

ADDENDUM NO. 2
TO THE PLANS, SPECIFICATIONS AND CONTRACT DOCUMENTS
Entitled

CITY OF LE ROY, IL
WATER SYSTEM IMPROVEMENTS

AD2-1 NOTICE

- 1.01 This Addendum No. 2 dated March 18, 2021, to the plans, specifications and contract documents for the above-captioned project supersedes all contrary and conflicting information in the documents which are hereby supplemented or revised as follows.

AD2-2 BID EXTENSION

- 2.01 Note the change to the bid due date. Separate sealed bids for the **WATER SYSTEM IMPROVEMENTS** project will be received at the **Le Roy City Hall, 207 S. East Street, Le Roy, IL 61752** until **3:00 p.m.** local time, **March 30, 2021**, and then at said office such bids will be publicly opened and read aloud.

The proposals shall be sealed in an envelope bearing only the printed endorsement "Proposals for **WATER SYSTEM IMPROVEMENTS**". In the case of proposals to be sent by mail, said envelope shall be placed in an outer, or mailing envelope, and endorsed "This envelope contains a sealed bid to be read at **3:00 p.m. local time, March 30, 2021**".

AD2-3 PRESSURE FILTER VALVE TABLE I/O

- 3.01 Note the addition of the Filter Valves and Flow Meters to the I/O table on page E-203 of the plan set. The attached page replaces the table in the plan set.

AD2-4 PRESSURE FILTER SUPPORT MEDIA

- 4.01 It shall be noted that support gravel shall be provided in accordance with the following size and depth distribution. The attached page replaces the corresponding page 90 in Section 15400 of the project manual.

| <u>Size</u> | <u>Depth</u> |
|---------------------|---------------|
| 2 ½ to 1 ½ inches | 5 to 8 inches |
| 1 ½ to ¾ inches | 3 to 5 inches |
| ¾ to ½ inches | 3 to 5 inches |
| ½ to ³/₁₆ inches | 2 to 3 inches |
| ³/₁₆ to ³/₃₂ inches | 2 to 3 inches |

AD2-5 FILTER PAINT

- 5.01 Note the update to the filter tank coatings in Section 15400-4.16 on page 91. The attached page replaces the corresponding page in the project manual.

AD2-6 PRESSURE FILTER APPROVED MANUFACTURERS

- 6.01 The base bid shall be to provide Greensand Pressure Filters as supplied by Loprest, Inc. as described in Section 15400 Greensand Pressure Filters. Alternate bids may be submitted for equivalent filters supplied by AdEdge Water Technologies, and Marlo Incorporated. Such bids will be listed as an add or (deduct) on lines provided on the attached revised BID SCHEDULE.

AD2-7 WATER TEST KITS

- 7.01 It shall be noted that water test kits for testing water quality are not required as stated in Section 15400, 4.15, page 91 of the project manual. The attached page replaces the corresponding page in the project manual.

AD2-8 PRE-BID MEETING

- 8.01 A pre-bid meeting was conducted on March 11, 2021 at 9:30 am in the City Hall (207 S. East Street, Le Roy, IL 61752). Meeting minutes are attached to this addendum.

AD2-9 INSTRUMENTATION-MAGNETIC FLOW METER

- 9.01 All the flow meters to be used on this project shall be Badger Meter Model M-2000 Electromagnetic Flow Meter. See attached Section 16901 INSTRUMENTATION which replaces the corresponding section in the project manual.

AD2-10 REVISED BID SCHEDULE

- 10.01 The attached Revised Bid Schedule replaces the bid schedule included in the Project Manual.

**Chastain & Associates LLC
5 N. Country Club Rd.
Decatur, Illinois 62521**

| Instrument ID | Instrument Description | Signal | | Conduit Route | | | | Remarks |
|---------------|---|--------|----------------|---------------|--------|--------------|-------------------|-------------------|
| | | VO | Conductor Size | Conduit | Source | Intermediate | Destination | |
| FPS-1 | feed pump 1 speed control | AO | 18 STP | C-1 | CP-1 | | MCC-1-05 | |
| FPS-2 | feed pump 2 speed control | AO | 18 STP | | CP-1 | | MCC-1-06 | |
| FPS-3 | feed pump 3 speed control | AO | 18 STP | | CP-1 | | MCC-1-07 | |
| FPS-4 | feed pump 4 speed control | AO | 18 STP | | CP-1 | | MCC-1-08 | |
| FPS-1 | feed pump 1 run indication | DI | 14 AWG | C-2 | CP-1 | | MCC-1-05 | |
| FPS-1 | feed pump 1 fault status | DI | 14 AWG | | CP-1 | | MCC-1-05 | |
| FPS-2 | feed pump 2 run indication | DI | 14 AWG | | CP-1 | | MCC-1-06 | |
| FPS-2 | feed pump 2 fault status | DI | 14 AWG | | CP-1 | | MCC-1-06 | |
| FPS-3 | feed pump 3 run indication | DI | 14 AWG | | CP-1 | | MCC-1-07 | |
| FPS-3 | feed pump 3 fault status | DI | 14 AWG | | CP-1 | | MCC-1-07 | |
| FPS-4 | feed pump 4 run indication | DI | 14 AWG | | CP-1 | | MCC-1-08 | |
| FPS-4 | feed pump 4 fault status | DI | 14 AWG | | CP-1 | | MCC-1-08 | |
| FP-1 | feed pump 1 start/stop | DO | 14 AWG | | CP-1 | | MCC-1-05 | |
| FP-2 | feed pump 2 start/stop | DO | 14 AWG | | CP-1 | | MCC-1-06 | |
| FP-3 | feed pump 3 start/stop | DO | 14 AWG | | CP-1 | | MCC-1-07 | |
| FP-4 | feed pump 4 start/stop | DO | 14 AWG | | CP-1 | | MCC-1-08 | |
| HSP-1 | high service pump 1 start/stop | DO | 14 AWG | | CP-1 | | MCC-1-09 | |
| HSP-2 | high service pump 2 start/stop | DO | 14 AWG | | CP-1 | | MCC-1-10 | |
| CP-1 | CIP pump start/stop | DO | 14 AWG | | CP-1 | | MCC-1-14 | Demo |
| CH-1 | tank heater start/stop | DO | 14 AWG | | CP-1 | | MCC-1-15 | |
| CL-2 | softened water chlorine solenoid valve open/close | DO | 14 AWG | C-3 | CP-1 | | CL-2 | |
| LT-3 | backwash tank level transducer | AI | 18 STP | C-4 | CP-1 | CP-3 | LT-3 | Demo |
| CTT-1 | CIP temperature transmitter | AI | 18 STP | | CP-1 | CP-3 | CTT-1 | Demo |
| CLT-1 | CIP tank level transducer | AI | 18 STP | | CP-1 | CP-3 | CLT-1 | Demo |
| CCT-1 | conductivity transducer | AI | 18 STP | | CP-1 | CP-3 | CCT-1 | |
| CPT-1 | CIP pump pressure transducer | AI | 14 AWG | | CP-1 | CP-3 | CPT-1 | Demo |
| LS-3 | backwash tank low level switch | DI | 14 AWG | C-5 | CP-1 | CP-3 | LS-3 | Demo |
| LS-4 | backwash tank high level switch | DI | 14 AWG | | CP-1 | CP-3 | LS-4 | Demo |
| CLS-1 | CIP tank high level switch | DI | 14 AWG | | CP-1 | CP-3 | CLS-1 | Demo |
| CLS-2 | CIP tank high level switch | DI | 14 AWG | | CP-1 | CP-3 | CLS-2 | Demo |
| CFS-1 | concentrate flow switch | DI | 14 AWG | | CP-1 | CP-3 | CFS-1 | |
| CTO-1 | CIP tank temperature | DI | 14 AWG | | CP-1 | CP-3 | CTO-1 | |
| | | | | | CP-1 | | | |
| CV-1 | CIP valve 1 at plant pneumatic control panel | DO | 14 AWG | C-6 | CP-1 | CP-4 | CV-1 | Demo |
| CV-2 | CIP valve 2 at plant pneumatic control panel | DO | 14 AWG | | CP-1 | CP-4 | CV-2 | Demo |
| CV-3 | CIP valve 3 at plant pneumatic control panel | DO | 14 AWG | | CP-1 | CP-4 | CV-3 | Demo |
| CV-4 | CIP valve 4 at plant pneumatic control panel | DO | 14 AWG | | CP-1 | CP-4 | CV-4 | Demo |
| CV-5 | CIP valve 5 at plant pneumatic control panel | DO | 14 AWG | | CP-1 | CP-4 | CV-5 | Demo |
| | ethernet network cable | | CAT 5 | C-7 | CP-1 | CP-1A | | |
| | ethernet network cable | | CAT 5 | C-8 | CP-1 | | | |
| CDS-3 | chemical drum scale 3 sodium fluoride | AI | 18 STP | C-9 | CP-1 | JB-1 | CDS-3 | |
| CDS-4 | chemical drum scale 4 polyphosphate | AI | 18 STP | | CP-1 | JB-1 | CDS-4 | |
| CDS-5 | chemical drum scale 5 sodium hypochlorite | AI | 18 STP | | CP-1 | JB-1 | CDS-5 | |
| CDS-6 | chemical drum scale 6 citric acid | AI | 18 STP | | CP-1 | JB-1 | CDS-6 | |
| FPCV-1 | flow propotional chlorine valve | AI | 18 STP | | CP-1 | JB-1 | FPCV-1 JB-2 (C25) | |
| CCS-1 | chlorine cylinder scale 1 | AI | 18 STP | | CP-1 | JB-1 | CCS-1 JB-2 (C25) | |
| CCS-2 | chlorine cylinder scale 2 | AI | 18 STP | | CP-1 | JB-1 | CCS-2 JB-2 (C25) | |
| CFS-5 | sodium hypochlorite tank flow switch 5 | DI | 14 AWG | C-10 | CP-1 | JB-1 | CFS-5 | |
| CFS-6 | citric acid tank flow switch 6 | DI | 14 AWG | | CP-1 | JB-1 | CFS-6 | Demo |
| CA-1 | chlorine gas alarm | DI | 14 AWG | | CP-1 | JB-1 | CA-1 | |
| CF-2 | pre-filter/CIP chemical feed pump receptacle start/stop | DO | 14 AWG | | CP-1 | JB-1 | CF-2 | |
| CF-3 | softened water chemical feed pump receptacle start/stop | DO | 14 AWG | | CP-1 | JB-1 | CF-3 | |
| F-2 | finished water meter | AI | 18 STP | C-17 | CP-1 | JB-3 | F-2 | |
| F-3 | softened backwash water meter | AI | 18 STP | | CP-1 | JB-3 | F-3 | |
| CL-3 | finished water chlorine solenoid valve 1 open/close | DO | 14 AWG | C-18 | CP-1 | JB-3 | CL-3 | |
| CL-4 | finished water chlorine solenoid valve 2 open/close | DO | 14 AWG | | CP-1 | JB-3 | CL-4 | |
| BP-1 | brine pump 1 running | AO | 14 AWG | C-19 | CP-2 | | MCC-1-13 | |
| BP-1 | brine pump 1 start/stop | AO | 14 AWG | | CP-2 | | MCC-1-13 | |
| SF-1 | softener 1 flow meter | DO | 14 AWG | C-20 | CP-2 | CP-2A | SF-1 | |
| SF-2 | softener 2 flow meter | DO | 14 AWG | | CP-2 | CP-2A | SF-2 | |
| IV-1 | inlet valve solenoid valve 1 | DO | 14 AWG | C-21 | CP-2 | CP-2A | IV-1 | Replace Electric |
| BWV-1 | backwash waste valve solenoid valve 1 | DO | 14 AWG | | CP-2 | CP-2A | BWV-1 | Replace Electric |
| BSV-1 | backwash supply valve solenoid valve 1 | DO | 14 AWG | | CP-2 | CP-2A | BSV-1 | Replace Electric |
| RWV-1 | rinse waste valve splenoid valve 1 | DO | 14 AWG | | CP-2 | CP-2A | RWV-1 | Replace Electric |
| EV-1 | effluent valve solenoid valve 1 | DO | 14 AWG | | CP-2 | CP-2A | EV-1 | Replace Electric |
| BV-1 | brine valve solenoid valve 1 | DO | 14 AWG | | CP-2 | CP-2A | BV-1 | Replace Electric |
| IV-2 | inlet valve solenoid valve 2 | DO | 14 AWG | | CP-2 | CP-2A | IV-2 | Replace Electric |
| BWV-2 | backwash waste valve solenoid valve 2 | DO | 14 AWG | | CP-2 | CP-2A | BWV-2 | Replace Electric |
| BSV-2 | backwash supply valve solenoid valve 2 | DO | 14 AWG | | CP-2 | CP-2A | BSV-2 | Replace Electric |
| RWV-2 | rinse waste valve solenoid valve 2 | DO | 14 AWG | | CP-2 | CP-2A | RWV-2 | Replace Electric |
| EV-2 | effluent valve solenoid valve 2 | DO | 14 AWG | | CP-2 | CP-2A | EV-2 | Replace Electric |
| BV-2 | brine valve solenoid valve 2 | DO | 14 AWG | | CP-2 | CP-2A | BV-2 | Replace Electric |
| BTV-1 | brine tank supply solenoid valve open/close | DO | 14 AWG | | CP-2 | CP-2A | BTV-1 | Replace Electric |
| BF-1 | brine meter | AI | 18 STP | C-22 | CP-2 | CP-2B | BF-1 | Replace Electric |
| SF-3 | softener 3 flow meter | AI | 18 STP | | CP-2 | CP-2B | SF-3 | |
| SF-4 | softener 4 flow meter | AI | 18 STP | | CP-2 | CP-2B | SF-4 | |
| DP-1 | differential pressure switch | DO | 14 AWG | C-23 | CP-2 | CP-2B | DP-1 | |
| BDV-1 | brine dilution solenoid valve open/close | DO | 14 AWG | | CP-2 | CP-2B | BDV-1 | |
| IV-3 | inlet valve solenoid valve 3 | DO | 14 AWG | | CP-2 | CP-2B | IV-3 | Replace Electric |
| BWV-3 | backwash waste valve solenoid valve 3 | DO | 14 AWG | | CP-2 | CP-2B | BWV-3 | Replace Electric |
| BSV-3 | backwash supply valve solenoid valve 3 | DO | 14 AWG | | CP-2 | CP-2B | BSV-3 | Replace Electric |
| RWV-3 | rinse waste valve solenoid valve 3 | DO | 14 AWG | | CP-2 | CP-2B | RWV-3 | Replace Electric |
| EV-3 | effluent valve solenoid valve 3 | DO | 14 AWG | | CP-2 | CP-2B | EV-3 | Replace Electric |
| BV-3 | brine valve solenoid valve 3 | DO | 14 AWG | | CP-2 | CP-2B | BV-3 | Replace Electric |
| IV-4 | inlet valve solenoid valve 4 | DO | 14 AWG | | CP-2 | CP-2B | IV-4 | Replace Electric |
| BWV-4 | backwash waste valve solenoid valve 4 | DO | 14 AWG | | CP-2 | CP-2B | BWV-4 | Replace Electric |
| BSV-4 | backwash supply valve solenoid valve 4 | DO | 14 AWG | | CP-2 | CP-2B | BSV-4 | Replace Electric |
| RWV-4 | rinse waste valve solenoid valve 4 | DO | 14 AWG | | CP-2 | CP-2B | RWV-4 | Replace Electric |
| EV-4 | effluent valve solenoid valve 4 | DO | 14 AWG | | CP-2 | CP-2B | EV-4 | Replace Electric |
| BV-4 | brine valve solenoid valve 4 | DO | 14 AWG | | CP-2 | CP-2B | BV-4 | Replace Electric |
| PS | pressure switch for backup alarm dialer | DI | 14 AWG | C-25 | AD-1 | | PS | alarm dialer only |
| FRW-1 | filter 1 raw water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-1 | FRW-1 | |
| FFW-1 | filter 1 filtered water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-1 | FFW-1 | |
| FBW-1 | filter 1 backwash water butterfly valve modulating | | 14 AWG | | MP-1 | FTP-1 | FBW-1 | |
| FBR-1 | filter 1 rinse to waste valve modulating | | 14 AWG | | MP-1 | FTP-1 | FBR-1 | |
| FFM-1 | filter 1 filtered water flow meter | | 14 AWG | | MP-1 | FTP-1 | FFM-1 | |
| FBM-1 | filter 1 backwash water flow meter | | 14 AWG | | MP-1 | FTP-1 | FBM-1 | |
| FRW-2 | filter 2 raw water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-1 | FRW-2 | |
| FFW-2 | filter 2 filtered water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-1 | FFW-2 | |
| FBW-2 | filter 2 backwash water butterfly valve modulating | | 14 AWG | | MP-1 | FTP-1 | FBW-2 | |
| FBR-2 | filter 2 rinse to waste valve modulating | | 14 AWG | | MP-1 | FTP-1 | FBR-2 | |
| FFM-2 | filter 2 filtered water flow meter | | 14 AWG | | MP-1 | FTP-1 | FFM-2 | |
| FBM-2 | filter 2 backwash water flow meter | | 14 AWG | | MP-1 | FTP-1 | FBM-2 | |
| FRW-3 | filter 3 raw water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-2 | FRW-3 | |
| FFW-3 | filter 3 filtered water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-2 | FFW-3 | |
| FBW-3 | filter 3 backwash water butterfly valve modulating | | 14 AWG | | MP-1 | FTP-2 | FBW-3 | |
| FBR-3 | filter 3 rinse to waste valve modulating | | 14 AWG | | MP-1 | FTP-2 | FBR-3 | |
| FFM-3 | filter 3 filtered water flow meter | | 14 AWG | | MP-1 | FTP-2 | FFM-3 | |
| FBM-3 | filter 3 backwash water flow meter | | 14 AWG | | MP-1 | FTP-2 | FBM-3 | |
| FRW-4 | filter 4 raw water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-2 | FRW-4 | |
| FFW-4 | filter 4 filtered water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-2 | FFW-4 | |
| FBW-4 | filter 4 backwash water butterfly valve modulating | | 14 AWG | | MP-1 | FTP-2 | FBW-4 | |
| FBR-4 | filter 4 rinse to waste valve modulating | | 14 AWG | | MP-1 | FTP-2 | FBR-4 | |
| FFM-4 | filter 4 filtered water flow meter | | 14 AWG | | MP-1 | FTP-2 | FFM-4 | |
| FBM-4 | filter 4 backwash water flow meter | | 14 AWG | | MP-1 | FTP-2 | FBM-4 | |
| FRW-5 | filter 5 raw water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-2 | FRW-5 | |
| FFW-5 | filter 5 filtered water butterfly valve open/close | | 14 AWG | | MP-1 | FTP-2 | FFW-5 | |
| FBW-5 | filter 5 backwash water butterfly valve modulating | | 14 AWG | | MP-1 | FTP-2 | FBW-5 | |
| FBR-5 | filter 5 rinse to waste valve modulating | | 14 AWG | | MP-1 | FTP-2 | FBR-5 | |
| FFM-5 | filter 5 filtered water flow meter | | 14 AWG | | MP-1 | FTP-2 | FFM-5 | |
| FBM-5 | filter 5 backwash water flow meter | | 14 AWG | | MP-1 | FTP-2 | FBM-5 | |

4.04 Each filter is to be provided with 18" depth of Manganese Greensand Plus filter media. Manganese Greensand Plus media shall have an effective size of 0.30 to 0.35 mm and uniformity coefficient less than 1.60. In addition to the filter media, the filters shall have an anthracite cap, 12 inches in depth. Anthracite shall have an effective size of 0.6 to 0.8 mm and uniformity coefficient less than 1.6. All filter media shall meet the requirements of NSF/ANSI 61.

4.05 The filter manufacturer shall supply graded support gravel as listed below to support the media bed as required for their underdrain design. All support and filter media shall be shipped bagged and palletized and field installed by the Contractor.

| Size | Depth |
|-------------------|---------------|
| 2 ½ to 1 ½ inches | 5 to 8 inches |
| 1 ½ to ¾ inches | 3 to 5 inches |
| ¾ to ½ inches | 3 to 5 inches |
| ½ to ⅜ inches | 2 to 3 inches |
| ⅜ to ⅙ inches | 2 to 3 inches |

4.06 Loss of head gauges shall be provided on the inlet and outlet pipes of each filter.

4.07 All mounting hardware, nuts and bolts shall be stainless steel.

4.08 The filter shall be pre-piped, leak tested and painted at the manufacturer's facility. On-site assembly of the filter equipment will not be allowed.

4.09 Face piping shall be schedule 80 pvc with 150 lb threaded or flanged fittings. Face piping shall be properly supported.

4.10 All valves necessary for the operation of the equipment shall be provided. The butterfly valves shall be Bray resilient seated Series 30/31 or approved equal. These valves are wafer type butterfly valves with ductile iron bodies, stainless steel stems, stainless steel disc, buna seats, and infinitely adjustable throttling handles with memory stop. Additional manual isolation butterfly valves shall be provided by the Contractor for each filter at the Raw Water Header, Finished Water Header and Backwash Header.

4.11 The operating sequence of the filters shall be controlled by the plant PLC controller signaling to the electronic butterfly valves on the filter face piping. Electric actuators shall be double operating and suitable for both on-off and throttling operation. They shall include a shaft position indicator and travel stops to limit the valve opening position. Electric actuators shall be Bray Series 70 – Servo Pro or approved equal.

4.12 Each filter effluent line shall include a magnetic flow meter capable of reading in both flow directions. Mag meter shall be installed with display easily read locally or include a remote read for mounting on the filter face piping. Installation of the meter in the face piping shall follow meter manufacturer's recommendation for straight length requirements. Magnetic flow meters shall be 120 V. and shall be Badger, Endres-Hauser or engineering approved equivalent.

4.13 The filter backwash header shall include a backwash rate of flow indicator and control valve to regulate the backwash flow rate.

4.14 The air release valves shall automatically release air under the operating pressure of the filter in operation. The trim and float shall be stainless steel with viton seat. The valve shall be a Val-Matic Model 22 or equal. Air release discharge piping shall be 3/4" Sch 80 pvc and piped to the trench drain.

- 4.15 Sampling cocks shall be provided at each filter influent and effluent pipe and be smooth nosed for bacterial sampling. Water test kits shall be provided for testing water quality at the filters. One Hach IR20 Iron and Manganese test kit and one Hach Model CN-66 free or total chlorine test kit shall be provided.
- 4.16 The tanks shall be sand blasted to SSPC SP-10 and factory painted. Interior coating shall be epoxy primer Tnemec Series 94 H2O Hydro-Zinc at 3.0 mils DFT, and two coats of Series N140-15BL Tank WhitePota-Pox Plus at 4.0 mils per coat. Exterior surfaces shall be primed with Tnemec Series N69-1255 Beige Hi-Build Epoxoline II at 3.0 mils DFT, intermediate coat of Series 69-color Hi-Build Epoxoline II at 3.0 mils DFT and a finish coat of Series 1095 Endura-Shield at 2.0 mils DFT. All interior paint or paint in contact with water shall be NSF61 rated for use with Potable Water Service.
- 4.17 Filters shall be able to remove iron and manganese from the raw water to levels less than 0.3 mg/l Fe and 0.05 mg/l Mn. Recent raw water analysis from Le Roy wells are shown below

Raw Water Quality

| | Well #4 | Well #6 | Well #7 | Well #8 | Average |
|----------------------------------|---------|---------|---------|---------|---------------|
| Iron | 3.6 | 4.7 | 3.6 | 4.5 | 4.1 |
| Manganese | 0.046 | 0.063 | 0.091 | 0.044 | 0.061 |
| Calcium | 82 | 97 | 83 | 72 | 83 |
| Magnesium | 36 | 43 | 36 | 31 | 36 |
| Sodium | 15 | 29 | 15 | 19 | 20 |
| pH | 7.0 | 6.2 | 6.1 | 7.2 | 6.6 |
| Chloride | 6.4 | 3.3 | 3.7 | 3.0 | 4.1 |
| Sulfate | <10 | 14 | <10 | <10 | <10 |
| Alkalinity | 422 | 501 | 434 | 435 | 448 |
| Hardness (as CaCO ₃) | 342 | 416 | 369 | 383 | 377 |
| TDS | 424 | 328 | 413 | 443 | 402 |
| TOC | 8.4 | 8.6 | 5.6 | 5.5 | 7.0 |
| Ammonia | 6.7 | 5.9 | 7.7 | 6.7 | 6.7 |
| Arsenic | 0.037 | 0.028 | 0.037 | 0.031 | 0.033 |

- 4.18 Filter Performance shall meet the following requirements:

Rate of Filtration across both filters in operation:

152 GPM max each @ 4.0 gpm/sf
760 GPM max total @ 4.0 gpm/sf

Headloss across both filters while in operation: 475

GPM total @ 1.2 psi drop, 2.5 gpm/sf
950 GPM total @ 5.2 psi drop, 5.0 gpm/sf

Backwash rate, per filter, 570 gpm @ 15 gpm/sf

PRE-BID MEETING
CITY OF LE ROY, ILLINOIS
WATER TREATMENT PLANT IMPROVEMENTS

March 11, 2021 at 9:30AM

207 S. EAST STREET, LE ROY, IL 61752

MEETING MINUTES

These meeting minutes are intended to capture the highlights of what was discussed at the construction update meeting. They are not intended to be a verbatim account of everything said or discussed, nor are they a summary of all the project requirements. The written agenda items (shown in black below) were discussed. A summary of the discussion for each item is given in bold red below. Notes by R. Legner and M. Bingham.

1. Attendees

| | | | |
|------------------------|----------------------------------|---------------------|--|
| Perry Mayer | City of Le Roy | 309/962-3031 | pmayer@leroy.org |
| Mark Bingham | Chastain & Associates | 217/422-8544 | mbinham@chastainengineers.com |
| Ron Legner | Chastain & Associates | 217/422-8544 | rlegner@chastainengineers.com |
| Kyle Richardson | Mid-Illinois Mechanical | 309/275-0005 | KyleR@midilmech.com |
| Nathan Joos | GA Rich | 309/208-8848 | Nate@garich.com |
| Steve Shryock | RE Pedrotti | 314/239-6319 | SteveS@repedrotti.com |
| Brian Gorniak | Vandevanter | 314/756-7298 | BGorniak@Vandevanter.com |
| Todd Whitworth | Mid-Illinois Mechanical | 309/706-6908 | TWhitworth@midilmech.com |

2. Project Overview

a. Background

- i. New Pressure Filters – **Install 5 pressure filters to replace existing microfilters.**
- ii. New Piping, Valves and Flow Meters
- iii. Electrical and Telemetry – **Radio telemetry to replace existing Frontier network comm.**

b. Construction Sequencing

- i. Install Two New Filters and Piping – **Existing Microfiltration to remain operational in the meantime. One pump can be temporarily removed to facilitate getting filters past. Finished water will be used for backwashing when only two filters are installed.**
- ii. Demolish Existing Microfilters and Piping – **Existing microfilters can only be decommissioned and removed after initial two pressure filters are operational.**
- iii. Install Remainder of Filters – **Once all the filters are operational, intent is to use filtered water from operating filters to supply backwash water for 1 filter at a time.**

c. Special Conditions

- i. Insurance – **Described in bid documents.**
- ii. Prevailing Wage Rates – **Certified payrolls will be required.**

- iii. Joint Utility Locating Information **Contact JULIE before any excavating work.**
- iv. Existing Conditions Record
- v. Dust Control and Cleaning - **Plant to remain operational during construction.**
- vi. Alterations, Cancellations, Extensions, Deductions and Extra Work – **Approved Change Orders will be required for any change in contract.**
- vii. Lien Waivers and Releases – **Will be required for partial payments.**
- viii. Guaranty-Warranty

3. General Clarifications and Updates

- a. Manways – **Two filter vessel manways do not both need to be on top.**
- b. Header/Lateral Underdrain System - **304SS header/lateral underdrain system with wedge wire slotted steel laterals acceptable in place of the hub and lateral system**
- c. Colorimeter – **New Test kits are not required.**
- d. Upcoming Addendum No. 2
 - i. Filter Valve Table
 - ii. Gravel Sizes
 - iii. Filter Painting
 - iv. Approved Manufacturers

4. Additional project information available from Chastain and Associates LLC, contact jmarler@chastainengineers.com

- a. Plan-holders List
- b. Addendums to the Project

5. Tentative Schedule

- a. Bid Opening – March 24, 2021 at 3:00 PM at City Hall
- b. Bid Review by City at April Meeting – TBD
- c. City Council Recommendation to Award– April 5th
- d. Notice of Award – April 9, 2021 (approximate)
- e. Contract Completion – 300 days

6. Questions

- a. Please submit questions to rlegner@chastainengineers.com

A tour of the water plant was given after the discussion at City Hall.

A telemetry antenna will be needed at the water plant. It can either be mounted on the existing antenna tower on the south side of the east Old Water Treatment Plant Building or a new one erected adjacent to the New Water Treatment Plant Building.

7. Adjournment

SECTION 16901 INSTRUMENTATION

1. GENERAL

1.01 SCOPE

- A) This section describes the requirements for a flow sensor.
- B) Under this item, the contractor shall furnish and install the flow measurement equipment and accessories as indicated on the plans and as herein specified.

1.02 QUALITY ASSURANCE

- A) Referenced Standards and Guidelines - Complies with applicable portions of ANSI/AWWA Standards and NSF/ANSI Standard 61, Annex G. There are currently no AWWA standards that specifically address electromagnetic metering.

- (1) Flow measurement function complies with Industry Standards

- (a) ANSI B16.5 Class 150 RF
- (b) AWWA Class B
- (c) NEMA 4X/6P (IP67/IP68)
- (d) CSA

1.03 SUBMITTALS

- A) The following information shall be included in the submittal for this section:
 - (1) Outline dimensions, conduit entry locations and weight
 - (2) Customer connection and power wiring diagrams
 - (3) Data sheets and catalog literature for microprocessor-based transmitter and transducer
 - (4) Interconnection drawings
 - (5) Installation and operations manual
 - (6) List of spare parts
 - (7) Complete technical product description including a complete list of options provided
 - (8) Any portions of this specification not met must be clearly indicated or the supplier and contractor shall be liable to provide all additional components required to meet this specification

1.04 SYSTEM DESCRIPTION

- A) Electromagnetic flow meter is intended for fluid metering in industries including water, wastewater, food and beverage, pharmaceutical and chemical. Measures fluid flow of water or fluids which are highly corrosive, very viscous, contain a moderate amount of solids, or require special handling. No moving parts are in the flow stream. Amplifier can be integrally mounted to the detector or can be remote-mounted. Unit is ideally suited for measuring dynamic, non-continuous flow. In applications where a minimum and/or maximum flow rate must be tracked and monitored, the unit provides pulse signals that can be fed to dedicated batch controllers, PLCs and other more specialized instrumentation.

1.05 DEFINITIONS

- A) Amplifier – Device used for increasing the power of a signal. It does this by taking energy from a power supply and controlling the output to match the input signal shape but with larger amplitude.
- B) ANSI – (American National Standards Institute) A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States. The organization also coordinates U.S. standards with international standards so that American products can be used worldwide.
- C) AWWA – (American Water Works Association) An international non-profit professional organization founded to improve water quality and supply.
- D) Detector Coils – Also called an “induction loop”, an electromagnetic communication or detection system which generates a magnetic field to induce an electrical current in a nearby wire.
- E) Electrode – An electrical conductor used to make contact with a nonmetallic part of a circuit (e.g. a semiconductor, an electrolyte or a vacuum).
- F) Modbus RTU – a serial communications protocol published by Modicon (now Schneider Electric) in 1979 for use with its programmable logic controllers (PLCs). This is used in serial communication & makes use of a compact, binary representation of the data for protocol communication.
- G) NEMA – (National Electrical Manufacturers Association) Is the 'Association of Electrical Equipment and Medical Imaging Manufacturers' in the United States. Its approximately 450 member companies manufacture products used in the generation, transmission, distribution, control, and end use of electricity. These products are used in utility, industrial, commercial, institutional, and residential applications.

- H) NSF International – An independent, accredited organization that develops standards, and tests and certifies products and systems. They provide auditing, education and risk management solutions for public health and the environment.
- I) PLCs – (Programmable Logic Controller) A digital computer used for automation of electromechanical processes, such as control of machinery on factory assembly lines, amusement rides, or light fixtures. PLCs are used in many industries and machines.
- J) PTFE – (Polytetrafluoroethylene) A synthetic fluoropolymer of tetrafluoroethylene that finds numerous applications. The best known brand name of PTFE is Teflon by DuPont Co.
- K) Serial Communications – In telecommunication and computer science, serial communication is the process of sending data one bit at a time, sequentially, over a communication channel or computer bus. This is in contrast to parallel communication, where several bits are sent as a whole, on a link with several parallel channels.

2. PRODUCTS

2.01 APPROVED MANUFACTURERS

- A) Basis-of-Design Product: Subject to compliance with specifications, provide flow measurement equipment by one of the following:
 - (1) Badger Meter Model M-2000 Electromagnetic Flow Meter, Liquid, Single-Channel with remote mounted amplifier.

2.02 OPERATING CONDITIONS

A) System Components

- (1) Metering Tube (Detector)
 - (a) Consists of stainless steel tube lined with a non-conductive material. Energized detector coils around tube create a magnetic field across the diameter of the pipe. As a conductive fluid flows through the magnetic field, a voltage is induced across two electrodes; this voltage is proportional to the average flow velocity of the fluid.
- (2) Signal Amplifier
 - (a) Consists of unit which receives, amplifies, and processes the detector's analog signal. Signal is converted to both analog and digital signals that are used to display rate of flow and totalization. Processor controls zero-flow stability, analog and frequency outputs, serial communications and a variety of other parameters. Integrated LCD display indicates rate of flow, forward and reverse

totalizers and diagnostic messages. Display guides user through programmable routines.

B) Operational Requirements

(1) Electromagnetic Flow Meter

- (a) The flow meter system shall operate with a pulsed DC excitation frequency, and shall produce a signal output that is directly proportional and linear with the volumetric flow rate of the liquid flowing through the metering tube. The metering system shall include a metering sensor tube (detector), a signal amplifier, and the necessary connecting wiring. The metering system shall have the ability to incorporate a meter mounted or remote mounted amplifier.
- (b) Engineering Units:
 - i. The signal amplifier shall be program selectable to display the following units of measure: U.S. gallons, imperial gallons, million gallons (U.S.), cubic feet, cubic meters, liters, hector-liters, oil barrels, pounds, ounces or acre feet.
- (c) Operating Principle: Electromagnetic Induction
- (d) Metering Tube (Detector)
 - i. The metering tube (detector) shall be constructed of stainless steel, and rated for a maximum allowable non-shock pressure and temperature for steel pipe flanges, according to ANSI B16.5.
 - ii. The metering tube (detector) shall be available in line size from 1/4" [6 mm] to 78" [2000 mm].
 - iii. The metering tube (detector) end connections shall be carbon steel, 304 or 316 stainless steel flanged, according to ANSI B16, Class 150 and AWWA Class B standards.
 - iv. The insulating liner material of the metering tube (detector) shall be made of a hard rubber elastomer and NSF-listed for meter sizes 4" and above, in conformance with manufacturer's recommendation for the intended service or an NSF-listed meter option with PTFE liner.
 - v. The metering tube (detector) shall include two self-cleaning measuring electrodes. The electrode material shall be corrosion resistant and available in Alloy C or 316 stainless steel.
 - vi. The metering tube (detector) shall include a third "empty pipe detection" electrode located in the upper portion of the inside diameter of the flow tube in order to detect an empty pipe condition when the flow tube is running partially empty. Empty pipe detection that is not activated until the pipe is 50% empty is not acceptable.

- vii. The metering tube (detector) housing shall be constructed of carbon steel, welded at all joints, and rated to meet NEMA 4X/6P (IP67) ratings.
- viii. For remote amplifier applications, the metering tube (detector) junction box enclosure shall be constructed of cast aluminum (powder-coated paint) and shall meet NEMA 4X/6P (IP67) ratings.
- ix. When installed in non-metallic or internally lined piping, the metering tube (detector) shall be provided with a pair of corrosion resistant grounding rings. The grounding ring material shall be 316 stainless steel.
- x. Fluid Temperature Range
 - a) For remote amplifier applications, the fluid temperature range shall be 32°F to 178°F [0°C to 80°C] at a maximum ambient temperature of 140°F [60°C] for the hard rubber liner material.

(e) Signal Amplifier

- i. The signal amplifier shall be microprocessor based, and shall energize the detector coils with a digitally controlled pulsed DC. The excitation frequency shall be program selectable for the following: 1Hz, 3.75Hz, 7.5Hz, or 15Hz. (factory optimized to pipe size and application)
- ii. The signal amplifier electrical power requirement shall be 85-265VAC, 45-65Hz. The power consumption shall not exceed 15W.
- iii. The signal amplifier shall have an ambient temperature rating of -4°F to 140°F [-20°C to 60°C].
- iv. The signal amplifier shall include non-volatile memory capable of storing all programmable data and accumulated totalizer values in the event of a power interruption.
- v. Automatic zero stability, low flow cut-off, empty pipe detection and bi-directional flow measurement shall be inherent capabilities of the signal amplifier.
- vi. All signal amplifier outputs shall be galvanically isolated to 250 volts.
- vii. The signal amplifier and remote junction enclosures shall be constructed of cast aluminum (powder-coated paint) and shall meet NEMA 4X/6P (IP66/IP67) ratings.
- viii. Outputs:

The signal amplifier shall provide a total of four digital outputs, one analog output and one digital input.

- a) Up to four open collector digital outputs, program selectable from the following: Forward pulse, reverse pulse, AMR pulse, flow set point, empty pipe alarm, flow direction, reset output, error alarm and 24V supply.
- b) Up to two active digital (24 Volt) outputs, program selectable from the following: Forward pulse, reverse pulse, AMR pulse, flow set point, empty pipe alarm, flow direction, preset output, error alarm and 24V supply.
- c) Up to two AC solid-state relay outputs, program selectable from the following: Frequency output, flow set point, empty pipe alarm, flow direction, preset amount and error alarm.
- d) One digital input, program selectable from the following: Remote reset, batch reset and positive return to zero.
- e) Advanced protocol support using Modbus/RTU.
- f) One analog output programmable and scalable from the following: 0-10mA, 0-20mA, 2-10mA or 4-20mA. Voltage sourced and isolated. Max. loop resistance = 800 ohms.

(f) Control and Programming

- i. The signal amplifier shall be programmed via three function buttons. The programming functions shall be available in a user-friendly, menu driven software through the four-line LCD interface. The signal amplifier shall accommodate the following languages: English, German, Czech, French or Spanish.
- ii. Programmable parameters of the amplifier include, but are not limited to: calibration factors, totalizer resets, unit of measure, analog and pulse output scaling, flow-alarm functions, language selection, low-flow cutoff, noise dampening factor and excitation frequency selection.
- iii. The signal amplifier shall have a programming option allowing entry of a selected numeric password value for tamper protection.

(g) System Performance

- i. The metering system shall operate over a flow range of 0.1 to 39.4 ft/s [0.03 to 12 m/s].
- ii. The metering system shall perform to an accuracy ± 0.2 percent of rate ± 0.0032 ft/s [± 1 mm/s].
- iii. The metering system shall be capable of measuring the volumetric flow rate of liquids having an electrical conductivity as low as 5 $\mu\text{S/cm}$ (demineralized water 20 $\mu\text{S/cm}$).

- iv. The system measuring repeatability shall be $<0.1\%$ of full scale.
- (h) Indication
 - i. The signal amplifier shall include a four-line, 20-character, backlit LCD interface to display the following values:
 - a) Flow rate in selectable rate units
 - b) Forward totalizer in selectable volume units
 - c) Reverse totalizer in selectable volume units
 - d) Net totalizer in selectable volume units
 - e) Error or alarm messages
 - f) Software revision level

3. EXECUTION

3.01 INSTALLATION

- A) Follow manufacturer's recommendation for installation. Installation will conform to the guidelines provided by the Installation & Operation Manual.
- B) Straight pipe requirement shall be an equivalent of three diameters on the inlet (upstream) side, and two diameters on the outlet (downstream) side.
- C) For best performance, place meter vertically, with liquid flowing upward and meter electrodes in a closed, full pipe.

3.02 CALIBRATION

- A) Each meter shall be hydraulically calibrated in an ISO 9000-certified testing facility, which utilizes a computerized gravimetric testing method with a measuring uncertainty of 0.1%.
- B) Each meter shall be provided with a calibration certificate indicating the measured error (percent deviation) at three different flows, respectively equivalent to 25%, 50% and 75% of the nominal flow rate for each size.

3.03 MANUFACTURER'S WARRANTY

- A) Terms
 - (1) The manufacturer of the above specified equipment warrants the Product to be free from defects in materials and workmanship appearing within the earlier of either: One (1) year after installation; or one (1) year and six (6) months after shipment from manufacturer.

END OF SECTION

| BID SCHEDULE | | | | | |
|--|--|-------------|------------|-------------------|--------------|
| CITY OF LE ROY - WATER SYSTEM IMPROVEMENTS | | | | | |
| | <u>DESCRIPTION</u> | <u>UNIT</u> | <u>QTY</u> | <u>UNIT PRICE</u> | <u>TOTAL</u> |
| 1 | Bond, Insurance, and Mobilization | LS | 1 | | |
| 2 | New Filtration Vessel Equipment Package Shop Drawing Approval | EA | 5 | | |
| 3 | Delivered to Site New Filtration Vessel with Valves, Valve Operators, mag meter, fittings, media | EA | 5 | | |
| 4 | Phase 1- Demolition of Existing Pump Temporary Modifications for Vessel Install | LS | 1 | | |
| 5 | Phase 1- Relocate Air Compressor for Temporary Use | LS | 1 | | |
| 6 | Phase 1- Install New Filtration Vessel with Valves, Valve Operators, mag meter, fittings, media, painting, testing, and operation complete in place | EA | 2 | | |
| 7 | Phase 1- Install Interior Header Piping, valves, sample taps, fittings, and appurtenances for Vessels | LS | 1 | | |
| 8 | Phase 1- Replace Existing Pump Removed for Temporary Modification | LS | 1 | | |
| 9 | Phase 1- Rehabilitate Softener Vessel with valve, valve operator, mag meter, exterior painting, testing, complete ready for operation (Existing Media to Remain) | EA | 4 | | |
| 10 | Equipment electrical and install for Phase 1 New electrical equipment panels, including all valve operators and control, and other conductor feeds for Phase 1 Operation | LS | 1 | | |
| 11 | Telemetry and Controls Phase 1- Water Treatment Plant Operational with Two Filters, Four Softeners, Chemical Feeds, Aerator, Wells, and Level Control | LS | 1 | | |
| 12 | Demolition of Existing Micro Filters, CIP, Backwash Tank, and appurtenances | LS | 1 | | |
| 13 | Existing Open Trench Concrete Modifications | LS | 1 | | |
| 14 | Phase 2- Install New Filtration Vessel with Valves, Valve Operators, mag meter, fittings, media, painting | EA | 3 | | |

| | | | | | |
|--------------------|---|----|---|-----------|--|
| 15 | Phase 2- Install Interior Header Piping for Vessels | LS | 1 | | |
| 16 | Equipment electrical and install for Phase 2- New electrical equipment panels, including all valve operators and control, and other conductor feeds for Phase 2 Operation | LS | 1 | | |
| 17 | Telemetry and Controls Phase 2- Water Treatment Plant Operational with Three Additional Filters Complete in Operation | LS | 1 | | |
| 18 | Epoxy Floor Repair at Trench and Any Damaged Area | | | | |
| 19 | Well #6 Mag Meter Pit Install | LS | 1 | | |
| 20 | Well Site #6 Electrical, VFD, and Controls Equipment Install with new Radio | LS | 1 | | |
| 21 | Well #8 Mag Meter Pit Install | LS | 1 | | |
| 22 | Well Site #8 Electrical, VFD, and Controls Equipment Install with new Radio | LS | 1 | | |
| 23 | North Water Tower Electrical and Radio Install | LS | 1 | | |
| 24 | South Water Tower Electrical and Radio Install | LS | 1 | | |
| 25 | Bypass Valve Replacement with Electric operated valve | LS | 1 | | |
| TOTAL BID : | | | | \$ | |

| | | | | | |
|--|---|----|---|--------------|--|
| | ALTERNATE 1 – Provide Pressure Filters as supplied by AdEdge Water Technologies in lieu of Loprest filters | LS | 1 | Add/(Deduct) | |
|--|---|----|---|--------------|--|

| | | | | | |
|--|--|----|---|--------------|--|
| | ALTERNATE 2 – Provide Pressure Filters as supplied by Marlo Incorporated in lieu of Loprest filters | LS | 1 | Add/(Deduct) | |
|--|--|----|---|--------------|--|