

CITY OF BATAVIA

DATE: October 5, 2018
TO: Committee of The Whole - PU
FROM: Rahat Bari, Engineering Manager
SUBJECT: Resolution 18-116-R: Authorizing Task Order #9 with Power System Engineering Inc. (PSE) for designing distribution substation rebuild at Paramount substation for an amount not-to-exceed \$386,000.00.

Background

In recent years, the City of Batavia Electric Department has experienced problems with the outdoor medium voltage switchgear buildings at Paramount Substation. Paramount has two transformers and two switchgear buildings. The oldest was installed in the late 1980s and is over thirty years old. The newer one was installed in 2000 and is 18 years old. The older transformer and switchgear are nearing end of life however the newer ones are in good working condition.

Discussion

Batavia Electric experienced multiple electric faults in both sections of the switchgear buildings. Up to this point, we have been able to repair the damage; however our industrial customers have experienced many interruptions. Last few years, we have been inspecting and testing the switchgear annually in the hopes of preventing any more damage. The cost to perform testing, inspection, repairs, and return to service has become excessive. This maintenance work does not reduce the risk of faults and service interruptions to an acceptable level. In 2017 alone, we had couple of emergency repairs done which was expensive as well as disruptive to our customers. Hence, staff recommended replacement of the older equipment with a more reliable and cost-effective equipment. Currently, construction work has started at the Northeast substation for the first stage of replacing half of paramount substation. This work is slated for completion before summer peak of 2019.

The second stage of paramount substation rebuild will be to replace the switchgear and other items at the paramount substation itself. We will be reusing the existing transformer as this transformer has considerable remaining service life. From the bidding process of first phase, staff has learnt about more than usual lead time of switchgear and other items. Hence, keeping those lead times in mind, staff would like to start design work of the second phase. The plan is to have the rebuild paramount substation operational by summer peak of 2020.

This contract is for the design, specifications and bid documents, evaluations and recommendations, project management assistance, project close out, and as built documentation of the paramount substation rebuilt at the paramount substation site. The projected cost to rebuild the paramount substation is about \$3.75 million. Staff will bring all those contracts including contracts for materials and construction contractors for this second phase to the City Council for approval. The design proposal cost was budgeted in 2018 however some of the expenses will be in 2019 hence staff has split design costs in 2018 expenditure and rest of the amounts in 2019 budget.

Staff recommendations

The City has successfully worked with Power Systems Engineering Group on past projects including first phase of paramount substation rebuild, Carlisle, Colonial Village and the Fabyan/Western Transmission project. PSE has designed the new distribution substation at Northeast Substation which is currently under construction. As a result of that design, PSE has

gathered data from the existing Paramount sub and very familiar with the rebuild site and existing equipments. Staff feels that there is a cost savings in awarding this design contract to PSE because of their familiarity with our system and intimate knowledge of the site. Staff finds that PSE is responsible and responsible consultants. Staff has developed a good working relationship with PSE and feels comfortable recommending Resolution 18-116-R: Authorizing Task Order #9 with PSE Group designing distribution substation rebuild at Paramount substation for an amount not-to-exceed \$386,000.00.

Attachment- Task Order #9 and PSE Proposal

**CITY OF BATAVIA, ILLINOIS
RESOLUTION 18-116-R**

**AUTHORIZING EXECUTION OF TASK ORDER #9 WITH POWER
SYSTEM ENGINEERING INC. (PSE) FOR DESIGNING PARAMOUNT
SUBSTAION REBUILD FOR AN AMOUNT NOT TO EXCEED \$386,000.00.**

WHEREAS, the City of Batavia owns and operates an Electric Utility; and

WHEREAS, in connection therewith, it is necessary and appropriate to improve the aging Infrastructure; and

WHEREAS, the city of Batavia has a Master Services Agreement with PSE for Electric Engineering Services; and

WHEREAS, PSE has submitted a proposal for Professional Engineering Services related to design Paramount substation rebuild for the City of Batavia, outlined and attached as Task Order #9; and

NOW, THEREFORE, BE IT RESOLVED, by the Mayor and City Council of the City of Batavia, Kane and DuPage Counties, Illinois, as follows:

SECTION 1: That the Mayor and City Clerk are hereby authorized execute a Task Order #9, attached hereto as Exhibit A , with PSE Group, Professional Engineering Services related to design Paramount substation rebuild amount not to exceed \$385,000.00.

CITY OF BATAVIA, ILLINOIS RESOLUTION 18-116-R

PRESENTED to and **PASSED** by the City Council of the City of Batavia, Illinois, this 15th day of October, 2018.

APPROVED by me as Mayor of said City of Batavia, Illinois, this 15th day of October, 2018.

Jeffery D. Schielke, Mayor

Ward	Aldermen	Ayes	Nays	Absent	Abstain	Aldermen	Ayes	Nays	Absent	Abstain
1	O'Brien					Salvati				
2	Callahan					Wolff				
3	Meitzler					Chanzit				
4	Mallay					Stark				
5	Uher					Theilin Atac				
6	Cerone					Russotto				
7	McFadden					Brown				
Mayor Schielke										
VOTE:		Ayes	Nays	Absent	Abstentions					
Total holding office: Mayor and 14 aldermen										

ATTEST:

Ellen Posledni, City Clerk

EXHIBIT "A"

TASK ORDER NO. 9

REGARDING GENERAL AGREEMENT BETWEEN CITY OF BATAVIA

AND

POWER SYSTEM ENGINEERING, INC.

Project Description: Design Paramount Substation Rebuild

Scope of Services: See Attached Proposal

Time of Performance: See Attached Proposal

Estimated Fee for Services: Not-to-Exceed \$386,000.00

Proposed: _____

Date

Approved:

City of Batavia

Date

September 20, 2017

Mr. Robert Rogde [via email: rrogde@cityofbatavia.net]
Senior Project Engineer
City of Batavia
Municipal Electric Utility
200 N Raddant Road
Batavia, IL 60510

***Subject: Batavia Distribution Substation Rebuild at the Paramount Substation
Substation Design Proposal***

Dear Bob:

Power System Engineering, Inc. (PSE) is pleased to provide the following proposed scope of work and cost estimate for professional engineering substation design services for the City of Batavia, IL (“Batavia” or “the City”). Tasks covered under this proposal include design and construction phase services for the new distribution substation to be rebuilt at the existing Paramount Substation.

We understand that this project is tentatively scheduled for design to begin in October 2018 with construction starting in 2019. It is desired that the substation be completed and in service before peak season in 2020, typically before June 1st, 2020. We are able to commit the resources required to support Batavia with this effort upon agreement of the proposal and can begin immediately.

Background and Project Description

The City has initiated a system upgrade program to rebuild the aged Paramount substation to address equipment that is at the end of its usable life span. The existing Paramount substation will be removed and replaced with a new Paramount substation.

The new 34.5 to 12.47 kV distribution substation will be a single transformer substation fed from the existing 34.5 kV system. The new distribution substation will extend 12.47 KV feeders to tie into the existing 12.47 kV distribution system which will allow for load transfer with other substations.

Proposed Scope of Work and Deliverables

High-level tasks include project kickoff, design, permitting support, preparation of specifications for equipment and labor procurement, coordination of acceptance testing quote, support for obtaining other outside services, and construction support. More details are below.

1. Project Kickoff Meeting

Scope of Work

A project kickoff meeting will be held onsite at the City's Public Works Building. The purpose of this meeting will be to discuss design parameters, specific requirements of the substation configuration, and project scheduling. Based on initial conversations with City personnel, it is desired that the substation design be similar in nature to the new Northeast Distribution Substation along with some aspects of the Cherry Park substation.

Deliverables

- Kickoff meeting onsite with City electric utility staff if needed. At present, with PSE's working knowledge of Batavia's system and the Northeast Distribution Substation, a kickoff meeting is not necessary to begin the design.
- Initial field review. This has been completed with past site visits.

Assumptions

- The City will provide preferred equipment standards and specifications.
- The City has already provided drawings of the NE, Paramount, and Cherry Park Substations for reference.

2. Substation Design

Scope of Work

The substation design is anticipated to be similar in nature to the new Northeast Distribution Substation with a few aspects similar to the Cherry Park Substation and possible modifications based on design coordination between City Personnel and PSE.

PSE, in coordination with City of Batavia personnel, will design the new 34.5 kV to 12.47 kV Paramount Distribution Substation at the site of the existing Paramount Substation and have it ready for connection to the existing 34.5 KV distribution system

Design efforts by PSE will include:

- Develop the design one-line and site plan.
- Review the existing relay plan for design consideration.
- PSE will provide a set of plans including, but not limited to, the following: one-line diagram, three-line diagram, site plan, foundation plan, grounding plan, conduit plan, substation plan and profile views, bill of materials, cable schedule, control building layout, AC and DC wiring diagrams, schematics, control, and interconnecting wiring diagrams to equipment.

- Develop the specification for 34.5 kV and 15 KV switchgear.
 - City personnel will be given the opportunity to review the procurement documents before issuing them for bids.
- Develop the drawings, bill of materials, specifications, and/or data sheets as may be needed to obtain the substation structural steel and electrical components (commonly known as the substation material package). This covers items such as steel structures, bus pipe, insulators, etc. Structural engineering such as structural steel design and calculations will be provided by the substation steel packager as specified by PSE.
 - City personnel will be given the opportunity to review the procurement documents before issuing them for bids.
- Develop the drawings, bill of materials, and specifications for relay panel procurement, and construction procurement.
 - City personnel will be given the opportunity to review the procurement documents before issuing them for bids.
- PSE will subcontract the civil design items with its standard subcontractor, SCS Engineers (SCS), for the substation site. SCS will work directly with PSE and PSE will coordinate with the City. SCS will provide specifications covering the earthwork/grading, erosion controls, and restoration.
- PSE will subcontract the foundation design within the substation with its standard subcontractor, Gaskell Engineering. Gaskell Engineering will work directly with PSE, and PSE will coordinate with the City.
- PSE, in conjunction with the City, will arrange for and obtain subsurface investigation (soil borings) as needed for the project. Locations will be coordinated by PSE based on foundation design requirements.
- PSE will prepare advertisements and will send advertisements directly to standard bidders. The City will place advertisements in the paper/electronically meeting city and state requirements for municipal bidding.
- PSE will be available to address bidder questions during the bidding process.
- PSE will prepare a ground grid model for ground grid design associated with the new distribution substation using existing soil resistivity testing if available. Due to the age of the substation and construction activities, the site will be designed with a completely new ground grid.
 - PSE can perform soil resistivity testing at an additional charge if existing soil resistivity data is unavailable.

- PSE will coordinate with City personnel to obtain a topographic survey of the substation site for design purposes.
- The new Paramount Distribution Substation will be designed with its own control building and battery system.
- For the substation design, the new relaying will be connected to an SEL RTAC for SCADA purposes.
- PSE will develop a quote document for acceptance testing procurement.
 - As a professional service, this is anticipated to be a quote.
- PSE will provide startup support.
- PSE will perform project management duties in conjunction with City personnel, such as creating a detailed project schedule, project updates (showing tasks completed, next tasks, etc.), and consulting with City personnel to answer questions that may arise. PSE will provide answers to third-party vendor questions and will assist with other project management duties.
- PSE will work closely with City staff to facilitate project communications that may include conference calls, emails, and meetings as needed for the design and construction phases of the work.

Deliverables

- Specifications and bidding documents for:
 - 35 kV and 15 kV switchgear
 - Substation structure and material package
 - Relay panels
 - Control building (either as part of relay panel specification or construction contract specification)
 - Construction
 - Testing and Commissioning quote document
- Bid tabulations, evaluations, and recommendations for bid packages noted above.
- Coordination of contract execution for bid packages noted above.
- Up to 9 site visits including:
 - 1 kickoff meeting
 - 2 bid openings
 - 1 construction pre-bid meeting.

- 1 preconstruction meeting
- 3 progress inspections (1 during foundation installation, 1 during other installation to be determined, 1 for punch list preparation)
- 1 for substation start-up
- Relay settings files for commissioning/testing personnel.
- Record drawings and specifications sealed by the Electrical Engineer and Structural Engineer of record. Record drawings will be AutoCAD and specifications will be PDF files.
- PSE prepared drawings in AutoCAD and manufacturer drawings as may be available from the manufacturers.

Assumptions/Clarifications

- The City has and will provide the standard “front end” specification sections for PSE to use in preparation of the bidding and contracting documents.
- The City will provide other standard specifications they may have available for other equipment, labor, etc. Should additional specifications not be available, PSE will use our standard specifications. The City will be given an opportunity to review and accept specification bid packages before they are issued.
- Existing substation drawings are accurate and complete.
- The City will pay the land surveyor directly for the topographic survey. This can be added to PSE’s scope and cost if the City would prefer that PSE handles hiring the land surveyor.
- The City will pay for the geotechnical investigation (soil borings) directly to the geotechnical firm. This can be added to PSE’s scope and cost if the City would prefer that PSE handles hiring the geotechnical firm.
- SCADA programming is not included in the substation scope; however, PSE has SCADA personnel available to assist with this if desired as part of a separate, agreed-upon scope of work and cost estimate.
- The incoming 34.5 kV feeder reconfiguration and the outgoing 12.47 kV distribution feeder connections to the distribution system are not part of the substation scope.
 - Conduit will be routed outside the substation fence for the distribution interconnection.
- The existing Delta Star transformer will remain and a new transformer is not planned for this substation. The layout design will attempt to keep the transformer on its existing pad and have the new substation laid out around it. The transformer has existing oil containment and it is assumed this will be adequate for the transformer.

- The City will relocate the fiber building for the rebuild of the substation. This relocation is not part of PSE's scope; however, we can assist at additional cost if the City would like assistance with this work item.
- Items for demolition/relocation such as the ASEA Substation Transformer or other miscellaneous items will be written into the construction specification for the contractor to move items to a Batavia-designated storage location within the city. We will work with City personnel to determine what should be done with the obsolete materials. If a disposal specification or sale of items is desired, a specification for this can be prepared at additional cost.
- Existing soil resistivity measurements are available and will be used for the ground grid design. If existing soil resistivity information is not available, PSE will perform the soil resistivity test on a time/materials basis. It is approximately 1 day of work to obtain the test results, so costs are minimal in the overall scope of the project.
- Ground grid resistance testing is not included, but can be included by PSE at an additional cost.
- The City will either provide the transmission fault current information or the ComEd contact for PSE to obtain the transmission fault current data.
- A transfer trip scheme between the 35 kV feeders is not included with the design; however, should it be desired, it could be added based on additional time required.
- A backup generator is not required for this distribution substation.
- Architectural services are not included with this proposal; however, they can be arranged at an additional charge if needed. It is anticipated the building design chosen by the City will come with calculations and architectural/engineering seal from the manufacturer.
- Warranty work associated with faulty equipment, materials, or construction is beyond our control. If additional time is needed to address warranty items, this will be billed on an actual cost basis.
- Updating the transmission studies, fault current studies, fuse and relay coordination studies, etc., are outside the scope of this proposal.
- The City will update and certify the spill prevention control and counter measure (SPCC) plan. PSE can prepare a SPCC plan at an additional cost, if needed.
- A substation operations and maintenance manual is not included but can be added if desired as part of a separate, agreed-upon scope of work and cost estimate.

3. Permitting

Scope of Work

A building permit will be obtained by City personnel if one is required.

Permits including storm water management and erosion control permits will be coordinated by PSE and their subcontractor. PSE/PSE's subcontractor will draft the necessary documentation for the City to file to obtain these permits. Permit fees will be paid to the permitting agency directly by the City.

New easements, property procurement, zoning changes, or variances are not anticipated for this substation project because it is an existing substation location. If new easements, property procurement, zoning changes, or variances become necessary, PSE will assist City personnel with obtaining these items at an additional charge based on the time required.

Deliverables

- Storm water management/erosion control permit application if needed.

Assumptions

- The City will be responsible for filing all permits.
- The City has either obtained or will obtain and record all necessary easements.

4. Construction Phase Support and Contract Closeout

Scope of Work

PSE will participate in construction status update meetings between the City and the Contractor. These meetings are anticipated to be held monthly throughout construction. PSE anticipates that many of the project status meetings will be held over the phone rather than in person, but if additional site visits beyond those defined in this proposal are deemed necessary, PSE standard rates will apply.

PSE will also be available for remote construction support via phone or email throughout the duration of the project. PSE will make an initial inspection early in construction, one later in the construction, as well as a final inspection. Any noted deficiencies in construction will be compiled in a punch-list for the Contractor to remediate. Following satisfactory completion of the project, PSE will develop the necessary contract closeout documents.

Deliverables

- Participate in project progress meetings when deemed necessary by the City.
- Initial or "25% Progress" construction inspection.
- Final construction inspection.
- Construction punch-list items.
- Preparation of contract closeout documents.

Project Schedule

PSE is willing to work with City personnel in an effort to fast-track design, bidding, and construction. Equipment lead times and coordination of substation installation will influence the project schedule. A preliminary schedule is included below demonstrating the approximate lead times for various items associated with the substation.

City of Batavia - Electric Division																										
Paramount Substation																										
Schedule of Events - Schedule subject to change																										
Latest revision: 9-20-2018																										
			<div style="display: flex; justify-content: space-between; font-size: small;"> ■ Approximate dates ■ Required Dates ■ Completed </div>																							
ID	Task Name	Duration	Sep 18	Oct 18	Nov 18	Dec 18	Jan 19	Feb 19	Mar 19	Apr 19	May 19	June 19	July 19	Aug 19	Sep 19	Oct 19	Nov 19	Dec 19	Jan 20	Feb 20	Mar 20	Apr 20	May 20	Jun 20		
Certificate of Authority -																										
	Kickoff meeting and field inspection																									
	Prepare project cost estimate																									
	PSC Coordination and application if required																									
	Preparation of one-line, site plan and relay plan																									
Substation design/construction																										
	Transformer		Transformer																							
	Existing		Existing to remain on site																							
	Switchgear (35 and 15 kV)		New Switchgear																							
	Prepare drawings and specifications		[Black bar from Sep 18 to Jan 19]																							
	Review		[Black bar from Sep 18 to Dec 18]																							
	Bidding		[Black bar from Jan 19 to Feb 19]																							
	Review bids		[Black bar from Feb 19 to Mar 19]																							
	Award contract		[Black bar from Mar 19 to Apr 19]																							
	Manufacturer fabrication	25-32 weeks	[Black bar from Apr 19 to Feb 20]																							
	Relay Panels		Relay Panels																							
	Prepare drawings and specifications		[Black bar from Sep 18 to Feb 19]																							
	Review		[Black bar from Sep 18 to Dec 18]																							
	Quoting phase		[Black bar from Jan 19 to Feb 19]																							
	Review quotes		[Black bar from Feb 19 to Mar 19]																							
	Award		[Black bar from Mar 19 to Apr 19]																							
	Manufacturer fabrication	16-20 weeks	[Black bar from Apr 19 to Feb 20]																							
	Substation material package		Material package																							
	Prepare drawings and specifications		[Black bar from Sep 18 to Jan 19]																							
	Review		[Black bar from Sep 18 to Dec 18]																							
	Bidding		[Black bar from Jan 19 to Feb 19]																							
	Review bids		[Black bar from Feb 19 to Mar 19]																							
	Award contract		[Black bar from Mar 19 to Apr 19]																							
	Manufacturer fabrication	20-28 weeks	[Black bar from Apr 19 to Feb 20]																							
	Construction (includes building and misc. materials)		Construction																							
	Prepare drawings and specifications		[Black bar from Sep 18 to Feb 19]																							
	Review		[Black bar from Sep 18 to Dec 18]																							
	Bidding		[Black bar from Jan 19 to Feb 19]																							
	Review bids		[Black bar from Feb 19 to Mar 19]																							
	Award contract		[Black bar from Mar 19 to Apr 19]																							
	Construction	20-26 weeks	[Black bar from Apr 19 to Feb 20]																							
	Acceptance testing and start up		[Black bar from Mar 20 to Apr 20]																							
	Acceptance testing		[Black bar from Mar 20 to Apr 20]																							

Cost Estimate

The table below outlines the costs to complete the scope of work and deliverables described above. PSE will attempt to participate in multiple tasks during any site visits in order to reduce travel expenses (for example, a construction inspection will be scheduled for the same day as a project progress meeting).

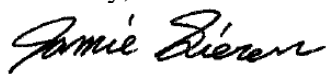
Task	Qty.	Unit	Estimated Blended Hourly Rate	Cost
Foundation design	1	Lot		\$25,000
Site grading design and oil containment design	1	Lot		\$30,000
Relay settings	1	Lot		\$40,000
Engineering, including project and contract management (Estimated hours)*	1820	Hours	\$160	\$291,000
Total Not to Exceed Estimate (<u>includes</u> travel expenses)				\$386,000

* The listed hourly rate is the estimated average rate of all involved personnel. Individual rates will be higher and lower; however, the overall average is anticipated to be approximately \$160/hr.

Please feel free to contact me if you have any questions, need additional information, or would like us to redefine our proposed scope of work and deliverables in any way. I can be reached via email at sierenj@powersystem.org or direct line at 608-268-3552.

I look forward to speaking with you.

Sincerely,



Jamie Sieren
Senior Consultant

This proposal has been reviewed and approved by Jeff Triplett, Vice President and duly authorized officer of the company.



Jeff Triplett, PE.
Vice President