MUNICIPAL ENGINEERING, INC.

Engineering Excellence: Innovative Approaches / Sustainable Solutions

Town of Murfreesboro, NC
Water Meter Replacement Project
MEI Project No. 24040.0
State Funding Number SRP-D-134-0042

ADDENDUM NUMBER 3   9 July 2025

<u>**NEW** BID DATE</u>: 26 August 2025, 10:00 A.M.

<u>TO ALL BIDDERS</u>:

This Addendum – along with previous Addenda #1 and #2 – forms a part of the Contract Documents and modifies the Bidding Documents dated 27 February 2025.

Acknowledge receipt of all Addenda in the space provided on page 1 of the Agreement, EJCDC Form C-410 §3.01.A. Failure to do so may disqualify the Bidder.

Below are changes, additions, and/or clarifications to the previous bid documents for this project.
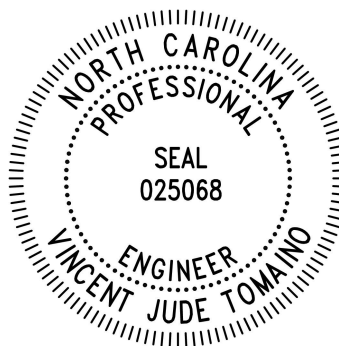
Information for Bidders

1. A new bid opening date is announced. See the attached "Re-Advertisement for Bids (Dated 9 July 2025).

Changes to the Bid Documents

1. Specification 33 19 30 is revised and simplified.

Sincerely,

Vincent Jude Tomaino, PE
Principal Project Manager

Enclosures: Re-Advertisement for Bids (dated 9 July 2025)
                      Specification 33 19 30 (dated 8 July 2025)

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MESCO.COM
Licenses: F-0812 & C-586

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**Water Meter Replacement
for the
Town of Murfreesboro
Project Number SRP-D-134-0042**

RECEIPT OF PROPOSALS

Sealed bids for the furnishing of labor, materials, tools, and equipment for the following:

Remove ±1,450 existing meters and replace them with new remote read meters, complete with a drive-by data collector and as delineated in the Bid herein:

All Bids will be received by the **Town of Murfreesboro** in the **Town Hall** located at **105 East Broad Street, Murfreesboro, NC 27855** on or before, but no later than **10:00 AM,** local time, on the **26th day** of **August 2025.** Immediately thereafter, all bids received will be publicly opened and read aloud.

NON-MANDATORY PRE-BID CONFERENCE

A non-mandatory Pre-bid Conference for prospective bidders was held at **11:00 AM on 25 March 2025,** in the **Town Hall** located at **105 East Broad Street, Murfreesboro, NC 27855**. While not mandatory, all prospective bidders were strongly encouraged to attend.

Bids must be made on the blank form provided in the Project Manual and must be enclosed in a sealed envelope and addressed to **Carolyn Brown, Town Administrator, Town of Murfreesboro** at one the following addresses:

Physical Address (for parcel delivery)	**Mailing Address (using USPS)**
105 East Broad Street, Murfreesboro, NC 27855 252-398-5904	PO BOX 6 Murfreesboro, NC 27855

The name, address, and license number of the Bidder must be plainly marked on the outside of each envelope. Acceptable classifications for this Project shall be "Public Utilities (PU)" or "Unclassified." Bids shall be based upon the lump sum and unit price basis, as indicated on the Bid Form.

All bidders must follow the Guidelines for Recruitment and Selection of Minority Business for Participation in Construction Contracts as Revised November 1, 2002.

All bidders must include with their bids an Affidavit (1) attesting to the Contractor's compliance with E-Verify (or if the Contractor employs less than 25 employees in this state, attesting to that fact), and (2) attesting to the Contractor's subcontractors' compliance with E-Verify (or, if any subcontractors employ less than 25 employees in this state, attesting to that fact).

Bids will be received for a single prime Contract. Bids shall be on a lump sum and unit price basis, with additive alternate bid items indicated in the Bid Form.

EQUAL OPPORTUNITY -- Minority and Women Business Enterprises (MBE/WBEs) are invited and encouraged to bid. The **Town of Murfreesboro** does not discriminate against any person/business because of race, color, religion, sex, or national origin.

The Issuing Office for the Bidding Documents is **Municipal Engineering, Inc., 68 Shipwash Drive, Garner, NC 27529**; Contact Person: **Vincent Jude Tomaino** phone **919-772-5393**; email **vtomaino@mesco.com**

Prospective Bidders may examine the Bidding Documents at the Issuing Office on Mondays through Fridays between the hours of 8:00 AM to 5:00 PM and may obtain copies of the Bidding Documents from the Issuing Office as described below. Bidding Documents also may be examined at the **Town Hall** located at **105 East Broad Street, Murfreesboro, NC 27855** or online at **Construct Connect** and **Dodge Data and Analytics.** All questions regarding this Project shall be addressed to the Engineer in writing. Prospective Bidders shall not contact the Owner directly.

All questions regarding this Project shall be addressed to the Engineer in writing. **Prospective Bidders and Plan Rooms shall not contact the Owner directly.**

Prospective Bidders must obtain Plans & Specifications from Municipal Engineering, Inc**. No bids will be accepted from prospective bidders who did not obtain a complete set of plans and specifications (printed or electronic) from the Issuing Office.**

Printed copies of the Bidding Documents may be obtained from the Issuing Office, during the hours indicated above, upon payment of **$50.00** for an electronic version only and **$100.00** for an electronic and printed version, which is non-refundable. **No bids will be accepted from prospective bidders who did not obtain a complete set of plans and specifications (printed or electronic) from the Issuing Office**.

Checks for Bidding Documents shall be payable to **Municipal Engineering Inc.** Upon request and receipt of the document payment indicated above, the Issuing Office will transmit the Bidding Documents via electronic means and/or via land shipment as appropriate. Additional charges for expedited shipping will depend on the shipping method selected by the prospective Bidder. The date that the Bidding Documents are transmitted by the Issuing Office will be considered the Bidder's date of receipt of the Bidding Documents. Partial sets of Bidding Documents will not be available from the Issuing Office. Neither Owner nor the Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda, if any, obtained from sources other than the Issuing Office. Prospective Bidders **shall not** contact the Owner Directly!

BID SECURITY

Each Proposal must be accompanied by a certified or cashier's check payable to the **Town of Murfreesboro** North Carolina, or a satisfactory bid bond executed by the Bidder and corporate surety licensed under the laws of the State of North Carolina to execute such bond in an amount not less than 5% of the bid as a guarantee that the Bidder will within ten (10) days after the date of the Bidder's receipt of the NOTICE OF AWARD of a contract, execute an agreement and file same as required by the Contract Documents if his/her Proposal is accepted.

If a Bidder fails to execute and file an agreement, the amount of his security shall be forfeited. **No Bidder may withdraw his/her bid within 90-days after the opening thereof.**

AWARD OF CONTRACT

The Owner will award a contract to the lowest responsive, responsible Bidder in accordance with the General Statutes of North Carolina, Article 8, Chapter 143-129. The Owner reserves the right to reject all Proposals of Bidders. The Owner further reserves the right to reject the Proposal of any Bidder submitting a proposal that is not responsive to the bid document or the Proposal of and Bidder, which is found not responsible for carrying out the scope and intent of the bid document.

The Owner reserves the right to reject any Proposal for failure to comply with all requirements of this notice or the Contract Document; however, the Owner may waive any minor defects or informalities at their discretion. The Owner further reserves the right to reject any and all Proposals or award the contract in their best interest.

This 9th day of July 2025.

Carolyn Brown, Town Administrator

**SECTION 33 19 30
AMR WATER METERS**

PART 1- GENERAL

1.1 Scope of Work

A. The scope of work involves but is not limited to, providing and installing the System, which includes the meter, software, hardware, and all necessary training and installation support. The reading equipment shall be capable of receiving meter readings while utilizing a handheld reading device and/or a mobile reading unit (collectively as "AMR" or "mobile").

B. The System must have the capability to improve meter reading efficiency, increase meter reader safety, and provide data that facilitates the resolution of customer bill complaints, water conservation initiatives, and distribution system management efforts. The vendor shall describe the upgrade requirements to incorporateradio frequency (RF) technology.

C. All System components furnished (software, reading Equipment, RF MIUs, meters with encoders) shall be produced in a manufacturing facility whose QMS is ISO 9001 certified.

PART 2 - FUNCTION

2.1 System Overview

A. The System shall comprise RF MIUs, data collection devices, and hosted software. The System shall be capable of operating simultaneously in a walk-by (handheld), mobile (drive-by), or a combination of these data collection methods.

B. For reliability and meter reading integrity, the vendor shall be the sole manufacturer of the System's different components (water meters, RF MIUs, meter reading equipment, and meter reading software) and provide a turnkey system offering to the utility.

2.2 Mobile AMR Functionality

A. When used as mobile AMR, Mobile data devices shall facilitate retrieval of consumption data for field presentment on a handheld, laptop, Android/iOS-powered mobile device, and storage for later use with the host software application.

PART 3 – PRODUCTS

3.1 Meters

A. The replacement water meter shall be designed to measure cold water flow in one direction in a residential or business application and shall operate on one of the following principles and shall meet the relevant AWWA C700-series standard listed below:
- nutating disc or oscillating piston, positive displacement principle per AWWA C700.
- nutating disc, or oscillating piston, positive displacement meters with plastic main bodies per AWWA C710, so long as they have a continuous metal connection between brass end threads to handle mechanical strain.

- ultrasonic per AWWA C715. **N***ote electromagnetic meters per AWWA C715 are not allowed*).

  All replacement water meters complying with AWWA C700 or AWWA C710 shall be connected to an encoder-type remote registration system (register). The register shall meet AWWA standard C707, and the combined unit shall meet or exceed all applicable AWWA C700 Standards.

B. The meter shall be housed in a lead-free bronze main case in accordance with NSF/ANSI 61 and NSF/ANSI 372 certified, SDWA Compliant (lead-free).

3.2 Meter Boxes

A. Meter boxes shall be a rectangular or oval type with minimum nominal dimensions of 20" x 10-1/2" x 12" (l.w.d.). Lids shall have a Cast Iron with a 1-3/4" hole to accommodate antenna and wiring. Boxes shall be *ductile* iron and manufactured in the United States.

B. All meters, registers, and MIUs installed in the meter box shall be IP68 compliant.

3.3 Copper Meter Setter

A. Copper meter yokes with lockable angle meter stops shall be used on all water services. The copper setter shall be lead-free in accordance with the SDWA and NSF/ANSI 61.

3.4 Meter Interface Units (MIUs)

A. Meters connected to RF MIUs shall collect meter usage from an encoder meter register. They shall transmit the meter reading and a unique ID number to the data collection device.

B. The MIUs must be compact electronic devices connected to the water meters. They shall interrogate the encoder register and transmit the meter reading and other information to a remote reading device. MIUs shall be capable of reading all major meter brands including Zenner, Sensus, Neptune and Badger meters. MIUs shall feature "auto-detect" functionality to detect the type of encoder connected. The same RF MIUs must be capable of being read by a walk-by handheld computer equipped with an RF receiver, or a mobile system with an RF receiver mounted in a vehicle,

C. The MIUs shall be attached to new meters or shall be capable of retrofit to existing meters in the field. The MIUs shall be manufactured in both wall and pit models. The wall MIU shall have the ability to be mounted in a basement or outside of a house. The pit MIU shall have the ability to be mounted in a pit or an underground vault and offer an optional through-the-pit-lid antenna. The wall and pit MIUs shall have a fully-potted, submersible design.

D. All registers for AWWA C700 or C710 meters shall attach to the meter body via a bayonet mount or tamper screw on the meter main case. The MIU shall have a water-resistant enclosure and a permanent internal antenna. The MIU enclosure shall be a roll-sealed copper can and glass lens, designed to ensure a watertight seal with a permanent internal antenna and offer an optional through-the-pit-lid antenna to optimize performance in hard-to-read or fixed network applications.

3.5 Physical/Mechanical Requirements

A. Wall Unit

1. The MIU housing shall be constructed of a polycarbonate plastic compound and capable of mounting indoors and outdoors on a wall or pole or attached directly to the meter. The device must be water-resistant and capable of exposure to spray and splash. The device must be able to withstand a 200-hour salt fog test as specified in NEMA 4 standard.

2. The device shall provide a location for a tamper-deterrent seal. Tampering with the device functions or connections shall not be possible without causing visible damage to the device exterior of the seal.

3. The device shall be capable of operating at temperatures of -22°F to +149°F (-30°C to +65°C) with operating humidity of 0 to 100% condensing.

4. The circuit board and the battery will be protected by a potting material.

5. The unit must retrofit to existing installations.

6. The MIU device must be protected against static discharge without data loss per IEC 801-2, issue 2.

B. Pit Unit

1. For pit or vault applications, the MIU antenna shall be designed to be installed through the industry-standard 1¾" hole in the pit lid with no degradation of transmission range. The MIU antenna unit will be capable of mounting to various thicknesses of pit lids from ½" to 2½".

2. The device shall be capable of operating at temperatures of -22°F to +149°F (-30°C to +65°C) and operating humidity of 0 to 100% condensing.

3. The range will not be affected when the pit is flooded.

4. The circuit board and the battery will be protected by a potting material.

5. The antenna shall be made of a metallic and polymer material to withstand traffic and shall have a dual seal connection to the MIU housing.

6. The MIU device must be protected against static discharge without data loss per IEC 801-2, issue 2.

3.6 Operating Specifications

A. FCC Licensing and Certification

1. The MIU shall operate within FCC Part 15.247 regulations for devices operating in the 902 MHZ to 928 MHz unlicensed band. Their conformance will govern the output power of the devices to these relevant FCC standards.

2. To minimize the potential for RF interference from other devices, the MIU shall transmit using the frequency hopping spread spectrum technique comprised of alternating pseudo-random frequencies within the 902 MHz to 928 MHz unlicensed band.

3. For ease of implementation, the System shall not require any special licensing, including licenses from the FCC. The System must, therefore, operate in the 902 MHz to 928 MHz unlicensed bands.

3. The System must be expandable anytime without getting the FCC's authorization.

B. Field and Installation Operations

1. The MIU shall be mounted per the manufacturer's installation instructions to ensure a reliable and quality installation throughout the life of the MIU.

2. The handheld reading equipment shall provide a test mode to verify the MIU's proper operation by displaying the MIU ID number and meter reading.

3. The MIU shall be capable of being received by a handheld receiver or mobile receiver, without special configuration, programming of operation modes, or re-manufacture.

C. Data Transport

1. The MIU shall simultaneously provide 8-digit reading resolution from registers in network data collection applications.

2. The MIU shall read the encoded register at 60-minute or shorter intervals to provide accurate leak and reverse flow detection using 8-digit resolution reads.

3. The MIU shall transmit readings from the encoder that are not older than 15 minutes.

4. In the event of a cut wire, the MIU shall not send the last good read, which can lead to miss-billing. The MIU shall transmit a trouble code in lieu of the meter reading..

5. Tamper – If the wiring has been disconnected, a "non-reading" shall be provided indicating wire tamper; a reading that gives the last available reading is incorrect.

6. Each device shall have unique pre-programmed identification numbers of ten (10) characters. ID numbers will be permanent and shall not be altered. Each device shall be labeled with the ID number in numeric and barcode form. The label shall also display FCC approval information, the manufacturer's designation, and the date of manufacture.

7. The MIU shall transmit the encoder meter reading and a unique MIU ID number.

8. The MIU shall interface to encoder registers via wire without requiring special configuration to the MIU.

9. The MIU shall periodically transmit a packet containing the registration information, such as register ID, register type, and other status information, no less than weekly.

D. Operational Characteristics

1. A battery with a capacitor shall supply power to the MIU.

2. The number of radio-based meter reads must not affect the battery life.

3. The battery life shall not be affected by outside erroneous wake-up tones (e.g., other water, gas,or electric utilities reading and therefore sending out a wake-up tone).

4. The vendor shall warrant that the MIUs shall be free of manufacture and design defects for twenty (20) years – the first ten (10) years from the date of shipment from the factory without prorating and the second ten (10) years with prorating, as long as the MIU is working under the environmental and meter reading conditions specified.

PART 4 – DATA COLLECTION DEVICES

The System shall provide a means of communication between the MIU installed at the meter site and the host software. A walk-by system must be a handheld computer capable of reading meters using keyed entry, or RF communications with an attached receiver device without switching modes within the handheld.

In the case of a mobile application, the data collection device must be a portable tablet or smartphone that is Android or iOS compatible.

4.1. Walk-by Application

A. For Walk-By applications, the System must give the user the ability to collect metering data in several ways:

1. Keyed entry using a mobile app on an Android or iOS device.

2. RF communication: The handheld must connect via Bluetooth to an RF-receiving device.

3. The proposed walk-by data collection system must include the following:
    a. Handheld data collector device Bluetooth paired RF receiving device.
    b. Communication cradles or cables for charging and loading the handheld unit.

4.2. Handheld Data Collector Device

A. Basic Functions
1. The handheld data collection device shall have the capability to collect and store meter readings at any point in the meter reading route by any of the following methods:

    a. Manual use through an alphanumeric keypad.

    b. Via radio frequency through a Bluetooth-paired receiver.

2. The unit shall be able to obtain all types of readings on any particular route without requiring:

    a. Reprogramming of the handheld computer.

    b. Physical change of software contained within the unit while in the field.

    c. access through special software menus contained within a given route/program.

3. The handheld data collection device must be able to multitask by collecting data while in keyed entry(manual) meter reading mode.

4.3 Operating System

A. The System must support a variety of handheld data collection devices. These devices must run Android Operating System or Apple iOS Operating System.

4.4 Display

A. The size of the display characters must be selectable, allowing the use of larger charactersthat are easier to read. The screen must support a minimum resolution of 480 by 640 pixels or 640 by 480 pixels.

B. There must also be a manual contrast adjustment feature that will allow the user toadjust the contrast to their satisfaction.

C. Battery

1. The battery capacity must be sufficient for at least ten (10) hours of meter reading.

2. The handheld must have a power management system designed to conserve power.

E. Memory

1. The handheld data collection device must include a minimum of 128 MB of DDR SDRAM.

2   The handheld must have 512MB or greater of onboard non-volatile flash storage.

4.5 Weight

A. The unit's weight must be no more than 2.5 lbs with a battery installed.

4.6 Handheld Software Requirements

A. Basic Functions

1. The handheld software must be easy to use and give the meter reader control over the route insearching for accounts, entering related notes, and manually reading meters.

2. The handheld software must include the entry of meter readings.

3. In addition, the handheld software shall include but shall not be limited to the following basic features:

a. User-customizable key assignments.

b. Allow manual or automatic entry of meter readings, ID numbers, and note codes.

     c. Perform high/low tests on readings.

     d. Date and timestamped to each reading.

     e.   Identify the type of reading – manual keyed, probed, or RF MIU.

     f. Perform an unread meter search.

     g. Found meter processing for new accounts.

     h. Data search capability (display, notes, and ID).

     i. Auto-search for automatic reading of encoded meters.

     j. Display the number of read and unread accounts on demand.

4.7. Sounds

    A. Successful meter reading must be confirmed by an audible tone.

4.8 Communications/Charging Equipment

    A. Communication

      1. Communications between the handheld and the PC software must be established using a wirelesssynchronization, cord, or cradle connected via Ethernet or USB. In addition, the following basic features must be included:

      2. Extensive error checking is provided to ensure data integrity during communications betweenthe handheld and the PC.

      3. A typical route of 400-500 accounts can be loaded or unloaded in less than one minute, withthe ability to load more than 5,000 records into a single handheld unit.

      4. Routes/books can be split at the PC level.

      5. Once loaded, routes may be individually selected on the handheld.

4.9. Communication/Charging Cradles or cables

    A. A communications/charging cradle (if used) will be housed in a suitable material that can be wall ortabletop mounted.

    B. A communications/charging cradle or cable will be able to recharge the handheld unit within four hours and provide the communication port connected to the computer.

    C. The cradle or cable will communicate with the host computer at no less than10 Mbps.

    D. Any cradle (if used) must be capable of both USB and Ethernet communications with a PC.

E. The charging units must carry the Underwriters Laboratory (UL) seal of approval.

4.10. Probes – Section removed

4.11 Radio Frequency Capability

    A.   The meter reading system must be capable of being upgraded to radio frequency communications. The utility plans to read water meters equipped with radio frequency MIUs. For the radio frequency-based meter reading system, the encoder registers will be connected to an RF MIU that shall provide the radio link from the meter to the handheld interface unit.

    B.   The handheld radio frequency receiver must be separate from the handheld unit.

4.12. Radio Frequency Reading Function

    A.   The function of the handheld and external receiver in radio frequency mode is to provide the utility with the capability of reading meters via radio signals transmitted by the RF MIUs. The external receiver mustbe capable of receiving RF readings and transferring those readings to the handheld via Bluetooth connection. All transmissions from supported MIUs will be collected. The reading of any MIU shall be automatically stored in the proper account record without the meter reader's intervention.

    B.   Should any MIU not be able to be read during the route, the software shall support the storage of a flag in the account record, indicating clearly that the MIU could not be read. When reading the meters in theRF mode, it should not require the meter reader to activate any wake-up tone.

    C.   The handheld with the external receiver reading equipment must provide a test mode to verify the MIU operation. This test mode must be accessible from within the meter reading application and accessible from a handheld's main screen (no login required). The test application must report statistics for an individual MIU or display all MIUs within range.

4.13. Walk-by RF Transceiver

    A.   The walk-by RF transceiver must be a separate belt clip, wearable, transmit/receive a device thatcommunicates via Bluetooth to the handheld.

    B.   The walk-by RF transceiver must support the ability to remotely command the MIU to transmitdata log interval data.

    C.   The walk-by RF transceiver antenna shall be internally mounted.

    D.   The walk-by RF transceiver must meet FCC Class B certification.

    E.   The walk-by RF transceiver must EITHER
        1. contain an SD card, or
        2. communicate through a cellphone link.

F.   The walk-by RF transceiver must utilize SDR (software-defined radio) technology.

G.   The walk-by RF transceiver must contain a mini-USB port for both battery charging and PC communications.

H.   The walk-by RF transceiver must EITHER
    1. contain a field-replaceable battery OR
    2. be chargeable to 80% within two hours.

I.   The walk-by RF transceiver must display the following:
    1. Battery/Power status
    2. RF status
    3. Bluetooth status
    4. Mode status

J.   The external RF transceiver must be capable of unattended operations where the receiver is not paired with any handheld device but hears and stores any received reading packets to the SD card.This data must be able to be imported into the host software for use as billing reads.

K.   The following specifications must be met:

4.14 Radio Characteristics

A.   Receiving Frequency: operate in the 902 MHzto 928 MHz unlicensed band RF.

B.   The walk-by RF transceiver must have no less than 40 channels.

C.   The walk-by RF transceiver must support reading no less than eight (8) channels simultaneously.

D.   The walk-by RF transceiver must be capable of processing 360 RF packets per second.

4.15 Size and Weight (Removed

4.16. Environmental Operating Conditions.

A.   Operating conditions: -4°F to +122°F (-20°C to +50°C)

B.   Storage temperature: -40°F to +185°F (-30°C to +70°C)

C.   Designed to and tested toMIL-STD-810F specifications

D.   Designed to withstand electrostatic discharges per EN61000-4-2

4.17. RF Walk-by Receiver Battery Life

A. The data collection device battery must provide enough power to support RF meter reading for aminimum of eight (8) hours.

4.18. Mobile Data Collection System

A. The mobile data collection device must be a portable, compact electronic system mountable in any vehicle.

B. The mobile data collection device shall be easily transportable from vehicle to vehicle or from vehicle tooffice.

4.19 Hardware Requirements

A. The mobile data collection device's key components must consist of a portable personal computer(PPC) or Android/iOS mobile device, an integrated radio receiver unit, and a remote rooftop magnet mount antenna.

B. The mobile data collection device must be easily installed in any vehicle that will drive to the field for a meter reading. It must be mounted securely in the passenger seat with a standard seat belt. Through a 12-volt DC plug-in power cord, the unit must be powered from the vehicle's power supply (cigarette lighter).

C. The mobile data collection device must include a magnetic base antenna and the antenna cord, and all necessary power and communication cables.

D. The mobile data collection device shall draw no more than one (1) AMP of power. The weight shall not be more than five (5) lbs.

E. The mobile data collection device shall support the connection to any mobile device that meets the following minimum system requirements:

1. Operating System: Android Operating System 12 or above, iOS Operating System 16 or above.

2. Communication: Internal 801.11 b/g wireless LAN or Cellular Connectivity.

3. Bluetooth

F. The mobile data collection unit should also be capable of supporting Itron R300 and Itron electric bubble-up ERTs if the utility supports electric meters.

4.20 Environmental Conditions

A. The mobile data collection device must work in the following environmental conditions:

1. Operating Temperature: 32° to +122°F (0° to +50°C)

2. Storage Temperature: -40°F to +185°F (-40°C to +85°C)

3. Operating Humidity: 5 to 95% non-condensing relative humidity.

4.21 Mobile Data Collection Software Requirements

A.   Basic Functions

1. The software must be a dialog-based, intuitive, easy-to-use meter reading application.

2. After the meter reader starts the reading process, the software must automatically collect the meter reading data received from the radio receiver unit. The software should capture all readings for any routes loaded without having to select the route for reading.

3. The software should have an option to wirelessly synchronize meter reading routes and reading datawith the host software in real-time or on-demand.

4. The software shall be touchscreen-friendly and operate on Android or iOS devices.

5. Unit must be capable of optimizing the memory storage space by filtering out duplicate readingsfrom the same MIU and keeping only the last reading received.

6.   Each reading record must contain an MIU ID and a timestamp of the reading.The software must be capable of performing high/low tests on readings.

7.   The software must provide a progress bar that provides route reading status for an individual and all routes combined.

8. The software must support retrieval and graphing of 96 days of data logging intervals from the MIU.

9.   The software must contain a test mode used to validate MIU installation. The test mode mustprovide MIU ID reading, as well as flag status.

10. The software must have an option to geocode meter reading routes by address. The software must allow a manual reading to be entered into the account record.

11. The software must allow freeform notes to be entered to record conditions in the field that requirenoting and may require an additional work order created to address at a later date.

12. The software must have a GIS mapping option compatible with ESRI ArcGIS.

13. The software must have advanced filtering to allow the user to view route mapping data byconditions such as flag type/status, audit status, and read status.

14. The software must be capable of displaying meter points and read success and unread accounts via a GIS mapping interface. The software must be capable of collecting the following information for thehost to generate reports; leak detection, tamper detection, and backflow conditions.

15. The software must allow for GPS location tracking of the meter reading vehicle.

16. The software must allow for GPS breadcrumb tracking of the meter reading vehicle during the routereading process.

4.22 Mobile Data Collection Device Performance Requirements

    A. The magnet mount antenna must be omnidirectional and support a gain of 5 dB minimum. The receiver utilized must operate with a minimum sensitivity of greater than 110 dBm.

    B. The receiver module must process at a minimum of 72 discreet channels across a 10 MHz bandwidth utilizing a digital signal processor capable of capturing eight-meter readings simultaneously from these channels.

    C. The receiver module must operate with a dynamic range greater than or equal to 100 dB with a message success rate greater than 50%.

    D. The mobile data collection device must maintain a minimum sustained processing rate of 70 unique meter reading accounts per second.

    E. The mobile data collection device must reject a minimum of 45 dB of noise energy above the adjacent channels' target message.

    G. The mobile data collection device must operate effectively at posted speed limits.

PART 5 – SOFTWARE

5.1 AMR Utility Software Application Overview

The utility application must provide all the controls needed in the network for the essential functions of the metering data output received from the communication with field collection devices. The application must present this data within an intuitive user interface that is easy to interpret and understand. It must integrate seamlessly with other third-party applications the utility utilizes, such as CIS/billing software applications and work order management systems.

5.2 Basic Functionality for AMR

    A. The utility application shall be able to interface with the utility's CIS/billing software through a file layout that meets the specifications provided by the systems vendor.

    B. The application must have a method to import and export files for billing processes.

    C. A method must be available for users to specify the routes to be exported and transfer files from the application to the billing system.

    D. The application must be accessible through an internet web browser for accessibility anywhere.

    E. The utility application must operate within a Microsoft Windows platform and is hosted by the systems vendor.

    F. The user interface shall have A geographical view of metering assets.

G. (Section Removed)

H. Graphical presentation of consumption data must be viewable within the user interface.

I. The application must have a method to display individual account consumption based on meter size,meter type, and unit of measure.

J. Multiple levels of user security access must be available within the utility application.

K. A method to search for records matching an MIU ID, Account, Name, or Address must be available within the application.

L. The application must support meter readings (4-8 digits) and MIU ID numbers up to 10 digits.

M. All metering output data, such as leaks and reverse flow indications, shall be viewable within the application. Granular reporting shall be available that defines all accounts that have triggered the event.

N. utility application shall display the top 10 consumers with the highest consumption within the user interface. A method to view additional high-usage consumers should be available.

O. Reading performance reports and usage analysis capabilities shall be available within the utility application.

P. All available reports shall be exportable to Microsoft Excel or PDF formats.

Q. The utility application shall present to the user the number of successful, unsuccessful, and invalid readings.

5.3 Mobile AMR System Functionality

The cloud platform must provide the capabilities of collecting metering data from the Mobile AMRcollection devices and present the data in a user-friendly view for consumption by utility users.

The following functionality shall be provided within the software:

A. The utility application must have a method to view, load, and make route assignments for meter readers.

B. A method of loading routes to handheld, mobile drive-by, handheld, cellular phones, and tablet devices shallbe viewable within the application.

C. The application shall provide a data transfer method to the mobile drive-by device and accept data fromthe device.

D. The application shall manage the routes loaded into the data collection device.

E. The application shall have a method to communicate wirelessly to handheld, cellular phones, or tabletdevices.

F. The utility application shall have a method to split routes by collection method or into equal parts formanaging meter reading load activities.

5.4 Mobile Application Device Compatibility

A. The mobile application shall contain a method of completing meter reading tasks via an Android or an iOSmobile phone or tablet device.

B. The mobile application shall contain a method to provide data log capabilities via a mobile phone or tabletdevice.

C. When using a mobile device for meter reading, the software platform shall provide a method of real-timesynchronization for loading and unloading routes on the device.

D. The mobile application shall have a method to data log a meter end-point and include graphical and tabular views that include any meter output, such as leaks and reverse flow indications.

5.5 Software as a service (SaaS)

A. The utility requires a vendor that is responsible for ownership of the software and all associated hardware to operate the software. The utility shall only be responsible for the computers or laptops needed to access the applications via a web browser. The City shall maintain ownership of all data received by the AMR system and shall be provided online access to all data during an active subscription. The vendor shall provide the utility data in an agreed-upon media format if the subscription terminates.

1. The vendor shall provide the following services to the utility during the subscription:

2. The SaaS vendor must have at least two years of experience providing hosting services within the water utility space.

3. The SaaS subscription must cover all software patches, operating system updates, security and network monitoring, and platform preventive maintenance.

4. The vendor shall provide the utility with a service level agreement that meets 99%application availability during business hours of operation, excluding corporate holidays.

5. A disaster recovery plan for any failures at the managed services center to ensure continuity of theutility's data and continued access that meets agreed-upon contract SLAs shall be provided by the SaaS vendor.

6. The SaaS vendor must have a data backup strategy and process.

7. The vendor must provide A method of communicating or alerting the utility in the event of system failure or downtime.

8. The vendor shall have security and monitoring services that ensure the privacy and security of the utility's data.

9.   The vendor shall ensure that the data and all redundant data are housed in the country where the United States of America.

10.   All data in transit to the cloud must be encrypted.

5.6 Training and Support

A.   An approved, detailed training plan must be developed by the vendor with approval by the utility based on pre-implementation meetings. The following are items to be determined during these meetings:

1. Identity the training personnel and the employees to be trained.

2. Identify training schedules for hardware, software, and complete system products.

3. Define acceptance criteria for system deployment.

B.   The vendor shall fully train utility personnel in the system mapping, deployment planning, and installation of all end-point hardware and reading systems.

5.7 Support Services

A.   The vendor shall have a customer support department. The customer support department is required to maintain a telephone help desk and must continue the support through the use of a service agreement. A list of required services to be provided by the help desk includes but is not limited to the following.

1. Answer and resolve hardware/operation/maintenance questions and problems.

2. Answer and resolve software operation questions and problems.

3. Evaluate information for updates or revisions.

4. Evaluate personnel for training needs.

5. Perform additional on-site training or evaluation as needed.

B.   The help desk must be available on weekdays between 8:00 a.m. and 6:00 p.m. EST with after-hours numbers available as needed.

5.8 Installation and Training

A.   Complete installation and operating instructions will be included for all supplied hardware and software equipment. The training must be supplied by the System manufacturer or approved VAR. The proposal must include any additional costs for training and assistance to install and begin the System's operation. The vendor will also inform the customer of what pre-installation activities are to be completed and what support material will be needed for all hardware installations.

PART 6 – MAINTENANCE SUPPORT

6.1 System Maintenance Support

    A.   In addition to warranty periods, vendors must supply information on required or optional maintenance programs beyond the warranty period for both hardware and software.

    B.   Vendor must offer multiple-year maintenance contracts so that the utility can take advantage of multi-year discounts.

    C.   The location of and procedures for obtaining such support shall be stated. A toll-free help desk number mustbe provided for system support.

PART 7 – VENDOR QUALIFICATIONS

The qualified vendor will have at least thirty (30) years of experience with meter reading systems. The selected vendor shall be thoroughly versed in encoder meters and AMR technology and be a major supplier in the marketplace. The proposed System shall be manufactured and maintained by the selected vendor or an equity partner.

All vendors shall document which water meter manufacturers and models with which they can interrogate the proposed meter reading equipment. A customer reference list shall be enclosed with the proposal.

PART 8 - WARRANTY

8.1 Performance Warranty.

    A.   In evaluating bid submittals, warranty coverage will be considered. The vendor shall be required to state its warranty and/or guarantee policy in writing concerning each item of proposed Equipment. The procedurefor submitting warranty claims must also be provided.

<center>END OF SECTION</center>