SCOPE OF SERVICES

Solicitation Number: CLMP142
Project Name: Engineering Services for Electric Service Delivery

PROJECT FOR:

CITY OF AUSTIN, AUSTIN ENERGY, THROUGH ITS CONTRACT MANAGEMENT DEPARTMENT

PROJECT TITLE:

ENGINEERING SERVICES FOR ELECTRIC SERVICE DELIVERY

OBJECTIVES OF THE PROJECT:

Provide engineering and associated services, for Austin Energy's Transmission, Substation, Distribution, Planning, Project Management, Operations, Real Estate, and Network Engineering groups.

BACKGROUND:

The selected firm shall serve as Electric Service Delivery's professional consultant and shall provide technical consultation and advice to Austin Energy (AE). The firm shall be capable of producing turnkey projects and construction drawing packages. The firm shall also be capable of supplying on-site (at AE offices) engineering, technical, and drafting personnel as needed. The specific skills required and duration of time will be provided in each scope of work that is issued to the firm. The firm must be capable of transmitting correspondence and drawings via an approved Internet connection.

All tasks required to complete the work shall be performed by the firm or by subconsultants under the supervision of the firm on a case by case basis. AE reserves the option to participate in the work to the degree deemed necessary or appropriate. When AE exercises the right to perform any part of the work, the firm shall cooperate with the assigned AE staff.

ANTICIPATED SERVICES:

An authorized AE representative, with input and assistance of the firm, shall develop for each assignment a scope of services consistent with AE's specific needs per assignment. Work is not to begin until the approved AE representative and the firm have agreed to a scope, schedule, and cost for each task or group of tasks and a notice to proceed (NTP) is issued. ***All designs for construction and engineering reports shall be stamped with an approved State of Texas Professional Engineering seal***. The anticipated scope of engineering services AE may require is described below. Assigned projects may require only portions of the described scope of services. Related engineering services necessary for the implementation of a project may also be required.

***A. Design Criteria Services*:**

In conjunction with AE, the firm shall, recommend general design criteria and methods for the design, performance and operation of new or upgraded AE transmission, substation, distribution, lighting, and network facilities. The objective will define the scope of technical design features and establish a set of standards and methodology to review, analyze and recommend design options. The criteria shall, as a minimum, address the following:

Safety	Applicable Codes and Standards
Reliability	Electric and Magnetic Fields (EMF)
Aesthetics	Electric System Operations
Economics	Right-of-Way Requirements
Environmental Impact	Feeder Analysis
Failure Analysis	Lightning Protection and Grounding
Technical Training	Drafting Services
Power Quality Problem Resolution	Civil/Structural Design Services
Equipment Analysis and Selection	Underground Distribution Design
Street and Security Lighting Design	Overhead Distribution Design

Equipment/System Protection Coordination and Selectability

B. *Right-Of-Way and Siting Services*:

The scope of work for a particular assignment may include the development of right-of-way requirements for AE transmission and distribution systems. The firm may also perform siting studies and develop siting requirements, as specified by AE, for new construction or for modifications to existing facilities. Criteria for right-of-way and siting analysis shall include applicable ordinances, regulations, standards and codes, land-use and compatibility issues, line clearances, right-of-way and site access, safety, cost, and other pertinent factors. Services required for right-of-way and site acquisitions may include, but shall not be limited to the following:

1. Determine right-of-way widths for various overhead and underground transmission and distribution designs and configurations.
2. Prepare right-of-way strip maps for proposed line routes.
3. Identify, locate, and document other utilities or infrastructure within existing or proposed rights-of-way, or in the close proximity thereof, which might impact proposed transmission, distribution, and network systems or facilities.
4. Perform feasibility studies, as specified by AE, in connection with the siting of transmission, distribution, and network facilities.

***C. Engineering Design Services*:**

The transmission system operates at 69kV, 138kV, and 345kV voltages. The distribution system operates at 12.5kV. The network operates at 15kV and 34.5kV.

1. TRANSMISSION DESIGN

a. Use PlsCadd to perform design and modification of new and existing transmission lines and provide an "ISSUE FOR CONSTRUCTION" drawing package which includes plan and profiles, sag charts, hardware and structure details, materials lists, foundation designs and all related design calculations.

b. Use Sag10 software and sagging templates to make design modifications to existing hand-drawn manual drawings.

c. Asbuilt existing lines utilizing existing information AE has and, performing some level of field reconnaissance, obtain necessary additional information.

d. Perform design of underground transmission lines.

e. Analyze existing lattice towers and their foundations for increased loading.

f. Obtain necessary permits to construct line (ie, road crossing, FAA, environmental, etc).

2. SUBSTATION DESIGN

a. Perform design and modification of new and existing substations to include material lists, foundation, containment designs, and all related design calculations.

b. Must be able to design stations utilizing open air, enclosed switchgear and GIS equipment.

c. Design substation feeder get-a-ways.

3. RELAY DESIGN

a. Perform engineering and design of existing and new protective relay and control systems for AE's transmission, substation, and distribution system.
   - ☐ Provide in-the-field construction support to technicians of relay design projects.
   - ☐ Generate as-built drawings of relay design projects

b. Generate work instruction, trip check procedures, check-out guidelines and other procedural documentation for protective relay and control projects.

c. Personnel performing the work described in “Relay Design” will predominately be required to work out of AE’s offices.

d. All work to be performed per AE and industry standards.

e. Extensive knowledge of electro-mechanical and microprocessor relay design is required.

4. PLANNING

a. Perform equipment outage analysis to determine continuous load requirements for all equipment.

b. Develop electrical loading criteria for all equipment during overload conditions. Develop a thermal loading model for transformers based on the IEEE transformer loading guide.

c. Perform conductor selection analysis.

d. Perform AE system performance studies and associated analysis, including EMF effects, audible noise, radio and television interference; line resistance, reactance and losses; lightning effects; transient and switching surge effects; and grounding.

e. Perform distribution, network, and transmission expansion and contingency planning using industry standard tools. Experience in using PTI's PSSE transmission analysis package and ABB's Foresite load-forecasting package is highly desirable.

f. Perform steady state load flow analysis, transient stability analysis, and short circuit analysis.

g. Use industry accepted techniques to analyze system load forecasts to determine proper load allocation. Prepare local area forecast for Distribution and Network Planning Studies.

h. Perform Generation Planning studies as required.

5. GROUNDING DESIGN

a. Perform soil-resistivity tests using the Wenner 4 pin method in accordance with IEEE Std. 81 (latest revision), "IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System" when required by the task.

b. Design substation grounding systems to achieve touch and step voltages anywhere within the substation proper and to the substation perimeter fence that are less than or equal to the IEEE Std. 80 (latest revision) "IEEE Guide for Safety in AC Substation Grounding" recommended values. All grounding system designs shall be accomplished using the CDEGS (Current Distribution, Electromagnetic interference, Grounding and Soil structure analysis) software package developed and marketed by Safe Engineering Services & technologies, ltd. (SES), Montreal, Quebec, Canada. SES can be reached at 1-800-668-3737.

c. Design grounding systems for transmission and distribution line structures to achieve specified maximum ohm values to remote earth.

d. Evaluate grounding systems of existing transmission, distribution, and network systems and facilities to assess their performance based on the IEEE Std. 80 (latest revision) or other criteria as set forth by AE. Perform ground system resistance tests using the Fall-of-Potential method in accordance with IEEE Std. 81 (latest revision), "IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System" for use in the analysis and modification of existing grounding systems with no external or interconnecting grounds. However, for large or interconnected grounding systems, in low resistivity earth (< 75Ohm-m), and for grounding systems that have numerous extended grounding conductors (distribution neutrals, OHGWs, etc.), the ground system impedance test shall be conducted in accordance with IEEE Std. 81.2 (latest revision), "IEEE Guide for Measurement of Impedance and Safety Characteristics of Large, Extended or Interconnected Grounding Systems".

e. Perform studies and design solutions to resolve and address lightning issues within the AE system.

6. DISTRIBUTION DESIGN

a. Design, review, and approve overhead distribution feeders and service requests.

b. Design, review, and approve lighting for roadways and security.

c. Determine and design appropriate lighting levels for all illumination requirements at AE.

d. Design, review, and approve underground distribution feeders, downtown network feeders and service requests.

e. Perform pole loading analysis using O-Calc Software.

7. SYSTEM PROTECTION AND CONTROL

a. Perform system engineering and relay settings for new and existing transmission, substation, and distribution projects.

b. Personnel performing the work described in Part “a.” above will predominately be required to work out of AE’s offices.

c. Evaluate SCADA/EMS system and practices.

d. Evaluate and analyze system power quality abnormalities and develop resolutions.

e. All work to be performed per AE and industry standards.

f. Extensive knowledge of electromechanical and microprocessor relay design required.

8. STANDARDS, SPECIFICATIONS, AND GUIDELINES

a. Prepare, submit, review, and revise engineering design and construction standards as required.

b. Develop performance standards and prepare specifications for equipment, conductors, and hardware necessary for assisting in procuring materials detailed in AE’s standards.

9. EQUIPMENT AND MATERIALS

a. Analyze materials and equipment shop samples, catalog data, schedules, shop drawings, and shop and mill tests as required.

b. Perform and assist in the analysis of failed components and systems in use at AE.

c. Analyze and evaluate existing construction and hardware standards to determine suitability for existing and planned loads as required. Review and analyze available engineering data, develop computerized load models, prepare graphics, report calculations and findings, and make recommendations to remedy existing or potential problems.

d. Perform in-service equipment tests and analysis per manufacturer listed requirements.

10. ENVIRONMENTAL

a. Develop erosion and sedimentation control plans to meet all ordinances and regulatory requirements.

b. Develop water quality and drainage designs to meet any applicable local, state and federal requirements.

c. Develop alternative schemes and provide final designs for landscaping and visual screening of electrical system facilities.

d. Incorporate design elements determined applicable from the Sustainable Design Checklist for Municipal Buildings/Projects in compliance with Volume 1 of the City of Austin Sustainable Building Guidelines.

e. Prepare storm water construction plans per EPA requirements for sites over one acre of disturbance.

11. DRAFTING AND CADD SERVICES

a. On-site drafting personnel, when needed, shall be located at Kramer Lane and St. Elmo service centers. One person at each site shall be capable of coordinating all work to meet requested deadlines. Drafting services can also be off-site with the capability of transferring documents electronically.

b. Revise existing drawings and prepare new drawings utilizing both manual and electronic methods. Manual shall include pencil and ink. Electronic shall be prepared in AutoCAD format (latest revision).

c. Utilize AE's drafting standards and conventions, unless otherwise mutually agreed.

d. Reproducible engineering drawings shall be available in paper, sepia, Mylar or blue line as needed by AE.

e. Able to generate and furnish plan and profile drawings from GIS format survey information files.

12. PROJECT MANAGEMENT

a. Acquire project data requested by AE personnel with minimal guidance.

b. Produce project documents such as business cases, project management plans, and scope change requests using AE templates.

c. Analyze project data and produce forecasts, critical path conflicts, and proposed project timelines.

d. Prepare and monitor budgets.

e. Utilize Microsoft Project (latest version). Black Belt skill level preferred.

f. Staff providing project management should expect to office at AE.

g. Utilize Microsoft Access (latest version).

13. PERMITTING

a. Prepare permit drawings for projects requiring Site Development or Demolition permits through the City of Austin.

b. Act as AE's agent in the approval of permits.

c. Prepare studies required to supplement permit drawings.

PROPOSED SCHEDULE:

AE anticipates the engagement of the firm in May 2014. Upon execution of the completed contract, the firm shall be prepared to immediately begin assisting AE in all phases of planning, analysis and design of needed facilities.

COST ESTIMATE:

The City anticipates developing and executing a professional services agreement with one firm for an estimated total amount of $1,500,000 per year for a period of three years, or until available funding authorization is expended. The firm will be compensated under a standing contract for varying amounts depending on the job assignment.

Authorization of services shall be contingent upon annual Council approval of the CIP budget and extensions of this contract. This contract does not in any way guarantee payment by AE to the firm of any of the above amount.

MAJOR AND OTHER SCOPES OF WORK:

Below is a list of the major scopes of work that the City has identified for this project. There must be representation for all major scopes of work listed in the prime's statement of qualifications. The experience of the firms listed to perform the Major Scopes of Work,

whether a subconsultant or prime firm, will be evaluated under Consideration Item 6 – Major Scopes of Work – Comparable Project Experience. In addition, the City has identified Other Scopes of work that MAY materialize during the course of the project. The City does not guarantee that the scopes listed under Other Scopes of work will materialize on this contract. If the prime consultant intends to enter into a subconsulting agreement on a scope of work not listed below, the prime consultant is required to contact SMBR and request an updated availability list of certified firms in each of the scopes of work for which the prime consultant intends to utilize a subconsultant.

Major Scopes of Work

Electric Utility Protection and Control Engineering
Electrical Engineering

Other Scopes of Work

Surveying Service
Drainage Engineering
Foundation Engineering
GIS Services
Lab and Field Testing Services
Concrete Testing Services
Permitting Services
Electrical Engineering – below 5kV

Notes:

- Participation at the prime or subconsultant level may create a conflict of interest and thus necessitate exclusion from any contracts resulting from the work performed in the design phase.

- If the City determines that a conflict of interest exists at the prime or subconsultant level, the City reserves the right to replace/remove the prime or instruct the prime consultant to remove the subconsultant with the conflict of interest and to instruct the prime consultant to seek a post-award change to the prime consultant's compliance plan as described in City Code § 2-9B-23. Such substitutions will be dealt with on a case-by-case basis and will be considered for approval by Small and Minority Business Resources (SMBR) in the usual course of business. The City's decision to remove a prime or subconsultant because of a conflict of interest shall be final.

- Construction Inspection and Public Information and Communications are **NOT** a subconsultant opportunity on this rotation list. These services will be performed in-house or under a separate contract, if needed, and will be determined when project assignment is made.