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November 8, 2017

To: All Planholders (via email)

BIOMASS TO BIOFUEL (B2B) PROJECT, CITY PROJECT NUMBERS
C66401728 & C66501518

ADDENDUM NO. 2

This addendum shall hereby be made a part of the contract documents to the same extent as though it was originally included.

The time provided for completion of the Contract has not changed.

The bid opening date of November 16, 2017 at 3:00 P.M. has not changed.

Bidders shall acknowledge receipt of all Addenda by Number in the space provided in the Proposal.

Addendum No. 2 includes the following:

1. The Addendum itself, 4 pages
2. Specifications changed in Addendum No. 2:
 - a. Volume 2 - Technical Specifications, High Strength Waste Project: Section 13329.
3. Specifications to be added in Addendum No. 2:
 - a. Volume 2 – Technical Specifications, High Strength Waste Project: Section 13447.

ADDENDUM NO. 2

CONTRACT DOCUMENTS, BID SCHEDULE

1. Paragraph B. Basis of Award

Replace the text:

“BASIS OF AWARD:

1. If award is made, it will be based on the lowest responsive, responsible bid in which the Total Base Bid yields the lowest Contract Price.
2. The previously listed alternative is only utilized for determination of

the low bid. Such listing does not indicate that the CITY will select the listed alternatives.”

with the following:

“BASIS OF AWARD:

1. If award is made, it will be based on the lowest responsive, responsible bid in which the Total Base Bid (Items 1-16) yields the lowest Contract Price.”

CONTRACT DOCUMENTS, VOLUME 2 OF 6-TECHNICAL SPECIFICATIONS – DIVISIONS 02-14 - HIGH STRENGTH WASTE PROJECT – C66401728

Section 13329:

1. Page 13329-6, Part 3.03.G:

- a. Replace the text with the following:

1. The performance test shall be conducted by either the media supplier or by an independent testing agency in coordination with the media supplier while the sources being controlled are fully operational. The biofilter cells shall have been fully functional and receiving odorous air for a minimum of 45 consecutive days prior to commencing the testing.
2. The inlet concentrations shall be collected at the inlet of each biofilter cell. The outlet concentrations shall be monitored at the center point of the biofilter and 4 feet from the opposite wall of the biofilter inlet. A flux chamber shall be used to collect the outlet samples to prevent ambient air dilution.
3. Inlet and outlet concentrations of hydrogen sulfide, ammonia, amines, total reduced sulfides, and total odor used to determine performance for the control test and operational test shall be obtained by the following:
 - a. Hydrogen sulfide concentration shall be measured every 30 minutes at the inlet and outlets of each biofilter cell using an Interscan Corporation portable analyzer. Prior to use, the field instrument will be calibrated per manufacturer's instructions. Calibration results will be submitted with the Performance Test Report.
 - b. Ammonia and amine concentration shall be measured every hour at the inlet and outlets of each biofilter cell using a GASTEC portable sampling pump. Compound-specific

- sampling tubes shall be used with the sampling pump to collect the required measurements.
- c. Total reduced sulfide concentrations shall be measured every hour at the inlet and outlets of each biofilter cell. The set of hourly samples with the highest concentrations will be collected in Tedlar bags and submitted to a laboratory and tested per ASTM D5504 for 20 reduced sulfur compounds. The lab analysis shall be submitted with the Performance Test Report.
 - d. Total odor concentrations shall be measured every hour at the inlet and outlets of each biofilter cell. The set of hourly samples with the highest concentrations will be collected in Tedlar bags and submitted to a laboratory and tested per EN 13275:2003 and ASTM E679-04 for total odor concentrations. The lab analysis shall be submitted with the Performance Test Report.
4. Test only after supplier-approved acclimation period for each biofilter. Acclimation is not to exceed 3 weeks. Acclimation procedures shall be submitted in advance to the Engineer for review and approval.
 5. Operate each fan including control systems to demonstrate the fan, piping, appurtenances, and control systems as specified. Adjust fan sheaves and air balance the system per Section 15954 for proper air requirements.
 6. Retesting: After a failure, correct, repair, or replace the causative components and repeat the testing for the full specified duration.

INSTRUCTIONS TO BIDDERS:

1. The City requests that all questions be submitted in writing by November 13, 2017.
2. Bidders shall acknowledge receipt of all Addenda by number in the space provided in the Bid Schedule.

This Addendum No. 2 shall become part of the Contract and all provisions of the Contract shall apply thereto.

City of Petaluma





Jason L. Beatty, P.E. 11/8/17

SECTION 13447

ELECTRIC ACTUATORS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes: Electric motor-driven actuators for valves and gates as identified in the valves and gates schedule as EAM, EDM, OR EDR.
- B. Related sections:
 - 1. Section 15116 - Plug Valves.

1.02 REFERENCES

- A. American Water Works Association (AWWA):
 - 1. C504 - AWWA Standard for Rubber-Seated Butterfly Valves.
 - 2. C540 - AWWA Standard for Power-Actuating Devices for Valves and Slide Gates.
- B. National Electrical Manufacturers Association (NEMA):
 - 1. 250 - Enclosures for Electrical Equipment (1000 V Maximum).

1.03 DEFINITIONS

- A. NEMA:
 - 1. Type 4X enclosure in accordance with NEMA 250.
 - 2. Type 7 enclosure in accordance with NEMA 250.

1.04 SUBMITTALS

- A. Provide a complete list/schedule of all actuators being provided with their associated tag names as indicated on the design drawings and/or specifications, service process area and the size of the valve they are actuating.
- B. Clearly identify any exceptions in terms of quantities and/or quality of actuator(s) being submitted.
- C. Product data:
 - 1. Electrical ratings:
 - a. Voltage and number of phases.
 - b. Starting and running current.
 - c. Voltage levels and source for control and status.
 - 2. Electric motor data.
 - 3. Description of integral control interface.
 - 4. Remote control station components.
 - 5. Environmental ratings, including NEMA enclosure rating and submergence capabilities.
 - 6. Gear ratios for both manual and motorized actuation.
 - 7. Opening and closing directions.

8. Allowable starts per hour.
 9. List of all included options and accessories.
 10. Full travel times.
 11. Gearbox data including gear ratio, and gearbox efficiency.
 12. Affidavit in accordance with AWWA C540.
- D. Shop drawings:
1. Wiring diagrams:
 - a. Include all options and expansion cards furnished with each actuator.
 2. Dimensioned drawings of each valve and actuator combination.
 3. Dimensioned drawings of each valve gearbox.
- E. Calculations: Submit the following for each valve/gate size and class:
1. Operating torque calculations.
 2. Maximum torque calculations for seating and unseating.
 3. Maximum operating torque at starting and normal operation.
- F. Test reports:
1. Factory test report and certificate.
 2. Each actuator must be performance tested with a simulated load at the factory and individual test certificates and detailed test reports shall be provided:
 - a. The test equipment used should simulate a typical valve load.
- G. Manufacturer's instructions:
1. Include manufacturer's instructions, description of system operation, start-up data, and troubleshooting checklist.
- H. Operations and maintenance data:
1. Include manufacturer's literature; cleaning procedures, replacement part lists, wiring diagrams, and repair data.
 2. Include a list of all configurable parameters, and the final values for each.
 3. List of recommended spare parts.
 4. List of special tools necessary for proper operation and/or maintenance.
 5. Exploded view drawings that illustrate all assemblies, sub-assemblies, and components.
 6. Routine test procedures for all electronic and electrical circuits.
 7. Troubleshooting chart covering the complete valve and controls/electrical power systems, showing description of trouble, probable cause, and suggested remedy.
 8. Certified factory and field-test results.

1.05 QUALITY ASSURANCE

- A. Obtain required information from the valve/gate supplier, including but not limited to:
1. Interface to gate or valve.
 2. Operating range (In degrees).
 3. Quarter turn or multi-turn.
 4. Required turns for full travel on multi-turn applications.
 5. Direction of rotation for opening and closing.
 6. Maximum and normal torque requirements.
 7. Additional sizing requirements indicated in the following Specifications:
 - a. Section 15116 - Plug Valves.

- B. All motorized actuators shall be the product of a single manufacturer for all valve and gate applications on this project, regardless of gate or valve type, manufacturer, or supplier.

1.06 SPARE PARTS

- A. Provide the following spare parts (minimum 10 percent of total number of actuators of each model type furnished, but not less than 1 for each model of actuator furnished):
 - 1. Stem nut.
 - 2. Worm shaft subassembly.
 - 3. Drive sleeve subassembly.
 - 4. Complete actuator seal kit.
 - 5. Actuator gearbox oil (sufficient quantity to fill 4 gearboxes).
 - 6. Encoder.
 - 7. Control module.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable manufacturers for lines 4 inch and larger:
 - 1. Rotork Controls Inc.:
 - a. IQ3 (Multi-turn).
 - 2. Limatorque Corporation:
 - a. Accutronix MX (Multi-Turn).
 - 3. Auma:
 - a. SA (multi-turn) with Aumatic AC controls.

2.02 CHARACTERISTICS FOR ACTUATORS ON LINES 4 INCHES AND LARGER

- A. Provide actuators complete and operable with all components and accessories required for operation.
- B. Power supply:
 - 1. Voltage and phases as indicated in the Schedule.
 - 2. Valve or gate motion independent of power supply phase rotation.
 - 3. Provide an internal backup power source to maintain settings and track valve position when main power is off.
 - 4. The actuators shall incorporate all major components such as the motor, starter, local controls, terminals etc. housed within a self-contained, sealed enclosure.
- C. Size actuator to move gates or valves from full open to closed position within the time indicated in the Schedule:
 - 1. If an operating time is not indicated on the Schedule, size the actuator to move gates or valves at minimum 12 inches per minute under maximum load. Measure rate of closure for valves at maximum diameter of disc, plug, or ball.
 - 2. Size actuators so that gear boxes are not required where possible.
- D. Control interface:
 - 1. Configuration:

- a. Provide a non-intrusive, non-contacting interface for configuring all input and output settings, control values, ranges, torque switch settings, valve positions switch settings, and options:
 - 1) Configurable from a hand-held configuring tool or input devices on the actuator.
2. Local interface, integral to actuator:
 - a. Non-intrusive, non-contacting selector switches:
 - 1) LOCAL-STOP-REMOTE:
 - a) Motor actuator operation is prevented with the switch in STOP.
 - 2) OPEN-CLOSE:
 - a) Controls the valve when LOCAL-STOP-REMOTE is in LOCAL.
 - b) Spring return to center.
 - c) Configurable between maintained (actuator runs until end of travel, high torque, or a LOCAL-STOP-REMOTE is switched to STOP) and momentary (actuator stops when lever is released).
 - b. Local display:
 - 1) Valve fully open and fully closed indicators.
 - 2) Numerical display showing actual valve or gate position in percent of travel.
3. Remote control station - (VCP):
 - a. Provide remote control stations for all actuators located more than 5 feet above finished floor/grade or where indicated Valve and Gate Schedule:
 - 1) NEMA rating as listed in the Valve and Gate Schedule:
 - a) Where the rating is not listed, use NEMA Type 4X enclosures for non-hazardous areas, and explosion proof (XP) Class I Division 1 for hazardous areas.
 - b) All pilot devices shall 30 mm and pilot lights shall be illuminated by LEDs.
 - 2) LOCAL-STOP-REMOTE selector switch.
 - 3) LOCAL mode control devices:
 - a) Operate valve when LOCAL-STOP-REMOTE integral to actuator is in REMOTE and LOCAL-STOP-REMOTE on remote control station is in LOCAL.
 - 4) OPEN-STOP-CLOSE maintained switch or OPEN, STOP and CLOSE pushbuttons. Pilots lights to indicate valve position:
 - a) Fully open.
 - b) Fully closed.
4. Control inputs:
 - a. Capable of using 120 VAC or 24 VDC inputs.
 - b. Controls the valve when LOCAL-STOP-REMOTE is in REMOTE.
 - c. Isolated inputs capable of operating from external control voltage source or internal power supply:
 - 1) Furnish 120 VAC and 24 VDC control power supplies within the actuator.
 - d. Provide the following inputs:
 - 1) OPEN.
 - 2) CLOSE.
 - 3) STOP.
 - e. OPEN and CLOSE inputs configurable between maintained (actuator runs until end of travel, high torque, or a STOP input) and momentary (actuator stops when command is removed).
5. Status outputs:

- a. Monitor relay output: Dry contact, normally closed, opens when actuator is not in REMOTE or in the event of any internal fault or alarm condition.
 - b. Dry contact outputs configured for the functions indicated on the Drawings. Provide the following outputs for all actuators:
 - 1) Fully closed.
 - 2) Fully open.
 - 3) LOCAL-STOP-REMOTE in REMOTE position.
 - c. All output contacts rated for 5 amps, 120 VAC and 24 VDC.
- E. Features:
- 1. Time delay on reversal: Incorporate time delay between stopping actuator and starting in opposite direction to limit excessive current, torque, and heating from instantaneous reversal.
 - 2. Data logging:
 - a. Store diagnostic data and reference data:
 - 1) Store reference data (recorded during commissioning) and data from last operation.
 - 3. Provide display of logged data on the actuator, or provisions to download to a personal computer.
- F. Materials:
- 1. Construct motorized actuators of materials suitable for the environment in which the valve or gate is to be installed.
- G. Components:
- 1. Motors.
 - 2. Specifically designed for valve actuator service with high starting torque, totally enclosed non-ventilated construction.
 - 3. Torque ratings equal to or greater than that required for valve seating and dynamic torques with a 25 percent factor of safety:
 - a. Design requirements for rubber-seated AWWA butterfly valves:
 - 1) Design actuators for maximum gate or valve operating torque, in accordance with and using safety factors required in AWWA C504 and AWWA C540:
 - a) Valve actuator torque requirement for open-close service: Not less than the required valve-seating and dynamic torques under design operating conditions in accordance with AWWA C504.
 - b) Valve actuator torque requirement for modulating service: Not less than twice the required valve dynamic torque under design operating conditions in accordance with AWWA C504.
 - b. Design requirements for slide gates, gate valves, knife gate valves, globe valves, and diaphragm valves:
 - 1) Design valves and actuators for maximum operating torque, in accordance with and using safety factors required in AWWA C540.
 - 2) Design for the maximum torque and thrust running load over the full cycle.
 - 3) Maximum torque or thrust rating: The actuator stall torque or maximum thrust output shall not exceed the torque or thrust capability of the valve or gate, as determined by the valve or gate manufacturer.
 - 4. Capable of being removed and replaced without draining the actuator gear case.

5. Motor bearings shall be amply proportioned of the anti-friction type and permanently lubricated.
 6. Rated for operating under the following conditions without exceeding temperature limits with ambient temperature of 40 degrees Celsius:
 - a. Continuous operation for 15 minutes or twice the open-to-close operating time (whichever is greater) at normal operating torque or 33 percent of maximum torque (whichever is greater).
 - b. 60 starts per hour for open/close service or 1,200 starts per hour for modulating service.
 7. Provide the following motor protection features:
 - a. Jammed valve (no valve motion detected through a time delay).
 - b. High motor temperature (sensed by an embedded thermostats).
 - c. High torque.
 - d. Single phasing protection.
- H. Enclosures:
1. Actuator housing ratings as indicated in the Schedule.
 2. Stainless steel external fasteners.
 3. Provide 'O' ring seals for each of the following areas:
 - a. Between the terminal compartment and the internal electrical elements.
 - b. Between the mechanical and electrical portions to protect from the ingress of oil, and to protect the mechanical components of oil from dust and moisture when the electrical terminal is open.
 4. Provide the following minimum enclosure ratings:
 - a. NEMA Type 4X enclosure for general applications.
- I. Position sensing:
1. Electronic and adjustable using a solid-state encoder wheel:
 - a. Mechanical limit switches and potentiometers are not acceptable.
 2. Capable of retaining position and monitoring valve or gate motion when valve is manually actuated and when main power is not present.
 3. Valve range and position switch outputs field adjustable.
- J. Torque sensing:
1. Torque shutdown setting: 40 percent to 100 percent rated torque:
 - a. Adjustable in 1 percent increments.
 2. Capable of interrupting control circuit during both opening and closing and when valve torque overload occurs.
 3. Electrical or electronic torque sensing.
 4. Independent of variations in frequency, voltage, or temperature.
 5. Provide a temporary inhibit of the torque sensing system during unseating or during starting in mid-travel against high inertia loads.
 6. Provide visible verification of torque switch status without any housing disassembly.
- K. Manual actuators:
1. Hand wheel for manual operation:
 - a. Maximum 80 pound pull on rim when operating gate or valve under maximum load.
 - b. Provide pull chain when motorized actuator is located more than 6 feet above floor surface:

- 1) Chain shall be of sufficient length to reach approximately 4 feet above the operating level.
 - 2) Where the chain obstructs an aisle or walkway, provide holdback or other means to ensure chain does not create a nuisance or hazard to operating personnel.
2. Declutch lever: Padlockable, capable of mechanically disengaging motor and related gearing and freeing hand wheel for manual operation.
- L. Gearing: Hardened alloy steel spur or helical gears and self-locking, alloy bronze worm gear set:
1. Accurately cut to assure minimum backlash.
- M. Bearings:
1. Anti-friction bearing with caged balls or rollers throughout.
 2. Sealed-for-life type thrust bearings housed in a separate thrust base.
- N. Drive bushing:
1. Easily detachable for machining to suit the valve stem or gearbox input shaft.
 2. Positioned in a detachable base of the actuator.
- O. Lubrication:
1. Provide totally enclosed actuator gearing with oil filled gear case suitable for operation at any angle.
 2. Suitable for standard SAE80EP gear oil.
 3. Actuators requiring special or exotic lubricants are not acceptable.

2.03 SOURCE QUALITY CONTROL

- A. Factory test:
1. Test each actuator in the factory, and submit an individual test certificate for each actuator.
 2. Perform a high potential test and record the following information:
 - a. Test voltage.
 3. Simulate a maximum and typical valve loads and record the following information:
 - a. Current and power factor at maximum and set torque values.
 - b. Torque as measured by the actuator.
 - c. Actuator output speed or operating time.
 4. Performance testing: Conduct performance test for each actuator simulating valve operating torque from full-open to full-close and from full-close to full-open. The following information shall be recorded during each performance test:
 - a. Torque at maximum torque setting.
 - b. Current at maximum torque setting.
 - c. Test voltage and frequency.
 - d. Actuator output speed and operating time for full-open to full-close.
 - e. Amperage draw on motors at breakaway and under normal operation.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install actuators in accordance with manufacturer's instructions.

3.02 MOTORIZED ACTUATOR SCHEDULE

- A. Provide all actuators indicated on the Drawings:
 - 1. Major process actuators are listed in the Intelligent Actuator Schedule in this section.
 - 2. The schedule does not include all number and types of actuators required for the Project.
- B. Abbreviations relating to type:
 - 1. BFV = Butterfly Valve.
 - 2. BV = Ball Valve.
 - 3. PV = Plug Valve.
- C. Abbreviations relating to actuator type:
 - 1. O/C = Open and Close Service.
 - 2. MOD = Modulating Service.
- D. Abbreviations relating to controls:
 - 1. PA = Profibus PA.
 - 2. DP = Profibus DP.
 - 3. DN = DeviceNet.
 - 4. FF = Foundation Fieldbus H1.
 - 5. MB = Modbus RTU (RS-485).
 - 6. NET = Manufacturer's proprietary network.
 - 7. A = Analog (4-20mA) control, modulating duty.
 - 8. D = Discrete control, modulating duty.
 - 9. D-O/C = Discrete Open/Close.

END OF SECTION

INTELLIGENT ACTUATOR SCHEDULE

Item	Reference DWG	Type	Size	Actuator Type	Rating	Voltage /Phase /Hz	Notes	Open Time	Controls
HSW Receiving Valve No. 1 (15-EDR-004)	15M01	PV	6"	O/C	4	480/3/60	1	30 s	D-O/C
HSW Receiving Valve No. 2 (15-EDR-005)	15M01	PV	6"	O/C	4	480/3/60	1	30 s	D-O/C

Notes:
(1) Provide actuators with integrated control station.

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pww://Carollo/Documents/Client/CAP/etalumna/7310M10/Specifications/13447 (IDS_90)

13447-9

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