Illinois Department of Transportation
2300 South Dirksen Parkway / Springfield, Illinois / 62764

January 9, 2012

SUBJECT: TR 256 (Austin Avenue)
Project BHOS-00D1(653)
Section 03-01130-00-BR
Kane County
Contract No. 63660
Item 73
January 20, 2012 Letting
Addendum (A)

NOTICE TO PROSPECTIVE BIDDERS:

Due to clarify information necessary to revise the following:

1. **Added Geotechnical Investigation, pages 122 - 132 to the Special Provisions.**

Prime contractors must utilize the enclosed material when preparing their bid and must include any Schedule of Prices changes in their bidding proposal.

Bidders using computer-generated bids are cautioned to reflect any and all Schedule of Prices changes, if involved, into their computer programs.

Very truly yours,

Scott Stitt, P.E.
Acting Engineer of Design and Environment

By: Ted B. Walschleger, P.E.
Engineer of Project Management

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Revised 1-9-12

SOIL AND MATERIAL CONSULTANTS, INC.

8 W. COLLEGE DR. • ARLINGTON HEIGHTS, IL 60004 • 847-870-0544 • FAX 847-870-0661

August 9, 2007
File No. 19017

Mr. John J. Tebrugge, P.E.
Tebrugge Engineering
146 Huntsman Drive
P.O. Box 38
Plano, Illinois 60545

Re: Geotechnical Investigation
Austin Avenue Bridge Structure No. 045-3087
Aurora, Illinois

Dear Mr. Tebrugge:

The following is our report of findings for the geotechnical investigation completed for the Austin Avenue bridge improvements in the City of Aurora, Illinois.

The investigation was requested to determine current subsurface soil and water conditions at select boring locations. The findings of the field investigation and the results of laboratory testing are intended to assist in the design and construction of proposed site improvements. We understand that it is proposed to add a pedestrian sidewalk on the west side of the existing bridge. The improvements would include extending both abutements to the west for support.

SCOPE OF THE INVESTIGATION

The field investigation included obtaining 2 borings at the locations requested and as indicated on the enclosed location sketch. The boring locations and elevations were provided by your company.

We auger drilled the borings to depths of 38.5 feet to 40.0 feet below existing surface elevations. Boring 1 was not extended to the scheduled depth of 40.0 feet as it hit refusal at 38.5 feet. Soil samples were obtained using a split barrel sampler advanced utilizing an automatic SPT hammer. Soil profiles were determined in the field and soil samples returned to our laboratory for additional testing including determination of moisture content. Cohesive soils obtained by split barrel sampling were tested further to determine dry unit weight and unconfined compressive strength.

The results of all field determinations and laboratory testing are included in summary with this report.

RESULTS OF THE INVESTIGATION

Enclosed are boring logs indicating the soil conditions encountered at each location. Site surface conditions include the existing bridge approach pavement section which includes bituminous concrete over a granular base.

Fill soil conditions were encountered at both borings. The composition of the fill includes the presence of poorly compacted clay/silt mixtures extending to depths of 8.5 feet to 12.5 feet. The limits of fill placement were not determined within the scope of this investigation.

The underlying soil conditions include the presence of cohesive soils. These are classified as tough to hard clay/silt mixtures with lesser portions of sand and gravel.

Non-cohesive soils were also encountered as indicated on the logs. These include loose to medium dense silt/clay and sand mixtures. The non-cohesive granular soils are often in a damp to very damp condition. Cobbles and boulders may be present within the site soils at any elevation, although none were encountered while drilling. Refusal, possible bedrock, was encountered at boring 1 at 38.5 feet.

The following table summarizes depth ranges below existing grade, the magnitude of soil strength within these ranges and other information:

Boring	Surface Elevation (feet)	Depth Range Below Existing Surface (feet)	Soil Strength (lbs./sq.ft.)	Recorded Water Levels, W.D./A.D. (feet)
1	694.7	2.0 to 9.5	*1,000	36.0/36.0
		9.5 to 13.0	*2,000	
		13.0 to 17.5	5,000	
		17.5 to 22.5	4,000	
		22.5 to 30.0	5,000	
		30.0 to 35.0	4,000	
2	694.0	2.0 to 9.0	*1,000	dry/dry
		9.0 to 11.5	3,000	
		11.5 to 21.0	4,000	
		21.0 to 30.0	5,000	
		30.0 to 35.0	3,000	

* Not recommended for support of foundations.

SUBSURFACE WATER

The boring logs and the above table indicate the depth at which subsurface water was encountered in the bore holes at the time of the drilling operations and during the period of these readings. It is expected that fluctuations from the water levels recorded will occur over a period of time due to variations in rainfall, temperature, subsurface soil conditions, soil permeability and other factors not evident at the time of the water level measurements.

FOUNDATIONS

Based on the results of this investigation it is our opinion that isolated footing foundations may be considered for support of the addition to the bridge. These foundations can be supported on undisturbed natural soils located below all topsoil, debris, fill soils, low strength soils and other unsuitable conditions which may be encountered. Soil strength values and the depths at which

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they are expected to be encountered at these boring locations are indicated in the above table. Foundations should extend at least 60.0 inches below exposed surface elevations to provide adequate protection against uplift due to freezing of the supporting soils.

A deep foundation system could also be considered for support of the structure. A caisson or pile foundation system, designed by a licensed structural engineer, can be utilized to transmit loads through the unsuitable fill soil conditions and into the suitable soil conditions present at the deeper elevations.

Caissons designed for end bearing should extend about 3.0 feet or deeper into cohesive soils and should bottom in soils possessing the design bearing strength. The bottom of the shafts can be belled to increase the load carrying capacity of each caisson. This will require extending the drilled shaft further into the cohesive soils as needed to assure non-caving soil conditions in the sidewall of the bell. Temporary or permanent casing extending above the ground surface is needed to prevent caving of the soil around the top of the drilled shaft. Further, temporary or permanent casing will be needed when drilling through caving soils or through soft soils which squeeze thus narrowing the diameter of the drilled shaft. The casing will also reduce the volume of water seeping into the drilled shaft.

A pile foundation system should include consideration of the negative impact of vibration on adjacent structures. Driven piles will typically extend to variable depths. Generally, pile penetration depths of 15.0 feet or deeper into suitable soil conditions are needed to develop design strength. Specific driving depths are dependent upon factors which include the required load carrying capacity of the pile, pile type and size, variations in subsurface soil conditions and other factors.

DEWATERING

Excavations may require dewatering due to subsurface water seepage and/or surface precipitation. This water can likely be removed to depths of several feet by standard sump and pump operations. Soils exposed at the foundation elevations should not be permitted to become saturated. Loss of bearing strength and stability may occur thus requiring additional soil excavation.

Aggressive dewatering efforts will be necessary for deep excavations. Well-points or deep sumps can be utilized to collect the water for pumping in an effort to lower the water level below the bottom elevation of proposed excavations. The dewatering should be accomplished prior to soil excavation when possible.

It should be noted that fill soils, non-cohesive soils and others can be quite unstable when saturated. These soils tend to cave or run when submerged or disturbed. The stability of exposed embankments is minimal to non-existent as confining soil pressures are removed. Proper drainage within excavations is necessary at all times, particularly when excavations extend below anticipated water levels and below saturated soils.

CONCLUSION

The information within this report is intended to provide initial information concerning subsurface soil and water conditions on the site. Variations in subsurface conditions are

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expected to be present between boring locations due to naturally changing and filled soil conditions.

Our understanding of the proposed improvements is based on limited information available to us at the writing of this report. The findings of the investigation and the recommendations presented are not considered applicable to significant changes in the scope of the improvements or applicable to alternate site uses. We recommend that proposed foundation plans be reviewed by our office to determine if additional considerations are necessary to address anticipated subsurface conditions. Additionally, soil conditions encountered at foundation elevations should be tested to verify the presence of design soil strength prior to concrete placement.

If you have any questions concerning the findings or recommendations presented in this report, please let me know.

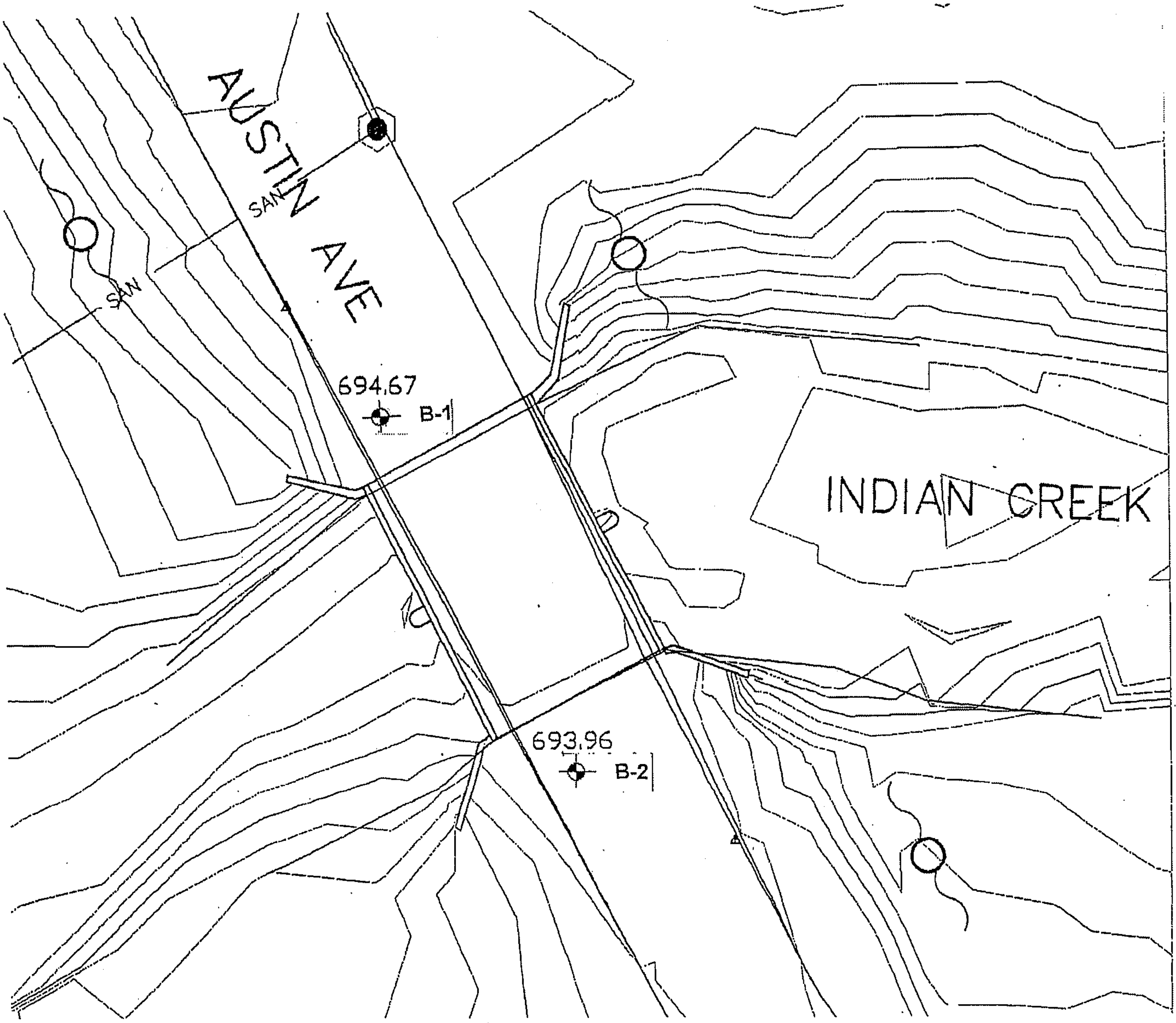
Very truly yours,

SOIL AND MATERIAL CONSULTANTS, INC.

Gordon J. McKavanagh, P.E.
Director of Engineering

GJM:dl
Enc.

Added 1-9-12



SMC	SOIL AND MATERIAL CONSULTANTS, INC.	LOCATION SKETCH
Client:	TEBRUGGE ENGINEERING	
Project:	AUSTIN AVENUE BRIDGE STRUCTURE NO. 045-3087	
Location:	AURORA, ILLINOIS	
File No. 19017	Date: 8-1-07	Scale: 1" = 20'

G-300 *Added 1-9-12*

SOIL AND MATERIAL CONSULTANTS, INC.
Arlington Heights, Illinois (847) 870-0544

SOIL BORING LOG 1

Logged By: DA **Page:** 1 of 1

Client: Tebrugge Engineering **File No.** 19017 **Date Drilled:** 8/1/07

Reference: Austin Avenue Bridge Structure
No. 045-3087
Aurora, IL

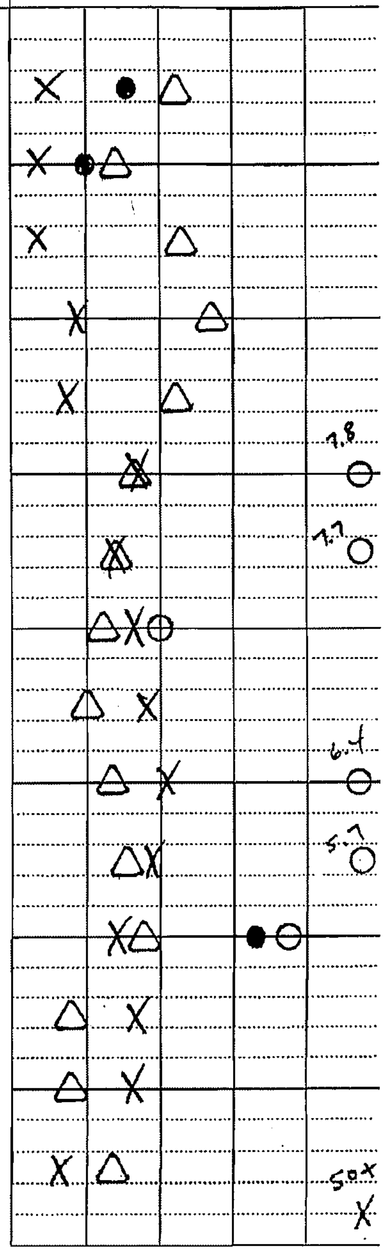
Comments:

Equipment: ☒ CME 45B ☐ CME 55 ☐ Hand Auger ☐ Other

○ unconfined compressive strength, tons/sq.ft.
● penetrometer reading, tons/sq.ft.
1.0 2.0 3.0 4.0

× standard penetration "N", blows/ft.
△ moisture content, %
10 20 30 40

depth, ft.	CLASSIFICATION Elevation 694.7' Existing Surface	standard penetration ×	moisture content △	dry unit weight lbs./cu.ft. γ	unconfined compressive strength ○
	(a & b) see below				
	Brown clay & silt, trace sand & gravel, damp, tough - Fill	5	21.0		
5		4	13.5		
	Brown silt, some clay, trace sand, damp, very loose - Fill	4	22.4		
10	Dark gray-black silt, some clay, trace sand & gravel, damp-very damp, loose - Fill	8	28.1		
		7	20.5		
15	Brown to gray clay, some silt, trace sand & gravel, damp, hard	17	17.3	116.1	7.8
		14	13.9	123.4	7.7
20	Gray clay & silt, trace sand & gravel, damp, very tough	16	10.6	135.1	2.0
	Gray silt, some clay, trace sand & gravel, damp, medium dense	18	10.1		
25	Gray clay, some silt, trace sand & gravel, damp, hard	21	12.7	122.8	6.4
		19	14.9	120.7	5.7
30	Gray clay, some silt, trace sand & gravel, damp, very tough	14	18.5	115.0	3.8
	Brown sand, trace silt & gravel, damp-very damp, medium dense	17	9.3		
35		16	8.8		
	Brown sand, trace silt & gravel, damp-very damp, loose	6	12.9		
	Weathered bedrock				
40	Refusal End of Boring	50+			



(a) Bituminous concrete - 6.0"
(b) Base-brown sand & gravel, damp 10.0"

Water encountered at 36.0 feet during drilling operations (W.D.).
Water recorded at 36.0 feet on completion of drilling operations (A.D.).
Water recorded at feet hours after completion of drilling operations (A.D.).

Added 1-9-12

SOIL AND MATERIAL CONSULTANTS, INC.
Arlington Heights, Illinois (847) 870-0544

SOIL BORING LOG 2

Logged By: DA Page: 1 of 1

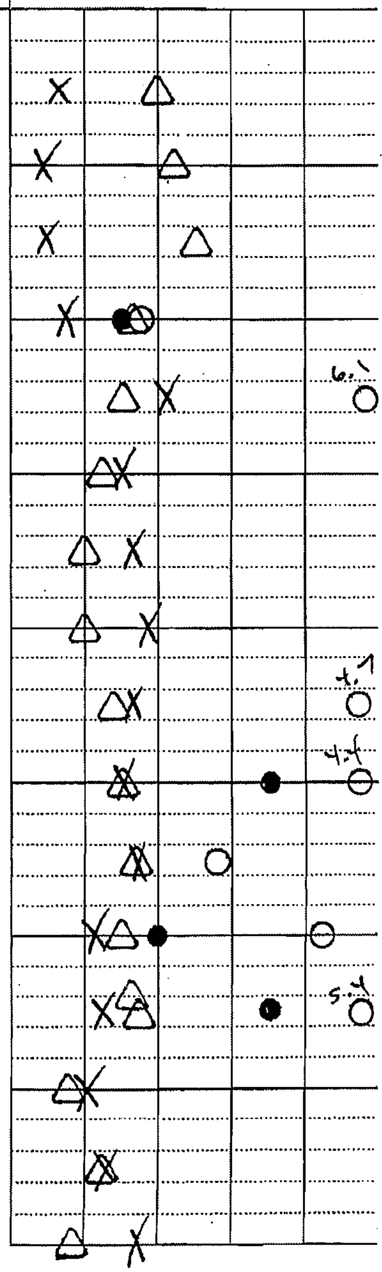
Client: Tebrugge Engineering File No. 19017 Date Drilled: 8/1/07

Reference: Austin Avenue Bridge Structure
No. 045-3087
Aurora, IL

Comments:

Equipment: ☒ CME 45B ☐ CME 55 ☐ Hand Auger ☐ Other

CLASSIFICATION — Elevation 694.0' Existing Surface	standard penetration X	moisture content Δ	dry unit weight lbs./cu.ft.	unconfined compressive strength O
(a & b) see below				
Brown-gray silt, some clay, trace sand, damp-very damp, loose - Fill	6	20.3		
	5	20.9		
	5	24.7		
Brown clay, some silt, trace sand & gravel, damp, tough	7	17.1	114.5	1.8
Brown clay & silt, trace sand & gravel, damp, hard	21	14.6	118.9	6.1
Gray silt, some clay, trace sand & gravel, damp, medium dense	15	10.6		
	17	9.5		
	18	10.1		
Gray clay, some silt, trace sand & gravel, damp, hard	17	13.7	121.1	4.7
	15	15.1	122.0	4.4
Gray clay, some silt, trace sand & gravel, damp, very tough to hard	17	18.1	114.4	2.9
	11	15.2	119.0	4.2
(c) see below		17.4		
(d) see below	12	18.9	107.6	5.4
Brown sand, trace silt & gravel, very damp, medium dense	10	8.7		
	12	11.2		
Gray silt, some clay, trace sand & gravel, damp, medium dense	17	9.1		



End of Boring

(a) Bituminous concrete - 6.0"
(b) Base-brown sand & gravel, damp
(c) Gray silt, some clay, trace fine sand & gravel, damp, loose
(d) Gray clay, some silt, trace sand & gravel, damp, hard

Water encountered at dry feet during drilling operations (W.D.).
Water recorded at dry feet on completion of drilling operations (A.D.).
Water recorded at feet hours after completion of drilling operations (A.D.).

Added 1-9-12

SOIL AND MATERIAL CONSULTANTS, INC.

General Notes

SAMPLE CLASSIFICATION

Soil sample classification is based on the Unified Soil Classification System, the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), ASTM D-2488, the Standard Test Method for Classification of Soils for Engineering Purposes, ASTM D-2487(when applicable), and the modifiers noted below.

CONSISTENCY OF COHESIVE SOILS

Term	Qu -tons/sq. ft.	N (unreliable)
Very Soft	0.00 - 0.25	0 - 2
Soft	0.26 - 0.49	3 - 4
Stiff	0.50 - 0.99	5 - 8
Tough	1.00 - 1.99	9 - 15
Very Tough	2.00 - 3.99	16 - 30
Hard	4.00 - 7.99	30 +
Very Hard	8.00 +	

RELATIVE DENSITY OF GRANULAR SOILS

Term	N - blows/foot
Very Loose	0 - 4
Loose	5 - 9
Medium Dense	10 - 29
Dense	30 - 49
Very Dense	50 +

IDENTIFICATION AND TERMINOLOGY

Term		Size Range
Boulder		over 8 in.
Cobble		3 in. to 8 in.
Gravel	-coarse	1 in. to 3 in.
	-medium	3/8 in. to 1 in.
	-fine	#4 sieve to 3/8 in.
Sand	-coarse	#10 sieve to #4 sieve
	-medium	#40 sieve to #10 sieve
	-fine	#200 sieve to #40 sieve
Silt		0.002 mm to #200 sieve
Clay		smaller than 0.002 mm

Modifying Term	Percent by Weight
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

Moisture Condition

Dry
Damp
Very Damp
Saturated

DRILLING, SAMPLING & SOIL PROPERTY SYMBOLS

CF - Continuous Flight Auger
HS - Hollow Stem Auger
HA - Hand Auger
RD - Rotary Drilling
AX - Rock Core, 1-3/16 in. diameter
BX - Rock Core, 1-5/8 in. diameter
NX - Rock Core, 2-1/8 in. diameter
S - Sample Number
T - Type of Sample
J - Jar
AS - Auger Sample
SS - Split-spoon (2 in. O.D. with 1-3/8 in. I.D.)
ST - Shelby Tube (2 in. O.D. with 1-7/8 in. I.D.)
R - Recovery Length, in.
B - Blows/ 6 in. interval, Standard Penetration Test (SPT)
N - Blows/ foot to drive 2 in. O.D. split-spoon sampler with 140 lb. hammer falling 30 in., (STP)
Pen. - Pocket Penetrometer reading, tons/ sq. ft.
W - Water Content, % of dry weight
Uw - Dry Unit Weight of soil, lbs./ cu. ft.
Qu - Unconfined Compressive Strength, tons/ sq. ft.
Str - % Strain at Qu.
WL - Water Level
WD - While Drilling
AD - After Drilling
DCI - Dry Cave-in
WCI - Wet Cave-in
LL - Liquid Limit, %
PL - Plastic limit, %
PI - Plasticity Index (LL-PL)
LI - Liquidity Index [(W-PL)/PI]

Added 1-9-12

SOIL AND MATERIAL CONSULTANTS, INC.

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June 23, 2011
File No. 19017

Mr. John J. Tebrugge, P.E.
Tebrugge Engineering
146 Huntsman Drive
P.O. Box 38
Plano, Illinois 60545

Re: Supplemental Report
Austin Avenue Bridge
Structure No. 045-3087
Aurora, Illinois

Dear Mr. Tebrugge:

The following is a supplement to our original geotechnical report dated August 9, 2007. The original report was for the proposed reconstruction of the Austin Avenue Bridge in Aurora, Illinois. The supplemental report was requested to determine the estimated pile lengths for various steel H-Piles.

It is our understanding that steel H-Piles are now being considered by the design engineer for support of the new bridge abutments. We do not expect downdrag or liquefaction to affect the design of the new bridge. Based on the hydraulic report performed by others, design scour elevations of 687.9' and 686.0' were used in determining the pile lengths for the north and south abutments respectively.

The following are our estimated pile lengths based upon the Modified IDOT Static Method of Estimating Pile Length using a geotechnical resistance factor (Φ_G) of 0.55.

Table of Estimated Lengths for Steel HP 12x53

Location	R_n (kips) [(1)]	R_f (kips) [(2)]	Length (ft.) [(3)]
North Abutment (B-1)	419	230	33
South Abutment (B-2)	291	160	26

Table of Estimated Lengths for Steel HP 14x73

Location	R_n (kips) [1]	R_f (kips) [2]	Length (ft.) [3]
North Abutment (B-1)	578	317	33
South Abutment (B-2)	291	160	23
	328	180	27
	364	200	29

(1) R_n: Nominal Required Bearing
(2) R_f: Factored Resistance Available
(3) Pile Lengths were estimated using pile cutoff elevations of 689.9 feet at the North Abutment and 688.0 feet at the South Abutment.

It should be noted that at boring 1 weathered bedrock was encountered at EL. 656.7 feet. Boring 2 extended to EL. 654.0 feet with no bedrock encountered. The design engineer could consider driving the piles to refusal for both abutments. If weathered bedrock is encountered at boring 2 the Nominal Required Bearing and Factored Resistance Available values similar to boring 1 can be used for design.

One test pile should be performed at each substructure location. The piles should be driven until the required driving resistance is developed as determined using the appropriate pile driving formula. The test piles should be driven to not less than 110% of the Nominal Required Bearing. We would also recommend that the WSDOT formula be used in the field as the construction verification.

The existing soils are expected to undergo some small degree of long-term settlement as the soils consolidate under loading. We estimate settlements of less than 0.25 inches, in addition to the elastic compression of the pile itself. Minimal settlement is expected for any new embankments constructed near the abutments provided they are constructed in accordance with IDOT Standard Specifications.

Drainage should be provided behind the new wing walls and abutments. We recommend that the open excavation behind wing walls and abutments be backfilled with open graded, free-draining materials such as CA05 or CA07. These materials have unit weights of approximately 100 lbs/ft^3 (wet) with an internal friction angle (Φ) of 32°. For yielding walls, a lateral active earth pressure of 45 psf per foot of depth can be used for design for granular backfill above the water table. For non-yielding walls, with drained granular backfill, a lateral at-rest pressure of 60 psf per foot can be used.

The information within this report is intended to provide additional information concerning subsurface soil and water conditions on the site. Variations in subsurface conditions are expected to be present between boring locations due to naturally changing and filled soil conditions. Our understanding of the proposed improvements is based on information available to us at the writing of this report.

Added 1-9-12

If you have any questions concerning the findings or recommendations presented in this report, please let us know.

Very truly yours,

SOIL AND MATERIAL CONSULTANTS, INC.

Thomas P. Johnson

Thomas P. Johnson, P.E.
Director of Engineering

TPJ:jk
Enc.

Added 1-9-12