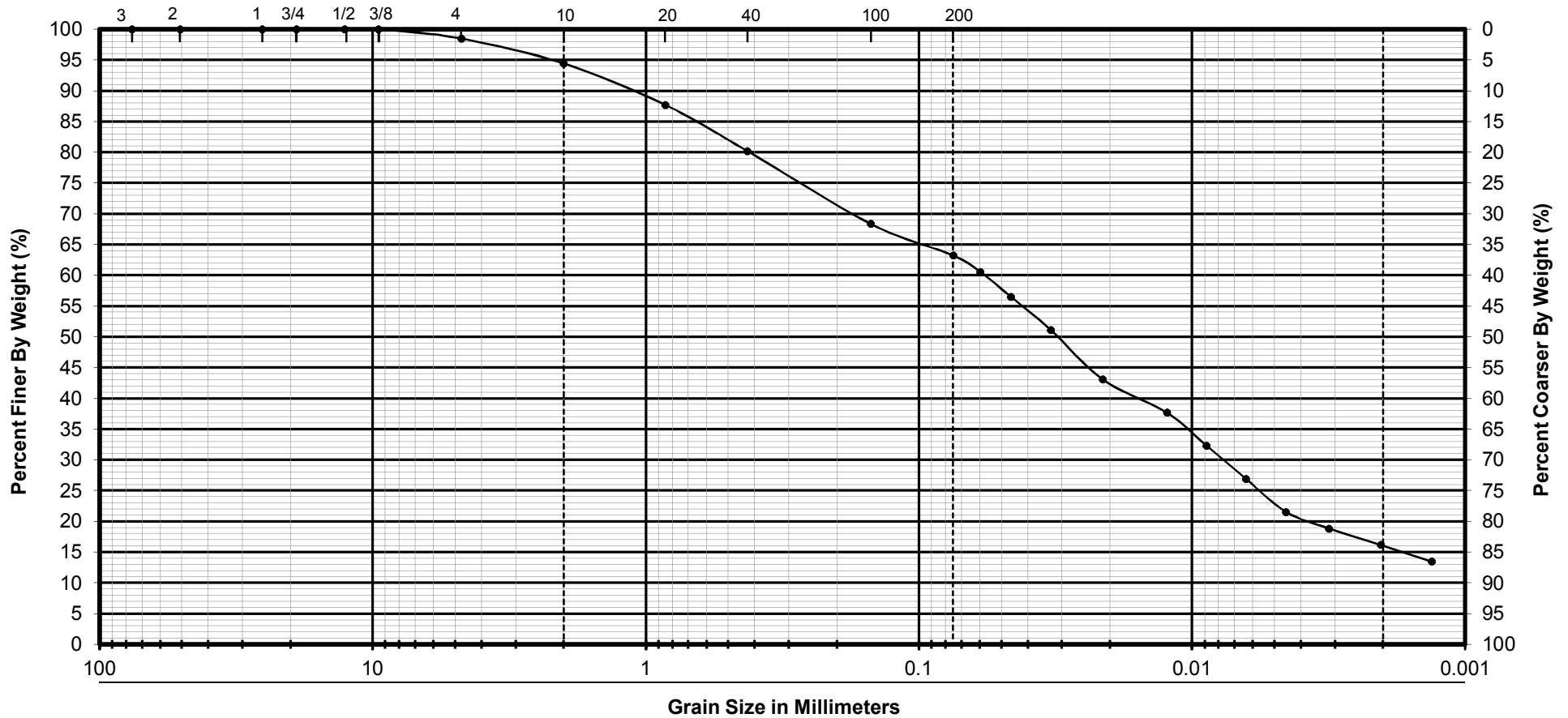
GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-35	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	5	ORGANIC SILTY LOAM A-7 gray Group Index 15 % Gravel 2.7 % Sand 10.4 % Silt 67.0 % Clay 19.9	I-80 Phase II Will County, Illinois  Geo Services, Inc. <small>Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm</small> 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	8.0'-10.0'		
Liquid Limit	53		
Plastic Limit	41		
Plasticity Index	12		
Test By	CC/NOB		
Date	6/17/14		
Reviewed By	RR		
Job No	13125		




GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-36	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	3 & 4	LOAM A-4 brown/gray Group Index 0 % Gravel 8.4 % Sand 32.2 % Silt 44.7 % Clay 14.6	I-80 Phase II Will County, Illinois  Geo Services, Inc. Geotechnical, Environmental and Civil Engineering An MBE - DBE Firm 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	3.5'-8.0'		
Liquid Limit	-		
Plastic Limit	-		
Plasticity Index	-		
Test By	CC/NOB		
Date	6/17/14		
Reviewed By	RR		
Job No	13125		



GRAVEL	SAND		SILT	CLAY
	COARSE	FINE		

Boring No.	BSB-41	CLASSIFICATION	PARTICLE SIZE ANALYSIS-AASHTO T88
Sample No.	17 & 18	ORGANIC LOAM A-7 brown/black Group Index 7 % Gravel 5.6 % Sand 31.2 % Silt 47.1 % Clay 16.1	I-80 Phase II Will County, Illinois  Geo Services, Inc. <small>Geotechnical, Environmental and Civil Engineering</small> <small>An MBE - DBE Firm</small> 1235 E. Davis St., Arlington Heights, IL 60005 Phone 847-253-3845 • Fax 847-253-0482
Depth	38.0'-42.0'		
Liquid Limit	-		
Plastic Limit	-		
Plasticity Index	-		
Test By	CC/NOB		
Date	6/17/14		
Reviewed By	RR		
Job No	13125		



1235 E. DAVIS STREET
ARLINGTON HEIGHTS, IL 60005
(847) 253-3845 FAX (847) 253-0482

**DETERMINATION of ORGANIC CONTENT in SOILS by LOSS on IGNITION
AASHTO T267**

Project Name I-80 Phase II

Date 5/9/14

Location Will County, Illinois

Job No 13125

Boring No	BSB-33	BSB-36
Sample No.	44	4
Depth	58.5'-60.0'	6.0'-7.5'
Sample Description		
% Organic Content	16.2	24.1

Tested By JE



**1235 E. DAVIS STREET
 ARLINGTON HEIGHTS, IL 60005
 (847) 253-3845 FAXES (847) 253-0482**

**Organic Matter in Soils by Wet Combustion
 AASHTO T 194**

Project Name I-80 Phase II

Date 6/19/14

Location Will County, Illinois

Job No 13125

Sample Location	BSB-33	BSB-35	BSB-35	BSB-35	BSB-36	BSB-41		
Sample No	24 & 25	3	3 & 4	5	3 & 4	17 & 18		
Depth	57.5'-60.0'	3.5'-5.0'	5.0'-8.0'	8.0'-10.0'	3.5'-8.0'	38.0'-41.0'		
Total Organic Matter %	0.5	4.0	7.8	8.1	1.0	8.2		

Comments: -

Performed by: JE



1235 E. Davis Street
 Arlington Heights, Illinois 60005
 Phone: (847) 253-3845 Fax: (847) 253-0482

UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS - ASTM D 7012

Project Name I-80 Reconstruction (Near Term Phase 2)
 Location Various
 County Will
 Sample Type Drilled Bedrock Core Sample

Date 11/7/13
 Job No. 13125
 Tested By: RWC

Sample No.	Depth (ft)	Length (in)	Diameter (in)	Weight (g)	Load (lbs)	Area (in ²)	Unit Weight (lbs ft ³)	Compressive Strength	
								(tsf)	(psi)
BSB-33 Run 1	61.4	4.088	2.064	582.2	55000	3.35	162.1	1184	16438
BSB-34 Run 1	65.3	4.084	2.060	605.2	48020	3.33	169.3	1037	14408
BSB-35 Run 1	13.7	4.115	2.053	578.4	43990	3.31	161.7	957	13289
BSB-36 Run 1	15.1	4.081	2.048	574.5	53570	3.29	162.7	1171	16262
BSB-37 Run 1	49.1	4.111	2.056	572.2	40920	3.32	159.7	888	12331
BSB-38 Run 1	49.7	4.068	2.045	563.3	29360	3.28	160.5	644	8939
BSB-39 Run 1	48.2	4.094	2.046	543.1	26380	3.29	153.7	578	8026
BSB-40 Run 1	49.8	4.074	2.050	576.2	50040	3.30	163.2	1092	15161
BSB-41 Run 1	52.5	4.075	2.036	560.5	37600	3.26	160.9	832	11549
BSB-42 Run 1	41.5	4.025	1.989	541.1	30650	3.11	164.8	710	9864
BSB-43 Run 1	52.3	4.035	2.046	555.3	42900	3.29	159.5	940	13055
BSB-44 Run 1	50.0	4.091	2.048	564.6	51220	3.29	159.5	1119	15549
BSB-45 Run 1	48.3	4.081	2.040	543.7	27120	3.27	155.2	597	8297
BSB-45 Run 2	54.6	4.091	2.045	554.3	43150	3.28	157.1	946	13137
BSB-46 Run 1	14.8	4.100	2.057	594.3	54100	3.32	166.1	1172	16279
BSB-47 Run 1	15.7	4.114	2.063	603.0	72700	3.34	167.0	1566	21749
BSB-48 Run 1	16.5	4.105	2.056	607.2	66880	3.32	169.6	1450	20145
BSB-49 Run 1	13.2	4.103	2.057	559.2	26030	3.32	156.2	564	7833
BSB-50 Run 1	53.7	4.169	2.101	608.7	43650	3.47	160.3	906	12588
BSB-51 Run 1	48.9	4.039	2.045	557.0	41050	3.28	159.9	900	12498