STRUCTURE GEOTECHNICAL REPORT
INTERSTATE 80 BRIDGES OVER HOUBOLT ROAD
EX SNS 099-0301 AND 099-0302
PR SNS 099-0301 AND 099-0302
WILL COUNTY, ILLINOIS

For
TranSystems Corporation
1475 East Woodfield Road, Suite 600
Schaumburg, IL 60173

Submitted by
Wang Engineering, Inc.
1145 North Main Street
Lombard, IL 60148

Original Report: December 9, 2021
Revised Report: January 11, 2022, August 29, 2022, August 31, 2022

Technical Report Documentation Page

<table>
<tr><td colspan="2">1. Title and Subtitle
Structure Geotechnical Report
Interstate 80 Bridges Over Houbolt Road</td><td>2. Original Date: December 9, 2021
Revised Date: January 11, 2022
August 29, 2022
August 31, 2022
3. Report Type ☒ SGR ☐ RGR
☒ Draft ☐ Final ☒ Revised</td></tr>
<tr><td colspan="2">4. Route / Section / County/ District/ Region
F.A.I 80 / NA / Will / 1 / 1</td><td>5. IDOT Project No. / Contract No.
D-91-207-19 / 62R27</td></tr>
<tr><td>6. PTB / Item No.
194/011</td><td>7. Existing Structure Number(s)
SN 099-0301 and SN 099-0302</td><td>8. Proposed Structure Number(s)
SN 099-0301 and SN 099-0302</td></tr>
<tr><td>9. Prepared by
Wang Engineering, Inc.
1145 N Main Street
Lombard, IL 60148</td><td>Contributor(s)
Author: Azza Hamad, PE
Nesam Balakumaran, P.Eng
QC/QA: Corina Farez, PE, PG
PM: Azza Hamad, PE</td><td>Contact
(630) 953-9928 ext. 1035
ahamad@wangeng.com</td></tr>
<tr><td>10. Prepared for
TranSystems Corporation
1475 East 6001301
Schaumburg, IL, 60173</td><td>Design Engineer
Martin Ross, PE</td><td>Contacts
(847) 407-5821
maross@transystems.com</td></tr>
</table>

11. Abstract

The existing bridges carrying Interstate 80 over Houbolt Road will be widened by about 24.3 feet in both eastbound and westbound directions. The single-span structures will have back-to-back of abutments lengths of 149.1 feet and out-to-out widths of 69.5 feet. The proposed east and west abutment cap base elevations range from 593.59 to 594.07 feet. A combination of concrete slope walls graded at slopes of 1:2 and soldier-pile walls is proposed in front of each of the abutments. This report provides geotechnical recommendations for the design and construction of the proposed substructure widenings.

The pavement structure along I-80 consists of 15 inches of concrete overlying 6 to 24 inches of aggregate base. About 17 to 18 inches of silty clay loam topsoil were measured within the I-80 median. Beneath the pavement or topsoil, the general lithologic profile includes up to 18.0 feet of existing embankment fill consisting of stiff to hard silty clay to silty clay loam followed by up to 10.0 feet of stiff to hard silty clay and silty clay loam overlying loose to very dense sand to sandy gravel and dense to very dense silty loam. Dolostone bedrock was encountered at elevations of about 558.0 to 557.0 feet. The groundwater level was measured at elevations ranging from 580 to 576 feet.

The widened approach embankments behind the east and west abutments will undergo an estimated 0.2 inch of total long-term settlement. Global stability analyses at the embankments show factors of safety meeting the IDOT minimum requirement of 1.5. The maximum allowable soil bearing capacity for the design of approach slab footings is 2,000 psf.

The widened sections of the bridge abutments could be supported on driven piles similar to the existing abutments. To support the integral abutments, driven HP12x53, HP12x74, HP14x73, and HP14x89 steel piles will provide 139 to 235 kips of allowable resistance at total lengths of 28 to 41 feet. We do not anticipate the need for downdrag allowances on the piles.

The construction of the proposed widened abutments will require temporary shoring of the excavations. It is recommended to include the Pay Item *Temporary Soil Retention Systems.*

12. Path to archived file

N:_WANGLegacy\SHARED\Netprojects\79011501\Reports\SGRs\Bridges\I-80 Over Houbolt Road\RPT_Wang_AZH_79011501_I80OverHouboltRoadBridgesSGR_V04_20220831.doc

TABLE OF CONTENTS

List of Tables

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

STRUCTURE GEOTECHNICAL REPORT
INTERSTATE 80 BRIDGES OVER HOUBOLT ROAD
EX SNS 099-0301 AND 099-0302
PR SNS 099-0301 AND 099-0302
WILL COUNTY, ILLINOIS
FOR
TRANSYSTEMS CORPORATION

1.0 INTRODUCTION

This report presents the results of our subsurface investigation, laboratory testing, geotechnical evaluations, and recommendations in support of the widening of the existing bridges carrying eastbound and westbound Interstate 80 (I-80) over Houbolt Road in Will County, Illinois. On the USGS *Channahon Quadrangle 7.5 Minute Series* map, the project is located in the NE 1/4 of Section 26, Tier 35 N, Range 9 E of the Third Principal Meridian (Exhibit 1). The bridge widenings are part of the proposed widening and reconstruction of I-80 from Houbolt Road to west of Center Street and Larkin Avenue Interchange in Will County, Illinois. These bridges will be widened as part of Contract ML-3.

The purpose of this investigation was to characterize the site soil and groundwater conditions, perform geotechnical analyses, and provide recommendations for the design and construction of the proposed substructure widenings.

1.1 Existing Structure and Ground Conditions

Based on the *Bridge Condition Report (BCR)*, dated February 27, 2020 and *General Plan and Elevation (GPE)*, dated August 10, 2022, and provided by TranSystems Corporation (TranSystems), Wang Engineering, Inc. (Wang) understands the existing bridges were originally built in 1993 and 1994 as single-span structures with reinforced concrete decks on steel wide flange beams. The substructure consists of cast-in-place reinforced concrete integral abutments supported on a single row of 50-ton capacity steel H-piles. The existing bridges have lengths of 148.6 feet from back-to-back of abutments and out-to-out widths of 45.2 feet. Reinforced concrete wingwalls and slope walls are located at the ends of the structures. The structures were rehabilitated in 2001. The surface elevation at the bridge site is about 606.0 to 602.0 feet along I-80.

In the project area (see Exhibit 2), about 30-foot thick overburden made up of moderate plasticity, moderate to high strength, moderate moisture clayey diamicton with occasional silt, sand, and gravel lenses rest over moderate to high density, low compressibility sand and gravel saturated outwash, resting over low plasticity, high strength, and low moisture content silty diamicton resting unconformably over the bedrock (Bauer et al. 1991, Hansel and Johnson 1996, Willman et al. 1971). The bedrock is made up of dolostone. Top of bedrock is mapped at about 560.0 feet elevation. Sinkholes and other dissolution features are not known in the project area (Bretz 1940; Otto 1963). The site is located on the northern, downthrown block of the inactive Sandwich Fault Zone that may be traced about two miles southwest of the proposed improvements (Kolata 2005). Records of mining activity in the vicinity of the bridge are missing. The outwash is water bearing.

1.2 Proposed Structure

Based on the *General Plan and Elevation (GPE)* provided by TranSystems and dated August 10, 2022, Wang understands the existing bridge deck will be removed and replaced, which will include an in-kind widening of the substructures in both the eastbound and westbound directions. The bridges will be widened by about 24.3 feet in both directions. The widened single-span bridges will have back-to-back of abutment lengths of 149.1 feet and out-to-out deck widths of 69.5 feet to accommodate a 12-foot wide shoulder, two 12-foot wide lanes, a 12-foot wide shoulder or future lane, an 18.6-foot wide shoulder, and two 1.4-foot wide parapets. The plans indicate a portion of the existing concrete end slopes will be removed and in its place a combination of concrete slope walls graded at 1:2 (V: H) and soldier-pile walls is proposed in front of each of the abutments. Based on information provided by TranSystems, we understand the soldier pile walls will be designed and constructed as part of a separate contract. The walls will likely be already installed at the time of the bridge widenings. As such, this report does not address the soldier pile walls located in front of the abutments. The *GPE* is included as Appendix E.

Based on the *Preliminary Cross-Sections* (Appendix F) provided by TranSystems and dated August 12, 2020, we understand the existing grade along I-80 is approximately 606.0 to 602.0 feet and the proposed grade along I-80 ranges from 605.1 to 607.0; therefore, the grade along the approaches near the bridges will be raised by up to 1.7 feet along each centerline. A minimal amount of fill, about 2.0 to 4.0 feet, will be placed along the existing median to facilitate the inward widening of the bridges by about 24.3 feet at the north and south sides of the eastbound and westbound bridges. We understand the side slopes would be graded at slopes similar to the existing approach embankment side slopes of 1:2 to 1:4 (V: H).

The *Preliminary Cross-Sections* also indicate that a regional detention basin will be excavated between Stations 442+00 and 443+00 as part of the improvements proposed along westbound I-80. The existing grade elevation varies from 585.0 to 583.0 feet and the detention basin bottom elevation is proposed at 577.0 feet.

2.0 METHODS OF INVESTIGATION

The following sections outline the subsurface and laboratory investigations performed by Wang.

2.1 Field Investigation

The subsurface investigation consisted of four bridge borings, designated as HR-BSB-01, HR-BSB-01A, HR-BSB-02, and HR-BSB-02A, drilled by Wang between April 21, 2021 and May 5, 2021. The borings were drilled from elevations of 602.4 to 605.7 feet and were advanced to depths of 26.0 to 63.0 feet bgs. The as-drilled northings and eastings were acquired with a mapping-grade GPS unit. Stations, offsets, and elevations were provided by TranSystems. Boring location data are presented in the *Boring Logs* (Appendix A) and the as-drilled boring locations are shown in the *Boring Location Plan* (Exhibit 3).

A combination of truck-mounted and ATV-mounted drilling rigs, equipped with hollow stem augers, were used to advance and maintain open boreholes. Mud rotary drilling techniques were used from 10.0 feet bgs to advance Borings HR-BSB-01 and HR-BSB-02. Soil sampling was performed according to AASHTO T206, *"Penetration Test and Split Barrel Sampling of Soils."* The soil in the Borings HR-BSB-01 and HR-BSB-02 was sampled at 2.5-foot intervals to 30.0 feet bgs and at 5.0-foot intervals thereafter to the top of bedrock whereas the soil in Borings HR-BSB-01A and HR-BSB-02A was sampled continuously to the boring termination depths. Bedrock cores were obtained from Borings HR-BSB-01 and HR-BSB-02 in 5- to 10-foot runs with and NDW4-sized core barrel. Soil samples collected from each sampling interval were placed in sealed jars and rock cores were placed into boxes and transported to the laboratory for further examination and testing.

Field boring logs, prepared and maintained by a Wang field engineer, included lithological descriptions, visual-manual soil (IDH Textural) classifications, results of Rimac and pocket penetrometer unconfined compressive strength tests, and results of Standard Penetration Tests (SPT) recorded as blows per 6 inches of penetration.

Groundwater levels were measured while drilling all the borings and at the completion of Borings HR-BSB-01A and HR-BSB-02A. Each borehole location was backfilled upon completion with lean grout, soil cuttings, and/or bentonite chips and, where necessary, the pavement surface was restored as much as possible to its original condition.

2.2 Laboratory Testing

The soil samples were tested in the laboratory for moisture content (AASHTO T265). Atterberg limits (AASHTO T89 and T90) and particle size (AASHTO T88) analyses were performed on selected samples. An unconfined compressive strength test (T22) was performed one selected bedrock core. Field visual descriptions of the soil samples were verified in the laboratory and index tested soils were classified according to the IDH soil Classification System. The laboratory test results are shown in the *Boring Logs* (Appendix A) and in the *Laboratory Test Results* (Appendix B).

3.0 INVESTIGATION RESULTS

Detailed descriptions of the soil conditions encountered during the subsurface investigation are presented in the attached *Boring Logs* (Appendix A) and in the *Soil Profile* (Exhibit 4). Please note that strata contact lines represent approximate boundaries between soil types. The actual transition between soil types in the field may be gradual in horizontal and vertical directions.

Our subsurface investigation results fit into the local geologic context. The borings drilled in the project area revealed the native sediments consists of silty clay to silty clay loam diamicton (Unit 2) sand and gravel (Units 3), silty diamicton (Unit 4), over dolostone bedrock. The top of dolostone bedrock was reached in the structure borings at an elevation of about 558 to 557 feet (about 48.0 feet bgs) as predicted based on geological data.

3.1 Lithological Profile

Borings HR-BSB-01 and HR-BSB-02 were drilled along westbound I-80 and revealed the pavement structure consisted of 15 inches of concrete pavement over 6 to 21 inches of sandy gravel aggregate base. About 18 inches of silty clay loam topsoil was encountered in the borings drilled outside the I-80 pavement in the median. In descending order, the general lithologic succession encountered beneath the pavement or topsoil includes: 1) man-made ground (fill); 2) stiff to hard silty clay to silty clay loam; 3) loose to very dense sand to sandy gravel; 4) dense to very dense silty loam; and 5) strong, very poor quality dolostone.

1) Man-made ground (fill)

Beneath the topsoil and/or pavement structure, the borings encountered up to 18.0 feet of cohesive and non-cohesive fill. The cohesive fill consists of medium stiff to hard, black, brown, and gray silty clay to silty clay loam with unconfined compressive strength (Q_u) values of 0.5 to 5.3 tsf and moisture content values of 15 to 25%. Laboratory index testing on a sample from the cohesive fill layer showed a liquid limit (L_L) value of 42% and a plastic limit (P_L) value of 16%.

The non-cohesive fill consists of medium dense to dense, brown and gray, coarse sand, sandy gravel to loam with SPT-N values of 12 to 40 blows per foot and moisture content values of 5 to 7%. At a depth of 9.5 feet bgs, Boring HR-BSB-02A encountered 5 inches of asphalt fragments below the cohesive fill.

2) Stiff to hard silty clay to silty clay loam

Beneath the fill, at elevations of 590 to 589 feet (depths of 13.0 to 20.5 feet bgs), the borings advanced through 2.5 to 10.0 feet of stiff to hard, brown to gray silty clay to silty clay loam. The silty clay and silty clay loam is characterized by Q_u values of 1.2 to 5.9 tsf and moisture content values of 19 to 26%.

A 30-inch thick intercalation of medium dense, wet sand was sampled in Boring HR-BSB-01 at an elevation of 587 feet.

3) Loose to very dense sand to sandy gravel

At elevations of 587 to 580 feet (depths of 16.5 to 25.5 feet bgs), the borings advanced through 11.0 to 19.0 feet of loose to very dense, brown and gray, damp to saturated, medium to coarse sand to sandy gravel. This soil unit has N-values of 4 to 84 blows per foot, and moisture content values of 4 to 14%. This layer was encountered to the termination depths of Borings HR-BSB-01A and HR-BSB-02A. Rig chatter indicating the presence of cobbles was noted in Borings at elevations of 574.7 feet (depths of 31.0 feet bgs).

4) Dense to very dense silty loam

At elevations of 569 to 568 feet (depths of 36.5 feet bgs), the borings advanced through up to 9.0 feet of dense to very dense, gray, damp silty loam. This soil unit has N-values of 49 blows per foot to greater than 50 blows per 3 inches, and moisture content values of 8 to 11%.

5) Strong, very poor quality dolostone

At elevations of 560 to 559 feet (46.0 feet bgs), the borings advanced through 2.0 feet of weathered dolostone bedrock. At elevations of 558 to 557 feet (a depth of 48.0 feet bgs), the borings encountered and cored strong, very poor quality, highly to moderately weathered dolostone bedrock. The rock quality designation (RQD) ranges from 7 to 21% and a tested rock core sample revealed a uniaxial compressive strength (Q_u) value of 10,795 psi. The bedrock core data are shown in the *Bedrock Core Photographs* (Appendix C).

3.2 Groundwater Conditions

Groundwater was encountered while drilling Borings HR-BSB-01 and HR-BSB-02 at elevations of 580 to 576 feet (25.5 to 28.5 feet bgs) within the medium dense to very dense sandy gravel layer. For the purpose of analysis, the design groundwater elevation is considered at elevation 580 feet. It should be noted that groundwater levels might change with seasonal rainfall patterns and long-term climate fluctuations or may be influenced by local site conditions. Water level seems consistent with rest of the project.

4.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS

We understand the structural design of the widened abutments will be based on the Allowable Stress Design (ASD) method in accordance with 2002 *AASHTO Standard Specifications for Highway Bridges* (AASHTO 2002) except as modified by the IDOT 2012 *Bridge Manual* (IDOT 2012). Geotechnical evaluations and recommendations for the approach embankments, approach slabs, and substructure foundations are included in the following sections.

A minimal amount of fill, about 2.0 to 4.0 feet, will be placed along the existing median to facilitate the inward widening of the bridges by about 24.3 feet. We understand the side slopes would be graded at slopes similar to the existing approach embankment side slopes. The plans also indicate a portion of the existing concrete end slopes will be removed and in its place a combination of concrete slope walls graded at 1:2 (V: H) and soldier-pile walls is proposed in front of each of the abutments. Based on information provided by TranSystems, we understand the soldier pile walls will be designed and constructed as part of a separate contract. This report does not address the soldier pile walls located in front of the abutments.

Wang has evaluated possible foundation types for supporting the proposed bridge structure widenings, and we recommend widening in-kind using driven H-pile deep foundations as shown on the *GPE*. Supporting the widened bridge substructures on shallow foundations is not feasible due to the large loads anticipated and drilled shaft foundations are not approved for use with integral abutments (IDOT 2020a).

4.1 Seismic Design Considerations

The seismic design for the proposed structure widenings will be in accordance with Article 3.4, Division 1-A of *AASHTO Standard Specifications for Highway Bridges* (AASHTO 2002). Based on the encountered soil conditions in borings, the soil profile Type is I and Site Coefficient (S) is 1.0. Based on Figure 6.12-2.2-1 of the 2015 IDOT *Geotechnical Manual* (IDOT 2015), we estimated a Seismic Performance Category (SPC), and a Horizontal Bedrock Acceleration Coefficient (A) as summarized in Table 1. According to the IDOT *Bridge Manual* (IDOT 2012), liquefaction analysis is not required for sites located in Seismic Performance Zone 1.

Table 1: Recommended Seismic Design Parameters

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

4.2 Approach Embankments and Slabs

Wang has performed evaluations of the settlement and global stability of the approach embankments. The grade along the I-80 approach embankments near the bridge will be raised by up to 1.7 feet along each centerline. A minimal amount of fill, about 2.0 to 4.0 feet, will be placed along the existing median to facilitate the inward widening of the bridges by about 24.3 feet. We understand the side slopes would be graded at slopes similar to the existing approach side slopes.

4.2.1 Settlement

To facilitate the bridge widenings, up to 4.0 feet of new fill will be placed along the existing medians. Settlement estimates have been made based on correlations to measured index properties obtained from the laboratory tests (Appendix B). Based on the soil conditions, we estimate the foundation soils at the approaches will undergo up to 0.2 inch of long-term consolidation settlement under the applied load of the new approach embankment fill material. These settlements are appropriate for the construction of the approach slabs, and we do not anticipate downdrag allowances for the proposed abutment piles.

4.2.2 Global Stability

The global stability of the approach embankment side slopes was analyzed at the critical sections based on the soil profile described in Section 3.1 and the information provided in the plans. We also analyzed the stability of the end slope. The analysis discounts the beneficial effect of the abutment piles and soldier pile wall. The minimum required factor of safety (FOS) for both short (undrained) and long-term (drained) conditions is 1.5 (IDOT 2012). *Slide2* evaluation exhibits employing the Bishop Simplified method of analysis are shown in Appendix D. The FOS values meet the minimum requirement.

4.2.3 Approach Slabs

We understand the approach slabs will be widened in-kind and will be supported on spread footing foundations (IDOT 2012). Based on the soil conditions revealed in Borings HR-BSB-01A and HR-BSB-02A, the approach footings will be supported mainly on the new fill placed as part of the widening. We estimate the fill has a maximum allowable bearing capacity of 2,000 psf calculated based on a FOS of 3.0 (AASHTO 2002). Settlement of the approach footing is not anticipated.

4.3 Structure Foundations

The foundation soil consists of stiff to hard clayey soils followed by medium dense to very dense sandy gravel and dense to very dense silty loam overlying dolostone bedrock. As per the *GPE*, we understand the bridges will be widened in-kind. Wang recommends supporting the integral abutments on driven steel H-piles.

The preliminary loading information provided and proposed abutment cap base elevations as provided by TranSystems are summarized in Table 2.

Table 2: Preliminary Loads and Proposed Pile Cap Elevations

Direction	Substructure	Pile Cap Elevations (feet)	Total Load (kips)
Eastbound	West Abutment	593.62	1304
	East Abutment	594.07	
Westbound	West Abutment	593.59	
	East Abutment	593.97	

4.3.1 Driven Piles

The pile nominal, allowable resistances, and pile lengths were estimated using the IDOT spreadsheet, *IDOT Static Method of Estimating Pile Length* with ASD method. Based on the loads provided by TranSystems and the proposed widened widths of the substructures, the service load per pile at the widened abutments will range between about 113 and 302 kips for a single row of piles spaced at 3- to 8-feet.

Based on IDOT standards, piles with greater than 0.4 inch of relative settlement along the sides require allowances for downdrag loads. We estimate that less than 0.4 inch of settlement will remain following the construction of the embankment and subsequent pile driving. We estimate that downdrag allowances will not be required for the abutment piles.

Borings HR-BSB-01 and HR-BSB-01A revealed the foundation soils within 10.0 feet below the west abutment pile cap elevations consist of very stiff to hard silty clay to silty clay loams with Q_u values of 2.9 to 5.9 tsf. In accordance with the *All Bridge Designers Memo 19.8* (IDOT 2019), when the average soil strengths at an integral abutment exceed 3.0 tsf, the piles at the abutments should be precored for a depth of 10.0 feet below the abutment cap elevation and backfilled with bentonite having a Q_u value of 1.0 tsf to increase pile flexibility (IDOT 2019). The pile capacity evaluations at the west abutments have been performed assuming pile driving begins about 10.0 feet below the proposed abutment pile cap elevations.

The R_U, R_A, estimated pile tip elevations, and pile lengths for HP12x53, HP 12x74, HP 14x73, and HP14x89 steel H-piles for the abutments are summarized in Table 3. The driving elevation was taken from the proposed cap elevations provided by TranSystems. The pile lengths shown in Table 3 assume a 2-foot pile embedment into the abutment pile cap and include the precored length of the pile (at the west abutments). The allowable resistances provided consider an FOS of 3.0 (IDOT 2012).

High blow counts, sampler refusal, and difficult drilling were noted within the borings below an approximate elevation of 577.0 feet indicating the presence of cobbles. As such, pile shoes should be used for piles driven below an elevation of 577.0 feet to avoid damage to the piles. Additionally, to achieve the maximum nominal required bearing, the analysis shows the H-piles would need to be driven to the top of the bedrock or about 1 to 2 feet into the weathered bedrock/bedrock. In these instances, the piles should be considered end bearing and designed for the maximum capacity of the pile.

Wang understands the soldier pile walls at the end slopes will be constructed under a separate contract and will be likely be in place during the bridge widenings. The possible impact of the construction of the proposed bridge widenings and pile driving on the walls should be taken into consideration by the Contractor. If needed, the Contractor should perform a vibration analysis and provide vibration monitoring during construction.

Table 3: Estimated Pile Lengths and Tip Elevations for Steel H-Piles Driven to R_{NMAX}-ASD

Bridge Structure Unit (Reference Boring)	Pile Cap Base Elevations (feet)	Pile Size	Maximum Nominal Bearing, R_N (kips)	Allowable Geotechnical Loss (kips)	Ultimate Geotechnical Load Loss (kips)	Allowable Resistance Available, R_A (kips)	Total Estimated Pile Length (feet)	Estimated Pile Tip Elevation (feet)
WB Bridge West Abutment (HR-BSB-01)	593.59	HP 12x53	418	0	0	139	40	556
		HP 12x74	589	0	0	196	41	555
		HP 14x73	578	0	0	193	40	556
		HP 14x89	705	0	0	235	41	555
WB Bridge East Abutment (HR-BSB-02)	593.97	HP 12x53	418	0	0	139	28	568
		HP 12x74	589	0	0	196	37	559
		HP 14x73	578	0	0	193	32	564
		HP 14x89	705	0	0	235	37	559
EB Bridge West Abutment (HR-BSB-01 and HR-BSB-01A)	593.62	HP 12x53	418	0	0	139	39	557
		HP 12x74	589	0	0	196	40	556
		HP 14x73	578	0	0	193	41	555
		HP 14x89	705	0	0	235	41	555
EB Bridge East Abutment (HR-BSB-02 and HR-BSB-02A)	594.07	HP 12x53	418	0	0	139	31	565
		HP 12x74	589	0	0	196	38	558
		HP 14x73	578	0	0	193	33	563
		HP 14x89	705	0	0	235	38	558

4.3.2 Lateral Loading

Lateral loads on the piles should be analyzed for maximum moments and lateral deflections. If the analysis at the proposed pier indicates excessive pile head deflection, the pile would need to be set into rock to satisfy the deflection requirements (IDOT 2020). Recommended lateral soil modulus and strain parameters required for analysis via the p-y curve method are included in Tables 4 to 6.

Table 4: Recommended Soil Parameters for Lateral Load Analysis at West Abutments
Reference Borings HR-BSB-01 and HR-BSB-01A

Elevation Range (feet) Soil Type (Layer)	Unit Weight, γ (pcf)	Undrained Shear Strength, c_u (psf)	Estimated Friction Angle, Φ (°)	Estimated Lateral Soil Modulus Parameter, k (pci)	Estimated Soil Strain Parameter, ε_{50} (%)
593.6$^{(1)}$ to 583.6$^{(2)}$ New Fill (Bentonite)	120	1000	0	500	0.7
583.6 to 579 Loose to M Dense SAND	53$^{(3)}$	0	33	60	--
579 to 568 M Dense to V Dense SANDY GRAVEL	58$^{(3)}$	0	34	60	--
568 to 559$^{(4)}$ Dense to V Dense SILTY LOAM	58$^{(3)}$	0	34	125	--

(1) Proposed pile cap base elevation;

(2) Approximate precoring length;

(3) Submerged unit weight;

(4) Approximate top of bedrock.

Table 5: Recommended Soil Parameters for Lateral Load Analysis at East Abutments
Reference Borings HR-BSB-02 and HR-BSB-02A

Elevation Range (feet) Soil Type (Layer)	Unit Weight, γ (pcf)	Undrained Shear Strength, c_u (psf)	Estimated Friction Angle, Φ (°)	Estimated Lateral Soil Modulus Parameter, k (pci)	Estimated Soil Strain Parameter, ε_{50} (%)
594$^{(1)}$ to 589 M Stiff to V Stiff SILTY CLAY to SILTY CLAY LOAM FILL	120	1000	0	500	0.7
589 to 582 Stiff to Hard SILTY CLAY to SILTY CLAY LOAM	120	3000	0	1000	0.5

Elevation Range (feet) Soil Type (Layer)	Unit Weight, γ (pcf)	Undrained Shear Strength, c_u (psf)	Estimated Friction Angle, Φ (°)	Estimated Lateral Soil Modulus Parameter, k (pci)	Estimated Soil Strain Parameter, ε_{50} (%)
582 to 569 Dense to V Dense SAND to SANDY GRAVEL	58(2)	0	34	125	--
569 to 560(3) V Dense SILTY LOAM	58(2)	0	34	125	--

(1) Proposed pile cap base elevation;

(2) Submerged unit weight;

(3) Approximate top of bedrock.

Table 6: Recommended Bedrock Parameters for Lateral Load Analysis
Reference Borings HR-BSB-01 and HR-BSB-02

Bedrock	Total Unit Weight, γ (pcf)	Modulus of Rock Mass (ksi)	Uniaxial Compressive Strength (psi)	RQD (%)	Strain Factor
Dolostone	140	300	10,795	7 to 21	0.0005

4.4 Stage Construction

Wang understands that the bridge widenings will be performed utilizing three stages of construction to maintain traffic on each bridge. During Stage I, traffic will be moved to the outside lane and shoulder while the median portion is constructed. During Stage II, two lanes of traffic would utilize the roadway constructed during Stage I so that the outside portion can be replaced. During Stage III, traffic will continue to utilize the roadway constructed during Stage I so that a closure pour in the deck can be completed within the outside portion of the bridges.

The construction activities will likely involve excavations of up to 12.0 feet along the sides of the existing east and west abutments. Due to the presence of very hard cohesive soils and very dense granular soils, we estimate these excavations may not be supported with cantilever steel sheet piling, and we recommend including the pay item, *Temporary Soil Retention System* for the shoring.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 Site Preparation

Vegetation, surface topsoil, and debris should be cleared and stripped where the structure will be placed. If unstable or unsuitable materials are exposed during excavation, they should be removed and replaced with compacted structural fill as described in Section 5.3.

5.2 Excavation, Dewatering, and Utilities

Excavations should be performed in accordance with local, state, and federal regulations. The potential effect of ground movements upon nearby utilities should be considered during construction. Any slope that cannot be graded at 1:2 (V:H) should be properly shored in accordance with the temporary sheet piling charts provided in *IDOT Design Guide-Simplified Temporary Sheet Piling Design Charts* (IDOT 2020).

During the subsurface investigation, the groundwater was encountered at elevations ranging from 580 to 576 feet, as discussed in Section 3.2. At the east and west abutments, the groundwater will be about 14.0 to 17.0 feet below the pile cap base elevations, respectively; therefore, we do not anticipate the need for dewatering. Perched, or temporary water, may be encountered during times of heavy precipitation while excavating within the upper fill soils and will require dewatering efforts. Water that does accumulate in open excavations by seepage or runoff should be immediately removed by sump pump.

5.3 Filling and Backfilling

Fill material used to attain final design elevations should be pre-approved, compacted, cohesive or granular soil conforming to Section 204, *Borrow and Furnished Excavation* (IDOT 2016). The fill material should be free of organic matter and debris and should be placed in lifts and compacted according to Section 205, *Embankment* (IDOT 2016).

Backfill materials for the abutments must be pre-approved by the Resident Engineer. To backfill the abutments, we recommend porous granular material conforming to the requirements specified in the IDOT Supplemental Special and Recurring Special Provisions, *Granular Backfill for Structures* (IDOT 2020b).

5.4 Earthwork Operations

The required earthwork can be accomplished with conventional construction equipment. Moisture and traffic will cause deterioration of exposed subgrade soils. Precautions should be taken by the Contractor to prevent water erosion of the exposed subgrade. A compacted subgrade will minimize water runoff erosion.

Earth moving operations should be scheduled to not coincide with excessive cold or wet weather (early spring, late fall or winter). Any soil allowed to freeze or soften due to the standing water should be removed. Wet weather can cause problems with subgrade compaction.

It is recommended that an experienced geotechnical engineer be retained to inspect the exposed subgrade, monitor earthwork operations, and provide material inspection services during the construction phase of this project.

5.5 Pile Installation

The driven piles shall be furnished and installed according to the requirements of IDOT Section 512, *Piling* (IDOT 2016). Wang recommends performing one test pile at each substructure location. Since hard driving is expected below an elevation of 577 feet, pile shoes are required as indicated in Section 4.3.1.

The foundation soils within 10.0 feet below the west abutment pile cap elevations consist of very stiff to hard silty clay to silty clay loams with Q_u values of 2.9 to 5.9 tsf. In accordance with the *All Bridge Designers Memo 19.8* (IDOT 2019), when the average soil strengths at an integral abutment exceed 3.0 tsf, the piles at the abutments should be precored for a depth of 10.0 feet below the abutment cap elevation and backfilled with bentonite having a Q_u value of 1.0 tsf to increase pile flexibility (IDOT 2019).

The possible impact of the construction of the proposed bridge widenings and pile driving on the walls should be taken into consideration by the Contractor. If needed, the Contractor should perform a vibration analysis and provide vibration monitoring during construction.

6.0 QUALIFICATIONS

The analysis and recommendations submitted in this report are based upon the data obtained from the borings drilled at the locations shown on the boring logs and in Exhibit 3. This report does not reflect any variations that may occur between the borings or elsewhere on the site, variations whose nature and extent may not become evident until the course of construction. In the event that any changes in the design and/or location of the structure are planned, we should be timely informed so that our recommendations can be adjusted accordingly.

It has been a pleasure to assist TranSystems Corporation and the Illinois Department of Transportation on this project. Please call if there are any questions, or if we can be of further service.

Respectfully Submitted,

WANG ENGINEERING, INC.

Azza Hamad, P.E.
Senior Geotechnical Engineer

Nesam Balakumaran, P.Eng.
Project Geotechnical Engineer

Corina Farez, P.E., P.G.
QC/QA Reviewer

REFERENCES

AMERICAN ASSOCIATION OF STATE HIGHWAY TRANSPORTATION OFFICIALS (2002) "*AASHTO Standard Specifications for Highway Bridges*" United States Depart of Transportation, Washington, D.C.

BAUER, R.A., CURRY, B.B., GRAESE, A.M., VAIDEN, R.C., SU, W.J., AND HASEK, M.J. (1991) "*Geotechnical Properties of Selected Pleistocene, Silurian, and Ordovician Deposits of Northeastern Illinois*." Environmental Geology 139, Illinois State Geological Survey.

BRETZ, J.H. (1940) *Solution Cavities in the Joliet Limestone of Northeastern Illinois*: Journal of Geology, v. 46. p. 337-384.

HANSEL, A.K., and JOHNSON, W.H. (1996) "*Wedron and Mason Groups: Lithostratigraphic Reclassification of the Wisconsin Episode, Lake Michigan Lobe Area*." ISGS Bulletin 104. Illinois State Geological Survey, Champaign 116 p.

IDOT (2005) *Subgrade Stability Manual.* Illinois Department of Transportation.

IDOT (2012) *Bridge Manual.* Illinois Department of Transportation.

IDOT (2015) *Geotechnical Manual.* Illinois Department of Transportation.

IDOT (2016) *Standard Specifications for Road and Bridge Construction.* Illinois Department of Transportation.

IDOT (2019) *All Bridge Designers Memo 19.8.* Illinois Department of Transportation.

IDOT (2020a) *Geotechnical Manual.* Illinois Department of Transportation.

IDOT (2020b) *Supplemental Special and Recurring Special Provisions.* Illinois Department of Transportation. 1098 pp.

KOLATA, D.R. (2005) *Bedrock Geology of Illinois:* Illinois Sate Geological Survey, Illinois Map 14, 1:500,000.

LEIGHTON, M.M., EKBLAW, G.E., and HORBERG, L. (1948) "*Physiographic Divisions of Illinois*." The Journal of Geology, v. 56. p. 16-33.

OTTO, G.H. (1963) *Engineering Geology of the Chicago Area, in Foundation Engineering in the Chicago Area*: Proceedings of Lecture Series, American Society of Civil Engineers, Department of Civil Engineering, Illinois Institute of Technology, Chicago, Illinois, p. 3.1-3.24.

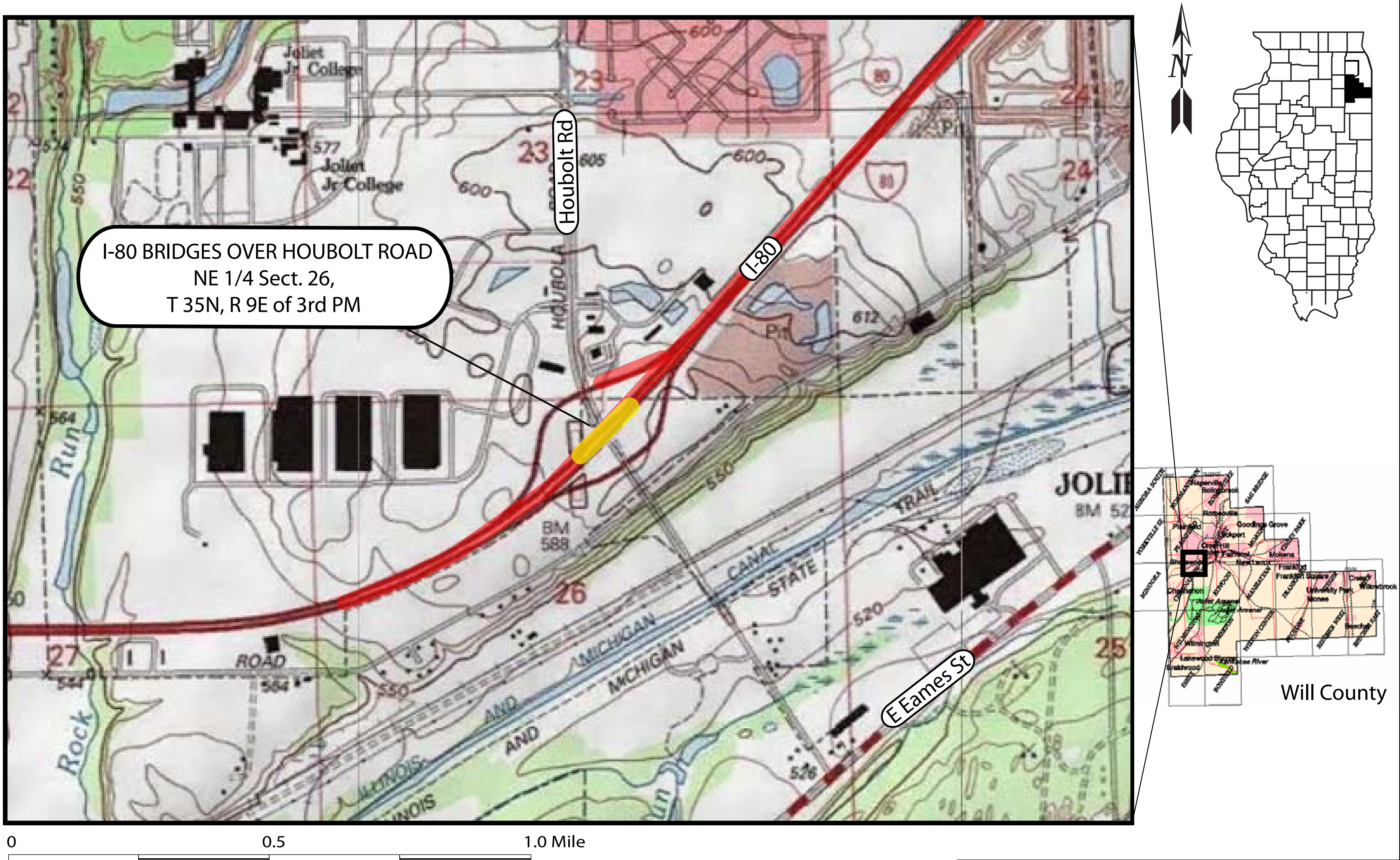
SHILTS, W.W. (2000) *Surficial Deposits of Illinois*: Illinois State Geological Survey, ISGS, OFS 2000-7, 1:500,000.

WILLMAN, H.B. (1971) *Surficial Deposits of Illinois:* Illinois State Geological Survey, ISGS, OFS 2000-7, 1:500,000.

WOLLER, D.M. AND SANDERSON, E.W. (1983) Public groundwater supplies in Will County. Bulletin (Illinois State Water Survey) no. 60-29.

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

EXHIBITS



SITE LOCATION MAP: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT RD TO W CENTER ST & LARKIN AVE INTERCHANGE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS

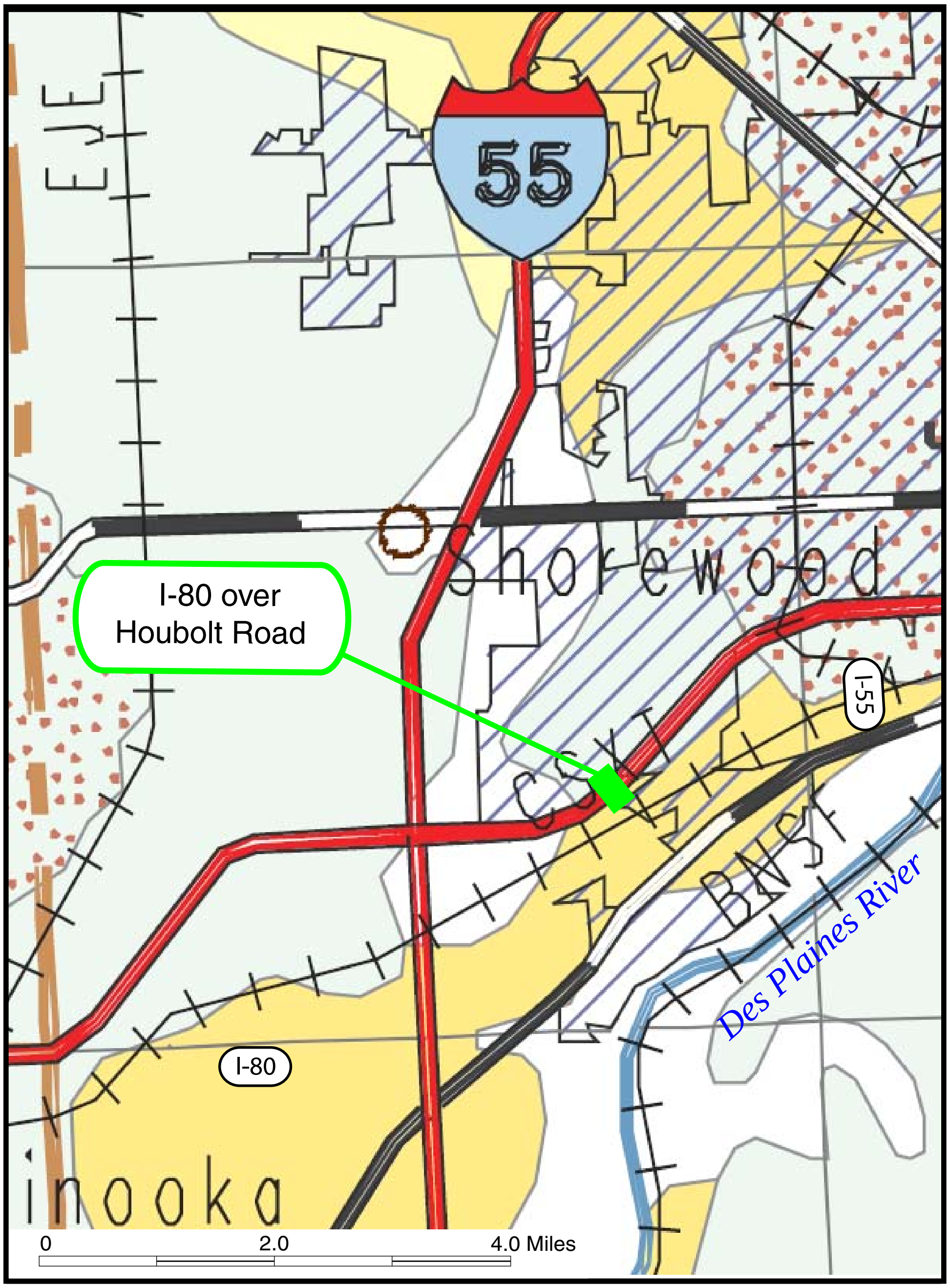
SCALE: GRAPHICAL	EXHIBIT 1	DRAWN BY: J. Bensen CHECKED BY: A. Hamad

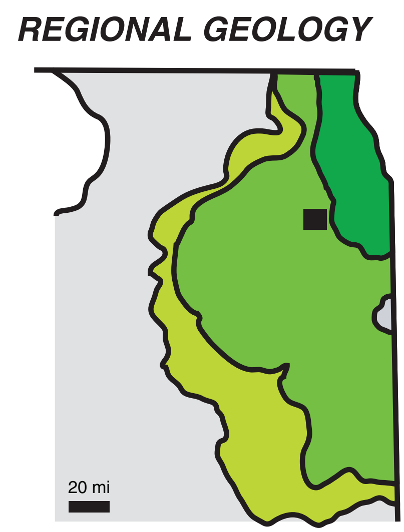
Wang Engineering

1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR TRANSYSTEMS

7901-15-01





Wedron Group

- Wadsworth Formation
- Lemont Formation
- Tiskilwa Formation

Modified after Hansel and Johnson (1996)

Legend

Cahokia Formation
Bedded silts, clays and sand and gravel deposited in floodplains and channels of modern rivers and streams

Equality Formation
Laminated silt, clay, or fine sand deposited in slackwater, glacial, and postglacial lakes; massive to bedded, calcareous

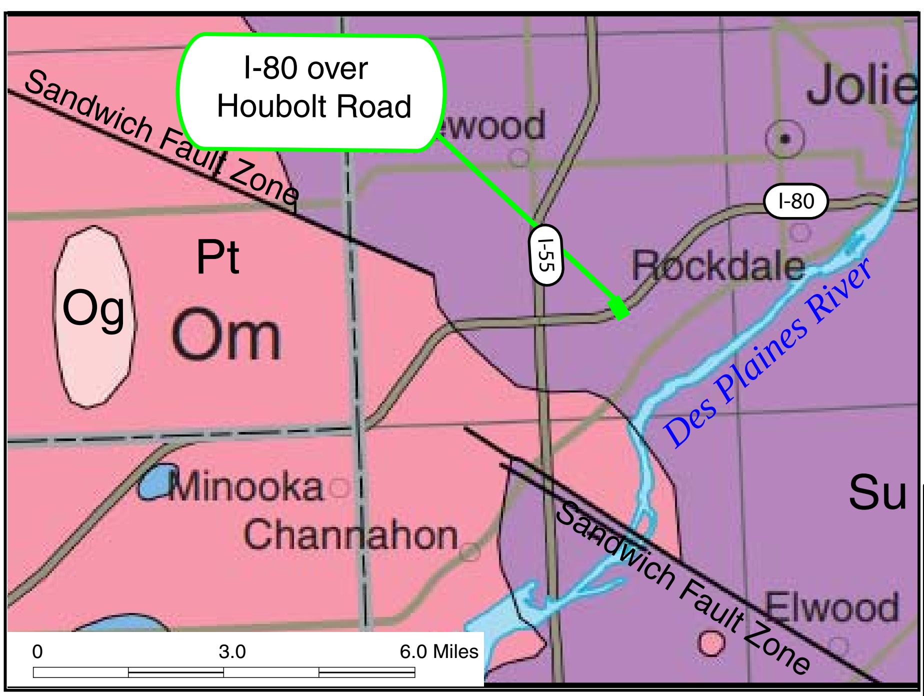
Henry Formation
Predominantly stratified sand and gravel; locally occurring silt, clay, organic debris, wood, shell lenses; outwash on floodplains

Lemont Formation
Diamicton; silty clay loam to silty clay; fine grained matrix; unsorted, unstratified mixture of gravel, sand, silt, and clay; containing lenses of sand, gravel and/or silt.

Bedrock near or at the surface

Major metropolitan area

Modified after William W. Shilts (2000)

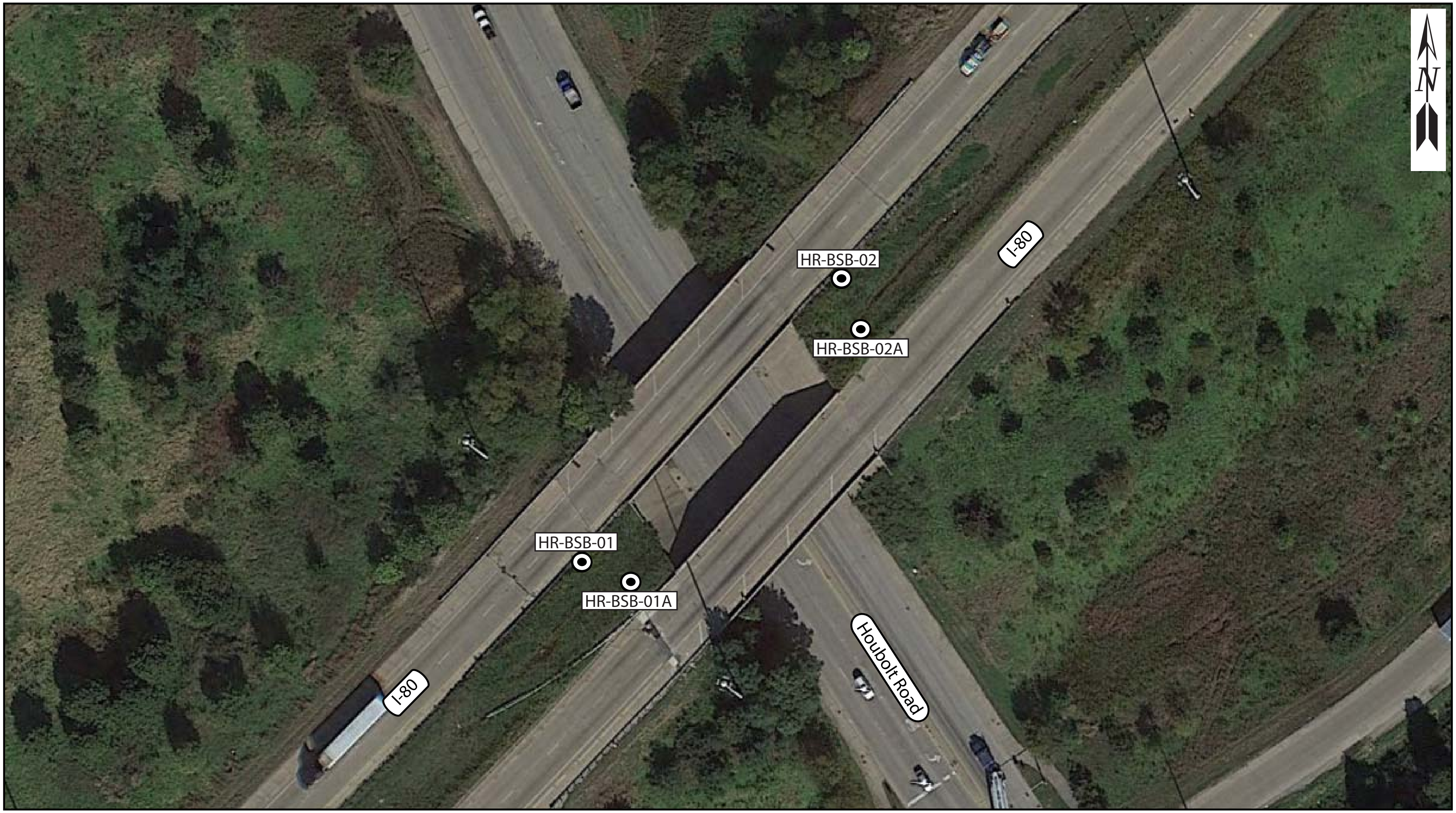


Modified after Dennis R. Kolata (2005)

Legend

- Pt — **Pennsylvanian Shale** Tadewater Formation
- Su — **Silurian Dolomitic Limestone**
- Om — **Ordovician Formation** Maquoketa Group
- Og — **Ordovician Formation** Galena Group

SITE AND REGIONAL GEOLOGY: I-80 RECONSTRUCTION, I-80 BRIDGES OVER HOUBOLT ROAD, WILL COUNTY, ILLINOIS		
SCALE: GRAPHICAL	EXHIBIT 2	DRAWN BY: C. Marin CHECKED BY: L. Iordache
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR TRANSYSTEMS CORPORATION		7901-15-01



0 200 400 Feet

Legend

◉ Boring Location

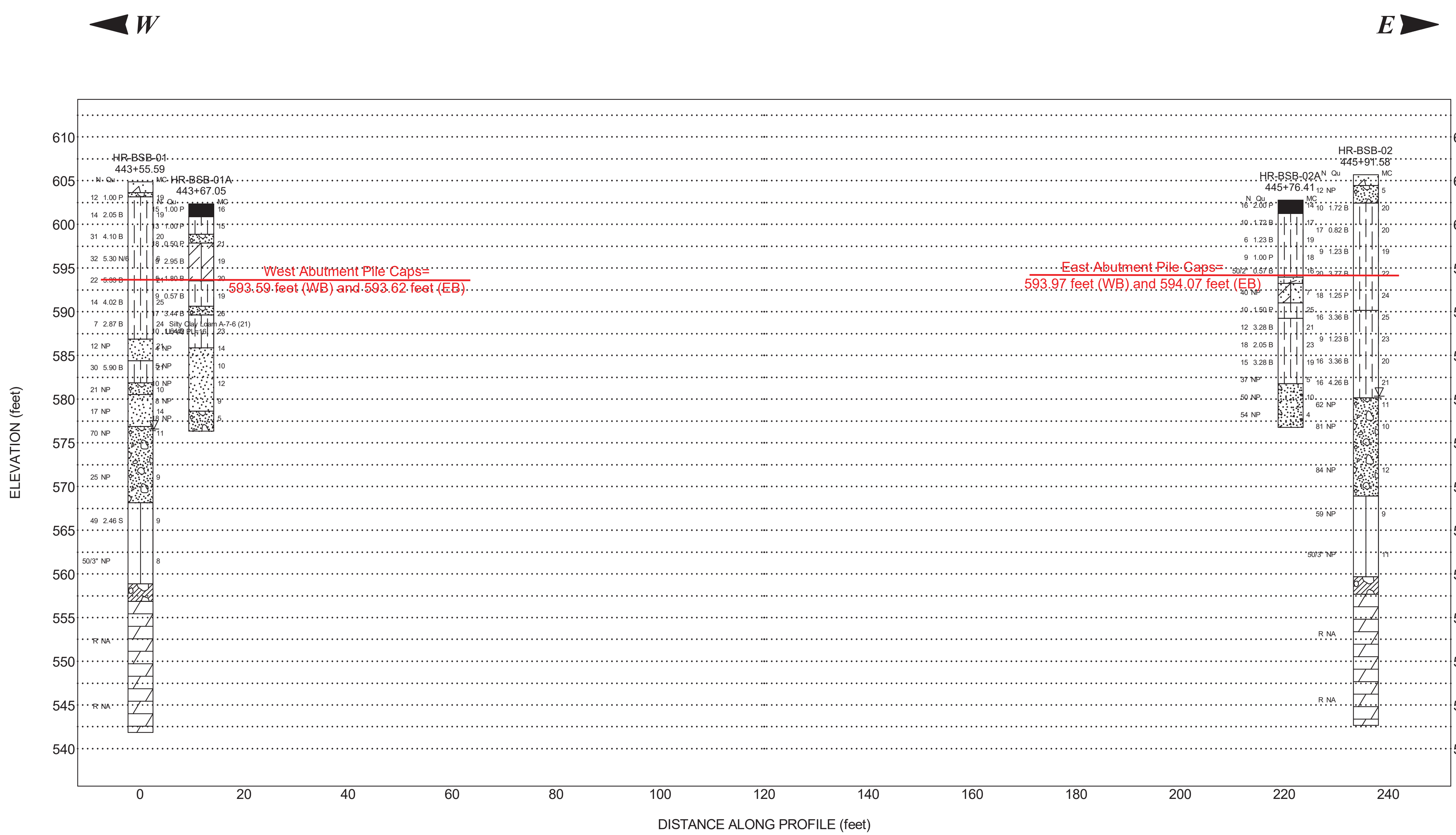
BORING LOCATION PLAN: I-80 BRIDGES OVER HOUBOLT RD; I-80 RECONSTRUCTION FROM HOUBOLT RD TO W CENTER ST & LARKIN AVE INTERCHANGE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS

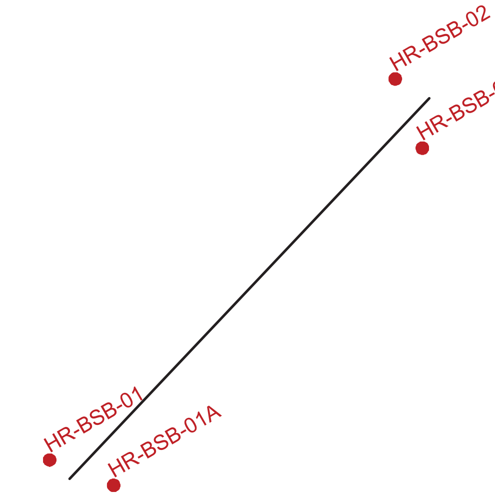
SCALE: GRAPHICAL	EXHIBIT 3	DRAWN BY: J. Bensen CHECKED BY: A. Hamad

Wang Engineering

1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

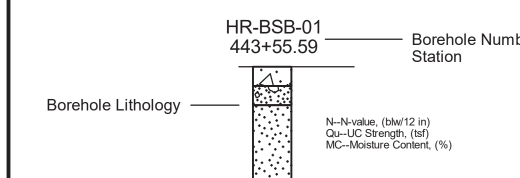
FOR TRANSYSTEMS	7901-15-01





Site Map Scale 1 inch equals 90 feet

Explanation:



Water Level Reading at time of drilling.

Water Level Reading 24-hr after drilling or at end of drilling

0 24

Horizontal Scale (feet)

Vertical Exaggeration: 1.5x

Lithology Graphics

- Concrete
- IDH Silt, Silty Loam
- IDH Clay Loam
- Gravelly sand, sandy gravel
- Weathered bedrock
- Pavement
- IDH Silty Clay, Silty Clay Loam
- Dolomite or Dolomitic Limestone
- IDH Loam
- IDH Sand, Sandy Loam
- Topsoil
- Coarse sand

Wang Engineering, Inc.
1145 N MAin Street
Lombard, IL 60148

Soil Profile
I-80 Bridges over Houbolt Road

WEI SINCE 1982

I-80 Reconstruction (Houbolt Road to Center Street)
Will County, Illinois

JOB NUMBER	PLATE NUMBER
7901-15-01	EXHIBIT 4

WEI 11X17 79011501.GPJ WANGENG.GDT 1/11/22

APPENDIX A

Wang Engineering
wangeng@wangeng.com
1145 N. Main Street
Lombard/IL/60148
Telephone: 6309539928
Fax: 6309539938

BORING LOG HR-BSB-01

WEI Job No.: 7901-15-01

Client: **TranSystems Corporation**
Project: **I-80 Reconstruction (Houbolt Road to Center Street)**
Location: **Will County, Illinois**

Datum: NAVD 88
Elevation: 604.87 ft
North: 1757424.96 ft
East: 1029622.93 ft
Station: 443+55.59
Offset: 25.83 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	15-inch thick CONCRETE --PAVEMENT--					
603.6	Gray SANDY GRAVEL --AGGREGATE BASE--					
603.1	Stiff to hard, brown SILTY CLAY LOAM to SILTY CLAY, trace to some gravel; damp --FILL-- --RDR 2--		1	6 8 4	1.00 P	19
		5	2	6 5 9	2.05 B	19
			3	6 12 19	4.10 B	20
	--some gravel--	10	4	7 10 22	5.30 N/6	6
			5	4 9 13	5.33 B	21
		15	6	7 6 8	4.02 B	25
	--L_L(%)=42, P_L(%)=16-- --%Gravel=0.0-- --%Sand=17.2-- --%Silt=57.2-- --%Clay=25.6-- --A-7-6 (21)--		7	3 4 3	2.87 B	24
586.9	Medium dense, brown, medium SAND; wet --RDR 2--	20	8	6 5 7	NP	21
584.4	Hard, brown SILTY CLAY, trace gravel; damp --RDR 2--		9	9 12 18	5.90 B	21
581.9	Medium dense, gray SANDY GRAVEL; moist --RDR 2--		10	15 11 10	NP	10
580.5	Medium dense, brown, medium SAND; damp --RDR 2--	25				
			11	7 9 8	NP	14
576.9	Medium dense to very dense, brown SANDY GRAVEL; saturated --RDR 3--	30	12	29 35 35	NP	11
		35	13	14 11 14	NP	9
	--lost drilling mud--					
568.1	Dense to very dense, gray SILTY LOAM, trace to some gravel; damp --RDR 3--	40	14	29 25 24	2.46 S	9

GENERAL NOTES

Begin Drilling **04-21-2021** Complete Drilling **04-21-2021**
Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**
Driller **R&J** Logger **I. Nenn** Checked by **C. Marin**
Drilling Method **2.25" IDA HSA to 10 ft; mud rotary thereafter; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **28.50 ft**
At Completion of Drilling **mud in borehole**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N. Main Street
Lombard/IL/60148
Telephone: 6309539928
Fax: 6309539938

BORING LOG HR-BSB-01

WEI Job No.: 7901-15-01

Client: **TranSystems Corporation**
Project: **I-80 Reconstruction (Houbolt Road to Center Street)**
Location: **Will County, Illinois**

Datum: NAVD 88
Elevation: 604.87 ft
North: 1757424.96 ft
East: 1029622.93 ft
Station: 443+55.59
Offset: 25.83 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			15	44 50/3"	NP	8
		45				
558.9	Weathered Bedrock					
556.9	Moderate, light grayish gray, very poor quality, intenssely to moderately fractured DOLOSTONE, gouge area; very closely spaced, highly weathered, horizontal, oblique, and vertical joints, with <0.05 inch opening, slightly rough to rough walls, and 0 - 0.2 inch thick clay infill. --RUN 1: 48.0 to 58.0 feet-- --Recovery= 100%-- --RQD= 18%--	50	16	CORE		
		55				
	--RUN 2: 58.0 to 63.0 feet-- --Recovery= 100%-- --RQD= 21%--	60		CORE		
541.9	Boring terminated at 63.00 ft		17			
		65				
		70				
		75				
		80				

GENERAL NOTES

Begin Drilling **04-21-2021** Complete Drilling **04-21-2021**
Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**
Driller **R&J** Logger **I. Nenn** Checked by **C. Marin**
Drilling Method **2.25" IDA HSA to 10 ft; mud rotary thereafter; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **28.50 ft**
At Completion of Drilling **mud in borehole**
Time After Drilling **NA**
Depth to Water **NA**
The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N. Main Street
Lombard/IL/60148
Telephone: 6309539928
Fax: 6309539938

BORING LOG HR-BSB-01A

WEI Job No.: 7901-15-01

Client: **TranSystems Corporation**
Project: **I-80 Reconstruction (Houbolt Road to Center Street)**
Location: **Will County, Illinois**

Datum: NAVD 88
Elevation: 602.35 ft
North: 1757413.35 ft
East: 1029652.28 ft
Station: 443+67.05
Offset: 3.59 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	Stiff, dark brown SILTY CLAY LOAM --TOPSOIL--		1	3, 6, 9, 9	1.00 P	16
600.9	Stiff, brown SILTY CLAY LOAM, trace gravel; damp --FILL--		2	7, 6, 7, 6	1.00 P	15
598.9	Brown, coarse SANDY GRAVEL; damp --FILL--					
597.9	Medium stiff to very stiff, brown and gray SILTY CLAY LOAM to CLAY LOAM, trace to little gravel and asphalt; damp --FILL-- --RDR 2--	5	3	8, 10, 8, 9	0.50 P	21
			4	7, 4, 5, 5	2.95 B	19
593.5	Medium stiff, black SILTY CLAY LOAM, trace gravel; moist --FILL-- --RDR 2--	10	5	2, 2, 3, 5	1.80 B	20
			6	3, 3, 6, 9	0.57 B	19
590.6	Medium dense, brown, Gravelly coarse SAND; moist --FILL--					
589.6	Stiff to very stiff, brown and gray SILTY CLAY LOAM to SILTY CLAY, trace gravel; damp --RDR 2--		7	10, 13, 4, 5	3.44 B	26
		15	8	4, 4, 6, 6	1.64 B	23
585.9	Loose to medium dense, brown, medium SAND, trace gravel; damp --RDR 2--		9	3, 2, 2, 3	NP	14
		20	10	2, 2, 3, 5	NP	10
			11	5, 5, 5, 8	NP	12
578.6			12	6, 2, 6, 9	NP	9
	Dense, brown Gravelly SAND; damp --RDR 2--	25	13	7, 5, 13, 20	NP	5
576.4	Boring terminated at 26.00 ft					
		30				
		35				
		40				

GENERAL NOTES

Begin Drilling: **05-05-2021** Complete Drilling: **05-05-2021**
Drilling Contractor: **Wang Testing Services** Drill Rig: **20D25A [83%]**
Driller: **J&M** Logger: **I. Nenn** Checked by: **C. Marin**
Drilling Method: **2.25" IDA HSA; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **DRY**
At Completion of Drilling: **DRY**
Time After Drilling: **NA**
Depth to Water: **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N. Main Street
Lombard/IL/60148
Telephone: 6309539928
Fax: 6309539938

BORING LOG HR-BSB-02

WEI Job No.: 7901-15-01

Client: **TranSystems Corporation**
Project: **I-80 Reconstruction (Houbolt Road to Center Street)**
Location: **Will County, Illinois**

Datum: NAVD 88
Elevation: 605.66 ft
North: 1757599.41 ft
East: 1029781.34 ft
Station: 445+91.58
Offset: 25.85 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	15-inch thick CONCRETE --PAVEMENT--					
604.4	Medium dense, gray SANDY GRAVEL; damp --AGGREGATE BASE--		1	9 8 4	NP	5
602.4	Medium stiff to very stiff, brown, gray and black SILTY CLAY LOAM to SILTY CLAY, trace gravel; damp --FILL-- --RDR 2-3--		2	3 3 7	1.72 B	20
		5				
			3	4 8 9	0.82 B	20
			4	3 3 6	1.23 B	19
		10				
			5	4 5 15	3.77 B	22
			6	9 10 8	1.25 P	24
		15				
590.2	Stiff to hard, brown and gray SILTY CLAY LOAM to SILTY CLAY, trace gravel; damp --RDR 2--		7	6 7 9	3.36 B	25
			8	2 3 6	1.23 B	23
		20				
			9	6 8 8	3.36 B	20
			10	6 6 10	4.26 B	21
		25				
580.2	Dense to very dense, brown and gray SANDY GRAVEL; wet to saturated --RDR 2-3--		11	20 22 40	NP	11
			12	12 29 52	NP	10
		30				
	--rig chatter; possible cobbles-- --cave-in--					
			13	36 42 42	NP	12
		35				
568.9	Very dense, gray SILTY LOAM, some gravel; damp --RDR 3-4--		14	23 27 32	NP	9
		40				

GENERAL NOTES

Begin Drilling **04-21-2021** Complete Drilling **04-21-2021**
Drilling Contractor **Wang Testing Services** Drill Rig **20D50T [80%]**
Driller **R&J** Logger **M. Sadowski** Checked by **C. Marin**
Drilling Method **2.25" IDA HSA to 10 ft; mud rotary thereafter; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **25.50 ft**
At Completion of Drilling **mud in borehole**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering
wangeng@wangeng.com
1145 N. Main Street
Lombard/IL/60148
Telephone: 6309539928
Fax: 6309539938

BORING LOG HR-BSB-02

WEI Job No.: 7901-15-01

Client: **TranSystems Corporation**
Project: **I-80 Reconstruction (Houbolt Road to Center Street)**
Location: **Will County, Illinois**

Datum: NAVD 88
Elevation: 605.66 ft
North: 1757599.41 ft
East: 1029781.34 ft
Station: 445+91.58
Offset: 25.85 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type (recovery)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			SS	15	28, 50/3"	NP	11
		45					
559.7	Weathered Bedrock						
557.7	Strong, light grayish gray, very poor quality, moderately fractured DOLOSTONE; closely spaced, moderately weathered, horizontal, oblique, and vertical joints, with 0-0.2 inch opening, slightly rough walls, and <0.2 inch thick clay infill. --RUN 1: 48.0 to 58.0 feet-- --Recovery= 100%-- --RQD= 7%-- --Q_u= 10,795 psi--	50	Core	16	CORE		
		55					
	--RUN 2: 58.0 to 63.0 feet-- --Recovery= 100%-- --RQD= 7%--	60	Core	17	CORE		
542.7	Boring terminated at 63.00 ft						
		65					
		70					
		75					
		80					

GENERAL NOTES

Begin Drilling: **04-21-2021** Complete Drilling: **04-21-2021**
Drilling Contractor: **Wang Testing Services** Drill Rig: **20D50T [80%]**
Driller: **R&J** Logger: **M. Sadowski** Checked by: **C. Marin**
Drilling Method: **2.25" IDA HSA to 10 ft; mud rotary thereafter; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **25.50 ft**
At Completion of Drilling: **mud in borehole**
Time After Drilling: **NA**
Depth to Water: **NA**
The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

Wang Engineering

wangeng@wangeng.com
1145 N. Main Street
Lombard/IL/60148
Telephone: 6309539928
Fax: 6309539938

BORING LOG HR-BSB-02A

WEI Job No.: 7901-15-01

Client **TranSystems Corporation**
Project **I-80 Reconstruction (Houbolt Road to Center Street)**
Location **Will County, Illinois**

Datum: NAVD 88
Elevation: 602.76 ft
North: 1757567.75 ft
East: 1029793.73 ft
Station: 445+76.41
Offset: 4.57 RT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	Very stiff, brown SILTY CLAY LOAM, trace gravel; damp --TOPSOIL--		1	4 7 9 12	2.00 P	14
601.3	Medium stiff to stiff, brown SILTY CLAY to SILTY CLAY LOAM, trace gravel; damp --FILL-- --RDR 2--		2	6 6 4 5	1.72 B	17
		5	3	3 2 4 5	1.23 B	19
			4	4 3 6 7	1.00 P	18
			5	3 33 50/2"	0.57 B	16
593.9	ASPHALT fragments --FILL--					
593.3	Dense, brown Gravelly LOAM; moist --FILL-- --RDR 2--	10	6	11 20 20 12	NP	7
591.0	Stiff, brown SILTY CLAY, trace gravel; damp --FILL-- --RDR 2--		7	4 6 4 6	1.50 P	25
589.3	Very stiff, brown SILTY CLAY; damp --RDR 2--	15	8	4 5 7 8	3.28 B	21
			9	6 8 10 10	2.05 B	23
		20	10	3 6 9 13	3.28 B	19
			11	7 18 19 21	NP	5
581.8	Dense to very dense, brown, medium to coarse SAND, little gravel; damp --RDR 2--		12	17 22 28 29	NP	10
		25	13	18 24 30 31	NP	4
576.8	Boring terminated at 26.00 ft					
		30				
		35				
		40				

GENERAL NOTES

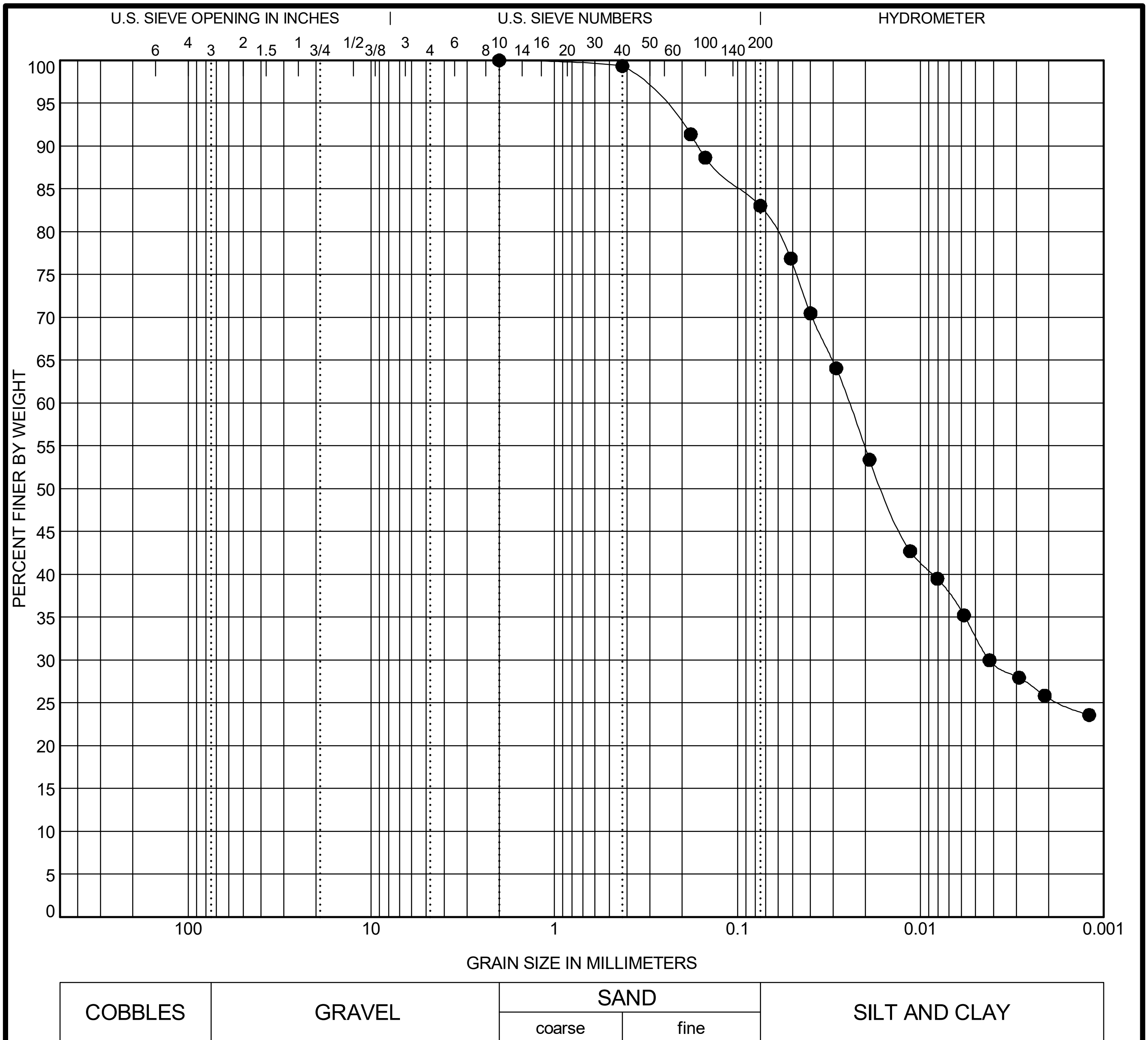
Begin Drilling **05-05-2021** Complete Drilling **05-05-2021**
Drilling Contractor **Wang Testing Services** Drill Rig **20D25A [83%]**
Driller **J&M** Logger **I. Nenn** Checked by **C. Marin**
Drilling Method **2.25" IDA HSA; boring backfilled upon completion**

WATER LEVEL DATA

While Drilling **DRY**
At Completion of Drilling **DRY**
Time After Drilling **NA**
Depth to Water **NA**

The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

APPENDIX B



Specimen Identification		IDH Classification	LL	PL	PI	Cc	Cu
● HR-BSB-01#7	16.0 ft	**Silty Clay Loam**	**42**	**16**	**26**		

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● HR-BSB-01#7	16.0 ft	**2**	**0.025**	**0.004**		**0.0**	**17.2**	**57.2**	**25.6**

WEI GRAIN SIZE IDH 79011501.GPJ US LAB.GDT 12/2/21

WEI SINCE 1982

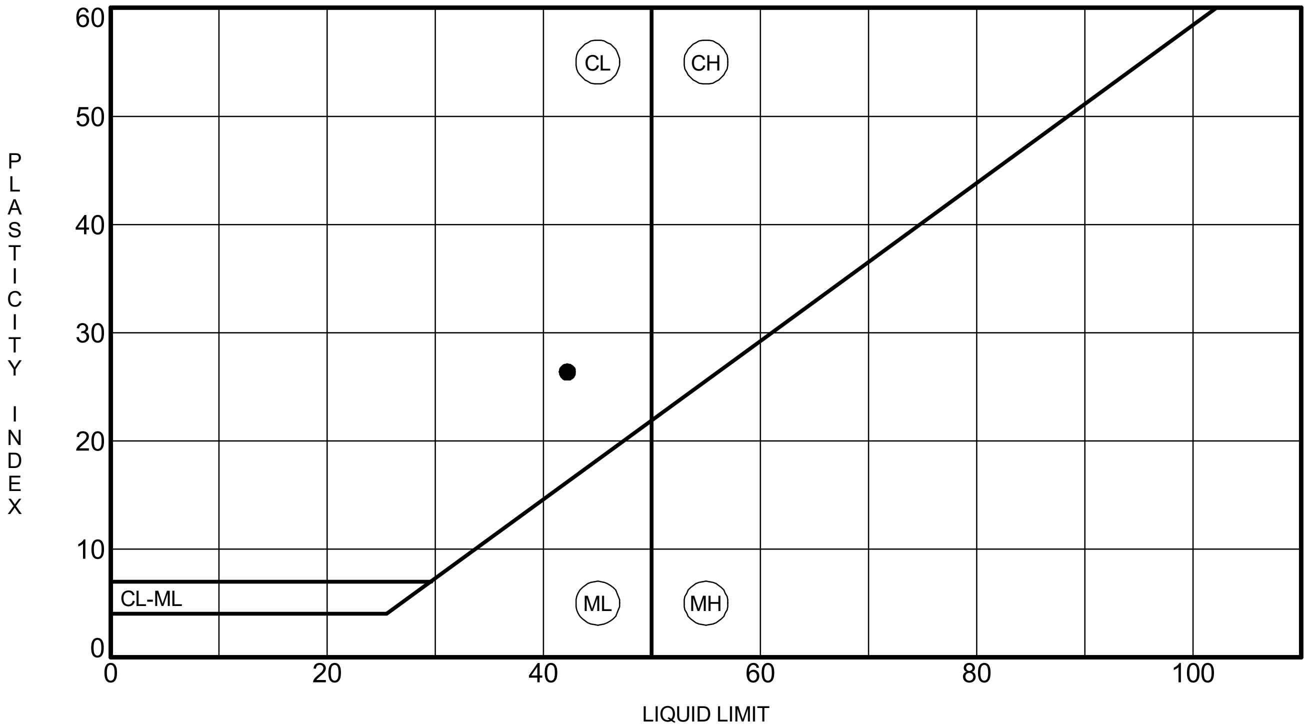
Wang Engineering, Inc.
1145 N MAin Street
Lombard, IL 60148
Telephone: (630) 953-9928
Fax: (630) 953-9938

GRAIN SIZE DISTRIBUTION

Project: I-80 Reconstruction (Houbolt Road to Center Street)

Location: Will County, Illinois

Number: 7901-15-01



	Specimen Identification		LL	PL	PI	Fines	IDH Classification
●	**HR-BSB-01#7**	**16.0 ft**	**42**	**16**	**26**	**83**	**Silty Clay Loam**

WEI SINCE 1982
Wang Engineering, Inc.
1145 N MAin Street
Lombard, IL 60148
Telephone: (630) 953-9928
Fax: (630) 953-9938

ATTERBERG LIMITS' RESULTS

Project: I-80 Reconstruction (Houbolt Road to Center Street)

Location: Will County, Illinois

Number: 7901-15-01

WEI ATTERBERG LIMITS IDH 79011501.GPJ US LAB.GDT 12/2/21

Unconfined Compressive Strength of Intact Rock Core Specimens

Project: I-80

Client: Transystems

WEI Job No.: 7901-15-01

Field Sample ID	Run #	Depth (ft)	Location	Sample Description	Length (in) Before Capping	Length (in) After Capping	Diameter (in)	Total Load (lbs)	Total Pressure (psi)	Fracture Type*	Break Date	Tested By	Area (in^2)
HR-BSB-02	1	49.0	East Abutments	Dolostone	4.14	NA	2.01	34150	10794.6	3	5/14/21	MAC	3.16

*** Fracture Types:**

Type 1 - Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps;
Type 2 - Well-formed cone on one end, vertical cracks running through caps, no well defined cone on other end;
Type 3 - Columnar vertical cracking through both ends, no well-formed cones;
Type 4 - Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1;
Type 5 - Side fractures at top or bottom (occur commonly with unbonded caps);
Type 6 - Similar to Type 5 but end of cylinder is pointed.

Prepared by:_______________________________

Checked by: _______________________________

WANG ENGINEERING, INC.
1145 N. Main Street, Lombard. IL 60148

Wang
Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

APPENDIX C

Run #1

0 6 inches

Boring HR-BSB-01:
Run #1, 48.0 to 58.0 feet, RECOVERY=100%, RQD=18%

BEDROCK CORE: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT RD TO W CENTER ST & LARKIN AVE INTERCHANGE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS		
SCALE: GRAPHICAL	APPENDIX C-1	DRAWN BY: J. Bensen CHECKED BY: A. Hamad
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR TRANSYSTEMS		7901-15-01

Run #2

0 6 inches

Boring HR-BSB-01:
Run #2, 58.0 to 63.0 feet, RECOVERY=100%, RQD=21%

BEDROCK CORE: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT RD TO W CENTER ST & LARKIN AVE INTERCHANGE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS		
SCALE: GRAPHICAL	APPENDIX C-2	DRAWN BY: J. Bensen CHECKED BY: A. Hamad
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR TRANSYSTEMS		7901-15-01

Run #1

0 6 inches

Boring HR-BSB-02:
Run #1, 48.0 to 58.0 feet, RECOVERY=100%, RQD=7%

BEDROCK CORE: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT RD TO W CENTER ST & LARKIN AVE INTERCHANGE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS		
SCALE: GRAPHICAL	APPENDIX C-3	DRAWN BY: J. Bensen CHECKED BY: A. Hamad
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR TRANSYSTEMS		7901-15-01

Run #2

0 6 inches

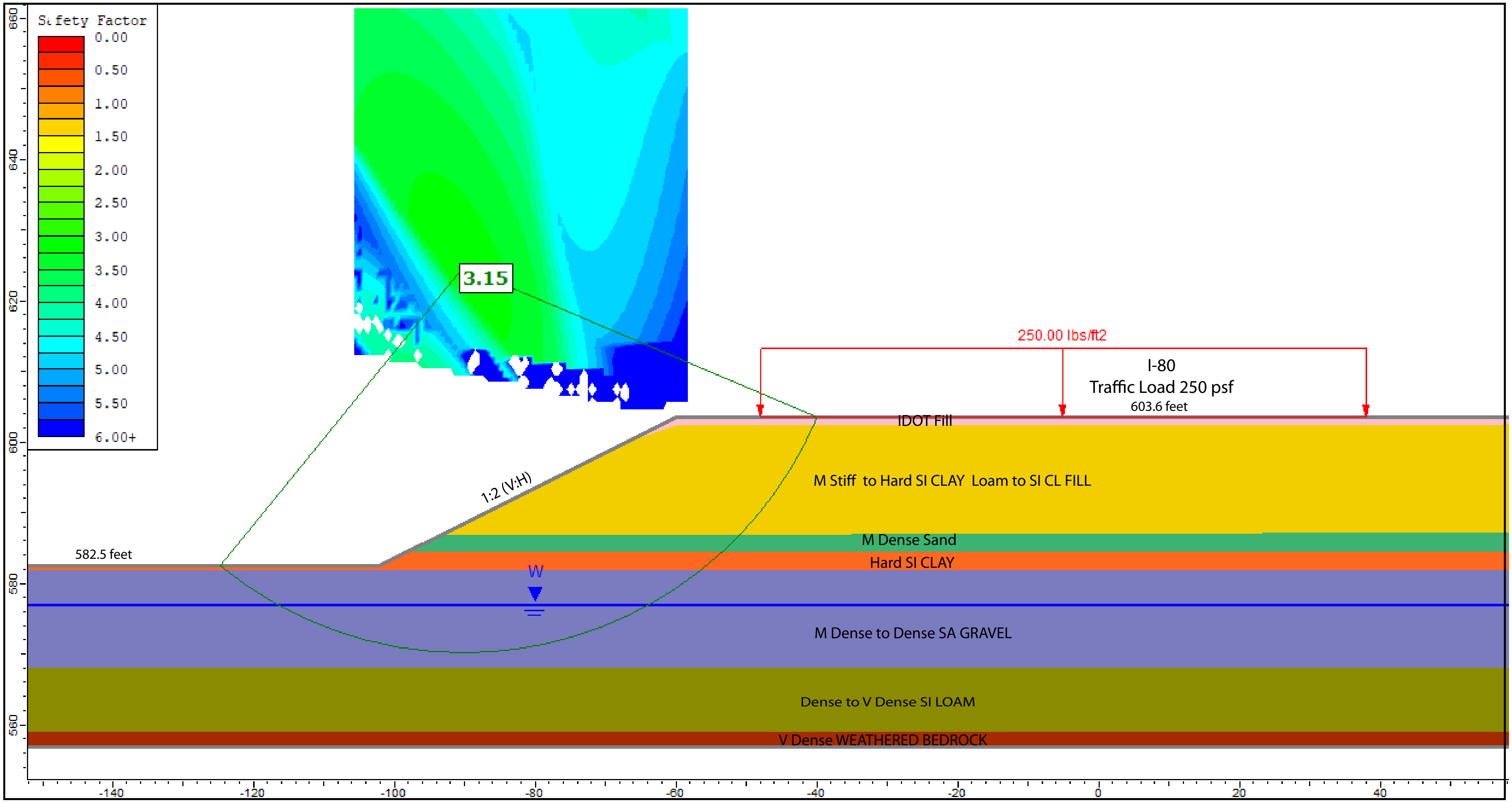
Boring HR-BSB-02:
Run #2, 58.0 to 63.0 feet, RECOVERY=100%, RQD=7%

BEDROCK CORE: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT RD TO W CENTER ST & LARKIN AVE INTERCHANGE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS		
SCALE: GRAPHICAL	APPENDIX C-4	DRAWN BY: J. Bensen CHECKED BY: A. Hamad
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR TRANSYSTEMS		7901-15-01

Wang
Engineering

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

APPENDIX D



Undrained Analysis, West Abutment Side Slope, Reference Borings: HR-BSB-01 and HR-BSB-01A

Layer ID	Description	Total Unit Weight (pcf)	Undrained Cohesion (psf)	Undrained Friction Angle (degrees)
1	IDOT FILL	125	1000	0
2	M Stiff to Hard SI CL Loam to SI CL Fill	125	1500	0
3	M Dense Sand	125	0	30
4	Hard SI CLAY	120	4000	0
5	M Dense to Dense SA (Y) GRAVEL	125	0	32
6	Dense to V Dense SI Loam	120	0	33
7	V Dense WEATHERED BEDROCK	125	0	35

GLOBAL STABILITY: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL

APPENDIX D-1

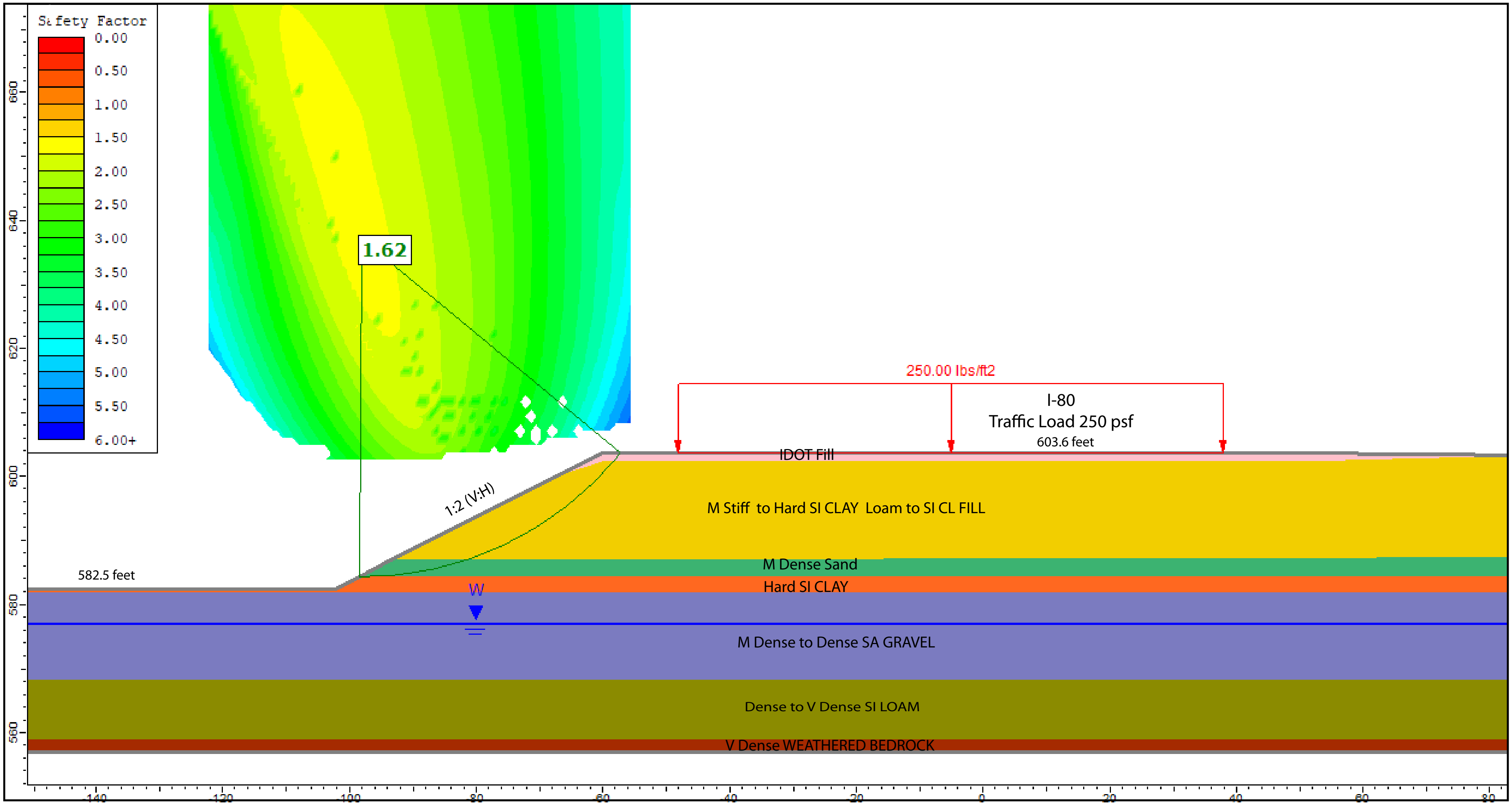
DRAWN BY: N. Balakumaran
CHECKED BY: A. Hamad

Wang Engineering

1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR TRANSYSTEMS CORPORATION

7901-15-01



Drained Analysis, West Abutment Side Slope, Reference Borings: HR-BSB-01 and HR-BSB-01A

Layer ID	Description	Total Unit Weight (pcf)	Drained Cohesion (psf)	Drained Friction Angle (degrees)
1	IDOT FILL	125	100	30
2	M Stiff to Hard SI CL Loam to SI CL Fill	125	100	30
3	M Dense Sand	125	0	30
4	Hard SI CLAY	120	100	30
5	M Dense to Dense SA (Y) GRAVEL	125	0	32
6	Dense to V Dense SI Loam	120	0	33
7	V Dense WEATHERED BEDROCK	125	0	35

GLOBAL STABILITY: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL

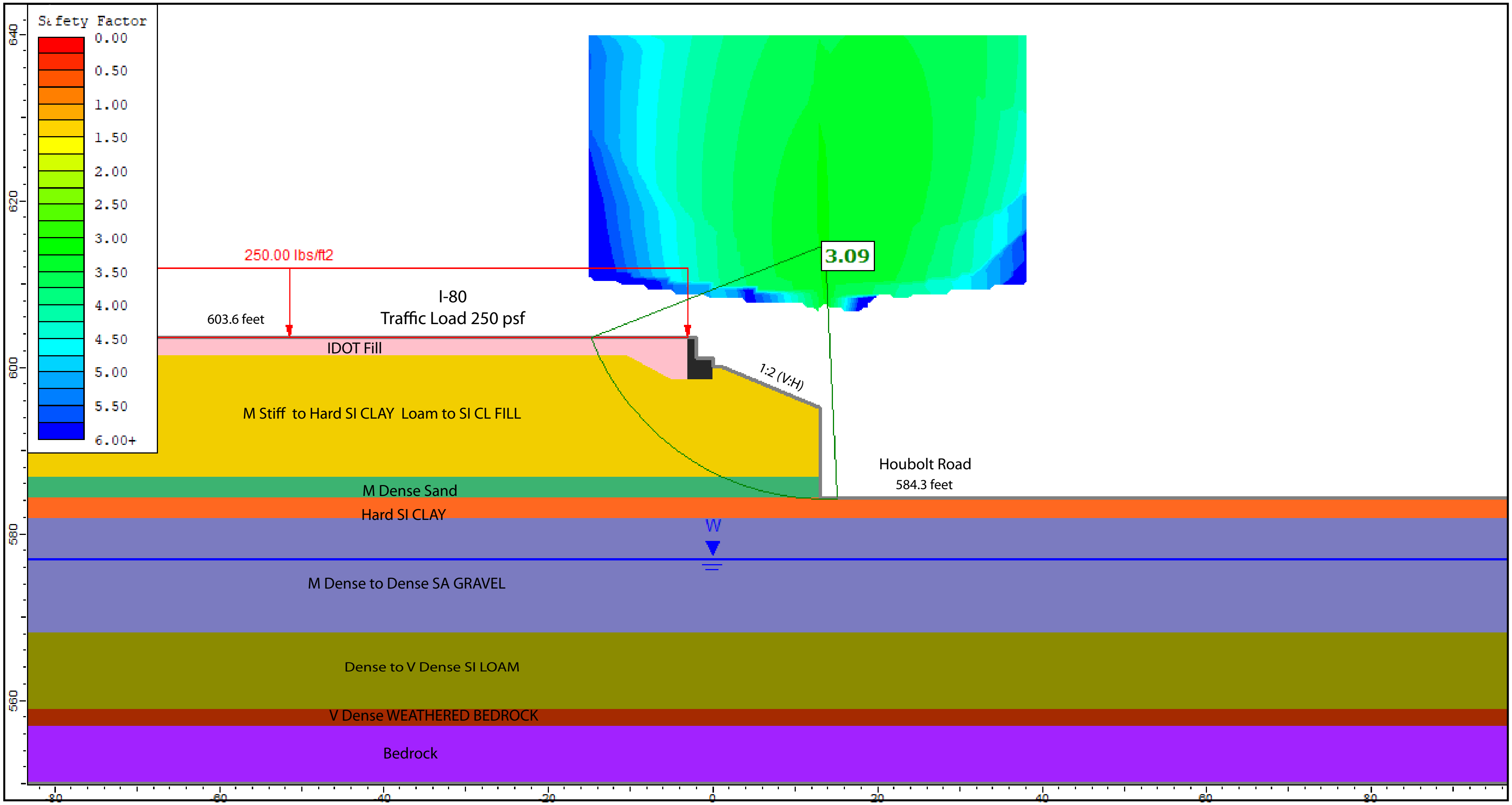
APPENDIX D-2

DRAWN BY: N. Balakumaran
CHECKED BY: A. Hamad

Wang Engineering
1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR TRANSYSTEMS CORPORATION

7901-15-01



Undrained Analysis, West Abutment End Slope, Reference Borings: HR-BSB-01 and HR-BSB-01A

Layer ID	Description	Total Unit Weight (pcf)	Undrained Cohesion (psf)	Undrained Friction Angle (degrees)
1	IDOT FIll	125	1000	0
2	M Stiff to Hard SI CL Loam to SI CL Fill	125	1500	0
3	M Dense Sand	125	0	30
4	Hard SI CLAY	120	4000	0
5	M Dense to Dense SA (Y) GRAVEL	125	0	32
6	Dense to V Dense SI Loam	120	0	33
7	V Dense WEATHERED BEDROCK	125	0	35

GLOBAL STABILITY: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL

APPENDIX D-3

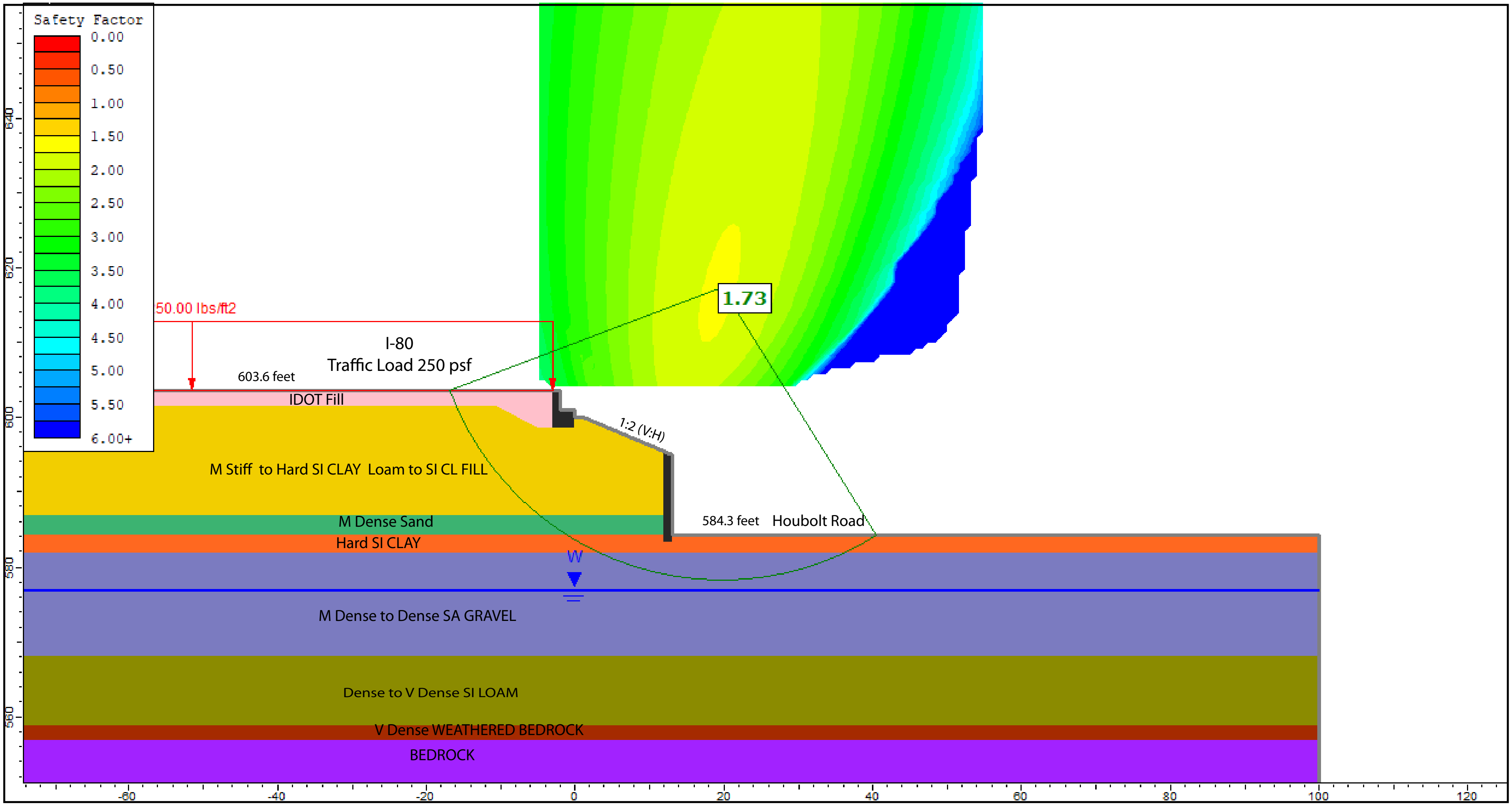
DRAWN BY: N. Balakumaran
CHECKED BY: A. Hamad

Wang Engineering

1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR TRANSYSTEMS CORPORATION

7901-15-01



Drained Analysis, West Abutment Side Slope, Reference Borings: HR-BSB-01 and HR-BSB-01A

Layer ID	Description	Total Unit Weight (pcf)	Drained Cohesion (psf)	Drained Friction Angle (degrees)
1	IDOT Fill	125	100	30
2	M Stiff to Hard SI CL Loam to SI CL Fill	125	100	30
3	M Dense Sand	125	0	30
4	Hard SI CLAY	120	100	30
5	M Dense to Dense SA (Y) GRAVEL	125	0	32
6	Dense to V Dense SI Loam	120	0	33
7	V Dense WEATHERED BEDROCK	125	0	35

GLOBAL STABILITY: I-80 BRIDGES OVER HOUBOLT ROAD; I-80 RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL

APPENDIX D-4

DRAWN BY: N. Balakumaran
CHECKED BY: A. Hamad

Wang Engineering

1145 N. Main Street
Lombard, IL 60148
www.wangeng.com

FOR TRANSYSTEMS CORPORATION

7901-15-01

APPENDIX E

Benchmark: Chiseled square on top easterly side of concrete foundation for the cantilevered highway sign over I-80, east of the gore at I-80 west bound and I-80 west bound on ramp, south side of ramp, north side of I-80, west of Houbolt; Elev.=591.589.

Existing Structure: S.N. 099-0301 and S.N. 099-0302. Built in 1994 and 1993 respectively as F.A.I. Rte. 80, Project HDP-9105(001), Section 99-2(K & HB-1-R) at Sta. 151+86.42. Existing dual structures each consist of a single-span reinf. concrete composite deck on steel plate girders supported by cast-in-place reinforced concrete integral abutments supported on steel piles. The bridge measures 148'-7" back to back abutments, 45'-2" out to out width with a skew of 14°-03'-57" skew. Deck to be removed and replaced.

Traffic Control: Traffic to be maintained using staged construction. The road shall remain open to at least two lanes of traffic in each direction at all times.

Salvage: None.

Scope of Work: Remove existing bridge deck & end diaphragms. Widen existing substructure to accomodate additional future traffic lanes. Erect new 54" Web-Plate Girders. Pour new deck & end diaphragms.

HIGHWAY CLASSIFICATION

FAI Rte. 80 - I-80
Functional Class: Interstate
ADT: 65,200 (2019); 93,900 (2040)
ADTT: 18,120 (2019); 26,100 (2040)
DHV: 11,270 (2040)
Design Speed: 70 m.p.h.
Posted Speed: 65 m.p.h.
Two-Way Traffic
Directional Distribution: 50:50

FAU 0325 - Houbolt Rd.
Functional Class: Other Principle Arterial
ADT: 24,700 (2021); 43,900 (2040)
ADTT: 6,730 (2021); 11,960 (2040)
DHV: 5,270 (2040)
Design Speed: 35 m.p.h.
Posted Speed: 30 m.p.h.
Two-Way Traffic
Directional Distribution: 50:50

DESIGN SPECIFICATIONS

2002 Standard Specifications for Highway Bridges, 17th Edition

DESIGN STRESSES

FIELD UNITS (New Const.)
f'c = 3,500 psi
f'c = 4,000 psi (Superstructure)
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

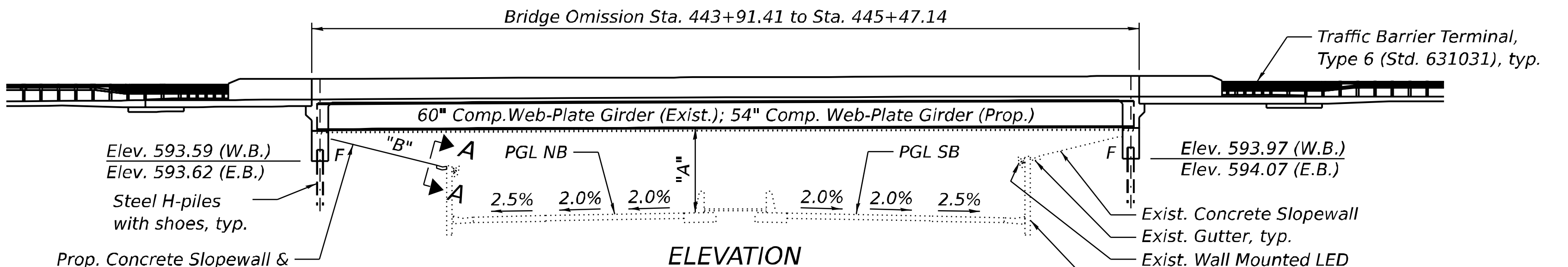
FIELD UNITS (Exist. Const.)
f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 36,000 psi (M270 Grade 36)

LOADING HS20-44 & ALT.

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

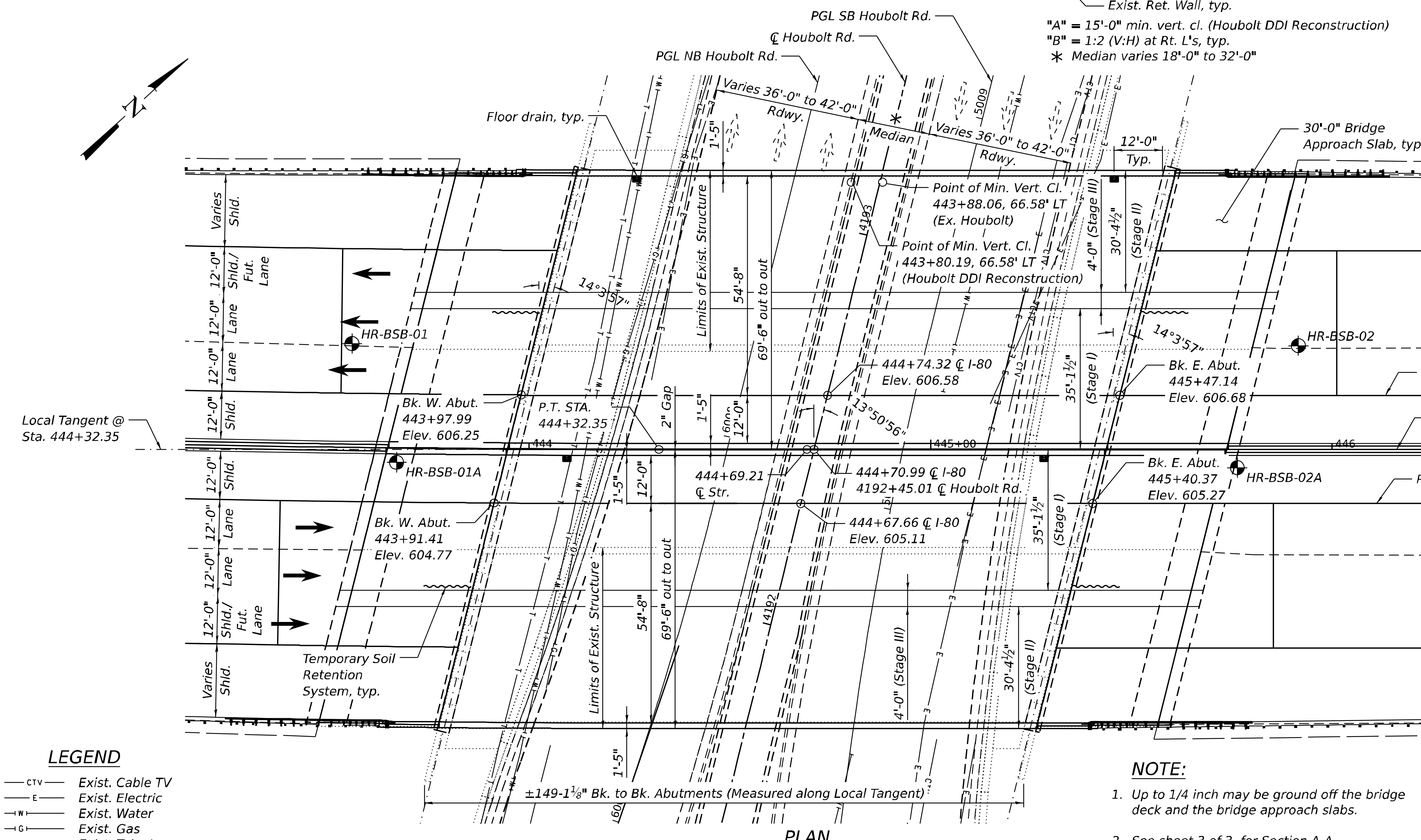
SEISMIC DATA

Seismic Performance Category (SPC) = A
Horizontal Bedrock Acceleration Coefficient (A) = 0.039g
Site Coefficient (S) = 1.0



ELEVATION

"A" = 15'-0" min. vert. cl. (Houbolt DDI Reconstruction)
"B" = 1:2 (V:H) at Rt. L's, typ.
* Median varies 18'-0" to 32'-0"



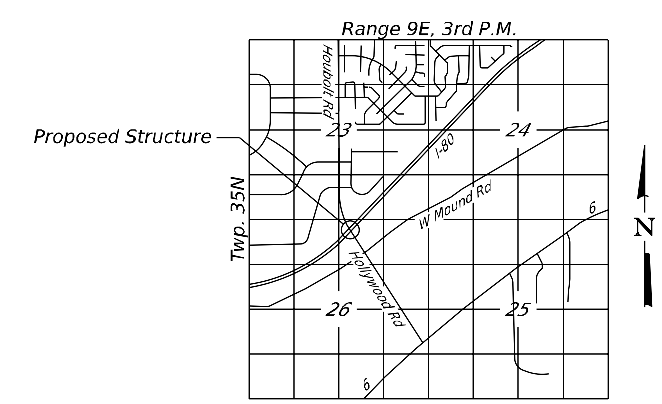
PLAN

LEGEND

—CTV— Exist. Cable TV
—E— Exist. Electric
—W— Exist. Water
—G— Exist. Gas
—T— Exist. Telephone
⊕ Soil Boring Location

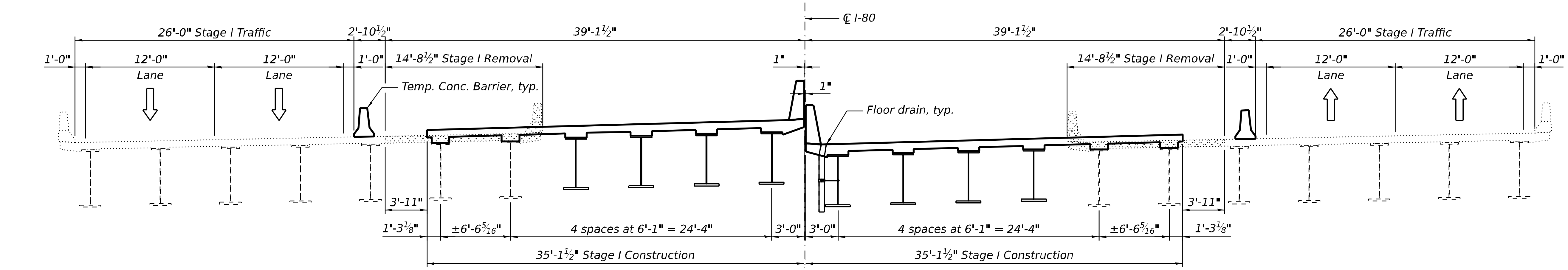
NOTE:

1. Up to 1/4 inch may be ground off the bridge deck and the bridge approach slabs.
2. See sheet 3 of 3, for Section A-A.



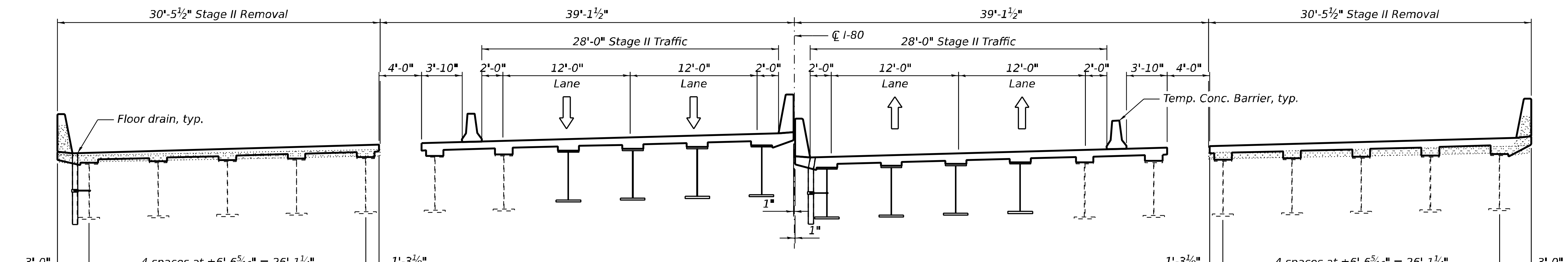
LOCATION SKETCH

GENERAL PLAN AND ELEVATION
I-80 OVER HOUBOLT ROAD
F.A.I. RTE. 80 - SEC. FAI 80 21 STRUCTURE 6
WILL COUNTY
STATION 444+69.21
S.N. 099-0301 (E.B.)
S.N. 099-0302 (W.B.)



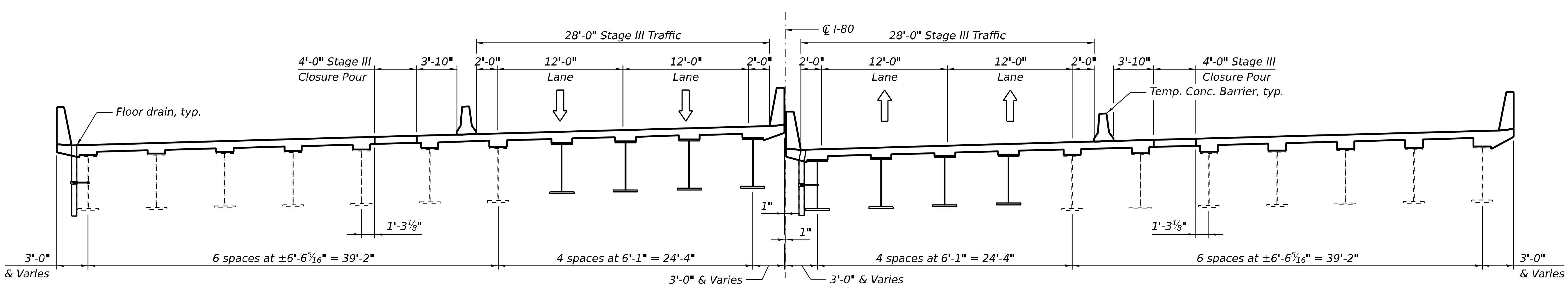
STAGE I REMOVAL AND CONSTRUCTION

(Looking East)



STAGE II REMOVAL AND CONSTRUCTION

(Looking East)



STAGE III CONSTRUCTION

(Looking East)

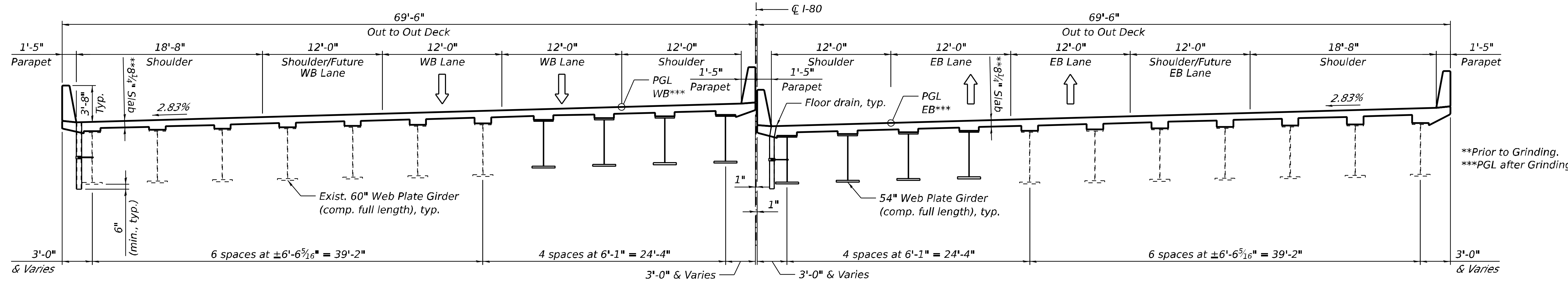
CONSTRUCTION STAGING
I-80 OVER HOUBOLT ROAD
F.A.I. RTE. 80 - SEC. FAI 80 21 STRUCTURE 6
WILL COUNTY
STATION 444+69.21
S.N. 099-0301 (E.B.)
S.N. 099-0302 (W.B.)

MODEL: Drawing
FILE NAME: pw://transystems-pw.bentley.com:transyscorp-pw1-hosted/Documents/Projects_2018/CH401/401180022/02-TranSystems/CAD/62R27/Sheets/23-Structural/099-0301 & 099-0302/D162R27_099-0301&0302_TSL_002

TranSystems

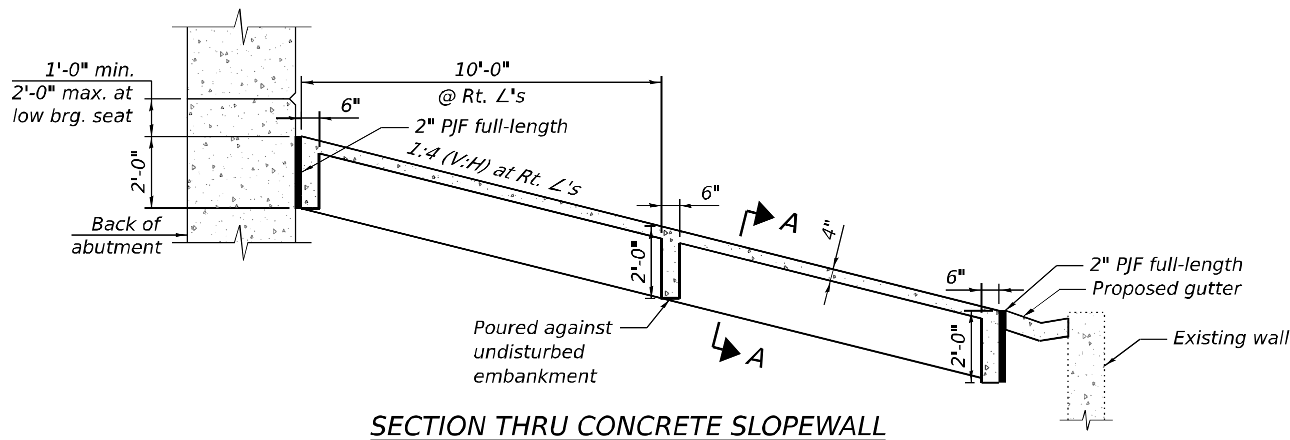
USER NAME = tjallen	DESIGNED - BMJ	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
	CHECKED - AMD	REVISED -	
PLOT SCALE = NTS	DRAWN - BMJ	REVISED -	
PLOT DATE = 8/10/2022	CHECKED - AMD	REVISED -	SHEET 2 OF 3 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-80	FAI 80 21 STRUCTURE 6	WILL	1071	596
CONTRACT NO. 62R27				
ILLINOIS FED. AID PROJECT				



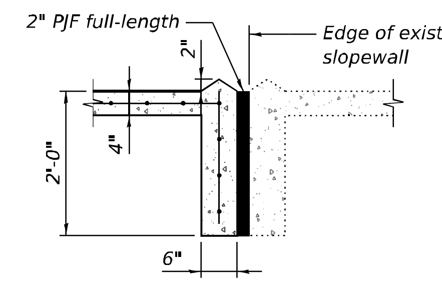
FINAL CROSS SECTION

(Looking East)

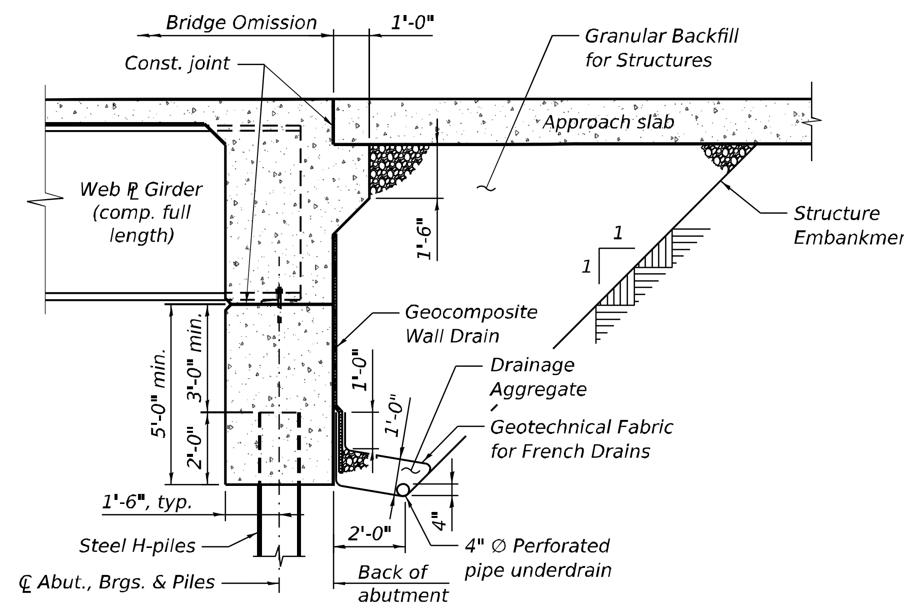


SECTION THRU CONCRETE SLOPEWALL

(Looking East)

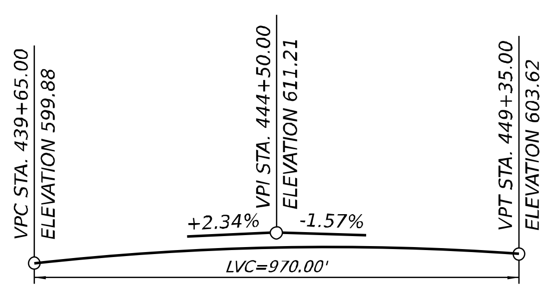


SECTION A-A

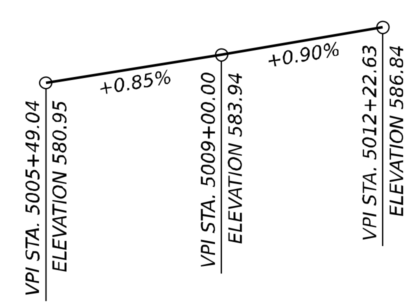


SECTION THRU INTEGRAL ABUTMENT

(Horiz. dim. @ Rt. ∠'s)



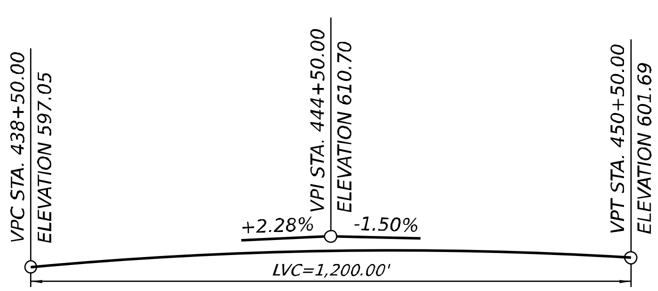
*WB I-80 PROFILE GRADE



EXIST. SB HOUBOLT RD. PROFILE GRADE

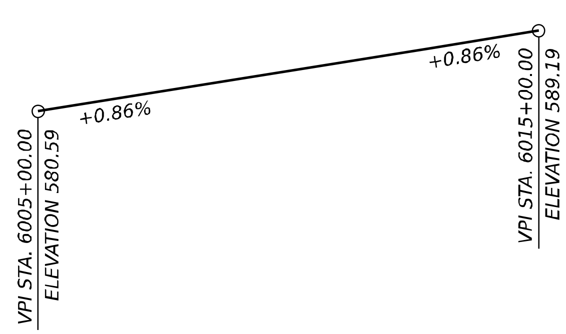
CURVE DATA

PROP. CURVE P_CURVE-I80-5
P.I. STA. = 442+52.00
Δ = 46° 06' 50" (LT)
D = 0° 59' 47"
R = 5,750.00'
T = 2,447.48'
L = 4,627.83'
E = 499.21'
e = 3.40%
T.R. = 89'
S.E. = 2.8%
S.E. RUN = 255'
P.C. STA. = 398+04.52
P.T. STA. = 444+32.35
DESIGN SPEED = 70 MPH

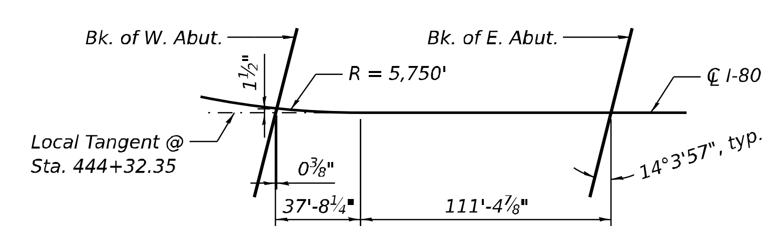


*EB I-80 PROFILE GRADE

*The Profile Grade shows the final elevations after grinding.



EXIST. NB HOUBOLT RD. PROFILE GRADE



OFFSET SKETCH

DETAILS
I-80 OVER HOUBOLT ROAD
F.A.I. RTE. 80 - SEC. FAI 80 21 STRUCTURE 6
WILL COUNTY
STATION 444+69.21
S.N. 099-0301 (E.B.)
S.N. 099-0302 (W.B.)

MODEL: Drawing
FILE NAME: pw://transystems-pw.bentley.com:transyscorp-pw1-hosted/Documents/Projects_2018/CH401/401180022/02-TranSystems/CAD/62R27/Sheets/23-Structural/099-0301 & 099-0302/D162R27_099-0301&0302_TSL_003

TranSystems

USER NAME = tjallen	DESIGNED - BMJ	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		
	CHECKED - AMD	REVISED -			
PLOT SCALE = NTS	DRAWN - BMJ	REVISED -			
PLOT DATE = 8/10/2022	CHECKED - AMD	REVISED -		SHEET 3 OF 3 SHEETS	

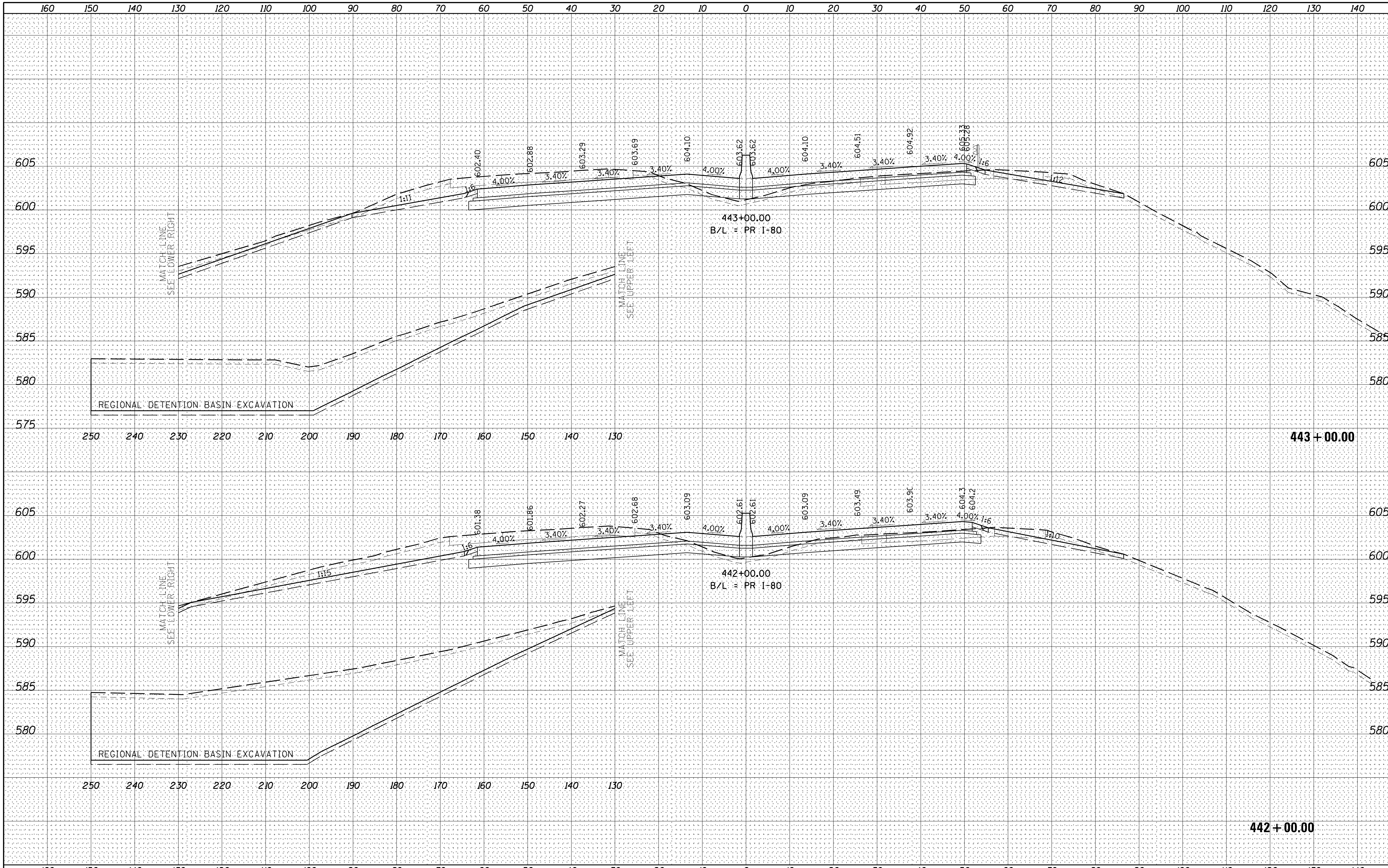
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-80	FAI 80 21 STRUCTURE 6	WILL	1071	597
CONTRACT NO. 62R27				
ILLINOIS	FED. AID PROJECT			

1145 North Main Street
Lombard, Illinois 60148
Phone (630) 953-9928
www.wangeng.com

APPENDIX F

FINAL SURVEY | NOTE BOOK NO. | SURVEYED | PLOTTED | TEMPLATE | AREAS | AREAS CHECKED | BY | DATE

ORIGINAL SURVEY | NOTE BOOK NO. | SURVEYED | PLOTTED | TEMPLATE | AREAS | AREAS CHECKED | BY | DATE



FILE NAME = d146314-sht-ILR-I80-XSect.dgn	USER NAME = mostafan	DESIGNED - BAJ	REVISED -
		DRAWN - BAJ	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED - MAM	REVISED -
	PLOT DATE = 8/12/2020	DATE - 10/11/2019	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

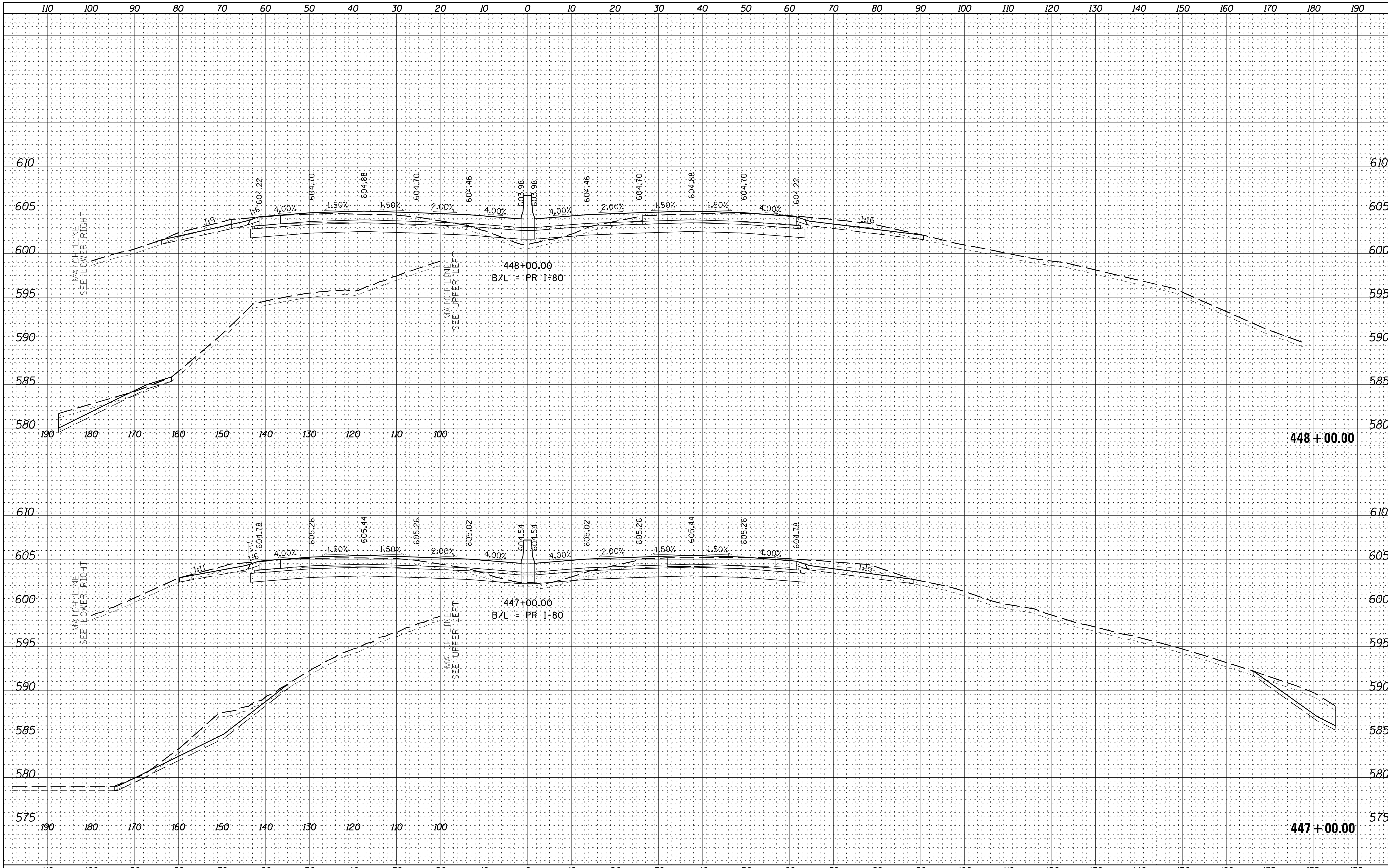
ILR – I-80 FROM RIDGE ROAD TO US ROUTE 30
I-80 PROPOSED CROSS SECTIONS

SCALE: 10 H : 5 V | SHEET 125 OF 352 SHEETS | STA. 442+00.00 TO STA. 443+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
			352	125
		CONTRACT NO.		
	ILLINOIS FED. AID PROJECT			

FINAL SURVEY	NOTE BOOK	NO.	BY	DATE
		SURVEYED		
		PLOTTED		
		TEMPLATE		
		AREAS		
		AREAS CHECKED		

ORIGINAL SURVEY	NOTE BOOK	NO.	BY	DATE
		SURVEYED		
		PLOTTED		
		TEMPLATE		
		AREAS		
		AREAS CHECKED		



FILE NAME = d146314-sht-ILR-I80-XSect.dgn	USER NAME = mostafan	DESIGNED - BAJ	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	ILR – I-80 FROM RIDGE ROAD TO US ROUTE 30	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		DRAWN - BAJ	REVISED -		I-80 PROPOSED CROSS SECTIONS				352	128
	PLOT SCALE = 20.0000 ' / in.	CHECKED - MAM	REVISED -			CONTRACT NO.				
	PLOT DATE = 8/12/2020	DATE - 10/11/2019	REVISED -		SCALE: 10 H : 5 V SHEET 128 OF 352 SHEETS STA. 447+00.00 TO STA. 448+00.00	ILLINOIS FED. AID PROJECT				