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February 12, 2024

City of Camas
Public Works Department
Camas, Washington

Attn: Jim Hodges and Rob Charles
via email: JHodges@cityofcamas.us RCharles@cityofcamas.us

Subject: City of Camas
Lower Prune Hill Booster Station & Reservoir 1 Improvements
I&C Scope of Work and Quotation – Revised to coordinate with Well 5 cancellation

Dear Public Works Team:

We are pleased to quote the instrumentation and controls (I&C) for the Lower Prune Hill project. This quotation is based upon the 100% design documents as presented by Consor Engineering to us in October 2023 and with electrical drawing updates sent to us January 17, 2024. This scope of work is updated in price only to reflect opportunities the City made elect to capture by the cancellation of the Well 5 Improvements Project (Contract 2022-xxx) where automation equipment ordered for this project is now available for use at the 2022 pricing structure. Equipment for Well 5 arrived in the Fall 2023. Our approach would be to move other projects forward in our queue using inventory purchased for Well 5 and replacing them with newer components where possible between this time and when the needed components for Lower Prune Hill should be encumbered to meet your delivery schedule. Not all of the parts required for Lower Prune Hill are part of the Well 5 scope. The remaining parts to order are calculated using January 2024 pricing information. Delivery for these remaining parts range from 8 to 28 weeks.

We learned from our January 4 Teams® meeting that electrical updates were in process for this project and we received these on January 17. This information did not require changes to the control system, however we advise in a general statement that all engineered electrical apparatus is experiencing very long lead times typically ranging from 50 to 70 weeks or more.

Unique to this project is that the control system will require an interim solution to allow for communication during the construction cycle. The existing leased phone circuit is in the path of construction and the existing control system will require change to use cellular communication immediately. We plan to solve this need by inserting the new PLC and cellular modem inside the existing control panel to provide the necessary proxy for communication. When the new station is built and ready for testing, we will move the equipment to the new control panel.

Our scope of work includes a PLC control panel, enclosed drives, instrumentation, application software, and startup/commissioning services of the control system. Details for the scope of work are included in the following sections.

I&C Scope Overview

S&B is pleased to scope the following equipment and services associated with a unified control system.

1. Design Services (30% to Final) with Consor

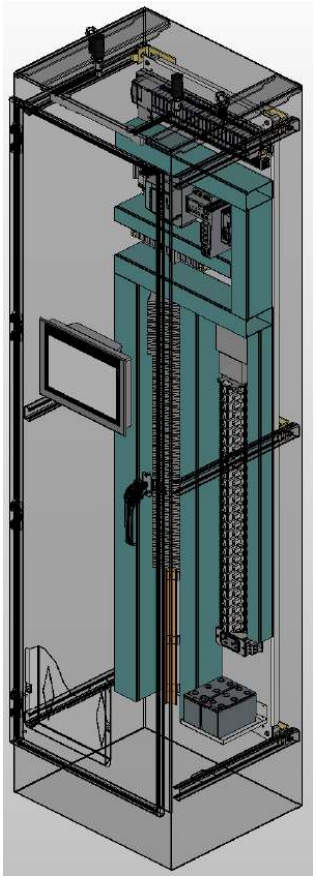
2. [SCP] Station Control Panel – the PLC control panel which provides the automatic control of the facility
3. Three (3x) 250HP Enclosed Drives with Passive Harmonic Filter, seismically certified and UL508A listed.
4. One (1) 2hp VFD panel for the pump room exhaust fan, seismically certified and UL508A listed
5. Instrumentation (see table in following sections) providing the measurement and detection signals required for the automation system to provide continuous operation of the facility
6. Application Software (PLC, HMI Touch Panel, and SCADA Computers)
7. Transitional Commissioning – commissioning the control system for the interim operations state while the facility is constructed and partially commissioned, to enable partial facility operations.
8. Final Commissioning – commissioning of the final state of the Lower Prune Hill facility and all new equipment. This includes operating training on the new system.

Detailed Scope of Supply

Design Services:

S&B participated in the design of the facility with Consor Engineering. S&B focused on the I&C portion of the work, and developed the IC-G and IC sheets, along with the specification sections of the control system equipment. This work was performed prior to this quotation and fees incurred by the City. S&B incurred 35.15 hours of design time across our team of engineers. These fees are included in this bid price.

Station Control Panel:



The new station control panel [SCP] is a PLC control panel where all networked and hardwired controls are terminated. It provides the logic of automatic controls for the facility.

S&B is supplying our "Model G" RTU which is 90"H x 24"W x 20"D. It uses a Siemens S7-1512 PLC with hot-swappable IO, a managed network switch, cellular modem, 24Vdc power distribution, relays, circuit breakers, gel cell batteries for 4-hour backup time, and a 12" touch panel HMI where all operational adjustments and diagnostics are provided.

Cellular Communication

The SCP will communicate with the City headquarters via cellular communication. S&B will assist the City in procuring the SIM card for the cellular modem as we approach the shop test phase of the work. The City will be responsible for maintaining the monthly cellular bill associated with the SIM card.

Shop Test

The SCP will be connected in S&B's shop to VFDs and a test PLC representing the City headquarters. The process control program is simulated and tested by S&B engineers to validate functionality prior to the system being shipped to the jobsite. This reduces startup time for S&B and the contractor.

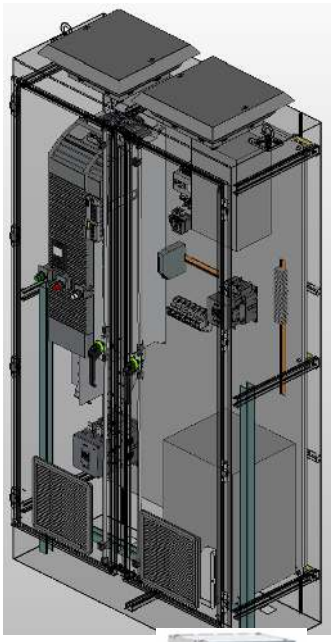
Freight Included

S&B will ship the SCP, along with the Instrumentation and VFDs on a commercial truck. Equipment will be palletized, and the Contractor will be responsible for

receiving the truck at the jobsite as well as offloading the equipment from the truck and any equipment movement on the jobsite.

Storage & Installation Requirements

S&B will include the installation and storage requirements of the I&C equipment as part of our submittal as well as via email to the contractor. This will educate the Contractor on storage and installation to protect the warranty of the equipment.



Enclosed VFDs:

Three (3) new enclosed VFDs, each at 250HP are supplied for the project. These VFDs all come in their own enclosure, sized at 98"H x 48"W x 20"D. The drives feature a Siemens G120 VFD and a passive harmonic filter, in addition to a main breaker, fans, and door mounted VFD operations panel.

These 250HP enclosed drives are specialized units, requiring a higher level of design, in order to meet the following unique requirements:

- Harmonic mitigation (required by the local power utility)
- Seismically Certified
- 65kAIC rated short circuit rating

Our scope includes a 1.5kW enclosed drive for the exhaust fan. This enclosed drive is a wall mount unit with a fused disconnect below the drive to meet electrical code requirements. This drive will also be PROFINET connected to the PLC in the SCP enclosure. All control adjustments of the exhaust fan will be performed at the 12" touch panel HMI on the SCP enclosure.

Profinet Connection to PLC

The VFDs are designed to have a Profinet cable connection to the PLC. Each VFD will have a "home run" connection to the PLC. S&B has provided a total of 60 meters of Profinet cable and 6 metalized connector heads to enable the electrical contractor to pull the Profinet cable from each VFD to the SCP. S&B will commission the Profinet cable heads on each end, the electrical contractor only needs to pull the Cabling.

Shop Test

All VFDs will be connected to the SCP in S&B's shop test. Control, status, and diagnostic information is checked for each VFD, and the initial VFD parameterization (i.e. motor nameplate info) is also set for each VFD.

Freight Included

S&B will ship the VFDs on a commercial truck with the rest of the I&C equipment. Equipment will be palletized, and the Contractor will be responsible for receiving the truck at the jobsite as well as offloading the equipment from the truck and any equipment movement on the jobsite.

Storage & Installation Requirements

S&B will include the installation and storage requirements of the I&C equipment as part of our submittal as well as via email to the contractor. This will educate the Contractor on storage and installation to protect the warranty of the equipment.

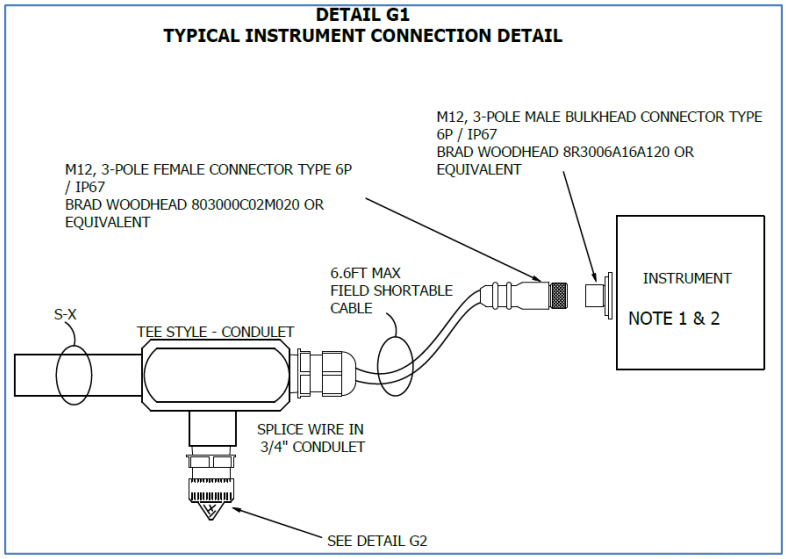
Instrumentation:

Instrumentation is integral to the functional performance of the control system. S&B is providing the following equipment, as shown on the IC drawings for the project.

Tag	Instrument Type	Description	M12 Connector
FE/FIT-1	12" Magnetic Induction Flow	integral mount, booster flow	
FSL-852	Thermal Flow Switch	3" relief line open	Yes
GAH-1	Air Quality	Pump Room Air Quality (smoke) Sensor	
LSHH-1	Float - rising stem	Station Flood	
LSH-011	Float - rising stem	1.5MG Reservoir High-High Level	
LSH-021	Float - rising stem	0.5MG Reservoir High-High Level	
PIT-1	Gage Pressure Transmitter	Suction pressure transmitter	Yes
PIT-455	Gage Pressure Transmitter	455' HGL zone pressure transmitter	Yes
PIT-852	Gage Pressure Transmitter	Pump discharge pressure transmitter	Yes
ZS-1	Limit Switch – type 4	Pump Room South Door Ajar	
ZS-2	Limit Switch – type 4	Pump Room East Door Ajar	
ZS-3	Limit Switch – type 4	Pump Room East Door Ajar	
ZS-012	Limit Switch - type 6P	1.5MG Reservoir Hatch Ajar	
ZS-022	Limit Switch - type 6P	0.5MG Reservoir Hatch Ajar	
ZS-023	Limit Switch - type 6P	0.5MG Reservoir Ladder Cover Ajar	
PIR-1	Motion Detector	Motion detector, multimode	
PIR-2	Motion Detector	Motion detector, multimode	
TT-1	RTD Temperature Transmitter	Indoor air temperature	Yes
TT-2	RTD Temperature Transmitter	Outdoor air temperature	Yes
LT-010	Submersible Level Transmitter	1.5MG Reservoir Level	
LT-020	Submersible Level Transmitter	0.5MG Reservoir Level	
ZT-1	Vibration Transmitter	Vibration Sensor for Pump 1	Yes
ZT-2	Vibration Transmitter	Vibration Sensor for Pump 2	Yes
ZT-3	Vibration Transmitter	Vibration Sensor for Pump 3	Yes

M12 Connectors

Several Instruments will come with M-12 connectors, providing quick connections for 24Vdc loop powered instruments. This matches the intent of Detail G1 and G2 found on drawing GIC-7. S&B will mount the M12 bulkhead on the instrument, and the electrical contractor will shorten the 2-meter long cable as required and wire-nut the M12 cable to the field wiring in the condulet.



M12 Bulkhead M12 Cable

Shop Test

Some instrumentation will be configured and shop tested prior to shipment to the jobsite. S&B will configure M12 bulkhead connectors on the instruments identified in the table. Instrumentation scaling and 4-20mA signal testing is performed in our shop as is the trip point of the thermal flow switch.

Freight Included

S&B will ship the instruments in a large box, set on a pallet. Equipment will be palletized, and the Contractor will be responsible for receiving the truck at the jobsite as well as offloading the equipment from the truck and any equipment movement on the jobsite.

Storage & Installation Requirements

S&B will include the installation and storage requirements of the I&C equipment as part of our submittal as well as via email to the contractor. This will educate the Contractor on storage and installation to protect the warranty of the equipment.

S&B will store equipment for up to 60 days in our warehouse prior to shipment to allow for contractor scheduling. If the project site is not ready to receive the equipment, we offer to ship the equipment to the City Operations Center for storage or hold at S&B for a $300/month. The City shall provide a target delivery date with “not before” and “not after” dates. S&B will use these dates to plan for panel assemblies and target delivery dates. The “not before” dates must be on or later than our lead time estimates below (ranging from 8 to 58 weeks).

Application Software:

Application Software links the equipment together and enables autonomous control of the station. S&B will provide application software to the following pieces of equipment:

- PLC (in the SCP)
- HMI Touch panel (in the SCP)
- VFDs (3x)
- SCADA Computer System (updates to the existing system at City Headquarters)
- Alarm Notification System (updates to the existing system at City Headquarters)

The application software is engineered at S&B's offices by Project and field engineering staff. All software is simulated and tested at our facility. Software that has completed its test is shelved and will be officially commissioned when S&B performs our field startup and commissioning activities.

Transitional Commissioning:

With the Lower Prune Hill site undergoing significant civil work, the leased line connection to the existing station is anticipated to be broken and not functional after this date. Our scope advances the cellular communication features of the new system, by connecting this equipment with the existing Lower Prune Hill RTU to allow for telemetry and SCADA operation during construction via the cellular network. Our work includes two days of transition startup services and 8 hours of engineering to design and program the interim system operations. S&B will provide the planning, coordination with the City in advance of contractor activities at the site. This action is anticipated to allow for civil work to continue without jeopardizing the control and operation of the existing facilities.

Final Commissioning:

After the construction is completed, S&B will perform the commissioning of the supplied equipment for the final end-state, as defined by the I&C drawings and control narratives in the project specifications. S&B field engineers will commission the VFDs, SCP, instrumentation, and application software.

S&B plans the following time to commission the control system

- SCP – 2 days
- VFDs (3x) – 1 day (requires the Contractor to have pump vendors onsite for complete commissioning)
- Instrumentation – 1 day
- SCADA Computer System Updates and Training – 1 day

Contractor Coordination

Startup/Commissioning services at jobsite are performed by our field engineer. A 2-week written notice is recommended for securing the Contractor's required startup date. Our field engineers schedule fills up quickly and the contractor can only choose from dates that are currently available.

The Contractor must also coordinate the required vendors for startup. Vendors will support the vendor-supplied field equipment, and S&B will support the testing of signals to the PLC in the SCP. The vendors we anticipate will need to be onsite during testing include:

1. Cla-Val
2. Pump Vendors (for 250HP VFDs)
3. ATS (testing the dry contacts in their control panel sending status info to the SCP)
4. Generator (testing the dry contacts and ModbusTCP ethernet connection in their control panel sending status info to the SCP)

Pre-Startup Checklist Requirements

S&B will provide a pre-startup checklist for the Contractor to use in verifying the electrical and mechanical systems are ready for commissioning services. An email confirmation of the pre-startup checklist completion is required prior to S&B performing startup services. Our startup time budget is based on completed checklist. If S&B arrives on site and instrumentation installations or wirings are not complete, the Contractor is responsible to purchase all required field engineering hours needed for commissioning services that go beyond the quoted time for the Control System Startup (as instrumentation startup is done during the same time). Any required new hours must be pre-purchased as part of a change order. Therefore, it is paramount that the contractor comply with the pre-startup checklist prior to S&B field engineers arriving to the site.

S&B will include the installation and storage requirements of the I&C equipment as part of our submittal as well as via email to the City. The City will review and forward this information to the Contractor.

Exceptions / Deviations from 100% Design Documents

- Plans: none
- Specifications: none

Pricing:

Pricing Breakout Table

Item	Function	Price
SCP RTU	Station Control Panel and RTU System	$ 80,837.00
VFD-EF1	Exhaust Fan Controller	$ 4,640.00
VFD-P1	250hp Booster Pump	$ 67,711.00
VFD-P2	250hp Booster Pump	$ 67,711.00
VFD-P3	250hp Booster Pump	$ 67,711.00
Interim LPH cellular transition	Interim LPH cellular transition	$ 4,192.00
Instruments	See table for details	$ 18,460.00
Design Engineering	30% - 100% design drawings	$ 8,098.00
	Sales Tax at 8.5%	$ 27,145.60

The pricing for the scope of work is offered as a lump sum value of: **$346,505.60**.

Standard Terms and Conditions:

Installation by Electrical Contractor:

The system quoted is intended for purchase by the City and installation by the contractor. Electrical and mechanical installation of the instruments at the project site is excluded from our scope. The Electrical Contractor is encouraged to review the system prior to shipment. Following installation of the equipment our field engineer will perform startup testing and owner training.

Assumed Responsibilities of the City's Selected Contractor:

The Contractor is responsible for the following items related to the I&C package:

- Providing the schedule for delivery of the I&C system. The Contractor may elect to receive the shipment in up to three groups of products to best fit the needs of their construction schedule: SCP, VFDs and Instrumentation.
- Attend one on-site meeting to review installation requirements and pre-startup tasks. This is a 2 to 3 hour meeting where we review mechanical and electrical installation requirements for each instrument and control panel. For control panels this includes seismic anchorage and recommended techniques. The pre-startup task review covers our check list indicating completion of the installation for each device with specific notes.
- Advance planning for startup and coordination of technical services. The pump station includes several complex equipment items. Since the control system connects with most of these items, the Contractor must provide a coordinated startup planning calendar indicating the time slots for each vendor and a sequenced plan for startup activities. All equipment provided by our firm is fully factory tested as a system on our shop floor prior to startup. Startup activities are a focus for integration of items that were not included in our scope of delivery. S&B provides a total of five days of onsite startup and testing work over as many as two time periods as part of this quotation. The Contractor can arrange for all startup in a contiguous 5-day sequence or break this up into two segments as best fits their schedule. Specific challenges to pumping stations are coordinating pump startup and generator startup.
- Provide a two-week advance notice via email for delivery to jobsite. S&B includes freight on board delivery via common freight with equipment on pallets and blanket wrapped. We typically can provide 4 hour resolution on exact delivery date and time requests. The Contractor is responsible for offloading freight and will require a forklift or similar lifting system to remove equipment from the freight van. Alternatively, the City may elect to receive all equipment from S&B at their Operations Center and make the equipment available as Will Call for the Contractor.
- All movement and storage of the IC equipment. This includes following the prescribed storage requirements of the control panels and instrumentation in a thermally controlled environment to ensure the warranty is maintained. Reference the included Control Panel Storage and Installation guide.
- Installation of equipment, including all bolts, fasteners, sealants, or other materials to support the required installation method.
- Communicating with S&B of the anticipated startup dates, or changes to the startup dates. The Contractor must request dates with at least a 2-week advance notice. S&B will give startup date options from dates that are currently available.

- Contractor is responsible to complete the S&B supplied pre-startup checklist, sign and return, to ensure the systems are both mechanically and electrically ready for startup services. If S&B arrives to perform the requested startup services and checklists were not representative of field conditions, additional field engineering labor may be required to complete the work.

Startup & Commissioning:

S&B field engineers will perform startup services for all quoted instrumentation on the project. Therefore, prior to I&C equipment checkout, all equipment for the entire site must be mechanically installed, wired, and the S&B control panel pre-commissioned so that the signal for each field device can be witnessed on the 12" operator touch panel.

S&B will be responsible to initially power up the SCP, as S&B will check for foreign voltages prior to energization. The Contractor is not allowed to power the panel without S&B first reviewing installation and providing initial startup services. This ensures the warranty of the control panel can be maintained.

Submittal Documentation:

Submittal drawings and supporting literature are provided in electronic format only, estimated at twelve (12) weeks from receipt of order.

O&M Documentation:

O&M information is supplied via electronic format prior to startup for Engineer review and Contractor use. Final documentation provided in As Built drawings supplied approximately two weeks after startup.

Lead Time Estimates:

The I&C scope of supply remains severely impacted with most equipment being long-lead items. All lead times are estimates based upon the current information from our suppliers. Lead times are subject to change and S&B does not bear responsibility for changes to manufacturer's lead times. S&B will communicate with the Owner and Contractor if lead times change.

The following lead times represent the most up to date information we have from our vendors:

- SCP – 20 weeks (use of the CPU and analog modules from the Well 5 project reduced this)
- VFDs – 32 weeks (changes in supply lead times for the VFD have improved since October)
- Instrumentation – 8-10 weeks
- Application Software – 24 weeks

Standard Inclusions:

- Award based on City Contract similar to previous work such as scope for Well 5 or Well 6.
- Equipment is factory tested and shipped FOB factory with freight allowed, common carrier, destination.
- Shop Drawings, instruction manuals and software documentation via electronic media.
- Submittal Documentation per specifications
- Field Engineering Services for technical support of installation questions, start-up, and acceptance testing of equipment supplied by this quotation. S&B is a designer and supplier of control system equipment, providing technical support and engineering services to review installation of our equipment, commission and attest to its compliance with the project specifications.

- Quote is valid for ninety days

Standard Exclusions:

Unless specifically included as a line item in this quotation's scope of supply the following are excluded from our scope of deliverables:

- Installation costs and any associated permits
- Arc Flash studies and/or labeling
- Short Circuit and circuit breaker trip coordination studies
- 3rd party circuit breaker certification testing and certification
- Piping, tubing, valves, fittings between the instruments and the process
- Process appurtenances: Pumps, pressure gauges, manifolds, bushings, thermowells, diaphragms, annular seals, purge assemblies, stilling wells, valves, pump over-temp sensors, pump moisture sensors, or solenoids that are not an integral part of the listed scope.
- Conduit, wire or cable external to the control system panels listed in this scope
- Mounting brackets, stanchions, supports, pads that are not integral to the control system panels or process instruments listed in this scope.
- Liquidated damages (available upon request and definition of scope)
- Bonding (service available for additional fee)
- Credit Card payment
- Equipment not specifically listed in our scope of work

Our quotation is based on a progress payment schedule to reflect progress in design, system assembly, product delivery and startup. Our payment requests will be submitted electronically per City requirements. Our form 977 (attached) provides our standard terms and conditions which provides the guidelines used for progress billing. We anticipate adopting the City's standard contract along with its terms and conditions assuming that it is similar to our recent contracts. Form 977 is provided until we have opportunity to review the current City standard contract.

We look forward to the opportunity to work on this important project and will contribute to making this successful by delivering the highest quality of materials and startup services according to the agreed schedule. Please feel free to contact us regarding any questions that you may have regarding our quotation.

Yours truly,

Randall T. Stead
President
S&B Inc.