Amendment 1 to Addendum Q

**Agreement for Professional
Engineering Services**

Post-Rehabilitation Flow Monitoring Areas 2, 11 and 16 of Basin C
City of Kirksville, Missouri

This Amendment 1 to Addendum Q is made this _____ day of _____, 2010, by and between the City of Kirksville, Missouri hereinafter referred to as the OWNER, and George Butler Associates, Inc. hereinafter referred to as the ENGINEER.

WITNESSETH:

WHERAS, the OWNER and ENGINEER have entered into an Agreement dated March 11, 1997, for the ENGINEER to provide professional engineering services for a project generally described as a Phase 1 Sewer Improvements – Design and Construction Observation; and

WHERAS, said agreement was amended by Addendum Q in 2007 to provide **Basin C and F Collection System Rehabilitation Evaluation and Design** and

WHERAS, the OWNER desires to change the scope of the Addendum Q and have the ENGINEER provide the additional services as indicated in Attachment 1.

WHERAS, the OWNER and ENGINEER agree that such change in the Scope of Services will cause a net increase in the maximum not to exceed cost to the OWNER for the basic services tendered by the ENGINEER in the amount of $0.

IN WITNESS WHEREOF, the CITY OF KIRKVILLE AND GEORGE BUTLER ASSOCIATES, INC., by their authorized representatives, have hereunto subscribed their names this _____ day of _____, 2010.

GEORGE BUTLER ASSOCIATES, INC.   THE CITY OF KIRKSVILLE, MISSOURI

By: _____   By: _____

Title: _____   Title: _____

Attest

By: _____   By: _____

Title: _____   Title: _____

Attachment 1

Scope and Schedule
Post-Rehabilitation Flow Monitoring Areas 2, 11 and 16 of Basin C
Kirksville, Missouri

The project is intended to provide post-rehabilitation flow monitoring at three (3) locations for areas 2, 11 and 16 in Basin C. An addition, area 7 will be monitored at one (1) location as a control site. No rehabilitation has been completed in this area. Area 2 post-rehabilitation flow monitoring will establish the effectiveness of repairs on Area 2 that included complete main sewer repair and service lateral connection repairs. Post-rehabilitation flow monitoring o f Areas 11 and 16 will establish the effectiveness of the replacement of approximately 5,000 feet of parallel sewers identified to leak excessively by pre-rehabilitation flow monitoring.

Task 100 – Meetings. Regular meetings and other communication between Engineer and the City will ensure that the project goals are being met throughout the project. The meeting will serve as work sessions, allowing Engineer to receive valuable input from City staff as it relates to the project.

    A - Kick-Off Meeting. Engineer will conduct one (1) kick-off meeting with City staff. A project procedures memorandum outlining project goals, project assignments, project contacts, project schedule and the scope of services will be provided prior to the meeting.

    B - Progress Meetings. Engineer will conduct two (2) progress meetings during the project by teleconference. Additional teleconferences may be added if necessary. This will ensure that project work is performed as intended and will keep the City informed of the project's progress.

    C - Final Meeting. Engineer will conduct one (1) presentation meeting of the draft reports to City staff. The final reports will incorporate any City review comments.

Task 200 – Flow and Rainfall Monitoring. Accurate flow and rainfall monitoring data is essential to determining precise flow parameters. A total of 4 flow meters and 2 rain gauges will be installed for 70 days (10 weeks) to capture dry weather base flows and wet weather infiltration / inflow flows.

    A - Flow Monitoring. Depth and velocity flow meters will be installed at the selected sites and will monitor flow continuously for a 70 day period. The flow monitoring period will determine system flow response under various antecedent ground conditions and weather conditions.

    The flow monitoring activities will include meter installation, hydraulic calibration measurements, bi-weekly servicing of flow meters including performance checks and

collection of recorded data and removal of flow meters.

Each flow meter will be capable of continuously recording flow depth and velocity measurements under free flow, surcharge and reverse flow conditions. Data will be logged at 5-minute intervals. The data will be provided in electronic format and ready for use to determine flow parameters for the monitoring sites.

B - Rainfall Monitoring. Sites for rain gauges will be determined based on the selected sites for flow monitoring. Data will be recorded at 5-minute intervals in electronic format and ready for use to determine flow parameters for the monitoring sites.

C - Analyze Data and Determine Flow Parameters. Utilizing flow and rainfall data, Engineer will determine the values of base flow, infiltration, and inflow for each flow meter. Peak system flows for 1-year or 5-year events will be developed from these three flow parameters.

Task 300 Post-Rehabilitation Evaluation and Report – Basin C – Areas 2, 11 and 16.
Engineer will compare pre and post-rehabilitation flow data for areas 2, 11 and 16 in Basin C and develop a report presenting results.

    A – Compare Pre and Post-Rehabilitation Flow Data. A comparison of pre and post-rehabilitation flow monitoring results for Areas 2, 11 and 16 in Basin C will be conducted. The comparison will include rainfall amounts, base flow, infiltration and inflow. Reductions or increase in flow for these parameters will be noted.

    B – Summarize Results and Submit Report. The Engineer will then develop a draft report that includes the results of pre and post-rehabilitation flow monitoring.. The Engineer will submit 3 draft reports for the City to review. A meeting will be held with the City to review the draft report. Based on review comments, a final report will be developed and 5 copies submitted to the City. The report will include:
- Summary of sewer rehabilitation work completed in Areas 2, 11 and 16
- Summary of post rehabilitation flow monitoring.
- Comparison of pre and post-rehabilitation flow data
- Recommendations for future rehabilitation methods to reduce I/I.