corrpro an AEGION company

HOUSTON OFFICE
7000B Hollister St, Houston, TX 77040
713.460.6050| www.corrpro.com

Mr. Jeff Edmonds, P.E.
Director of Engineering Services
City of Corpus Christi

July 31, 2023

Subject: Proposal for Cathodic Protection Engineering Services
E13022 – Gas Cathodic Protection Upgrades
Corpus Christi, TX

In accordance with your request, Corrpro is pleased to submit our cost proposal to provide cathodic protection (CP) design services and construction support services as indicated in the **E13022 – Gas Cathodic Protection Upgrades** kickoff meeting held on May 19, 2023.

SCOPE OF WORK

Corrpro understand that the work is to include field discovery and testing, design, bid package preparation, construction technical support, inspection, commissioning, and training. These tasks will be discussed in greater detail below.

Phase 1 – Tasks 1, 2, 3, 4 & 8

Task 1 - Compile and Review System Data

- Review Corpus Christi natural gas system data. Include pipe type, diameter, protective coatings, cased crossings, electrical isolation, leak history, areas of high risk of external corrosion, soil composition and resistivity. Establish a database of the existing distribution and transmission pipeline data. Import data from the Corpus Christi GIS and PCS systems to the AIM™ data management system.
- Review corrosion control data related to cathodic protection and DC or AC interference. Compile the location and readings associated with sacrificial anodes, test stations and impressed current cathodic protection systems and enter into the database. High voltage AC transmission lines and foreign regulated pipeline systems will be imported to AIM™ and overlaid to the gas distribution piping network.

Task 2 - Field Investigations

- Locate each of the existing cathodic protection tests stations and record submeter GPS coordinates. Pipe-to-soil potential, casing-to-soil potential, foreign line potentials, galvanic anode potential and galvanic anode current output measurements will be taken as appropriate. Inspect rectifier units and record operating data. In areas of crossing or colocation with overhead transmission lines, AC potentials-to-earth will be measured. Potential DC stray current hazards from energy pipelines will be noted. Interference tests will be performed where indicated. Electrical isolation and/or electrical continuity testing will be performed where measurements indicate possible system shorts or electrically discontinuous pipe sections. Perform a close interval potential survey (CIS) along the transmission lines.

- Program the Correlator℠ electronic field data collection system with locations of existing cathodic protection test stations and defined routes for field data collection. Collect all data electronically for processing and analysis to enhance efficiency and assure accuracy. Include GPS coordinates and time stamps for all data. In addition to GPS coordinates, record technician name, date, time, and photographic documentation as appropriate. Download the data from the Correlator℠ to the AssetView® application, for mapping with color coded icons for visualization of compliant and noncompliant assets. Work with Corpus Christi to export to the City's GIS system.

Task 3 Program Development

Under Task 2, the data from the records review and field investigations will have been entered into AssetView™ for archiving. Under this task, the data shall be analyzed and evaluated. The analysis will focus on:

- Identifying trends and areas of high priority
- Maintaining existing corrosion protection measures
- Predicting expected remaining life
- Identifying data gaps
- Defining data collection requirements for filling those gaps
- Developing a 3-year plan to upgrade the existing CP system

This work is to focus on upgrading and enhancing existing CP systems and identifying where supplemental corrosion protection is needed to maintain regulatory compliance over time. The sacrificial anode CP circuits will be combined to create larger and fewer zones for design of impressed current CP systems. The zones will then be prioritized for CP system design and construction.

Task 4 Standards Review & Revision

- Review existing Corpus Christi standard specifications and detail drawings related to corrosion prevention, cathodic protection, and DC interference mitigation. Update and revise as needed. Prepare additional standards where needed.

Task 8 Training

Train City personnel in corrosion and cathodic protection in the following areas:

- Corrosion in Gas Systems
- Cathodic Protection
    - Sacrificial Anode Systems
    - Impressed Current Systems
- Cathodic Protection Monitoring
    - Criteria for Protection
    - Testing
- Rectifier Operation
    - System Monitoring
    - Troubleshooting
- System Maintenance

Phase 2 – Tasks 5, 6, 7 & 9 – Dependent on findings/data collection from Phase 1

Task 5 Supplemental Cathodic Protection Designs

- Execute field measurements for design to include combining existing small pipeline circuits to form zones for protection by impressed current CP systems. Calculate current requirements for protection using existing magnesium anode current outputs and current requirement tests to apply additional CP current, simulating the installation of permanently installed systems. Give preference to locating rectifiers at existing City properties with AC power, such as wastewater lift stations. Perform additional field tests as needed, which may include soil, stray current and/or electrical continuity testing. Research and test to define subsurface geological information for possible use of deep anode CP designs. Design cathodic protection and stray current mitigation including facilities for system testing and monitoring.

60% Design Submittals

Prepare the 60% design submittal to consist of the following:

- Locations of new test station installations and or repairs of existing test stations
- Locations for new CP systems. Work with the City to assess options based on land rights and power availability
- Installation detail drawings
- OPCC
- Cover page, Table of Contents, and Executive Summary

90% Design Submittals

Prepare the 90% design submittal to consist of the following:

- Installation locations with illustrated access or traffic control as deemed necessary from conversations with the City. Formal traffic control plans to be part of awarded contractor's responsibility.
- Plan views of CP and interference mitigation systems
- CP and interference detail drawings
- Bills of material
- OPCC

100% Design Submittals

Prepare the 100% design submittal to consist of the following:

- Final installation locations with illustrated access or traffic control as deemed necessary from conversations with the City. Formal traffic control plans to be part of awarded contractor's responsibility.
- Final plan views of CP and interference mitigation systems
- Final CP and interference detail drawings
- Final Bills of material
- Signed and sealed plans and specs
- Final OPCC

Bid Package - ***Optional***

Prepare the bid package for the City to release for public bid to include the following:

- Material Specifications
- Approved "For Construction" plan drawings and details
- Testing and inspection specifications
- Hold point requirements
- Pre-bid meeting
- Bid Proposal
- OPCC
- Respond to all RFI's
- Support the city with review and evaluation of all bids
- Supply recommendation letter for evaluation of contractor bids

Task 6 Technical Support During Construction

Provide technical support for CP system construction to include:

- Attendance at pre-construction meeting
- Review and approve shop drawings and material submittals
- Perform periodic spot checks during construction
- Observe or review documentation required at quality check points
- Review as-built drawings for accuracy and completion
- Develop punch lists of incomplete or non-conforming items
- Respond to contractor Request for Information (RFI)

Task 7 System Commissioning

After construction is substantially complete, but before final acceptance, perform functionality testing to assure proper installation and commission the system(s).

- Measure base line pipe-to soil potentials
- Energize rectifier and check for proper operation and wiring
- Adjust rectifier to desired output
- Collect interrupted On and Instant Off pipe-to-soil potentials after adequate polarization
- Enter data in AssetView®
- After completion of the commissioning procedures, provide a final written report to include the following:
    - Analysis of data
    - Description of field-testing procedures
    - Operations and maintenance manual of the installed system
    - Record drawings (as-builts)

Task 9 Related Corrosion Engineering

- Perform related corrosion engineering services at the request of the City to investigate events on the gas system, perform inspections or assist with the evaluation of internal or external corrosion concerns, atmospheric corrosion control, corrosion related compliance matters, or foreign pipeline operations that may affect the City's gas system assets.
- Survey the market and develop recommendations for a CP remote monitoring solution. Prepare economic comparisons of alternatives and designs for implementation.

ESTIMATED SCHEDULE

Estimated Schedule – Phase 1		
Task Number	**Description**	**Completion Date**
	Notice to Proceed/Signed Contract	August 18, 2023
Task 1	Compile and Review System Data	September 22, 2023
Task 2	Field Investigation	October 13, 2023
Task 3	Program Development	November 17, 2023
Task 4	Standards Review & Revision	December 15, 2023
Task 8	Training	January 13, 2024

PRICING SUMMARY

Corrpro will be pleased to provide the above-described work for the below price.

Summary of Estimated Costs – Phase 1	
Compile and Review System Data (Task 1)	$44,000
Field Investigations (Task 2)	$26,000
Program Development (Task 3)	$46,000
Standards Review & Revision (Task 4)	$10,000
Training (Task 8)	$22,000
Total	**$148,000**

Summary of Tasks – Phase 2
Supplemental Cathodic Protection Designs (Task 5)
Technical Support During Construction (Task 6)
System Commissioning (Task 7)
Related Corrosion Engineering (Task 9)

Corrpro will invoice monthly based progress percentage complete with the final 5% billed after delivery of commissioning report.

SERVICES/MATERIALS PROVIDED BY OTHERS

1. Records, drawings and historical reports to be provided to Corrpro, if available.
2. Access to the right-of-way. Delays and cost associated with right-of-way or access problems may incur additional charges.
3. For site easements, services to be provided by the City.

COMMERCIAL TERMS AND CONDITIONS

1. Payment terms will be net 30 days.
2. Progress invoices to be submitted as agreed upon
3. Contract is T&M NTE

HOUSTON OFFICE
7000B Hollister St, Houston, TX 77040
713.460.6050| www.corrpro.com

NOTES

1. All terms and conditions listed above, whether explicitly detailed or not detailed in a resulting contract or purchase order, shall be accepted as "condition of sale" between Corrpro and the Purchaser and cannot be waived unless it is explicitly mentioned in the resulting contract or purchase order.

We appreciate the opportunity to submit this proposal. Please contact **Business Development Matthew Speights** at **281-770-8790 or Regional Engineering Manager Bob Little at 470-475-3139** if you have any questions or require any further information regarding this proposal.

Sincerely,

Matthew Speights
Business Development
C: 281.770.8790
Mspeights@aegion.com