



RESPONSE TO INVITATION TO BID FOR

# City of Republic, MO Sanitary Sewer Flow Metering 2023

**SUBMISSION DATE:**  
MONDAY, JULY 10, 2023  
3:00PM CST

**SUBMITTED TO:**  
CITY OF REPUBLIC  
C/O CITY CLERK, LAURA BURBRIDGE  
213 N. MAIN AVENUE  
REPUBLIC, MO 65738





July 10th, 2023  
City of Republic  
c/o City Clerk, Laura Burbridge  
213 N. Main Avenue  
Republic, MO

## Response to Sanitary Sewer Flow Metering 2023 IFB

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Core & Main LP ("Core & Main") is pleased to present the following response to the City of Republic's request for Sanitary Sewer Flow Metering. Core & Main has a long history of providing our customers high-quality. We are proud to present this Advanced Monitoring Solution to the City with our best-in-class vendor partners, Utility Systems Science & Software (US3), and *infinitii ai*.

Core & Main will provide five (5) flow meters and one (1) rain gauge. The data will be tracked and monitored on cloud-based redundant, secure servers, with access from virtually any web-enabled device.

The advantages of selecting the Core & Main Team include the following:

- Improved data accuracy with non-contact AV Flow Meters.
- Elimination of Confined Space Entry Risks.
- Near-Real time Metrics Dashboard/Reporting.
- Local Core & Main Branch Office – Springfield.
- 24x7 secure server access via a web browser to view system status and data.
- Direct, relevant experience of over 15 years with Wastewater Monitoring Services.
- An excellent reputation for providing high quality-engineering Services within stipulated budgets and schedules.
- US3 is one of the USA's leading sewer flow monitoring companies and a Top 100 Minority-owned Engineering Company.

Our **Advanced Monitoring Solution** is purpose-built for utilities and will allow the City of Republic to meet its objective of obtaining 5 flow meters and 1 rain gauge before December 1<sup>st</sup>, 2023.

Core & Main is committed to helping the City of Republic through an integrated solution that supports the requirements outlined in the Invitation for Bid.



Kaleb Breshears, Meter Specialist II, will be the primary contact throughout the bid evaluation and next steps.

**Kaleb Breshears**

Meter Specialist II

kaleb.breshears@coreandmain.com

(816) 598-2754

We look forward to the opportunity to provide the City of Republic with a high-performance Sanitary Sewer Flow Metering System and a highly successful implementation.

Best regards,

A handwritten signature in black ink, appearing to read "J. Pope", written over a horizontal line.

**Jerry Pope**

2854 E Kearney St.

Springfield, MO 65803

**Phone: (254) 772-7910**

**Principals:**

Chief Executive Officer: Steve LeClair

Regional Vice President: Rich Schaefer



## 1.0 Core & Main and Our Partners

### COMPANY BACKGROUND & HISTORY

Core & Main was established in 2017 and built on the foundation of 80+ legacy companies, including HD Supply Waterworks, Hughes Supply, and National Waterworks. Our products and services are integral to building, repairing, and maintaining water and wastewater systems. They serve as part of the basic municipal infrastructure required to support population and economic growth, including residential and commercial construction. Core & Main holds a leading market position in the United States for water, sewer, storm drain, and fire protection products and services.



### CORE & MAIN EXPERTISE

Core & Main engineers and technical personnel have applied advanced instrumentation system technology to water/wastewater open channel flow monitoring, pipeline evaluation, engineering, and data analysis, coupled with the power of the Internet. This unique integrated systems approach allows the company to bring greater insight and intelligence in gathering information about our clients' water and wastewater system performance and, in turn, support fulfilling their commitments to design, manage, operate, and maintain these systems cost-effectively.

We have over 4,500 employees across 49 states and 325+ locations that strive daily to provide local knowledge, experience, and service nationwide. Our brick-and-mortar location closest to the City of Republic is in Springfield, MO.

### OUR PARTNERS

#### UTILITY SYSTEMS SCIENCE & SOFTWARE, INC. (US3)

Utility Systems Science & Software, Inc. ("US3") is a specialty service company providing wastewater monitoring and control for Utilities since 1996, performing sewer flow monitoring services 24/7 throughout North America. US3



engineers and technical personnel have applied advanced instrumentation system technology to water/wastewater monitoring & control systems, pipeline evaluation, engineering, and data analysis. US3's industrial hardware & software solutions address production operations, performance, utility intelligence, operations management, and collaboration. By relentlessly focusing on solving our customers' most pressing

operational problems and delivering robust, secure, and easy-to-use solutions to solve those problems. Utility Systems Science & Software has grown to become one of the leading sewer flow monitoring companies in the USA.

#### INFINITII AI, INC.

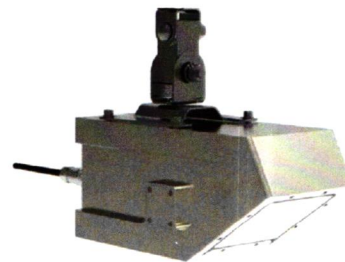
Trusted since 2014 to provide environmental monitoring to many of the largest water utilities in North America, *infinittii ai* (formerly Carl Data Solutions Inc.) has evolved into a leader in AI-driven predictive analytics for industrial and Smart City infrastructure applications that rely on time-series data. *infinittii ai* software performs real-time analysis, checks flow monitoring status, sets alarms through a single interface, accepts all types of data from any source, and offers predictive (what will happen) and prescriptive (what should happen) analytics. *infinittii ai* transforms raw data into actionable information. Customers include more than 70 smart city and Industrial Infrastructure organizations including Los Angeles, Boston, Miami, Dallas, Seattle, Vancouver, and Toronto.



## 2.0 Project Approach

### 2.1 FLOW MONITORING EQUIPMENT

We are pleased to offer the City of Republic an equal of the manufacturers called out in the IFB – a low-maintenance, non-contact, open-channel flow meter. The **US3 FlexFlow IQ** utilizes a sophisticated combination of digital radar velocity sensing and ultrasonic depth sensing to provide continuous flow measurements. Data collected by the FlexFlow will be logged and transmitted by a **US3 AMS RTU**, utilizing a cellular network, to the web-based software platform.



FlexFlow IQ sensors are well-suited for uninterrupted functioning in the most challenging environments, including high solids content, high temperature, shallow and caustic flows, large, manufactured channels, and velocities up to 65 ft/s. Since they are installed outside the process flow, there is no fouling by grease or debris, ensuring no flow data is lost. The sensors typically remain reliable and steady for up to three years without site calibration and can maintain their accuracy in low flow depths and surcharge conditions.

**No sewer bands or probes are required for installation, due to the non-contact technology, reducing your costs. No confined space entry is required for installation or maintenance, increasing the safety for your crews.**

The battery powered **US3 AMS RTU** is designed for wastewater, flood, and ultra-harsh submersible environments. AMS RTU arrays provide the interface for real-time instrumentation to web-enable the data collected from the FlexFlow IQ instrumentation. Get the data you need when you need it to improve the quality of life in smart communities.



Features include:

- Ultra-high accuracy for flow, level, and velocity outputs
- Non-contact measurement
- Sensor is away from the water for low maintenance
- Nominal power consumption
- RS-485 interface

## 2.2 RAIN GAUGE EQUIPMENT

Core & Main is pleased to offer the City of Republic an equal reliable tipping bucket-style rain gauge. Data collected by the **US3 Rain Gauge** (an equal to requirements) will be logged and transmitted by the **US3 AMS RTU**, utilizing a cellular network, to the web-based software platform. The US3 Rain Gauge accurately measures rainfall in 0.01" increments.

The US3 Rain Gauge tipping bucket uses a standard tipping bucket mechanism that allows for straightforward and effective rainfall measurement. The geometry and material selection of the bucket, along with the inclusion of a leaf filter, help minimize contamination and errors in the measurement process. The rain gauge features an 8" (200mm) diameter collector funnel. The tipping bucket device is divided into two compartments to enable the measurement of rainfall in fixed increments. The bucket is pivoted at its center and has a preset calibration to tip for a specific amount of rainfall, either 0.5 mm or 1 mm. The tipping action of the bucket magnetically opens and closes a reed switch. When the bucket is full and tips, it triggers the reed switch, generating a pulse signal. The pulse signal from the reed switch is sent to a data logger or AMS RTU.



**Pricing for an optional heating plate to measure snowfall data can be provided upon request.**

## 2.3 INSTALLATION

**Pricing for installation or installation training is available upon request.**

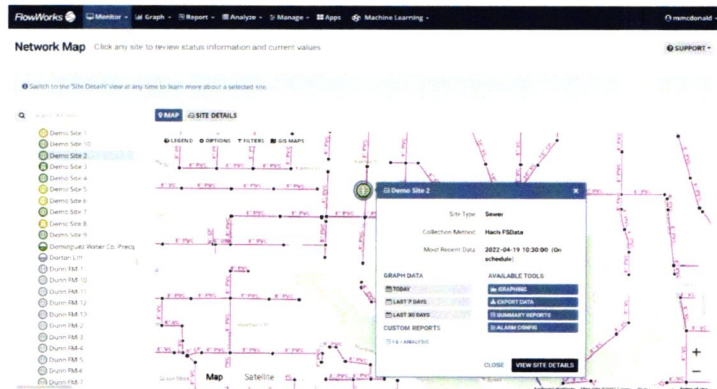
See installation manuals, warranty information, and data sheets in the Appendix.



## 2.4 WEB-BASED SOFTWARE ANALYTICS PLATFORM

### *infinittii flowworks*

Our solution includes *infinittii flowworks*, a powerful, web-based, interactive, Software-as-a-Service platform of monitoring, analysis, and reporting tools enabling you to manage all your monitoring systems efficiently. Perform real-time analysis, check flow monitoring status, and set alarms through a single interface. With its Artificial Intelligence and Machine Learning-enabled software, *infinittii flowworks* enables you to transform raw data into actionable information. Core & Main can complete integration to obtain USGS weather data from the Republic, MO, location to supplement the precipitation data reported from the physical rain gauges. Core & Main can further augment precipitation data with Gauge-Adjusted Radar Rainfall (GARR) data. GARR data can be obtained from anywhere within your wastewater collection system. The role-based, interactive platform will retrieve flow, level, and rain gauge data every fifteen minutes to provide the City with near-real time access to current conditions across their collection system. All data collected will be stored and available on the platform, enabling graphing, reporting, event logging, and alarming features. City-provided GIS sanitary sewer layer will be imported into the platform to enable the mapping features of the software.

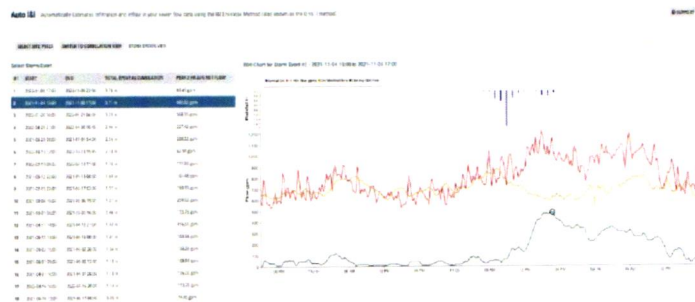


### Monitoring and alarm notifications

Infrastructure monitoring made easy. Click on any station to see current values and active alarms. Overlay GIS data to get a complete view of your infrastructure. Define rules and conditions for alarm notifications. Receive instant email, SMS, and voice notifications as soon as an alarm OCCURS. Maintain fine-grained control of alarm settings, behavior, and recipients.

### Powerful graphing and reporting

*infinittii flowworks* graphing enables you to visually display multi-channel data in either a time-series or scatter plot graph format. Freely explore your data with zoom features and navigate through massive volumes of data efficiently.



### **Customizable layouts**

Customizable layouts allow you to control the colors, line types, and plot types. Choose how you want to visualize your data by controlling the number of axes, the labels, and how they are displayed. Quickly save and share your graphs with colleagues.

### **View relationships and correlations between data channels**

Scatter Plots allow you to view relationships and correlations between two or more data channels. A variety of curve fitting functions are available and can be used to visualize trends. Manning equations can be added to your plot to represent the relationship between depth and velocity.

### **Summarize the status of your network or facility at-a-glance**

There are basic summary reports for daily, monthly, and yearly statistics. Create your summary reports for multiple sites and channels. Control the level of detail, grouping, and statistics displayed. Create and incorporate customized display screens to summarize the status of your network or facility at-a-glance.

## **2.5 ALARMS**

Flexibility is vital when it comes to configuring Alarms for your monitoring system. The *infinitii flowworks* application offers the City of Republic a significant level of customization, enabling the definition of rules and conditions to proactively monitor your data as it arrives. The City will have the capability to maintain fine-grained control of alarm settings, behavior, and recipients. Late Alarms can be used to notify when data hasn't arrived on schedule. Communication issues, Surcharge, and No Flow condition alarms can be easily created. Alarms can be configured to trigger on any measurement or combination of measures collected by The City. Immediate alarm notification options include email, SMS, and voice messages to one or more recipients with ease. Alarm escalation can be easily configured through the Dwell Time feature to alert another person should the alarm condition exist for an unacceptable amount of time.

## **2.6 DATA**

The *infinitii flowworks* platform provides a comprehensive platform for logging, storing, retrieving, and reporting all data reported by the monitoring equipment, USGS precipitation data, field events, and triggered alarms. All data collected during the project will be available on the platform and readily available to City staff. Exporting data for archiving or use in another application is accomplished with a single button click. A date range and the desired file format (i.e., CSV) can be selected. The user can specify if the export is to include one or multiple sites. Data can also be retrieved from *infinitii flowworks* via an Application Programming Interface (API) or web service.

## **2.7 TRAINING AND SUPPORT**

Core & Main will provide the City of Republic staff with a one-day training session on software application functions, user navigation, system administration, account management, device configuration, alarms and notifications, data management,



graphing, and reporting. An online Support Center is available from within *infinitii flowworks* and includes the following:

- A User Guide
- A Knowledge Base
- Support Ticket Submission
- Customer Support Phone Number
- Product News & Updates
- A List of Recent Activities/Articles

## **2.8 MONITORING AND REPORTING**

The Core & Main Team recognizes the value of accessible, near-real time, easy-to-consume, actionable data. This solution will provide a modern, Artificial Intelligence and Machine Learning-enabled analytics platform that the City can access from any web-enabled device. Your collection system's 5-minute interval meter and rain gauge data are transmitted to the platform and available for use by the City.

## 3.0 References

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### **City of Kingsport**

#### *Wastewater Monitoring*

Dates: On-going  
Contact: Will Stallard, P.E.  
Civil Engineer  
(423) 224-2921 ;  
WillStallard@KingsportTN.gov



Wireless Sewer Flow Monitoring Projects, Wastewater Event Notification, Rainfall derived inflow and infiltration (RDII) of extraneous stormwater and groundwater to the sanitary sewer system analysis, Custom Meter Installation.

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### **City of Houston**

#### *Wastewater Monitoring*

Dates: On-going  
Contact: Robert Riedel, P.E.  
Supervising Engineer,  
Wastewater Operations  
(832) 395-5037 ;  
Robert.RiedelIII@houstontx.gov



Sewer Flow Monitoring Project with Integration of City-Wide Wireless Telemetry Network, Wastewater Event Notification Systems, Wastewater Monitoring Training, Custom Meter Installation, Finalist in Environmental Project of the Year.

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### **City of Boston**

#### *Wastewater Monitoring*

Dates: On-going  
Contact: Tony Omobono, P.E.  
Vice President , Tetra-Tech Municipal  
Infrastructure Services, New England  
(617) 443-7571 ; Tony.Omobono@tetrattech.com



Wireless Sewer Flow /Level Monitoring Projects, Wastewater Event Notification, Rainfall Derived inflow and infiltration (RDII) of extraneous stormwater and groundwater to the sanitary sewer system analysis, Custom Meter Installation.

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## APPENDIX A – PRODUCT SPECIFICATIONS

### US3 FLEXFLOW IQ



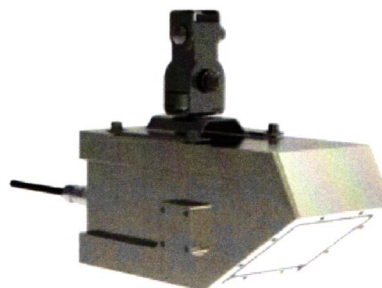
# FlexFlow IQ

## OPEN CHANNEL MONITORING

The FlexFlow IQ flow sensors offer maintenance-free, non-contact open channel monitoring, including sewer flow monitoring that can be portable or permanent. FlexFlow is particularly suited for monitoring open channels, utilizing a sophisticated combination of digital radar velocity sensing and ultrasonic depth sensing to provide continuous flow measurements. FlexFlow is available in both wireless and standard versions that can be integrated directly with PLCs.

The FlexFlow sensors are well-suited for uninterrupted functioning in the toughest situations, which may include high solids content, high temperature, shallow and caustic flows, large man-made channels, and high velocities up to 65 ft/s. Since they are installed outside the process flow, there is no fouling by grease or debris, ensuring that no flow data is lost. The sensors typically remain reliable and steady for up to three years without site calibration, and can maintain their accuracy even in low flow depths up to surcharge conditions.

Installing the FlexFlow sensors is easy and straightforward, as they come with mounting brackets that require no additional in-pipe bands or rings. Temporary cross-bar mounts are also available for convenience.



## ORDERING INFORMATION

Ordering Information Code:

### FLEXFLOW-FN

FlexFlow for Sensus FlexNet

Wireless Flow end-node for Wastewater Monitoring

### FLEXFLOW-GSM

FlexFlow for GSM Networks. Wireless Flow end-node for

Wastewater Monitoring

### FLINT

Installation kit for FlexFlow

### US3-DH

Data Hosting & Monitoring Services

## FEATURES

- Flow, level and velocity outputs
- Non-contact measurement
- Uses rotatable swivel and easy mounting
- Sensor is away from the water, making the installation safer to achieve
- Standard interfaces for communication with data loggers and other devices
- Extremely low power consumption
- Anti polarity protection
- Compact and solid design – long sensor life with minimal maintenance
- RS-485 interface – allows a connection cable length of up to 1,000 m, allowing data logger and power source to be situated further away
- Wide range of power supply from 7-32 V (typically 12 / 24 V) – allows differing power supplies such as solar panel, battery or grid.

## SUITABLE APPLICATIONS

- Rivers/Streams
- Sewer Systems
- Canals
- Irrigation canals
- Process Water Canals
- Outlets / Inlets

## SPECIFICATIONS

### GENERAL

**Network Interfaces:** GSM, Modbus RTU, Flexnet, LoRaWAN

**Internal Pwr Supply:** 13.0 Lithium Thionyl battery or external 12-30V power adaptor

**Consumption:** 40uA for normal operation 200mA for alarm messaging

**Dimensions:** 130 x 130 x 75mm

**Depth Rating:** 0 - 20m

**Type Approval:** PTCRB, GCF, FCC, CE, RoHS

### PERFORMANCE

**Velocity:**  $\pm 0.098 \text{ ft/s}$  - 65 ft/s or 0.03-20m/s

**Accuracy:**  $\pm 0.1 \text{ ft/s}$  or  $\pm 0.03 \text{ m/s}$

**Level Measurement:** 131 ft or 40m

**Accuracy:**  $\pm 0.4 \text{ inch}$  or  $\pm 10 \text{ mm}$

### ENVIRONMENTAL

**Operating Temp:** -20°C to 65°C

**Storage Temp:** -40°C to 85°C

**Relative Humidity:** 0 to 95%, non-condensing

**Enclosure Rating:** IP68

### MECHANICAL

**Housing Materials:** PPA High Performance Polyamide

**Cable:** Conductor, PVC jacket, 22 AWG, 4.6cm (18") pigtail [user-extendable for RS-485 communication up to 1500m (5000ft)]

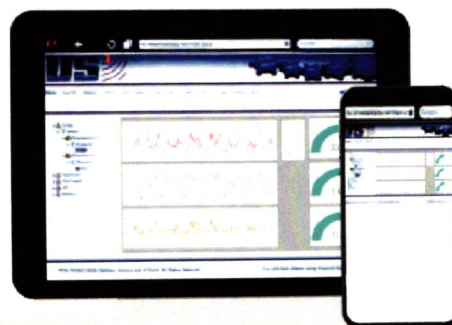


**Utility Systems, Science & Software, Inc.**  
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Utility Systems, Science & Software, Inc.



## US3 RAIN GAUGE



# US3 Rain Gauge

Rain Gauge Tipping Bucket  
With Leaf Filter



The US3 Rain Gauge tipping bucket uses a standard tipping bucket mechanism that allows for straightforward and effective rainfall measurement. The geometry and material selection of the bucket, along with the inclusion of a leaf filter, help minimize contamination and errors in the measurement process.

The rain gauge features a 8" (200mm) diameter collector funnel. The tipping bucket device is divided into two compartments to enable the measurement of rainfall in fixed increments. The bucket is pivoted at its center and has a preset calibration to tip for a specific amount of rainfall, either 0.5 mm or 1 mm. The tipping action of the bucket magnetically opens and closes a reed switch. When the bucket is full and tips, it triggers the reed switch, generating a pulse signal. The pulse signal from the reed switch is sent to a data logger or RTU.

### Ordering information

Code US3-RGTB

### Applications

- Water management
- Rain Measurement
- Flood Control Monitoring
- Environmental telemetry
- Intelligent Irrigation systems
- Integrates with Most Loggers/PLCs

### Technical characteristics

Item	Specification
Measurement object	Rain
Measured rainfall intensity	0-9.5 inch/hour
Sample interval	1s
Resolution	0.004 inch
Accuracy(0.08 inch/min)	±4%
Power consumption	1.6W
Supply	7-24VDC
Output	RS485, RS232, SDI-12 optional
Operating temperature	-40-+176F -40-+80°C
Main material	SS+ABS
Weight (unpacked)	1.4 lbs (0.65kg)



**APPENDIX B – INSTALLATION GUIDE – US3 FLEXFLOW IQ**  
**APPENDIX C – WARRANTY & REPAIR GUIDE**



# **FlexFlow IQ Installation Manual**

Utility Systems Science and Software

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Santa Ana, CA 92705

Sales 714-564-3494, [sales@uscubed.com](mailto:sales@uscubed.com)

Support 619-546-4281, [support@uscubed.com](mailto:support@uscubed.com)

[www.uscubed.com](http://www.uscubed.com)

[www.sewerflow.com](http://www.sewerflow.com)

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## 1. Introduction

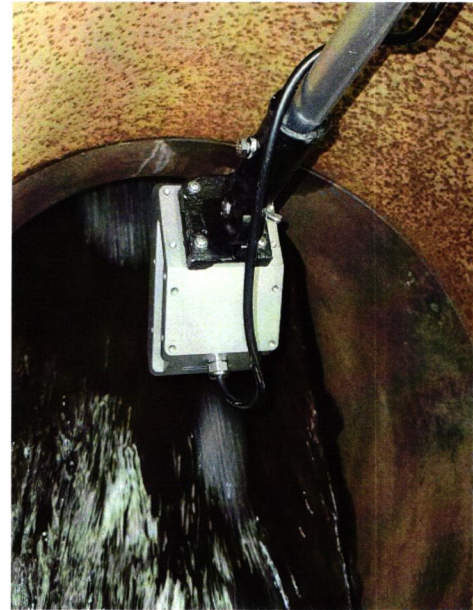
FlexFlow IQ flowmeter is an advanced device that utilizes microwave radar technology to provide non-contact open channel water flow measurement. This innovative technology enables simple and fast measurement without the need for physical contact with the water being measured. The non-contact nature of the equipment offers several advantages:

- **Resistance to Corrosion:** Since the FlexFlow IQ flowmeter does not come into direct contact with the water or sewage being measured, it is not affected by corrosion caused by the properties of the fluid. This resistance to corrosion ensures accurate and reliable measurements over an extended period.
- **Temperature Insensitivity:** Microwave radar technology is not significantly influenced by temperature variations. Therefore, the FlexFlow IQ flowmeter can maintain its accuracy and reliability even when exposed to different temperature conditions, ensuring consistent measurements.
- **Sediment Tolerance:** Traditional flow measurement methods can be affected by sediment or suspended particles in the water, which may cause inaccuracies. However, the non-contact nature of the FlexFlow IQ flowmeter means that it is not affected by sediment, ensuring precise measurements regardless of the water's particulate content.
- **Simplified Installation:** Installing the FlexFlow IQ flowmeter is relatively simple due to its non-contact nature. It eliminates the need for complex installation work, such as cutting into pipes or creating physical contact points with the water flow. This simplicity reduces installation time and costs.
- **Easy Maintenance:** The FlexFlow IQ flowmeter is designed for ease of maintenance. With no moving parts or components in contact with the water, the maintenance requirements are minimal. This reduces downtime and ensures continued accurate measurements.
- **Safety Considerations:** The non-contact nature of the FlexFlow IQ flowmeter enhances the safety of utility technicians. They can install or maintain the equipment without the need to work in close proximity to flowing water, reducing the risk of accidents or injuries.

Overall, the FlexFlow IQ flowmeter's use of microwave radar technology for non-contact open channel water flow measurement providing numerous benefits, including resistance to corrosion, temperature insensitivity, sediment tolerance, simplified installation, minimal water damage, easy maintenance, and improved safety for utility technicians.

FlexFlow IQ flowmeter uses precision flat narrowband array radar sensor, digital signal floating point algorithm processing, velocity direction identification, rain denoising, automatic correction of vertical angle, etc.; the maximum flow rate that the instrument can measure is 20m / s. The sensitivity is as high as 0.01m / s; the range of the water level is 40m, and the detection sensitivity reaches  $\pm 0.008\text{m}$ .

Please read the manual before using FlexFlow IQ flowmeter, so that you will better understand how to use this measuring instrument. The manual details the usage, maintenance, and precautions of the radar flowmeter.



## 1.2 Measurement principle

The FlexFlow IQ flowmeter uses planar microwave technology, uses the principle of Doppler radar to measure the surface velocity of water flow, and uses the built-in microstrip radar technology to measure the water level. According to the velocity-area method, the measured water level is used to convert the cross-sectional area, and then the surface velocity is combined with the cross-section parameters to calculate the average velocity. The empirical formulas for the cross-section velocity distribution of open channels such as circles, rectangles, and trapezoids are established and combined with the hydraulic model algorithm. Open channel flow; it is a non-contact flow measuring instrument that accurately measures the flow without changing the boundary conditions of channels, rivers, pipes, etc.

## 1.2 Principle of flow velocity measurement

The radar flow meter uses the principle of Doppler radar speed measurement. When measuring the speed of the water surface, the radar velocity sensor emits microwaves to the water surface. After encountering the water surface, the microwaves will be absorbed and reflected. A part of the reflected wave is received by the flowmeter probe, and then converted into an electrical signal. The Doppler frequency shift is processed by the measurement circuit, and then the water flow velocity can be calculated by using a signal processing algorithm such as FFT according to the above principle. The principle of Doppler velocimetry is as follows: When the radar wave transmitting source and the target are relatively stationary, the receiving frequency and the transmitting frequency are equal:

### 1.3 Water level measurement principle

The water level adopts FMCW modulation, and the triangle wave is used as the modulation signal. The working process is as follows: first, the voltage modulation circuit generates a triangular wave voltage and inputs it to a VCO (voltage-controlled oscillator) to generate electromagnetic waves with a frequency change. The frequency of the electromagnetic wave changes according to the modulation voltage law.

FMCW stands for Frequency-Modulated Continuous Wave, and it refers to a modulation technique used in various applications, including radar communication systems. In FMCW modulation, the frequency of a continuous wave signal is continuously varied over time.

The electromagnetic waves emitted by the antenna are reflected back after being reflected by the measured object. Waves, electromagnetic waves from the beginning to the target, reflected by the target and then returned to the antenna within the time period of the radar transmission frequency has changed, the radar antenna couples the echo signal with the transmitted signal to obtain the difference frequency signal, the target's distance and speed information It is included in the frequency of the difference frequency signal. Because the difference frequency signal is very weak, it is processed by the pre-amplification and filtering circuit of the radar sensor, and the signal is sent to the ADC (analog-to-digital converter) of the MCU. The MCU analyzes the ADC collected by the FFT algorithm. The frequency of the difference frequency is obtained from the waveform. Finally, the distance from the measured target to the sensor is calculated by the derived formula.

### 1.4 Flow measurement principle

The average velocity can be obtained and converted by the radar velocity probe, and the water depth can be obtained and converted by the radar water level probe. The cross-sectional flow is equal to the average velocity  $\times$  the cross-sectional area of the current  $\times$  the bank coefficient (surface).

Among the open channels in the sewer systems and irrigation area, the common types of open channel sections in the irrigation area are rectangular, trapezoidal, or U-shaped; commonly used slopes are dry and branch canal longitudinal slopes; and two commonly used roughness ratios are concrete canal walls and masonry canal walls.

For these common open channels, the bottom slope and roughness are determined. In the flow velocity distribution of the section, the flow velocity has a strong symmetry, and the straight section of the irrigation section and the downstream section are longer, and the section is symmetrical to the left and right. The distribution has the characteristics of good symmetry. Correct the velocity field distribution according to

the profile, bottom (longitudinal) slope and roughness; the turbulence mathematical model used is mainly RNG (renormalized group)  $\kappa$ - $\epsilon$  model, with high calculation accuracy, good numerical stability, and calculated data Moderate.

## 2. Remote Terminal Unit (RTU) Features

- Integrated design, small in size, easy mounting
- 4G and LTE
- Ultralow power consumption

### 2.1 RTU Technical details

- Data collection: 1 way (RS485) and/or 4-20mA。
- Communication: 3G/4G、NB-IOT、Blue-tooth
- Sleep power:  $\leq 40\mu\text{A}/12\text{V}$ 。
- Working power: DC 7V~32V ; default 12V
- Size: 60×85×15mm。
- Working temp.: -40~+85°C ; Humidity:  $\leq 95\%$ 。
- Two 4-20 MA inputs
- One RS485 Communications Port

## 3. FlexFlow IQ Features

- RS232 interface、
- RS485 interface
- maximum flow rate that the instrument can measure is 10m / s. The sensitivity is as high as 0.005m/s;
- level range is 4m, and the detection sensitivity reaches  $\pm 0.002\text{m}$ .
- Small size, high reliability, simple operation and easy maintenance.
- Not affected by environmental factors such as temperature, sediment, dust, rants, floating objects on the water surface, and air pressure.
- It is used for non-contact flow measurement in open channels, river channels, irrigation channels, underground drainage pipe networks, flood prevention, etc.
- Non-contact measurement method, convenient measurement and no pollution to the environment.
- with rain mode, to prevent interference caused by rain.
- Waterproof grade IP68, effectively prevent the internal components from getting wet.
- Ultralow power consumption, easy installation and maintenance-free.

### 3.1 Technical Parameters

Flow measurement system	Measurement principle Planar Microstrip Array Antenna CW + FMCW
Modes of Operation	Operating mode Manual, automatic, telemetry
Operating temperature	-30~80°C
Operating Voltage	7~32VDC;
Working current	12VDC input, working mode: ≤120mA standby mode: <1mA
Protection class	IP67, IP68
Lightning protection	level 6KV
Physical dimension	235.4×100×104(mm)
Weight	Less than 1.5kg
Radar wave speed sensor	Radar frequency 24GHz
Level sensor range	3m, 7m, 40m
Speed measurement -	range 0.03~10m/s
Speed measurement	accuracy ±0.01m/s;±1%FS
Automatic identification of water flow direction	built-in vertical angle correction
Radar water level gauge	Radar frequency 24GHz

### 3.2 Metering Shapes

The device supports three basic types of canal shapes: **circular, trapezoidal and U-shaped**. By adjusting the length of the bottom and top sides of the trapezoid, rectangular and triangular canals can be obtained.

#### 3.2.1 Round

The parameters that need to be set for the circular canal are the shape of the canal, the distance from the radar flow meter to the bottom of the canal, and the radius of the circular canal. The distance from the radar flow meter to the bottom of the canal and the radius of the circular canal need to be enlarged by 100 times the actual value.

#### 3.2.2 Trapezoidal

The parameters required for the trapezoidal canal are the shape of the canal, the distance from the radar flow meter to the bottom of the canal, the length of the bottom of the trapezoidal canal, the length of the top of the trapezoidal canal, and the height of the trapezoidal canal. The distance from the radar flow meter to the bottom of the canal, the length of the bottom edge of the trapezoidal canal, the length of the top edge of the trapezoidal canal, and the height of the trapezoidal canal need to be enlarged by 100 times. If the actual value is 1.23m, the value written is 123.

#### 3.2.3 U Shape

The parameters required for the U-shaped canal are the shape of the canal, the distance from the radar flow meter to the bottom of the canal, the height of the fan, the length of the bottom edge of the trapezoidal part, the length of the top edge of the trapezoidal part, and the height of the canal. The distance from the radar flow meter to

the bottom of the canal, the height of the fan, the length of the bottom of the trapezoidal part, the length of the top of the trapezoidal part, and the height of the canal need to be enlarged by 100 times the actual value.

## 4 How to Select a suitable Manhole to Monitor.

### 4.1 When looking down the MH at the flow... What we want to see:

- Consistent, open-channel flow
- When installing and calibrating, we check the FFT graph from the Real Time reading.
- Some clear flow lines that create a “V” shape. This slight surface flow disturbance is easiest for the FlexFlow IQ sensor to read.

### 4.2 What we do NOT want to see:

- Swirling hydraulics, created by the channel construction (Ex: if the bottom trough or walls aren't smooth and has an irregular surface) or incoming lines. We will not get a clear velocity reading if it is swirling.
- Drop inlets that ruin the pattern of the open-channel flow. A drop inlet is what it sounds like, where the flow comes into the MH via a pipe usually ~1-2 feet above the channel. This creates turbulence within the flow pattern. Think the swirling turbulence at the bottom of a waterfall.
- Blockages / stagnation / no flow – we need level and velocity (and pipe size) to calculate flow, and if there is no velocity, we will not have the information that we need. If we see this and we have a permit for the work, we can usually contact the City / Inspector that we're working with, and they will arrange for the line to be jetted (cleaned). We can re-investigate and possibly install it after the line has been cleaned.
- Laminar flow – surface is smooth as glass.
- Pulses of flow – if we are downstream of a lift station, we might see consistent, gravity-fed flow for most of the installation, then have a rapid increase in level and velocity. This will look like a stream that turns into a firehose.
  - In this case, we might shorten the reading interval from the usual 15-min to 5-min or 1-min.
  - Consider the length of the study in this decision. Factors include storage space on the logger, as well as quantity of data points to go through.

- The loggers can store data for a Maximum of 90 days at a 5-min reading interval.
- Typically, one does not want 1-min samples unless absolutely necessary. One-minute reads will have impact on the battery and generate a significant amount of data.

\*\*If there are any of these “no” items present, they can often be avoided by:

- Installing the sensor away from the flow irregularity within the MH.
  - If there is a drop inlet on the US side of the flow, we can place the sensor downstream where the flow has evened out.
- Move upstream (US) or downstream (DS) one MH. Review sewer maps to make sure we are still getting the same data.

## 5. Physical Installation

### 5.1 Part Identification

- |                                            |                               |
|--------------------------------------------|-------------------------------|
| • FlexFlow IQ Sensor                       | • Bolt Set with qty. (8) ¼-20 |
| • Extension Pipe, 2" SCH 40 (Not Included) | • Sensor Cable Battery Pack   |
| • FlexFlow IQ RTU                          | • Top Frame Mount             |
|                                            | • Jack-Bar Assembly - Red Bar |

## 5.2 Temporary / Permanent Installation

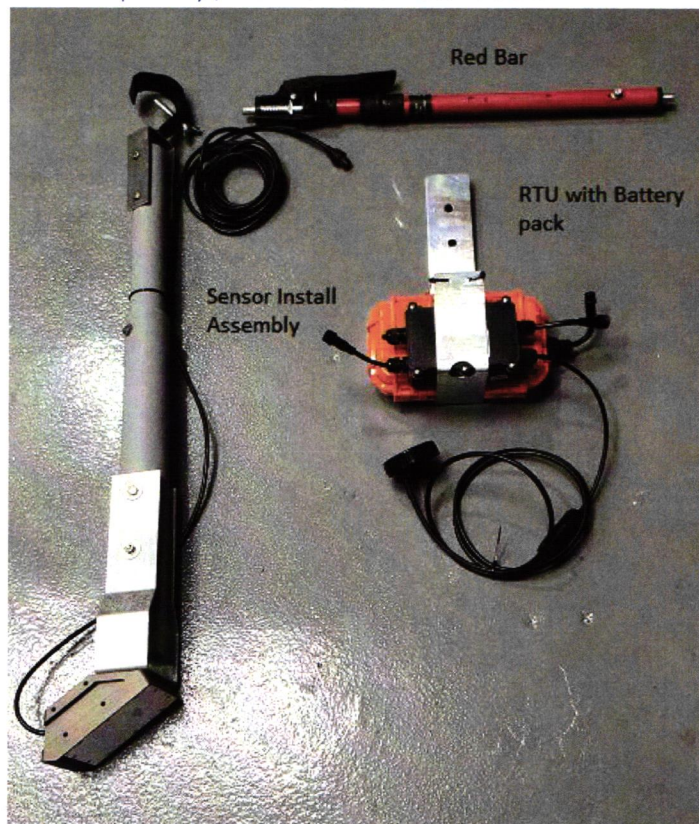


Figure 1

### 5.2.1 Set up the mounting frame and jack-bar assembly.

A) Install the Red Bar assembly in the manhole. As a general rule, the Red Bar should be approximately 12 to 15 Inches Below the Manhole Ring" located as parallel to the pipe and invert of the manhole as possible.



Figure 2: Jack-bar for mounting the drop-down pole to the sensor.

### 5.2.2 Assemble the frame as shown in figure 3.



Figure 3: Using standard PVC pipe, cut to length 6-12" above the crown of the pipe.

Set the elevation of the frame Approximately 6 to 12 inches above the inside crown of the pipe (for pipe I.D. under 25") or 5" above the inside crown of the pipe (for pipe I.D. of 25" and greater). An easy way to use a Stick and Measure the Distance between the Bottom of the Invert and

### 5.3 Install the Sensor.

Zip tie the sensor cable to extension pipe to prevent snagging sensor cable. Then Gently lower the sensor into the manhole and hook it on to the Red Bar and adjust to

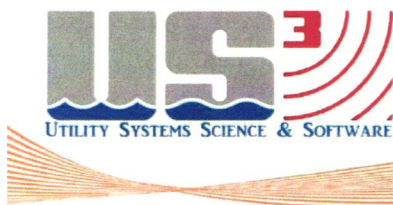
make sure the sensor is parallel with the flow. Lock down the hardware affixing the top hook, to the red Bar. Figure 4



Figure 4: Typical installation.

#### 5.3.1 Connect the Data Logger.

Connect the sensor cables to the data logger. Make sure the black cable-end connects to the connector marked communications. Tighten the threaded cable connector-ends securely to the data logger connectors. Do not over tighten. Install battery box and insert cable to the Logger. Do not over tighten the cable.



The programming over Bluetooth, so when the logger is powered up Bluetooth will be active.

## 6 Android Application Installation

Currently the application is only on Android tablets and phones. The Application will be on a USB drive.

Android users enjoy the privilege of installing APK files on Android directly should they choose. Some instances where you would like to install an app on Android using an APK file.

- The app is not available on Play Store or Galaxy Store
- You want to install a previous version of an application.

### 6.1 For Windows

If you are using a Windows computer, you can follow this guide to transfer files between your computer and Android:

1. Unlock your Android device.
2. Use a USB cable to connect your Android to your computer.
3. Tap the **Charging this device via USB** option on your Android device.
4. Select **File Transfer** under **Use USB for**.
5. You will see a file transfer window on your computer. Then, you can drag files to the window to transfer files.
6. When the transfer job is done, you can eject your phone or Tablet from your computer and then unplug the USB cable.

## 6.2 For Mac

This guide is for Mac OS X 10.5 and the above version.

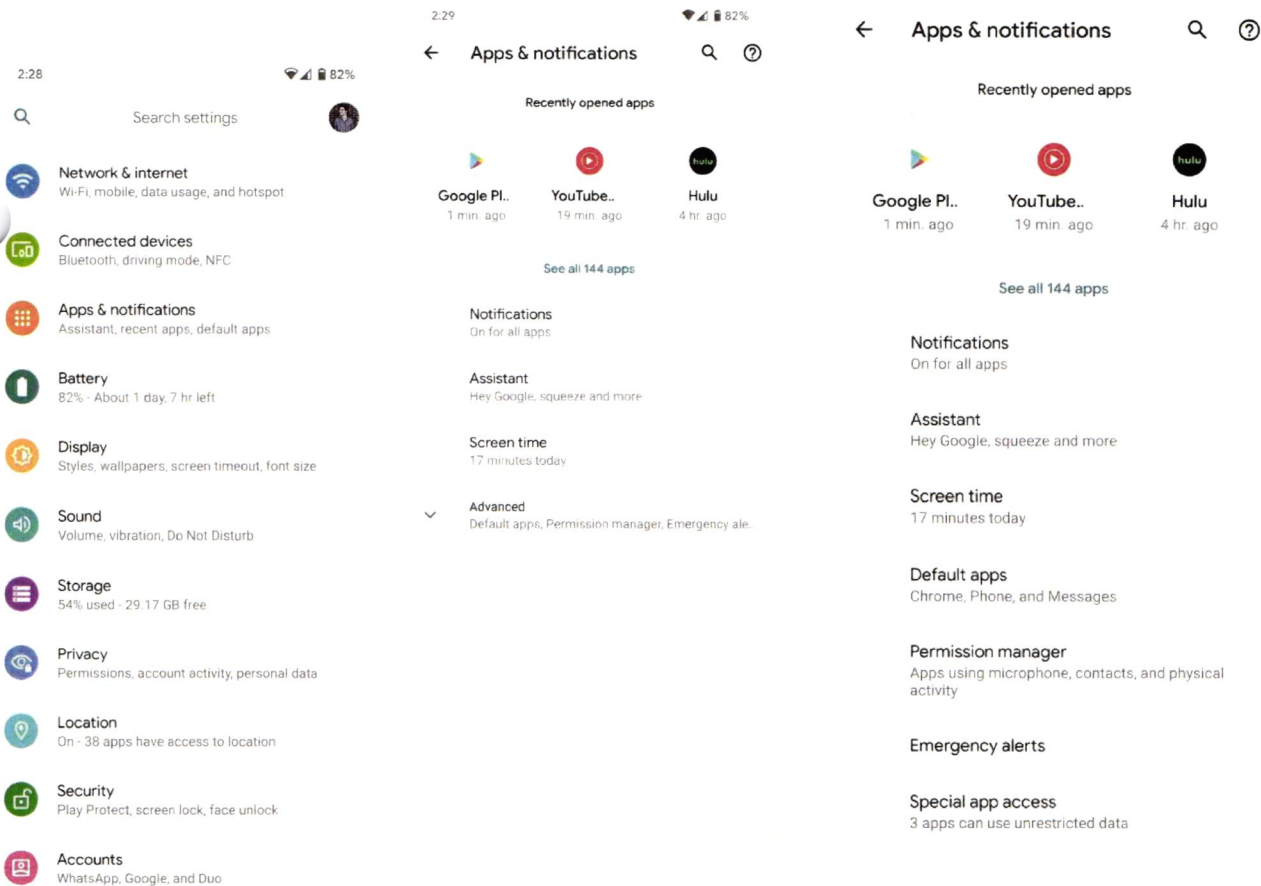
1. Search for Android File Transfer (an application) on the internet and select the official site to download & install it on your computer.
2. Open Android File Transfer.
3. Unlock your Android device.
4. Connect your Android to your Mac using a USB cable.
5. Tap **Charging this device via USB** on your Android.
6. Select **File Transfer** under **Use USB for**.
7. You will see a file transfer window on your Mac. Then, you can drag files to the window to transfer files.
8. When the transfer job is done, you can eject your phone or tablet from your computer and then unplug the USB cable.

### 6.3 How to install apps from other sources

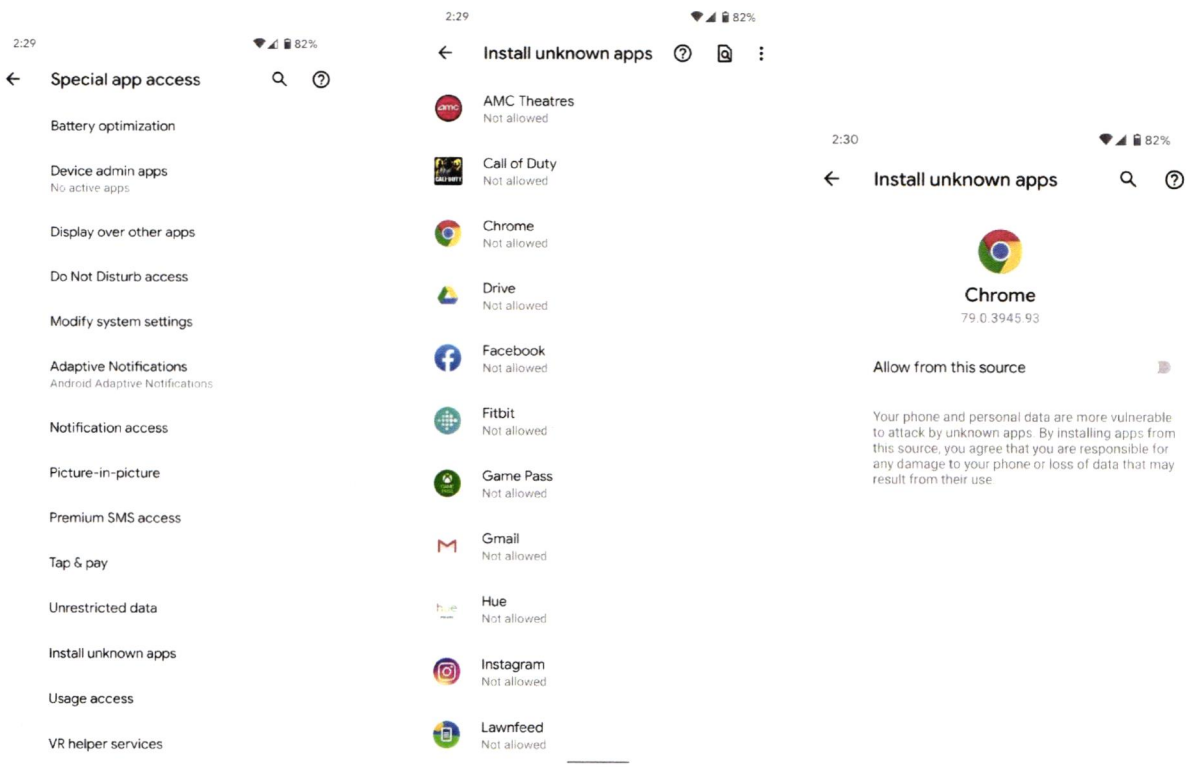
For the vast majority of folks, the Play Store has all of the apps you could ever want. In some cases, however, you may want to venture outside of Google's marketplace to find titles that aren't available on it for whatever reason.

To make sure your phone can download apps from other sources, here's what you need to do.

1. Open the **Settings** on your phone.
2. Tap **Apps & notifications**.
3. Tap **Advanced**.
4. Tap **Special app access**.



1. Tap **Install unknown apps**.
2. Tap the web browser you'll use to find outside apps.
3. Tap the toggle next to **Allow from this source**. *Source: Joe Maring / Android Central*



With this done, you can now venture online, find the app file you're looking for, and download it to your phone. There's always some level of risk when installing apps that don't come from the Play Store, so make sure you trust the source you're downloading the outside app from.

## 7. APP setting


### 7.1.1 Installation of APP

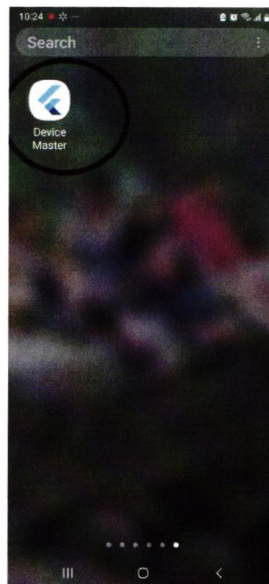
Copy APP to your cellphone and install it

**Note:** System should be Android, version higher than v4.4

### 7.1.2 APP instruction

#### 1、 Connection

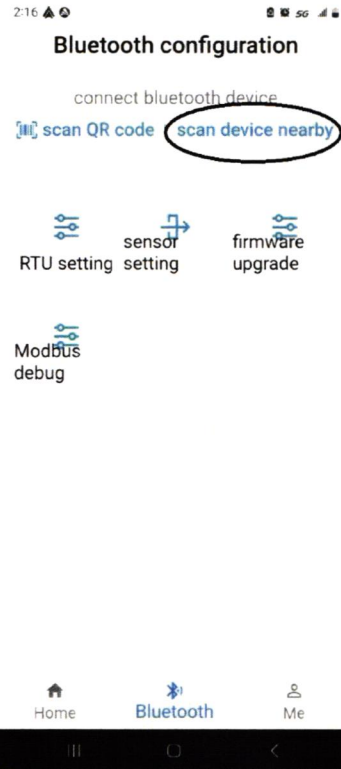
- Turn on , open APP
- Input user name and password  
User name: DWKJAME  
Password: 20230112
- Log in



**Note:** 1. User name and password only can be customized in factory. Can NOT reset on field.

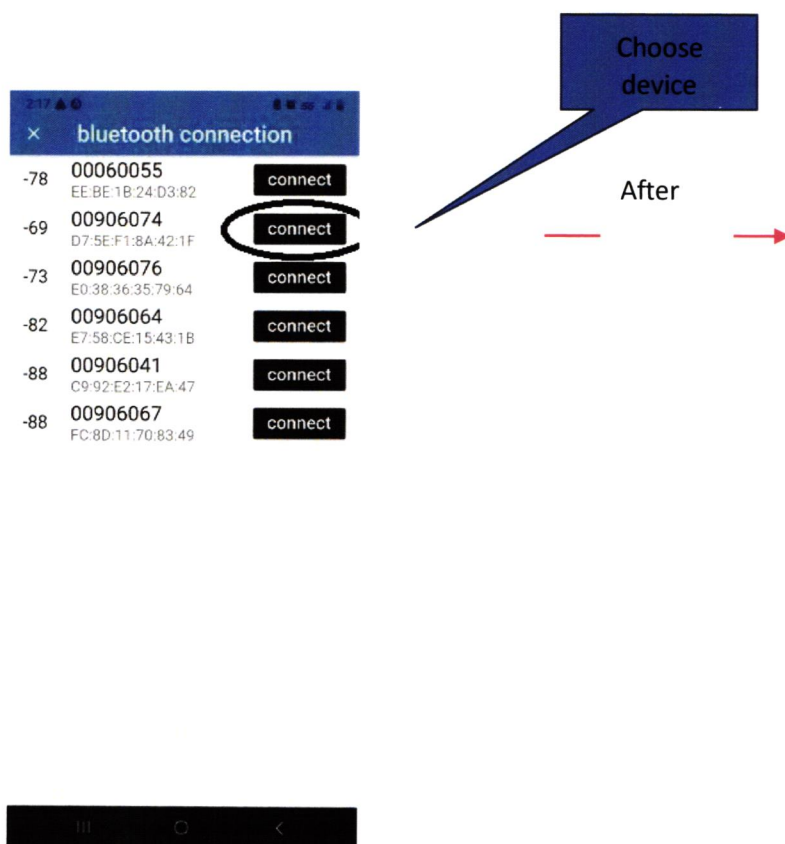
2. After log in, sensor parameters can be set and improper setting might cause damage. **Please keep user name and password safe.**

### 7.1.3 Bluetooth

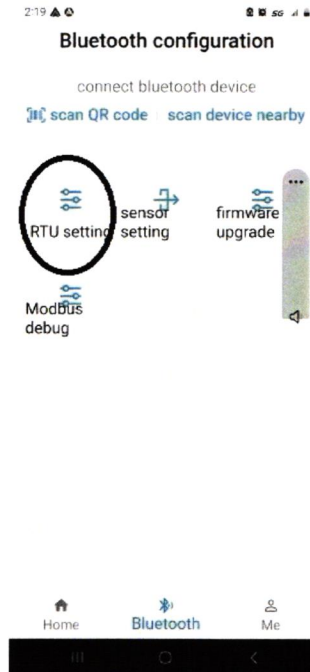


Scan

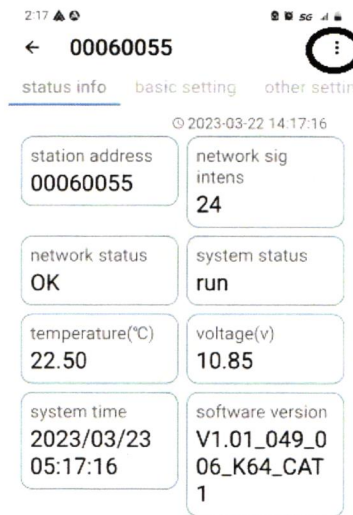
#### 7.1.4 Choose the device to connect.



## 7.1.5 Verify RTU



### Check Status of the RTU.



### Checking Status Look for.

1. Network Status OK
2. System Status in Run
3. Network Sig Intens needs to be above 10 to consistently transmit.
4. Voltage over 8 Volts.

## 7.1.6 Basic RTU setting.

There are 3 basic settings that will need to be modified from time to time.

### 1. Sensor Power On Duration.

If a site is real turbulent or Laminor flow the sensor may need more time to take a read.

**Typical Sensor time is 35 seconds**

### 2. Sample Interval. This is the cycle time for a sample.

**The Standard is 15 min**



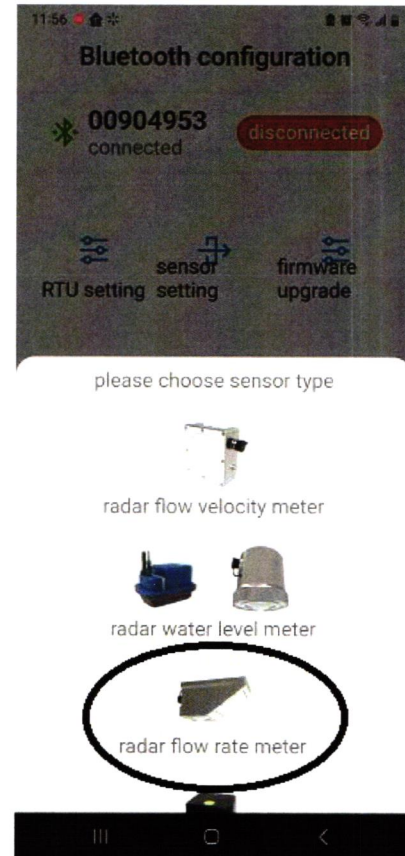
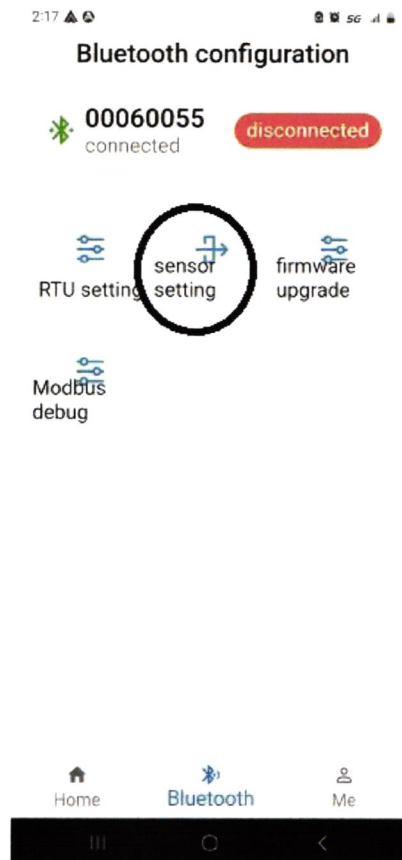
3. RTU Transmit Interval. This is how often the RTU sends Data.

**Industry Standard is 240 to 360 Minutes**

Note: RTU Transmit Interval can have a dramatic effect on battery life.

### 7.1.7 FlexFlow IQ Sensor

#### Select Sensor Settings



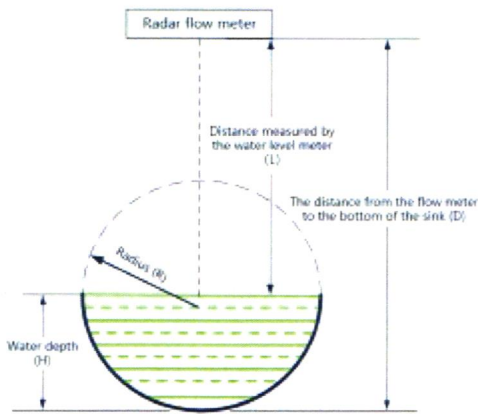
## 7.1.8 Sensor Status Screen

12:33 

← **00904958** ⋮

or data water canal para setting base p

The Status Screen allows for last read display. It also allows the ability to see the active FFT Signal for better sensor placement and calibration.

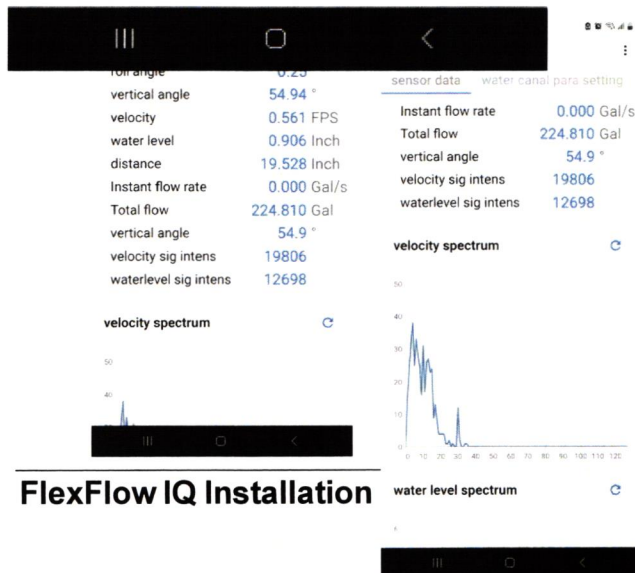


circular ☒ trapezoid ☐ U ☐

radius R(Inch) 3.150

distance from  
device to canal  
bottom D(Inch) 18.079

read para



## 7.1.9 Water Channel Parameter setting



Water Canal Para Setting is the time of channel or Pipe you are trying to monitor.

**Typical sewer pipe is** Circular. The radius of the pipe is the dimensional data from the pipe. What Diameter is the Pipe? \_\_\_\_\_

Distance from Sensor mount location to the bottom of the Pipe / Channel.

**Typically, we want to be 8 to 10 inches above the crown of the pipe.**

Once the Parameters are set select the Blue button at the bottom of the screen that says **Set Para**

**You can also read back the Para by selecting Read Para.**

## 7.1.10 Basic Settings

12:33 100% 5G

← 00904958

ra setting    base para setting    water can

velocity multiplier()	1.0	<input type="button" value="set"/>
velocity measurement gear	gear 2	<input type="button" value="set"/>
radar direction	up stream	<input type="button" value="set"/>
velocity noise threshold	600	<input type="button" value="set"/>
water level noise threshold	200	<input type="button" value="set"/>
velocity filter counter	1	<input type="button" value="set"/>
water level filter counter	5	<input type="button" value="set"/>
horizontal angle(°)	0	<input type="button" value="set"/>

|||    □    <

There are 2 main settings on this screen you will need to modify depending on the install.

1. **Velocity Multiplier.** This is the calibration tool for Surface Velocity. When doing an installation, a Pipe profile is taken. If profiler is not available we can use Standard Velocity Multipliers for calibration.

### **Standard Multipliers.**

Pipe	Multiplier
8	.75
10	.73
12	.72
15	.70
18	.67
20	.63

2. **Radar Direction** – Knowing upstream vs down stream is important for flow direction and speed calculations.

## Pipe Profiling

*Just like in streams and rivers the sewer channel has eddies and currents. The pipe as well as the connections to the manhole can cause hydraulic influences. Taking a Pipe profile with a handheld velocity meter can help profile the flow in the pipe. Flows near the surface can be higher than flows near the side walls or bottom. By taking a profile you can get a good average velocity of the pipe that should make the site accurate through a full pipe.*

12:33 00904958

← 00904958

base para setting

velocity filter counter 1

water level filter counter 5

horizontal angle(°) 0

rain mode open

sleep time(minute) 0

min depth to generate flow rate 0.0

silt height(m) 0.0

maximum velocity(m/s) 3.8

### 7.1.11 Basic Setting 2

In this section there is 1 setting that needs to be set.

**Sleep Time:** This setting sets the amount of time the sensor Bluetooth stays active. Since we are accessing the sensor through the RTU the Bluetooth is not needed for the sensor.

**Set the Sleep Time to 15 minutes as a standard setting.**

### 7.1.12 Advance Settings

**If advanced settings are needed, please call for support. 619-546-4281**

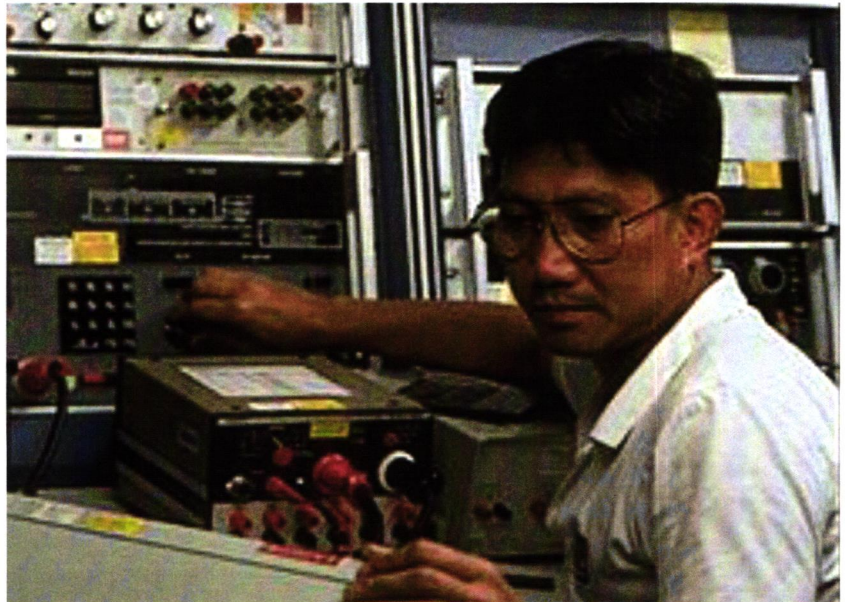
## Trouble shooting

SN	Description	Reason	Correction
1	Not working after power on	◆ Wrong wiring/No power	◆ Check all the connection and battery
		◆ Sleep mode	◆ Normal
2	No blue tooth	◆ Wrong wiring/No power	◆ Check all the connection and battery
3	No data receiving in data base	◆ Improper SIM installation	◆ Check SIM
		◆ No fee	◆ Pay the fee
		◆ No signal	◆ Check cell phone signal
		◆ Loose antenna connection	◆ Check antenna
		◆ No or Low power	◆ Change battery
		◆ SIM card does not support 4G data transmission	◆ Start the service
4	Sensor is working, but no data transmission	◆ No connection with module or data base	◆ Check parameter settings
			◆ Change fire wall setting
5	RS485 mis-communication	◆ Wrong wiring	◆ Change connection or wire/connector
		◆ Wrong serial NO.	◆ Check setting and data format
		◆ Unknown	◆ Contact factory
6	Module is working but data not correct	◆ System error	◆ Reset RTU
7	Not working	◆ Un know	◆ Contact factory





## ***Warranty, Service & Repair***



## **Factory/Field Support**

Our responsiveness doesn't end with the development of equipment or with the sale. Utility Systems Science and Software instrumentation and controllers are supported by both in-house and field service technicians, allowing for quick response to customer needs.

We provide need assessments and start-up assistance, plus warranty and non-warranty repairs at either your location or our factory. There is constant involvement of engineers, technicians and support personnel to ensure that our customers have access to the latest in instrumentation technology, from the simplest to the most difficult applications. Help from our knowledgeable US3 Customer Support Center is just a phone call away.

Manufacturer warrants all products of its manufacture to be free from defects in workmanship and material under normal use and service. This warranty extends for a period of twelve (12) months, from date of shipment, unless altered by mutual agreement between the Purchaser and Manufacturer prior to the shipment of the product. If this product is believed to be defective, Purchaser shall notify Manufacturer and will return the product to the Manufacturer, postage paid, within twelve (12) months, after date of shipment by the Manufacturer.

If the Purchaser believes the return of the product to be impractical, Manufacturer shall have the option, but will not be required, to inspect the product wherever located. In any event, if the Purchaser requests the Manufacturer visit their location, the Purchaser agrees to pay the non-warranty expenses of travel, lodging, and subsistence for the field service response.

If the product is found by the Manufacturer's inspection to be defective in workmanship or material, the defective part or parts will either be repaired or replaced, at Manufacturer's election, free of charge. Warranty repairs will be returned to Purchaser, transportation prepaid to any point in the United States. If inspection by the Manufacturer of such product does not disclose any defect of workmanship or material, Manufacturer's regular service repair charges and freight charges will apply.

This warranty statement does not apply to any products sold or provided, that are not manufactured by Utility Systems Science & Software, Inc. These products may be covered by the original manufacturer's written warranty.

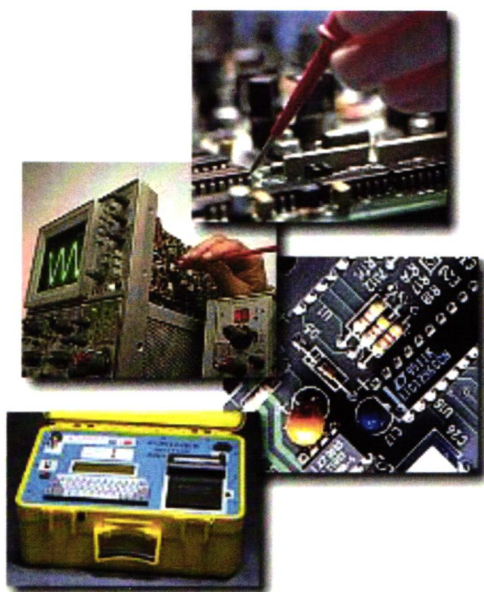
THE FOREGOING WARRANTY IS MANUFACTURER'S SOLE WARRANTY, AND ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY INCLUDING AND IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE NEGATED AND EXCLUDED. THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, GUARANTEES, REPRESENTATIONS, OBLIGATIONS OR LIABILITIES ON THE PART OF THE MANUFACTURER.

Purchaser's sole remedy and Manufacturer's sole obligation for alleged product failure, whether under warranty claim or otherwise, shall be the aforementioned obligation of Manufacturer to repair or replace products returned within the above stated warranty periods.

The Manufacturer shall not be liable for, and the Purchaser assumes and agrees to indemnify and save harmless the Manufacturer in respect to, any loss or damage that may arise through the use by the Purchaser, or others of any of the Manufacturer's products.

## Factory Service

Send instrumentation and wireless controllers to the US3 factory where our qualified and experienced electronic technicians perform all required repairs and preventative maintenance.



### ***Instrument maintenance***

All repair parts, factory labor, ground shipping to the factory and return shipping from the factory are included. US3 will also provide factory calibration and certification every time you send in your instrument.

### ***Confidence in US3 factory service professionals***

US3 experts have years of experience working on US3 equipment and applying their certified expertise will ensure that your equipment stays as good as new!

## Field Service

Supporting customer service commitment, Utility Systems Science & Software employs highly qualified field engineers and technicians throughout North America. Wherever your facility is located, our specialists speak your language, know your market, know your technology, and they are available with rapid-response solutions that translate into keeping your system operational.

Beside installation and commissioning, we offer you integrated, comprehensive solutions for inspections, on-site repairs and outage services. Our experienced service specialists have the know-how to get your equipment back online in the shortest time. US3 also provides timely delivery of parts and components featuring quality and reliability.



## Repair Pricing

### Standard Turnaround

At US3 our normal turnaround time is 8-10 working days. However, there are times when a repair will take longer (if some needed material replacement part are not available). Our technicians will make every effort to repair the instrument within the standard given time.

### Rush Repairs

At Utility Systems Science & Software, we realize that your instrumentation is critical to your operation. Every minute your industrial equipment isn't operational, puts your customers and environment at risk. We work hard to ensure you receive fast, efficient, quality repairs. We provide a rush repair service to accommodate your needs. We will make every effort to repair and return your item within 2-3 business days.

If a faster response time is required, please be sure to make your US3 customer service professional aware of your requirements when you place a repair order. In such instances, your unit will be placed under the "Hot Rush" repair option and be moved ahead of other repairs.

### Emergency Repairs

If, at your request, your repair requires us to work beyond normal business hours, you will be charged the overtime shop rate (or field service rate, if applicable) for the amount of time an engineer is involved with the repair. This charge will apply whether or not the item is repaired. If the normal repair price exceeds this minimum charge, the normal repair charge will apply with additional charges for after-hours service.

### Return Shipping

Before we ship, all repaired items are placed in Bubble Pack Rolls, if applicable, and carefully packed to UPS specifications. A documented quality report and warranty statement is sent with each item. Our Automated Company Portal sends email to the customer when the shipment is delivered with all the Carrier Details.

Return freight will normally be prepaid and added to the invoice. We will ship the best way, as determined by us, unless a specific carrier and priority is determined previously by the customer. Customer is responsible for all shipping charges, regardless of repair ability.

# Repair Pricing

"How much will my repair cost?" is one of the most frequently asked questions. It is also one of the most important questions.

0-1 year Free\*

All hardware and software will be repaired at our factory.

## Why We Test Before We Quote

The cost to repair an item can have a significant range. The amount of damage is the largest factor affecting the cost. Other variables considered in pricing include the cost of the replacement components, the testing required to verify that the item has been repaired correctly, and also whether there have been previous repairs or repair attempts.

## No "Flat Fees"

This is why US3 does free evaluations. We base your repair price on what is damaged on your item and how much work it will take to make the repairs needed. We provide free price quotes on all in house repairs. All items are carefully evaluated in order to determine the actual repair price. We're totally committed to gaining your loyalty as a customer. We know this loyalty must be won by proving to you that we're watching out for your best interest.

## Repair Cost versus Replacement Cost

Every now and then, we do get an item that approaches the 50% cost of new to repair, but the majority are not that high so you don't have to pay excessive repair charges. To come up with a rough estimate of what your repair cost range may be, consider 25% to 50% the cost of replacement, however, your repair price from US3 will be determined when we do a physical examination and then you will get a written quote to approve.

## Warranty Service Options

In order to receive warranty service, you must first contact US3 Customer Service staff using the contact information provided below for a Return Materials Authorization (RMA) number.

US3 will provide warranty service through one or more of the following options defined below:

- (i) Mail in service. If US3 determines that your US3 branded hardware is eligible for mail-in service, US3 will send you prepaid waybills and if applicable, packaging material, so that you may ship your US3 branded hardware to an US3 location in accordance with our instructions. Once service is complete, the US3 service location will return the US3 branded hardware and/or component to you. US3 will pay for shipping to and from your location if all instructions are followed

US3 Customer Service staff must be contacted for a Return Materials Authorization (RMA) number and shipping instructions prior to shipment to US3.

The US3 Application Kit must be shipped, postage prepaid, to US3 and must show the RMA number on the inside and outside of the package.

- (ii) Do-it-yourself (DIY) parts service. DIY parts service allows you to service your own US3 branded hardware. If DIY parts service is available in the circumstances, the following process will apply.
  - (a) Service where US3 requires return of the replaced US3 Application Kit or part(s). US3 may require a credit card authorization as security for the retail price of the replacement US3

Application Kit or part and applicable shipping costs. If you are unable to provide credit card authorization, DIY parts service may not be available to you and US3 will offer alternative arrangements for service. US3 will ship a replacement US3 or part to you with installation instructions, if applicable, and any requirements for the return of the replaced US3 Application Kit or part(s) or part. If you follow the instructions, US3 will cancel the credit card authorization, and you will not be charged for the US3 Application Kit or part and shipping to and from your location. If you fail to return the replaced US3 Application Kit or part as instructed or return a replaced part that is ineligible for service, US3 will charge your credit card for the authorized amount.

- (b) Service where US3 does not require return of the replaced US3 Application Kit or part(s). US3 will ship to you free of charge a replacement US3 Application Kit or part(s) accompanied by installation instructions, if applicable, and any requirements for the disposal of the replaced US3 Application Kit or part.
- (c) US3 is not responsible for any labor costs incurred relating to DIY parts service. Should you require further assistance, contact US3 at the telephone number listed below.

US3 reserves the right to change the method by which US3 may provide warranty service to you, and your US3 Application Kit's eligibility to receive a particular method of service. Service will be limited to the options available in the country where service is requested. Service options, parts availability and response times may vary according to country. You may be responsible for shipping and handling charges if the US3 Application Kit cannot be serviced in the country it is in. If you seek service in a country that is not the country of purchase, you will comply with all applicable import and export laws and regulations and be responsible for all custom duties, V.A.T. and other associated taxes and charges. For international service, US3 may repair or replace US3 Application Kit and parts with comparable US3 Application Kit and parts that comply with local standards. US3 will repair, or, at its option, replace at no charge, components that have proven to be defective during the applicable warranty period.

### **What is Covered by Warranty**

US3 Application Kits as defined below shall be free from defects in materials and workmanship for a period of one (1) year.

The following components/parts of US3 Application Kits shall be covered by this Warranty:

- (i) Mechanical enclosure and connectors
- (ii) Internal electronics
- (iii) Global SIM card (If applicable)
- (iv) Internal and/or external antennae
- (v) Sensor inputs

### **What is Not Covered by Warranty**

This Warranty does not apply to certain non-US3 branded hardware products or parts, even if packaged or sold with US3 hardware. These third-party products include sensors. US3 does not warrant that the operation of the US3 Application Kit will be uninterrupted or error-free. US3 is not responsible for damage arising from failure to follow instructions relating to the US3 Application Kits' use.

This Warranty does not apply to: (a) consumable parts, (b) cosmetic damage, including but not limited to scratches, dents and broken plastic on connectors and/or ports; (c) damage caused by use with another product other than the third-party products shipped by US3 or one of our distributors, agents or affiliates; (d) damage caused by accident, abuse, misuse, liquid contact, lightning strikes,

volcanic eruptions, earthquakes, flooding, wind, snow, hail, and other weather related elements or other external cause; (e) damage caused by service (including upgrades and expansions) performed by anyone who is not a representative of US3; (f) part(s) that have modified to alter functionality or capability of the US3 Application Kit without the express written permission of US3; (g) defects caused by normal wear and tear or otherwise due to the normal aging of the US3 Application Kit, or (h) if any serial number has been removed or defaced from the US3 Application Kit.

## Battery Warranty

"How long will the battery last?" is often asked. The battery pack has a warranty of 3 years.

0-3 years Free\*

## Payment Terms

Once a repair quote is approved, we will establish payment terms. For your convenience, we accept Visa, MasterCard, Discover, & American Express. Other modes of payments are through standard Purchase Orders.

Contact Information: **M-F 8-5 Pacific**

### CONTACT – SANTA ANA

P: [+1 \(714\) 564-3494](tel:+17145643494)  
E: [sales@uscubed.com](mailto:sales@uscubed.com)  
Technical Support:  
[support@uscubed.com](mailto:support@uscubed.com)

### CONTACT – SAN DIEGO

P: [+1 \(619\) 546-4281](tel:+16195464281)  
E: [sales@uscubed.com](mailto:sales@uscubed.com)  
Technical Support:  
[support@uscubed.com](mailto:support@uscubed.com)

### CONTACT – HOUSTON

P: [+1 \(714\) 564-3494](tel:+17145643494)  
E: [sales@uscubed.com](mailto:sales@uscubed.com)  
Technical Support:  
[support@uscubed.com](mailto:support@uscubed.com)

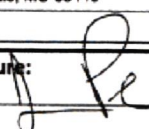
\* Utility Systems Science and Software warrants the electronics and software for a period of (1) year This warranty does not cover damage or repairs or replacements by any cause beyond the control of US3, including acts of nature, improper use, lack of proper maintenance, vandalism, or unauthorized repair. US3 shall not be liable for any actual, exemplary, indirect or consequential damages, including damages for loss of goodwill or profits and/or losses, that stem from a failure or malfunction of the US3.

**ATTACHMENT A - BID SUBMISSION FORM**

BIDDERS MUST PROVIDE THE FOLLOWING INFORMATION:

Description of Work	Price
<p>Prepare the attached "Bid Submission Form Template" to develop unit and extended costs. Confirm description of proposed equipment.</p> <p>A Bid Submission form template should be developed for all pricing options/alternatives presented.</p> <p>Please note any of the following:</p> <ul style="list-style-type: none"><li>Any labor personnel requests of the City of Republic for this project.</li><li>Any other requests or responsibilities of the City of Republic for this project.</li></ul>	Flow Monitoring Summary: <u>\$43,750.00</u>
	Sewer Band Cost Summary: <u>No bid - Not required for proposed solution</u>
	Rain Gauge Cost Summary: <u>\$2,647.86</u>
	Software Cost Summary: <u>\$9,694.29</u>
	Total Cost: <u>\$56,092.15</u>

In compliance with this Invitation for Bid and to all terms, conditions, and specifications imposed therein and hereby incorporated by reference, the undersigned offers and agrees to furnish the goods and/or services described herein.

<b>City of Republic, Missouri</b>  <b>IFB for: Sanitary Sewer Flow Metering 2023</b>  <b>Republic, MO 65738</b>	<b>Company Legal Name:</b> Core & Main LP
	<b>Address:</b> 1830 Craig Park Court St. Louis, MO 63146
	<b>Signature:</b>  <b>Name and Title:</b> Jerry Pope, District Manager
<b>Telephone:</b> (816) 598-2754 <b>Cellular:</b> <b>Email:</b> jerry.pope@coreandmain.com	<b>Dated:</b> <b>Bidder's Federal ID Number:</b> 03-0550887



Affidavit of Compliance with Section 285.500, RSMo., et seq.  
for all agreements providing services in excess of \$5,000.00

Effective 1/1/2009

STATE OF MISSOURI     )  
                                      ) ss.  
COUNTY OF GREENE     )

Before me, the undersigned Notary Public, in and for the County of Rogers, State of Oklahoma, personally appeared Jerry Pope (Name) who is District Manager (Title) of Core & Main LP (Name of company), a (circle one) corporation, partnership, sole proprietorship, limited liability company, and is competent and authorized to make this affidavit, and being duly sworn upon oath deposes and says as follows:

- (1) that said company is enrolled in and participates in a federal work authorization program with respect to the employees working in connection with the contracted services; and
- (2) that said company does not knowingly employ any person who is an unauthorized alien in connection with the contracted services.

The terms used in this affidavit shall have the meaning set forth in Section 285.500 RSMo., et seq.

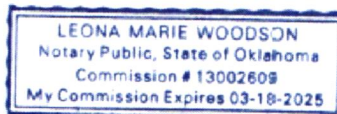
Documentation of participation in a federal work authorization program is attached to this affidavit.

Jerry Pope  
Signature  
Jerry Pope  
Printed Name

Subscribed and sworn to before me this 6 day of July, 2023.

Leona Marie Woodson  
Notary Public

My commission expires: 3/18/2025





City of Republic, Missouri  
AFFIDAVIT OF COMPLIANCE WITH INVITATION FOR BID

To be submitted with all Bids in response to this IFB

\_\_\_\_ We **DO NOT** take exception to the IFB Documents/Requirements.

  X   We **TAKE** exception to the IFB Documents/Requirements as follows:

INDEMNITY. Core & Main will agree to defend the City from claims only to the extent it is  
alleged by third parties that Core & Main is at fault (through its negligence, willful misconduct,  
violation of law or breach of contract), and Core & Main will indemnify the City only to the extent such third party  
claims are caused by fault on its part.

I have carefully examined the Invitation for Bid and agree to abide by all submitted pricing, delivery, terms and  
conditions of this IFB unless otherwise stipulated herein.

Company Name Core & Main LP

By [Signature]  
(Authorized Person's Signature)

Company Address 1830 Craig Park Court  
St. Louis, MO 63146

Telephone Number (254) 772-7910

Fax Number \_\_\_\_\_

Date 7-10-2023

**ADDENDA**

Offeror acknowledges receipt of the following addendum:

Addendum No. \_\_\_\_\_

Addendum No. \_\_\_\_\_

Addendum No. \_\_\_\_\_

Addendum No. \_\_\_\_\_

Email jerry.pope@coreandmain.com

Federal Tax ID No. 03-0550887

DBE Vendor (Yes/No): No Minority Owned: \_\_\_\_\_  
Women Owned: \_\_\_\_\_  
Veteran Owned: \_\_\_\_\_



**Bid Submission Form Template**  
City of Republic, Missouri

Bid Alternative #: \_\_\_\_\_

Item Description	Quantity	Unit Rate	Extended Cost	Notes
<b>Flow Monitoring Equipment</b>				
Flow Meter & Battery Module	5	\$ <del>8571.43</del> <sup>43</sup>	\$ <del>42857.14</del>	
AV Probes	5	\$ No Bid	\$	
Modems (Telemetry)	5	\$ built-in to flow meter price - no bid	\$	
Cabling & Appurtenances	5	\$ 178.86	\$ 892.90	
<b>Sewer Bands</b>				
18 inches & Below (6, 8, 10, 12, 15, 18)	5	\$ No Bid - not required	\$	
21" or Greater	2	\$ No Bid - not required	\$	
<b>Rain Gauge</b>				
Rain Gauge & Tipping Bucket	1	\$ 823.57	\$ 823.57	
Modem	1	\$ 1824.29	\$ 1,824.29	
<b>Software Installation</b>				
Meter Install Configuration (Mobile)	1	\$ 4242.86	\$ 4,242.86	Meter & Rain Gauge Installation & Configuration - one time fee
Cloud Hosting Environment	1	\$ 5451.43 / year	\$ 5,451.43	Cloud Hosting for Five Meter Sites and one (1) Rain Gauge - annually
<b>Total Bid Alternative Cost</b>		<del>56,092.15</del>	\$ 56,092.15	



# City of Republic - Invitation for Bid

## Sanitary Sewer Flow Metering 2023

**SEALED BIDS MUST BE PHYSICALLY RECEIVED AT REPUBLIC CITY HALL PRIOR TO 3:00 P.M. on Monday July 10<sup>th</sup>.** Bids will be opened by the City at Republic City Hall at said time and place.

BIDS SHOULD BE ADDRESSED AS FOLLOWS:

City of Republic  
c/o City Clerk, Laura Burbridge  
213 N. Main Avenue  
Republic, MO 65738

Bids must be submitted on the forms provided and must be manually signed by the individual authorized to legally bind the Bidder. Bidders can add their own sheets for clarification of pricing on certain products if they choose.

- Bids shall be submitted with the **Invitation for Bid ("IFB") project name or item clearly indicated on the outside of the mailing envelope.**
- Bids received after the opening date and time **will be rejected.**
- The attached Terms and Conditions shall become part of and are herein expressly incorporated into any contract, agreement or award resulting from this Invitation for Bid.
- **FAXED/EMAILED BIDS WILL NOT BE ACCEPTED.**
- Projects exceeding \$75,000 in total cost shall be paid at prevailing wage.
- You are invited to submit your Bid to furnish the materials and/or services described herein. Please submit your prices/fees net of all discounts. Bidders do not necessarily need to bid all requested categories, but it is encouraged.
- Bids will be taken to City Council for approval on **July 18<sup>th</sup>, 2023.** Notice to proceed shall follow no later than July 24<sup>th</sup>, 2023 following approval granted by City Council.

### DESCRIPTION:

Flow Metering Equipment:

- Provide 5 area-velocity flow meters including all necessary sensors, data recorders, mounting hardware, cables, software and equipment needed for the meters to be fully operational.
  - ISCO 2150, Hach FL900, or equal
- Sensors must measure the depth, velocity and flow (minimum, maximum and average) with the following levels of accuracy:
  - Depth accuracy of +/- 0.2 inches (maximum)
  - Velocity accuracy of +/- 0.3 feet per second (maximum)
- Provide flow meters and A/V probes that are capable to accurately measure gravity flow in pipes with diameters ranging from 6" to 24".
- Provide metering bands necessary for flow monitoring installations for pipe sizes ranging from 8" to 24" diameter.

**Rainfall Monitoring Equipment:**

- Provide one (1) tipping bucket rain gauge:
  - ISCO 677Ci (2015Ci with antenna and 2191 Battery node) , Trimble/Telog Rain Gauge Recorder with Cellular Modem ( RG-32A) with Texas Electronics TR-525 Tipping Bucket, or equal.
- Provide wireless communication modules (modems) and necessary cabling for each flow meter and rain gauge that are capable of transmitting the data collected to the cloud in near real time (up to every 5-minutes).

**Software**

- Provide quote for flow monitoring software to support meter installations and provide data cloud hosting and remote access to the flow monitoring data for up to five (5) flow meters and one (1) rain gauge.
- Software costs should include all up-front purchase pricing for the software platform and annual maintenance costs.

**Include with the bid the following information:**

- Equipment specifications and warranty information for the flow meters to be furnished, and a description of the equipment, communication processes and data feed transmission process.
- Procedures, schedule, and documentation for meter calibration.
- Manufacturer Procedure Recommendations for installation

City plans to award Base bid, plus any combination of alternates as determined by the City. Therefore, please provide pricing for each, separately.

**SCHEDULE:**

City intends to take the winning bid to City Council for Approval on July 18th, 2023, with Notice to Proceed to follow no later than July 24th, 2023. Delivery of all equipment awarded shall be no later than December 1<sup>st</sup> 2023.

**Inquiries:** All inquiries for information should be directed to:

Garrett Brickner, Engineering Manager  
BUILDS Department, City of Republic  
[gbrickner@republicmo.com](mailto:gbrickner@republicmo.com)  
(417) 732-3405

**Important Notice Regarding Competitive Bidding:**

It is the City's intent and desire that this Invitation for Bid promotes competitive Bidding. To the extent any language, requirements, terms and/or requests contained within this Invitation for Bid result in the elimination of all but one source from which a responsive and responsible Bid may be submitted, such restriction/limitation is not intended by the City but is merely an unintentional error. In the event such error is discovered by any potential Bidder, the potential Bidder must notify the City contact listed above of the error, in writing, no later than three (3) days prior to the Bid opening day. Upon receipt of any such notice, the City will take reasonable efforts to correct the error and resubmit the Invitation for Bid once corrected.

## TERMS AND CONDITIONS

01. **Opening Location:** Bids submitted in response to this Invitation for Bid ("IFB") will be opened at Republic City Hall, located at 213 N. Main Avenue, at 3:00 P.M. on Monday July 10th. All Bidders (individually, "Bidder"; collectively, "Bidders") and/or their authorized representative(s) are permitted to attend the opening of the Bids.
02. **IFB Delivery Requirements:** Any Bids received after the above stated time and date will not be considered. It shall be the sole responsibility of the Bidder to have their Bid delivered to Republic City Hall for receipt on or before the due date and time indicated.
- If a Bid is sent by U.S. Mail, the Bidder shall be responsible for its timely delivery to Republic City Hall.
  - Bids delayed by mail shall not be considered, shall not be opened, and shall be rejected.
  - Arrangements may be made for their return at the Bidder's request and expense.
  - Bids may be mailed to Republic City Hall and accepted if the signed Bid form and required information was mailed and received prior to the due date and time.
  - Bids sent by email will not be accepted.

**Sealed and Marked:** If sent by mail, one original signed Bid shall be submitted in one sealed package, clearly marked on the outside of the package with the **IFB project name clearly indicated on the outside of the mailing envelope and addressed to:**

City of Republic  
C/O City Clerk, Laura Burbridge  
213 N. Main  
Republic MO 65738

03. **Legal Name and Signature:** Bids shall clearly indicate the legal name, address, and telephone number of the Bidder (company, firm, corporation, partnership, or individual).
- Bids shall be manually signed above the printed name and title of signer on the Affidavit of Compliance page.
  - The signer shall have the authority to bind the Bidder to the submitted Bid.
  - Failure to properly sign the Bid form shall invalidate the Bid, and it shall not be considered for award.
04. **Corrections:** No erasures are permitted.
- In the event a correction is necessary, in order for the City to consider the correction, the following formatting must be applied:
    - A single line (strike-through) to the entered text needing correction, and
    - The corrected text written above the strike-through text, and
    - The signer(s) of the Bid must initial all corrections.
05. **Clarification and Addenda:** Bidders are expected to examine all documents attached to and/or provided by the City with this IFB, and prior to submitting any Bid in response to this IFB, make any necessary and/or reasonable inquiries of the City to ensure all such Bidders understand the entirety of the documents.
- Any inquiries or suggestions concerning interpretation, clarification, or other additional information pertaining to the IFB shall be made through the listed City contact in writing (email is permitted).
  - The City of Republic shall not be responsible for verbal interpretations or other information given by any individual purporting to be employed by or otherwise representing the City.
  - The issuance of written addenda is the official method whereby interpretation, clarification, or additional information can be given.
  - It shall be the responsibility of each Bidder, prior to submitting their Bid, to direct any inquiries to the listed City contact.
06. **IFB Expenses:** There is no expressed or implied obligation for the City of Republic to reimburse responding

Bidders and the City will not reimburse for any expenses incurred in preparing responses to this IFB.

07. **Bid Security:** All Bids must be accompanied by a Bid Security, which shall constitute the Bidder's guarantee that, if awarded the contract under this IFB, the Bidder will promptly execute all contract documents and other documents required under this IFB, and will furnish good and sufficient bond for the performance of the same.
- a. The Bid Security shall consist of a certified check, cashier's check or a Bid bond, guaranteed by a surety company authorized by the Director of the Missouri Department of Insurance and Commerce to conduct surety business in the state of Missouri, in an amount no less than ten percent (10%) of the Bid, and made payable to the City of Republic.
  - b. Bids submitted without the required Bid Security will not be considered for award under this IFB.
  - c. The Bid Securities of all Bidders, except for the three apparent lowest Bidders, will be returned as soon as reasonably possible after the opening and review of Bids.
  - d. The City shall have the right to retain the Bid Security of the three apparent lowest Bidders until either: (1) all contract documents have been duly executed and all required bonds and proof of insurance, including certificates of insurance, have been furnished by the Bidder to the City; or (2) all Bids have been rejected, whichever occurs first.
08. **Irrevocable Offer:** Any Bid may be withdrawn up until the due date and time set for opening of the IFB. Any Bid not so withdrawn shall, upon opening, constitute an irrevocable offer for a minimum period of ninety (90) days to provide to the City the goods or services set forth in the IFB, until one or more of the Bids have been duly accepted by the City.
09. **Responsive and Responsible Bidder:** To be a responsive Bidder, a Bidder shall submit a Bid which conforms in all material respects to the requirements set forth in the IFB. To be a responsible Bidder, the Bidder shall have the capability in all respects to perform fully the contract requirements, and the tenacity, perseverance, experience, integrity, reliability, capacity, facilities, equipment and credit which will ensure good faith performance. The lowest responsible Bidder shall mean the Bidder who makes the lowest Bid to sell goods or services of a quality which conforms closest to the quality of goods or services set forth in the specifications or otherwise required by the City and who is known to be fit and capable to perform the Bid as made.
10. **Reserved Rights:** The City reserves the right to make such investigations as it deems necessary to make the determination of the Bidder's responsiveness and responsibility. Such information may include but shall not be limited to: current financial statement, verification of availability of equipment and personnel, and past performance records.
11. **The Right to Audit:** The Bidder agrees to furnish supporting detail as may be required by the City to support charges or invoices, to make available for audit purposes all records covering charges pertinent to the purchase, and to make appropriate adjustments in the event discrepancies are found.
- a. The City shall have the right to audit the Bidder's records pertaining to the work/product for a period of three (3) years after final payment.
  - b. The cost of any audit conducted pursuant to this term will be paid by the City.
12. **Applicable Law:** All applicable laws and regulations of the State of Missouri and the City including the City Procurement Regulations and Procedures will apply to any resulting agreement, contract, or purchase order entered into under the terms of this IFB. Any involvement with the City Procurement shall be in accordance with the Procurement Regulations and Procedures.
13. **Right to Protest:** Appeals and remedies are provided for in the City Procurement Regulations.
- a. Protestors shall seek resolution of their complaints initially with the City Purchasing Agent.

- b. Any protest shall state the basis upon which the solicitation or award is contested and shall be submitted within ten (10) calendar days after such aggrieved person knew or could have reasonably been expected to know of the facts giving rise thereto.

14. **Ethical Standards Applicable:** With respect to this IFB, if any Bidder violates or is a party to a violation of the general ethical standards of the City Procurement Code or the State of Missouri Statutes, such Bidder will be disqualified from furnishing the goods or services for which the Bid is submitted and shall be further disqualified from submitting any future Bids.

15. **Collusion Absolutely Prohibited:** All Bidders offering a submission in response to this IFB hereby expressly acknowledge and certify that they have not divulged, discussed, or compared their Bid to the Bids of any other Bidder(s), and further that they have not colluded or conspired with any other Bidder or parties to this IFB, to violate the terms and conditions governing submission of responses to this IFB whatsoever. All Bidders offering a submission in response to this IFB additionally promise that:

- a. Any prices and/or cost data submitted have been arrived at independently, without consultation, communication, or agreement for the purpose of restricting competition, as to any matter relating to such prices and/or cost data, with any other Bidder or with any competitor.
- b. Any prices and/or cost data submitted have not knowingly been disclosed by the Bidder and will not knowingly be disclosed by the Bidder prior to the scheduled opening directly or indirectly to any other Bidder or to any competitor.
- c. No attempt has been made or will be made by the Bidder to induce any other person or firm to submit or not to submit a Bid for the purpose of restricting competition.
- d. The only person or persons interested in this Bid, principal or principals are named therein and that no person other than therein mentioned has any interest in this Bid or in any contract awarded under this IFB. No person or agency has been employed or retained to solicit or secure the contract awarded under this IFB upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee exempting bona fide employees or established commercial agencies maintained by the Purchaser for the purpose of doing business.

16. **Contract Forms:** Any agreement, contract, or purchase order resulting from the acceptance of a Bid shall be on forms either supplied by or approved by the City.

17. **Liability and Indemnity:**

- a. In no event shall the City be liable to the successful Bidder for special, indirect, liquidated, incidental, or consequential damages, except those caused by the City's gross negligence or willful or wanton misconduct arising out of or in any way connected with a breach of any agreement or contract under the terms of this IFB. The maximum liability of the City shall be limited to the amount of money to be paid or received by the City under any agreement or contract awarded under the terms of this IFB.
- b. The successful Bidder shall defend, indemnify and save harmless the City, its elected or appointed officials, agents and employees from and against any and all liability, suits, damages, costs (including attorney fees), losses, outlays, expenses, and claims, caused or allegedly caused by, or arising out of or related in any way whatsoever to (1) any agreement or contract awarded under this IFB, or (2) the work performed pursuant to such contract or agreement or any subcontract thereunder (the successful Bidder expressly acknowledging and assuming full responsibility for its subcontractors), including, but not limited to, claims for personal injuries, death, property damage, or for any other alleged damages.
- c. The successful Bidder shall indemnify and hold the City harmless from all wages or overtime compensation due any employees in rendering services pursuant to this agreement or any subcontract, including payment of reasonable attorneys' fees and costs in the defense of any claim made under the Fair Labor Standards Act, the Missouri Prevailing Wage Law or any other federal or state law.

18. **IFB Forms, Variances, and Alternates:** Bids must be submitted on the forms attached to this IFB as provided by the City; however, additional information may be attached. Bidders must indicate any variances from the City requested specifications and/or terms and conditions, on the IFB Affidavit of Compliance. Otherwise, Bidders

must fully comply with the City requested specifications and terms and conditions. Alternate Bids may or may not be considered at the sole discretion of the City Purchasing Agent.

19. **Bid Form:** All blank spaces must be completed with the appropriate response.
  - a. Bidders must state the price, written in ink, for what is proposed to complete each item of the project.
  - b. Bidders must insert the words "no Bid" in the space provided for any item for which no Bid is made.
  - c. Bidders must submit an executed Bid form, affidavit of compliance with other requested documents.
20. **Modifications or Withdrawal of Bid:** A modification of a Bid already submitted will be considered only if the modification is received prior to the time announced for opening of Bids, and is made in writing; executed and submitted on the same form and manner as the original Bid. Modifications submitted by telephone, fax, or email will not be considered.
21. **No Bid:** If not submitting a Bid, respond by returning the "Statement of No Bid" no later than the stated Bid opening time and date, and explain the reason in the space provided.
22. **Errors in Bids:** Bidders are expected to fully inform themselves as to the conditions, requirements, and specifications before submitting Bids; failure to do so will be at the Bidder's own risk. Applicable law and regulations do not make allowance for errors either of omission or inclusion on the part of Bidders. In case an error regarding extension of prices in the Bid, the unit price shall govern.
23. **Prices:** Bids must include both unit price and extended total.
  - a. Price must be stated in units of quantity specified in the Bidding specifications. In case of discrepancy in computing the amount of the Bid, the unit price of the Bid will govern.
  - b. All prices shall be F.O.B. destination, freight prepaid (unless otherwise stated in special conditions). FOB, as used in this IFB, shall mean that the successful Bidder, at their own expense, shall transport the equipment and/or materials and bear the risk of loss from successful Bidder's location to a specified location in the City of Republic. City shall not take title to the materials or equipment until it is delivered and accepted by City at the address specified within the City of Republic.
  - c. Each item must be Bid separately and no attempt is to be made to tie any item or items in with any other item or items.
  - d. If a Bidder offers a discount on payment terms, the discount time will be computed from the date of satisfactory delivery at place of acceptance and receipt of correct invoice at the office specified.
  - e. Payment terms shall be Net 30 if not otherwise specified.
  - f. Pre-payment terms are not acceptable.
24. **Discounts:** Any and all discounts, except cash discounts for prompt payments, must be incorporated as a reduction in the Bid price and not shown separately. The price as shown on the Bid shall be the price used in the City's determination of award(s).
25. **Descriptive Information:** All equipment, materials, and articles incorporated in the product/work covered by this IFB are to be new and of suitable grade for the purpose intended.
  - a. Brand or trade names referenced in specifications are for comparison purposes only.
  - b. Bidders may submit Bids on items manufactured by an individual/entity other than the manufacturer specified so long as an "or equal" is expressly stated.
26. **Deviations to Specifications and Requirements:** When Bidding on an "or equal," Bids must be accompanied with all descriptive information necessary for an evaluation of the proposed material or equipment such as the detailed drawings and specifications, certified operation and test data, and experience records.
  - a. Failure of any Bidder to furnish the data necessary to determine whether the product is equivalent, may be cause for rejection of the specific item(s) to which it pertains.
  - b. All deviations from the specifications must be noted in detail by the Bidder on the Affidavit of Compliance form, at the time of submittal of Bid.

- c. The absence of listed deviations at the time of submittal of the Bid will hold the Bidder strictly accountable to the specifications as written.
- d. Any deviation from the specifications as written and accepted by the City may be grounds for rejection of the material and/or equipment when delivered.

27. **Quality Guaranty:** If any product delivered does not meet applicable specifications or otherwise fails to compare with the quality represented by the Bidder, the Bidder shall retrieve the product from the City as its own expense. The Bidder shall refund to the City any money the City has remitted to the Bidder for same. In the event the successful Bidder fails or refuses to retrieve the product and refund to the City any money previously remitted to the Bidder for such product in accord with the terms of this paragraph, the Bidder shall be responsible for the City's attorney fees and other costs it incurs in enforcing its rights under this paragraph.
28. **Quality Terms:** The City reserves the right to reject any or all materials if, in its judgment, the item reflects unsatisfactory workmanship, manufacturing, or shipping damages.
29. **Tax-Exempt:** The City is exempt from sales taxes and Federal Excise Taxes: Missouri Tax ID Number 12492990.
30. **Bid Awards:** Awards will be made to the Bidder whose Bid (1) meets the specifications and all other requirements of the IFB and (2) is the lowest and best Bid, considering price, delivery, responsibility of the Bidder, and all other relevant factors.
- a. Unless otherwise stated in the IFB, cash discounts for prompt payment of invoices will not be considered in the evaluation of prices. However, such discounts are encouraged to motivate prompt payment.
  - b. As the best interest of the City may require, the right is reserved to make awards by item, group(s) of items, all or none or a combination thereof; and to reject any and all Bids or waive any minor or non-material irregularity or technicality in Bids received.
31. **Authorized Product Representation:** The successful Bidder(s) by virtue of submitting the name and specifications of a manufacturer's product will be required to furnish the named manufacturer's product. By virtue of submission of the stated documents, it will be presumed by the City that the Bidder(s) is legally authorized to submit and the successful Bidder(s) will be legally bound to perform according to the documents.
32. **Regulations:** It shall be the responsibility of each Bidder to assure compliance with OSHA, EPA, Federal, State of Missouri, and City rules, regulations, or other requirements, as each may apply.
- a. **E-VERIFY COMPLIANCE REQUIREMENTS:** All contractors or subcontractors to be utilized by Bidder on contracts exceeding five thousand dollars shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services and affirm that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services.
  - b. Bidders are herein informed that the work to be performed under this IFB is subject to the requirements of Section 292.675, RSMo., which requires all contractors or subcontractors perform work such to provide and require its on-site employees to complete a ten (10) hour course in construction safety and health approved by the Occupational Safety and Health Administration ("OSHA") or a similar program approved by the Missouri Department of Labor and Industrial Relations which is at least as stringent as an approved OSHA program. The training must be completed within sixty (60) days of the date work on the Project commences. On-site employees found on the worksite without documentation of the required training shall have twenty (20) days to produce such documentation.
  - c. Pursuant to Section 292.675 RSMo., the successful Bidder shall forfeit to the City as a penalty two thousand five hundred dollars (\$2,500.00), plus one hundred dollars (\$100.00) for each on-site employee employed by it, or any contractors or subcontractors hired by it, for each calendar day, or portion thereof, Such on-site employee is employed without the construction safety training required in the above paragraph.

d. Section 208.009 RSMo. shall apply to any contracts awarded under this Bid.

33. **Termination of Award:** Any failure of the Bidder to satisfy the requirements of the City shall be reason for termination of the award. Any Bid may be rejected in whole or in part for any reason by the City.
34. **Royalties and Patents:** The successful Bidder(s) shall pay all royalties and license fees for equipment or processes in conjunction with the equipment being furnished. Bidder shall defend all suits or claims for infringement of any patent right and shall hold the City harmless from loss on account or cost and attorney's fees incurred.
35. **Equal Employment Opportunity Clause:** The City of Republic, in accordance with the provision of Title VI of the Civil Rights Act of 1964 (78 Stat. 252) and the Regulations of the Department of Commerce (15 CFR, Part 8) issued pursuant to the aforementioned Civil Rights Act, hereby notifies all Bidders that the City takes all reasonably necessary steps to affirmatively ensure that all Bidders, including minority businesses, will be afforded full opportunity to submit Bids in response to this IFB and that no Bidder will be discriminated against on the grounds of race, color, or national origin in determining the successful Bidder for award.
36. **Insurance Requirements:** For the duration of any contract awarded under this IFB, (which, for projects including any labor, means until the work is completed and accepted by the City; and which, for projects involving supply of materials only, means until the materials are delivered and accepted by the City), the successful Bidder is required to maintain certain insurance to protect it and the City against risks of loss in connection with the Project, as defined more fully below. The Successful Bidder will be required to provide the City with proof of insurance that satisfies the requirements stated below, unless otherwise specified by the City. The insurance requirements below may be modified or waived by the City at the City's sole discretion.
- a. **Workers' Compensation:** The Successful Bidder shall maintain Employers Liability and Workers Compensation Insurance for all persons it will employ or retain to perform any work in connection with a contract awarded under this IFB, and in the event the Successful Bidder will sublet or subcontract any such work, the Successful Bidder shall require the subcontractor to provide similar Workers Compensation Insurance for the subcontractor's employees, unless such employees are covered by the Successful Bidder's coverage. Workers Compensation coverage shall meet the minimum requirements under Missouri law of \$500,000 each employee and \$500,000 each accident.
  - b. **Commercial General Liability:** The Successful Bidder shall maintain Commercial General Liability coverage for personal and advertising injury, bodily injury including accidental death, and broad-form property damage, which may arise from the performance of any contract awarded under this IFB, in an aggregate amount of not less than \$2,000,000 each occurrence and \$1,000,000 each person.
  - c. **Commercial Automobile Liability (*applies only to projects involving the Successful Bidder's operation of vehicles in performing the work awarded under this IFB*):** The Successful Bidder shall maintain Commercial Automobile Liability coverage of not less than \$2,000,000 each occurrence and \$1,000,000 each person for "any auto" on an occurrence basis.
37. **Performance Bond and Labor & Materials Payment Bond (*applies only to projects involving labor*):** Pursuant to Section 107.170, RSMo., if the total cost of the project is estimated to exceed \$50,000.00, the successful Bidder shall execute a Performance and Maintenance Bond and a Labor and Materials Payment Bond with surety, approved by the City and on forms approved by the City, each bond shall be in the amount of the total project cost, conditioned upon the full and faithful performance of all major terms and conditions of the IFB and payment of all labor and material supplies.

38. **Liquidated Damages:** Time of completion of the Project by the Successful Bidder is of the essence. Should the Successful Bidder fail to complete the Project within the time specified in the governing contract/schedule, without express authorization by the City allowing for an extension of time to completion, the Successful Bidder shall be liable to the City in the amount of \$100 per day for each and every calendar day the Project remains uncompleted, as liquidated damages, and not as a penalty, it being stipulated and agreed that the actual damages to the City arising from the Successful Bidder's failure to timely complete the Project would be difficult, if not impossible, to reasonably ascertain. Assessment of liquidated damages will not relieve the Successful Bidder, or its surety/ies, of any responsibility or obligation under the Contract.
39. **Nonresident/Foreign Contractors:** To the extent the successful Bidder utilizes non-resident/foreign contractors to provide services or supplies in connection with this IFB, the successful Bidder shall procure and maintain:
- a. A certificate of authority to transact business in the State of Missouri from the Secretary of State, unless exempt pursuant to the provisions of Section 351.570, RSMo.
  - b. A certificate from the Missouri Director of Revenue evidencing compliance with the transient employer financial assurance law, unless exempt pursuant to the provisions of Section 285.230, RSMo.
40. **Bid Tabulation:** Bidders may request a copy of the Bid tabulation of the IFB.
41. **Budgetary Constraints:** The City reserves the right to reduce or increase the quantity, retract any item from the Bid, or upon notification, terminate entire agreement without any obligations or penalty based upon availability of funds.
42. **Additional Purchases by Other Public Agencies:** By submitting a Bid in response to this IFB, the Bidder authorizes other publicagencies to "Piggy-Back" or purchase equipment and services being proposed in this IFB unless otherwise noted on the Affidavit of Compliance Form.
43. **Order of Precedence:** Any and all Special/General Conditions and Specifications attached hereto, which varies from the instruction to Bidders, shall take precedence.
44. **Affidavit for Service Contracts:** The successful Bidder represents, in accordance with Section 285.530.2, RSMo., that it has not employed, or subcontracted with, unauthorized aliens in connection with the scope of work to be done under this IFB and agrees to provide an affidavit to the City of Republic affirming that it has not, and will not at any point in time relating to this IFB, knowingly employ, or subcontract with, any person who is an unauthorized alien.
45. **Inspection and Acceptance:** No item(s) received by the City pursuant to any agreement or contract awarded under this IFB shall be deemed accepted by the City until the City has had reasonable opportunity to inspect the item(s).
- a. Any item(s) which are discovered to be defective, or which do not conform to any warranty of the successful Bidder and/or entity/individual who sold the item(s), upon inspection, may be returned by the City to the successful Bidder and/or entity/individual who sold the item(s) for full credit and reimbursement or replacement.
  - b. If, at a later time, any defect is discovered which was not ascertainable upon the initial inspection, the City may also return the defective item(s) to the successful Bidder and/or entity/individual who sold the item(s) for full credit and reimbursement or replacement.
  - c. The City's return of defective items shall not exclude any other legal, equitable or contractual remedies the City has under applicable Missouri or Republic law and/or any agreement or contract awarded under this IFB.

46. **Davis-Bacon Act:** If the Instructions to Bidders have indicated that the Project is financed, in whole or in part, from Federal funds, then all work performed pursuant to any contract awarded under this IFB shall be subject to all applicable federal statutes, rules and regulations, including provisions of the Davis-Bacon Act, 40 U.S.C. §3141 et seq., and the "Federal Labor Standards Provisions," incorporated into this any agreement or contract awarded under this IFB.. Where the Missouri Prevailing Wage Law and the Davis-Bacon Act require payment of different wages for work performed pursuant to any contract awarded under this IFB, all contractors, subcontractors and other individuals/entities hired by the successful Bidder to perform work under this IFB shall pay the greater of the wages required under either law.
47. **Jurisdiction and Venue:** This IFB and any executed agreement required pursuant to the terms of this IFB, shall be taken and deemed to have been fully executed and made by the parties herein and governed by the laws of the State of Missouri for all purposes and intents. Venue under this Agreement or any disputes that come from it shall be in the Circuit Court of Greene County, Missouri. **THE PARTIES HEREBY WAIVE THEIR RIGHT TO A JURY TRIAL UNDER ANY APPLICABLE STATUTE, COMMON LAW OR FEDERAL OR STATE CONSTITUTION.**
48. **Conflict of Interest:** By participating in this IFB and/or accepting an agreement pursuant to the IFB's terms, the successful Bidder certifies that no salaried officer or employee of the City, and no member of the City Council or Mayor of the City of Republic, has a financial interest, direct or indirect, in this Agreement. Any federal regulations and applicable provisions in Section 105.450 et seq., RSMo. shall not be violated.
49. **Sovereign Immunity:** In no event shall any language or requirement in this IFB or any Agreement that comes from this IFB be construed as or constitute a waiver or limitation of City's defenses with regard to sovereign immunity, governmental immunity, or official immunity under federal or state constitutions, states, and/or laws.
50. **Terms:** The City of Republic reserves the right to reject any and all proposals received from this Bid. It further has the right to negotiate with any qualified source, or to cancel in part or in its entirety this Bid. The City also reserves the right to modify, suspend, or terminate at its sole discretion any and all aspects of this bud process, to obtain further information from any and all respondents, and to waive any defects as to form or content of the Bid or any submissions by any firm. This bud does not commit the City to award a contract, to defray any costs incurred in the preparation of a response to this request, or to procure or contract for services. All submissions become the property of the City as public record. All submissions may be subject to public review upon request.

## ATTACHMENT A - BID SUBMISSION FORM

BIDDERS MUST PROVIDE THE FOLLOWING INFORMATION:

Description of Work	Price
<p>Prepare the attached "Bid Submission Form Template" to develop unit and extended costs. Confirm description of proposed equipment.</p> <p>A Bid Submission form template should be developed for all pricing options/alternatives presented.</p> <p><b>Please note any of the following:</b></p> <ul style="list-style-type: none"><li>• Any labor personnel requests of the City of Republic for this project.</li><li>• Any other requests or responsibilities of the City of Republic for this project.</li></ul>	Flow Monitoring Summary: _____
	Sewer Band Cost Summary: _____
	Rain Gauge Cost Summary: _____
	Software Cost Summary: _____
	Total Cost: _____

In compliance with this Invitation for Bid and to all terms, conditions, and specifications imposed therein and hereby incorporated by reference, the undersigned offers and agrees to furnish the goods and/or services described herein.

<b>City of Republic, Missouri</b>  <b>IFB for: Sanitary Sewer Flow Metering 2023</b>  <b>Republic, MO 65738</b>	<b>Company Legal Name:</b> _____ _____
	<b>Address:</b> _____ _____ _____
	<b>Signature:</b> _____  <b>Name and Title:</b> _____ _____
<b>Telephone:</b> _____ <b>Cellular:</b> _____ <b>Email:</b> _____	<b>Dated:</b> _____  <b>Bidder's Federal ID Number:</b> _____

**NOTICE AND INSTRUCTIONS TO BIDDERS/VENDORS**  
**Regarding Sections 285.525 through 285.550 RSMo., effective January 1, 2009,**  
**and Section 292.675 RSMo., effective August 28, 2009**

Effective January 1, 2009 and pursuant to Section 285.530(1) of the Revised Statutes of Missouri, "[n]o business entity or employer shall knowingly employ, hire for employment, or continue to employ an unauthorized alien to perform work within the state of Missouri."

State law additionally provides that, as a condition for the award of any contract or grant in excess of five thousand dollars by the state or by any political subdivision of the state (*e.g., the City of Republic*) to a business entity (*e.g., potential bidders in response to this IFB*), the business entity (Company) shall, by sworn affidavit and provision of documentation, affirm its enrollment and participation in a federal work authorization program with respect to the employees working in connection with the contracted services. Every such business entity shall sign an affidavit affirming that it does not knowingly employ any person who is an unauthorized alien in connection with the contracted services. See § 285.530(2), RSMo.

Section 285.530 RSMo. pertains to all solicitations for services over \$5,000, but does not apply to solicitations for goods only. If a solicitation is for a combination of services and goods, Section 285.530 RSMo. applies if the services portion of the solicitation is over \$5,000.

1. **Required Affidavit for Contracts Over \$5,000.00 (US)** – Effective 1-1-2009, the company (submitting a Bid) shall comply with the provisions of Section 285.525 through 285.550, RSMo., which require certain statements to be made under penalty of perjury pertaining to employment of unauthorized aliens. The award of any contract under this IFB is expressly contingent on the company (submitting a Bid) providing an acceptable, notarized affidavit, stating as follows:
  - a. that said company is enrolled in and participates in a federal work authorization program with respect to the employees working in connection with the contracted services; and
  - b. that said company does not knowingly employ any person who is an unauthorized alien in connection with the contracted services.

The terms used in this affidavit shall have the meaning set forth in Section 285.500 RSMo., *et seq.*

2. Additionally, Company must provide documentation evidencing current enrollment in a federal work authorization program (e.g. electronic signature page from E-Verify Program's Memo of Understanding (MOU). See attached sample.

A copy of the required affidavit is included on the following page. A digital copy of the affidavit can also be accessed and downloaded from the City of Republic's official website, URL address: <https://www.republicmo.com/DocumentCenter/View/77/Affidavit-of-Compliance-with-Section-285500-RSMO-PDF?bidId=>

The City of Republic is an E-Verify employer. The City of Republic encourages companies that are not already enrolled and participating in a federal work authorization program to do so. E-Verify is an example of a federal work authorization program. Information regarding E-Verify is available at <http://www.uscis.gov/e-verify> or by calling **888-464-4218**.

**Affidavit of Compliance with Section 285.500, RSMo., et seq.  
for all agreements providing services in excess of \$5,000.00**

Effective 1/1/2009

STATE OF MISSOURI       )  
                                          ) ss.  
COUNTY OF GREENE       )

Before me, the undersigned Notary Public, in and for the County of \_\_\_\_\_, State of \_\_\_\_\_, personally appeared \_\_\_\_\_ (Name) who is \_\_\_\_\_ (Title) of \_\_\_\_\_ (Name of company), a (circle one) corporation, partnership, sole proprietorship, limited liability company, and is competent and authorized to make this affidavit, and being duly sworn upon oath deposes and says as follows:

- (1) that said company is enrolled in and participates in a federal work authorization program with respect to the employees working in connection with the contracted services; and
- (2) that said company does not knowingly employ any person who is an unauthorized alien in connection with the contracted services.

The terms used in this affidavit shall have the meaning set forth in Section 285.500 RSMo., et seq.

**Documentation of participation in a federal work authorization program is attached to this affidavit.**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_

Company ID Number: XXXXXX

The foregoing constitutes the full agreement on this subject between the SSA, DHS (Department of Homeland Security), and the Employer.

The individuals whose signatures appear below represent that they are authorized to enter into this Memorandum of Understanding on behalf of the Employer and DHS respectively.

To be accepted as a participant in E-Verify, you should only sign the Employer's Section of the signature page. If you have any questions, contact E-Verify Operations at 888-464-4218.

**Employer, Your Company Name**

**John Doe**

Name (Please type or print)

Title

**Electronically Signed**

Signature

Date

**Verification**

**Department of Homeland Security Division**

**USCIS Verification Division**

Name (Please type or print)

Title

**Electronically Signed**

Signature

Date

Sample  
E-Verify  
Memo of  
Understanding - MOU  
Electronic Signature  
Page

**City of Republic, Missouri**  
**AFFIDAVIT OF COMPLIANCE WITH INVITATION FOR BID**

***To be submitted with all Bids in response to this IFB***

\_\_\_\_\_ We **DO NOT** take exception to the IFB Documents/Requirements.

\_\_\_\_\_ We **TAKE** exception to the IFB Documents/Requirements as follows:

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I have carefully examined the Invitation for Bid and agree to abide by all submitted pricing, delivery, terms and conditions of this IFB unless otherwise stipulated herein.

Company Name \_\_\_\_\_

By \_\_\_\_\_

(Authorized Person's Signature)

Company Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Telephone Number \_\_\_\_\_

Fax Number \_\_\_\_\_

Date \_\_\_\_\_

**ADDENDA**

Offeror acknowledges receipt of the following addendum:

Addendum No. \_\_\_\_\_

Addendum No. \_\_\_\_\_

Addendum No. \_\_\_\_\_

Addendum No. \_\_\_\_\_

Email \_\_\_\_\_

Federal Tax ID No. \_\_\_\_\_

DBE Vendor (Yes/No): \_\_\_\_\_ Minority Owned: \_\_\_\_\_

Women Owned: \_\_\_\_\_

Veteran Owned: \_\_\_\_\_

**City of Republic, Missouri**  
**STATEMENT OF "NO PROPOSAL" / "NO BID"**

**RETURN THIS PAGE ONLY IF YOUR COMPANY PROVIDES THE PRODUCTS/SERVICES BEING BID AND DECLINES TO DO SO.**

WE, THE UNDERSIGNED, HAVE DECLINED TO BID ON YOUR IFB FOR THE FOLLOWING REASON(S):

\_\_\_\_\_ SPECIFICATIONS ARE TOO "TIGHT," I.E. GEARED TOWARD ONE BRAND OR MANUFACTURER ONLY (PLEASE EXPLAIN IN THE "REMARKS" SECTION BELOW).

\_\_\_\_\_ INSUFFICIENT TIME TO RESPOND TO INVITATION FOR BID.

\_\_\_\_\_ OUR PRODUCT SCHEDULE WOULD NOT PERMIT US TO PERFORM.

\_\_\_\_\_ UNABLE TO MEET SPECIFICATIONS.

\_\_\_\_\_ UNABLE TO MEET INSURANCE REQUIREMENTS.

\_\_\_\_\_ SPECIFICATIONS UNCLEAR (PLEASE EXPLAIN IN THE "REMARKS" SECTION BELOW).

\_\_\_\_\_ OTHER (PLEASE SPECIFY IN THE "REMARKS" SECTION BELOW).

REMARKS:

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COMPANY NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

TITLE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

TELEPHONE NUMBER: \_\_\_\_\_

DATE: \_\_\_\_\_

# State of Missouri

## Limited Exemption from Missouri State Sales and Use Tax on Purchases (Political Subdivision)

Issued To:

MISSOURI ID: 12492990

CITY OF REPUBLIC  
213 N MAIN AVE  
REPUBLIC, MO 65738-1472

Effective Date: 07/11/2002

Your application for sales and use tax exempt status has been approved under Section 144.030.1, RSMo. This letter is issued as documentation of your agency's exempt status. Your agency must adhere to all requirements of your exempt status.

This is a continuing exemption subject to legislative changes and review by the Director of Revenue. Outlined below are specific requirements regarding this exemption. This summary is not intended as a complete restatement of the law. You should review the law to ensure your understanding and compliance.

- This exemption is not assignable or transferable. It is an exemption from sales and use taxes only and is not an exemption from real or personal property tax.
- Purchases by your agency are not subject to sales or use tax if conducted within your agency's exempt functions and activities. When purchasing with this exemption, furnish all sellers or vendors a copy of this letter.
- Individuals making personal purchases may not use this exemption.
- A contractor may purchase and pay for construction materials exempt from sales tax when fulfilling a contract with your agency only if your agency issues a project exemption certificate and the contractor makes purchases in compliance with the provisions of Section 144.062 RSMo.
- Sales by your agency are subject to all applicable state and local sales taxes.
- If your agency engages in the business of selling tangible personal property or taxable services at retail, you must obtain a Missouri Retail Sales Tax License and collect and remit state and local sales taxes.
- Any alteration to this exemption letter renders it invalid.

If you have any questions regarding the use of this letter, contact the Taxation Division, Post Office Box 358, Jefferson City, MO 65105-0358, [salestaxexemptions@dor.mo.gov](mailto:salestaxexemptions@dor.mo.gov), or call 573-751-2836.

Notice Number: 2017597353

## MISSOURI PROJECT EXEMPTION CERTIFICATE

Authorization for Purchasing Construction Materials for Tax Exempt Project  
(The Form and Content of this Exemption Certificate have been approved by the Missouri Department of Revenue)

### **EXEMPT ENTITY ISSUING CERTIFICATE**

Name: City of Republic, Missouri  
Address: 213 N. Main Avenue  
City/State/Zip: Republic, Missouri 65738

MO Tax Exempt I.D. #: 12492990

Contract Date:

Contract #: \_\_\_\_\_

Project Description: \_\_\_\_\_

Project Location: \_\_\_\_\_

Project Completion Date: \_\_\_\_\_

Auth. Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Letter Effective Date:

Certificate Expiration Date:

Revised Expiration Date: \_\_\_\_\_

The Missouri exempt entity named above hereby authorizes the purchase, without sales tax, of tangible personal property to be incorporated or consumed in the construction of the project identified herein and no other, pursuant to Section 144.62, RSMo.

### **PURCHASING CONTRACTOR OR SUBCONTRACTOR**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

## INSTRUCTIONS

**EXEMPT ENTITY** - A signed copy of this certificate, along with your MO Tax Exemption Letter, must be furnished to each contractor and/or subcontractor who will be purchasing tangible personal property for use in the project. It is the exempt entity's responsibility to ensure the validity of the certificate. You must issue a certificate with a Revised Expiration Date if purchases will be required to complete the project beyond the original Project Exemption Date.

**CONTRACTOR OR SUBCONTRACTOR** - The contractor shall furnish a completed copy of this exemption certificate, along with a copy of the exempt entity's MO Tax Exemption Letter, to all subcontractors, and any contractor or subcontractor purchasing materials shall present copies of such documents to all material suppliers as authorization to purchase, on behalf of the exempt entity, all tangible personal property and materials to be incorporated or consumed in the construction of that project and no other on a tax-exempt basis. A copy of each certificate must be retained by the purchaser for a period of five years.

**MATERIAL SUPPLIER** - A completed copy of this exemption certificate, along with the MO Tax Exemption Letter of the exempt entity contracting for the project, must be obtained from the contractor or subcontractor making purchases of tangible personal property for use in the project, and retained for audit purposes. Invoices issued for such purchases must reflect the name of the exempt entity and the project number assigned by the exempt entity shown above.

**Bid Submission Form Template**  
City of Republic, Missouri

Bid Alternative #: \_\_\_\_\_

Item Description	Quantity	Unit Rate	Extended Cost	Notes
<b>Flow Monitoring Equipment</b>				
Flow Meter & Battery Module	5	\$	\$	
A/V Probes	5	\$	\$	
Modems (Telemetry)	5	\$	\$	
Cabling & Appurtenances	5	\$	\$	
<b>Sewer Bands</b>				
18 inches & Below (6,8,10,12,15,18)	5	\$	\$	
21" or Greater	2	\$	\$	
<b>Rain Gauge</b>				
Rain Gauge & Tipping Bucket	1	\$	\$	
Modem	1	\$	\$	
<b>Software Installation</b>				
Meter Install Configuration (Mobile)	1	\$	\$	Meter & Rain Gauge Installation & Configuration
Cloud Hosting Environment	1	\$	\$	Cloud Hosting for Five Meter Sites and one (1) Rain Gauge
<b>Total Bid Alternative Cost</b>			\$	



# AIA<sup>®</sup> Document A310<sup>™</sup> – 2010

## Bid Bond

### CONTRACTOR:

(Name, legal status and address)

CORE & MAIN LP  
2854 E Kearney  
Springfield, MO 65803

### SURETY:

(Name, legal status and principal place of business)

RLI INSURANCE COMPANY  
9025 North Lindbergh Drive  
Peoria, IL 61615

### OWNER:

(Name, legal status and address)

CITY OF REPUBLIC  
c/o City Clerk Laura Burbridge  
213 North Main Avenue, Republic, MO 65738

**BOND AMOUNT:** Ten Percent of Amount bid  
(10% of Amount Bid)

### PROJECT:

(Name, location or address, and Project number, if any)

Sanitary Sewer Flow Metering 2023

Project Number, if any:

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

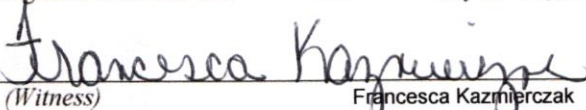
Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

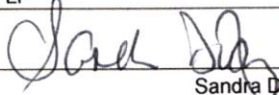
The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.


When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 6th day of July, 2023

  
(Witness) Francesca Kazmierczak

CORE & MAIN LP  
(Principal)  (Seal)  
(Title) Sandra Diaz, Attorney in Fact

  
(Witness) Beverly Woolford


RLI INSURANCE COMPANY  
(Surety)  (Seal)  
(Title) Anne Potter, Attorney in Fact

## LIMITED POWER OF ATTORNEY

The undersigned, Core & Main LP, a Florida limited partnership (the "Company"), hereby designates Susan Welsh, Frances Rodriguez, Sara Owens, Ben Stahl, Sandra Diaz, Anne Potter, Francesca Kazmierczak, Elizabeth Sterling, Jennifer Jakaitis, Marisa Thielen and Wayne McVaugh of Aon Corporation as its attorneys in fact (referred to individually or collectively as "the Agent") on the following terms and conditions:

1. **Authority to Act.** The Agent is authorized to act for the Company under this Power of Attorney.
2. **Powers of Agent.** The Agent shall have the full power and authority to execute and deliver surety, performance, bid and payment bonds (collectively, "Bonds") in an amount not to exceed \$10,000,000.00 per Bond, upon receipt by the Agent of a written request for a Bond from an individual or individuals at the Company or its subsidiaries duly authorized to make such a request.
3. **Reliance by Third Parties.** Third parties may rely upon the representations of the Agent as to all matters regarding powers granted to the Agent. No person who acts in reliance on the representations of the Agent or the authority granted under this Power of Attorney shall incur any liability to the Company for permitting the Agent to exercise any power prior to actual knowledge that the Power of Attorney has been revoked or terminated by operation of law or otherwise.
4. **Indemnification of Agent.** No agent named or substituted in this power shall incur any liability to the Company for acting or refraining from acting under this power, except for such agent's own misconduct or negligence.
5. **Original Counterparts.** Photocopies of this signed Power of Attorney shall be treated as original counterparts.
6. **Compensation.** The Agent shall be reimbursed for reasonable expenses incurred while acting as Agent and may receive reasonable compensation for acting as Agent.

Dated: July 11, 2022

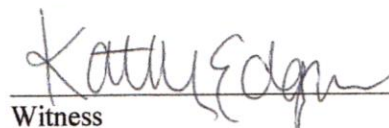


Name: Mark Witkowski

Signed in the presence of:




Witness



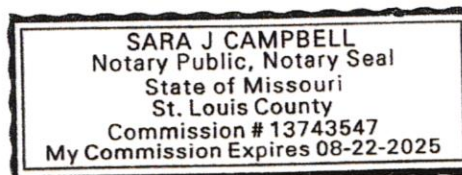
Witness

Subscribed and sworn to before me on July 11, 2022

  
Notary Public, [County/State] ST LOUIS, MISSOURI

My commission expires: 08-22-2025

(SEAL)



# POWER OF ATTORNEY

## RLI Insurance Company Contractors Bonding and Insurance Company

9025 N. Lindbergh Dr. Peoria, IL 61615  
Phone: 800-645-2402

### Know All Men by These Presents:

That this Power of Attorney is not valid or in effect unless attached to the bond which it authorizes executed, but may be detached by the approving officer if desired.

That **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, each an Illinois corporation, (separately and together, the "Company") do hereby make, constitute and appoint:

Debra A. Deming, Sandra Diaz, Valorie Spates, Susan A. Welsh, Jennifer L. Jakaitis, Peter Healy, Aklima Noorhassan, Frances Rodriguez, Francesca Kazmierczak, Anne L. Potter, Kemal Brkanovic, Beverly A. Woolford, jointly or severally

in the City of New York, State of New York its true and lawful Agent(s) and Attorney(s) in Fact, with full power and authority hereby conferred, to sign, execute, acknowledge and deliver for and on its behalf as Surety, in general, any and all bonds and undertakings in an amount not to exceed Twenty Five Million Dollars (\$25,000,000.00) for any single obligation.

The acknowledgment and execution of such bond by the said Attorney in Fact shall be as binding upon the Company as if such bond had been executed and acknowledged by the regularly elected officers of the Company.

**RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, as applicable, have each further certified that the following is a true and exact copy of a Resolution adopted by the Board of Directors of each such corporation, and is now in force, to-wit:

"All bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or Agents who shall have authority to issue bonds, policies or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile."

IN WITNESS WHEREOF, the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, as applicable, have caused these presents to be executed by its respective Vice President with its corporate seal affixed this 8th day of March, 2023.



**RLI Insurance Company  
Contractors Bonding and Insurance Company**

By: Barton W. Davis Vice President

State of Illinois } SS  
County of Peoria

### CERTIFICATE

On this 8th day of March, 2023, before me, a Notary Public, personally appeared Barton W. Davis, who being by me duly sworn, acknowledged that he signed the above Power of Attorney as the aforesaid officer of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** and acknowledged said instrument to be the voluntary act and deed of said corporation.

I, the undersigned officer of **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, do hereby certify that the attached Power of Attorney is in full force and effect and is irrevocable; and furthermore, that the Resolution of the Company as set forth in the Power of Attorney, is now in force. In testimony whereof, I have hereunto set my hand and the seal of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** this 6th day of July, 2023.

By: Catherine D. Geiger  
Catherine D. Geiger Notary Public

**RLI Insurance Company  
Contractors Bonding and Insurance Company**

By: Jeffrey D. Fick Corporate Secretary





P.O. BOX 3967 PEORIA, IL 61612-3967  
P: (800)645-2402 E: asksurety@rlicorp.com  
RLISURETY.COM

# RLI Insurance Company

December 31, 2022

## Admitted Assets

### Investments:

Fixed maturities	\$ 1,343,631,923
Equity securities	1,268,806,758
Short-term investments	3,054,500
Real estate	27,014,108
Properties held to produce income	0
Cash and cash equivalents	57,699,481
Other invested assets	53,001,785
Receivables for securities	203,933
Agents' balances	88,924,498
Investment income due and accrued	10,365,084
Funds held	0
Reinsurance recoverable on paid losses	10,825,931
Federal income taxes receivable	1,430,379
Net deferred tax asset	11,010,858
Guarantee funds receivable or on deposit	0
Electronic data processing equipment, net of depreciation	755,308
Receivable from affiliates	0
Other admitted assets	39,343,761

Total Admitted Assets \$ 2,916,068,307

## Liabilities and Surplus

### Liabilities:

Reserve for unpaid losses and loss adjustment expenses	\$ 830,658,551
Unearned premiums	354,155,024
Accrued expenses	97,292,026
Funds held	422,374
Advance premiums	19,971,481
Amounts withheld	84,822,062
Remittances and items not allocated	1,448,394
Dividends declared and unpaid	44,327
Ceded reinsurance premium payable	28,148,458
Payable for securities	2,248,339
Statutory penalties	785,200
Current federal & foreign income taxes	0
Net deferred tax liability	0
Borrowed money and accrued interest	50,036,167
Drafts outstanding	0
Payable to affiliate	33,879,630
Other liabilities	4,231,114

Total Liabilities \$ 1,508,143,147

### Surplus:

Common stock	\$ 10,000,375
Additional paid-in capital	242,451,084
Unassigned surplus	1,155,473,701

Total Surplus \$ 1,407,925,160

Total Liabilities and Surplus \$ 2,916,068,307

State of Illinois }

County of Peoria }

The undersigned, being duly sworn, says: That he is the President of **RLI Insurance Company**; that said Company is a corporation duly organized, in the State of Illinois, and licensed and engaged in business in the State of \_\_\_\_\_ and has duly complied with all the requirements of the laws of said State applicable of said Company and is duly qualified to act as Surety under such laws; that said Company has also complied with and is duly qualified to act as Surety under the Act of Congress approved July 1947, 6U.S.C sec. 6-13; and that to the best of his knowledge and belief the above statement is a full, true, and correct statement of the financial condition of the said Company on the 31st day of December 2022.

### Attest:



{ Corporate  
Seal  
Affixed }

Craig Kliethermes President

Olga S. Happel Assistant Secretary

Sworn to before me this 10th day of March, 2023.



{ Notarial  
Seal  
Affixed }

Catherine D. Geiger Notary Public, State of Illinois

M0058323\_Portal