GEOTECHNICAL REPORT

Proposed Noise Wall Structure (SN 016-2293)

I-90, Canfield Avenue and Oriole Avenue

F.A.P. Route I-90, Sec. (1517 & 1415) R-2

IDOT Project No. P-91-128-12

Cook County, Illinois

Submitted to:

Mr. Donald Wittmer, P.E.

HNTB
One South Wacker Drive
Suite 900
Chicago, Illinois, 60606

Prepared by:

Geo Services, Inc.
805 Amherst Court
Suite 204
Naperville, Illinois 60565
(630) 305-9186

JOB NO. 12245

May, 2016

Geo Services, Inc.
Geotechnical, Environmental and Civil Engineering

Revised: May 31, 2016
December 23, 2014

HNTB
1 South Wacker Drive
Suite 900
Chicago, Illinois 60606

Attn: Mr. Donald Wittmer, P.E.

GSI Project No. 12245

Re: Geotechnical Report
Proposed Noise Wall Structure No. 016-2293
F.A.P Route I-90, Sec. (1517 & 1415) R-2
IDOT Project No. P-91-128-12
Cook County, IL.

Dear Mr. Wittmer:

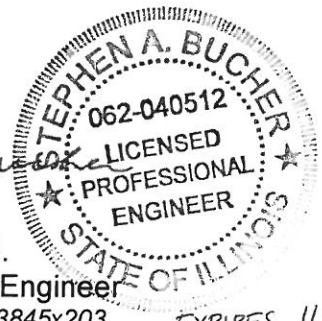
The following report presents the geotechnical analysis and recommendations for the construction of proposed noise wall (SN 016-2293) included for the I-90 Improvements Project, IDOT Project Number: P-91-128-12. A total of four (4) noise wall borings (NWB-01 to NWB-04) were completed at the site by Geo Services, Inc. (GSI). Copies of the location diagram, along with the boring logs, are included in this report.

If there are any questions regarding the information submitted herein, please do not hesitate to contact us.

Very truly yours,

GEO SERVICES, Inc.

Richard Realeza
Staff Engineer
Office Phone: (847) 253-3845x202
richard@geoservicesinc.net



Stephen Bucher, P.E.
Senior Geotechnical Engineer
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EXPIRES 11/30/17

enc.

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PROJECT DESCRIPTION

The following report presents the results of the geotechnical investigation performed for the proposed I-90 WB Noise Wall (SN 016-2293) between Canfield Avenue and Oriole Avenue for the I-90 Improvements Project, IDOT Project Number P-91-128-12. The noise wall consists of a structure mounted wall (on proposed moment slab) which will sit atop existing retaining wall structures.

Structure Mounted Noise Wall (on Proposed Moment Slab):

The structure mounted noise wall unit will consist of proposed 431'-8" long moment slab construction along the W. Higgins Road as follows:

- The proposed moment slab shall replace a segment of the existing W. Higgins Road pavement, and be overlaid with concrete (at the sidewalk) and hot-mix asphalt wearing surface (at the traffic pavement).
- The proposed moment slab shall sit atop of the existing retaining wall and soldier pile structures.
- The proposed moment slab shall be constructed with a modified F-shape barrier to tie into the noise wall post structure.
- The proposed structure mounted noise wall and moment slab shall span W. Higgins Road from approximate Station 601+68.90 to 605+98.65 along W. Higgins Road alignment.

The existing structure (SN 016-W755), which was constructed in 2000, is a soldier pile retaining wall structure. The soldier pile retaining wall is approximately 430 feet long with a maximum exposed height of approximately 14'-2". Existing wall will remain, and the top portion of the wall will be removed and a moment slab and associated noise wall will be constructed.

Table 1 contains a summary of each noise wall, station limits, and the corresponding borings that were drilled for the proposed wall SN 016-2293 along I-90 project limits.

Table 1- Noise Wall Boring Summary

Station Limits along I-90 Alignment	Approximate Wall Length (feet)	Borings used for the Wall
601+68.90 to 605+98.65	431'-8"	NWB-01 to NWB-04

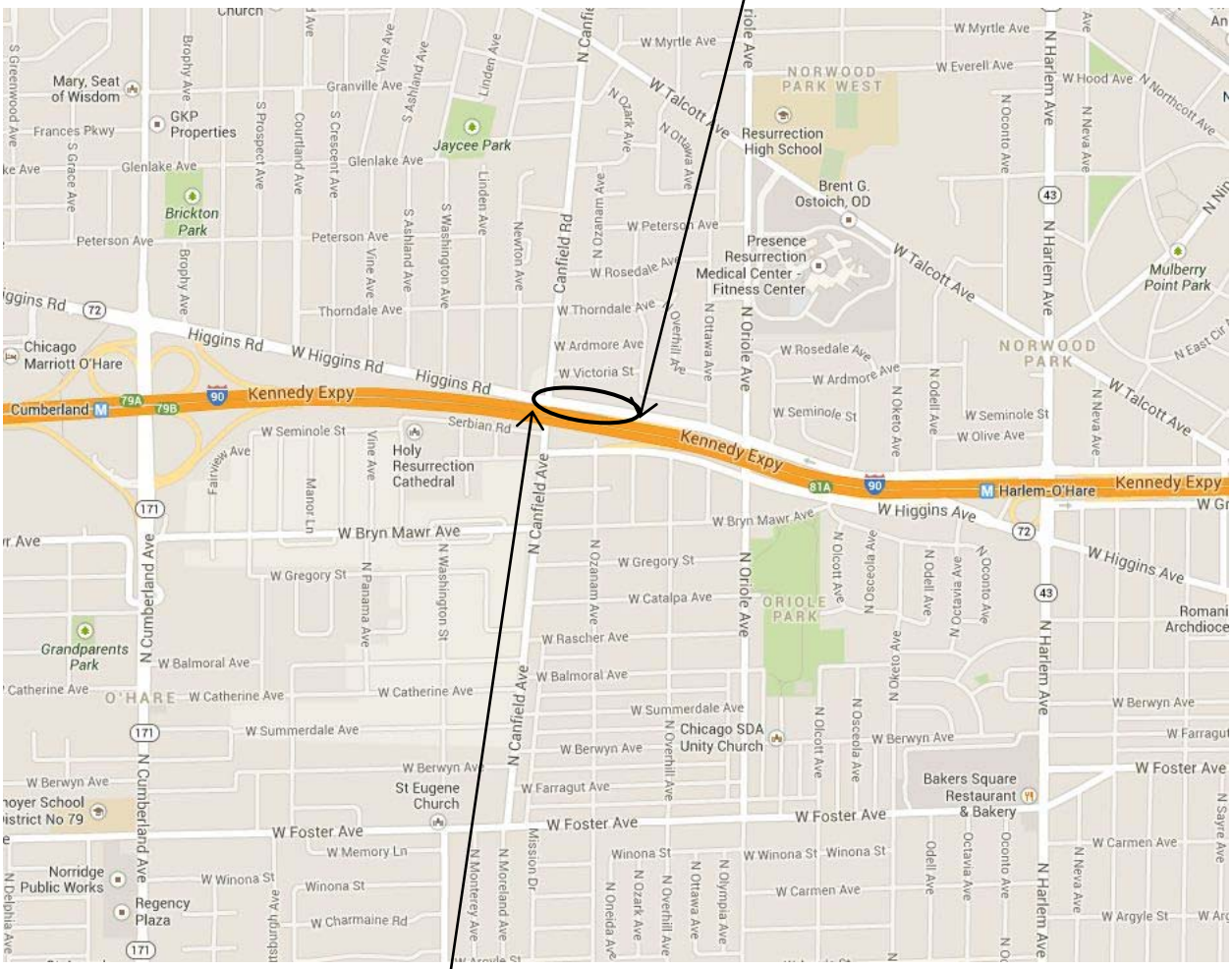
The noise wall proposed for this report is based upon information regarding the proposed improvements and subsurface information obtained from the four (4) soil borings.

The soil boring locations were selected by Geo Services based on the criteria in the IDOT Geotechnical Manual and submitted to and approved by HNTB. Soil borings were laid out by Geo Services, Inc. field personnel. Surveyed elevations were estimated by GSI based on the provided topographic drawings and are shown on the boring logs. The as-drilled locations for the borings are shown on the Boring Location Diagram found in the Appendix section of this report. The project improvement limits are shown on the site map below.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED

PROPOSED NOISE WALL (SN 016-2293)
I-90 AT CANFIELD AVENUE AND ORIOLE AVENUE
COOK COUNTY, ILLINOIS

Approx. Station 605+98.65



R12E

T40N

Approx. Station 601+68.90

SUBSURFACE INVESTIGATION PROCEDURES

Borings were performed during the month of October, 2014 with the use of a truck mounted drill rig and advanced by means of hollow stem augers to termination of borings at a depth of approximately 25 feet. Representative soil samples were obtained employing split spoon sampling procedures in accordance with AASHTO Method T-206. Samples obtained in the field were delivered to our laboratory for further examination and testing.

Split spoon sampling involves driving a 2.0-inch outside diameter split-barrel sampler into the soil with a 140-pound weight falling freely through a distance of 30 inches. Blow counts are recorded at 6" intervals and the blow counts are shown on the boring logs. The number of blows required to advance the sampler the last 12 inches is termed the Standard Penetration Resistance (N). The N value is an indication of the relative density of the soil.

LAB TESTING PROGRAM

The test procedures were performed in accordance with test procedures discussed in the IDOT Geotechnical Manual. All split-spoon samples obtained from the drilling operation were visually classified in the field. Cohesive samples were tested for unconfined compressive strength using an IDOT modified RIMAC test device and/or calibrated penetrometer in the field.

The soil testing program included performing water content, density and either unconfined compression and/or calibrated penetrometer tests on the cohesive samples recovered. Water content tests were performed on the non-cohesive samples recovered. These tests were performed upon representative portions of the samples obtained in the field. The results of the above testing, along with a visual classification of the material based upon both the Illinois textural classification and the AASHTO Soil Classification System, are indicated on the logs.

SUBSURFACE CONDITIONS

Specific soil conditions encountered in the borings are indicated on the soil boring logs. The stratification lines shown on the boring logs represent the approximate boundary between soil types, and the actual transition may be gradual.

Borings NWB-01 to NWB-04 encountered surface pavement (3 to 4 inches of asphalt and 8 to 9 inches of concrete) overlying 2 to 10 feet of clay loam, sand and/or gravel fill materials. Boring NWB-01 had very loose to dense sand with gravel fill to approximately 25 feet depth. Underlying the fill materials, native soils generally consisted of stiff to hard clay to clay loam that extended to the termination of borings at approximately 25 feet below ground surface (approximate elevations 630 to 632 feet).

Moisture contents were generally in the range of 10% to 30% for cohesive soils, with an average of 21%. Fill soils had moisture contents in the range of 3% to 17%, with an average of 11%.

GROUNDWATER CONDITIONS

Groundwater was estimated from water levels encountered while drilling in conjunction with observed soil coloration change from brown and gray to gray between the strata.

Groundwater was noted only at boring NWB-01 during drilling at 17 feet depth (approximately 638 feet). Based on the color change of the soil from brown and gray to gray, we estimate the long-term groundwater table at depths of 10 to 15 feet below existing grade (approximately elevations 641 to 652 feet). Fluctuations in the amount of water accumulated and in the hydrostatic water table can be anticipated depending upon variations in precipitation and surface runoff.

ANALYSIS

Site Seismic Considerations

According to the AASHTO LRFD Bridge Design Specification 2012, the project site has a Horizontal Response Spectral Acceleration Coefficient S_1 of 0.035 (AASHTO Figure: 3.10.2.1-3) at a period of 1.0 second and 5% critical dampening and Horizontal Response Spectral Acceleration Coefficient S_s of 0.089 (AASHTO Figure: 3.10.2.1-2) at a period of 0.2 seconds and 5% critical dampening and a Site Class: D according to the soil conditions. Based on these coefficients, the resultant design seismic data is provided in Table 2 below.

Table 2 – Seismic Data Summary [1]

Seismic Site Class	D
S_{D1}	0.084
S_{Ds}	0.142
Seismic Performance Zone	1

Note: 1. Unless special circumstances exists for the proposed wall, the wall does not need to design for seismic forces.

The project site is considered to be in a low seismic area. Liquefiable layers are not expected to impact the design of the new noise wall.

Settlement Analysis

Based on the fact that little to no new fill is proposed and a review of the soil conditions at the wall, no settlement concerns are noted for the noise wall. Total settlement of foundations for the walls situated on approved natural soils is estimated to be on the order of 1/4 inch or less.

FOUNDATION RECOMMENDATIONS

Recommended Foundation Support for the Proposed Noise Wall

Noise Wall (SN 016-2293) consists of a structure mounted wall (on proposed moment slab) which will sit atop existing soldier pile retaining wall structure along EB Higgins Road outside shoulder. Economic, construction and scheduling factors should be evaluated for the decision of wall design. The following provides a general discussion of soil conditions as they relate to the noise wall construction.

Shallow Foundation Recommendations for the Structure Mounted (Moment Slab)

Based on the estimated bottom of the moment slab elevations shown on the TS&L and cross-section drawings provided by the designer (Rubinos & Mesia Engineers, Inc.), and review of the boring logs for the wall, the subgrade should provide adequate support for the structure mounted wall and moment slab.

The moment slab will bear on the loose to dense crushed stone and gravel fill soils to hard clay loam soils, which is at estimated elevations ranging from 653 to 655 feet. For the moment slab founded on the granular fill or clay loam soils, we recommend using a maximum factored bearing resistance of 3,500 psf based on the proposed slab bearing elevations as shown in the TS&L or on a pad of compacted, structural fill that is first excavated to the remedial treatment depth detailed in the ***Table 3- Remedial Treatment Recommendations***. A resistance factor of 0.55 is recommended for use in the wall foundation design. For the evaluation of the resistance to sliding, we recommend using a friction factor of 0.80 for cast-in-place concrete slab on granular base or 0.85 for cast-in-place concrete on clay or clay loam fill to be used for design per AASHTO LRFD Design Specifications.

Based on the results of the borings and the estimated bottom of the moment slab elevation (estimated elevations ranging from 653 to 655 feet), majority of the wall alignment will not remedial treatments with the exception of boring NWB-02, which will require undercutting. Also, disking, drying and recompaction of the exposed loose granular subgrade of the noise wall/moment slabs alignment prior to installation of aggregate base is recommended.

Table 3 – Remedial Treatment Recommendations

Boring (Approx. Station Limits)	Subgrade Description (water content)	Unconfined Compressive Strength (tsf)	Approx. Bearing Range Elevation	Reason for Remedial Treatment	Remedial Treatment, Depth (inches) [1]	Remedial Treatment
NWB-02 (602+20 to 603+70)	Medium Stiff Silty Clay Fill (30%)	0.6	653.0 to 655.0	Low Bearing Soils, High Moisture Contents Soils	18	Remove & Replace with Approved Structural (Granular) Fill

Note: 1. Verify undercuts in field

In areas where the moment slab structures are proposed, the exposed subgrade should be verified in the field at the time of construction by a licensed Geotechnical Engineer or representative, and any topsoil, organics, unsuitable or deleterious material be removed. Undercutting should be performed in such a manner as to minimize disturbance to the undercut subgrade.

Heavy equipment traffic directly on the undercut subgrade should be minimized. The actual need for the recommended treatment should be determined in the field at the time of construction based on guidelines presented in the Illinois Department of Transportation Geotechnical Manual under the direction of a licensed geotechnical engineer. Evaluation of soils in the field should be performed based on the guidelines presented in the IDOT Subgrade Stability Manual.

Lateral Earth Pressure Recommendations

For the evaluation of the lateral loads on the existing retaining wall foundations and the proposed moment slab spread footings, we recommend that the following soil properties on the following Table 4 be used.

Table 4 – Lateral Soil Pressure Parameters (NWB-01 to NWB-04)

Material Description (Elevation, feet)	Unit Weight (pcf)	Drained Friction Angle (°)	Undrained Cohesion (pcf)	Lateral Modulus of Subgrade Reaction[1] (pci)	Strain (ε_{50})[1]
Loose to Dense Sand and Gravel Fill [2] (655 to 630)	125	30	n/a	100	0.002
Medium Stiff to Stiff Clay to Clay Loam Fill (654 to 650)	120	26	1,000	230	0.008
Stiff to Very Stiff to Clay to Clay Loam (650 to 631)	125	28	1,800	720	0.006

Notes: 1. Values recommended for use in design from COM624 software
2. Sand with gravel fill encountered at NWB-01 throughout the boring strata.

GENERAL QUALIFICATIONS

The analysis and recommendations presented in this report are based upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations that may occur between borings or across the site. In addition, the soil samples cannot be relied on to accurately reflect the strata variations that usually exist between sampling locations. The nature and extent of such variations may not become evident until construction. If variations appear evident, it will be necessary to reevaluate the recommendations of the report. In addition, it is recommended that Geo Services Inc. be retained to perform construction observation and thereby provide a complete professional geotechnical engineering service through the observational method.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranties, either expressed or implied, are intended or made. In the event that any changes in the nature, design or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing by the geotechnical engineer. Also note that Geo Services Inc. is not responsible for any claims, damages, or liability associated with any other party's interpretation of this report's subsurface data or reuse of the report's subsurface data or engineering analyses without the express written authorization of Geo Services Inc.

ATTACHMENTS

GENERAL NOTES

CLASSIFICATION

American Association of State Highway & Transportation Officials (AASHTO) System used for soil classification.

Cohesionless Soils

Relative Density	No. of Blows per foot N
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	Over 50

Cohesive Soils

Consistency	Unconfined Compressive Strength - qu (tsf)
Very Soft	Less than 0.25
Soft	0.25 - 0.5
Medium Stiff	0.5 - 1.0
Stiff	1.0 - 2.0
Very Stiff	2.0 - 4.0
Hard	Over 4.0

TERMINOLOGY

Streaks are considered to be paper thick. **Lenses** are considered to be less than 2 inches thick. **Layers** are considered to be less than 6 inches thick. **Stratum** are considered to be greater than 6 inches thick.

DRILLING AND SAMPLING SYMBOLS

SS:	Split Spoon 1-3/8" I.D., 2" O.D.	HS:	Housel Sampler
ST:	Shelby Tube 2" O.D., except where noted	WS:	Wash Sample
AS:	Auger Sample	FT:	Fish Tail
DB:	Diamond Bit - NX: BX: AX	RB:	Rock Bit
CB:	Carboloy Bit - NX: BX: AX	WO:	Wash Out
OS:	Osterberg Sampler		

Standard "N" Penetration: Blows per foot of a 140 lb. hammer falling 30" on a 2" O.D. Split Spoon

WATER LEVEL MEASUREMENT SYMBOLS

WL:	Water	WD:	While Drilling
WCI:	Wet Cave In	BCR:	Before Casing Removal
DCI:	Dry Cave In	ACR:	After Casing Removal
WS:	While sampling	AB:	After Boring

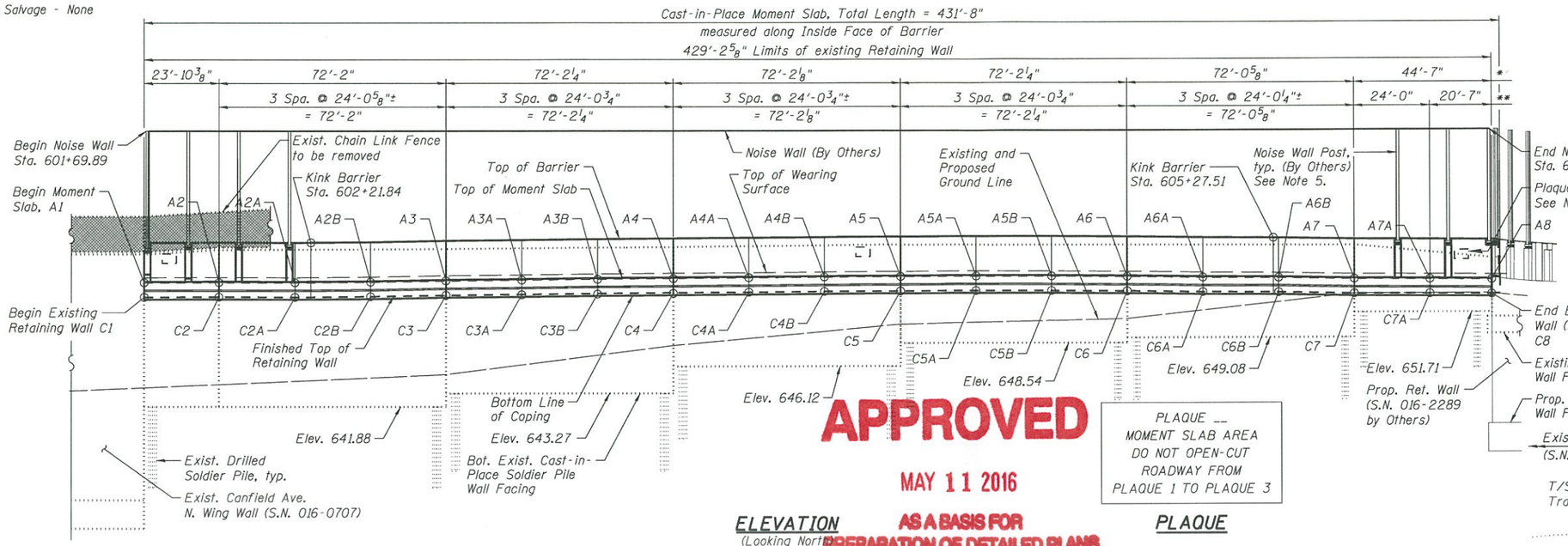
Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils, the accurate determination of ground water elevations is not possible in even several days observation, and additional evidence on ground water elevations must be sought.

SOIL BORING LOCATION			
Geotechnical Report Interstate 90 Improvements I-90 at Canfield Avenue and Oriole Avenue Proposed Noise Walls IDOT Job No. P-91-128-12 Chicago, Cook County, Illinois	**Geo Services, Inc.** Geotechnical, Environmental & Civil Engineering 805 Amherst Court, Suite 204 Naperville, Illinois 60565 (630) 355-2838	DRAWN BY	RR
		APPROVED BY	AJP
		DATE	December 15, 2014
		GSI JOB No.	12245
		SCALE	NTS

Bench Mark: TBM #19 (ELEV. 638.00)- Square cut on top of barrier wall by light pole (FC13) mile marker 80.40 on North side WB I-90 just East of Canfield.

Existing Structure: Existing structure, constructed in 2000, is a soldier pile retaining wall (S.N. 016-W755). The soldier pile wall is approximately 429 feet long with a max. exposed height of 14'-2". A chain link fence is mounted on top of the wall. Top portion of wall will be removed and a Moment Slab and associated noise wall will be constructed in separate contracts. Existing wall to remain. Traffic will be maintained in westbound direction during construction. Eastbound Higgins Rd. traffic will be detoured according to Detour Plan.

Salvage - None



ELEVATION
(Looking North)

APPROVED
MAY 11 2016
AS A BASIS FOR PREPARATION OF DETAILED PLANS

PLAQUE
MOMENT SLAB AREA
DO NOT OPEN-CUT
ROADWAY FROM
PLAQUE 1 TO PLAQUE 3

LOADING

Allow 35 psf wind load for Structure Mounted Noise Wall (see Special Provision)
Maximum Dead Load not to exceed 55 psf of wall face area.
Traffic Impact per AASHTO LRFD Bridge Specifications
Approx. Noise Wall Height = 17'-0"

HIGHWAY CLASSIFICATION

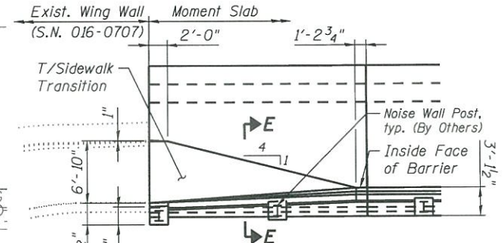
F.A.I Rte. - Higgins Road (S.R. 72)
Functional Class: Major Collector
ADT: 19,800 (2013)
ADTT: 1,200 (2013)
Speed: 30 m.p.h (posted)

DESIGN SPECIFICATIONS

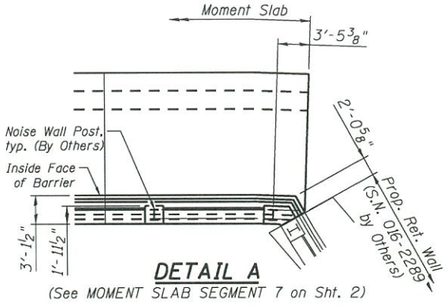
AASHTO LRFD Bridge Design Specifications, 7th Edition (2014) with 2015 Interim Revisions

DESIGN STRESSES

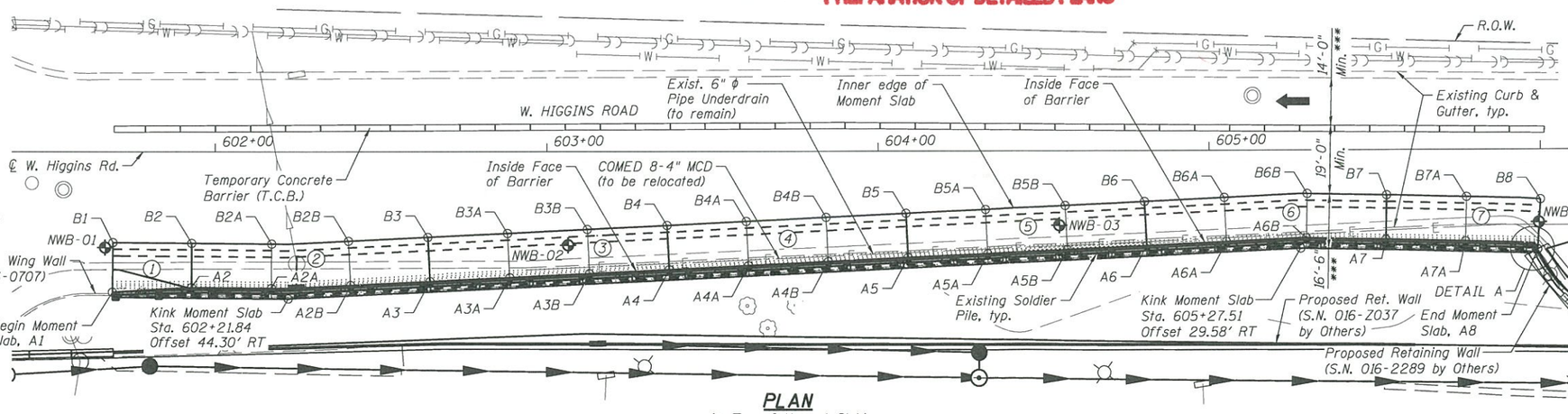
New Construction
f'c = 4,000 psi (Superstructure Concrete)
f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
Existing Construction
f'c = 3,480 psi
fy = 58,000 psi (Reinforcement)
fy = 50,000 psi (Soldier Piles)



SIDEWALK TRANSITION
(See SECTION E-E on Sht. 2)
(See MOMENT SLAB SEGMENT 1 on Sht. 2)



DETAIL A
(See MOMENT SLAB SEGMENT 7 on Sht. 2)



PLAN
(@ Top of Moment Slab)

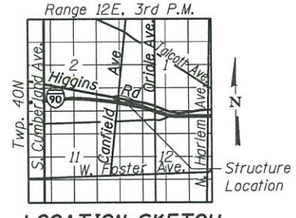
LEGEND:

- Exist. Electrical Line
- Exist. Fence
- Exist. Gas Line
- Exist. Storm Sewer
- Exist. Water Line
- Exist. Combined Sewer
- Prop. Storm Sewer
- Boring Location
- Proposed Catch Basin
- Proposed Inlet
- Exist. Catch Basin
- Moment Slab Segment Number
- Temporary Travel Lane
- Exist. Light Pole

NOTES:

1. Horizontal dimensions measured along front face (I-90 side) of Existing Retaining Wall U.N.O.
2. Stations & offsets are given to front face (I-90 side) of Existing Retaining Wall relative to ℄ W. Higgins Road.
3. Stations, offsets & elevations for control points are provided on Sheet 2.
4. Provide Plaque on inside face (W. Higgins Road side) of Barrier, at every 200' (or less).
5. Spacing of pilasters and layout of noise wall post anchors to be determined during final design.

*Expansion Joint Spacing in Barrier and Moment Slab (along front face (I-90 side) of Existing Retaining Wall)
**Construction Joint Spacing in Barrier
***Subject to refinement during final design



LOCATION SKETCH

GENERAL PLAN & ELEVATION
W. HIGGINS ROAD
F.A.P. RTE. I-90 - SEC. (1517 & 1415) R-2
COOK COUNTY
STA. 601+68.90 TO STA. 605+98.65
STRUCTURE NO. 016-2293

RME Rubinos & Mesia Engineers, Inc.
200 S. Michigan Avenue, Suite 1500, Chicago, IL 60604-2482

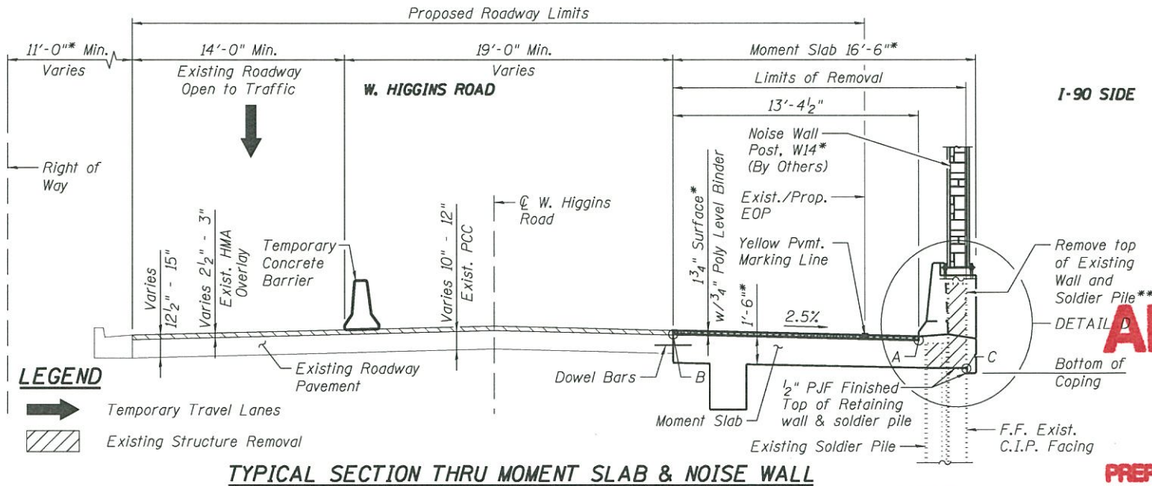
USER NAME = PHodina	DESIGNED - EV	REVISED -	
	CHECKED - PAH	REVISED -	
PLOT SCALE =	DRAWN - EV	REVISED -	
PLOT DATE = 3/28/2016	CHECKED - PAH	REVISED -	

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN & ELEVATION
EX WB-B MOMENT SLAB
SHEET NO. 1 OF 2 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-90		COOK	2	1
		ILLINOIS	FED. AID PROJECT	

MODEL: $MODELNAME$
D158015-sht-NW5.1_TSL01.GP&E.dgn



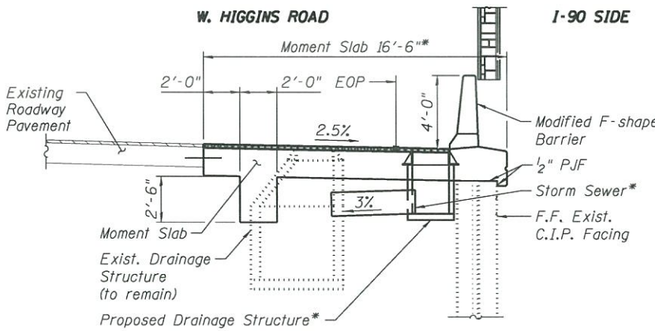
TYPICAL SECTION THRU MOMENT SLAB & NOISE WALL

(Looking East)

A Stations, offsets and elevations for Inside Face of Barrier are provided w.r.t. this point, see Plan & Elevation views.

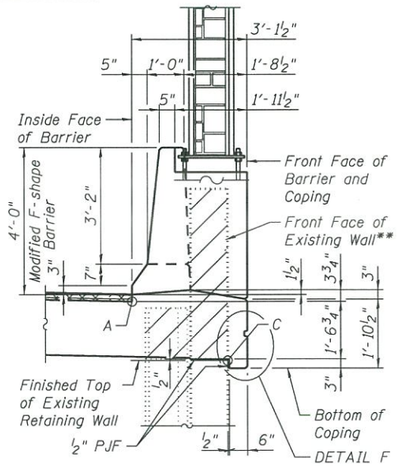
B Stations and offsets for inner edge of Moment Slab are provided w.r.t this point, see Plan view.

C Stations and elevations for finished top of Retaining Wall are provided w.r.t. this point, see Elevation view.

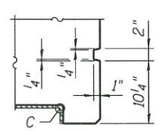


MOMENT SLAB SECTION

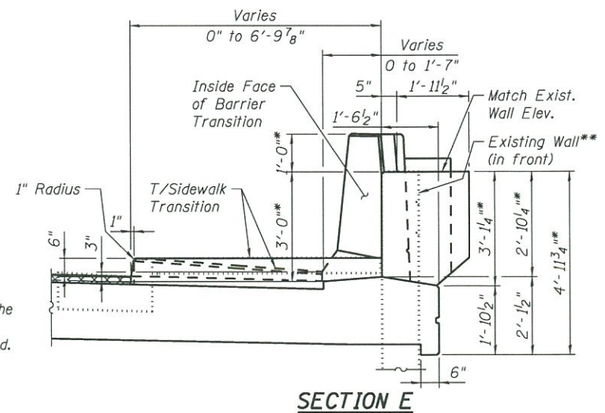
(Looking East @ Catch Basin Location)



DETAIL D



DETAIL F



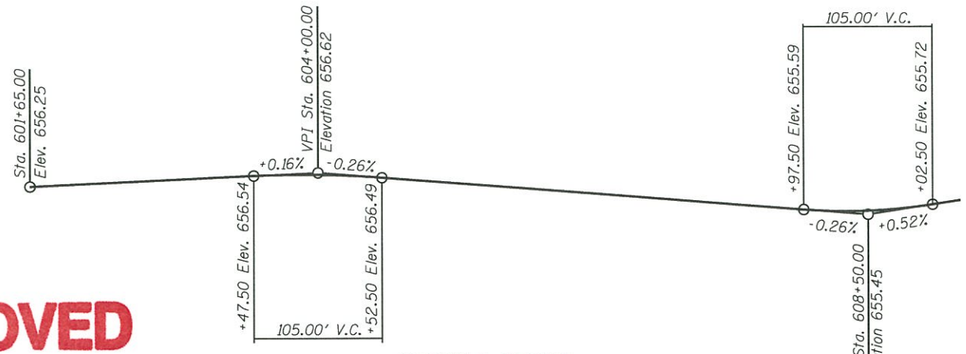
SECTION E

Notes:

* Subject to refinement during final design

** Remove top portion of existing Retaining Wall & Soldier Piles to the elevations shown on this sheet.

1. Stations and offsets are provided with respect to ℄ W. Higgins Rd.
2. See TYPICAL SECTION THRU MOMENT SLAB & NOISE WALL for location of Geometric Control Points.
3. Spacing of pilasters and layout of noise wall post anchors to be determined during final design.



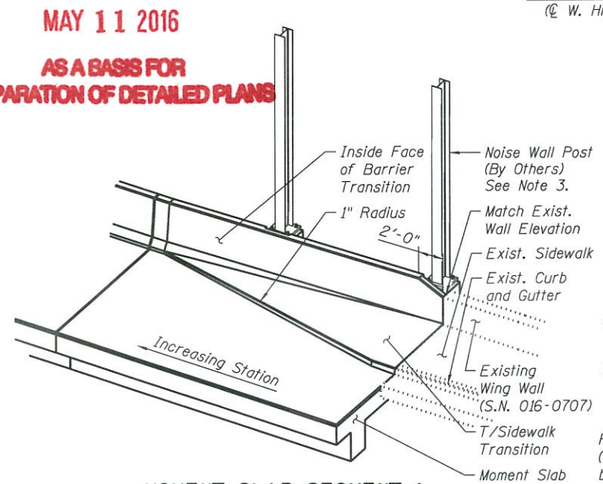
PROFILE GRADE

(℄ W. Higgins Rd.)

APPROVED

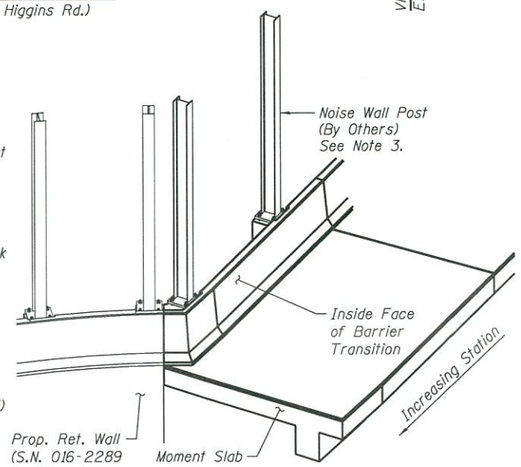
MAY 11 2016

AS A BASIS FOR PREPARATION OF DETAILED PLANS



MOMENT SLAB SEGMENT 1

(Looking South-East at Barrier Transistion)



MOMENT SLAB SEGMENT 7

(Looking South-West at Inside Face of Barrier)

GEOMETRIC CONTROL POINTS STATIONS, OFFSETS & ELEVATIONS

INSIDE FACE OF BARRIER (A)

Location	Station	Offset (' RT)	Elevation
A1	601+68.93	40.65	655.12
A2	601+92.77	41.13	655.19
A2A	602+16.78	41.13	655.28
A2B	602+40.75	40.21	655.34
A3	602+64.79	39.06	655.41
A3A	602+88.83	37.90	655.48
A3B	603+12.86	36.74	655.55
A4	603+36.89	35.59	655.62
A4A	603+60.92	34.43	655.69
A4B	603+84.96	33.27	655.76
A5	604+08.99	32.11	655.83
A5A	604+33.03	30.96	655.90
A5B	604+57.07	29.80	655.82
A6	604+81.10	28.64	655.74
A6A	605+05.12	27.49	655.66
A6B	605+27.47	26.41	655.58
A7	605+53.22	27.02	655.49
A7A	605+77.22	27.59	655.41
A8	605+98.72	28.10	655.34

INNER EDGE OF MOMENT SLAB (B)

Location	Station	Offset (' RT)	Elevation
B1	601+69.05	27.28	655.45
B2	601+92.89	27.49	655.53
B2A	602+21.51	27.75	655.61
B2B	602+40.11	26.85	655.67
B3	602+64.15	25.70	655.74
B3A	602+88.19	24.54	655.81
B3B	603+12.22	23.38	655.88
B4	603+36.25	22.23	655.95
B4A	603+60.28	21.07	656.03
B4B	603+84.32	19.91	656.10
C5	604+08.35	18.75	656.17
B5A	604+32.39	17.60	656.24
B5B	604+56.43	16.44	656.15
B6	604+80.46	15.28	656.07
B6A	605+04.48	14.13	655.99
B6B	605+27.30	13.03	655.92
B7	605+53.54	13.65	655.83
B7A	605+77.54	14.22	655.75
B8	605+99.03	14.73	655.67

FINISHED TOP OF RETAINING WALL (C)

Location	Station	Offset (' RT)	Elevation
C1	601+68.90	43.28	653.35
C2	601+92.75	43.49	653.42
C2A	602+21.83	43.75	653.51
C2B	602+40.88	42.84	653.56
C3	602+64.92	41.68	653.64
C3A	602+88.96	40.52	653.71
C3B	603+12.99	39.36	653.78
C4	603+37.02	38.21	653.85
C4A	603+61.05	37.05	653.92
C4B	603+85.09	35.89	653.99
C5	604+09.12	34.74	654.06
C5A	604+33.16	33.58	654.13
C5B	604+57.20	32.42	654.05
C6	604+81.23	31.26	653.97
C6A	605+05.25	30.11	653.89
C6B	605+27.50	29.04	653.81
C7	605+53.16	29.65	653.72
C7A	605+77.16	30.21	653.64
C8	605+98.65	30.72	653.57

MODEL: $MODELNAME$
D158015-sht-NW5.1_TSL02_Details.dgn

RME Rubinos & Mesia Engineers, Inc.
200 S. Michigan Avenue, Suite 1500, Chicago, IL 60604-2482

USER NAME = PHodina	DESIGNED - EV	REVISED -
	CHECKED - PAH	REVISED -
PLOT SCALE =	DRAWN - EV	REVISED -
PLOT DATE = 3/28/2016	CHECKED - PAH	REVISED -

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

SECTIONS AND DETAILS
EX WB-B MOMENT SLAB
SHEET NO. 2 OF 2 SHEETS

F.A.I. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
I-90		COOK	2	2
		ILLINOIS FED. AID PROJECT		

Geo Services, Inc.
Geotechnical, Environmental & Civil Engineering
805 Amherst Court, Suite 204
Naperville, Illinois 60565
(630) 355-2828

GSI Job No. 12245

SOIL BORING LOG

Page 1 **of** 1

Date 10/28/14

ROUTE -- **DESCRIPTION** I-90 Retaining Walls (Canfield Ave. to Oriole Ave.) **LOGGED BY** VH

SECTION -- **LOCATION** SW 1/4, **SEC.** 1, **TWP.** T40N, **RNG.** R12E, 3rd **PM**

COUNTY Cook **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. NWB-01
Station 3076+21
Offset 109.40ft Left
Ground Surface Elev. 655.40 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter 638.4 ft ▼
Upon Completion n/a ft
After ____ **Hrs.** ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				3.0" ASPHALT, 9.0" CONCRETE
654.40				
	15			SAND with Gravel-brown-loose to dense (Fill)
	19		3	
	22			
	13			
	15		5	
-5	17			
	4			
	5		5	
	8			
	5			
	6		4	
-10	5			
	4			
	4		7	
	3			
642.40				
	6			CLAYEY SAND with Gravel-dark gray-very loose (Fill)
	1		13	
-15	2			
639.90				
	2			SAND with Gravel-brown-very loose to medium dense (Fill)
▼	2		16	
	1			
	4			
	1		11	
-20	3			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				SAND with Gravel-brown-very loose to medium dense (Fill) *(continued)*
	10			
	5		17	
	8			
	5			
	6		9	End Of Boring @ -25.0'. Boring backfilled with cuttings.
630.40 -25	7			
-30				
-35				
-40				

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

BBS, from 137 (Rev. 8-99)

Z:\PROJECTS\2012\12245 HNTB, I-90 FROM I-190 TO HARLEM AVENUE (PTB 162-001)\12245 BORING LOGS\12245_LOG.GPJ 12/24/14

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

GSI Job No. 12245

SOIL BORING LOG

Page 1 **of** 1

Date 10/28/14

ROUTE -- **DESCRIPTION** I-90 Retaining Walls (Canfield Ave. to Oriole Ave.) **LOGGED BY** VH

SECTION -- **LOCATION** SW 1/4, **SEC.** 1, **TWP.** T40N, **RNG.** R12E, 3rd **PM**

COUNTY Cook **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. NWB-02
Station 3077+61
Offset 112.20ft Left
Ground Surface Elev. 655.70 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter Dry ft
Upon Completion Dry ft
After ____ **Hrs.** ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				3.0" ASPHALT, 9.0" CONCRETE
654.70				
	12			SAND with Gravel-brown-medium dense (Fill)
	13		4	
	13			
652.70				
	10			SILTY CLAY-dark brown & gray-medium stiff (Fill)
	3	0.6	30	
-5	3	B		
650.20				
	6			CLAY LOAM-brown & gray-stiff to very stiff
	4	2.7	22	
	5	B		
	2			
	3	1.2	24	
-10	5	B		
645.20				
	4			CLAY-gray-stiff to very stiff
	5	2.6	18	
	7	B		
	2			
	4	1.8	22	
-15	6	B		
	2			
	4	1.1	23	
	4	B		
	2			
	4	1.8	23	
-20	4	B		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				CLAY-gray-stiff to very stiff *(continued)*
	3			
	4	1.7	21	
	5	B		
	2			
	3	1.1	22	End Of Boring @ -25.0'. Boring backfilled with cuttings.
630.70 -25	5	B		
-30				
-35				
-40				

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

BBS, from 137 (Rev. 8-99)

Geo Services, Inc.
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Naperville, Illinois 60565
(630) 355-2818

GSI Job No. 12245

SOIL BORING LOG

Page 1 **of** 1

Date 10/28/14

ROUTE -- **DESCRIPTION** I-90 Retaining Walls (Canfield Ave. to Oriole Ave.) **LOGGED BY** VH

SECTION -- **LOCATION** SW 1/4, **SEC.** 1, **TWP.** T40N, **RNG.** R12E, 3rd **PM**

COUNTY Cook **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. NWB-03
Station 3079+09
Offset 120.30ft Left
Ground Surface Elev. 656.00 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter Dry ft
Upon Completion Dry ft
After ____ **Hrs.** ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
3.0" ASPHALT, 9.0" CONCRETE			
655.00			
SAND with Gravel-brown-medium dense (Fill)	10		
	14 16		3
653.00			
CLAY-brown & gray-stiff to hard	2		
	2 4	2.8 P	22
-5			
	5		
	6 9	6.8 B	19
	4		
	7 8	6.5 B	19
-10			
becoming gray @ -10.5'	2		
	5 9	6.5 B	19
	4		
	5 7	4.0 B	19
-15			
	4		
	4 6	2.9 B	20
	3		
	4 6	2.5 B	21
-20			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
CLAY-brown & gray-stiff to hard *(continued)*			
	3		
	5 5	1.5 B	22
	3		
End Of Boring @ -25.0'. Boring backfilled with cuttings.	5 6	1.8 B	22
631.00 -25			
-30			
-35			
-40			

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BBS, from 137 (Rev. 8-99)

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

GSI Job No. 12245

SOIL BORING LOG

Date 10/29/14

ROUTE -- **DESCRIPTION** I-90 Retaining Walls (Canfield Ave. to Oriole Ave.) **LOGGED BY** VH

SECTION -- **LOCATION** SW 1/4, **SEC.** 1, **TWP.** T40N, **RNG.** R12E, 3rd **PM**

COUNTY Cook **DRILLING METHOD** Hollow Stem Auger **HAMMER TYPE** CME Automatic

STRUCT. NO.
Station

BORING NO. NWB-04
Station 3080+54
Offset 123.10ft Left
Ground Surface Elev. 655.40 ft

Surface Water Elev. n/a ft
Stream Bed Elev. n/a ft

Groundwater Elev.:
First Encounter Dry ft
Upon Completion Dry ft
After ____ **Hrs.** ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				4.0" ASPHALT, 8.0" CONCRETE
				654.40
	6			CLAY-brown & gray-stiff to hard
	4	4.8	19	
	4	B		
	3			
	8	7.5	19	
-5	10	B		
	5			
	9	6.3	20	
	13	B		
	3			
	6	6.5	20	
-10	10	B		
	2			
	4	4.2	20	
	8	B		
	4			becoming gray @ -13.0'
	7	4.1	19	
-15	10	B		
	3			
	7	2.6	19	
	9	B		
	4			
	6	1.9	22	
-20	7	B		

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				CLAY-brown & gray-stiff to hard *(continued)*
	4			
	6	1.9	22	
	8	B		
	3			
	5	2.9	20	End Of Boring @ -25.0'. Boring backfilled with cuttings.
-25	8	B		
630.40				
-30				
-35				
-40				

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BBS, from 137 (Rev. 8-99)