PROFESSIONAL ENGINEERING SERVICES PROPOSAL
FOR
ALLISON SUBSTATION

Prepared For

CITY OF
GALLUP

JANUARY 2019

Prepared By

ESC engineering
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Chk'd		1/29/19
	Initials	Date
Apprv'd	EVL	1-29-19
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	Initials	Date

SCOPE OF SERVICES

A. Basis for the Scope of Work

The Allison Substation is an existing 115kV-13.2kV facility owned and operated by the City of Gallup (Gallup). Gallup is going to build a second Substation adjacent to the existing Allison Substation. This new Substation will include a 12/16/20MVA power transformer, four (4) feeders, and a capacitor bank. The existing Allison Substation utilized metal clad switchgear for the low voltage feeders, and the Long-Range Plan that Gallup received in 2008 recommends utilizing metal clad switchgear in this new Substation. Based on equipment costs, ESC recommends that Gallup consider utilizing an open-air feeder configuration. In either case, the Scope of Work that will be performed by ESC will include the following:

Substation:

1. Develop a one-line diagram to guide the physical and electrical design.
2. Develop a General Arrangement for the new 115kV (550kV BIL) and 13.2kV (110kV or 150kV BIL) Substation layout. Substation layout will include the following new equipment, unless stated otherwise:
   a. 115kV Buswork.
   b. 115kV Equipment.
   c. One (1) 115kV Power Circuit Breaker, Power Circuit Switcher, or fuses. This will depend on any requirements imposed by Public Service of New Mexico (PNM).
   d. One (1) 12/16/20MVA, 115kV-13.2kV Power Transformer.
   e. Either:
      i. One (1) metal clad switchgear building consisting of a main disconnect breaker, four (4) feeder bays with breakers, and one (1) bay to connect to a capacitor bank, including relaying, or –
      ii. An open-air feeder configuration consisting of four (4) distribution breakers, associated hook stick discount switches, and metering PT's/CT's
   f. One (1) capacitor bank, with associated cap switcher.
   g. One (1) control building with associated relay panels – for open air configuration only
3. Develop physical elevations that depict the installation of the new Substation equipment.
4. Develop the material list to include:
   a. 115kV Power Circuit Breaker, Circuit Switcher, or Fuses.
   b. 115kV Disconnect Switches.
   c. Power Transformer.
   d. 13.2kV Disconnect Switches.
   e. 13.2kV Distribution Circuit Breakers or Metal Clad Switchgear
   f. Metering and Relaying PTs/CTs.
   g. Steel.
   h. Bus Fittings.
   i. Grounding Fittings.
5. Develop the new relay panel layouts (inside the metal clad gear or for open-air) to include:
   a. Test Switches.
   b. Transformer Differential Relays.
   c. Transformer Overcurrent Relays.
   d. Bus Differential Relays.
   e. Transmission Line Overcurrent Relays – as required.

f. Feeder Overcurrent Relays.
g. 0/1 Breaker Control Switches.
h. 86 Lockout Relays.
i. 87CO Cutout Switch.
j. AC Receptacle.

6. Develop AC&DC schematics for the new relay panels, relays, test switches, cutouts, and lockouts based on the desired protection scheme as shown on the one-line diagram.
7. Develop the grading plan and details.
8. Create bid documents, bid, and place on order (with the approval of Gallup) the required Power Transformer.
9. Create bid documents, bid, and place on order (with the approval of Gallup) the required Substation steel.
10. Create bid documents, bid, and place on order (with the approval of Gallup) the required metal clad switchgear – if this option is selected.
11. Create bid documents, bid, and place on order (with the approval of Gallup) the required relay panels – might be with a metal clad switchgear bid.
12. Create bid documents, bid, and place on order (with the approval of Gallup) the required long lead Owner Furnished Material to include disconnect switches, circuit breakers, circuit switchers, PT's, CT's, etc.
13. Create bid documents, bid, and award bid (with the approval of Gallup) of the Construction Contract.
14. Develop a cable schedule based on the wiring schematics to include field cables from the control building to field equipment.
15. Develop differential, transformer protection, 115kV distance, 115kV over-current, and feeder over-current relay settings.
16. Provide review sets of each section of design to Gallup for review and comment prior to completing design.
17. Utilize the ESC standard AutoCAD drawing styles.
18. Review of shop drawings and Contractor/Supplier submittal packages.
19. Make periodic site visits as follows:
    a. One (1) project kickoff meeting to be help at Gallup's office.
    b. One (1) pre-bid meeting to be held at Gallup's office.
    c. One (1) pre-construction meeting to be held at Gallup's office.
    d. Up to two (2) site visits during construction to aid the Contractor and inspect work progress.
    e. One (1) visit to the site to verify commissioning activities.

B. Clarifications

1. The following equipment will be Owner Furnished and placed on order by Gallup, but bid out by ESC:
    a. Power Transformer
    b. Substation Steel.
    c. Metal Clad Switchgear – if applicable.
    d. Relay Panels and Control Building – if applicable.
    e. Long Lead Owner Furnished Materials including disconnect switches, circuit breakers, circuit switchers, PT's, CT's, etc.
2. Full-time construction inspection is requested for the project. ESC anticipates that Gallup will provide qualified and competent full-time construction inspection, whether using third party firms

or internal Gallup staff. ESC will not accept responsibility for errors, schedule delays, and costs associated with inadequate construction inspection.

3. ESC will generate Pay Applications based on the Contactor's monthly list of work units completed, as verified by Gallup.
4. Gallup shall be responsible for check-in/check-out of Substation Owner Furnished Materials (OFM) to the Contactor(s). The Contractor(s) shall be responsible for managing and tracking OFM received from Gallup.
5. Phone calls placed to ESC will be responded to within two (2) business days in order to avoid project delay, but every effort will be made to answer calls sooner.
6. Eighty (80) hours have been allocated for Construction Support via telephone and/or email for Gallup and the Contractor. If the eighty (80) hours is exceeded, the hours will be charged at ESC billing rates.
7. Point of contact for the Substation shall be either Eli ImMasche or John Bridges.
8. Emails for the Substation should be addressed to Eli ImMasche or John Bridges.
9. Emails sent to ESC will be responded to within three (3) business days in order to avoid project delay, but every effort will be made to respond sooner.
10. Gallup will supply a list of approved Construction Contractors to send request for bids on the Substation Construction Contract. If Gallup does not have a list, ESC will provide a recommended bidders list to Gallup.
11. Gallup shall hire a local Geotechnical firm to provide a geotechnical investigation of the soils at the Substation site.
12. Gallup shall hire a local Surveyor to provide survey data to ESC. This data will be used to create the grading plan and details. ESC will provide to the hired Survey the specifications and requirements to provide the detailed survey data back to ESC.
13. Any permitting or surveying during construction will be the responsibility of the Construction Contractor and will be defined as such in the Construction Contract. ESC will provide to the hired Surveyor the specifications and requirements to aid in the locating of foundations.
14. No permits are anticipated for this phase of construction. If permits are required, however, it is the responsibility of the Construction Contractor to obtain the permits.
15. The design will not be considered deficient under the following conditions:
    a. Design changes after bidding due to as-built equipment drawings.
    b. Design changes after bidding due to requested changes to the physical design by Gallup.
    c. Omission of materials caused by lack of equipment as-builts or a change in physical design after bidding.
    d. Workmanship defects during construction due to unexpected physical conditions (for example, concrete chipping due to soils not included in the soils report).
16. The timeline is based on the approach that a physical design will be based on the one-line originally developed in the first two (2) weeks of the project. If design changes occur, the impact will be reviewed by ESC and Gallup to determine if the design schedule and/or design costs will be impacted.
17. ESC's role in commissioning will include the following. A testing firm will be hired as part of the Construction Contract to perform full substation testing.
    a. Overall review and assessment of construction activities.
    b. Aid in verification of wiring.
    c. Aid in verification of relay settings.
    d. Aid in functional check of control scheme.
18. Ground resistivity tests for areas of the new Substation will be performed by a third party, normally the same firm that performs geotechnical investigation of the site. This third party shall be hired by Gallup.

19. Construction Contractor's testing firm shall perform testing of any newly added sections of ground grid to the Substation.
20. All traffic control will be the responsibility of the Construction Contractor and will be defined as such in the Construction Contract.
21. It is anticipated that during construction, the Contractor and/or Gallup may request field changes to the designs. Changes will be noted by ESC and incorporated into Record Prints. Revised drawings, however, will not be issued to Gallup or the Construction Contractor as these changes are anticipated to be minor in nature.
22. ESC will complete Record Prints after receiving all required field information and markups from Gallup, the Construction Contractor, and the Surveyor.

C. Exclusions

ESC will not provide the following services or support as part of this proposal, but can provide these services at an additional cost:

1. Permitting.
2. Equipment, materials, or construction services.
3. Inspection Services.
4. Construction Management Services.
5. Radio interference testing.
6. Siting analysis and land survey.
7. Road survey and design beyond the proposed Substation site.
8. Topographical surveying (other than supporting Gallup's geotechnical firm and subsequent review of reports).
9. Geotechnical report (other than supporting Gallup's geotechnical firm and subsequent review of reports).
10. SPCC and SWMP Plans.
11. Landscaping and decorative wall design.

D. Project Schedule

The Project Schedule listed below is based on all scope, discussion points, clarifications, and exclusions listed above. This schedule is also based on the timely response of other parties involved, including Gallup. ESC cannot maintain the proposed schedule if other parties cause schedule delays by responding in timeframes beyond those expected. Gallup will be allocated three (3) weeks of drawing review before drawings are released for bidding.

Item	Date
Start of Project	February 1, 2019
Project Kickoff meeting	TBD
Construction Contract bid documents – Substation	November 2019
Start of Substation Construction	Early 2020
In Service	Mid 2020

E. Deliverables

The following items shall be delivered to Gallup:

Substation:

1. Four (4) sets of "Release for Construction" drawings to include:
   a. One-line drawings.
   b. Three-line drawings.
   c. General Arrangement.
   d. Elevations.
   e. Cable and Conduit Schedule.
   f. Material List.
   g. Other physical drawings as required to complete Substation construction.
   h. Electrical Schematics.
   i. Panel Layout and Panel Wiring Diagrams.
   j. Interconnect Diagrams.
2. Competitive quotations and ESC's recommendations for construction, steel, relay panels, and miscellaneous OFM.
3. Three (3) Conformed copies of equipment supply contracts, if required.
4. One (1) Set of final as-built drawings plus one (1) electronic copy in AutoCAD Format and one (1) electronic copy in .pdf format.

F. Project Cost of Engineering Services

Based on the project Scope as described previously, ESC engineering, Inc. can offer engineering services that will not exceed the values shown below for engineering labor. Expenses are estimated as shown in the table below and will be invoiced according to the terms within the Engineering Service Contract. ESC understands that the Scope of the project could change or that additional services may be requested by Gallup. Any changes to Scope or requests for additional services will be evaluated to determine if there will be an impact to the project cost.

Substation Engineering Cost Summary	
Engineering Labor (Not-To-Exceed)	$179,100
Travel and Living Expenses (Estimated)	$11,800
Production, Communications, Equipment (Estimated)	$1,400
Subconsultant, Supplemental Staff	$0
Field Services Expenses	$0
Total Cost	$192,300