

LETTER OF TRANSMITTAL

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FROM: Philip Schofield, P.E., Senior Project Manager

DATE: November 19, 2024

PROJ. NO.: G22005-01\G23005-01

SUBJECT: Addendum No. 5
 Contract A: Water Line Replacement WTP to Peters Lane
 Contract B: Poplar Springs Road Water Treatment Facility (Pump House) and Transmission Water Line
 City of Ringgold, Georgia

PAGES: 5 pages follow

<p>PLEASE RESPOND</p> <p>➔ ➔ ➔ ➔</p>	<p>TO CONFIRM RECEIPT OF THIS ADDENDUM NO. 5 PLEASE SIGN AND EMAIL TO CTI vvisco@ctiengr.com</p> <p>Company _____</p> <p>Signature _____</p> <p>Title _____</p> <p>Date _____</p>
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ADDENDUM NO. 5

CONTRACT A: WATER LINE REPLACEMENT PROJECT WTP TO PETERS LANE TANK CONTRACT B: POPLAR SPRINGS ROAD WATER TREATMENT FACILITY (PUMP HOUSE) AND TRANSMISSION WATER LINE

CITY OF RINGGOLD, GEORGIA CTI PROJECT NO. G22005-01/G23005-01

The following changes shall be made to the Contract Documents, Specifications, and Drawings:

I. CONTRACT DOCUMENTS

- A. Page 00 11 00-1.1 In the first paragraph, line 5, DELETE the words “November 21, 2024,” and SUBSTITUTE therefor the words, “**Tuesday November 26, 2024**”

II. SPECIFICATION

A. **Section 40 70 00 Instrumentation**

1. Page 40 70 00-2 DELETE 2.3 *in its entirety*.
2. Page 40 70 00-5 ADD the following:

“2.6 FREE CHLORINE RESIDUAL ANALYZER

- A. The free chlorine analyzer shall be a reagentless, amperometric, free chlorine analyzer designed for continuous, in-line chlorine residual analysis. It shall feature a wall-mount, stainless steel back panel with chlorine sensor and sensor cell, pH sensor cell, conditioning module, sample tubing, and indicating digital transmitter/controller. The chlorine analyzer shall be a Hach CL 1 0sc with SC200 transmitter/controller, or approved equal.
- B. The temperature compensated sensor shall have a measurement range of 0 – 30 ppm, a resolution of 1 ppb, and a lower limit of quantitation of 90 ppb. It shall operate on 12 vdc supplied by the associated controller. It shall be made of corrosion resistant materials (stainless steel, PVC, silicone rubber, and polycarbonate).
- C. Transmitter/controller shall have an alphanumeric display, keypad, built-in lightning protection, EMI/RFI immunity and automatic sensor diagnostics that warn of analyzer and warn probe faults.
- D. Transmitter/controller shall accept 120 V AC, 60 Hz input power. No less than two programmable relay outputs rated for 5 amps at 30 VDC.”

B. **Section 40 90 16.25 Magnetic Flow Meters**

1. DELETE pages 1-3 and REPLACE with the attached 40 90 16.25, 1.1 - 3.1

C. Section 43 41 16.20 High Density Cross-Linked Polyethylene Storage Tanks

1. Page 8 Paragraph 6. ADD the following after the last sentence:

“Axial Compression ≥ 0.67 ”
Axial Extension ≥ 0.67 ”
Lateral Deflection ≥ 0.51 ”
Angular Deflection $\geq 14^\circ$
Torsional Rotation $\geq 4^\circ$ “

Date: November 19, 2024

CTI Engineers, Inc.
/s/ Philip R. Schofield, P.E.
Senior Project Manager

SECTION 40 91 16.25
MAGNETIC FLOW METERS

PART 1 - GENERAL

1.1 SCOPE

This section describes the requirements for an electromagnetic flow meter and microprocessor-based signal converter. Under this item, the contractor shall furnish and install the mag meter equipment and accessories as indicated on the plans and as herein specified.

1.2 SUBMITTALS

The following information shall be included in the submittal for this section:

1. Data sheets and catalog literature for the magmeter and the microprocessor-based signal converter.
2. Connection diagrams for equipment wiring.
3. List of spare parts and optional equipment.

PART 2 - PRODUCTS

2.1 ELECTROMAGNETIC FLOWMETER (MAG METER)

The electromagnetic flow meter shall consist of a flow sensor based on Faraday's Law of Electromagnetic Induction and microprocessor-based signal converter.

A. Sensor:

1. Operating principle: Utilizing Faraday's Law of Electromagnetic Induction, the flow of liquid through the sensor induces an electrical voltage that is proportional to the velocity of the flow.
2. Construction:
 - a. The sensor flow tube shall be NEMA 6P or IP68 rated.
 - b. Flow tube shall be constructed of 304 Stainless Steel.
 - c. The liner material shall be Ultra Liner NSF approved fusion bonded epoxy. The liner shall carry a lifetime guarantee.
 - d. Measurement and grounding electrodes shall be 316 Stainless Steel.
 - 1) Optional: Hastelloy C276 Electrodes shall be available for when corrosive fluids are present.
 - e. Connecting flanges shall be AWWA 150# (Optional 300# service shall be available) Flat Face Carbon Steel.
3. ANSI Flanges shall be available when required.
4. Two Stainless Steel grounding rings shall be supplied with each flow meter.
5. Installation: A minimum of 1 pipe diameters up stream and 0 pipe diameters downstream are recommended for sizes 4" – 48" and 3 diameters upstream and 1 diameter downstream for 2" and 3" size wafer style meters.
6. Flow tube Operating Temp: +14 to +140° F.
7. Size: 2" to 48" diameter (see instrument schedule) 2" and 3" to be supplied as wafer type.
8. Submergence: The sensor shall be capable of continual submergence at up to 30 ft. with standard strain relief cable or up to 6 ft. with optional quick connect cabling system.

B. Converter:

1. Electronic Enclosure: Shall be a NEMA 4X, IP67 rated enclosure.
2. Converter/display: Background illumination with alphanumeric 8-line graphical backlit LCD display with 6-key touch programming to indicate flow rate, totalized values, settings, and faults.
3. Power supply:
 - a. 90/265 VAC
 - b. 10-35 VDC
 - c. Battery
 - d. Battery-solar
4. Operating temperature: -4 to +140 degrees F.
5. Outputs:
 - a. Two 4-20 mA (0-21mA).
 - b. Two separate digital programmable outputs:
 - 1) Open collector transistor usable for pulse
 - 2) Frequency and alarm settings
6. Communications-Optional:
 - a. HART
 - b. Modbus
 - c. AMI Smart Output (Sensus, Itron 6, Itron 9)
7. Converter Self Diagnostics – Optional Data logger and Built In-Verification
8. Manufacturer shall provide an optional Hazardous Location certified model. Certified by MET to UL 6100-1 and MET C22.2 No. 61010-1-04
 - a. Class I, Division 2, Groups A-D, T5
 - b. Class I, Zone 2, IIC T5
9. Sensor and signal converter performance:
 - a. Flow Range: .2 FPS to 32 FPS for accuracies stated below.
 - b. Accuracy:
 - 1) AC or DC Power: Plus, or minus 0.2% or Plus, or minus 0.5% of actual flow.
 - 2) Battery Power: Plus, or minus 1% of actual flow.
 - c. Cable Length: Remote Mount
 - 1) AC or DC Power: Up to 500'/152.4m
 - 2) Battery Power: Up to 25'/7.6m
 - d. Manufacturer shall offer optional Quick Connect cabling for remote mounted installations.
 - e. Repeatability: $\pm 0.05\%$ or $\pm 0.0008\text{ft/s}$ ($\pm 0.25\text{mm/s}$), whichever is greater
 - f. Conductivity: Minimum 5 $\mu\text{s/cm}$
 - g. Optional meter mounted converter.
 - h. Bi-directional flow capabilities shall be standard.

- i. Power & Signal Cabling: The power and signal between the converter and sensor are isolated and placed in separate cables.
 - j. Flow Direction Measurement: Forward and reverse flow indication and forward, reverse, net totalization is standard on all meters.
10. The electromagnetic flow meter shall be a McCrometer UltraMag or approved equal.

2.2 SPARE PARTS

- A. Spare parts for the equipment shall include the following, unless otherwise noted:
1. Extra operation manuals as required.

2.3 OPERATOR FUNCTIONS

A. Calibration

1. Each flow sensor shall have a 3 or 5- point wet flow calibration of the complete meter flow tube and its signal converter. The calibration facilities must be traceable to the National Institute of Standards and Technology (N.I.S.T). All the calibration information and factory settings matching the sensor shall be stored in an integrally mounted memory unit. The memory unit shall store sensor calibration data and signal converter settings for the lifetime of the product. At initial commissioning, the flow meter commences measurement without any initial programming. Any customer specified settings are downloaded to the memory unit. Should the signal converter need to be replaced, the new signal converter will upload all previous settings and resume measurement without any need for reprogramming or rewiring.
2. Manufacturer shall provide a calibrated meter set which includes the sensor tube, the cabling and the converter.
3. An N.I.S.T. certificate of calibration shall accompany each flow sensor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow manufacturer's recommendation for the minimum upstream and downstream installation requirements for the flow sensor.
- B. Wiring between flow sensors and remote mounted signal converters shall use cable type and procedures as per the manufacturers' recommendations.

3.2 MANUFACTURER'S ASSISTANCE

A. Warranty

1. The manufacturer of the electromagnetic flow meter shall provide a two-year warranty that the equipment shall be free from defects in design, workmanship, or materials. Extended warranties up to five years shall be available for additional cost.
2. The manufacturer of the electromagnetic flow meter shall provide a Lifetime Guarantee on the flow tubes Ultra Liner fusion bonded epoxy liner.
3. In the event a component fails to perform as specified or is proven defective in service during the guarantee period, the manufacturer shall promptly repair or replace the defective part at no cost to the owner.