STRUCTURE GEOTECHNICAL REPORT
CIRCLE INTERCHANGE RECONSTRUCTION
RETAINING WALL 34 (PROPOSED SN 016-1823)
F.A.I ROUTE 90/94 (KENNEDY EXPRESSWAY)
IDOT D-91-227-13/ PTB 163-001
COOK COUNTY, ILLINOIS

For

AECOM

303 East Wacker Drive

Chicago, IL 60601

(312) 938-0300

Submitted by

Wang Engineering, Inc.

1145 North Main Street

Lombard, IL 60148

(630) 953-9928

Original: April 19, 2019
Revised: November 1, 2019

Technical Report Documentation Page

1. Title and Subtitle Structure Geotechnical Report Circle Interchange Reconstruction Retaining Wall 34, F.A.I. Route 90/94 Station 8562+04.40 to Station 8563+33.33		**2. Report Date** Original: April 19, 2019 Revised: November 1, 2019 **3. Report Type** ☒ SGR ☐ RGR ☐ Draft ☒ Final ☒ Revised
4. Route / Section / County FAI 90/94/2014-016R & B / Cook		**5. IDOT Job No./Contract** D-91-259-12/62A77
6. PTB / Item No. 163/001	**7. Existing Structure Number(s)** No existing wall	**8. Proposed Structure Number(s)** 016-1823
9. Prepared by Wang Engineering, Inc. 1145 N Main Street Lombard, IL 60148	**Contributor(s)** Author: Metin W. Seyhun, P.E. QC/QA: Mohammed Kothawala, P.E., D.GE. PIC: Corina T. Farez, P.E., P.G.	**Author Phone Number/Email Address** (630) 953-9928 Ext 1018 mseyhun@wangeng.com
10. Prepared for AECOM 303 East Wacker Drive Chicago, IL 60601	**Structural Engineer** Matt Santeford, P.E., S.E. TranSystems Corporation	**Contact Phone Number** (847) 407-5235

11. Abstract

A new Retaining Wall 34 will be constructed to support the approach embankment to the Madison SB Entrance Ramp structure. The 130-foot long back-to-back MSE walls will start at Station 8562+04.40 and end at Station 8563+33.33. The maximum total height near the ramp abutment will be 16.6 feet and will have a 3.5 foot tall parapet on the top. The MSE Wall is a feasible as proposed.

Beneath the pavement, the subsurface soils consists of up to 2 to 16 feet of fill materials, up to 2.5 feet stiff clay crust, up to 33 feet of very soft to medium stiff silty clay, 32 feet of stiff to hard clay to silty clay loam, and 36 feet of dense to very dense silt to silty loam and sand to gravelly sand extending to the boring termination depths or bedrock. Sound bedrock was encountered at elevations of about 481.0 to 481.6 feet. Groundwater was not encountered within the fill layers; however it should be expected in the upper granular fill. Groundwater is also present within the granular layers just above the top of bedrock.

The proposed MSE wall is feasible with the use of Class III LCCF fill material as well as between back-to-back walls. The wall will have a maximum factored bearing resistance of 1,800 psf using a geotechnical resistance factor of 0.65. We do not see global stability concerns for the proposed back-to-back MSE retaining wall since the Class III LCCF will be used for the MSE wall and fill area between walls. Considering the unloading and reloading effect and the use of LCCF, the settlement is not a concern.

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Wang Engineering

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

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FOR
AECOM

1.0 INTRODUCTION

This report presents the results of Wang Engineering, Inc. (Wang) subsurface investigation, laboratory testing, geotechnical engineering evaluations and recommendations for new back to back Mechanically Stabilized Earth (MSE) retaining walls to support the approach embankment to the existing Madison SB Entrance Ramp which will remain. The new wall is designated as SN 016-1823 (Retaining Wall 34) and will be constructed in connection with the Circle Interchange Reconstruction project in the City of Chicago, Cook County, Illinois. A *Site Location Map* is presented as Exhibit 1.

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

1.1 Project Description

The Circle Interchange is over 50 years old and has significant congestion and safety problems. The project is aiming to improve safety and mobility as well as upgrade the mainline and interchange facilities. The project will also improve other modes of transportation such as transit, pedestrians and bicyclists within the same corridor.

The Circle Interchange Reconstruction project is along Interstate 90/94 (I-90/94) from south of Roosevelt Road to north of Lake Street, along Interstate 290 (I-290) from Loomis Street to the Circle Interchange; and along Congress Parkway from the Circle Interchange to Canal Street/Old Post Office. The routes typically have three lanes of traffic in each direction with mostly one lane ramp at interchanges. Locally, the north leg is known as the Kennedy Expressway, the south leg as the Dan

Ryan Expressway and the west leg as the Eisenhower Expressway. Within the project area, there are several cross street bridges over I-90/94 and I-290 considered for reconstruction. Along I-90/94, from south to north, the cross street overpasses include Taylor Street, Van Buren Street, Jackson Boulevard, and Adams Street. Along I-290, from west to east, the cross street overpasses include Morgan Street, Peoria Street, and Halsted Street.

The proposed improvements include additional through lanes in each direction on I-90/94. The horizontal alignment and vertical profiles throughout the interchange will be improved. A new two-lane flyover, Ramp NW (Flyover) will be constructed for I-90/94 northbound to I-290 westbound traffic. Cross street bridges, Morgan Street, Harrison Street, Halsted Street, Peoria Street, Taylor Street, Adams Street, Jackson Boulevard, and Van Buren Street will be reconstructed. Various existing ramps will be reconstructed and up to fifty new retaining walls will be constructed.

1.2 Proposed Structure

Based on the Type, Size, and Location (TSL) plan received on April 18, 2019 provided by TranSystems Corporation (TranSystems), the proposed Retaining Wall 34 (SN 016-1823) will support the approach embankment to the Madison SB Entrance Ramp structure. The 130-foot long back-to-back MSE walls will start at Station 8562+04.40 and end at Station 8563+33.33 and will be offsets 19.25 feet left and 3.25 feet right. The maximum total height of wall near the ramp abutment will be 16.6 feet and will have a 3.5 foot tall parapet on the top. The TSL plan is included in *Appendix D*.

1.3 Existing Structure

There two existing cast-in-place retaining walls 26 and 27 are on spread footings and drilled shafts that measure 69’-5” from existing Madison Entrance Ramp abutment south. Maximum height from top of wall to the bottom of footing measures 16’-3”. Existing retaining walls are to be removed and replaced.

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 wall is located in the NW¼ 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 wall is situated within the Chicago Lake Plain Physiographic Subsection. The area is characterized by a flat surface that slopes gently toward the lake, largely made of groundmoraine till covered by thin and discontinuous lacustrine silt and clay. The ground elevation along the wall ranges from 586 feet at the south end to 595 feet at the north end.

2.2 Surficial Cover

The project area was shaped during the Wisconsinan-age glaciation, and more than 75-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 about 480 feet elevation or 95 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 (hardpan) of the Lemont Formation, which in turn is underlain by bedrock. Sound dolostone bedrock was sampled at depths of 98.0 and 105.0 feet bgs, corresponding to 481.0 and 481.6 feet elevation, within the predicted range based on published geological data.

3.0 METHODS OF INVESTIGATION

The following sections outline the subsurface and laboratory investigations. All elevations in this report are based on NAVD 1988.

3.1 Subsurface Investigation

Wang drilled three structure borings, designated as 34-RWB-01, 35-RWB-01, and 35-RWB-02, in July 2014. Wang has also referenced one nearby structure boring located at the northwest corner of Monroe Bridge, designated as 2054-B-02, drilled in September 2015. Wang also performed Boring VST-03 to obtain in-situ vane shear strength of soft clay. The as-drilled boring locations 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).

ATV- and truck-mounted drilling rigs equipped with hollow stem augers, were used to advance and maintain an open borehole to 10 feet depth after that mud rotary was used to the boring termination depth. 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 to boring termination depths or bedrock. Soil samples collected from each sampling interval were placed in sealed jars and transported to Wang Geotechnical Laboratory in Lombard, Illinois for further examination and laboratory testing.

Field boring logs, prepared and maintained by a Wang engineer or geologist, include lithological descriptions, visual-manual soil/rock classifications, results of Rimac and pocket penetrometer unconfined compressive strength tests, 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 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.

Groundwater observations were made during drilling to a depth of 10 feet before using rotary wash method. Due to safety considerations, boreholes were backfilled with grout immediately upon completion.

3.2 Vane Shear Tests

Wang performed vane shear tests in Borings VST-03 and 34-RWB-01. Boring VST-03 is located about 200 feet east of Wall 34. Vane shear tests were performed in undisturbed and remolded conditions using calibrated RocTest vane shear equipment. The sensitivity shown on the boring logs is the ratio of shear strength in undisturbed and remolded conditions. In general, the vane shear values for soft clays were significantly higher than the corresponding values from unconfined compressive strength tests using the RIMAC apparatus. Vane shear test results were used on our engineering analyses.

3.3 Laboratory Testing

The soil samples were tested in the laboratory for moisture content (AASHTO T265). Atterberg limits (AASHTO T 89/T 90) and particle size analyses (AASHTO T 88) tests were performed on selected soil samples representing the main soil layers encountered during the investigation. Field visual descriptions of the soil samples were verified in the laboratory. Laboratory test results are shown in the *Boring Logs* (Appendix A), in the *Soil Profile* (Exhibit 4), and in the *Laboratory Test Results* (Appendix B).

4.0 RESULTS OF FIELD AND LABORATORY INVESTIGATIONS

Detailed descriptions of the soil conditions encountered during our 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

Borings drilled on the Madison SB Entrance Ramp encountered 4 to 6 inches of asphalt overlying 6 to 14 inches of concrete followed by crushed stone base course. Boring 2054-B-02 encountered 5 inches of asphalt overlying 10 inches of concrete followed by crushed stone. In descending order, the general lithologic succession encountered beneath the pavement structure: 1) man-made ground (fill); 2) stiff silty clay to silty clay loam; 3) very soft to medium stiff clay to silty clay; 4) stiff to hard clay to silty clay loam; 5) dense to very dense silt to silty loam and sand to gravelly sand; and 6) strong dolostone.

1) Man-made ground (fill)

Underneath the pavement structure, the borings encountered 2 to 12 feet of fill. Granular fill consists of loose to medium dense, brown sand white sandy gravel. Cohesive fill includes stiff, gray silty clay loam. The granular fill layer has N-values of 4 to 13 blows per foot and moisture content value of 3%. The cohesive fill layer has an unconfined compressive strength (Q_u) value of 1.8 tsf and moisture content value of 20%.

2) Stiff silty clay to silty clay loam

Beneath the pavement, at elevation of 573.8 feet, Boring 34-RWB-01 encountered 2.5-foot thick of stiff, brown to gray silty clay loam. This layer has Q_u value of 1.23 tsf and moisture content value of 19%.

3) Very soft to medium stiff clay to silty clay

At elevations of 571.8 to 574.9 feet (5.5 to 14.5 feet bgs), the borings revealed up to 33 feet of very soft to medium stiff, gray clay to silty clay with Rimac Q_u values of 0.08 to 0.90 tsf and moisture content values of 18 to 31%. This layer is commonly known as the "*Chicago Blue Clay*."

As discussed in Section 3.2, undrained shear strength values from vane shear tests are generally higher than Rimac tests. In-situ undisturbed vane shear strengths obtained in Boring VST-03 between elevations 574 and 542 feet ranged from 370 to 1680 psf.

4) Stiff to hard stiff clay to silty clay loam

At elevations of 539.8 to 543.6 feet (37 to 47 feet bgs), the borings encountered up to 32 feet of stiff to hard clay to silty clay loam. The unit has Q_u values of 1.1 to 4.8 tsf and moisture content values of 17 to 27%. Laboratory index testing on samples from this layer showed a liquid limit (L_L) value of 27% and a plastic limit (P_L) value of 16%.

(5) Dense to very dense silt to silty loam and sand to gravelly sand

At elevations of 512.3 to 517.6 feet (67 to 69 feet bgs), Borings 2054-B-02 and 35-RWB-01 encountered up to 36 feet of dense to very dense silt to silty loam and sand to gravelly sand. This layer has N values of 32 to over 50 blows per foot.

(6) Strong dolostone

Borings 35-RWB-01 and 2054-B-02 encountered strong bedrock at elevations of 481.0 and 481.6 feet or 98.0 and 105.0 feet bgs. Based on the 2 and 3-foot long rock cores obtained from the borings, the measured RQD values are 25 and 32% corresponding poor to fair rock quality. *Bedrock core photograph is* shown in Appendix A.

4.2 Groundwater Conditions

Groundwater was not observed during drilling or after drilling in borings due to the mud rotary drilling from 10 feet bgs. Groundwater may be perched within the granular fill layers. Water-bearing silt and gravel layers may also be present at deeper levels. A Piezometer 30-PZ-01 was installed for the nearby structure about 230 feet east of the proposed Retaining Wall 34 on November 21, 2014 and monitored until March 2017. The screen was placed with the top and bottom elevations at 503.7 and 493.7 feet (89.5 to 99.5 feet bgs), respectively within granular layers above bedrock. Piezometer readings show an average water table elevation of 545.8 feet indicating under hydrostatic pressure within the granular deposit encountered on top of the bedrock.

Although groundwater was not observed within upper granular fill layers, we anticipate perched water may be encountered during times of heavy precipitation.

4.3 Seismic Design Considerations

The retaining wall is located in Seismic Performance Zone (SPZ) 1 and is not required to be designed for seismic forces as per 2012 IDOT *Bridge Manual* (IDOT 2012).

5.0 ANALYSIS AND RECOMMENDATIONS

5.1 Retaining Wall Type Evaluation

Based on TSL, the proposed Retaining Wall 34 (SN 016-1823) will support the approach embankment to the Madison SB Entrance Ramp structure. The 130-foot long back-to-back MSE walls will start at Station 8562+04.40 and end at Station 8563+33.33. The maximum total height near the ramp abutment will be 16.6 feet and will have a 3.5 foot tall parapet on the top. The MSE Wall is a feasible as proposed.

The following sections present the results of our geotechnical engineering analyses and recommendations for the back-to-back MSE walls design and construction.

5.2 MSE Walls

The back-to-back MSE retaining walls base should be established a minimum of 3.5 feet below the finished grade at the front face of the wall for frost protection.

5.2.1 Bearing Resistance and External Stability Analyses

Based on our boring data, the foundation soils at the MSE wall base elevations consist of about 0.8 feet of granular fill overlying up to 33 feet of soft to medium stiff clay to silty clay. We estimate, without foundation treatment, the soils will have a nominal bearing resistance of 2,900 psf and a factored bearing resistance of 1,800 psf based on a geotechnical resistance factor of 0.65 (AASHTO 2017).

We have considered reinforcement lengths equal to 70 percent of the total wall height or a minimum of 8 feet. We analyzed several alternatives for the fill material to be used in the reinforcement zone and fill area in the back-to-back walls as follows:

1. Using regular fill material (unit weight of 125 pcf) for the MSE wall zone and fill area; and
2. Using IDOT District One Class III Lightweight Cellular Concrete Fill (LCCF) for the MSE wall reinforcement zone and between the back-to-back walls.

For Option 1, at the highest portion of the wall near Station 8562+04.40, the wall will apply a maximum factored equivalent bearing pressure of 4,700 psf with a regular MSE wall fill material (unit weight is 125 pcf) which exceeds the factored bearing resistance available, thus Option 1 is not feasible.

In Option 2, to reduce the applied wall pressure, we have considered IDOT District One Special Provisions Class III LCCF with as-cast density ranging from 36 to 44 pcf for the MSE wall zone and between the back-to-back walls. We estimate the wall will apply a maximum equivalent factored bearing pressure of 1,600 psf; thus, the foundation soils will have sufficient bearing resistance to support the wall.

The estimated friction angle between an MSE wall base and underlying cohesive soil is 30º, and the corresponding friction coefficient is 0.58. MSE retaining walls are designed based on a geotechnical sliding resistance factor of 1.0 for soil-on-soil contact (AASHTO 2017).

We recommend Option 2 with 0.7 H reinforcement width for back-to-back walls. It should be noted that the embankment between the back-to-back walls should consist of LCCF so it does not exert any earth pressure on the LCCF MSE mass.

5.2.2 Settlement Analyses

For Option 2, considering the unloading and reloading effect and the placement of LCCF, the applied service pressure will be less than the existing pressure. Therefore, the settlement is not concern.

5.2.3 Global Stability Analyses

With Class III LCCF being used as a fill material in reinforced zone and in between the walls, thus the whole mass will act as rigid body with significant reduction of the driving forces. Therefore, we do not see global stability concerns for the proposed back-to-back MSE retaining walls.

6.0 CONSTRUCTION CONSIDERATIONS

6.1 Excavation

Any required excavations should be performed in accordance with local, state, and federal regulations including current OSHA regulations. The potential effect of ground movements upon nearby structures and utilities should be considered during construction. As per TSL plan, the existing Madison SB Entrance Ramp traffic will be closed and traffic will be detoured during construction. Existing Madison Street Bridge to remain open during construction. Traffic on I-90/94 will be maintained with stage construction. The existing abutment should be protected during MSE wall construction since about 10 feet of excavation will be required near the abutment.

6.2 Dewatering

Based on the results of our investigation and proposed excavation for the wall, perched water is likely to be encountered during construction during times of heavy precipitation which should be removed through conventional sump and pump methods.

6.3 Filling and Backfilling

All fill and backfill materials will be as per IDOT *Standard Specification for Road and Bridge Construction* (IDOT 2016).

6.4 Wall Construction

The wall should be constructed as per IDOT *Standard Specification for Road and Bridge Construction* (IDOT 2016). Class III LCCF should be as per IDOT District One special provision.

6.5 Construction Monitoring

There is no need for special construction monitoring for the retaining wall except normally required by the IDOT *Standard Specification for Road and Bridge Construction* (IDOT 2016).

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 Retaining Wall 34 (SN016-1823) are planned, we should be timely informed so that our recommendations can be adjusted accordingly.

It has been a pleasure to assist AECOM 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: 11/30/21

WANG ENGINEERING, INC.

METIN WOLFGANG SEYHUN
062-052588
LICENSED
PROFESSIONAL
ENGINEER
OF
ILLINOIS

Metin W. Seyhun, P.E.
Senior Geotechnical Engineer

Nesam S. Balakumaran
Project Geotechnical Engineer

Corina T. Farez, P.E., P.G.
Project Manager

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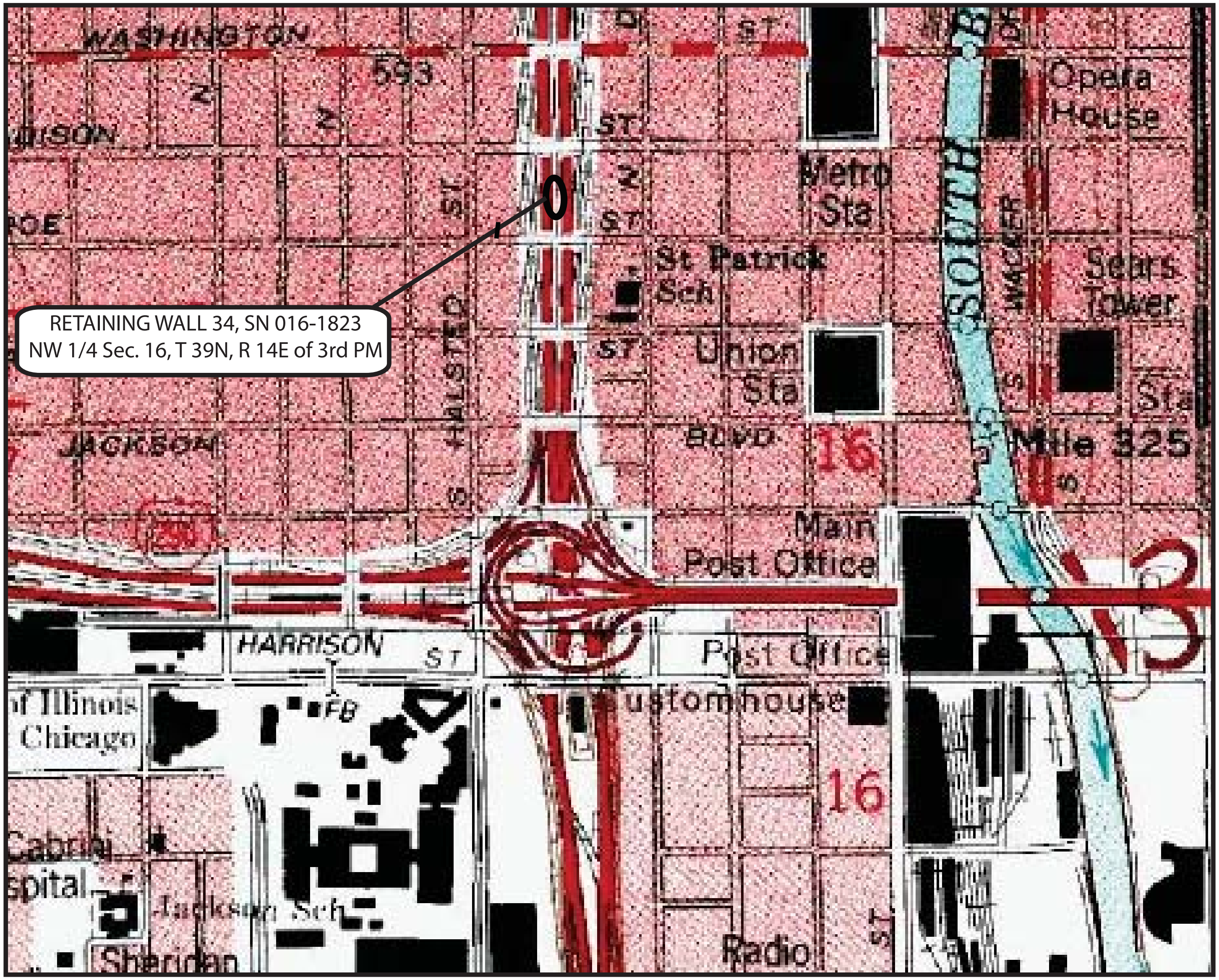
EXHIBITS



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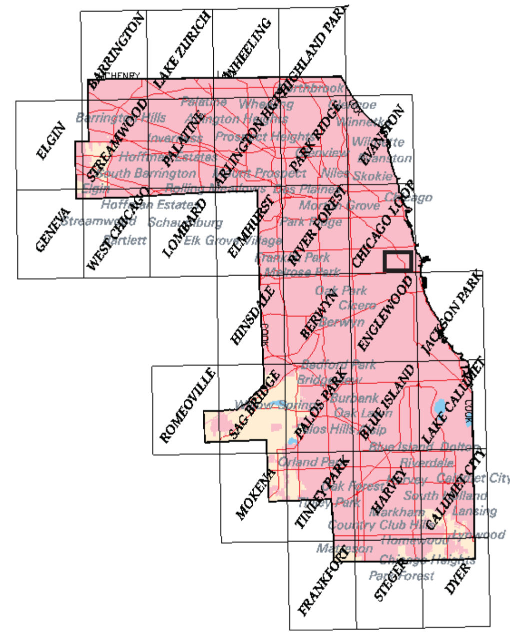

Cook County

0 0.25 0.5 Mile

SITE LOCATION MAP: CIRCLE INTERCHANGE RECONSTRUCTION
RETAINING WALL 34, SN 016-1823, COOK COUNTY

SCALE: GRAPHICAL	EXHIBIT 1	DRAWN BY: NSB CHECKED BY: MWS

Wang Engineering

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

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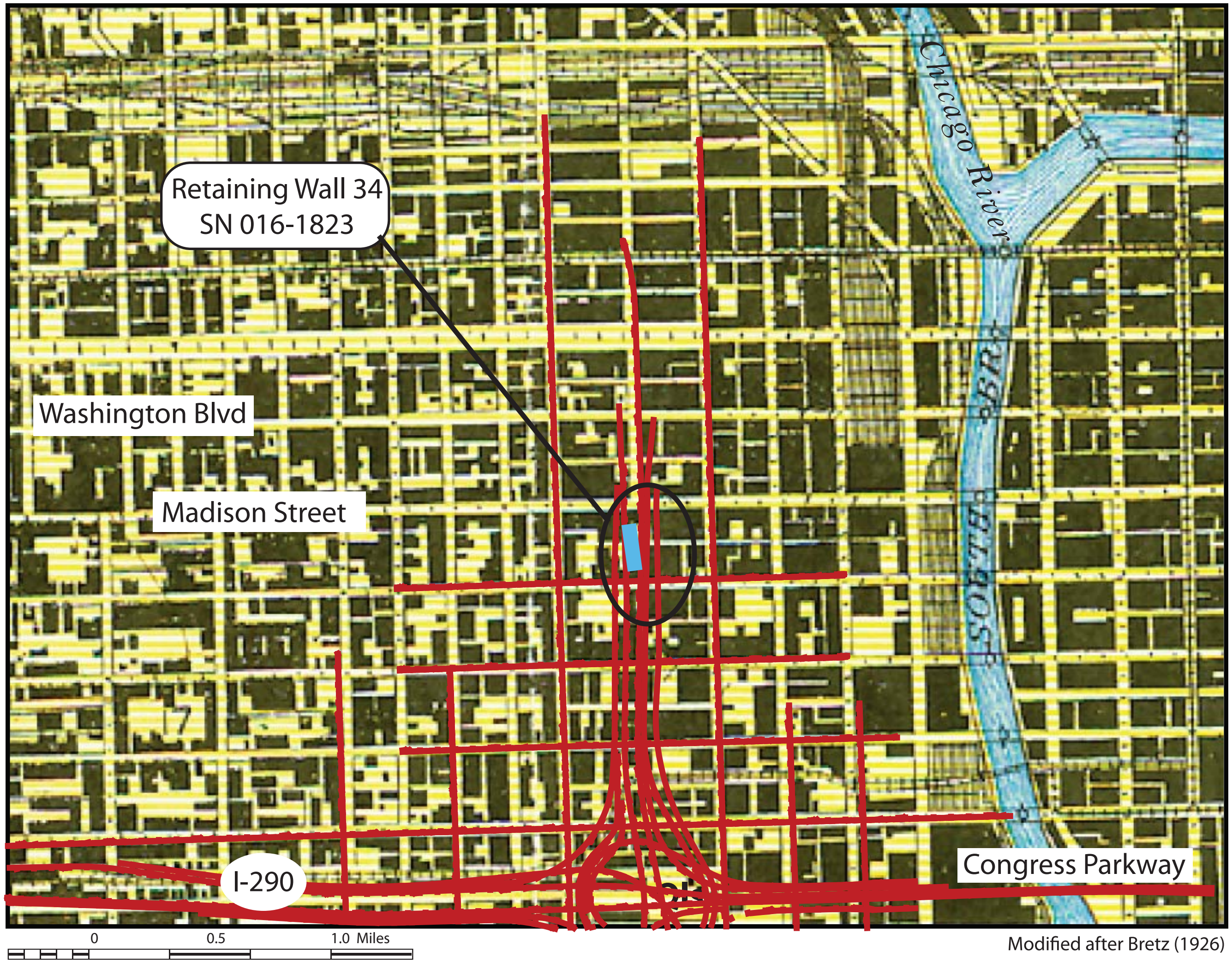

Modified after Bretz (1926)

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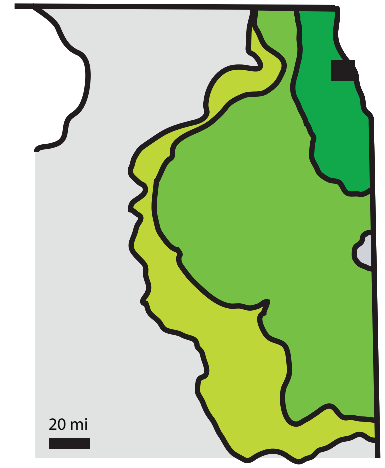
REGIONAL GEOLOGY



Wedron Group

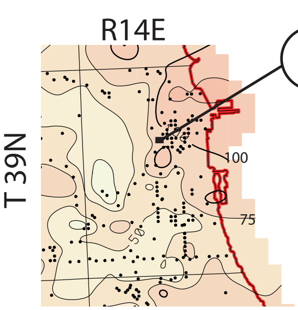
- Wadsworth Formation
- Lemont Formation
- Tiskilwa Formation

Modified after Hansel and Johnson (1996)

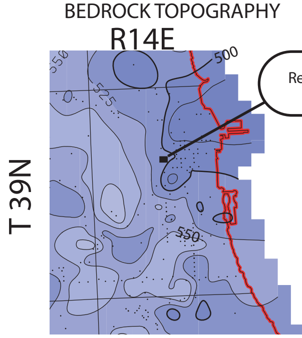
Legend

Qls	Glacial lake bottom (Covered by lacustrine deposits)

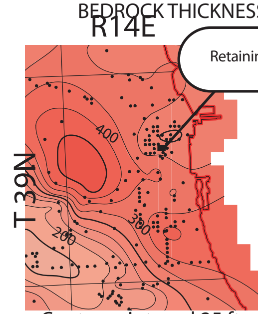
DRIFT THICKNESS



BEDROCK TOPOGRAPHY



BEDROCK THICKNESS



Contours interval 25 ft
Modified after Leetaru et. al. (2004)

0 2 4 8 miles

SITE AND REGIONAL GEOLOGY: CIRCLE INTERCHANGE RECONSTRUCTION, RETAINING WALL 34, SN 016-1823, COOK COUTY, IL		
SCALE: GRAPHIC AL	EXHIBIT 2	DRAWN BY: R. KC CHECKED BY : C. Marin
Wang Engineering		1145 N. Main Street Lombard, IL 60148 www.wangeng.com
FOR AECOM		1100-04-01

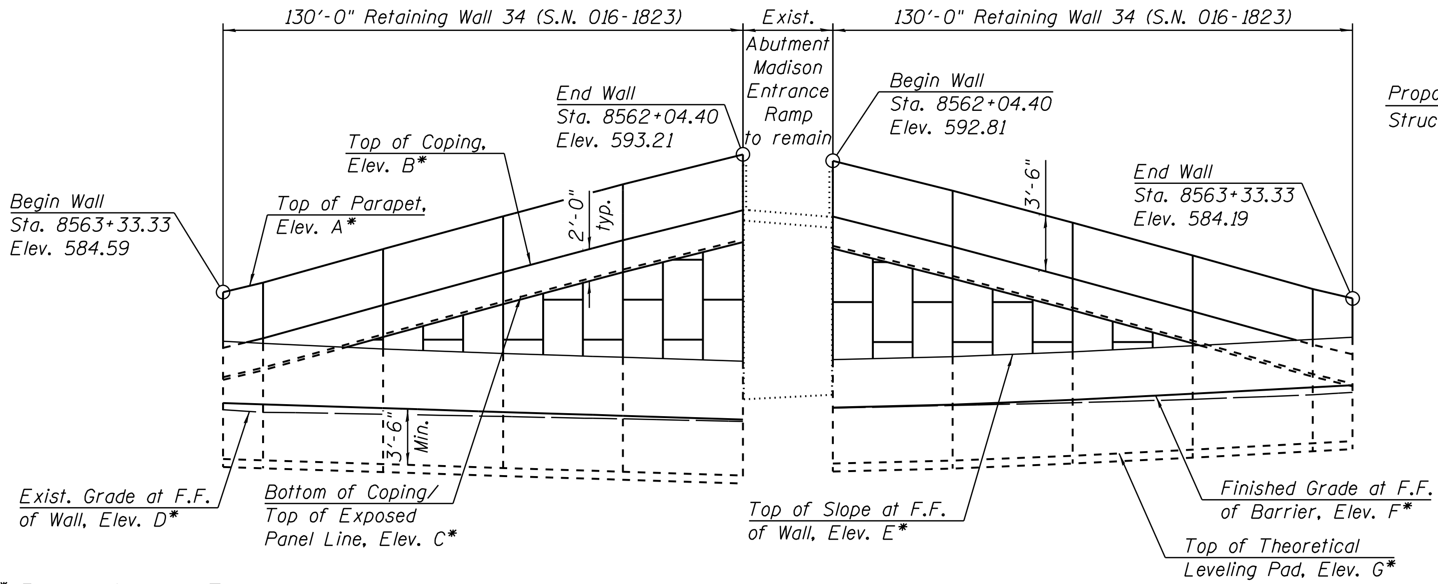
Bench Mark: Chisel "X" on east side of I-90 ±80 feet South of Monroe Street on southeast corner of handhole on concrete. Elev. 578.58.

Existing Structure: Existing Retaining Walls 26 and 27. XX.

The existing bridge will be closed and traffic will be detoured during construction. Traffic on I-290 and I-90/94 will be maintained with stage construction.

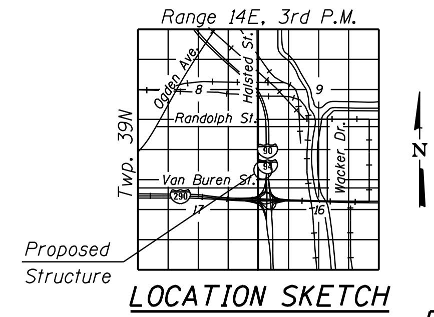
No Salvage.

Notes:
1. Wall offsets are measured from the ℄ of Madison SB Entrance Ramp to the front face of precast panels.
2. F.F. denotes Front Face.
3. B.F. denotes Back Face.



* For elevations, see Table 1 on Sheet 2 of 2.

UNFOLDED ELEVATION
(Looking West at F.F. of Wall)



LOCATION SKETCH

CURVE DATA
(Madison Entrance Ramp)
Prop. Curve P-MAD-ST-1
P.I. Sta. = 8562+69.46
Δ = 3° 07' 15"
D = 5° 24' 19"
R = 1,060.00'
T = 28.88'
L = 57.74'
E = 0.39'
e = NA
T.R. = NA
S.E. Run = NA
P.C. Sta. = 8562+40.59
P.T. Sta. = 8562+98.32

CURVE DATA
(I-90/94 NB)
Prop. Curve P-KDR-NB-5
P.I. Sta. = 6159+31.09
Δ = 2° 57' 23"
D = 0° 30' 55"
R = 11,122.00'
T = 286.99'
L = 573.86'
E = 3.70'
e = NA
T.R. = NA
S.E. Run = NA
P.C. Sta. = 6156+44.09
P.T. Sta. = 6162+17.96

DESIGN SPECIFICATIONS
2017 AASHTO LRFD Bridge Design Specifications 8th Edition

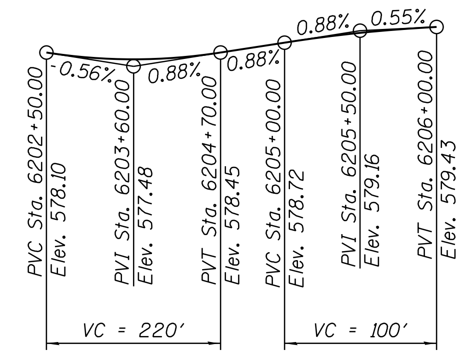
DESIGN STRESSES
FIELD UNITS
f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

PRECAST UNITS
f'c = 4,500 psi

HIGHWAY CLASSIFICATION
Madison Entrance Ramp
Functional Class: Interstate
ADT: ___ (2012); ___ (2040)
ADTT: __ (2012); __ (2040)
DHV: ___ (2040)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic
Directional Distribution: 100%

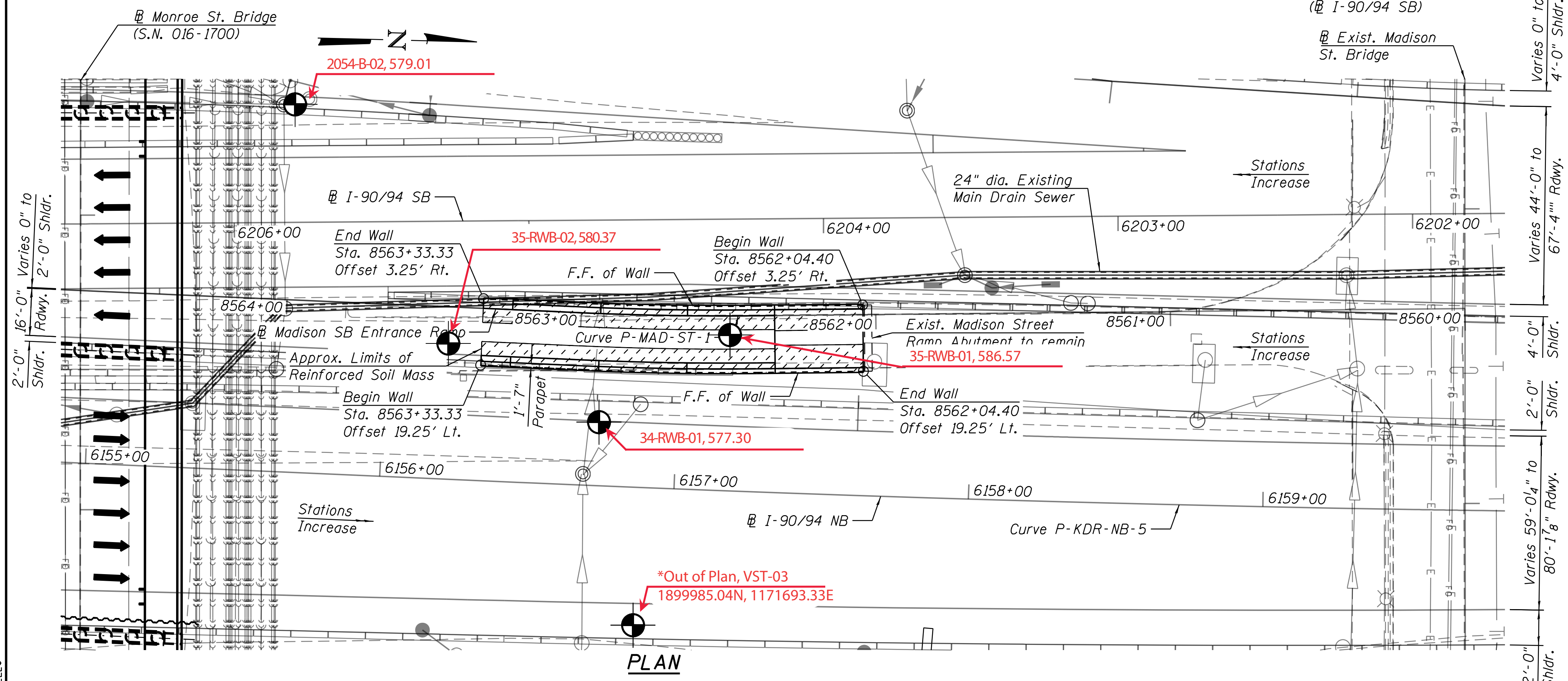
I-90/94 NB
Functional Class: Interstate
ADT: _____ (2012); _____ (2040)
ADTT: ___ (2012); ___ (2040)
DHV: ____ (2040)
Design Speed: __ m.p.h.
Posted Speed: __ m.p.h.
One-Way Traffic
Directional Distribution: 100%

I-90/94 SB
Functional Class: Interstate
ADT: _____ (2012); _____ (2040)
ADTT: ___ (2012); ___ (2040)
DHV: ____ (2040)
Design Speed: __ m.p.h.
Posted Speed: __ m.p.h.
One-Way Traffic
Directional Distribution: 100%



PROFILE GRADE
(℄ I-90/94 SB)

GENERAL PLAN
RETAINING WALL 34 ALONG MADISON SB ENTRANCE RAMP
F.A.I. RTE. 90/94 (KENNEDY EXPRESSWAY)
SECTION 2015-018R
COOK COUNTY
STATION 8562+04.40 TO STATION 8563+33.33
STRUCTURE NO. 016-1823



PLAN

LEGEND:

Ex. Chain Link Fence	—x—x—	Soil Boring	
Combined Sewer		Existing Catch Basin	
Electric	—E—	Proposed Catch Basin	
Ex. Storm Sewer		Existing Manhole	
Prop. Storm Sewer		Proposed Manhole	
Ex. Fiber Optic	—FO—	Proposed Inlet	
Ex. ITS Cable	— — —	Limits of Soil Reinforcement	

BORING LOCATION PLAN:CIRCLE INTERCHANGE RECONSTRUCTION
RETAINING WALL 34, SN. 016-1823, COOK COUNTY, IL

SCALE: GRAPHICAL	EXHIBIT 3	DRAWN BY: RKC CHECKED BY: N. Balakumaran

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

FOR AECOM | 1100-04-01

TranSystems

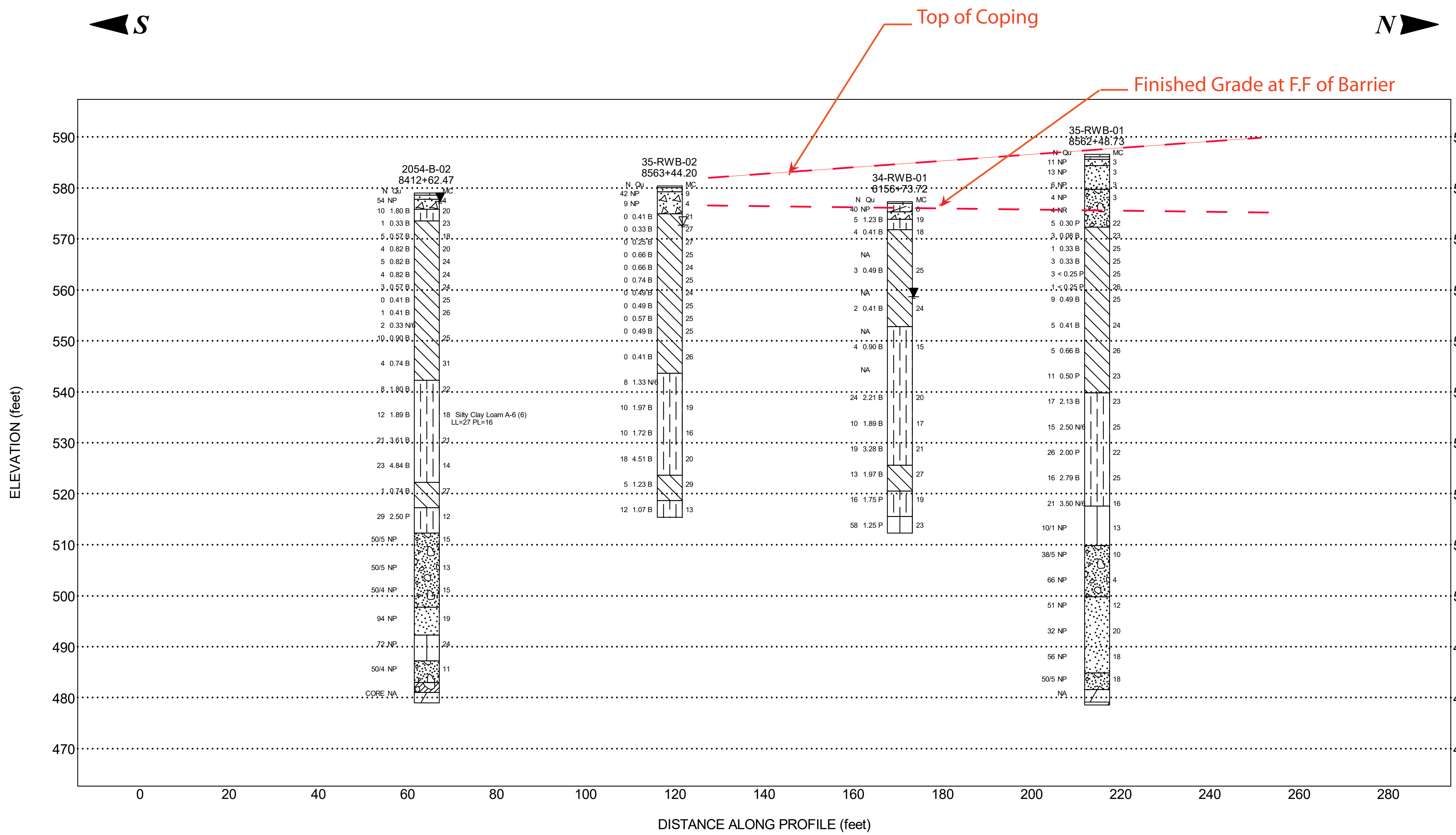
USER NAME = $USER$	DESIGNED - JNP	REVISED -	
	CHECKED - WJC/MDS	REVISED -	
PLOT SCALE = $SCALE$	DRAWN - JNP	REVISED -	
PLOT DATE = $DATE$	CHECKED - WJC/MDS	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SHEET NO. 1 OF 2 SHEETS

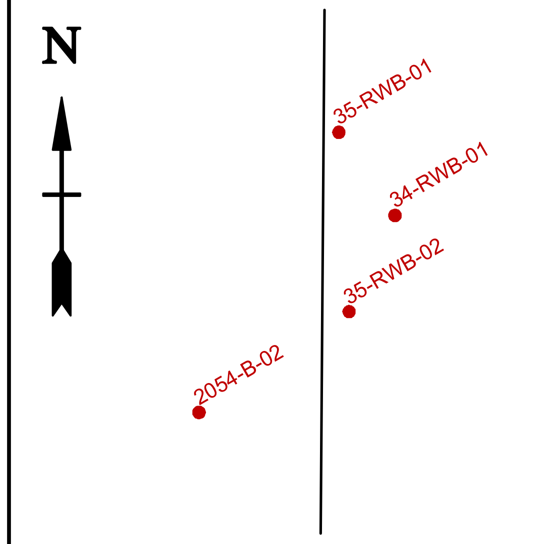
F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
90/94	2015-018R	COOK	2	1
		CONTRACT NO. 62A77		
	ILLINOIS FED. AID PROJECT			

$TIME$ - $FILE$



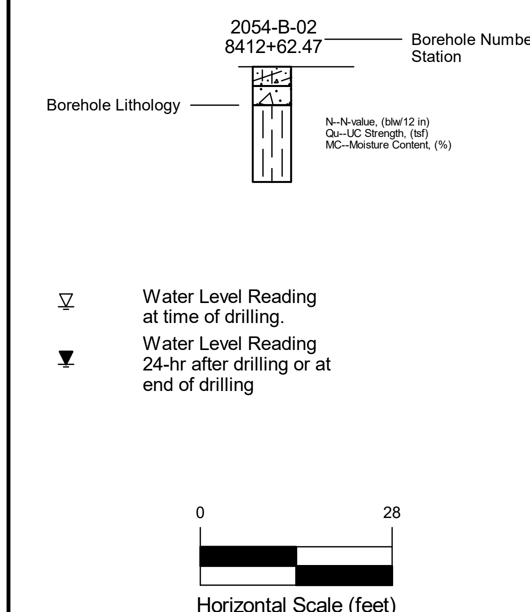
Lithology Graphics

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



Site Map Scale 1 inch equals 105 feet

Explanation:



Vertical Exaggeration: 1x

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

Soil Profile
Retaining Wall 34, SN 016-1823

WEI SINCE 1982

Jane Byrne Interchange
Section 17, T39N, R14E of 3rd PM

JOB NUMBER	PLATE NUMBER
1100-04-01	EXHIBIT 4

WEI 11X17 11000401.GPJ WANGENG.GDT 3/25/19

APPENDIX A

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG 2054-B-02

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 579.01 ft
North: 1899869.30 ft
East: 1171404.59 ft
Station: 8412+62.47
Offset: 73.45 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
578.6	5-inch thick ASPHALT					
577.8	10-inch thick CONCRETE --PAVEMENT--					
575.8	Very dense, gray CRUSHED STONE --BASE COURSE--		1	21 29 25	NP	4
573.5	Stiff, gray SILTY CLAY LOAM, trace gravel --FILL--	5	2	6 4 6	1.80 B	20
	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel		3	0 0 1	0.33 B	23
		10	4	0 2 3	0.57 B	18
			5	1 2 2	0.82 B	20
		15	6	0 2 3	0.82 B	24
			7	1 2 2	0.82 B	24
		20	8	0 1 2	0.57 B	24
			9	0 0 0	0.41 B	25
		25	10	0 0 1	0.41 B	26
			11	0 1 1	0.33 N/6	
		30	12	4 5 5	0.90 B	25
		35	13	1 2 2	0.74 B	31
542.3	Stiff to hard, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel					
		40	14	3 3 5	1.80 B	22

GENERAL NOTES

Begin Drilling **09-15-2015** Complete Drilling **09-20-2015**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR [78%]**
Driller **K&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **Rotary wash**
At Completion of Drilling ▼ **Mud at 5 ft**
Time After Drilling **120 hours**
Depth to Water ▽ **2.00 ft**

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

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
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BORING LOG 2054-B-02

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 579.01 ft
North: 1899869.30 ft
East: 1171404.59 ft
Station: 8412+62.47
Offset: 73.45 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
	--L_L(%)=27, P_L(%)=16-- --%Gravel=4.4-- --%Sand=21.2-- --%Silt=54.9-- --%Clay=19.5-- --A-6 (6)--	45	15	6 6 6	1.89 B	18
		50	16	5 8 13	3.61 B	21
		55	17	11 12 11	4.84 B	14
522.3	Medium stiff, gray CLAY to SILTY CLAY, trace gravel					
		60	18	0 0 1	0.74 B	27
517.3	Very stiff, gray SILTY CLAY LOAM, trace gravel					
		65	19	5 14 15	2.50 P	12
512.3	Very dense, gray GRAVELLY SAND to SANDY LOAM; wet to saturated					
			20	50/5	NP	15
	--possible under pressure groundwater bearing layer--	70				
	--hard drilling, 69.5 to 73.5 feet-- *possible cobbles*					
		75	21	34 37 50/5	NP	13
	--hard drilling, 73.5 to 78.5 feet-- *possible cobbles*					
			22	50/4	NP	15
		80				

GENERAL NOTES

Begin Drilling **09-15-2015** Complete Drilling **09-20-2015**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR [78%]**
Driller **K&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **Rotary wash**
At Completion of Drilling ▼ **Mud at 5 ft**
Time After Drilling **120 hours**
Depth to Water ▼ **2.00 ft**

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

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG 2054-B-02

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 579.01 ft
North: 1899869.30 ft
East: 1171404.59 ft
Station: 8412+62.47
Offset: 73.45 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
497.8	Very dense, gray, fine SAND; saturated						
		85	SS	23	32 47 47	NP	19
492.3	Very dense, gray SILT; saturated						
		90	SS	24	18 30 42	NP	24
487.3	Very dense, gray GRAVELLY SAND; saturated						
		95	SS	25	38 42 50/4	NP	11
483.0	--very hard, steady drilling-- --WEATHERED BEDROCK--						
481.0	Strong, light gray, very poor rock quality, bedded, slightly vuggy DOLOSTONE, highly fragmented, 2-inch joint spacing, joints with less than 0.2 inch or no infilling, hard joint walls --Run 1 -RECOVERY= 83%-- --RQD= 25%--		CORE	1	CORE		
479.0	Boring terminated at 100.00 ft	100					
		105					
		110					
		115					
		120					

GENERAL NOTES

Begin Drilling **09-15-2015** Complete Drilling **09-20-2015**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR [78%]**
Driller **K&N** Logger **F. Bozga** Checked by **C. Marin**
Drilling Method **3.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **Rotary wash**
At Completion of Drilling ▼ **Mud at 5 ft**
Time After Drilling **120 hours**
Depth to Water ▼ **2.00 ft**

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

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG 34-RWB-01

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 577.30 ft
North: 1899974.61 ft
East: 1171509.36 ft
Station: 6156+73.72
Offset: 21.5607 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type (recovery)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
577.0	4-inch thick, ASPHALT						
	14-inch thick, CONCRETE						
575.3	Dense, white CRUSHED STONE --BASE COURSE-- --DRY--		SS	1	23 25 15	NP	6
573.8	Stiff, gray and brown SILTY CLAY LOAM, trace gravel	5	SS	2	1 2 3	1.23 B	19
571.8	Soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel		SS	3	0 1 3	0.41 B	18
		10					
	--In-Situ Vane Shear, 11.5 feet-- --$S_{u\ undis}$ = 1010 psf-- --$S_{u\ remold}$ = 544 psf-- --Sensitivity = 1.86--		Vane	1			
		15	SS	4	0 1 2	0.49 B	25
	--In-Situ Vane Shear, 19.0 feet-- --$S_{u\ undis}$ = 803 psf-- --$S_{u\ remold}$ = 363 psf-- --Sensitivity = 2.12--		Vane	2			
		20					
			SS	5	0 0 2	0.41 B	24
552.8	Medium stiff to very stiff, gray SILTY CLAY to SILTY CLAY LOAM, trace gravel	25					
	--In-Situ Vane Shear, 26.5 feet-- --$S_{u\ undis}$ = 1140 psf-- --$S_{u\ remold}$ = 673 psf-- --Sensitivity = 1.69--		Vane	3			
		30	SS	6	1 1 3	0.90 B	15
	--In-Situ Vane Shear, 34.0 feet-- --$S_{u\ undis}$ = 1165 psf-- --$S_{u\ remold}$ = 544 psf-- --Sensitivity = 2.13--	35	Vane	4			
		40	SS	7	5 10 14	2.21 B	20

GENERAL NOTES

Begin Drilling **07-21-2014** Complete Drilling **07-21-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **CME-55 TMR [85%]**
Driller **A&K** Logger **A. Happel** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **Rotary wash**
At Completion of Drilling ▼ **19.00 ft**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG 34-RWB-01

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 577.30 ft
North: 1899974.61 ft
East: 1171509.36 ft
Station: 6156+73.72
Offset: 21.5607 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		45	8	2 4 6	1.89 B	17
		50	9	5 6 13	3.28 B	21
525.6	Stiff, gray SILTY CLAY, trace gravel					
		55	10	5 5 8	1.97 B	27
520.6	Stiff, gray SILTY CLAY LOAM, trace gravel					
		60	11	4 5 11	1.75 P	19
515.6	Very dense, gray SILTY LOAM --Moist--					
512.3		65	12	19 22 36	1.25 P	23
	Boring terminated at 65.00 ft					
		70				
		75				
		80				

GENERAL NOTES

Begin Drilling **07-21-2014** Complete Drilling **07-21-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **CME-55 TMR [85%]**
Driller **A&K** Logger **A. Happel** Checked by **C. Marin**
Drilling Method **2.25" SSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **Rotary wash**
At Completion of Drilling: **19.00 ft**
Time After Drilling: **NA**
Depth to Water: **NA**

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

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
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BORING LOG 35-RWB-01

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 586.57 ft
North: 1900019.05 ft
East: 1171479.36 ft
Station: 8562+48.73
Offset: 6.7436 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
586.1	6-inch thick, ASPHALT --PAVEMENT--					
585.6	6-inch thick, CONCRETE --PAVEMENT--					
584.4	White CRUSHED STONE --BASE COURSE--		1	3, 5, 6	NP	3
	Medium dense, brown, fine SAND, trace gravel --FILL--	5	2	6, 6, 7	NP	3
579.7	Loose, grayish white SANDY GRAVEL --FILL--		3	4, 3, 3	NP	3
		10	4	1, 2, 2	NP	3
			5	2, 2, 2	NR	
572.3	Very soft to medium stiff, gray CLAY to SILTY CLAY, trace gravel	15	6	5, 3, 2	0.30 P	22
			7	0, 1, 2	0.08 B	23
		20	8	0, 0, 1	0.33 B	25
			9	0, 1, 2	0.33 B	25
		25	10	0, 1, 2	< 0.25 P	25
			11	0, 0, 1	< 0.25 P	26
		30	12	1, 4, 5	0.49 B	25
		35	13	0, 3, 2	0.41 B	24
		40	14	1, 2, 3	0.66 B	26

GENERAL NOTES

Begin Drilling **07-07-2014** Complete Drilling **07-08-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR [78%]**
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 ▽ **Rotary wash**
At Completion of Drilling ▼ **mud in the borehole**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

Wang Engineering
wangeng@wangeng.com
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BORING LOG 35-RWB-01

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 586.57 ft
North: 1900019.05 ft
East: 1171479.36 ft
Station: 8562+48.73
Offset: 6.7436 LT

Elevation (ft)	Soil and Rock Description	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		45	15	2, 4, 7	0.50 P	23
539.8	Very stiff, gray SILTY CLAY, trace gravel					
		50	16	5, 7, 10	2.13 B	23
		55	17	5, 7, 8	2.50 N/6	25
		60	18	5, 10, 16	2.00 P	22
		65	19	4, 7, 9	2.79 B	25
517.6	Very dense, gray SILTY LOAM, trace to some gravel	70	20	8, 10, 11	3.50 N/6	16
		75	21	38, 52, 10/1	NP	13
509.8	Very dense, gray GRAVELLY SAND --Moist--					
		80	22	32, 40, 38/5	NP	10

GENERAL NOTES

Begin Drilling: **07-07-2014** Complete Drilling: **07-08-2014**
Drilling Contractor: **Wang Testing Services** Drill Rig: **D-50 TMR [78%]**
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: **Rotary wash**
At Completion of Drilling: **mud in the borehole**
Time After Drilling: **NA**
Depth to Water: **NA**

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

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wangeng@wangeng.com
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Lombard, IL 60148
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BORING LOG 35-RWB-01

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 586.57 ft
North: 1900019.05 ft
East: 1171479.36 ft
Station: 8562+48.73
Offset: 6.7436 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		85	23	19 33 33	NP	4
499.8	Dense to very dense, gray, fine to medium SAND, trace gravel --Moist--					
	--possible underpressure groundwater bearing layer--	90	24	20 26 25	NP	12
	--Wet--	95	25	15 14 18	NP	20
		100	26	16 29 27	NP	18
484.8	Very dense, gray GRAVELLY SAND --Wet--		27	50/5	NP	18
481.6	Strong, light gray, poor rock mass quality, bedded DOLOSTONE, up to 6-inch beds, 3-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= 97%-- --RQD= 32%--	105	1			
478.6	Boring terminated at 108.00 ft	110				
		115				
		120				

GENERAL NOTES

Begin Drilling **07-07-2014** Complete Drilling **07-08-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **D-50 TMR [78%]**
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 **Rotary wash**
At Completion of Drilling **mud in the borehole**
Time After Drilling **NA**
Depth to Water **NA**

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

Wang Engineering
wangeng@wangeng.com
1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG 35-RWB-02

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 580.37 ft
North: 1899923.16 ft
East: 1171484.85 ft
Station: 8563+44.20
Offset: 12.9370 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
580.0	4-inch thick ASPHALT --PAVEMENT--					
579.2	10-inch thick CONCRETE --PAVEMENT--					
	Loose to dense, gray CRUSHED STONE --FILL--		1	9 30 12	NP	9
		5	2	4 5 4	NP	4
574.9	Soft to medium stiff, brown CLAY to SILTY CLAY, trace gravel		3	0 0 0	0.41 B	21
	--Wet SAND lens--	10	4	0 0 0	0.33 B	27
			5	0 0 0	0.25 B	27
		15	6	0 0 0	0.66 B	25
			7	0 0 0	0.66 B	24
		20	8	0 0 0	0.74 B	25

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
			9	0 0 0	0.49 B	24
		25	10	0 0 0	0.49 B	25
			11	0 0 0	0.57 B	25
		30	12	0 0 0	0.49 B	25
		35	13	0 0 0	0.41 B	26
543.6	Stiff to hard, gray SILTY CLAY, trace to little gravel					
		40	14	3 4 4	1.33 N/6	

GENERAL NOTES

Begin Drilling **07-08-2014** Complete Drilling **07-08-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR [100%]**
Driller **A&K** Logger **A. Mohammed** Checked by **C. Marin**
Drilling Method **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **8.00 ft**
At Completion of Drilling ▼ **mud in the borehole**
Time After Drilling **NA**
Depth to Water ▼ **NA**
The stratification lines represent the approximate boundary between soil types; the actual transition may be gradual.

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BORING LOG 35-RWB-02

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 580.37 ft
North: 1899923.16 ft
East: 1171484.85 ft
Station: 8563+44.20
Offset: 12.9370 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		45		15	3 5 5	1.97 B	19
		50		16	4 5 5	1.72 B	16
		55		17	7 7 11	4.51 B	20
523.6	Stiff, gray CLAY to SILTY CLAY, trace gravel						
		60		18	2 2 3	1.23 B	29
518.6	Stiff, gray SILTY CLAY LOAM, trace gravel						
515.4		65		19	4 7 5	1.07 B	13
	Boring terminated at 65.00 ft						
		70					
		75					
		80					

GENERAL NOTES

Begin Drilling **07-08-2014** Complete Drilling **07-08-2014**
Drilling Contractor **Wang Testing Services** Drill Rig **B-57 TMR [100%]**
Driller **A&K** Logger **A. Mohammed** Checked by **C. Marin**
Drilling Method **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling ▽ **8.00 ft**
At Completion of Drilling ▼ **mud in the borehole**
Time After Drilling **NA**
Depth to Water ▼ **NA**

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

Wang Engineering
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1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG VST-03

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 593.21 ft
North: 1899985.05 ft
East: 1171693.33 ft
Station: 8415+53.90
Offset: 182.276 LT

Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type recovery	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
592.9	ASPHALT --PAVEMENT--						
	Medium dense, brown gravelly coarse SAND --FILL--						
		5	SS	1	5 7 7	NP	6
586.5	Medium stiff, brown and gray SILTY CLAY LOAM						
		10	SS	2	3 2 2	0.75 P	26
580.2	Soft, gray SILTY CLAY						
		15	SS	3	3 2 2	NR	
			SS	4	1 1 1	0.25 P	23
575.0							
	--In-Situ Vane Shear, 19.5 feet--	20	VS	1			
	--$S_{u\ undis}$ = 425.9 psf-- --$S_{u\ remold}$ = 371.3 psf-- --Sensitivity = 1.1--				VS		
	--In-Situ Vane Shear, 22.0 feet-- --$S_{u\ undis}$ = 371.3 psf-- --$S_{u\ remold}$ = 305.8 psf-- --Sensitivity = 1.2--		VS	2	VS		
	--In-Situ Vane Shear, 24.5 feet-- --$S_{u\ undis}$ = 382.2 psf-- --$S_{u\ remold}$ = 316.7 psf-- --Sensitivity = 1.2--	25	VS	3	VS		
	--In-Situ Vane Shear, 27.0 feet-- --$S_{u\ undis}$ = 393.1 psf-- --$S_{u\ remold}$ = 338.5 psf-- --Sensitivity = 1.2--		VS	4	VS		
	--In-Situ Vane Shear, 29.5 feet-- --$S_{u\ undis}$ = 622.5 psf-- --$S_{u\ remold}$ = 371.3 psf-- --Sensitivity = 1.7--	30	VS	5	VS		
	--In-Situ Vane Shear, 32.0 feet-- --$S_{u\ undis}$ = 535.1 psf-- --$S_{u\ remold}$ = 327.6 psf-- --Sensitivity = 1.6--		VS	6	VS		
	--In-Situ Vane Shear, 34.5 feet-- --$S_{u\ undis}$ = 535.1 psf-- --$S_{u\ remold}$ = 393.1 psf-- --Sensitivity = 1.4--	35	VS	7	VS		
	--In-Situ Vane Shear, 37.0 feet-- --$S_{u\ undis}$ = 655.2 psf-- --$S_{u\ remold}$ = 404.1 psf-- --Sensitivity = 1.6--		VS	8	VS		
	--In-Situ Vane Shear, 39.5 feet--	40	VS	9			

GENERAL NOTES

Begin Drilling **12-02-2015** Complete Drilling **12-02-2015**
Drilling Contractor **Wang Testing Services** Drill Rig **CME-55 TMR [85%]**
Driller **R&N** Logger **F. Bozga** Checked by **A. Kurnia**
Drilling Method **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **Rotary wash**
At Completion of Drilling: **mud in the borehole**
Time After Drilling: **NA**
Depth to Water: **NA**

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

Wang Engineering
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1145 N Main Street
Lombard, IL 60148
Telephone: 630 953-9928
Fax: 630 953-9938

BORING LOG VST-03

WEI Job No.: 1100-04-01

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

Datum: NAVD 88
Elevation: 593.21 ft
North: 1899985.05 ft
East: 1171693.33 ft
Station: 8415+53.90
Offset: 182.276 LT

Profile	Elevation (ft)	SOIL AND ROCK DESCRIPTION	Depth (ft)	Sample Type *recovery*	Sample No.	SPT Values (blw/6 in)	Qu (tsf)	Moisture Content (%)
		--$S_{u\ undis}$ = 622.5 psf-- --$S_{u\ remold}$ = 382.2 psf-- --Sensitivity = 1.6--				VS		
		--In-Situ Vane Shear, 42.0 feet-- --$S_{u\ undis}$ = 851.8 psf-- --$S_{u\ remold}$ = 458.7 psf-- --Sensitivity = 1.9--			10	VS		
		--In-Situ Vane Shear, 44.5 feet-- --$S_{u\ undis}$ = 928.3 psf-- --$S_{u\ remold}$ = 600.6 psf-- --Sensitivity = 1.5--	45		11	VS		
		--In-Situ Vane Shear, 47.0 feet-- --$S_{u\ undis}$ = 1266.8 psf-- --$S_{u\ remold}$ = 633.4 psf-- --Sensitivity = 2.0--			12	VS		
			50					
	541.7	--In-Situ Vane Shear, 51.0 feet-- --$S_{u\ undis}$ = 1681.8 psf-- --$S_{u\ remold}$ = 1266.8 psf-- --Sensitivity = 1.3--			13	VS		
		Boring terminated at 51.50 ft						
			55					
			60					

GENERAL NOTES

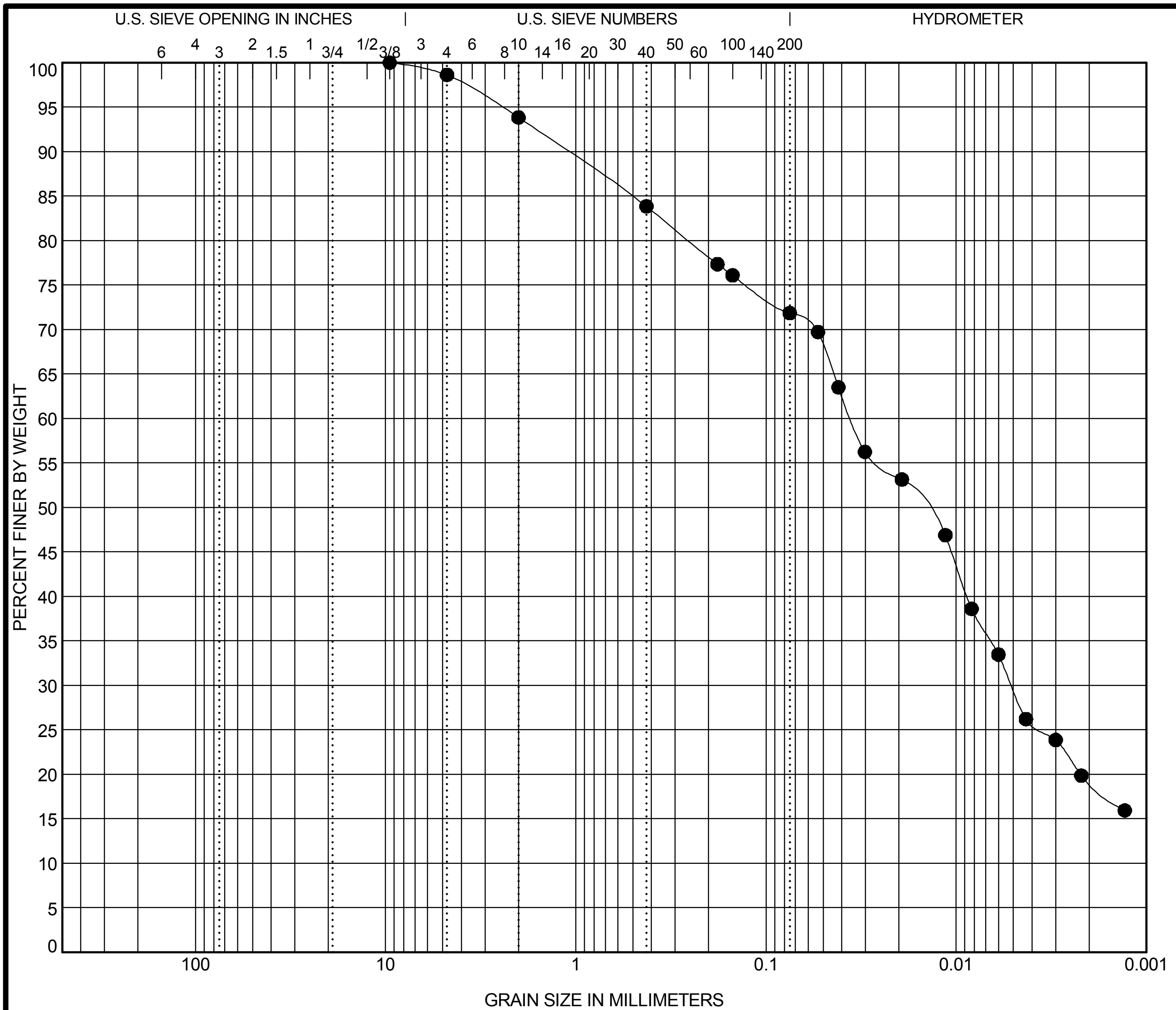
Begin Drilling **12-02-2015** Complete Drilling **12-02-2015**
Drilling Contractor **Wang Testing Services** Drill Rig **CME-55 TMR [85%]**
Driller **R&N** Logger **F. Bozga** Checked by **A. Kurnia**
Drilling Method **2.25" HSA to 10', mud rotary thereafter, boring backfilled upon completion**

WATER LEVEL DATA

While Drilling: **Rotary wash**
At Completion of Drilling: **mud in the borehole**
Time After Drilling: **NA**
Depth to Water: **NA**

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

APPENDIX B



COBBLES	GRAVEL	SAND		SILT AND CLAY
		coarse	fine	

	Specimen Identification		IDH Classification	LL	PL	PI	Cc	Cu
●	2055-B-02#23	83.5 ft	**Silty Clay Loam**	**26**	**14**	**12**		

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	2055-B-02#23	83.5 ft	**9.5**	**0.036**	**0.005**		**6.2**	**22.1**	**52.6**	**19.1**

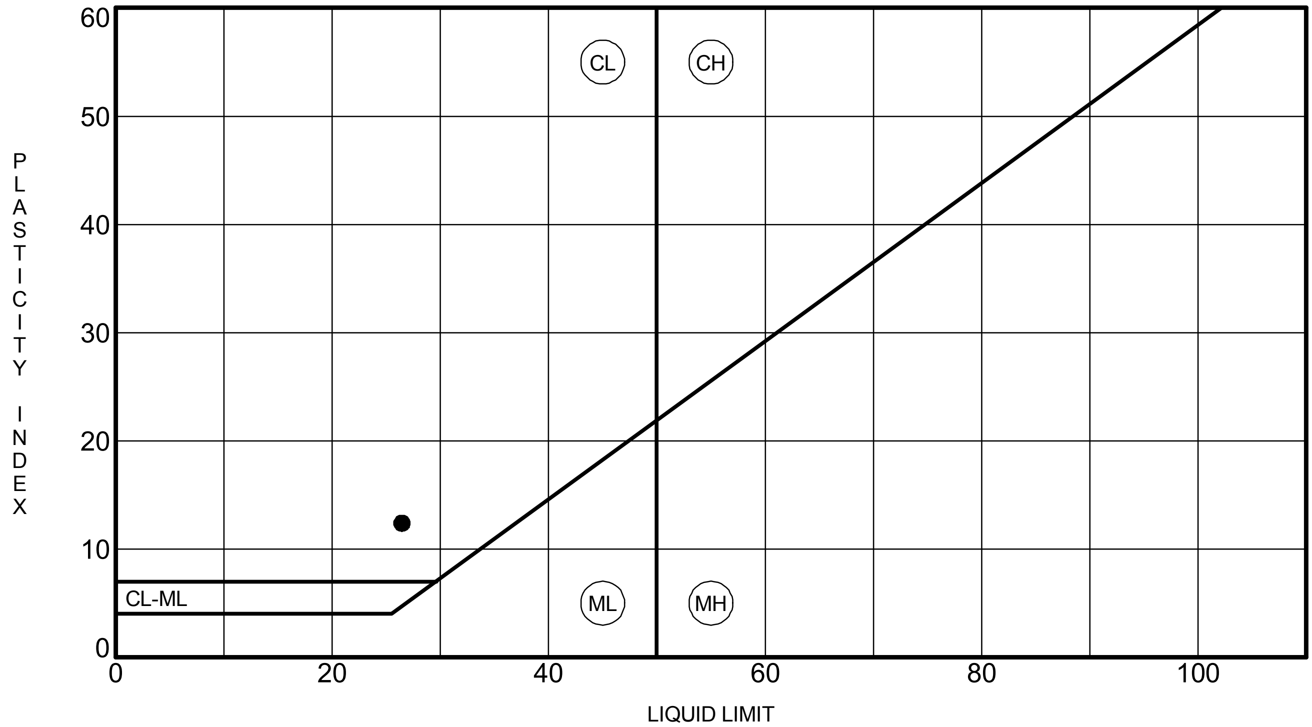
Wang Engineering, Inc.
1145 North Main Street
Lombard, IL 60148
Telephone: 630-953-9928
Fax: 630-953-9938

GRAIN SIZE DISTRIBUTION

Project: Jane Byrne Interchange

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

Number: 1100-04-01



	Specimen Identification		LL	PL	PI	Fines	IDH Classification
●	**2055-B-02#23**	**83.5 ft**	**26**	**14**	**12**	**72**	**Silty Clay Loam**

Wang Engineering, Inc.
1145 North Main Street
Lombard, IL 60148
Telephone: 630-953-9928
Fax: 630-953-9938

ATTERBERG LIMITS' RESULTS

Project: Jane Byrne Interchange

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

Number: 1100-04-01

APPENDIX C

Bench Mark: Chisel "X" on east side of I-90 ±80 feet South of Monroe Street on southeast corner of handhole on concrete. Elev. 578.58.

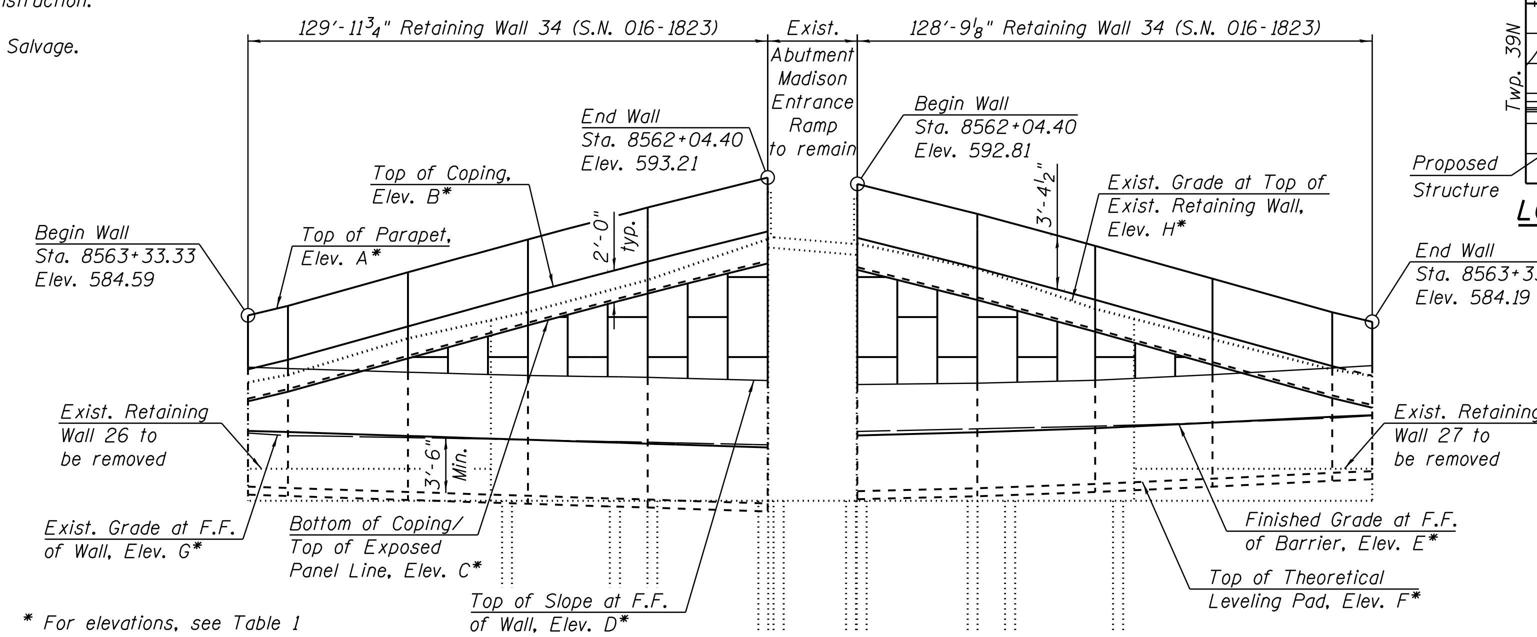
Existing Structure: Existing Retaining Walls 26 and 27. Cast-in-place retaining walls on spread footing and drilled shafts that measure 69'-5" from existing Madison Entrance Ramp abutment south. Maximum height from top of wall to bottom of footing measures 16'-3". Existing retaining walls are to be removed and replaced.

The existing Madison SB Entrance Ramp will be closed and traffic will be detoured during construction. Existing Madison Street Bridge to remain open during construction. Traffic on I-90/94 will be maintained with stage construction.

No Salvage.

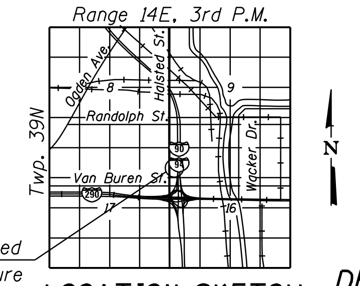
Notes:

1. Wall offsets are measured from the ℄ of Madison SB Entrance Ramp to the front face of precast panels.
2. F.F. denotes Front Face.
3. B.F. denotes Back Face.
4. Proposed drainage information shown is conceptual and will be determined during final design.



UNFOLDED ELEVATION

(Looking at F.F. of Wall)



LOCATION SKETCH

CURVE DATA

(Madison SB Entrance Ramp)
Prop. Curve P-MAD-ST-1
P.I. Sta. = 8562+69.46
Δ = 3° 07' 15" (RT)
D = 5° 24' 19"
R = 1,060.00'
T = 28.88'
L = 57.74'
E = 0.39'
e = NA
T.R. = NA
S.E. Run = NA
P.C. Sta. = 8562+40.59
P.T. Sta. = 8562+98.32

CURVE DATA

(I-90/94 NB)
Prop. Curve P-KDR-NB-5
P.I. Sta. = 6159+31.09
Δ = 2° 57' 23" (LT)
D = 0° 30' 55"
R = 11,122.00'
T = 286.99'
L = 573.86'
E = 3.70'
e = NA
T.R. = NA
S.E. Run = NA
P.C. Sta. = 6156+44.09
P.T. Sta. = 6162+17.96

HIGHWAY CLASSIFICATION

Madison SB Entrance Ramp
Functional Class: Interstate
ADT: 9,300 (2012); 11,000 (2040)
ADTT: 168 (2012); 198 (2040)
DHV: 1,040 (2040)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.
One-Way Traffic
Directional Distribution: 100%

I-90/94 NB
Functional Class: Interstate
ADT: 130,800 (2012); 116,000 (2040)
ADTT: 12,408 (2012); 10,660 (2040)
DHV: 7,130 (2040)
Design Speed: 60 m.p.h.
Posted Speed: 45 m.p.h.
One-Way Traffic
Directional Distribution: 100%

I-90/94 SB
Functional Class: Interstate
ADT: 119,900 (2012); 87,000 (2040)
ADTT: 12,217 (2012); 9,177 (2040)
DHV: 5,760 (2040)
Design Speed: 60 m.p.h.
Posted Speed: 45 m.p.h.
One-Way Traffic
Directional Distribution: 100%

DESIGN SPECIFICATIONS

2017 AASHTO LRFD Bridge Design Specifications 8th Edition

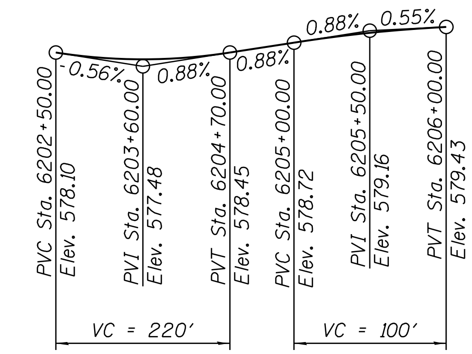
DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)

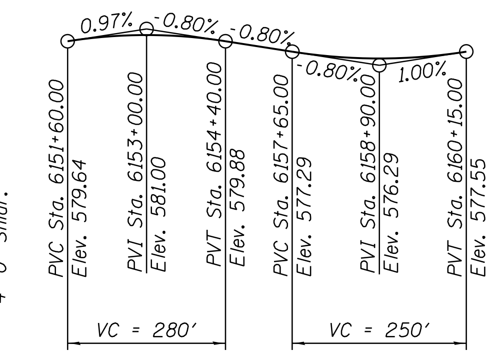
PRECAST UNITS

f'c = 4,500 psi



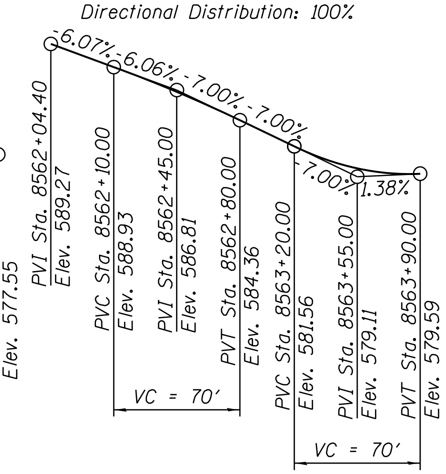
PROFILE GRADE

(℄ I-90/94 SB)



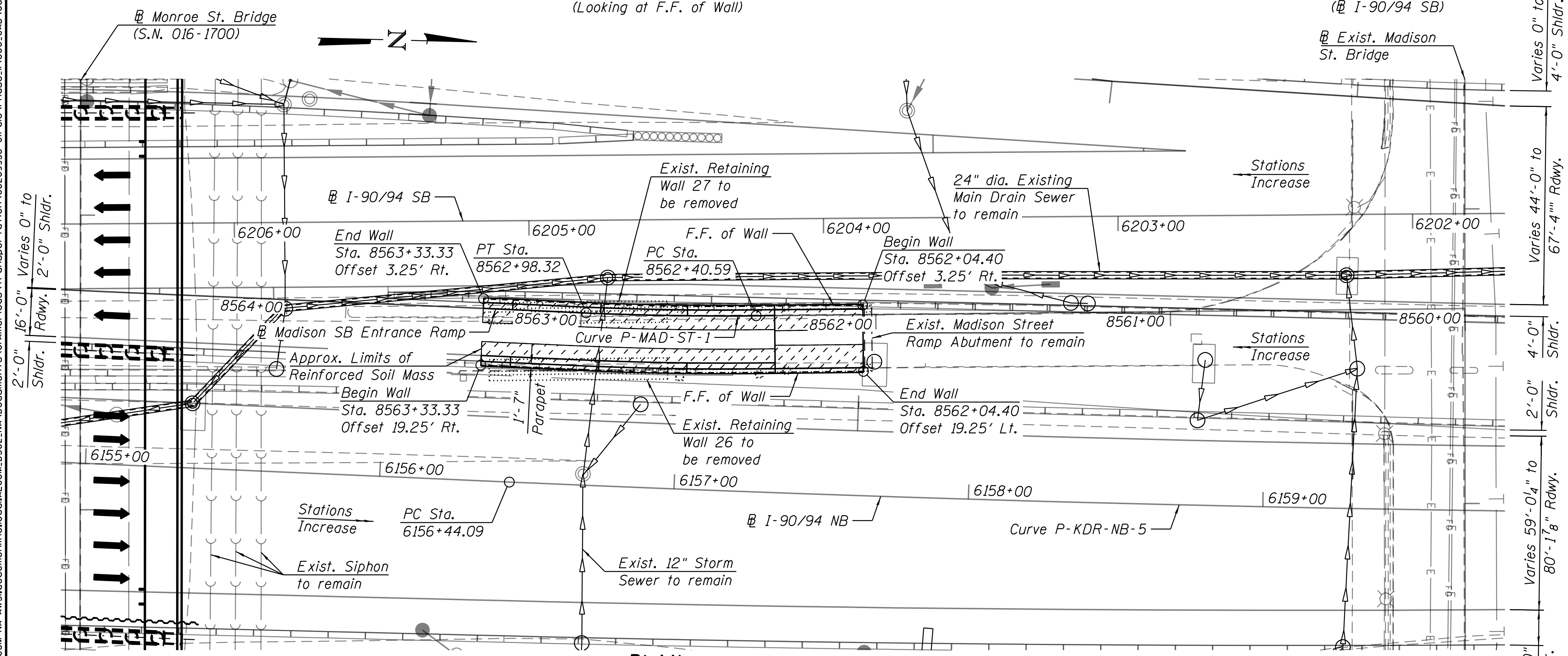
PROFILE GRADE

(℄ I-90/94 NB)



PROFILE GRADE

(℄ Madison SB Entrance Ramp)



PLAN

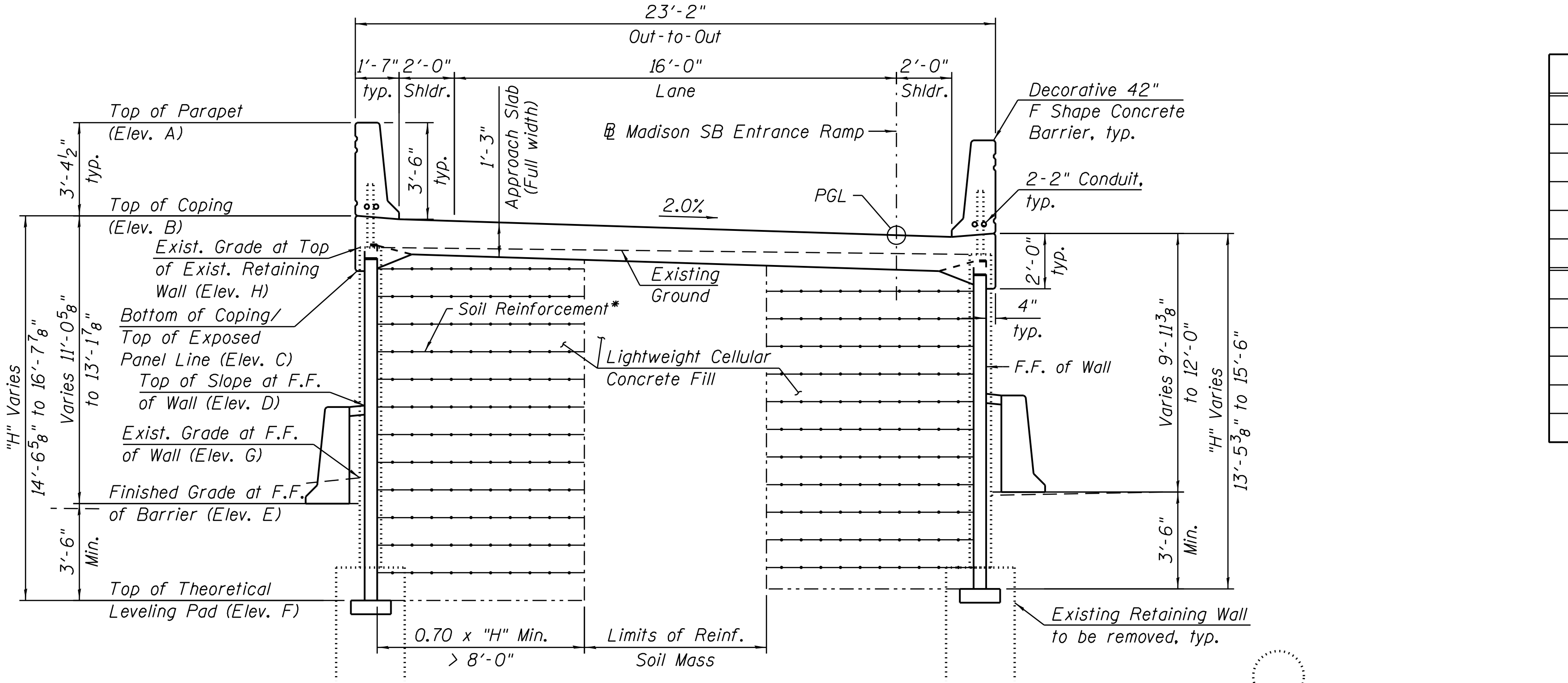
LEGEND:

Ex. Chain Link Fence	— x — x —	Soil Boring	
Combined Sewer		Existing Catch Basin	
Electric	—— E ——	Proposed Catch Basin	
Ex. Storm Sewer		Existing Manhole	
Prop. Storm Sewer		Proposed Manhole	
Ex. Fiber Optic	—— FO ——	Proposed Inlet	
Ex. ITS Cable	— — — —	Limits of Soil Reinforcement	

GENERAL PLAN
RETAINING WALL 34 ALONG MADISON SB ENTRANCE RAMP
F.A.I. RTE. 90/94 (KENNEDY EXPRESSWAY)
SECTION 2015-018R
COOK COUNTY
STATION 8562+04.40 TO STATION 8563+33.33
STRUCTURE NO. 016-1823

TranSystems	USER NAME = jnpilotte	DESIGNED - JNP	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
		CHECKED - WJC/MDS	REVISED -			90/94	2015-018R	COOK	2	1
	PLOT SCALE = 48.0000 ' / in.	DRAWN - JNP	REVISED -					CONTRACT NO. 62A77		
	PLOT DATE = 4/18/2019	CHECKED - WJC/MDS	REVISED -		SHEET NO. 1 OF 2 SHEETS			ILLINOIS FED. AID PROJECT		

1:43:49 PM - pw:\\AECOM-NA-AWS\aecomonline.local\AECOM_DS02_NA\Documents\01 Americas\Transportation\60269938 Circle\Phase_II\000_CAD\008_Structural\Structure_016-1823\TSL\Sheets\016823-62A77-SHT-TSL-001.dgn



CROSS SECTION

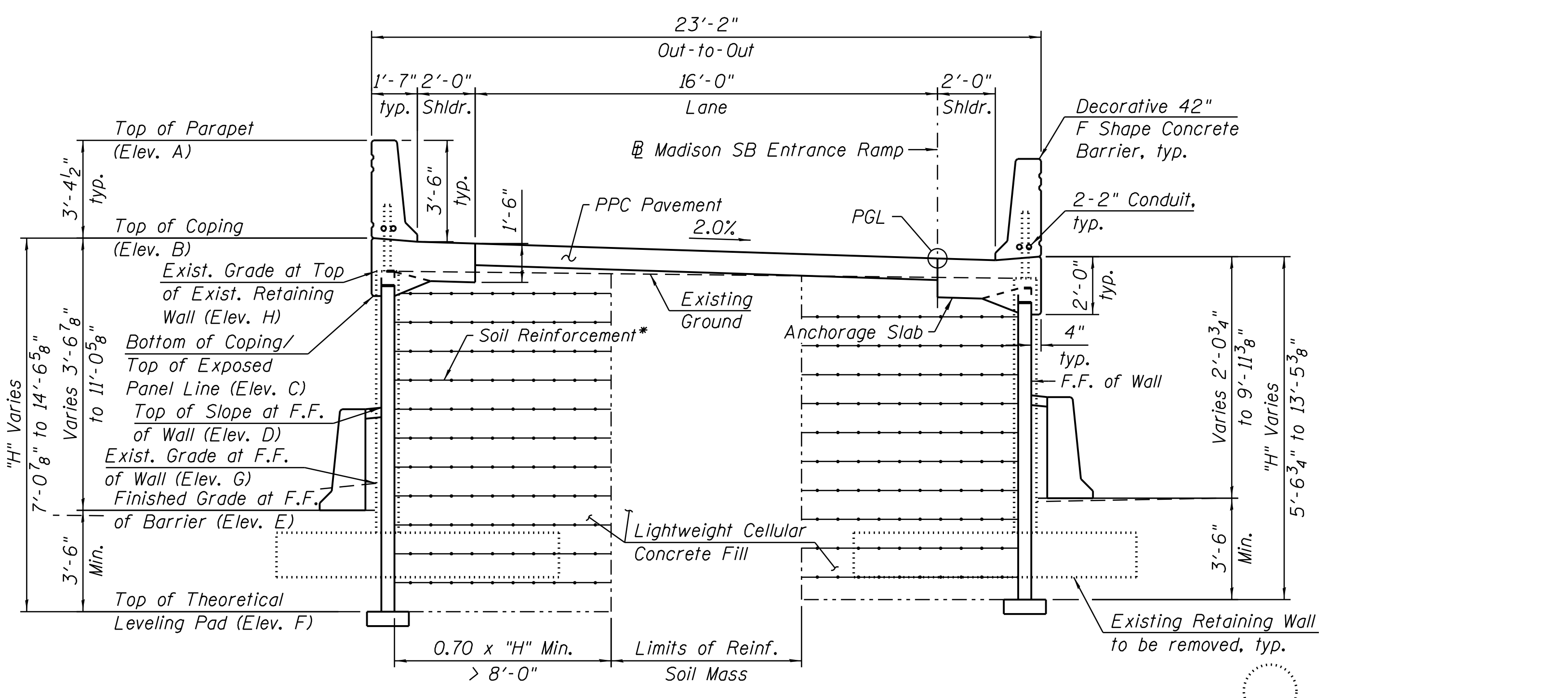
(Looking Upstation, Sta. 8562+04.40 to Sta. 8562+34.40)

TABLE 1 - WALL ELEVATIONS

Station	Offset	Elevation A	Elevation B	Elevation C	Elevation D	Elevation E	Elevation F	Elevation G	Elevation H
8563+33.33	19.25' Lt.	584.59	581.22	579.22	581.31	577.64	574.14	577.23	580.90
8563+23.33	19.25' Lt.	585.19	581.82	579.82	581.23	577.56	574.06	577.07	581.36
8562+93.42	19.25' Lt.	587.28	583.90	581.90	580.99	577.32	573.82	576.95	583.65
8562+63.96	19.25' Lt.	589.32	585.95	583.95	580.79	577.08	573.58	576.80	585.30
8562+34.40	19.25' Lt.	591.27	587.89	585.89	580.67	576.84	573.34	576.65	587.30
8562+04.40	19.25' Lt.	593.13	589.76	587.76	580.47	576.60	573.10	576.50	589.85
8562+04.40	3.25' Rt.	592.73	589.36	587.36	580.87	577.36	573.86	577.33	589.57
8562+34.40	3.25' Rt.	590.87	587.49	585.49	581.16	577.55	574.05	577.49	588.00
8562+63.96	3.25' Rt.	588.92	585.55	583.55	581.54	577.85	574.35	577.66	585.50
8562+93.42	3.25' Rt.	586.88	583.50	581.50	581.91	578.23	574.73	577.87	583.60
8563+23.33	3.25' Rt.	584.79	581.42	579.42	582.25	578.63	575.13	578.16	581.70
8563+33.33	3.25' Rt.	584.19	580.82	578.82	582.34	578.76	575.26	578.32	581.30

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

* The M.S.E. Wall supplier's internal stability design shall account for the anchorage slab's bearing pressure surcharge of 1.0 ksf and horizontal sliding force of 0.83 kips/ft of wall.

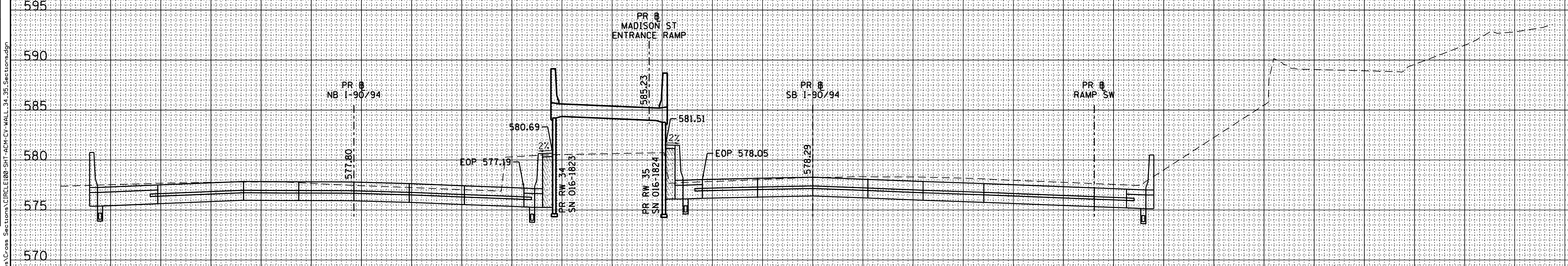


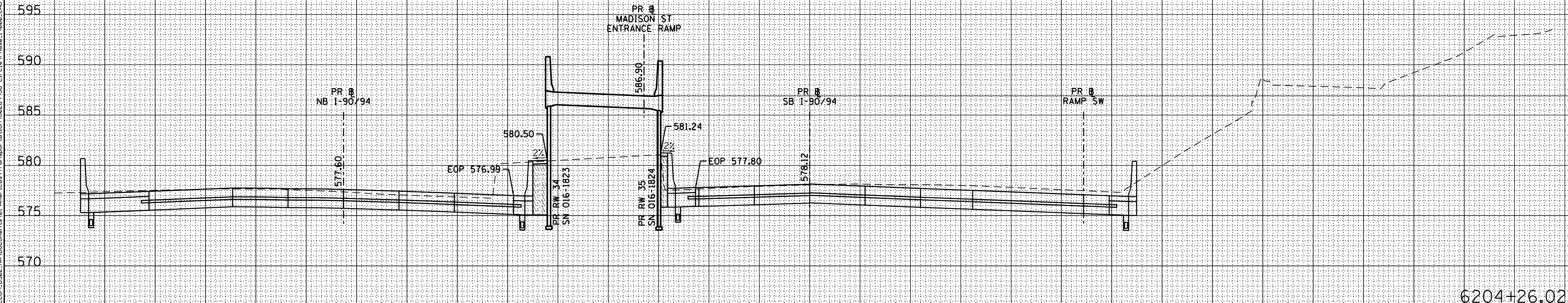
CROSS SECTION

(Looking Upstation, Sta. 8562+34.40 to Sta. 8563+33.33)

CROSS SECTION & DETAILS
RETAINING WALL 34 ALONG SB MADISON ENTRANCE RAMP
F.A.I. RTE. 90/94 (KENNEDY EXPRESSWAY)
SECTION 2015-018R
COOK COUNTY
STATION 8562+04.40 TO STATION 8563+33.33
STRUCTURE NO. 016-1823

APPENDIX D





Jane Byrne INTERCHANGE	XS_SHEET	DESIGNED -	REVISED -
	USER NAME = dishevaz	DRAWN -	REVISED -
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -
	PLOT DATE = 3/21/2019	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

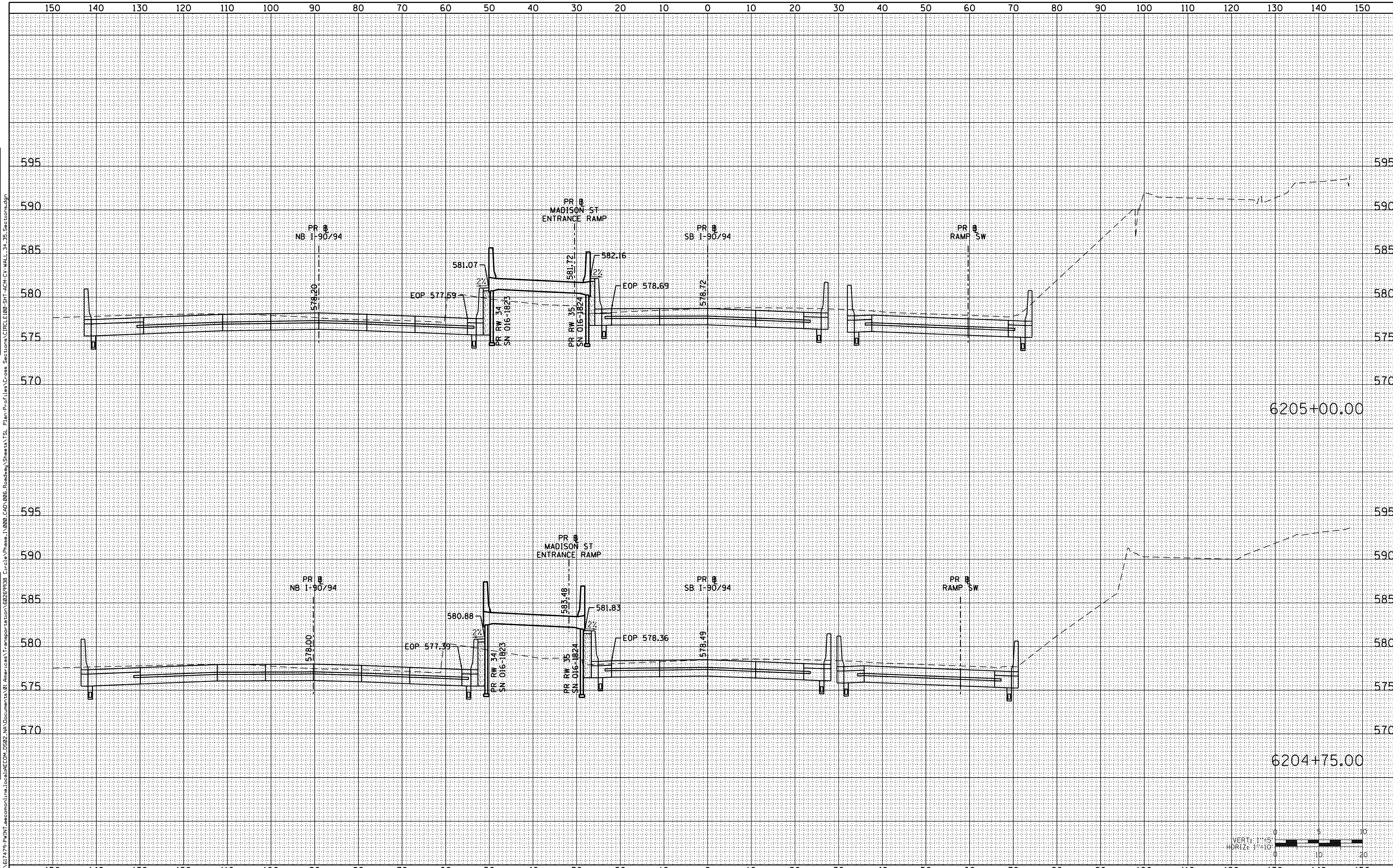
CROSS SECTIONS
RETAINING WALLS 34 AND 35

SCALE: 1:5V, 1:10H | SHEET 1 OF 3 SHEETS | STA. 6204+26.02 TO STA. 6204+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.

CONTRACT NO.

ILLINOIS FED. AID PROJECT



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

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

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Jane Byrne INTERCHANGE

XS_SHEET	DESIGNED -	REVISED -
USER NAME = dishevaz	DRAWN -	REVISED -
PLOT SCALE = 20.0000 '/ in.	CHECKED -	REVISED -
PLOT DATE = 3/21/2019	DATE -	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

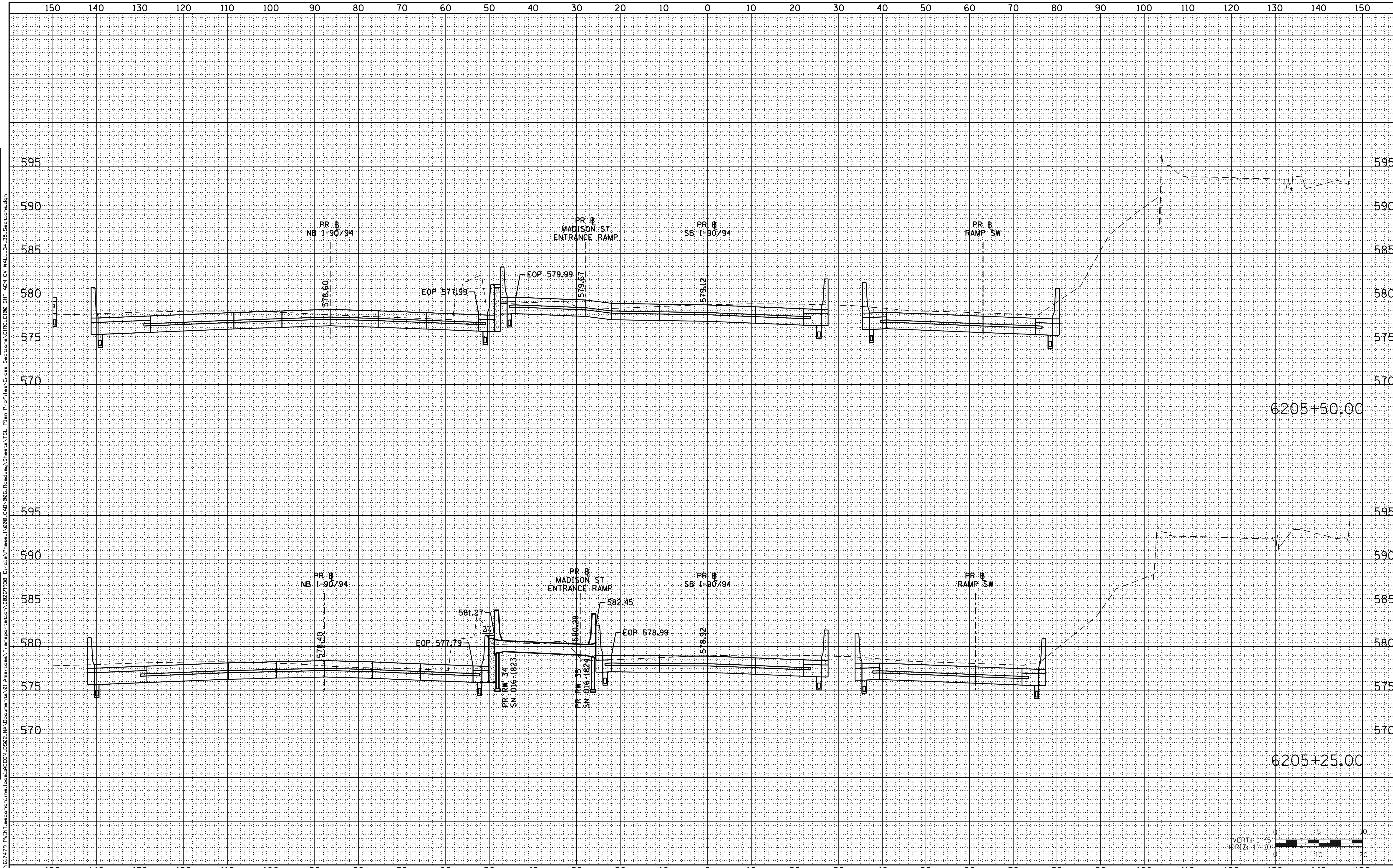
CROSS SECTIONS
RETAINING WALLS 34 AND 35

SCALE: 1:5V, 1:10H | SHEET 2 OF 3 SHEETS | STA. 6204+75.00 TO STA. 6205+00.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.

CONTRACT NO.

ILLINOIS | FED. AID PROJECT



Jane Byrne INTERCHANGE	XS_SHEET	DESIGNED -	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
	USER NAME = dishevaz	DRAWN -	REVISED -	
	PLOT SCALE = 20.0000 ' / in.	CHECKED -	REVISED -	
	PLOT DATE = 3/21/2019	DATE -	REVISED -	

CROSS SECTIONS
RETAINING WALLS 34 AND 35

SCALE: 1:5V, 1:10H | SHEET 3 OF 3 SHEETS | STA. 6205+25.00 TO STA. 6205+50.00

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.

CONTRACT NO.

ILLINOIS | FED. AID PROJECT