STRUCTURE GEOTECHNICAL REPORT
CIRCLE INTERCHANGE RECONSTRUCTION
JACKSON BOULEVARD (F.A.U. 1422) BRIDGE OVER INTERSTATE 90/94 (KENNEDY EXPRESSWAY)
EXISTING SN 016-0588, PROPOSED SN 016-1702
SECTION 2015-020B
IDOT D-91-227-13, PTB 163/ITEM 001
COOK COUNTY, ILLINOIS

For

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11. Abstract

The existing, three-span Jackson Boulevard Bridge over Interstate 90/94 and its three-span Jackson Entrance Ramp will be removed and replaced. The Jackson Bridge will be replaced with a new, three-span structure with closed abutments and multi-column piers with a back-to-back of abutments length of 268.40 feet and an out-to-out width of 69.0 feet. The Entrance Ramp will be replaced with a new, two-span structure with multi-column piers with centerline girder to back of abutment length of 163.50 feet and an out-to-out width ranging from 23.1 to 41.3 feet. Two MSE walls, designated as Retaining Wall 25 and Retaining Wall 26 will extend north of the north abutment with a maximum total wall height of 15.6 feet.

The foundation soils consist of up to 10.5 feet of fill, up to 42 feet of very soft to medium stiff clay, and 24 to 35 feet of medium stiff to hard silty clay to silty clay loam. Deeper foundation soils include up to 29 feet of medium dense to very dense silt to silty loam hardpan and sand to gravelly sand resting on top of strong, fair rock quality dolostone. The bedrock was sampled or inferred at depths ranging from 92.0 to 108.5 feet bgs, corresponding to 484.5 to 487.8 feet elevation. The site classifies in the Seismic Class D and is in the Seismic Performance Zone 1.

New abutments will be placed behind existing ones and profile grade along the spans will only change slightly, we anticipate negligible settlements and suitable global stability at abutments. We provide recommendations for drilled shafts socketed into the bedrock with factored resistances of about 2,600 to 4,700 kips for 3- to 4-foot diameter socket bases. Special care will need to be taken for drilled shafts crossing through an abandoned tunnel, various utilities, and through existing buried timber piles at the abutments.

Ground movements adjacent to the existing building were determined to be about 0.60 to 0.75 inches. Impact on existing structure should be accounted for in design, as well as impact on utilities.

A number of temporary excavations will likely be required to remove the existing facilities and construct the new bridge abutment. The design of these excavation systems should include the pay item, *Temporary Soil Retention System* and their impact on nearby structures and utilities should be considered in the design.

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1.0 INTRODUCTION

This report presents the results of our subsurface investigation, laboratory testing, and geotechnical evaluations, and recommendations for the design and reconstruction of the Jackson Boulevard Bridge over Interstate 90/94 and Jackson Entrance Ramp within the Circle Interchange in Chicago, Cook County, Illinois. A *Site Location Map* is presented as Exhibit 1.

1.1 Proposed Structure

Wang Engineering, Inc. (Wang) understands AECOM envisions a new, three-span bridge structure (SN 016-1702) which will replace the existing bridge (SN 016-0588). The bridge will have a back-to-back of abutments length of 268.40 feet with spans ranging from 55.2 to 104.8 feet in length. The out-to-out bridge deck width will measure 69.0 feet. The spans will be supported by 30-inch girders. The substructure will consist of reinforced concrete closed abutments and multi-column piers all supported on drilled shaft foundations. Both abutments will be placed at the back of existing ones increasing the bridge length, creating additional lane spaces on I-90/94 to accommodate prosed Ramp SW and NB Bypass.

The Jackson Entrance Ramp will be replaced with a new, two-span structure consisting of Pier R1 and North Abutment with centerline girder to back of abutment length of 163.5 feet and out-to-out width of 23.1 to 41.3 feet. Two MSE walls, designated as Retaining Wall 25 and Retaining Wall 26, will retain the embankment north of the North Abutment. The 79.8-foot long proposed Wall 25 starts at Station 8241+94.38 ends at Station 8242+74.29, on the east side with a maximum total wall height of 11.9 feet. The 127.3-foot proposed Wall 26 starts at Station 8241+94.33 and ends at

Station 8243+20.18, offset 19.25 feet Lt on west side with a maximum total wall height of 15.6 feet. The TSL dated July 7, 2017 was used for the preparation of the report as shown in the Type Size Location Plan (Appendix C).

The purpose of our investigation was to characterize the site soil and groundwater conditions, perform geotechnical analyses, and provide recommendations for the design and construction of the foundations.

1.2 Existing Structure

The existing Jackson structure (SN016-0588) is a three-span bridge that was constructed in 1955 under FAI Route 173, Section 0101.2-2B. The bridge has a total back-to-back of abutments length of 199.8 feet and an out-to-out bridge width varying from 67.9 to 72.1 feet. The spans are supported by 36-inch wide flange beams. The substructures consist of reinforced concrete closed abutments and multi-column piers founded on timber piles. The foundation of the West Pier is supported on drilled shafts.

The Jackson Entrance Ramp, also constructed in 1955, has the centerline perpendicular to Jackson Boulevard centerline. The three-span bridge measure 169.83 feet from back of north abutment to the centerline of the facia beam on Jackson Boulevard with an out-to-out width of 22.5 feet. The spans are supported by 24-inch flange beams. A concrete cantilever retaining wall extends north of the north abutment for 215.00 feet. The total ramp length is 384.83 feet. The substructures consist of reinforced concrete closed north abutment and single hammerhead pier founded on caissons.

Repairs were made to the Jackson and Ramp bridges in 2002 under Section 0101-2-1B-R-1. Both bridges are to be removed and replaced by new bridges and substructures founded on drilled shafts encased in bedrock. Also, a new MSE wall will be constructed north of the north entrance ramp.

2.0 SITE CONDITIONS AND GEOLOGICAL SETTING

The site is located within the City of Chicago at the I-90/94 and I-290 Circle Interchange. On the USGS *Chicago Loop 7.5 Minute Series* map, the bridge is located in the NW ¼ of Section 16, Tier 39 N, Range 14 E 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 present subsurface investigation results. For the study of the regional geologic framework, Wang considered northeastern Illinois in general and Cook County in particular. Exhibit 2 illustrates the *Site and Regional Geology*.

2.1 Physiography

The general topography of the project area slopes gently southeast toward Lake Michigan. The bridge is situated within the Chicago Lake Plain Physiographic Subsection. The area is largely made up of ground moraine till covered by thin and discontinuous lacustrine silt and clay. The ground elevation along the bridge ranges from 597 feet at west end to 593 feet at east end. Along I-90/94, the ground elevation is about 575.0 feet.

2.2 Surficial Cover

The project area was shaped during the Wisconsinan-age glaciation, and approximately 100-foot thick drift covers the bedrock (Leetaru et al. 2004). The glacial cover is made up of clay and silt of the Equality Formation of the Mason Group and diamictons of the Wadsworth and Lemont Formations of the Wedron Group (Hansel and Johnson 1996). The Equality Formation is made up of bedded silt and clay, locally laminated, with lenses and/or thin beds of sand and gravel. The Wadsworth Formation consists of relatively homogenous, massive, gray till with clay to silty clay matrix, with dolostone and shale clasts and occasional lenses of sorted and stratified silt. The Wadsworth Formation is underlain by the pebbly silty clay loam to silty loam diamicton of the Yorkville Member of the Lemont Formation, known informally as the Chicago “hardpan.”

From a geotechnical viewpoint, the Equality Formation is characterized by low strength, medium to high plasticity, and medium to high moisture content, whereas the Wadsworth Formation is characterized by low plasticity, medium to low moisture content, medium to very stiff consistency, poor permeability, and low compressibility. The Yorkville Member (hardpan) is characterized by low plasticity, high blow counts, and low moisture content (Bauer et al. 1991; Peck and Reed 1954).

2.3 Bedrock

In the project area, the glacigenic deposits unconformably rest over approximately 350-foot thick Silurian-age dolostone (Leetaru et al 2004). The top of bedrock may be encountered at 500 feet elevation or 100 feet below ground surface (bgs) or more. The Silurian dolostone dips gently eastward at a pace of 15 feet per mile. Only inactive faults are known in the area, and the seismic

risk is minimal (Leetaru et al. 2004; Willman 1971). There are no records of mining activity in the area, but deep tunnel excavations are known to exist.

Our subsurface investigation results fit into the local geologic context. The borings drilled in the project area revealed the native sediments consist of clay to silty clay diamicton of the Wadsworth Formation resting on top of more competent silty clay loam diamicton of the Lemont Formation, which rest over granular unit made of interbedded silt, sand, and gravel, water bearing that rests over bedrock. Dolostone bedrock was sampled or inferred at depths ranging from 92.0 to 108.5 feet bgs, corresponding to 484.5 to 487.8 feet elevation, within the range predicted based on published geological data.

3.0 METHODS OF INVESTIGATION

The following sections outline the subsurface and laboratory investigations performed by Wang. All elevations in this report are based on North American Vertical Datum (NAVD) 1988.

3.1 Subsurface Investigation

The subsurface investigation performed by Wang consisted of three structure borings for Jackson Bridge, designated as 1702-B-01 to 1702-B-03, drilled along the proposed Jackson Bridge alignment. Borings 1702-B-01 and 1702-B-03 were drilled along the existing bridge's east and west approach embankments, respectively. Boring 1702-B-02 was drilled from I-90/94 pavement elevation. The bridge borings ranged from elevations of 577.4 to 593.8 feet elevations to depths of 102.0 to 108.5 feet bgs.

To supplement our investigation, for the Entrance Ramp, we considered three nearby structure borings, designated as 25-RWB-01, 26-RWB-01, and 0589-B-02 drilled by Wang from elevations of 575.37 to 577.91 to depths of 65.0 to 104.0 feet bgs. The borings were drilled from pavement on existing I-90/94.

The as drilled boring elevations were surveyed by Dynasty Group Inc., and station and offset information for each boring were provided by AECOM. Boring location data are presented in the *Boring Logs* (Appendix A). The as-drilled boring locations are shown in the *Boring Location Plan* (Exhibit 3).

A truck-mounted drilling rig, equipped with solid and hollow stem augers and mud rotary equipment,

was used to advance and maintain an open borehole. Soil sampling was performed according to AASHTO T 206, "*Penetration Test and Split Barrel Sampling of Soils*." The soil was sampled at 2.5-foot intervals to 30 feet bgs and at 5-foot intervals thereafter. Samples collected from each interval were placed in sealed jars for further examination and testing. NWD4-size bedrock cores were collected from Borings 1702-B-02 and 0589-B-02 in 10-foot runs.

Field boring logs, prepared and maintained by a Wang field engineer, include lithological descriptions, visual-manual soil/rock 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. The SPT N-value, shown on the soil profile, is the sum of the second and third blows per 6 inches. The soils were described and classified according to the Illinois Division of Highways (IDH) Textural Classification system. The field logs were finalized by an experienced engineering geologist after verifying the field visual classifications and laboratory test results. The bedrock cores were described and measured for recovery and Rock Quality Designation (RQD). Geological Strength Index (GSI) evaluations were also performed on the bedrock cores.

Groundwater observations were made during and at the end of drilling operations. Due to safety considerations, the boreholes were backfilled with grout immediately upon completion.

3.2 Vane Shear Tests

Wang performed vane shear tests in Boring 1702-B-03 to determine the in-situ shear strength of the soft/very soft silty clay (Chicago Blue Clay). The tests were performed using an Acker Vane Shear Test kit in undisturbed and remolded conditions. The results are shown on the boring logs. The sensitivity is the ratio of shear strength in undisturbed and remolded conditions. In general, the vane shear values were significantly higher than the corresponding values from unconfined compressive strength tests using the RIMAC apparatus. Vane shear test results were used for our engineering analyses.

3.3 Laboratory Testing

Soil samples were tested in the laboratory for moisture content (AASHTO T265). Atterberg limits (T89/T90) and particle size analyses (T88) tests were performed on selected samples. Unconfined compressive strength test (T22) was performed one selected bedrock core. Field visual descriptions of the soil samples were verified in the laboratory, and the tested samples were classified in accordance

with the IDH Textural Classification chart. Laboratory test results are shown in the *Boring Logs* (Appendix A) and in the *Laboratory Test Results* (Appendix B).

The soil and rock samples will be retained in our laboratory for 60 days following this report submittal. Soil samples will be discarded unless a specific written request is received as to their disposition and the rock cores will be transported to IDOT District One laboratory for storage.

4.0 RESULTS OF FIELD AND LABORATORY INVESTIGATIONS

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.

4.1 Soil Conditions

Along the proposed bridge and ramp alignments, the investigation revealed that the pavement structure consists of 3 to 6 inches of asphalt overlying 7 to 16 inches of concrete followed by 20 to 29 inches of crushed stone base coarse. Pavement structure thicknesses at each boring locations are shown on logs (Appendix A). In descending order, the general lithologic succession encountered beneath the pavement structure includes: 1) man-made ground (fill); 2) very soft to medium stiff clay to silty clay; 3) stiff to hard silty clay to silty clay loam; 4) medium dense to very dense sand to gravelly sand with interbedded silt to silty loam; and 5) strong dolostone bedrock.

1) Man-made ground (fill)

Underneath the pavement structure, borings encountered up to 9.0 feet of cohesive and/or granular fill. The cohesive fill measured up to 7.3 feet of medium stiff to very stiff brown and gray silty clay loam with unconfined compressive strength (Q_u) values of 0.57 to 2.5 tsf with an average of 1.5 tsf and moisture content (MC) values of 17 to 23% averaging 19%. The granular fill included up to 4.3 feet of very loose to dense, brown and gray sand, sandy loam and crushed stone with SPT N-values of 1 to 45 blows/foot and MC content values of 11 to 16%.

2) Very soft to medium stiff clay to silty clay

At elevations of 570.5 to 583.3 feet, borings encountered up to 42.0 feet of very soft to medium stiff, gray clay to silty clay deposits with Q_u values of 0.16 to 0.75 tsf with an average of 0.43 tsf and MC

values of 16 to 36% with an average of 24%. This layer is commonly known as the "Chicago Blue Clay." Laboratory index testing performed in a sample from this layer show liquid (L_L) and plastic (P_L) limit values of 28 and 14%, respectively. According to the AASHTO Soil Classification System, the soil belongs to the A-6 (7) soils group.

3) Stiff to hard silty clay to silty clay loam

At elevations of 552.1 to 538.6 feet, borings advanced through up to 35 feet of stiff to hard gray silty clay to silty clay loam with occasional clay interbeds. This layer has Q_u values of 1.0 to 5.25 tsf with an average of 2.84 tsf and MC values of 13 to 24% averaging 20%. Laboratory index testing performed on a sample from this layer show L_L and P_L values of 34 and 17%, respectively. The consistency of this soil sample belongs to the A-6 (13) soil group. Occasional layers of medium stiff clay with Q_u values of 0.82 to 0.98 tsf with an average of 0.9 tsf were encountered. The corresponding MC values of 28 to 39% with an average of 32% were reached.

4) Medium dense to very dense sand to gravelly sand and silt to silty loam

At elevations of 517.1 to 514.2 feet and extending to the boring termination depths or top of bedrock, borings encountered brown to gray medium dense to very dense fine to medium sand, sandy loam, silt, silty loam and sandy gravel with SPT N-values of 10 to more than 50 blows/inch and MC values of 9 to 24%. Hardpan consisting of very dense silty loam was encountered below the gravelly sand layer resting on top of the weathered bedrock. The hardpan at this site is thin, only about 3 to 6 feet in thickness, and contains a number of cobbles causing hard drilling conditions and rig chatter. Hardpan was not encountered in all the borings.

At elevations of 489.0 to 487.8 feet borings encountered difficult drilling conditions that included up to 5.5 feet of weathered bedrock. Auger/bit refusal on the apparent top of bedrock was recorded at elevations of 484.5 to 487.8 feet.

5) Dolostone bedrock

Strong, light gray dolostone bedrock was confirmed at elevations of 485.4 (92 feet bgs) and 483.9 (94 feet bgs) feet in borings 1702-B-02 and 0589-B-02, respectively. Based on the 10-foot rock core obtained from the borings, the measured RQD values are 57 and 98% corresponding to fair and excellent rock mass quality. A tested rock core sample shows an unconfined compressive strength of 10,280 psi. Bedrock core photographs are shown in Appendix A.

4.2 Groundwater Conditions

Borings 0589-B-02 and 26-RWB-01 encountered groundwater during drilling at elevations of 513.4 and 515.9 feet. Groundwater was recorded at an elevation of 500.9 feet (77.0 feet bgs) after 24 hours of drilling completion of Boring 0589-B-02. Since the groundwater was observed within the granular unit (layer 4), for design purposes, the granular soils (layer 4) should be considered water bearing and accounted for during the design and construction phases. Cohesive soils above the borings have not encountered granular pockets within the massive clay; however, it is well known that granular pockets exist. Thus, the possibility of encountering perched water within the granular layers should be accounted for during construction.

4.3 Seismic Design Considerations

Due to the fixity considerations included in the IDOT *All Geotechnical Manual Users (AGMU) 9.1* method of analysis, the seismic site class is dependent on the type of foundation chosen. A 3-foot diameter drilled shaft was assumed in the calculations. The soils within the top 100 feet have a weighted average S_u of 1.22 ksf (AASHTO 2012; Method C controlling), and the results classify the site in the Seismic Site Class D in accordance with the IDOT method. The project location belongs to the Seismic Performance Zone 1. The seismic spectral acceleration parameters were determined using the AASHTO computer program "Seismic Design Parameters, version 2.10" by specifying the location by latitude and longitude. The location of the bridge was considered at Latitude of 41.87779162 and a Longitude of -87.64569109. The seismic spectral acceleration parameters recommended for design in accordance with AASHTO (2016) are summarized in Table 1. The factor of safety (FOS) against liquefaction for the bridge site is greater than the AASHTO-required value of 1.

Table 1: Seismic Design Parameters

Spectral Acceleration Period (sec)	Spectral Acceleration Coefficient[1)] (% g)	Site Class Factors	Design Spectrum for Site Class D[2)] (% g)
0.0	PGA = 4.1	F_{pga} = 1.6	**A_s = 6.6**
0.2	S_S = 9.0	F_a = 1.6	**S_{DS} = 14.4**
1.0	S_1 = 3.6	F_v = 2.4	**S_{D1} = 8.5**

1) Base spectral acceleration coefficients from AASHTO (2016)

2) Site Class D values to be presented on plans (A_s = PGA*F_{pga}; S_{DS}= S_S*F_a; S_{D1}= S_1*F_v)

5.0 FOUNDATION ANALYSIS AND RECOMMENDATIONS

Geotechnical evaluations and recommendations for the Jackson Bridge approach embankments, approach slabs, and foundations for Jackson and Entrance Ramp bridges are included in the following sections. The design is based on 2016 AASHTO LRFD Bridge Design Specification and IDOT 2012 Bridge Manual.

5.1 Jackson Bridge Approach Settlement and Global Stability

Wang understands the profile grade along Jackson Boulevard will not be significantly changed; therefore, we anticipate negligible settlements for the approach embankments and approach slabs. The TSL Plan provided shows the proposed Jackson bridge abutments will be located behind the existing, thus it is a cut condition with little new fill at both abutments. The settlement is estimated to be less than 0.4 inches; therefore, we have not included downdrag allowances on the drilled shafts.

The proposed closed abutments for both structures will be supported on drilled shafts extending to bedrock with 3 feet or more socketed into sound bedrock, thus we do not anticipate global instability of the proposed new embankments.

5.2 Foundations for Jackson Bridge and Entrance Ramp

Wang considered foundation options such as driven piles, drilled belled shafts on hardpan, and rock-socketed drilled shafts for the support of proposed abutments and piers.

Driven pile option was eliminated due to noise and vibration concerns. Belled shafts on hardpan were also eliminated due to the thin layer of the hardpan and the presence of gravel and cobbles making the construction of bells very difficult and time consuming. Therefore, Wang recommends supporting the proposed structures in rock-socketed straight-sided drilled shafts into bedrock.

Preliminary Service Loads

Preliminary service combination loads for the substructures were provided by TranSystems. The largest service loads are summarized in Tables 2 and 3.

Table 2: Summary of Service Loads on Jackson Bridge

Substructure ID	Vertical Service Load (kips)	Lateral Service Load (kips)
West Abutment	2031	605
Pier 1	1370	580
Pier 2	1305	580
East Abutment	1032	615

Table 3: Summary of Service Loads on Jackson Entrance Ramp

Substructure ID	Vertical Service Load (kips)	Lateral Service Load (kips)
Pier 1	515	580
North Abutment	605	140

Based on the applied factored loads and the factored resistance available outlined below, the structural engineer will determine the number, diameter, and spacing of rock drilled shafts needed at each bridge abutment and pier structure to safely transfer the loads from the bridge to the ground.

5.2.1 Drilled Shaft Axial Resistance

The abutments and piers will be supported on drilled shafts on top of sound bedrock. Bedrock was encountered at elevations of 485.4 (92 feet bgs) and 483.9 (94 feet bgs) feet in Borings 1702-B-02 and 0589-B-02, respectively. The bedrock cores show fair to excellent rock quality conditions. We estimate the rock sockets will have diameters of 3.0 to 4.0 feet. Above the bedrock, the shafts should have diameters 6 inches larger than the sockets. Due to the possible presence of water-bearing granular materials above the bedrock, the shafts should include casings extending to the top of the rock to prevent the water from entering the shaft and the sloughing of the granular layer. Alternatively, wet method of installation might be considered. Wang understands this should be left to the construction means and methods.

We recommend designing the rock sockets based on the methods outlined in the 2016 AASHTO LRFD *Bridge Design Specifications*, which indicate the sockets should be designed for a geotechnical unit base resistance factor (ϕ_{stat}) 0.50 (AASHTO 2016). As per 2012 IDOT Bridge Manual drilled shafts extending into rock, in most cases, should be designed utilizing only end bearing or side resistance in rock, whichever is larger. For shafts socketed into the bedrock less than 10-foot long, we estimate the end bearing will give more capacity than the side resistance. Therefore, we considered only the end bearing/tip resistance in our capacity calculations.

The rock mass jointing and joint conditions were evaluated based on the geologic conditions in accordance with Hoek and Marinos (2000). The bedrock cores at the Jackson Bridge and Entrance Ramp have GSI values range between 47 to 60 for RQD's of 57% and 98%. Using a lower bound value GSI of 50 for the capacity calculations, we estimate a nominal unit end resistance of 750 ksf and a factored unit end resistance of 375 ksf for the shafts. Based on this criterion, the R_F, R_N, and estimated base elevations for 3.0-, 3.5-, and 4.0- foot diameter sockets are summarized below in Table 4. We estimate the settlement of rock socketed drilled shafts will be less than 0.5 inch.

Alternatively, the dilled shafts can be placed on top of sound bedrock using a nominal unit end resistance of 400 ksf and a factored unit end resistance of 200 ksf for the shafts. The bottom of shafts shall be cleaned and inspected during construction to establish the top of sound bedrock at each shaft location.

Table 4: Estimated Tip Resistances for Rock Socketed Drilled Shafts

Structure Unit	Shaft Cap Base Elevation (feet)	Top of Bedrock Elevation (feet)	Socket Diameter (feet)	Nominal Unit Tip Resistance (ksf)	Nominal Shaft Tip Resistance, R_N (kips)	Factored Tip Resistance Available**, R_F (kips)	Total Socket Length (feet)	Estimated Total Shaft Length*** (feet)
Jackson Boulevard West Abutment (1702-B-02) GSI - 50	570.66	485.0	3.0	750*	5300	2650	3.0	90
			3.5	750*	7216	3608	3.0	90
			4.0	750*	9424	4712	3.0	90
Jackson Boulevard Pier 1 (1702-B-02) GSI - 50	572.65 (Assumed)	485.0	3.0	750	5300	2650	3.0	92
			3.5	750	7216	3608	3.0	92
			4.0	750	9424	4712	3.0	92
Jackson Boulevard Pier 2 (1702-B-02) GSI - 50	572.29 (Assumed)	485.0	3.0	750	5300	2650	3.0	92
			3.5	750	7216	3608	3.0	92
			4.0	750	9424	4712	3.0	92
Jackson Boulevard East Abutment (1702-B-02) GSI - 50	586.30 (Assumed)	485.0	3.0	750*	5300	2650	3.0	106
			3.5	750*	7216	3608	3.0	106
			4.0	750*	9424	4712	3.0	106
Jackson Entrance Ramp Pier R1 (1702-B-02) GSI - 50	572.71 (Assumed)	485.0	3.0	750*	5300	2650	3.0	92
			3.5	750*	7216	3608	3.0	92
			4.0	750*	9424	4712	3.0	92
Jackson Entrance Ramp North Abutment (1702-B-02) GSI - 50	570.55 (Assumed)	485.0	3.0	750*	5300	2650	3.0	90
			3.5	750*	7216	3608	3.0	90
			4.0	750*	9424	4712	3.0	90

* Nominal unit socket base resistance is obtained based on rock conditions from nearby Borings 1702-B-02 and 0589-B-02, using a GSI of 50.

** Unit base resistance factor (ϕ_{stat}) 0.5 was used in accordance with Table 10.5.5.2.4-1, AASHTO 2016.

***The lengths shown in the table include a 1-foot shaft embedment into the abutments and piers and a 3-foot shaft embedment into the rock.

5.2.2 Drilled Shaft Lateral Parameters

Lateral loads on shafts should be analyzed for maximum moments and lateral deflections. Recommended lateral soil modulus and strain parameters required for analysis via the p-y curve method are included in Tables 5 through 8 and rock parameters are included in Table 9. The parameters for the soft silty clay (**Layer 2**) were obtained from vane shear testing conducted near the east abutment in Boring 1702-B-03. Information on the vane shear testing is provided in the boring log.

Table 5: Recommended Soil Parameters for Lateral Load Analysis at West Abutment (Jackson Boulevard) Borings 1702-B-01

Soil Type (Layer)	Moist 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}
593.8 to 590.6 Sand Fill	110	0	28	10	--
590.6 to 583.3 Silty Clay Loam Fill	120	2000	0	500	0.005
583.3 to 574.0 Clay to Silty Clay	110	550	0	100	0.010
574.0 to 564.0 Clay to Silty Clay	110	650	0	100	0.010
564.0 to 554.0 Clay to Silty Clay	115	720	0	100	0.010
554.0 to 542.1 Silty Clay Loam	120	1400	0	500	0.005
542.1 to 527.1 Silty Clay	115	750	0	100	0.010
527.1 to 521.8 Clay	120	2200	0	1000	0.005
521.8 to 517.1 Clay	115	820	0	100	0.010
517.1 to 511.3 Sand	115	0	33	40	--
511.3 to 502.1 Sand	120	0	36	100	--
502.1 to 487.8 Silty Loam	120	0	36	100	--

Table 6: Recommended Soil Parameters for Lateral Load Analysis at Piers 1 and 2 (Jackson Boulevard)
Borings 1702-B-02

Soil Type (Layer)	Moist 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}
577.4 to 571.9 Silty Clay Loam Fill	110	570	0	100	0.010
571.9 to 564.0 Clay to Silty Clay	110	650	0	100	0.010
564.0 to 545.6 Clay to Silty Clay	115	720	0	100	0.010
545.6 to 520.6 Silty Clay	120	2000	0	1000	0.050
520.6 to 515.6 Clay	115	820	0	100	0.010
515.6 to 510.6 Silty Loam	115	0	33	25	--
510.6 to 495.6 Sand to Gravelly Sand	120	0	36	100	--
495.6 to 485.4 Silt	120	0	36	100	--

Table 7: Recommended Soil Parameters for Lateral Load Analysis at East Abutment (Jackson Boulevard) Boring 1702-B-03

Soil Type (Layer)	Moist 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}
593.0 to 585.8 Sandy Loam to Sand	110	0	28	10	--
585.8 to 582.5 Silty Clay to Silty Clay Loam	120	1300	0	500	0.010
582.5 to 574.0 Clay to Silty Clay	115	544	0	100	0.010
574.0 to 564.0 Clay to Silty Clay	120	650	0	100	0.010
564.0 to 554.0 Clay to Silty Clay	115	712	0	100	0.010
554.0 to 545.0 Clay to Silty Clay	120	1450	0	500	0.005
545.0 to 540.3 Clay to Silty Clay	110	410	0	30	0.020
540.3 to 521.3 Silty Clay to Silty Clay Loam	120	3600	0	1000	0.005
521.3 to 516.3 Stiff Clay to Silty Clay	115	980	0	100	0.010
516.3 to 511.0 Dense Sand	120	0	36	40	--
511.0 to 484.5 Sand to Gravelly Sand and Silty Loam	120	0	36	100	--

Table 8: Recommended Soil Parameters for Lateral Load Analysis at Pier R1 (Jackson Entrance Ramp)
Boring 25-RWB-01

Soil Type (Layer)	Moist 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}
574.7* to 572.7 Gravel	120	0	32	20	--
572.7 to 563.0 Clay to Silty Clay	110	610	0	100	0.010
563.0 to 550.5 Clay to Silty Clay	110	490	0	30	0.020
550.5 to 539.2 Clay to Silty Clay	110	570	0	100	0.010
539.2 to 524.2 Clay to Silty Clay	120	3500	0	1000	0.005
524.2 to 514.2 Silty Clay to Silty Clay Loam	120	1450	0	500	0.007
514.2 to 504.2 Sand	125	0	36	55	--
504.2 to 494.2 Gravelly Sand	125	0	38	60	--
494.2 to 485.0** Silt to Silty Loam	125	0	36	55	--

*Top of ground elevation;
**Estimated top of bedrock elevation

Table 9: Recommended Soil Parameters for Lateral Load Analysis at North Abutment (Jackson Entrance Ramp) Boring 26-RWB-01 and 25-RWB-01

Soil Type (Layer)	Moist 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}
574.55* to 569.9 Gravel	120	0	32	20	--
569.9 to 564.9 Clay to Silty Clay	110	730	0	100	0.010
564.9 to 562.4 Silty Clay Loam	115	1720	0	500	0.005
562.4 to 554.9 Clay to Silty Clay	110	660	0	100	0.010
554.9 to 543.6 Clay to Silty Clay	110	410	0	30	0.020
543.6 to 538.6 Clay to Silty Clay	115	750	0	100	0.010
538.6 to 528.6 Silty Clay to Silty Clay Loam	120	2500	0	1000	0.005
528.6 to 523.6 Silty Clay Loam	125	5000	0	2000	0.004
523.6 to 518.6 Clay to Silty Clay	115	900	0	100	0.010
518.6 to 513.4 Silty Loam to Sand	115	0	30	20	--
513.4 to 504.2 Sand	125	0	36	55	--
504.2 to 494.2 Gravelly Sand	125	0	38	60	--
494.2 to 485.0** Silt to Silty Loam	125	0	36	55	--

*Top of ground elevation;

**Estimated top of bedrock elevation

Table 10: Recommended Rock Parameters for Lateral Load Analysis (Jackson Boulevard and Entrance Ramp) Boring 1702-B-02

Rock Type	Total Unit Weight, γ (pcf)	Young's Modulus (ksi)	Uniaxial Compressive Strength (ksi)	RQD (%)	Lateral Rock Modulus Parameter
Fair Quality DOLOSTONE	135	2,500	10.3	57	0.0005

5.3 Jackson Entrance Ramp MSE Wall

The proposed MSE walls 25 and 26 will extend north of the north abutment and have a maximum total wall height of 15.6 feet and retained height of 12.1 feet. The walls will start at the north abutment of the exit ramp and transition down to I-90/94.

5.3.1 Bearing Resistance and Sliding

The top of leveling pad elevation for the MSE wall should be established at a minimum depth of 3.5 feet below the finished grade at the front face of the wall which corresponds to about 575 feet elevation for wall 25 and 572 feet for wall 26. Based on the nearby borings, the wall will likely be founded on medium to stiff clay or on crushed stone fill.

We estimate the foundation soils will have a maximum factored bearing resistance of 2,000 psf, based on a resistance factor (ϕ_b) of 0.65 (AASHTO 2016). Considering the regular fill with a unit weight of 125 pcf for the MSE wall, we estimate an equivalent factored bearing pressure of 3,100 psf for a maximum total wall height of 15.6 feet. The applied factored bearing pressure exceeds the foundation soil maximum factored bearing resistance. Therefore, to reduce the applied wall bearing pressure, we recommend the use of Class III LCCF (unit weight of 42 pcf) for the proposed MSE wall. Considering the recommended Class III LCCF for the MSE wall with 0.7H, we estimate the wall will apply an equivalent factored bearing pressure of 1,350 psf, satisfying the maximum bearing resistance limit.

The estimated friction angle between the base of the MSE wall and the existing gravel subgrade is estimated at 30˚, and the corresponding friction coefficient is 0.58. MSE retaining walls are designed based on an AASHTO sliding resistance factor (ϕ_τ) of 1.0 for soil-on-soil contact (AASTHO 2016). Design lateral pressure from surcharge loads due to roadway traffic and construction equipment should be added to the lateral earth pressure load.

5.3.2 Settlement

Based on Borings 25-RWB-01 and 26-RWB-02, the soil conditions within the zone of influence for settlement beneath the MSE walls consist of gravel overlying medium stiff clay. Our analyses using IDOT settlement spreadsheet with actual soil properties and a maximum retained height of 12.1 feet, show that using regular backfill for the MSE walls will create over 2 inches of long-term settlement; therefore, it is not suitable. However, using Class III LCCF (unit weight 42 pcf) as backfill material gave a long-term settlement of 1 inch or less.

5.3.3 Slope Stability

The global stability of the MSE Wall is considered not an issue due to low dead loads and no eccentricity.

In conclusion, we recommend using Class III LCCF (unit weight of 42 pcf) for the full width of the ramp comprising Walls 25 and 26 from Station 8341+94.33 to 8342+74.29. For the Wall 26 portion extending beyond the back of the wall from Station 8342+74.29 to 8343+20.18, we recommend that the normal weight portion of the overall embankment behind the wall system should be laid back so it does not exert any earth pressure on the LCCF backfill that is to be placed behind the LCCF MSE mass.

5.4 Stage Construction Design Recommendations

The entrance bridge will be closed to traffic and detoured during construction. The removal of the existing abutments will require temporary shoring of the surrounding embankment soils. Both abutments should be supported by a *Temporary Soil Retention System* designed by the Contractor and approved by IDOT prior to construction. The Temporary Soil Retention System design should take into account the impact on nearby structures, utilities, and roadways.

5.5 Ground Movement Evaluations

There is an existing building at 728 W. Jackson Boulevard (Haberdasher Square Lofts) that has an entrance at the same level as the proposed east abutment. The building corner is about 4 feet away from the east abutment. The building is supported on deep foundations.

The wall's potential impact on the building 4 feet away was determined considering IDOT wall deflection criteria issued on November 14, 2016. It states that the project design criteria or limitations are set for a maximum allowable wall deflection of up to 1.0% of the exposed wall height (which is

maximum 1.8 inches for the east abutment), if the wall is not supporting sensitive structures or facilities. For walls supporting sensitive structures, the maximum allowable wall deflection should be limited to 0.5% of the exposed wall height (which is maximum 0.9 inches), or less as required, to prevent detrimental effects on adjacent structures or facilities. The latter criteria of 0.5% was selected by the structural engineer as shown on the TSL. The acceptable surface movement by CDOT is maximum 0.25 inches.

Using empirical data compiled in various research papers, Wang estimates the ground movement adjacent to the building induced by the maximum lateral wall deflection of 0.9 inches is about 0.60 to 0.75 inches which exceeds the ground movement criteria. The building is supported on deep foundations. The potential impact of the wall deflection inducing ground movements on other existing structures such as the existing Jackson Boulevard pavement and any buried utilities must be considered in final design to ensure specific deformation limits are not exceeded, leading to settlement and structural displacements.

For the West abutment deflection, Wang estimates the ground movement adjacent to the southwest parking structure (the closest structure) about 40 feet away induced by the maximum lateral wall deflection of 0.9 inches is about 0.10 inches which satisfies the ground movement criteria.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Site Preparation

All vegetation, existing pavement, and debris should be cleared and stripped where foundations and structural fills will be placed. The exposed subgrade should be proofrolled. To aid in locating unstable and unsuitable materials, the proofrolling should be observed by a qualified engineer. Any unstable or unsuitable materials should be removed and replaced with compacted structural fill as described in Section 6.3.

6.2 Excavation

Foundation 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. The construction of temporary support at the abutments may impact the nearby building, utility, and roadway. The temporary support should be designed and contracted to prevent excessive movement and to maintain stability of nearby building, utility, and roadway.

6.3 Filling and Backfilling

Fill material required to attain the final design elevations should be structural fill material and should be pre-approved prior to placement. Compacted cohesive or granular soil conforming to IDOT Section 204 would be acceptable as structural fill (IDOT 2016). The fill material should be free of organic matter and debris. Structural fill should be placed in lifts and compacted according to IDOT Section 205, *Embankment* (IDOT 2016).

Backfill materials must be pre-approved by the Resident Engineer. To backfill the abutments, we recommend porous granular material conforming to the requirements specified in Section 586 of the 2017 IDOT Supplemental Specifications and Recurring Special Provisions, *Granular Backfill for Structures*.

6.4 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.

6.5 Drilled Shafts

The installation of drilled shafts through the water-bearing sand and gravelly sand frequently occurring above the hard silty clay and/or immediately atop of bedrock may present challenges. We expect the shaft excavations will encounter groundwater in granular layer shown in borings. Casing will be necessary and/or drilling fluid at each shaft location. For shafts socketed into the underlying bedrock, casing extending to the top of bedrock elevation will be required to seal the excavation for coring. Failure to anticipate the challenges posed by the groundwater at this depth will result in caving or heaving sand and complicate bedrock coring operations. Prior to coring the bedrock, casing should be firmly seated into the top of the rock, and any drilling fluid removed to prevent caking of mud on the sides of the bedrock sockets. The shafts should be designed 6 inches larger in

diameter than the proposed sockets.

In the event that permanent casing is not designed for the construction of drilled shaft socketed into bedrock, shafts structural integrity should be verified by Crosshole Sonic Logging (CSL). IDOT special provision "Crosshole Sonic Logging" dated March 9, 2010 or latest edition should be included in the specifications for inspection and testing of drilled shaft socketed into bedrock. Wang recommends providing CSL structural integrity testing for at least one drilled shaft per substructure.

The soft soil layer with Qu less than 0.5 tsf (500 ksf cohesion) is prone to squeeze if left open for long period of time. Therefore, to minimize the squeeze potential, casing should also be provided. Due to high squeeze potential, the following note should be provided on the final plans.

"Based on the squeeze potential of the clay soils, the use of temporary casing will be required to Elevation 540.00 in order to properly construct the drilled shafts. Casing may be pulled or left in place, as determined by the Contractor at no cost to the Department."

6.6 Abandoned Tunnel, Utilities, and Existing Foundations

An abandoned, 8-foot diameter, concrete freight tunnel runs east-west the full length of the proposed bridge replacement offset a few feet south of the centerline. This tunnel has a top elevation of about 517 feet and an invert elevation of about 509 feet.

It is understood that the tunnel has been previously filled by others with Controlled Low-Strength Material (CLSM). The tunnel should be cored to allow for the shafts. The concrete in the tunnel will likely be stronger than the CLSM and difficult drilling should be expected. The shafts should be extended to the foundation base elevation by conventional means after coring the tunnel. The City of Chicago Department of Transportation should be notified about any abandoned tunnel bulkheads and filling. A separate plan set and utility abandonment program approval may be required to obtain permission to perform the work and an additional set of specifications conforming to the City of Chicago standard for abandoning tunnels may be required.

Depending on the layout, the drilled shafts may or may not be able to avoid going through existing tunnel. In the case of a drilled shaft traversing the freight tunnel, permanent casing is recommended through the full tunnel depth to avoid any voids that may be present in the filled tunnel.

There is a 30-inch diameter main drain is planned to remain. This main drain runs in the north south direction along I-90/94 and crosses Jackson Bridge at Pier 2 and under part of the Entrance Ramp. There are also existing abandoned gas lines, combined sewers, fiber optic lines, some of which will be relocated. Caution must be taken during construction to ensure the utilities do not create conflicts.

Wang understands existing foundations at the east and west abutments are on vertical and battered timber piles; therefore, we expect several new drilled shafts will be installed by coring through existing cap and piles.

7.0 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 bridge are planned, we should be timely informed so that our recommendations can be adjusted accordingly.

It has been a pleasure to assist AECOM, 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,

Exp. 11/30/2017

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062-052583
LICENSED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

WANG ENGINEERING, INC.

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Senior Geotechnical Engineer

Corina T. Farez, P.E., P.G.
Principal

Jerry W.H. Wang, Ph.D., P.E.
QA/QC Reviewer

REFERENCES

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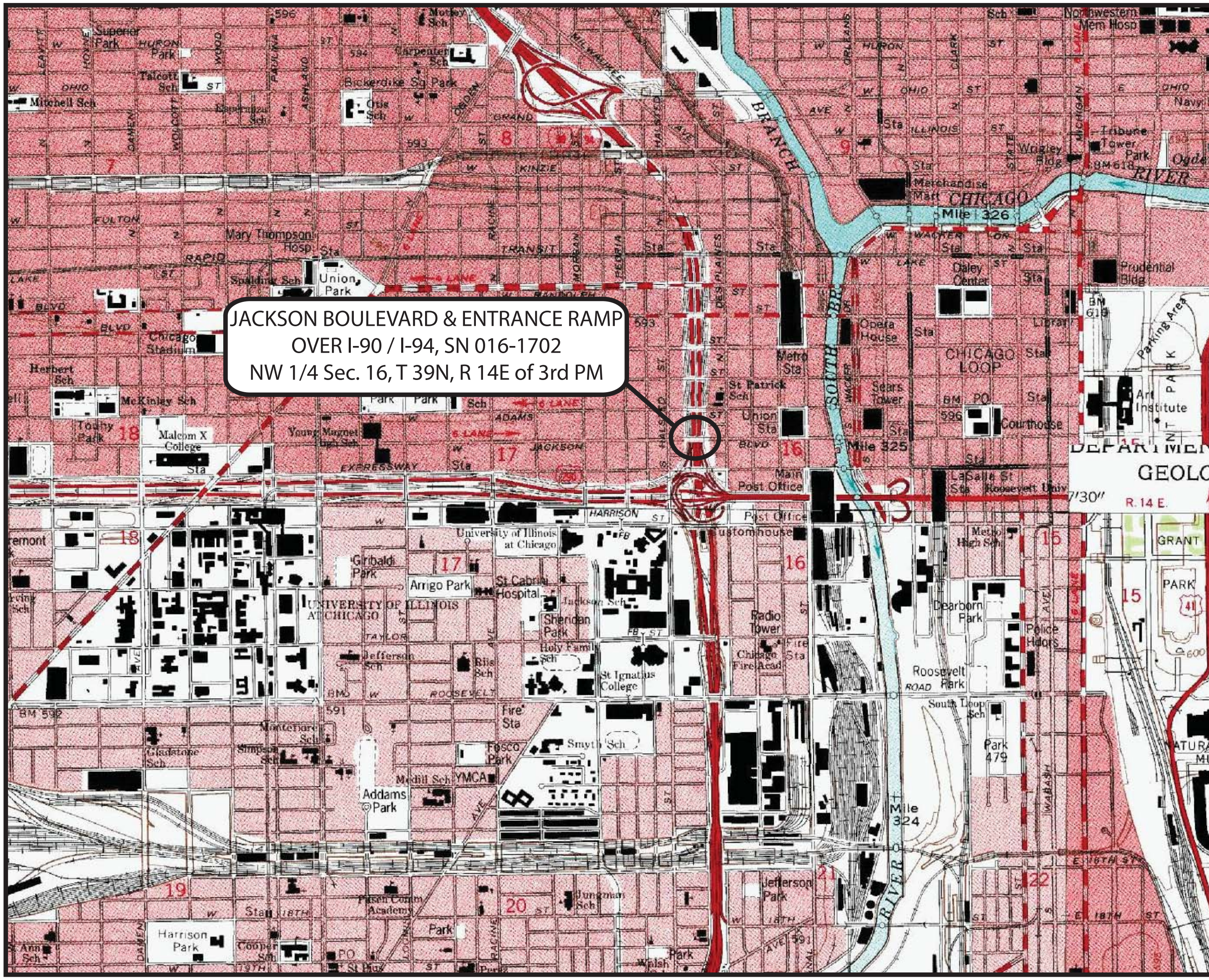
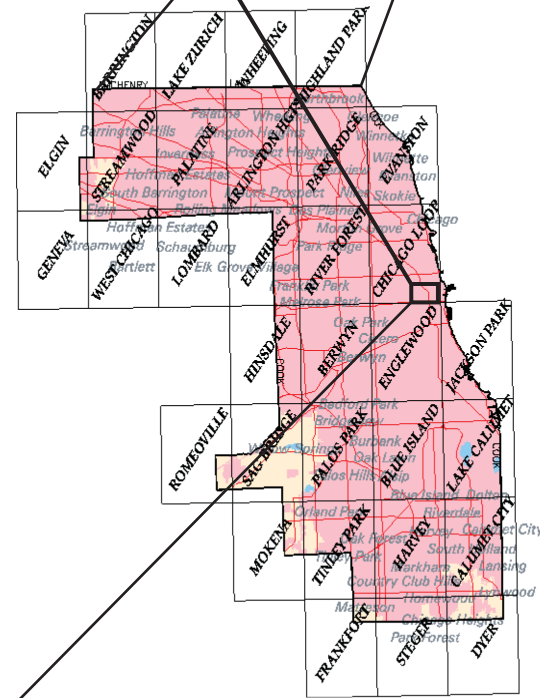
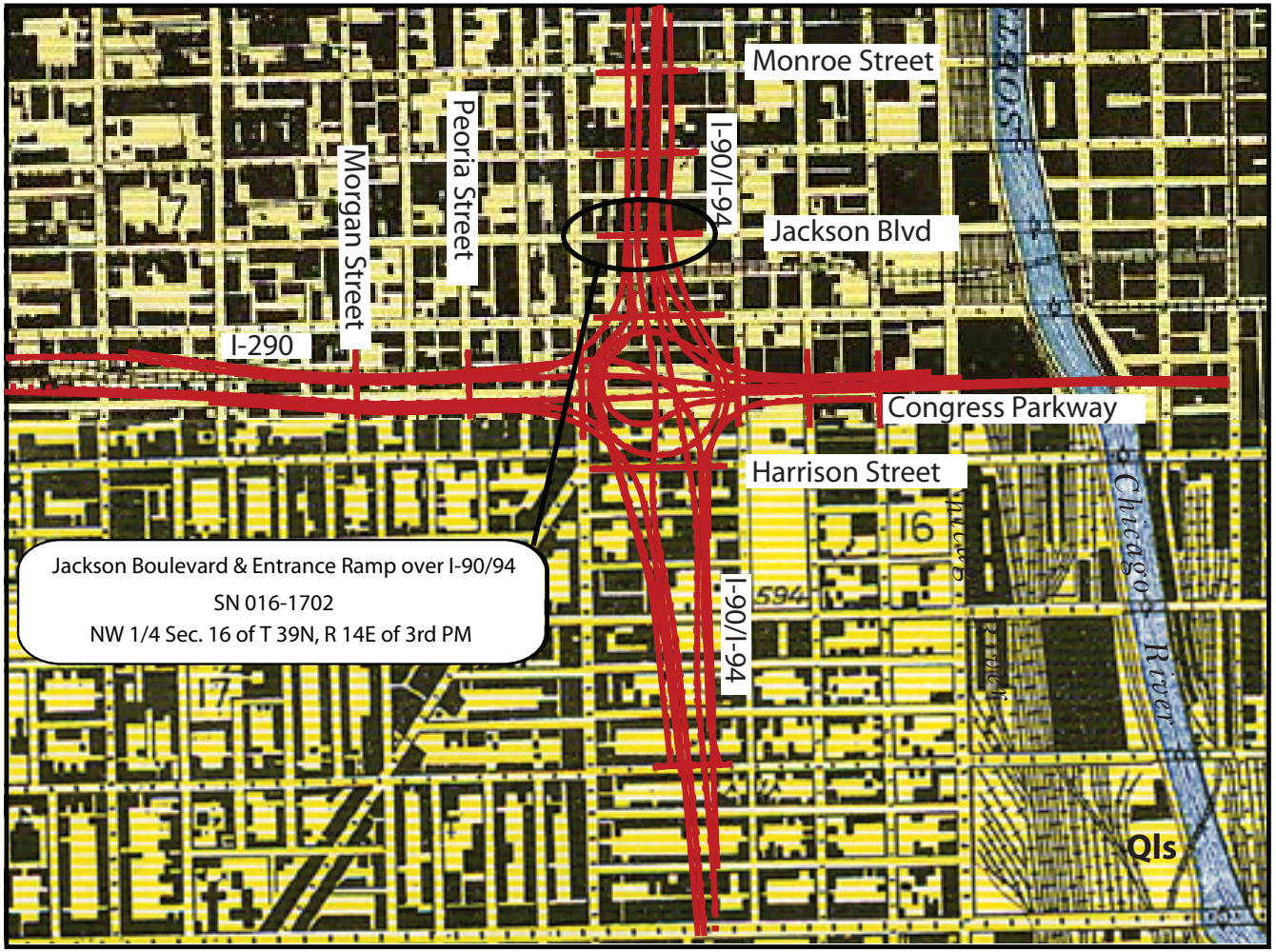
EXHIBITS



0 0.25 0.5 0.75 1.0 Mile



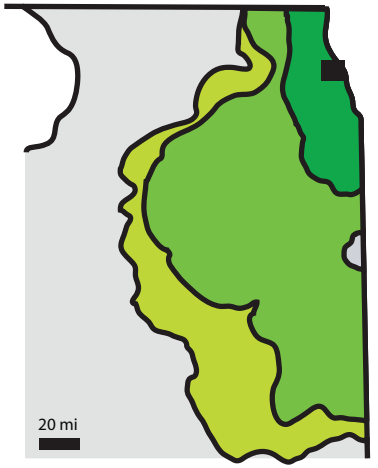
SITE LOCATION MAP: CIRCLE INTERCHANGE RECONSTRUCTION JACKSON BOULEVARD & ENTRANCE RAMP OVER I-90/94, SN 016-1702, COOK COUNTY		
SCALE: GRAPHICAL	EXHIBIT 1	DRAWN BY: H. Bista CHECKED BY: A. Hamad
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR AECOM		1100-04-01



Modified after Bretz (1926)

N

REGIONAL GEOLOGY



Wedron Group

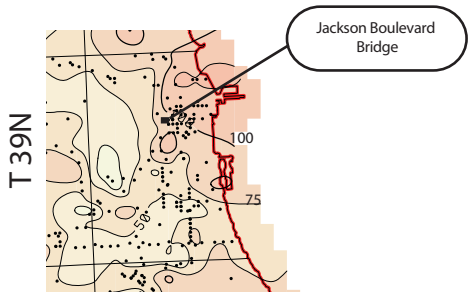
- Wadsworth Formation
- Lemont Formation
- Tiskilwa Formation

Modified after Hansel and Johnson (1996)

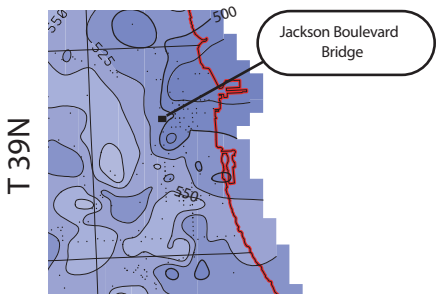
Legend

Qls — Glacial lake bottom
(Covered by lacustrine deposits)

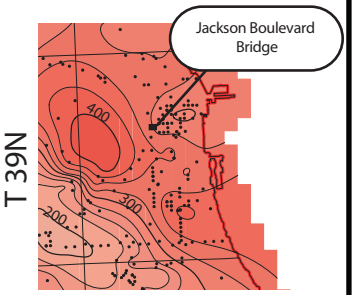
DRIFT THICKNESS



BEDROCK TOPOGRAPHY



BEDROCK THICKNESS



Modified after Leetaru et. al. (2004)

0 2 4 8 miles

SITE AND REGIONAL GEOLOGY: CIRCLE INTERCHANGE RECONSTRUCTION, JACKSON BOULEVARD & ENTRANCE RAMP OVER I-90/94, SN 016-1702, CHICAGO, IL		
SCALE: GRAPHIC AL	EXHIBIT 2	DRAWN BY: C. Marin CHECKED BY : L. Iordache
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR AECOM		1100-04-01

Bench Mark: Cut "X" on southwest balcony of Jackson Blvd. Bridge. Elev. 597.26.

Existing Structure: SN 016-0588. Constructed in 1955 under F.A.I. Route 173, Section 0101.2-2B. Repairs were made to the bridge in 2002 under Section 0101-2-1B-R-1. Three span bridge that measures 199'-9" from back to back of abutments. Out-to-out width varies from 67'-11¾" to 72'-1". The spans are supported by 36" wide flange beams. Substructure is reinforced concrete closed abutments and multi-column piers founded on timber piles. The foundation of the west pier is founded on caissons. The existing bridge is to be removed and replaced.

The bridge will be closed to traffic and detoured during construction.

No Salvage.

LOADING HL-93

Allow 50#/sq. ft. for future wearing surface.

DESIGN SPECIFICATIONS

2014 AASHTO LRFD Bridge Design Specifications 7th Edition with 2015 and 2016 Interim Specifications

HIGHWAY CLASSIFICATION

F.A.U. Rte. 1422 (Jackson Boulevard)
Functional Class: Collector (Urban)
ADT: 9,800 (2012); 13,000 (2040)
ADTT: 0 (2012); 0 (2040)
DHV: 1300 (One-Way)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic
Directional Distribution: NA

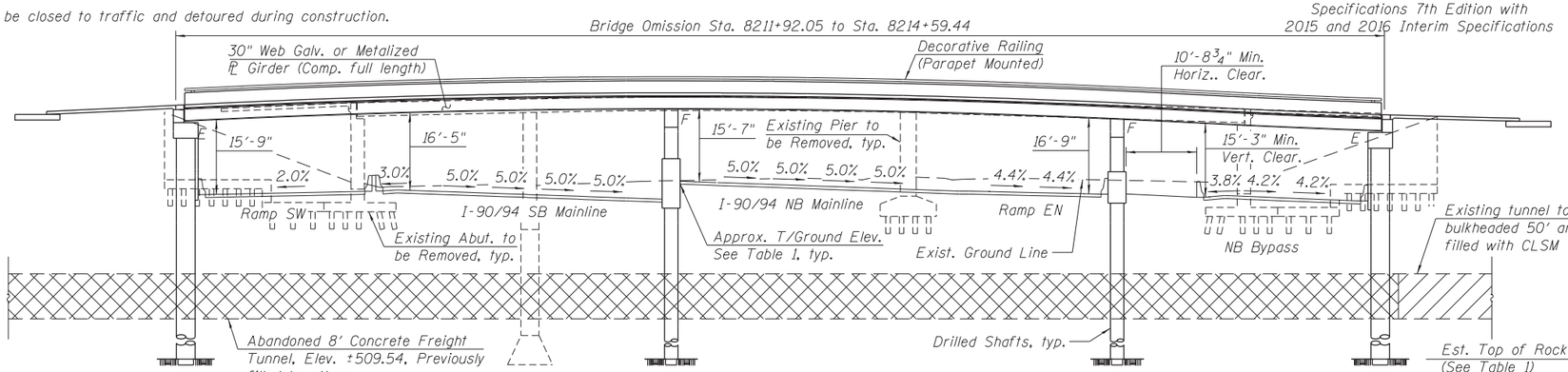
F.A.I. Rte. 90/94 SB
Functional Class: Interstate
ADT: 100,100 (2012); 98,000 (2040)
ADTT: 11,351 (2012); 11,113 (2040)
DHV: 6,340 (2040)
Design Speed: 60 m.p.h.
Posted Speed: 45 m.p.h.
One-Way Traffic
Directional Distribution: NA

Ramp EN
Functional Class: Interstate
ADT: 26,600 (2012); 31,000 (2040)
ADTT: 1,032 (2012); 1,203 (2040)
DHV: 1,910 (2040)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic
Directional Distribution: NA

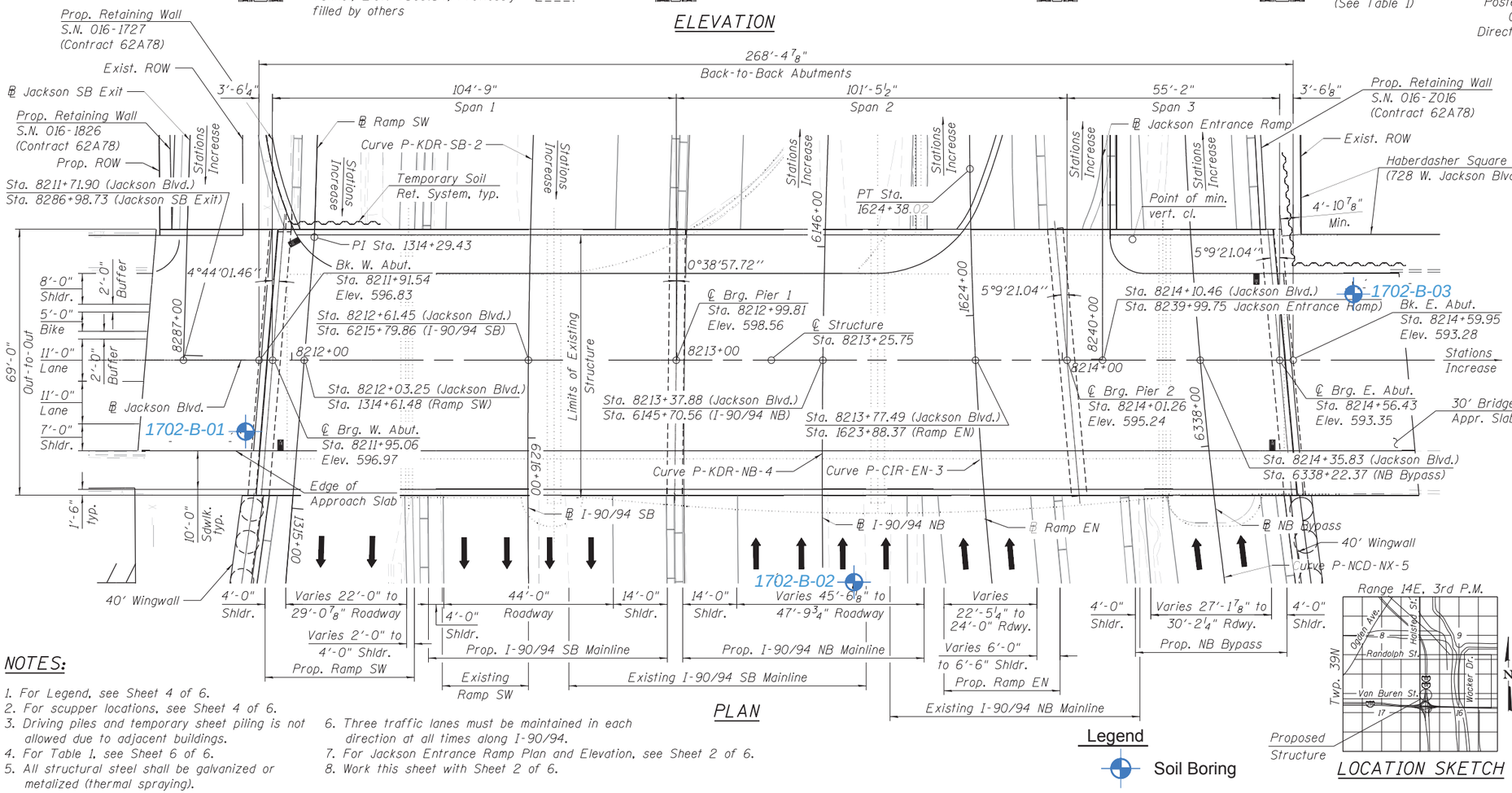
Ramp SW
Functional Class: Interstate
ADT: 24,500 (2012); 23,000 (2040)
ADTT: 907 (2012); 851 (2040)
DHV: 1,720 (2040)
Design Speed: 35 m.p.h.
Posted Speed: 35 m.p.h.
One-Way Traffic
Directional Distribution: NA

F.A.I. Rte. 90/94 NB
Functional Class: Interstate
ADT: 96,700 (2012); 81,000 (2040)
ADTT: 11,217 (2012); 9,396 (2040)
DHV: 4,780 (2040)
Design Speed: 60 m.p.h.
Posted Speed: 45 m.p.h.
One-Way Traffic
Directional Distribution: NA

NB Bypass
Functional Class: Interstate
ADT: NA (2012); 17,000 (2040)
ADTT: NA (2012); 440 (2040)
DHV: 1,680 (2040)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic
Directional Distribution: NA



ELEVATION



PLAN

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
f'c = 4,000 psi (Superstructure Concrete)
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

SEISMIC DATA

Seismic Performance Zone (SPZ) = 1
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 0.085g
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 0.144g
Soil Site Class = D

EAST ABUTMENT DEFLECTION CRITERIA:

Maximum total lateral east abutment deflection at top of wall: 0.9 inches.

NOTES:

1. For Legend, see Sheet 4 of 6.
2. For scupper locations, see Sheet 4 of 6.
3. Driving piles and temporary sheet piling is not allowed due to adjacent buildings.
4. For Table 1, see Sheet 6 of 6.
5. All structural steel shall be galvanized or metalized (thermal spraying).
6. Three traffic lanes must be maintained in each direction at all times along I-90/94.
7. For Jackson Entrance Ramp Plan and Elevation, see Sheet 2 of 6.
8. Work this sheet with Sheet 2 of 6.

Legend
Soil Boring

Proposed Structure

LOCATION SKETCH

GENERAL PLAN & ELEVATION
JACKSON BOULEVARD OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8213+25.75
STRUCTURE NO. 016-1702

BORING LOCATION PLAN: CIRCLE INTERCHANGE RECONSTRUCTION, JACKSON BOULEVARD OVER I-90/94, SN 016-1702, COOK COUNTY, ILLINOIS

SCALE: GRAPHICAL | EXHIBIT 3-1 | DRAWN BY: H. Bista | CHECKED BY: M. Seyhun

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

FOR AECOM | 1100-04-01

TranSystems

USER NAME = wjcolletti	DESIGNED - WJC	REVISED	
	CHECKED - DL/TLR	REVISED	
PLOT SCALE = 32:0.0000 ':' / in.	DRAWN - WJC	REVISED	
PLOT DATE = 12/30/2016	CHECKED - DL/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 1 OF 6 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	6	1
		CONTRACT NO. 62A78		
		ILLINOIS FED. AID PROJECT		

2:23:13 PM
016-1702-CIRCLE100-SHT-ACM-ST-TSL-001

Bench Mark: Cut "X" on southwest balcony of Jackson Blvd. Bridge. Elev. 597.26.

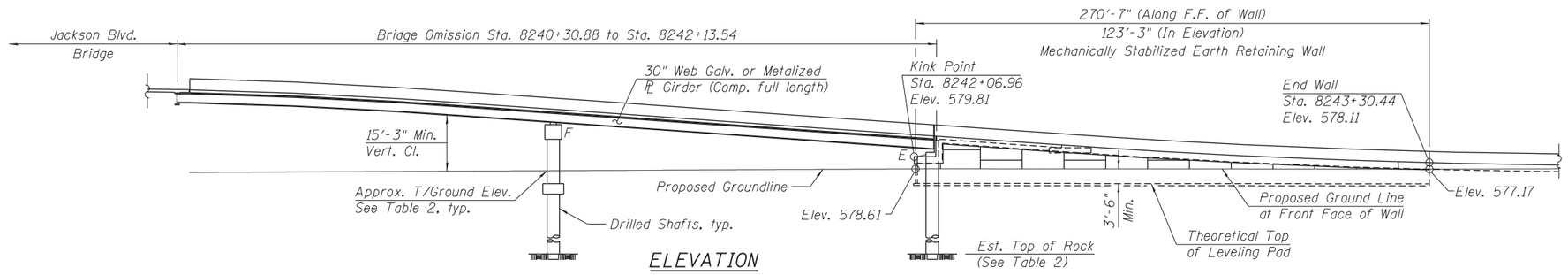
Existing Structure: SN 016-0588. Existing Jackson Entrance Ramp is offset 90° from the centerline of Jackson Boulevard. Constructed in 1955 under F.A.I. Route 173, Section 0101.2-2B. Repairs were made to the bridge in 2002 under Section 0101-2-1B-R-1. Three span bridge that measures 169'-10" from back of north abutment to the centerline of the north fascia beam on Jackson Boulevard. Out-to-out width is 22'-6". The spans are supported by 24" wide flange beams. Substructure is reinforced concrete closed north abutment and single hammerhead pier founded on caissons. A concrete cantilever retaining wall extends north of the north abutment for 215'-0". The existing bridge is to be removed and replaced.

The bridge will be closed to traffic and detoured during construction.

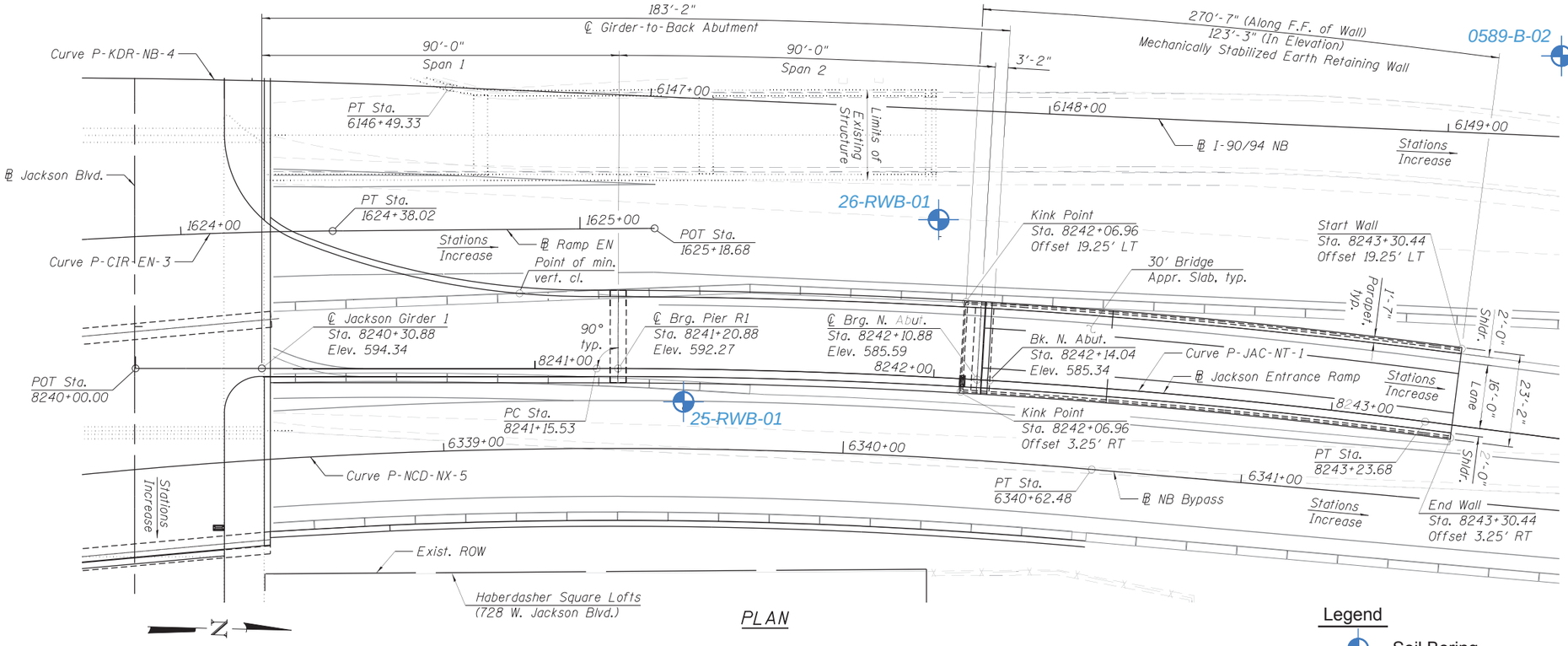
No Salvage.

NOTES:

1. Work this sheet with Sheet 1 of 6.
2. For Offset Sketch and Cross Sections, see Sheet 3 of 6.
3. For Legend, see Sheet 4 of 6.
4. For scupper locations, see Sheet 5 of 6.
5. For Table 2, see Sheet 6 of 6.



ELEVATION



PLAN

Legend

Soil Boring

CURVE DATA
(℄ Jackson Entrance Ramp)

P-JAC-NT-1
P.I. Sta. = 8242+19.75
Δ = 7°18'60" (RT)
D = 3°30'54"
R = 1,630.00'
T = 104.22'
L = 208.15'
E = 3.33'
e = 3.20%
T.R. = 52'
S.E. Run = 83'
P.C. Sta. = 8241+15.53
P.T. Sta. = 8243+23.68

CURVE DATA
(℄ I-90/94 SB)

P-KDR-SB-2
P.I. Sta. = 6217+28.62
Δ = 10°40'60" (LT)
D = 2°17'50"
R = 2,494.00'
T = 233.19'
L = 465.03'
E = 10.88'
e = 5.00%
T.R. = 107'
S.E. Run = 268'
P.C. Sta. = 6214+95.43
P.T. Sta. = 6219+60.46

CURVE DATA
(℄ I-90/94 NB)

P-KDR-NB-4
P.I. Sta. = 6143+87.92
Δ = 12°26'15" (RT)
D = 2°22'10"
R = 2,418.00'
T = 263.48'
L = 524.89'
E = 14.31'
e = 5.00%
T.R. = 80'
S.E. Run = 268'
P.C. Sta. = 6141+24.44
P.T. Sta. = 6146+49.33

CURVE DATA
(℄ Ramp EN)

P-CIR-EN-3
P.I. Sta. = 1621+43.96
Δ = 28°56'55" (RT)
D = 4°48'53"
R = 1,190.00'
T = 307.19'
L = 601.25'
E = 39.01'
e = 4.40%
T.R. = NA
S.E. Run = 50'
P.C. Sta. = 1618+36.77
P.T. Sta. = 1624+38.02

CURVE DATA
(℄ NB Bypass)

P-NCD-NX-5
P.I. Sta. = 6336+57.47
Δ = 35°13'41" (RT)
D = 4°12'24"
R = 1,362.00'
T = 432.42'
L = 837.42'
E = 67.00'
e = 4.20%
T.R. = 41'
S.E. Run = 87'
P.C. Sta. = 6332+25.05
P.T. Sta. = 6340+62.48

GENERAL PLAN & ELEVATION
JACKSON ENTRANCE RAMP OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8241+20.88
STRUCTURE NO. 016-1702

BORING LOCATION PLAN: CIRCLE INTERCHANGE RECONSTRUCTION, JACKSON ENTRANCE RAMP OVER I-90/94, SN 016-1702, COOK COUNTY, ILLINOIS

SCALE: GRAPHICAL | EXHIBIT 3-2 | DRAWN BY: H. Bista | CHECKED BY: M. Seyhun

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FOR AECOM | 1100-04-01

TranSystems

USER NAME = wjcolletti	DESIGNED - WJC	REVISED	
	CHECKED - DL/TLR	REVISED	
PLOT SCALE = 32.0000 '' / in.	DRAWN - WJC	REVISED	
PLOT DATE = 12/30/2016	CHECKED - DL/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 2 OF 6 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	6	2
		CONTRACT NO. 62A78		
	ILLINOIS FED. AID PROJECT			

215-11 PM
016-1702-CIRCLE100-SHT-ACM-ST-TSL-002

W

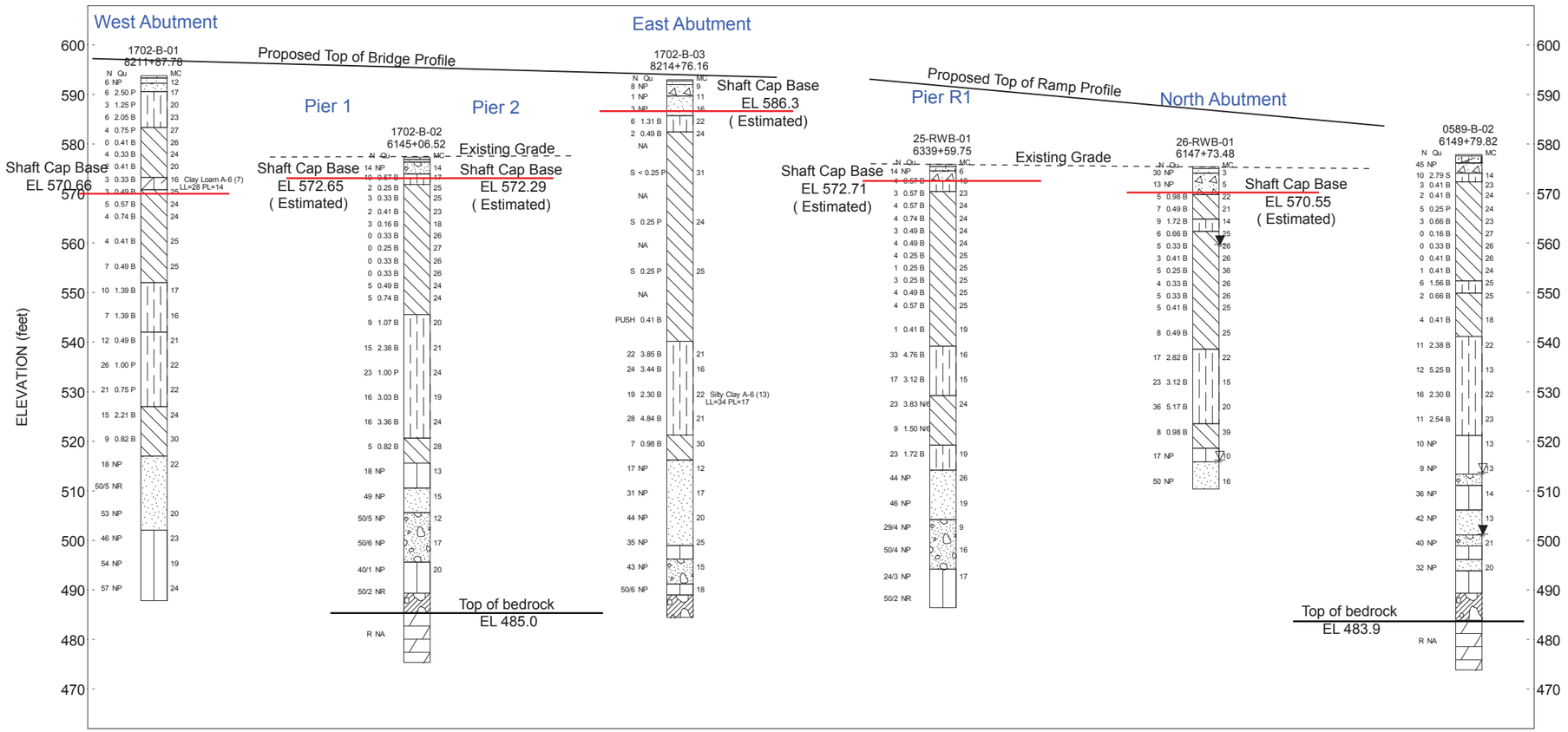
E

S

N

JACKSON BOULEVARD

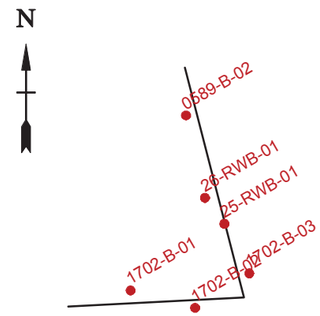
JACKSON ENTRANCE RAMP



DISTANCE ALONG PROFILE (feet)

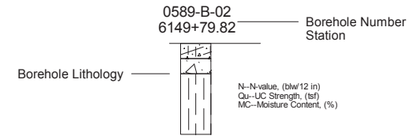
Lithology Graphics

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



Site Map Scale 1 inch equals 365 feet

Explanation:



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

0 100

Horizontal Scale (feet)

Vertical Exaggeration: 4x

Wang Engineering
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Lombard, IL 60148

Soil Profile
Jackson Boulevard & Entrance Ramp

WEI SINCE 1982

Circle Interchange Reconstruction
Section 17, T39N, R14E of 3rd PM

JOB NUMBER	PLATE NUMBER
1100-04-01	EXHIBIT 4

WEI 11X17 1100401.GPJ WANGENG.GDT 12/15/16

APPENDIX A

Wang Engineering
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BORING LOG 0589-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.91 ft
North: 1899272.85 ft
East: 1171495.74 ft
Station: 6149+79.82
Offset: 21.5012 LT

Depth (ft)	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	576.3	4-inch thick ASPHALT --PAVEMENT-- 16-inch thick CONCRETE --PAVEMENT--					
	576.2	Dense, white and gray CRUSHED STONE --BASE COURSE--		1	16 21 24	NP	
	574.2	Very stiff, gray SILTY CLAY LOAM to SILTY LOAM, trace gravel		2	3 5 5 5	2.79 S	14
5	572.4	Very soft to soft, gray CLAY to SILTY CLAY, trace gravel		3	2 1 2 3	0.41 B	23
				4	1 1 1 2	0.41 B	24
10				5	1 2 3	0.25 P	24
				6	0 1 2	0.66 B	23
15				7	0 0 0	0.16 B	27
				8	0 0 0	0.33 B	26
20				9	0 0 0	0.41 B	26
				10	0 0 1	0.41 B	24
25	552.4	Stiff, gray SILTY CLAY LOAM, trace gravel		11	2 3 3	1.56 B	25
	549.9	Soft to medium stiff, gray CLAY to SILTY CLAY LOAM, trace gravel		12	0 0 2	0.66 B	25
30				13	0 1 3	0.41 B	18
	541.2	Very stiff to hard, gray SILTY CLAY LOAM, trace gravel					
		--seams of medium SAND--		14	5 5 6	2.38 B	22
40							

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **A&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **64.50 ft**
At Completion of Drilling: **Rotary wash mud**
Time After Drilling: **24 hours**
Depth to Water: **77.00 ft**

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

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BORING LOG 0589-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.91 ft
North: 1899272.85 ft
East: 1171495.74 ft
Station: 6149+79.82
Offset: 21.5012 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		15	4 5 7	5.25 B	13
			50		16	5 7 9	2.30 B	22
			55		17	3 5 6	2.54 B	23
	521.2	Medium dense, gray SILTY LOAM, trace gravel	60		18	3 5 5	NP	13
	513.4	Loose, brown SANDY GRAVEL	65		19	4 4 5	NP	13
	511.2	Dense, gray SILTY LOAM, trace gravel	70		20	12 14 22	NP	14
	506.2	Dense, gray SANDY LOAM, little gravel	75		21	17 21 21	NP	13
	501.2	Brown and gray, SANDY GRAVEL						
	498.9	Dense, gray SILTY LOAM, trace gravel	80		22	13 19 21	NP	21

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **A&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **64.50 ft**
At Completion of Drilling: **Rotary wash mud**
Time After Drilling: **24 hours**
Depth to Water: **77.00 ft**

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

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BORING LOG 0589-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.91 ft
North: 1899272.85 ft
East: 1171495.74 ft
Station: 6149+79.82
Offset: 21.5012 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	496.2							
		Brown and gray, medium and coarse SAND, little gravel						
	493.9							
		Dense, gray SILTY LOAM, trace gravel	85		23	11 13 19	NP	20
	489.4							
		--DIFFICULT DRILLING at 88.5 ft-- --WEATHERED BEDROCK--	90					
	483.9							
		Strong, light gray, excellent rock mass quality, bedded fresh DOLOSTONE, 1 to 3 feet beds, 1.4 feet joints spacing, horizontal joints with none to less than 0.2-inch infilling, hard joint wall, with stylolitic surfaces, and moderately vuggy porosity --Run 1 - RECOVERY=100%-- --RQD=98%--	95		1	CORE		
			100					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	473.9							
		Boring terminated at 104.00 ft	105					
			110					
			115					
			120					

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **A&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: ▽ **64.50 ft**
At Completion of Drilling: ▼ **Rotary wash mud**
Time After Drilling: **24 hours**
Depth to Water: ▼ **77.00 ft**

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

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BORING LOG 1702-B-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.83 ft
North: 1898849.46 ft
East: 1171361.60 ft
Station: 8211+87.78
Offset: 18.3545 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	593.3	6-inch thick, ASPHALT --PAVEMENT--						
	592.3	12-inch thick, CONCRETE --PAVEMENT--						
		Loose, brown and gray, fine and medium SAND, trace gravel --FILL--			1	3 3 3	NP	12
	590.6	Stiff to very stiff, brown and gray SILTY CLAY LOAM, trace gravel and sand layers --FILL--	5		2	3 3 3	2.50 P	17
					3	2 1 2	1.25 P	20
			10		4	2 2 4	2.05 B	23
	583.3	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			5	3 2 2	0.75 P	27
			15		6	0 0 0	0.41 B	26
					7	0 2 2	0.33 B	24
			20		8	0 0 2	0.41 B	20

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	573.3	Soft, gray CLAY LOAM, trace gravel --L_L(%)=28, P_L(%)=14-- --%Gravel=5.4-- --%Sand=23.0-- --%Silt=46.7-- --%Clay=24.8-- --A-6 (7)--			9	1 1 2	0.33 B	16
	570.8	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel	25		10	1 1 2	0.49 B	25
					11	0 3 2	0.57 B	24
			30		12	0 2 2	0.74 B	24
			35		13	1 2 2	0.41 B	25
			40		14	2 3 4	0.49 B	25

GENERAL NOTES

Begin Drilling: **06-17-2014** Complete Drilling: **06-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **N&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **3.25"HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

0 3 6 9 12 inches

Boring 0589-B-02:
Run #1, 94' to 104', RECOVERY = 100%, RQD = 98%

BEDROCK CORE: CIRCLE INTERCHANGE RECONSTRUCTION, JACKSON BOULEVARD & ENTRANCE RAMP OVER I-90/94, SN 016-1720, COOK COUNTY, I LLINOIS

SCALE : GRAPHIC	0589-B-02	DRAWN BY: A. Tomaras CHECKED BY: C. Marin

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FOR AECOM	1100-04-01

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BORING LOG 1702-B-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.83 ft
North: 1898849.46 ft
East: 1171361.60 ft
Station: 8211+87.78
Offset: 18.3545 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	552.1	Stiff, gray SILTY CLAY LOAM to SILTY LOAM, trace gravel	45		15	3 4 6	1.39 B	17
			50		16	2 4 3	1.39 B	16
	542.1	Soft to stiff, gray SILTY CLAY, trace gravel	55		17	4 6 6	0.49 B	21
			60		18	5 9 17	1.00 P	22
	527.1	Medium stiff to very stiff, gray CLAY, trace gravel	65		19	5 7 14	0.75 P	22
			70		20	5 7 8	2.21 B	24
	517.1	Medium dense to very dense, gray, fine SAND and SILT laminations --Moist--	75		21	3 4 5	0.82 B	30
			80		22	10 7 11	NP	22

GENERAL NOTES

Begin Drilling: **06-17-2014** Complete Drilling: **06-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **N&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **3.25"HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-01

WEI Job No.: 1100-04-01

Client **AECOM**
Project **Circle Interchange Reconstruction**
Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.83 ft
North: 1898849.46 ft
East: 1171361.60 ft
Station: 8211+87.78
Offset: 18.3545 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			85		23	50/5	NR	
			90		24	20 21 32	NP	20
	502.1	Dense to very dense, gray SILTY LOAM --Moist--	95		25	22 23 23	NP	23
			100		26	18 27 27	NP	19
			105		27	23 32 25	NP	24
	487.8	--AUGER REFUSAL-- Boring terminated at 106.00 ft	110					
			115					
			120					

GENERAL NOTES

Begin Drilling **06-17-2014** Complete Drilling **06-17-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR**
Driller **N&K** Logger **A. Happel** Checked by **C. Marin**
Drilling Method **3.25"HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **76.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 1702-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.38 ft
North: 1898807.43 ft
East: 1171517.63 ft
Station: 6145+06.52
Offset: 5.1113 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	577.0	5-inch thick, ASPHALT --PAVEMENT--						
	576.4	7-inch thick, CONCRETE --PAVEMENT--						
		Grayish white CRUSHED STONE --BASE COURSE--			1	6 10 4 5	NP	14
	574.0	Medium stiff, brown and gray SILTY CLAY LOAM, trace gravel --FILL--	5		2	2 5 5 5	0.57 B	17
	571.9	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			3	1 1 1 2	0.25 B	25
			10		4	0 1 2 2	0.33 B	25
					5	0 1 1	0.41 B	23
			15		6	0 1 2	0.16 B	18
					7	0 0 0	0.33 B	26
			20		8	0 0 0	0.25 B	27
			25		9	0 0 0	0.33 B	26
					10	0 0 0	0.33 B	26
			30		11	1 2 3	0.49 B	24
					12	0 2 3	0.74 B	24
	545.6	Medium stiff to very stiff, gray SILTY CLAY, trace to little gravel	35		13	1 3 6	1.07 B	20
			40		14	3 6 9	2.38 B	21

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-23-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **66.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.38 ft
North: 1898807.43 ft
East: 1171517.63 ft
Station: 6145+06.52
Offset: 5.1113 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	520.6	Medium stiff, gray CLAY, trace gravel	45		15	6 10 13	1.00 P	24
			50		16	4 6 10	3.03 B	19
			55		17	5 7 9	3.36 B	24
			60		18	1 2 3	0.82 B	28
	515.6	Medium dense, gray SILTY LOAM, trace gravel; moist	65		19	6 9 9	NP	13
	510.6	Dense, brown fine to medium SAND, trace gravel; moist	70		20	13 21 28	NP	15
	505.6	Very dense, gray GRAVELLY SAND; moist	75		21	50/5	NP	12
			80		22	50/6	NP	17

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-23-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **66.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.38 ft
North: 1898807.43 ft
East: 1171517.63 ft
Station: 6145+06.52
Offset: 5.1113 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	495.6	Very dense, gray SILT; moist						
					23	40 56 40/1	NP	20
			85					
	489.4	--difficult drilling from 88.0 feet-- --WEATHERED BEDROCK--			24	50/2	NR	
			90					
	485.4	Strong, light gray, fair rock mass quality, bedded fresh DOLOSTONE, up to 18-inch beds, 4-inch spaced joints, horizontal joints with none or less than 0.2-inch infilling, hard joint wall, with stylolitic surfaces, and moderately vuggy porosity. --Run 1 - RECOVERY=99%-- --RQD=57%-- --Qu = 10,280 psi--				CORE		
			95					
					1			
			100					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	475.4	Boring terminated at 102.00 ft						
			105					
			110					
			115					
			120					

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-23-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **66.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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Boring 1702-B-02
Run #1, 92' to 102', RECOVERY = 99% , RQD = 57%

0 3 6 9 12 inch

BEDROCK CORE: CIRCLE INTERCHANGE RECONSTRUCTION, JACKSON BOULEVARD & ENTRANCE RAMP OVER I-90/94, SN 016-1702, COOK COUNTY

SCALE : GRAPHIC	1702-B-02	DRAWN BY: A. Hamad CHECKED BY: M. Seyhun

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FOR AECOM | 1100-04-01

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BORING LOG 1702-B-03

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.01 ft
North: 1898890.82 ft
East: 1171649.04 ft
Station: 8214+76.16
Offset: 15.8644 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	592.8	3-inch thick ASPHALT --PAVEMENT--						
	592.0	9-inch thick CONCRETE --PAVEMENT--						
		Loose, gray GRAVELLY SAND --BASE COURSE--			1	5 3 5	NP	9
	589.8	Very loose, grayish brown SANDY LOAM to SAND, trace to little gravel; moist to wet	5		2	1 0 1	NP	11
					3	1 2 1	NP	16
	585.8	Stiff, grayish brown SILTY CLAY to SILTY CLAY LOAM, trace gravel	10		4	1 3 3	1.31 B	22
	582.5	Very soft to soft, gray CLAY to SILTY CLAY, trace gravel			5	1 1 1	0.49 B	24
		--In-Situ Vane Shear, 14.0 feet-- --$S_{u\ undis}$ = 544 psf-- --$S_{u\ remold}$ = 181 psf-- --Sensitivity = 3.00--	15		1			
			20		1	P U S	< 0.25	31

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
						H	P	
		--In-Situ Vane Shear, 24.0 feet-- --$S_{u\ undis}$ = 1067 psf-- --$S_{u\ remold}$ = 648 psf-- --Sensitivity = 1.64--	25		2			
			30		2	P U S H	0.25 P	24
		--In-Situ Vane Shear, 34.0 feet-- --$S_{u\ undis}$ = 712 psf-- --$S_{u\ remold}$ = 233 psf-- --Sensitivity = 3.05--	35		3			
			40		3	P U S	0.25	25

GENERAL NOTES

Begin Drilling: **06-26-2014** Complete Drilling: **06-26-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-03

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.01 ft
North: 1898890.82 ft
East: 1171649.04 ft
Station: 8214+76.16
Offset: 15.8644 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
						H	P	
		--In-Situ Vane Shear, 44.0 feet--						
		--$S_{u\ undis}$ = 1450 psf--						
		--$S_{u\ remold}$ = 803 psf--						
		--Sensitivity = 1.81--	45		4			
			50		6	PUSH	0.41 B	
	540.3	Very stiff to hard, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel	55		7	7 9 13	3.85 B	21
			60		8	4 7 17	3.44 B	16
		--L_L(%)=34, P_L(%)=17--	65		9	3 7 12	2.30 B	22
		--%Gravel=4.1--						
		--%Sand=13.2--						
		--%Silt=49.7--						
		--%Clay=33.0--						
		--A-6 (13)--						
			70		10	6 12 16	4.84 B	21
	521.3	Medium stiff, gray CLAY to SILTY CLAY, trace gravel	75		11	1 2 5	0.98 B	30
	516.3	Medium dense to dense, gray SAND; moist to saturated	80		12	10 9 8	NP	12

GENERAL NOTES

Begin Drilling: **06-26-2014** Complete Drilling: **06-26-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-03

WEI Job No.: 1100-04-01

Client **AECOM**
Project **Circle Interchange Reconstruction**
Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.01 ft
North: 1898890.82 ft
East: 1171649.04 ft
Station: 8214+76.16
Offset: 15.8644 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			85		13	13 16 15	NP	17
			90		14	17 19 25	NP	20
	499.0	Dense, gray SILT; saturated	95		15	13 17 18	NP	25
	496.3	Dense, brown GRAVELLY SAND; wet	100		16	18 21 22	NP	15
	491.3	Very dense, gray GRAVELLY SILTY LOAM; wet	105		17	50/6	NP	18
	489.0	*Dolostone fragments in the head of the spoon* --difficult drilling from 104 feet-- --WEATHERED BEDROCK--	110					
	484.5	--ROLLER BIT REFUSAL-- Boring terminated at 108.50 ft	115					
			120					

GENERAL NOTES

Begin Drilling **06-26-2014** Complete Drilling **06-26-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR**
Driller **R&J** Logger **S. Woods** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **76.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 25-RWB-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.97 ft
North: 1899010.62 ft
East: 1171588.78 ft
Station: 6339+59.75
Offset: 11.7335 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	575.5	5-inch thick, ASPHALT --PAVEMENT--						
	574.6	10-inch thick, CONCRETE --PAVEMENT--						
		Medium dense, gray CRUSHED STONE --BASE COURSE--			1	6 8 6	NP	6
	572.7	Medium stiff, gray SILTY CLAY LOAM, trace gravel --FILL--	5		2	1 2 2	0.57 B	18
	570.5	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			3	0 1 2	0.57 B	23
			10		4	0 2 2	0.57 B	24
					5	0 2 2	0.74 B	24
			15		6	0 2 1	0.49 B	24
					7	0 2 2	0.49 B	24
			20		8	0 2 2	0.25 B	25
			25		9	0 0 1	0.25 B	25
					10	0 1 2	0.25 B	25
			30		11	0 2 2	0.49 B	25
					12	0 2 2	0.57 B	25
	539.2	Very stiff to hard, gray SILTY CLAY LOAM, trace gravel	35		13	0 0 1	0.41 B	19
			40		14	8 10 23	4.76 B	16

GENERAL NOTES

Begin Drilling: **07-09-2014** Complete Drilling: **07-09-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **61.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 0589-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.91 ft
North: 1899272.85 ft
East: 1171495.74 ft
Station: 6149+79.82
Offset: 21.5012 LT

Depth (ft)	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	576.3	4-inch thick ASPHALT --PAVEMENT-- 16-inch thick CONCRETE --PAVEMENT--					
	576.2	Dense, white and gray CRUSHED STONE --BASE COURSE--		1	16 21 24	NP	
	574.2	Very stiff, gray SILTY CLAY LOAM to SILTY LOAM, trace gravel		2	3 5 5 5	2.79 S	14
5	572.4	Very soft to soft, gray CLAY to SILTY CLAY, trace gravel		3	2 1 2 3	0.41 B	23
				4	1 1 1 2	0.41 B	24
10				5	1 2 3	0.25 P	24
				6	0 1 2	0.66 B	23
15				7	0 0 0	0.16 B	27
				8	0 0 0	0.33 B	26
20				9	0 0 0	0.41 B	26
				10	0 0 1	0.41 B	24
25	552.4	Stiff, gray SILTY CLAY LOAM, trace gravel		11	2 3 3	1.56 B	25
	549.9	Soft to medium stiff, gray CLAY to SILTY CLAY LOAM, trace gravel		12	0 0 2	0.66 B	25
30				13	0 1 3	0.41 B	18
	541.2	Very stiff to hard, gray SILTY CLAY LOAM, trace gravel					
		--seams of medium SAND--		14	5 5 6	2.38 B	22
40							

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **A&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **64.50 ft**
At Completion of Drilling: **Rotary wash mud**
Time After Drilling: **24 hours**
Depth to Water: **77.00 ft**

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

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BORING LOG 0589-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.91 ft
North: 1899272.85 ft
East: 1171495.74 ft
Station: 6149+79.82
Offset: 21.5012 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		15	4 5 7	5.25 B	13
			50		16	5 7 9	2.30 B	22
			55		17	3 5 6	2.54 B	23
	521.2	Medium dense, gray SILTY LOAM, trace gravel	60		18	3 5 5	NP	13
	513.4	Loose, brown SANDY GRAVEL	65		19	4 4 5	NP	13
	511.2	Dense, gray SILTY LOAM, trace gravel	70		20	12 14 22	NP	14
	506.2	Dense, gray SANDY LOAM, little gravel	75		21	17 21 21	NP	13
	501.2	Brown and gray, SANDY GRAVEL						
	498.9	Dense, gray SILTY LOAM, trace gravel	80		22	13 19 21	NP	21

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **A&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **64.50 ft**
At Completion of Drilling: **Rotary wash mud**
Time After Drilling: **24 hours**
Depth to Water: **77.00 ft**

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

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BORING LOG 0589-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.91 ft
North: 1899272.85 ft
East: 1171495.74 ft
Station: 6149+79.82
Offset: 21.5012 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	496.2							
		Brown and gray, medium and coarse SAND, little gravel						
	493.9							
		Dense, gray SILTY LOAM, trace gravel	85		23	11 13 19	NP	20
	489.4							
		--DIFFICULT DRILLING at 88.5 ft-- --WEATHERED BEDROCK--	90					
	483.9							
		Strong, light gray, excellent rock mass quality, bedded fresh DOLOSTONE, 1 to 3 feet beds, 1.4 feet joints spacing, horizontal joints with none to less than 0.2-inch infilling, hard joint wall, with stylolitic surfaces, and moderately vuggy porosity --Run 1 - RECOVERY=100%-- --RQD=98%--	95		1	CORE		
			100					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	473.9							
		Boring terminated at 104.00 ft	105					
			110					
			115					
			120					

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **A&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: ▽ **64.50 ft**
At Completion of Drilling: ▼ **Rotary wash mud**
Time After Drilling: **24 hours**
Depth to Water: ▼ **77.00 ft**

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

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BORING LOG 1702-B-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.83 ft
North: 1898849.46 ft
East: 1171361.60 ft
Station: 8211+87.78
Offset: 18.3545 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	593.3	6-inch thick, ASPHALT --PAVEMENT--						
	592.3	12-inch thick, CONCRETE --PAVEMENT--						
		Loose, brown and gray, fine and medium SAND, trace gravel --FILL--			1	3 3 3	NP	12
	590.6	Stiff to very stiff, brown and gray SILTY CLAY LOAM, trace gravel and sand layers --FILL--	5		2	3 3 3	2.50 P	17
					3	2 1 2	1.25 P	20
			10		4	2 2 4	2.05 B	23
	583.3	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			5	3 2 2	0.75 P	27
			15		6	0 0 0	0.41 B	26
					7	0 2 2	0.33 B	24
			20		8	0 0 2	0.41 B	20

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	573.3	Soft, gray CLAY LOAM, trace gravel --L_L(%)=28, P_L(%)=14-- --%Gravel=5.4-- --%Sand=23.0-- --%Silt=46.7-- --%Clay=24.8-- --A-6 (7)--			9	1 1 2	0.33 B	16
	570.8	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel	25		10	1 1 2	0.49 B	25
					11	0 3 2	0.57 B	24
			30		12	0 2 2	0.74 B	24
			35		13	1 2 2	0.41 B	25
			40		14	2 3 4	0.49 B	25

GENERAL NOTES

Begin Drilling: **06-17-2014** Complete Drilling: **06-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **N&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **3.25"HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

0 3 6 9 12 inches

Boring 0589-B-02:
Run #1, 94' to 104', RECOVERY = 100%, RQD = 98%

BEDROCK CORE: CIRCLE INTERCHANGE RECONSTRUCTION, JACKSON BOULEVARD & ENTRANCE RAMP OVER I-90/94, SN 016-1720, COOK COUNTY, I LLINOIS

SCALE : GRAPHIC	0589-B-02	DRAWN BY: A. Tomaras CHECKED BY: C. Marin

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FOR AECOM	1100-04-01

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BORING LOG 1702-B-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.83 ft
North: 1898849.46 ft
East: 1171361.60 ft
Station: 8211+87.78
Offset: 18.3545 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	552.1	Stiff, gray SILTY CLAY LOAM to SILTY LOAM, trace gravel	45		15	3 4 6	1.39 B	17
			50		16	2 4 3	1.39 B	16
	542.1	Soft to stiff, gray SILTY CLAY, trace gravel	55		17	4 6 6	0.49 B	21
			60		18	5 9 17	1.00 P	22
	527.1	Medium stiff to very stiff, gray CLAY, trace gravel	65		19	5 7 14	0.75 P	22
			70		20	5 7 8	2.21 B	24
	517.1	Medium dense to very dense, gray, fine SAND and SILT laminations --Moist--	75		21	3 4 5	0.82 B	30
			80		22	10 7 11	NP	22

GENERAL NOTES

Begin Drilling: **06-17-2014** Complete Drilling: **06-17-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **B-57 TMR**
Driller: **N&K** Logger: **A. Happel** Checked by: **C. Marin**
Drilling Method: **3.25"HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-01

WEI Job No.: 1100-04-01

Client **AECOM**
Project **Circle Interchange Reconstruction**
Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.83 ft
North: 1898849.46 ft
East: 1171361.60 ft
Station: 8211+87.78
Offset: 18.3545 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			85		23	50/5	NR	
			90		24	20 21 32	NP	20
	502.1	Dense to very dense, gray SILTY LOAM --Moist--	95		25	22 23 23	NP	23
			100		26	18 27 27	NP	19
			105		27	23 32 25	NP	24
	487.8	--AUGER REFUSAL-- Boring terminated at 106.00 ft	110					
			115					
			120					

GENERAL NOTES

Begin Drilling **06-17-2014** Complete Drilling **06-17-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR**
Driller **N&K** Logger **A. Happel** Checked by **C. Marin**
Drilling Method **3.25"HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **76.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 1702-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.38 ft
North: 1898807.43 ft
East: 1171517.63 ft
Station: 6145+06.52
Offset: 5.1113 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	577.0	5-inch thick, ASPHALT --PAVEMENT--						
	576.4	7-inch thick, CONCRETE --PAVEMENT--						
		Grayish white CRUSHED STONE --BASE COURSE--			1	6 10 4 5	NP	14
	574.0	Medium stiff, brown and gray SILTY CLAY LOAM, trace gravel --FILL--	5		2	2 5 5 5	0.57 B	17
	571.9	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			3	1 1 1 2	0.25 B	25
			10		4	0 1 2 2	0.33 B	25
					5	0 1 1	0.41 B	23
			15		6	0 1 2	0.16 B	18
					7	0 0 0	0.33 B	26
			20		8	0 0 0	0.25 B	27
			25		9	0 0 0	0.33 B	26
					10	0 0 0	0.33 B	26
			30		11	1 2 3	0.49 B	24
					12	0 2 3	0.74 B	24
	545.6	Medium stiff to very stiff, gray SILTY CLAY, trace to little gravel	35		13	1 3 6	1.07 B	20
			40		14	3 6 9	2.38 B	21

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-23-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **66.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG 1702-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.38 ft
North: 1898807.43 ft
East: 1171517.63 ft
Station: 6145+06.52
Offset: 5.1113 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	520.6	Medium stiff, gray CLAY, trace gravel	45		15	6 10 13	1.00 P	24
			50		16	4 6 10	3.03 B	19
			55		17	5 7 9	3.36 B	24
			60		18	1 2 3	0.82 B	28
	515.6	Medium dense, gray SILTY LOAM, trace gravel; moist	65		19	6 9 9	NP	13
	510.6	Dense, brown fine to medium SAND, trace gravel; moist	70		20	13 21 28	NP	15
	505.6	Very dense, gray GRAVELLY SAND; moist	75		21	50/5	NP	12
			80		22	50/6	NP	17

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-23-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **66.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-02

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 577.38 ft
North: 1898807.43 ft
East: 1171517.63 ft
Station: 6145+06.52
Offset: 5.1113 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	495.6	Very dense, gray SILT; moist						
					23	40 56 40/1	NP	20
			85					
	489.4	--difficult drilling from 88.0 feet-- --WEATHERED BEDROCK--			24	50/2	NR	
			90					
	485.4	Strong, light gray, fair rock mass quality, bedded fresh DOLOSTONE, up to 18-inch beds, 4-inch spaced joints, horizontal joints with none or less than 0.2-inch infilling, hard joint wall, with stylolitic surfaces, and moderately vuggy porosity. --Run 1 - RECOVERY=99%-- --RQD=57%-- --Qu = 10,280 psi--				CORE		
			95					
					1			
			100					

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	475.4	Boring terminated at 102.00 ft						
			105					
			110					
			115					
			120					

GENERAL NOTES

Begin Drilling: **07-13-2014** Complete Drilling: **07-23-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **66.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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WANGENGINC 11000401.GPJ WANGENG.GDT 12/22/16

Boring 1702-B-02
Run #1, 92' to 102', RECOVERY = 99% , RQD = 57%

0 3 6 9 12 inch

BEDROCK CORE: CIRCLE INTERCHANGE RECONSTRUCTION, JACKSON BOULEVARD & ENTRANCE RAMP OVER I-90/94, SN 016-1702, COOK COUNTY

SCALE : GRAPHIC	1702-B-02	DRAWN BY: A. Hamad CHECKED BY: M. Seyhun

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FOR AECOM | 1100-04-01

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BORING LOG 1702-B-03

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.01 ft
North: 1898890.82 ft
East: 1171649.04 ft
Station: 8214+76.16
Offset: 15.8644 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	592.8	3-inch thick ASPHALT --PAVEMENT--						
	592.0	9-inch thick CONCRETE --PAVEMENT--						
		Loose, gray GRAVELLY SAND --BASE COURSE--			1	5 3 5	NP	9
	589.8	Very loose, grayish brown SANDY LOAM to SAND, trace to little gravel; moist to wet	5		2	1 0 1	NP	11
					3	1 2 1	NP	16
	585.8	Stiff, grayish brown SILTY CLAY to SILTY CLAY LOAM, trace gravel	10		4	1 3 3	1.31 B	22
	582.5	Very soft to soft, gray CLAY to SILTY CLAY, trace gravel			5	1 1 1	0.49 B	24
		--In-Situ Vane Shear, 14.0 feet-- --$S_{u\ undis}$ = 544 psf-- --$S_{u\ remold}$ = 181 psf-- --Sensitivity = 3.00--	15		1			
			20		1	P U S	< 0.25	31

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
						H	P	
		--In-Situ Vane Shear, 24.0 feet-- --$S_{u\ undis}$ = 1067 psf-- --$S_{u\ remold}$ = 648 psf-- --Sensitivity = 1.64--	25		2			
			30		2	P U S H	0.25 P	24
		--In-Situ Vane Shear, 34.0 feet-- --$S_{u\ undis}$ = 712 psf-- --$S_{u\ remold}$ = 233 psf-- --Sensitivity = 3.05--	35		3			
			40		3	P U S	0.25	25

GENERAL NOTES

Begin Drilling: **06-26-2014** Complete Drilling: **06-26-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 1702-B-03

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.01 ft
North: 1898890.82 ft
East: 1171649.04 ft
Station: 8214+76.16
Offset: 15.8644 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
						H	P	
		--In-Situ Vane Shear, 44.0 feet--						
		--$S_{u\ undis}$ = 1450 psf--						
		--$S_{u\ remold}$ = 803 psf--						
		--Sensitivity = 1.81--	45		4			
			50		6	PUSH	0.41 B	
	540.3	Very stiff to hard, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel	55		7	7 9 13	3.85 B	21
			60		8	4 7 17	3.44 B	16
		--L_L(%)=34, P_L(%)=17--	65		9	3 7 12	2.30 B	22
		--%Gravel=4.1--						
		--%Sand=13.2--						
		--%Silt=49.7--						
		--%Clay=33.0--						
		--A-6 (13)--						
			70		10	6 12 16	4.84 B	21
	521.3	Medium stiff, gray CLAY to SILTY CLAY, trace gravel	75		11	1 2 5	0.98 B	30
	516.3	Medium dense to dense, gray SAND; moist to saturated	80		12	10 9 8	NP	12

GENERAL NOTES

Begin Drilling: **06-26-2014** Complete Drilling: **06-26-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **76.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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BORING LOG 1702-B-03

WEI Job No.: 1100-04-01

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Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 593.01 ft
North: 1898890.82 ft
East: 1171649.04 ft
Station: 8214+76.16
Offset: 15.8644 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			85		13	13 16 15	NP	17
			90		14	17 19 25	NP	20
	499.0	Dense, gray SILT; saturated	95		15	13 17 18	NP	25
	496.3	Dense, brown GRAVELLY SAND; wet	100		16	18 21 22	NP	15
	491.3	Very dense, gray GRAVELLY SILTY LOAM; wet	105		17	50/6	NP	18
	489.0	*Dolostone fragments in the head of the spoon* --difficult drilling from 104 feet-- --WEATHERED BEDROCK--	110					
	484.5	--ROLLER BIT REFUSAL-- Boring terminated at 108.50 ft	115					
			120					

GENERAL NOTES

Begin Drilling **06-26-2014** Complete Drilling **06-26-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR**
Driller **R&J** Logger **S. Woods** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **76.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 25-RWB-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.97 ft
North: 1899010.62 ft
East: 1171588.78 ft
Station: 6339+59.75
Offset: 11.7335 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	575.5	5-inch thick, ASPHALT --PAVEMENT--						
	574.6	10-inch thick, CONCRETE --PAVEMENT--						
		Medium dense, gray CRUSHED STONE --BASE COURSE--			1	6 8 6	NP	6
	572.7	Medium stiff, gray SILTY CLAY LOAM, trace gravel --FILL--	5		2	1 2 2	0.57 B	18
	570.5	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			3	0 1 2	0.57 B	23
			10		4	0 2 2	0.57 B	24
					5	0 2 2	0.74 B	24
			15		6	0 2 1	0.49 B	24
					7	0 2 2	0.49 B	24
			20		8	0 2 2	0.25 B	25
			25		9	0 0 1	0.25 B	25
					10	0 1 2	0.25 B	25
			30		11	0 2 2	0.49 B	25
					12	0 2 2	0.57 B	25
	539.2	Very stiff to hard, gray SILTY CLAY LOAM, trace gravel	35		13	0 0 1	0.41 B	19
			40		14	8 10 23	4.76 B	16

GENERAL NOTES

Begin Drilling: **07-09-2014** Complete Drilling: **07-09-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR**
Driller: **R&J** Logger: **S. Woods** Checked by: **C. Marin**
Drilling Method: **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **61.75 ft**
At Completion of Drilling: **Rotary wash**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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BORING LOG 25-RWB-01

WEI Job No.: 1100-04-01

Client **AECOM**
Project **Circle Interchange Reconstruction**
Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.97 ft
North: 1899010.62 ft
East: 1171588.78 ft
Station: 6339+59.75
Offset: 11.7335 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		15	4 7 10	3.12 B	15
	529.2	Medium stiff to stiff, gray CLAy to SILTY CLAY, trace gravel						
			50		16	5 9 14	3.83 N/6	24
			55		17	3 4 5	1.50 N/6	
	519.2	Stiff, gray SILTY CLAY LOAM, trace gravel						
			60		18	8 11 12	1.72 B	19
	514.2	Dense, brown fine SAND						
			65		19	14 21 23		NP 26
			70		20	13 18 28		NP 19
	504.2	Very dense, gray GRAVELLY SAND --DRY--						
			75		21	33 38 29/4		NP 9
			80		22	50/4		NP 16

GENERAL NOTES

Begin Drilling **07-09-2014** Complete Drilling **07-09-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR**
Driller **R&J** Logger **S. Woods** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **61.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 25-RWB-01

WEI Job No.: 1100-04-01

Client **AECOM**
Project **Circle Interchange Reconstruction**
Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.97 ft
North: 1899010.62 ft
East: 1171588.78 ft
Station: 6339+59.75
Offset: 11.7335 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	494.2	Very dense, gray SILT to SILTY LOAM, trace gravel --DRY--			23	33 43 24/3	NP	17
			85					
					24	50/2	NR	
	486.5	--ROLLER BIT REFUSAL-- Boring terminated at 89.50 ft	90					
			95					
			100					

GENERAL NOTES

Begin Drilling **07-09-2014** Complete Drilling **07-09-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR**
Driller **R&J** Logger **S. Woods** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **61.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 26-RWB-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.37 ft
North: 1899073.58 ft
East: 1171541.57 ft
Station: 6147+73.48
Offset: 28.20527 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	575.1	4-inch thick ASPHALT --PAVEMENT--						
	574.2	10-inch thick CONCRETE --PAVEMENT--						
		Medium dense to dense, gray and white CRUSHED STONE, brick fragments --FILL--			1	18 16 14	NP	3
			5		2	9 6 7	NP	5
	569.9	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			3	1 2 3	0.98 B	22
			10		4	2 2 5	0.49 B	21
	564.9	Stiff, gray SILTY CLAY LOAM, trace gravel *--Occasional SAND seams--*			5	3 3 6	1.72 B	14
	562.4	Very soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			6	2 2 4	0.66 B	25
			15		7	2 2 3	0.33 B	26
			20		8	1 1 2	0.41 B	26
			25		9	1 2 3	0.25 B	36
					10	2 1 3	0.33 B	26
					11	2 2 3	0.33 B	26
			30		12	1 2 3	0.41 B	25
			35		13	2 3 5	0.49 B	25
	538.6	Very stiff to hard, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel						
			40		14	5 8 9	2.82 B	22

GENERAL NOTES

Begin Drilling: **07-31-2014** Complete Drilling: **07-31-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **CME-55**
Driller: **R&J** Logger: **A. Happel** Checked by: **GLM (-Sta,Offset)**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: ▽ **59.50 ft**
At Completion of Drilling: ▼ **16 ft Rotary wash Mud**
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 11000401.GPJ WANGENG.GDT 12/22/16

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wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9928

BORING LOG 26-RWB-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.37 ft
North: 1899073.58 ft
East: 1171541.57 ft
Station: 6147+73.48
Offset: 28.20527 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		15	12 11 12	3.12 B	15
			50		16	12 15 21	5.17 B	20
	523.6	Medium stiff, gray CLAY to SILTY CLAY, trace gravel	55		17	3 3 5	0.98 B	39
	518.6	Gray SILTY LOAM						
	515.9	Very dense, brown and gray, medium to coarse SAND, trace gravel	60		18	5 6 11	NP	10
			65		19	13 23 27	NP	16
	510.4	Boring terminated at 65.00 ft	70					
			75					
			80					

GENERAL NOTES

Begin Drilling: **07-31-2014** Complete Drilling: **07-31-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **CME-55**
Driller: **R&J** Logger: **A. Happel** Checked by: **CLM (-Sta,Offset)**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: ▽ **59.50 ft**
At Completion of Drilling: ▼ **16 ft Rotary wash Mud**
Time After Drilling: **NA**
Depth to Water: ▼ **NA**

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

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BORING LOG 25-RWB-01

WEI Job No.: 1100-04-01

Client **AECOM**
Project **Circle Interchange Reconstruction**
Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.97 ft
North: 1899010.62 ft
East: 1171588.78 ft
Station: 6339+59.75
Offset: 11.7335 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		15	4 7 10	3.12 B	15
	529.2	Medium stiff to stiff, gray CLAy to SILTY CLAY, trace gravel						
			50		16	5 9 14	3.83 N/6	24
			55		17	3 4 5	1.50 N/6	
	519.2	Stiff, gray SILTY CLAY LOAM, trace gravel						
			60		18	8 11 12	1.72 B	19
	514.2	Dense, brown fine SAND						
			65		19	14 21 23		NP 26
			70		20	13 18 28		NP 19
	504.2	Very dense, gray GRAVELLY SAND --DRY--						
			75		21	33 38 29/4		NP 9
			80		22	50/4		NP 16

GENERAL NOTES

Begin Drilling **07-09-2014** Complete Drilling **07-09-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR**
Driller **R&J** Logger **S. Woods** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **61.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 25-RWB-01

WEI Job No.: 1100-04-01

Client **AECOM**
Project **Circle Interchange Reconstruction**
Location **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.97 ft
North: 1899010.62 ft
East: 1171588.78 ft
Station: 6339+59.75
Offset: 11.7335 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	494.2	Very dense, gray SILT to SILTY LOAM, trace gravel --DRY--			23	33 43 24/3	NP	17
			85					
					24	50/2	NR	
	486.5	--ROLLER BIT REFUSAL-- Boring terminated at 89.50 ft	90					
			95					
			100					

GENERAL NOTES

Begin Drilling **07-09-2014** Complete Drilling **07-09-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR**
Driller **R&J** Logger **S. Woods** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **61.75 ft**
At Completion of Drilling ▼ **Rotary wash**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

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BORING LOG 26-RWB-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.37 ft
North: 1899073.58 ft
East: 1171541.57 ft
Station: 6147+73.48
Offset: 28.20527 RT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	575.1	4-inch thick ASPHALT --PAVEMENT--						
	574.2	10-inch thick CONCRETE --PAVEMENT--						
		Medium dense to dense, gray and white CRUSHED STONE, brick fragments --FILL--			1	18 16 14	NP	3
			5		2	9 6 7	NP	5
	569.9	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			3	1 2 3	0.98 B	22
			10		4	2 2 5	0.49 B	21
	564.9	Stiff, gray SILTY CLAY LOAM, trace gravel *--Occasional SAND seams--*			5	3 3 6	1.72 B	14
	562.4	Very soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel			6	2 2 4	0.66 B	25
			15		7	2 2 3	0.33 B	26
			20		8	1 1 2	0.41 B	26
			25		9	1 2 3	0.25 B	36
					10	2 1 3	0.33 B	26
					11	2 2 3	0.33 B	26
			30		12	1 2 3	0.41 B	25
			35		13	2 3 5	0.49 B	25
	538.6	Very stiff to hard, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel						
			40		14	5 8 9	2.82 B	22

GENERAL NOTES

Begin Drilling: **07-31-2014** Complete Drilling: **07-31-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **CME-55**
Driller: **R&J** Logger: **A. Happel** Checked by: **GLM (-Sta,Offset)**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: ▽ **59.50 ft**
At Completion of Drilling: ▼ **16 ft Rotary wash Mud**
Time After Drilling: **NA**
Depth to Water: ▼ **NA**

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BORING LOG 26-RWB-01

WEI Job No.: 1100-04-01

Client: **AECOM**
Project: **Circle Interchange Reconstruction**
Location: **Section 17, T39N, R14E of 3rd PM**

Datum: NAVD 88
Elevation: 575.37 ft
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Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type / recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			45		15	12 11 12	3.12 B	15
			50		16	12 15 21	5.17 B	20
	523.6	Medium stiff, gray CLAY to SILTY CLAY, trace gravel	55		17	3 3 5	0.98 B	39
	518.6	Gray SILTY LOAM						
	515.9	Very dense, brown and gray, medium to coarse SAND, trace gravel	60		18	5 6 11	NP	10
			65		19	13 23 27	NP	16
	510.4	Boring terminated at 65.00 ft	70					
			75					
			80					

GENERAL NOTES

Begin Drilling: **07-31-2014** Complete Drilling: **07-31-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **CME-55**
Driller: **R&J** Logger: **A. Happel** Checked by: **CLM (-Sta,Offset)**
Drilling Method: **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: ▽ **59.50 ft**
At Completion of Drilling: ▼ **16 ft Rotary wash Mud**
Time After Drilling: **NA**
Depth to Water: ▼ **NA**

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

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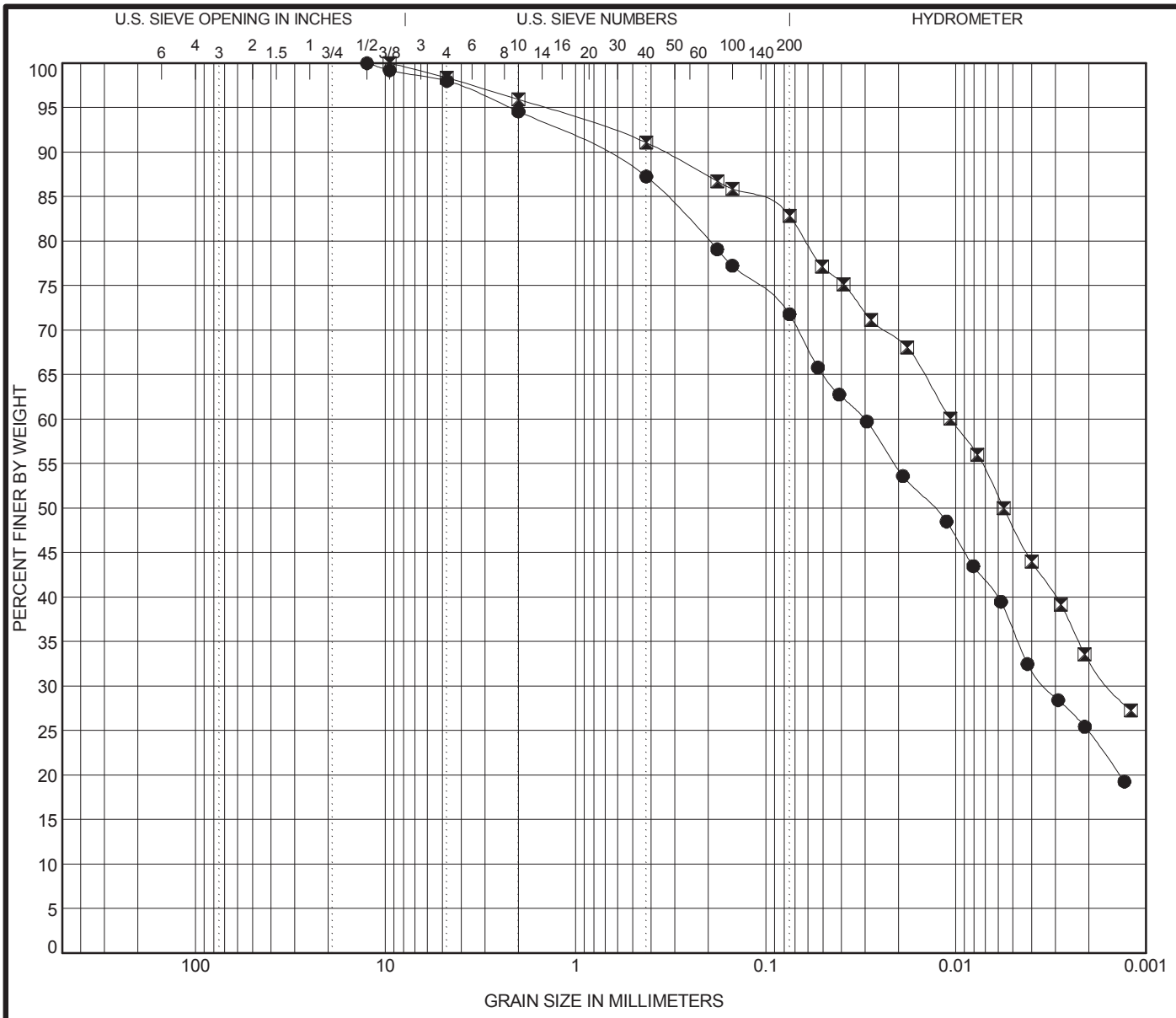
APPENDIX B



COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

	Specimen Identification		IDH Classification	LL	PL	PI	Cc	Cu
●	1702-B-01#9	21.0 ft	**Clay Loam**	**28**	**14**	**14**		
⊠	1702-B-03#9	63.5 ft	**Silty Clay**	**34**	**17**	**17**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1702-B-01#9	21.0 ft	**12.5**	**0.03**	**0.003**		**5.4**	**23.0**	**46.7**	**24.8**
⊠	1702-B-03#9	63.5 ft	**9.5**	**0.011**	**0.002**		**4.1**	**13.2**	**49.7**	**33.0**

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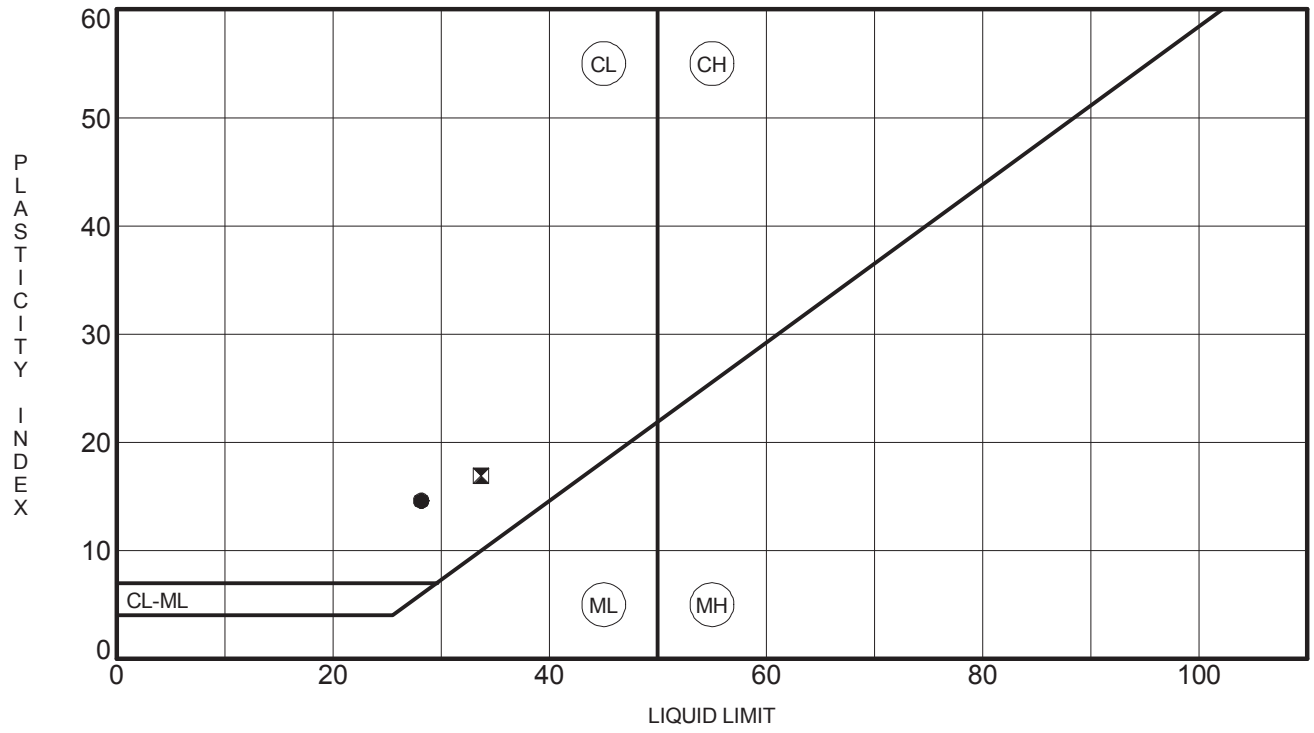
GRAIN SIZE DISTRIBUTION

Project: Circle Interchange Reconstruction

Location: Section 17, T39N, R14E of 3rd PM

Number: 1100-04-01

WEI_GRAIN_SIZE_IDH_1100401.GPJ_US_LAB.GDT 2/4/16



	Specimen Identification		LL	PL	PI	Fines	IDH Classification
●	1702-B-01#9	21.0 ft	28	14	14	72	**Clay Loam**
⧓	1702-B-03#9	63.5 ft	34	17	17	83	**Silty Clay**

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ATTERBERG LIMITS' RESULTS

Project: Circle Interchange Reconstruction

Location: Section 17, T39N, R14E of 3rd PM

Number: 1100-04-01

Unconfined Compressive Strength of Intact Rock Core Specimens

Project: Circle Interchange

Client: AECOM

WEI Job No.: 1100-04-01

Note: The specimens were sulphur capped for a more uniform break

Field Sample ID	Lab Specimen ID	Depth (ft)	Location	Sample Description	Length (in)		Diameter (in)	Total Load (lbs)	Total Pressure (psi)	Fracture Type*	Break Date	Tested By	Area (in^2)
					Before Capping	After Capping							
1702-B-02 RUN 1	7620	95.0		Dolomite	3.80	3.91	2.04	33630	10280	3	2/4/16	AM	3.27

*** 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

APPENDIX C

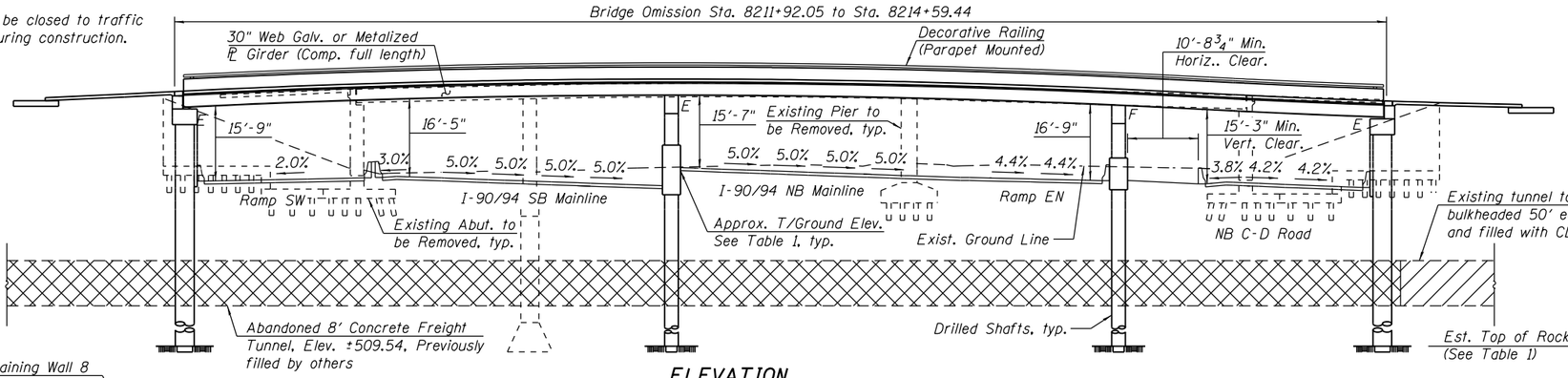
Bench Mark: Cut "X" on southwest balcony of Jackson Blvd. Bridge. Elev. 597.26.

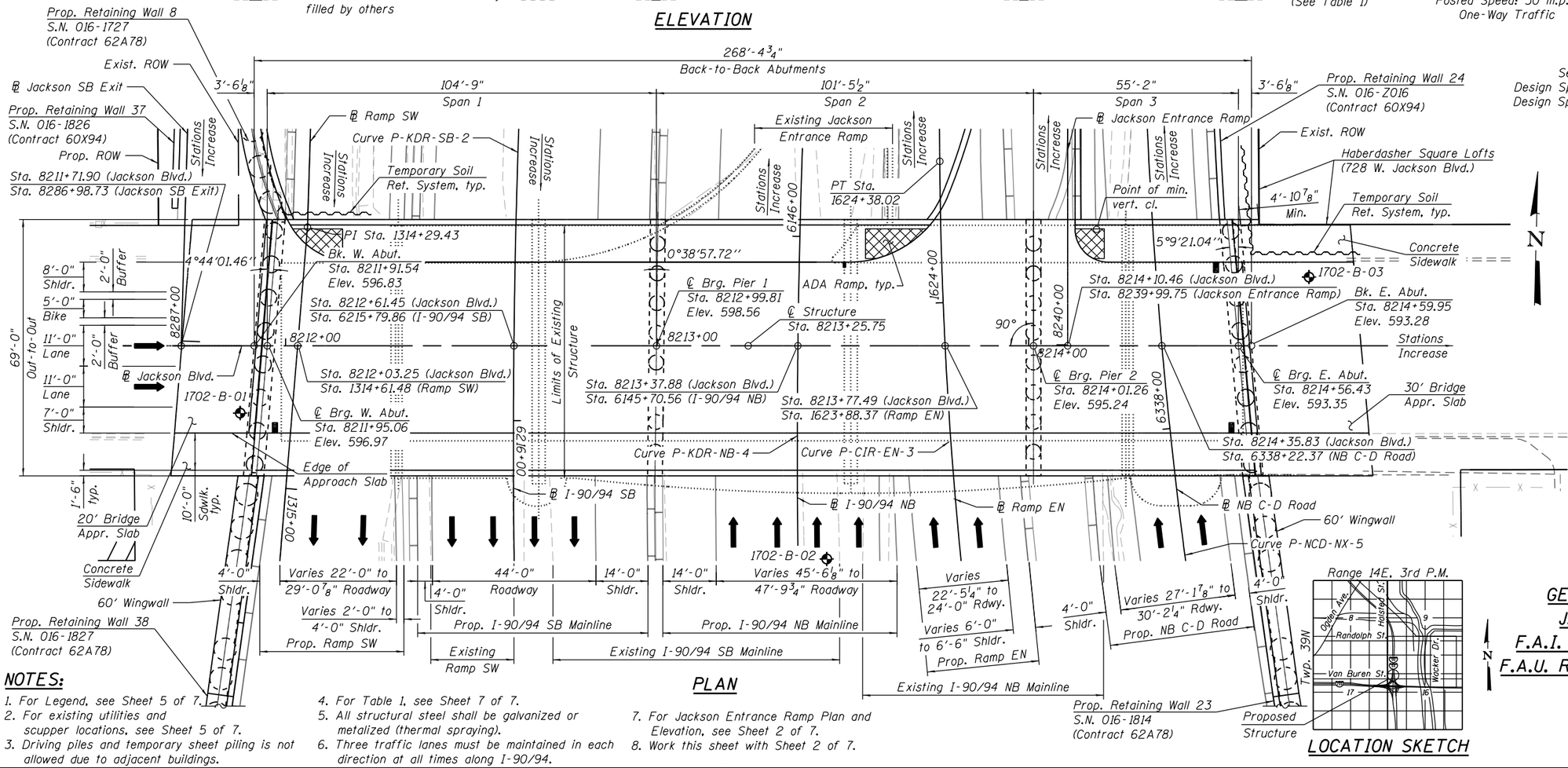
Existing Structure: SN 016-0588. Constructed in 1955 under F.A.I. Route 173, Section 0101.2-2B. Repairs were made to the bridge in 2002 under Section 0101-2-1B-R-1. Three span bridge that measures 199'-9" from back to back of abutments. Out-to-out width varies from 67'-11¾" to 72'-1". The spans are supported by 36" wide flange beams. Substructure is reinforced concrete closed abutments and multi-column piers founded on timber piles. The foundation of the west pier is founded on caissons. The Existing Jackson Entrance Ramp is offset 90° from the centerline of Jackson Boulevard. Three span bridge that measures 169'-10" from back of north abutment to the centerline of the north fascia beam on Jackson Boulevard. Out-to-out width is 22'-6". The spans are supported by 24" wide flange beams. Substructure is reinforced concrete closed north abutment and single hammerhead pier founded on caissons. A concrete cantilever retaining wall extends north of the north abutment for 215'-0". The existing bridge is to be removed and replaced.

The bridge will be closed to traffic and detoured during construction.

No Salvage.

ELEVATION





PLAN

NOTES:

1. For Legend, see Sheet 5 of 7.
2. For existing utilities and scupper locations, see Sheet 5 of 7.
3. Driving piles and temporary sheet piling is not allowed due to adjacent buildings.
4. For Table 1, see Sheet 7 of 7.
5. All structural steel shall be galvanized or metalized (thermal spraying).
6. Three traffic lanes must be maintained in each direction at all times along I-90/94.
7. For Jackson Entrance Ramp Plan and Elevation, see Sheet 2 of 7.
8. Work this sheet with Sheet 2 of 7.

HIGHWAY CLASSIFICATION

F.A.U. Rte. 1422 (Jackson Boulevard)
Functional Class: Collector (Urban)
ADT: 9,800 (2012); 13,000 (2040)
ADTT: 0 (2012); 0 (2040)
DHV: 1,300 (One-Way)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic

Ramp SW
Functional Class: Interstate
ADT: 24,500 (2012); 23,000 (2040)
ADTT: 907 (2012); 851 (2040)
DHV: 1,720 (2040)
Design Speed: 35 m.p.h.
Posted Speed: 35 m.p.h.
One-Way Traffic

F.A.I. Rte. 90/94 SB
Functional Class: Interstate
ADT: 100,100 (2012); 98,000 (2040)
ADTT: 11,351 (2012); 11,113 (2040)
DHV: 6,340 (2040)
Design Speed: 60 m.p.h.
Posted Speed: 45 m.p.h.
One-Way Traffic

F.A.I. Rte. 90/94 NB
Functional Class: Interstate
ADT: 96,700 (2012); 81,000 (2040)
ADTT: 11,217 (2012); 9,396 (2040)
DHV: 4,780 (2040)
Design Speed: 60 m.p.h.
Posted Speed: 45 m.p.h.
One-Way Traffic

Ramp EN
Functional Class: Interstate
ADT: 26,600 (2012); 31,000 (2040)
ADTT: 1,032 (2012); 1,203 (2040)
DHV: 1,910 (2040)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic

NB C-D Road
Functional Class: Interstate
ADT: NA (2012); 17,000 (2040)
ADTT: NA (2012); 440 (2040)
DHV: 1,680 (2040)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic

SEISMIC DATA

Seismic Performance Zone (SPZ) = 1
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 0.085g
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 0.144g
Soil Site Class = D

LOADING HL-93

Allow 50#/sq. ft. for future wearing surface.

DESIGN SPECIFICATIONS

2014 AASHTO LRFD Bridge Design Specifications 7th Edition with 2015 and 2016 Interim Specifications

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
f'c = 4,000 psi (Superstructure Concrete)
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50)

PRECAST UNITS

f'c = 4,500 psi

EAST AND WEST ABUTMENT DEFLECTION CRITERIA:

Maximum total lateral east abutment deflection at top of wall: 0.9 inches.

LOCATION SKETCH

GENERAL PLAN & ELEVATION
JACKSON BOULEVARD OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8213+25.75
STRUCTURE NO. 016-1702

USER NAME = wjcolletti	DESIGNED - WJC	REVISED	
	CHECKED - MDS/TLR	REVISED	
PLOT SCALE = 32:0.0000 ':" / in.	DRAWN - WJC	REVISED	
PLOT DATE = 7/7/2017	CHECKED - MDS/TLR	REVISED	

TranSystems

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

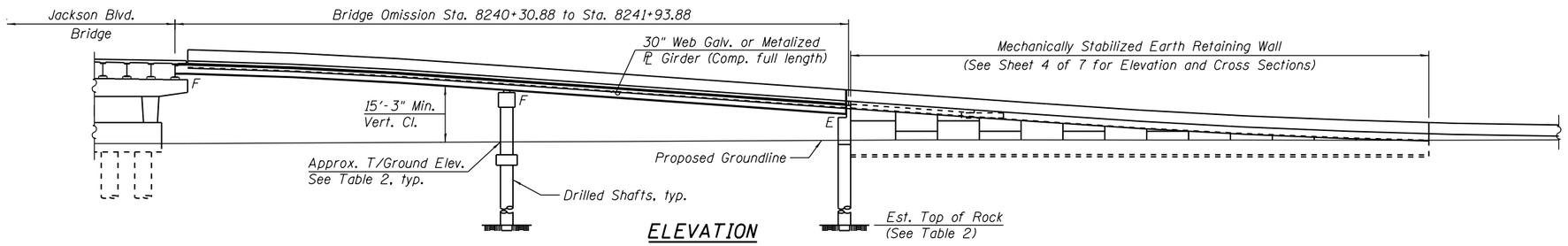
SHEET NO. 1 OF 7 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	7	1
		CONTRACT NO. 62A78		
	ILLINOIS FED. AID PROJECT			

3:32:52 PM
016-1702-CIRCLE100-SHT-ACM-ST-TSL-001

NOTES:

1. Work this sheet with Sheet 1 of 7.
2. For Offset Sketch and Cross Sections, see Sheet 3 of 7.
3. For Legend, see Sheet 5 of 7.
4. For existing utilities and scupper locations, see Sheet 6 of 7.
5. For Table 2, see Sheet 7 of 7.
6. Offsets are measured from the ℄ Jackson Entrance Ramp to the front face of the precast panel. Elevations are shown at the top of the barrier.
7. Span lengths are measured along the ℄ Jackson Entrance Ramp.



ELEVATION

CURVE DATA
(℄ Jackson Entrance Ramp)

P-JAC-NT-1
P.I. Sta. = 8242+19.75
Δ = 7°18'60" (RT)
D = 3°30'54"
R = 1,630.00'
T = 104.22'
L = 208.15'
E = 3.33'
e = 3.20%
T.R. = 52'
S.E. Run = 83'
P.C. Sta. = 8241+15.53
P.T. Sta. = 8243+23.68

CURVE DATA
(℄ I-90/94 SB)

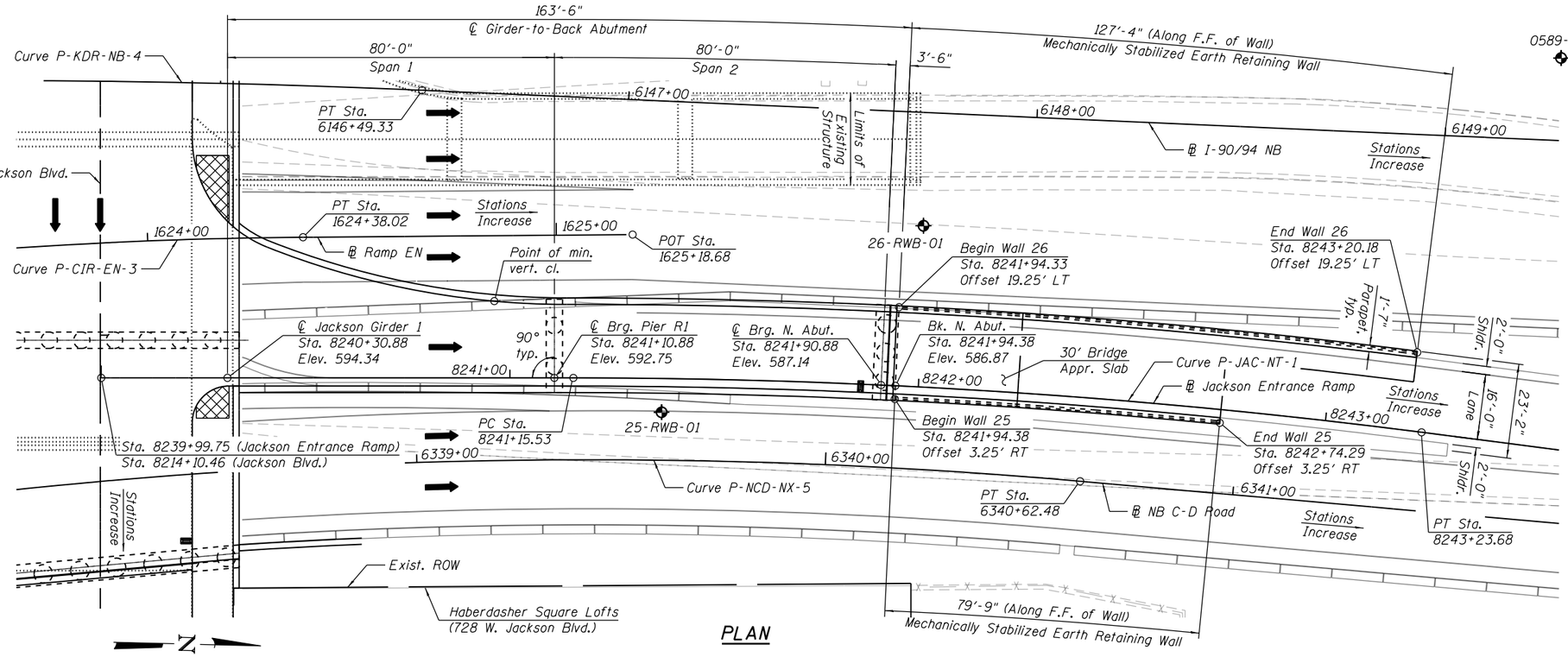
P-KDR-SB-2
P.I. Sta. = 6217+28.62
Δ = 10°40'60" (LT)
D = 2°17'50"
R = 2,494.00'
T = 233.19'
L = 465.03'
E = 10.88'
e = 5.00%
T.R. = 107'
S.E. Run = 268'
P.C. Sta. = 6214+95.43
P.T. Sta. = 6219+60.46

CURVE DATA
(℄ I-90/94 NB)

P-KDR-NB-4
P.I. Sta. = 6143+87.92
Δ = 12°26'15" (RT)
D = 2°22'10"
R = 2,418.00'
T = 263.48'
L = 524.89'
E = 14.31'
e = 5.00%
T.R. = 80'
S.E. Run = 268'
P.C. Sta. = 6141+24.44
P.T. Sta. = 6146+49.33

CURVE DATA
(℄ Ramp EN)

P-CIR-EN-3
P.I. Sta. = 1621+43.96
Δ = 28°56'55" (RT)
D = 4°48'53"
R = 1,190.00'
T = 307.19'
L = 601.25'
E = 39.01'
e = 4.40%
T.R. = NA
S.E. Run = 50'
P.C. Sta. = 1618+36.77
P.T. Sta. = 1624+38.02



PLAN

0589-B-02

CURVE DATA
(℄ NB C-D Road)

P-NCD-NX-5
P.I. Sta. = 6336+57.47
Δ = 35°13'41" (RT)
D = 4°12'24"
R = 1,362.00'
T = 432.42'
L = 837.42'
E = 67.00'
e = 4.20%
T.R. = 41'
S.E. Run = 87'
P.C. Sta. = 6332+25.05
P.T. Sta. = 6340+62.48

GENERAL PLAN & ELEVATION
JACKSON ENTRANCE RAMP OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8241+10.88
STRUCTURE NO. 016-1702

3:08:44 PM
016-1702-CIRCLE100-SHT-ACM-ST-TSL-002

TranSystems

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	CHECKED - MDS/TLR	REVISED	
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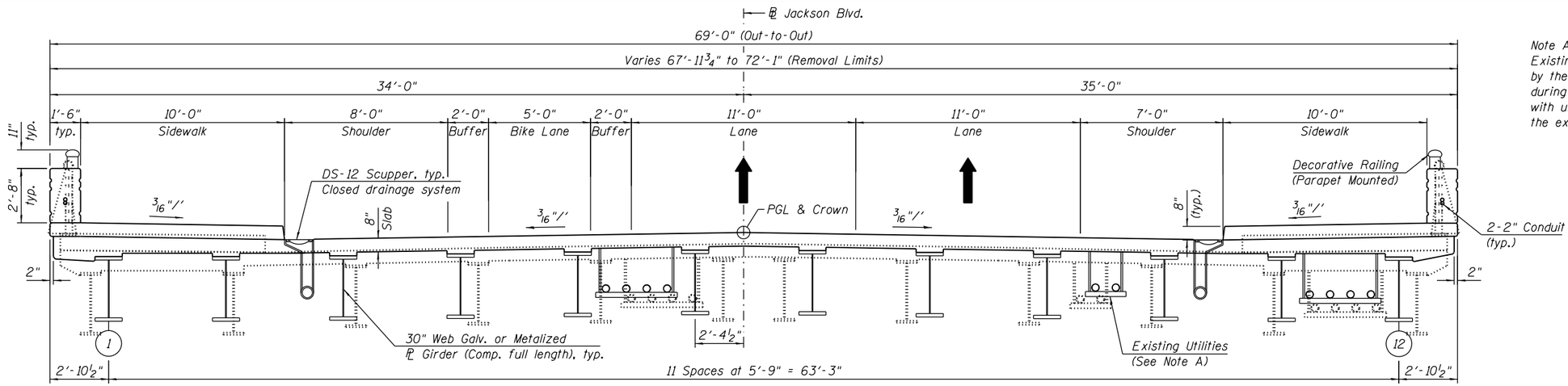
PLOT DATE = 7/7/2017	CHECKED - MDS/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 2 OF 7 SHEETS

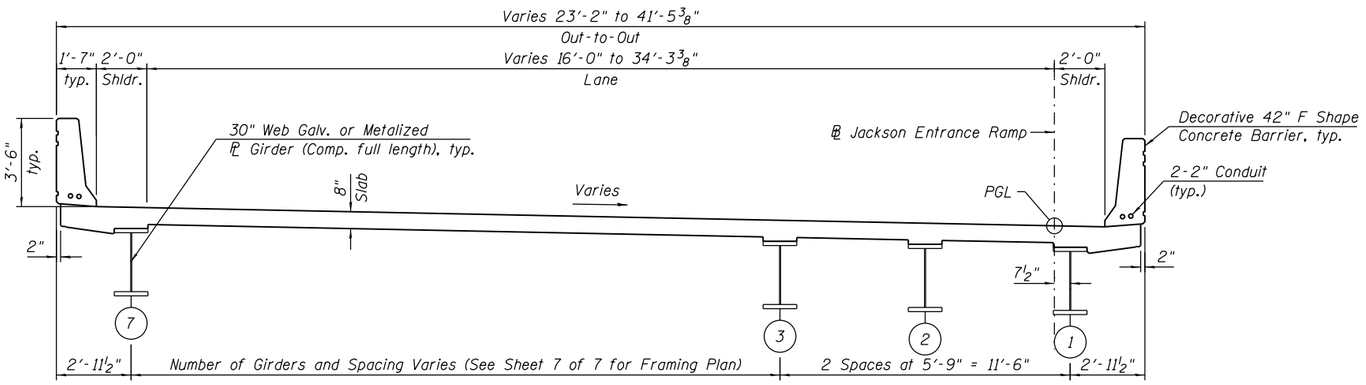
F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	7	2
		CONTRACT NO. 62A78		
	ILLINOIS FED. AID PROJECT			



Note A:
Existing utilities between girders will be relocated by the utility owner to provide uninterrupted service during construction unless otherwise coordinated with utility owner. Provisions will be made to accomodate the existing utilities into the proposed structure.

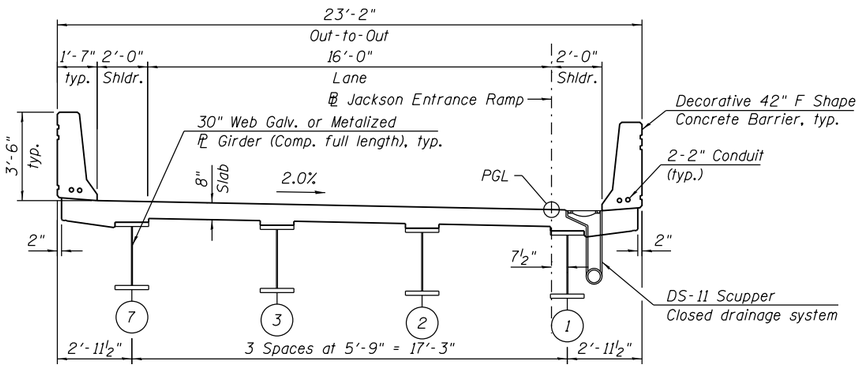
CROSS SECTION - JACKSON BLVD.

(Looking East)



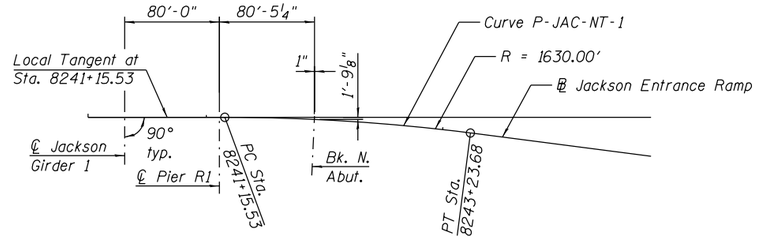
CROSS SECTION - JACKSON ENTRANCE RAMP

(Looking North, Sta. 8240+30.88 to Sta. 8241+10.88)
(Dimensions are measured perpendicular to ℄ Jackson Entrance Ramp)



CROSS SECTION - JACKSON ENTRANCE RAMP

(Looking North, Sta. 8241+10.88 to Sta. 8241+90.88)
(Dimensions are measured perpendicular to ℄ Jackson Entrance Ramp)



OFFSET SKETCH - JACKSON ENTRANCE RAMP

CROSS SECTIONS & DETAILS
JACKSON BOULEVARD OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8213+25.75
STRUCTURE NO. 016-1702

3/09/21 PM
016-1702-CIRCLE100-SHT-ACM-ST-TSL-003

TranSystems

USER NAME = wjcolletti	DESIGNED - WJC	REVISED	
	CHECKED - MDS/TLR	REVISED	
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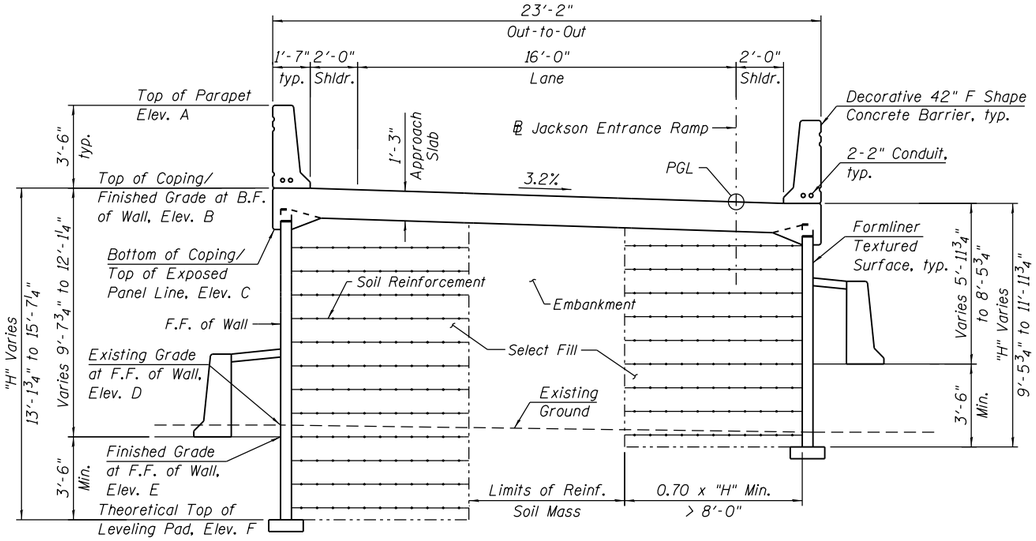
PLOT DATE = 7/7/2017	CHECKED - MDS/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

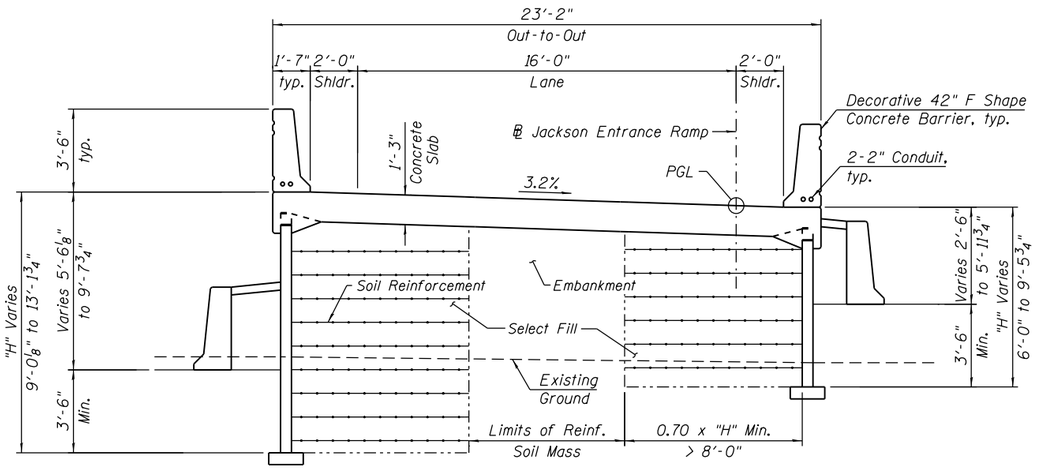
SHEET NO. 3 OF 7 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	7	3
		CONTRACT NO. 62A78		
		ILLINOIS FED. AID PROJECT		



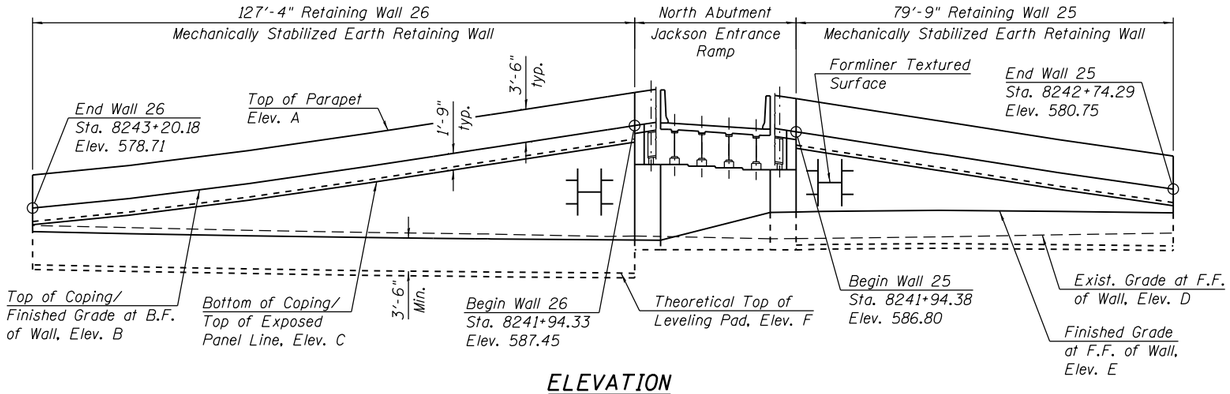
CROSS SECTION

(Looking Upstation, Sta. 8241+94.33 to 8242+24.38)



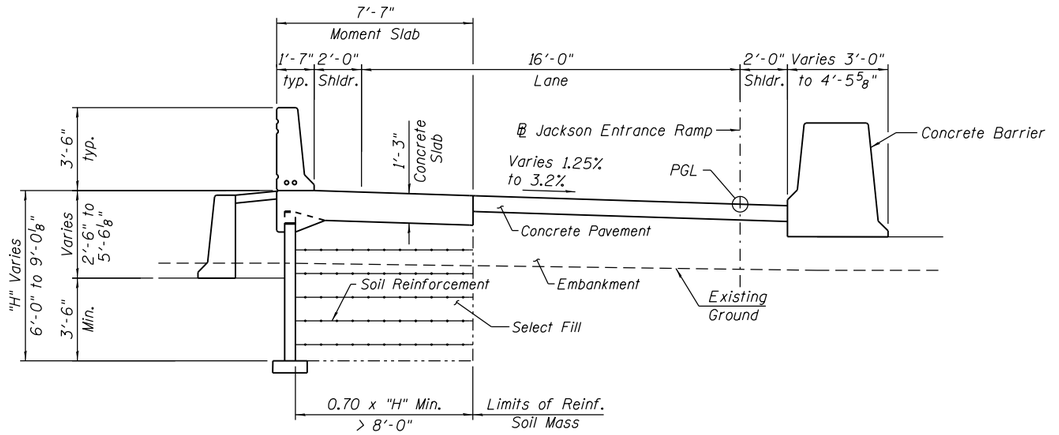
CROSS SECTION

(Looking Upstation, Sta. 8242+24.38 to 8242+74.29)



ELEVATION

(Looking at F.F. of Wall, Roadway barrier not shown for clarity)



CROSS SECTION

(Looking Upstation, Sta. 8242+74.29 to 8243+20.18)

Elevation A- Top of Parapet
Elevation B- Top of Coping / Finished Grade at B.F. of Wall
Elevation C- Bottom of Coping / Top of Exposed Panel Line
Elevation D- Existing Grade at F.F. of Wall
Elevation E- Finished Grade at F.F. of Wall
Elevation F- Theoretical Top of Leveling Pad

RETAINING WALL 25 ELEVATIONS

Station	Offset	Elevation A	Elevation B	Elevation C	Elevation D	Elevation E	Elevation F
8241+94.38	3.25' Rt.	590.30	586.80	585.05	575.51	578.32	574.82
8242+00.00	3.25' Rt.	589.87	586.37	584.62	575.54	578.39	574.89
8242+24.38	3.25' Rt.	587.97	584.47	582.72	575.69	578.49	574.99
8242+25.00	3.25' Rt.	587.93	584.43	582.68	575.69	578.49	574.99
8242+50.00	3.25' Rt.	585.98	582.48	580.73	575.91	578.38	574.88
8242+74.29	3.25' Rt.	584.25	580.75	579.00	576.10	578.25	574.75

RETAINING WALL 26 ELEVATIONS

Station	Offset	Elevation A	Elevation B	Elevation C	Elevation D	Elevation E	Elevation F
8241+94.33	19.25' Lt.	590.95	587.45	585.70	575.78	575.34	571.84
8242+00.00	19.25' Lt.	590.51	587.01	585.26	575.83	575.37	571.87
8242+24.38	19.25' Lt.	588.61	585.11	583.36	575.97	575.46	571.96
8242+25.00	19.25' Lt.	588.57	585.07	583.32	575.98	575.47	571.97
8242+50.00	19.25' Lt.	586.62	583.12	581.37	576.15	575.60	572.10
8242+75.00	19.25' Lt.	584.80	581.30	579.55	576.35	575.79	572.29
8243+00.00	19.25' Lt.	583.21	579.71	577.96	576.64	576.01	572.51

MSE WALL ELEVATION & CROSS SECTIONS
JACKSON ENTRANCE RAMP OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8241+94.33 TO 8243+20.18
STRUCTURE NO. 016-1702

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016-1702-CIRCLE100-SHT-ACM-ST-TSL-004

TranSystems

USER NAME = wjcolletti	DESIGNED - WJC	REVISED	
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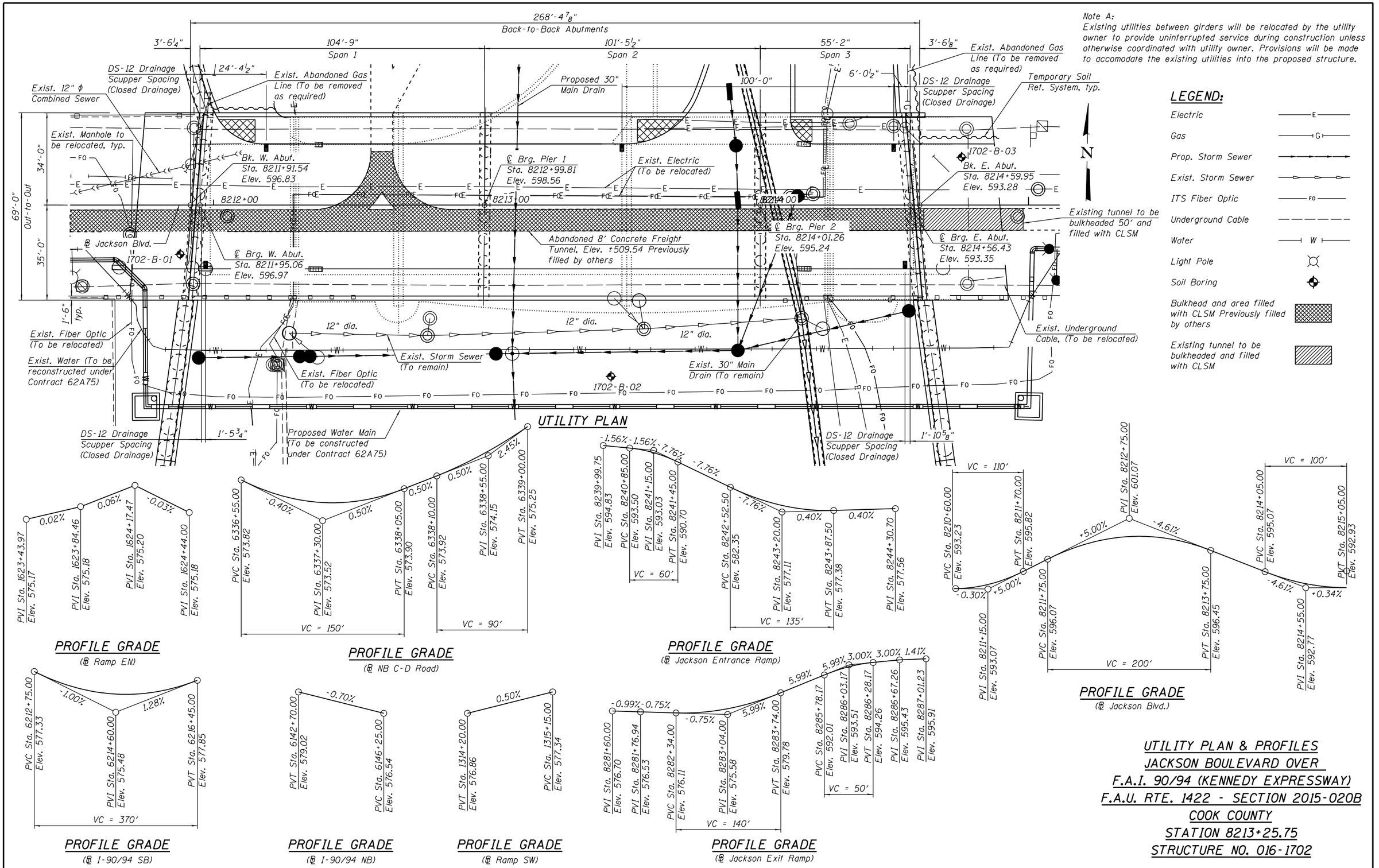
PLOT DATE = 7/7/2017	CHECKED - MDS/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 4 OF 7 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	7	4
		CONTRACT NO. 62A78		
	ILLINOIS FED. AID PROJECT			

Note A:
Existing utilities between girders will be relocated by the utility owner to provide uninterrupted service during construction unless otherwise coordinated with utility owner. Provisions will be made to accomodate the existing utilities into the proposed structure.



LEGEND:

- Electric
- Gas
- Prop. Storm Sewer
- Exist. Storm Sewer
- ITS Fiber Optic
- Underground Cable
- Water
- Light Pole
- Soil Boring
- Bulkhead and area filled with CLSM Previously filled by others
- Existing tunnel to be bulkheaded and filled with CLSM

UTILITY PLAN

PROFILE GRADE
(℄ Ramp EN)

PROFILE GRADE
(℄ NB C-D Road)

PROFILE GRADE
(℄ Jackson Entrance Ramp)

PROFILE GRADE
(℄ Jackson Blvd.)

PROFILE GRADE
(℄ I-90/94 SB)

PROFILE GRADE
(℄ I-90/94 NB)

PROFILE GRADE
(℄ Ramp SW)

PROFILE GRADE
(℄ Jackson Exit Ramp)

UTILITY PLAN & PROFILES
JACKSON BOULEVARD OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8213+25.75
STRUCTURE NO. 016-1702

USER NAME = wjcolletti	DESIGNED - WJC	REVISED	
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PLOT DATE = 7/7/2017	CHECKED - MDS/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 5 OF 7 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	7	5
		CONTRACT NO. 62A78		
		ILLINOIS FED. AID PROJECT		

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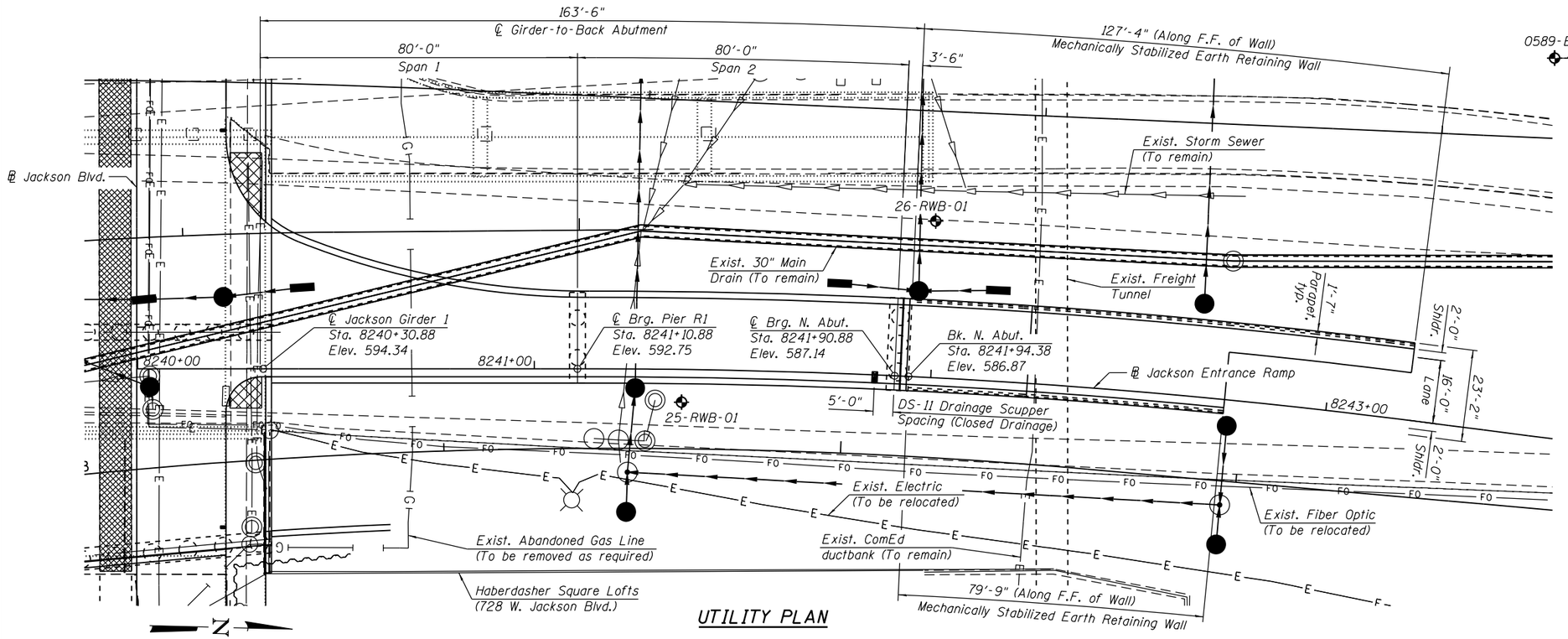
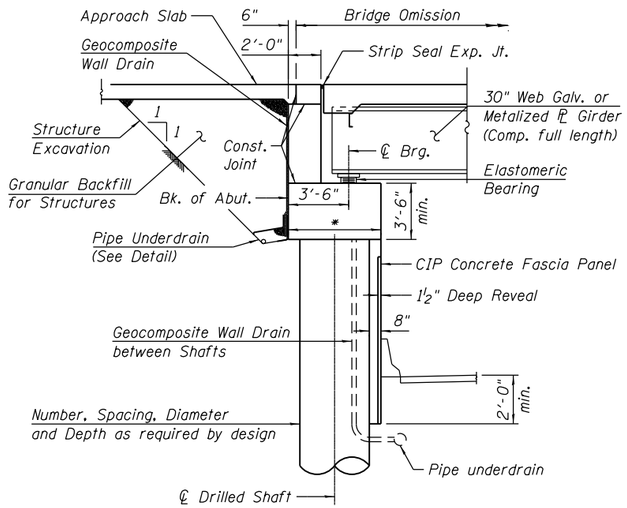
016-1702-CIRCLE100-SHT-ACM-ST-TSL-005



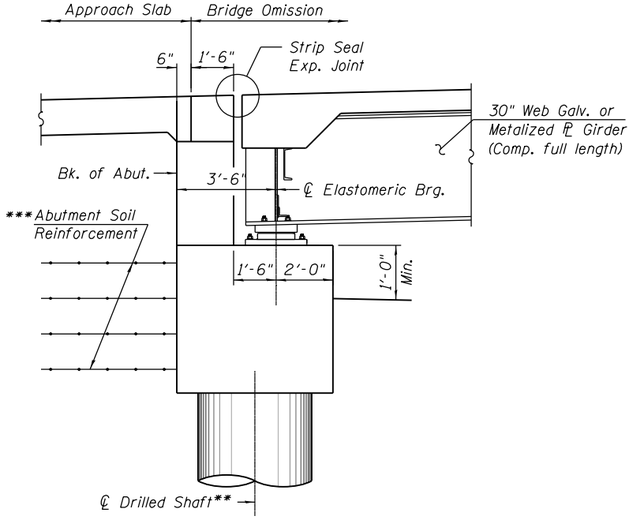
UTILITY PLAN



SECTION THRU WEST AND EAST ABUTMENTS

(Horiz. dim. at Rt. L's)

* Cap width to be determined during final design.

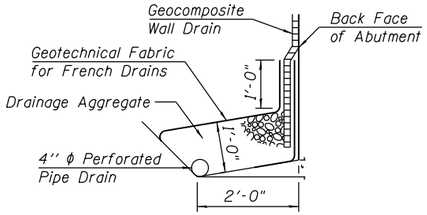


SECTION THRU NORTH ABUTMENT

(Horiz. dim. at Rt. L's)

**Size, spacing & no. to be determined in design

***Abutment Soil Reinforcement to resist lateral loads in lieu of drilled shafts



PIPE UNDERDRAIN DETAIL AT WEST AND EAST ABUTMENTS

NOTES:

1. All proposed drainage structure locations are conceptual at this stage and are subject to refinement during final design.

UTILITY PLAN & DETAILS
JACKSON ENTRANCE RAMP OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8241+10.88
STRUCTURE NO. 016-1702

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016-1702-CIRCLE100-SHT-ACM-ST-TSL-006

TranSystems

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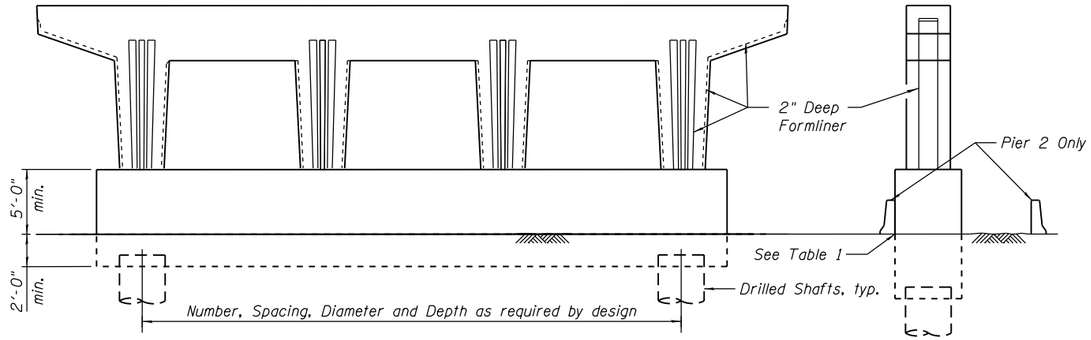
PLOT DATE = 7/7/2017	CHECKED - MDS/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

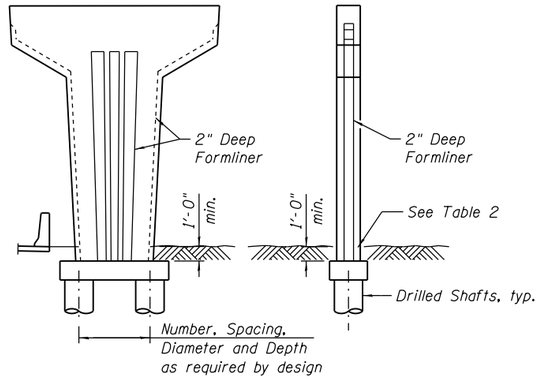
SHEET NO. 6 OF 7 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	7	6
		CONTRACT NO. 62A78		
		ILLINOIS FED. AID PROJECT		



PIER SKETCH - JACKSON BLVD.

END VIEW



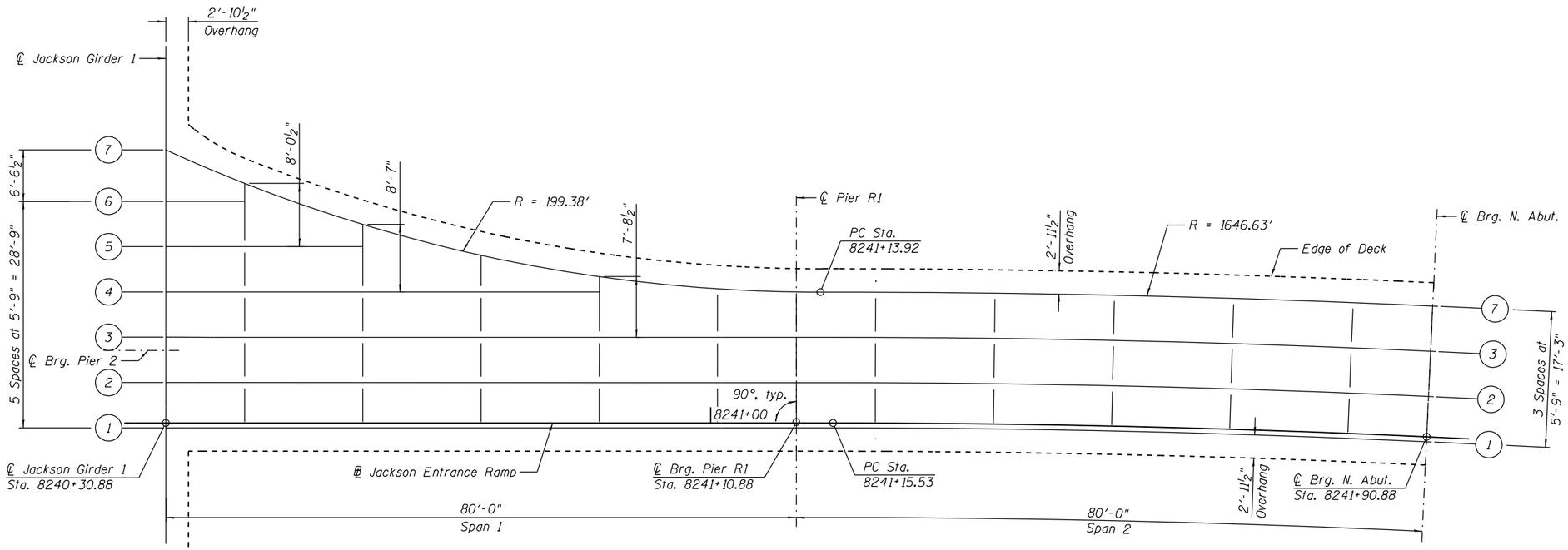
PIER SKETCH - JACKSON ENTRANCE RAMP

TABLE 1

Pier	Approx. T/Ground Elev.	Approx. T/Rock Elev.
W. Abut.	576.66	485.00
1	574.65	485.00
2	574.29	485.00
E. Abut.	573.05	485.00

TABLE 2

Pier	Approx. T/Ground Elev.	Approx. T/Rock Elev.
R1	574.82	485.00
N. Abut.	575.32	485.00



SCHEMATIC FRAMING PLAN

NOTE:

1. Location of bolted field splices and cross frames to be determined during final design.
2. Span lengths are measured along the ℄ Jackson Entrance Ramp.

FRAMING PLAN & DETAILS
JACKSON ENTRANCE RAMP OVER
F.A.I. 90/94 (KENNEDY EXPRESSWAY)
F.A.U. RTE. 1422 - SECTION 2015-020B
COOK COUNTY
STATION 8241+10.88
STRUCTURE NO. 016-1702

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016-1702 CIRCLE100-SHT-ACM-ST-TSL-007

TranSystems

USER NAME = wjcollett1	DESIGNED - WJC	REVISED	
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PLOT DATE = 7/7/2017	CHECKED - MDS/TLR	REVISED	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 7 OF 7 SHEETS

F.A.U. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1422	2015-020B	COOK	7	7
		CONTRACT NO. 62A78		
		ILLINOIS FED. AID PROJECT		