



## FRISCH ENGINEERING, INC.

Consulting Electrical Engineers and Programmers  
13405 Folsom Blvd., Unit 600  
Folsom, CA 95630

dba Frisch  
Electric  
Electrical Contractor  
C-10 Lic #1025671  
Phone (916) 353-1025

September 23, 2020

Mr. Dan Jaurequi  
Tri City Engineering  
4630 W. Jennifer Ave., Suite 101  
Fresno, CA 93722  
danj@tricityengineering.com

Location: Coalinga WTP Automation Upgrade  
Subject: Electrical Engineering Programming and Construction Services

Mr. Jaurequi,

Frisch Electrical Engineering Inc. is pleased to submit this proposal to perform the automation system programming and construction services for this project. The following detail is provided in defining our proposed scope of work.

### Programming Services

SCADA Programming - We will program the new SCADA system for the new and revised site process controls. We have used the control strategies and P&IDs to approximate the effort needed to do PLC and SCADA programming and startup. The following tasks are:

1. SCADA Programming
  - A. Coordination meetings
  - B. Setup new machines for SCADA application
  - C. Load new software onto SCADA system (Inductive Automation)
  - D. Program and Configure new SCADA Application specific for project
    1. Database configuration
    2. Alarm Summary and configuration
    3. Alarm notification system configuration
    4. Screen Graphic development.
  - E. Factory Testing
  - F. Start-up and testing services
  - G. Reconnect to existing radio system and bring in data for remote pump stations
    1. Oil King BPS
    2. Palmer Ave Reservoirs
    3. Derrick Reservoir
    4. Derrick BPS
    5. Caleveras Reservoir
    6. Caleveras CI2 station
    7. North West Reservoir

2. PLC software Descriptions -- Additional features to be added to the Plant PLC control system are included: We will define the control strategies similar to existing functions and improve those functions with programming standards. Control strategies will be completed to the extent necessary for discussion and assume that software programming is by Frisch Engineering. Additional functions will be added as shown below:
  - A. Apply PLC programming standards to all systems to include:
    1. Enable/disable toggles
    2. Setpoints and time delays for every alarm and control function
    3. SCADA auto/manual control
    4. Fail alarms based on non-running when called, or no flow, or non-expected action of some sort.
    5. Out of auto alarms
    6. High, low, hi-hi, low low, and transducer alarms for each analog.
    7. Analogs scaled to engineering units.
    8. Others as needed.
  - B. PLC Application Programming:
    1. Program Plant PLCs to include the following:
      - a. Master Control Panel PLC
      - b. Raw Water Pump Station
      - c. Travelling Screen Sed Basins (modify as needed)
      - d. Filter 1-2
      - e. Filter 3-4
      - f. Filter 5-6, Plant Influent, Backwash Rate of Flow
      - g. Treated Water Effluent Pumps / Washwater System / Clarifiers
      - h. Chem Feed / Rapid Mixer
      - i. Incorporate new systems defined under other design tasks – permanganate and carbonic acid systems.
  - C. Factory Testing
  - D. On-site start-up and testing services
3. Operator Training
  - A. Electronic O&M manual
  - B. Training for staff – one session

### **Construction Services**

We will perform the following services to the extent possible limited only by the budget of hours and costs. Please see spreadsheet for quoted budget quantities of the tasks as listed below. We have estimated the quantity of hours for each task based on experience with similar projects. Occasionally, project circumstances require more attention than anticipated. If the project requires more effort than allocated, additional budget may be required.

4. Construction Services
  - A. Project Management and Meetings during construction
  - B. Respond to RFIs
  - C. Assist with change orders
  - D. Review Contractor Submittals
    1. General Electrical materials
    2. Control Panels
    3. Interconnection diagrams
    4. Upgrade integration plans
    5. Instrumentation
    6. Testing Submittal
    7. O&M Submittal Review
  - E. Witness factory testing (multiple days)
  - F. Site visit(s) to oversee installation of electrical work.
    1. Underground conduit prior to cover.
    2. Equipment anchorage and conduit installation prior to pulling wire.
    3. Wire installation and termination.
  - G. Witness on-site electrical and instrumentation testing
    1. Electrical pre-energization tests.
    2. Electrical pre-operational tests
    3. Electrical Operational tests
    4. Commissioning
  - H. Perform on-site Construction Inspection and generate punch lists.
  - I. As Built drawing revisions and production.

#### **Assumptions**

- Our existing insurance coverage limits for general liability (\$2M/4M) and E&O liability at (\$2M/4M) are sufficient.
- We are assuming that the Radio system be reused and connected to the new SCADA server. Communications to the remote stations can be improved when the station controls are improved under another project.
- The project construction budget includes an industry standard 10% minimum contingency such that changes can be designed and implemented as deemed necessary by the Engineer or Owner during construction. This quotation does not include cost for construction changes regardless of initiating source.
- This quotation does not include Arc-Flash analysis (unless specifically stated) as required by the NFPA 70 electrical code. That analysis and associated equipment labeling can be provided for an additional fee.
- Rate escalation of 5% per hour is scheduled for January 1, 2021 and each anniversary

thereafter. Escalated rates will only apply to extra work performed after January 1, 2021.

- Hourly rates include overhead costs such as telephone, photocopies, computer costs, and insurance.
- Hourly rates do not include expenses such as mileage, rental equipment, airline tickets, rental vehicles, lodging, non-incidental photocopying and materials.
  - Travel time will be billed at hourly rate, plus current Federal mileage rate.
  - Per diem charge will be added based on half or full day of field work.
  - Actual travel expenses (airfare, ground transportation lodging, etc.) are billed at cost plus 10% for overhead and handling.

### **Deliverables**

- Submittal reviews, RFI and change order responses, Field reports.
- Programming documentation

### **Terms**

- As defined per contract, contract by Client.
- Attached quote is based on project scope as described. We anticipate that we can perform the scope as described within our budget. If the project changes, or work scope increases or decreases, we will make every effort to inform the Client in advance of work for authorization.
- Client will be invoiced monthly based on project progress.
- Changes to project scope may result in increased or reduced costs.

### **Electrical Engineering Costs**

#### **See attached Quotation**

Frisch Engineering is pleased to offer this quotation for your consideration. Please give me a call or email if you have any questions or require further information.

Sincerely,



Thomas P. Frisch, P.E.  
Electrical Engineer  
[tfrisch@frischengineering.com](mailto:tfrisch@frischengineering.com)

I agree to project scope, assumptions, deliverables and terms and authorize Frisch Engineering to proceed:

X \_\_\_\_\_

Title: \_\_\_\_\_ Date: \_\_\_\_\_

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**PROFESSIONAL ENGINEERING SERVICES COST ESTIMATE**

JOB TITLE: Coalinga WTP SCADA Improvements  
CLIENT: Coalinga, City of

DATE: 9/23/2020

**Programming Services**

## Electrical Engineering Discipline

Task	Description	Principal Engineer	Senior Engineer	Senior Designer	Junior Designer	Associate Designer	Total hours per task	cost per task
1A	Coordination Meetings	16	16	0	16	0	48	\$8,560.00
1B,1C	SCADA machine setup and software	3	3	30	48	0	84	\$13,380.00
1D	Application Programming	11	44	176	110	0	341	\$57,310.00
1E	SCADA Factory Testing	3	12	54	18	0	87	\$14,940.00
1F	SCADA Startup and Testing	6	24	54	108	0	192	\$30,870.00
1G	Existing Remote Site Programming and Test	8	60	120	75	0	263	\$44,875.00
2A,2B	PLC Programming	24	270	120	30	0	444	\$81,450.00
2C	PLC Factory Testing	3	54	18	18	0	93	\$16,620.00
2D	PLC Startup and Testing	6	96	54	0	0	156	\$28,890.00
3	Operator Training	2	16	0	32	0	50	\$8,080.00
	Travel Expense and Per Diem							\$5,000.00
Subtotal Hours		82	595	626	455	0	1758	
Hourly rate per discipline		\$200	\$190	\$175	\$145	\$125		Subtotal Costs
Total cost per discipline		\$16,400	\$113,050	\$109,550	\$65,975	\$0		\$309,975.00

**Construction Services**

## Electrical Engineering Discipline

Task	Description	Principal Engineer	Senior Engineer	Senior Designer	Junior Designer	Associate Designer	Total hours per task	cost per task
4A	Meetings and PM 4 each	16	4	16	0	0	36	\$6,760.00
4B	Respond to RFIs 16 each	7	16	64	0	0	87	\$15,640.00
4C	Change Order Documents 6 each	10	12	48	0	0	70	\$12,680.00
4D	Submittal Reviews 20 each	10	25	100	0	0	135	\$24,250.00
4E	Factory Testing 2 days	2	4	16	0	0	22	\$3,960.00
4F	Site Visit 4 visits	5	12	48	0	0	65	\$11,680.00
4G	Witness Testing 24 days	29	72	288	0	0	389	\$69,880.00
4H	Inspection and Punchlist 2 revs	2	4	16	0	0	22	\$3,960.00
4I	As Built Drawings lot	0	0	8	0	16	24	\$3,400.00
	Travel Expense and Per Diem							\$9,000.00
Subtotal Hours		81	149	604	0	16	850	
Hourly rate per discipline		\$200	\$190	\$175	\$145	\$125		Subtotal Costs
Total cost per discipline		\$16,200	\$28,310	\$105,700	\$0	\$2,000		\$161,210.00

**Total Costs \$471,185.00**

Individual tasks cost are approximate and some cost shifting between tasks may be necessary