



**CHRISTOPHER B. BURKE ENGINEERING, LTD.**

9575 West Higgins Road Suite 600 Rosemont, Illinois 60018 TEL (847) 823-0500 FAX (847) 823-0520

November 13, 2019

Village of Orland Park  
Development Services – Planning & Engineering Division  
15655 Ravinia Avenue  
Orland Park, IL 60462

Attention: S. Khurshid Hoda, CPP  
Director | Programs and Engineering Services

Subject: Phase I Engineering Supplemental Services  
143<sup>rd</sup> Street – Wolf Road to Southwest Highway  
Supplement #3

Dear Mr. Hoda:

Enclosed is our proposal to completed Phase I Engineering services for the subject project. Included in this proposal is the scope of services included with Supplement #3, and our cost estimate of consultant services.

**Understanding of the Assignment**

Supplement #3 compensates for additional level of effort that is required to complete Phase I Engineering and Environmental Studies for 143<sup>rd</sup> Street from Wolf Road to Southwest Highway. The additional level of effort to meet IDOT engineering design requirements and federal project development procedures, and is related to the following four general areas:

1. From coordination with IDOT and Illinois Commerce Commission (ICC) regarding the 143<sup>rd</sup> Street at Southwest Highway/Union Street intersection, a detailed traffic signal and phasing design is required due to the complexity of the proposed improvement and proximity to the Norfolk Southern Railroad crossing. Depending on the outcome of the detailed traffic signal and phasing design, significant changes may be required at the intersection affecting the geometric design (Task 7) and intersection design study (Task 9). Contingency sub-tasks have been added to Task 7 and Task 9 accordingly.
2. There are 13 potential National Register of Historic Places (NHRP) properties/structures within the project limits, six of which currently have proposed acquisition. The proposed direct impacts/effects and indirect impacts/effects are under review with the IDNR State Historic Preservation Officer (SHPO) to determine if there are adverse effects to the historic properties. To comply with Section 106 of the National Historic Preservation Act and Section 4(f) of the U.S. Department of Transportation Act, it requires that the effects of this project on properties potentially eligible for the NHRP be evaluated as part of Phase I Engineering and measures be taken to avoid, minimize or mitigate effects/impacts. It is possible that the SHPO determines there are adverse effects to historic properties and additional documentation, design modifications, and analysis would be required. The

outcome of the Section 106 process would be an agreeable mitigation plan via a Memorandum of Agreement (MOA) between IDOT, SHPO and FHWA and the outcome of the Section 4(f) process would be approval of FHWA of the Section 4(f) Evaluation document, which justifies impacts to the potential NHRP properties. Approximately 6 to 8 months could be added to the project schedule if full Section 106 and Section 4(f) processes need to be followed. A contingency sub-task has been added to Task 12 accordingly.

3. The IDOT geotechnical manual was updated in 2015 after the project was previously scoped. Per the current IDOT Geotechnical Manual and IDOT District 1 policy, structural analysis Type, Size and Location (T,S&L) drawings and Soil Geotechnical Reports (SGR) are required for all retaining walls over 7-feet of exposed height during Phase I Engineering. Through coordination with IDOT, IDOT District 1 has allowed the structural T,S&L drawings can be deferred to Phase II Engineering, however, the retaining wall types must be identified in Phase I. Additionally, due to the circumstances of this project, IDOT District 1 is allowing a reduction in required geotechnical borings per wall (typically every 75-feet) and SGR's (and remaining geotechnical work) will be deferred to Phase II Engineering (for walls over 7-feet in exposed height). A revised scope was obtained from the geotechnical subconsultant, Wang Engineering, and is included the geotechnical investigations work task (Task 16). While structural T,S&L drawings and a portion of the geotechnical work were deferred to Phase II Engineering, an additional level of effort from the original scope of work is required to complete the geotechnical component that IDOT is requiring during Phase I Engineering. The existing contract assumed three walls that required geotechnical investigations (walls over 7-feet in exposed height) and the current design has 11 walls. Overall there are currently a total of 28 retaining walls proposed with the project.
4. The proposed improvement affects 103 parcels with either proposed and/or temporary impacts. Additional stakeholder coordination meetings are anticipated to discuss and seek input on the proposed improvement.

### **Supplement #3 Scope of Services**

On the above basis, Supplement #3 includes additional scope for Tasks 7, 9, 12, 15, 16, and 17 following detailed scope of service by task per the original agreement. This additional fee will complete Phase I Engineering assuming the scope of work for the overall project, including Supplement 3, is not modified.

### **Task 7 –Alternate Geometric Studies**

This task includes minor revisions to the geometric design (curb radius returns, sidewalks, stop bar, cross walks, turn lane storage/taper lengths, etc.) at the 143<sup>rd</sup> Street at Southwest Highway/Union Street intersection as a result of the detailed traffic signal and phasing design (Included in Supplement 2). This includes modifications to plan and profile sheets (40 scale), typical sections, cross sections, and curb ramp details (6 curb ramps and sidewalk along 143<sup>rd</sup> Street between Union Street and RR). If significant modifications are made at the intersection Task 7b will be utilized.

Additional impact assessment will be performed for the entire project to minimize property acquisition and associated impacts. Currently there is proposed acquisition from 103 parcels. The plan and profile sheets and cross sections will be update accordingly.

*Task 7b – Alternative Geometric Studies (Contingency):* Contingent upon results of the detailed traffic signal and phasing design, Task 7b will only be utilized if significant/major revisions to the geometric design (lane modifications, alignment changes, profile modifications, or other major geometric components) at the 143<sup>rd</sup> Street at Southwest Highway/Union Street intersection are required. Design modifications include 1,500 feet along 143<sup>rd</sup> Street, 2,100 feet along Southwest

Highway and 400 feet along Union Street. This includes horizontal alignment design, vertical alignment design, plan and profile sheet (40 scale), typical sections, cross section, and curb ramp details.

#### **Task 9 – Intersection Design Studies**

This task includes minor revisions to the intersection design study (IDS) at the 143<sup>rd</sup> Street at Southwest Highway/Union Street intersection as a result of the detailed traffic signal layout and phasing design (Included in Supplement 2). The capacity analysis will be updated using Synchro traffic modeling software. A new queue analysis will be conducted and turn lanes adjusted accordingly. Other modifications to the IDS may include curb radius returns, sidewalks, stop bar locations, cross walk location, refuge island, turn lane storage/taper lengths, etc.). If significant modifications are made at the intersection Task 9b will be utilized.

It has been confirmed with IDOT that the IDSs for the entire project can utilize 2040 design hourly volumes.

*Task 9b – Intersection Design Studies – Southwest Highway Intersection (Contingency):* Contingent upon results of the detailed traffic signal and phasing design, Task 9b will only be utilized if significant/major revisions to the geometric design (lane modifications, alignment changes, profile modifications, or other major geometric components) at the 143<sup>rd</sup> Street at Southwest Highway/Union Street intersection are required. The intersection design study will be revised per the geometric revisions. The capacity analysis will be updated using Synchro traffic modeling software. A new queue analysis will be conducted. Minor IDS revisions are anticipated at West Avenue.

The Southwest Highway / Union Street / 143<sup>rd</sup> Street IDS will be prepared at a scale of 1" = 50' and will include the following:

- Preliminary intersection geometry and labeling (2 sheets)
- Detailed traffic signal layout and phasing design (1 sheet)
- Auto Turn design vehicle layout (2 sheets)
- Profile (3 sheets)
- ADA curb ramp details (6; 3 sheets; Design conducted under Task 7)

#### **Task 12 – Prepare Environmental Studies**

This task includes additional environmental studies required by IDOT and FHWA, including:

- Section 4(f) *de minimis* documentation for impacts (property acquisition) to 6 potentially eligible National Register of Historic Places (NHRP), as required by FHWA policy.
- Section 4(f) *de minimis* documentation for proposed temporary impacts to McGinnis Slough Forest Preserve, as required by FHWA policy. As a result of detailed drainage design, two temporary construction easements are needed to regrade existing ditches. One temporary easement is needed for grading associated with the proposed multi-use path where a retaining wall is not feasible. There are three potential locations for water quality best management practice areas, which would require a permanent drainage easement; these would only be included if the Forest Preserve District of Cook County desires them. As a result of the additional impacts of Forest Preserve property, additional tree survey will be required (2" and greater), per Cook County requirements.
- As a result of the Wolf Road alignment to minimize impacts to the Yunker School site and the addition of two travel lanes, noise mitigation is anticipated along the west side of Wolf Road and will be verified with the completion of the Traffic Noise Report. IDOT District 1 has required that noise wall solicitation (voting) take place during Phase I Engineering. As

such, a noise forum will be held for benefitted receptors/properties of the noise wall(s) to inform of the proposed improvement, review IDOT/FHWA noise policy, and review the proposed noise wall location(s). Mailings will be sent out informing of the noise forum and solicitation packages (up to two rounds) will be mailed out.

*Task 12b – Section 106 / Section 4(f) Adverse Effect Finding (Contingency):* Contingent upon the results IDNR SHPO Adverse Effect determination, Task 12b will only be utilized if an Adverse Effect is found for impacts to historic/cultural resources protected by Section 106 of the National Historic Preservation Act. Section 4(f) and Section 106 are related to separate Federal laws with different requirements, with some overlap, but each require separate documentation. The main difference is that Section 106 is primarily a consultative process whereas Section 4(f) is a substantive law that can preclude project approval if there is a use of a historic site when a prudent and feasible alternative is available. It is assumed that no historic structures will be removed/impacted from their sites. However, it is possible that the SHPO issues an Adverse Effect due to substantial alteration to the context and setting of the site. The requirements for the Section 106 process are specified in IDOT Bureau of Local Roads Manual (Chapter 20-5) and IDOT Bureau of Design and Environment Manual (Chapter 26-5).

Specific Section 106 work tasks include:

- Coordination with IDOT BLRS, IDOT Cultural Unit, Advisory Council on Historic Preservation (ACHP), and other local interested parties. The objective of this coordination is to obtain the views of consulting parties of the undertaking and solicit input on ways to avoid/minimize/mitigate Adverse Effect.
- Geometric modifications of the preferred alternatives to address further IDOT and SHPO comments to minimize impacts.
- Preparation of Section 106 historic documentation, via memorandum, including sections:
  - Description of the undertaking, including photographs, maps and drawings (as necessary)
  - Description of the efforts to identify historic properties
  - Description of the affected historic properties (using materials compiled during the evaluation of significance)
  - Description of the undertaking's effects on historic properties
- The announcement or notice of the effect of the project on the eligible properties involved, which is anticipated to take place at a separate Public Meeting from the one occurring at the end of the project. The timing of this meeting is anticipated to occur prior to the public hearing.
- Memorandum of Agreement (MOA prepared by IDOT BDE) review and coordination. It is anticipated that no buildings/structures will be impacted with this project and that a Historic American Building Survey (HABS Report) will not be required as part of the MOA.

With an Adverse Effect finding, FHWA will require a separate Section 4(f) Evaluation to be prepared for FHWA's approval. Section 4(f) of the U.S. Department of Transportation Act provides for consideration of historic sites and other recreational lands during transportation project development. FHWA must determine that there is no feasible and prudent alternative that avoids the Section 4(f) properties and that the project includes all possible planning to minimize harm or had a de minimis impact. The requirements for the Section 4(f) process are specified in IDOT Bureau of Local Roads Manual (Chapter 20-3) and IDOT Bureau of Design and Environment Manual (Chapter 26-2).

The Section 4(f) documentation includes sections:

- Introduction / Description of the proposed action, including concise statement of the project purpose and need. With the anticipated processing of this project as a Categorical Exclusion (CE), a purpose and need statement is not prepared.
- Description of the Section 4(f) resource
- Description of the alternatives, including avoidance alternatives
- Description of impacts
- Discussion of mitigation measures
- Discussion of coordination activities
- Documentation of coordination with the official(s) having jurisdiction of the Section 4(f) resource. This is anticipated to be the SHPO.
- It is anticipated that the Section 4(f) documentation will be submitted to IDOT for draft review and then FHWA for draft review. The final Section 4(f) documentation will be prepared for final submittal to IDOT and FHWA for their review and approval.
- Project coordination due to elongated schedule to complete Section 106 and Section 4(f) process.

It is anticipated that three submittals will be required:

- Draft submittal to IDOT Local Roads (prior to Public Meeting)
- Draft submittal to FHWA (prior to Public Meeting)
- Final submittal to IDOT and FHWA (following Public Meeting)

The Section 4(f) process concludes following the final public meeting for the project where comments are solicited regarding the proposed Section 4(f) impacts. The outcomes of the public meeting and comments received, are included in the final Section 4(f) document, which is executed by the jurisdictional agency, which is the SHPO for impacts to historic properties.

#### **Task 15 – Public Involvement/Meetings**

This task includes preparation and attendance at 6 additional stakeholder coordination meeting (2 staff members). These meetings will lead up to the Public Hearing for the project and will include key individual or group stakeholder meetings. These meetings are intended to communicate with stakeholders that are most affected by the project ahead of public hearing.

#### **Task 16 – Geotechnical Investigations**

Per IDOT policy, geotechnical investigations will be conducted for all retaining walls over 7-feet exposed height (11 walls), however Soil Geotechnical Reports (SGR) will be deferred to Phase II Engineering (and any other necessary borings). Wang Engineering will perform the geotechnical investigations and prepare a summary report for this task. The findings of the geotechnical investigations will be utilized CBBEL under Task 6 (Retaining Wall Analysis) to determine the anticipated retaining wall type. This information will be included in the Project Development Report. Refer to separately attached Wang Engineering proposal for the detailed geotechnical scope of work.

#### **Task 17 – Project Administration and Quality Control / Assurance**

This task includes overall project administration and management. Due to the extended project schedule and associated coordination with the supplemental scope of work, an extra level of project administration and QA/QC is required for completion of Phase I Engineering. The Task assumes Phase I Design Approval by April 2020.

**Estimate of Fee**

Based on the above Scope of Services, our Estimate of Fee for Supplement 3 is \$363,393.91 as shown in the attached CECS.

We will bill you at the same hourly rates as the federally funded Preliminary Engineering Services Agreement.

If this proposal is acceptable to you, please have the appropriate signature added below on behalf of the Village of Orland Park and return one copy as an indication of acceptance and notice to proceed. If you have any questions, please contact Matthew Huffman at 847/823-0500.

Sincerely,



Michael E. Kerr, PE  
Executive Vice President

Attachments: Supplement #3 Work Hour Estimate, CECS, Wang Engineering Geotechnical Engineering Services Proposal

THIS PROPOSAL ACCEPTED FOR THE VILLAGE OF ORLAND PARK.

BY: \_\_\_\_\_

TITLE: \_\_\_\_\_

DATE: \_\_\_\_\_

# 143rd Street - Wolf Road to Southwest Highway

SN: 14-00072-00-WR

## Work Hour Estimate

### Supplement #3

November 2019

Task <i>(refer to detailed scope of work document for further explanation )</i>		CBBEL		Subconsultants - Work Hours
		Units	Work Hours	Wang Eng.
<b>7</b>	<b>Alternative Geometric Studies</b>			
a	Southwest Highway intersection minor geometric design modifications (no lane changes) resulting from detailed traffic signal phasing and layout; includes plan sheet updates.		30	0
b	Impacts/ROW Minimization Evaluation & Cross Section Updates	21 sheets at 4 hrs/sht	84	0
c	ADA curb ramp details associated with Southwest Highway intersection	6 ramps at 8 hrs/ramp + 143rd Street sidewalk between RR and south union st. (14 hours)	62	0
	SUBTOTAL:		176	0
<b>7b</b>	<b>Alternative Geometric Studies - Southwest Highway Intersection (Contingency)</b>			
a	Southwest Highway intersection design modifications (lane modifications) resulting from detailed traffic signal phasing and layout (143rd St. - 1,500'; Southwest Highway 2,100', Union Street - 400'); includes plan sheet updates, cross sections and typical section sheets	5 sheets at 16 hrs/sht	80	0
	SUBTOTAL:		80	0
<b>9</b>	<b>Intersection Design Studies</b>			
a	Southwest Highway, Union Street and 143rd Street Intersection minor IDS Update (no lane changes) resulting from detailed traffic signal phasing and layout; includes plan sheet updates.		48	0
	SUBTOTAL:		48	0
<b>9b</b>	<b>Intersection Design Studies - Southwest Highway Intersection (Contingency)</b>			
a	Southwest Highway and Union Street major IDS Update (lane changes) resulting from detailed traffic signal phasing and layout; includes plan sheet updates.; includes capacity analysis, queue analysis, and auto turn		90	0
	SUBTOTAL:		90	0



# 143rd Street - Wolf Road to Southwest Highway

SN: 14-00072-00-WR

## Work Hour Estimate

### Supplement #3

November 2019

Task <i>(refer to detailed scope of work document for further explanation )</i>	CBBEL		Subconsultants - Work Hours
	Units	Work Hours	Wang Eng.
<b>12 Prepare Environmental Studies</b>			
a Section 4(f) Evaluation (de minimis) for Section 106 / Cultural Impacts (6) Properties		80	0
b Section 4(f) Evaluation (de minimis) for additional impacts to Cook County Forest Preserve Property		60	
c Traffic Noise Forum Meeting (Wolf Road)		80	0
d Pick-Up Tree Survey (Report & Field Work)		50	0
SUBTOTAL:		270	0
<b>12b Section 106 / Section 4(f) Adverse Effect Finding (Contingency)</b>			
a Section 106 Adverse Effect Finding		220	0
b Section 4(f) for Historic Adverse Effect Finding		200	0
SUBTOTAL:		420	0
<b>15 Public Involvement / Meetings</b>			
a Public Involvement / Meetings	6 meetings (2 ppl each)	64	0
SUBTOTAL:		64	0
<b>16 Geotechnical Investigations</b>			
a Geotechnical Investigations		0	611
SUBTOTAL:		0	611
<b>17 Project Administration and Quality Control / Assurance</b>			
a Project Management and Administration		52	0
SUBTOTAL:		52	0
SUBTOTAL:		1200	611





DF-824-039  
REV 12/04

Cost Plus Fixed Fee 2	14.50% [DL+R(DL) +1.4(DL)+IHDC]
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ITEM	MANHOURS  (A)	PAYROLL  (B)	OVERHEAD & FRINGE BENF ( C )	IN-HOUSE DIRECT COSTS (D)	FIXED FEE (E)	Outside Direct Costs (F)	SERVICES BY OTHERS (G)	DBE TOTAL (H)	TOTAL  (B-G)	% OF GRAND TOTAL
7. Alternate Geometric Studies	176	9,073.66	11,780.33		0.00				20,853.99	5.74%
7b. Alternate Geometric Studies - Southwest Highway Intersection (Contingency)	80	4,072.92	5,287.87		0.00				9,360.79	2.58%
9. Intersection Design Studies	48	2,370.18	3,077.20		0.00				5,447.38	1.50%
9b. Intersection Design Studies - Southwest Highway Intersection (Contingency)	90	4,451.54	5,779.43		0.00				10,230.97	2.82%
12. Prepare Environmental Studies	270	13,028.98	16,915.52		0.00	750.00			30,694.50	8.45%
12b. Section 106 / Section 4(f) Adverse Effect Finding (Contingency)	420	20,410.80	26,499.34		0.00	750.00			47,660.14	13.12%
15. Public Involvement / Meetings	64	3,355.58	4,356.55		0.00	400.00			8,112.13	2.23%
16. Geotechnical Investigations		0.00	0.00		0.00		223,958.08		223,958.08	61.63%
17. Project Administration & QA/QC	52	3,078.76	3,997.15		0.00				7,075.91	1.95%
Subconsultant DL										
TOTALS	1200	59,842.42	77,693.41	0.00	0.00	1,900.00	223,958.08	0.00	363,393.91	100.00%

## AVERAGE HOURLY PROJECT RATES

FIRM Christopher B. Burke Engineering, Ltd.  
 Local Agency Orland Park  
 Section 14-00072-00-WR  
 Project 143rd Street  
 Job No: 0

DATE 11/11/19SHEET 1 OF 5

PAYROLL CLASSIFICATION	AVG HOURLY RATES	TOTAL PROJECT RATES			7. Alternate Geometric Stu			7b. Alternate Geometric S			9. Intersection Design Stu			9b. Intersection Design St			12. Prepare Environmental		
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg
PRINCIPAL	70.00	0																	
ENGINEER VI	70.00	76	6.33%	4.43	12	6.82%	4.77	4	5.00%	3.50	4	8.33%	5.83	4	4.44%	3.11	10	3.70%	2.59
ENGINEER V	65.98	0																	
ENGINEER IV	54.41	402	33.50%	18.23	60	34.09%	18.55	28	35.00%	19.04	16	33.33%	18.14	32	35.56%	19.35	76	28.15%	15.32
ENGINEER III	46.70	48	4.00%	1.87													20	7.41%	3.46
ENGINEER I/II	33.08	168	14.00%	4.63	32	18.18%	6.01	18	22.50%	7.44	14	29.17%	9.65	24	26.67%	8.82	32	11.85%	3.92
SURVEY V	70.00	0																	
SURVEY IV	65.50	0																	
SURVEY III	57.75	0																	
SURVEY II*	43.30	0																	
SURVEY I*	34.50	0																	
ENGINEERING TECHN	64.77	0																	
ENGINEERING TECHN	48.25	24	2.00%	0.97							8	16.67%	8.04	16	17.78%	8.58			
ENGINEERING TECHN	51.44	0																	
ENGINEERING TECHN	20.67	0																	
CAD MANAGER	61.75	98	8.17%	5.04	54	30.68%	18.95	24	30.00%	18.53	6	12.50%	7.72	14	15.56%	9.61			
ASST. CAD MANAGER	51.33	0																	
CAD II *	46.92	0																	
GIS SPECIALIST III	49.00	40	3.33%	1.63													16	5.93%	2.90
GIS SPECIALIST I/II*	32.00	78	6.50%	2.08	18	10.23%	3.27	6	7.50%	2.40							16	5.93%	1.90
LANDSCAPE ARCHITE	55.50	0																	
ENVIRONMENTAL RES	68.50	16	1.33%	0.91													6	2.22%	1.52
ENVIRONMENTAL RES	53.13	168	14.00%	7.44													60	22.22%	11.81
ENVIRONMENTAL RES	40.67	64	5.33%	2.17													26	9.63%	3.92
ENVIRONMENTAL RES	31.13	18	1.50%	0.47													8	2.96%	0.92
ENVIRONMENTAL RES	38.50	0																	
ADMINISTRATIVE*	36.28	0																	
ENGINEERING INTERN	16.00	0																	
TOTALS		1200	100%	\$49.87	176	100.00%	\$51.55	80	100%	\$50.91	48	100%	\$49.38	90	100%	\$49.46	270	100%	\$48.26

## AVERAGE HOURLY PROJECT RATES

**FIRM** Christopher B. Burke Engineering, Ltd.  
**Local Agency** Orland Park  
**Section** 14-00072-00-WR  
**Project** 143rd Street  
**Job No:** 0

**DATE** 11/11/19

**SHEET** 2 **OF** 5

PAYROLL CLASSIFICATION	AVG HOURLY RATES	12b. Section 106 / Section 4(f)			15. Public Involvement / Meeting			16. Geotechnical Investigation			17. Project Administration & Construction								
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg
PRINCIPAL	70.00																		
ENGINEER VI	70.00	14	3.33%	2.33	12	18.75%	13.13				16	30.77%	21.54						
ENGINEER V	65.98																		
ENGINEER IV	54.41	116	27.62%	15.03	38	59.38%	32.31				36	69.23%	37.67						
ENGINEER III	46.70	28	6.67%	3.11															
ENGINEER I/II	33.08	48	11.43%	3.78															
SURVEY V	70.00																		
SURVEY IV	65.50																		
SURVEY III	57.75																		
SURVEY II*	43.30																		
SURVEY I*	34.50																		
ENGINEERING TECH	64.77																		
ENGINEERING TECH	48.25																		
ENGINEERING TECH	51.44																		
ENGINEERING TECH	20.67																		
CAD MANAGER	61.75																		
ASST. CAD MANAGER	51.33																		
CAD II *	46.92																		
GIS SPECIALIST III	49.00	24	5.71%	2.80															
GIS SPECIALIST I/II	32.00	24	5.71%	1.83	14	21.88%	7.00												
LANDSCAPE ARCHITECT	55.50																		
ENVIRONMENTAL ENGINEER	68.50	10	2.38%	1.63															
ENVIRONMENTAL ENGINEER	53.13	108	25.71%	13.66															
ENVIRONMENTAL ENGINEER	40.67	38	9.05%	3.68															
ENVIRONMENTAL ENGINEER	31.13	10	2.38%	0.74															
ENVIRONMENTAL ENGINEER	38.50																		
ADMINISTRATIVE*	36.28																		
ENGINEERING INTERN	16.00																		
<b>TOTALS</b>		420	100%	\$48.60	64	100%	\$52.43	0	0%	\$0.00	52	100%	\$59.21	0	0%	\$0.00	0	0%	\$0.00

September 4, 2019

Mr. Matthew J. Huffman, PE, M.ASCE  
Project Manager - Phase I Engineering Department  
**Christopher B. Burke Engineering, Ltd.**  
9575 W. Higgins Road, Suite 600  
Rosemont, IL 60018

Reference: Proposal for Geotechnical Engineering Services  
Contract 2 – Phase I Design  
Preliminary Investigation for 11 Walls  
143<sup>rd</sup> Street Reconstruction  
From Wolf Road to Southwest Highway  
Orland Park, Illinois  
Wang No. P130619 – Contract 2

Dear Mr. Huffman:

Wang Engineering, Inc. (Wang) is pleased to submit this proposal for preliminary geotechnical investigations to support the design and construction of eleven new retaining walls associated with the proposed widening and reconstruction of 143<sup>rd</sup> Street from Wolf Road to Southwest Highway, in Orland Park, Illinois.

Based on information provided by Christopher B. Burke Engineering, Ltd. (CBBEL), Wang understands a 10,900-foot long section of 143<sup>rd</sup> Street is proposed for widening and reconstruction. The existing roadway will be widened to include two 11- to 12-foot wide lanes in each direction, a 12- to 16-foot wide landscaped median, and left turn lanes. In addition, about 7,000 feet of cross streets will be included in the project along Wolf Road, West Street, 108<sup>th</sup> Avenue, Crystal Tree Drive, and Southwest Highway. Structures included in the project consist of several retaining walls and one triple box culvert at Station 543+30. The retaining walls will support a proposed raise in profile grade over highly compressible soils, and solutions to reduce or eliminate the anticipated settlement and stability concerns will be required. Within this section, a 12-inch diameter watermain will be installed between Crystal Tree Drive and Southwest Highway, and a 16-inch diameter watermain will be constructed between Wolf Road and 108<sup>th</sup> Avenue.

The subsurface investigation for the roadway improvements, peat delineation, box culvert, watermain, walls with exposed heights less than 7 feet, and complete investigation for the 11 walls with exposed heights more than 7 feet will be investigated during Phase II Design.

## SCOPE OF WORK

A subsurface investigation for this section of 143<sup>rd</sup> Street was performed by Wang between 2001 and 2003. The results of the investigation were presented in Wang's report, "*Soil Survey, 143<sup>rd</sup> Street from Wolf Road to LaGrange Road*," dated January 27, 2003. The investigation included 33 subgrade borings, nine peat delineation borings, and nine pavement cores. The investigation revealed deposits of peat and other highly compressive and organic clays between approximately Stations 62+50 to 65+50, Stations 75+50 and 85+50, and at Station 138+00. We do not anticipate needing additional roadway borings along 143<sup>rd</sup> Street. *Please note the stationing has changed from the 2003 design.*

We estimate the preliminary subsurface investigation for eleven retaining walls with exposed heights equal and greater than 7 feet will require 32 retaining wall borings to depths ranging from 50 to 75 feet below ground surface (bgs) for an estimated drilling footage 1900 feet. Retaining wall borings will be spaced at 150 to 225 feet intervals along wall alignments. The proposed *Preliminary Investigation Program* is presented on the attached **Table 1**. However, as per Per IDOT 2015 Geotechnical Manual, the retaining wall borings should be spaced at 75 feet intervals along the walls. Additional borings will be drilled under a Phase II Design for the preparation of structure geotechnical reports. Moreover, geotechnical investigation will be conducted during the Phase II Design to address the roadway improvements to cross-streets, to delineate the highly compressible organic soils/peat; for the triple box culvert design, and the 1200 feet of watermain. The proposed Phase II investigation is shown on the attached Tables 2, 3, and 4.

The depth of each boring may be adjusted in the field depending on the actual subsurface soil conditions. Since most of the wall alignments are proposed just below the existing overhead electrical lines, we anticipate taking the borings from the 143th Street roadway pavement with lane closures that will require flagging to control the traffic. We also included 3 days of hand auger borings to investigate the soil conditions within the first 10 to 15 feet below the ground at the actual proposed wall alignments. Most of the structure borings will be located within the roadway right-of-way.

To accomplish these objectives, Wang will complete the following tasks.

**Geotechnical Drilling Services** — Wang will provide equipment, labor, and associated materials to drill and sample 32 soil borings to depths of 50 to 75 feet bgs for a total footage of 1900 feet. The borings will be advanced with hollow stem augers to maintain an open borehole. Soil samples will be collected with split-barrel samplers in accordance with AASHTO T 206 "*Penetration Test and Split-Barrel Sampling of Soils*." Undisturbed Shelby tube samples will be collected if unstable clays and peat soil are uncovered. Moreover, up to 24 hand auger borings to depths of 10 to 15 feet

will be continuously sampled with geoprobe samplers. The soil samples will be transported to our laboratory for index and advanced geotechnical testing.

**Field Supervision** — Prior to drilling, Wang will locate the boring locations in the field and clear utilities through the JULIE on-call system. A field engineer will monitor drilling activities, maintain daily field notes and soil boring logs, as well as receive, classify, and prepare soil samples for laboratory analysis. The field engineer will monitor the groundwater level during drilling and at the completion of drilling operations. Soil samples will be classified according to the IDH Textural Classification System. As-drilled boring locations will be surveyed by Wang using a mapping grade GPS unit; the GPS unit has sub-foot accuracy in the horizontal direction. As drilled boring elevations will be verified against the topographical survey plans.

**Laboratory Testing** — Upon completion of the drilling phase, the soil samples will be transported to our in-house laboratory. The general soil testing program will include natural moisture content (AASHTO T 265) on each sample, as well as Atterberg limits (AASHTO T 89/90), particle size (AASHTO T 88), and organic content on selected samples. To obtain advanced strength and deformation properties on the foundation soils, the Shelby tube samples will be tested for consolidated-undrained (AASHTO T 297) triaxial and one- dimensional consolidation (AASHTO T 216). Most of the advanced testing will be done during Phase II Design.

**Engineering Analysis and Recommendations** — during Phase I Design, Wang will determine the most feasible and economical wall type based on the proposed preliminary investigation along the 11 walls. Wang will present our investigation results and recommendations in one geotechnical report.

During Phase II, Wang will prepare a Structure Geotechnical Report (SGR) for each wall that will require a TS&L plan (11 SGRs), a report for the triple box culvert (one SGR), a geotechnical report addressing all the walls less than 7 feet exposed height and the watermain, one roadway geotechnical report and proposed subgrade improvement methods. The reports will be prepared following the 2015 IDOT Geotechnical Manual. In general, the reports will include a detailed description of the project, a description of field and laboratory testing results and procedures, a characterization of the soil and groundwater conditions, soil boring logs, and soil profiles. Geotechnical recommendations will be provided to support the design of feasible wall types. We also anticipate piles and load transfer platform will be the preferred ground improvement to support the embankments and walls/backfill. Wang will perform the analysis and provide preliminary design recommendations for load transfer platform and piles supported embankments to aid CBBEL Team to estimate the construction cost. Manhours for a complete ground improvement design are not included in this proposal.

## **SCHEDULING**

Wang will start the project expediently upon authorization to proceed. We anticipate that boring layout and utility clearance will require approximately two days of field work and office coordination. We anticipate the drilling and sampling will require approximately 29 days. We assumed two rigs will be used simultaneous to reduce the cost of lane closures. The laboratory testing program will be completed in about a month after the completion of drilling and at that time the date for submittal of geotechnical reports will be coordinated with CBBEL.

## **COST ESTIMATE**

Wang proposes to provide the preliminary geotechnical investigation for 11 retaining wall for Phase I Design on a time and material basis at the hourly rates and direct costs shown on the attached cost estimate. This cost estimate was prepared assuming the following conditions.

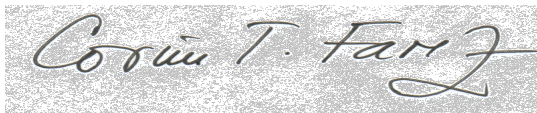
- Structure borings will be obtained from the 143<sup>rd</sup> roadway elevations behind flagged lane closures and two rigs will be used to reduce the traffic control cost;
- Borings along the exact wall alignments will be obtained using hand augers;
- Work will only be performed within the 143<sup>rd</sup> right-a-way and permitting will not be required;
- No hazardous materials are encountered.

As requested, we are also providing an estimated cost for geotechnical investigation under the Phase II Design.

Wang Engineering, Inc. appreciates the opportunity to present this proposal and we look forward to working with CBBEL and the Village of Orland Park on this project. If you have questions, or if you require additional information, please contact us at (630) 953-9928.

Sincerely,

**Wang Engineering, Inc.**



Corina T. Farez, P.E., P.G.  
Vice President



Mickey L. Snider, P.E.  
Senior Geotechnical Engineer

143rd Street (IL Route 7) - Wolf Road (IL Route 7) to Southwest Highway (IL Route 7) Phase I Study  
Sec. No. 14-00072-00-WR

TABLE 1: PROPOSED GEOTECHNICAL INVESTIGATION PROGRAM FOR RETAINING WALLS FOR PHASE I DESIGN

Structure	Feature Carried	Station Range	Existing Structure Number	Existing Wall	Wall Length (Feet)	Anticipated Scope	Max Retained Height (Feet)	Average Retained Height (Feet)	Req Spacing (Feet)	Estimated Number of Borings	Phase I Spacing (Feet)	Proposed Phase I Number of Borings	Proposed Boring Depth (Feet)	Total Drilling (Feet)	Drilling Days	ATV/TM Mounted Drill Rig	Traffic Control (Days)	Moisture Content
1.4	143rd	LT Sta. 531+49 to Sta. 542+45	No	No	1096	Retaining Wall	8.3	5.7	75.0	15.0	150	8	75	600	8	TM	8	168
1.5	143rd	RT Sta. 541+82 to Sta. 544+17	No	No	235	Retaining Wall	7.6	6.0	75.0	4.0	150	2	75	150	2	TM	2	42
1.7	143rd	RT Sta. 544+50 to Sta. 546+50	No	No	200	Retaining Wall	9.1	6.7	75.0	3.0	150	2	75	150	2	TM	2	42
1.8	143rd	RT Sta. 546+76 to Sta. 548+24	No	No	148	Retaining Wall	7.3	6.2	75.0	2.0	150	1	50	50	1	TM	1	16
1.10	143rd	LT Sta. 552+00 to Sta. 556+67	No	No	467	Retaining Wall	7.3	5.3	75.0	7.0	150	4	50	200	3	ATV	0	64
1.14	143rd	LT Sta. 564+38 to Sta. 573+50	No	No	912	Retaining Wall	8.3	4.7	75.0	13.0	225	5	50	250	4	TM	4	80
1.16	143rd	LT Sta. 577+50 to Sta. 581+02	No	No	352	Retaining Wall	10.5	8.3	75.0	5.0	225	2	50	100	2	TM	2	32
1.23	143rd	Lt. Sta. 574+50 to Sta. 576+50	No	No	200	Retaining Wall (CUT)	9.0	5.5	75.0	3.0	225	1	50	50	1	TM	1	16
2.2	Wolf Road	LT Sta. 259+38 to Sta. 261+66	No	No	228	Retaining Wall	7.4	6.5	75.0	4.0	225	2	50	100	2	TM	2	32
2.3	Wolf Road	LT Sta. 26+50 to Sta. 33+00	No	No	650	Retaining Wall	7.1	4.7	75.0	9.0	225	3	50	150	2	ATV	0	48
3.0	Southwest Highway	LT Sta. 313+78 to Sta. 317+60	No	No	382	Retaining Wall	7+	NA	75	6	225	2	50	100	2	TM	2	32
											<b>TOTAL</b>	<b>32</b>		<b>1900</b>	<b>29</b>		<b>24</b>	<b>572</b>



143rd Street (IL Route 7) - Wolf Road (IL Route 7) to Southwest Highway (IL Route 7) Phase I Study  
Sec. No. 14-00072-00-WR

**TABLE 2: PROPOSED GEOTECHNICAL INVESTIGATION PROGRAM FOR RETAINING WALLS FOR PHASE II DESIGN**  
**Walls with Retained Height >7 feet SGR in Phase II**

1.4	143rd	LT Sta. 531+49 to Sta. 542+45	No	No	1096	Retaining Wall	8.3	5.7	75	8	7	75	525	7	TM	7	147
1.5	143rd	RT Sta. 541+82 to Sta. 544+17	No	No	235	Retaining Wall	7.6	6.0	75	2	2	75	150	2	TM	2	42
1.7	143rd	RT Sta. 544+50 to Sta. 546+50	No	No	200	Retaining Wall	9.1	6.7	75	2	1	75	75	1	TM	1	21
1.8	143rd	RT Sta. 546+76 to Sta. 548+24	No	No	148	Retaining Wall	7.3	6.2	75	1	1	50	50	1	TM	1	16
1.10	143rd	LT Sta. 552+00 to Sta. 556+67	No	No	467	Retaining Wall	7.3	5.3	75	3	3	50	150	2	ATV	0	48
1.14	143rd	LT Sta. 564+38 to Sta. 573+50	No	No	912	Retaining Wall	8.3	4.7	75	4	8	50	400	5	TM	5	128
1.16	143rd	LT Sta. 577+50 to Sta. 581+02	No	No	352	Retaining Wall	10.5	8.3	75	2	3	50	150	2	TM	2	48
1.23	143rd	Lt. Sta. 574+50 to Sta. 576+50	No	No	200	Retaining Wall (CUT)	9.0	5.5	75	1	2	50	100	2	TM	2	32
2.2	Wolf Road	LT Sta. 259+38 to Sta. 261+66	No	No	228	Retaining Wall	7.4	6.5	75	2	2	50	100	2	TM	2	32
2.3	Wolf Road	LT Sta. 26+50 to Sta. 33+00	No	No	650	Retaining Wall	7.1	4.7	75	2	6	50	300	4	ATV	0	96
3.0	Southwest Highway	LT Sta. 313+78 to Sta. 317+60	No	No	382	Retaining Wall	16	12	75	2	4	50	200	3	TM	3	64
									<b>TOTAL</b>		<b>39</b>		<b>2200</b>	<b>31</b>		<b>25</b>	<b>674</b>

**COST ESTIMATE FOR  
GEOTECHNICAL SERVICES  
UNIT PRICES  
2019**

**Name:** Phase I Design - 143rd Street IL Route 7 - Preliminary Walls Investigations (H>7 feet)  
**Location:** From Wolf to SW Highway, Orland Park, Illinois  
**Contract/Job:** P-91-180-14

**Date:** 09/04/2019  
**Wang No.:** P130619

Task Description	Units	Unit Price	Extended Cost
<b>DRILLING, SAMPLING &amp; INSITU TESTING</b>			
Drilling Coordination, Utilities Clearance, Site Access, Permitting	7.0 Hours	\$96.00 /Hour	\$672.00
Mobilization (ATV mounted)	2	\$1,400.00 /Each	\$2,800.00
Stand-by Hourly Rate	0.0 Hours	\$420.00 /Hour	\$0.00
<u><b>Drilling &amp; Sampling - Hourly</b> (SPT, Penetrometer, Rimac, Visual Classification Included)</u>			
Two-man crew - normal working hrs	232.0 Hours	\$420.00 /Hour	\$97,440.00
Two-man crew - overtime (2 hrs per day)	58.0 Hours	\$468.00 /Hour	\$27,144.00
Two-man crew and field supervisor- normal working hrs	0.0 Hours	\$495.00 /Hour	\$0.00
Two-man crew and field supervisor - overtime (2 hrs per day)	0.0 Hours	\$543.00 /Hour	\$0.00
<u><b>Hand Augering, Pavement/ Deck Coring &amp; Testing</b></u>			
Two-man crew and equipment	27.0 Hours	\$420.00 /Hour	\$11,340.00
Asbestos content testing on deck cores	0 Tests	\$180.00 /Test	\$0.00
<u><b>Surveying of Boring Locations</b></u> (Two-man crew)	0.0 Hours	\$200.00 /Hour	\$0.00
<u><b>Monitoring Well or Inclinator Installation</b></u>			
<u><b>2.0- or 4-inch monitoring wells</b></u>			
Two-man crew - normal working hours	0.0 Hours	\$420.00 /Hour	\$0.00
Two-man crew - overtime (2 hours per day)	0.0 Hours	\$468.00 /Hour	\$0.00
<u><b>Inclinator casing instalation</b></u>			
Two-man drilling crew - normal working hours	0.0 Hours	\$420.00 /Hour	\$0.00
Two-man crew - overtime (2 hours per day)	0.0 Hours	\$468.00 /Hour	\$0.00
<u><b>Other items</b></u>			
55 gallon dot containment drums	0.0 Drums	\$43.00 /Drum	\$0.00
Digital datalogger and barometer	0.0 Each	\$1,339.00 /Each	\$0.00
Well and Casing Materials	At Cost		\$0.00
<u><b>Boring Location Accessibility, Railroad Fees, State/County/Municipal Fees, Barge Drilling</b></u>			
Private utility determination	At Cost		\$0.00
Tree clearance	At Cost		\$0.00
Guardrail removal and replacement	At Cost		\$0.00
Dozer / equipment rental	At Cost		\$0.00
Railroad permitting	At Cost		\$0.00
Railroad protective insurance	At Cost		\$0.00
Railroad flagman	At Cost		\$0.00
Pavement opening permit	At Cost		\$0.00
State/municipal insurance and bonding	At Cost		\$0.00
Barge drilling on a navigable waterway	At Cost		\$0.00
<b>\$139,396.00</b>			

**Name:** Phase I Design - 143rd Street IL Route 7 - Preliminary Soils Investigations (H>7 feet)  
**Location:** From Wolf to SW Highway, Orland Park, Illinois  
**Contract/Job:** P-91-180-14

**Date:** 09/04/2019  
**Wang No.:** P130619

Task Description			Units	Unit Price	Extended Cost
<b>LABORATORY TESTING</b>					
T265	D2216	Water Content	692.00 Tests	\$10.00 /Test	\$6,920.00
--	D7263	Unit Weight (Density)	0 Tests	\$37.00 /Test	\$0.00
T100	D854	Specific Gravity	0 Tests	\$68.00 /Test	\$0.00
--	D4972	pH of Soil	0 Tests	\$61.00 /Test	\$0.00
T267	D2974	Organic Content by LOI	8 Tests	\$62.00 /Test	\$496.00
T194	--	Organic Content by Wet Combustion	0 Tests	\$137.00 /Test	\$0.00
<b><u>Particle Size Distribution</u></b>					
T88	D422	Sieve Analysis	0 Tests	\$79.00 /Test	\$0.00
T88	D422	Combined Sieve and Hydrometer	0 Tests	\$126.00 /Test	\$0.00
--	D1140	Percent Finer than No. 200 Sieve	0 Tests	\$52.00 /Test	\$0.00
<b><u>Atterberg Limits</u></b>					
T89, T90	D4318	Liquid and Plastic Limits	11 Tests	\$79.00 /Test	\$869.00
T92	D427	Shrinkage Factors	0 Tests	\$93.00 /Test	\$0.00
<b><u>Classification of Soils</u></b>					
--	D2488	Visual Manual	0 Samples	\$20.00 /Sample	\$0.00
--	D2487	Unified Soil Classification System	0 Samples	\$201.00 /Sample	\$0.00
M145	--	AASHTO Classification	0 Samples	\$201.00 /Sample	\$0.00
--	--	USDA Classification	0 Samples	\$126.00 /Sample	\$0.00
<b><u>Soil Settlement, Swelling, and Collapse Potential</u></b>					
T216	D2435	One-Dimensional Consolidation	0 Tests	\$573.00 /Test	\$0.00
--	D4546	One-Dimensional Swell	0 Tests	\$556.00 /Test	\$0.00
--	D5333	Collapse Potential	0 Tests	\$309.00 /Test	\$0.00
<b><u>Shear Strength of Soil</u></b>					
		Rimac Unconfined Compressive Strength	0 Tests	\$15.00 /Test	\$0.00
T208	D2166	Unconfined Compressive Strength	0 Tests	\$83.00 /Test	\$0.00
T236	D3080	Direct Shear of Soils (3 points)	0 Tests	\$736.00 /Test	\$0.00
T296	D2850	UU Triaxial Compression (3 points)	0 Tests	\$345.00 /Test	\$0.00
T297	D4767	CU Triaxial Compression (3 points)	0 Tests	\$1,133.00 /Test	\$0.00
T297	D4767	CD Triaxial Compression (3 points)	0 Tests	\$1,133.00 /Test	\$0.00
	D7012	Peak Uniaxial Compressive Strength of Rock Core	0 Tests	\$168.00 /Test	\$0.00
<b><u>Laboratory Compaction Tests</u></b>					
T99	D698	Moisture-Density of Soils (Standard Effort)	0 Tests	\$206.00 /Test	\$0.00
T180	D1557	Moisture-Density of Soils (Modified Effort)	0 Tests	\$216.00 /Test	\$0.00
T193	--	Illinois Bearing Ratio (1 point)	0 Tests	\$515.00 /Test	\$0.00
T193	D1883	California Bearing Ratio (3 points)	0 Tests	\$948.00 /Test	\$0.00
<b><u>Coefficient of Permeability</u></b>					
T215	D2434	Hydraulic Conductivity (Constant Head)	0 Tests	\$464.00 /Test	\$0.00
--	D5084	Hydraulic Conductivity (Flexible Wall)	0 Tests	\$489.00 /Test	\$0.00
<b><u>Additional Sample Preparation Procedures</u></b>					
		Removal of Organic Matter	0 Samples	\$90.00 /Sample	\$0.00
		Extrusion & Preservation of Undisturbed Samples	0 Samples	\$29.00 /Sample	\$0.00
		Logging & Classification of Undisturbed Samples	0 Samples	\$67.00 /Sample	\$0.00
		Remolding and Trimming of Samples	0 Samples	\$64.00 /Sample	\$0.00
<b><u>Planting Soil Mix Testing</u></b>					
<i>Chemical Analyses &amp; Mitigation Recommendations (300 g sample required)</i>					
		pH, CEC, Soluble Salts, OM, P, K, Other Nutrients	0 Tests	\$118.00 /Test	\$0.00
		Residual Chemicals , Herbicides Full Screen	0 Tests	\$664.00 /Test	\$0.00
<i>Mechanical Analyses &amp; Mitigation Recommendations (1,000 g sample required)</i>					
T88	D422	Combined Sieve and Hydrometer	0 Tests	\$126.00 /Test	\$0.00
<b><u>Analytical Laboratory Services - for CCDD</u></b>					
		Volatile Organic Components (VOC)	0 No	\$53.00 /Each	\$0.00
		SemiVOC including PNA's	0 No	\$105.00 /Each	\$0.00
		PCB	0 No	\$58.00 /Each	\$0.00
		Total Metals	0 No	\$47.00 /Each	\$0.00
		PH Determination	0 No	\$7.00 /Each	\$0.00
<b><u>Corrosion Testing</u></b>					
		(Resistivity, Chlorides, pH, Redox, and Sulfates)	0 No	\$340.00 /Each	\$0.00
<b>\$ 8,285.00</b>					

**Name:** Phase I Design - 143rd Street IL Route 7 - Preliminary Soils Investigations (H>7 feet)  
**Location:** From Wolf to SW Highway, Orland Park, Illinois  
**Contract/Job:** P-91-180-14

**Date:** 09/04/2019  
**Wang No.:** P130619

Task Description	Units	Unit Price	Extended Cost
<b>TRAFFIC CONTROL</b>			
<u><b>Expressway (1/2 mile)</b></u>			
Shoulder Closure	0.0 No.	\$800.00 /Each	\$0.00
One-lane Closure	0.0 No.	\$2,500.00 /Each	\$0.00
Two-lane Closure	0.0 No.	\$2,700.00 /Each	\$0.00
Three-lane Closure	0.0 No.	\$3,150.00 /Each	\$0.00
Ramp Closure	0.0 No.	\$850.00 /Each	\$0.00
Additional 1/2 mile	0.0 No.	\$100.00 /Each	\$0.00
<u><b>Arterial (1/2 mile)</b></u>			
Shoulder Closure	0.0 No.	\$700.00 /Each	\$0.00
One-lane Closure	0.0 No.	\$800.00 /Each	\$0.00
Two-lane Closure	0.0 No.	\$900.00 /Each	\$0.00
Detour	0.0 No.	\$800.00 /Each	\$0.00
U-2	0.0 No.	\$1,000.00 /Each	\$0.00
Additional 1/2 mile	0.0 No.	\$100.00 /Each	\$0.00
<u><b>Impact Attenuator with Driver</b></u>			
Port-to-Port	0.0 Hours	\$185.00 /Hour	\$0.00
<u><b>Roadway Flagmen (two-man crew)</b></u>			
Port-to-Port	96.0 Hours	\$180.00 /Hour	\$17,280.00
(with two rigs)			<b>\$ 17,280.00</b>
<b>FIELD VEHICLES &amp; MILEAGE</b>			
<u><b>Field Vehicle</b></u>			
Field Vehicle Mileage (>100 Miles per Day)	0.0 Miles	\$0.535 /Mile	\$0.00
Field Vehicle Daily (<100 Miles per Day)	34.00 Days	\$65.00 /Day	\$2,210.00
			<b>\$ 2,210.00</b>
<b>OUT-OF-TOWN EXPENSES</b>			
<u><b>Lodging</b></u>	0 Days	\$100.00 /Day	\$0.00
<u><b>Per Diem</b></u>	0 Days	\$50.00 /Day	\$0.00
			<b>\$ -</b>
<b>ENGINEERING, REPORTING &amp; MANAGEMENT</b>			
<u><b>Desk Study, Site Access &amp; Permitting</b></u>			
Senior Engineer	2.0 Hours	\$170.46 /Hour	\$340.92
Project Engineer/Project Geologist	8.0 Hours	\$108.40 /Hour	\$867.20
Assistant Engineer/Assistant Geologist	6.0 Hours	\$73.12 /Hour	\$438.72
<u><b>Field Activities</b></u>			
Project Engineer/Project Geologist	33.0 Hours	\$108.40 /Hour	\$3,577.20
Assistant Engineer/Assistant Geologist	330.0 Hours	\$73.12 /Hour	\$24,129.60
<u><b>Laboratory Testing</b></u>			
Project Engineer/Project Geologist	0.0 Hours	\$108.40 /Hour	\$0.00
Laboratory Technician	0.0 Hours	\$79.18 /Hour	\$0.00
<u><b>Data Analyses &amp; Engineering</b></u>			
Senior Engineer	18.0 Hours	\$170.46 /Hour	\$3,068.28
Project Engineer/Project Geologist	27.0 Hours	\$108.40 /Hour	\$2,926.80
Assistant Engineer/Assistant Geologist	54.0 Hours	\$73.12 /Hour	\$3,948.48
<u><b>Report Preparation</b></u>			
Senior Engineer	36.0 Hours	\$170.46 /Hour	\$6,136.56
Project Engineer/Project Geologist	72.0 Hours	\$108.40 /Hour	\$7,804.80
Assistant Engineer/Assistant Geologist	9.0 Hours	\$73.12 /Hour	\$658.08
QC/QA Reviewer	9.0 Hours	\$196.79 /Hour	\$1,771.11
<u><b>Project Management</b></u>			
Principal in Charge	0.0 Hours	\$200.29 /Hour	\$0.00
Project Manager	6.0 Hours	\$170.46 /Hour	\$1,022.76
Administrative Assistant	1.0 Hours	\$96.57 /Hour	\$96.57
			<b>\$ 56,787.08</b>



**COST ESTIMATE FOR  
GEOTECHNICAL SERVICES  
UNIT PRICES**



**Name:** Phase I Design - 143rd Street IL Route 7 - Preliminary Walls Investigations (H>7 feet)  
**Location:** From Wolf to SW Highway, Orland Park, Illinois  
**Contract/Job:** P-91-180-14

**Date:** 09/04/2019  
**Wang No.:** P130619

Task Description	Units	Unit Price	Extended Cost
<b>SUMMARY</b>			
<i>DRILLING, SAMPLING &amp; INSITU TESTING</i>			\$139,396.00
<i>LABORATORY TESTING</i>			\$8,285.00
<i>TRAFFIC CONTROL</i>			\$17,280.00
<i>FIELD VEHICLES &amp; MILEAGE</i>			\$2,210.00
<i>OUT-OF-TOWN EXPENSES</i>			\$0.00
			<b>\$ 167,171.00</b>
<i>ENGINEERING, REPORTING &amp; MANAGEMENT</i>			
Principal in Charge	0.0 Hours	\$200.29 /Hour	\$0.00
Project Manager	6.0 Hours	\$170.46 /Hour	\$1,022.76
Senior Engineer	56.0 Hours	\$170.46 /Hour	\$9,545.76
Project Engineer/Project Geologist	140.0 Hours	\$108.40 /Hour	\$15,176.00
Assistant Engineer/Assistant Geologist	399.0 Hours	\$73.12 /Hour	\$29,174.88
Laboratory Technician	0.0 Hours	\$79.18 /Hour	\$0.00
Administrative Assistant	1.0 Hours	\$96.57 /Hour	\$96.57
QC/QA Reviewer	9.0 Hours	\$196.79 /Hour	\$1,771.11
	611.0		<b>\$ 56,787.08</b>
		<b>TOTAL</b>	<b>\$ 223,958.08</b>