



We Are Columbia

MEETING DATE: October 18, 2016

DEPARTMENT: Procurement and Contracts

FROM: *Sandra Wright, Purchasing Agent*

SUBJECT: Council is asked to approve Contract Amendment #5 for Project SS685401; An Agreement for Modeling and Evaluating the Sanitary Sewer Piping and Pump Station System, as requested by the Utilities and Engineering Department. Award to Hazen & Sawyer in the amount of \$412,200.00. This firm is located in Columbia, SC.

PRESENTER: Josep D. Jaco, P.E., Director of Utilities & Engineering

FINANCIAL IMPACT: Funding Source: Capital Outlay Budget, 5529999-SS685401-658650. This is a Clean Water 2020 Program Project and a Mentor Protege Program Project. Palmetto Consulting Engineering Group, Inc., a Woman Owned Business Enterprise of Chapin, SC is the Protege. The original contract amount is \$1,761,508.00 and the revised contract amount is \$2,649,452.00.

ORIGINAL BUDGET: \$1,761,508.00 (this amendment \$412,200.00)

CLEAN WATER 2020?: Yes

STRATEGIC GOALS: Invest in Infrastructure

The Agreement is for Engineering Services between the City of Columbia and Hazen & Sawyer for Modeling and Evaluating the City's Sanitary Sewer System Piping and Pump Station to Support a Capacity Assurance Program (CAP). Hazen and Sawyer developed a calibrated hydraulic model for the City's trunk sewer system. As part of Hazen & Sawyer's deliverables, the City requested that the Capital Improvements Report be expanded to be an all-inclusive document that includes previous technical memoranda as well as documenting decisions on additional projects, such as Project Oro.

Staff has negotiated a fee totaling Four Hundred Twelve Thousand Two Hundred Dollars and No/100 (412,200.00) for the specified needs with Hazen & Sawyer a non-DBE firm headquartered in New York, NY, with an office in Columbia. This Amendment is not associated with the Mentor Protégé Program or Sub-Contractor Outreach. Hazen & Sawyer is however, an approved Mentor in the

Mentor Protégé Program with Palmetto Consulting Engineering Group, Inc. a FBE firm located in Chapin, SC as their Protégé. Funding for this Amendment is budgeted from the Capital Outlay Budget (5529999-SS685401-658650).

Original Agreement Contract Amount:	\$1,761,508.00
Previous Amendment totals 1-4:	\$ 475,744.00
This Amendment (addition):	\$ 412,200.00
New Agreement Amount:	\$2,649,452.00

Services to be performed will impact all City Council Districts. The Amendment has been reviewed and approved by the Legal Department.

ATTACHMENTS:

- Hazen.&.Sawyer.2015.Sewer.Hydraulic.Model.SS685401.Council.Pkg.2 (PDF)
- Hazen.&.Sawyer.SS685401.CA#5.Justification (DOCX)
- Hazen.&.Sawyer.2015.Sewer.Hydraulic.Model.SS685401.Map. (PDF)
- Approved Project Form SS685401 Sewer Model & CAP (PDF)

Agreement for Engineering Services For
Modeling & Evaluating the City's Sanitary Sewer System Piping & Pump Stations to
Support a Capacity Assurance Program (CAP);
CIP SS685401

Hazen and Sawyer, P.C. and City of Columbia, SC

Contract Amendment #5

August 29, 2016

Description of Change: Request change in Agreement for Engineering Services between the City of Columbia (City) and Hazen and Sawyer, P.C. (Engineer) dated September 18, 2012 (Agreement), amended by Contract Amendment 1 dated June 24, 2014; Contract Amendment 2; January 14, 2015; Contract Amendment 3 dated April 14, 2015; Contract Amendment #4 dated April 6, 2016 and this Amendment is for the Sewer Model and Capacity Assurance Program, more fully described in the Exhibit attached hereto.

All other provisions of the Agreement, except as herein modified or changed, remain in full force and effect.

Proposed Change and Basis for Payment:

Original Contract Price:	\$1,761,508.00
Previous Change Orders:	\$ 475,744.00
This Change (addition/deletion):	\$ 412,200.00
Revised Contract Price:	\$2,649,452.00

Additional funds are to be provided in the following manner: 5529999-SS685401-658650

This Change is Acceptable:

By: [Signature] Hazen and Sawyer, P.C.
Title: SENIOR ASSOCIATE

Recommended for Approval: [Signature] Director of Utilities and Engineering
Joseph D. Jaco, P.E.

Recommended for Approval: [Signature] Purchasing Agent
Sandra A. Wright

Recommended for Approval _____ Assistant City Manager for Operations
Melissa Gentry, P.E.

Approval of Change: _____ City Manager
Teresa Wilson

Hazen&Sawyer.2015.Sewer.Hydraulic.Model.LSS685401.CA5.kr

APPROVED AS TO FORM

[Signature]
Legal Department, City of Columbia, SC



Hazen and Sawyer
1122 Lady Street, Suite 1230 • Columbia, SC 29201

Cost Change Amendment

May 13, 2016

Mr. John Riggs
Assistant Wastewater Engineer
City of Columbia
Utilities and Engineering
1136 Washington Street
Columbia, South Carolina 29201

Re: PROJECT NAME: Sewer Model and Capacity Assurance Program
CIP NUMBER: SS685401 - Amendment 5

Dear Mr. John Riggs:

Under a previously executed City of Columbia contract for SS685401 Sewer Model and Capacity Assurance Program, Hazen and Sawyer developed a calibrated hydraulic model for the City's trunk sewer system. As part of Hazen's deliverables, the City has requested that the Capital Improvements Report be expanded to be an all-inclusive document that includes previous technical memoranda as well as documenting decisions on additional projects, such as Project Oro, over the past 3 years. Hazen has also reformatted the stand-alone model development report to meet the needs of the EPA submittal requirement in accordance with requirements from Clean Water 2020. Lastly, Hazen is currently developing a Capacity Assurance Program (CAP) report to describe the CAP tool and CAP process. In consideration of these more detailed reports, Hazen respectfully requests the following proposed additional scope items:

1. Scope Addition/Deletion

Continued Project Administration:

It is anticipated that this amendment will be in effect over a 24 month period. Regular monthly progress meetings will be held over the duration of the project.

Items under this task will be bill on an hourly rate basis

Capital Improvements Report:

As alluded to above, Hazen is currently completing its third revision of the CIP summary report after submitting drafts on the recommended CIP and a review copy of additional reporting details for the Crane Creek basin. Several of the recent changes are highlighted below:

Completed Items:

Hazen

- Document decisions were reached by consensus early in the project, including a review of previous documentation on tunnel evaluation (by others).
- Add maps for each planning year for dry-weather and wet-weather flow both before and after proposed improvements.
- Document preliminary sizing and operation of storage facilities, including detailing flows in and out of storage during wet-weather events.
- Prepare individual basin capacity analyses maps.
- Discuss the calibration of the hydraulic model to data collected during drier than normal rainfall and groundwater saturation conditions.
- Re-draft the Crane Creek evaluation based on a change in the number of storage facilities which considered upper and lower storage alternatives in conjunction with possible future industrial demand.
- Document the Project Oro evaluation in the CIP Report.

Items to be Completed:

- Document preliminary RDII cost analyses for each river basin for which the potential existed to defer capital improvement projects.
- Model and describe ongoing project changes, including keeping the existing 36" in service in parallel to the new 48" sewer in Crane Creek and the consideration of two construction phases for the Lower Crane Creek Storage facility.
- Submit revised Draft CIP Report.
- Incorporate review comments and submit Final CIP Report.

Items under this task will be bill on a lump sum basis. 75% will be billed with the revised CIP Report Draft. 100% will be billed with the final report submittal

EPA Model Development Report

Completed Items:

- Format to standards and outline provided by Clean Water 2020.

Items to be Completed:

- Anticipated work tasks and report review meetings will include:
 - City review of the current draft
 - Develop 90% report based on City comments
 - City review of the 90% draft
 - Develop 100% report based on City comments
 - City review of the 100% draft
 - Final changes to the 100% draft before Legal Review by City
 - Legal Review of the 100% draft & corresponding revisions by Hazen based on the legal review. (5 meetings with the Legal Time are budgeted)

Hazen

- Preparation of EPA deliverable including final formatting

Items under this task will be bill on an hourly rate basis

CAP Tool Changes and Process Report:

Items to be Completed:

- Modify the Hazen CAP tool to account for additional hydraulic loadings at the Metro WWTP based on capacity requests. The CAP tool will track capacity requests at the plant as well as the collection system. The flows applied to the treatment capacity CAP analysis will be the average day contributory loading in the capacity request.
- Develop a report that documents the procedural process for the Capacity Assurance Program and the CAP tool. It is intended that this report will be utilized as an internal tool for the CAP process. Anticipated report review meetings will include:
 - Kickoff meeting & report outline
 - 30% report and City review
 - 60% report and City review
 - 90% report and City review
 - 100% report and City review
- Develop the CAP Program Process Report for the Capacity Assurance Program for submittal to the EPA. This report will outline and document the CAP process for EPA. Anticipated report review meetings will include:
 - Kickoff meeting & report outline
 - 30% report and City review
 - 60% report and City review
 - 90% report and City review
 - 100% report and City review
 - Final changes of the 100% draft before Legal Review
 - Legal Review of the 100% draft & revisions by Hazen based on the legal review (5 meetings with the Legal Time are budgeted)
 - Preparation of EPA deliverable including final formatting

Items under this task will be bill on an hourly rate basis

CAP Tool On-Call Support:

Items to be Completed:

- Answer questions about the CAP Tool and provide technical assistance after tool has been signed over to the City and installed on the City's system.

Items under this task will be bill on an hourly rate basis

Hydraulic Model Review Task:

The scope includes the following activities:

Hazen

- Lead a review workshop and present the key findings of the hydraulic modeling project. The summary shall cover all sections in the hydraulic modeling report.
- Provide model files for review as requested (calibration, capacity analysis, and improvement alternatives) and review the files with the committee.
- Attend conference calls to answer questions during review (3 calls for review questions).
- Attend a meeting to review any comments
- Prepare a letter report responding to comments (No changes will be made to the model under this amendment. Any model modifications will be made under separate amendment.)

Items under this task will be bill on an hourly rate basis

2. Compensation

The work to be performed for this Amendment 5 of the Wastewater Collection System Sewer Model and Capacity Assurance Program as previously delineated in Exhibit A – Scope of Services, will be billed as stated above in the specific scope items. The fee is broken out as follows:

Continued Project Administration:	\$59,400
Capital Improvements Report:	\$67,500
EPA Model Development Report:	\$61,000
CAP Tool Changes and Process Report:	\$134,700
CAP Tool On-Call Support:	\$41,800
Hydraulic Model Review:	\$47,800

The following changes to the initial SS#385401 contract are recommended to perform the scope of services described herein:

Amendment 5 – \$412,200

The new contract values based on the above recommended changes are presented below:

Task 1 - \$682,078
Task 2 - \$186,630
Task 3 - \$77,440
Task 4 - \$520,340
Task 5 - \$295,020
Amendment 1 - \$100,000
Amendment 2 - \$100,000
Amendment 3 - \$175,744
Amendment 4 - \$100,000
Amendment 5 - \$412,200
Total - \$2,649,452



Table 1 summarizes the agreed upon 2015-2016 hourly rates by employee classification. Project expenses for subconsultants employed by Hazen and Sawyer, will be billed to the City at cost times a multiplier of 1.10 and billed at direct cost for other expenses such as travel and reproduction.

Services will be provided for requested tasks as can be accomplished within the not-to-exceed budget limit. The specific services requested and corresponding levels of effort will determine the number of tasks that can be accomplished within the budget limit. When services performed under this contract approach the not-to-exceed budget limit, Hazen will notify the City. Additional work will not be performed beyond the authorized budget limit without prior authorization and a corresponding budget increase.

Table 1: 2015 – 2016 Hourly Billing Rates

Employee Classification	Billing Rates
Vice President	\$225.00
Senior Associate	\$190.00
Associate	\$165.00
Senior Principal Engineer	\$145.00
Principal Engineer	\$125.00
Engineer	\$115.00
Assistant Engineer	\$101.00
Senior Principal Designer	\$135.00
Principal Designer	\$115.00
GIS Specialist	\$100.00
Designer	\$90.00
Administrative	\$64.00
Intern	\$29.00

Hazen shall be allowed to adjust employee hourly rates in Table 1 on an annual basis starting in July 2016. Adjustments shall not exceed 3% per year. Hazen will submit to the City, for approval, the proposed hourly rates. Approval of adjusted hourly rates by the City does not affect the total project cost ceiling for compensation under this Agreement.

3. Schedule

The services described herein will be accomplished in response to specific requests from the City according to a mutually agreeable schedule established within a period from notice to proceed through June 2018. It is anticipated that the major task items will be complete follows:

Continued Project Administration:	Though June, 2018
Capital Improvements Report:	
Draft CIP Report (Dependent on receipt of Crane Creek CIP Section Approval)	July 1, 2016
Final CIP Report	October 1, 2016
EPA Model Development Report	
Draft EPA Report	March, 2016
Final EPA Report	October 1, 2016

Hazen

CAP Tool Changes and Process Report:

CAP Tool Changes	June 2016
Draft Capacity Assurance Program and the CAP Report	October, 2016
Final Capacity Assurance Program and the CAP Report	February, 2017
Draft CAP Program Process Report	June, 2017
Final CAP Program Process Report	December, 2017

CAP Tool On-Call Support:

Through December 2017

Hydraulic Model Review:

Review Workshop	July 2016
Respond to Review Comments	December, 2016

Hazen & Sawyer appreciates the opportunity to provide this highly technical modification to the City of Columbia for the Sewer Model and Capacity Assurance Program project. If you have any questions please feel free to contact me.

Sincerely,



William H. Orne, PE
Senior Associate

cc: Clean Water 2020 Project Manager

Memorandum

To: Kimberley Roof

From: Don Freeman

Date: September 7, 2016

Subject: SS685401 CA#5 Justification

For the past several years, Hazen and Sawyer (H&S) has been leading the effort to the develop a collection system-wide hydraulic computer model and a Capacity Assurance Program (CAP) tool, both of which will be used to evaluate and refine future projects necessary to improve the sewer system and the reduce sanitary sewer overflows (SSO's). This work is required by the Consent Decree and is an integral part of the overall CleanWater 2020 program. H&S possesses an extensive working knowledge of the City of Columbia's collection system and has completed much of the required work to date. This amendment is for follow-on work requested by the City to further enhance the cost-effectiveness of the Program and to ensure the best total-solutions are implemented.

Contract Amendment #5 includes the following:

1. Expansion and further refinement of the Capital Improvements Report: This report summarizes the development of the hydraulic model, evaluates project alternatives, and makes recommendations for future capacity improvements. This report documents general direction of the CleanWater 2020 program but is not an EPA deliverable. Although this report was included in H&S original scope, the City has requested additional alternatives be evaluated and requested the report be modified to be an all-inclusive report encompassing previously prepared technical memos. Since H&S is the author of the original memos and the creator of the hydraulic model, no other consultant is suited to perform this work in a timely manner.
2. Preparation of the Consent Decree required a Hydraulic Model Development Report: This report is an EPA deliverable and is separate from the report discussed above in Item 1. H&S will also be required to coordinate a legal review of this report by the City and incorporate any changes requested. Development of this report and addressing legal comments were not in their original scope. Since H&S developed the hydraulic model no other consultant is suited to perform this work in a timely manner.
3. Develop CAP Tool Reports: H&S has already prepared a CAP tool which is a computer based tool to quickly evaluate new sewerage flow requests and determine if the pipes have adequate capacity to accommodate the requests. The City has requested that a summary

report be prepared to document all tool processes. This report will assist the City with implementation of the tool when it is formally turned over to the City for execution. This CAP Tool Report was not included in H&S's original scope. Since H&S developed the CAP tool no other consultant is suited to perform this work in a timely manner.

The Consent Decree requires a CAP Report. This report is an EPA deliverable and is separate from the summary report to document tool processes discussed above. H&S will be required to coordinate a legal review of this report by the City and incorporate any changes requested which was not included in their original scope. Since H&S developed the CAP Tool, no other consultant is suited to perform this work in a timely manner.

4. Provide on-call support of the CAP tool: H&S will provide as-needed technical assistance after the tool has been signed over to the City. Since H&S developed the CAP tool no other consultant is suited to perform this work in a timely manner.
5. Hydraulic Model Review: Since the Hydraulic Model will be used to make major decisions on future projects necessary to enhance the City's sewer system, the City has recommended that the model undergo a Peer Review to ensure the model integrity and accuracy is as best the best that can be expected by industry standards. The Peer Review will be done by engineering staff from CleanWater 2020, but H&S will need to participate and cooperate with the process. This CA#5 includes the necessary tasks for H&S to participate in the Peer Review. Since H&S developed the model, no other consultant can perform these tasks.

In order to achieve efficiency and align the various tasks with the requirements of the consent decree, H&S will work with the U&E staff and it's CleanWater 2020 Program Manager to complete the above work. No other firm has the extensive knowledge of the City of Columbia's sewer collection system, the hydraulic model and the CAP tool so CW2020 recommends that Contract Amendment #5 be issued solely to Hazen & Sawyer.



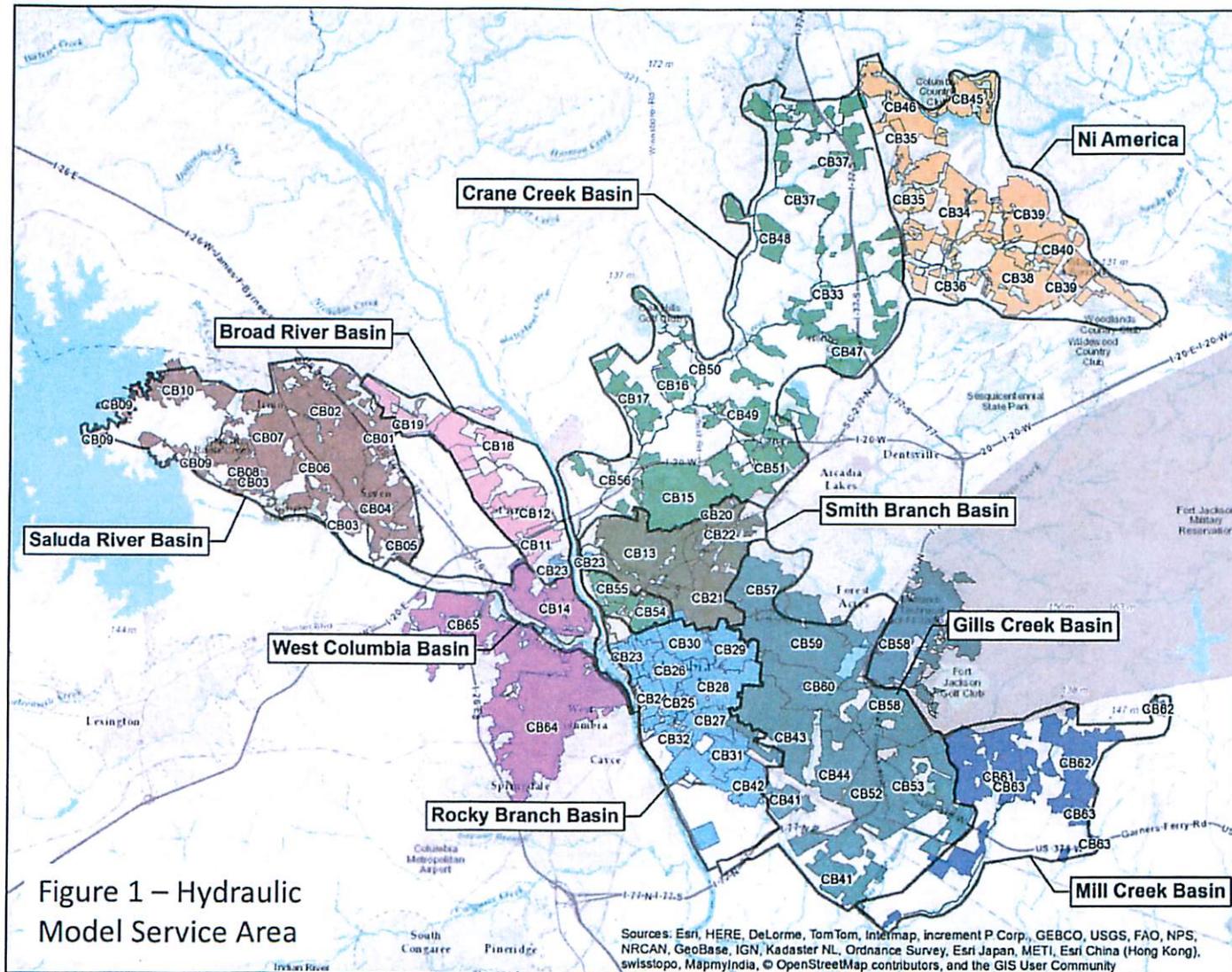


Figure 1 – Hydraulic Model Service Area

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



CITY OF COLUMBIA - APPROVED PROJECT

THIS SECTION TO BE COMPLETED BY DEPARTMENT TO ADD OR ADJUST A PROJECT

DEPARTMENT NAME	Utilities & Engineering	DIVISION NAME	Wastewater Maintenance	DATE	6/2/2016
PROJECT NAME	Sewer Model & Capacity Assurance Program			NEW PROJECT?	No
PROJECT ID	SS685401		PROJECT TYPE	Capital	
MANAGER NAME	John Riggs				

THIS SECTION TO BE COMPLETED BY DEPARTMENT

REVENUE BUDGET CONTROL- identifies source of funding

AMOUNT	FUNDING SOURCE	DESCRIPTION OF FUNDING SOURCE
\$ 412,200.00	SS676404	30" Forcemain from Mill Creek PS to MWWTP
\$ 412,200.00		

EXPENDITURE BUDGET CONTROL- creates capital project line item budget

BUDGET YEAR	OBJECT CODE	FUND	DIVISION	PROJECT	CURRENT BUDGET	REVISED BUDGET	INCREASE (DECREASE)
15/16	658660	552	9999	SS685401	\$ 1,989,980.59	\$ 2,402,180.59	\$ 412,200.00
			9999			\$ -	
			9999			\$ -	
TOTALS:					\$ 1,989,980.59		\$ 412,200.00

EXPLANATION SS685401 - Sewer Model & Capacity Assurance Program CA#5.

AUTHORIZED SIGNATURES:

DEPARTMENT MANAGER	ASST CITY MANAGER
DIVISION MANAGER	CITY MANAGER