SUPPLEMENTAL AGREEMENT FOR ASSIGNED PROJECT

Consultant: LEIDOS ENGINEERING, LLC

Project Name: Substation Standards Support

This Project Narrative for Substation Standards Support ("Project"), a copy of which is attached hereto as Exhibit "A" and incorporated herein by this reference, and Consultant's proposal dated 17th day of October 2018, a copy of which is attached hereto as Exhibit "B" and incorporated herein by this reference, shall constitute a supplement to the Master for Professional Consultant Services Agreement for Various Engineering Services for Public Utilities Department, Electric Division, Non-G.O. 165 Projects by and between City and Consultant dated 28th day of March, 2017 (the "Agreement"). Consultant agrees to perform the services described in the Project Narrative within the time set forth in the Notice to Proceed for a not-to-exceed amount of Three Hundred Thousand Dollars ($300,000.00), unless otherwise modified by Change Order. Performance of the Services shall be subject to the terms and conditions contained in the Agreement.

Dated this 22nd day of March, 2019.

CITY OF RIVERSIDE, a California charter city and municipal corporation

By: _____
City Manager

APPROVED AS TO FORM:

By: _____
Assistant City Attorney

Certified as to Availability of Funds:

By: _____
Finance Director

ATTEST:

By: _____
City Clerk

LEIDOS ENGINEERING, INC.
a Delaware corporation authorized to do business in California

By: Raymond Okeke

Title: Vice - President

By: Samantha Pori

Title: Assistant Secretary

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16-1421.2 SDW 01/11/19

EXHIBIT "A"

PROJECT NARRATIVE

Exhibit A
Scope of Services

1. RPU Substation Standards Committee support.
    a. Prepare and maintain a list of work assignments, status, staff hours accrued to date, responsible party and scheduled completion date. Update monthly.
    b. Prepare and submit information requests to clarify any issues related to a work assignment. Track status monthly.
    c. Issue a Substation Standards Committee agenda with all deliverable items to be reviewed one week prior to the monthly meeting
    d. Conduct an on-site or webinar based meeting with the RPU Substation Standards Committee to review work progress on a monthly basis
    e. Prepare minutes of the Substation Standards Committee meeting and issue for comment within one (1) business day after the meeting, including an action items list showing scope, due date and responsible party.
    f. Issue final minutes within one week following the monthly meeting.
    g. Issue completed deliverables within one week following approval by the Substation Standards Committee.
    h. Submit detailed invoices for Substation Standards Support monthly, in conjunction with final Substation Standards Committee Meeting minutes and completed deliverables.

2. Substation Apparatus Specification – Review and revise existing specifications to consistent format, citing current applicable IEEE, ANSI and other applicable industry standards. Develop new specification where specification does not currently exist. Submit for review: outline, 30% draft, 60% draft, 90% final review. Incorporate review comments from the RPU Substation Standards Committee at each review stage. Deliverable is a Word Document for each specification. AutoCAD drawings or templates may be required for: equipment outline, plan, elevation, section, anchor bolt layout and physical detail; single-line, three-line, AC and DC schematic drawings; wiring diagrams; logic diagram or other drawings necessary for a complete specification.
    a. 67/12.47kV Power Transformer
    b. 15kV Switchgear
    c. Control Building/ Relay Panel
    d. Fiber Optic Communications Rack
    e. Substation Automation Rack
    f. Batteries/Battery Charger
    g. 69kV Circuit Breaker
    h. 69kV Circuit Switcher
    i. 69kV Disconnect Switches
    j. 69kV GIS Substation
    k. 15kV Metal-clad Capacitor Bank

3. Specifications for Substation Site Development - Review and revise existing specifications to consistent format, citing current applicable IEEE, ANSI and other applicable industry standards and regulations. Develop new specification where specification does not currently exist. Cite and comply with City of Riverside Public Works Department Requirements for Grading Plans and Site Development. Cite and

comply with Riverside County Flood Control District Requirements for storm water run-off and pollution prevention plans. Submit for review: outline, 30% draft, and 90% final review. Incorporate review comments from the RPU Substation Standards Committee at each review stage. Deliverable is a Word Document for each specification. AutoCAD drawings or templates may be required for: grading plan and erosion control details; storm drain plan, section, elevation and details; wall plan, section, elevation, and physical details; gate fabrication details, mounting and motor operator; water system plan, elevation and details; wastewater system plan, elevation and details; landscape plan, details and irrigation plan; security system plan, elevation, sections details and schematics or other drawings necessary for a complete specification.

a. earthwork/grading
b. erosion protection
c. drainage plan and storm drain system
d. Block Wall
e. Gates
f. Water system
g. Sanitary Sewer system
h. Landscaping and irrigation
i. Security
    i. Access Control
    ii. Intrusion Detection
    iii. Video Surveillance
    iv. Lighting

4. Request For Proposal Template - Review and revise existing Request for Proposal (RFP) Templates to consistent format. Develop new RFP template where RFP template does not currently exist. Submit for review: outline, 30% draft, and 90% final review. Incorporate review comments from the RPU Substation Standards Committee at each review stage. Deliverable is a Word Document for each RFP Template.
    a. Construction
    b. Design-Build
    c. Consultant

5. Construction Design Package – Develop a complete construction design package for Submit for review: outline, 30% draft, and 90% final review. Incorporate review comments from the RPU Substation Standards Committee at each review stage. Deliverable is a Word Document and related AutoCAD drawings for each package.
    a. Physical, schematic and wiring package for 15kV Switchgear
    b. Physical, schematic and wiring package for 69kV Relay Panels
    c. Physical, schematic and wiring package for Fiber Optic Communications Rack
    d. Physical, schematic and wiring package for 69kV Circuit Switchers
    e. Physical, schematic and wiring package for 69kV Circuit Breakers
    f. Physical, schematic and wiring package for 67/12.47kV Power Transformers
    g. Logic Diagrams for Protection and Automation schemes
    h. Physical, schematic and wiring Substation Automation System (SAS)

i. Physical, schematic and wiring Supervisory Control and Data Acquisition System (SCADA)
j. Physical, schematic and wiring Operational Data Management System (ODMS)
k. Automation points/architecture (Operational/non-operational)
l. Physical drawings for control Building
m. Foundation Standards for:
    i. Power Transformers
    ii. 69kV circuit breakers
    iii. 69kV circuit switcher
    iv. 69kV Potential Transformer (PT)
    v. 69kV Power Potential Transformer (PPT)
    vi. 15kV switchgear
    vii. control building
    viii. 15kV capacitor banks
n. Block Wall/Gates

6. Substation Design & Construction Standards (SDCS) - Review and revise existing SDCS to consistent format, citing current applicable IEEE, ANSI and other applicable industry standards. Develop new SDCS where specification does not currently exist. Submit for review: outline, 30% draft, and 90% final review. Incorporate review comments from the RPU Substation Standards Committee at each review stage. Deliverable is an AutoCAD drawing with one or more sheets for each SDCS.
    a. Grounding
    b. Lightning Protection
    c. Site lighting (other than security lighting)
    d. Battery/Battery Charger
    e. Conduits
    f. Wiring/cables
    g. The naming convention for SCADA/ODMS Points
    h. Design Criteria/Philosophy Standard
    i. Protection Philosophy (update existing)

7. Operations, Maintenance and Testing Procedures - Review and revise existing procedures to consistent format, citing current applicable IEEE, ANSI and other applicable industry standards or General Orders. Develop new procedure where procedure does not currently exist. Submit for review: outline, 30% draft, and 90% final review. Incorporate review comments from the RPU Substation Standards Committee at each review stage. Deliverable is a Word Document for each procedure. AutoCAD drawings or Visio process flow charts may be necessary for a complete procedure.
    a. General Order No. 174 (GO 174)
    b. Maintenance and Testing Programs
        i. Periodic and non-periodic inspection
        ii. 69KV Circuit Breaker Maintenance and Testing
        iii. Relay/communication testing
        iv. Ground grid testing/inspection

v. Transformer/LTC and ancillaries
vi. Battery/Battery Charger Testing
vii. Switchgear Maintenance/Testing
viii. Capacitor Bank Maintenance/Testing

8. Substation Automation Convert DAQ RTU to SEL RTAC – Develop a conversion standard for Submit for review: outline, 30% draft, and 90% final review. Incorporate review comments from the RPU Substation Standards Committee at each review stage. Deliverable is a Word Document and related AutoCAD drawings for each DAQ RTU conversion to SEL RTAC.
    a. Analog
    b. Status
    c. Control
    d. RTU Alarms

EXHIBIT "B"

CONSULTANT'S PROPOSAL

October 17, 2018

leidos

Section A: Cover Letter

Mr. Jairo Cortez
City of Riverside
3900 Main Street, 6th Floor
Riverside, CA 92522

Via PlanetBids Submittal

Subject: **Proposal for Professional Services – Substation Standards Support – RFP No. 1842**

Dear Mr. Cortez:

The City of Riverside (City) is seeking a qualified company to provide consulting engineering, design, and technical support related to substation standards support, and Leidos Engineering, LLC (Leidos) is prepared to perform the services as outlined in the City's Request for Proposals (RFP). We propose to perform the following project types:

- Substation Apparatus Specification
- Specifications for Substation Site Development
- Construction Design Package
- Substation Design and Construction Standards (SDCS)

We are not bidding the other project types listed in the RFP.

The team that will execute the City's projects has the requisite skills and first-hand experience necessary to meet the City's requirements to serve as a staff extension, providing support related to standards development in collaboration with the City. We offer significant knowledge of municipal electric power substations, electrical apparatus specifications, site development/design, protection and controls (P&C), and transmission and distribution systems.

Members of our team have provided substation design services to the City and other California clients, making us familiar with system conditions, equipment, and relevant standards and specifications. For example, our Project Manager, Adam Stevenson, has 17 years of experience leading substation and P&C design, as well as direct experience conducting substation projects for the City including the Mt. View, Riverside, and Casa Blanca Substations. Ken Aldridge, P.E. and Baker Tee, P.E., who are licensed Professional Engineers in the State of California, bring the professional credentials required to perform this project.

Mr. Stevenson is Leidos' single point of contact to the City during the RFP review process. If you have questions about the enclosed proposal or require additional information, please contact Mr. Stevenson at (615) 431-3224 or adam.w.stevenson@leidos.com. Leidos is prepared to enter into a contract under the Terms and Conditions of the City's RFP and Sample Agreement. All elements of the RFP are understood.

Sincerely,
Leidos Engineering, LLC

Samantha Prociv

Samantha J. Prociv
Senior Contracts Representative

SECTION B

Work Plan

Project Approach and Example Work Plan Tasks

The goal of the substation standards project is to provide RPU with deep expertise and professional services related to the development of substation standards. The outcome of the project will be standards that meet industry technical standards and best practices, while incorporating RPU's preferences and specific requirements.

Leidos proposes a collaborative approach to providing services related to substation standards support, working closely with Riverside Public Utilities (RPU) to create a powerful, efficient and seamless team.

We will support select areas of the RFP scope including the following tasks:

- Substation Apparatus Specifications
- Specifications for Site Development
- Construction Design Package
- Substation Design and Construction Standards

With detailed knowledge of RPU's electric system and specific experience on the Riverside, Casa Blanca, and Mt. View Substation projects, the proposed team will immediately be able to mobilize and begin work with minimized ramp-up time.

Based on our review of the RFP document and drawings, we have identified the work flow tasks for each of the selected areas of the scope. The work plan steps and the associated workflow outlined will be followed for each of the example projects Leidos proposes to support:

- Substation Apparatus Specification (RFP Project 2: Review and Update 69 kV Circuit Breaker Specification)
- Specifications for Substation Site Development (RFP Project 3: Prepare Substation Site Development Specification Outline – Hunter Site)
- Construction Design Package (Project 5: Review and Update SCADA points list)
- Substation Design and Construction Standards (Project 6: Review and Update Substation Design & Construction Standards – Key Interlock Sequence University Substation 12 kV Switchgear)

Work Plan Tasks

Substation Apparatus Specification

- For each piece of electrical apparatus, secure any existing specifications that RPU maintains or provide Leidos' standard specification as an initial draft
- Prepare basis of design and specific application criteria for all substations that the specification will be used
- Collaborate with RPU to review any specifics regarding preferences
- Identify applicable industry standards
- Develop any required drawings for inclusion in the specification
- Prepare 30% draft, 60% draft, and 90% final review versions of all documents to RPU for review
- Participate in meetings with RPU Substation Standards Committee to discuss and review comments, and incorporate appropriate comments into the subsequent versions, progressing toward final completion
- Provide final version in Microsoft® Word format along with any developed drawings in AutoCAD format

Specifications for Site Development

- Secure any existing specifications that RPU maintains or provide Leidos' standard specification as an initial draft
- Prepare basis of design and specific application criteria for all substations for which the specification will be used
- Cite and develop compliance criteria with City of Riverside Public Works Department for Grading Plans and Site Development as well as Riverside County Flood Control District Requirements for storm water run-off and pollution prevention plans
- Collaborate with RPU to review any specifics regarding preferences
- Identify applicable industry standards
- Develop any required drawings for inclusion in the specification Including the following:
  - Grading and drainage plan
  - Erosion control plan and details
  - Storm drain plan, section and details
  - Wastewater system plan, elevation, and details
  - Block wall plan and details
  - Irrigation plan and details
  - Security Fencing plan and details
- Prepare 30% draft, 60% draft, and 90% final review versions of all documents to RPU for review

- Participate in meetings with RPU Substation Standards Committee to discuss and review comments, and incorporate appropriate comments into the subsequent versions, progressing toward final completion
- Provide final version in Microsoft® Word format along with any developed drawings in AutoCAD format

Construction Design Package

- Secure any existing specifications that RPU maintains or provide Leidos' standard construction specifications as an initial draft
- Prepare basis of design and specific application criteria for all substations for which the specification will be used
- Collaborate with RPU to review any specifics regarding preferences
- Identify applicable industry standards
- Develop any required drawings for inclusion in the specification Including the following:
  - Physical, schematic and wiring package for 15 kV Switchgear
  - Physical, schematic and wiring package for 69 kV Relay Panels
  - Physical, schematic and wiring package for Fiber Optic Communications Rack
  - Physical, schematic and wiring package for 69 kV Circuit Switchers
  - Physical, schematic and wiring package for 69 kV Circuit Breakers
  - Physical, schematic and wiring package for 67/12.47 kV Power Transformers
  - Logic Diagrams for Protection and Automation Schemes
  - Physical, schematic, and wiring for Substation Automation System
  - Physical, schematic, and wiring for SCADA System
  - Physical, schematic, and wiring for Operational Data Management System
  - Automation points Architecture
  - Control Building physical drawings
  - Foundation standards for power transformers, power circuit breakers/switchers, instrument and power transformers, switchgear, control building, capacitor banks, and additional auxiliary equipment
  - Block wall and gates
- Prepare 30% draft, 60% draft, and 90% final review versions of all documents to RPU for review
- Participate in meetings with RPU Substation Standards Committee to discuss and review comments, and incorporate appropriate comments into the subsequent versions, progressing toward final completion
- Provide final version in Microsoft® Word format along with any developed drawings in AutoCAD format

Substation Design and Construction Standards

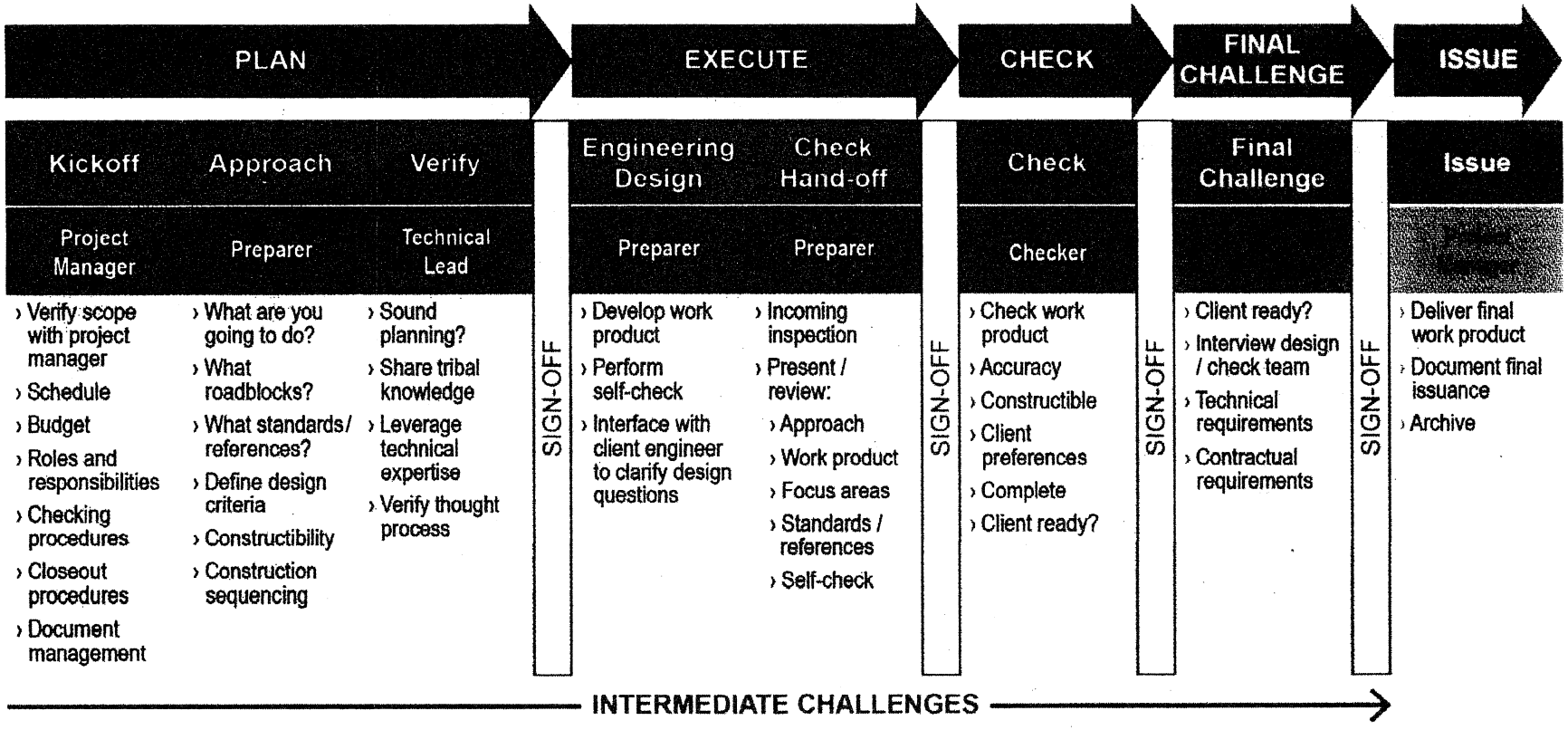
- Secure any existing standards that RPU maintains or provide Leidos' standard design and construction standard as an initial draft
- Prepare basis of design and specific application criteria for all substations for which the standard will be used
- Collaborate with RPU to review any specifics regarding preferences
- Identify applicable industry standards
- Develop any required drawings for inclusion in the standard Including the following:
  - Grounding
  - Shielding and lightning protection
  - Site lighting and illumination
  - DC system including cells, racks, charger, and auxiliary equipment
  - Conduit and cable systems
  - Naming convention and practices for SCADA and outage data management systems
  - Design criteria/philosophy standard and practice
  - Substation protection and control criteria/philosophy
- Prepare 30% draft, 60% draft, and 90% final review versions of all documents to RPU for review
- Participate in meetings with RPU Substation Standards Committee to discuss and review comments, and incorporate appropriate comments into the subsequent versions, progressing toward final completion
- Provide final version in AutoCAD format

Quality Management

Leidos strives to maintain meticulous attention to quality in our work products. To do so, Leidos requires clearly established responsibility, accountability, and authority for well-defined quality assurance/quality control (QA/QC) procedures for each project. Individual project QC is backed by appropriate company-wide QA requirements. Leidos' philosophy is to proactively instill project quality and prevent project problems rather than react to project problems that might result from poor QA.

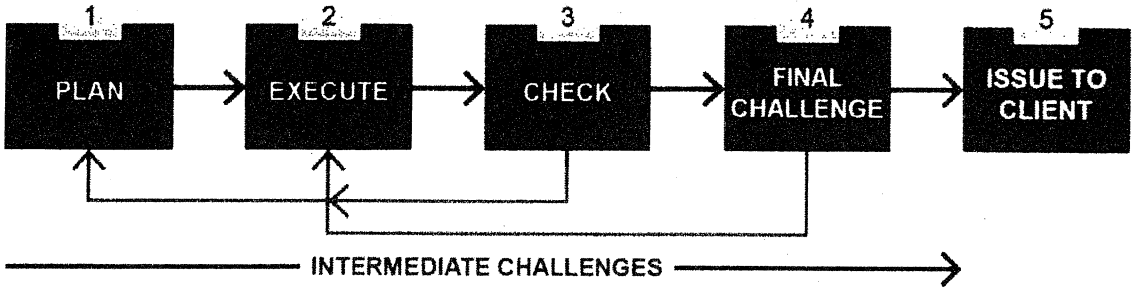
Leidos' project quality management process, which is illustrated in **Figure B-1** and summarized below, is applied concurrently with the client's engineering quality process for work to be performed.

Figure B-1. Leidos' QC Process



At the initiation of each project, the program manager reads and understands the contractual requirements to assure that the project's scope and associated approaches, standards, lessons learned, and client preferences are defined and that the project team is selected to meet the QC requirements of the project.

Figure B-2. Leidos' Project Quality Lifecycle



- Preparer of the work package meets with the project manager and the technical lead to verify the scope of the work package and discuss the conceptual **PLAN** for the project
- Preparer then **EXECUTES** the work and performs self-checks prior to submitting the work product to a formal check phase
- Individual identified to check the package performs a complete **CHECK** of every document that represents or incorporates work involved in the scope of work. The check process verifies that the results presented are accurate, reasonable, complete, and consistent with the stated requirements of the assignment as set forth in the Project Quality Management Plan
- Following the check, the project deliverable is **CHALLENGED** for accuracy, completeness, and adherence to scope by the challenge review team

QA is accomplished by the company to verify that the work has been performed in accordance with the established QC requirements. Leidos conducts periodic independent audits to make sure that the established quality processes are being followed.

Opportunities for Project Optimization

To provide overall project optimization and efficiency, Leidos will provide standard specifications and design standards as an initial draft, when there are no existing RPU standards in place. These specifications and standards have been developed, refined, and maintained over the course of project execution for hundreds of utilities.

Proposed Staff Utilization

Following is a summary of select project team leadership and their associated project task assignments. Information on the full team of experts assigned to this project is included in **Section E: Key Project Personnel**.

Table B-1. Tasks and Staff Assignments

Staff/Role	Task Assignments
Adam Stevenson – Project Manager	Project management, document management and control, and technical support
Baker Tee, P.E. – Principal Civil Engineer	Civil design (foundation evaluation/design), site design development, and technical support
Ken Aldridge – Principal Electrical Engineer and Apparatus Engineer	Equipment and construction specification/standards development. Physical design, analysis, and technical support
Robert Jenkins, P.E. – Principal SCADA Engineer	Protective relay scheme designs, SCADA/automation points list, logic diagrams, and technical support

Addressing Possible Issues

Collaborating with larger groups of stakeholders to address concerns and input can be a challenge during development of standards projects. Regular, intentional communication will facilitate resolution of this challenge. Leidos looks forward to applying solid communication practices as detailed in the section below.

Project Management and Communication

Leidos will attend the project kickoff meeting, meetings via conference calls to review the project, and will prepare and distribute meeting minutes to project team. Leidos will also prepare monthly progress reports that include:

- Description of work completed during the period
- Description of work in progress
- List of outstanding issues requiring action and continuing register
- List of out of scope work and approximate cost and schedule impact, if any
- Schedule update and critical path item identification
- Recovery plan, if any activities are behind schedule

Schedule for Example Projects

The expected duration for each of the identified sample projects is as outlined in **Section C: Project Schedule**, in Microsoft® Project format.

SECTION C

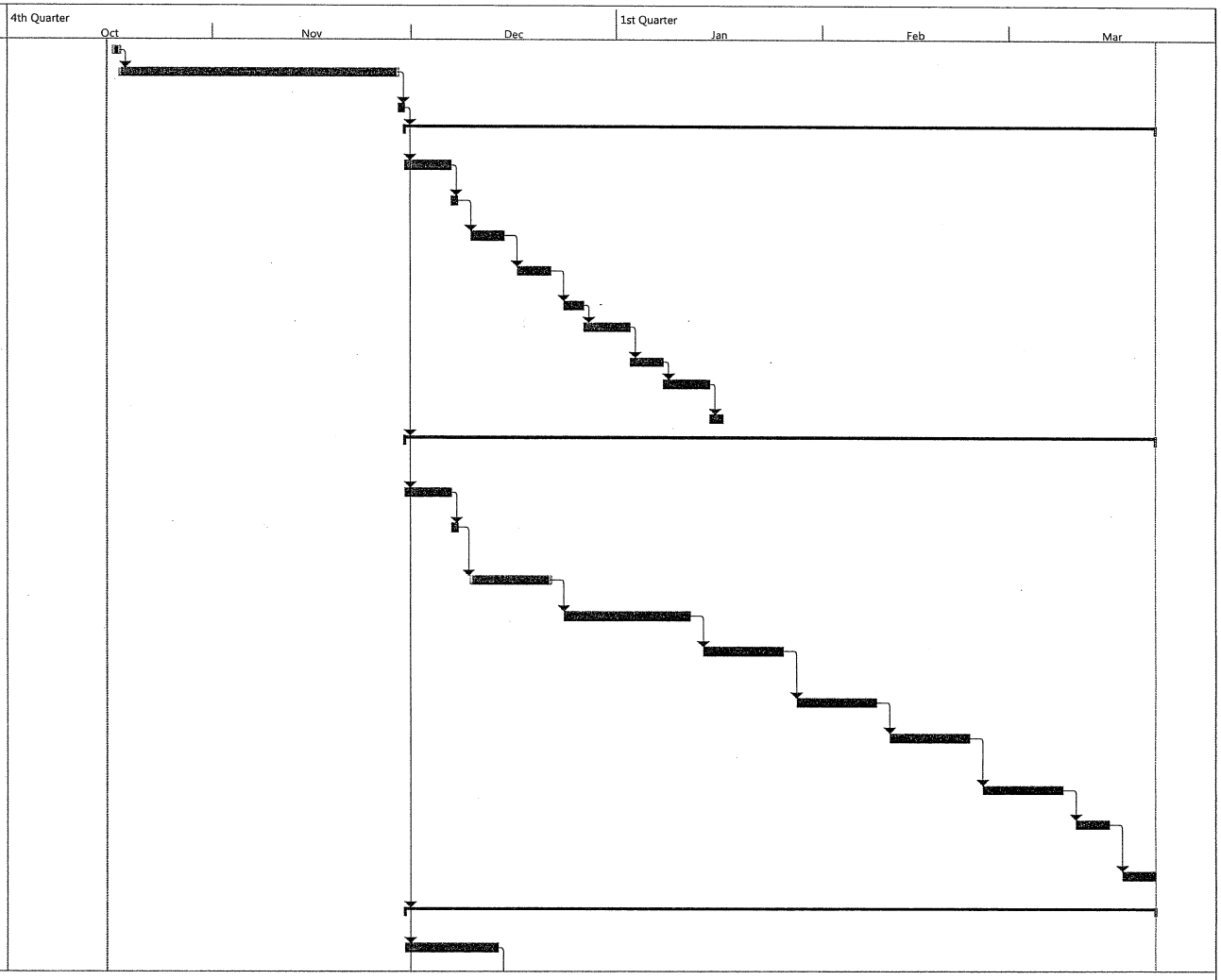
Project Schedule

We have prepared the project schedule based on an Engineering Notice to Proceed occurring on November 29, 2018.This schedule includes the tasks for which Leidos is proposing, all commencing upon the Notice to Proceed. These schedules are for illustrative purposes, demonstrating the approximate duration for each task. These dates would be adjusted as each task is assigned. Our schedule to complete the work associated with the substation standards support is provided in the following pages in Microsoft® Project format.

Leidos will conduct weekly internal project meetings and project time charge reports and compare them to actual work to verify that project costs and work are on schedule. In addition, a monthly status report will be provided to RPU with each invoice.

Leidos is capable of providing project schedules in the Oracle Primavera scheduling software format.

ID	Task Name	Duration	Start	Finish	Predecessors
1	Engineering Proposal Due	1 day	Wed 10/17/18	Wed 10/17/18	
2	Engineering Contract Award	30 days	Thu 10/18/18	Wed 11/28/18	1
3	Engineering Notice to Proceed	1 day	Thu 11/29/18	Thu 11/29/18	2
4	**Review & Update 69 kV Breaker Specification**	**81 days**	**Fri 11/30/18**	**Fri 3/22/19**	**3**
5	Identify and Gather initial base Spec	5 days	Fri 11/30/18	Thu 12/6/18	3
6	Kick-Off meeting with RPU to discuss applications/preferences	1 day	Fri 12/7/18	Fri 12/7/18	5
7	Develop 30% Breaker Spec draft version	5 days	Mon 12/10/18	Fri 12/14/18	6
8	RPU review 30% Breaker Spec draft and provide comments	5 days	Mon 12/17/18	Fri 12/21/18	7
9	Prepare 60% Breaker Spec	3 days	Mon 12/24/18	Wed 12/26/18	8
10	RPU review 60% Breaker Spec and provide comments	5 days	Thu 12/27/18	Wed 1/2/19	9
11	Prepare 90% Breaker Spec	3 days	Thu 1/3/19	Mon 1/7/19	10
12	RPU review 90% Breaker Spec and provide comments	5 days	Tue 1/8/19	Mon 1/14/19	11
13	Finalize Breaker Spec	2 days	Tue 1/15/19	Wed 1/16/19	12
14	**Prepare Substation Site Development Spec - Hunter Substation**	**81 days**	**Fri 11/30/18**	**Fri 3/22/19**	**3**
15	Identify and Gather initial base GA and Layout Specifications	5 days	Fri 11/30/18	Thu 12/6/18	3
16	Kick-Off meeting with RPU to discuss applications/preferences	1 day	Fri 12/7/18	Fri 12/7/18	15
17	Collaborate with RPU Public Works and Riverside County	10 days	Mon 12/10/18	Fri 12/21/18	16
18	Develop 30% Site Spec Design Package	15 days	Mon 12/24/18	Fri 1/11/19	17
19	RPU review 30% Site Spec Design Package draft and provide comments	10 days	Mon 1/14/19	Fri 1/25/19	18
20	Prepare 60% Site Spec Design Package	10 days	Mon 1/28/19	Fri 2/8/19	19
21	RPU review 60% Site Spec Design Package and provide comments	10 days	Mon 2/11/19	Fri 2/22/19	20
22	Prepare 90% Site Spec Design Package	10 days	Mon 2/25/19	Fri 3/8/19	21
23	RPU review 90% Site Spec Design Package and provide comments	5 days	Mon 3/11/19	Fri 3/15/19	22
24	Finalize Site Spec and Design Package	5 days	Mon 3/18/19	Fri 3/22/19	23
25	**Prepare Substation Construction Design Package**	**81 days**	**Fri 11/30/18**	**Fri 3/22/19**	**3**
26	Identify and Gather initial Spec base versions	10 days	Fri 11/30/18	Thu 12/13/18	3

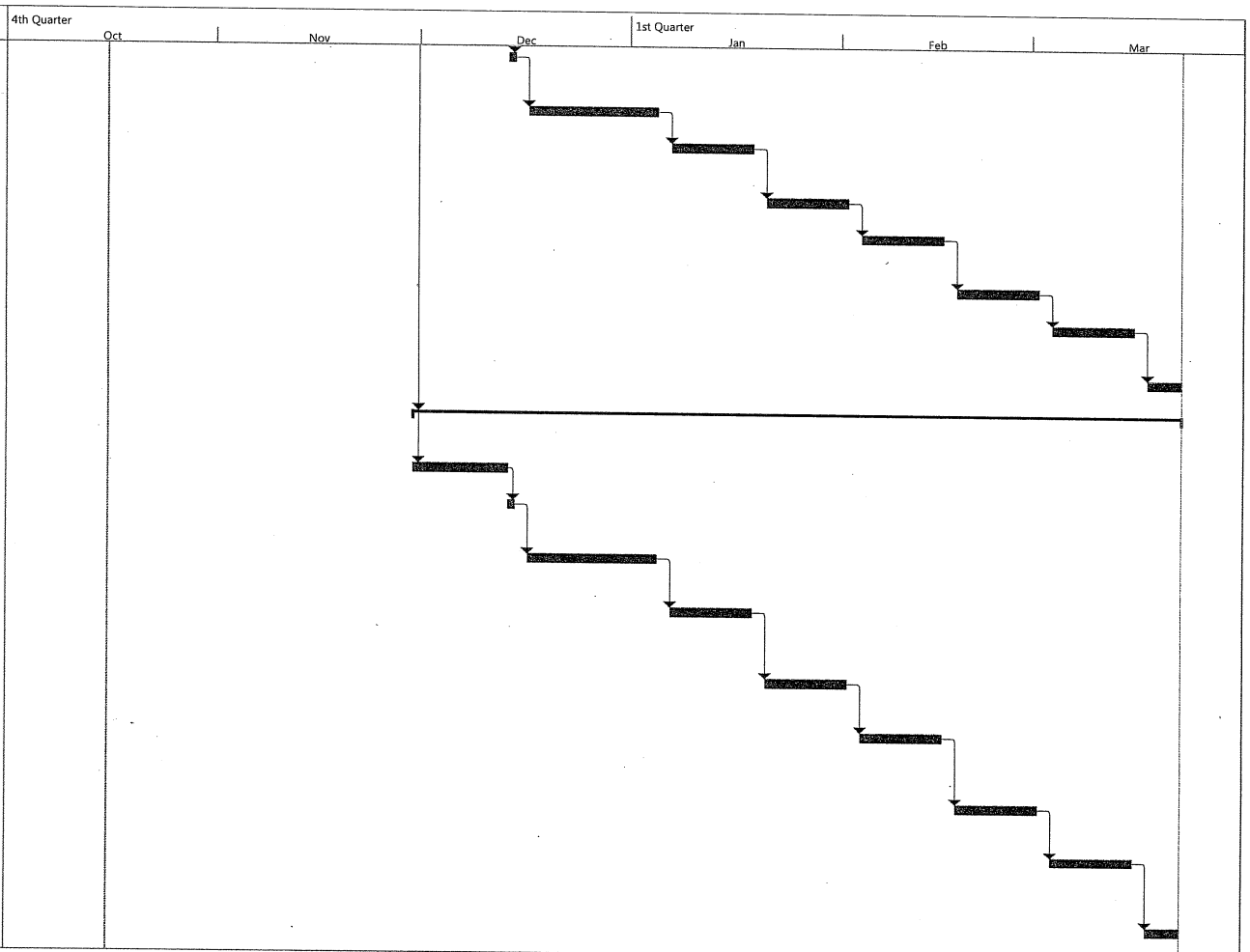


Project: Project1
Date: Tue 10/16/18

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

Leidos

ID	Task Name	Duration	Start	Finish	Predecessors
27	Kick-Off meeting with RPU to discuss applications/preferences	1 day	Fri 12/14/18	Fri 12/14/18	26
28	Develop 30% Construction Design Package	15 days	Mon 12/17/18	Fri 1/4/19	27
29	RPU review 30% Construction Design Package draft and provide	10 days	Mon 1/7/19	Fri 1/18/19	28
30	Prepare 60% Construction Design Package	10 days	Mon 1/21/19	Fri 2/1/19	29
31	RPU review 60% Construction Design Package and provide	10 days	Mon 2/4/19	Fri 2/15/19	30
32	Prepare 90% Construction Design Package	10 days	Mon 2/18/19	Fri 3/1/19	31
33	RPU review 90% Constuction Design Package and provide comments	10 days	Mon 3/4/19	Fri 3/15/19	32
34	Finalize Construction Design Package	5 days	Mon 3/18/19	Fri 3/22/19	33
35	**Prepare Substation Design & Construction Design Standards**	**81 days**	**Fri 11/30/18**	**Fri 3/22/19**	**3**
36	Identify and Gather initial Spec base standards	10 days	Fri 11/30/18	Thu 12/13/18	3
37	Kick-Off meeting with RPU to discuss applications/preferences	1 day	Fri 12/14/18	Fri 12/14/18	36
38	Develop 30% Substation Design & Construction Standard	15 days	Mon 12/17/18	Fri 1/4/19	37
39	RPU review 30% Substation Design & Construction Standard draft and provide	10 days	Mon 1/7/19	Fri 1/18/19	38
40	Prepare 60% Substation Design & Construction Standard	10 days	Mon 1/21/19	Fri 2/1/19	39
41	RPU review 60% Substation Design & Construction Standard and provide comments	10 days	Mon 2/4/19	Fri 2/15/19	40
42	Prepare 90% Substation Design & Construction Standard	10 days	Mon 2/18/19	Fri 3/1/19	41
43	RPU review 90% Substation Design & Constuction Standard and provide comments	10 days	Mon 3/4/19	Fri 3/15/19	42
44	Finalize Substation Design & Construction	5 days	Mon 3/18/19	Fri 3/22/19	43



Project: Project1
Date: Tue 10/16/18

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

SECTION D

Project Experience

Leidos has performed hundreds of complete substation designs including design, equipment specifications, and construction specifications for multiple utility clients as well as extensive standards development. **Figure D-1** details the representative Leidos project experience completed in the last five years that applies to the following types of services outlined in the RFP.

1. Substation Apparatus Specification
2. Specifications for Substation Site Development
3. Construction Design Package
4. Substation Design and Construction Standards (SDCS)

A description of each project is provided in this section, including the client's name and contact information, completion date, budget, and project scope.

Figure D-1. Representative Project Experience

Project	Type of Service			
	1	2	3	4
Project #1: Mecca Pike Substation* Etowah Utilities	✓	✓	✓	✓
Project #2: Campbell Lane Substation Bowling Green Municipal Utilities	✓	✓	✓	✓
Project #3: North and Spring Creek Substations Breaker Replacements Tullahoma Utilities Authority	✓		✓	✓
Project #4: Progress Substation PPL Electric Utilities	✓		✓	✓
Project #5: Specifications Development* Fort Pierce Utilities Authority	✓			
Project #6: Fort Campbell Army Base 59th Street Substation Groves Construction	✓	✓	✓	✓
Project #7: North and South Cullman Substations* Cullman Electric Power Board	✓	✓	✓	✓

Example deliverable provided in* **Section H: Examples of Prior Project Deliverables.

Project Experience Details

Project #1: Mecca Pike Substation

Client name:
Etowah Utilities

Contact information:
Ronnie Camp, Engineering Manager
(423) 263-3920, rcamp@eubnet.org
1313 South Tennessee Avenue, Etowah, TN 37331

Completion date:
November 2016

Budget:
$190,000

Project scope:
Leidos provided design and engineering services associated with the new substation in Etowah, Tennessee, a 161-13 kV substation with metal-clad switchgear. This substation included primary and back-up circuit switchers on each transformer bank, 161-13 kV, 18 MVA power transformers with load tap changer, Tennessee Valley Authority metering installation, and 13 kV metal-clad switchgear for the distribution facilities. SEL relays were integrated into the switchgear on separate panels for the complete relay and control scheme.

Services included complete design, development of all construction and apparatus (power transformers, circuit switchers, metalclad switchgear) specifications, and contract documents for the procurement of the site; construction standards, labor, and materials for construction of the station; and protective relay settings and control panels. We also provided schematic development, grounding plan (including soil resistivity field measurements), interconnection diagrams, and relay settings. Additionally, Leidos performed periodic construction site visits to monitor the contractor's progress and adherence to the construction specifications.

Project #2: Campbell Lane Substation

Client name:
Bowling Green Municipal Utilities (BGMU)

Contact information:
Brent Norris, Electric Substation and Metering Supervisor
(270) 782-4390, brent.norris@bgmu.com
801 Center St., Bowling Green, KY 42101

Completion date:
May 2016

Budget:
$135,000

Project scope:
BGMU required design and engineering services related to the construction of the new Campbell Lane Substation. Leidos provided field investigations, preliminary design, design and procurement, and construction phase engineering.

The Campbell Lane Substation required the installation of:

- One pre-fabricated 12.47 kV metal-clad switchgear building which housed the 12.47 kV distribution breakers, relay panels, DC battery system, and SCADA equipment
- One 69-12.47 kV power transformer (15/20/25 MVA)
- One 69 kV power circuit breaker
- Nine 12.47 kV voltage regulators
- Three 12.47 kV underground distribution circuits

BGMU personnel and Leidos team members collaborated to meet BGMU's needs for the new Campbell Lane Substation, including a cost-efficient design that is flexible and enduring.

Project #3: North and Spring Creek Substations Breaker Replacements

Client name:
Tullahoma Utilities Authority

Contact information:
Brian D. Coate, P.E., Vice-President, Electric and Fiber Systems
(931) 571-7108, bcoate@tullahomautilities.com
901 South Jackson Street, Tullahoma, TN 37388

Completion date:
September 2018

Budget:
$60,000

Project scope:
Leidos provided design and professional services associated with replacing a 161 kV oil-filled circuit breaker with an SF6 circuit breaker at the North Substation and a 46 kV with SF6 Breakers at the North Substation and the Spring Creek substation over a three-year period. Leidos performed extensive relay system upgrades, and performing substation high-voltage switch replacements. The existing electromechanical relays were replaced with microprocessor based SEL relays to include transformer differential protection, high-side overcurrent and back-up ground protection, and 13 kV bus differential protection. A fast bus tripping scheme was implemented on the 13 kV bus protection scheme.

Leidos performed the following tasks to support the design.

- Modified the existing single-line and three-line diagrams to reflect the removal and new installation
- Prepared 161 and 46 kV breaker specifications in collaboration with the customer
- Prepared physical installation drawings for the new breaker including foundation and elevation details as well as construction specifications
- Prepared high-voltage switch specifications and installation drawings including bus section/elevations
- Prepared physical panel details and construction standards to support procurement of a replacement panel skins for field rewire/rebuilding of the existing panels
- Prepared relay equipment bill of materials and nameplate schedules
- Developed AC/DC removal and replacement control schematics to indicate the new breaker and relay devices
- Prepared detailed point-to-point wiring removal and new installation drawings
- Prepared 161 kV breaker connection diagrams

Project #4: Progress Substation

Client name:
PPL Electric Utilities

Contact information:
N/A

Completion date:
November 2016

Budget:
$773,000

Project scope:
Progress 69-12 kV Substation Including the 69 kV Switchgear Standard, Civil/Structural Design, Physical/Electrical Design, Protection and Control and SCADA

Leidos was selected to assist PPL with development of a completely new distribution substation design which incorporated metal-clad switchgear. The substation would be operable for both 138 and 69 kV transmission delivery points. PPL desired to transition toward metal-clad switchgear for future applications for reliability purposes. Leidos collaborated extensively with PPL standards, engineering, procurement, construction, and operations groups to develop a switchgear standard that would be adopted by PPL for the Progress Substation as well as a standard for future substations. The design incorporated a transmission terminating A-frame structure, motor-operated disconnect switches, potential transformers, 69 kV breaker, power transformers with load tap

changers, metering transformers, and metal-clad switchgear with eight distribution cubicles as well as main and tie breakers. The switchgear housed all station protective relaying and control panels, AC/DC auxiliary systems, and communications equipment. Leidos performed the following tasks to develop the specifications and to complete the Progress Substation design:

- Reviewed various existing PPL switchgear standards/references, incorporating these into a switchgear draft specification; conducted numerous meetings with PPL staff to review and revise the draft toward a final document and associated drawings for switchgear bidding
- Supported PPL in bid evaluation and preparation of the final conformed specification for construction of the metal-clad switchgear
- Developed substation general arrangements, plans, and elevations
- Designed complete protective relay and control scheme and all wiring connections as well as panel physical details
- Conducted detailed structure design and detail
- Prepared foundation, grounding, lighting, and trench/cable plan and detail drawings
- Provided final drawing package and specifications in format for future standard substation design documents

PPL is undergoing significant transition in protective relay schemes as well as overall substation design standards, and this transition presented a challenge in capturing previous standards, incorporating necessary changes, and developing a final standard. Leidos worked extensively with the various groups within PPL to finalize the design and subsequent standard.

Project #5: Specifications Development

Client name:
Fort Pierce Utilities Authority

Contact information:
Larry Lammers, P.E., Supervising Engineer
(772) 466-1600, ext. 3467, lammers@fpua.com
1701 South 37th Street Fort Pierce FL, 34947

Completion date:
August 2018

Budget:
$9,100

Project scope:
In preparation for an extensive capital improvement plan, Leidos worked to develop standard specifications for 69 kV power transformers and 69 kV power circuit breakers

for use in multiple substation projects. Leidos reviewed the multiple substation applications for which the specifications would be used, collaborated with FPUA stakeholders, obtained client feedback, and incorporated comments into final standards to be used on the upcoming projects.

Project #6: Fort Campbell Army Base 59th Street Substation

Client name:
Groves Construction (Prime contractor)

Contact information:
Andy Bachman, President
(270) 825-1437, ABachman@grovesconstruction.com
3135 Grapevine Rd, Madisonville, KY 42431

Completion date:
June 2017

Budget:
$275,000

Project scope:
Leidos performed all engineering including substation physical, site, foundations, electrical, equipment/ construction/testing specifications, and project support during construction for the Fort Campbell Army Base 59th Street Substation in an engineer-procure-construct (EPC) delivery method. This station was a greenfield installation on a compressed site, adjacent to an existing station that was being replaced. Leidos developed construction sequencing plans for migration of the transmission and distribution circuits during construction. The substation included a 69 kV high-side breaker, a 69 kV-12.47 kV transformer bank comprised of three single-phase transformers, two independently regulated 12.47 kV buses, and a total of eight distribution feeders exits. Distribution feeders included both overhead and underground configurations. Fire protection walls were integrated into the design along with oil containment systems for the transformers and regulators. The protection and controls (P&C) system included all Schweitzer Engineering Lab relays, as well as a local supervisory control and data acquisition (SCADA) system with a human machine interface (HMI). Leidos prepared all relay settings, as well as the SCADA configuration.

Project #7: North and South Cullman Substations

Client name:
Cullman Electric Power Board

Contact information:
Scott Whitfield, Engineering Supervisor
(256) 736-5616, swhitfield@cullmanpowerboard.com
106 Second Avenue NE, Cullman, Alabama 35055

Completion date:
North Cullman – October 2013
South Cullman – November 2013

Budget:
North Cullman – $278,000
South Cullman – $192,000

Project scope:

North Cullman Primary Substation Rebuild
Leidos provided design and engineering services including foundation, structural, substation, protection and control (P&C) and relay settings for the design and upgrading of Cullman Power Board's North Cullman 161/13 kV Substation. Elements of the new design included a 161 kV power circuit breaker, a 161-13 kV 30/40/50 MVA power transformer, TVA metering installation and a 13 kV distribution structure with five bays, main and transfer bus, and single phase line regulators. SEL relays were integrated into the switchgear on separate panels for the complete relay and control scheme, including SEL data concentrator. Services included design, specifications, and contract documents for the procurement of the site; construction, labor, and materials for station construction; and protective relay settings and control panels. We also provided schematic development, grounding plan, interconnection diagrams, and relay settings.

South Cullman Substation
Leidos provided professional services associated with rebuilding the South Cullman 46 kV-13 kV substation. This substation was an aging 46 kV-13 kV facility that was constructed in the late 1940s. The substation was in poor condition and much of the equipment had surpassed the end of its reliable service life, as evidenced in failures in the substation relay and equipment controls. Leidos provided design services including the following: preparation of substation general arrangement, electrical elevations, conduit and cable plans, grounding plans and analysis, single-line and three-line diagrams, AC/DC control schematics and wiring diagrams, detailed relay removal and replacement schematic/wiring diagrams, relay panel details, control building details/specifications, electrical equipment specifications, and distribution circuit integration. In particular, Leidos provided detail design for the implementation of an SEL-2414 transformer temperature monitor incorporated into the new power transformer including identification of all monitor inputs and associated schematics, monitor configuration, integration with an SEL communications processor, and field installation of the settings.

License and Professional Credentials

Leidos possesses the permits, licenses, and professional credentials necessary to perform the services as specified in the RFP. Key project personnel **Ken Aldridge, P.E.** and **Baker Tee, P.E.** are licensed Professional Engineers in the State of California. Further information on their credentials are provided in **Section E: Key Project Personnel.**

SECTION E

Key Project Personnel

Project Team Qualifications

Leidos has assembled a qualified team with the requisite skills and first-hand experience necessary to provide the City substation standards support. This team routinely works together to solve problems, share ideas and strategies, and learn from each other's experiences. Our team members, including experienced project leadership, California Professional Engineers, and supporting substation and P&C experts, have conducted projects similar to the City's RFP.

Figure E-1 details team members whose qualifications will be applied in the following services outlined in the RFP.

1. Substation Apparatus Specification
2. Specifications for Substation Site Development
3. Construction Design Package
4. Substation Design and Construction Standards (SDCS)

Figure E-1. Leidos' Team Member Experience

Project Personnel	Type of Service			
	1	2	3	4
LEADERSHIP				
Ken Aldridge, P.E. Principal Electrical Engineer and Apparatus Engineer	✓		✓	✓
Adam Stevenson Project Manager	✓		✓	✓
Baker Tee, P.E. Principal Civil Engineer		✓	✓	✓
Robert Jenkins, P.E. Principal SCADA Engineer				✓
SUPPORT				
Matthew Bell, P.E. Senior Civil Engineer		✓	✓	✓
Maha Mohammed Senior SCADA Engineer				✓

Project Personnel	Type of Service			
Thomas Proios, P.E. Senior Substation Engineer			✓	✓
Michael Isaac Substation Engineer	✓		✓	✓
Rick Wales AutoCAD Operator	✓	✓	✓	✓
Todd Crandell Technical Writer	✓		✓	✓

Key Personnel Biographies

Project Leadership

› **Ken Aldridge, P.E., Principal Electrical Engineer and Apparatus Engineer,** offers 27 years of electrical engineering experience including substation design, rebuilds, and modifications. Mr. Aldridge holds an Electrical P.E. license in California.

› **Adam Stevenson, Project Manager,** has 17 years of experience in leading substation and P&C design, as well as direct experience conducting substation projects for the City including the Mt. View 69 kV/12.47 kV Substation, Riverside Bay 4 Breaker Replacement, and Casa Blanca Power projects.

› **Baker Tee, P.E., Principal Civil Engineer,** provides more than 11 years of experience including foundation design, existing structure evaluation, and retrofit design. Mr. Tee holds a Civil P.E. license in California.

› **Robert Jenkins, P.E., Principal SCADA Engineer**, has 24 years of experience including work for the City. He evaluates short-circuit and relay coordination studies; prepares relay settings and configuration files; and is proficient at testing, commissioning, and troubleshooting control systems and protective relays.

Project Support

› **Thomas Proios, P.E., Senior Substation Engineer,** has more than 40 years of experience in the design and layout of complex electrical systems in the utility industry with expertise in construction, startup and testing, and modification design.

› **Matthew Bell, P.E., Senior Civil Engineer,** focuses on site plans and structural foundation systems; he has calculated loads for transmission structures and performed on-site construction administration for the civil component of substations

› **Maha Mohammed, Senior SCADA Engineer** has 12 years of experience including technical SCADA integration, control room design, human machine interface (HMI) development, SCADA commissioning of substations, design of full-scale testing of distribution automation systems, and P&C design.

- **Michael Isaac, Substation Engineer,** has worked in power distribution for six years, specifically in substation and switchgear design and engineering.
- **Rick Wales, AutoCAD Operator,** brings 20 years of experience in substation control system design.
- **Todd Crandell, Technical Writer,** is a technical writer/editor with over 20 years of experience in the energy and public works utility fields.

Resumes

A resume for each key project team member is provided in the following pages, outlining relevant experience for the service types indicated for him/her in **Figure E-1**.

Ken R. Aldridge, P.E.

PRINCIPAL ELECTRICAL ENGINEER/APPARATUS ENGINEER

Ken Aldridge's 27 years of electrical engineering experience includes substation design, rebuilds, and modifications. His design expertise includes site layout, bus and structure design, protective relay and control systems, grounding grids, conduit and cable systems, and auxiliary alternating current (AC) and direct current (DC) systems. Mr. Aldridge helps prepare short-circuit calculations and develop relay panel layouts, schematics, and wiring. He also writes equipment specifications and procurement documents.

Mr. Aldridge's project management experience includes preparation of bid documents, bid evaluation and negotiation, construction contract preparation, and construction inspections. He also develops design and construction cost estimates, project schedules, and construction sequencing plans to make sure jobs are completed on time and within budget.

EDUCATION

- B.S. in Electrical Engineering, Tennessee Technological University
- A.S. in Engineering Technology in Electrical, Nashville State Technical Institute

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

- Professional Engineer, Electrical: AL, AR, CA, DE, GA, IL, IN, KY, LA, MO, MS, OK, PA, TN, TX, VA
- National Council of Examiners for Engineering and Surveying (NCEES)

PROJECT EXPERIENCE

Mr. Aldridge has served as Engineering Manager for each of the projects described in proposal *Section D: Project Experience*, including:

- Mecca Pike Substation, Etowah Utilities
- Campbell Lane Substation, Bowling Green Municipal Utilities
- North and Spring Creek Substations Breaker Replacements, Tullahoma Utilities Authority
- Progress Substation, PPL Electric Utilities
- Specifications Development, Fort Pierce Utilities Authority
- Fort Campbell Army Base 59th Street Substation, Groves Construction
- North and South Cullman Substations, Cullman Electric Power Board

In addition, he has conducted the following representative projects relevant to the Request for Proposals.

Sunset 69 kV/12.47 kV Substation Design – City of Banning, California. Quality Assurance/Quality Control (QA/QC) and Cost Estimating. Leidos was selected as the owner's engineer for the project, responsible for project management, design, procurement, and construction of the substation and its related transmission and distribution facilities. Leidos provided project management, engineering, environmental permitting,

land acquisition, equipment procurement, and construction management expertise throughout project development.

Multiple Substation Projects – Burbank Water and Power, California. Project Manager. Leidos has provided design services for numerous substation upgrade projects including preparation and development of schematics, wiring, plans/sections, conduit and cable, relay panels, protective relay settings, and substation planning. Projects include:

- Flower Substation: Transformer protective relay replacements
- Winona Substation: Transformer Relay Replacements
- McCambridge Substation: Breaker Replacements
- Lincoln kV Substation: 69 kV Breaker Replacement
- NBC Studio Substation: Substation upgrade feasibility study

Beverly Park Substation – Public Utility District No. 1 of Snohomish County, Washington (Snohomish County PUD). QA/QC and Cost Estimating. The expanded substation is a 230 kV to 115 kV delivery to the Snohomish County PUD from Bonneville Power Administration (BPA) with a 300 MVA power transformer. The 115 kV yard was expanded to a 16-position breaker-and-half arrangement with a 230 kV yard with provisions for a future seven-position GIS arrangement. The station is shared by the Snohomish County PUD, Puget Sound Energy, Inc., and BPA. The station expansion was constructed while the existing 115 kV bus remained in service.

161 kV/13 kV Substation – Union City Electric System (UCES), Tennessee. Senior Project Manager. To meet increasing system load and to improve reliability, UCES constructed a new delivery point substation that was to be served by the Tennessee Valley Authority (TVA) 161 kV transmission system.The station included three 161 kV circuit switchers, two 161 kV-13 kV load tap changer (LTC) transformers, eight 13 kV distribution feeder bays, and an onsite constructed relay and control building. Mr. Aldridge's team conducted field investigations, developed substation designs, solicited bids for procurement contracts, and completed construction engineering and management support for the complete substation project. Leidos coordinated transmission line egress details with TVA.

Ooltewah 161 kV Substation Design – Chattanooga Electric Power Board, Tennessee. Senior Project Manager. Engineering services for the new substation included design, specifications, and contract documents for site procurement; station construction, labor, and materials; and protective relay and control panels.

North Hixson 161 kV/46 kV Substation – Chattanooga Electric Power Board, Tennessee. Project Manager. Mr. Aldridge's team provided design and construction support for the 161 kV/46 kV substation with a 75/100/125 MVA transformer and two 46 kV sub-transmission feeders.

Adam W. Stevenson

PROJECT MANAGER

Adam Stevenson brings 17 years of industry experience and knowledge especially in substation and protection and controls (P&C) design. As outlined below, he has worked on projects of various size and scope. Through this project experience, he has developed an intimate knowledge of what is required to complete both new greenfield substation projects and modifications to an existing substation.

His technical expertise includes substation siting; preparing projects scopes, budgets, and schedules; equipment procurement specifications; construction specifications; bid evaluations; one-line diagrams; control schematics; relay panel layouts; site arrangements; three-dimensional substation models; electrical equipment plans and sections; foundation plans and details; circuit and material lists; grounding plans; conduit plans; wiring diagrams; shielding plans; site grading plans; and control building layouts.

EDUCATION

› B.S. in Electronic Engineering Technology, ITT Technical Institute

PROJECT EXPERIENCE

Mr. Stevenson has served in the role of Project Engineer for each of the projects described in proposal *Section D: Project Experience*, including:

› Mecca Pike Substation, Etowah Utilities

› Campbell Lane Substation, Bowling Green Municipal Utilities

› North and Spring Creek Substations Breaker Replacements, Tullahoma Utilities Authority

› Progress Substation, PPL Electric Utilities

› Specifications Development, Fort Pierce Utilities Authority

› Fort Campbell Army Base 59th Street Substation, Groves Construction

› North and South Cullman Substations, Cullman Electric Power Board

In addition, he has conducted the following representative projects relevant to the Request for Proposals.

Casa Blanca Power Project – Riverside Public Utilities, California. Task Manager. Leidos provided electrical design engineering and technical support services for the construction of a new Casa Blanca Substation (69 kV-12 kV). Mr. Stevenson managed and/or performed a protective relay coordination study, prepared relay settings, reviewed vendor drawings, prepared battery and battery charger sizing calculations, AC and DC control schematics, and interconnection wiring diagrams.

Mt. View 69 kV/12.47 kV Substation – Riverside Public Utilities, California. Task Manager. In providing engineering services to upgrade and modernize the City of Riverside's Mt. View Substation, Mr. Stevenson managed P&C tasks.

Alola and Airport 34 kV/12 kV Substation Rebuilds – City of Banning, California. Project Manager. The City of Banning is converting its 4 kV distribution system to 12 kV. Included in this conversion are the replacements of two existing 34.4 kV-4 kV substations, Airport and Alola Substations. Mr. Stevenson's team is providing engineering, project management, and construction management services to support these projects.

Multiple Relay Replacement Projects – Burbank Water and Power (BWP), California. Project Engineer. Leidos has provided design services for numerous substation upgrade projects for BWP. Design services include preparation and development of schematics, wiring, plans/sections, conduit and cable, relay panels, protective relay settings, and substation planning. Specifically, Mr. Stevenson provided engineering for the Lincoln Substation 69 kV breaker replacements, the Valley Substation transformer and breaker failure relay replacements, and the Victory Substation breaker replacement.

Orchard Substation – City of Ukiah, California. Project Engineer. The City added transformer capacity to its electric system, which resulted in relocating its existing Gobbi Substation, adding a third transformer to that substation, and relocating it to an adjacent site with a new name: Orchard Substation. The project involved construction of a new 115 kV 12 kV distribution substation. The substation included three 20/26.6/33.3/37 MVA transformers, four 115 kV circuit breakers, 115 kV steel structures and bus work, and a prefabricated control building. The control building houses the 12 kV switchgear, protective relaying, communication equipment, and DC battery system. Mr. Stevenson provided substation design, technical reviews of conceptual plans, equipment procurement, duct bank design, and permitting support. The project also included a single master station, a substation communication processor, and an Ethernet communication system for communications from the substation to the office and operation center.

Beverly Park Substation – Public Utility District No. 1 of Snohomish County (Snohomish County PUD) , Washington. Project Engineer. This project is the expansion of an existing 115 kV switching station. The expanded substation will be a 230 kV to 115 kV delivery to Snohomish County PUD from Bonneville Power Administration (BPA) with a 300 MVA power transformer. The 115 kV yard will be expanded to a 16-position breaker-and-half arrangement with a 230 kV yard with provisions for a future seven-position gas-insulated switchgear arrangement. The station will be shared by Snohomish County PUD, Puget Sound Energy, Inc., and BPA. The station expansion is to be constructed while the existing 115 kV bus remains in-service.

North Franklin Substation – Franklin Electric Plant Board (FEPB), Kentucky. Project Manager. FEPB needed to add transformer capacity to its electric system, resulting in a new 161 kV/13 kV distribution substation. Mr. Stevenson provided project cost estimates, schedule, substation design, equipment procurement, and construction procurement and monitoring. He witnessed and provided technical support for the testing and commissioning of the substation.

Baker W. Tee, P.E.

PRINCIPAL CIVIL ENGINEER

Baker Tee is a lead civil/structural engineer for substation projects with over 11 years of experience. He reviews calculations and drawings relevant to all structural aspects of substation design, such as equipment support structure design, foundation design, rigid bus design, transformer oil containment, and construction specifications. He has extensive experience in existing structure evaluation and retrofit design.

Mr. Tee's responsibilities include assuring designs meet the project/client design criteria; working with physical designers to coordinate with structural substation work; making sure structural tasks adhere to the project schedule; reviewing vendor calculations and structural drawings; performing field investigations of existing rigid bus, structures, and foundations; designing retrofits and upgrades to existing rigid bus, structures, and foundations; oversees and reviews the development of internal civil design standards; and writing technical specifications.

EDUCATION

- M.S. in Civil Engineering – Structural Discipline, University of Illinois – Chicago
- B.S. in Civil Engineering – Structural Discipline, University of Illinois – Urbana Champaign

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

- Professional Engineer, Civil: AL, CA, CT, FL, GA, IL, MI, MT, NH, NY, OK, PA, TX
- Professional Engineer - Structural 1: VT

PROJECT EXPERIENCE

Enterprise 138 kV Substation – Lansing Board of Water and Light, Michigan. Lead Civil/Structural Engineer. Mr. Tee reviewed the design of new steel structures and foundations. The project included the installation of new circuit breakers, existing yard upgrades, and the installation of a new capacitor bank for the 138 kV cap bank yard expansion. The project also consisted of a thorough rigid bus analysis of the entire yard.

New London Avenue 138 kV/12 kV Greenfield Project – National Grid, New England. Lead Civil/Structural Engineer. Mr. Tee reviewed the rigid bus design, new structure designs, and foundation designs. The project included the design of the entire 138 kV/12 kV substation structures and foundations. The project also involved a new 115 kV/12 kV transformer and along with a 12 kV cap bank. The project required installation of a new 115 kV dead end structure and control house as well.

Salem Harbor 115 kV Substation – National Grid, New England. Lead Civil/Structural Engineer. Mr. Tee reviewed the finite element analysis of the existing 115 kV

lattice steel box structure, as well as the new steel retrofit designs required. The project included the analysis of the existing 115 kV lattice steel box structure, and new expansion of the existing 115 kV switchyard. The expansion of the yard consisted of a newly designed double-bay 115 kV lattice steel box structure, installation of new dead end, and equipment support structures and foundations.

Bear Swamp 230 kV/115 kV Bus Extension – National Grid, New England. Lead Civil/Structural Engineer. Mr. Tee reviewed the rigid bus design, existing structures analysis, new structure designs, and foundation designs. The project included the analysis of the entire existing 230 kV/115 kV switchyard structures and foundations for rigid bus and disconnect switch upgrades. The project also involved a new 230 kV/115 kV transformer and bus tie installation along with a 115 kV cap bank. The project required modifying existing structure supports to meet current industry standard deflection requirements.

Unionville 115 kV Switchyard – National Grid, New York. Lead Civil/Structural Engineer. Mr. Tee reviewed the design and structural steel detailing of a new double-bay 115 kV A-Frame dead-end structure and associated drilled pier foundations. The project included the new design of a new double-bay 115 kV A-Frame dead-end structure that required full detailed fabrication piece marks be provided for fabrication within the clients in-house shop. The project also included the installation of air core reactors and their associated foundations.

Professional Transmission and Substation Engineering Services – Sacramento Municipal Utility District (SMUD), California. Lead Civil/Structural Engineer. Mr. Tee and the team of senior civil engineers at Leidos performed "on-call" professional engineering services to support multiple substation projects. The work performed as part of this contract includes:

- Franklin Substation – Third-party senior engineering review of design submittal packages for SMUD civil engineering. Mr. Tee and his team of senior engineers reviewed the 50 percent and 90 percent submittal packages, providing comments and red-line markups for both civil/structural drawing and calculation packages.
- Station "E" Substation – Third-party senior engineering review of design submittal packages for SMUD civil engineering. Mr. Tee and his team of senior engineers reviewed the 90 percent submittal package, providing comments and red-line markups for both civil/structural drawing and calculation packages.
- Chain Link Fence Specification C914 Standard Revision – Mr. Tee and his team of civil engineers performed design calculations and provided written updates to the current Chain Link Fence Specification C914. In addition to the specification, Mr. Tee's team of civil engineers provided "on-call" review and comments on the Hurly substation fence installation, reflecting the results of their recently performed work for direct application to a project already in process.

Robert N. Jenkins, P.E.

PRINCIPAL SCADA ENGINEER

Robert Jenkins is an electrical engineer with 24 years of industry experience focused on relay protection and controls (P&C) systems, protective device coordination, and supervisory control and data acquisition (SCADA) integration. He performs short-circuit and relay coordination studies; prepares relay settings and configuration files; and is proficient at testing, commissioning, and troubleshooting control systems and protective relays.

Mr. Jenkins leads Leidos' protective relaying group, responsible for staffing the teams for various project assignments. He provides technical insight and reviews focused on the protection and SCADA aspects of design, protection, and planning projects.

EDUCATION

- B.S. in Electrical Engineering, Tennessee Technological University
- B.B.A, Belmont University

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

- Professional Electrical Engineer: TN
- Construction Specifications Institute - Certified Construction Documents Technologist

PROJECT EXPERIENCE

Quarry Relay Settings – PPL Electric Utilities, Pennsylvania. Senior Engineer. At the existing Quarry Substation, the control building was replaced and the 230 kV and 69 kV bay configurations were reconfigured. Mr. Jenkins led the team that developed the protective relay settings based on a non-standard substation configuration. Temporary and final relay settings were developed to accommodate the construction sequences. Leidos reviewed and updated the substation points list for the new configuration. In the course of performing these tasks, Leidos coordinated settings with the neighboring utility as required by PRC-001.

Casa Blanca, Freeman, and Mt. View Substations – Riverside Public Utilities, California. Project Engineer. Mr. Jenkins provided transmission relay setting calculations, and protection logic diagrams and detailed configuration files for the substation relays.

Transmission System Protection Analysis – Keys Energy/Florida Keys Electric Cooperative (FKEC), Florida. Project Engineer. Mr. Jenkins assisted with the review and recommendations for possible system modifications of FKEC's isolated transmission system including 138 kV and 69 kV protective relays, as well as associated adjacent protection systems and the 13 kV fast bus transfer scheme. Mr. Jenkins helped develop a protection system philosophy and reviewed system behavior, providing recommendations for the ultimate future design and short-term improvements.

Development of Protective Relay Settings – PPL Electric Utilities (PPL EU), Pennsylvania. Senior Engineer. Mr. Jenkins performed short-circuit and coordination analysis, developed the calculations, and prepared detailed settings for the 69 kV line protection relays for the program of construction and system improvement in the Northeast Pocono area. Following this, Mr. Jenkins led the group that has prepared settings for numerous projects for PPL EU including the Lockhaven 69 kV gas-insulated switchgear substation and the Quarry 230 kV/69 kV substation.

Dowling Substation Protective Relay Settings – FirstEnergy, Ohio. Senior Engineer. Leidos was retained to develop 345 kV line and transformer relay settings for the new 345 kV/138 kV Dowling substation. Using the existing FirstEnergy computer-aided protection engineering model, Leidos performed the necessary short-circuit and coordination studies, prepared calculations, and developed detailed relay settings files for the line and transformer relays. As technical advisor, Mr. Jenkins reviewed methodologies, recommended approaches, and reviewed the work product.

System-wide Relay Protection Study – Kodiak Electric Association, Inc., Alaska. Project Engineer. Mr. Jenkins developed a system model encompassing generation, transmission, and distribution facilities. He reviewed and recommended updates to the protective system philosophy; gathered and catalogued relay settings for the entire system, analyzed the performance of the existing system; recommended revised settings and relay replacements to improve reliability and operational efficiency; provided an implementation plan with setting files and test points for relay testing; and observed field testing of key relay sub-systems.

North Mill Substation – Bowling Green Municipal Utilities (BGMU), Kentucky. Project Engineer. Leidos designed a new substation to establish a third delivery point from the transmission provider. The North Mill substation included a 161 kV/69 kV transformer, as well as two 69 kV/ 12.47 kV transformers. The existing sub-transmission system was looped through this substation and new distribution feeders were tied into the distribution system from this point.

Tahoe Donner Substation – Truckee Donner Public Utility District, California. Project Engineer. Leidos prepared a design for the substation to replace the high-side fuses with a circuit switcher, install an oil containment system, implement a physical arrangement to allow the connection of a spare transformer, and install a new control building with protective relays and updated SCADA remote terminal units. Mr. Jenkins developed and analyzed an updated ground grid layout using current distribution, electromagnetic fields, grounding, and soil software by Safe Engineering Services and Technologies.

Sunset Substation Design – City of Banning, California. Project Engineer. Expansion of the City's electric system consisted of the addition of a third 33 kV interconnection with Southern California Edison and the construction of the new distribution Sunset Substation. Mr. Jenkins developed protection and integration schemes for the substation. His team's work included specifying all components and programming of the master station, communication processor and relays, and startup and commissioning responsibility of the system.

Matthew D. Bell, P.E.

SENIOR CIVIL ENGINEER

Mr. Bell is a senior civil/structural project engineer experienced in a wide range of civil engineering projects. With 24 years of experience, 12 in the power delivery industry, Mr. Bell brings extensive knowledge in site development for electric utility infrastructure, as well as past experience in healthcare, commercial, industrial, residential, and hotel/resort facilities. He has been involved in the planning and designing of roadways, aircraft facilities, transportation projects, and wastewater treatment facilities.

Mr. Bell's substation and transmission design experience focuses on site plans and structural foundation systems. He calculates loads for transmission structures and performs onsite construction administration for the civil component of substations.

EDUCATION

- B.S. in Mechanical Engineering, University of Tennessee at Chattanooga

PROFESSIONAL REGISTRATIONS

- Professional Civil Engineer: AL, AR, CT, FL, GA, IN, KY, LA, MA, MI, MO, MS, NM, NV, OK, PA, TN, TX, WA
- National Council of Examiners for Engineering and Surveying

PROJECT EXPERIENCE

Mr. Bell has served in the role of Senior Civil Engineer for each of the projects described in proposal *Section D: Project Experience*, including:

- Mecca Pike Substation, Etowah Utilities
- Campbell Lane Substation, Bowling Green Municipal Utilities
- North and Spring Creek Substations Breaker Replacements, Tullahoma Utilities Authority
- Progress Substation, PPL Electric Utilities
- Specifications Development, Fort Pierce Utilities Authority
- Fort Campbell Army Base 59th Street Substation, Groves Construction
- North and South Cullman Substations, Cullman Electric Power Board

In addition, he has conducted the following representative projects relevant to the Request for Proposals.

Enterprise Substation – Lansing Board of Water and Light, Michigan. Civil Engineer. Mr. Bell designed the site development for the Enterprise Substation 2015 Interconnects project. This included asphalt driveway modifications, grading and drainage, ditches, culverts, design of a concrete retaining wall nearly 400-feet long, and erosion and sediment control plans.

Salem Harbor 115 kV Substation Projects – National Grid, Massachusetts. Lead Site Civil Engineer. The project was rebuilding of the 115 kV switchyard at Canal Street. Engineering included site plan and grading for modifications to the

pad and design of new retaining wall to replace a timber wall that had exceeded its useful life. We also changed the driveway profile to allow reversing of gate swing.

North Hixson Substation – Chattanooga Electric Power Board, Tennessee. Engineer-of-Record. Mr. Bell was responsible for the site plans, specifications, and foundation designs for a new 161 kV/12 kV substation. The grading and drainage contract for the site required nearly 60,000 cubic yards of earthwork and an 830 feet driveway with maximum cut and fill depths of 24 feet and 13 feet, respectively. The project's stormwater system included benched slopes along the driveway, three pipe networks, a few thousand feet of open grass or riprap ditches, and a detention pond. He also performed structural calculations for drilled pier and mat foundation designs and provided civil and structural expertise.

North Mill Substation – Bowling Green Municipal Utilities, Kentucky. Engineer-of-Record. Mr. Bell was responsible for the retaining wall and foundations of a new 161 kV/69 kV/13 kV substation. Bowling Green has karst topography and the geotechnical investigation showed anomalies, so he coordinated subsurface improvements through compaction grouting, then performed structural calculations for shallow foundation designs required by those limitations.

Substation 7 Modification – City of Vero Beach, Florida. Engineer-of-Record. Leidos modified an existing 138 kV/69 kV substation. As the engineer-of-record for the transformer foundation, Mr. Bell performed structural calculations for foundation design in poor soil conditions and provided civil and structural expertise.

Alfermann 138 kV Substation – Rolla Municipal Utilities, Missouri. Project Engineer. Mr. Bell prepared the site plans and technical specifications for a grading contract and also designed the drilled pier and hybrid foundations for the equipment and structures, and the drilled pier pole foundations for the associated transmission line project, including drilled pier foundations in varying bedrock depth conditions.

13 kV/12 kV Substation – Confidential Client, Nevada. Civil Engineer-of-Record for site modifications and foundations. Mr. Bell designed grading modifications, surfacing, and foundations for a new 138 kV/12 kV substation. The project involved relocating existing switchgear and control house enclosures to the new greenfield site, requiring unique foundation designs.

MYS Substation – NV Energy, Nevada. Civil Engineer-of-Record for site modifications and foundations. Mr. Bell designed grading modifications, surfacing, and foundations for a new 138 kV/12 kV substation. The project involved relocating existing switchgear and control house enclosures to the new greenfield site, requiring unique foundation designs.

Maha M. Mohamed

SENIOR SCADA ENGINEER

Maha Mohamed is a protection and controls (P&C) engineer with 12 years of experience in the electric power industry. Her responsibilities have included technical supervisory control and data acquisition (SCADA) integration, control room design, human machine interface (HMI) development, SCADA commissioning of substations, design of full-scale testing of distribution automation systems, and P&C design.

EDUCATION

- M.B.A., University of Medical Science, Sudan
- B.S. in Electrical Engineering, Khartoum University, Sudan

PROJECT EXPERIENCE

PPL NERC CIP Firmware Project – PPL Electric Utilities (PPL EU), Pennsylvania. P&C Engineer. To remain in compliance with the North American Electric Reliability Corporation (NERC) Critical Infrastructure Protection (CIP) requirements, PPL EU must update firmware versions to standard releases on a periodic basis. Leidos evaluates each device for firmware revisions and evaluates specific protection settings.

Serial to IP (STIP) Conversion – Confidential Client, Florida. P&C Engineer. As part of a 10-year STIP program, the client is converting its substations to an internet protocol-based platform. Leidos is designing the upgrade of existing SCADA communications and remote terminal units (RTU) at several substations.

Lauschtown-Berks 69 kV Substations Upgrade – PPL EU, Pennsylvania. P&C Engineer. Leidos is providing configuration for SCADA equipment during the system upgrades between PPL EU's Lauschtown-Berks substations. This includes conducting computer-aided protection engineering (CAPE) modeling, relay settings development, and relay logic diagrams; uploading new settings to Relay Test via PowerBase; and providing remote field support.

EXPERIENCE PRIOR TO LEIDOS

Minster Storage Management System (SMS) Half Moon Ventures (HMV) and Village of Minster, Ohio. Design Engineer. HMV is using S&C Electric Company's (S&C) 7 MW PureWave® SMS, providing fully integrated storage management and power conversion for 3 MWh of lithium-ion batteries. The system is tied to HMV's adjacent 4.2 MW solar plant, allowing the Village of Minster municipal utility to further reduce their peak demand charges in the middle of the day. This solar and storage system is the largest U.S. facility of its kind connected through a municipal utility. Ms. Mohamed performed the volt-amp-reactive compensation logic in the Real-Time Automation Controller (RTAC) by measuring the power factor at the utility and sending analog set points to the reactive power to the SMS. She was also the lead engineer for the

SCADA design and testing.
Ms. Mohamed performed the network design, specifications, and configuration for the Ethernet switch and the virtual private network routers.

Orion and Vega SCADA Projects, California – SunEdison, Inc. Design Engineer. S&C built 20 MW and 26 MW photovoltaic (PV) plants. SunEdison provides solar asset management services and 24 hours a day, seven days a week global monitoring, field dispatch, and reporting services through its Renewable Operation Center. Ms. Mohamed performed the HMI design and historian system using ClearView software. She also added a custom login in the ClearView software for reporting and trending. Orion and Vega were the largest SCADA projects that were completed by S&C. The projects included more than 3,000 SCADA points, four RTACs, and more than 30 remote devices.

Relay Settings Update – Eastern New Mexico University, New Mexico. Design Engineer. Ms. Mohamed performed the relay settings update for the S&C high-speed fault clearing system to add SCADA points. She also performed the HMI design using Diagram Builder software and the RTAC as a data concentrator through fiber optic communication.

Dynamic Line Rating and Blackrock Data Centers –Various Locations. Design Engineer. Ms. Mohamed performed SCADA design for S&C PME pad mounted gear controlled by 6800 automatic control switch using SUBNET software. She used SubSTATION Explorer 2015 for the HMI, and SubSTATION Server for data concentration.

Ashland and Carver P&C Testing – Lodestar, Massachusetts. Design Engineer.
Ms. Mohamed performed testing on a Schweitzer Engineering Laboratories (SEL)-351A protection system relay in an S&C facility.The relay was programmed with automatic reclosing logic.

T.A. Acacia West Antelope Solar Project – Uber Transmission Co., California. Design Engineer. The project consisted of an S&C PV electric generating facility that totals 28.35 MW. Ms. Mohamed performed relay settings for the substation, SCADA setup, and testing.

Thomas G. Proios, P.E.

SENIOR SUBSTATION ENGINEER

Mr. Proios has more than 40 years of experience in the design and layout of complex electrical systems in the utility industry with expertise in construction, startup and testing, and modification design. His background includes electric power, supervisory control and data acquisition (SCADA) and instrumentation, and control systems applications. He has extensive experience with electrical transmission and distribution, power applications, power plant design, security, fire detection, and plant communications.

As a senior systems engineer, Mr. Proios coordinates maintenance activities, reviews station operating and surveillance procedures, interfaces with operations staff, reviews modification packages for design adequacy and testing requirements, and performs troubleshooting to maintain system operability. As a test engineer, Mr. Proios has commissioned plant electrical systems, substations, building ventilation systems, and process control systems.

Mr. Proios has coordinated rework packages and electrical equipment turnover to start up and performed construction supervision of the prime electrical subcontractor at several generation sites. He has also worked in the areas of civil engineering, estimating, and quality assurance records. Mr. Proios also serves as an engineer-in-charge, providing staff guidance, overseeing quality reviews on multi-disciplinary projects, and sealing client "for construction" documents.

EDUCATION

› B.S. in Electrical Power Engineering, Rensselaer Polytechnic Institute

PROFESSIONAL REGISTRATIONS/ CERTIFICATIONS

› Professional Electrical Engineer: CT, FL, IL, IN, KY, MA, MD, MI, MO, NC, NH, NV, NY, OH, OK, OR, PA, SC, TN, TX, WA, WI

› Member IEEE PES Substation Committee, Working groups for stds. Chair - 1127, Vice-chair - 1818, Member - 80, 81, 525, 605,998

PROJECT EXPERIENCE

Substation Upgrades, Naval Base Kitsap, Washington – U.S. Navy. quality assurance/quality control (QA/QC) Manager. Mr. Proios provides staff guidance, technical review, and QA/QC for upgrade and replacement projects involving the 115 kV substations and 12 kV distribution system. He provides the redesign of Substation 2 at Bangor Base which involves creating an eight position 115 kV ring bus and replacement 12 kV switchgear also configured as a ring bus serving 16 feeders. This project addressed an interlocking scheme. Studies performed include 115 kV bus calculations per Institute of Electrical and Electronics Engineers (IEEE)-605 and ground grid calculations per IEEE-80. Construction specifications are also provided.

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Greenfield Soil Boring Contract Specifications – Confidential Client, Florida. Principal Engineer. Mr. Proios is responsible for scope definition, staff guidance, and technical QA/QC reviews for substation improvements and new greenfield substations involving transformer, breaker, bus, and switch additions; station layout; and grounding for voltage levels from 12 kV through 500 kV stations. He is responsible for developing 500 kV substation design criteria and initial station layout for 500 kV greenfield substations.

Substation Upgrades – National Grid, New York. Technical Lead. Mr. Proios was responsible for staff guidance, technical review, and QA/QC for upgrade and replacement projects. Work included replacement of two 345 kV breakers and redundant switch position switches; 115 kV capacitor bank installations to improve voltage regulation due to the retirement of generation facilities; protective relaying upgrades for underground pipe cables; and the addition of line reactors. It also included multiple projects at 230 kV, 115 kV, and 34 kV voltage levels and 12 kV cap bank installations for local voltage improvements tied to Department of Energy programs.

Tri-Cities Engineer-Procure-Construct Bundle – Bonneville Power Administration, Washington. Outdoor Physical Electrical Lead. Mr. Proios is physical lead for this project, which includes 12 substations in Washington's Tri-Cities region. He is responsible for final reviews of design packages and resolving design questions. He is also responsible for conceptual and preliminary design packages with complex design issues.

Substation Upgrades – Pennsylvania Power and Light, Pennsylvania. Senior Engineer. Mr. Proios was responsible for scope definition; staff guidance; technical QA/QC reviews for substation improvements involving transformer, breaker, bus, and switch additions; and replacements for voltage levels from 12 kV through 230 kV.

Snohomish Substation Upgrades –Bonneville Power Administration, Washington. QC Lead. Mr. Proios is QC lead for this project to replace 115 kV and 230 kV breakers, switches, and capacitor banks. He is also responsible for QA/QC reviews of station service upgrades at Snohomish and Chief Joe substations.

Substation Upgrades – Confidential Client. Principal Engineer. Mr. Proios was responsible for scope definition, staff guidance, and technical QA/QC reviews for substation improvements and new greenfield substations involving transformer, breaker, bus, and switch additions; station layout; and grounding for voltage levels from 12 kV through 500 kV stations. He was responsible for developing 500 kV substation design criteria and initial station layout for 500 kV greenfield substations.

Substation Retrofit – Commonwealth Edison, Illinois. Senior Project Manager. Mr. Proios was responsible for substation design and retrofit of 138 kV and 345 kV substations for reliability and independent power producers interconnection improvements. He provided design and staff guidance for 345 kV ring bus additions; 138 kV, 34.5 kV, and 12 kV bus expansions; and 12 kV concept substation (pre-fabricated metal enclosed switchgear) additions and expansions.

Michael M. Isaac

SUBSTATION ENGINEER

Mr. Isaac is an experienced electrical engineer with six years working in the power distribution industry. His experience in power systems and project management has allowed him to work and lead projects of different complexity for electrical utilities and public sector investors.

Mr. Isaac provides switchgear design, medium-voltage substation design, protection schemes, electrical and control panel design, relay logic, single-line diagrams, three-line diagrams, control schematics, wiring diagrams, substation layout, foundation plans, compiling bill of materials, and issues construction documents.

EDUCATION

› B.S. in Electrical Engineering, Tennessee Technological University

PROJECT EXPERIENCE

MISAE Solar Farm – Mortenson, Texas. Substation Engineer. Mr. Isaac supports the design of a 34.5 kV to 345 kV solar farm substation. He is developing single line diagrams, three line diagrams, control schematics, panel layout, bill of materials, cable schedule, grounding study, lightning study, lighting study, and AC/DC studies.

EXPERIENCE PRIOR TO LEIDOS

Application Engineering – Schneider Electric. Senior Application Engineer. Mr. Isaac designed medium voltage switchgear (5 kV-38 kV) and its control gear products that are manufactured per NSI, NEMA, IEEE, NES, and UL standards for international use. He interpreted customer specifications, drawings, and power system requirements as they apply to medium voltage switchgears, and verified bill of material alignment with specifications. He developed one-line diagrams, electrical bill of materials, elevation views, layout views, AC/DC panelboard layouts, control schematics, communication drawings, and three-line diagrams for customer-specified equipment.

Mr. Isaac designed and implemented various protection designs such as busbar schemes, arc flash protection, breaker failure protection, breaker controls, and bus transfer schemes. He developed and programmed automatic transfer schemes for use with protective relays and PLCs; provided customer support during witness testing, installation, and commissioning; managed each project from order conversion to the plant through manufacturing, product shipment, and after shipment support; and managed and tracked multiple projects simultaneously in a flexible and changing/demanding environment.

He provided consulting support for large projects, including review of electrical substation arrangements and associated control components. Mr. Isaac conducted product line cost analysis and implemented significant improvements to reduce product cost.

Rick A. Wales

AUTOCAD OPERATOR

Rick Wales is a substation designer with 20 years of experience in substation control system design. His primary responsibilities include the design and completion of substation project drawings using AutoCAD® and Bentley® Systems, Inc. MicroStation software. He has prepared one-line diagrams; control schematics; relay panel, plan, and section drawings; site arrangements; three-dimensional (3-D) substation models; electrical equipment plans and sections; foundation plans and details; circuit and material lists; grounding plans; conduit plans; connection diagrams; site grading plans; and control building layouts. Prior to joining Leidos, he had seven years of experience in substation control systems design and manufacturing with Clark Control Systems.

EDUCATION

- Associates in Applied Science in Electrical Engineering Technology, Nashville State Technical College
- Certificate in Computer-Aided Design (CAD) and Development, Nashville State Technical College

PROJECT EXPERIENCE

Mr. Wales has served as an AutoCAD Operator for each of the projects described in proposal *Section D: Project Experience*, including:

- Mecca Pike Substation, Etowah Utilities
- Campbell Lane Substation, Bowling Green Municipal Utilities
- North and Spring Creek Substations Breaker Replacements, Tullahoma Utilities Authority
- Progress Substation, PPL Electric Utilities
- Specifications Development, Fort Pierce Utilities Authority
- Fort Campbell Army Base 59th Street Substation, Groves Construction
- North and South Cullman Substations, Cullman Electric Power Board

In addition, he has conducted the following representative projects relevant to the Request for Proposals.

Casa Blanca Power Project, California – Riverside Public Utilities. AutoCAD Operator. Leidos provided electrical design engineering and technical support services for the construction of a new Casa Blanca substation consisting of a 69 kV ring bus, a power transformer, and a 12.47 metal-clad switchgear building. Mr. Wales provided CAD support for the following tasks: protective relay logic diagrams, AC and DC control schematics, and interconnection wiring diagrams.

North Cullman Primary Substation 161 kV/46 kV/13 kV Rebuild, Alabama – Cullman Power Board. AutoCAD Operator. Leidos provided design and engineering services associated with the rebuilding the North Cullman distribution facilities in Alabama. Elements of the new design included a 161 kV power circuit breaker, a 161 kV-13 kV 30/40/50 MVA power transformer, Tennessee Valley Authority metering installation, and 13 kV

distribution structure with five bays, main and transfer bus, and single phase line regulators. Schweitzer Engineering Laboratories (SEL) relays were integrated into the switchgear on separate panels for the complete relay and control scheme including SEL data concentrator. Services included design, specifications, and contract documents for procurement of the site; construction, labor, and materials for construction of the station; and protective relay settings and control panels. We provided schematic development, the grounding plan, interconnection diagrams, and relay settings.

West Ooltewah 161 kV Substation Design, Tennessee – Chattanooga Electric Power Board (CEPB). AutoCAD Operator. Leidos provided design and professional engineering services associated with the new substation located in the West Ooltewah area of Chattanooga. Mr. Wales was responsible for the drawings for the substation.

5th and High Substation, Kentucky – Bowling Green Municipal Utilities (BGMU). AutoCAD Operator. Mr. Wales is responsible for the drawings for the 5th and High substation. The drawings included a one-line diagram, electrical equipment plans, electrical sections, foundation plans, conduit plans, grounding plans, circuit list, material list, and connection diagrams.

Franklin Primary Substation, Kentucky – Franklin Electric Plant Board (FEPB). AutoCAD Operator. To increase system reliability, FEPB modified its existing 161 kV-69 kV-13 kV Franklin Primary substation. The substation modifications included installing three 161 kV circuit switchers and disconnect switches, two 13 kV transformer main breakers, one 13 kV bus-tie breaker, new 13 V bus, and three relay protection panels. Mr. Wales provided drawings, which included a one-line diagram, electrical equipment plans, electrical sections, foundation plans, conduit plans, grounding plans, a circuit list, a material list, and connection diagrams.

North Franklin Substation, Kentucky – FEPB. AutoCAD Operator. Leidos designed a new 161 kV-13 kV distribution substation. We assisted in choosing a building site by providing preliminary substation equipment plans and site layout drawings prepared by Mr. Wales. Once a site was determined, he was responsible for the substation drawings, including a one-line diagram, electrical equipment plan, electrical sections, foundation plan, conduit plan, grounding plan, a circuit list, a material list, and connection diagrams. The North Franklin substation includes two 161 kV circuit switchers, one 30/40/50/56 MVA power transformer with load tap changer, six 13 kV distribution breakers, and one control building. The control building houses the protective relaying, communication equipment, and DC battery system.

Amazon 46 kV-13 kV Substation, Tennessee – CEPB. AutoCAD Operator. Leidos provided design and construction monitoring for a new substation that included 46 kV motor-operated switches installed in CEPB's 46 kV transmission line, two 46/13 kV transformers, and two distributions feeders with underground, redundant feeders to the new facility. Mr. Wales provided drawings for the substation, which included a one-line diagram, electrical equipment plans, electrical sections, foundation plans, conduit plans, grounding plans, a circuit list, material list, and connection diagram.

M. Todd Crandell

TECHNICAL WRITER

Mr. Crandell is a technical writer/editor with over 20 years of experience in the energy and public works utility fields. He has managed over 1,000 documents in his career, communicating technical information to a mostly non-technical audience.

At Leidos, he manages the production of technical reports, proposals, and presentations. He plans, coordinates, and edits the work of technical staff in the utility consulting field to produce a variety of technical documents. As a technical editor for Leidos, he has coordinated the production of documents by teams of word processing, graphic design, and reprographics staff. He has also overseen the work of other editors. Mr. Crandell is skilled at tailoring written material to meet the needs of an identified audience. In addition, he assists in the development of useful graphics and works with graphic designers to ensure that the graphics convey the intended meaning.

EDUCATION

› B.A. in German/Journalism, Western Michigan University

PROJECT EXPERIENCE

Electric System Master Plan – Riverside Public Utilities (RPU), California. Mr. Crandell provided technical editing and served with the Leidos team to organize a comprehensive long-range Electric System Master Plan. The plan addressed RPU's electric delivery system including topics such as infrastructure replacement, organization effectiveness, and long-range system and financial planning.

Electric Distribution System Master Plan – Pasadena Water and Power Department, California. Mr. Crandell organized, edited, and coordinated production of this Master Plan intended to guide the utility's decision making for the next 20 years. Leidos analyzed performance objectives for the Department, which included achieving adequate system capacity to meet service demand, maintaining service reliability, and maximizing resources and business opportunities. For each of the Department's challenges, the plan provided an analysis of solutions and a plan that combined the solutions into a logical and progressive guide for decision making.

Distributed Generation Interconnection Plan (DGIP) – Hawaiian Electric Company, Inc. (HECO), Hawaii. Mr. Crandell edited a DGIP report analyzing and assessing potential constraints of photovoltaic systems in the HECO region. The DGIP included a staged proactive approach to distributed generation (DG) planning that allowed for a clear plan of action, justified technical constraints, and mitigation strategies related to DG.

Smart Grid Customer Engagement Essentials: A Public Power Primer – American Public Power Association. Mr. Crandell provided technical editing of a guidebook for

utilities to help them communicate with customers about issues related to smart grid technology and deployment.

Distributed Generation Guidebook – American Public Power Association. Mr. Crandell provided technical editing of a guidebook that discussed emerging energy supply systems of distributed generation and the effect they will have on municipal utilities.

Puget Energy Acquisition Due Diligence – Macquarie Infrastructure Partners. Mr. Crandell edited and coordinated the development of five separate due diligence reports prepared under an accelerated timeline by various Leidos personnel. Leidos provided an Independent Engineer to report on the technical and environmental aspects of Puget Energy's electric transmission and distribution system, natural gas system, and electric generating assets.

Water Master Plan and Rate Study – County of Hawaii, Department of Water Supply, Hawaii. Mr. Crandell edited this master plan update for the Department of Water Supply (DWS). The DWS provides water service to the island of Hawaii, which is separated into 23 individual water systems. The plan included evaluation of distribution and transmission capacity, pump station capacity, storage requirements, and source of supply, as well as an update to DWS's capital improvement program.

On-Call Writing and Editing Services – King County Wastewater Treatment Division, Washington. Mr. Crandell managed a contract to provide technical writing and editing services to the Wastewater Treatment Division of King County. One representative assignment involved writing the Phase 3 summary document for the siting of the Brightwater wastewater treatment facilities. For the Brightwater project, this 50-page summary document described to a non-technical audience the environmental review and technical evaluation that led to the county executive's final selection of a site.

Central Puget Sound Regional Water Supply Outlook – Central Puget Sound Water Suppliers' Forum, Washington. Mr. Crandell edited two drafts and the final report for this regional water planning report. He edited the writing of eight contributing authors, achieving a consistent writing style and report format. The report is based on 13 technical memoranda, several of which Mr. Crandell edited during the development of the Outlook. The Outlook report is geared toward decision-makers and elected officials from state government, from King, Pierce and Snohomish counties, and from cities, towns and water utilities within the three-county area.

SECTION C

Fee Proposal Section

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SECTION C

Fee Proposal Section

Leidos Labor Billing Rates

The rates listed below will be in effect through June 30, 2019.

Payment to the Consultant for services performed under this Agreement shall be on the basis of the following hourly labor rates:

Table C-1. Hourly Labor Rates for Leidos Personnel

Billing Class	Role	Hourly Labor Rate
1	Senior Consultant	$350
2	Consultant	$300
3	Senior Technical Project Manager	$235
4	Technical Project Manager	$215
5	Lead Engineer	$200
6	Supervising Engineer	$185
7	Senior Engineer	$180
8	Sr. Project Manager/Construction Manager	$180
9	Project Manager	$140
10	Engineer II	$169
11	Engineer I	$159
12	Assistant Engineer II	$135
13	Assistant Engineer I	$124
14	Designer II	$129
15	Designer I	$112
16	Senior CADD	$106
17	CADD	$101
18	Senior Project Assistant	$101
19	Project Assistant	$90
20	Office Assistant	$53

Leidos Expense Billing Rates

The following table provides a schedule of typical Expense Billing Rates. The Expense Billing Rates shown are effective through June 30, 2019.

Table C-2. Leidos Expense Billing Rates

Expense Category	Cost
Printing and Reproduction	
Copies (up to 11x17)	Internal: no charge External: at cost
Plots	Internal: no charge External: at cost
Supplies (e.g., bindings)	Internal: no charge External: at cost
Delivery and Courier Services	
U.S. Mail	no charge
Shipping	at cost
Travel and Transportation	
Airfare	at cost (typically less than $1000 round-trip from any Leidos office), plus travel agency fee
Hotels	at cost
Car Rental	at cost
Mileage	at IRS mileage rate for privately owned vehicles
Taxi	at cost
Parking	at cost
Gas (for rental cars only)	at cost
Tolls	at cost
Ferries	at cost
Meals	at Federal Per Diem per IRS Publication 1542
Hardware and Software	
Hardware (owned)	no charge
Specialty hardware (purchased for project)	at cost
Software (owned)	no charge
Software (purchased for project)	at cost
Communications	
Long Distance Phone Calls	no charge
Conference Calls	no charge
Cell Phone Calls	no charge
Facsimile	no charge

Expense Category	Cost
Equipment and Small Tools	
Owned	no charge
Rented	at cost
Miscellaneous	
Stenographic services	at cost
Dues, Licensing and Fees	at cost
Maps	at cost
Books and Publications	at cost
Consultant and Contractor Services	
Subconsultants	at cost + 10%
Contractors	at cost + 10%

Table C-3. Typical Travel Expense between Riverside and Leidos Office Locations

Item	Cost
Salt Lake City UT – Ontario CA	Billed at actual cost – Typical airfare round-trip: $550
Seattle WA – Ontario CA	Billed at actual cost – Typical airfare round-trip: $450
Nashville TN – Ontario CA	Billed at actual cost – Typical airfare round-trip: $850
Detroit MI – Ontario CA	Billed at actual cost – Typical airfare round-trip: $550
Orlando FL – Ontario CA	Billed at actual cost – Typical airfare round-trip: $900
Sacramento CA – Ontario CA	Billed at actual cost – Typical airfare round-trip: $450
Oklahoma City OK – Ontario CA	Billed at actual cost – Typical airfare round-trip: $800
Chicago IL – Ontario CA	Billed at actual cost – Typical airfare round-trip: $700