

Olivehurst Public Utility District



Agenda Item Staff Report

Meeting Date: May 19, 2022

Item description/summary:

Plumas Lake Water Treatment Plant Upgrade. This item has been discussed in recent committees. OPUD is starting to get low on unreserved water connections in the Plumas Lake water system. It was originally planned to construct a second water storage tank at the Plumas Lake Water Treatment Plant but a recent water capacity and use study indicates that adding 3 additional filters and control system will provide for more connections than the additional storage tank. Since the PLOG reservation agreement calls specifically for the storage tank and funding was set aside for this, we will likely have to amend the agreement. At this time we want to get the design started and get the actual filters ordered since they have a very long lead time to be built. Attached is a proposal for the design of the system.

Fiscal Analysis:

Estimates for the 3 additional filters is roughly \$1.5M. Design cost is \$163,000

Employee Feedback

None

Sample Motion:

Move to approval attached proposal from Affinity Engineering for the design of additional filters, piping and controls for the Plumas Lake Water Treatment Plant at a cost not to exceed \$163,000.

Prepared by:

John Tillotson, P.E., General Manager



April 4, 2022

Mr. John Tillotson
Olivehurst Public Utility District
1970 9th Avenue
Olivehurst, CA 95961

**Subject: Olivehurst Public Utility District
Plumas Lake Water Treatment Plant Improvements**

Affinity Engineering Inc. (Affinity) is pleased to provide a proposal to Olivehurst Public Utility District (OPUD) to provide engineering to add additional water treatment capacity to the Plumas Lake Water Treatment Plant (WTP). The engineering will be completed to bid the project with enough time that improvements can be completed prior to the summer of 2023. The purchasing of the pressure filters may need to be separated from the construction work due to the long lead time required for the pressure filters.

Scope of Work

The scope of service includes plans and specification to complete improvements to the WTP that will increase its treatment capacity and reliability. Affinity will provide all the civil and mechanical engineering and is proposing to team up with Frisch Engineering, Inc. to provide the electrical and programming engineering.

Affinity Engineering's Scope of Work:

More specifically, Affinity will provide the following:

1. Project Management

Provide Project Management services by overseeing the electrical engineering and being responsible for the overall design of the WTP Improvements.

2. Contract Documents

Civil Drawings:

- Civil site drawings to show the following:
 - Addition of three manganese treatment filters to be located adjacent to the existing two pressure filters
 - Identifying the "Clayton Style" globe valves that will be replaced with motor operated butterfly valves (MOV)
 - Identifying the propeller meters that will be replaced with magnetic meters (Mag Meter)

- Provide a profile drawing showing the connecting piping of the three filters and their appurtenances to the existing filters
- Electrical site drawing that shows new conduit locations and conductors for the new MOVs and Mag Meters
- Partial site plan of the new filters showing electrical details

Civil Specifications:

- Provide technical specifications as follows:
 - Manganese Treatment System (Three New Filters)
 - Piping Systems
 - Fittings, valves, and meters
 - Paving
 - Disinfection
 - Protective coatings

3. Bid Support

- Provide technical assistance and addenda during the bidding of the project.

Frisch Engineering (Frisch)

Frisch will be providing the electrical and programming engineering that is required for the project. Their scope of services is provided in Appendix B.

Schedule

The Manganese Treatment System is required to be operational by spring 2023 to meet the maximum day demands in the summer. The following estimated project time from when Affinity receives the District's Notice to Proceed:

- Design: 3 months
- Bidding: 1 month
- Construction: 10 months

Deliverables

- Plans and Specifications
 - Electronic Copy (PDF Format and provided on flash drive)
 - 60% Design Level
 - 90% Design Level
 - 100% Design Level (Bid Set)
 - Printed Copy – half size (11" x 17") (if requested)
 - (2) 90% Design Level
 - (2) 90% Design Level
 - (2) 100% Design Level (Bid Set)

Meetings

- 60% Submittal review with district staff
- 90% Submittal review with district staff

Assumptions:

The following are the assumptions that are associated with this project:

- The work would be performed under a negative declaration with all environmental work completed by OPUD.
- OPUD will provide all front-end documents required for bidding.
- Services during construction are not included in this proposal.

Fee Estimate

The total estimated fee to design the manganese treatment system is \$162,000 and is based on a time and material not to exceed without prior approval from the OPUD. Reimbursable expenses and sub-consultants will be billed at cost plus 15 percent. A breakdown of the costs is included in Appendix A.

The project will be billed at the following rate schedule:

Affinity Engineering 2022 Rate Schedule	
Position	Rate (\$/hr.)
Senior Project Engineer	200
Senior Hydrogeologist	200
Senior Designer	145
CAD Operator	90
Clerical	85
Sub-consultant fees and Reimbursable Expenses are billed at cost plus 15%	
Mileage cost is based on the IRS published rate plus 15%.	

Appendix A

Civil Engineering Detailed Estimate

Profession Engineering Services Detailed Cost Estimate

Project: Plumas Lake Water Treatment Plant Design Services

Task	Description	Senior Engineer (Hours)	Senior Designer (Hours)	Project Assistant (Hours)	Other Direct Costs		Hours/Task Hours	Task Cost
					Cost	Markup		
1	Project Management	80		20	\$1,000	\$150	100	\$18,850
2	Facility Design							
	Frisch Engineering				\$75,635	\$11,345		\$86,980
	Affinity's Design Services							
2.1a	60% Design	80	100				180	\$30,500
2.1b	90 % Design	20	80				100	\$15,600
2.1c	100% Design	20	20				40	\$6,900
3	Bidding Services	16					16	\$3,200
	Subtotals	216	200	20	\$76,635	\$11,495	436	\$162,030
	Hourly Rate \$/hr	\$200	\$145	\$85				

Appendix B
Electrical Engineering Detailed Estimate



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

March 29, 2022

Mr. Jim Carson
Affinity Engineering
Jim Carson <jcarson@affinityengineering.com>

Location: Plumas Lake WTP, 2023 Capacity Upgrades
Subject: Electrical Engineering Design Services

Mr. Carson,

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

Design Services

We will produce electrical drawings and specifications for upgrades to the existing WTP.

The design will include electrical drawings and specifications. The systems included in this quotation are as follows.

Common systems

- Replacement of PLC control panel.
 - New panel to control entire WTP including 2 existing filters and 3 new filters, chemicals, tanks, and booster pump station. Filters have 5 or 6 valves each.
 - New PLC control panel to control all new and existing equipment already being controlled.
 - SCADA system and PLC programming description. Existing SCADA system to be upgraded.
- Power distribution and control modifications for new valves.

Filter systems

- 3 new filters to be installed next to the existing 2 filters.
- Two new filters similar to the existing filters. Valves to be motorized.
- New control valves on the existing filters. Valves to be converted from pneumatic to motorized type such as Rotork IQ series or equal.

Instrumentation systems

- New flowmeters for each existing and new filter.
- New headloss instrumentation for each new filter.

Site electrical

- Conduit and wire layouts and schedules for items noted above.

The following drawings and specifications will be included in the design.

1. Electrical and Instrumentation Design
 - A. Site visit to observe and document current conditions
 - B. Design Meetings at kickoff and progress deliverables
 - C. Electrical Design Drawings
 1. Electrical and instrumentation symbols and abbreviations.
 2. Process and instrumentation diagrams (P&IDs)
 - a. Filter systems.
 3. Single line diagram of power distribution with load calculations.
 4. Elevation layout drawing:
 - a. Electrical equipment to be modified
 - b. Control Panel with backpan layout
 - c. Miscellaneous other panels
 5. Control panel wiring diagrams.
 - a. PLC Control Panel.
 - b. Miscellaneous control diagrams for valves, lights, heaters, etc.
 6. Plan drawings:
 - a. Building Power and Control Plan
 - b. Site Electrical Plan
 7. Detail drawings:
 - a. Pad mounted electrical equipment.
 - b. Instrumentation (flowmeters, pressure transmitters, etc.)
 - c. Underground conduit
 - d. Conduit transition through grade
 - e. Underground pull box installation.
 - f. Miscellaneous additional details
 - D. Electrical schedules:
 1. Conduit & wire
 2. Panelboard
 3. Instrumentation
 - E. Electrical specifications:
 1. General Electrical Materials
 2. Conduit and Boxes
 3. Low Voltage Wire
 4. Grounding

5. Automatic Transfer Switch
 6. Panelboard and Power Transformer
 7. Factory and Field testing.
 8. Control Panel Components
 9. PLC and Operator Interface Hardware
 10. Instrumentation (flowmeters, pressure transmitters, etc)
 11. Other electrical components.
- F. Electrical and Instrumentation construction cost estimate at each design deliverable.
- G. Bid services and addenda.

Assumptions

- We have assumed one design bid package, one project for construction, and a design period not to exceed 6 months. If the project is broken up into additional bid packages or design duration is exceeded for any reason, additional charges may apply.
- Design reviews are comprehensive and that information furnished at each design stage (design drawings, standards, methods, equipment tags, conventions) will be reviewed, commented, and/or approved when presented. Revisions to previously presented, yet uncommented, design information may create additional cost in Engineering for rework.
- Our existing insurance coverage limits for general liability (\$10M) and E&O liability (\$3M/5M) are sufficient. Please request insurance certificate for details.
- Drawings and specifications can be completed by using our standards and templates created in AutoCad and MS Word using CSI format.
- Reuse of Utility meter/main, ATS and Generator. Loads will remain similar to existing and utility services will not need upgrade.
- PLC I/O will remain as existing plus the addition of new filters and valves.
- Drawings furnished to Frisch Engineering from the existing O&M manuals and designs are accurate. Inaccuracies may cause additional time and effort in sorting it out during design.
- 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.
- Electronic files (ACAD) for the siteplan, mechanical and building plan will be provided to us for our use as background files. If electronic files need to be generated for the site plan, additional charges may apply.
- Rate escalation of 5% per hour is scheduled for January 1, 2023 and each anniversary thereafter. Escalated rates will only apply to extra work performed after January 1, 2023.
- 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-incidentual 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

- Plans, specifications, and cost estimate, delivered PDF, at 60%, 90%, and 100% design stages.

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. This quotation is for design services only. We will gladly quote services during construction such as submittal review, electrical inspection, and management after the design is complete. 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

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

X _____

Title: _____ Date: _____



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dba Frisch Electric

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Phone:

(916) 353-1025

PROFESSIONAL ENGINEERING SERVICES COST ESTIMATE

JOB TITLE: Plumas Lake WTP
CLIENT: Jim Carson <jcarson@affinityengineering.com>

DATE: 3/29/2022

Design Services

Electrical Engineering Discipline

Task	Description	Principal Engineer	Senior Engineer	Senior Designer	Junior Designer	Associate Designer	Total hours per task	cost per task
1	60% Design PS&E	31	31	56	99	25	242	\$43,245.00
1	90% Design PS&E	13	25	28	50	13	129	\$23,235.00
1	100% Design PS&E	6	7	10	17	5	45	\$8,105.00
	Travel Expense and Per Diem							\$1,050.00
Subtotal Hours		50	63	94	166	43	416	
	Hourly rate per discipline	\$230	\$215	\$185	\$160	\$130		Subtotal Costs
	Total cost per discipline	\$11,500	\$13,545	\$17,390	\$26,560	\$5,590		\$75,635.00
							Total Costs	\$75,635.00

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