

**HIGHLINE WATER DISTRICT
King County, Washington**

RESOLUTION 17-7-5B

RESOLUTION AUTHORIZING CONSULTANT AGREEMENT #17-60-23 WITH S&B, INC. FOR THE 2017 SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) SYSTEM UPGRADE

WHEREAS, the District's SCADA System was installed in 1996 and nearing the end of its useful life; and

WHEREAS, the District identified the need for upgrading the SCADA System in the 2017 Budget; and

WHEREAS, the District requested RH2 Engineering, Inc. to prepare the Request for Proposals documentation to use in advertising and soliciting proposals for furnishing and installing the SCADA system improvements for the District's water system; and

WHEREAS, in accordance with RCW 39.04.270, the request for proposals was published in the Seattle Daily Journal of Commerce on 5/9/17 and 5/16/17; and

WHEREAS, the District received one (1) proposal from S&B, Inc.; and

WHEREAS, the District's Engineer and General Manager have reviewed the scope of services from S&B, Inc. and recommend approval of this resolution.

NOW, THEREFORE, BE IT RESOLVED:

1. The General Manager or designee is authorized to enter into Contract #17-60-23 (referenced as Attachment 1 and incorporated herein by this reference) with S&B, Inc., for a not-to-exceed amount of \$140,733.66.
2. The General Manager and/or the District's Legal Counsel are authorized to make minor changes to the agreement if required.

ADOPTED BY THE BOARD OF COMMISSIONERS of Highline Water District, King County, Washington, at an open public meeting held this **5th** day of **July 2017**.

BOARD OF COMMISSIONERS



Todd Fultz, President



Daniel Johnson, Secretary



Vince Koester, Commissioner



George Landon, Commissioner



Kathleen Quong-Vermeire, Commissioner

ATTACHMENT - 1

AGREEMENT FOR CONSULTING SERVICES

This Agreement ("Agreement") is made and entered into by and between **Highline Water District**, a Washington municipal corporation ("District"), and **S&B, Inc.** a Washington corporation ("Consultant") (individually a "Party" and collectively the "Parties") for the purposes forth below.

1. Scope of Consulting Services. Consultant shall provide consulting services to the District under the terms of this Agreement for the following Project: 2017 SCADA System Upgrade Project ("Project"). The scope of services is more fully described on Exhibit A attached hereto and incorporated herein by this reference ("Scope of Work" or "Work").
2. Compensation and Payment. District shall pay Consultant for the time and materials devoted to the Project as consideration for the performance of the services set forth on Exhibit A, not to exceed the amount of ONE HUNDRED FORTY THOUSAND, SEVEN HUNDRED THIRTY THREE DOLLARS AND SIXTY SIX CENTS (\$140,733.66) including tax. Such compensation shall be payable in the following manner:
 - A. Consultant shall submit a detailed monthly billing for all services provided describing in reasonable and understandable detail the services rendered, fees charged and expenses incurred by Consultant during the previous month in accordance with a schedule of rates and charges set forth on Exhibit A ("Rates and Charges"), including fees and expenses for additional services authorized by District as provided herein. District shall pay the invoice within forty five (45) days of receipt, except as to any disputed amounts.
 - B. Upon District's failure to pay within forty five (45) days of receipt the undisputed amount set forth in any monthly billing submitted to District by Consultant, such unpaid balance will bear interest at the rate of one half percent (.5%) per month until the amount of such unpaid balance, plus interest thereon shall be paid in full.
 - C. Consultant shall maintain accounts and records of fees billed and expenses incurred as described in this Section 2 in accordance with generally accepted accounting principles, and agrees to make such accounts, records and supporting documentation available to the District and its authorized representatives for inspection at mutually convenient times, both during the Project work and for three (3) years following the final payment for services rendered or termination of the Consultant's services under this Agreement.
3. Schedule of Work. Consultant shall commence the performance of its services under this Agreement upon receipt of notice to proceed from the District to do so and shall provide the services in accordance with the schedule on Exhibit A, subject to delays for causes beyond the reasonable control of Consultant or as otherwise agreed to by District.
4. Subcontractors. Consultant shall not subcontract or assign any portion of the work covered by this Agreement without the prior written approval of the District, such consent to be given in District's sole discretion. Subject to the provisions of the preceding sentence, this Agreement shall be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto.
5. Independent Contractor. Consultant is an independent contractor and not an employee of

the District. Consultant shall be responsible in full for payment of its employees, including insurance and deductions, and for payment to any subcontractors. No personnel employed by Consultant shall acquire any rights or status regarding the District. All of the services required hereunder shall be performed by Consultant or under its direction, and all personnel engaged therein shall be fully qualified under applicable state, federal and local laws to undertake the work performed by them.

6. Changes in Scope of Services. The District may require changes or modifications in the scope of services to be performed under this Agreement. Any such changes or modifications shall be in writing and signed by the Parties. The compensation for the changes or modifications, whether a decrease or increase, shall be on the same terms and conditions as set forth in Paragraph 2 above or in a manner otherwise mutually agreed to by the parties.
7. Insurance. Consultant shall maintain throughout the performance of this Agreement the following types and amounts of insurance.
 - A. Comprehensive vehicle liability insurance covering personal injury and property damage claims arising from the use of motor vehicles with combined single limits of Two Million Dollars (\$2,000,000).
 - B. Commercial General Liability Insurance written on an occurrence basis with limits no less than Two Million Dollars (\$2,000,000) combined single limit per occurrence and Two Million Dollars (\$2,000,000) aggregate for personal injury, bodily injury and property damage. Coverage shall include, but not be limited to: blanket contractual; products/completed operations; broad form property damage; explosion, collapse and underground (XCU) if applicable; and employer's liability; and
 - C. Professional liability insurance (Errors and Omissions insurance) with limits no less than Two Million Dollars (\$2,000,000).

The insurance policies shall: (1) state that coverage shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability; (2) be primary to any insurance maintained by the District, except as respects losses attributable to the sole negligence of the District; and (3) shall state that the District will be given 45 days prior written notice of any cancellation, suspension, non-renewal or material change in coverage.

The District shall be named as an additional insured on the Commercial General Liability Insurance policy with regard to work and services performed by or on behalf of the Consultant and a copy of the endorsement naming the District as an additional insured shall be attached to the Certificate of Insurance.

Before commencing work and services, Consultant shall provide to the District a Certificate of Insurance and required endorsements evidencing the insurance described above. The District reserves the right to request and receive a certified copy of all required insurance policies.

The above insurance limits do not constitute a limit on Consultant's liability to the District. Any payment of deductible or self-insurance retention shall be the sole responsibility of

Consultant.

Consultant shall be solely responsible for the safety of its employees and subcontractors at the Project work site, and shall comply with all applicable federal, state and local statutes, regulations and ordinances regarding safety.

8. Performance/Payment/Maintenance Bonds. If required by the District, the Contractor shall furnish performance and payment bonds for the faithful performance and payment of all its obligations under this Agreement, provided the District shall reimburse the Contractor for the reasonable cost of such bonds. Each bond shall be in penal sums at least equal to the Project Cost unless otherwise stated, in such form and with such corporate sureties as are acceptable to the District. The performance bond shall remain in effect to guarantee the repair and replacement of defective equipment, materials, and workmanship, and payment of damages sustained by the District on account of such defects, discovered within two (2) years after final acceptance of the Work by the District.
9. Retainage. The District shall retain and hold back a retainage in the amount of five percent (5%) of any and all payments made to the Consultant for a period of sixty (60) days after the date of final acceptance of the Work, or until receipt of all necessary releases from the State Department of Revenue and the Department of Employment Security and until settlement of any liens relating to the Work filed under Chapter 60.28 RCW, whichever date is later.
10. Indemnification. Consultant shall defend, indemnify and hold harmless the District, its elected and appointed officers, employees and agents and volunteers from and against all claims, injuries, damages, liabilities, losses of suits, including attorneys' fees and costs, arising out of or relating to Consultant's performance under this Agreement, except for injuries or damages caused by the sole negligence of the District. For the purposes of this indemnification, Consultant specifically and expressly waives any immunity granted under the Washington Industrial Insurance Act, Title 51 RCW. This waiver has been mutually negotiated and agreed to by the parties. If a court of competent jurisdiction determines that this contract is subject to RCW 4.24.115, Consultant's obligation to defend, indemnify and hold harmless the District, its officers, employees, agents and volunteers shall be limited to the extent of Consultant's negligence. The provisions of this Section shall survive the expiration of termination of this Agreement.
11. Ownership of Documents and Work Product. Consultant agrees to return to District upon termination of this Agreement all documents, logs, drawings, photographs and other written or graphic material, however produced, received from District and used by Consultant in performance of its services hereunder. All documents, logs, drawings, specifications, designs, programs, software, information, equipment reports, mylars, surveys, data, reports and other work product (collectively referred to as "Work Product") produced by Consultant in connection with the services rendered under this Agreement shall be owned by District. Except for software and related documentation copyrighted by Consultant, District shall own all copyrights to such Work Product and Consultant agrees to assign all ownership rights to such Work Product to the District. Reuse of any such Work Product by the District for other than a specific project or modification in use by the District of any of the Work Product without the Consultant's prior written approval shall be at the District's sole risk.

12. Standard of Care. Consultant shall perform its services under this Agreement with the level of care, skill and competence of the consulting profession in accordance with the standard for professional services at the time the services are rendered under similar circumstances, at the same time and in the same locality.
13. Right of Entry. District shall provide for the right of entry of Consultant and its subcontractors and all necessary equipment in order to complete the services under this Agreement.
14. Compliance with Codes and Standards. Consultant's Professional Services shall be consistent with the standard of care and shall incorporate those publicly known federal, state and local laws, regulations, codes and standards that are applicable at the time Consultant renders its services.
15. Termination. This Agreement may be terminated by either Party upon five (5) days written notice for any reason. In the event of termination, Consultant shall be entitled to compensation for all services performed, costs incurred, and equipment provided through and including the date of termination, except as to any disputed amounts.
16. Disputes, Claims and Appeals. The Consultant shall address questions or claims (other than a request for equitable adjustment) regarding the Agreement in writing to the District, within ten (10) days of the date in which the Consultant knows or should know of the question or claim (including any denial of request for equitable adjustment). No claim by the Consultant shall be allowed if asserted after final payment under this Agreement. No claim shall be allowed for any costs incurred more than ten (10) days before the Consultant gives written notice, as required in this section. The District shall ordinarily respond to the Consultant in writing with a decision, but absent such written response, the questions or claim shall be deemed denied upon the tenth (10th) day following receipt by the District. Discussion between Consultant and District after the time period for notification of claim has expired shall not waive the ten (10) day requirement in this Pending final decision of a dispute hereunder, the Consultant shall proceed diligently with the performance of the Agreement and in accordance with the direction of the District. Complying with the procedures set forth herein is a prerequisite to filing any lawsuit by the Consultant against the District. Failure to comply precisely with the time deadlines under this Section as to any claim shall operate as a waiver and release of that claim and an acknowledgement of prejudice to the District.
17. Patents, Royalties and Consultant's Infringement Indemnity. The Consultant is responsible for paying all license fees, royalties or the costs of defending claims for the infringement of any intellectual property that may be used in performing this Agreement. Before final payment is made on this Agreement, the Consultant shall, if requested by the District, furnish acceptable proof of a proper release from all such fees or claims.
18. Consultant's Infringement Indemnity. Consultant shall indemnify and hold the District harmless from and against any and all third-party suits, actions, losses, damages, claims or liability of any type of character, type or description, including, but not limited to, all expenses of litigation, court costs and attorneys' fees, based upon any claim of infringement of any patent or other license or intellectual property right (whether by way of trademark or otherwise) resulting directly or indirectly from the manufacture, sale, supply or importation of the parts and components or their use in a waste water treatment plant. Consultant

agrees to notify the District as soon as reasonably possible of any material matters with respect to which the foregoing indemnity is likely to apply and of which the Consultant has actual knowledge. If notified in writing of any action or claim for which the Consultant may be liable to provide indemnity, the Consultant shall, without limitation, defend (subject to reasonable consultation with the District) such action or claim at Consultant's expense and pay the cost and damages and attorneys' fees awarded against the District in such action or claim; provided, however, that the Consultant shall have the reasonable right to control the defense and settlement of all such actions or claims, which settlement shall be subject to the consent of the District if applicable, not to be unreasonably withheld. Indemnification pursuant to this provision shall not be predicated on the District having made payment on any such claim. The obligations of this Subsection 1.18 shall survive Contract completion or termination and/or assignment of this Contract.

19. Liquidated Damages. Notwithstanding any other remedies allowed under this Agreement, the Parties agree that time is of the essence on each and every portion of the Agreement. In the Scope of Work, fixed milestone dates are established for the performance of the Agreement. These milestone dates shall only be changed via a Change Order. Should the Consultant fail to meet the milestone dates established in the Agreement Schedule, including any extension of time authorized by Change Order, it is mutually understood and agreed by and between the Consultant and the District that the District may assess Liquidated Damages ("LDs") for such delays to the Contract Schedule, fixed and agreed, but not as a penalty, PROVIDED HOWEVER, LDs shall not be charged when the failure to meet specified milestones is due to a Force Majeure delay such as acts of God, fire or flood, serious explosions or accidents, foreign or domestic embargoes, wars or riots, labor disputes, or when the District causes the delay. It is further understood and agreed that the LDs set forth below may be offset against progress payments to the Consultant. In the event the remaining balance due to the Consultant is insufficient to cover the full amount of assessed LDs, upon demand, the Consultant shall pay the difference to the District:

LDs for services rendered before and after construction period	
Condition	Liquidated Damages
Missing District milestones in Attachment A	\$100 for each day that expires after the dates specified in the Scope of Work

20. Acceptance Process. The District may give iterative acceptances as the Work is accomplished either by phase or milestone. The Consultant shall give the District "notice of completion" of Work related to a specific milestone following the Consultant's completion of all such Work associated with the Milestone or phase.

A. Acceptance process.

Upon completion of the milestone deliverables the Consultant shall notify the District in writing and the Acceptance process will commence. Acceptance shall be based on conformance with the milestone guidelines. After notice by Consultant of completion of the milestone, District will issue a written notice of milestone Acceptance or provide Consultant with a notification of rejection, which will include documentation of the specific grounds for rejection, outlining items not in compliance with the deliverable guidelines. Acceptance shall not be unreasonably withheld.

B. Correction of deficiencies process.

If a deliverable is rejected, Consultant will have a commercially practicable time to correct items documented in the District's notification of rejection. Following the delivery of Consultants' notice that the Work has been corrected, the District will issue a written notice of Acceptance or provide Consultant with a notification of rejection, which will include documentation of the specific grounds for the rejection, outlining Work not in compliance with the milestone. The project schedule will be adjusted accordingly in the event that a dispute regarding the method or accuracy of the correction causes a delay. If the deliverable(s) fails to comply with the milestone after Consultants' second attempt to correct the Work and no clear plan can be agreed upon between the District's Project Manager and the Consultant's Project Manager, the District will determine the appropriate corrective actions.

21. Final Acceptance Process. The District shall begin the Final Acceptance process in accordance with the Agreement as follows:

- A. Final Acceptance shall be based on successful completion of commissioning period, as set forth in the Specifications and described in the Scope of Work provided in Exhibit A.
- B. If the District Accepts the Work, the District will send a notice of Final Acceptance to the Consultant indicating the successful completion of the performance testing described in the Scope of Work, Exhibit A.
- C. If the District determines that the Work is not acceptable, the District shall notify the Consultant in writing, describing the deficiencies.
- D. The Consultant shall either provide a detailed, written plan to achieve Final Acceptance or to make corrections or replacements within a mutually agreed upon time period with no charge to the District. The Parties shall mutually agree on a start date for beginning another Performance test as described in Attachment A, Scope of Work.
- E. If the District Accepts the Work following a second or subsequent Performance Test the District will send a notice of Final Acceptance to the Consultant
- F. If the Consultant does not correct or replace the unacceptable Work the District may declare a breach of contract.
- G. Final Acceptance shall not be unreasonably withheld.

22. Warranty Provisions. Consultant warrants that the Work shall in all material respects conform to the requirements of this Agreement. Consultant warrants that qualified, professional personnel with in-depth knowledge shall perform the Work in a timely and professional manner, and that the Work shall conform to the standards generally observed in the industry for similar Work and shall be in compliance with all applicable laws, rules and regulations. Consultant further warrants that its provided service, software and equipment shall perform substantially in accordance with the description of such in this Agreement and its Exhibits, for a period of two (2) years from the date of final acceptance and that all service, software, and

equipment shall be free from defects in materials and workmanship for a period of one (1) year from the date of final acceptance.

23. General Provisions.

- A. Notices. Any notice or demand desired or required to be given under this Agreement shall be in writing and deemed given when personally delivered, sent by electronic mail, or deposited in the United States Mail (or with an express courier), postage prepaid, sent certified or registered mail, and addressed to the Parties as set forth below or to such other address as either Party shall have previously designated by such a notice:

To the District:

Highline Water District
Attn: General Manager
23828 30th Ave S
Kent, WA 98032
Email: meverett@highlinewater.org

To the Consultant:

S&B, Inc.
c/o James Swanson, Vice President
13200 SE 30th St.
Bellevue, WA 98005
Email: jswanson@sb-inc.com

- B. Entire Agreement. This Agreement and its exhibit attachments contain the entire understanding between the District and Consultant relating to the consulting services which are the subject of this Agreement. This Agreement merges all prior discussions, negotiations, letters of understanding or other promises whether oral or in writing. Subsequent modification or amendment of this Agreement shall be in writing and signed by the parties to this Agreement.
- C. Waiver. Waiver of any breach or default hereunder shall not constitute a continuing waiver or a waiver of any subsequent breach either of the same or of another provision of this Agreement.
- D. No Third Party Rights. This Agreement is made only for the benefit of the District and Consultant and successors in interest and no third party or person shall have any rights hereunder whether by agency, as a third party beneficiary, or otherwise.
- E. Jurisdiction/Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. Any suit to enforce or relating to this Agreement shall be brought in King County Superior Court, King County, Washington.
- F. Severability. If any term, covenant or condition of this Agreement is held by a court of competent jurisdiction to be invalid, the remainder of this Agreement shall remain in effect.

G. Effective Date. The effective date of this Agreement shall be the date that this Agreement has been signed by authorized representatives of both Parties hereto ("Effective Date").

S&B, Inc.
("CONSULTANT")

Highline Water District
("DISTRICT")

By _____
Typed Name Randall T. Stead
Its President
Dated _____

By _____
Typed Name Matt Everett
Its General Manager
Dated _____

ATTACHMENT A

The District and Consultant will negotiate a project milestone/schedule at the kickoff meeting.

All work to be completed by 12/31/17 unless modified by amendment.



05-25-17 P02:33 IN

S & B inc. 13200 S.E. 30th St., Bellevue, Washington 98005 (425) 644-1700 FAX (425) 746-9312

May 25, 2017

EXHIBIT A

Highline Water District
23828 30th Avenue South
Kent, WA 98032-2821

Attention: Mr. Jeremy Delmar, P.E. Engineering Manager

Subject: Statement of Qualifications and Proposal for SCADA Improvements

Dear Review Team:

S&B Inc. presents a team with the necessary experience, project management skills and commitment to provide Highline Water District with the specified Supervisory Control and Data Acquisition (SCADA) Improvements described in the District RFP document dated May 9, 2017. All work contemplated will be done in-house by our staff of engineers and designers. Our experience includes a broad base knowledge of municipal telemetry and SCADA systems with an exclusive focus in water and wastewater applications. The District is familiar with the level of support our firm provides with your existing water control systems, and we look forward to the opportunity to work for the District to assist with the upgrade and expansion work identified.

All of our team members are experienced with the automation and control system applications currently used within your system. Key team members include:

- Randy Stead is the Principal Engineer-In-Charge providing the conceptual plan and technical direction to the team.
- Jim Swanson serves as Project Manager for implementation and delivery commitments.
- Dan Thwing is our Technical Director responsible for implementing system integration standards.
- Eric Dinh will serve as the project engineer responsible for software development and panel design.

S&B offers the District the following advantages:

- A highly experienced team in SCADA deployments with experience required to meet District needs.
- Comprehensive experience and understanding of the District's existing system's process control requirements.
- A staff with emphasis on customer service, cooperation and satisfaction.
- A team with staff available and committed to serving the District.

All proposals provided by S&B Inc. for engineering and system integration services described in this proposal will be valid for a period of not less than 90 days.

We are excited about the opportunity to provide the District with quality system integration services. Please find attached detailed information to support S&B's qualifications and describes the proposed solution. We look forward to answering any questions you may have.

Sincerely,

Randall T. Stead, P.E.
President
S&B Inc.

FIRM QUALIFICATIONS

The following overview outlines our qualifications to provide the system integration services for designing, building, implementing and supporting a comprehensive master telemetry and SCADA system replacement.

Experienced and Professional Design Team

S&B offers an experienced professional SCADA integration team focused exclusively on water and wastewater customers in the Pacific Northwest since our 1977 incorporation in the State of Washington. Our scope of services includes all facets of Instrumentation, Control and SCADA systems; from developing the conceptual ideas through engineering, assembly, integration, commissioning, training and follow up support services. We train our engineers and share knowledge in process control theory, hardware design, communication and software development to meet our goals for a consistent design of function and feature. This skill-set includes a vast experience with various forms of instruments, microprocessors and computers from the major manufacturers of electronic and electrical equipment. Each control system project is supervised by a registered professional engineer.

Reputation and Service

Our staff strives to be responsive to the needs of each customer. We adapt our schedule to meet the customer need and work together by providing clear objectives for the scope of work proposed. Our reputation of providing quality design, superior service and durable systems is recognized throughout the Pacific Northwest. We believe our focus on quality, value and service are key to our organization's health and longevity, now completing our 40th year of business. Our location in Bellevue is central to our Western Washington customer base, and offers the District a rapid physical presence when needed.

We answer our phones at all hours and provide emergency service. Our facility has replacement parts for everything we build, stocking over \$50k in inventory. Our primary automation supplier is Siemens and as our backup, they carry stock worldwide with the logistics and ability to deliver next day to cover the most unusual of problems.

Innovation to Solve Challenging and Difficult Issues

Our expertise is centered on municipal water and wastewater applications. We are able to couple engineering knowledge in treatment, conveyance, storage and pumping with an in depth knowledge of the hardware and software to provide solutions that are sustainable and have industry leading longevity. We are familiar with the operational performance characteristics of water and wastewater equipment, system hydraulics and facility needs. This background allows us to quickly identify unusual applications and assist the owner with creating innovative solutions that minimize capital expenditures and facility changes. The result of this approach provides improved performance and reliability.

Commitment to Technology

The world of electronics and software is one of the fastest moving technology sectors. Our engineers study changes in technology and evaluate their application and longevity in our industry. Our key engineers are committed to continuing education, certification and training with regular classroom and conference attendance. Municipal and public domain utility funding will not tolerate replacement of equipment every few years due to obsolescence and we focus solutions that are supported for decades instead of years. Our system solutions consider equipment from manufacturers that have a minimum ten year commitment of support and continue to demonstrate financial and technological strength to convince us they will be leaders in the future as well. Our firm commits leading edge object oriented software solutions to run on open platforms. These two features together provide our end user an unsurpassed control system lifespan. This is easily demonstrated as our customer base typically has systems that are a blend of technologies ranging fifteen to twenty years that work together in unison. This method allows for sequential upgrades as opposed to wholesale replacement and therefore a very low total cost of ownership. By following this approach, the owner avoids costs associated with obsolete products, including lack of support or availability of equipment.

Complete Turnkey Capability

S&B Inc is a full service, turnkey company – where every step of a SCADA system is designed and built in-house. We offer Professional Engineering, consulting services, programming, panel building, integration services, field service, and ongoing support for our customers. We keep a regular stock of commonly used parts to service our customers in emergency situations. We also hold general contracting licenses for project

FIRM QUALIFICATIONS

applications that require installation and sub-contract electrical installation using locally recognized electrical contractors with our field engineers providing on-site supervision. We are licensed for professional and contracting activities in Washington and other Pacific Northwest states. Our full service approach allows us to serve our customer in multiple phases of project development, giving our customers the benefits of single-unit responsibility for their SCADA system.

Proposal Specific Affirmations on Basic Qualifications

1. S&B Inc. is an instrumentation and control system manufacturer
2. Our facilities are less than 20 miles from the District Office
3. Since 1977, we have performed design, assembly, testing, installation and service of municipal water and wastewater control and communication systems.
4. Our firm's technicians and engineers are well qualified to design, assemble, test, operate, calibrate, troubleshoot, repair and train others.
5. S&B has many systems in the nearby areas using the Siemens PLC and SCADA systems described in this proposal. The design requirements identified in the proposal are consistent with our system design approach and all facets of this are features we regularly deliver.
6. S&B is a Siemens Solution Partner for more the ten years. Certification includes training and competency testing for engineers. Our listing may be confirmed on the Siemens partner listing website at: <https://www.automation.siemens.com/solutionpartner/partnerfinder/Home/Index?lang=en>
7. Similar to item 3 above, our 40 years of experience includes automation, telemetry, SCADA, motor control systems, data collection and archiving, engineering design, consulting, training and warranty work.
8. Our engineers work daily with computers and are competent working in all Microsoft operating systems and office products. We use automation programming tools including: Siemens Step 7, WinCC, TIA Portal, Simocode, Start Drive and Starter; Specter Instruments Win911 software dialers; and Wonderware InTouch, and Historian products.

TEAM QUALIFICATIONS

Overview:

The team we selected to design and implement your new master telemetry unit and SCADA system is led by Randy Stead and includes Jim Swanson, Dan Thwing and Eric Dinh. Each member of this team developed software solutions for at least one portion of the current SCADA system and we will take advantage of the embedded knowledge base for each facet of the upgrade.

S&B commits its most experienced and qualified staff to assist the District in meeting its goal for this project. Key team members include:

- **Randy Stead, P.E. President**

Project Manager

With more than 37 years of experience in the industry, Randy brings depth of knowledge by leveraging technology and facilitating the transition of older, legacy systems to the most current network oriented solutions. He has worked with District engineers to architect the current SCADA system, and implement the control necessary to meet hydraulic requirements within the District water system. He provides oversight on all medium and large projects. Areas of expertise include bringing new technology to solve existing control strategies, site presentation meetings, and authoring summary documentation / description of work. He serves as project manager on key projects and as a consultant to many utilities in the disciplines of electrical design, efficiency analysis, instrumentation, communications, control and management reporting for utilities operations. Randy is registered as a Professional Electrical Engineer in the States of Alaska, Oregon and Washington. Recent projects, including Professional Engineering Services: City of Beaverton, City of Bellevue, City of Enumclaw; Town of Friday Harbor, Sammamish Plateau Water and Sewer District, and the City of Tacoma Green River Filtration Facility



- **Jim Swanson, P.E. Vice President**

Field Engineering Manager.

With 23 years of experience at S&B working with instrumentation and control, he has understanding and knowledge in the transition of legacy systems to modern networked solutions and is familiar with the existing SCADA system. He provides quality assurance and oversight on all projects in the area of field inspection, equipment evaluation, startup, commissioning and training. He provides coordination for all field activities and is a liaison for meetings between our clients and our staff. He provides consultant services for many utilities in the discipline of controls, instrumentation, communication and management reporting; providing unique and innovative solutions. Experience includes design and production responsibility for over fifty significant I&C and SCADA projects in Washington, Oregon and Alaska. Included are Water Treatment Facilities ranging in size from 2 - 10MGD and Wastewater Treatment Facilities ranging from 10 - 30MGD. Jim is registered as a Professional Mechanical Engineer in the States of Oregon and Washington. Recent projects include: City of Bainbridge Island RTU upgrades; Coal Creek Utility City, Newcastle, WA; City of Issaquah, WA; Parkland Light & Water; City of Sunnyside, WA.



- **Dan Thwing, Technical Director**

Engineering Standards / Quality Assurance

As our Technical Director, Dan reviews each project for quality assurance. His goal for each of our projects is to deliver a consistent quality of design, using approved engineering methods and standardized procedures. While innovation is important to engineering, he reviews proposed changes to ensure that a client does not receive a one-of-a-kind that will be difficult to technically support in subsequent years. Previously to this position, Dan served as a Project Engineer for S&B working on projects for the Tyee WTP, McMicken WTP and Des Moines WTP. He is also responsible for design and production for several significant I&C and SCADA projects in Washington, Oregon and Alaska. Design included telemetry, process control, and software for PLC, and SCADA computer systems. Recent projects include: City of Beaverton; City of Bellevue; City of Homer, AK; and Tualatin Valley Water District.



- **Eric Dinh P.E. Sr Applications Engineer Startup and Commissioning Lead**

With nine years of experience at S&B, Eric currently divides his time between field engineering and project engineering. For eight years his work was focused on field applications, first performing general startup and maintenance services and expanding over time. Eric has a wide breadth of field experience with water treatment, water quality monitoring, complex pumping, networking and SCADA computer systems. Experience includes field commissioning and startup responsibility for over thirty significant I&C and SCADA projects in Washington and Oregon. Eric is registered as a Professional Electrical Engineer in the State of Washington. Recent projects include: City of Enumclaw; City of Issaquah, WA; City of Bellevue, WA.; and Rockwood Water PUD, Portland, OR.



TEAM QUALIFICATIONS

Reference Projects Completed By This Team

The following projects were selected based on their close geographic proximity to the District and very similar scopes of work. Each of these projects involved a master system PLC upgrade, migrating from a Siemens TI505 series system into the Siemens S7-1500 series equipment and integration with either a Siemens WinCC or Wonderware SCADA software package.

1) CITY OF BELLEVUE, WA

S&B has served as the City of Bellevue's Telemetry Consultant, beginning in 1989. Our first project design was designed and furnished to the City in 1989. Portions of the system were expanded and modernized over the years as part of capital system upgrades associated with reservoir and pumping station projects.

In January 2016, the City selected our firm to provide a replacement to their Simatic TI555 PLC based master telemetry units. Unique to this application, they have two master systems, each managing remote stations geographically split along the telephone company franchise areas of Century Link and Frontier. The PLC platform located at their City Hall location manages Century Link area sites and the Bellevue Service Center PLC platform hosts stations in the Frontier area. The scope of work included system design and turnkey upgrade, migrating the systems into the Siemens S7-1500 platform and synchronizing data between the two master sites. This series of processors and I/O modules provide the best in current technology logic processors and open communication protocols. SCADA updates between the master sites runs at fiber speed and is virtually instantons. Updates between the master and remote locations uses existing leased circuits with average complete system update times less than six seconds. The programming scope included master system logic processing for 37 lift stations, 11 storm water stations and 36 water stations.

All of the existing remote telemetry units (RTUs) were integrated into the new configuration without requiring replacement. Their existing Wonderware SCADA system was re-linked to the new master telemetry platform using symbolic naming features available in the S7-1500 PLC which minimized mistakes associated with transferring over 2,500 tags from the old system into the new. The work proceeded quickly utilizing the City's new project management approach to ensure design, function and cost components of the project would stay on plan. Commissioning was very successful with no unplanned outages and only short durations of communication loss while the stations were transitioned. Our work was completed in early June, six months ahead of the allowed schedule.

Overall control system scope of work described for this project was \$184k including design, PLC equipment, software application, commissioning and technical training.

Client Contact: Tony Marcum, Operations Manager
 (425) 452-2877
 TMarcum@bellevuewa.gov

Project team members: Randy Stead – conceptual design and project management
 Dan Thwing – project engineering
 Eric Dinh – field engineering

2) COAL CREEK UTILITY DISTRICT, NEWCASTLE, WA

S&B has served as the District's Telemetry Consultant, beginning in 1981, where we were selected to be the service provider of an existing third party system. Our first project was designed and furnished to the District in 1993. Portions of the system were expanded and modernized over the years as part of capital system upgrades associated with reservoir and pumping station projects.

In 2014 we responded to the District's RFQ to provide professional services for a SCADA master plan. The scope replaced the previous TI505 PLC based master telemetry unit and Wonderware SCADA package to a Siemens S7-1500 PLC platform master telemetry unit, and WinCC SCADA package. Overall control system scope of work described for this project including master plan, detailed design drawings, PLC control systems and upgrades for the master, new SCADA computer system, 9 lift stations and 10 water system sites, software application, commissioning and technical training. The price was \$272k.

TEAM QUALIFICATIONS

Methods and Toolsets

Our team of control system engineers and technicians have the necessary smarts, tools and training that allows them to keep pace with the fast moving technological changes in software and computing systems. The new technology platforms are object oriented, allowing us to build libraries of functions we use repetitively and then apply them without modification on production work. The new software running on these new technology platforms have more features and functions compared with previous generation equipment.

As a company we invest in continuing education, providing classroom and hands on training from national authorities in automation technologies. Our firm is listed as a Siemens Solution Provider, as we maintain certifications in PLC, HMI and VFD technologies through biannual testing. Our training also includes updates in SCADA applications and networking, two critical vehicles of delivering reliable automation systems for our clients. We have extensive expertise with Siemens WinCC and Wonderware® InTouch graphic systems, and with Siemens Process Historian and Wonderware Historian SQL database systems. These programs are industry leaders in delivering graphics and historical reporting services in Windows based server and client systems. We are conservative and practical in our overall systems approach to insure our client's money is spent for proven hardware and known performance. We do not experiment with unproven products or technology. For new systems we incubate the application for weeks, subjecting it to the worst conditions known in our industry and monitor performance prior to placing the system into a production or live environment where high reliability is paramount.

S&B's networking experience allows our engineers to build and use highly secure virtual private network (VPN) connections to provide access our fourth and fifth generation systems. This capability allows our staff to be virtually available within minutes to assist our client understand current operational conditions, provide training and instruction as well as perform system additions, modifications without the expense or delay associated with travel to jobsite. The latest generation PLC and computer technology is utilized for all of our activities, to improve both quality of work and overall efficiency.

Beginning in 2013, our control system drawings are developed using a computer aided engineering (CAE) tool ePlan, which improves the quality, consistency and detail of each solution. The drawing documentation includes 3D representation of control panel assembly with hyperlinked Adobe® pdf drawings that aid the end user in finding locations and references by 'clicking' instead of searching through the drawing. In addition, drawings may be exported to AutoCad® compatible drawing format for end user records. All drawings, schematics and software documentation are available to the owner on electronic media and the master copies are maintained on our Server Computers and backup copies kept for the life of the system.

Your SCADA system is a customized tool to assist operators and managers with their duties. Each member of this team is personally committed to the success of the project by meeting and exceeding your expectations.

Qualifications Summary

The proof of excellent SCADA engineering is evidenced in its long term cost of ownership, which has its foundations in serviceability, performance and longevity.

Instrumentation and Control systems represent a very small portion of the overall infrastructure investment of a utility, that conversely provides great benefits in operation and management. Our company's focus is to provide solutions within this narrow engineering discipline that combines classic engineering skills of process control with new technology skills of hardware and software platform selection.

Our team members are bright, enthusiastic and dedicated to planning, designing and implementing the best control systems in the Pacific Northwest.

PROPOSED SYSTEM SCOPE OF WORK

Overview

The request for proposal document identifies two phases of implementation; a master telemetry unit (MTU/PLC) and a new SCADA system. Our scope provides the description of services and pricing for this approach as well as a cost savings associated with performing Phase 1 and Phase 2 simultaneously.

The new system provides full flexibility of communication using existing leased line, and T1 circuits to each of your remote telemetry units (RTUs) and the flexibility for future use of cellular, fiber, DSL, and cable (all VPN encrypted TCP communication).

The MTU PLC life is projected to be suitable for operation for twenty years. Computers used for process visualization and historical archiving however will require replacements at much shorter intervals than the MTU. Typical lifespans of computers range from three to seven years depending on hardware limitations, the selected operating system and software applications. The system proposed in our response retains your existing system's design concept where process control resides in the PLC based industrial processor such that the highest level of reliability is realized.

Key performance factors identified for this complete upgrade includes:

- Improved System Reliability
- Master System PLC speed and processing ability
- Elimination of obsolete PLC hardware at the Master System
- Updated SCADA graphic application software

The MTU includes a programmable logic controller (PLC) that manages communication with each remote facility, executing logic as needed to meet the hydraulic and process treatment needs of the District. The logic unit and its accompanied communication coprocessors can be thought of as the "main body" of the control system, critical for operation yet also acting completely behind the scene. The "eyes and ears" of the supervisory control and data acquisition (SCADA) system can be correlated to the graphic display computer system. This computer provides the operator's primary interface to the PLC system, where data in the PLC unit is intuitively presented in graphic and numeric formats to assist their daily operations tasks.

Master Telemetry Unit Upgrade (Phase 1)

Existing System: The existing master telemetry unit (MTU) is a tower configuration located in the server room at the District Office. This unit has several major sub-systems including phone line conditioning, leased line communications and a programmable logic controller (PLC). Ancillary systems provide regulated power sources to the equipment. The tower configuration offers a convenient method to access front and rear mounted equipment and provide maintenance when required. The existing master telemetry system was supplied in 1996 and while there have been several expansions of the master system to accommodate new remote facilities; the majority of the existing master telemetry system tower components are original equipment. The Water SCADA System has served the District well throughout this time. The PLC unit is highly reliable, with a typical mean time before failure (MTBF) rate of 18 to 25 years. A high quality PLC system therefore is replaced due to technology obsolescence rather than failure. In the case of the existing system technology, the Siemens TI505 series PLC was designed in 1988 before the internet and high speed communication became standards for technology. To address this need, Ethernet and serial coprocessor cards were manufactured in the mid-nineties as aftermarket solutions to accommodate the industry demand. This PLC system is therefore scheduled for replacement due to age and technology limitations.

New System: A new master telemetry unit (MTU) is proposed, housed in a 90"Hx24"Wx20"D enclosure that will be plug in compatible with the phone and network connections. The new MTU features a Siemens S7-1515 CPU and ET200SP rack system of communication co-processors, selected due to its compatibility with the existing legacy RTUs as well as the open platform for new technology RTUs. This series processor accommodates simultaneous Ethernet and leased line data exchanges with a minimum of 100% I/O capacity and memory for future expansion.

PROPOSED SYSTEM SCOPE OF WORK

Improved Speed: The PLC architecture is designed around open communication standards, and high speed TCP/IP networks making this the appropriate solution for linking the SCADA Graphical User Interface (GUI) computers with the master system. The new MTU will provide a significant speed improvement to the SCADA system operation. This will be visually apparent when working on the SCADA computer system. The operator will typically notice the latency time between screen changes, and data entry updates to virtually disappear. We calculated CPU execution time with the predicted logic and communication tasks for the new PLC and determined scan cycles will range from 5 - 20 msec. This is about twelve times faster than the existing CPU. Data communication speed between the SCADA computer and PLC system will be set at 100Mb. The SCADA Server machine is currently located in the same facility with a direct Ethernet connection to the PLC and no change is anticipated for the future.

Communication with Existing Remotes: A second key function of the Master Telemetry Unit is communication with existing remote telemetry units (RTUs) via the leased phone lines. The long term expectation is the SCADA system will migrate from leased line to another more current technology such as cellular, cable or fiber and that support of the existing leased line system is necessary for a minimum of seven years. As part of Phase 1 work, our team will update software in four existing RTUs with the Koyo 405 processor. This software update converts the communication to Modbus RTU to be compatible with the new MTU system. No hardware changes are necessary at the RTU locations. The new MTU coprocessors used for communication are a bit faster processing data signals than the existing units, and though the speed of the modem linking remote sites to the master system will remain at 1200 baud, there will be an approximate 10% - 20% improvement in update time with remote stations. There are five modems remaining of the original design that will be replaced due to expected lifespan and five that are current design. We believe the remaining existing modems are still well within their expected lifespan, however we plan for one spare modem to be mounted in a warm-standby condition on the rack in case of a failure. The existing Telephone Network Interface System (TNIS) will be tested, with key parts refurbished as necessary. All other portions of the new MTU are new equipment. The leased line portion of the new MTU is expected to have a seven to ten year operation without significant expense. The next generation of RTUs will likely use an alternative media such as cellular, fiber, DSL or cable. The MTU is ready to accept these connections as they are defined. Any of the new technology communication systems require an interface device to be added as a gateway and our MTU design provides the power supply, cabling and rack space necessary to mount the equipment.

Within the new PLC, we reserve a separate and secure communication channel that is suitable for use with a non-leased line service provider. We envision that cellular networks will continue to offer cost competitive solutions for RTU communication and would be a likely selection. As residential demand for telephone lines decreases, we observe phone companies decreasing their copper infrastructure replacements, having ample supply of spare copper lines to use for both new service and maintenance. While cellular service is not without some connectivity errors, we see this option as an excellent mitigating position for our customer base such that they can be quickly able to move to another communication provider in the event of problems. Note that cellular communication is directly compatible at Des Moines WTP / PS2 and McMicken WTP locations. Angle Lake and North Hill sites are technology compatible but require an additional Ethernet communication card for connection. The remaining RTU sites are not directly compatible.

Redundant Alarm Notification: The third function provided by the new MTU is the redundant off-duty connection to the building security system. This includes two relay contacts that are opened when the primary off-duty notification software within the SCADA system fails to yield a response. The alarm is time delayed to allow time for the operator to receive alarm notification in the expected pattern. The new MTU equipment has features to detect a failure of the SCADA system and will notify the operator without a time delay if the Win911 software within the SCADA system is not responding correctly.

Schedule of Phases 1 and 2: We do not recommend separating Phase 1 and Phase 2 work in time as it requires significant overlaps of engineering effort and materials. The existing old technology PLC and old technology SCADA are well matched by feature and compatibility. Because of the technology shift of the new MTU PLC platform, the Wonderware system requires new PLC drivers that are not available to its current version 9.5 software and the Server 2003R2 operating system is not compatible with new drivers. To solve this issue, your IT support group will need to upgrade the existing computer operating system to Server 2008R2, which would be an interim version that is compatible with both the driver and the Wonderware application. Our scope will include the required driver, engineering and testing time to re-assign Wonderware tags previously connected to the TI505 system to the new S7-1515 system. The price for this sub-task is provided in our pricing section below and may be eliminated if Phase 2 is performed with Phase 1 work.

PROPOSED SYSTEM SCOPE OF WORK

SCADA Software Upgrades (Phase 2)

Siemens WinCC SCADA Software: The WinCC v7.4 SCADA package from Siemens is proposed as the replacement to the existing Wonderware InTouch and Historian, offering a modest cost savings over Wonderware in the first year and significant savings in the long term. The change of software platform has advantages and disadvantages. The advantages include long term cost, single manufacturer responsibility (single support call) and ease of thin client deployment. Operators will find both systems have a similar “look and feel”. Information Technology folks typically prefer the thin client approach of the Siemens product as it can run on a wide varieties of computers and does not require a custom software installation. Disadvantages include initial application development costs and managing legacy / historical data.

Virtualizing the SCADA Server: For the past five years, we recommend the SCADA application software work to work in a virtualized environment to provide a higher level of resiliency. In this configuration method, the SCADA server resides inside one or more physical server machine(s) and is managed by a host operating system. In the event of a disk failure, virus infection or malware intrusion, the SCADA can be immediately duplicated and placed on a different hardware platform if necessary to restore operation with the time and expensive of rebuilding the SCADA application. The Siemens application software packages are compliant with virtualization technology. We will provide recommended server features, including the operating system and application software requirements to your designated information technology services firm (Lighthouse) as we move forward to minimize impact to District operations during the transition. Costs associated with the server and operating system software are not included in our pricing.

Alarm Notification Software: The off-duty alarm notification software is not mentioned specifically in the District RFP, and we are assuming that its current functions must be duplicated or transferred to the SCADA system delivered as part of Phase 2 work. The District currently uses Win911 software to notify operators of alarm condition. The software connects to a voice call type modem using USB port connectivity which presents challenges to virtualized environments since USB support is not directly supported on Microsoft’s Hyper-V platform. VM Ware is a competitor to the Hyper-V virtualization product that includes USB support in both the workstation and ESX products. Virtualization using a hardware USB interface is restricted to single machine virtualization and not a load sharing implementation. In response to the changing technology, Win911 has a new advanced alarm notification product ‘Interactive’ that is designed for a fully virtualized environment. Its features include integration with SIP based phone systems, Ethernet connected cellular modems and interface with smart phones using an APP for either Android or iOS. The selection of the best off-duty software notification package for your operating personnel will be determined during the design cycle after a review of features and a needs analysis. Since the District remains on an active software support contract with Win911, you may transition to the standard ‘Interactive’ software product without additional fee, or alternatively move up in features to the advanced ‘Interactive’ product for \$1,000. It is critical that the District renew their direct support agreement with Win911 before its expiration in mid July 2017 to maintain these options during the Phase 2 work cycle.

HMI Workshops: Our HMI workshops will provide information to District engineers and operators on the implementation options for the WinCC v7.4 product. The first workshop will cover graphic objects, features and functions available on WinCC. It will also cover off-duty alarm notification and features available on the Win911 software products. The second workshop will cover historical data trending, Excel reports and thin client access. During the second meeting we will discuss how to bridge long term report needs that will have data in the legacy Wonderware Historian along with data accessed from the WinCC Information Server.

Implementation of MTU Upgrade:

In order to provide a rapid transition from the existing system, we propose to replace the existing PLC system / communication tower with the new MTU enclosure. There is no electrical installation required as the new MTU is powered from a standard AC plug and receives the standard RJ21X phone connector and Ethernet lines via receptacles. In the few cases where we plan to reuse some of the existing and newer hardware, we will supply loaner units into the existing system in advance of the transition in order that we can remove, refurbish, calibrate and prepare the new system prior to shipment to the District Office.

PROPOSED SYSTEM SCOPE OF WORK

If Phase 1 work is completed prior to Phase 2 authorization, the transition time is estimated at eight hours and will require about 2 hours of on-site support from your IT company. If Phase 1 and Phase 2 are completed concurrently, we estimate a transition time of thirty to ninety minutes to complete. Your IT folks will need to have the system ready prior to the transition day, but not be onsite during the event.

Implementation of SCADA Upgrade:

The WinCC v7.4 software products will load in a District supplied Server 2012R2 operating system with memory, processing and storage limits defined by our firm. The hardware platform may be physical or virtualized as selected by the District and its IT consultant. The new server platform will need to overlap with the existing Wonderware platform during the startup and commissioning cycle with a minimum advance time of 1 week. We supply the application software for loading on the server machine and will require (local) administrative rights on the operating system from the time of installation through commissioning.

The new server communicates directly with the MTU system's PLC unit over a dedicated Ethernet connection. The Client machine connections may be kept on a private sub-network or made available on the corporate domain network. Permissions for access to the SCADA are governed by domain rules established by the District and implemented by its IT consultant.

The server and the client connections are commissioned prior to the changeover from the existing SCADA software to the new to minimize or eliminate a lapse of data. The transition should be scheduled for the first day of the month as it provides an easy method to separate month end reports and historical logs.

As noted earlier in this proposal, Phase 2 work should be completed simultaneously with Phase 1. Staggering the phases requires some duplication of effort, resources and material costs. If staggered phasing is required for budget reasons, then we recommend implementing Phase 2 SCADA work prior to Phase 1 as the new WinCC v7.4 SCADA system can be configured to read the existing TI545 PLC unit with less effort, materials and cost than the Wonderware SCADA package read the new Siemens S7-1515 unit. Pricing for this approach can be provided upon request.

Startup and Commissioning:

Prior to transition each system is individually tested for operational readiness. A major focus to the startup efforts is in aligning the SCADA graphic computer system with the MTU system. We will coordinate our work with the District's IT consultant to enable us to test the new software system with District supplied hardware. We anticipate two to three days of advance testing prior to the transition and one day following the transition by our staff. District support will be needed for the day of transition with the support of at least two operators to monitor system operation while the new system is being validated.

Our quote includes startup and commissioning cycle for the GUI and PLC CPU, with 1 man day for follow-up visit approximately two weeks later to address any screen and control feature questions.

Training:

Training is provided concurrent with the upgrade. Our field engineer will instruct the assigned operator(s) with the use of the new systems with specific focus on updated troubleshooting methods and control features as part of the station commissioning. This provides the District with hands on training and self-sufficiency in maintaining the SCADA system as we update and improve the technology base. Training will include at least two (2) separate sessions for each project phase, each session approximately four (4) hours in duration. All training is provided at the District office.

PROPOSED SYSTEM SCOPE OF WORK

O&M Manual:

S&B will provide a conformed O&M for the District for the Water SCADA Master System. Two copies will be provided to the District. The Binders include schematic drawings on 11x17 and a DVD with hardware manuals and operation description. The documentation will meet requirements identified in the RFP.

Warranty Support:

The system integration and software development required for this project is included with full support for a time period not less than one (1) year. During this time period, we will receive requests for assistance and respond using a high speed network connection to the control system via VPN within one business day. The initial response will identify problem areas, determining if the system requires software modifications, hardware replacement or both in order to maintain automatic operation of the system. If either the District or S&B determines that onsite work is required to resolve a problem, we will respond physically within one business day. Typical response times will be faster than one day for either scenario. The technologies available to us for troubleshooting the new system allow our engineers to remotely access the MTU system, assess current and historical conditions, and make assessments quickly.

We will support the District in the diagnosis and resolution of hardware failures to equipment provided under this scope of work during the warranty period without additional fees.

In addition, per the RFP our scope of work includes eight (8) man-days of field engineering support during the warranty to perform inspection and calibration of the equipment at the request of the District. Scheduled service calls are requested with a one week advance notice

Scope of Work Pricing:

Our work is itemized into two separate components: Professional services / software engineering and System integration / hardware / packaged software. Professional services / software engineering include design, CAD drawings, and application development for the Siemens S7 PLC and graphic computer software environments. System integration, of hardware, / and packaged software are work performed at our facilities. This work includes basic services to receive hardware, inspect, test, document and startup the system.

The physical computers used to host the graphic and historical SCADA software are excluded from our scope since these products and services are provided by the District through your IT consultant. The recommended platform for the new software is Windows Server 2012R2. The support application will need to include Remote Desktop Services and Microsoft Office 2016 for interaction with your operator's client workstations. The District shall provide the licensing for the virtualized machine and we shall use this as part of the project implementation.

Scheduling:

Our typical project cycle is 8 to 10 weeks for delivery. Scheduling is dependent upon the number of items the District chooses to execute. Work will be scheduled to minimize disruption to the system operation.

PROPOSED SYSTEM SCOPE OF WORK

Price Summary Estimate of Work

Our scope of work includes the supply of the SCADA Graphical User Interface software and hardware, PLC equipment and application software as specified. Pricing includes local and state taxes for equipment and panel construction based on a rate of 10.0%. Professional Services for engineering, software development, documentation and field acceptance testing are not taxed.

	Professional Services	System Integration	10.0% WSST	Hardware & Equip Installation	TOTAL
Master Telemetry Unit	\$27,832.00	\$29,715.00	\$2,971.50	No Elec. Install Req'd	\$60,518.50
WinCC SCADA Software / Dev.	\$14,578.00	\$25,980.60	\$2,598.06	n/a	\$43,156.66
SCADA Server Hardware & OS	By District	By District		By District	
*Sequence Phase 1 then Phase 2	\$14,540.00	\$1,850.00	\$185.00	n/a	\$16,575.00
Phase 1 Training, O&M Manuals	\$3,550.50			n/a	\$3,550.50
Phase 2 Training, O&M Manuals	\$3,550.50			n/a	\$3,550.50
Phase 2 HMI Dev. Workshops	\$2,112.50			n/a	\$2,112.50
Phase 2 coordination with Lighthouse	\$420.00			n/a	\$420.00
Warranty Visits	\$10,850.00			n/a	\$10,850.00

TOTAL: \$ 140,733.66

Additional Item Descriptions

Master Telemetry Unit: The 90x24x18 cabinet with new processor control hardware. Professional services include the PLC code conversion from the old 505 format to the new S7-1500 format. Includes a Shop Test, witness test, and new ePlan drawings, startup and commissioning.

WinCC Software / Development: Software for the server and client machines. Development time to create the water system pages and tags. Shop test for 1 week with new PLC, Startup and commissioning.

SCADA Server Hardware & OS: Computers with Microsoft Operating systems (this portion may be virtualized). Configuring hardware for use with WinCC and for optimized SCADA use. This work supplied by District.

***Sequence Phase 1 and then Phase 2:** This cost includes necessary work to allow the legacy Wonderware system to read the new technology S7-1500 series PLC. This price includes SIMATIC Net software, configuration, test and commissioning. In addition, the District will likely have additional costs from their IT consultant to upgrade the existing server OS from 2003R2 to 2008R2. Engineering services to re-address every Wonderware tag to new addresses in CPU, and shop test of system for validation prior to deployment are included in this figure. This can be eliminated if phases 1 and 2 are simultaneously completed.

Various Trainings and Workshops: Includes two separate sessions of 4 hours in length plus our document prep and travel time.

Coordination with Lighthouse: Phone review of setup requirements for use with WinCC software. On-site review of computer setup and communications at startup.

Warranty Visits: Four separate 2-day warranty visits, 8 man days per specification. These are visits during the warranty period, and not necessary tied to equipment failures. We understand these to be visits where additional training or software features may be requested. Our standard warranty covers equipment and software delivered as part of the proposal without an additional charge.

