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January 8, 2016

Mr. Paul Holzen, P.E.
Franklin City Hall
109 3rd Avenue South
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Subject: Sanitary Sewer System Model Assistance, Phase 2

Paul:

CDM Smith is pleased to present this proposal to continue our support of the collection system model for the City of Franklin. This second phase will build on the previous work analyzing the collected flow monitor data and utilizing it to recalibrate the expanded hydraulic model.

Background

As part of work performed previously by CDM Smith, a hydraulic model was developed to represent the City's sewer collection system. The original model included all gravity pipe 12-inches in diameter and larger and was calibrated to monitored flow data collected in 2011 during the Integrated Water Resources Plan (IWRP) project.

As part of Phase 1 of this project, CDM Smith used as-built drawings and surveyed manhole data to confirm the infrastructure represented in the hydraulic model and to expand it to include all gravity pipe greater than 8-inches in diameter. The City of Franklin has implemented a flow monitoring program consisting of 20 permanent flow monitors. At the time of this writing, an additional 17 temporary flow monitors have been installed as well. CDM Smith will use this flow monitoring data to recalibrate the expanded hydraulic model.

Phase 1 also included the development of a Capacity Analysis Tool to aid the use of the hydraulic model to address development requests. This tool will continue to be supported by CDM Smith to aid City staff.

Scope of Work

The following Tasks 1 through 4 describe the scope of work for Phase 2.

Task 1 – Flow Monitoring Data Collection and Analysis

In addition to the existing permanent and temporary flow monitoring, radar rainfall data will also be collected for the period of temporary flow monitoring to assist with the calibration. A company (subcontractor) providing radar rainfall data will be selected and contracted directly by CDM Smith. An allowance of \$15,000 has been included in the budget for this service. The





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actual amount invoiced for the data will be a direct pass through based on the actual cost from our subcontractor plus a 5% markup for administration of the work and contract.

Following the temporary flow monitoring period of 60 to 90 days (depending on suitable rain events as determined by CDM Smith for proper calibration data), the collected data from both the temporary and permanent flow monitors will be analyzed in order to load into the hydraulic model for calibration. This process involves performing a quality check on all the data collected and then breaking the flow data down into dry-weather flow and wet-weather flow components for up to three appropriate storm events. The rainfall data will also be compiled and analyzed and CDM Smith will utilize it as part of the flow monitoring analysis and model recalibration process. Documentation and records of the data analysis will be included in the final deliverable to the City which will be summarized in a technical memorandum on the data analysis.

Task 2 – Model Recalibration

CDM Smith will recalibrate the model to reflect the model expansion and updates in accordance with industry standards and best management practices. Sewer flow rates, depths, and rain data will be the principal sources of data for recalibrating the model and will be supplemented with any field observations provided by the City, as appropriate. The model will be recalibrated to selected dry-weather days and to a wet-weather event close in volume to the 2-year design storm, if available from the dataset. A second wet-weather event will be used for verification if available from the dataset. The updated recalibrated model will be delivered back to the City at the conclusion of the recalibration for continued use and will be linked as the updated reference file to the capacity assurance tool. The models delivered will include results for the existing system under dry weather flow conditions, the 2-year design storm, and the 5-year design storm. Additional storms may be added as requested for additional scope and fee, but we feel these are the most appropriate to the needs of the City of Franklin.

The model is currently in SWMM version 5.0.022. If feasible and compatible with the Capacity Analysis Tool, CDM Smith and the City may explore updating the model to a newer version of SWMM as part of the final model recalibration.

Task 3 – Project Meetings

CDM Smith will meet with the City project team at key points throughout the project. For the purpose of scope and budgeting, the project shall consist of up to five (5) review and update meetings on the flow monitoring data and model calibration updates.

Task 4 – Continued Capacity Tool Support

In addition to the flow monitoring analysis and model recalibration, CDM Smith will continue to aid City staff and address questions and requested modifications to the Capacity Analysis Tool as needed. Although the exact needs are unknown, an estimated 8 hours per month are



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budgeted for anticipated support for the next year for a total of 96 hours of support over the 12 months following approval of this scope of work.

Budget

CDM Smith proposes to complete the work under Tasks 1 through 4 above for a not-to-exceed budget of \$145,000. The details of this cost estimate are shown on the table below and included in the task breakdown. CDM Smith will bill the project on a monthly basis based on the attached task breakdown and attached billing rate table. For each monthly invoice, CDM Smith will submit a monthly progress report and update on project status and deliverables.

CDM Smith proposes to complete the project, Tasks 1 through 4, and deliver the flow monitoring assistance, analysis and updated model based on the following budget.

City of Franklin - Sanitary Sewer System Model Assistance, Phase 2

Task	Description	Total Hours	Estimated Cost
Tasks 1 - 4			
Task 1	Flow Monitoring Data Collection and Analysis	330	\$50,000
	Rainfall Radar Data Allowance		\$15,000
Task 2	Model Recalibration	400	\$60,000
Task 3	Project Meetings (up to five)	24	\$3,500
Task 4	Capacity Tool Support	96	\$16,500
TOTAL			\$145,000

CDM Smith Labor Billing Rates

Labor Category	Billing Rate (\$/hour)
Senior Technical Specialist	\$195
Technical Specialist	\$180
Senior Engineer	\$170
Engineer/Scientist	\$135
Junior Engineer/Scientist	\$105
Contract Administrator	\$85
Clerical	\$70



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CDM Smith appreciates the opportunity to provide these services to the City of Franklin and continue our support of the City's collection system planning and capacity assurance programs. If you have any questions about this proposal, please do not hesitate to contact us. We are ready to initiate this work upon your notice to proceed.

Very truly yours,

A handwritten signature in blue ink that reads "Zack A. Daniel". The signature is fluid and cursive, with the first name "Zack" being more prominent.

Zack Daniel, PE
Associate Engineer/Client Service Leader
CDM Smith Inc.

cc: Paul Holzen – City of Franklin
Patricia McNeese – City of Franklin
Michelle Hatcher – City of Franklin
Mark Hilty – City of Franklin
Leeann Williams, P.E. – CDM Smith