

Scope of Work  
North Aurora Road at CN Railroad Underpass Project  
Pennsbury Lane to Frontenac Road

October 10, 2016



## SCOPE OF WORK

### Phase II Engineering for North Aurora Road Underpass at CN Railroad

The scope of work for this project includes Phase II design engineering services for the replacement of the North Aurora Road underpass at the Canadian National Railway (CN), formerly the EJ&E Railway. The work also includes the widening of North Aurora Road and the addition of a pump station according to the details found in the Project Development Report. The following tasks are included to complete this work.

#### 1.0 Project Coordination

This task includes coordination with various entities to complete the project including the following - City of Naperville, Naperville Township, City of Aurora, DuPage County, IDOT, CN, BNSF, Kane-DuPage Soil and Water Conservation District (SWCD) and the Army Corps of Engineers (ACOE).

Coordination will also be required with various utility companies to complete the project including – Enbridge Pipeline, Nicor, ComEd (Transmission and Distribution), Comcast, Naperville Public Works and Naperville Electric.

It is anticipated that coordination for permits that will need to be secured from the following agencies – DuPage County, Kane-DuPage SWCD, ACOE, and IEPA (NPDES, water main, and sanitary).

Public involvement will be conducted by the City to insure that the public remains informed as the project progresses. TranSystems will provide speaking points and exhibits for the City's use.

#### 2.0 Supplemental Topographic and SUE Survey

##### A. Supplemental Topographic Survey

- Required to update the base plans prepared in Phase I due to changed conditions at the site, primarily along the CN and in the southeast quadrant across from Frontanec Road. This work will be performed by Jorgensen & Associates and is summarized below. A detailed scope of work is attached for the work performed by Jorgensen & Associates.
- Pick-up additional topographic survey along the CN, the area in the southeast quadrant of the project, and other locations as needed to supplement previous surveys due to changed conditions (O'Reilly Auto Parts entrance, mass grading of City of Naperville owned site near the underpass, pipeline crossings, and All Seasons Ice Arena entrance).
- Pick-up JULIE utility location markings and test hole data.
- Correlate bench mark datums between this project and the hydraulic studies prepared by CEMCON, Ltd. for the Atwater Development.
- Download into CADD and update files, digital terrain models, and base mapping.

##### B. Subsurface Utility Engineering (SUE) Survey

- A Level A and Level B Subsurface Utility Engineering (SUE) Survey will be performed by American Survey and Engineering. The SUE survey is required to determine the horizontal and vertical locations of the pipelines that cross North Aurora Road in two locations west of the CN tracks. See the attached scope from American Survey and Engineering for details on the SUE survey.

C. **Miscellaneous supplemental pick-up survey during project.**

- Additional miscellaneous supplemental pick-up survey will be performed on an as need basis during the project to survey any unexpected items that are found or issues that arise that will require survey. TranSystems will be performing this work.

**3.0 Specifications and Estimates**

Project specifications will be developed at the preliminary, pre-final and final submittals. This will include utilizing standard provisions and checklists from IDOT as well as combining specifications from multiple agencies (CN, BNSF, Naperville, Aurora, and IDOT) to insure that the project is constructed to the sponsoring agencies criteria.

This task will include the preparation of cost estimates for the improvements at the preliminary, pre-final and final submittals. These will be developed utilizing a compilation of recent bid prices for typical items of similar quantities, and customized estimates for unique items prepared by analyzing the labor and materials required to complete the work and then applying appropriate industry costs.

An estimate of time will be prepared at preliminary, pre-final and final submittals. IDOT form BD 220 will be utilized to prepare the estimate of construction time.

**4.0 Civil Plans**

All plans for the project will be prepared using English units. Plans will be prepared in accordance with the Bureau of Local Roads Manual and applicable portions of the Bureau of Design and Environment Manual. The tasks comprising the scope of work are detailed below.

Revisions to the roadway profile are necessary to address changes in field conditions along the railroad that have occurred since the Project Development Report was completed in October 2009.

**4.1 Roadway Plans**

**1. Cover Sheet**

- The standard IDOT Title Sheet will be utilized.

**2. Notes/Index/Standards**

- A list of commitments from Phase I will be included.
- IDOT and Naperville general notes will be utilized as applicable.
- An index of sheets will be included
- A list of current IDOT and Naperville standards pertinent to the project will be included.

**3. Summary of Quantities**

- The Summary of Quantity sheets will consist of formatting the summary of quantity tables and inputting the required information. Appropriate funding columns shall be shown on the Summary of Quantity sheets and quantities shall be calculated accordingly.
- TranSystems will coordinate with IDOT to obtain the proper construction type fund coding.

**4. Schedules of Quantities**

- Items which are repeated on multiple pages will be shown in a tabular format in the Schedule of Quantities.

## 5. Typical Sections

- A legend will be provided on all Typical Section sheets. Pay items will be called out as they appear on the Summary of Quantity sheets.
- The Typical Sections will be proportioned in such a manner that all information will be adequately conveyed.
- Pavement design will be prepared and submitted to the appropriate agency for approval.
- Separate existing and proposed Typical Sections will be prepared.
- Existing Typical Sections will cover the entire length of the proposed improvement and will be determined based on the various pavement structures.
- Removal items will be cross hatched on the existing Typical Sections.
- Proposed Typical Sections will cover the entire length of the proposed improvement for the construction and will be provided based on changes to pavement width, cross section changes and side slope variations.
- Notes will be utilized where feasible to describe special cases and therefore limit the number of Typical Sections required.

## 6. Alignment and Ties

- A scale of 1"=200 will be utilized in order to fit the entire project on one sheet.
- Schematic drawings for all of the reference ties will be shown together on a separate sheet.
- Curve data and the survey marker schedule will be shown together on this sheet.

## 7. Removal Plans

- Removal plans will be prepared as separate sheets at 1"=50'.

## 8. Plan and Profile Sheets

The plans will be assembled under the following general assumptions:

- Two window view: existing plan/proposed plan and existing profile/proposed profile.
- Vertical and horizontal curve data, including superelevation rates and transitions, will be shown on the plans.
- Horizontal scale: 1"=50', Vertical scale: 1"=10' (with 1/10 grid)
- Utility lines will not be shown on these sheets, but will be shown on the Drainage and Utility plans.
- Benchmarks will be depicted and detailed on the plan sheets and the alignment and ties sheets
- Roadway removal items (including tree removal) will be shown on the Removal sheets.
- Clear zone and barrier warrant analyses.

## 9. Parking Lot Plans/Elevations/Geometrics

- 1"=20' Scale
- Three locations are anticipated:
  - All Seasons Ice Rink
  - Naperville Township Highway Department
  - Pump Station

## 10. Details - Roadway

- Include District One details
- Grading and site plans at pump station
- Various

## 11. Cross Sections

- Horizontal scale: 1"=10', Vertical scale: 1"=5' (with 1/10 grid)
- Cross Sections will be provided at 50' along the length of the project, plus at all driveways, side roads, and culvert crossings, as necessary.
- Existing and proposed right of way will be shown.
- Profile grade line, edge of pavement and ditch elevations will be depicted.
- Cut and fill areas will be labeled on each cross section per stage of construction.
- Estimated locations of unsuitable materials to be removed will be indicated.
- Temporary widening and temporary cut and fill areas will be shown.
- The proposed drainage system and existing utility lines will be shown and labeled.
- Cross Sections will show the grading required for the multi-use path.
- Earth excavation and embankment will be calculated and paid for in accordance with the methods outlined in the IDOT Standard Specifications. A 15% shrinkage factor will be utilized in accordance with District One policy.

## 4.2 Drainage and Utility Plans

- The Plan and Profile base sheets will be utilized as the basis of the Drainage and Utility sheets.
- Drainage and Utility sheets will depict and annotate drainage removal/adjustment items in the existing view and the proposed drainage system in the proposed plan views. In profile, the proposed drainage system will be depicted and annotated.
- Existing utility lines and structures will be shown.
- Drainage structure and storm sewer information will be shown on separate schedule sheets.

### Drainage Calculations

The IDOT Drainage Manual will be consulted to determine approved drainage software packages and methods for hydraulic calculations.

The following drainage calculations will be required to design and analyze the proposed drainage system:

- Inlet Spacing
- Storm Sewer Design
- Bridge Drainage
- Ditch Analysis
- Detention Calculations
- Pump Station Calculations and Design are included in Task 7.0

Hydrologic modeling for adding the pump station to the DuPage County permit is not included in the scope.

### Water Main and Sanitary Sewer Relocation:

West of Frontenac Road, the water main along the north side of the roadway within the existing right-of-way must be relocated and lowered to be underneath the proposed sidewalk due to the lowering of North Aurora Road.

Also, approximately 300 feet of sanitary sewer located within a 7-foot wide drainage and utility easement along the north side of the roadway will be shifted to be north of the proposed retaining wall due to the lowered profile east of the underpass.

This scope of work includes the engineering plans required to maintain the existing services during construction and the proposed water main modifications required as a result of lowering the North Aurora Road profile. Also included with this task is the effort needed to coordinate and obtain the necessary IEPA water main and sanitary permits for the project.

#### **4.3 Erosion Control and Sediment Plans**

Erosion control and sediment plans will be prepared in accordance with the following:

- 1"=50' Scale
- The Maintenance of Traffic base sheets will be utilized as the basis of the Erosion Control plans since erosion control must be shown for each major construction stage.
- Text describing the erosion control measures to be implemented at each stage of construction will also be included.
- During the development of the staging for the project, consideration will be given to IEPA requirements regarding disturbed area and discharge testing requirements during construction. Options will be presented for review and decisions will be documented.
- Prepare the Stormwater Pollution and Prevention Plan (SWPPP) and submit with the pre-final submittal.

#### **4.4 Staging and Traffic Control**

- Evaluate multiple scenarios including closing North Aurora Road and providing a detour.
- 1"=50' scale
- Measures required to maintain drainage during construction will be included.
- Access to active properties will be maintained during construction.
- A separate sheet for staging notes, general notes and the legend will be included and placed on all sheets as applicable.
- Temporary roadway plan sheets will be detailed within the Maintenance of Traffic plans.
- Detour plan sheet will be included.
- Construction guide signing will be depicted on the Maintenance of Traffic plans in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).
- Temporary lighting is not included in this scope of work.
- TranSystems will develop special provisions for MOT as required.
- TranSystems will be responsible for obtaining District One standard details pertaining to Maintenance of Traffic and incorporating the standards into the plan set.

#### **4.5 Pavement Marking and Signing Plans**

- Scale 1" = 50'
- Pavement marking shall be detailed and called out on the plans.
- Signage will be included.

#### **4.6 Traffic Signal Plans**

TranSystems will develop temporary and permanent traffic signal plans for the following North Aurora Road intersections:

- Pennsbury Lane (temporary traffic signals only)
- Frontenac Road

TranSystems will also develop temporary interconnect plans to maintain and reestablish interconnect along North Aurora Road between Frontenac Road to Fairway Drive.

#### 4.7 Roadway Lighting Plans

EJM Engineering will develop lighting plans for the North Aurora Road project. This work will include calculations of lighting levels to determine the number and type of fixtures to be utilized.

The work will include analyzing and designing underpass lighting at the railroad bridge. See the attached detailed scope from EJM Engineering.

#### 4.8 Railroad Track Plans

Since the completion of the Project Development Report, the CN completed extensive changes to the area near the North Aurora Road bridge. This scope of work includes hours to investigate three railroad alternatives that will be fully analyzed and coordinated with the CN. A memo summarizing the benefits of each alternative including approximate costs will be prepared.

- Alternative 1 – Shoo-fly to the east using permanent superstructure in a temporary location on new abutments that would require removal or left in place as retaining wall
- Alternative 2 – Shoo-fly to the east using a temporary superstructure in a temporary location on new abutments that would require removal or left in place as retaining wall
- Alternative 3 – Construct temporary “jump” span to allow construction of new abutments beneath existing alignment

This scope of work includes the preparation of temporary shoo-fly railroad track plans for approximately 3,500 feet of track on a new alignment. Railroad coordination is covered under Task 1.0 Project Coordination.

Details of this work include the following:

- Schedules
- Alignment and Ties
- Typical Sections
- Track Plan and Profiles
- Track Staging Plans
- Earthwork Cross Sections
- Temporary Track Plan and Profile
- Temporary Crossing Detail
- Railroad Standard Details
- Special Provisions

This scope of work does not include the following items and will be completed by others, if needed:

- Railroad communication modifications.
- Railroad signal modifications.

#### 5.0 Landscaping Plans

- 1"=50' Scale.
- Landscaping required to replace tree removals and areas disturbed during construction will be shown.

## 6.0 Structural Plans

The scope for Structural Design includes the permanent bridge, temporary shoo-fly bridge, retaining walls, and an underground detention structure.

### 6.1 CN Bridge over North Aurora Road

The scope of work includes the preparation of railroad bridge plans and specifications for a two-track bridge with 110' span over North Aurora Road that meets CN and AREMA Standards. The bridge will be a steel thru-girder with a ballast deck. The bridge will be stage constructed. The plans and specifications will include substructure for a triple track bridge and superstructure for two tracks. It is assumed that the bridge substructure will be supported on piles. Details of this work include the following:

- TSL
- Bridge Plans
  - General Plan and Elevation
  - General Notes and Quantities
  - Removal Plans
  - Foundation Layout Plan
  - Abutment Plan & Elevation
  - Abutment Sections and Details
  - Superstructure Framing Plan
  - Girder Elevation and Sections
  - Structural Steel Details
  - Bearing Details
  - Steel Ballast Pan and Walkway Details
  - Miscellaneous Details
- Specifications

This scope of work does not include the following items:

- Superstructure for a third track.

### 6.2 Temporary Shoo-fly Bridge for CN over North Aurora Road

The scope of work includes the preparation of railroad bridge plans and specifications for a temporary bridge to be used along the shoo-fly alignment during construction. Alternatives will be investigated to use the permanent bridge as the temporary structure and roll it into its permanent location, or design a temporary bridge that would be removed after construction. It is assumed that the bridge substructure will be supported on piles. Details of this work include the following:

- Bridge Plans
  - General Plan and Elevation
  - General Notes and Quantities
  - Foundation Plan
  - Abutment Plan & Elevation
  - Abutment Sections and Details
  - Superstructure Framing Plan
  - Girder Elevation and Sections
  - Structural Steel Details
  - Bearing Details
  - Steel Ballast Pan and Walkway Details
  - Miscellaneous Details
- Specifications



### **6.3 Retaining Walls**

The scope of work includes the plans and specifications for four retaining walls extending from the abutments and a fifth retaining wall extending along the east side of the CN, north of North Aurora Road. During the initial design for the bridge, the most cost effective wall designs will be evaluated. The results will be presented to Naperville and the CN for their review and comment prior to proceeding with the development of the plans and specifications. Five TSLs are included in this item.

### **6.4 Underground Detention Structure**

The scope of work includes the plans and specifications for the proposed underground detention structure that is required for detention near the proposed pump station. The design will be coordinated with the pump station designer to insure compatibility of the design.

### **7.0 Pump Station**

The scope of work for the pump station will follow the requirements of IDOT. Plans will be prepared in accordance with the IDOT Drainage Manual.

The scope of work will include a Pump Station Preliminary Engineering Report including alternatives analysis for approval. Once approved, the contract plan drawings and documents will be prepared. This work will be accomplished by Donohue. A detailed scope of work is attached.

### **8.0 Geotechnical Investigation**

The scope for the Geotechnical Investigation includes reviewing the structure geotechnical reports prepared during Phase I, and obtaining additional roadway and structural borings needed for the current design. Soil borings will also be required at the pump station location. This work will be accomplished by Wang Engineering. A detailed scope of work is attached.

### **9.0 Environmental and Permits**

The scope for this item includes updating work previously completed in Phase I, but has expired since the approval of the Phase I report in 2009. Work includes updates to wetland and "Waters of the US" delineations, Preliminary Environmental Site Assessment (PESA) update, and Preliminary Site Investigation (PSI) update, as well as determining potential best management practices that could be utilized for the project. This work will be accomplished by Huff & Huff, a subsidiary of GZA. A detailed scope of work is attached.

This items also includes preparation of the permits needed for the project. It is anticipated to require permits from DuPage County, ACOE, IEPA, and the Kane-DuPage Soil and Water Conservation District.

### **10.0 Quality Assurance/Quality Control**

QA/QC will include the preparation and implementation of a Quality Management Plan (QMP). Reviews will be conducted prior to the preliminary, pre-final, and final submittals.

The QMP will address the following:

- Management responsibility
- Design standards and documents
- Document control
- Process control
- Review of preliminary engineering; and quality records; and audit procedures

## 11.0 Project Administration

Administration consists of the following project management responsibilities to ensure a quality product on schedule and within budget:

- Invoicing (Progress Report BDE 430)
- Staffing resource management
- Internal project team meetings
- Preparation of the Project Management Plan which includes the Quality Management Plan
- Preparation and distribution of correspondence, meeting minutes, records of conversation and all other project documentation necessary to track and document the project decisions
- Coordination with Naperville's Project Manager including monthly status meetings.

Project Management will be performed within the communication channels established by the Project's Organization Chart.

TranSystems will prepare progress reports and invoices on a monthly cycle. These progress reports and invoices will be issued using IDOT BDE 430 form. The percent complete shown on the form shall be in agreement with the project percent complete reported on a monthly basis.

## 12.0 Shop Drawing Reviews

This task includes shop drawing reviews for the structural components of the project:

- CN Bridge plan
- Temp Shoo-Fly Bridge
- Retaining walls
- Underground detention structure

**City of Naperville**

North Aurora Road at CN Railroad Underpass Project  
Pennsbury Lane to Frontenac Road  
Phase II Estimate of Staff Hours

TASKS		TOTALS	TranSystems	Donohue	Jorgenson	Wang	EJM	Huff & Huff	American Survey
1.0	Project Coordination	550	550						
2.0	Supplemental Topographic Survey	575	112		425				38
3.0	Specifications & Estimates	344	344						
4.0	Civil Plans	4,832	4,576				256		
4.1	Roadway Plans	1,266	1,266						
4.2	Drainage & Utility Plans	722	722						
4.3	Erosion Control and Sediment Plans	312	312						
4.4	Staging and Traffic Control	598	598						
4.5	Pavement Marking & Signing Plans	44	44						
4.6	Traffic Signals Plans	396	396						
4.7	Roadway Lighting Plans	296	40				256		
4.8	Railroad Track Plans	1,198	1,198						
5.0	Landscaping Plans	48	48						
6.0	Structural Plans	4,070	4,070						
6.1	CN Bridge Over North Aurora Road	1,896	1,896						
6.2	Temporary Shoo-fly Bridge for CN over North Auro	922	922						
6.3	Retaining Walls	1,116	1,116						
6.4	Underground Detention Structure	136	136						
7.0	Pump Station	1,136	40	1,096					
8.0	Geotechnical Investigation	602	32			570			
9.0	Environmental and Permits	616	336					280	
10.0	Quality Assurance/Quality Control	452	452						
11.0	Project Administration	312	312						
12.0	Shop Drawing Reviews	344	344						
Total Manhours =		13,881	11,216	1,096	425	570	256	280	38

## 1.0 Project Coordination

Item	No. of Meetings	Hours per meeting/permit	Total
Coordination with Naperville			40
Meetings with Naperville, Aurora and Naperville Township	5	10	50
Meetings with IDOT	3	10	30
Meetings with Railroads			
CN and BNSF	5	10	50
Meetings with Utilities			
Utility Coordination Meetings	2	40	80
Follow-up coordination and evaluation			80
Permit Coordination			
DuPage County Stormwater	2	20	40
ACOE	1	20	20
Miscellaneous Exhibit Preparation			40
Public Involvement			120
		<b>Subtotal =</b>	<b>550</b>

## 2.0 Supplemental Topographic Survey

Item	Number of Staff	No. of Days (8 hrs/day)	Task or Sheet Hours Extended	Item Totals
Coordinate Supplemental Survey and Create New Basemaps				64
Supplemental Survey (By Jorgensen and Associates)				425
Subsurface Utility Engineering (SUE) Survey (By American Surveying and Engineering)				38
Miscellaneous supplemental pick-up survey during the project.				48
			Subtotal =	575

### 3.0 Specifications & Estimates

Item	Total
<b>Specifications</b>	
Develop specifications for preliminary submittal	100
Update specifications for prefinal submittal	80
Update specifications for final submittal	40
<b>Cost Estimate</b>	
Develop cost estimate for preliminary submittal	24
Update cost estimate for prefinal submittal	24
Update cost estimate for final submittal	24
<b>Estimate of Time</b>	
Develop estimate of time for preliminary submittal	24
Update estimate of time for prefinal submittal	16
Update estimate of time for final submittal	12
<b>Subtotal =</b>	
	<b>344</b>

Note: Submittals estimated to Naperville, Aurora, CN, and BNSF for all three submittals.  
 IDOT Local Roads does not require a preliminary submittal, so only two submittals to them.

## 4.1 Roadway Plans

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>General Plan Sheets</b>				<b>52</b>
Cover Sheet	1	12	12	
Index of Sheets	1	12	12	
Standard Sheets	1	12	12	
General Notes and Commitments	1	16	16	
<b>Summary and Schedule of Quantities</b>				<b>234</b>
Summary of Quantities	6	24	144	
Schedules	3	30	90	
<b>Typical Sections (Existing and Proposed)*</b>				<b>96</b>
North Aurora Road (2 Sections)	2	16	32	
Pump Station Entrance Road	1	16	16	
Half Section Details	1	16	16	
* Bike Path Pavement Design			8	
* Pavement Design			24	
<b>Alignment, Ties and Benchmarks</b>	2	24	48	<b>48</b>
1"=200' with 2 views per sheet				
<b>Removal Plans (Scale 1"=50')</b>				<b>48</b>
North Aurora Road	2	24	48	
Frontenac Road	0	16	0	
<b>Plan &amp; Profile Sheets (Scale 1"=50')</b>				<b>96</b>
North Aurora Road	2	36	72	
Frontenac Road (plan only)	1	24	24	
<b>Parking Lot Restoration Plans (Scale 1"=20')</b>				<b>72</b>
All Seasons Ice Rink	1	36	36	
Naperville Township Highway Department	1	36	36	
<b>Details - Roadway</b>				<b>124</b>
District Details	12	1	12	
Various	4	16	64	
Grading and Site Plans at Pump Station	1	48	48	
<b>Cross Sections (4 sections per sheet @ 50' intervals)</b>				<b>376</b>
North Aurora Road	19	8	152	
Frontenac Road (for PR Storm Sewer)	9	8	72	
Pump Station Entrance Road	6	8	48	
Stage Earth Quantity Calculations & Earthwork			104	
<b>Quantity Calculations</b>			120	<b>120</b>
	<b>77</b>		<b>Subtotals</b>	<b>1,266</b>

## 4.2 Drainage & Utility Plans

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Schedules</b>				
Drainage Schedules	2	32	64	64
<b>Drainage Removal Plans (Scale 1"=50')</b>				30
North Aurora Road	2	10	20	
Frontenac Road	1	10	10	
<b>Drainage Plan &amp; Profile Sheets (Scale 1"=50')</b>				100
North Aurora Road	2	40	80	
Frontenac Road	1	20	20	
<b>Details - Drainage</b>				220
Outlet Structures	1	28	28	
Miscellaneous	2	16	32	
<b>Drainage Calculations</b>			160	160
<b>Watermain and Sanitary Sewer Plan &amp; Profile Sheets</b>				88
North Aurora Road	2	32	64	
Frontenac Road	1	24	24	
<b>Quantity Calculations</b>			60	60
	14	<b>Subtotals</b>		722



### 4.3 Erosion Control and Sediment Plans

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Schedules &amp; Notes</b>				
Notes & Schedules	2	16	32	32
<b>Erosion Control Plan Sheets (use 2 plan view sheet)</b>				236
North Aurora Road	8	24	192	
Frontenac Road	1	24	24	
CN RR	1	20	20	
<b>Details</b>				
Miscellaneous	4	8	32	32
<b>Quantity Calculations</b>			12	12
	16	Subtotals		312

## 4.4 Staging and Traffic Control

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>General Plan Sheets</b>				
MOT General Notes	2	36	72	72
<b>MOT Typical Sections</b>				48
North Aurora Road (2 Sections)	2	16	32	
Frontenac Road (1 Section)	1	16	16	
<b>Detour Plan</b>				
North Aurora Road	2	24	48	48
<b>Pre-Stage Plan Sheets (use two view plan sheet)</b>				
North Aurora Road	2	24	48	48
<b>Stage 1 Plan Sheets (use two view plan sheet)</b>				68
North Aurora Road	2	24	48	
Frontenac Road	1	20	20	
<b>Stage 2 Plan Sheets (use two view plan sheet)</b>				
North Aurora Road	2	24	48	48
<b>Stage 3 Plan Sheets (use two view plan sheet)</b>				
North Aurora Road	2	24	48	48
<b>MOT Details</b>				
Temporary Sheet Piling	2	16	32	32
Various	2	16	32	32
<b>Cross Sections (plot temp pavement)</b>				114
North Aurora Road	19	6	114	
<b>MOT Quantity Calculations</b>			40	40
	39	Subtotals		598

## 4.5 Pavement Marking & Signing Plans

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
Pavement Marking & Signing Plan Sheets (use 2 plan view sheet)				32
North Aurora Road	1	24	24	
Frontenac Road	1	8	8	
Quantity Calculations			12	12
	2	Subtotals		44

## 4.6 Traffic Signals Plans

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>General Sheets</b>				<b>28</b>
Bill of Materials	1	12	12	
District and Other Details	4	4	16	
<b>Pennsbury Lane &amp; North Aurora Rd</b>				<b>64</b>
Temporary Traffic Signal Plan	1	24	24	
Temporary Traffic Signal, Stage 2	1	16	16	
Temporary Traffic Signal Cable Plan	1	24	24	
<b>Frontenac Rd &amp; North Aurora Rd</b>				<b>208</b>
Temporary Traffic Signal Plan	1	24	24	
Temporary Traffic Signal, Stage 2	1	16	16	
Temporary Traffic Signal Cable Plan	1	24	24	
Proposed Traffic Signal Plan	1	40	40	
Proposed Traffic Signal Cable Plan	1	40	40	
Proposed Signal Interconnect Plans and Schematics	2	32	64	
<b>Temporary Interconnect Plan</b>				
Frontenac Rd to Fairway Dr	2	24	48	<b>48</b>
<b>Quantity Calculations</b>			48	<b>48</b>
	<b>17</b>	<b>Subtotals</b>		<b>396</b>

## 4.7 Roadway Lighting Plans

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
Coordinate Lighting Design with Bridge and Combination Poles				40
Roadway Lighting Design and Plans				256
(By EJM Engineering, Inc)				
			Subtotals	296



## 5.0 Landscaping Plans

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
Landscaping Plan Sheets (use 2 plan view sheet)				
North Aurora Road	2	16	32	32
Frontenac Road	1	8	8	8
Quantity Calculations			8	8
	3	Subtotals		48

## 6.1 CN Bridge Over North Aurora Road

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Bridge Plan Sheets</b>				<b>1,692</b>
TSL	1	100	100	
General Plan and Elevation	1	54	54	
General Notes and Quantities	1	36	36	
Removal Plans	2	48	96	
Foundation Layout Plan	1	30	30	
South Abutment Stem	1	60	60	
South Abutment Backwalls	1	60	60	
South Abutment Footing	1	48	48	
South Abutment Sections	1	48	48	
South Abutment Details	1	48	48	
North Abutment Stem	1	24	24	
North Abutment Backwalls	1	24	24	
North Abutment Footing	1	24	24	
North Abutment Sections	1	24	24	
North Abutment Details	1	24	24	
Cross Section	1	48	48	
Framing Plan	1	60	60	
Girder Details I	1	80	80	
Girder Details II	1	40	40	
Girder Details II	1	40	40	
Design Data	1	16	16	
Sacrificial Beam Details	1	56	56	
End Floorbeam	1	60	60	
End Floorbeam Jacking Details	1	40	40	
Lateral Bracing Details	1	24	24	
Traction Bracing Details	1	24	24	
Floor Plate Plan	1	24	24	
Floor Plate Details	1	48	48	
Ballast Stop Plate Details	1	24	24	
Upper Floor Plate & Grating Details	1	48	48	
Walkway Details	2	24	48	
Handrail Details	2	24	48	
Drainage Details	1	24	24	
Drainage Plan	1	24	24	
Spherical Bronze Bearing Details	1	80	80	
Elastomeric Bearing Details	1	40	40	
Superstructure Relocation Details	2	32	64	
Boring Logs	8	4	32	
<b>Staging Details</b>				<b>144</b>



## 6.1 CN Bridge Over North Aurora Road

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
Temporary Soil Retention (3 Stages)	3	48	144	
Quantity Calculations			60	60
	52	Subtotals		1,896

## 6.2 Temporary Shoo-fly Bridge for CN over North Aurora Road

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Temporary Bridge Plan Sheets</b>				<b>882</b>
General Plan and Elevation	1	54	54	
General Notes and Quantities	1	24	24	
Foundation Layout Plan	1	30	30	
South Abutment	1	60	60	
South Abutment Backwalls	1	24	24	
South Abutment Sections	1	48	48	
South Abutment Details	1	48	48	
North Abutment	1	60	60	
North Abutment Backwalls	1	24	24	
North Abutment Footing	1	48	48	
North Abutment Sections	1	48	48	
North Abutment Details	1	48	48	
Cross Section	1	24	24	
Framing Plan	1	24	24	
Design Data	1	6	6	
Sacrificial Beam Details	1	24	24	
End Floorbeam	1	24	24	
Lateral Bracing Details	1	24	24	
Traction Bracing Details	1	40	40	
Floor Plate Plan	1	24	24	
Floor Plate Details	1	24	24	
Walkway / Handrail Details	1	24	24	
Handrail Details	2	24	48	
Bearing Details	2	40	80	
<b>Quantity Calculations</b>			40	<b>40</b>
	<b>26</b>		<b>Subtotals</b>	<b>922</b>

## 6.3 Retaining Walls

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Retaining Wall General Plan Sheets</b>				<b>80</b>
General Wall Layout	1	40	40	
General Notes and Quantities	1	40	40	
<b>Wall A - NW Quadrant of N Aurora and CN</b>				<b>164</b>
TSL	1	60	60	
Plan and Elevation	2	32	64	
Sections and Details	1	40	40	
<b>Wall B - NE Quadrant of N Aurora and CN</b>				<b>268</b>
TSL	1	60	60	
Plan and Elevation	4	32	128	
Sections and Details	2	40	80	
<b>Wall C - SW Quadrant of N Aurora and CN</b>				<b>164</b>
TSL	1	60	60	
Plan and Elevation	2	32	64	
Sections and Details	1	40	40	
<b>Wall D - SE Quadrant of N Aurora and CN</b>				<b>132</b>
TSL	1	60	60	
Plan and Elevation	1	32	32	
Sections and Details	1	40	40	
<b>Wall E - East Side of CN, North of N Aurora Road</b>				<b>268</b>
TSL	1	60	60	
Plan and Elevation	4	32	128	
Sections and Details	2	40	80	
<b>Quantity Calculations</b>			40	<b>40</b>
	<b>27</b>		<b>Subtotals</b>	<b>1,116</b>

## 6.4 Underground Detention Structure

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Detention Structure Plan Sheets</b>				<b>112</b>
General Plan	1	40	40	
Sections and Details	1	72	72	
<b>Quantity Calculations</b>			24	<b>24</b>
	<b>2</b>		<b>Subtotals</b>	<b>136</b>

## 7.0 Pump Station

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
Review and Coordinate Pump Station Design				40
Pump Station Preliminary Engineering Report, Design Plans, Specifications & Estimates (by Donohue)				876
Bidding and Construction Phase Services (by Donohue)				220
			Subtotal =	1,136

## 8.0 Geotechnical Investigation

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
Review Geotechnical Investigation				32
Roadway and Structure Geotechnical Reports				570
(by Wang)				
			Subtotal =	602

## 9.0 Environmental and Permits

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Review and Process Environmental Updates, DEC Permit and other permits</b>				<b>296</b>
DuPage County Stormwater			140	
ACOE			80	
IEPA Water Main			24	
IEPA Sanitary			24	
Kane DuPage SWCD			8	
NPDES			12	
LPC-663 (CCDD)			8	
<b>Wetland Delineations, Waters of US Delineation</b>				<b>280</b>
<b>PESA and PSI</b>				
(by Huff and Huff)				
<b>Best Management Practices</b>				<b>40</b>
<b>Subtotal =</b>				<b>616</b>

## 10.0 Quality Assurance/Quality Control

Items and Tasks	Hours			Total
	Preliminary Submittal	Prefinal Submittal	Final Submittal	
Quality Management Plan				
QA - Civil	48	72	48	168
QA - Drainage	24	24	12	60
QA - Rail	12	16	12	40
QA - Structural	48	72	48	168
Field Checks		16		16
			Subtotal =	452



## 11.0 Project Administration

Items and Tasks	Staff	Hours/ Week	No. of Weeks	Hours/ Month	No. of Months	Total
Schedules/Monitoring/Management	1	1	104			104
Internal Project Meetings (bi-weekly)	3	1	52			156
Preparation & Distribution of Correspondence	1	0.5	104			52
Subtotal =						312

## 12.0 Shop Drawing Reviews

Items and Tasks	No. of Sheets	Hours per Sheet	Task or Sheet Hours Extended	Item Totals
<b>Shop Drawing Reviews (CN Bridge Plans)</b>				<b>164</b>
Response to RFI's			64	
Review Design Changes			16	
Bearings			8	
Structural Steel			24	
Deck Waterproofing			4	
Deck Drains			4	
Walkways			8	
Railings			8	
Concrete Reinforcement			8	
Concrete Mixtures			8	
Foundation System			8	
Substructure Drainage			4	
<b>Shop Drawing Reviews (Temp Shoo-Fly Bridge)</b>				<b>56</b>
Response to RFI's			40	
Review Design Changes			16	
<b>Shop Drawing Reviews (Retaining Walls)</b>				<b>104</b>
Response to RFI's			40	
Review Design Changes			16	
Railings			8	
Concrete Reinforcement			16	
Concrete Mixtures			8	
Foundation System			8	
Wall Drainage			8	
<b>Shop Drawing Reviews (Underground Detention)</b>				<b>20</b>
Response to RFI's			8	
Review Design Changes			4	
Concrete Reinforcement			4	
Concrete Mixtures			4	
			<b>Subtotals</b>	<b>344</b>



## AVERAGE HOURLY PROJECT RATES

**FIRM** TranSystems  
**PSB** \_\_\_\_\_  
**PRIME/SUPPLEMENT** Prime

**DATE** 10/10/16

**SHEET** 1 OF 3

PAYROLL CLASSIFICATION	AVG HOURLY RATES	TOTAL PROJECT RATES			Project Coordination			Survey			Specs. and Estimates			Civil Plans			Landscaping		
		Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg
Engineer 5 (E5)	70.00	192	1.71%	1.20	46	8.36%	5.85						60	1.31%	0.92				
Engineer 4 (E4)	70.00	1518	13.53%	9.47	120	21.82%	15.27				20	5.81%	4.07	140	3.06%	2.14			
Engineer 3 (E3)	56.10	2728	24.32%	13.64	192	34.91%	19.58	40	35.71%	20.03	124	36.05%	20.22	738	16.13%	9.05	8	16.67%	9.35
Engineer 2 (E2)	44.13	2909	25.94%	11.44	64	11.64%	5.13	24	21.43%	9.46	100	29.07%	12.83	1359	29.70%	13.10	20	41.67%	18.39
Engineer 1 (E1)	34.72	2781	24.79%	8.61	64	11.64%	4.04				100	29.07%	10.09	1359	29.70%	10.31	20	41.67%	14.47
Surveyor 3 (S3)	36.72	24	0.21%	0.08				24	21.43%	7.87									
Surveyor 1 (S1)	22.20	24	0.21%	0.05				24	21.43%	4.76									
Technician 3 (T3)	36.72	528	4.71%	1.73	32	5.82%	2.14						480	10.49%	3.85				
Technician 1 (T1)	22.92	456	4.07%	0.93	16	2.91%	0.67						400	8.74%	2.00				
Administrative 2 (A2)	34.60	56	0.50%	0.17	16	2.91%	1.01						40	0.87%	0.30				
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<b>TOTALS</b>		11216	100%	\$47.33	550	100.00%	\$53.69	112	100%	\$42.11	344	100%	\$47.21	4576	100%	\$41.68	48	100%	\$42.20

# AVERAGE HOURLY PROJECT RATES

**FIRM** TranSystems  
**PSB** \_\_\_\_\_  
**PRIME/SUPPLEMENT** Prime

**DATE** 10/10/16

**SHEET** 2 **OF** 3

PAYROLL CLASSIFICATION	AVG HOURLY RATES	Structural Plans			Pump Station			Geotechnical Investigation			Environmental			QA/QC			Project Administration		
		Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg
Engineer 5 (E5)	70.00	24	0.59%	0.41	4	10.00%	7.00	2	6.25%	4.38	8	2.38%	1.67	12	2.65%	1.86	12	3.85%	2.69
Engineer 4 (E4)	70.00	782	19.21%	13.45	12	30.00%	21.00	16	50.00%	35.00	32	9.52%	6.67	220	48.67%	34.07	96	30.77%	21.54
Engineer 3 (E3)	56.10	896	22.01%	12.35	16	40.00%	22.44	14	43.75%	24.54	140	41.67%	23.37	220	48.67%	27.30	180	57.69%	32.36
Engineer 2 (E2)	44.13	1184	29.09%	12.84	4	10.00%	4.41				50	14.88%	6.57				24	7.69%	3.39
Engineer 1 (E1)	34.72	1184	29.09%	10.10	4	10.00%	3.47				50	14.88%	5.17						
Surveyor 3 (S3)	36.72																		
Surveyor 1 (S1)	22.20																		
Technician 3 (T3)	36.72										16	4.76%	1.75						
Technician 1 (T1)	22.92										40	11.90%	2.73						
Administrative 2 (A2)	34.60																		
<b>TOTALS</b>		4070	100%	\$49.15	40	100%	\$58.32	32	100%	\$63.92	336	100%	\$47.92	452	100%	\$63.23	312	100%	\$59.99

## AVERAGE HOURLY PROJECT RATES

FIRM TranSystems  
 PSB \_\_\_\_\_  
 PRIME/SUPPLEMENT Prime

DATE 10/10/16  
 SHEET 3 OF 3

PAYROLL CLASSIFICATION	AVG HOURLY RATES	Shop Drawing Reviews																	
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg			
Engineer 5 (E5)	70.00	24	6.98%	4.88															
Engineer 4 (E4)	70.00	80	23.26%	16.28															
Engineer 3 (E3)	56.10	160	46.51%	26.09															
Engineer 2 (E2)	44.13	80	23.26%	10.26															
Engineer 1 (E1)	34.72																		
Surveyor 3 (S3)	36.72																		
Surveyor 1 (S1)	22.20																		
Technician 3 (T3)	36.72																		
Technician 1 (T1)	22.92																		
Administrative 2 (A2)	34.60																		
<b>TOTALS</b>		344	100%	\$57.52	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00

COMPANY NAME: TranSystems Corporation

PTB NUMBER: \_\_\_\_\_

TODAY'S DATE: 7/14/2016

ITEM	ALLOWABLE	UTILIZE W.O. ONLY	QUANTITY J.S. ONLY	CONTRACT RATE	TOTAL
Per Diem (per GOVERNOR'S TRAVEL CONTROL BOARD)	Up to state rate maximum			\$0.00	\$0.00
Lodging (per GOVERNOR'S TRAVEL CONTROL BOARD)	Actual cost (Up to state rate maximum)			\$0.00	\$0.00
Air Fare	Coach rate, actual cost, requires minimum two weeks' notice, with prior IDOT approval			\$0.00	\$0.00
Vehicle Mileage (per GOVERNOR'S TRAVEL CONTROL BOARD)	Up to state rate maximum		4,240	\$0.54	\$2,289.60
Vehicle Owned or Leased	\$32.50/half day (4 hours or less) or \$65/full day		20	\$65.00	\$1,300.00
Vehicle Rental	Actual cost (Up to \$55/day)			\$0.00	\$0.00
Tolls	Actual cost			\$0.00	\$0.00
Parking	Actual cost			\$0.00	\$0.00
Overtime	Premium portion (Submit supporting documentation)			\$0.00	\$0.00
Shift Differential	Actual cost (Based on firm's policy)			\$0.00	\$0.00
Overnight Delivery/Postage/Courier Service	Actual cost (Submit supporting documentation)		82	\$25.00	\$2,050.00
Copies of Deliverables/Mylars (In-house)	Actual cost (Submit supporting documentation)			\$0.00	\$0.00
Copies of Deliverables/Mylars (Outside)	Actual cost (Submit supporting documentation)		20	\$5.00	\$100.00
Project Specific Insurance	Actual cost			\$0.00	\$0.00
Monuments (Permanent)	Actual cost			\$0.00	\$0.00
Photo Processing	Actual cost			\$0.00	\$0.00
2-Way Radio (Survey or Phase III Only)	Actual cost			\$0.00	\$0.00
Telephone Usage (Traffic System Monitoring Only)	Actual cost			\$0.00	\$0.00
CADD	Actual cost (Max \$15/hour)			\$0.00	\$0.00
Web Site	Actual cost (Submit supporting documentation)			\$0.00	\$0.00
Advertisements	Actual cost (Submit supporting documentation)			\$0.00	\$0.00
Public Meeting Facility Rental	Actual cost (Submit supporting documentation)			\$0.00	\$0.00
Public Meeting Exhibits/Renderings & Equipment	Actual cost (Submit supporting documentation)			\$0.00	\$0.00
Recording Fees	Actual cost			\$0.00	\$0.00
Transcriptions (specific to project)	Actual cost			\$0.00	\$0.00
Courthouse Fees	Actual cost			\$0.00	\$0.00
Storm Sewer Cleaning and Televising	Actual cost (Requires 2-3 quotes with IDOT approval)			\$0.00	\$0.00
Traffic Control and Protection	Actual cost (Requires 2-3 quotes with IDOT approval)			\$0.00	\$0.00
Aerial Photography and Mapping	Actual cost (Requires 2-3 quotes with IDOT approval)			\$0.00	\$0.00
Utility Exploratory Trenching	Actual cost (Requires 2-3 quotes with IDOT approval)			\$0.00	\$0.00
Testing of Soil Samples*	Actual cost			\$0.00	\$0.00
Lab Services*	Actual cost (Provide breakdown of each cost)			\$0.00	\$0.00
Equipment and/or Specialized Equipment Rental*	Actual cost (Requires 2-3 quotes with IDOT approval)			\$0.00	\$0.00
Printing/Copying 11x17	Actual Cost		44,500	\$0.10	\$4,450.00
Printing/Copying Full Size	Actual Cost		11,200	\$0.60	\$6,720.00
				\$0.00	\$0.00
				\$0.00	\$0.00
				\$0.00	\$0.00
				\$0.00	\$0.00
				\$0.00	\$0.00
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				\$0.00	\$0.00
				\$0.00	\$0.00
				\$0.00	\$0.00
<b>TOTAL DIRECT COST</b>					<b>\$16,909.60</b>

*\*If other allowable costs are needed and not listed, please add in the above spaces provided.***LEGEND**

W.O. = Work Order

J.S. = Job Specific

Supplemental Topographic Survey  
(Jorgensen & Associates)





# JORGENSEN & ASSOCIATES, INC.

LAND SURVEYORS

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Est. 1990

October 5, 2016

Mr. Joseph W. Cwynar, P.E.  
TranSystems Corporation  
1475 East Woodfield Road  
Suite 600  
Schaumburg, Illinois 60173-5440

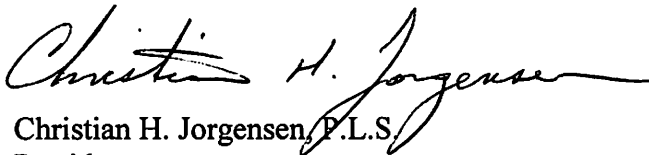
Re: City of Naperville - North Aurora Road Survey Proposal

Dear Mr. Cwynar:

Enclosed, please find our revised proposal to survey and prepare a topographic survey of parts of North Aurora Road, Frontenac Road, BNSF Railway and Canadian National Railway. Our revised proposal is based on your email of September 21<sup>st</sup> and our telephone conversations.

I would like to thank you for considering Jorgensen & Associates for this project. We look forward to continuing our working relationship with your firm. Should you have any questions, comments or require any further information concerning our proposal, please feel free to call me at (847)356-3371.

Respectfully submitted,  
Jorgensen & Associates, Inc.

  
Christian H. Jorgensen, P.L.S.  
President

CHJ/pt

Enclosures

E:\TranSystems\Naperville\North Aurora Rd\Topographic Survey\Letter

Route: North Aurora Road  
Section: @ Canadian National Railway  
County: DuPage  
Job No.:

**Exhibit "A"**

Payroll Burden & Fringe Costs

	<u>% of Direct Productive Payroll</u>
Federal Insurance Contributions Act _____	11.37%
State Unemployment Compensation _____	0.97%
Federal Unemployment Compensation _____	0.11%
Workmen's Compensation Insurance _____	0.96%
Paid Holidays, Vacation, Sick Leave, Personal Leave _____	10.79%
Bonus _____	7.01%
Pension _____	0.93%
Group Insurance _____	<b>35.63%</b>
Total Payroll Burden & Fringe Costs	<b>67.77%</b>

Route: North Aurora Road  
Section: @ Canadian National Railway  
County: DuPage  
Job No.:

**Exhibit "B"**

Overhead and Indirect Costs

	<u>% of Direct Productive Payroll</u>
Business Insurance _____	4.48%
Depreciation _____	12.02%
Indirect wages and salaries _____	38.85%
Reproductive and printing costs _____	0.18%
Office Supplies _____	3.57%
Computer Costs _____	1.98%
Professional Fees _____	2.54%
Telephone _____	1.85%
Fees, license & dues _____	0.98%
Repairs and maintenance _____	0.96%
Business space rent _____	4.92%
Facilities - capital _____	0.66%
Travel - Meals _____	0.08%
Survey Supplies _____	2.80%
Automobile/travel expense _____	1.45%
Miscellaneous Expense _____	0.31%
State Income Tax _____	1.05%
Postage _____	0.20%
Educational & Professional Registrations _____	<u>0.05%</u>
Total Overhead	78.93%

**COST PLUS FIXED FEE  
COST ESTIMATE OF CONSULTANT SERVICES**

**FIRM**  
**PSB**  
PRIME/SUPPLEMENT

Jorgensen & Associates, Inc.

Prime

**OVERHEAD RATE** 1.467  
**COMPLEXITY FACTOR** 0

**DATE** 10/05/16

<b>DBE DROP BOX</b>	<b>ITEM</b>	<b>MANHOURS</b> (A)	<b>PAYROLL</b> (B)	<b>OVERHEAD &amp; FRINGE BENF</b> (C)	<b>IN-HOUSE DIRECT COSTS</b> (D)	<b>FIXED FEE</b> (E)	<b>Outside Direct Costs</b> (F)	<b>SERVICES BY OTHERS</b> (G)	<b>DBE TOTAL</b> (H)	<b>TOTAL</b> (B-G)	<b>% OF GRAND TOTAL</b>
	(1) Field-Topographic Survey	314	7,222.00	10,594.67	23,121.00	5,761.08				46,698.76	82.15%
	(2) Office-Compile Field Data	25	846.00	1,241.08		282.14				2,369.22	4.17%
	(3) Office-Create Existing Topography Base Map	62	1,860.00	2,728.62		620.31				5,208.93	9.16%
	(4) Office-Create T.I.N. & Contours	9	270.00	396.09		90.05				756.14	1.33%
	(5) QC/QA	13	546.00	800.98		182.09				1,529.07	2.69%
	(6) Coordination Meetings	2	88.00	129.10	32.40	34.05				283.54	0.50%
	<b>Subconsultant DL</b>					0.00				0.00	0.00%
	<b>TOTALS</b>	425	10,832.00	15,890.54	23,153.40	6,969.72	0.00	0.00	0.00	56,845.66	100.00%

DBE 0.00%

## AVERAGE HOURLY PROJECT RATES

FIRM Jorgensen & Associates, Inc.  
 PSB \_\_\_\_\_  
 PRIME/SUPPLEMENT Prime

DATE 10/05/16

SHEET 1 OF 2

PAYROLL CLASSIFICATION	AVG HOURLY RATES	TOTAL PROJECT RATES			(1) Field-Topographic Survey			(2) Office-Compile Field Data			(3) Office-Create Existing Topography Base Map			(4) Office-Create T.I.N. & Contours			(5) QC/QA		
		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/Officer	44.00	2	0.47%	0.21															
Supervisor, P.L.S.	42.00	21	4.94%	2.08				8	32.00%	13.44							13	100.00%	42.00
Survey Party Chief, S.I.T.	25.75	157	36.94%	9.51	157	50.00%	12.88												
Instrument Operator	20.25	157	36.94%	7.48	157	50.00%	10.13												
Cadd Supervisor	30.00	88	20.71%	6.21				17	68.00%	20.40	62	100.00%	30.00	9	100.00%	30.00			
Secretarial	20.50	0																	
		0																	
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		0																	
<b>TOTALS</b>		425	100%	\$25.49	314	100.00%	\$23.00	25	100%	\$33.84	62	100%	\$30.00	9	100%	\$30.00	13	100%	\$42.00

## AVERAGE HOURLY PROJECT RATES

FIRM Jorgensen & Associates, Inc.  
 PSB \_\_\_\_\_  
 PRIME/SUPPLEMENT Prime

DATE 10/05/16

SHEET 2 OF 2

PAYROLL CLASSIFICATION	AVG HOURLY RATES	(6) Coordination Meetings																	
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg			
Principal/Officer	44.00	2	100.00%	44.00															
Supervisor, P.L.S.	42.00																		
Survey Party Chief, \$	25.75																		
Instrument Operator	20.25																		
Cadd Supervisor	30.00																		
Secretarial	20.50																		
<b>TOTALS</b>		2	100%	\$44.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00

Route: North Aurora Road  
 Section: @ Canadian National Railway  
 County: DuPage  
 Job No.:

**Manhour Breakdown  
 Topographic Survey Estimate**

North Aurora Road	± 1,370' = ± 0.259 mile
Frontenac Road	± 1,060' = ± 0.201 mile
Canadian National Railway	± 2,280' = ± 0.432 mile
BNSF Railway	± <u>1,000'</u> = ± <u>0.189 mile</u>
 Total Length	 ± 5,710' = ± 1.081 miles

1. Field – Topographic Survey

a.	Measure traverse		
	12 hours x 2 men =		24 MH
b.	Measure level circuit		
	7 hours x 2 men =		14 MH
c.	Locate existing topography & measure inverts		
	138 hours x 2 men =		<u>276 MH</u>
		Sub-total Item #1	314 MH

2. Office - Compile Field Data

a.	Compute traverse & level circuit		
	8 hours x 1 man =		8 MH
b.	Edit & compile topographic survey		
	17 hours x 1 man =		<u>17 MH</u>
		Sub-total Item #2	25 MH

3. Office - Create Existing Topography Base Map

a.	Layout and drafting		
	62 hours x 1 man =		62 MH

4. Office - Create T.I.N. & Contours		
a. Compute contours		
9 hours x 1 man =		9 MH
5. QC/QA		
a. Check topographic survey		
10 hours x 1 man =		10 MH
b. Check contours		
3 hours x 1 man =		<u>3 MH</u>
	Sub-total Item #5	13 MH
6. Coordination Meetings		
1 meeting @ 2 hours =		<u>2 MH</u>
	Total All Items	425 MH



Route: North Aurora Road  
Section: @ Canadian National Railway  
County: DuPage  
Job No.:

**Breakdown of  
In House Direct Costs**

Item

1. Field - Topographic Survey

a. Trips to project site - 20 ea. ± 120 miles/trip x 20 trips = ± 2,400 miles ± 2,400 miles @ \$0.54/mile =	\$ 1,296.00
b. BNSF Railway Right of Entry Permit	\$ 775.00
c. BNSF Railway Contract Fees	\$ 1,300.00
d. BNSF Railway Flagger 3 days @ \$1,200/day =	\$ 3,600.00
e. Canadian National Railway Right of Entry Permit	\$ 750.00
f. Canadian National Railway Flagger 8 days @ \$1,300/day =	\$ 10,400.00
g. Additional Liability Insurance	<u>\$ 5,000.00</u>
Sub-total Item #1	\$ 23,121.00

6. Coordination Meetings

a. Meetings at TranSystems' office - 1 ea. ± 60 miles/trip x 1 trip = ± 60 miles ± 60 miles @ \$0.54/mile =	<u>\$ 32.40</u>
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Total All Items      \$ 23,153.40

**Subsurface Utility Engineering  
(American Surveying & Engineering)**

# American Surveying & Engineering, P.C.

Surveyors ♦ Engineers ♦ Geodesists ♦ Mapping Scientists

**Project:** North Aurora Road SUE Level A  
**Location:** Naperville, IL  
**Job Number:**

**Agent:** TranSystems  
**Owner:** City of Naperville  
**Date:** July 6, 2016 (REV. July 7, 2016)

**ASE Proposal No.:** 216135

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## SCOPE OF WORK

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**STATEMENT OF PROJECT UNDERSTANDING:** ASE proposes to perform 13 Level A Subsurface Utility Engineering (SUE) exposures of major gas and oil pipelines at two locations on North Aurora Road, the first location is between approximately Station 100+33 and Station 102+37 and the second location is between approximately Station 106+38 and Station 109+03. The Level A SUE will extend out to the proposed ROW/Easements and/or the existing ROW. The Utility Easement and ComEd ROW on North Aurora Road shown within the attached exhibits. It is our understanding all the exposures will be between 6 and 12 feet deep. ASE will perform SUE Level B for 15 feet on either side of all exposures to verify presence of the utility. This proposal does not include direct costs for traffic control. It is assumed that all other utilities in the corridor will not need to be exposed using SUE Level A.

**Note:** ASE has estimated the depth of the exposures. The Client will only be responsible for actual depths of the Level A exposures as outlined in the table of Item 6 of the assumptions.

**Note:** This proposal assumes that no work on the railroad right of way will be necessary.

### SUE LEVEL A LOCATIONS

#### Utility Easement Exposures:

- Kinder Morgan/National Gas Pipeline Company of America 36 inch gas pipeline (2 exposures, one either side of project roadway near limits of project right of way).
- Kinder Morgan/National Gas Pipeline Company of America 36 inch gas pipeline (2 exposures, one either side of project roadway near limits of project right of way).
- Kinder Morgan/National Gas Pipeline Company of America 20 inch gas pipeline (2 exposures, one either side of project roadway near limits of project right of way).
- NICOR Gasline Running South from Center of Road of unknown diameter (1 exposure).
- Note: NICOR may have moved a gasline that was in the ComEd ROW to the Utility Easement. If this is true, ASE will perform SUE Level B services to locate the relocated gasline and will expose the gasline in two locations near the limits of the project ROW.

#### ComEd ROW Exposures

- Kinder Morgan of America 8 inch gas pipeline (2 exposures, one either side of project roadway near limits of project right of way).
- Enbridge Energy Partners 34 inch oil pipeline (2 exposures, one either side of project roadway near limits of project right of way).
- NICOR 36 inch gas pipeline (2 exposures, one either side of project roadway near limits of project right of way). Note: This might have been moved to Utility Easement.

### Page 1 of 4

# American Surveying & Engineering, P.C.

Surveyors ♦ Engineers ♦ Geodesists ♦ Mapping Scientists

**Project:** North Aurora Road SUE Level A  
**Location:** Naperville, IL  
**Job Number:**

**Agent:** TranSystems  
**Owner:** City of Naperville  
**Date:** July 6, 2016 (REV. July 7, 2016)

**ASE Proposal No.:** 216135

## SCOPE OF WORK

### GENERAL SCOPE ASSUMPTIONS:

- 1) All survey work will be performed in U.S. Survey Feet, tenths and hundredths of a foot, unless otherwise specified.
- 2) Client to provide a letter of introduction and right of entry access to subject properties prior to ASE commencement of field operations.
- 3) Subsurface Utility Engineering (SUE) standards referred to within this scope of work are taken from the ASCE 38-02 Standard Guideline of the Collection & Depiction of Existing Subsurface Utility Data.
- 4) American Surveying & Engineering shall not be responsible for any erroneous information provided by underground utility providers.
- 5) ASE assumes no lane closures will be necessary.
- 6) Level A exposures will be billed as direct costs at the following rates:  
Location holes 0-3.00 feet in depth will be billed at \$1,221.00 per hole.  
Location holes 3.01-6.00 feet in depth will be billed at \$1,461.00 per hole.  
Location holes 6.01-12.00 feet in depth will be billed at \$1,845.00 per hole. **(ASSUME 13)**.  
Location holes 12.01-18.00 feet in depth will be billed at \$2,558.00 per hole.  
Location holes 18.01 feet and over will be billed on a hourly rate.
- 7) Level B verification will be billed as direct costs at \$1.96 per foot **(ASSUME 390 FEET)**.
- 8) Utility locations (QL A) will be surveyed to the following accuracy:

QUALITY LEVEL	A
HORIZONTAL *	0.2'
VERTICAL	0.05'

\*Horizontal accuracy shall be to applicable survey and mapping standards. The listed values are typical of this accuracy.

### THE FOLLOWING TASKS WILL BE PERFORMED BY ASE AS PART OF THIS CONTRACT:

#### 1 ADMINISTRATION

- 1.1 Meetings with Client and/or Client's Agent. In-house meetings. Progress reports, scheduling, invoicing, etc.
- 1.2 Technical direction of staff.
- 1.3 Project management, coordination.

#### 2 DATA COMPILATION/UTILITY COORDINATION

### Page 2 of 4

150 N. Wacker Drive - Suite 2650 \* Chicago, IL 60606 \* 312-277-2000 \* Fax 312-277-2002  
841 N. Galena Avenue \* Dixon, IL 61021 \* 815-288-6277 \* Fax 815-288-6277  
888 South Edgelawn Drive, Suite 1759 Aurora, IL 60506\*630-897-4105  
2321 North Loop Dr., Suite 110 \* Ames, IA 50010 \* 515-233-6231

# American Surveying & Engineering, P.C.

Surveyors ♦ Engineers ♦ Geodesists ♦ Mapping Scientists

**Project:** North Aurora Road SUE Level A  
**Location:** Naperville, IL  
**Job Number:**

**Agent:** TranSystems  
**Owner:** City of Naperville  
**Date:** July 6, 2016 (REV. July 7, 2016)

**ASE Proposal No.:** 216135

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## SCOPE OF WORK

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- 2.1 Existing utility research, as required, and previous survey data.
- 2.2 Prepare compiled data for use by personnel.
- 2.3 Analyze utility locations and recommend locations for additional SUE Quality Level A exposures.

### 3 HORIZONTAL CONTROL

**NOTE:** *Horizontal control to be supplied by others.*

- 3.1 Recovery and verification of existing project control.
- 3.2 Densification of control.
- 3.3 Analyze, process and adjust horizontal control.

### 4 VERTICAL CONTROL

**NOTE:** *Vertical control to be supplied by others.*

- 4.1 Recovery and verification of existing project control.
- 4.2 Densification of control.
- 4.3 Analyze, process and adjust level data.

### 5 FIELD LOCATE HORIZONTAL LOCATION USING DIGITAL VERIFIER

**(SUE Level B) (Assume 390' of designation – 15' on each side at each exposure)**

- 5.1 Use digital verifier to insure locations & to determine the approx depths prior to Air Vacuum excavation. Mark with paint only **(billed as direct cost @ \$1.96/foot for a total of \$764.40).**

### 6 LEVEL A SUE EXPOSURES

**(Assume 13 locations at a rate of \$1,845 per exposure for a total \$23,985)**

(See Notes under Statement of Project Understanding)

- 6.1 Call JULIE and schedule locate.
- 6.2 Perform Air Vacuum excavation to expose specified utilities for accurate tie-in location and backfill with soil that is removed.
- 6.3 Obtain X, Y, Z coordinates of individual tie-in locations.
- 6.4 Provide wood hub over top of utility & add lath with ribbon.

### 7 REPORT PREPARATION

- 7.1 Prepare drawing and coordinate table.
- 7.2 Use CAD files furnished to update drawings to reflect location of exposed utilities.

**Page 3 of 4**

# American Surveying & Engineering, P.C.

Surveyors ♦ Engineers ♦ Geodesists ♦ Mapping Scientists

**Project:** North Aurora Road SUE Level A

**Location:** Naperville, IL

**Job Number:**

**Agent:** TranSystems

**Owner:** City of Naperville

**Date:** July 6, 2016 (REV. July 7, 2016)

**ASE Proposal No.:** 216135

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## SCOPE OF WORK

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### 8 QA/QC PLAN

- 8.1 Review contract documents to verify ASE project QA/QC requirements.
- 8.2 Periodic project review to assure compliance with policy and contract documents.
- 8.3 Final review of QA/QC compliance.

### ASE WILL DELIVER TO CLIENT THE FOLLOWING ITEMS AS PART OF THIS WORK:

#### DELIVERABLES

- A. Update Client Supplied Microstation Base Sheets to show the location of the underground utilities. ASE CAD deliverable will show ASE border and logo.
- B. Technical memorandum detailing the station, offset and depth of the utilities.

#### DIRECT COSTS - ASE will invoice the following at actual cost

- A. Permit application fee in Aurora \$100 plus cost for \$20,000 maintenance bond. Cost for bond is \$400. Totaling \$500.
- B. Permit Application fee in Naperville Township \$50 cost for \$20,000 maintenance bond. Cost for bond is \$400. Totaling: \$450.
- C. Copies of ASE obtained record utility information from Utility Owners records, if necessary.
- D. Location holes excavated by Air Vacuum will be billed as a unit cost per hole (SUE Level A).
- E. Utility designation using digital verifier will be billed as a unit cost per foot of designation (SUE Level B).

#### ITEMS TO BE SUPPLIED BY OTHERS

- A. Record utility information, utility atlas information, roadway plans, easement and ROW documents, and any information relevant to the purpose of this SUE work will be provided to ASE at the beginning of the project at no cost to ASE.
- B. Permission and access to closed or locked areas.
- C. Letter of Introduction and written authorization for access to subject property for ASE's services on subject site.

Page 4 of 4



PROJECT: SUE on North Aurora Road

LOCATION: Naperville

CLIENT: TranSystems

PROPOSAL No.:

216135

DATE:

7/6/2016

TASK 1.0 Administration		Man Hours																					
ITEM	Description	PIC	PM	P S/E 4	P S/E 3	P S/E 2	P S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL
1.1	Meetings, reports, scheduling, etc.		2																				2
1.2	Technical Direction of Staff		1																				1
1.3	Project management & coord.		2																				2
1.4																							0
1.5																							0
1.6																							0
1.7																							0
1.8																							0
1.9																							0
	TOTAL HOURS	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5

TASK 2.0 Data Compilation		Man Hours																					
ITEM	Description	PIC	PM	P S/E 4	P S/E 3	P S/E 2	P S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL
2.1	Existing Utility Research		1			2																	3
2.2	Compile & Review data		1			2																	3
2.3	Analyze utility locations		1			2																	3
2.4																							0
2.5																							0
2.6																							0
2.7																							0
2.8																							0
2.9																							0
	TOTAL HOURS	0	3	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9

TASK 3.0 Horizontal Control		Man Hours																					
ITEM	Description	PIC	PM	P S/E 4	P S/E 3	P S/E 2	P S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL
3.1	Recon. & locate existing control											1	1										2
3.2	Densification of Control										1	1											2
3.3	Analyze, Process, adjust control					1																	1
3.4																							0
3.5																							0
3.6																							0
3.7																							0
3.8																							0
3.9																							0
	TOTAL HOURS	0	0	0	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	5

TASK 4.0 Vertical Control		Man Hours																					
ITEM	Description	PIC	PM	P S/E 4	P S/E 3	P S/E 2	P S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL
4.1	Recon. & locate existing control										1	1											2
4.2	Densification of Control										1	1											2
4.3	Analyze, Process, adjust control					1																	1
4.4																							0
4.5																							0
4.6																							0
4.7																							0
4.8																							0
4.9																							0
	TOTAL HOURS	0	0	0	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	5



PROJECT: SUE on North Aurora Road  
 LOCATION: Naperville  
 CLIENT: TranSystems

PROPOSAL No. 216135  
 DATE: 7/6/2016

TASK 5.0 Level B SUE		Man Hours																						
ITEM	Description	PIC	PM	P/S/E 4	P/S/E 3	P/S/E 2	P/S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL	
5.1	Digital Verifier for location	0																						0
5.2																								0
5.3																								0
5.4																								0
5.5																								0
5.6																								0
5.7																								0
5.8																								0
5.9																								0
	TOTAL HOURS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TASK 6.0 Level A Exposures		Man Hours																						
ITEM	Description	PIC	PM	P/S/E 4	P/S/E 3	P/S/E 2	P/S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL	
6.1	Call Julie	0																						0
6.2	Perform AirVac Excavation																							0
6.3	Obtain X, Y, Z Coordinates																							0
6.4	Wood Hub, Lath Ribbon																							0
6.5																								0
6.6																								0
6.7																								0
6.8																								0
6.9																								0
	TOTAL HOURS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TASK 7.0 Report Preparation		Man Hours																						
ITEM	Description	PIC	PM	P/S/E 4	P/S/E 3	P/S/E 2	P/S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL	
7.1	Prepare drawing, Coordinate table		1			1		3																5
7.2	CAD to update drawings		1			1		3																5
7.3																								0
7.4																								0
7.5																								0
7.6																								0
7.7																								0
7.8																								0
7.9																								0
	TOTAL HOURS	0	2	0	0	2	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10

TASK 8.0 QA/QC		Man Hours																						
ITEM	Description	PIC	PM	P/S/E 4	P/S/E 3	P/S/E 2	P/S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL	
8.1	Project QA/QC		1																					1
8.2	Periodic Project review		1																					1
8.3	Final review and report		2																					2
8.4																								0
8.5																								0
8.6																								0
8.7																								0
8.8																								0
8.9																								0
	TOTAL HOURS	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4





PROJECT: SUE on North Aurora Road

LOCATION: Naperville

CLIENT: TranSystems

PROPOSAL No. : 216135

DATE: 7/6/2016

SUMMARY OF TASKS	MANHOURS																						
TASK	PIC	PM	P/S/E 4	P/S/E 3	P/S/E 2	P/S/E 1	CADD	ST4	ST3	ST2	ST1	ROW 4	ROW 3	ROW 2	ROW 1	SUE 3	SUE 2	SUE 1	CONTR.	A/C 3	A/C 2	TOTAL	
1.0 Administration	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2.0 Data Compilation	0	3	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
3.0 Horizontal Control	0	0	0	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	5
4.0 Vertical Control	0	0	0	0	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	5
5.0 Level B SUE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6.0 Level A Exposures	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7.0 Report Preparation	0	2	0	0	2	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
8.0 QA/QC	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Hours</b>	0	14	0	0	10	0	6	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	38



AVERAGE HOURLY PROJECT RATES

FIRM  
PTB  
PRIME/SUPPLEMENT

American Surveying & Engineering, PC

DATE 07/06/16

SHEET 1 OF 2

PAYROLL CLASSIFICATION	AVG HOURLY RATES	TOTAL PROJECT RATES			1.0 Administration			2.0 Data Compilation			3.0 Horizontal Control			4.0 Vertical Control			5.0 Level B SUE		
		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-in Charge	70.00	0			0			0			0			0			0		
Project Manager	70.00	14	36.84%	25.79	5	100.00%	70.00	3	33.33%	23.33	0			0			0		
Project Surveyor/Engineer_4	68.36	0			0			0			0			0			0		
Project Surveyor/Engineer_3	56.19	0			0			0			0			0			0		
Project Surveyor/Engineer_2	38.16	10	26.32%	10.04	0			6	66.67%	25.44	1	20.00%	7.63	1	20.00%	7.63	0		
Project Surveyor/Engineer_1	37.64	0			0			0			0			0			0		
CADD Technicians	37.12	6	15.79%	5.86	0			0			0			0			0		
Engr. / Survey Tech. 4	53.59	0			0			0			0			0			0		
Engr. / Survey Tech. 3	35.94	4	10.53%	3.78	0			0			2	40.00%	14.38	2	40.00%	14.38	0		
Engr. / Survey Tech. 2	27.00	4	10.53%	2.84	0			0			2	40.00%	10.80	2	40.00%	10.80	0		
Engr. / Survey Tech. 1	18.74	0			0			0			0			0			0		
ROW Specialist_4	53.59	0			0			0			0			0			0		
ROW Specialist_3	41.82	0			0			0			0			0			0		
ROW Specialist_2	32.41	0			0			0			0			0			0		
ROW Specialist_1	18.30	0			0			0			0			0			0		
S.U.E. Tech. Grade 3	38.10	0			0			0			0			0			0		
S.U.E. Tech. Grade 2	22.61	0			0			0			0			0			0		
S.U.E. Tech. Grade 1	20.43	0			0			0			0			0			0		
Deputy Controller/Admin Mana	22.48	0			0			0			0			0			0		
Administrative/Clerical 3	20.39	0			0			0			0			0			0		
Administrative/Clerical 2	15.68	0			0			0			0			0			0		
		0																	
		0																	
		0																	
		0																	
		0																	
		0																	
		0																	
		0																	
		0																	
<b>TOTALS</b>		38	100%	\$48.32	5	100.00%	\$70.00	9	100%	\$48.77	5	100%	\$32.81	5	100%	\$32.81	0	0%	\$0.00

# AVERAGE HOURLY PROJECT RATES

DF-824-039  
REV 12/04

**FIRM** American Surveying & Engineering, PC  
**PTB** \_\_\_\_\_  
**PRIME/SUPPLEMENT** \_\_\_\_\_

**DATE** 07/06/16  
**SHEET** 2 **OF** 2

PAYROLL CLASSIFICATION	AVG HOURLY RATES	6.0 Level A Exposures			7.0 Report Preparation			8.0 QA/QC			Permit Cost								
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg			
Principal-in Charge	70.00	0			0			0			0			0			0		
Project Manager	70.00	0			2	20.00%	14.00	4	100.00%	70.00	0			0			0		
Project Surveyor/Engineer_4	68.36	0			0			0			0			0			0		
Project Surveyor/Engineer_3	56.19	0			0			0			0			0			0		
Project Surveyor/Engineer_2	38.16	0			2	20.00%	7.63	0			0			0			0		
Project Surveyor/Engineer_1	37.64	0			0			0			0			0			0		
CADD Technicians	37.12	0			6	60.00%	22.27	0			0			0			0		
Engr. / Survey Tech. 4	53.59	0			0			0			0			0			0		
Engr. / Survey Tech. 3	35.94	0			0			0			0			0			0		
Engr. / Survey Tech. 2	27.00	0			0			0			0			0			0		
Engr. / Survey Tech. 1	18.74	0			0			0			0			0			0		
ROW Specialist_4	53.59	0			0			0			0			0			0		
ROW Specialist_3	41.82	0			0			0			0			0			0		
ROW Specialist_2	32.41	0			0			0			0			0			0		
ROW Specialist_1	18.30	0			0			0			0			0			0		
S.U.E. Tech. Grade 3	38.10	0			0			0			0			0			0		
S.U.E. Tech. Grade 2	22.61	0			0			0			0			0			0		
S.U.E. Tech. Grade 1	20.43	0			0			0			0			0			0		
Deputy Controller/Admin Manager	22.48	0			0			0			0			0			0		
Administrative/Clerical 3	20.39	0			0			0			0			0			0		
Administrative/Clerical 2	15.68	0			0			0			0			0			0		
<b>TOTALS</b>		0	0%	\$0.00	10	100%	\$43.90	4	100%	\$70.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00



**AMERICAN**  
SURVEYING & ENGINEERING, P.C.

**Direct Costs**

Item	Cost Per Unit	Total
Level B SUE per foot – 390 feet	\$1.96	\$764
Level A SUE per exposure – Assume 13 exposures	\$1,845	\$23,985
Permit Fee Aurora	\$100 Application Fee \$400 Bond Fee	\$500
Permit Fee Unincorporated Naperville Township	\$50 Application Fee \$400 Bond Fee	\$450

Visit our website at: [www.americansurvey.com](http://www.americansurvey.com)

150 N. Wacker Drive. \* Suite 2650 \* Chicago, IL 60606 \* 312-277-2000 \* FAX 312-277-2002  
P.O. Box 8 \* 841 N. Galena Ave. \* Dixon, IL 61021 \* 815-288-6231 \* FAX 815-288-6277  
888 S. Edgelawn Drive. \* Suite 1759 \* Aurora, IL 60506 \* 630-897-4105 \* FAX 630-897-4121

**Lighting Design  
(EJM Engineering)**



**September 23, 2016**

**NORTH AURORA ROAD AND EJ&E RAILROAD UNDERPASS  
IMPROVEMENT PROJECT**

**CITY OF NAPERVILLE  
PHASE I AND PHASE II ENGINEERING SERVICES**

**GENERAL SCOPE - PHASE II ENGINEERING SERVICES**

The scope of EJM Engineering, Inc. design services for this project consists of the preparation of Final Street Lighting Design Plans, Special Provisions, Summary of Quantities, and Estimate of Cost in conjunction with the proposed North Aurora Road and EJ&E Railroad Underpass improvement project. The proposed improvement along North Aurora Road extends from Station 98+00 to Station 118+20. The EJM scope of design services will also include the design of underpass lighting for the EJ&E Railroad over North Aurora Road.

**Scope of Services – EJM Engineering, Inc.**

**1. MEETINGS AND COORDINATION- 12 hours**

EJM will attend meetings and conduct coordination to complete the scope of services:

- A. Attend street lighting meetings with the City of Naperville- 4 hours.
- B. Coordination with the local Electric Utility Company- 8 hours.

**2. DATA COLLECTION – 16 hours**

EJM will collect and review data to complete the scope of services:

- A. Conduct one field surveys for the proposed street lighting improvement (2 people @ 4 hours each) – 8 hours
- B. Review of existing street lighting plans– 4 hours
- C. Review of design material, specifications and special provisions provided by the City of Naperville – 4 hours

**3. STREET LIGHTING CONCEPT STUDY TECHNICAL MEMORANDUM –28**

EJM will be responsible for the preparation of a street lighting concept study report as follows:

- A. Development of Lighting Concept Technical Memorandum. This work will include design narrative and alternative street lighting analysis, fixture selection, interface with adjacent roadway sections, and final street lighting design recommendation – 16 hours
- B. Conceptual Lighting and Voltage Drop Calculations – 8 hours



- C. Development of Conceptual Cost Estimate. This work will include an estimate of quantity and related unit cost – 4 hours

#### **4. FINAL STREET LIGHTING DESIGN – 182 hours**

EJM engineering will be responsible for the design of permanent street lighting system within the project limits.

- A. Design of the proposed street lighting- 160 hours
- Meetings and Coordination– Included in Item 1 above
  - Final street lighting calculations: North Aurora Road- 8 hours
  - Final underpass lighting calculations: EJ&E underpass- 4 hours
  - Preparation of proposed lighting plans: North Aurora Road (3 sheets @ 24 hours each)- 72 hours
  - Preparation of proposed underpass lighting plans: EJ&E underpass (1 sheet @ 24 hours)- 24 hours
  - Preparation of temporary lighting and removal plans: (1 sheets @ 16 hours each)- 16 hours
  - Voltage Drop Calculations- 4 hours
  - Preparation of wiring plans (1 sheets @ 16 hours each)- 16 hours
  - Preparation of electrical and underpass details (1 sheets @ 16 hours each)- 16 hours
- B. Preparation of Special Provisions- 8 hours
- C. Preparation of Summary of Quantities- 8 hours
- D. Preparation of Estimate of Cost- 6 hours

#### **5. QA/QC – 12 hours**

#### **6. ADMINISTRATION – 6 hours**

##### **General Items**

This scope of services includes the design and development of PS&E's in support of the preparation of one (1) set of construction contract documents following the typical three (3) submittal review process. Breaking up or separating portions of the work into additional construction contracts or including additional submittals is not included in this scope of services.

1. Plan sets and Special Provisions to be prepared in English units.
2. Lighting detail sheets will not be prepared to scale in order to properly illustrate installation details.





**EJM ENGINEERING, INC.**

3. Proposed permanent lighting designed using current City of Naperville Standards.
4. All electrical design will be in accordance with The National Electric Code (NEC), the National Electrical Safety Code (NESC) and any other applicable State or Local Electrical codes.



### AVERAGE HOURLY PROJECT RATES

**FIRM**  
**PROJECT**  
**PRIME/SUPPLEMENT**

EJM Engineering, Inc.  
North Aurora Road and EJ&E Underpass Improvement Project  
Prime

DATE 10/05/16

SHEET 1 OF 1

PAYROLL CLASSIFICATION	AVG HOURLY RATES	TOTAL PROJECT RATES			MEETINGS AND COORDINATION			DATA COLLECTION			STREET LIGHTING CONCEPT STUDY			FINAL STREET LIGHTING DESIGN			QA/QC AND ADMINISTRATION		
		Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg	Hours	% Part.	Wgt'd Avg
Principal	70.00	12	4.69%	3.28	2	16.67%	11.67				2	7.14%	5.00	4	2.20%	1.54	4	22.22%	15.56
Chief Engineer/Project Manager	70.00	34	13.28%	9.30	2	16.67%	11.67				4	14.29%	10.00	24	13.19%	9.23	4	22.22%	15.56
Senior Engineer	58.24	74	28.91%	16.83	4	33.33%	19.41	6	37.50%	21.84	10	35.71%	20.80	48	26.37%	15.36	6	33.33%	19.41
Lead Engineer	45.89																		
Engineer III	36.07	66	25.78%	9.30				6	37.50%	13.53	4	14.29%	5.15	56	30.77%	11.10			
Engineer II	33.39	36	14.06%	4.70				4	25.00%	8.35	4	14.29%	4.77	28	15.38%	5.14			
Engineer I	28.43	20	7.81%	2.22	4	33.33%	9.48				4	14.29%	4.06	12	6.59%	1.87			
CADD Operator	33.04	10	3.91%	1.29										10	5.49%	1.82			
Project Administrator	31.02	4	1.56%	0.48													4	22.22%	6.89
<b>TOTALS</b>		256	100%	\$47.40	12	100.00%	\$52.22	16	100%	\$43.71	28	100%	\$49.78	182	100%	\$46.05	18	100%	\$57.42

## IN-HOUSE DIRECT COSTS

### MEETINGS AND COORDINATION

	Unit	Cost per Unit	Total Cost
VEHICLE MILEAGE			\$ -
VEHICLE DAY	1	\$ 65.00	\$ 65.00
Overnight Delivery	0	\$ 25.00	\$ -
Copies of Deliverables 8 1/2" x 11"	0	\$ 0.10	\$ -
Copies of Deliverables 11"x 17"	0	\$ 0.25	\$ -
Copies of Deliverables 8 1/2" x 11"	0	\$ 0.25	\$ -
Copies of Deliverables 11"x 17" C	0	\$ 1.00	\$ -
Report Binding	0	\$ 3.00	\$ -
<b>MEETINGS AND COORDINATION</b>			<b><u>\$ 65.00</u></b>

### DATA COLLECTION

	Unit	Cost per Unit	Total Cost
VEHICLE MILEAGE			\$ -
VEHICLE DAY	1	\$ 65.00	\$ 65.00
Overnight Delivery	0	\$ 25.00	\$ -
Copies of Deliverables 8 1/2" x 11"	0	\$ 0.10	\$ -
Copies of Deliverables 11"x 17"	0	\$ 0.25	\$ -
Copies of Deliverables 8 1/2" x 11"	0	\$ 0.25	\$ -
Copies of Deliverables 11"x 17" C	0	\$ 1.00	\$ -
Report Binding	0	\$ 3.00	\$ -
<b>DATA COLLECTION</b>			<b><u>\$ 65.00</u></b>

### STREET LIGHTING CONCEPT STUDY

	Unit	Cost per Unit	Total Cost
VEHICLE MILEAGE			\$ -
VEHICLE DAY	0	\$ 65.00	\$ -
Overnight Delivery	1	\$ 25.00	\$ 25.00
Copies of Deliverables 8 1/2" x 11"	30	\$ 0.10	\$ 3.00
Copies of Deliverables 11"x 17"	24	\$ 0.25	\$ 6.00
Copies of Deliverables 8 1/2" x 11"	0	\$ 0.25	\$ -
Copies of Deliverables 11"x 17" C	0	\$ 1.00	\$ -
Report Binding	5	\$ 3.00	\$ 15.00
<b>STREET LIGHTING CONCEPT STUDY</b>			<b><u>\$ 49.00</u></b>

### FINAL STREET LIGHTING DESIGN

Pump Station Design  
(Donohue & Associates)



Donohue & Associates, Inc.  
125 South Wacker Drive, Suite 1850 | Chicago, IL 60606  
312.236.9147 | donohue-associates.com

Date: September 22, 2016

To: Matt Smith, PE

Copy:

From: Eric Cockerill PE

Re: North Aurora Road Pump Station Scope

#### General

The project scope consists of the preparation of the preliminary engineering report, contract plans, specifications, opinion of probable construction cost, and calculations services for the construction of a new North Aurora Road Pump Station. The work for this project will be in English units. The work will meet the description of scope of work below. It is assumed that compliance with IDOT guidelines for pump stations is not required.

For the purposes of this scope, it is assumed that the pump station will include a pre-fabricated concrete wet well and discharge vault with wet pit mounted, submersible non-clog pumps. Peak design pumping rate is 6600 gpm (14.67 cfs). Two pumps will be provided (one duty, one backup). Pumps will discharge to a discharge chamber that will then flow by gravity to discharge outlet. Pumps will be variable speed and controlled by level transducer with float backup. No flow meters will be provided. Access to the wet well and discharge vault will be via aluminum hatches at grade. An exterior, weatherproof electrical control panel will be provided at grade. The Owner does not desire remote monitoring of alarms. The pump station will meet applicable building and electrical codes including NFPA 820. Donohue will be responsible for connecting to proposed storm sewers at the limits of the pump station site but no more than 20' from the wet well. No backup generator will be provided.

Transystems or the Owner will provide the following information:

1. Site topographic survey
2. Geotechnical soil borings and report
3. Required design peak inflow rate into the Pump Station
4. Location, elevation, and slope of connecting sewers
5. Proposed topography around the pump station site
6. Base Flood Protection Elevation at the pump station site

Donohue and Associates, Inc. (Donohue) will be responsible for the proposed pump station design. Others will be responsible for the interconnection to the existing and proposed storm sewer system, roadway design, and overall project management.

Donohue's tasks are as follows:

#### Task 1 Data Review

- a. Review of existing reports and construction drawings
- b. Domestic steel considerations, required waivers, and determination of equipment needed for this project complying with steel requirements

#### Task 2 PS&E Preparation and Contract Packaging

This task item includes the preparation of PS&E documents for inclusion in the North Aurora Road Roadway contract. Plan submittals include City reviews at 70% preliminary [75% pump stations], 90% (pre-final [95% pump stations]) and Final. Pre-final and Final submittals will be provided to IDOT for their review and comment. A CADD CD will be delivered after the Final Submittal with all drawings in MicroStation format and specifications in PDF format. PDF versions of all drawings will be provided for each submittal. The scope of work includes:

- Summary of Quantities – The summary of quantity sheets will be prepared at every submittal. Approximately 15 items per sheet are assumed with applicable columns for funding breakdowns. The sheets will include pay item code number, description, unit and total quantity. The quantities will be broken down by construction type codes.
- Special Provisions – Special provision will be necessary to provide descriptions of the work that are not covered in the Standard Specifications. Also included in this item is review of applicable recurring special provisions, and BDE special provisions. This will be done for all submittals. It is assumed that the pump station special provisions will follow previous pump station contracts whereby they follow the BDE special provisions and are numbered Section 1A through Section 16G.
- Estimate of Time – The expected duration of construction time will be determined and provided according to the BDE Manual. This will be done for the final submittal only.
- Opinion of Cost – The anticipated cost of construction will be provided using the pay items, historical prices, and researched prices according to the BDE Manual. This will be done for each of the submittals.
- Pump Station Design – The pump station design will industry standards for stormwater pump stations and include the following:
  - a. Subsurface Utility Engineering (SUE) (level B) coordination:
    - i. It is assumed that SUE investigations will be completed by others and Donohue will provide the results; Donohue will provide SUE documentation for study (CADD files, base sheets as required).
    - ii. Donohue to provide coordination support with the following utilities for the pump station site including:
      1. Gas
      2. Electric

3. Water
  4. Sewer
  5. Telecommunications
  6. Any other utilities identified in the SUE Study and local agency utilities will require additional manhours
- iii. Identifying locations and resolutions of potential conflicts with utilities (gas, electric, water, sewer, and telecommunications)
  - iv. Provide input in the determination of the quantity and locations of test pit locations
- b. Verification of temporary construction and permanent easements by review of plats of highway (it is assumed that Transystems will provide draft easement/acquisition plat of highways that Donohue will review and comment on any need for additional temporary easements, permanent easements or ROW)
  - c. Zoning changes is not included in the scope
  - d. Site/Civil for the pump station site:
    - i. Grading and drainage
    - ii. Verification of grade floor elevation
    - iii. Verification of access to the pump station site
    - iv. Fences and gates design
    - v. Interception and extension of proposed influent and discharge storm sewers
    - vi. Pavement design around the pump station site and access
  - e. Structural :
    - i. Evaluate and recommend boring locations and depths. Geotechnical investigation by Wang Engineering, a subcontractor to Transystems; figure detailing boring requirements will be prepared by Donohue to identify boring location and required depths
    - ii. Review of geotechnical report that is prepared by Wang Engineering
    - iii. Design of sub-structures:
      1. Wet Pit complying with HI Standards
      2. Discharge Chamber
    - vi. Pump removal considerations
    - vii. Develop installation details
  - f. Mechanical Process:
    - i. Calculation of pump/system curves
    - ii. Wet well sizing
    - iii. Pump operation strategy
    - iv. Creation of field testing procedure
    - v. Develop installation details
  - g. Electrical:
    - i. Electric source coordination – Naperville Electric.



- ii. Short circuit current rating verification of equipment
  - iii. Control panel design
  - iv. Conduit and wiring schedule
  - v. Power system study specification
  - vi. Develop installation details
- h. Controls
- i. PLC investigation and selection
  - ii. SCADA panel design:
    - 1. Interior panel layout
    - 2. Bill of materials
    - 3. Front of panel layout
    - 4. Pushbutton layout
    - 5. HMI layout
      - a. List of screens to be included
  - iii. Control station design
  - iv. Develop installation details

### Task 3 Miscellaneous Meetings / Coordination

This task item includes the following meetings:

- Kickoff
- Three for status review
- Four with the Owner

### Task 4 Post Contract Coordination

This task item includes Phase III services:

- a. Response to bidding questions
- b. Shop Drawing, Product Data and Contractor's submittal review:
  - 1. Pump station site and inlet piping related
  - 2. Structural
  - 3. Mechanical Process
  - 4. Electrical
  - 5. Controls
- c. RFI responses (assuming 4)
- d. Periodic site visits:
  - 1. Assuming 2 visits as directed and approved in advance by Transystems
- e. Factory acceptance testing (travel expenses will be the responsibility of the Contractor to re-imburse):
  - 1. Pumps

2. Control Panel

- f. Review of O&M Manuals.
- g. Scope does not include construction inspection, oversight or construction management services

Task 5 QA/QC

This task item includes review of the documents. QA/QC of each of the three submittals will be performed.

Task 6 Administration / Management

This task item includes overall project management and administration of the contract.

## MAN-HOUR SUMMARY FORM - DONOHUE

PROJECT: North Aurora PS

<u>ITEM</u>	<u># OF SHEETS</u>	<u>MH PER SHEET</u>	<u>TOTAL MH'S</u>
Summary of Quantities (~70 pay items)	4	8	32
Schedule of Quantities	1	8	8
Progress/Review Meetings - (8 total)			96
Field Checks (2@2 engineers @ 6 hours each)			24
Cost opinions (3 iterations)			36
<b>Special Provisions</b>			68
Civil - 16 hours			
Structural - 4 hours			
Mechanical - 16 hours			
Electrical - 16 hours			
Controls - 16 hours			
<b>QA/QC (3 submittals x 5 disciplines)</b>			158
Civil - 8 hrs/review			
Mechanical - 12 hrs/review			
Structural - 2 hours/review			
Electrical - 12 hrs/review			
Controls - 12 hrs/review			
Comment Responses - 20 hrs			
<b>CIVIL - Design (see breakdown)</b>			26
<b>Plans and Sections</b>	5	12	60
<b>STRUCTURAL - Design and calculations (see breakdown)</b>			24
<b>Details</b>	2	8	16
<b>MECHANICAL - Design and calculations (see breakdown)</b>			24
<b>Plans and Sections</b>	7	10	70

<b>ELECTRICAL - Design and calculations (see breakdown)</b>			<u>44</u>
<b>Plans and Sections</b>	<u>6</u>	<u>10</u>	<u>60</u>
<b>CONTROLS - Design and calculations (see breakdown)</b>			<u>44</u>
<b>Plans and Sections</b>	<u>5</u>	<u>10</u>	<u>50</u>
<b>Sub-Total</b>			<u>840</u>
<b>Administration/Management (4%)</b>			<u>36</u>
<b>Total</b>			<u>876</u>

**North Aurora Road  
Manhour and Fee Estimate Summary - Donohue and Associates**

	Shadrake	Rokita	Gray	Halbach	Goecks	Stohl	Bates	Sveum	Cockerill	Shadrake	Wills	Bell	Berkold	Schueneman	Cockerill	Spurlin	Total
	PM	Mech	Civil	HVAC	Controls	Electr.	Str.	Hyd	Mech QC	Civil QC	HVAC QC	Control QC	Elec QC	Str QC	Hyd QC	Admin	
<b>PHASE II</b>																	
<b>Pump Station Design - Site/Civil</b>																	126
Review of necessary right of way and easements			4														4
SUE (level B) coordination (assume prep, meeting, minutes for each of the groups listed below):																	-
Gas			2														2
Electric			2														2
Water			2														2
Sewer			2														2
Telecommunications			2														2
Grading and drainage			4														4
Fences and gates design			4														4
Storm sewers and junction chambers to connect to Transystems sewers			4														4
G Drawings (5 drawings)			60														60
Special Provisions			16														16
QC (3 submittals)										24							24
<b>Structural</b>																	50
Evaluate and recommend boring locations and depths. Geotechnical investigation by IDOT							4										4
Review of geotechnical report that is prepared by other							4										4
Prefab Wet Pit Design							4										4
Installation Details							12										12
S Drawings (2 drawings)							16										16
Special Provisions							4										4
QC (3 submittals)														6			6
<b>Mechanical Process</b>																	146
Pump Calcs		4															4
Wet well Design		4															4
Finalize pump operation strategy		4															4
Creation of field testing procedure		4															4
Develop installation details		8															8
M Drawings (7 drawings)		70															70
Special Provisions		16															16
QC (3 submittals)									36								36
<b>Electrical</b>																	156
Electric source Coordination						8											8
Control Panel design						20											20
Conduit/wiring schedule						4											4
Power system study specification						4											4
Develop installation details						8											8
E Drawings (6 drawings)						60											60
Special Provisions						16											16
QC (3 submittals)													36				36
<b>Controls</b>																	146
SCADA panel design					16												16
PLC Selection					4												4
Control station design					16												16
Develop installation details					8												8
N Drawings (5 drawings)					50												50
Special Provisions					16												16
QC (5 submittals)												36					36
<b>Overall Project Management</b>																	252
Prepare documentation that addressed internal QA/QC comments	20																20
Progress/Review meetings (time includes 6 hr meeting with travel, 2 hr prep)	48	48															96

**North Aurora Road  
Manhour and Fee Estimate Summary - Donohue and Associates**

	Shadrake	Rokita	Gray	Halbach	Goecks	Stohl	Bates	Sveum	Cockerill	Shadrake	Wills	Bell	Berkold	Schueneman	Cockerill	Spurlin	Total
	PM	Mech	Civil	HVAC	Controls	Electr.	Str.	Hyd	Mech QC	Civil QC	HVAC QC	Control QC	Elec QC	Str QC	Hyd QC	Admin	
Creation of pay items and quantities		20	4		8	8											40
Field Visits (2)		12	12														24
Cost Opinions (3)	4	20	4		4	4											36
General Admin (respond to phone calls, invoicing, progress reports, etc.)	36																36
																	-
<b>Hours Total</b>	108	210	122	-	122	132	44	-	36	24	-	36	36	6	-	-	876
Rate with overhead	215.62	136.54	98.90	84.82	122.19	146.62	123.63	143.75	224.95	215.62	179.69	183.27	194.79	145.18	224.95	76.99	
<b>Fee Total</b>	\$23,287.43	\$28,674.27	\$12,066.12	\$0.00	\$14,907.56	\$19,353.81	\$5,439.64	\$0.00	\$8,098.29	\$5,174.99	\$0.00	\$6,597.89	\$7,012.28	\$871.11	\$0.00	\$0.00	\$131,483.39

<b>PHASE II</b>																	
<b>BIDDING AND CONSTRUCTION PHASE SERVICES</b>																	
Respond to Bidder Questions		4															4
Shop Drawing Review (assume 29)		40	8		30	40	24										142
RFI Responses (assume 4, 3 hrs/ea)		4	2		2	2	2										12
Periodic Site Visits	4	4	6														14
Factory Acceptance Testing		12				12											24
Review O&M Manuals		8			8	8											24
<b>Hours Total</b>	4	72	16	-	40	62	26	-	-	-	-	-	-	-	-	-	220
Rate with overhead	215.62	136.54	98.90	84.82	122.19	146.62	123.63	143.75	224.95	215.62	179.69	183.27	194.79	145.18	224.95	76.99	
<b>Fee Total</b>	\$862.50	\$9,831.18	\$1,582.44	\$0.00	\$4,887.73	\$9,090.43	\$3,214.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$29,468.60



# AVERAGE HOURLY PROJECT RATES

FIRM Donohue & Associates, Inc  
 PTB \_\_\_\_\_  
 PRIME/SUPPLEMENT \_\_\_\_\_

DATE 10/7/2016

SHEET 1 OF 5

PAYROLL CLASSIFICATION	AVG HOURLY RATES	TOTAL PROJECT RATES			Site/Civil Design (Phase II)			Structural Design (Phase II)			Mechanical Design (Phase II)			Electrical Design (Phase II)			I&C Design (Phase II)		
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg
Project Manager	70.00	112	10.22%	7.15															
Mechanical Engineer	47.15	282	25.73%	12.13						110	75.34%	35.53							
Civil Engineer	34.16	138	12.59%	4.30	102	80.95%	27.65												
I&C Engineer	42.20	162	14.78%	6.24												110	75.34%	31.79	
Electrical Engineer	50.63	194	17.70%	8.96									120	76.92%	38.95				
Structural Engineer	42.69	70	6.39%	2.73				44	88.00%	37.57									
		0																	
Mechanical Engineer	70.00	36	3.28%	2.30							36	24.66%	17.26						
Civil Engineer (QC)	70.00	24	2.19%	1.53	24	19.05%	13.33												
I&C Engineer (QC)	63.29	36	3.28%	2.08												36	24.66%	15.61	
Electrical Engineer (C)	67.27	36	3.28%	2.21									36	23.08%	15.52				
Structural Engineer (C)	50.14	6	0.55%	0.27				6	12.00%	6.02									
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<b>TOTALS</b>		1096	100%	\$49.91	126	100%	\$40.98	50	100%	\$43.59	146	100%	\$52.79	156	100%	\$54.47	146	100%	\$47.40



# AVERAGE HOURLY PROJECT RATES

FIRM Donohue & Associates, Inc  
 PTB \_\_\_\_\_  
 PRIME/SUPPLEMENT \_\_\_\_\_

DATE #####

SHEET 2 OF 5

PAYROLL CLASSIFICATION	AVG HOURLY RATES	Overall Project Management			Bidding and CS (Phase III)														
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg			
Project Manager	70.00	108	42.86%	30.00	4	1.82%	1.27												
Mechanical Engineer	47.15	100	39.68%	18.71	72	32.73%	15.43												
Civil Engineer	34.16	20	7.94%	2.71	16	7.27%	2.48												
I&C Engineer	42.20	12	4.76%	2.01	40	18.18%	7.67												
Electrical Engineer	50.63	12	4.76%	2.41	62	28.18%	14.27												
Structural Engineer	42.69				26	11.82%	5.05												
Mechanical Engineer	70.00																		
Civil Engineer (QC)	70.00																		
I&C Engineer (QC)	63.29																		
Electrical Engineer (QC)	67.27																		
Structural Engineer (QC)	50.14																		
<b>TOTALS</b>		252	100%	\$55.84	220	100%	\$46.18	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00

Geotechnical Engineering  
(Wang Engineering)

October 4, 2016

Lawrence L Kirchner, PE, SE  
Vice President  
**TranSystems**  
222 South Riverside Plaza, Suite 610  
Chicago, IL 60606

Proposal for Geotechnical Engineering Services  
Canadian National over North Aurora Road  
Naperville, DuPage County  
**Wang P160325**

Dear Mr. Kirchner:

Wang Engineering, Inc. (Wang) is pleased to submit this proposal for geotechnical engineering services to support final design engineering works for the replacement of the structure carrying Canadian National (CN) railroad over the North Aurora Road in the City of Naperville (herein, the City). We understand the roadway will be widened to allow for two lanes with shoulders in each direction, an 18.0-foot wide median, a sidewalk on the north side, and a bike path on the south side. Overall the new roadway section will measure about 93.0 feet. The new bridge will carry three tracks of rail; its length will measure about 110.3 feet and the width will amount to about 70 feet. Stage construction and temporary sheet piling will be required for the bridge replacement.

The proposed improvements and protection of existing underground pipelines and adjacent buildings will require lowering the roadway profile about 9.0 feet or more and shifting it to the east, as well as a total of 1,000 feet of new retaining walls in the quadrants of the grade separation. We also understand drainage improvements will require a pump station with an access road and a 333-foot long box culvert in the SE quadrant.

#### **SCOPE OF WORK**

A geotechnical investigation was performed for the preliminary design. It consisted of two bridge structure borings and eight roadway borings drilled along North Aurora Road between the project limits (Station 98+00 to Station 118+20). The preliminary geotechnical investigation showed the general lithological profile is made up of up to 3.0 feet of fill resting on top of 3.0- to 8.0-foot thick high moisture content clayey soil grading to an about 60-foot thick very stiff to hard low plasticity clayey diamicton that is underlain by 20 to 30 feet of very dense gravelly sandy loam, which in turn overlies a thin veneer of weathered bedrock. Sound bedrock lies at

about 95 feet below ground surface at the existing bridge location. Water table was measured as high as 6.0 feet below ground surface in several roadway borings. Given the intended engineering works and the general lithological profile, Wang proposes for the final design the following geotechnical investigation program:

Work Item	Geotechnical Investigation	Notes
New Bridge	Drill one 110-foot deep boring, including coring the top 15 feet of sound bedrock and installing an observation well screened within the granular soil underlain by bedrock.	Final design analyses will be based on the existing bridge boring logs and data obtained from the 110-foot deep additional boring.
New Retaining Walls	Drill eight 20-foot deep Standard Penetration Test (SPT) borings.	The 20 feet termination depth is an average. Actual drilling depth of each boring will be based on the anticipated wall height.
Temporary Sheet Piling	Drill four 10-foot deep hand augers through the existing railroad embankment and use data from previous borings.	
New Pump Station and Culvert	Drill three 35-foot deep SPT borings and install a 35-foot deep observation well near the anticipated pump station location.	The observation well will be installed at the beginning of the investigation, and it will be equipped with a datalogger for long-term, automatic, groundwater monitoring.
Roadway	No additional roadway borings	Pavement design analyses and suitability of excavated soils as borrow materials will be based on existing roadway boring data and new retaining wall and culvert borings.
CCDD Evaluation	Screen for contamination samples collected from the top 20 feet of borings drilled in the anticipated excavation areas and run a panel of analytical tests on two composite sample.	Analytical tests required for the environmental classification of the soils that will have to be disposed of to the profile lowering.

The boring termination depths and sampling program may be adjusted according to the actual subsurface conditions encountered during our investigation. To accomplish these objectives, Wang will complete the following tasks:

**Desk Study and Site Visit** --- Wang will study and analyze existing foundation drawings, bridge condition or inspection reports, boring logs, and subsurface geological information to check for factors that might impact the proposed engineering works. Ground surface features, potential construction limitations and impacts on nearby

structures, evidence of distress or deformation in the existing pavements and foundations, and signs of approach settlement will be examined during a site visit.

**Geotechnical Drilling and Coring Services** — Wang will provide equipment, labor, and associated materials to drill, core, test, and sample an estimated 450 feet of soil and rock in 17 boreholes. Traffic control with flaggers, brush clearing, and access on private property may be required for carrying out the drilling operations. The structure borings will be advanced with hollow stem augers, and the soil will be sampled at 2.5-foot intervals to 30 feet bgs and at 5.0-foot intervals thereafter. Soil samples will be collected with split-barrel samplers according to ASTM D1586, "Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils." After drilling completion, the boreholes will be grouted.

**Field Supervision** — Prior to drilling, Wang will layout the borings and clear utilities through JULIE and in coordination with the City. We assume the City will facility access on private property. A field engineer will monitor drilling activities, maintain daily field notes, log the geotechnical borings, as well as receive, classify, and prepare soil samples for laboratory analysis. Soil samples will be classified in accordance with the Unified Soil Classification System (D2488). The field engineer will perform penetrometer and Rimac unconfined compressive strength tests on cohesive soil samples; he will also observe the groundwater level in boreholes. As-drilled boring locations will be surveyed with a combination of mapping-grade GPS and leveling.

**Laboratory Testing** — The soil testing program will include natural moisture content (D2216), Atterberg limits (D4318), particle size analysis (D422), and organic content (AASHTO T 194) tests. For bedrock, we will run uniaxial strength tests (D7012). Analytical laboratory tests will be required for soil CCDD evaluation.

**Engineering Analysis and Recommendations** — We assume four separate geotechnical report submittals will be necessary (bridge, retaining walls, culvert and pump station, and roadway). The geotechnical reports will include a detailed description of the project, field, and laboratory testing procedures and a characterization of the soil and groundwater conditions. Foundation type analyses; axial and lateral capacity; foundation design and construction recommendations; seismic site classification; slope and global stability analyses; as well as criteria and procedures for temporary support, excavation, dewatering, backfilling, and compaction will be provided. The reports will be prepared as per the current AREMA and IDOT guidelines and requirements. We assume draft reports will be submitted for review; final reports will address issues raised by reviewers. The reports will also present site location and geological maps, boring location plans, boring logs, and summaries of laboratory test results.

## SCHEDULING

Wang will start the project expediently upon prior authorization to proceed. We anticipate that after utility clearance and access agreements eight working days will be necessary to complete the drilling phase of the project. The laboratory testing program will proceed concurrently with the drilling activities and will be concluded within two weeks after drilling completion. Draft reports will be submitted within two weeks after the Designer provides preliminary design drawings.

## ESTIMATED COST

Wang proposes to provide the above tasks on time and expense basis according to the attached estimate. The estimate was prepared assuming the following conditions:

- Drilling unit costs are considered prevailing rate under the Prevailing Wage Act (820 ILCS 130/0.01);
- Traffic control with roadway flaggers will be required for five working days;
- The presence of railroad flaggers will be required for drilling the hand auger borings through the railroad embankment;
- The City of Naperville will require no permits for work within the ROW or for traffic control;
- Wang will obtain the occupancy permits from NS and enroll on their railroad protective insurance program; and
- No hazardous materials are encountered.

Wang Engineering, Inc. appreciates the opportunity to present this geotechnical project approach, and we look forward to working with TranSystems on this project. Please call us if you have any questions, or if you require additional information regarding this proposal.

Sincerely,

**WANG ENGINEERING, INC.**



Liviu M. Iordache, PG  
Principal



Corina T. Farez, PE, PG  
Vice President



### AVERAGE HOURLY PROJECT RATES

FIRM Wang Engineering, Inc.  
 PSB NA  
 PRIME/SUPPLEMENT Prime

DATE 10/06/16

SHEET 1 OF 5

PAYROLL CLASSIFICATION	AVG HOURLY RATES	TOTAL PROJECT RATES			Desk Study, Site Access &			Field Activities			Laboratory Testing			Data Analyses & Engineer			Report Preparation		
		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 in Charge	70.00	0																	
Project Manager	61.69	12	2.11%	1.30															
Senior Engineer	61.69	120	21.05%	12.99	10	20.00%	12.34						40	20.00%	12.34	70	33.33%	20.56	
Project Engineer/Pro	35.82	280	49.12%	17.60	20	40.00%	14.33	20	22.22%	7.96			140	70.00%	25.07	100	47.62%	17.06	
Assistant Engineer/A	24.68	130	22.81%	5.63	20	40.00%	9.87	70	77.78%	19.20			20	10.00%	2.47	20	9.52%	2.35	
Laboratory Technicia	23.92	0																	
Administrative Assist	33.13	8	1.40%	0.47															
QC/QA Reviewer	58.96	20	3.51%	2.07												20	9.52%	5.61	
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<b>TOTALS</b>		570	100%	\$40.04	50	100.00%	\$36.54	90	100%	\$27.16	0	0%	\$0.00	200	100%	\$39.88	210	100%	\$45.58



## AVERAGE HOURLY PROJECT RATES

FIRM Wang Engineering, Inc.  
 PSB NA  
 PRIME/SUPPLEMENT Prime

DATE 10/06/16

SHEET 2 OF 5

PAYROLL CLASSIFICATION	AVG HOURLY RATES	Project Management																	
		Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg	Hours	% Part.	Wgtd Avg			
Principal in Charge	70.00																		
Project Manager	61.69	12	60.00%	37.01															
Senior Engineer	61.69																		
Project Engineer/Pro	35.82																		
Assistant Engineer/A	24.68																		
Laboratory Technicia	23.92																		
Administrative Assis	33.13	8	40.00%	13.25															
QC/QA Reviewer	58.96																		
<b>TOTALS</b>		20	100%	\$50.26	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00

Name: CN over North Aurora Road  
RFP/PTB/PSB/Item: NA  
Contract/Job: NA

Date: 10/04/2016  
Wang No.: P160325

Task Description	Units	Unit Price	Extended Cost
<b>DRILLING, SAMPLING &amp; INSITU TESTING</b>			
Drilling Coordination	0.0 Hours	\$97.00 /Hour	\$0.00
Utilities Clearance, Site Access, Permitting	0.0 Hours	\$97.00 /Hour	\$0.00
Mobilization (Truck-mounted Drill Rig)	0	\$814.00 /Each	\$0.00
Drilling Crew Daily Travel & Support Vehicle	0 Days	\$170.00 /Day	\$0.00
Stand-by Hourly Rate - Truck-mounted Drill Rig (Two-Man Crew & Equipment)	0.0 Hours	\$360.00 /Hour	\$0.00
Mobilization (ATV-mounted Drill Rig)	0	\$1,390.00 /Each	\$0.00
ATV-mounted Drill Rig Daily Charge	0 Days	\$314.00 /Day	\$0.00
Drilling Crew Daily Travel & Support Vehicle	0 Days	\$170.00 /Day	\$0.00
Stand-by Hourly Rate - ATV-Mounted Drill Rig (Two-Man Crew & Equipment)	0.0 Hours	\$360.00 /Hour	\$0.00
Portable Water Tank	0 Days	\$160.00 /Day	\$0.00
Lighting for Night Field Activities	0 Nights	\$119.00 /Night	\$0.00
<b><u>Drilling and Sampling</u></b>			
<b><u>Structure Borings</u></b>			
<i>Drilling including split spoon sampling at 2.5-foot intervals to 30 feet and at 5-foot intervals thereafter (SPT, Penetrometer, Rimac, Visual Classification Included)</i>			
<b>Between 0 and 75 Feet</b>			
Normal Working Hours	0.0 Feet	\$33.00 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$37.00 /Foot	\$0.00
Night Work	0.0 Feet	\$35.00 /Foot	\$0.00
<b>Between 75 and 100 Feet</b>			
Normal Working Hours	0.0 Feet	\$35.00 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$41.00 /Foot	\$0.00
Night Work	0.0 Feet	\$36.00 /Foot	\$0.00
<b>Between 100 and 125 Feet</b>			
Normal Working Hours	0.0 Feet	\$41.00 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$52.00 /Foot	\$0.00
Night Work	0.0 Feet	\$47.00 /Foot	\$0.00
<b>Between 125 and 150 Feet</b>			
Normal Working Hours	0.0 Feet	\$47.00 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$62.00 /Foot	\$0.00
Night Work	0.0 Feet	\$58.00 /Foot	\$0.00
<b>Additional Split-Spoon Sample</b>	0.0 Samples	\$46.00 /Sample	\$0.00
<b><u>Roadway Borings</u></b>			
<i>Drilling including continuous split spoon sampling to 10 feet (SPT, Penetrometer, Visual Classification Included)</i>			
<b>Continuous Sampling</b>			
Normal Hours	0.0 Feet	\$34.00 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$38.00 /Foot	\$0.00
Night Hours	0.0 Feet	\$36.00 /Foot	\$0.00
<b><u>Shelby Tube Borings</u></b>			
<i>Blind drilling and Shelby tube sampling at selected depths</i>			
<b>Drill without sampling</b>			
Normal Working Hours	0.0 Feet	\$23.00 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$28.00 /Foot	\$0.00
Night Work	0.0 Feet	\$26.00 /Foot	\$0.00
<b>Shelby Tube Samples</b>			
Normal Working Hours	0 Samples	\$63.00 /Sample	\$0.00
Restricted Hours (6 Hours)	0 Samples	\$73.00 /Sample	\$0.00
Night Work	0 Samples	\$69.00 /Sample	\$0.00
<b><u>Rock Coring</u></b>			
<b>Rock Coring Setup</b>	0 Setups	\$378.00 /Setup	\$0.00
<b>Set Casing Below 40 Feet</b>			
Normal Working Hours	0.0 Feet	\$14.50 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$16.50 /Foot	\$0.00
Night Work	0.0 Feet	\$15.50 /Foot	\$0.00
<b>Rock Coring</b>			
Normal Working Hours	0.0 Feet	\$63.00 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$77.00 /Foot	\$0.00
Night Work	0.0 Feet	\$69.00 /Foot	\$0.00

Name: CN over North Aurora Road  
RFP/PTB/PSB/Item: NA  
Contract/Job: NA

Date: 10/04/2016  
Wang No.: P160325

<b>Task Description</b>	<b>Units</b>	<b>Unit Price</b>	<b>Extended Cost</b>
<b><u>Drilling &amp; Sampling - Hourly - two-man crew</u></b>			
Two-Man Crew - normal working hrs	56.0 Hours	\$363.00 /Hour	\$20,328.00
Two-Man Crew - overtime (2 hrs per day)	14.0 Hours	\$452.00 /Hour	\$6,328.00
<b><u>Drilling &amp; Sampling - Hourly - three-man crew</u></b>			
Two-Man Crew and Field Supervisor- normal working hrs	0.0 Hours	\$435.00 /Hour	\$0.00
Two-Man Crew and Field Supervisor - overtime (2 hrs per day)	0.0 Hours	\$525.00 /Hour	\$0.00
<b><u>Pavement/ Deck Coring &amp; Testing</u></b>			
<i>For 2-inch, 4-inch, and 6-inch diameter cores</i>			
<b>Pavement/Deck Coring (Two-Man Crew and Equipment)</b>			
Normal Working Hours	0.0 Hours	\$292.00 /Hour	\$0.00
Restricted Hours (6 Hours)	0.0 Hours	\$336.00 /Hour	\$0.00
Night Work	0.0 Hours	\$315.00 /Hour	\$0.00
<b>Asbestos Content Testing</b>			
On Deck Cores	0 Tests	\$175.00 /Test	\$0.00
<b><u>Hand Augering (Two-Man Crew and Equipment)</u></b>			
<i>Hand augering and soil sampling to 10 feet</i>			
<b>Hand Augering</b>			
Normal Working Hours	0.0 Hours	\$292.00 /Hour	\$0.00
Restricted Hours (6 Hours)	0.0 Hours	\$335.00 /Hour	\$0.00
Night Work	0.0 Hours	\$315.00 /Hour	\$0.00
<b><u>Piezometer/Monitoring Well Installation</u></b>			
<b>2.0-inch Wells</b>			
2" x 5' PVC Screen, .010 slot, sch 40	0 Pipes	\$31.00 /Pipe	\$0.00
2" x 10' PVC Screen, .010 slot, sch 40	2 Pipes	\$37.00 /Pipe	\$74.00
2" x 5' PVC Riser, sch 40	0 Pipes	\$20.00 /Pipe	\$0.00
2" x 10' PVC Riser, sch 40	110 Pipes	\$28.00 /Pipe	\$3,080.00
2" PVC Female Points	2 Points	\$2.00 /Point	\$4.00
2" PVC Slip Caps	2 Caps	\$8.00 /Cap	\$16.00
4" Manhole Cast Iron w/Twist Lock Lid	2 Lids	\$50.00 /Lid	\$100.00
2" x 5' Green Steel Standups	0 Standups	\$52.00 /Standup	\$0.00
<b>4.0-inch Wells</b>			
4" x 5' PVC Screen, .010 slot, sch 40	0 Pipes	\$49.00 /Pipe	\$0.00
4" x 10' PVC Screen, .010 slot, sch 40	0 Pipes	\$70.00 /Pipe	\$0.00
4" x 5' PVC Riser, sch 40	0 Pipes	\$37.00 /Pipe	\$0.00
4" x 10' PVC Riser, sch 40	0 Pipes	\$53.00 /Pipe	\$0.00
4" PVC Female Points	0 Points	\$15.50 /Point	\$0.00
4" PVC Slip Caps	0 Caps	\$15.50 /Cap	\$0.00
<b>6.0-inch Wells</b>			
6" x 5' PVC Screen, .010 slot, sch 40	0 Pipes	\$117.00 /Pipe	\$0.00
6" x 10' PVC Screen, .010 slot, sch 40	0 Pipes	\$172.00 /Pipe	\$0.00
6" x 5' PVC Riser, sch 40	0 Pipes	\$90.00 /Pipe	\$0.00
6" x 10' PVC Riser, sch 40	0 Pipes	\$142.00 /Pipe	\$0.00
6" PVC Female Points	0 Points	\$48.00 /Point	\$0.00
6" PVC Slip Caps	0 Caps	\$16.50 /Cap	\$0.00
<b>Other Items</b>			
#1B008 Masterlock, 130D	2 Locks	\$7.00 /Lock	\$14.00
55 gallon DOT Containment Drums	0 Drums	\$38.00 /Drum	\$0.00
Concrete--Quikcrete 5000	2 Bags	\$16.00 /Bag	\$32.00
3/8" Coated Bentonite Pellets, 5 Gal Bucket	2 Buckets	\$16.50 /Bucket	\$33.00
10/20 Silica Sand, 50 lb plastic bag	10 Bags	\$9.00 /Bag	\$90.00
Digital Datalogger and Barometer	0 Each	\$1,300.00 /Each	\$0.00
<b><u>Labor - Hourly</u></b>			
Two Man Drilling Crew - normal working hours	0.0 Hours	\$363.00 /Hour	\$0.00
Two Man Drilling Crew - overtime (2 hours per day)	0.0 Hours	\$452.00 /Hour	\$0.00

Name: CN over North Aurora Road  
RFP/PTB/PSB/Item: NA  
Contract/Job: NA

Date: 10/04/2016  
Wang No.: P160325

Task Description	Units	Unit Price	Extended Cost
<b><u>Barge Drilling on a Navigable Waterway</u></b>			
<i>Price may vary depending on size and extent of waterway</i>			
Barge and Crane Mobilization	At Cost		\$0.00
Barge and Crane Daily Charge	At Cost		\$0.00
Barge and Crane Demobilization	At Cost		\$0.00
<b><u>Specialized Insitu Testing</u></b>			
<b>Pressuremeter Testing</b>			
Mobilization	0	\$550.00 /Each	\$0.00
Testing	0 Days	\$2,200.00 /Day	\$0.00
Vane Shear	0 Tests	\$115.00 /Test	\$0.00
Dilatometer Testing	0 Tests	\$815.00 /Test	\$0.00
<b>Piezometric Cone Penetrometer</b>			
Mobilization (Truck Mounted CPT)	0	\$5,200.00 /Each	\$0.00
CPTU	0.0 Feet	\$25.00 /Foot	\$0.00
Seismic Wave Measurement	0 Tests	\$190.00 /Test	\$0.00
Pore Pressure Dissipation Test	0 Tests	\$600.00 /Test	\$0.00
Photoionization Detector (PID)	0 Days	\$438.00 /Day	\$0.00
<b>Water Infiltration/Percolation Test</b>			
Double Ring Infiltrometer Test (ASTM D3385)	0 Tests	\$1,125.00 /Test	\$0.00
Single Ring Infiltrometer Test (Chicago Stormwater Ordinance)	0 Tests	\$620.00 /Test	\$0.00
Note: Drilling crew will be billed as standby for the duration of pressuremeter, vane shear, and dilatometer testing			
<b><u>Borehole Abandonment and Surface Restoration</u></b>			
<b>Backfilling Borehole</b>			
Normal Working Hours	0.0 Feet	\$9.30 /Foot	\$0.00
Restricted Hours (6 Hours)	0.0 Feet	\$10.30 /Foot	\$0.00
Night Work	0.0 Feet	\$9.30 /Foot	\$0.00
<b>Pavement/Deck Patching</b>			
Asphalt	0 Patches	\$17.50 /Each	\$0.00
Concrete	0 Patches	\$17.50 /Each	\$0.00
Patching of Full Deck Coring	0 Patches	\$330.00 /Each	\$0.00
Soil Cutting Removal	0.0 Hours	\$330.00 /Hour	\$0.00
<b><u>Boring Location Accessibility</u></b>			
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
<b><u>Railroad Fees</u></b>			
Permitting	At Cost		\$750.00
Railroad Protective Insurance	At Cost		\$500.00
Railroad Flagman	At Cost		\$1,200.00
<b><u>State/County/Municipal Fees</u></b>			
Pavement Opening Permit	At Cost		\$0.00
Insurance and Bonding	At Cost		\$0.00
<b><u>Surveying of Boring Locations</u></b>			
Two-man crew	10.0 Hours	\$228.00 /Hour	\$2,280.00
			<b>\$ 34,829.00</b>

Name: CN over North Aurora Road  
RFP/PTB/PSB/Item: NA  
Contract/Job: NA

Date: 10/04/2016  
Wang No.: P160325

Task Description		Units	Unit Price	Extended Cost	
<b>LABORATORY TESTING</b>					
<b><u>Soil Index Tests</u></b>					
T265	D2216	Water Content	161 Tests	\$9.80 /Test	\$1,577.80
--	D7263	Unit Weight (Density)	0 Tests	\$36.00 /Test	\$0.00
T100	D854	Specific Gravity	0 Tests	\$66.00 /Test	\$0.00
--	--	Void Ratio, Porosity, and Saturation	0 Tests	\$107.00 /Test	\$0.00
--	D4972	pH of Soil	0 Tests	\$59.00 /Test	\$0.00
T267	D2974	Organic Content by LOI	0 Tests	\$60.00 /Test	\$0.00
T194	--	Organic Content by Wet Combustion	3 Tests	\$133.00 /Test	\$399.00
<b><u>Particle Size Distribution</u></b>					
T88	D422	Sieve Analysis	0 Tests	\$77.00 /Test	\$0.00
T88	D422	Hydrometer Analysis	0 Tests	\$81.00 /Test	\$0.00
T88	D422	Combined Sieve and Hydrometer	6 Tests	\$122.00 /Test	\$732.00
--	D1140	Percent Finer than No. 200 Sieve	0 Tests	\$50.00 /Test	\$0.00
<b><u>Atterberg Limits</u></b>					
T89, T90	D4318	Liquid and Plastic Limits	6 Tests	\$77.00 /Test	\$462.00
T92	D427	Shrinkage Factors	0 Tests	\$90.00 /Test	\$0.00
<b><u>Classification of Soils</u></b>					
--	D2488	Visual Manual	0 Samples	\$19.00 /Sample	\$0.00
--	D2487	Unified Soil Classification System	0 Samples	\$195.00 /Sample	\$0.00
M145	--	AASHTO Classification	0 Samples	\$195.00 /Sample	\$0.00
--	--	USDA Classification	0 Samples	\$122.00 /Sample	\$0.00
<b><u>Soil Settlement, Swelling, and Collapse Potential</u></b>					
T216	D2435	One-Dimensional Consolidation	0 Tests	\$556.00 /Test	\$0.00
--	D4546	One-Dimensional Swell	0 Tests	\$540.00 /Test	\$0.00
--	D5333	Collapse Potential	0 Tests	\$300.00 /Test	\$0.00
<b><u>Shear Strength of Soil</u></b>					
		Hand Penetrometer	0 Tests	\$4.50 /Test	\$0.00
		Rimac Unconfined Compressive Strength	0 Tests	\$14.50 /Test	\$0.00
T208	D2166	Unconfined Compressive Strength	0 Tests	\$81.00 /Test	\$0.00
T236	D3080	Direct Shear of Soils (3 points)	0 Tests	\$715.00 /Test	\$0.00
T296	D2850	UU Triaxial Compression (3 points)	0 Tests	\$335.00 /Test	\$0.00
T297	D4767	CU Triaxial Compression (3 points)	0 Tests	\$1,100.00 /Test	\$0.00
T297	D4767	CD Triaxial Compression (3 points)	0 Tests	\$1,100.00 /Test	\$0.00
	D7012	Peak Uniaxial Compressive Strength of Rock Core	2 Tests	\$163.00 /Test	\$326.00
<b><u>Laboratory Compaction Tests</u></b>					
T99	D698	Moisture-Density of Soils (Standard Effort)	0 Tests	\$200.00 /Test	\$0.00
T180	D1557	Moisture-Density of Soils (Modified Effort)	0 Tests	\$210.00 /Test	\$0.00
T193	--	Illinois Bearing Ratio (1 point)	0 Tests	\$500.00 /Test	\$0.00
T193	D1883	California Bearing Ratio (3 points)	0 Tests	\$920.00 /Test	\$0.00
<b><u>Coefficient of Permeability</u></b>					
T215	D2434	Hydraulic Conductivity (Constant Head)	0 Tests	\$450.00 /Test	\$0.00
--	D5084	Hydraulic Conductivity (Flexible Wall)	0 Tests	\$475.00 /Test	\$0.00
<b><u>Additional Sample Preparation Procedures</u></b>					
		Removal of Organic Matter	0 Samples	\$87.00 /Sample	\$0.00
		Extrusion & Preservation of Undisturbed Samples	0 Samples	\$28.00 /Sample	\$0.00
		Logging & Classification of Undisturbed Samples	0 Samples	\$65.00 /Sample	\$0.00
		Remolding and Trimming of Samples	0 Samples	\$62.00 /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	\$115.00 /Test	\$0.00
		Residual Chemicals, Herbicides Full Screen	0 Tests	\$645.00 /Test	\$0.00
<i>Mechanical Analyses &amp; Mitigation Recommendations (1,000 g sample required)</i>					
T88	D422	Combined Sieve and Hydrometer	0 Tests	\$122.00 /Test	\$0.00
<b><u>Analytical Laboratory Services - for CCDD</u></b>					
		Volatile Organic Components (VOC)	2 No	\$200.00 /Each	\$400.00
		SemiVOC including PNA's	2 No	\$335.00 /Each	\$670.00
		PCB	2 No	\$135.00 /Each	\$270.00
		Total Metals	2 No	\$210.00 /Each	\$420.00
		PH Determination	2 No	\$23.00 /Each	\$46.00
<b><u>Corrosion Testing</u></b>					
		(Resistivity, Chlorides, pH, Redox, and Sulfates)	0 No	\$290.00 /Each	\$0.00
				<b>\$ 5,302.80</b>	

Name: CN over North Aurora Road  
RFP/PTB/PSB/Item: NA  
Contract/Job: NA

Date: 10/04/2016  
Wang No.: P160325

Task Description	Units	Unit Price	Extended Cost
<b>TRAFFIC CONTROL</b>			
<u>Expressway (1/2 mile)</u>			
Shoulder Closure	0.0 No.	\$1,200.00 /Each	\$0.00
One-lane Closure	0.0 No.	\$3,200.00 /Each	\$0.00
Two-lane Closure	0.0 No.	\$3,400.00 /Each	\$0.00
Three-lane Closure	0.0 No.	\$3,650.00 /Each	\$0.00
Ramp Closure	0.0 No.	\$1,250.00 /Each	\$0.00
Additional 1/2 mile	0.0 No.	\$100.00 /Each	\$0.00
<u>Arterial (1/2 mile)</u>			
Shoulder Closure	0.0 No.	\$1,000.00 /Each	\$0.00
One-lane Closure	0.0 No.	\$1,100.00 /Each	\$0.00
Two-lane Closure	0.0 No.	\$1,200.00 /Each	\$0.00
Detour	0.0 No.	\$1,100.00 /Each	\$0.00
U-2	0.0 No.	\$1,200.00 /Each	\$0.00
Additional 1/2 mile	0.0 No.	\$100.00 /Each	\$0.00
<u>Impact Attenuator with Driver</u>			
Port-to-Port	0.0 Hours	\$235.00 /Hour	\$0.00
<u>Roadway Flagmen (two-man crew)</u>			
Port-to-Port	50.0 Hours	\$250.00 /Hour	\$12,500.00
			<b>\$ 12,500.00</b>
<b>FIELD VEHICLES &amp; MILEAGE</b>			
<u>Field Vehicle</u>			
Field Vehicle Mileage (>100 Miles per Day)	0.0 Miles	\$0.565 /Mile	\$0.00
Field Vehicle Daily (<100 Miles per Day)	10 Days	\$65.00 /Day	\$650.00
Tolls	0 Tolls	\$1.00 /Toll	\$0.00
			<b>\$ 650.00</b>
<b>OUT-OF-TOWN EXPENSES</b>			
<u>Lodging</u>	0 Days	\$100.00 /Day	\$0.00
<u>Per Diem</u>	0 Days	\$50.00 /Day	\$0.00
			<b>\$ -</b>
<b>REPORT REPRODUCTION</b>			
<u>Report Reproduction</u>			
Copies, Black & White, 8.5" X 11"	0 No	\$0.20 /Each	\$0.00
Copies, Color, 8.5" X 11"	0 No	\$2.50 /Each	\$0.00
Copies, Reproduction or Reduction, 24" X 36"	0 No	\$10.00 /Each	\$0.00
			<b>\$ -</b>
<b>SUMMARY</b>			
<i>DRILLING, SAMPLING &amp; INSITU TESTING</i>			\$34,829.00
<i>LABORATORY TESTING</i>			\$5,302.80
<i>TRAFFIC CONTROL</i>			\$12,500.00
<i>FIELD VEHICLES &amp; MILEAGE</i>			\$650.00
<i>OUT-OF-TOWN EXPENSES</i>			\$0.00
<i>REPORT REPRODUCTION</i>			\$0.00
			<b>\$ 53,281.80</b>

Environmental Services  
(Huff & Huff/GZA)



A Subsidiary of GZA



October 7, 2016

Mr. Matt Smith  
TranSystems Corporation  
1475 Woodfield Road, Suite 600  
Schaumburg, Illinois 60173-5058

**Re: Environmental Services  
North Aurora Road at the  
EJ&E/BNSF Railroad  
Unincorporated, Will County, Illinois  
Proposal No. 81.PT00061.17**

Dear Mr. Smith:

Huff & Huff, Inc., a subsidiary of GZA GeoEnvironmental, Inc. (H&H) is pleased to submit this proposal to provide an update to the environmental work previously completed on the North Aurora Road underpass at the Elgin, Joliet and Eastern (EJ&E) and Burlington Northern Santa Fe (BNSF) railway crossing project, including an update to wetland and "Waters of the U.S." (WOUS) delineations, Preliminary Environmental Site Assessment (PESA) update, and Preliminary Site Investigation (PSI) update, as well as to assist with determining potential best management practices that could be utilized for the project.

The proposed project includes the construction of a new railroad bridge for the crossing of the EJ&E/BNSF railroad over North Aurora Road that will accommodate a five-lane roadway with a sidewalk and bike path under the bridge and provisions for a three track railroad cross section. This project proposes to widen North Aurora Road to two through lanes in each direction separated by a barrier median. The project extends along North Aurora Road between Pennsbury Lane and Frontenac Road and along the railroads extending approximately 3,000 feet north and 1,700 feet south from North Aurora Road. The project is located within the City of Naperville, the City of Aurora, and Naperville Township, Illinois (DuPage County; T38N, R9E, sections 8 and 17).

In 2006, 2007, and 2010, H&H completed wetland delineations, in 2007 H&H completed a PESA, and in 2009 H&H completed a PSI for the project. This proposal presents our project understanding and the scope of services.

**1. SCOPE OF SERVICES**

**Task 1 – Preliminary Environmental Site Assessment (PESA)**

A PESA was completed in 2007 with a PSI completed in 2009 for the EJ&E underpass. Also, a PESA was completed in 2008 for the section of north Aurora Road from Weston Ridge to Frontenac Road. Subsequently, in 2010, a PSI was completed for this segment.

GEOTECHNICAL  
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CONSTRUCTION  
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Given the age of the PESA and PSI documents, a new PESA will be prepared to assess the corridor. Historical land use information will be utilized; however, a new database search, site visit, and current land uses will be assessed.

The process will follow general protocols contained within:

- A Manual for Conducting Preliminary Environmental Site Assessments for Illinois Department of Transportation (IDOT) Highway Projects (Erdmann et al., 2012).
- ASTM International (ASTM) standard 1527-13.
- The IDOTs Bureau of Design and Environment (BDE) Procedure Memorandum Number 10-07, *Special Waste Procedures*. This memo was incorporated into Chapter 27-3 of the IDOT BDE Manual in June 2012.
- IDOT Bureau of Local Roads and Streets (BLRS) Manual, Chapter 20-12, Special Waste, July 2013.
- Public Act 96-1416
- Clean Construction or Demolition Debris Fill Operations (CCDD) and Uncontaminated Soil Fill Operations: Amendments to 35 Illinois Administrative Code 1100. Effective on August 27, 2012.

#### **A. Historical Research**

The site's historical land use/ownership record will be developed from standard historical sources. Historic aerial photographs will be reviewed to identify land use over time and potential areas of environmental concern, such as areas of surface disturbance and outside storage.

#### **B. Site Evaluation**

Current environmental features and conditions of sites adjacent to the right-of-way/project area will be evaluated. A site walkover of potential right-of-way/project areas designated for excavation and/or acquisition will be conducted for first-hand evaluation of current environmental conditions within the project limits. All of the features and conditions listed above will be investigated and, as appropriate, documented in photographs. The land-use and housekeeping practices of adjacent properties also will be evaluated in accordance with ASTM protocols.

#### **C. Records Review**

A records review will be conducted to determine potential environmental concerns within the study area. It will include a search of standard state and federal environmental record databases in accordance with the specifications of ASTM standards. This search is based on the outline of the study area.

Specifically, H&H will search each database to identify any potential sources requiring further investigation. As appropriate, Freedom of Information Act (FOIA) requests will be filed with the IEPA to obtain additional data pertaining to identified sites.

#### **D. Report Preparation**

One report summarizing the results of the evaluation will be prepared. The following information will be included in this report:

- a) The project location and description.
- b) Historical uses of corridor.



- c) The area geology and hydrology.
- d) The environmental status of sites adjacent to the corridor regarding chemical use and storage, underground and aboveground storage tanks, solid waste, special waste, and hazardous waste, and PCBs.
- e) An analysis of the site inspection.
- f) A summary of the findings regarding any environmental concerns. This will include IDOT's per Memo 66-10 and identification of Potentially Impacted Properties (PIPs) per Subpart F, Section 1100, 35 IAC, related to Clean Construction Demolition Debris management.

## **Task 2 – Preliminary Site Investigation (PSI)**

A 2009 PSI identified one area exceeding the arsenic CCDD concentration of 13 mg/kg at a depth of 0 to 5 feet. The locations of sampling and constituents to be sampled may vary depending upon the results of the PESA.

### **A. Identify and Mark Bore Holes**

H&H will coordinate soil sampling locations with the driller and the property owners.

- Determine sampling locations.
- Attend a site visit to mark borehole locations.
- Attend one meeting for coordination, with TranSystems Corporation and the Cities of Naperville and Aurora and Naperville Township.

### **B. Conduct Sampling Through On-site Drilling**

Prepare scope of work for drillers identifying the samples to be collected, screening protocols, and chain of custody procedures. Conduct soil borings at variable depths for collecting soil samples. For the purposes of this scope of services, it will be estimated that four borings to a depth of 20 feet will be conducted using a GeoProbe drilling unit.

Driller will collect continuous soil samples in appropriate sample jars and provide to H&H. After review of the materials collected and PID readings, H&H will select the sample intervals to be analyzed. The following constituents would be analyzed from the borings.

**Volatile organic compounds (VOCs)** – The cost estimate is based on analyzing four samples. Samples will be collected and screened with a photoionization detector (PID) in a separate sample. Samples with the highest PID reading from each boring will be analyzed for VOCs.

**RCRA Metals** – Arsenic, chromium, and lead would be analyzed in eight samples.

**PNAs**–PNA samples will be analyzed in four samples.

**Pesticides/Herbicides** – Two samples will be analyzed for pesticides/herbicides in the top four feet of two borings.

For purposes of this scope, the following constituents will be analyzed with an estimated number of samples.

- 8 – Volatile organic compounds (VOCs)
- 8 – RCRA metals and soil pH



12 – Polynuclear aromatic compounds (PNAs)  
2 – Pesticide/ Herbicide

Access to the properties within the proposed right-of-way will be coordinated with TranSystems Corporation. TranSystems Corporation will assist in the coordination of the utility locate. The driller will contact JULIE for a utility locate.

### **Task 3 – Wetland and “Waters of the U.S.” Delineation and Report Update**

H&H will update the existing wetland delineation using current methods and guidance from the U.S. Army Corps of Engineers (USACE). The assessment will include a document review (soils, topographic, wetlands, hydric soils, floodplain, and aerial photography mapping), an on-site field investigation, and a report summarizing findings, including mapping.

Access to the properties within the proposed right-of-way will be coordinated with TranSystems Corporation.

#### **A. Off-site Record/Document Review**

The following records/documents will be reviewed prior to conducting the field investigation. Soils information will be reviewed to determine the soil types encountered during the delineation procedures. The maps reviewed and to be used include:

- U.S. Geological Survey Topographic Maps
- National Wetlands Inventory (NWI) Maps
- DuPage County Soil Survey
- DuPage County Wetland Maps
- DuPage County Flood Insurance Rate Maps
- DuPage County Regulatory Flood Maps
- Aerial Photographs

Based on previous delineations conducted for this project, a total of eleven (11) wetlands are located within or immediately adjacent to the project limits.

#### **B. On-Site Investigation (Field Inventory)**

The on-site investigation will be conducted by our environmental staff experienced in Federal methods for conducting wetland delineations. H&H will classify and define hydric soils, hydrophytic vegetation, and evidence of hydrology to determine if wetlands are present. The wetland perimeters will be surveyed in the field by H&H. Eleven wetlands were previously identified within the project limits.

The wetland delineation will be conducted to meet the requirements of Executive Order 11990, "Protection of Wetlands;" Section 404 of the Federal Water Pollution Control Act as amended by the Clean Water Act (USACE, Section 404 Permit) and IEPA (Section 401 Guidelines) regulations. These regulations pertain to the placement of fill or alterations of drainage within wetlands of any type and apply to privately as well as publicly owned wetlands. The investigation will meet the requirements of these regulations by identifying the type, functions, and approximate boundaries of all wetlands.



Wetlands found will be classified according to type using the "Classification of Wetlands and Deep Water Habitats of the U.S." by Cowardin. Wetland boundaries will be defined using the *Midwest Region Manual* (USACE, 2010). Each potential wetland area will be evaluated for the presence of wetland indicators comprised of hydrophytic vegetation, hydric soils, and wetland hydrology. Functions of wetlands will be evaluated from field observations as well.

Based on previous delineations conducted for this project, a minimum of 11 wetlands are located within the project limits. All nine wetlands previously identified within the project limits will be revisited as part of the wetland delineation. In addition to the previously delineated wetlands, the entire area of the proposed project will be investigated in the event that additional wetlands are present. All areas exhibiting wetland characteristics within the project limits will be investigated.

H&H will survey the perimeters of all delineated wetlands and provide a shapefile of all wetlands and WOUS boundaries. This scope includes conducting a boundary verification with the appropriate agencies in order to meet the requirements of the DuPage County Stormwater Ordinance. This would include the potential for completing a second field verification with the USACE in addition to the DuPage County representatives.

There are no farmed areas within the project limits. Therefore, a farmed wetland determination (FWD) will not be required. Time for completing an FWD is not included in this scope.

### **C. Report**

A wetland delineation report will be prepared summarizing the findings of the fieldwork. Based on reviewed information, wetlands are present and this report will be needed. Specific items to be included are as follows:

- Map showing the wetland boundaries and project boundaries
- Aerial photograph with the appropriate limits of delineated wetlands
- USACE data sheets with color photos
- Written description of wetland functional classification
- Floristic Quality Assessment
- Permitting summary
- Jurisdictional Summary Table
- Identification of 303d impaired waterways
- Mitigation requirements and options

All wetland boundaries will be located using GPS. The wetland boundary map will be derived from the GPS survey of these features. Permitting with DuPage County is not included in this scope of services.

Time is included in this task to complete the IDOT Wetland Impact Evaluation (WIE) forms. The forms will be completed on the IDOT server and submitted electronically. Upon completion of the electronic submittal, H&H will upload hard copies of the wetland report and the WIE forms to the IDOT FTP site.

### **Task 4 – Best Management Practices**

The proposed improvement intersects the EJ&E/BNSF Railway, where adjacent wetlands may exist. The inclusion of storm water Best Management Practices (BMPs) and green infrastructure (where applicable) will be explored for the project.



The integration of sustainable practices, green infrastructure, and storm water BMPs into the project will potentially reduce impacts to the environment. H&H will provide plan review and coordination for storm water BMPs and green infrastructure that could be included in the proposed project. Potential BMPs could include (but are not limited to) bioswales, filter strips, or energy dissipaters. The underpass will need to be well drained to maintain roadway safety. BMPs will be identified and implemented following a checklist and outlined procedures. H&H will direct BMP coordination with TranSystems and other project officials to successfully integrate stormwater BMPs and other sustainable practices into the project.

This task includes time for two meetings with County officials as needed.

### **Task 5 – Wetland/Stormwater Permitting**

The DuPage County Stormwater Management Department has jurisdiction over all wetlands, wetland buffers, waterways, waterway buffers, and floodplains within DuPage County. H&H will assist TranSystems in preparing the necessary tabs for the DuPage County permit for the proposed project. A tab submittal will be completed consistent with DuPage County requirements. H&H will provide Tab 4 (Wetland and Wetland Buffer Submittal), Tab 5 (Riparian Submittal), and Tab 7 (Maintenance). The remaining Tabs in the Stormwater Ordinance permit submittal will be prepared by TranSystems.

As part of the permitting process, DuPage County requires coordination with the Chicago District, USACE. A copy of all permitting materials submitted to DuPage County will be provided to the USACE. In addition, coordination may be required with the following agencies:

- US Fish & Wildlife Service (FWS)
- Illinois Environmental Protection Agency (IEPA)
- Illinois Department of Natural Resources (IDNR)
- Illinois Historic Preservation Agency (IHPA)

If necessary, H&H will formally request a Letter of No Objection (LONO) from the USACE if wetland impacts can be completely avoided.

As part of the early coordination necessary with the USACE, the H&H will complete the Joint Application for a Section 404 Permit and will submit this permit package to the USACE as part of the DuPage County permitting coordination. Actual permitting with the USACE is not anticipated as DuPage County has the authority to oversee the 404 Permit program in DuPage County; however, coordination with the USACE is still required. If wetland impacts exceed one acre, the project no longer meets the requirements of the Regional Permit Program and the DuPage County authority. An Individual Section 404 Permit is required through the Chicago, District USACE if impacts exceed the one-acre threshold. As this is not anticipated and the scope and costs are extremely variable for an Individual Permit, a cost estimate for this effort is not provided at this time. If required, a more accurate cost estimate can be prepared once project and wetland conditions are more defined.

It is assumed due to the small amount of impact, that separate Section 401 water quality certification from IEPA, will not be required. Water quality certification is authorized under the USACE Regional Permit Program.



As IHPA is part of the permit process, information will be forwarded to them. If the area adjacent to the project site is undeveloped, a Phase I archaeological survey may need to be completed prior to issuance of permits. Phase I surveys are not part of this scope of work.

Endangered species consultation with the FWS will be required. The Section 7 Endangered Species consultation will be completed as documented on the FWS website. This documentation will determine whether threatened or endangered species habitat is present. If habitat is present, the next step is to determine whether the project will have an impact on the habitat. Coordination with the FWS is required if it is anticipated that there will be an effect on threatened or endangered species, or their habitat. Endangered species surveys are not included in this scope of services.

DuPage County requires submittal fees for wetland permitting. Because these fees may vary, we have not included them in this scope of work. Any permitting fees that are incurred will be paid by the City of Naperville.

This task assumes that all paper copies of permit submittals will be completed by TranSystems. This scope does not include hand delivery of permits to DuPage County by H&H. This scope includes the original submittal to DuPage County and two additional submittals to address any comments.

#### **Task 6 – Railroad Access Coordination**

For these tasks, the scope of work includes time necessary to manage the project, including scheduling and coordination with the prime consultant, EJ&E/BNSF, and environmental laboratories. Railroad right of way access is not currently anticipated for this project. However, since this is currently unknown, costs have been included as a contingency, only to be utilized if RR access is necessary.

#### **Task 7 – Project Management**

Time under this task includes project administration and management activities that include cost and schedule tracking, coordination with Client on authorized activities, memo production and other in-house management activities, and project closeout.

#### **Task 8 – QA/QC**

Time under this task includes QA/QC time for the permitting materials and reports as described above.

## **2. LEVEL OF EFFORT AND SCHEDULE**

PESA work will commence within 10 business days of project approval, with a target completion date of six weeks from the date of approval. This proposal assumes that the wetland delineations will occur within the 2017 growing season between April 15<sup>th</sup> and October 15<sup>th</sup> as the 2016 growing season ends eight days from the date of this proposal.

**Cost Estimate of  
Consultant Services  
(CPFF)**

Firm Huff & Huff, Inc.  
 Route North Aurora Road at EJ&E  
 Section Pennsbury Lane to Frontenac Road  
 County DuPage  
 Job No. \_\_\_\_\_  
 PTB & Item \_\_\_\_\_

Date 10/7/2016  
 Overhead Rate 171.26%  
 Complexity Factor 0

Item	Manhours	Payroll	Overhead & Fringe Benefits	In-House Direct Costs	Fixed Fee	Outside Direct Costs	Services By Others	Total	% of Grand Total
PESA	46	1,612.49	2,761.55	57.60	642.59	505.00	0.00	5,579.24	12.62%
PSI	46	1,573.03	2,693.97	47.80	625.65	5,563.20	0.00	10,503.64	23.75%
Wetland Delineation and Report Update	71	2,075.13	3,553.86	107.20	831.75	0.00	0.00	6,567.94	14.85%
Best Management Practices	31	1,103.29	1,889.50	21.60	437.09	0.00	0.00	3,451.47	7.80%
Wetland/Stormwater Permitting	71	2,570.68	4,402.55	5.00	1,011.84	40.00	0.00	8,030.07	18.16%
Railroad Access Coordination	4	154.36	264.36	0.00	60.71	7,650.00	0.00	8,129.44	18.38%
Project Management	4	219.40	375.75	0.00	86.30	0.00	0.00	681.45	1.54%
QA/QC	7	412.07	705.72	0.00	162.08	0.00	0.00	1,279.87	2.89%
<b>TOTALS</b>	<b>280</b>	<b>9,720.46</b>	<b>16,647.26</b>	<b>239.20</b>	<b>3,858.00</b>	<b>13,758.20</b>	<b>0.00</b>	<b>44,223.12</b>	<b>100.00%</b>

Method of Compensation:  
 Cost Plus Fixed Fee 1                    14.5%[DL + R(DL) + OH(DL) + IHDC]  
 Cost Plus Fixed Fee 2                    14.5%[DL + R(DL) + 1.4(DL) + IHDC]  
 Cost Plus Fixed Fee 3                    14.5%[(2.3 + R)DL + IHDC]  
 Specific Rate  
 Lump Sum

## Average Hourly Project Rates

**Route** North Aurora Road at EJ&E  
**Section** Pennsbury Lane to Frontenac Road  
**County** DuPage  
**Job No.**  
**PTB/Item**

**Consultant** Huff & Huff, Inc.

**Date** 10/7/2016

**Sheet** 1 **OF** 1

Payroll Classification	Avg Hourly Rates	Total Project Rates			PESA			PSI			Wetland Delineation and Repo			Best Management Practices			Wetland/Stormwater Permitting		
		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	6	2.14%	1.50	1	2.17%	1.52	1	2.17%	1.52				1	3.23%	2.26	1	1.41%	0.99
Senior Geotechnical Cons.	60.38	0																	
Senior Consultant	60.25	5	1.79%	1.08															
Senior Geologist PM	50.55	2	0.71%	0.36															
Geologist PM	31.85	0																	
Senior Engineering PM	48.25	0																	
Engineering PM	39.84	0																	
Assistant PM Engineer II	38.55	20	7.14%	2.75										20	64.52%	24.87			
Assistant PM Engineer I	32.91	40	14.29%	4.70				40	86.96%	28.62									
Engineer 1	30.73	0																	
Senior Scientist PM	41.59	0																	
Scientist PM I	41.40	0																	
Assistant PM Scientist	26.52	86	30.71%	8.15							54	76.06%	20.17				32	45.07%	11.95
Senior Technical Scientist	35.35	0																	
Environmental Scientist E1	24.68	8	2.86%	0.71										8	25.81%	6.37			
Senior Planning PM	46.82	0																	
Planning PM	33.93	34	12.14%	4.12	34	73.91%	25.08												
Senior Technical Specialist	44.58	51	18.21%	8.12	4	8.70%	3.88	2	4.35%	1.94	8	11.27%	5.02				35	49.30%	21.98
Senior CADD Specialist	32.44	19	6.79%	2.20	4	8.70%	2.82	3	6.52%	2.12	8	11.27%	3.65	2	6.45%	2.09	2	2.82%	0.91
Administrative Managers	38.59	4	1.43%	0.55															
Sr. Administrative Assistant	26.91	5	1.79%	0.48	3	6.52%	1.75				1	1.41%	0.38				1	1.41%	0.38
Administrative Assistant	22.00	0																	
Senior PM II (on call)	59.98	0																	
Senior PM I (on call)	40.43	0																	
Engineering Intern	18.71	0																	
Intern	16.11	0																	
		0																	
		0																	
		0																	
		0																	
<b>TOTALS</b>		<b>280</b>	<b>100%</b>	<b>\$34.72</b>	<b>46</b>	<b>100%</b>	<b>\$35.05</b>	<b>46</b>	<b>100%</b>	<b>\$34.20</b>	<b>71</b>	<b>100%</b>	<b>\$29.23</b>	<b>31</b>	<b>100%</b>	<b>\$35.59</b>	<b>71</b>	<b>100%</b>	<b>\$36.21</b>



## Average Hourly Project Rates

**Route** North Aurora Road at EJ&E  
**Section** Pennsbury Lane to Frontenac Road  
**County** DuPage  
**Job No.**  
**PTB/Item**

**Consultant** Huff & Huff, Inc.

**Date** 10/7/2016

**Sheet** 2 **OF** 1

Payroll Classification	Avg Hourly Rates	Railroad Access Coordination			Project Management			QA/QC											
		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				1	25.00%	17.50	1	14.29%	10.00									
Senior Geotechnical Cons.	60.38																		
Senior Consultant	60.25				1	25.00%	15.06	4	57.14%	34.43									
Senior Geologist PM	50.55							2	28.57%	14.44									
Geologist PM	31.85																		
Senior Engineering PM	48.25																		
Engineering PM	39.84																		
Assistant PM Engineer II	38.55																		
Assistant PM Engineer I	32.91																		
Engineer 1	30.73																		
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Senior Technical Scientist	35.35																		
Environmental Scientist E1	24.68																		
Senior Planning PM	46.82																		
Planning PM	33.93																		
Senior Technical Specialist	44.58				2	50.00%	22.29												
Senior CADD Specialist	32.44																		
Administrative Managers	38.59	4	100.00%	38.59															
Sr. Administrative Assistant	26.91																		
Administrative Assistant	22.00																		
Senior PM II (on call)	59.98																		
Senior PM I (on call)	40.43																		
Engineering Intern	18.71																		
Intern	16.11																		
<b>TOTALS</b>		4	100%	\$38.59	4	100%	\$54.85	7	100%	\$58.87	0	0%	\$0.00	0	0%	\$0.00	0	0%	\$0.00

**HUFF & HUFF, INC.**  
**SUMMARY OF INHOUSE DIRECT COSTS**

Project: TS - North Aurora Road

**DIRECT**

**Task 1 - PESA**

Trips - Company	25 miles	x	2	x	\$	0.54	=	\$	27.00
Tolls			4	x	\$	1.50	=	\$	6.00
Reproduction	3 sets	x	200	x	\$	0.03	=	\$	18.00
Color copies	3 sets	x	10	x	\$	0.11	=	\$	3.30
Photo sheets	3 sets	x	10	x	\$	0.11	=	\$	3.30
<b>Task Total</b>									<b>\$ 57.60</b>

**Task 2 - PSI**

Trips - Company	25 miles	x	2	x	\$	0.54	=	\$	27.00
Tolls			4	x	\$	1.50	=	\$	6.00
Reproduction	2 sets	x	100	x	\$	0.03	=	\$	6.00
Color copies	2 sets	x	20	x	\$	0.11	=	\$	4.40
Photo sheets	2 sets	x	20	x	\$	0.11	=	\$	4.40
<b>Task Total</b>									<b>\$ 47.80</b>

**Task 3 - Wetland Delineation Update**

Trips - Company	40 miles	x	4	x	\$	0.54	=	\$	86.40
Tolls			4	x	\$	1.50	=	\$	6.00
Reproduction	2 sets	x	100	x	\$	0.03	=	\$	6.00
Color copies	2 sets	x	20	x	\$	0.11	=	\$	4.40
Photo sheets	2 sets	x	20	x	\$	0.11	=	\$	4.40
<b>Task Total</b>									<b>\$ 107.20</b>

**Task 4 - Best Management Practices**

Trips - Company	20 miles	x	2	x	\$	0.54	=	\$	21.60
			0	x	\$	-	=	\$	-
<b>Task Total</b>									<b>\$ 21.60</b>

**Task 5 - Wetland/Stormwater Permitting**

Reproduction	1 sets	x	20	x	\$	0.03	=	\$	0.60
Color copies	1 sets	x	20	x	\$	0.11	=	\$	2.20
Photo sheets	1 sets	x	20	x	\$	0.11	=	\$	2.20
CAD Plots			0	x	\$	1.85	=	\$	-
				x	\$	-	=	\$	-
<b>Task Total</b>									<b>\$ 5.00</b>

**Task 6 - Railroad Access Coordination**

			0	x	\$	-	=	\$	-
<b>Task Total</b>									<b>\$ -</b>

**Task 07 - Project Management**

			0	x	\$	-	=	\$	-
<b>Task Total</b>									<b>\$ -</b>

**Task 08 - QA/QC**

			0	x	\$	-	=	\$	-
<b>Task Total</b>									<b>\$ -</b>

**GRAND TOTAL      \$ 239.20**

**HUFF & HUFF, INC.**  
**SUMMARY OF OUTSIDE DIRECT COSTS**  
 Project: TS - North Aurora Road

**OUTSIDE**

**Task 1 - PESA**

Maps/Aerials	2 x	\$ 95.00	=	\$	190.00
Federal Express	1 x	\$ 20.00	=	\$	20.00
Records Search	1 x	\$ 295.00	=	\$	295.00
<b>Task Total</b>					<b>\$ 505.00</b>

**Task 2 - PSI**

Driller	1 x	\$ 2,400.00	=	\$	2,400.00
<b>Soil Analytical</b>					
Method 5035	6 x	\$ 12.00	=	\$	72.00
VOCs	6 x	\$ 126.00	=	\$	756.00
PNAs	4 x	\$ 105.00	=	\$	420.00
RCRA Metals	8 x	\$ 158.20	=	\$	1,265.60
Herbicides	2 x	\$ 196.00	=	\$	392.00
Soil pH	8 x	\$ 8.40	=	\$	67.20
SPLP Chromium	2 x	\$ 95.20	=	\$	190.40
<b>Task Total</b>					<b>\$ 5,563.20</b>

**Task 3 - Wetland Delineation Update**

_____	0 x	\$ -	=	\$	-
<b>Task Total</b>					<b>\$ -</b>

**Task 4 Best Management Practices**

_____	0 x	\$ -	=	\$	-
<b>Task Total</b>					<b>\$ -</b>

**Task 5 Wetland/Stormwater Permitting**

Federal Express	2 x	\$ 20.00	=	\$	40.00
_____	0 x	\$ -	=	\$	-
<b>Task Total</b>					<b>\$ 40.00</b>

**Task 6 Railroad Access Coordination**

RR Access Application Fee	1 x	\$ 750.00	=	\$	750.00
RR Right of Entry Fee	1 x	\$ 1,000.00	=	\$	1,000.00
RR Flagger	1 x	\$ 900.00	=	\$	900.00
RR Liability Insurance	1 x	\$ 5,000.00	=	\$	5,000.00
_____	0 x	\$ -	=	\$	-
<b>Task Total</b>					<b>\$ 7,650.00</b>

**Task 07 - Project Management**

_____	0 x	\$ -	=	\$	-
<b>Task Total</b>					<b>\$ -</b>

**Task 08 - QA/QC**

_____	0 x	\$ -	=	\$	-
<b>Task Total</b>					<b>\$ -</b>

**GRAND TOTAL      \$ 13,758.20**