

STAFF REPORT



To: Board of Directors

From: Chris Foley, Maintenance Superintendent

Date: September 24, 2020

Subject: Professional Services Contract for Controls System Integration

RECOMMENDATION

It is recommended that the Board of Directors adopt a resolution authorizing the General Manager to enter into a professional services contract with Frisch Engineering Inc. in an amount not to exceed \$230,810 for fiscal year 2020-21 control system integration services.

DISCUSSION

CAWD continues to improve the Supervisory Control and Data Acquisition (SCADA) and Programmable Logic Controllers (PLC) programming. Staff solicited proposals from five (5) different system integrator firms. Three (3) proposals were received, and staff ranked the proposals. Staff selected Frisch Engineering, Inc as the firm that can best meet CAWD's on goals and vision.

- Frisch Engineering had the most wastewater plant experience.
- Frisch Engineering has sufficient staff size to complete the project efficiently while nimble enough to adapt to new projects.
- Frisch Engineering's cost estimate best mirrored CAWD's estimated effort to complete the project.

Rank	Firm	Cost Estimate Tasks 1-3
1	Frisch Engineering, Inc	\$230,810
2	Aspect Engineering Group	\$137,636
3	Mission Controls	\$114,180
N/A	Tesco	Did not submit proposal
N/A	Worksmart Automation	Did not submit proposal

The request for proposal listed a detailed task list of items to complete and scope of services.

- a. SCADA/PLC system integration during normal business hours (typical)
- b. Emergency Service Calls: The Consultant shall respond within eight (8) hours following notification from a CAWD representative; and provide a technician to physically be at the location within four (48) hours if needed or as requested.
- c. As needed 24/7 response for SCADA system troubleshooting or failures (emergency situations only)
- d. On-site assistance as required, and by phone when possible. Remote access will be provided.
- e. New project integration (requires working with Capital Improvement Plan (CIP) projects if requested)
- f. PLC and Human Machine Interface (HMI) programming and design
- g. Communication and network systems support for proper delivery of SCADA operations
- h. Provide staff training on any new equipment or changes to existing SCADA processes
- i. Creating Operations and Maintenance manuals for any new equipment or changes outside of a separate CIP project
- j. Systems design and instrumentation coordination with Owner and outside vendors
- k. Coordination with software support services from third parties through District- owned support agreements and with manufacturers of equipment.

JUSTIFICATION

The previous integrator is no longer available to complete the treatment plant and reclamation SCADA screen migration for the treatment plant and provide support. This

has delayed the project. Staff audited the progress of the migration and created a detailed list of remaining items so the project can be completed efficiently moving forward.

Ongoing support is necessary to troubleshoot instruments, programming and reports. A service agreement is the best approach so that institutional knowledge can be developed so that any issues are quickly resolved. CAWD does not have a programmer on staff since the amount of work would not require a long-term fulltime position.

The collections system SCADA and PLC system was recently updated and only requires limited support.

Staff is continuously improving the system and replacing components as they reach the end of their useful life. This includes motor controllers, analytical instruments and sensors. Staff can install equipment but requires integrator support to add to the PLC and SCADA system.

FUNDING

\$200,000 was approved in the 2020-21 Maintenance Department budget.

\$24,220 was approved in the 2020-21 Collections Department budget.

\$30,000 was approved in the 2020-21 Reclamation budget.



CARMEL AREA WASTEWATER DISTRICT SCADA/PLC CONSULTING AND SUPPORT SERVICES PROPOSAL

**Electrical Engineering and Application Programming
Professional Services**



Frisch Engineering, Inc.
Consulting Electrical Engineers

September 17, 2020



FRISCH ENGINEERING, INC.

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

Phone 916.353.1025

September 17th, 2020

Carmel Area Wastewater District
3945 Rio Road
P.O. Box 221428
Carmel, CA. 93922

Location: Carmel Area Wastewater District
Subject: SCADA/PLC Consulting and Support Services

Attn: Mr. Chris Foley, foley@cawd.org

Thank you for inviting Frisch Engineering to respond to this RFP and submit our proposal. I/we are very excited for this project as CAWD is a perfect fit client for us. Frisch Engineering has extensive experience in the PLC and SCADA programming services of many similar water and wastewater projects. We are familiar to the needs and requirements of water and wastewater operators and CAWD in general as it pertains PLC and SCADA needs and standards.

We realize that many system integrators and application programmers can do "programming," but we are offering highly experienced programmers and engineers who will actually be doing the work and are available to you for your projects. They follow our very high quality standards and have engineering oversight. They are not overworked, and only have a few systems to maintain. You can always get them on the phone and work with you remotely anytime, even on weekends if needed. Taking on the CAWD SCADA system would fit in nicely with our other already mature SCADA commitments. We will and already have the time to work on CAWD SCADA for as much time as needed and whenever needed. You probably know this from other projects, but felt it is very important to be stated here for those who are less familiar with our staff and abilities.

Inductive Automation and Allen Bradley are our two most utilized systems and we are in full agreement with their selection. We have found that these systems, regardless of product cost, are the most efficient and cost effective to deploy over many years of operation. Inductive Automation systems also have many features that allow the programmer to develop custom tools to monitor the systems and alert us to alarm conditions that require our attention. The tools we have developed may be used on the CAWD system and we can offer these to you for consideration.

This project is along our primary business lines like other projects we have performed for Carmel Area Wastewater District. We are very proud of those projects as they went very well. We can offer all of the services required in the RFP plus many others such as Electrical Design, Electrical Construction Management, Arc Flash Calculations, Troubleshooting, Startup, UL 508A Custom Panel Builds, and C-10 Electrical Construction. We are excited about a new opportunity to work with Carmel Area Wastewater District again.

Our goal is to provide the on-going support services as described in the scope of work as well as the individual tasks related to the Treatment Plant SCADA, Reclamation SCADA and Collections SCADA. We have offered an approach to complete the individual tasks and support services however, we are amenable to revisions along the way and will encourage CAWD to provide guidance anywhere they see fit.

Frisch Engineering is pleased to offer this proposal for your consideration. Please feel free to contact me, the authorized officer to contractually bind the firm and to negotiate on behalf of Frisch Engineering. Please contact me at mfrisch@frischengineering.com or (916) 353-1025.

Sincerely,

A handwritten signature in black ink that reads "Michael Frisch". The signature is written in a cursive style with a large initial "M".

Michael J. Frisch, P.E.
Vice-President

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Section 3 – Work Plan and Approach

Frisch Engineering will be available to complete the on-going services over the coming three years. The on-going service will include the following.

- A) SCADA/PLC system integration during normal business hours (typical).
- B) Emergency Service Calls: The Consultant shall respond within eight (8) hours following notification from a CAWD representative; and provide a technician to physically be at the location within four (48) hours if needed or as requested.
- C) As needed 24/7 response for SCADA system troubleshooting or failures (emergency situations only)
- D) On-site assistance as required, and by phone when possible. Remote access will be provided.
- E) New project integration (requires working with CIP projects if requested)
- F) PLC and HMI programming and design
- G) Communication and network systems support for proper delivery of SCADA operations
- H) Provide staff training on any new equipment or changes to existing SCADA processes
- I) Creating Operations and Maintenance manuals for any new equipment or changes outside of a separate CIP project
- J) Systems design and instrumentation coordination with Owner and outside vendors.
- K) Coordination with software support services from third parties through District-owned support agreements and with manufacturers of equipment.

We envision the services listed above will be based upon requests and/or need and can help to identify work that needs to be completed. We will review requests and detail the scope of work and estimated time to complete the task in a written quote.

In addition to the on-going services detailed above, specific tasks detailed in the RFP will be completed over the course of the next three years. In our opinion, we believe we can complete all of the tasks listed within the first 1 to 2 years and will remain on for all three years and have hopefully beyond.

Upon acceptance of the proposal, we will contact CAWD to develop a schedule to complete the services, on-going and tasks listed below. Michael Frisch will be the primary contact for this task as well as costs control, quality assurance/quality control, and other issues critical to this project. He will assign personnel for each task and coordinate communication between CAWD and the personnel completing the tasks. Mike Frisch (and Thomas Frisch) will provide engineering oversight to the SCADA project which will be invaluable to the overall quality of the project.

The tasks include the following.

Task 1 – Treatment Plant SCADA

Sub-Task

1.1- PLC communication status page.

- Will include color and text animation indicating if PLC is online, faulted and in run mode.
- Alarms will have enable/disable with time delay.
- Display PLC running clock and allow editing of time.

1.2- Trends

- Update all analog values to include trend popup. Optimize trend popup so historical vs live data can be toggled and buttons to select span. Set trend X axis to engineering span.

1.3- Influent screen

- Add popups for pump control for all 3 influent pumps
- Add individual trends for each analog value.
- Add setpoint popup for control
- Add setpoint popup for alarms
- Change pump graphics to P&ID look. Add animated wetwell pointers for control and alarms.

1.5- Headworks

- Add status and alarms for grinder, grit pump and 2 conveyers.

1.6- Primary system

- Add popup for control and alarms for clarifiers
- Add primary pumps and skimming box animation, alarm and control.

1.7- EQ basin

- Change page to match graphics standard for pumps, piping, instruments and popups.
- Change EQ control to popup for setup and indicate current mode on display

1.8- Aeration Blowers

- Change to standard graphics
- Add trends to analogs
- Re-tune blower control PID loop so that blower will work correctly in auto. Additional programming may be required including opening of vent valve if blower is at minimum speed and still producing too much air.
- Blower 211 status on SCADA is not correct. Needs to be linked to PLC inputs.

1.9- Secondary clarifier

- Change to standard graphics
- Add trends to analogs

1.10- RAS/WAS

- Change to standard graphics
- Add control and alarm popups for pumps
- Add trends to analogs

1.11- Digester

- Change to standard graphics
- Add control and alarm popups for pumps
- Add trends to analogs

1.12- DAFT

- Change to standard graphics
- Add control and alarm popups for pumps
- Add trends to analogs

1.14-Sodium Bisulfite

- Change to standard graphics
- Add control and alarm popups for pumps
- Add trends to analogs

1.15- Sodium Hypochlorite

- Change to standard graphics
- Add control and alarm popups for pumps
- Add trends to analogs

1.16- Stormwater

- Change 2 pumps to standard graphics
- Add control and alarm popups for pumps
- Add trends to analogs

1.17- Potable 1 Water

- Change 2 pumps to standard graphics
- Add control and alarm popups for pumps
- Add trends to analogs

1.18- Treated Secondary 3 Water

- Add 3 pumps to SCADA- Already exist in PLC
- Add flow and pressure to SCADA- Already exist in PLC
- Add control and alarm popups for pumps
- Add trends to analogs

1.19- First Alarm Autodialer

- Configure common alarm messages from 5 remote PLCs to OPS Master PLC. OPS Master PLC then will have 3 digital outputs to backup alarm dialer.

1.20- Ignition Voice module

- Configure and test voice module to work with CAWD VOIP system. VOIP vendor to provide settings.

1.21- Runtimes

- Add runtimes for current day, previous day and cumulative for each pump.

1.22- Duplicate existing RSview32 alarms in Ignition SCADA.**1.23- Link alarms to Ignition SMS and Voice dialer****1.24- Alarm enable and disable screens**

- Add navigation using drop down or tree view for alarm enable/disable screens. There will be approximately 150 alarms. Connect enable/disable button to PLC alarm block.

1.25- Update Navigation bar to Reflect new and updated pages

1.26- Instrument Additions List

- Program analog input and scale block for Digester mixer pump. Add SCADA numeric indicator and trend.
- Reclamation Turbidimeter will be replaced by CAWD. Calibrate analog input and verify correct scaling.
- Add new Methane detectors to SCADA include display, PLC code and alarms. Assist CAWD with analog wiring connection.

1.27- SCADA and PLC Troubleshooting support- 120 hours

Task 2 – Reclamation SCADA

Sub-Task

2.1- PLC communication status page.

- Will include color and text animation indicating if PLC is online, faulted and in run mode.
- Alarms will have enable/disable with time delay.
- Display PLC running clock and allow editing of time.

2.2- Alarm enable and disable screens

- Add navigation using drop down or tree view for alarm enable/disable screens. There will be approximately 150 alarms. Connect enable/disable button to PLC alarm block.

2.3- First Alarm Autodialer for Reclamation

- Configure common alarm messages from 4 remote PLCs to OPS Master PLC. OPS Master PLC then will have 1 digital outputs to backup alarm dialer for reclamation. This system shares components with the treatment plant but the alarming PLCs are different.

2.4- Duplicate existing Rsviw32 alarms in Ignition SCADA.

2.5- Link alarms to Ignition SMS and Voice dialer

2.6- SCADA and PLC Troubleshooting support- 80 hours

Task 3 – Collections SCADA

Sub-Task

3.1- Add Control of Highlands Pump station to Calle La Cruz local HMI

- Import pump control screens from Highlands PS into Calle La Cruz Automation Direct Cmore panel and then link to Highlands PLC.

3.2- Link existing SMS alarms to Ignition Voice Alarm dialer

3.3- SCADA and PLC Troubleshooting support- 20 hours

Section 4 – Key Personnel Background

Michael Frisch, PE will be project manager and lead Engineer. Michael Frisch, Michael Rogers, and Nigel Wakefield will perform PLC and SCADA programming tasks. Others such as Thomas Frisch, PE. Or Martin Yarbrough will be brought in for other tasks as needed. Each of these personnel has many years of experience and has worked on many projects over many years.

Frisch Engineering staff consists of 2 Electrical Engineers with PE registration, 3 Associate Engineers and 4 support staff. In terms of Electrical Consultants, we are one of the largest in the Sacramento area and are looking to expand when appropriate. Engineering team is as follows:

Thomas Frisch, PE 29 years	Design Engineer, plan review, oversight, project design interpretation, submittal review, RFI response
Michael Frisch, PE 26 years	Project Manager, Quality Control, PLC and SCADA programmer, Construction Engineer, inspection, start-up, design review, interpretation, RFI response, dispute resolution, design changes.
Martin Yarbrough 26 years	Senior Designer, design review, submittal review, RFI response, design clarification.
Mike Rogers 28 years	PLC and SCADA Programmer, Senior Designer, start-up, design review, submittal review, RFI response, design clarification.
Nigel Wakefield 9 years	PLC and SCADA Programmer, start-up, Field Work, and Networking.
Nik Conant 19 years	Junior Designer, Drafting, Computer work, Radio Survey, Electrical Design.
Brian Woodin 15 years	Junior Designer, Drafting, Control Panel Construction, Field Work, Radio Survey, Networking.
2 additional support staff	Office tasks, design related tasks, product research, computer and network testing and configuration.

All Frisch Engineering staff assigned (except Mike Rogers) to this project are located in our office in Folsom, California. Please see resumes at end of proposal for description of their abilities, qualifications and experience.

Section 5 – Team Experience

Frisch Engineering has extensive knowledge and experience in the planning, design, deployment, and administration of robust, fault tolerant SCADA systems. We have been doing this for many years and have seen many systems come and go. Presently, we are very fond of the Inductive Automation solution and Allen Bradley PLCs.

We have utilized Inductive Automation's Ignition SCADA platform to create intuitive control interfaces for the operation of complex control processes. Created scalable systems to easily track, display, and analyze large amounts of process data from disparate devices. Focus on server-centric systems in order to offer unlimited growth opportunities of the SCADA system with minimal cost. Provide the opportunity to connect all systems across remote locations of your organization, putting all your important data into the hands of your team where it is needed.

We have developed graphic and control standards to provide consistent, predictable control interfaces that are easy to understand, and simple to use. We use various graphic tools to visualize and analyze process data.

We have experience in utilizing many of the Ignition software modules. We have created robust Alarm Notification systems utilizing email, SMS, and Voice technologies. Provided customized and easily understandable alarm event messages. This has enabled rapid alert and response for critical systems.

We have deployed SCADA user security and tag configuration to provide modular levels of access and control. This provides an audit trail log for change events.

Technology is ever-changing, evolving, and advancing. We are committed to staying up to date with security, industry best practices, and we take great care to monitor and secure critical infrastructure system. We realize security is counter to usability we find a perfect balance that keeps Operators happy. Ease of remote access for operators to quickly get real time system information and monitor or control field operations remotely is key to a successful system. The system information shall be accessible anywhere, on any platform, at any time, by any authenticated user.

Some of the inductive Automation SCADA packages and features we utilize are:

- SCADA visualization packages
- Reporting software
- SQL Bridge, provide interop for SQL and OPC data
- Historian – high-performance time-series tag history
- Web development – integrate with organization existing web applications
- Various Device Drivers and ability to integrate bespoke devices
- Serial and Ethernet communications devices

We are familiar and use Microsoft Server platform and Ubuntu Linux Server for these systems. We find that the additional cost and licensing complexity of the Microsoft systems do cause problems that waste time. We have successfully built replacement operating system drives in non-related Linux machines and installed them into Linux servers to replace failed units. Try that with Microsoft.

We also understand that many more people are familiar with Microsoft systems and that becomes the over-riding reason for using it. We will happily use and develop on Microsoft systems as decided by the Client.

We can advise CAWD on the best use of each of the available operating systems in relation to SCADA and the remote terminals. We are very accomplished at each of these systems.

We encourage the use of virtualization software for deploying virtual machines for reducing downtime and enhance resiliency. We find a reduction in time and cost of IT expenses. We can easily add or remove servers to the overall system for the purposes of testing, upgrades, security patches, etc. This results in a reduction in System downtime.

Frisch Engineering programmers and engineers have been using Allen Bradley PLCs since the early 1990's and have countless projects completed. We have experience successfully completing water, wastewater, and treatment facility projects utilizing all of the various Allen-Bradley PLC models. We have a Rockwell Systems Integrators Consignment license to use any Rockwell software needed for your projects.

We have many years' experience utilizing various HMI operator panels and touchscreen devices to create on site process visualization and control interfaces. Develop graphical standards to match what is shown on SCADA. We have used many manufacturers and models over the years and have developed our standards for their use.

We recently replaced Pebble Beach CSD SCADA system for the reclaim system and will be continuing the migration from RSView to Inductive over the coming months and years as budgets allow.

Section 6 – Client References

Discipline	Name	Company	Contact
County Civil Engineer	Dave Bolen	Sacramento County	916-874-8546 dbolen@saccounty.net
Project Engineer	Lacy Carothers	Cal-Am Water	916-568-4215 lacy.carothers@amwater.com
Electrical and Controls Engineer	Ales Volcansek	EID	530-642-4141 avolcansek@eid.org
PLC and SCADA Tech	Jess Leanos	EID	530-642-4076 jleanos@eid.org

Section 7 – Manpower Allocation

We anticipate the following manhours for the tasks 1, 2, and 3. This is an estimate of the required personnel hours by task. This is not meant as a quote for the work listed, it is an estimate of the level of effort for each task. Note, that we feel there is more than enough hours listed in the proposal and that we will likely have time for other projects that can aid in overall performance and operability.

Task Number	Personnel (hours)				
	Thomas Frisch	Michael Frisch	Michael Rogers	Nigel Wakefield	Others
Task 1	24	60	283	588	0
Task 2	16	40	85	163	0
Task 3	16	32	30	62	0
Spare 21-22 years	60	91	450	1000	0
Total	116	223	848	1813	0

The RFP appeared to be a combination specific scope of work of tasks plus annual

Section 8 – Cost

Cost proposal is included as separate email attachment. Please let us know if you have trouble locating it.



FRISCH ENGINEERING, INC.

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

Phone 916.353.1025

Thomas P. Frisch, P.E.

Experience Summary Mr. Thomas Frisch has worked in the water/wastewater/power/landfill industry since 1991 and has developed skills in power, controls, instrumentation and communications. He has become very familiar with most practices and processes used in this industry. His experience is diverse since he has worked as a Contractor and Consultant in various capacities. As a Contractor, he brought contract drawings to completion by designing the final details, making submittals and managing production. As a Consultant, he has designed over 250 water and wastewater projects ranging from small pump stations to large scale treatment plants. Consequently he has a high degree of product knowledge that enables him to minimize design exposure to unproven materials or practices. He knows the challenges that Contractors face in taking plans to construction and knows when to assist on behalf on the Owner. His designs for electrical, instrumentation, and telemetry systems have been very successful with near-zero change orders due to design flaws. His designs include complex PLC motor controls for booster pump stations, lift stations and motor operated valves and SCADA telemetry between pump stations and tanks. He has performed electrical studies such as a damage assessment or to determine system capacity and cost comparisons to determine electrical operational costs of VFDs vs. throttled fixed speed motors

Education B.S. Electrical Engineering, University California Los Angeles, 1991

Registration Professional Electrical Engineer Reg. CA E15761, NV, NM, AZ, as needed

Work Experience Electrical Engineer (29 years)

Mr. Frisch obtained his Professional Engineering License 1998, and shortly thereafter, began working as a consultant in Electrical Design. Thomas has designed over 250 projects ranging from small sewage lift stations to large (2000 HP total medium voltage) pump stations and treatment plants. During this time, Mr. Frisch has become proficient as a designer, obtained the respect of his peers, and now operates a successful Electrical Engineering design and construction services business.

Prior to consulting, Mr. Frisch worked for Tesco Controls as a Field Service Engineer (4 years), Sales Engineer (1 year), and Project Engineer (3 years). While working for Tesco, He became very familiar with design philosophies of HDR, Montgomery Watson, Brown and Caldwell, Black and Veatch, Carollo and others. He engineered and coordinated many projects including full treatment plants at El Dorado Hills, City of Davis, City of Corona, and City of Sanger. He became very familiar with many manufacturers of instrumentation, PLCs and SCADA systems. He developed and defined many of the standards still in use today at Tesco Controls concerning drafting, testing and manufacturing.

Project Experience

SCADA

San Juan Water District SCADA System
SMUD Carson Power Plant
City of Galt WWTP Tertiary Improvements
City of Galt SCADA System
Foothill Oaks Casino SCADA System
City of West Sacramento SCADA System Improvements
City of Lincoln SCADA System

Water

City of Galt, Industrial Park Reservoir and BPS
Trinity Center WTP
Lewiston RW Pump Station, WTP, and Tank
Lucerne WTP
Pebble Beach CSD, Forest Lake Treatment Plant
Cal Water Service Dominguez Wells 275 and 294 WTP Projects
Contra Costa Raw Water Pumping Plants, Comistas and Cowell Pump Stations, Contra Loma Pump Station, Shell Recycle Pump Station.
EID Promontory Tank and Reservoir 12

Wells

City of Davis, Well #30, Well 31 and Well 32
City of Mountain View, Well 22
City of Vacaville, Well 15 and 16, and Well 16 Ion Exchange Hex Chrome

Storm Water

Bureau of Reclamation RD784, Pump Station #6

Bureau of Reclamation RD784, Pump Station #2,5,6,8,10
S. Olivehurst Storm Water Pump Station
Yuba City Walnut Park Storm Water Pump Station

Waste Water

Redding Clear Cleek WWTP Dewatering Project

Redding Stillwater WWTP Expansion
City of Atwater Wastewater Treatment Plant
City of Vacaville, Easterly Wastewater Treatment Plant Tertiary Upgrade
Redding Mary Street Sewage Lift Station
Redding Sunnyhill Lift Station Pump and VFD replacement
Pebble Beach CSD, Forest Lake Reclaim Reservoir and Booster Pump Station
EID Highland Hills Sewage Lift Station



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Michael J. Frisch, P.E.

Experience Summary Mr. Michael Frisch has worked in the water/wastewater industry since 1994 and is familiar with most processes used in this industry. His experience is well rounded as he has worked as a Consultant and a Contractor. This experience has provided Michael additional perspectives of a project or problem. As a Consultant he is capable of providing information and expertise to the Owner and to assist the Contractor with suggestions that can expedite the project without compromising contractual requirements. His experiences as a Contractor have provided knowledge in all areas in the water/wastewater industry. This experience has provided him the expertise to assist clients with product selection, application, implementation, and process control. He is diverse in PLC and SCADA automation that include motor and process control with instrumentation. His experience with telemetry application and testing has proven invaluable.

Education B.S. Electrical Engineering, University California Los Angeles, 1994

Registration California State Professional Electrical Engineer Reg. E17155

Work Experience **Electrical Engineer (26 years)**

Work Experience Mr. Frisch obtained his Professional Engineering License in 2003, and began working as a consultant in Electrical Design and Construction Support in 1999. Michael has designed projects but his primary focus has been SCADA and PLC programming and Construction Support. He has managed over one hundred projects ranging from small sewage lift stations and pump stations to water and wastewater treatment plants. During this time, Michael has become proficient as a Construction Manager, Designer and PLC programmer and has obtained the respect of his peers. He has experience with Allen Bradley, Modicon and GE products. His expertise has been invaluable to the Owner, project managing team and Contractor.

Mr. Frisch is very thorough at testing of systems including power, controls, programming, and communications. Because some of these items are invisible to the user, it takes a person who understands the intricacies of PLC and SCADAS programming to flush out the bugs. Mike insures the job is completed correctly and per plans and specifications and leaves the project with the confidence of knowing that each and every item has been tested. If the plans are short on detail, Mike can work with the Engineer to fill in the blanks and keep the project on track.

Mr. Frisch has extensive experience with electrical, instrumentation and power design, constructability reviews, project management, submittal reviews, RFI responses, clarifications, design modifications, change order management and review, field inspection, field startup, punchlist inspection and project closeout. His PLC, Operator Interface and SCADA programming experience has benefitted him during the inspection and implementation process.



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Michael Rogers

Experience Summary Mr. Michael Rogers has worked since 1990 on many diverse projects, most of them involving the design from initial concept all the way through installation, training and service. Since 2010, he has worked exclusively on water and wastewater projects. Prior to that, other projects involved large and complex process equipment for the semiconductor industry. He has extensive experience in all aspects of equipment design, fabrication, assembly, programming, functional testing, installation, customer training and after sale service. He is proficient with many software packages including AutoCAD, Solid Works, and many PLC, OIT and SCADA packages.

Mr. Rogers was responsible for implementation of new semiconductor chip manufacturing facilities. During this time, he became very familiar with equipment, systems, volatile compounds, materials compatibility, automation, safety, and process. The Semiconductor industry has many parallels to the water and wastewater industry which gave him a jump start and the ability to grow.

Mr. Rogers is a very good communicator and is very knowledgeable on almost any topic. He is basically a walking encyclopedia of physical science and materials technology. He is the go-to guy when you have complex problems that require unique solutions. He picks up new skills daily and has proved to be a very valuable asset to Frisch Engineering.

Education B.S. Geology & Physics, Dalhousie University, Halifax N.S., Canada 1983
Master of Science, Geophysics & Space Physics, University California, Los Angeles 1985

Work Experience SCADA and PLC Programmer

Mr. Rogers has performed SCADA and PLC programming services on various projects, as noted under project experience, in the water and waste water industry over the last few years.

Prior to his experience in water and wastewater, Mr. Rogers was involved with numerous projects in the semiconductor industry. These projects involved designing, building, programming, installing and service. He worked on many projects with NEC electronics in Roseville, CA, IBM Corporation, and Dow Corning Corp.

Electrical Engineering Design and Construction Management

Mr. Rogers has personally designed water treatment plants, pump stations, and wells. He has performed ACAD drafting and worked with drafters to create plans and specifications for bidding projects. He has written design documents including specifications and predesign reports for projects.

He has managed construction and performed inspection, submittal reviews, answered RFIs, and attended meetings.

Project Experience

City of Lathrop, SCADA (Ignition) for wastewater, stormwater and recycled water

Pebble Beach SCADA System

EID Promontory 2 SLS

South Tahoe PUD Diamond Valley Reclaim system

City of Yountville, Wastewater Lift Station,

Oakwood Lakes recycled water irrigation system, Modicon M340 and Magelis OIT

Port Costa Wastewater treatment facility, Modicon momentum

St. Helena WWTP, Modicon M340 and momentum, iFIX SCADA, Wonderware OIT

Port of Oakland Shore to ship power systems, Schweitzer PLCs



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Nigel Wakefield

Experience Summary Mr. Wakefield is a tinkerer. Self taught over the last 15 years since being able to type. Nigel reads poriferous about network and security issues and has taken dozens of on-line courses to improve skills.

Mr. Wakefield is proficient in various programming languages including Python, C++, Visual Basic, Java, Google Go, and others. He is an expert at Linux and the command line. He operates servers and systems for fun and experiments with his own hardware and own machines at the office and home on a regular basis. He manages networks and routers to provide himself and others access to networks while creating detection and alarm algorithms to find when hackers are trying to get in.

We cannot say enough about the amount of well rounded experience Mr. Wakefield has and will offer to our clients. Every problem we have encountered with SCADA systems, networking, CMMS programs, etc. he has been able to diagnose and solve.

Education High School Diploma

Work Experience Network specialist, SCADA Programmer

Mr. Wakefield has performed Network configuration, Server setup and configuration, and SCADA programming services on various projects, for the last few years.

Nigel has truly been one of the best additions to the Frisch Engineering team because it seems like there is nothing he cannot figure out and solve. He is in charge of our own network systems and those of many of our clients. Remote access and security are two items that are opposed to each other and he has been able to achieve high levels of security without compromise to our access to systems and network devices.

Project Experience

Pebble Beach CSD, SCADA (Ignition) for wastewater and recycled water
RD784 SCADA (Wonderware)
South Tahoe PUD Diamond Valley Reclaim system (Wonderware)
Clean World Partners, multiple sites, (CMore panel interface)
EID Forbay SCADA (Wonderware)
West Bay Sharon Heights SCADA (Wonderware)



FRISCH ENGINEERING, INC.

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

Phone 916.353.1025

The following rates apply to hourly engineering services for design, studies, inspections, programming, testing, and management. All services will be invoiced monthly per the rate schedule:

FRISCH ENGINEERING INC. 2021 ~2023 RATE SCHEDULE

<u>Name</u>	<u>Title</u>	<u>Hourly Rate</u>
Thomas Frisch, PE	Principal Electrical Engineer	\$205 per hour
Michael Frisch, P.E.	Senior Electrical Engineer Senior Programmer	\$195 per hour
Martin Yarbrough Mike Rogers	Senior Electrical Designer Senior Programmer	\$180 per hour
Nigel Wakefield Nik Conant Brian Woodin	Junior Electrical Designer Junior Programmer	\$150 per hour
Zach Paladini	Associate Electrical Designer	\$125 per hour

The above hourly rates include overhead costs such as: travel via owned vehicle for on-site work , telephone, photocopies, computer costs, copying, and insurance.

The hourly rates do not include expenses such as rental equipment, airline tickets, rental vehicles, lodging, non-incidentual photocopying and materials. Miscellaneous expenses will be billed at cost + 10% as expressly listed in the project's scope of work.

Rate escalation of 5% per hour is scheduled for January 1, 2021 and each anniversary thereafter.

Frisch Engineering, Inc. has \$1M general liability insurance, \$1M auto liability insurance, \$9M umbrella liability insurance, State required workers' compensation insurance, and \$3M/5M professional liability insurance.



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

PROFESSIONAL ENGINEERING SERVICES COST ESTIMATE

JOB TITLE: SCADA/PLC Consulting and Support Services
CLIENT: Carmel Area Wastewater District

DATE: 9/17/2020

Description of Services: Design Services

Costs associated with the SCADA/PLC Consulting Support Services 3 year Agreement. Rates held for 3 years.

Design Services

Electrical Engineering Discipline

Task	Description	Thomas Frisch	Michael Frisch	Michael Rogers	Nigel Wakefiled	Associate Designer	Total hours per task	cost per task
1	Task 1	24	60	283	588	0	955	\$155,760.00
2	Task 2	16	40	85	163	0	304	\$50,830.00
3	Task 3	16	32	30	62	0	140	\$24,220.00
4	2021-2022 year	60	91	450	1000	0	1601	\$261,045.00
	Travel Expense and Per Diem							\$0.00
Subtotal Hours		116	223	848	1813	0	3000	
Hourly rate per discipline		\$205	\$195	\$180	\$150	\$125		Subtotal Costs
Total cost per discipline		\$23,780	\$43,485	\$152,640	\$271,950	\$0		\$491,855.00
							Total Costs	\$491,855.00

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

RESOLUTION NO. 2020-58

A RESOLUTION AUTHORIZING THE GENERAL MANAGER TO EXECUTE A CONTRACT WITH FRISCH ENGINEERING, INC. FOR PROFESSIONAL SERVICES IN AN AMOUNT NOT TO EXCEED \$230,810 TO PROVIDE DESIGN SERVICES FOR THE "CONTROL SYSTEM INTEGRATION SUPPORT AND DESIGN"

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WHEREAS, the District requires professional services from Frisch Engineering, Inc., for Programmable Logic Controllers and Supervisory Control and Data Acquisition associated with pump stations, treatment plant and reclamation control systems; and

WHEREAS, Frisch Engineering, Inc., has demonstrated that the requirements of the proposal can be completely met and has demonstrated expertise in the field of services required;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Carmel Area Wastewater District that it does hereby authorize the General Manager to enter into a professional services agreement by a cost not to exceed \$230,810, with Frisch Engineering, Inc., for engineering services for the "Control System Integration Support and Design".

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Carmel Area Wastewater District duly held on September 24, 2020, by the following vote:

AYES: BOARD MEMBERS:

NOES: BOARD MEMBERS:

ABSENT: BOARD MEMBERS:

ABSTAIN: BOARD MEMBERS:

President of the Board

ATTEST:

Secretary of the Board