

AMENDMENT NO. 4
AMENDMENT TO AGREEMENT
BETWEEN OWNER AND ENGINEER
FOR
ENGINEERING SERVICES

This AMENDMENT is made part of the AGREEMENT dated September 23, 2014, between the Norman Utilities Authority (OWNER) and RJN Group, Inc. (ENGINEER) for engineering, maintenance, and installation services in connection with the Permanent Wastewater Flow Monitoring Project at specified locations within the collection system, per attached Exhibit 1, Project Location Map.

1. The Schedule as described in Attachment A, the Scope of Services of ENGINEER as described in Attachment B, and Compensation as described in Attachment C of said AGREEMENT are amended and supplemented as follows:
 - a. Schedule: The service and data management period will be extended for a one year period under this amendment from September 1, 2018 through August 31, 2019.
 - b. Compensation: The compensation for amended services rendered by ENGINEER shall be set forth in the compensation table in Attachment C of this AMENDMENT.

Acceptance of the terms of this Amendment is acknowledged by the following authorized signatures of the parties to the Agreement.

RJN GROUP, INC. – ENGINEER

ATTEST

By: Randall J. Brady
Title: BRANCH MANAGER

Amy Genting
Administrative Asst.

Norman Utilities Authority- OWNER

APPROVED as to form and legality this _____ day of _____, 2018.

City Attorney

APPROVED by the Trustees of the Norman Utilities Authority this _____ day of _____, 2018.

ATTEST

By: _____
Title: _____

ATTACHMENT A

SCHEDULE

If new equipment installation or relocation of existing metering or telemetry equipment is requested and authorized by the OWNER as Additional Services, the ENGINEER shall mobilize within 21 days of receipt of the written Notice to Proceed and shall achieve Substantial Completion of equipment installation at the approved site locations within 60 days of the Notice to Proceed. Upon Substantial Completion, the annual Service and Data Management Period shall commence on a site-by-site basis.

ATTACHMENT B

SCOPE OF SERVICES

Project Initiation Period

Coordination

ENGINEER shall review all information collected by the Norman Utilities Authority (OWNER) to ensure a thorough understanding of the project background. A kick-off meeting with the OWNER shall be conducted to develop a thorough understanding of the project, goals and to coordinate the routine and timely exchange of information.

Routine project team meetings shall be conducted with OWNER representatives as necessary to review the PROJECT issues and status. ENGINEER shall institute a safety program to be strictly followed throughout the entire duration of the project. All crews shall wear appropriate identification.

Site Investigation

ENGINEER shall assist in selecting the specific monitoring points from a strategic and feasibility viewpoint. Site investigations shall involve the evaluation of the monitoring location to ensure sensor survivability and the ability to collect quality flow data. The investigation shall further include hydraulic evaluation for potential flow regimes including laminar, turbulent, backwater, and surcharged conditions.

The investigation shall also include evaluation and feasibility of site accessibility, telemetry, and power.

Equipment Selection

Based on the site selection investigation reports, the appropriate technologies shall be considered and evaluated to fulfill the project objectives. Equipment selection criteria shall consider the pipe size, anticipated flow ranges, telemetry method, operating principal, accuracy, data management requirements, and cost. A recommendation of the most practical technology for each site shall be provided to the OWNER.

Installation Period

Flow Monitoring Equipment

ENGINEER shall procure and deliver the monitoring equipment including sensors, installation bands, and necessary installation hardware. The OWNER will be provided with a copy of the selected flow monitoring software. The OWNER shall become the owner of the equipment and software at the time that Substantial Completion is reached.

The selected flow monitoring units shall be operated under battery power to allow for in-manhole installations without the necessity to bring permanent power to each site.

The following flow monitoring equipment shall be maintained by the ENGINEER throughout the duration of the project:

- **Ten (10) newer, existing Hach FL902 Flow Meters (purchased by OWNER and installed by ENGINEER in 2014, 2015, 2016 & 2017) will be maintained at sites OU-04, OU-05, OU-06, OU-11, OU-12, WS-01, WS-11, BP-17, BP-18, and BP-30.**
- **Four (4) previously refurbished Hach Sigma 920 Flow Meters will be maintained at OU billing sites OU-01, OU-03, OU-07, and OU-14.**
- **Two (2) newer Hach FL902 Flow meters will be maintained, and were recently relocated in August 2017 at sewer rehabilitation sites selected by OWNER to monitor pre- and post-construction wastewater flows. Meters are currently named with existing identification of RM13A and RM13B (purchased by OWNER and originally installed by ENGINEER in 2014).**
- **Two (2) existing (purchased slightly used by OWNER and installed in 2011) Hach Sigma 920 Flow Meters will be maintained at interceptor locations BP-25 and WS-10.**

The remaining Hach Sigma 920 Flow Meters owned by OWNER and not in use will continue to be evaluated by ENGINEER to determine the condition and either be utilized as a backup meter or as a trade-in to reduce the cost of newly purchased meters by approximately \$800 per meter, dependent on supplier authorization, as needed and authorized.

Equipment Warranty – Any new flow monitoring equipment installed shall be warranted for 1 year against all defects. The OWNER shall have the opportunity to extend the manufacturer's warranty, annually.

Installation

The equipment shall be installed according to the manufacturer's recommendations by trained technicians. The flow monitors shall be capable of recording both depth and velocity components and shall be configured to obtain readings on 15 minute intervals.

The sensing equipment is typically installed on a thin metal ring for smaller pipe applications. For larger pipe installations over 42-inch inside diameter, the sensing equipment is generally installed on a flange or partial band. The cabling shall be secured to the manhole walls and attached to a data logger at the top of the manhole for easy access. Prior to leaving the site, each flow monitor shall be configured and activated at the site.

Each monitored location shall be calibrated at installation, which involves comparing the returned sensor values against independent devices. ENGINEER staff shall acquire at least six calibrations at various flow levels.

Substantial Completion shall be reached upon the installation of all flow monitoring equipment, sensors and completion of hydraulic calibrations. ENGINEER shall submit for approval of Substantial Completion and provide at least one week of data for each site to demonstrate that the equipment is operating within operating standards.

Telemetry

Cellular telemetry shall be provided at each flow monitoring location using Telog RU-33 remote telemetry units, except where subsequently noted. This will enable the data to be collected remotely. New meters at OU-04 and WS-11 have the built-in Hach modem in lieu of the separate RU-33 unit. Hach has agreed to provide free cellular service until March 2020 on these two (2) units.

Service and Data Management Period

The Service and Data Management Period shall commence once Substantial Completion of all metering locations is achieved and shall remain in effect for one year. The AGREEMENT shall be renewable each year for as long as Services are required by OWNER. ENGINEER shall provide written notice of any price increases within 30 days prior to the expiration date of each annual AGREEMENT.

Data Collection

Each flow meter shall be remotely collected and the data reviewed on a weekly basis. During each download operation, data shall be graphed to check for inconsistencies, gaps or adverse trends. The data shall be edited, processed and finalized on a monthly basis to generate final Q (flow) in addition to the depth and velocity readings.

Equipment Maintenance and Service

Quarterly calibrations shall be performed by ENGINEER and shall be reviewed against the measured sensor readings. On a quarter year interval, each site shall be visited to obtain hydraulic calibrations and to perform routine interrogation of the meters. Service or maintenance requirements shall be scheduled within 48 hours of data collection. ENGINEER technicians shall then have 72 hours to make necessary adjustments or repairs. Any equipment found to be working improperly shall be repaired or replaced with a spare unit until the equipment is repaired. Field technicians shall maintain a service log for all activities performed.

ENGINEER shall organize and maintain electronic records of the flow data. ENGINEER shall further maintain a back-up record of all collected flow data. The data shall be made available to the OWNER upon request.

ENGINEER shall perform quarterly calibrations of the flow meter equipment. The calibration of the flow metering sites shall consist of comparing manual depth and velocity measurements to the flow meters measurements using independent devices.

ENGINEER shall replace batteries during field visits according to the manufacturer's recommended battery replacement interval or as needed due to battery failure.

Monthly Deliverables

ENGINEER shall prepare and deliver electronically on a monthly basis a billing statement with monthly summary (as described below) to the University of Oklahoma (OU) in a format to be approved by OWNER. ENGINEER shall assist OWNER in responding to any billing inquiries from OU.

The data shall include a monthly summary of the daily total flow, monthly minimum, average and maximum flow from the billing meters. Flow shall be represented in both tabular and graphical formats.

Quarterly Deliverables

ENGINEER shall provide a quarterly summary of the interceptor flow data including a brief status of the monitoring results for each interceptor meter location along with interpretations of unique hydraulic conditions. The summary shall note any maintenance and service requirements in addition to any downtime that may have occurred.

ENGINEER shall prepare and deliver electronically on a quarterly basis a summary (as described below) to the OWNER.

The data shall include a summary of the daily total flow, monthly minimum, average and maximum flow. Depth, velocity, and flow shall be represented in tabular and graphical formats. All monthly flow and data reports shall be delivered in electronic format to enable special reports to be generated by the OWNER. Electronic data shall be created using the selected manufacturer's software. Electronic data shall be compatible with Microsoft Access and Excel.

ENGINEER shall analyze data from each monitoring site for maintenance problems and predictive failure. Any modifications to the meter configuration or adjustments to the data based on field calibrations shall be logged. Data analysis shall include the evaluation of hydraulic conditions such as surcharging, suspected overflows at meter site, and wet weather contributions. Average dry weather (baseline) and peak wet weather flows shall be established for each monitoring location. The data shall be reviewed for trend analysis of inflow and infiltration (I/I) contributions, and significant capacity variations. Any significant variations from this baseline flow shall be included with the deliverable. Indications of concern shall be reported immediately.

Annual Deliverable

ENGINEER shall provide an annual summary of the flow data including a brief status of the monitoring results for each pre- and post rehabilitation meter location along with interpretations of unique hydraulic conditions. The summary shall note any maintenance and service requirements in addition to any downtime that may have occurred.

ENGINEER shall prepare and deliver electronically on an annual basis a summary (as described below) to the OWNER.

The data shall include a summary of the baseline flow and percent reduction of wet weather flow. The pre- and post-rehabilitation comparative analysis shall be based on one of the following two (2) methods: linear regression of flow versus rainfall intensity benchmarked to a 1-year/60-minute rainfall intensity, or a volumetric analysis comparing similar storm events. Report shall be delivered in electronic format to enable special reports to be generated by the OWNER. Electronic data shall be created using the selected manufacturer's software. Electronic data shall be compatible with Microsoft Access and Excel.

ENGINEER shall analyze data from each monitoring site for maintenance problems and predictive failure. Any modifications to the meter configuration or adjustments to the data based on field calibrations shall be logged. Data analysis shall include the evaluation of hydraulic conditions such as surcharging, suspected overflows at meter site, and wet weather contributions. Indications of concern shall be reported immediately.

Limits of Responsibility

ENGINEER shall not be responsible for any damages to the equipment caused by activities of others including, construction, vandalism, sewer cleaning, sewer maintenance, or utility trenching. The OWNER shall not make any modifications or repair to the equipment without the prior consent of ENGINEER. The OWNER may authorize ENGINEER to repair such damages on a time and material basis. ENGINEER shall not be liable for any loss of data due to meter malfunction or causes beyond its control.

Payment of the monthly telephone and power utilities shall be the responsibility of the OWNER.

ATTACHMENT C

COMPENSATION

The OWNER agrees to compensate ENGINEER for these services based on the unit rate table below. Quantities under "Services Upon OWNER Request" are estimated and may be adjusted by OWNER.

The OWNER may request Additional Services that may not be identified in the compensation table. The OWNER may request a cost estimates from the Engineer for services that may include equipment repair or other flow monitoring related services for the OWNER.

Description	Quantity	Unit Rate	Total
Quarterly Service and Monthly Data Management			
OU Permanent Meters (12 mos. x 9 meters)	108 meter/mos.	\$450 /meter/mo.	\$48,600
Norman Interceptor Meters (12 mos. x 7 meters)	84 meter/mos.	\$450 /meter/mo.	\$37,800
Additional Meters for I/I Monitoring Pre- and Post-Rehab (12 mos. x 2 meters)	24 meter/mos.	\$450 /meter/mo.	\$10,800
Telemetry Cellular Billing (12 mos. x 11 Telem) ^{1/}	132 Telem/mos.	\$15 /Telem/mo.	\$1,980
Subtotal			\$99,180
Services Upon OWNER Request – Additional Site Visits	Units	Unit Rate	Total
A. FM Equipment ^{3/}	2	\$6,514.00/meter	\$13,028
B. Equipment Installation or Relocation	4	\$1,124.00/meter	\$4,496
C. Telemetry Equipment	2	\$2,871.00/Telem	\$5,742
D. Telemetry Install (cellular)	2	\$700.00/Telem	\$1,400
E. Unscheduled Site Visits (Relocate crews to Norman and maintenance) other than quarterly	8	\$2,144.00/each	\$17,152
F. Equipment Repairs ^{2/}	2/	2/	\$9,200
G. Refurbishing Uninstalled Meters for Back-up Equipment (Labor only)	40 hrs	\$120.00/hr	\$4,800
H. Allowance for Telemetry Cellular Upgrade Equipment	18 meters	\$800.00/meter	\$14,400
Subtotal			\$70,218
Total			\$169,398

1/ Based on Verizon charges

2/ As needed per repair based on Manufacturer's invoice

3/ If ENGINEER is able to negotiate trade-in discounts of old meters in disrepair, the unit price for new meter purchases will be discounted accordingly.