SUPPLEMENTAL AGREEMENT

ON-CALL CONTRACT

CITY OF GREENSBORO
GUILFORD COUNTY
NORTH CAROLINA

THIS SUPPLEMENTAL AGREEMENT to an On-Call Professional Services Agreement, made November 5, 2014, by and between the CITY OF GREENSBORO, a municipal corporation in Guilford County, North Carolina, hereinafter called the "CITY" and of ARCADIS G&M of North Carolina, Inc. , hereinafter called the "CONSULTANT,"

WITNESSETH:

WHEREAS, the City has entered into an On-Call Professional Services Agreement dated January 29, 2014 for a duration of three years with the Consultant and allows for two (2) extensions of one year each; and

WHEREAS, pursuant to said Agreement the Consultant has contracted to perform various professional services described therein as requested by the City for various public works projects; and

WHEREAS, the City desires the Consultant to perform the said Flow Monitoring according to the terms of the Agreement and the letter attached hereto;

NOW, THEREFORE, it is hereby agreed that the Consultant will perform the professional services described in the attached letter dated November 5, 2014, the letter being incorporated herein by reference. It is further agreed that the charges and fees for the described services shall not exceed the total sum of $465,000.00. The services shall be performed according to the terms and conditions as described in the basic Professional Services Agreement dated January 29, 2014 to which this Agreement is supplemental.

The Consultant shall comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes at all times during the term of this contract. The Consultant shall also require that all of its sub consultants that perform any work pursuant to this contract comply with the requirements of Article 2 of Chapter 64 of the North Carolina General Statutes. The terms "Consultant", "Sub Consultant" and "comply" shall have the same meanings intended by Chapter 160A Section 20.1(b) of the North Carolina General Statues. Violation of this E-VERIFY section shall be deemed a material breach of this Agreement and can result in stoppage of the work by the Owner.

Conflict of Interest

No officer, employee or agent of the City, and no sub-grantee or sub-recipient of any federal or state funds from the City shall participate in the selection or in the award or administration of a contract supported by federal, state, or City funds if a conflict of interest, real or apparent, would be involved. Such a conflict of interest would arise when any of the following persons or entities has a financial or other interest in the firm selected for the award:

(i) The employee, officer, agent;
(ii) Any member of his immediate family;
(iii) His or her partner; or
(iv) An organization which employs, or is about to employ, anyone listed in (i) through (iii) above.

The grantee's or sub-grantee's officers, employees or agents will not solicit or accept gratuities, favors or anything of monetary value from contractors, potential contractors, or parties to sub-agreements except as may be allowed in the City's Gift Policy, B-20.

The Definitions for the terms Officer, Employee and Agent as used in this Section are as follows:

1. **Officer** - An individual who is elected to or appointed to serve or represent the City of Greensboro, other than an employee or independent contractor of the City.
2. **Employee** - Those individuals who are employed at will by the City of Greensboro for remuneration, whether full time or part time, benefited or non-benefited, and are charged with implementing City policies and City Council goals and objectives.
3. **Agent** - Those individuals or companies who are authorized to act on behalf of the City and who provide services or products, whether contractual or not.

ARCADIS
Infrastructure · Water · Environment · Buildings

ARCADIS G&M of North Carolina, Inc.
1 Centerview Drive
Suite 208
Greensboro
North Carolina 27407
Tel 336 292 2271
Fax 336 855 5648
www.arcadis-us.com

WATER DIVISION

Ms. Melinda King, PE
Water Resources Department
City of Greensboro
2602 S. Elm-Eugene St.
Greensboro, NC 27406

Subject:
Greensboro, NC
2015 Sewer Model Recalibration – Flow and Rainfall Monitoring

Date:
November 5, 2014

Contact:
David Hamilton

Phone:
336-292-2271

Email:
david.hamilton@arcadis-us.com

Our ref:
GRGRN050.R005

ARCADIS G&M of North Carolina, Inc.

NC Engineering License # C-1869
NC Surveying License # C-1869

Dear Ms. King:

ARCADIS is pleased to submit this proposal to provide flow monitoring services in FY 2014-2015 for the anticipated Sewer Model Recalibration that will occur in FY2015-2016. This proposal outlines the various considerations involved with flow monitoring as well as providing the scope of services for the program implementation.

Project Considerations

Flow monitoring is a critical component of a properly calibrated sewer model. Proper placement of monitors will allow the modeling team to match anticipated flows within individual drainage basins with those actually measured under various field conditions. Likewise, monitors in basins where pre-rehabilitation monitoring was performed will provide confirmation of the effectiveness of the rehabilitation efforts.

ARCADIS and City staff have jointly reviewed the existing sewer system basins, system geometry, and operational considerations to determine the most effective placement of the flow monitors for these purposes. This review determined that 58 flow monitors and 7 rain gauges, in conjunction with data from 15 existing pump stations using Mission 800 alarms and also with rainfall data from various USGS gauges, would provide sufficient data to adequately recalibrate the sewer model.

Hydrostructures, PA has been selected by ARCADIS as the subcontractor to provide all field work and the initial meter data reviews and data quality checks associated with the flow and rainfall monitoring effort. Hydrostructures has provided successful monitoring services for the City in recent past.

Hydrostructures will begin their scope of work with field reconnaissance to determine what equipment will be needed at each monitoring location, followed by installation of the monitors. Once all monitors are installed, data collection will occur over a period of sixteen weeks (approximately four months). At the end of twelve weeks (approximately 3 months), a decision will be jointly made between ARCADIS and City staff whether sufficient data has been collected to adequately calibrate the sewer model. If so, some or all monitors and rain gauges will be removed after twelve weeks. If some or all monitors and rain gauges remain in place for the full sixteen weeks and insufficient data has been collected after that period to adequately calibrate the sewer model and provide confidence in the rehabilitation effectiveness, the monitors and rain gauges may be left in place on a weekly basis until sufficient data is collected.

Hydrostructures will provide ARCADIS with quality-checked flow and rainfall data within 30 days of completion of the flow and rainfall monitoring period. A final report will be delivered to the City by ARCADIS within 90 days following the availability of the quality-checked flow and rainfall data. The Report developed by ARCADIS will include documentation of the site installation, quality assurance review, meter evaluation, selected events for calibration, and infiltration and inflow (I/I) review.

Flow Monitoring Scope of Services

The proposed detailed scope of services is as follows:

1. Administer the subcontract with Hydrostructures to provide the required flow monitoring equipment and data analysis. *A copy of the Hydrostructures scope is attached as a reference.*
2. Review results of Hydrostructures site inspections in conjunction with City staff, answer any questions that Hydrostructures field crews may have and provide additional information as needed.
3. Provide an initial QA check of the data after the monitors have been in operation for two weeks. This initial effort will consist primarily of the following:
    a. Review and analysis of time series depth and velocity data.
    b. Provide initial dry weather flow balancing.

c. Develop scatter plots based on depth and velocity data and analyze them with comparisons to theoretical velocity (Manning's) calculations and field measurements of depth and velocity.

d. Review/analyze any rainfall data for consistency among gauges.

4. Conduct a meeting with Hydrostructures to discuss the results of the QA review and determine whether any changes to meter locations or equipment are warranted.

5. Review raw data on a bi-weekly basis as it is submitted by Hydrostructures to check for quality and consistency. Analyze the data and provide a summary table of observations, potential issues, and any problems with the collected data and work with Hydrostructures to identify corrective actions, where necessary.

6. Conduct bi-weekly conference calls or meetings with Hydrostructures to review the data and discuss resolutions to any problems with the data or the equipment and provide an update to the City following each call/meeting.

7. Provide a detailed review of the final data submitted by Hydrostructures. The final report will confirm the suitability of the full dataset for purposes of the model calibration and will address such issues as meter imbalance, sensor failure, low flow/level situations, velocity gain adjustments, and absence/loss of storm peaks.

8. Prepare a final report and deliver all raw and final data to the City. The report will include documentation of the site installation, quality assurance review, meter evaluation, and selected events for calibration. The report will include a characterization of average dry-weather flow conditions and observed wet-weather events. A one day workshop will be conducted to review the initial dry- and wet-weather evaluations.

Additional Services

Any work requested by the City that is not included in one of the items listed in this scope of services will be classified as Additional Services. Examples of Additional Services include but are not limited to:

1. Changes in the general scope, extent, or character of the project, including, but not limited to:

a. Changes in size or complexity.
b. The City's schedule.
c. Method of financing.
d. Revision of previously accepted studies, reports, or design documents when such revisions are required by changes in laws, rules, regulations, ordinances, codes, or orders enacted subsequent to the preparation of such studies, reports, documents, or designs; or are required by any other causes beyond ARCADIS' control.

2. Special consultants or subcontractors or independent professional associates requested or authorized by the City.

Responsibilities of the City

It is our understanding that the City will be responsible for the following:

1. Furnish available information pertinent to the project to allow ARCADIS to provide the scope of services contained herein.

2. Provide payment for independent third-party services as needed (and preapproved).

3. Arrange safe access onto public and private property for ARCADIS to perform the scope of services. Provide assistance to the flow monitoring subcontractor (Hydrostructures, PA) in locating the proper manholes for monitor installation. ARCADIS and Hydrostructures staff will follow City of Greensboro or ARCADIS safety requirements, whichever are stricter, when on site at any City-owned facilities.

4. Provide, as required for the project, accounting, financial, insurance, or legal advisory services to address issues that the City requires, or ARCADIS reasonably requests.

5. Advise ARCADIS of associated project issues as they arise, such as changes in scope or schedule.

6. Attend project meetings that ARCADIS reasonably requests.

Fee Proposal

ARCADIS proposes to provide the above engineering services on a time and materials fee basis with a 3.20 multiplier on direct labor, plus reimbursable expenses at a 1.0 multiplier, not to exceed the amounts noted below without prior authorization from the City.

Service	Fee
Flow and Rainfall Monitoring Program and Data Analysis	$465,000

Extended Monitoring Service	Fee
Extended Flow Monitoring (after 4 months; per meter per week)	$350
Extended Rainfall Monitoring (after 4 months; per gauge per week)	$60
Extended Services by ARCADIS (after 4 months; per week)	TBD based on # of meters (estimated NTE $3,000)

Reimbursable expenses are described as follows:

1. Mileage and associated travel costs for employees working on the project at the current IRS-approved rate per mile, or reimbursement of rental car rates for staff traveling from other offices.

2. Lodging and meals associated with staff traveling from other offices for required overnight stays.

3. Reproduction of project-related materials by outside vendors.

4. Postage and shipping charges associated with the project.

5. Subcontractor services.

6. Cost of materials or services obtained specifically for this project.

We look forward to assisting the City of Greensboro in recalibrating the Sewer Model with this initial step of Flow and Rainfall Monitoring. If this proposal meets your approval, please prepare a Supplemental Agreement to our existing On-Call Agreement for Professional Services for execution.

Sincerely,

ARCADIS G&M of North Carolina, Inc.

David Hamilton, PE
Project Manager

Copies:
Melinda King, PE
Robbie Bald, PE
Rebecca Cramer, PE
Bill Barrack, PE