

**Exhibit A**  
**Joplin Interceptor Project Flow Metering**  
**City of Joplin, Missouri**  
**Public Works Department**  
**August 24, 2023**

Joplin, Missouri (“CITY”) developed a hydraulic and hydrologic model previously and wishes to conduct flow metering and modeling updates near the area of the recently completed Baker’s Branch project, in the area adjacent to a satellite community and in the area of the Joplin Interceptor. The CITY desires to install flow meters within the three areas to understand the impacts of recent work on the sanitary sewer system.

Burns & McDonnell Engineering Company, Inc. (“ENGINEER”) proposes the following Scope of Work for the 2023 Flow Metering, Analysis and Model Updates, to be performed in accordance with the terms and conditions of the Agreement for Professional Services. This scope of services is prepared for the post-rehabilitation rainfall dependent inflow and infiltration (RDII) evaluation, for nine (9) flow meters and the existing model update with up to four (4) meters.

**Scope of Work**

This is the initial scope of work to further define the project. Optional Services will be issued as either an addendum to the Work Authorization or as an independent Work Authorization to the Agreement.

**Task 1 – PROJECT MANAGEMENT**

ENGINEER will conduct project management activities in accordance with the scope items outlined in tasks 2 and 3 including preparing and administering invoices for the work complete. There are no project meetings accounted for in this scope of services.

**Task 2 – FLOW METERING**

ENGINEER will perform a desktop review of existing infrastructure and determine preliminary locations for the installation of nine (9) flow meters and four (4) rain gauges within the Joplin Interceptor. Preliminary locations will be verified with the CITY.

ENGINEER will conduct site investigations for the proposed nine (9) flow meters and four (4) rain gauge locations and propose final installation locations as needed. ENGINEER will document the final installation location and details.

ENGINEER will install nine (9) flow meters and four (4) rain gauges at the final installation locations determined in the previous task for sixty (60) days. ENGINEER will perform two monthly maintenance site visit to each metering location.

**Optional Services (to be performed under a separate authorization or an amendment to this authorization):**

ENGINEER will perform flow metering and rainfall monitoring for an additional thirty (30) days as agreed upon with the CITY and conduct one (1) additional monthly maintenance site visit.

Following completion of the flow metering and rainfall monitoring activities, ENGINEER will remove all flow meters and rain gauges. All data will be provided to the CITY.

**Task 3 – FLOW ANALYSIS AND HYDRAULIC MODEL UPDATE**

ENGINEER will perform dry and wet weather flow analysis, wastewater hydraulic modeling and wastewater collection system analysis, and provide an executive summary of the wastewater model results and documentation of the analysis performed. The scope of services for Task 3 is as follows.

### **3.1 DRY AND WET WEATHER FLOW ANALYSIS**

- 3.1.1 The collected data from nine (9) flow meters will be analyzed to extract the average daily dry weather flow (ADDF), and dry weather diurnal profile for each flow meter basin.
- 3.1.2 The collected rain gauge data for 2023 will be used to identify independent, representative, and unique rainfall events within the flow metering period and the associated sewer system response to those events. In order to identify a sufficient pool of rainfall events for wet weather calibration and verification, it is anticipated that up to five (5) rain events will be used, as available. Adequate rain events for wet weather calibration and verification must be large enough to produce a recognizable, causal response in the wastewater collection network.
- 3.1.3 Inflow, infiltration, and groundwater influences will be estimated from the aggregate flow meter data.
- 3.1.4 The RDII will be extrapolated to the NRCS 1-year, 6-hour and 5-year, 6-hour design assessment storm.
- 3.1.5 The quantified RDII will be compared to the pre-construction I/I analysis completed in the 2017 Inflow and Infiltration Strategic Plan.

### **3.2 WASTEWATER HYDRAULIC MODEL**

The City's previously developed and calibrated sewer system hydraulic model will be used as the basis for this task.

The model update will focus on the rehabilitated Baker's Branch basin to capture the RDII flow and volume reduction due to the rehabilitation. The updated hydraulic model will then be used to determine incremental and cumulative downstream impacts on the City's sewer system.

- 3.2.1 Dry weather flow responses in the basin will be validated and updated as necessary using the information from Task 3.1.1.
- 3.2.2 Wet weather calibration will use up to three (3) different observed rain events at each of the four (4) flow meters. Wet weather calibration will be attempted at each flow meter location within the hydraulic model to within +/- 10-percent or +/- 2.0-MGD of peak wet weather flow. Wet weather calibration will be conducted for up to four (4) flow meters.
- 3.2.3 Wet weather verification will be conducted at each of the four (4) flow meter locations with the same tolerances as for wet weather calibration. Different rain events will be used for verification as used for wet weather calibration. Wet weather verification will include one rainfall at each of the four (4) wet weather calibration locations.

### **3.3 WASTEWATER COLLECTION SYSTEM ANALYSIS**

This task will evaluate the City's wastewater collection system responses to the 5-year, 6-hour assessment storm and evaluate the needed extent and the size of the proposed relief sewer at M11-145.

- 3.3.1 The calibrated hydraulic model and the NRCS 5-year, 6-hour assessment storm will be used to evaluate the collection system response. System assessment will identify locations within the existing wastewater collection system where the model predicts Level of Service (LoS) deficiencies as defined in the Joplin Sewer Model Study dated November 2018.
- 3.3.2 Evaluate the extent and size of the relief sewer proposed at M11-145.

### **3.4 DOCUMENTATION OF EVALUATION**

Documentation of the efforts completed in this scope of work will be as follows:

- 3.4.1 A draft report will be submitted to the City to document flow analysis results, model update, and system assessment evaluations.
- 3.4.2 A final report will be submitted to the City to document flow analysis results, model update, and system assessment evaluations five months following the date the flow meters are installed.