

**STANDARD AGREEMENT FOR PROFESSIONAL SERVICES**

**THIS AGREEMENT** made between the City of Aurora, whose address is 44 E. Downer Place, Aurora, Illinois 60507 hereinafter called the **CLIENT** and Crawford, Murphy & Tilly, Inc., Consulting Engineers, 2750 West Washington Street, Springfield, Illinois 62702, hereinafter called the **ENGINEER**.

**WITNESSETH**, that whereas the **CLIENT** desires the following described professional engineering, land surveying or architectural services:

Planning, design, and construction phase engineering services for various water projects which may include the following:

- Hydraulic Model Update
- Well House #18 Site Improvements
- Fox Valley East Pump Station Generator Improvements
- Or other water system improvement projects as determined by the City

The engineering services for the above are described in the attached Exhibit A – Scope of Services.

**NOW THEREFORE**, the **ENGINEER** agrees to provide the above described services and the **CLIENT** agrees to compensate the **ENGINEER** for these services in the manner checked below:

On a time and expense basis in accordance with the attached Exhibit B - Schedule of Hourly Charges which is subject to change at the beginning of each calendar year. Reimbursable direct expenses will be invoiced at cost. Professional or Subconsultant services performed by another firm will be invoiced at cost plus ten percent. Note that no Professional or Subconsultant services are anticipated to be furnished to the **ENGINEER** by another firm on this project.

At the lump sum amount of \$\_\_\_\_\_.

**IT IS MUTUALLY AGREED THAT**, payment for services rendered shall be made monthly in accordance with invoices rendered by the **ENGINEER**.

**IT IS FURTHER MUTUALLY AGREED:**

That the compensation for planning, design and construction phase engineering services for various water projects shall not exceed \$151,400 per the attached Exhibits C, C-1, C-2a, C-2b, and C-3 – Professional Cost Estimate without further authorization from the **CLIENT**.

The **CLIENT** and the **ENGINEER** each binds himself, his partners, successors, executors, administrators and assignees to each other party hereto in respect to all the covenants and agreements herein and, except as above, neither the **CLIENT** nor the **ENGINEER** shall assign, sublet or transfer any part of his interest in this **AGREEMENT** without the written consent of the other party hereto. This **AGREEMENT**, and its construction, validity and performance, shall be governed and construed in accordance with the laws of the State of Illinois. This **AGREEMENT** is subject to the General Conditions attached hereto.

**IN WITNESS WHEREOF**, the parties hereto have affixed their hands and seals this \_\_\_\_ day of \_\_\_\_\_, 2016.

**CLIENT:**

CITY OF AURORA

(Client Name)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Name and Title)

**ENGINEER:**

CRAWFORD, MURPHY & TILLY, INC.

*Theresa O'Grady, P.E.*  
(Signature)

Theresa O'Grady, P.E. – Group Manager Water Resources  
(Name and Title)

**CMT Job No.** \_\_\_\_\_

**STANDARD GENERAL CONDITIONS**  
**Crawford, Murphy & Tilly, Inc.**

1. Standard of Care

In performing its professional services hereunder, the **ENGINEER** will use that degree of care and skill ordinarily exercised, under similar circumstances, by members of its profession practicing in the same or similar locality. No other warranty, express or implied, is made or intended by the **ENGINEER'S** undertaking herein or its performance of services hereunder.

2. Reuse of Document

All Reports, Drawings, Specifications, other documents, and electronic media prepared or furnished by **ENGINEER** pursuant to this Agreement are instruments of service in respect to the Project and shall be the property of the **CLIENT**. **ENGINEER** shall retain the right of reuse of said documents and electronic media by and at the discretion of the **ENGINEER** whether or not the Project is completed. Reproducible copies of **ENGINEER'S** documents and electronic media of the Project and **ENGINEER'S** documents shall be delivered to the **CLIENT**; however, Project and **ENGINEER'S** documents and electronic media are not intended or represented to be suitable for reuse by the **CLIENT** or others on additions or extensions of the Project, or on any other project.

3. Termination

This Agreement may be terminated by either party upon seven days prior written notice. In the event of termination, the **ENGINEER** shall be compensated by the client for all services performed up to and including the termination date, including reimbursable expenses.

4. Parties to the Agreement

The services to be performed by the **ENGINEER** under this Agreement are intended solely for the benefit of the **CLIENT**. Nothing contained herein shall confer any rights upon or create any duties on the part of the **ENGINEER** toward any person or persons not a party to this Agreement including, but not limited to any contractor, subcontractor, supplier, or the agents, officers, employees, insurers, or sureties of any of them.

5. Construction and Safety

The **ENGINEER** shall not be responsible for the means, methods, procedures, techniques, or sequences of construction, nor for safety on the job site, nor shall the **ENGINEER** be responsible for the contractor's failure to carry out the work in accordance with the contract documents.

6. Payment

Payment for services rendered shall be made monthly in accordance with invoices rendered by the **ENGINEER**. If payment is to be on a lump sum basis, monthly payments will be based on the portion of total services completed during the month. Invoices, or any part thereof, which are not paid within 45 days after the date of issue shall bear interest at the rate of 1% for each month or fraction thereof from the date 45 days after issue to time of payment.

7. Insurance

**ENGINEER** shall indemnify and save harmless CITY, its officers and employees, from suits, actions or claims of any character brought because of any injuries or damages received or sustained by any person, persons, or property resulting from any negligent act, error or omission on the part of **ENGINEER**.

CITY shall indemnify and save harmless **ENGINEER**, its officers and employees, from suits, actions or claims of any character brought because of any injuries or damages received or sustained by any person, persons, or property resulting from any negligent act, error or omission on the part of CITY.

During the term of this AGREEMENT, **ENGINEER** shall provide the following types of insurance with no less than the following specified amounts.

- a. Comprehensive general liability – combined single limit amount of \$1,000,000 per incident, \$2,000,000 general aggregate limit.
- b. Auto Liability – combined single limit amount of \$1,000,000 per incident on any vehicle driven by an R.I. while engaged in any activity within the scope of this AGREEMENT.
- c. Professional Liability - \$5,000,000;
- d. Worker's Compensation – Statutory Limit; the policy shall include a "Waiver of Subrogation" clause;
- e. "Umbrella Coverage" - \$5,000,000.

**ENGINEER** shall furnish to CITY satisfactory proof of coverage of the above insurance requirements by a reliable company or companies, before commencing any work. Such proof shall consist of a current certificate executed by the insurance company(s) and shall be filed with CITY. Said certificate shall name the city of Aurora as additional, non-contributory insured and contain a clause which requires that no change shall be made to the coverage and there shall be no cancellation or lapse of such coverage unless CITY receives written notification from the insurance company providing coverage at least thirty (30)-days in advance of said cancellation or change in coverage.

City of Aurora  
2016 Water Improvements Projects

**Exhibit A - SCOPE OF WORK**

**I. Hydraulic Model Update**

Background

Crawford, Murphy & Tilly, Inc. (CMT) last updated the city of Aurora (City) water distribution hydraulic model in 2005. The hydraulic model has been used for several water service evaluations over the past 10 years. Since the last hydraulic model update, population in the City has increased from 165,197 in 2006 to 197,899 in 2010, representing a population growth of almost 20% in 4 years. The 2014 US Census Bureau estimated population is 200,456.

When the model was updated in 2005, model demands were revised based on the water usage observed in 2005 (drought year) which included an Average Day Demand of 17.0 MGD (12.58 MGD in Normal Pressure System and 4.42 MGD in High Pressure System) and a Maximum Day Demand of 28.00 MGD (20.71 MGD in Normal Pressure System and 7.29 MGD in High Pressure System).

Given the growth that has occurred since 2005, one would anticipate that water usage would have increased. It didn't. In fact, water usage has decreased. Water Production has been compiling water usage data annually. In 2006, the City enacted a water conservation ordinance which resulted in an observed decrease of ~20 gallons per person per day in the Maximum Day Demand. In the most recent drought year, 2012, the Average Day Demand was 17.39 MGD and the Maximum Day Demand was 27.28 MGD, both lower than water usage in 2005.

Given the above, as well as the potential geographic population changes, the demand distribution in the 2005 hydraulic model is not representative of the water usage occurring in the system and therefore, the hydraulic model needs to be updated. This is especially important as the hydraulic model continues to be utilized for water service evaluations to new residential, commercial and industrial developments.

Project Tasks

For the 2016 Hydraulic Model Update, we anticipate updating both the steady state and extended period simulation scenarios in the hydraulic model. Therefore, the following tasks are anticipated for the project:

1. Project Kick-off Meeting – A meeting will be held with CMT and City staff to review scope, schedule and budget as well as discuss information to be collected from the City for the project.
2. Data Collection – The following information will be obtained from the City:
  - o An electronic copy of the City's current GIS map including watermain locations, right-of-way lines, street names, parcel lines, watermain material, watermain installation

- year, zoning, elevation points and contours, and comprehensive land use plan boundaries.
- Water billing information for 2011, 2012, 2013, 2014 and 2015 (5 years) including customer address, customer type (residential, commercial, etc.) and water usage in excel or database format.
  - Historical average day and maximum day water usage information for the past five years.
  - Water System Operation – operational information for pumps and tank levels during average day demand, maximum day demand and peak hour demand conditions.
3. Review/Update historical water demands – CMT will review historical system wide demands that the City has been annually updating. CMT will work with the City to collect data required to separate the usage into Normal Pressure System and High Pressure System demands and update diurnal demand curves based on an average day and a high demand summer day in 2015.
4. Update Hydraulic Model – Updating the hydraulic model will consist of the following tasks:
- Incorporate watermain modifications since 2005 – This includes the addition of new watermain as well as watermain replacements. The City's Water GIS Map will be compared to the model to determine the watermain modification locations. Note that previous versions of the hydraulic model have been skeletonized for optimized running of the software. For this update, the intent is to include all piping 6" in diameter and above in the model.
  - Update Roughness Coefficients – Watermain roughness coefficients will be updated for the model pipes based on age of watermain and time that has elapsed since the last update. In areas where pipe condition is known to be poor, pipe roughness will be adjusted accordingly.
  - Update Elevations - Import topographic elevations from the GIS map using the TRex Elevation Extractor tool in WaterGEMS.
  - Update fire flow requirements – Update fire flow requirements (flow and residual pressure) in the model for junction nodes based on parcel zoning contained in GIS map.
  - Update Model Demands - CMT will automatically import water billing data from the GIS map into WaterGEMS using the software's LoadBuilder tool. It is our understanding that the City's GIS mapping contains property information (location ID number) and this same property information is contained in water billing data so that the water billing data (annual usage and peak month usage) can be imported into the GIS map. Once the water billing data is in the GIS map, demands can be applied to the junction nodes using the LoadBuilder tool in WaterGEMS. A ratio between water billing usage and average day demand will be utilized in the model based on historical water usage information obtained from the City.
5. Calibrate Steady State Model - Once the steady state model is updated, it will be calibrated. We will perform calibration similar to the calibration performed in 2005 using pressure measurement throughout the system. First, the model would be calibrated over a two to three hour period by taking static pressure measurements at 15 minute intervals at approximately 40 fire hydrants throughout the City. It has been assumed that two CMT staff members and two City staff members will collect the pressure measurements at locations identified by CMT. During the calibration period, source

information data at the time of the testing (source flows and pressures, tank levels, and pump status) will be recorded by City staff and provided to CMT for input into the model.

Once the field calibration measurements have been obtained, they will be input into the model. Operating conditions, such as demand, pump operation, and tank levels will be input into the model. Field-measured pressures will be compared to model-computed pressures to determine if the accuracy of the model is within AWWA guidelines (2 psi for pressure measurements).

6. Calibrate Extended Period Simulation (EPS) model – The EPS model was previously calibrated as part of the 2006 Water Master Plan Update. The EPS Model will be recalibrated as part of this hydraulic model update. The extended period calibration will consist of the following tasks:
  - Create a minimum 24 hour calibration scenario and associated alternatives based on historical SCADA data from a period of high water usage from 2015. For the extended period selected, the City will need to provide source information to be input into the model to determine if actual tank levels compare favorably to computer calculated tank levels.
  - Troubleshoot the model to ensure that the model is accurately calibrated.
  - Compare and evaluate the model predicted versus actual water levels for the storage facilities to verify calibration.
7. Update and Run Modeling Scenarios – Both steady state and extended period simulation scenarios will be updated to reflect current water system operations and demands, as follows:
  - Steady State - Average Day Demand, Maximum Day Demand and Peak Hour modeling Scenarios will be updated. Current operations (pumps on and tank levels) will be updated as well as demand ratios (average to maximum day demand and maximum day demand to peak hour demand).
  - Extended Period Simulation - The EPS scenario in the model will be updated based on a typical 2015 summer day. Updated diurnal demands will be input into the model as well as current operations (pump on/off controls, etc.)Once the scenarios have been updated, they will be run and the results will be compiled in tables and exhibits including pressure contours, fire flow contours, flow directions and water age contour maps.
8. Evaluate Alternative EPS Scenarios – Once the EPS model has been calibrated and scenarios updated, the EPS model will be run under different scenarios (assume 3) specifically looking at operational impacts to water age.
9. Prepare report – The information compiled in the Hydraulic Model Update will be presented in report format. A draft report will be prepared and submitted to the City for review. CMT will then meet with the City staff to discuss comments on the draft report. Then CMT will incorporate comments and submit the final report to the City. The final report will include an electronic copy of the water model

*Note: that this model update does not include evaluation of the existing source, supply and treatment systems. It is anticipated that evaluation of the entire water system (including the distribution) would be completed separately as part of a Water Master Plan Update (similar to the previous 2005 Hydraulic Model Update and 2006 Water Master Plan Update).*

### Schedule

The schedule for the project is based on a start date of March 9, 2016. The intent is to submit the pre-final report by November 1, 2016 and submit the final report by December 15, 2016

### Engineering Effort

We estimate the level of effort for hydraulic model update at 926 man-hours at a cost of \$95,200. Additional detail regarding the level of effort and cost is attached for your review.

## II. Well House #18 Site Improvements

### Background

The Well House #18 site is located on the east side of the city at 218 Hillside Avenue. The site is fenced with the deep well located inside the wellhouse building. There is a gravel driveway along the north side of the building and a sidewalk (in bad condition) along the east side of the building to the front door. There is an overhead door on the west side of the building with no driveway access.

The site is in need of the following improvements:

- Replacement of gravel driveway with bituminous driveway at the current location, widened to 12'.
- Extension of the driveway to the west side of the building for access to the overhead door and turnaround "T" near the northwest corner of the building.
- Replacement of the sidewalk along the east side of the building from the new driveway to the step up landing in front of the door. The new sidewalk will match the elevation of the top of the landing so there will no longer be a step up to the doorway.
- Grading of the site to minimize current unintended ponding of water throughout the site.
- Repairs to Hillside Avenue pavement in front of the site that will, in particular, square off the pavement on the south end.
- Grading south of the street repairs noted above to eliminate area of ponding in front of the fire hydrant.

See attached exhibit showing proposed improvements. The site was surveyed by CMT in 2014. It is anticipated that the site improvements will be competitively bid. The effort includes development of plans and specifications for public bidding.

In addition, the valves on the interior well discharge piping need to be replaced. It is anticipated that CMT will prepare a Memorandum of Design (consisting of a preliminary mechanical plan and materials list) for this work to allow the City to obtain proposals from local mechanical contractors. Detailed plans and specifications for public bidding will not be prepared for this work.

### Project Tasks

Based on the above, the following tasks are anticipated to provide design phase engineering services for this project:

1. Conduct project kick off meeting with the City.
2. Obtain JULIE (and any other utility) information. Compile preliminary base map using site survey from 2014 and utility information.
3. Develop preliminary site improvements layout plan and grading plan. Submit pdf drawings to the City for review.
4. Develop preliminary mechanical plan and materials list for interior valve replacement work. Submit pdf to City for review and to obtain proposals.
5. Prepare pre-final drawings, specifications and opinion of probable construction cost. Submit pdf pre-final documents to the City for review.

6. Prepare final drawings, specifications and cost estimate for bidding based on City comments. Submit 5 copies to the City.
7. Coordinate and distribute plans and specifications to prospective bidders.
8. Conduct pre-bid meeting, prepare and distribute meeting minutes and respond to contractor's questions.
9. Prepare addenda (as necessary) for issuance by the City.
10. Review and evaluate bids and prepare a recommendation for award letter.

The following tasks are anticipated to provide construction phase engineering services for this project:

1. Issue Notice of Award.
2. Prepare (five) contracts for execution. Send to the Contractor for execution. Review returned contracts prior to signature by the City.
3. Issue Notice to Proceed.
4. Conduct pre-construction meeting and prepare meeting minutes.
5. Review shop drawings.
6. Perform part-time construction observation. (Assume 20 visits to the site.)
7. Review and recommend submitted pay request.
8. Review submitted change order requests, and requests for interpretation.
9. Conduct punchlist inspection and prepare punchlist.
10. Review and recommend final payment.
11. Prepare project close out documents including record drawings and final payment to contractor. Submit 2 copies of record drawings (including electronic pdf version) to the City.

#### Assumptions:

- It has been assumed that the interior valve(s) replacement would not require field visits to check on this work.
- Environmental soils testing has not been included.
- Given the short construction duration anticipated, it has been assumed that there will be only one pay request meeting and no progress meetings.
- Material testing services are not anticipated and have not been included for either design or construction.

#### Schedule

The schedule for the project based on a design start date of March 9, 2016. The intent is to advertise for bids in May 2016 and open bids in June 2016 so that construction can begin in August 2016. Taking into account time for shop drawing review and material delivery, it is anticipated that construction will be complete in November 2016.



Engineering Effort

We estimate the level of effort for design/bidding and construction phase engineering services for the Well House #18 Site Improvements at 373 man-hours at a cost of \$39,100. Additional detail regarding the level of effort and cost is attached for your review.

# CITY OF AURORA WELL 18 IMPROVEMENTS

FOUND 1/2" IRON PIPE

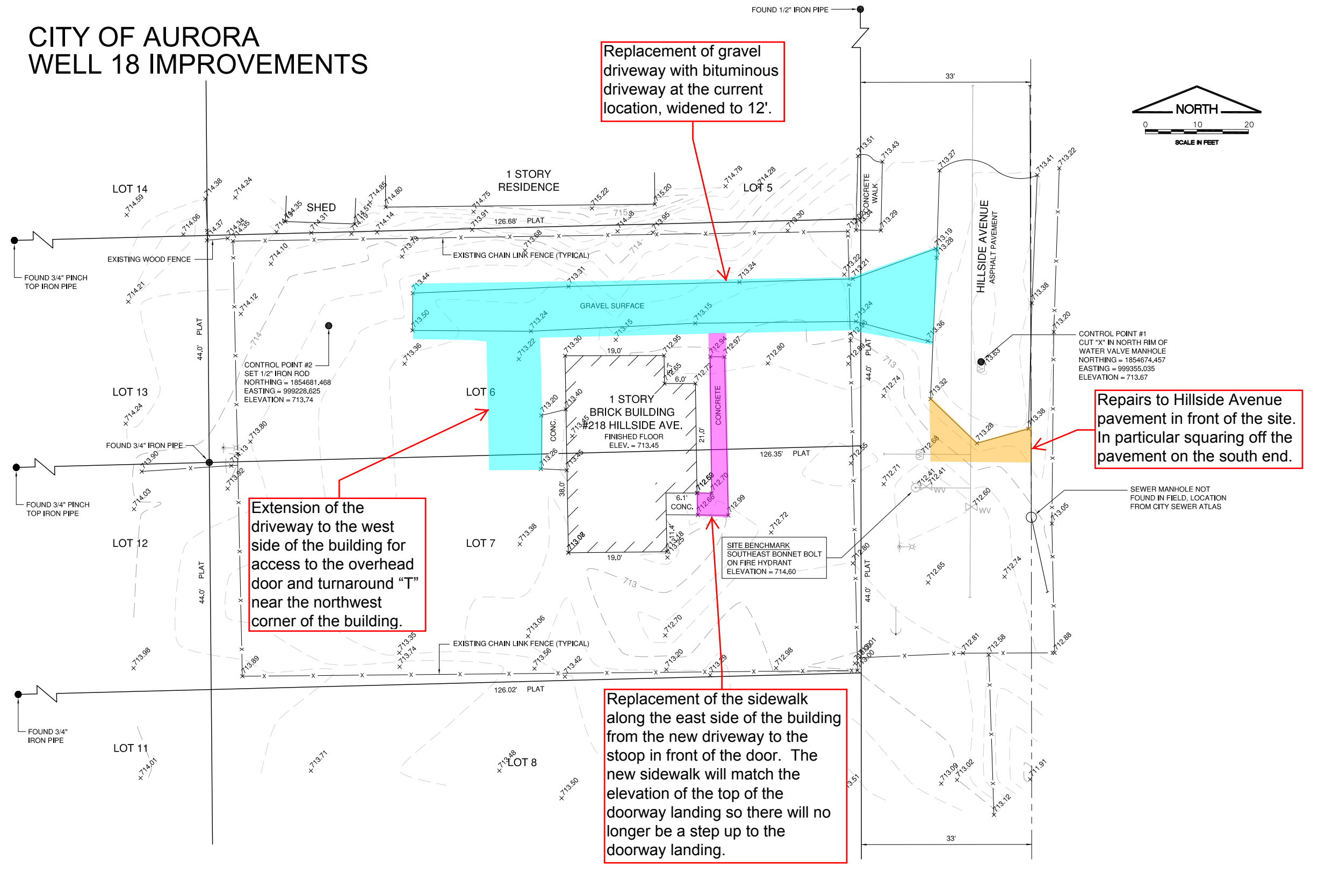


Replacement of gravel driveway with bituminous driveway at the current location, widened to 12'.

Repairs to Hillside Avenue pavement in front of the site. In particular squaring off the pavement on the south end.

Extension of the driveway to the west side of the building for access to the overhead door and turnaround "T" near the northwest corner of the building.

Replacement of the sidewalk along the east side of the building from the new driveway to the stoop in front of the door. The new sidewalk will match the elevation of the top of the doorway landing so there will no longer be a step up to the doorway landing.



CONTROL POINT #2  
SET 1/2" IRON ROD  
NORTHING = 1854681.468  
EASTING = 999228.625  
ELEVATION = 713.74

CONTROL POINT #1  
CUT "X" IN NORTH RIM OF  
WATER VALVE MANHOLE  
NORTHING = 1854674.457  
EASTING = 999355.035  
ELEVATION = 713.67

SITE BENCHMARK  
SOUTHEAST BONNET BOLT  
ON FIRE HYDRANT  
ELEVATION = 714.60

SEWER MANHOLE NOT  
FOUND IN FIELD. LOCATION  
FROM CITY SEWER ATLAS

### **III. Fox Valley East Pump Station Generator Improvements**

#### Background

The Fox Valley East Pump Station site is located at 3244 Richland Court on the east side of the City. The site consists of the pump station, four (4) 1.0 million gallon ground storage tanks and Deep Well #22. The Fox Valley East Pump Station is one of two primary supplies to the High Pressure Zone in the northeast part of the City. The second supply is the high pressure pumps at the Water Treatment Plant.

In order to improve reliability, the City would like to have a standby generator connection so that in the event of a power outage, the city could rent a standby generator and then easily and quickly connect to the pump station.

In order to allow for connection of a standby generator, the following electrical modifications are required:

- Installation of a manual transfer switch inside the electrical room.
- Installation of a generator receptacle outside the pump station building.
- Installation of conduit/conductors.
- Removal of existing flow recorder to allow space at the appropriate location.
- Relocation of light fixtures.

Note that CMT provided design and construction engineering services for the Fox Valley East Pump Station Electrical Improvements that were completed in 2002. Electrical improvements included the replacement of a motor control center, piping modifications, and replacement of lighting fixtures.

It is anticipated that CMT will prepare a Memorandum of Design (consisting of a preliminary electrical plan, one-line diagram and materials specification) for this work to allow the City to obtain proposals from local electrical contractors. Detailed plans and specifications will not be compiled for this work

#### Project Tasks

Based on the above, the following tasks are anticipated to provide design phase engineering services for this project:

1. Conduct project kick off meeting with the City.
2. Utilizing pump station drawings from 2002, develop proposed electrical plan and one-line diagram. Submit pdf drawings to the City for review.
3. Prepare material specifications. Provide opinion of probable material cost and opinion of probable installation cost. Submit to the City for review.
4. Finalize drawings and materials specification based on City comments. Submit pdf copies to the City for use in obtaining proposals.
5. Assist City with answering questions and reviewing proposals received as needed.

The following tasks are anticipated to provide construction phase engineering services for this project:

1. Review shop drawings.
2. Perform field visits to observe installation (assume 4).
3. Answer questions and provide clarification as needed.

### Schedule

The schedule for the project is based on a design start date of March 9, 2016. The intent is to complete the Design Memorandum in May 2016 to allow the City to obtain proposals in June 2016 so that construction can begin in August 2016. Taking into account time for shop drawing review and material delivery, it is anticipated that construction will be complete in December 2016.

### Engineering Effort

We estimate the level of effort for design/bidding and construction phase engineering services for the Fox Valley East PS Generator Improvements at 150 man-hours at a cost of \$17,100. Additional detail regarding the level of effort and cost is attached for your review.

**EXHIBIT B- SCHEDULE OF HOURLY CHARGES  
CITY OF AURORA  
RESIDENT INSPECTION AND ENGINEERING SERVICES**

<b>CLASS NO.</b>	<b>CLASSIFICATION</b>	<b>2014 AVG DIRECT LABOR RATE</b>	<b>BILLING RATE MULTIPLIER @ 2.78</b>	<b>2015/2016 BILLING RATE*</b>
10	<b>Principal</b> (IDOT cap at \$70)	\$70.00	\$194.60	\$197.40
20	<b>Senior Project Engineer/Manager</b> (CMT management engineer)	\$55.78	\$155.06	\$157.29
30	<b>Project Engineer/Manager</b> (sr. level PE or special discipline struct. or elect.)	\$49.38	\$137.28	\$139.26
40	<b>Senior Engineer</b> (licensed professional engineer)	\$36.19	\$100.62	\$102.07
42	<b>Senior Technical Manager</b>	\$45.48	\$126.43	\$128.25
43	<b>Senior Planner</b>	\$32.58	\$90.58	\$91.88
50	<b>Engineer</b> (graduate engineer)	\$28.57	\$79.41	\$80.55
51	<b>Architect</b>	\$24.76	\$68.83	\$69.82
60	<b>Planner</b> (aviation planning, environ. assessments, etc.)	\$51.77	\$143.92	\$145.99
65	<b>Technical Manager</b>	\$23.49	\$65.31	\$66.25
70	<b>Registered Land Surveyor</b> (PLS for plats, easements, etc.)	\$40.05	\$111.35	\$112.95
80	<b>Senior Technician</b> (exp survey tech, CAD tech, resident inspector)	\$31.92	\$88.74	\$90.02
90	<b>Technician</b> (survey instrument man, CAD operator, inspector)	\$27.17	\$75.53	\$76.62
100	<b>Technical Assistant</b> (junior-level rodman, inspector, CAD operator)	\$19.39	\$53.89	\$54.67
110	<b>Clerical/Word Processor</b>	\$19.30	\$53.66	\$54.43

\* Using escalation rate of 1.44% based on CPI change from November 2013 to November 2014

<u>Computation of billing rate multiplier:</u>	
Direct labor factor	1.0000
Audited overhead rate (3-yr average)	1.531
Subtotal	2.5307
Profit factor	1.10
Total	2.78

*Overhead and rate calculation is based on AASHTO guidelines for all US DOT's nationwide.*

**CITY OF AURORA**  
**2016 WATER PROJECTS**

Exhibit C - Professional Services Cost Estimate Summary  
25-Jan-16

<b>Exhibit</b>	<b>Description</b>	<b>Manhours</b>	<b>Amount</b>
C-1	2016 Hydraulic Model Update	926	\$95,200
C-2a	Well House #18 Site Improvements - Design Phase	229	\$22,500
C-2b	Well House #18 Site Improvements - Construction Phase	144	\$16,600
C-3	FVE PS Generator Improvements - Design/Construction Phase	150	\$17,100
	<b>TOTAL</b>	<b>1,449</b>	<b>\$151,400</b>

CRAWFORD, MURPHY & TILLY, INC.  
 CONTRACT ATTACHMENT - EXHIBIT C-1 - 2016 PROFESSIONAL SERVICES COST ESTIMATE

CLIENT City of Aurora  
 PROJECT NAME 2016 Hydraulic Model Update  
 CMT JOB NO. \_\_\_\_\_

Prep By	TLO
DATE	01/29/16
Apprvd	BDH
DATE	01/29/16

TASK NO.	TASKS \ CLASSIFICATIONS	PRINCIPAL	SENIOR PROJECT MANAGER	PROJECT ARCHITECT	SENIOR ENGINEER / LAND SURVEYOR	SENIOR ARCHITECT	SENIOR ENGINEER MANAGER	SENIOR TECHNICAL GIS SPECIALIST	SENIOR PLANNER ARCHITECT	ENGINEER ARCHITECT	SENIOR TECHNICIAN	TECHNICAL MGR PLANNER	TECHNICIAN II	TECHNICIAN I	ADMIN ASSISTANT ACCOUNTANT	LABOR SUMMARY	MAN HOURS & LABOR SUMMARY
CURRENT YEAR HOURLY RATES		\$197.40	\$157.29	\$139.26	\$102.07	\$128.25	\$91.88	\$80.55	\$90.02	\$66.25	\$76.62	\$54.67	\$54.43	TOTAL			
1	Kick-off Meeting & Progress Meetings (assume 2)		12		18												30
2	Data Collection				4			8									12
3	Review/Update Historical Water Demands		4		16			40									60
4	Update Model																
5	- Incorporate WM modifications		4		24			60				24					112
6	- Update roughness coefficients				4			24									28
7	- Update elevations				2			8									10
8	- Update fire flow requirements				4			8									12
9	- Update model demands		4		24			24									52
10	Calibrate Steady State Model		4		12			48				8					72
11	Calibrate EPS Model		16		50			50									116
12	Update & Run Modeling Scenarios		4		50			50				20					124
13	Evaluate Alternate EPS Scenarios (assume 3)		4		20			20				20					64
14	Prepare Report		8		50			50				50				8	166
15	Project Management & QA/QC	8	60														68
TOTAL MAN HOURS		8	120		278			390				122				8	926
SUBTOTAL - BASE LABOR EFFORT		\$1,579	\$18,875		\$28,375			\$31,415				\$9,348				\$435	\$90,027

TASKS (CONTINUED)	TOTAL LABOR EFFORT	DIRECT EXPENSE & REIMBURSABLES											TOTAL EXPENSE	TOTAL FEE		
		TRAVEL MILEAGE	MEALS & LODGING	PRINTING	EQUIP-MENT	MISC	SURVEY MTL	SUBS	SUBS ADMIN	OTHER EXP	OTHER EXP					
1 Kick-off Meeting & Progress Meetings (assume 2)	\$3,725	\$25													\$25	\$3,750
2 Data Collection	\$1,053															\$1,053
3 Review/Update Historical Water Demands	\$5,484															\$5,484
4 Update Model																
5 - Incorporate WM modifications	\$9,751															\$9,751
6 - Update roughness coefficients	\$2,341															\$2,341
7 - Update elevations	\$849															\$849
8 - Update fire flow requirements	\$1,053															\$1,053
9 - Update model demands	\$5,012															\$5,012
10 Calibrate Steady State Model	\$6,333	\$100													\$100	\$6,433
11 Calibrate EPS Model	\$11,648															\$11,648
12 Update & Run Modeling Scenarios	\$11,293			\$500											\$500	\$11,793
13 Evaluate Alternate EPS Scenarios (assume 3)	\$5,814															\$5,814
14 Prepare Report	\$14,656															\$14,656
15 Project Management & QA/QC	\$11,017															\$11,017
TOTALS	\$90,029	\$125		\$500											\$625	\$90,654
TIME PERIOD OF PROJECT	2016	2017	2018	2019	TOTAL	EST % OF OT HRS INCLUDED ABOVE						MULTI-YEAR + OT				
PERCENTAGE OF WORK TO BE PERFORMED BY YEAR	100%				100%	AVERAGE OVERTIME RATE PREMIUM						MLTPLR & AMT				
WEIGHTING FACTOR FOR 5% ANNUAL ADJUSTMENT	1.0000				1.0000	OT ADJUSTMENT FACTOR						1.0000	\$3			
ESTIMATED CONTINGENCY															5%	\$4,530
ROUNDING																\$13
TOTAL FEE	MATH CROSS CHECK IS OK															\$95,200

CRAWFORD, MURPHY & TILLY, INC.  
 CONTRACT ATTACHMENT - EXHIBIT C-2a - 2016 PROFESSIONAL SERVICES COST ESTIMATE

CLIENT City of Aurora  
 PROJECT NAME Well House #18 Site Improvements - Design Phase  
 CMT JOB NO. \_\_\_\_\_

Prep By	TLO
DATE	01/29/16
Apprvd	BDH
DATE	01/29/16

TASK NO.	TASKS \ CLASSIFICATIONS	PRINCIPAL	SENIOR PROJECT ENGINEER / MANAGER	ARCHITECT	PROJECT ARCHITECT	SENIOR ENGINEER / LAND SURVEYOR / PROJECT MANAGER	SENIOR ARCHITECT	SENIOR ENGINEER / MANAGER	SENIOR TECHNICAL GIS SPECIALIST	ENGINEER ARCHITECT	SENIOR TECHNICIAN	TECHNICAL PLANNER	TECHNICIAN I	TECHNICIAN II	ADMIN ASSISTANT ACCOUNTANT	LABOR HOURS & LABOR SUMMARY	TOTAL
CURRENT YEAR HOURLY RATES		\$197.40	\$157.29	\$139.26	\$102.07	\$128.25	\$91.88	\$80.55	\$90.02	\$66.25	\$76.62	\$54.67	\$54.43				
1	Kick-off Meeting with City		2					4									6
2	Obtain JULIE & other utility info. to compile base map							4				4					8
3	Prepare preliminary layout & grading plans & Submit to City		2			6		12				12					32
4	Prepare preliminary mechanical plan and materials list		1			4		8				8					21
5	Prepare pre-final plans, specifications & cost estimate		2			8		40				40					90
6	Incorporate city comments & prepare final documents		1			4		8				8					21
7	Prepare bid advertisement & distribute documents							4									4
8	Conduct Pre-Bid Meeting and Prepare Meeting Minutes		2					6									8
9	Answer Questions During Bidding, Prepare addenda		1					8									9
10	Review bids & recommend award		2					8									10
11	Project Management & QA/QC		20														20
12																	0
13																	0
14																	0
15																	0
TOTAL MAN HOURS		0	33	0	22	0	0	102	0	0	72	0	0				229
SUBTOTAL - BASE LABOR EFFORT		\$0	\$5,191	\$0	\$2,246	\$0	\$0	\$8,216	\$0	\$0	\$5,517	\$0	\$0				\$21,170

TASKS (CONTINUED)	TOTAL LABOR EFFORT	DIRECT EXPENSE & REIMBURSABLES											TOTAL EXPENSE	TOTAL FEE			
		TRAVEL MILEAGE	MEALS & LODGING	PRINTING	EQUIP-MENT	MISC	SURVEY MTL	SUBS	SUBS ADMIN	OTHER EXP	OTHER EXP						
1 Kick-off Meeting with City	\$637	\$10														\$10	\$647
2 Obtain JULIE & other utility info. to compile base map	\$629															\$0	\$629
3 Prepare preliminary layout & grading plans & Submit to City	\$2,813															\$0	\$2,813
4 Prepare preliminary mechanical plan and materials list	\$1,823															\$0	\$1,823
5 Prepare pre-final plans, specifications & cost estimate	\$7,418			\$200												\$200	\$7,618
6 Incorporate city comments & prepare final documents	\$1,823															\$0	\$1,823
7 Prepare bid advertisement & distribute documents	\$322	\$10														\$10	\$332
8 Conduct Pre-Bid Meeting and Prepare Meeting Minutes	\$798															\$0	\$798
9 Answer Questions During Bidding, Prepare addenda	\$802															\$0	\$802
10 Review bids & recommend award	\$959															\$0	\$959
11	\$3,146															\$0	\$3,146
12	\$0															\$0	\$0
13	\$0															\$0	\$0
14	\$0															\$0	\$0
15	\$0															\$0	\$0
TOTALS	\$21,170	\$20	\$0	\$200	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$220	\$21,390
TIME PERIOD OF PROJECT	2016	2017	2018	2019	TOTAL	EST % OF OT HRS INCLUDED ABOVE						0%	MULTI-YEAR + OT				
PERCENTAGE OF WORK TO BE PERFORMED BY YEAR	100%	0%	0%	0%	100%	AVERAGE OVERTIME RATE PREMIUM						0.0000	MLTPLR & AMT				
WEIGHTING FACTOR FOR 5% ANNUAL ADJUSTMENT	1.0000	0.0000	0.0000	0.0000	1.0000	OT ADJUSTMENT FACTOR						0.0000	1.0000 \$0				
ESTIMATED CONTINGENCY															5%	\$1,070	
ROUNDING																\$40	
TOTAL FEE	MATH CROSS CHECK IS OK															\$22,500	



CRAWFORD, MURPHY & TILLY, INC.  
 CONTRACT ATTACHMENT - EXHIBIT C-2b - 2016 PROFESSIONAL SERVICES COST ESTIMATE

CLIENT City of Aurora  
 PROJECT NAME Well House #18 Site Improvements - Construction Phase  
 CMT JOB NO. \_\_\_\_\_

Prep By	TLO
DATE	01/29/16
Apprvd	BDH
DATE	01/29/16

TASK NO.	TASKS \ CLASSIFICATIONS	PRINCIPAL	SENIOR PROJECT ENGINEER / MANAGER	ARCHITECT	PROJECT ENGINEER / PROJECT MANAGER	SENIOR ARCHITECT / LAND SURVEYOR	SENIOR ENGINEER / MANAGER	SENIOR TECHNICAL / GIS SPECIALIST	SENIOR PLANNER / ARCHITECT	ENGINEER / ARCHITECT	SENIOR TECHNICIAN	TECHNICAL MGR / PLANNER	TECHNICIAN II	TECHNICIAN I	ADMIN ASSISTANT / ACCOUNTANT	LABOR HOURS & SUMMARY
		TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
	CURRENT YEAR HOURLY RATES	\$197.40	\$157.29	\$139.26	\$102.07	\$128.25	\$91.88	\$80.55	\$90.02	\$66.25	\$76.62	\$54.67	\$54.43			TOTAL
1	Issue Notices & Prepare Contracts for Execution		2				8								8	18
2	Attend Pre-Construction Meeting & prepare meeting minutes		2				4									6
3	Review Shop Drawings		1				16									17
4	Part-Time Construction Observation (assume 15 visits)		15				45									60
5	Review Pay Requests (assume 1)		1				4									5
6	Review Change Order Requests		1				4									5
7	Conduct Punchlist Inspection															0
8	Project Close-out - Prepare record drawings		1				8									9
9	Project Close-out - Review final pay request		1				8									9
10	Project Management		15													15
11																0
12																0
13																0
14																0
15																0
	TOTAL MAN HOURS	0	39	0	0	0	97	0	0	0	0	0	0	0	8	144
	SUBTOTAL - BASE LABOR EFFORT	\$0	\$6,134	\$0	\$0	\$0	\$8,912	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$435	\$15,481

TASKS (CONTINUED)	TOTAL LABOR EFFORT	DIRECT EXPENSE & REIMBURSABLES										TOTAL EXPENSE	TOTAL FEE			
		TRAVEL MILEAGE	MEALS & LODGING	PRINTING	EQUIP-MENT	MISC	SURVEY MTL	SUBS	SUBS ADMIN	OTHER EXP	OTHER EXP					
1 Issue Notices & Prepare Contracts for Execution	\$1,485													\$0	\$1,485	
2 Attend Pre-Construction Meeting & prepare meeting minutes	\$682	\$10												\$10	\$692	
3 Review Shop Drawings	\$1,627													\$0	\$1,627	
4 Part-Time Construction Observation (assume 15 visits)	\$6,494	\$200												\$200	\$6,694	
5 Review Pay Requests (assume 1)	\$525													\$0	\$525	
6 Review Change Order Requests	\$525													\$0	\$525	
7 Conduct Punchlist Inspection	\$0													\$0	\$0	
8 Project Close-out - Prepare record drawings	\$892			\$100										\$100	\$992	
9 Project Close-out - Review final pay request	\$892													\$0	\$892	
10 Project Management	\$2,359													\$0	\$2,359	
11	\$0													\$0	\$0	
12	\$0													\$0	\$0	
13	\$0													\$0	\$0	
14	\$0													\$0	\$0	
15	\$0													\$0	\$0	
TOTALS	\$15,481	\$210	\$0	\$100	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$310	\$15,791	
TIME PERIOD OF PROJECT	2016	2017	2018	2019	TOTAL	EST % OF OT HRS INCLUDED ABOVE AVERAGE OVERTIME RATE PREMIUM						0%	MULTI-YEAR + OT MLTPLR & AMT			
PERCENTAGE OF WORK TO BE PERFORMED BY YEAR	100%	0%	0%	0%	100%	OT ADJUSTMENT FACTOR						0.0000	1.0000	(\$1)		
WEIGHTING FACTOR FOR 5% ANNUAL ADJUSTMENT	1.0000	0.0000	0.0000	0.0000	1.0000											
ESTIMATED CONTINGENCY															5%	\$790
ROUNDING																\$20
TOTAL FEE	MATH CROSS CHECK IS OK															\$16,600

CRAWFORD, MURPHY & TILLY, INC.  
 CONTRACT ATTACHMENT - EXHIBIT C-3 - 2016 PROFESSIONAL SERVICES COST ESTIMATE

CLIENT City of Aurora  
 PROJECT NAME FVE PS Generator Improvements - Design/Construction Phase  
 CMT JOB NO. \_\_\_\_\_

Prep By TLO  
 DATE 01/29/16

Apprvd BDH  
 DATE 01/29/16

TASK NO.	TASKS \ CLASSIFICATIONS	PRINCIPAL	SENIOR PROJECT ENGINEER / MANAGER	ARCHITECT PROJECT MANAGER	SENIOR ARCHITECT LAND SURVEYOR	SENIOR ENGINEER ARCHITECT	SENIOR TECHNICAL GIS SPECIALIST	SENIOR PLANNER ARCHITECT	ENGINEER ARCHITECT	SENIOR TECHNICIAN	TECHNICAL MGR PLANNER	TECHNICIAN II	TECHNICIAN I	ADMIN ASSISTANT ACCOUNTANT	LABOR SUMMARY	MAN HOURS & LABOR SUMMARY	
																	TOTAL
CURRENT YEAR HOURLY RATES		\$197.40	\$157.29	\$139.26	\$102.07	\$128.25	\$91.88	\$80.55	\$90.02	\$66.25	\$76.62	\$54.67	\$54.43				
1	Kick-off Meeting with City		4					4									8
2																	0
3	Design:																0
4	Develop proposed electrical plan & one-line diagram		8					40									48
5	Prepare material specifications & OPCC		4					8									12
6	Incorporate city comments & prepare final documents		2					4									6
7	Assist City with answering questions & reviewing proposals		4					8									12
8																	0
9	Construction:																0
10	Review Shop Drawings		4					12									16
11	Field visits (assume 4 visits)		12					12									24
12	Answer questions		2					8									10
13																	0
14	Project Management & QA/QC		14														14
15																	0
TOTAL MAN HOURS		0	54	0	0	0	0	96	0	0	0	0	0	0	0	0	150
SUBTOTAL - BASE LABOR EFFORT		\$0	\$8,494	\$0	\$0	\$0	\$0	\$7,733	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16,227

TASKS (CONTINUED)	TOTAL LABOR EFFORT	DIRECT EXPENSE & REIMBURSABLES										TOTAL EXPENSE	TOTAL FEE		
		TRAVEL MILEAGE	MEALS & LODGING	PRINTING	EQUIP- MENT	MISC	SURVEY MTL	SUBS	SUBS ADMIN	OTHER EXP	OTHER EXP				
1 Kick-off Meeting with City	\$951	\$10												\$10	\$961
2	\$0													\$0	\$0
3 Design:	\$0													\$0	\$0
4 Develop proposed electrical plan & one-line diagram	\$4,480													\$0	\$4,480
5 Prepare material specifications & OPCC	\$1,274													\$0	\$1,274
6 Incorporate city comments & prepare final documents	\$637													\$0	\$637
7 Assist City with answering questions & reviewing proposals	\$1,274													\$0	\$1,274
8	\$0													\$0	\$0
9 Construction:	\$0													\$0	\$0
10 Review Shop Drawings	\$1,596													\$0	\$1,596
11 Field visits (assume 4 visits)	\$2,854	\$40												\$40	\$2,894
12 Answer questions	\$959													\$0	\$959
13	\$0													\$0	\$0
14 Project Management & QA/QC	\$2,202													\$0	\$2,202
15	\$0													\$0	\$0
TOTALS	\$16,227	\$50	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$50	\$16,277
TIME PERIOD OF PROJECT	2016	2017	2018	2019	TOTAL	EST % OF OT HRS INCLUDED ABOVE						0%	MULTI-YEAR + OT		
PERCENTAGE OF WORK TO BE PERFORMED BY YEAR	100%	0%	0%	0%	100%	AVERAGE OVERTIME RATE PREMIUM						0.0000	MLTPLR & AMT		
WEIGHTING FACTOR FOR 5% ANNUAL ADJUSTMENT	1.0000	0.0000	0.0000	0.0000	1.0000	OT ADJUSTMENT FACTOR						1.0000	\$3		
ESTIMATED CONTINGENCY														5%	\$810
ROUNDING															\$10
TOTAL FEE	MATH CROSS CHECK IS OK														\$17,100