GRW | engineers | architects | planners
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615.366.1600 • www.grwinc.com

October 18, 2012

Mr. J.H. Graham III, Mayor
Crossville City Council
City of Crossville, City Hall
99 Municipal Avenue
Crossville, TN 38557

Subject: Wastewater Collection System Study
Engineering Proposal for Flow Monitoring and Infiltration/ Inflow Analysis

Dear Mayor Graham:

For twenty-four years GRW Engineers, Inc. has had the pleasure of working with the City of Crossville's employees while providing engineering services to the City. In 2006, with Crossville's help, GRW completed the Wastewater Facilities Plan Report. This report analyzed the needs and suitability of the existing wastewater treatment plant and collection system for the City's planning area. It reviewed several options to provide for the future growth of Crossville. Compilation of the study consisted of input from the City of Crossville's various departments, the State of Tennessee Department of Environment and Conservation (TDEC), local interest groups, and the Crossville City Council.

The Wastewater Facilities Plan recommended a two phased approached to provide for sustainable growth in the Crossville planning limits. The first phase was to address issues at the Wastewater Treatment Plant. The second phase would address the collection system.

Improvements to the plant were begun in 2007 with the submittal of applications to various agencies for funding. At the present time the final recommended improvements at the Wastewater Treatment Plant are under construction and are expected to be completed by January 31, 2013. Funding for these improvements has come in the form of;

- A $1,000,000 grant from the United States Department of Commerce, Economic Development Agency (EDA).
- Two (2) $500,000 Community Development Block Grants (CDBG), from the State of Tennessee, Department of Economic and Community Development.
- A 1.23% loan from the State of Tennessee, State Revolving Fund (SRF) in the amount of $500,000.
- A $4.5 million dollar allocation from SRF in which 40% ($1.8 million) was grant funds. This money was through the American Recovery and Reinvestment Act (ARRA).

As indicated above, the City of Crossville has had the good fortune of receiving favorable funding for the wastewater projects. This is due to growth and jobs in the community, hard work from City staff and elected officials, and the Crossville's proximity to the Obed River. The Obed River is currently recognized by both the State and Federal governments, as a natural resource to be protected. As long as this recognition lasts, the City of Crossville has an excellent opportunity to receive the competitive $500,000 Community Development Block Grant.

To continue Crossville's approach to address growth and provide for the future, the Facility Plan recommended the second phase address the collection system. The proposed plan is to complete the current project at the Wastewater Plant by January 31, 2013 and apply in February for a $500,000 Community Development Block Grant. As this grant is a competitive process, it would be beneficial for the City to provide Inflow and Infiltration (I&I) data with the application to confirm the need of collection system rehabilitation to the funding agencies. The City has data from the Treatment Plant flow; additional information in the system would validate the need to address a certain area. All involved with this project, agree the first basin to address is the Little Obed Drainage Basin. This study will further demonstrate the need for sewer rehabilitation in the drainage basin and will help direct the area of emphasis once funding is available.

After funding for sewer rehabilitation is obtained, the lines will be televised to determine the priority, need, and most cost effective method of repair. Construction drawings will be completed for review by the funding agencies and TDEC, and the project will be advertised and bid for construction.
The proposed project schedule follows;

WWTP project completion-	January 31, 2013
Flow Monitoring –	November 2012, thru January 2013
CDBG Applications Due –	Mid February 2013
CDBG Awards-	October 2013
Construction –	Spring 2014

At this time we are respectfully requesting the City of Crossville to allow GRW to complete the following tasks for a total not to exceed cost of $42,260.00.

- Installation and maintenance of 7 flow monitors and one rain gage for a period of up to 3 months, and a preliminary analysis of the data (CSL Services Inc.) $37,260.00.
- Final Flow Monitoring Analysis and Report, monitoring of data, and submittal of CDBG Application (GRW Engineers Inc.) $5,000.00.

Please feel free to call if you have any questions or need additional information.

Sincerely,

Jim Hilborn
GRW Engineers, Inc.

Enclosure: Proposal from CSL Services Inc.

CC: Mr. Bruce Wyatt, City Manager
Mrs. Sally Oglesby, City Recorder
Mr. Clark Annis, WWTP Operator

CSL Services, Inc. *Customized Solutions to your Flow Metering Needs*

October 22, 2012

Mr. Andrew Hulsey, P.E.
Director – Water and Sewer
GRW ENGINEERS, INC.
404 BNA Drive, Suite 201
Nashville, TN 37217

RE: PROPOSAL FOR TEMPORARY FLOW MONITORING AND INFILTRATION / INFLOW ANALYSIS – CROSSVILLE, TENNESSEE

Dear Andrew,

Thank you for giving me the opportunity to present this proposal for the referenced project. Based on our previous conversations, I understand that this project will consist of a total of 5 to 7 flow monitoring points and one rain gauge in the Crossville, TN wastewater collection system. CSL will install and calibrate the equipment, collect data for a period of 90 days, and then analyze the data and develop an infiltration and inflow (I&I) analysis. You have indicated that all of the sites that you have selected as monitoring points are easily accessible, that there are no heavy traffic issues and that none of the manholes are more than 3 feet above grade.

There is a requirement that a preliminary report will be submitted to the Tennessee Department of Environment and Conservation by January 31, 2013. If the flow monitors are installed by December 1, 2012 this will mean that we will prepare a status report based on data collected during December 2012 in time for GRW Engineers to submit the preliminary report to TDEC. Our final report that includes data collected during January and February 2013 will be completed by March 1, 2013. Our final report will include the actual flow data, infiltration and inflow quantities, a sub-basin prioritization and recommendations for the best types of source detection methods to use in the priority areas. The sub-basin prioritization will be developed from the comparison of dry and wet weather flows at each site.

CSL has been in the flow monitoring services business for over 12 years and has accumulated almost 1,000,000 meter days of experience. Our Project Manager is a Professional Engineer with over 25 years of experience in flow monitoring and wastewater collection system design and construction. The number of customers who have elected to give us additional work is a tribute to the level of service that we provide. In support of this statement we offer the following references for projects we have completed that are similar to this one.

PROJECT REFERENCES

Temporary and Long Term Flow Monitoring Projects, Cleveland, TN
Client: Cleveland Utilities
Contact: Mr. Greg Clark, (423) 478-9377

CSL was retained to install temporary flow meters and rain gauges at key locations throughout the city and to identify which portions of the collection system contribute excessive I/I. Second and third phases of this project have now been completed and a fourth phase is under way. In these subsequent phases, some of the original sites were used as anchors and more intensive monitoring is being conducted upstream of those locations. This will direct future I/I source detection and rehabilitation efforts. Each flow monitor is connected to a Telog RTU so that data can be viewed through a secure internet connection. Project included a total of 20 flow meters and all aspects of flow meter installation, calibration, operation and maintenance, data collection, and data analysis. CSL installed five long-term flow meters in August 2011 and are providing monthly reports that will document rehabilitation effectiveness.

Temporary and Long Term Flow Monitoring Projects, La Vergne, TN

Client: City of La Vergne, TN/CTI Engineers

Contacts: Mr. Greg Skinner,
Director of Public Works, (615) 793-9891
Mr. Neal Hall, P.E., CTI (615) 834-8300

CSL was initially selected to perform a 6-month temporary flow study consisting of 6 flow meters and 1 rain gauge in the East Hurricane Creek portion of the City's wastewater collection system. The data collection period for that project will end in July. Prior to the completion of the temp study, the City hired CSL to install flow meters on a long term basis at 5 more sites. These long term meters will be used to verify the accuracy of billing meters that are part of the Metro Nashville network.

Temporary/ Long Term Flow Monitoring Project Cookeville, TN

Client: Gresham, Smith & Partners / City of Cookeville
Contact: Mr. Hal Humphrey, P.E., GS&P (205)298-9291

CSL was initially selected to perform temporary flow metering services for the City of Cookeville and to provide data for the calibration of a model that is being developed by Gresham, Smith & Partners. A total of 8 sites were selected after passing a rigorous evaluation process. In addition, 8 rain gauges were installed. A complete Infiltration / Inflow Analysis will be conducted when the data collection period ends, and sub-system prioritizations will be developed for subsequent source detection and rehabilitation efforts. On August 10, 2012 CSL was notified that the monitoring period will be extended by 5 months through January 10, 2013.

Temporary and Long Term Flow Monitoring Projects,
Alexander City, AL

Client: Alexander City Public Works Department / CH2MHill

Contact: Mr. Gerard Brewer, Public Works Director, (256) 409-2020
Mr. Scott Cummings, P.E., CH2M Hill, (334) 329-0795

CSL installed 25 flow meters and 2 rain gauges necessary to conduct this city-wide temporary flow monitoring study and I/I analysis. This project had a number of sites that were located in remote areas with extremely difficult access. Remote telemetry was utilized to ensure quality data and minimal down-time. Data was collected for a period of 60 days and then I/I amounts determined for each sub-system. A prioritization table was developed for subsequent source detection projects. On July 26, 2012 CSL was notified that we had been selected as the service provider for a long term flow monitoring project in Alexander City, AL that consists of 8 flow meters and an initial term of 12 months.

City-Wide Temporary Flow Study, Lewisburg, TN

Client: Wauford Engineering / Lewisburg Wastewater Department

Contact: Mr. Greg Davenport, P.E., (615) 883-3243

A total of 10 flow meters and 2 rain gauges were installed and maintained for this 60-day study. As is often the case, several routine maintenance issues were identified by CSL field technicians during the course of this project and were reported to the City for corrective action. A prioritization table was developed for subsequent source detection projects.

Our proposed cost schedules for a study with 7 flow monitors and a study with 5 flow monitors are presented below, and our Terms and Conditions are provided on pages 6 through 8. If GRW decides to do the I&I analysis and the reports, Items 3 and 4 can be deducted.

PROPOSED COST SCHEDULE FOR 7 SITES AND 1 RAIN GAUGE

Item	Units	Unit Price	Item Total
1. Flow Monitor Installation and Calibration, each	7 each	$ 600	$ 4,200
2. Flow Monitor Maintenance and Data Collection, per meter-day	630 meter- days	$ 47	$ 29,610
3. I&I Analysis and CSL Final Report submitted to GRW	LS	$ 2,500	$ 3,450
	TOTAL		$ 37,260

PROPOSED COST SCHEDULE FOR 5 SITES AND 1 RAIN GAUGE

Item	Units	Unit Price	Item Total
1. Flow Monitor Installation and Calibration, each	5 each	$ 600	$ 3,000
2. Flow Monitor Maintenance and Data Collection, per meter-day	450 meter- days	$ 50	$ 22,500
3. I&I Analysis and CSL Final Report submitted to GRW	LS	$ 2,000	$ 3,000
	TOTAL		$ 28,500

I will say again that I appreciate this opportunity, and I give you my pledge to provide a quality product. Please let me know if you have any questions or comments.

Best regards,

CSL SOUTH, INC.

William H. Dawson, P.E.
Vice President

CSL South, Inc. (CSL)

Terms and Conditions for Temporary Flow Monitoring Services

CSL Scope of Services:

The Services To Be Performed by CSL Will Include the Following:

- Provide a 2-person field crew for all CSL field work
- Provide sewer flow monitoring equipment to measure sanitary flows
- Install and program flow monitoring equipment at client designated locations
- Collect flow data and manually confirm depth and velocity measurements of monitors at monitor equipment installation, and immediately prior to monitoring equipment removal
- Remove flow monitoring equipment at the end of the monitoring period
- Perform data processing and analysis
- Prepare and deliver a final report

Flow Monitoring Equipment:

The flow monitoring equipment provided by CSL shall be suitable for open channel sewer flow monitoring. CSL will use portable, battery-powered flow monitoring equipment at all flow monitor locations. Flow monitors will be programmed to record measured flow depth and velocity at no greater than 15-minute intervals.

CSL will use Hach/American Sigma, Isco, ADS or FlowAV area-velocity flow monitoring equipment. These flow monitors use bubbler or pressure sensor technology for level measurement, and ultrasonic, continuous wave Doppler technology for velocity measurement.

Safety:

CSL has full responsibility for the safety of its employees and agents, including providing appropriate safety equipment for its field personnel.

CSL shall assign personnel to the project who are trained in flow monitoring, familiar with working in the field and are trained in safe traffic control and permit-required confined space access procedures. A 2-person field crew is nominally required for safe confined space access (manhole entry) per OSHA regulation. CSL shall be fully responsible for its own safety while on the job. CSL personnel shall comply with City, County, State and Federal OSHA requirements.

CSL will provide limited traffic control setup with cones and signs, as required. CSL assumes heavy traffic control, including all labor and equipment beyond cones and signs, will be provided by others, if required. Heavy traffic control would include, but not be limited to, traffic plan(s), flag person(s), arrow

board(s), lighted sign board(s), etc.

Specific Exclusions:

CSL specifically excludes the following work tasks necessary to accomplish the base scope of work:

- Field locating potential monitoring locations
- Uncovering buried or paved over manholes
- Accessing manholes on private property
- Field visit(s) to the flow monitoring location(s) between scheduled visits
- Interim data submittals
- Moving flow monitors once installed
- Provision of more than a 2-person field crew
- Data loss due to events beyond CSL's control
- Heavy traffic control not provided by CSL

Deliverables:

CSL will deliver to the CLIENT two (2) copies of a flow monitoring data report that is to include:

- Field investigation report(s) describing monitoring location information, access information, and area maps
- Hydrograph(s) of depth, velocity, and flow using hourly averaging of 15-minute measurements
- Tabular output(s) of the flow using hourly averaging of 15-minute measurements, including daily minimum, average, and peak flow rate
- High Groundwater Infiltration and Rainfall-derived I&I quantities for each sub-system
- Sub-system prioritization table

Responsibilities Of The Client:

CSL is proposing to provide a turnkey service that will minimally impact the client's resources. Certain items, however, will be required in advance of CSL filed activities to accomplish the basic Scope of Services. The items are:

- Provide engineering maps clearly identifying each of the flow monitoring locations
- Provide linear footages and diameters of each sub-system
- Provide a list of proposed flow monitoring location(s) with pipe diameters identified at least 2 weeks prior to CSL's mobilization to the project site (Imperative for preparing sensor flow monitoring equipment)
- Field confirm that manhole(s) are accessible, not buried, not paved over, not on private property, etc.
- Field confirm that monitoring locations do not have accumulated debris precluding flow monitoring equipment installation or causing flow disturbance

Payment Terms:

CSL shall submit progress payment invoices at monthly intervals during the performance of services. The progress payment invoices will be based on CSL estimated completion percentages. At the completion of services, CSL will submit a final invoice for any remaining portion of the contract amount not previously invoiced. If CSL's CLIENT is not the Primary Contracting entity, CLIENT shall invoice the Primary

Contracting entity for CSL work within 5 business days of receipt of CSL invoice. Payment Terms are Net 30 days. 1.5% per month interest shall be added to all payments in excess of 30 days.

Work Schedule:
CSL will coordinate the start of the monitoring period with the CLIENT after CSL receives a written notice to proceed.

Additional Work Items:
CSL shall not perform work outside of the scope of services listed in these terms and conditions for temporary flow monitoring services unless changed by written amendment by both CSL and the CLIENT.

Insurance:
CSL currently carries the following coverage:

General & Excess Umbrella Liability
HARTFORD FIRE INSURANCE COMPANY
$1,000,000
Policy # 13uunkh0479
Exp. 03/13/13

Automobile Liability
SENTIINEL INSURANCE COMPANY
$1,000,000
Policy # 13UUNKH0479
Exp. 3/13/13

Excess/Umbrella Liability
HARTFORD CASUALTY INSURANCE COMPANY
$1,000,000
POLICY # 13XHUKH0603
EXP. 03/13/13

Professional Liability
IRONSHORE SPECIALTY INSURANCE CO.
$1,000,000
Policy # 000530302
Exp. 07/16/13

Workers Compensation & Employer's Liability
Trumbull Insurance Company
$500,000/ $500,000/ $500,000
Policy # 13WECBJ6990
Exp. 01/15/13

EXECUTION

Execution by a representative of GRW ENGINEERS, INC. will be authorization for CSL to proceed with the Services described herein.

The parties hereto have caused this Agreement to be executed this _____ day of

_____ 20 ____.

FOR GRW ENGINEERS, INC.:

By: _____

Title: _____

Date: _____

ATTEST:_____

FOR CSL SOUTH, INC.:

By: _____

Title: Vice President

Date: 9/5/2012