

---

**ROADWAY GEOTECHNICAL REPORT  
INTERSTATE 80 IMPROVEMENTS  
WHEELER AVENUE OVER I 80  
CONTRACT 62R30  
STATION 17+35 TO STATION 22+86  
WILL COUNTY, ILLINOIS**

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

**Submitted by  
Wang Engineering, Inc.  
a Terracon Company  
1145 North Main Street  
Lombard, IL 60148**

**Original Report: July 14, 2022  
Revised Report: August 09, 2022**

**Technical Report Documentation Page**

<b>1. Title and Subtitle</b> Roadway Geotechnical Report Interstate 80 Improvements Wheeler Avenue; Contract 62R30 Station 17+35 to Station 22+86		<b>2. Original Date:</b> July 14, 2022 <b>Revised Date:</b> August 09, 2022	
		<b>3. Report Type</b> <input type="checkbox"/> SGR <input checked="" type="checkbox"/> RGR <input checked="" type="checkbox"/> Draft <input type="checkbox"/> Final <input checked="" type="checkbox"/> Revised	
<b>4. Route / Section / County/ District/ Region</b> F.A.U 340 / NA / Will /1 / 1		<b>5. IDOT Project No. /Contract No.</b> D-91-207-19/ 62R30	
<b>6. PTB / Item No.</b> 194/011	<b>7. Existing Structure Number(s)</b> NA	<b>8. Proposed Structure Number(s)</b> NA	
<b>9. Prepared by</b> Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148		<b>Contributor(s)</b> Author: Cornelia Marin, PG QC/QA: Liviu Iordache, PG PM: Andri Kurnia, PE	<b>Contact</b> (630) 953-9928 <a href="mailto:cmarin@wangeng.com">cmarin@wangeng.com</a> <a href="mailto:akurnia@wangeng.com">akurnia@wangeng.com</a>
<b>10. Prepared for</b> TranSystems Corporation 1475 East Woodfield Road, Suite 600 Schaumburg, IL 60173		<b>Design Engineer</b> Jennifer Golemba, PE	<b>Contact</b> (847) 407-5252 <a href="mailto:jmgolemba@transystems.com">jmgolemba@transystems.com</a>
<b>11. Abstract</b> <p>The proposed improvements include roadway reconstruction and sidewalk widening along Wheeler Avenue from Station 17+65 to Station 22+56, Park Avenue from Station 10+00 to Station 11+03, Park Front Street from Station 5+32.50 to Station 6+00, and a temporary pavement, during bridge construction, along I-80 from Station 632+07 to R2 12+42. Wheeler Avenue will be raised with about 2 feet to accommodate the new bridge elevation. The other alignments will remain at the same grade. Most of the widening will occur over the sidewalks of Wheeler Avenue, Park Avenue, and Park Front Street. The new sidewalk will be built over the existing grassy edge, and the grade along it will be slightly raised by less than a foot.</p> <p>At the surface, the borings encountered 3 to 10 inches of silty clay topsoil. The recommended topsoil thickness to be stripped is 6 inches. The existing pavements are made of both asphalt and concrete with thicknesses of up to 19 inches over aggregate base. The existing subgrade consists of stiff to hard clay loam to silty clay loam fill or stiff to hard silty clay native soil. The groundwater levels were found at 6 feet below proposed subgrade or deeper.</p> <p>The proposed subgrade will generally provide a stable working platform for the placement of fill and pavement construction. Subgrade treatment is not needed unless during construction unsuitable soils are encountered. As per District One, we recommend that a plan quantity of Aggregate Subgrade Improvement equal to 25% be added for estimating purposes. This material should be used to replace any unsuitable soils that are encountered in the field during construction below the bottom of the aggregate improved subgrade.</p> <p>For a mechanistic pavement design, the pavement sections should be designed using an SSR of POOR. For an AASHTO pavement design, the pavement sections should be designed using an IBR of 3.</p> <p>The embankment end slope will have adequate factor of safety against slope instability and foundation soil settlement will be 1 inch or less. A shrinkage factor of 15% should be used to measure borrowed and furnished excavation quantities.</p>			
<b>12. Path to archived file:</b> N:\_WANGLegacy\SHARED\Netprojects\79011501\Reports\RGRs\Wheeler_62R30\RPT_Wang_CLM_79011501_I80Contract62R30 RGR-WA_V02_20220809.docx			

## TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>2.0</b>	<b>GEOLOGICAL SETTING .....</b>	<b>2</b>
2.1	PHYSIOGRAPHY .....	2
2.2	PEDOLOGICAL FEATURES .....	2
2.3	SURFICIAL COVER .....	3
2.4	BEDROCK .....	3
2.5	CLIMATOLOGICAL DATA .....	3
<b>3.0</b>	<b>METHODS OF INVESTIGATION .....</b>	<b>6</b>
3.1	FIELD INVESTIGATION.....	6
3.2	LABORATORY TESTING.....	7
<b>4.0</b>	<b>INVESTIGATION RESULTS .....</b>	<b>8</b>
4.1	SURFACE CHARACTERIZATION.....	8
4.2	SUBGRADE CONDITIONS .....	9
4.3	GROUNDWATER CONDITIONS.....	10
<b>5.0</b>	<b>ANALYSIS AND RECOMMENDATIONS .....</b>	<b>10</b>
5.1	SITE PREPARATION .....	11
5.2	SUBGRADE TREATMENT RECOMMENDATIONS.....	12
5.3	PAVEMENT DESIGN RECOMMENDATIONS .....	14
5.4	EMBANKMENT AND CUT SECTIONS .....	14
5.4.1	<i>Settlement</i> .....	15
5.4.2	<i>Global Stability</i> .....	15
5.5	ROADWAY DRAINAGE .....	15
<b>6.0</b>	<b>CONSTRUCTION CONSIDERATIONS .....</b>	<b>15</b>
6.1	EXCAVATION, DEWATERING, AND UTILITIES.....	15
6.2	FILLING AND BACKFILLING.....	16
6.3	REUSE OF MATERIALS .....	16
6.4	EARTHWORK OPERATIONS .....	16
<b>7.0</b>	<b>QUALIFICATIONS.....</b>	<b>17</b>

**REFERENCES..... 18**

**EXHIBITS**

- 1. SITE LOCATION MAP*
- 2-1. SITE PEDOLOGICAL MAP*
- 2-2. SITE PEDOLOGICAL TABLE*
- 3. SITE AND REGIONAL GEOLOGY MAP*
- 4. SUBGRADE SUPORT RATING CHART*

**APPENDIX A**

- BORING LOGS*

**APPENDIX B**

- LABORATORY TEST RESULTS*

**APPENDIX C**

- IDOT BMPR 507A AND 508A FORMS*

**APPENDIX D**

- TYPICAL CROSS SECTIONS*

**APPENDIX E**

- SLOPE STABILITY*

**APPENDIX F**

- PAVEMENT CORES*

**APPENDIX G**

- BORING LOCATION PLANS AND SOIL PROFILES*

**LIST OF TABLES**

Table 1: Surface Investigation Summary ..... 6

Table 2: Summary of Existing Pavement Thickness and Composition..... 8

Table 3: Summary of Groundwater Measurements..... 10

**LIST OF FIGURES**

Figure 1: Monthly Precipitation Data for 2020 to 2021 ..... 4

Figure 2: Monthly Temperature Data for 2020 to 2021 ..... 4

Figure 3: Monthly Precipitation Data for 2022 ..... 5

Figure 4: Monthly Temperature Data for 2022 ..... 5

**ROADWAY GEOTECHNICAL REPORT  
INTERSTATE 80 IMPROVEMENTS  
WHEELER AVENUE OVER I-80  
CONTRACT 62R30  
STATION 17+35 TO STATION 22+86  
WILL COUNTY, ILLINOIS  
FOR  
TRANSYSTEMS**

## **1.0 INTRODUCTION**

This report presents the results of our subsurface investigation, laboratory testing, and geotechnical evaluations and recommendations in support of the roadway improvements proposed for Wheeler Avenue over Interstate 80 (I-80) in Will County, Illinois. The bridge replacement and roadway reconstruction 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. A *Site Location Map* is presented as Exhibit 1.

Based on drawings and information provided by TranSystems Corporation (TranSystems) dated May 06, 2022, Wang Engineering, Inc. (Wang), a Terracon Company, understands the proposed improvements include roadway improvements along:

- Wheeler Avenue between Station 17+65 and Station 22+56; the proposed improvements include roadway reconstruction to accommodate the new Wheeler Avenue Bridge over I-80 and sidewalk widening. A Structure Geotechnical Report (SGR) was submitted on September 16, 2021;
- Park Avenue between Station 10+00 and Station 11+03; the proposed improvements include roadway reconstruction with new curb and gutter and widening of the sidewalk to accommodate the roadway reconstruction along Wheeler Avenue;
- Park Front Street between Station 5+32.50 and Station 6+00; the proposed improvements include roadway reconstruction with new curb and gutter and widening of the sidewalk to accommodate the roadway reconstruction along Wheeler Avenue;
- I-80 between Station 632+07.23 and Station R2 12+42.27; the proposed improvements include temporary pavement widening and/or shoulder rehabilitation for staging to support Wheeler Avenue Bridge reconstruction.

The purpose of our investigation was to characterize the pavement, subgrade, and groundwater conditions; perform geotechnical engineering analyses; and provide geotechnical recommendations for the design and construction of the proposed roadway improvements.

## **2.0 GEOLOGICAL SETTING**

The project area is located in the City of Joliet, Will County, Illinois. On the USGS *Joliet 7.5 Minute Series Quadrangle* map, the project is located in SE  $\frac{1}{4}$  of Section 17, Tier 35N, Range 10E of the Joliet Township of the Third Principal Meridian.

The following review of published geologic data, with emphasis on factors that might influence the design and construction of the proposed engineering works, is meant to place the project area within a geological framework and confirm the dependability and consistency of the subsurface investigation results. For the study of the regional geologic framework, Wang considered northeastern Illinois in general and Will County in particular.

### **2.1 Physiography**

The project area is located within the western part of the Wheaton Morainal Country physiographic subsection of the Great Lake Section (Leighton et al. 1948). The project area is dominated by the Rockdale Moraine, and it is characterized by morainic topography with series of broad parallel morainic ridges, elongated hills, mounds, basins, sags and valleys. The surface along the project area slopes gently west to east, from the up-ice slope of the Rockdale Moraine into intermorainal area between Rockdale and Manhattan Moraines. The elevation along Wheeler Avenue roadway is about 640 feet and the elevation along I-80 is about 615 feet.

### **2.2 Pedological Features**

After the Wisconsin glaciation, several types of soils developed through weathering of glacial sediments. In Will County, the soil types were surveyed by the USDA (2021). A summary of the USDA soil types present within the project area, including their relevant geotechnical index properties and suitability as subgrade and road fill are shown in Exhibits 2-1 and 2-2. The soil information provided by USDA is meant to be used as a general reference in the absence of a site-specific investigation. In this instance, our findings regarding soil features affecting suitability for highway and street construction are in agreement with the information presented in the exhibits.

### 2.3 Surficial Cover

The surficial cover is the result of Wisconsin-age glacial activity. The glacial deposits were emplaced during pulsating advances and retreats of an ice-sheet lobe responsible for the formation of end moraines and associated low-relief till and lake plains (Hansel and Johnson 1996). Along the project area, the drift thickness varies from about 20 feet to 40 feet. Predominantly, the drift is dominated by silty clay diamicton of the Yorkville Member of the Lemont Formation that overlies sand and gravel outwash of the Henry Formation, which in turn rests on top of bedrock. Exhibit 3 illustrates the *Site and Regional Geology*.

In the project area, the Yorkville Member of the Lemont Formation, up to 35-foot thick, consists of yellowish brown to gray silty clay to silty clay loam diamicton that contains lenses of gravel, sand, and silt. The Henry Formation consists of stratified sand and gravel outwash with thicknesses of about 5 to 10 feet (Caron 2017).

From a geotechnical viewpoint, the Yorkville Member is characterized by moderate plasticity, high strength, and low to moderate moisture content (Bauer et al. 1991).

### 2.4 Bedrock

Within the project limits, the surficial cover rests unconformably on top of Silurian-age bedrock that dips eastward. The top of the bedrock lies at about 45 feet below the ground surface (bgs). The Silurian-age dolostone (Kolata 2005) is slightly to highly weathered.

Structurally, the site is located on the eastern flank of the Wisconsin Arch. The northwest to southeast trending inactive Sandwich Fault Zone is about 5 miles southwest of the project.

### 2.5 Climatological Data

The subsurface investigation was performed from March to April of 2021 and in May of 2022. To assess the possible effects of temperature and precipitation on water table data and soil moisture, the climatic conditions for the investigation period and three months prior to the start of the investigation are summarized graphically in Figures 1 through 4. The precipitation and temperature data for the investigation period are compared against thirty-year monthly data (1991 to 2020) in box-and-whiskers format to show deviations from “normal” climate conditions during the current investigation. Local climate data were obtained from the O’Hare Station (NCDC 2021 and 2022).

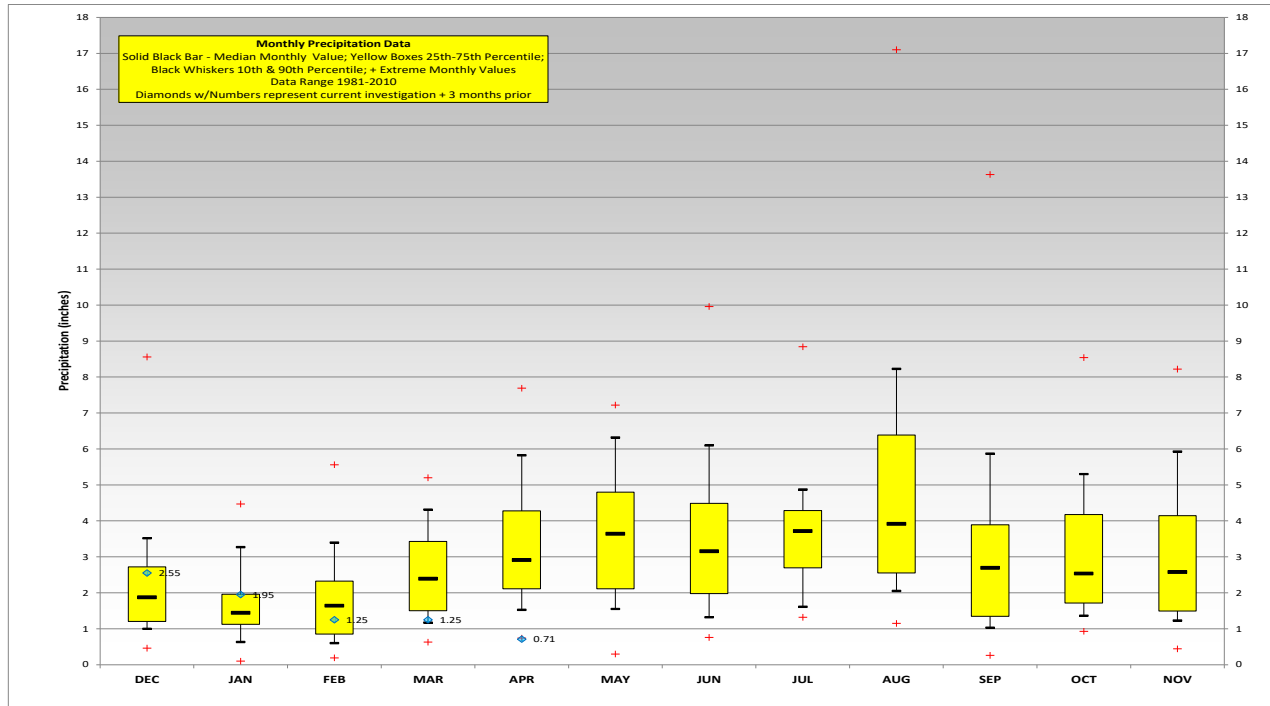


Figure 1: Monthly Precipitation Data for 2020 to 2021

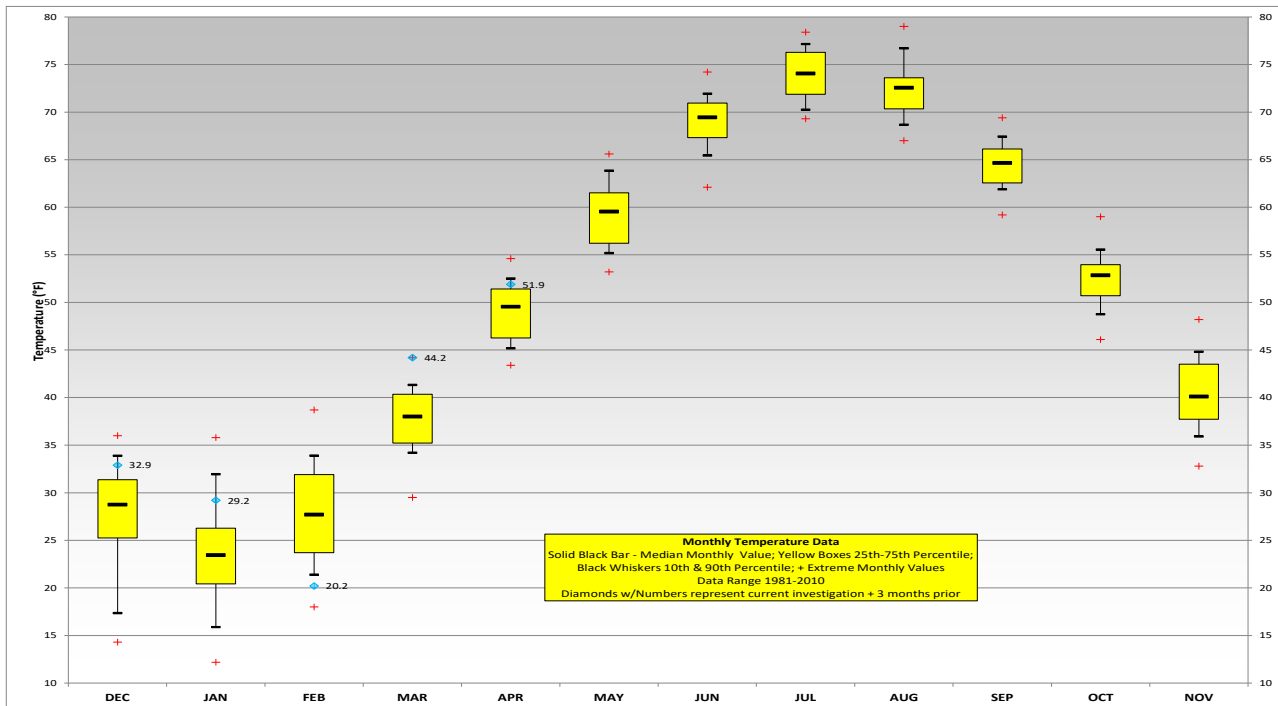


Figure 2: Monthly Temperature Data for 2020 to 2021



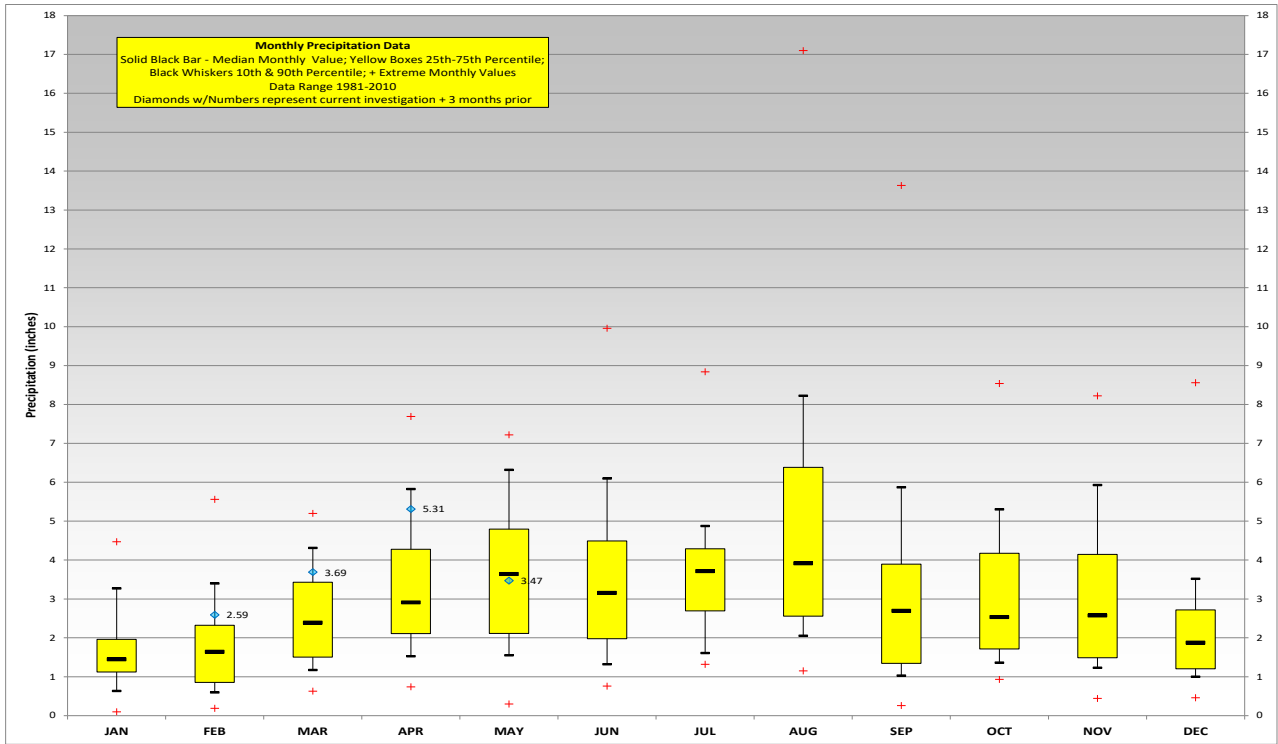


Figure 3: Monthly Precipitation Data for 2022

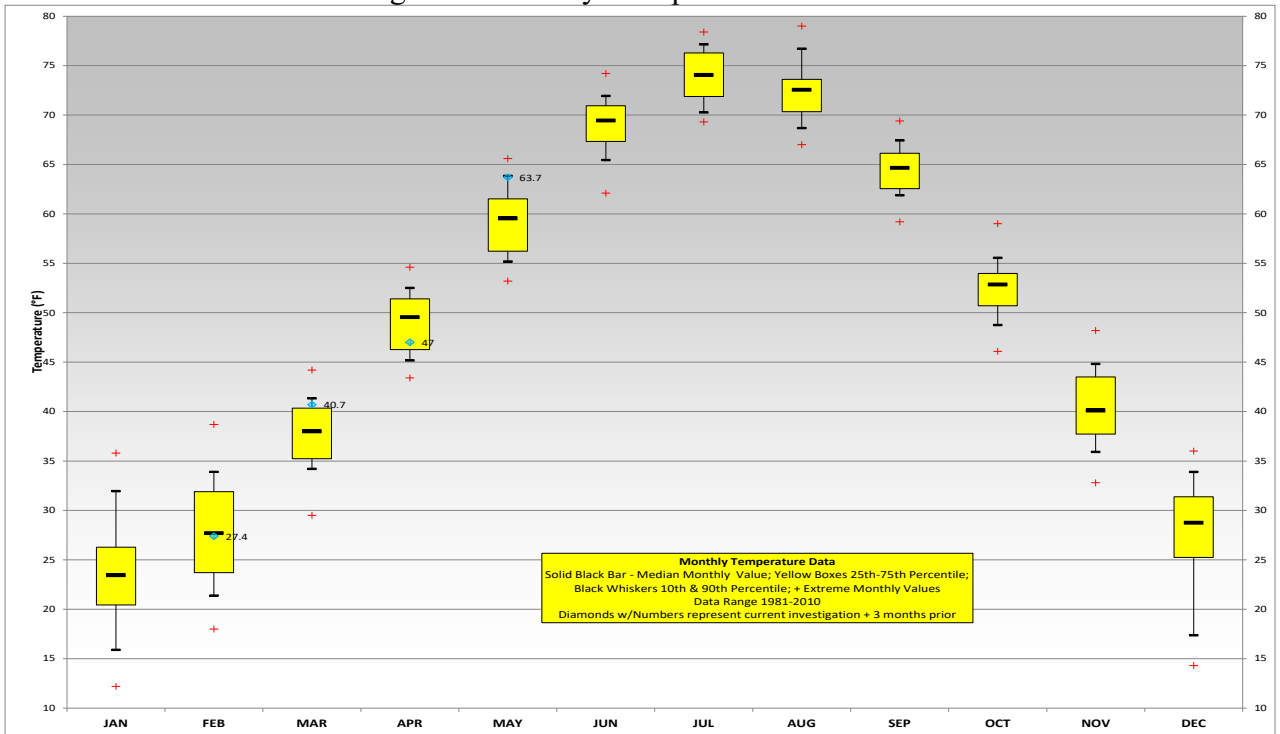


Figure 4: Monthly Temperature Data for 2022

The deviations from the historical 30-year climate data show the investigation period was characterized in general by average precipitations and average to high temperatures with the exception of record high temperatures with average to low precipitation in March 2021 and in May 2022. Observations of perched water within the granular fill may have been influenced by these climate factors.

### 3.0 METHODS OF INVESTIGATION

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

#### 3.1 Field Investigation

The subsurface investigation consisted of subgrade borings (SGB) drilled along Wheeler Avenue and along the I-80 eastbound (EB), westbound (WB), and centerline/median (CL). To supplement the subsurface data, we considered Wheeler Avenue bridge borings (BSB). For pavement structure description, pavement cores (PC) were performed. The investigation was performed by Wang between March and April 2021 and May 2022 from surface elevations of 610.2 to 637.5 feet. The borings were advanced to depths of 10.0 to 67.0 feet bgs. A summary of soil borings, associated roadway alignments, ground surface elevations, and termination depths is provided in Table 1.

Table 1: Surface Investigation Summary

Roadway Alignment	Alignment Limits (Station to Station)	Reference Borings and Pavement Cores IDs	Ground Surface Elevations (feet)	Termination Depths (feet)
Wheeler Avenue	17+35.00 to 22+86.00	WA-SGB-01, WA-SGB-02, WA-BSB-01, and WA-BSB-02	613.3 to 637.5	11.0 to 67.0
Park Avenue	10+00.00 to 11+02.57	WA-BSB-01	637.5	60.0
Park Front Street	5+17.50 to 6+00.00	WA-BSB-01	637.5	60.0
I-80 Temporary pavement	632+07.23 to R2 12+42.27	CL-SGB-36, CL-SGB-37, EB-SGB-38, WB-SGB-39, WA-BSB-03; and PC- CL-SGB-36, PC- CL-SGB-37, PC- EB-SGB-38, PC- WB-SGB-39	610.2 to 614.9	10.0 to 37.0

The as-drilled northing and easting coordinates were surveyed by Wang with a mapping-grade GPS unit, whereas stations, offsets, and elevations were provided by TranSystems. Boring location data are presented in the *Boring Logs* (Appendix A) and the as-drilled locations are shown in the *Boring Location Plans and Soil Profiles* (Appendix G).

ATV- and truck-mounted drilling rigs equipped with hollow stem augers were used to advance and maintain open boreholes. Soil sampling was performed according to AASHTO T206, "*Penetration Test and Split Barrel Sampling of Soils.*" The soil was sampled continuously in SGB borings. The BSB borings were sampled at 2.5-foot intervals to 30 feet and at 5-foot intervals thereafter. Soil samples collected from each sampling interval were placed in sealed jars and transported to the laboratory for further examination and laboratory testing.

Field boring logs, prepared and maintained by a Wang field engineer, included lithological descriptions, visual-manual soil classifications, results of Rimac and/or pocket penetrometer unconfined compressive strength tests, and results of Standard Penetration Tests (SPT) recorded as blows per 6 inches of penetration. The N-values shown in the *Boring Location Plans and Soil Profiles* (Appendix G) are the sum of the second and third set of blows per 6 inches of penetration.

Groundwater levels were measured while drilling and at the completion of each boring. For safety considerations each borehole was backfilled upon completion with soil cuttings and bentonite chips and the pavement surface was restored as close as possible to its original condition.

### **3.2 Laboratory Testing**

The soil samples were tested in the laboratory for moisture content (T265). Atterberg limits (T89 and T90), and particle size analysis (T88) tests were performed on select samples. Field visual descriptions of the soil samples were verified in the laboratory and the soils were classified according to the IDH and AASHTO Soil Classification Systems. The laboratory test results are shown in the *Boring Logs* (Appendix A), in the *Laboratory Test Results* (Appendix B), in the *IDOT Forms* (Appendix C), and in the *Boring Location Plans and Soil Profiles* (Appendix G).

## 4.0 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 *Boring Location Plans and Soil Profiles* (Appendix G). Please note that the strata contact lines shown on the logs and profiles represent approximate boundaries between soil types. The actual transition between soil types in the field may be gradual in horizontal and vertical directions.

### 4.1 Surface Characterization

The improvement will include reconstruction along Wheeler Avenue, Park Avenue, Park Front Street, and temporary pavement along a section of I-80 for staging during Wheeler Bridge construction. The borings were drilled through either shoulder pavement or through grassy area just off road. The topsoil thickness ranges from 3 to 10 inches with an average of 6 inches.

Primarily, the borings were drilled through paved shoulders. The borings drilled in the existing Wheeler Avenue roadway show pavement structures consisting of asphalt or asphalt over concrete. The pavement thickness along Wheeler Avenue ranges from 5 to 15 inches with an average of 10 inches. The pavement thickness along I-80 ranges from 13.3 to 19 inches with an average of 15 inches. The aggregate base consists of either crushed stone or gravelly sand and its thickness along Wheeler Avenue is up to 2 inches. Pavement structure thicknesses are summarized in Table 2.

Table 2: Summary of Existing Pavement Thickness and Composition

Alignment	Total Number of Measurements (No)	Pavement Structure Thickness (inches)				Pavement Average Thickness (inches)
		Asphalt No <sup>1</sup> /Range	Concrete No <sup>1</sup> /Range	Asphalt base No <sup>1</sup> /Range	Total Pavement No <sup>1</sup> /Range	
Wheeler Avenue	3	3/3-5	2/7-12	0	3/5-15	10
Park Avenue	0	NA	NA	0	NA	NA
Park Front Street	0	NA	NA	0	NA	NA
I-80 Temporary pavement	4 <sup>2</sup>	4/3.25-4-50	4/9.75-10.25	1/4.5	4/13.25-19.0	14.9

<sup>1</sup>No = number of measurements along the alignment. <sup>2</sup> = Data obtained from pavement cores.

## 4.2 Subgrade Conditions

Beneath the surface, in descending order, the lithologic succession encountered includes: 1) man-made ground (fill); 2) stiff to hard silty clay diamicton; 3) very dense sand and gravel outwash; 4) dolostone bedrock. The following section presents the subgrade conditions encountered within and along the roadway alignments by our subsurface investigation. The geotechnical properties are presented below.

### 1) *Man-made ground (fill)*

Beneath the surface, the borings encountered up to 5.2 feet of cohesive fill along Wheeler Avenue and up to 1.3 feet of fill along I-80 west end of this section. The cohesive fill generally consists of stiff to hard clay loam to silty clay loam with unconfined compressive strength ( $Q_u$ ) values of 1.5 to 4.5 tsf with an average of 3.2 tsf, SPT N-value of 7 to 17 blows per foot averaging 11 blows per foot, and moisture content values of 8 to 30% with an average of 20%. Laboratory index testing shows liquid limit ( $L_L$ ) values of 35 to 46% and plastic limit ( $P_L$ ) values of 14 to 16%. The soil belongs primarily to the A-6 group in accordance with AASHTO.

Buried topsoil was encountered below the fill in two borings along I-80. Buried topsoil thickness varies from 10 to 14 inches; it is a black silty clay characterized by  $Q_u$  values of 0.5 to 1.1 tsf, and moisture content of 34%.

### 2) *Stiff to hard silty clay diamicton*

Beneath the fill, buried topsoil, or at the surface, borings encountered more than 10-foot thick, stiff to hard silty clay diamicton. This unit makes up most of the subgrade. The unit is characterized by  $Q_u$  values of 1.3 to 8.7 tsf, averaging 3.9 tsf, SPT N-values of 5 to 28 blows per foot, averaging 15 blows per foot, moisture content of 12 to 24% and an average of 19%,  $L_L$  values of 33 to 36%, and  $P_L$  of 15 to 16%. The AASHTO soil classification show the soil belongs to A-6 group.

Within this unit, lenses of sand and silt are discontinuously encountered. Lenses are 0.5- to 2.5-foot thick, moist to saturated, with N-values of 7 to 24 blows per foot, and moisture content values of 12 to 17%.

### 3) *Very dense sand and gravel outwash*

Below Unit 2, at elevations of 597.8 to 599.0 feet (15.5 to 39.1 feet bgs), the borings advanced through very dense sand and gravel. This unit rest over bedrock, is damp to wet, and its thickness, including the weathered bedrock, varies from 4.5 to 15 feet. The unit is characterized by SPT N-values greater than

50 blows per foot, considered spoon refusal and moisture content values of 4 to 7% averaging 17%.

### 4.3 Groundwater Conditions

Groundwater was recorded during and upon completion of drilling. The groundwater was encountered in 4 out of 10 borings, within granular lenses, found within diamicton (Unit 2). However, it should be noted that groundwater levels were found 6 feet or more below proposed subgrade and they might change with seasonal rainfall patterns or may be influenced by local site conditions. A groundwater data summary is presented in Table 3.

Table 3: Summary of Groundwater Measurements

Roadway Alignment	Groundwater measurements No <sup>1</sup> ./out of <sup>2</sup>	Groundwater while drilling (feet)		Groundwater after drilling (feet)	
		Depth	Elevation	Depth	Elevation
		min-max	min-max	min-max	min-max
Wheeler Avenue	2/4	31.8-36.8	600.8-604.0	Dry	Dry
Park Avenue	1/1	36.8	600.8	NA	NA
Park Front Street	1/1	36.8	600.8	NA	NA
I-80 Temporary pavement	3/3	6.3-8.0	606.6-607.0	17	596.3

<sup>1</sup>No = number of borings that encountered groundwater; <sup>2</sup> total number of borings drilled along the alignment

## 5.0 ANALYSIS AND RECOMMENDATIONS

According to the drawings provided by TranSystems, Wang understands the following improvements are proposed:

- Reconstruction of Wheeler Avenue from Station 17+65 to Station 22+56;
- Reconstruction of Park Avenue from Station 10+00 to Station 11+03;
- Reconstruction of Park Front Street from Station 5+32.50 to Station 6+00; and
- Temporary pavement widening and/or shoulder rehabilitation of I-80 from Station 632+07.23 to Station R2 12+42.27 to support the staging for Wheeler Avenue new Bridge construction.

Design and cross-section drawings indicate the proposed grade will be not changed or slightly changed along all roadways and insignificant cut and/or fill of under one foot is assigned.

As per TranSystems draft cross sections, the typical pavement design is:

Wheeler Avenue; Park Avenue; and Park Front Street

Lane

7.25" Hot-mix Asphalt (HMA);  
12" Aggregate Subgrade Improvement

Sidewalk

5" Portland cement concrete (PCC)  
3" Subbase Granular material Type C

Wheeler Avenue

Approach Slab (AS)

HMA Pavement Connector for AS  
12" Aggregate Subgrade Improvement

W Park Front Street

7.25" HMA ;  
12" Aggregate Subgrade Improvement

W Park Avenue

7.25" HMA ;  
12" Aggregate Subgrade Improvement

I-80

Shoulders/ temporary lanes/concrete guard-rail

Option 1: Temporary HMA Pavement

2" HMA surface course;  
11" HMA binder course;  
4" Subbase Granular material Type B

Option 2: Temporary PCC Pavement

11" PCC;  
4" Subbase Granular material Type B

## 5.1 Site Preparation

For the proposed reconstruction, it is recommended that any topsoil and existing pavement be stripped within the limits of the proposed improvements. For estimating purposes, the topsoil thickness to be stripped is 6 inches. As per IDOT District One, a shrinkage factor of 15% should be used to measure borrowed and furnished excavation quantities.

We understand that stockpiles will be not utilized. However, if needed, as per IDOT District One: We recommend that all the topsoil that is stripped be stockpiled, sorted, and reused for the proposed landscaping improvements. The pay item for this is TOPSOIL EXCAVATION AND PLACEMENT

(CU YD). We recommend that a plan note containing the stockpiling information be included in the contract documents. The actual removal depth and the quantity of topsoil removal should be verified in the field.

After stripping, the stability of the exposed subgrade should be observed for the presence of any unsuitable and/or unstable soils to determine if remedial treatment is necessary. The prepared subgrade should be proofrolled to check for rutting and subgrade deformation. Using a static or dynamic cone penetrometer, any unstable and/or unsuitable soils revealed during proofrolling should be tested and evaluated according to the IDOT *Subgrade Stability Manual* (IDOT 2005).

## 5.2 Subgrade Treatment Recommendations

Based on the soil conditions encountered in the subgrade borings, the subgrade will consist of stiff to hard silty clay to silty clay loam and clay fill with  $Q_u$  values greater than 1.0 tsf, moisture content values less than 25%, and LL values below 50%. In general, the subgrade will provide a stable working platform for the placement of the new pavement structure. Boring WA-SGB-02 revealed a 22-inch thick layer of stiff clay fill, with a  $Q_u$  value of greater than 1.0 tsf, a moisture content of 28%, and an LL value of 46%. Due to a higher moisture content, if this layer is encountered during construction, it should be disked, dried, and compacted prior to placement of the pavement structure.

Depending on the subgrade soils encountered at the site, the actual need for, and limits of, improvement should be determined in the field at the time of construction. Any highly moist soils, if not otherwise unsuitable or unstable, encountered within the exposed subgrade should be disked, dried, and compacted before placing the new pavement structure. The subgrade should be proofrolled and tested as outlined in the sections below for site preparation. If low strength and/or high moisture soils are encountered during construction, they should be removed to a minimum depth of 12 inches and replaced with compacted granular fill over geofabric.

The improved subgrade should be in accordance with the IDOT Bureau of Design and Environment (BDE) *Aggregate Subgrade Improvement* Special Provision. We recommend placing geotextile fabric at the base of undercut areas. Fabric should meet the requirements of Article 210, Fabric for Ground Stabilization of IDOT *Standard Specifications* (IDOT 2022).

As per IDOT District One: In addition to the undercuts recommended, we recommend that a plan quantity of Aggregate Subgrade Improvement (CU YD) equal to 25% of the planned full depth



pavement area assuming a thickness of 12 inches should be added for estimating purposes. This material should be used to replace any unsuitable soils below the bottom of the improved subgrade layer that are encountered in the field during construction. The actual need for removal and replacement with Aggregate Subgrade Improvement should be determined in the field at the time of construction by the Geotechnical Engineer or soils inspector. All potentially unstable soils should be tested with a cone penetrometer and treated in accordance with Article 301.04 of the SSRBC and the undercut guidelines in the IDOT Subgrade Stability Manual. Any material not needed for undercut replacement at the time of construction should be deleted from the contract with no extra compensation to the contractor.

Based on the above recommendation, there will be a need for two separate Aggregate Subgrade Improvement line items in the Schedule of Quantities (SOQ) included in the design plans:

- AGGREGATE SUBGRADE IMPROVEMENT 12" (SQ YD) – This will be used for the 12 inch aggregate subgrade improvement below new pavement sections and widening pavement sections.
- AGGREGATE SUBGRADE IMPROVEMENT (CU YD) – This will be used in locations where there are undercuts (below the 12 inch improved subgrade layer) where poor soils were removed.

It should be noted that both above items refer to the IDOT Bureau of Design and Environment (BDE) Aggregate Subgrade Improvement Special Provision (April 1, 2022).

The subgrade should be proofrolled and tested as outlined in Section 5.1. If low strength and/or high moisture soils are encountered during construction other locations, they should be removed to a minimum depth of 6 inches and replaced with compacted granular fill.

As per IDOT District One: We also recommend including a plan quantity of **geotechnical fabric for ground stabilization** (SQ YD) equal to at least 25% of the planned pavement area. We recommend placing geotextile fabric at the base of undercut areas where low strength subgrade soils are encountered. The 12 inches of improved subgrade is not considered an undercut, and we do not recommend placing the fabric at the base of the proposed 12 inch improved subgrade layer unless it is determined to be necessary to achieve stability by the Geotechnical Engineer or soils inspector at the time of construction. Fabric should meet the requirements of Article 210, Fabric for Ground Stabilization, of the SSRBC. Any material not needed at time of construction should be deleted from the contract with no extra compensation to the contractor.

The frost depth for pavement design in northern Illinois ranges from 45 to 60 inches (IDOT 2020). Within the frost susceptible depths, the samples tested in the laboratory measured silt and fine sand contents of less than 65% with plasticity indices (PI) of greater than 12%. Additionally, the subgrade borings did not encounter groundwater and Borings WA-BSB-01 and WA-BSB-02 encountered groundwater at depths of 32.0 to 37.0 feet bgs. We estimate the soils will exhibit low to moderate frost susceptibility (IDOT 2020) and adequate drainage will suffice to alleviate any frost heave. Any highly moist soils, if not otherwise unstable or unsuitable, encountered within the exposed subgrade should be disked, dried, and compacted before placing the new pavement structure.

### **5.3 Pavement Design Recommendations**

For a Mechanistic Pavement Design (MPD), IDOT rates the subgrade using the Subgrade Support Rating (SSR). Laboratory testing on representative samples of the subgrade soil shows SSR ratings of POOR to FAIR (Exhibit 4). Considering the worst subgrade conditions, we recommend that an SSR of POOR be used for the purpose of pavement design. Pavement structure conforming to IDOT's MPD requires a minimum of 12 inches of improved subgrade below the design pavement structure to ensure stability during construction and long-term pavement performance (IDOT 2022).

For an AASHTO pavement design, the subgrade soil support is characterized using the Illinois Bearing Ratio (IBR). Based on soil tests and classifications (A-6), we recommend that the pavement be designed based on an IBR value of 3 (IDOT 2022).

### **5.4 Embankment and cut sections**

Based on the cross-sections drawings, the proposed improvements along Wheeler Avenue and I-80 show little to no fill or cut. Wang has performed evaluations of the settlement and global stability for the bridge and the analysis and results are included in the Wheeler Avenue Bridge over I-80 SGR submitted on September 21, 2021. The *Boring Location Plans and Soil Profiles* (Appendix G) show the proposed grade along Wheeler Avenue will be raised by up to 2.0 feet to approximate pavement elevations of 638.8 to 637.6 feet at the north and south abutments, respectively. The grade along I-80 temporary pavement and traffic staging new pattern for bridge construction will remain the unchanged. Additionally, the *Boring Location Plans and Soil Profiles* (Appendix G) show concrete end slopes graded at 1:2 (V: H).

#### 5.4.1 Settlement

We do not anticipate excessive settlement. To match the new bridge elevation, up to 2.0 feet of new fill will be placed behind the abutments to raise the grade along the approach embankments. 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.

#### 5.4.2 Global Stability

There is no major slope proposed on the embankment approach. The global stability was analyzed for the end slope of the bridge abutment based on the soil profile described in Section 3.1 and the information provided in the plans. The analysis discounts the beneficial effect of the abutment piles. The minimum required 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 E. The FOS values meet the minimum requirement.

### 5.5 Roadway Drainage

The proposed subgrade and pavement should have proper surface grading to prevent the pooling of water. The soils encountered beneath the proposed subgrade will exhibit poor to fair drainage characteristics. The fill material to be placed in support of the widening will likely be cohesive and will exhibit poor drainage characteristics. We do not anticipate a high water table. However, any water reaching the surface may not drain rapidly. Excessive moisture and traffic will deteriorate the condition of the subgrade and cause deformation and stability problems. Therefore, a drainage system such as longitudinal edge drains is recommended.

## 6.0 CONSTRUCTION CONSIDERATIONS

### 6.1 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. Excavations should be sloped at no steeper than 1:2 (V: H) for cohesive soils and 1:2.5 (V:H) for granular soils.

We do not anticipate the need for special dewatering systems. However, during and immediately following periods of heavy precipitation, the excavations may encounter perched groundwater within any granular layers interbedded within the cohesive layers. Therefore, the Contractor should ensure proper surface grading to prevent pooling of water and run-off into open excavations. Any water allowed to enter excavations should immediately be removed via sump-pump.

## **6.2 Filling and Backfilling**

Fill material used for replacement of any poor soils encountered during construction should be pre-approved by the Engineer. The fill material should be free of organic matter and debris and should be placed in lifts compacted in accordance with Section 205, *Embankment* (IDOT 2022).

## **6.3 Reuse of Materials**

Soil excavated from the existing subgrade may be reused as embankment fill if testing shows it conforms to the following criteria: a)  $L_L$  less than 50%; b) PI value of more than 12%; c) maximum dry density greater than 90 pcf according to AASHTO T99; and d) organic content less than 10%. The excavated soils should be removed, brought to within  $\pm 2\%$  of the optimum moisture content and recompacted according to Section 205, *Embankment* (IDOT 2022).

## **6.4 Earthwork Operations**

The required earthwork can be accomplished with conventional construction equipment. Moisture and traffic will cause deterioration of the 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 avoid 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.

## 7.0 QUALIFICATIONS

The analysis and recommendations submitted in this report are based upon data obtained from the borings drilled at the locations shown on the *Boring Logs* (Appendix A) and in the *Boring Location Plans* (Appendix F). 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. If any changes in the design and/or location of the proposed improvements are planned, we should be timely informed so that our recommendations can be adjusted accordingly.

It has been a pleasure to assist TranSystems 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.

Cornelia L Marin, P.G.  
Senior Engineering Geologist

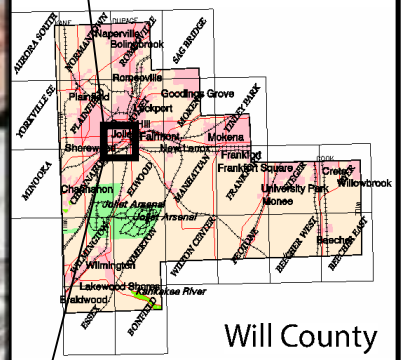
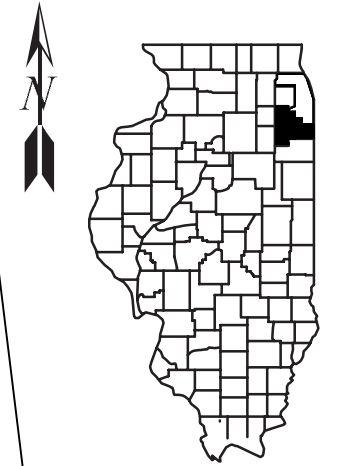
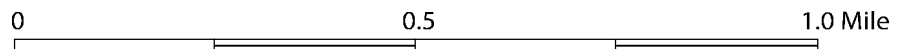
Andri Kurnia, P.E.  
Senior Engineer

Liviu M Iordache, P.G.  
QA/QC Reviewer

## ***REFERENCES***

- 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, 69 p.
- CARON, O.J., 2017, Surficial Geology of Joliet Quadrangle, Will County, Illinois: Illinois State Geological Survey, USGS-STATEMAP contract report, 2 sheets, 1:24,000;
- 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, IL. 116 p.
- IDOT (2005) *Subgrade Stability Manual*. Illinois Department of Transportation. 34 pp.
- IDOT (2020) *Geotechnical Manual*. Illinois Department of Transportation. 546 pp.
- IDOT (2022) *Standard Specifications for Road and Bridge Construction*. Illinois Department of Transportation. 1098 pp.
- KOLATA, D.R. 2005, Bedrock Geology of Illinois, Illinois Map 14: Illinois State Geological Survey.
- LEIGHTON, M.M., EKBLAW, G.E., and HORBERG, L. (1948) *Physiographic Divisions of Illinois*. The Journal of Geology, v. 56, p. 16-33.
- NCDC (2021 and 2022) National Climatic Data Center: Global Historical Climatological Network Data, <http://www.ncdc.noaa.gov/ghcn/ghcn.SELECT.html>.
- WILLMAN, H.B., ATHERTON, E., BUSCHBACH, T.C., COLLINSON, C., FRYE, J.C., HOPKINS, M.E., LINEBACK, J.A., and SIMON, J.A., 1971, Handbook of Illinois Stratigraphy: ISGS Bulletin 95: Urbana, Illinois State Geological Survey, 261 p.

## EXHIBITS



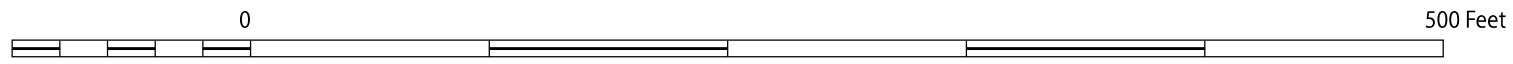
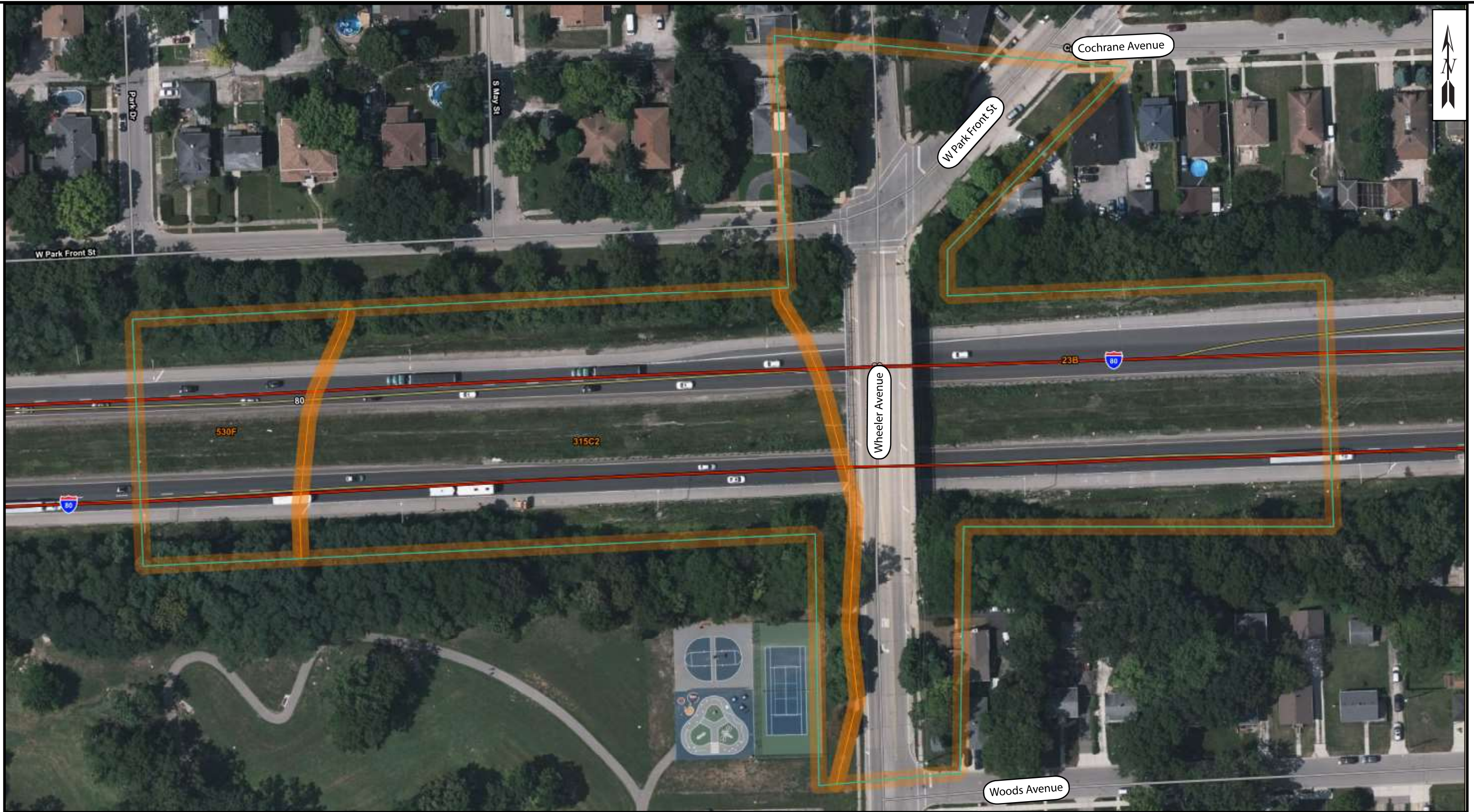
SITE LOCATION MAP: WHEELER AVENUE OVER I-80; I-80 RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET & LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL	<b>EXHIBIT 1</b>	DRAWN BY: J. Bensen CHECKED BY: C. Marin
------------------	------------------	---

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

7901-15-01





SITE PEDOLOGICAL MAP: WHEELER AVENUE OVER I-80; RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL	<b>EXHIBIT 2-1</b>	DRAWN BY: J. Bensen CHECKED BY: C. Marin
------------------	--------------------	---

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

7901-15-01
------------

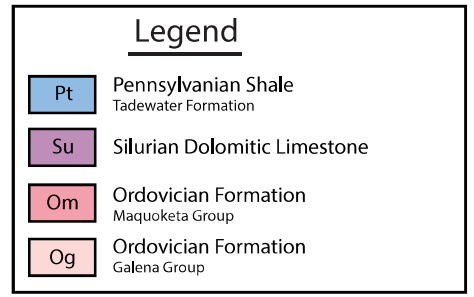
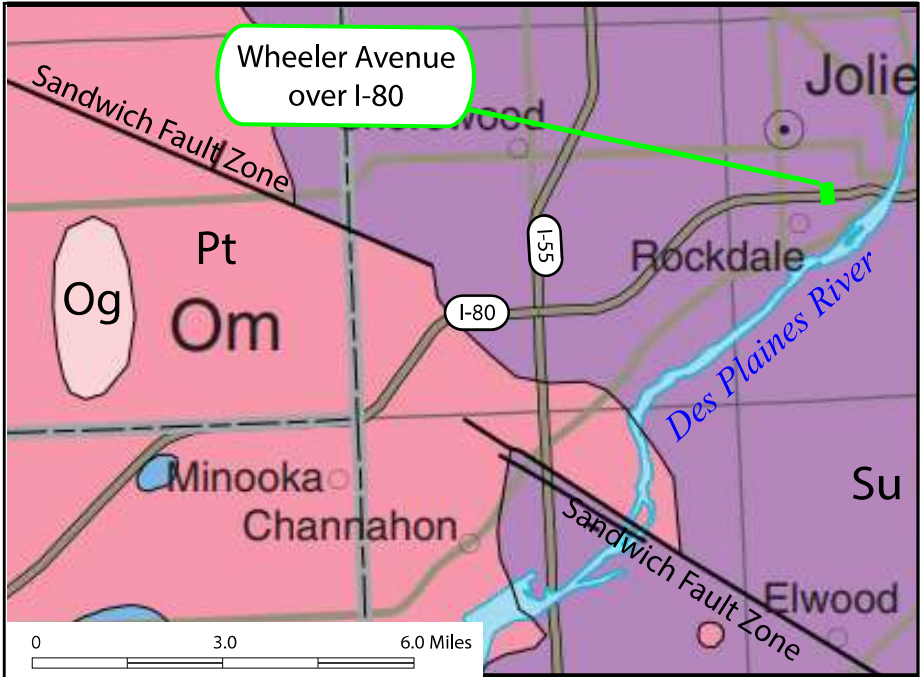
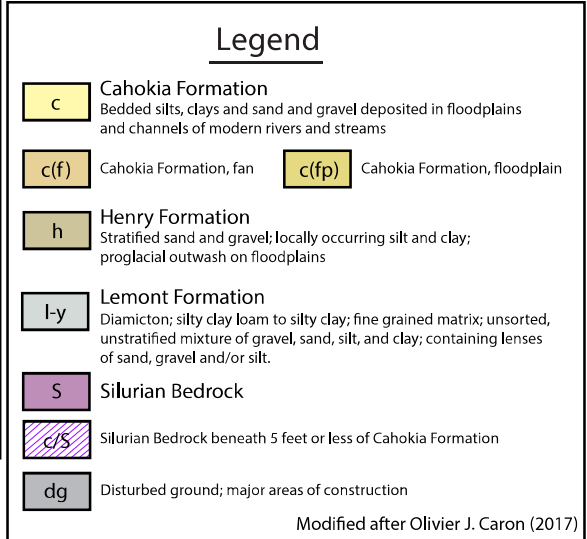
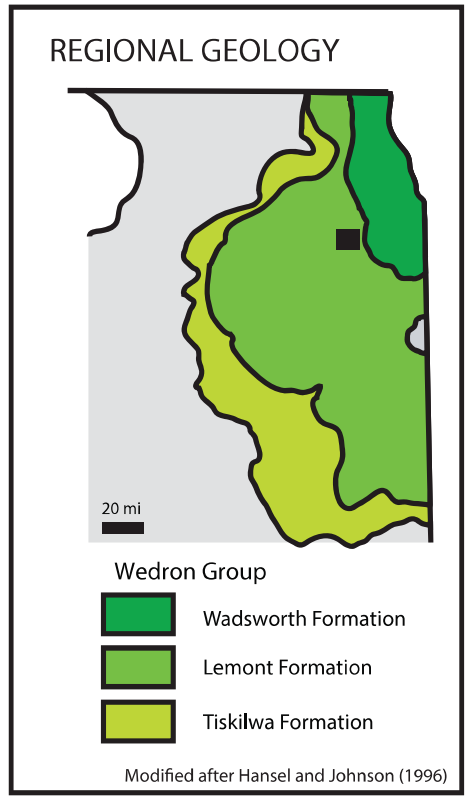
Map unit symbol and soil name	Depth <i>In</i>	USDA texture	Classification AASHTO	Fragments		Sand <i>Pct</i>	Silt <i>Pct</i>	Clay <i>Pct</i>	Moist bulk density <i>g/cc</i>	Saturated hydraulic conductivity <i>micro m/sec</i>	Organic matter <i>Pct</i>	Liquid limit <i>Pct</i>	Plasticity index	Erosion factors			Potential as a source of roadfill Rating class and limiting features	Local roads and streets Rating class and limiting features	Shallow excavations Rating class and limiting features
				>10 inches <i>Pct</i>	3-10 inches <i>Pct</i>									Kw	Kf	T			
<b>23B—Blount silt loam, Lake Michigan Lobe, 2 to 4 percent slopes</b>																			
Blount silt loam, lake michigan lobe	0-6	Silt loam	A-6, A-7-6	0-0-0	0-1-3	5-12-20	53-66-77	18-22-27	1.25-1.35-1.45	4.23-9.17-14.11	2.0-2.5-3.0	31-37-43	11-14-18	0.37	0.37	3	Poor, Low strength, Wetness, Dusty	Very limited, Low strength, Shrink-swell, Depth to saturated zone, Frost action, Ponding	Very limited, Depth to saturated zone, Dusty, Too clayey, Unstable excavation walls, Ponding
	6-10	Silt loam	A-4, A-6	0-0-0	0-1-3	5-12-20	53-67-80	15-21-27	1.30-1.40-1.55	4.23-9.17-14.11	0.2-0.6-1.0	25-32-39	9-14-19	0.55	0.55				
	10-28	Silty clay loam, silty clay, clay loam	A-7-6	0-1-1	0-1-3	5-15-25	27-43-60	35-42-48	1.40-1.50-1.55	0.42-2.33-4.23	0.2-0.6-1.0	44-51-58	25-30-35	0.32	0.32				
	28-34	Silty clay loam, clay loam, silty clay	A-6, A-7-6	0-1-1	0-3-4	5-15-25	30-49-68	27-36-45	1.50-1.55-1.70	0.42-0.92-1.41	0.0-0.3-0.5	37-46-55	19-26-32	0.37	0.37				
	34-60	Silty clay loam	A-6, A-7-6	0-1-1	0-2-4	5-15-20	40-55-68	27-30-40	1.60-1.75-1.90	0.42-0.92-1.41	0.0-0.3-0.5	35-39-49	18-21-28	0.43	0.43				
<b>315C2—Channahon silt loam, 4 to 6 percent slopes, eroded</b>																			
Channahon silt loam	0-6	Silt loam	A-4, A-6	0-0-1	0-1-4	10-20-30	50-58-72	18-22-27	1.20-1.30-1.40	4.23-9.17-14.11	2.0-2.5-3.0	20-30-40	7-14-20	0.43	0.43	1	Poor, Depth to bedrock, Low strength, Dusty, Shrink-swell	Very limited, Depth to hard bedrock, Frost action, Low strength, Shrink-swell	Very limited, Depth to hard bedrock, Dusty, Unstable excavation walls
	6-13	Clay loam, silty clay loam, silt loam, loam	A-6, A-7-6	0-1-1	0-1-1	15-35-50	15-39-60	25-26-35	1.35-1.47-1.60	4.23-9.17-14.11	0.0-0.7-1.5	30-38-45	15-20-25	0.37	0.37				
	13-60	Bedrock	-	-	-	-	-	-	-	0.42-2.33-4.23	-	-	-	-	-				
<b>530F—Ozaukee silt loam, 20 to 30 percent slopes</b>																			
Ozaukee silt loam	0-5	Silt loam	A-4, A-6, A-7-6	0-0-0	0-0-1	7-14-23	52-67-76	15-19-27	1.30-1.40-1.50	4.23-9.17-14.11	1.2-2.0-3.0	28-33-43	9-12-18	0.43	0.43	3	Poor, Slope, Low strength, Wetness, Dusty	Very limited, Slope, Low strength, Depth to saturated zone, Frost action	Very limited, Slope, Depth to saturated zone, Dusty, Unstable excavation walls
	5-9	Silt loam	A-4, A-6	0-0-0	0-0-1	5-10-18	57-69-77	16-21-27	1.35-1.45-1.55	4.23-9.17-14.11	0.3-0.8-1.2	27-32-39	10-14-19	0.55	0.55				
	9-14	Silty clay loam, silt loam	A-6, A-7-6	0-0-0	0-0-1	5-10-18	50-59-69	24-31-34	1.40-1.50-1.60	4.23-9.17-14.11	0.3-0.6-1.0	34-41-45	16-21-24	0.43	0.43				
	14-29	Silty clay loam, clay, silty clay	A-6, A-7-6	0-0-1	0-1-4	5-11-18	34-50-58	35-39-50	1.45-1.55-1.65	0.42-2.33-4.23	0.2-0.5-0.9	30-36-52	15-18-26	0.37	0.37				
	29-36	Silty clay loam, silty clay	A-6	0-1-2	0-1-5	5-12-20	40-52-64	29-36-42	1.55-1.65-1.70	0.42-0.92-1.41	0.1-0.3-0.6	24-31-37	11-15-19	0.37	0.37				
	36-60	Silty clay loam, clay loam	A-4, A-6	0-1-2	0-2-7	7-14-23	50-55-64	27-31-35	1.65-1.75-1.85	0.42-0.75-1.41	0.0-0.2-0.5	21-26-31	9-12-15	0.43	0.43				

Source: USDA, Natural Resources Conservation Service; Web Soil Survey  
Soil Survey Area: Will County, Illinois  
Survey Area Data: Version 16, Aug 31, 2021

SITE PEDOLOGICAL MAP: WHEELER AVENUE OVER I-80; RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS		
SCALE: GRAPHICAL	EXHIBIT 2-2	DRAWN BY: J. Bensen CHECKED BY: C. Marin
		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR TRANSYSTEMS CORPORATION		7901-15-01



Modified after Olivier J. Caron (2017)



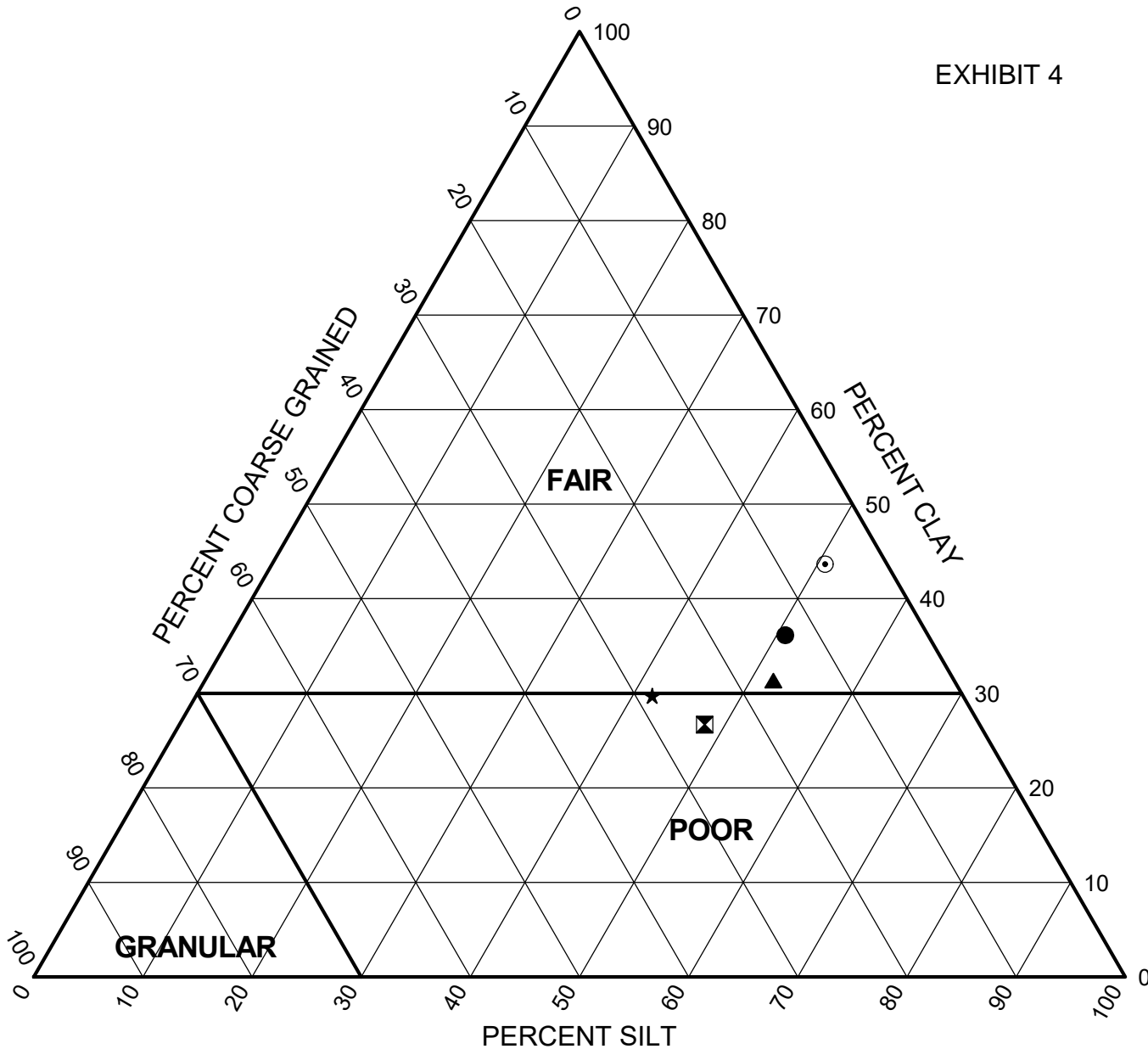
SITE AND REGIONAL GEOLOGY: WHEELER AVENUE OVER I-80; I-80 RECONSTRUCTION FROM HOBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL	EXHIBIT 3	DRAWN BY: C. Marin CHECKED BY: L. Iordache
------------------	-----------	---

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

FOR TRANSYSTEMS CORPORATION 7901-15-01

Modified after Dennis R. Kolata (2005)



Sample	Depth (ft)	Coarse (%)	Silt (%)	Clay (%)	Classification		
					IL DOT	AASHTO	RATING
● EB-SGB-38#1	0.0	13.1	50.8	36.1	Silty Clay	A-7-6 (23)	FAIR
⊠ WA-BSB-01#1	1.0	25.2	48.1	26.7	Silty Clay Loam	A-6 (12)	POOR
▲ WA-SGB-01#2	3.0	16.6	52.1	31.3	Silty Clay	A-6 (17)	FAIR
★ WA-SGB-02#1	1.0	28.5	41.8	29.7	Clay	A-7-6 (20)	POOR
⊙ WB-SGB-39#2	2.0	5.7	50.7	43.7	Silty Clay	A-6 (23)	FAIR

WEI SSR 79011501.GPJ WANGENG.GDT 6/9/22



Wang Engineering  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

**Subgrade Support Rating Chart**  
 Project: I-80 Reconstruction (Houbolt Road to Center Street)  
 Location: Will County, Illinois  
 Number: 7901-15-01

## APPENDIX A



wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

# BORING LOG CL-SGB-36

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: 610.22 ft  
 North: 1764783.12 ft  
 East: 1046534.60 ft  
 Station: 639+55.72  
 Offset: -4.601

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	609.4	10-inch thick, black SILTY CLAY				4											
		--TOPSOIL--			1	4	4.10	19									
	608.2	Hard, black and gray SILTY CLAY, trace gravel; moist				7	B										
		--FILL--				9											
		--RDR 2--															
	607.4	Stiff, black SILTY CLAY, trace gravel; moist			2	3	1.07	34									
		--Buried TOPSOIL--				5	B										
		Stiff to very stiff, gray SILTY CLAY, trace gravel; moist				8											
		--RDR 2--															
			5		3	2	1.56	18									
						7	B										
						12											
						10											
					4	3	2.87	22									
						4	B										
						6											
						7											
					5	3	2.79	20									
						3	B										
						3											
						5											
						5											
						8											
	600.2	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

Begin Drilling **05-12-2022** Complete Drilling **05-13-2022**  
 Drilling Contractor **Wang Testing Services** Drill Rig **D25 ATV [93%]**  
 Driller **JS&AG** Logger **A. Scifers** 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.



wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

# BORING LOG CL-SGB-37

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: 614.86 ft  
 North: 1764785.94 ft  
 East: 1046962.83 ft  
 Station: 643+83.72  
 Offset: 9.645

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	614.4	6-inch thick, black SILTY CLAY --TOPSOIL--				2											
		Stiff to very stiff, gray SILTY CLAY, trace gravel; moist --RDR 2--			1	2 2 3 5	2.38 B	19									
					2	3 2 3 4	1.64 B	24									
			5		3	2 3 3 8	2.05 B	22									
					4	3 5 7 10	2.87 B	21									
					5	3 5 7 9	1.64 B	21									
	604.9	Boring terminated at 10.00 ft	10														
			15														

### GENERAL NOTES

Begin Drilling **05-13-2022** Complete Drilling **05-13-2022**  
 Drilling Contractor **Wang Testing Services** Drill Rig **D25 ATV [93%]**  
 Driller **JS&AG** Logger **A. Scifers** 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.



wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

# BORING LOG EB-SGB-38

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: 612.55 ft  
 North: 1764770.79 ft  
 East: 1046617.37 ft  
 Station: 640+37.93  
 Offset: 11.008

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	612.1	5-inch thick, black SILTY CLAY --TOPSOIL--				3											
		Very stiff, black and gray SILTY CLAY, trace gravel; moist			1	4	3.61	30									
	610.8	--FILL-- --RDR 2--				4	B										
		--L <sub>L</sub> (%)=41, P <sub>L</sub> (%)=14-- --%Gravel=3.1-- --%Sand=10.0-- --%Silt=50.8-- --%Clay=36.1-- --A-7-6 (23)--				5											
	609.6	Medium stiff, black SILTY CLAY, trace gravel; moist --Buried TOPSOIL--			2	3	2.62	21									
		Stiff to very stiff, gray SILTY CLAY, trace gravel; moist --RDR 2--				4	B										
					3	5	2.13	21									
						5	B										
					4	6	1.97	21									
						5	B										
						5	6	21									
						6	B										
						6											
						8											
	602.5	Boring terminated at 10.00 ft	10														

### GENERAL NOTES

Begin Drilling **05-12-2022** Complete Drilling **05-13-2022**  
 Drilling Contractor **Wang Testing Services** Drill Rig **D25 ATV [93%]**  
 Driller **JS&AG** Logger **A. Scifers** 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.





wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

# BORING LOG WB-SGB-39

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: 614.55 ft  
 North: 1764803.44 ft  
 East: 1046895.35 ft  
 Station: 643+16.99  
 Offset: -10.530

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	614.33	33-inch thick, black SILTY CLAY --TOPSOIL--				2											
		Stiff, black and gray SILTY CLAY, trace gravel; moist --RDR 2--			1	4 3 5	1.31 B	17									
					2	4 3 5 8	2.21 B	17									
		--L <sub>L</sub> (%)=40, P <sub>L</sub> (%)=16-- --%Gravel=0.1-- --%Sand=5.5-- --%Silt=50.7-- --%Clay=43.7-- --A-6 (23)--			3	2 4 4 6	1.72 B	22									
					4	4 4 6 7	2.05 B	21									
	606.9																
	606.6	Gray SILTY LOAM; wet															
		Medium stiff, gray SILTY CLAY, trace gravel; moist --RDR 2--			5	2 4 5 5	0.98 B	18									
	604.1	Very stiff, gray SILTY CLAY LOAM to SILTY LOAM, trace gravel; moist --RDR 2--			6	8 12 12 7	3.20 B	12									
	601.6	Boring terminated at 13.00 ft															

WANGENGINC 79011501.GPJ WANGENG.GDT 6/6/22

### GENERAL NOTES

Begin Drilling **05-13-2022** Complete Drilling **05-13-2022**  
 Drilling Contractor **Wang Testing Services** Drill Rig **D25 ATV [93%]**  
 Driller **JS&AG** Logger **A. Scifers** Checked by **C. Marin**  
 Drilling Method **2.25" IDA HSA; boring backfilled upon completion**

### WATER LEVEL DATA

While Drilling  $\nabla$  **8.00 ft**  
 At Completion of Drilling  $\nabla$  **DRY**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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



wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

# BORING LOG WA-SGB-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: 636.98 ft  
 North: 1765063.51 ft  
 East: 1046741.61 ft  
 Station: 22+76.57  
 Offset: 4.31 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	636.6	5-inch thick ASPHALT --PAVEMENT--															
	636.0	7-inch thick, gray SANDY GRAVEL --AGGREGATE BASE--				2											
		Very stiff to hard, gray SILTY CLAY, trace gravel; damp --FILL-- --RDR 2-- --L <sub>L</sub> (%)=37, P <sub>L</sub> (%)=15-- --%Gravel=4.1-- --%Sand=12.5-- --%Silt=52.1-- --%Clay=31.3-- --A-6 (17)--	1			4	4.10	24									
			6			6											
			7			7											
			10		2	10	3.28	17									
			14			14											
	632.5	Hard, brown SILTY CLAY, trace gravel; damp --RDR 2--	5			7											
			9			9	6.97	17									
			11			11											
			12			12											
			8			8											
			9			9											
			10		4	10	6.89	19									
			13			13											
			5			5											
			8			8											
			10		5	10	8.69	17									
			13			13											
	626.0	Boring terminated at 11.00 ft															

### GENERAL NOTES

Begin Drilling **03-23-2021** Complete Drilling **03-23-2021**  
 Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**  
 Driller **RR&J** 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.



wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

# BORING LOG WA-SGB-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: 634.01 ft  
 North: 1764495.37 ft  
 East: 1046733.89 ft  
 Station: 17+08.93  
 Offset: 20.61 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	633.83	3-inch thick ASPHALT --PAVEMENT--															
	633.2	7-inch thick CONCRETE --PAVEMENT--															
	633.0	2-inch thick, gray SANDY GRAVEL; damp --AGGREGATE BASE--	2		1	2	1.48	28									
		Stiff, brown CLAY, trace to few gravel; damp	3			3											
		--FILL-- --RDR 2-- --L <sub>L</sub> (%)=46, P <sub>L</sub> (%)=15-- --%Gravel=8.8-- --%Sand=19.6-- --%Silt=41.8-- --%Clay=29.7-- --A-7-6 (20)--	4		2	4											
	631.2	Hard, brown SILTY CLAY, trace gravel; damp	5			5											
		--RDR 2--	6			6											
			7			7											
			8			8											
			9			9											
			10			10											
			11			11											
			12			12											
			13			13											
			14			14											
			15			15											
	623.0	Boring terminated at 11.00 ft															

### GENERAL NOTES

Begin Drilling **03-22-2021** Complete Drilling **03-22-2021**  
 Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**  
 Driller **RR&J** 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.



# BORING LOG WA-BSB-01

wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

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: 637.53 ft  
 North: 1764933.78 ft  
 East: 1046708.69 ft  
 Station: 21+47.90  
 Offset: 32.52 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	637.24	4-inch thick, black SILTY CLAY LOAM															
		--TOPSOIL--															
		Hard, brown SILTY CLAY LOAM, trace to some gravel; damp			1	4 7 7	4.50 P	17						9	6 9 11	3.94 B	20
		--FILL-- --RDR 2-- --L <sub>L</sub> (%)=35, P <sub>L</sub> (%)=16-- --%Gravel=10.8-- --%Sand=14.4-- --%Silt=48.1-- --%Clay=26.7-- --A-6 (12)--			2	11 4 5	NA	8				25		10	5 6 6	4.92 B	24
	632.0	Very stiff to hard, brown to gray SILTY CLAY to SILTY CLAY LOAM, trace gravel; damp			3	3 3 5	5.83 B	18						11	5 6 8	2.46 B	16
		--RDR 2--			4	9 10 13	7.38 B	18				30		12	5 5 7	2.21 B	20
					5	11 12 15	8.61 B	18									
		--L <sub>L</sub> (%)=36, P <sub>L</sub> (%)=16-- --%Gravel=2.4-- --%Sand=5.9-- --%Silt=56.3-- --%Clay=35.4-- --A-6 (18)--			6	4 7 8	7.63 B	19				35		13	5 5 8	3.03 B	22
					7	5 8 9	3.69 B	19		600.8	Gray SILTY LOAM; wet --RDR 2--						
					8	4 4 6	3.03 B	21		598.5	Medium dense to very dense, brown SANDY GRAVEL; damp			14	6 2 18	NP	23

### GENERAL NOTES

Begin Drilling **03-23-2021** Complete Drilling **03-23-2021**  
 Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**  
 Driller **RR&J** Logger **I. Nenn** Checked by **C. Marin**  
 Drilling Method **2.25" IDA HSA; boring backfilled upon completion**

### WATER LEVEL DATA

While Drilling  $\nabla$  **36.75 ft**  
 At Completion of Drilling  $\nabla$  **NA**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

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

WANGENGINC 79011501.GPJ WANGENG.GDT 6/6/22





# BORING LOG WA-BSB-02

wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

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: 635.74 ft  
 North: 1764635.42 ft  
 East: 1046768.31 ft  
 Station: 18+47.88  
 Offset: 18.04 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	635.5	3-inch thick ASPHALT --PAVEMENT--															
	634.5	12-inch thick CONCRETE --PAVEMENT--															
	632.5	Stiff, black and gray SILTY CLAY to CLAY LOAM, trace gravel; damp			1	10 5 4	1.50 P	18						9	4 6 6	2.62 B	21
		--FILL-- --RDR 2--			2	3 6 9	1.50 P	15						10	5 5 7	2.46 B	22
		Stiff to hard, brown to gray SILTY CLAY to SILTY CLAY LOAM, trace gravel; damp to moist	5		3	6 9 11	6.15 B	16						11	4 6 7	2.30 B	21
		--RDR 2--			4	6 9 13	8.69 B	19						12	4 6 9	1.80 B	19
			10		5	6 9 12	7.38 B	12		604.2	Possible SILT; saturated --wet spoon recovery--						
			15		6	6 8 11	6.07 B	22		603.2	Very stiff, gray SILTY CLAY; damp			13	5 7 12	3.12 B	22
					7	6 7 10	7.38 B	21			--RDR 2--			14	37 50/4"	NP	7
			20		8	6 6 9	3.69 B	16		599.0	Very dense, brown SANDY GRAVEL; damp						
											--RDR 2--						
											--possible cobbles--						

### GENERAL NOTES

### WATER LEVEL DATA

Begin Drilling **03-22-2021** Complete Drilling **03-22-2021**  
 Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**  
 Driller **RR&J** Logger **I. Nenn** Checked by **C. Marin**  
 Drilling Method **3.25" IDA HSA; boring backfilled upon completion**

While Drilling **31.75 ft**  
 At Completion of Drilling **NA**  
 Time After Drilling **NA**  
 Depth to Water **NA**

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

WANGENGINC 79011501.GPJ WANGENG.GDT 6/6/22



wangeng@wangeng.com  
 1145 North Main Street  
 60148  
 Telephone: (630) 953-9928  
 Fax: (630) 953-9938

# BORING LOG WA-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: 635.74 ft  
 North: 1764635.42 ft  
 East: 1046768.31 ft  
 Station: 18+47.88  
 Offset: 18.04 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)	Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	594.2	Very dense, brown, coarse SAND; damp --RDR 2-3--  --possible cobbles--	45	X	15	35 50/3"	NP	4			--RUN 2: 62.0 to 67.0 feet-- --Recovery = 100%-- --RQD= 35%--	65		18			
	589.2	Very dense, brown SANDY GRAVEL; damp --WEATHERED BEDROCK--  --possible cobbles--	50	X	16	50/3"	NP	4		568.7	Boring terminated at 67.00 ft	70					
	583.7	Medium strong to strong, light grayish gray, very poor to poor quality, DOLOSTONE; very closely spaced, slightly to moderately weathered, horizontal, oblique, and vertical joints, with <0.05 inch opening, rough walls, and no infill. --RUN 1: 52.0 to 62.0 feet-- --Recovery = 93%-- --RQD= 6%--	55									75					
			60									80					

WANGENGINC 79011501.GPJ WANGENG.GDT 6/6/22

### GENERAL NOTES

Begin Drilling **03-22-2021** Complete Drilling **03-22-2021**  
 Drilling Contractor **Wang Testing Services** Drill Rig **20CME55T[81%]**  
 Driller **RR&J** Logger **I. Nenn** Checked by **C. Marin**  
 Drilling Method **3.25" IDA HSA; boring backfilled upon completion**

### WATER LEVEL DATA

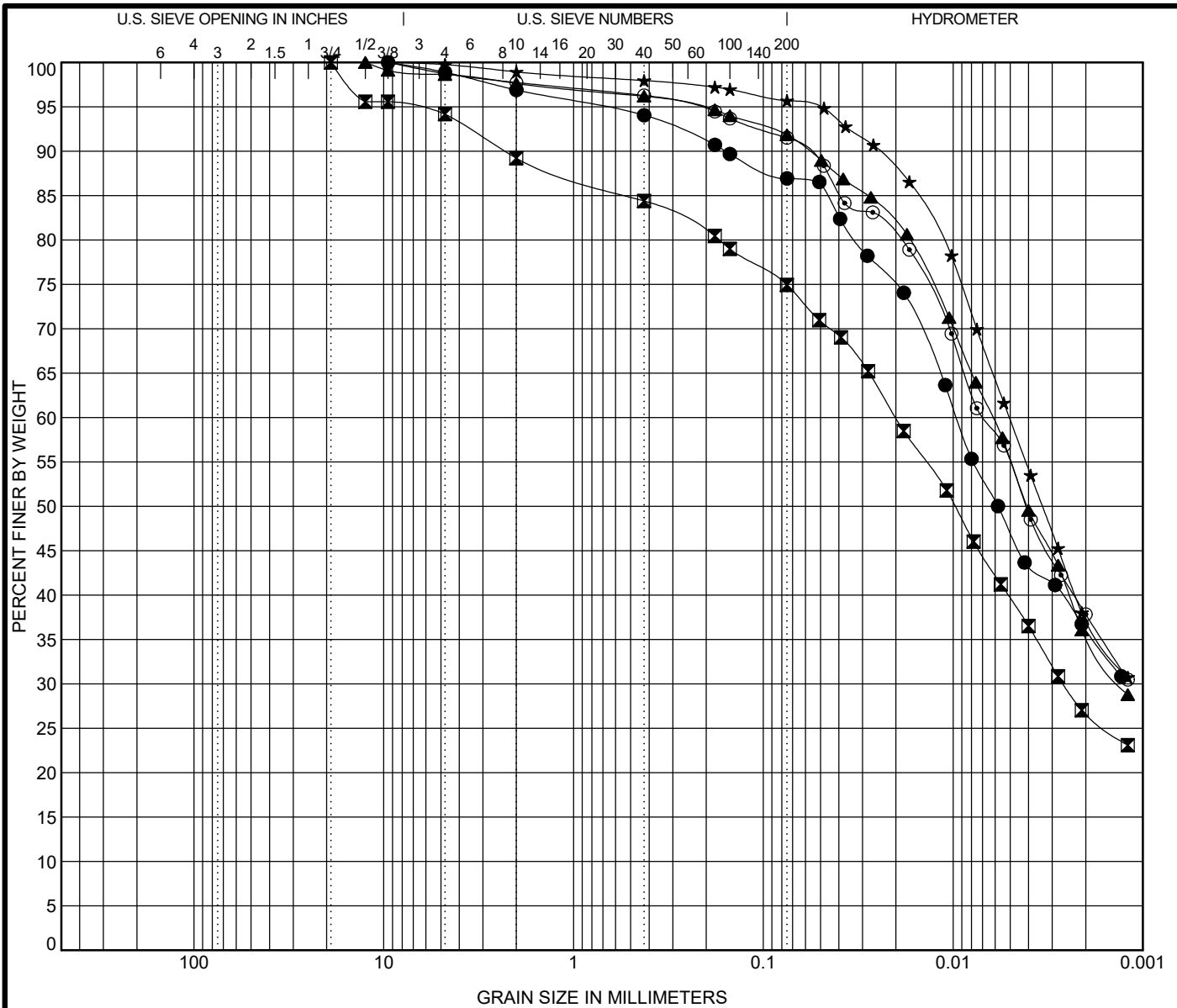
While Drilling  $\nabla$  **31.75 ft**  
 At Completion of Drilling  $\nabla$  **NA**  
 Time After Drilling **NA**  
 Depth to Water  $\nabla$  **NA**

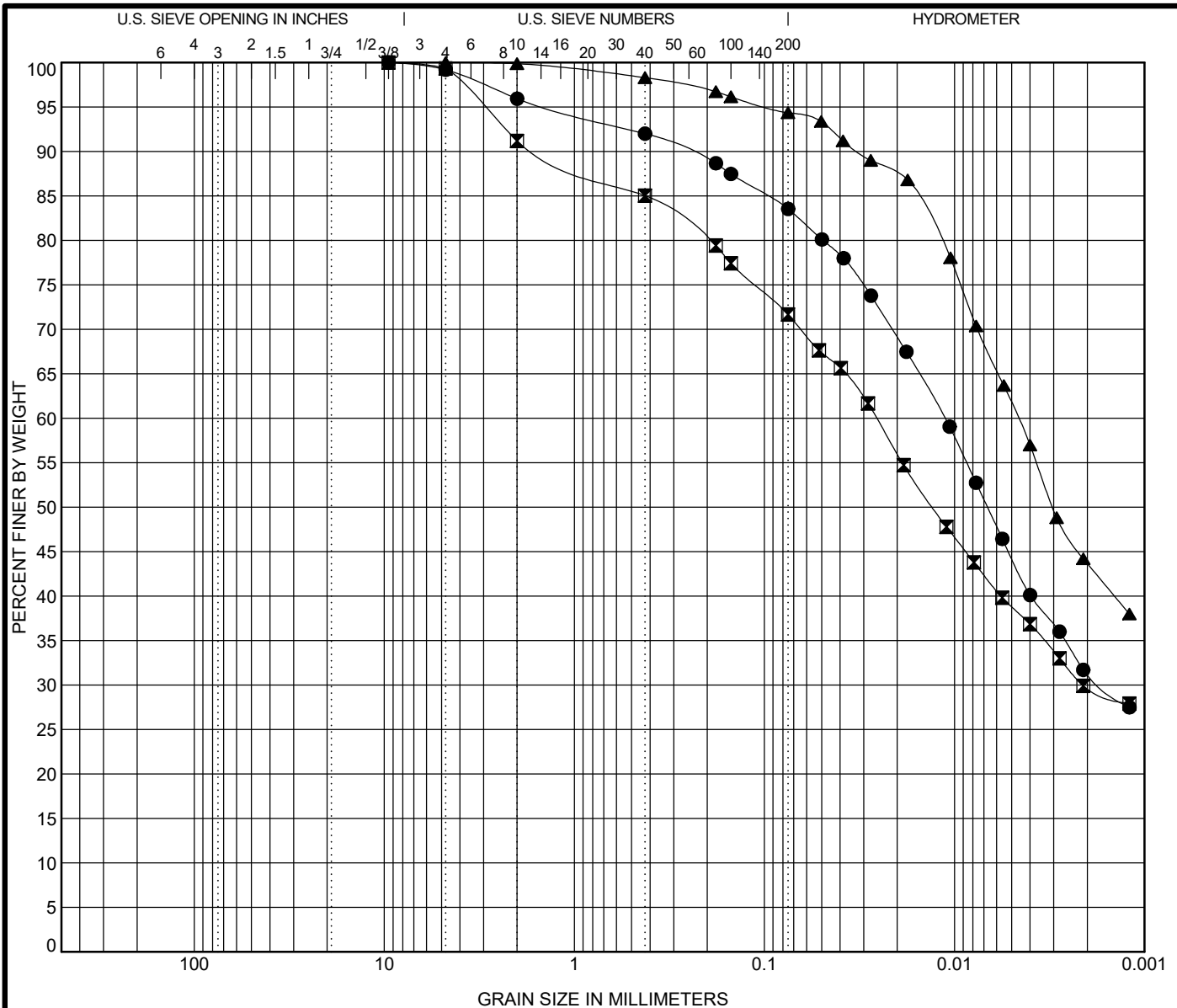
The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.





## **APPENDIX B**





COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

Specimen Identification			IDH Classification					LL	PL	PI	Cc	Cu
●	WA-SGB-01#2	3.0 ft	Silty Clay					37	15	22		
☒	WA-SGB-02#1	1.0 ft	Clay					46	15	31		
▲	WB-SGB-39#	3.0 ft	Silty Clay					40	16	24		
Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
●	WA-SGB-01#2	3.0 ft	9.5	0.011	0.002		4.1	12.5	52.1	31.3		
☒	WA-SGB-02#1	1.0 ft	9.5	0.026	0.002		8.8	19.6	41.8	29.7		
▲	WB-SGB-39#	3.0 ft	4.75	0.005			0.1	5.5	50.7	43.7		



Wang Engineering  
 1145 North Main Street  
 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

WEI GRAIN SIZE IDH 79011501.GPJ US LAB.GDT 6/3/22





## APPENDIX C



State Job Number: 7901-15-01 Project: I-80 Reconstruction Route: I-80

Section: \_\_\_\_\_ City or County: Will Date: 06/15/2022

ADT: \_\_\_\_\_ Year: \_\_\_\_\_ Design Period: \_\_\_\_\_ Class Highway: \_\_\_\_\_

Passenger Cars Per Day: \_\_\_\_\_ Trucks S.U. Per Day: \_\_\_\_\_ Trucks M.U. Per Day: \_\_\_\_\_

Pavement Structure: \_\_\_\_\_

Type Surface Course: \_\_\_\_\_ Thickness: \_\_\_\_\_

Type Base Course: \_\_\_\_\_ Thickness: \_\_\_\_\_

Type Subbase Material: \_\_\_\_\_ Thickness: \_\_\_\_\_

Sta. to Sta.	17+65 to 22+56	632+07 to 12+42	+ to +	+ to +
*Sta. of Test	21+47.90	640+37.93		
*Drainage Class	Poor	Poor		
*Ave. Frost Penetration	45 to 60 in.	45 to 60 in.		
Illinois Textural Classification	Silty Clay Loam	Silty Clay		
Classification and Group Index (AASHTO M 145)	A-6 (12)	A-7-6 (23)		
*Percent Silt (AASHTO T 88)	48.1	50.8		
*Illinois Bearing Ratio (%)				
Std. Dry Density (IL Mod. AASHTO T 99)				
Optimum Moisture (IL Mod AASHTO T 99)				

\* Indicates worst condition within the above station limits.

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SOIL TEST DATA**

**ROUTE**  
Wheeler Avenue  
(I-80 Improvements)

**PROJECT**  
7901-15-01

**SECTION**  
Wheeler Avenue (Sta. 17+65 to Sta. 22+56)

**COUNTY**  
Will County

Lab. No.	WA-BSB-01 No.1	WA-SGB-01 No.2	WA-SGB-02 No.1
Station ft)	21+47.90	22+76.57	17+08.93
Offset (ft)	32.52 LT	4.31 RT	20.61 LT
Depth (ft)	1	3	1
AASHTO M 145 Classification and Group Index	A-6 (12)	A-6 (17)	A-7-6 (20)
Illinois Textural Classification (Illinois Method)	Silty Clay Loam	Silty Clay	Clay
Gradation--Passing 1" Sieve %			
--"-- 3/4" Sieve %	100.0		
--"-- 1/2" Sieve %	95.7	100.0	100.0
--"-- No.4 Sieve %	94.2	99.2	99.3
--"-- No.10 Sieve %	89.2	95.9	91.2
--"-- No.40 Sieve %	84.4	92.0	85.0
--"-- No.100 Sieve %	79.0	87.5	77.4
--"-- No.200 Sieve %	74.8	83.4	71.5
Sand % (AASHTO T 88)	14.4	12.5	19.6
Silt % (AASHTO T 88)	48.1	52.1	41.8
Clay % (AASHTO T 88)	26.7	31.3	29.7
Liquid limit % (AASHTO T 89)	35.0	37.0	46.0
Plasticity index % (AASHTO T 90)	20.0	22.0	31.0
IBR % (Illinois Method)			
Standard Dry Density % (AASHTO T 99)			
Optimum Moisture % (AASHTO T 99)			
Subgrade Support Rating	POOR	FAIR	POOR
Insitu Moisture % (AASHTO T 99)	17	17	28



**SOIL TEST DATA**

**ROUTE**  
I-80 Reconstruction

**PROJECT**  
7901-15-01

**SECTION**  
I-80 (Sta. 632+07 to Sta. 12+42)

**COUNTY**  
Will County

Lab. No.	EB-SGB-38 No.1	WB-SGB-39 No.2
Station ft)	640+37.93	643+16.99
Offset (ft)	11.008	-10.53
Depth (ft)	0	2
AASHTO M 145 Classification and Group Index	A-7-6 (23)	A-6 (23)
Illinois Textural Classification (Illinois Method)	Silty Clay	Silty Clay
Gradation--Passing 1" Sieve %		
--"-- 3/4" Sieve %		
--"-- 1/2" Sieve %		
--"-- No.4 Sieve %	98.9	100.0
--"-- No.10 Sieve %	96.9	99.9
--"-- No.40 Sieve %	94.1	98.3
--"-- No.100 Sieve %	89.7	96.2
--"-- No.200 Sieve %	86.9	94.3
Sand % (AASHTO T 88)	10.0	5.5
Silt % (AASHTO T 88)	50.8	50.7
Clay % (AASHTO T 88)	36.1	43.7
Liquid limit % (AASHTO T 89)	41.0	40.0
Plasticity index % (AASHTO T 90)	26.0	24.0
IBR % (Illinois Method)		
Standard Dry Density % (AASHTO T 99)		
Optimum Moisture % (AASHTO T 99)		
Subgrade Support Rating	FAIR	FAIR
Insitu Moisture % (AASHTO T 99)	30	17

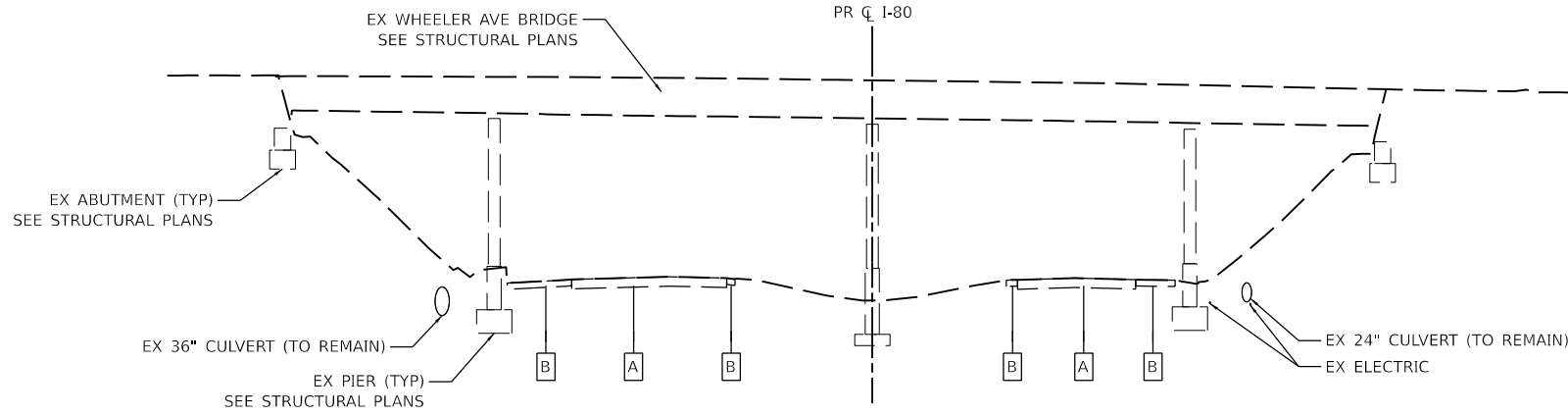
## APPENDIX D



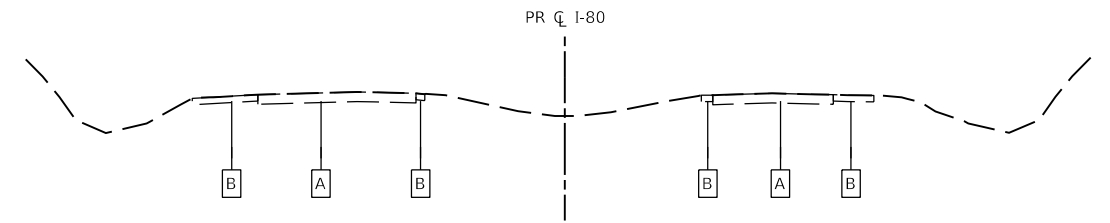


**LEGEND**

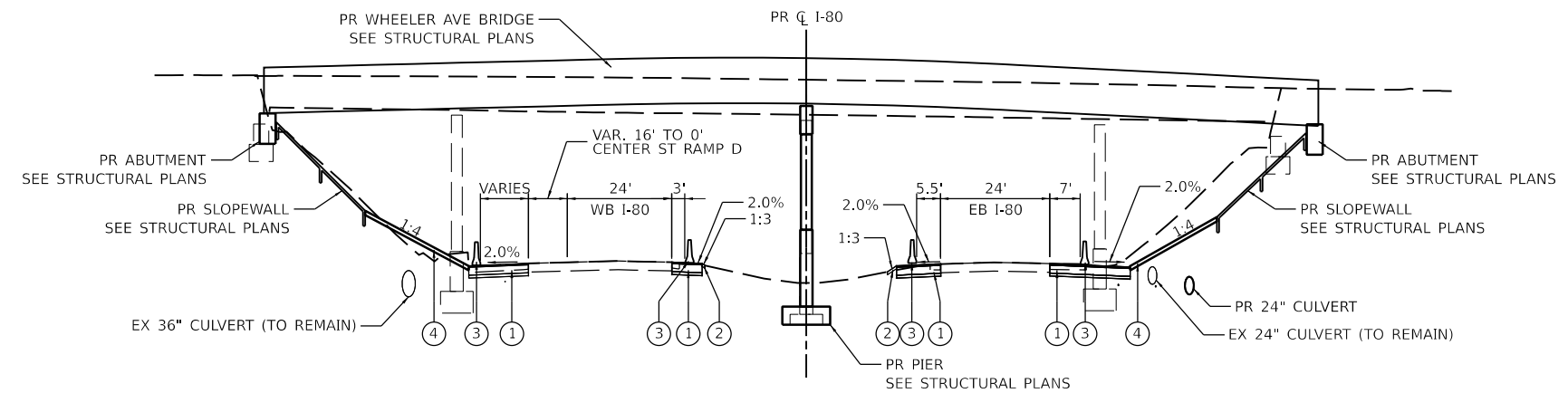
- [A] EXISTING PAVEMENT
- [B] EXISTING SHOULDER
- ① TEMPORARY PAVEMENT  
SEE MAINTENANCE OF TRAFFIC PLANS FOR LOCATIONS AND WIDTHS
- ② TOPSOIL FURNISH AND PLACE, 6"
- ③ TEMPORARY CONCRETE BARRIER (TO REMAIN PERMANENTLY)
- ④ SUBBASE GRANULAR MATERIAL, TYPE B 6"



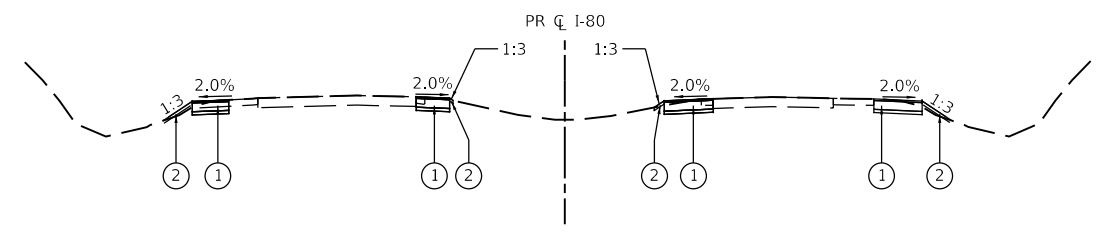
**EXISTING TYPICAL SECTION**  
I-80  
LOOKING EAST  
STA 641+38 TO STA 641+95



**EXISTING TYPICAL SECTION**  
I-80  
LOOKING EAST  
STA 633+00.00 TO STA 641+38  
STA 641+95 TO STA 13+00.00 R2



**PROPOSED TYPICAL SECTION**  
I-80  
LOOKING EAST  
STA 641+38 TO STA 641+95



**PROPOSED TYPICAL SECTION**  
I-80  
LOOKING EAST  
STA 633+00.00 TO STA 641+38  
STA 641+95 TO STA 13+00.00 R2

MODEL Default  
 FILE \\wae\p\proj\transystem\p\h\entley\com\TRANS\SCORP\PIV1\HOSTED\Documents\Projects\_2018\CH401\401\_18002702\TransSystems\CAD\2023\02\_Sheets\02\_Typ\_Sec\I-80R30-SHT-TYPSEC-C3.dwg  
 303 EAST WACKER DRIVE, SUITE 1400  
 CHICAGO, IL 60601-5276  
 PHONE: (312) 373-7700 FAX: (312) 373-6800



USER NAME = karim.mostafa	DESIGNED - NWM	REVISED -
	DRAWN - KWM	REVISED -
PLOT SCALE = 40,000' / 1"	CHECKED - SPF	REVISED -
PLOT DATE = 7/21/2022	DATE - 7/22/2022	REVISED -

**STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION**

<b>WHEELER AVENUE OVER F.A.I. ROUTE 80 TYPICAL SECTIONS</b>	
SCALE: N.T.S.	SHEET 3 OF 4 SHEETS
STA.	TO STA.

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
340	FAI 80 21 STRUCTURE 9	WILL	126	19
CONTRACT NO. 62R30				
ILLINOIS FED. AID PROJECT				

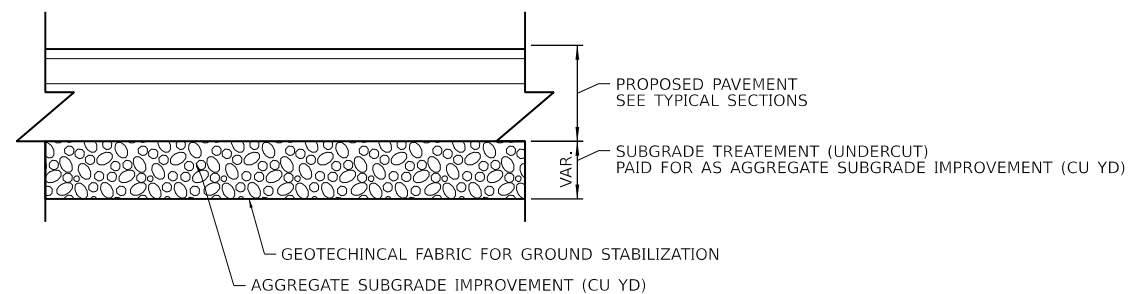
## HOT-MIX ASPHALT MIXTURE REQUIREMENTS

HOT-MIX ASPHALT MIXTURE REQUIREMENTS		
MIXTURE TYPES	AIR Voids @ NDES	QUALITY MANAGEMENT PROGRAM (QMP)
HOT-MIX ASPHALT PAVEMENT (FULL-DEPTH), 7 1/4"		
HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70, 2"	4% @ 70 GYR.	QC/QA
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70, 5 1/4"	4% @ 70 GYR.	QC/QA
HOT-MIX ASPHALT DRIVEWAY PAVEMENT, 3"		
HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N50, 3" (IN 2 LIFTS)	4% @ 50 GYR.	QC/QA
HOT-MIX ASPHALT STABILIZATION 6" AT STEEL PLATE BEAM GUARD RAIL		
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50, 6"	4% @ 50 GYR.	QC/QA
PAVEMENT CONNECTOR (HMA) FOR BRIDGE APPROACH SLAB		
HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70, 2"	4% @ 70 GYR.	QC/QA
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70, 13"	4% @ 70 GYR.	QC/QA
TEMPORARY PAVEMENT		
HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "D", N70, 2"	4% @ 70 GYR.	QC/QA
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N70, 11"	4% @ 70 GYR.	QC/QA
QMP DESIGNATION: QUALITY CONTROL/QUALITY ASSURANCE (QC/QA); QUALITY CONTROL FOR PERFORMANCE (QCP)		

### MIXTURE TABLE NOTES

1. THE UNIT WEIGHT USED TO CALCULATE ALL HOT-MIX ASPHALT SURFACE MIXTURE QUANTITIES IS 112 LBS/SY/IN.
2. THE "AC TYPE" FOR POLYMERIZED HMA MIXES SHALL BE "SBS/SBR PG 76-22" AND FOR NON-POLYMERIZED HMA THE "AC TYPE" SHALL BE "PG 64-22", UNLESS MODIFIED BY RECLAIMED MATERIALS SPECIFICATIONS.

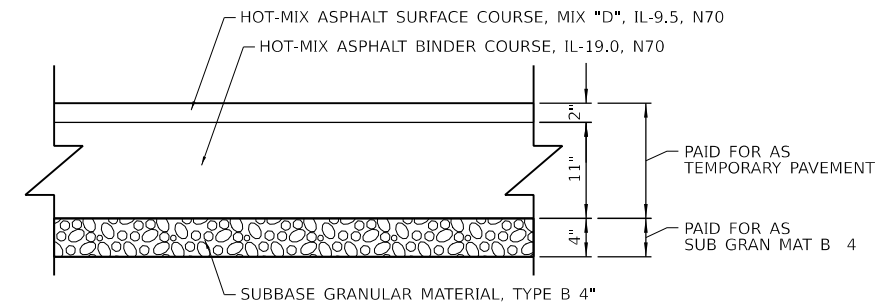
### SUBGRADE TREATMENT DETAIL



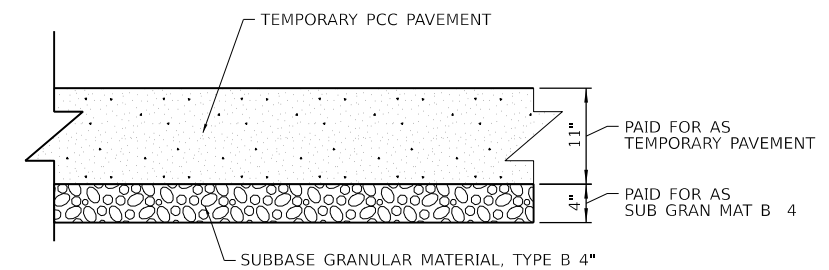
### SUBGRADE TREATMENT GENERAL NOTES

1. APPROVAL BY THE ENGINEER IS REQUIRED BEFORE PROCEEDING WITH SUBGRADE TREATMENT (UNDERCUT). NO PAYMENT WILL BE MADE FOR LOCATIONS TREATED WITHOUT THE ENGINEER'S PRIOR APPROVAL.
2. SUBGRADE TREATMENT (UNDERCUT) LOCATIONS AND DEPTH SHALL BE DETERMINED IN THE FIELD. REFER TO THE BDE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

### TEMPORARY PAVEMENT DETAILS



### OPTION 1: TEMPORARY HMA PAVEMENT



### OPTION 2: TEMPORARY PCC PAVEMENT

### TEMPORARY PAVEMENT GENERAL NOTES

1. THE CONTRACTOR SHALL HAVE THE OPTION OF CONSTRUCTING EITHER MATERIAL TYPE IF BOTH PORTLAND CEMENT CONCRETE AND HMA ARE SHOWN IN THE PLANS. FOR QUANTITY ESTIMATION PURPOSES, EXCAVATION QUANTITIES SHOULD BE ESTIMATED ASSUMING THE THICKER DESIGN IF BOTH OPTIONS ARE SHOWN IN THE PLANS.
2. PC CONCRETE TEMPORARY PAVEMENT SHALL CONSIST OF CLASS PV CONCRETE MEETING THE REQUIREMENTS OF ART. 1020 OF THE STANDARD SPECIFICATIONS. TEMPORARY PCC PAVEMENT DOES NOT REQUIRE DOWEL BARS.

MODEL Default  
 FILE: \\p01\proj\trans\systems\temp\hwy\constr\TRANS\SCORP\PIV\H\HOSTED\Documents\Projects\_2018\CH401\4011\0002\02-TransSystems\CAD\02R30\Sheets\02-Typ\_Sec\02R30-SHT-TYPSEC-04.dwg



USER NAME = karim.mostafa  
 PLOT SCALE = 20,000' / In.  
 PLOT DATE = 7/21/2022

DESIGNED - NWM  
 DRAWN - KWM  
 CHECKED - SPF  
 DATE - 7/22/2022

REVISED -  
 REVISED -  
 REVISED -  
 REVISED -

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

WHEELER AVENUE OVER F.A.I. ROUTE 80  
 TYPICAL SECTIONS

SCALE: N.T.S. SHEET 4 OF 4 SHEETS STA. TO STA.

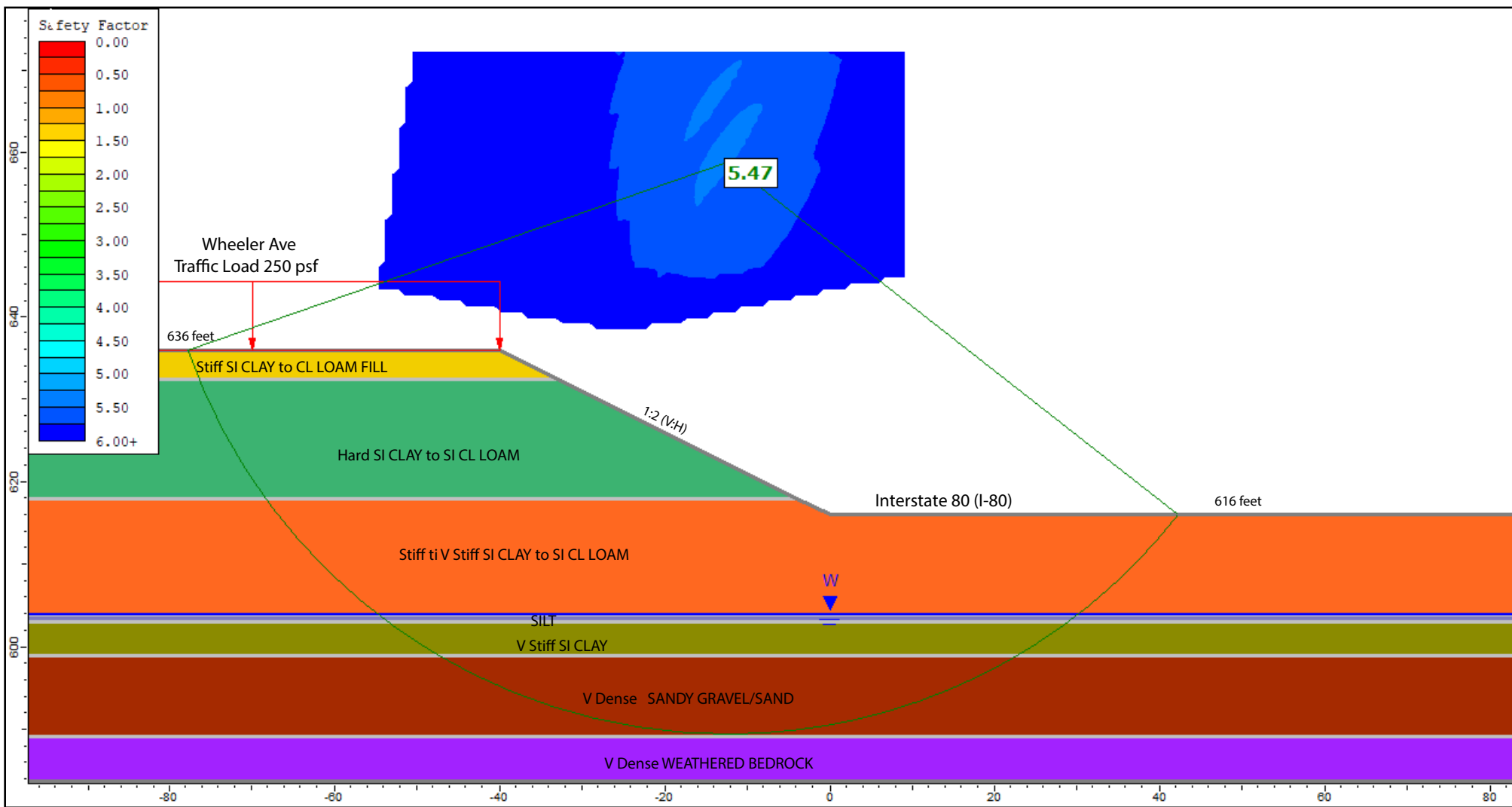
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
340	FAI 80 21 STRUCTURE 9	WILL	126	20
CONTRACT NO. 62R30				
ILLINOIS FED. AID PROJECT				







## APPENDIX E




Undrained Analysis, South Abutment Side Slope, Reference Boring: WA-BSB-02

Layer ID	Description	Total Unit Weight (pcf)	Undrained Cohesion (psf)	Undrained Friction Angle (degrees)
1	Stiff SI CLAY to CL LOAM Fill	125	1500	0
2	Hard SI CLAY to SI CL LOAM	125	4000	0
3	Stiff to V Stiff SI CLAY to SI CL LOAM	120	2500	0
4	SILT	120	0	30
5	V Stiff SI CLAY	125	3100	0
6	V Dense SANDY GRAVEL/SAND	125	0	34
7	V Dense WEATHERED BEDROCK	130	0	36

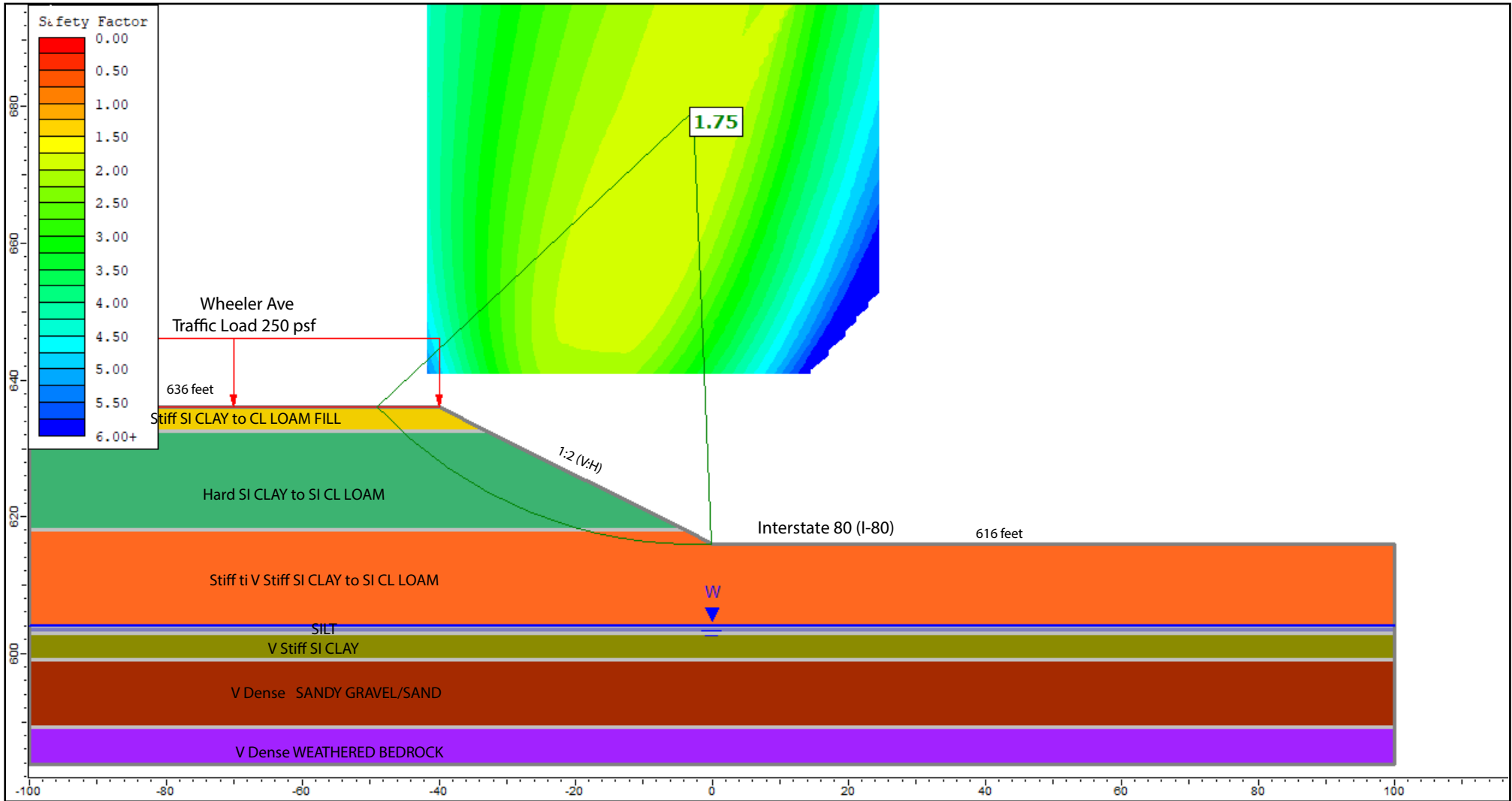
GLOBAL STABILITY: WHEELER AVENUE BRIDGE OVER I-80; I-80 RECONSTRUCTION FROM HOUBOLT ROAD TO WEST OF CENTER STREET AND LARKIN AVENUE INTERCHANGE, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL      APPENDIX E-1      DRAWN BY: N. Balakumaran  
CHECKED BY: A. Hamad



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

FOR TRANSYSTEMS CORPORATION      7901-15-01



Drained Analysis, South Abutment Side Slope, Reference Boring: WA-BSB-02

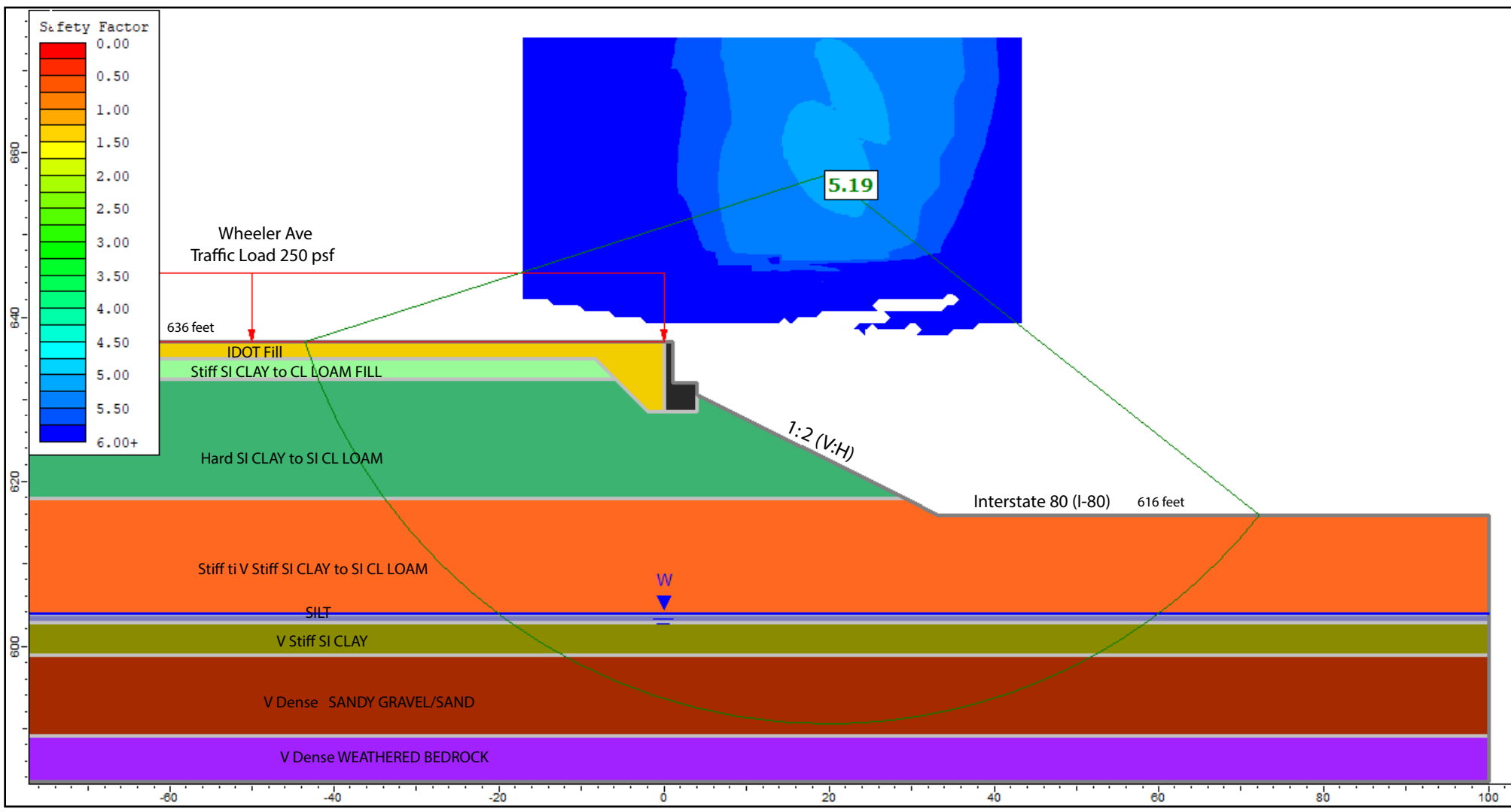
Layer ID	Description	Total Unit Weight (pcf)	Drained Cohesion (psf)	Drained Friction Angle (degrees)
1	Stiff SI CLAY to CL LOAM Fill	125	100	30
2	Hard SI CLAY to SI CL LOAM	125	100	30
3	Stiff to V Stiff SI CLAY to SI CL LOAM	120	100	30
4	SILT	120	0	30
5	V Stiff SI CLAY	125	100	30
6	V Dense SANDY GRAVEL/SAND	125	0	34
7	V Dense WEATHERED BEDROCK	130	0	36

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

SCALE: GRAPHICAL | APPENDIX E-2 | DRAWN BY: N. Balakumaran  
CHECKED BY: A. Hamad

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


7901-15-01

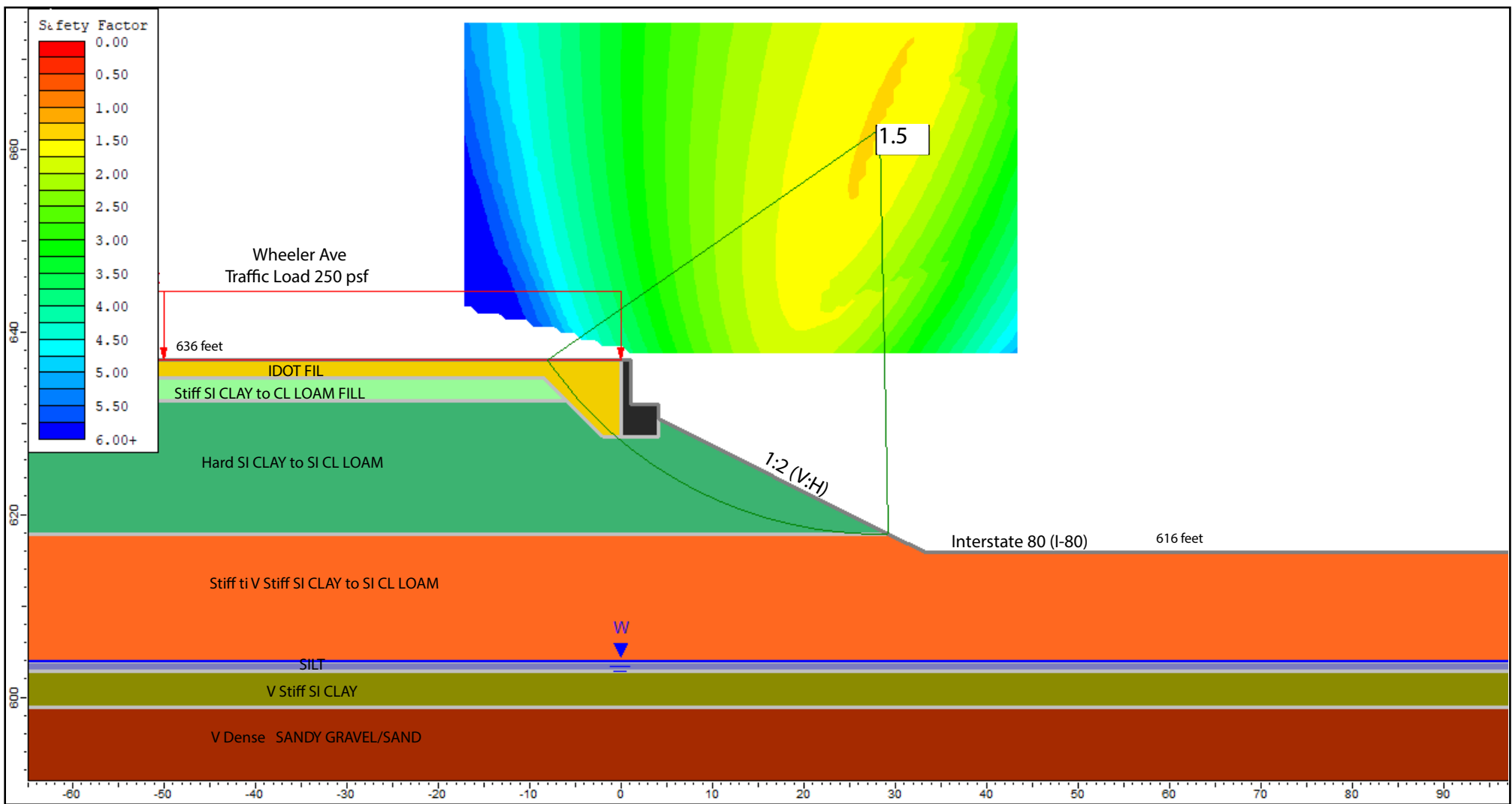


Undrained Analysis, South Abutment End Slope, Reference Boring: WA-BSB-02

Layer ID	Description	Total Unit Weight (pcf)	Undrained Cohesion (psf)	Undrained Friction Angle (degrees)
1	IDOT FILL	125	1000	0
2	Stiff SI CLAY to CL LOAM FILL	120	1500	0
3	Hard SI CLAY to SI CL LOAM	125	4000	0
4	Stiff to V Stiff SI CLAY to SI CL LOAM	120	2500	0
5	SILT	120	0	30
6	V Stiff SI CLAY	125	3100	0
7	V Dense SANDY GRAVEL/SAND	125	0	34

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

SCALE: GRAPHICAL	APPENDIX E-3	DRAWN BY: N. Balakumaran CHECKED BY: A. Hamad
		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
		7901-15-01



Drained Analysis, South Abutment End Slope, Reference Boring: WA-BSB-02

Layer ID	Description	Total Unit Weight (pcf)	Drained Cohesion (psf)	Drained Friction Angle (degrees)
1	IDOT FILL	120	100	30
2	Stiff SI CLAY to CL LOAM Fill	125	100	30
3	Hard SI CLAY to SI CL LOAM	125	100	30
4	Stiff to V Stiff SI CLAY to SI CL LOAM	120	100	30
5	SILT	120	0	30
6	V Stiff SI CLAY	125	100	30
7	V Dense SANDY GRAVEL/SAND	125	0	34

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

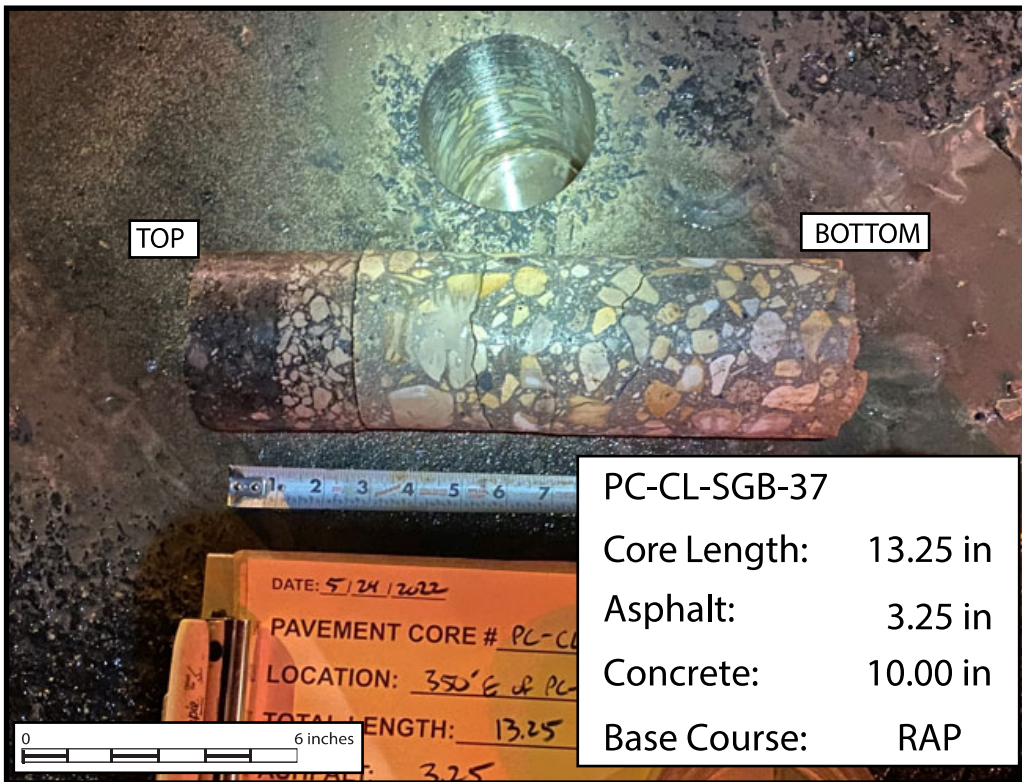
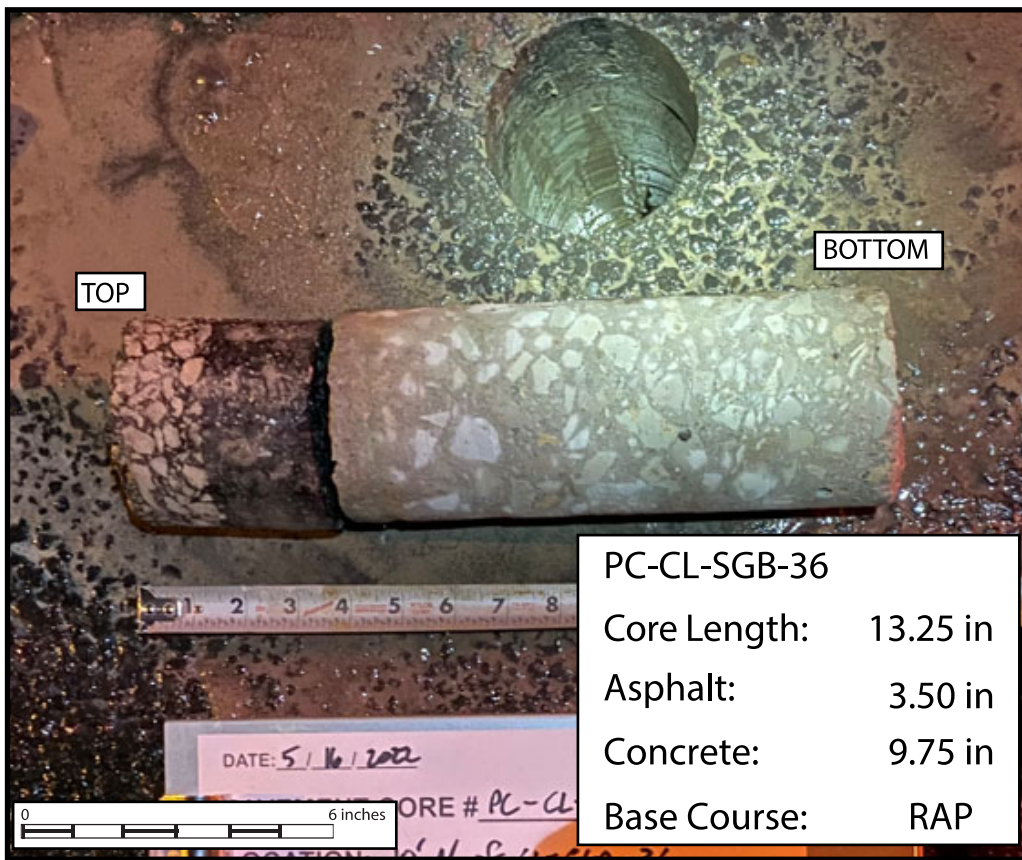
SCALE: GRAPHICAL | APPENDIX E-4 | DRAWN BY: N. Balakumaran  
CHECKED BY: A. Hamad



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

7901-15-01

## APPENDIX F

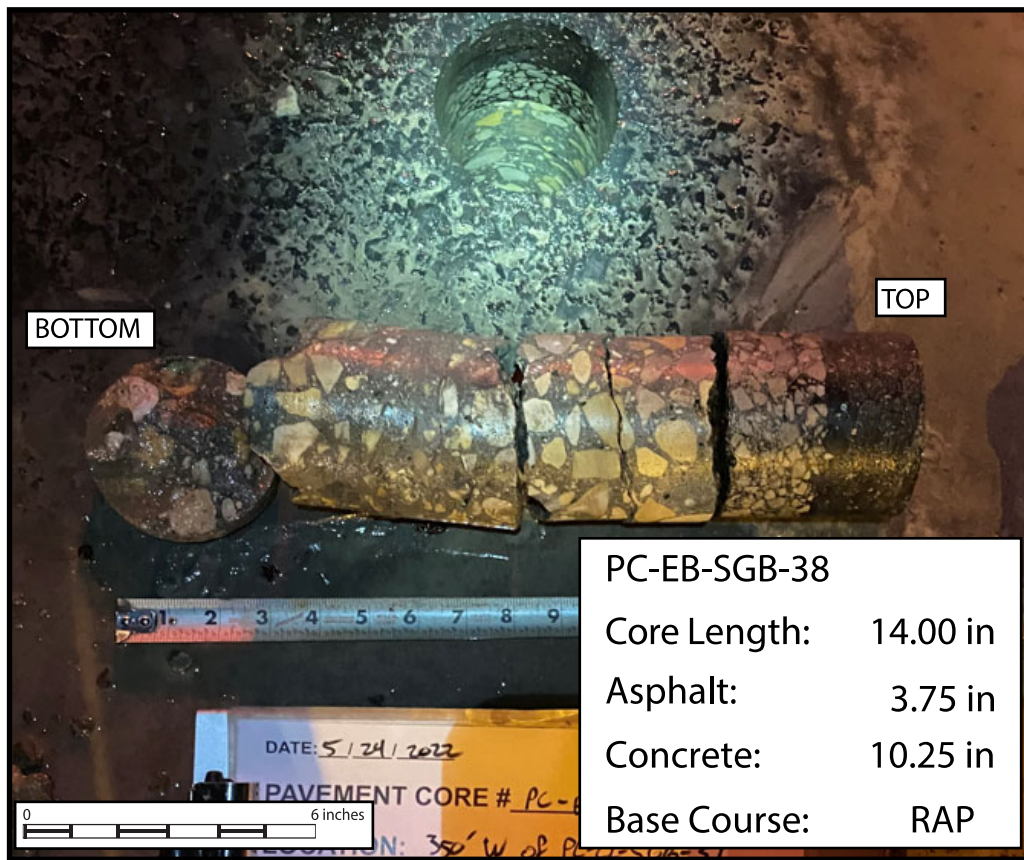


PAVEMENT CORES: I-80 RECONSTRUCTION FROM HOUBOLT RD TO WEST OF CENTER ST & LARKIN AVE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL	APPENDIX F-01	DRAWN BY: J. Bensen CHECKED BY: A. Kurma
------------------	---------------	---

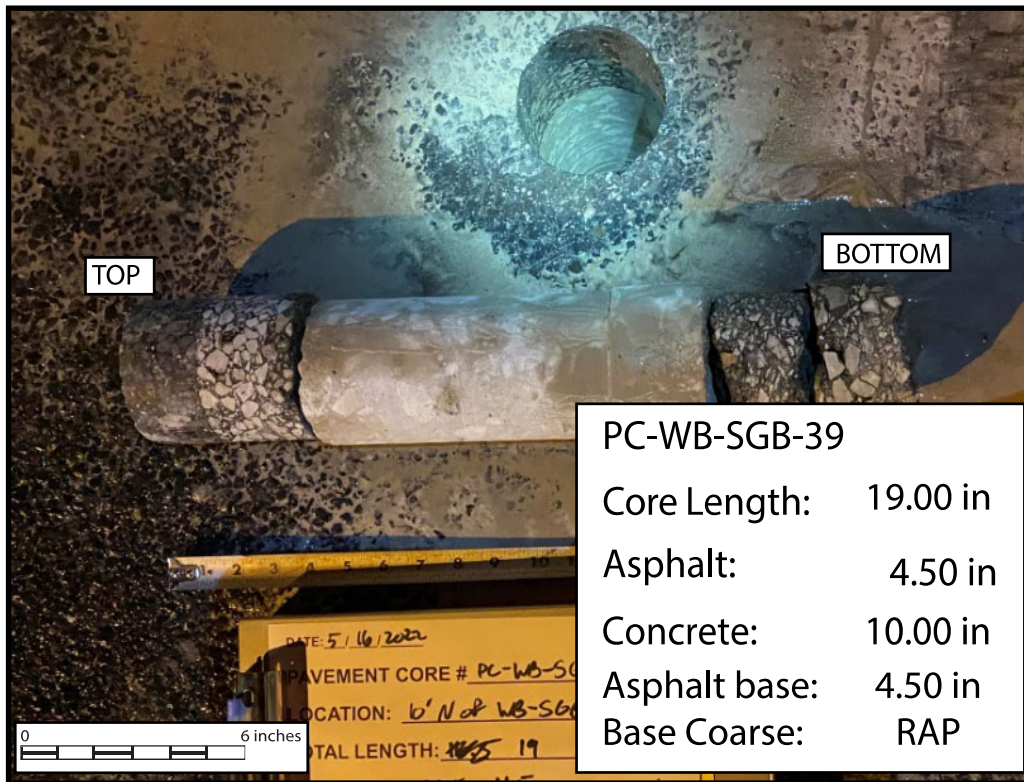
	1145 N. Main Street Lombard, IL 60148 www.wangeng.com
	FOR TRANSYSTEMS CORPORATION

7901-15-01



PC-EB-SGB-38

Core Length: 14.00 in  
 Asphalt: 3.75 in  
 Concrete: 10.25 in  
 Base Course: RAP



PC-WB-SGB-39

Core Length: 19.00 in  
 Asphalt: 4.50 in  
 Concrete: 10.00 in  
 Asphalt base: 4.50 in  
 Base Course: RAP

PAVEMENT CORES: I-80 RECONSTRUCTION FROM HOUBOLT RD TO WEST OF CENTER ST & LARKIN AVE; CONTRACT D-91-207-19, PTB 194/11, WILL COUNTY, ILLINOIS

SCALE: GRAPHICAL

APPENDIX F-02

DRAWN BY: J. Bensen  
 CHECKED BY: A. Kurma



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

FOR TRANSYSTEMS CORPORATION

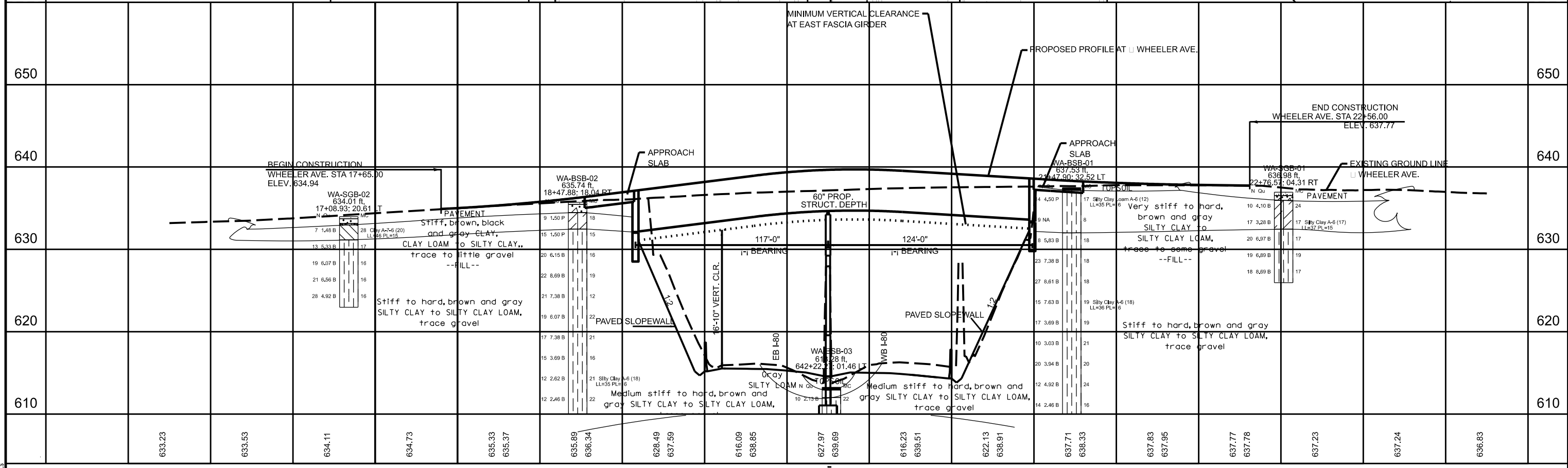
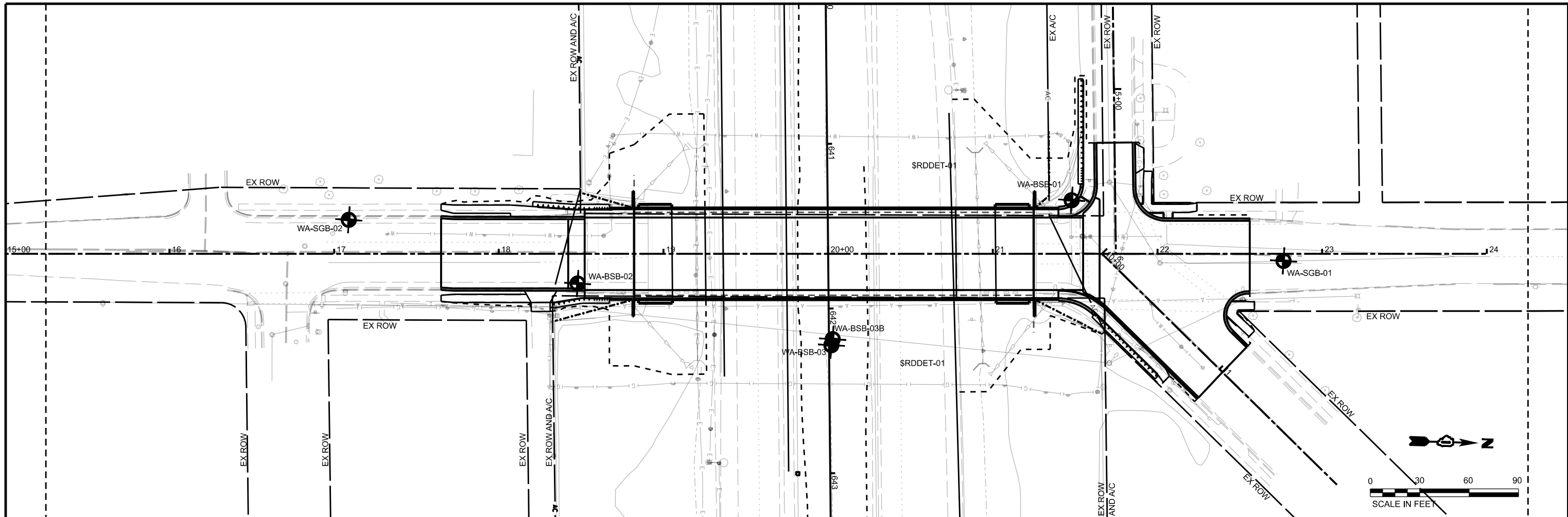
7901-15-01



## APPENDIX G

PLAN	REVIEWED	DATE
	PLOTTED	
	ALIGNED	
	CHECKED	
	GRADES	
	FILE NAME	
	NO.	

PROFILE	REVIEWED	DATE
	PLOTTED	
	GRADES	
	FILE NAME	
	NO.	



MODEL: MODELNAMES  
FILE NAME: \$FILE\$

16+00	17+00	18+00	19+00	20+00	21+00	22+00	23+00	24+00
633.23	633.53	634.11	634.73	635.33	635.37	635.89	636.34	636.83
637.71	637.83	637.95	637.77	637.78	637.23	637.24	636.83	

USER NAME = \$USERS	DESIGNED -	REVISED -
PLOT SCALE = \$SCALE\$	DRAWN -	REVISED -
PLOT DATE = \$DATES	CHECKED -	REVISED -
	DATE -	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

WHEELER AVENUE OVER F.A.I. ROUTE 80  
PLAN & PROFILE

SCALE: 1"=30' SHEET: PLNPRF-00/PLNPRF-SHEETS STA. 15+00 TO STA. 24+00

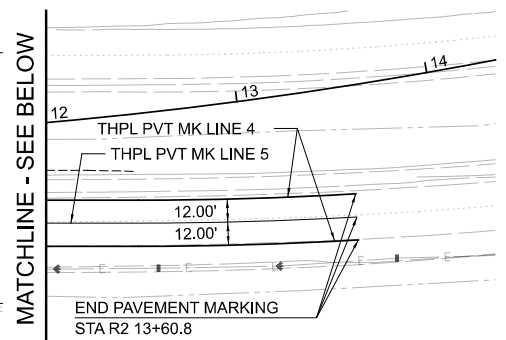
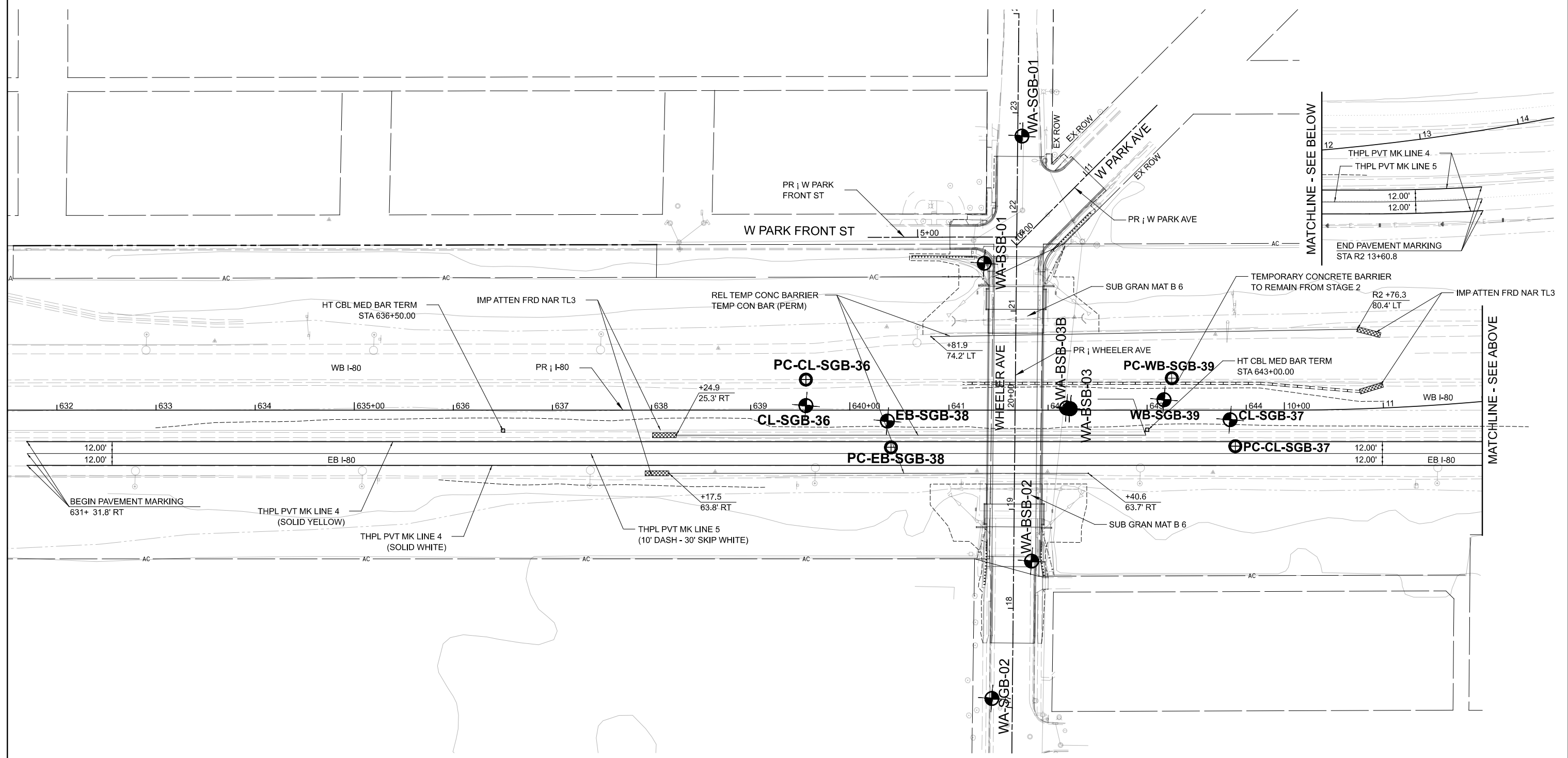
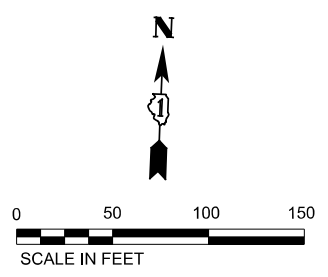
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
340	\$SECTION	WILL	\$TOTAL\$	\$PLNPRF-00\$
CONTRACT NO.				
ILLINOIS FED. AID PROJECT				

**REMOVAL LEGEND:**

	PAVEMENT REMOVAL		LINEAR REMOVAL
	PAVED SHOULDER REMOVAL		TREE TRUNK PROTECTION
	SIDEWALK REMOVAL		TREE REMOVAL, ACRES
	DRIVEWAY PAVEMENT REMOVAL		

**NOTES**

1. SEE SHEET \$RDR FOR REMOVAL INFORMATION ALONG WHEELER AVE.
2. ALL STATIONING REFERS TO PR | I-80 UNLESS OTHERWISE NOTED.
3. SEE MAINTENANCE OF TRAFFIC PLANS FOR TEMPORARY PAVEMENT LOCATIONS.



MATCHLINE - SEE ABOVE

MODEL, MODEL NAMES, FILE NAMES, STYLES



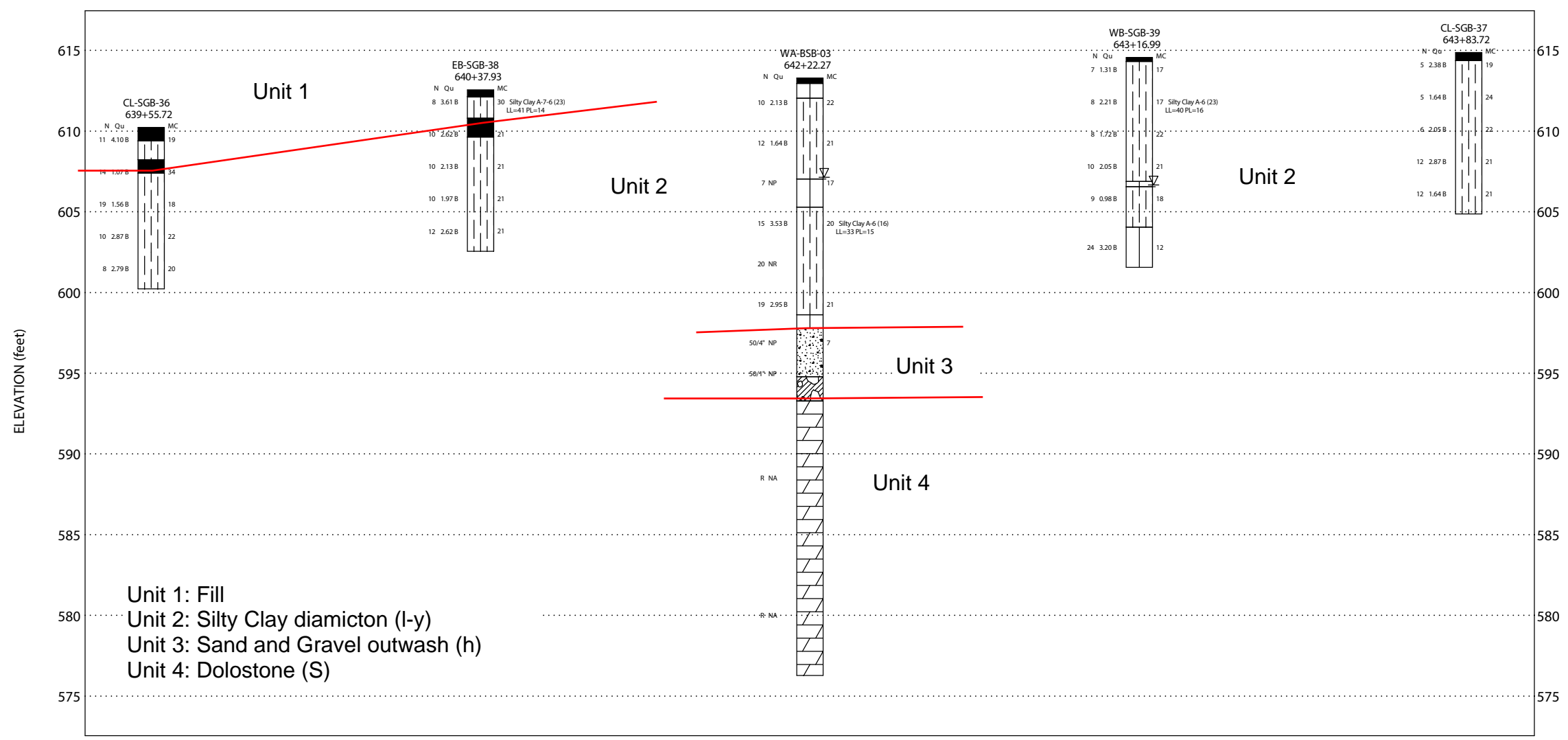
USER NAME = \$USERS	DESIGNED -	REVISED -
PLOT SCALE = \$SCALE\$	DRAWN -	REVISED -
PLOT DATE = \$DATES	CHECKED -	REVISED -
	DATE -	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

WHEELER AVENUE OVER F.A.I. ROUTE 80  
ROADWAY AND PAVEMENT MARKING PLAN - I-80

SCALE: 1"=50'  
SHEET PLNPRF-02 OF PLNPRF-SHEETS  
STA. 631+50 TO STA. 12+90

F.A.U. RTE. 80	SECTION	COUNTY	TOTAL SHEETS NO.
	SSECTION	WILL	STOTAS PLNPRF-02
			CONTRACT NO. 15C01
		ILLINOIS	FED. AID PROJECT

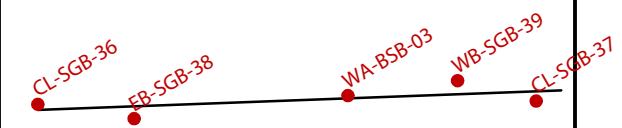


- Unit 1: Fill
- Unit 2: Silty Clay diamicton (I-y)
- Unit 3: Sand and Gravel outwash (h)
- Unit 4: Dolostone (S)

DISTANCE ALONG PROFILE (feet)

Lithology Graphics

Topsoil	IDH Silty Clay, Silty Clay Loam	IDH Silt, Silty Loam	Coarse sand
Weathered bedrock	Dolomite or Dolomitic Limestone		



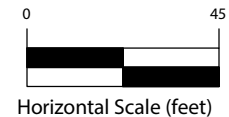
Site Map Scale 1 inch equals 165 feet

Explanation:

Borehole Lithology Borehole Number Station

N - N-value, (blw/12 in)  
 Qu - UC Strength, (tsf)  
 MC - Moisture Content, (%)

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



Vertical Exaggeration: 5.5x

**Wang Engineering**  
 1145 North Main Street  
 60148

I-80 Temporary Pavement  
 Soil Profile



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

JOB NUMBER	PLATE NUMBER
7901-15-01	APPENDIX G-3