

# SE-235 PROFESSIONAL INCIDENTAL SERVICES CONTRACT

**AGENCY:** The South Carolina Office of Resilience

**PROJECT NAME:** Georgetown and Williamsburg Counties Hydrologic and Hydraulic Study

**PROJECT NUMBER:** D30-N013-MJ

**A/E NAME:** McCormick Taylor

**ADDRESS:** 1818 Market Street,  
Philadelphia, PA 19103

In consideration of the mutual covenants and obligations set forth herein, the Agency and A/E (hereinafter jointly referred to as the "parties") agree to the following:

## A. CONTRACT DOCUMENTS

1. Documents forming a part of this contract are, in order of precedence:
  - a. This Contract, SE-235.
  - b. A/E Proposal describing services to be provided for this project, the associated hourly billing rates for the A/E and the A/E Consultants, and the projected Reimbursable items.
  - c. Supplemental Conditions, attached if applicable.
  - d. The following other documents:
    - Attachment A - Scope of Work
    - Attachment B - Fees & Schedule
2. The contract is the entire and integrated agreement between the parties and supersedes prior negotiations, representations, or agreements, whether written or oral.

## B. REPRESENTATIVES

### 1. Agency's Representatives

Agency designates the individual listed below as its Representative, which individual shall have the authority to bind the Agency with respect to all matters regarding the Contract and requiring the Agency's approval or authorization:

**NAME:** Eric Fosmire

**TITLE:** Chief of Staff & General Counsel

**ADDRESS:** 632 Rosewood Drive, Columbia, SC

**TELEPHONE:** 803-822-9580

**FAX:** 803-771-2887

**EMAIL:** Eric.Fosmire@scor.sc.gov

The term "Agency" means the Agency or the Agency's Representative.

### 2. A/E's Representatives

A/E designates the individual listed below as its A/E's Representative, which individual shall have the authority to bind the A/E with respect to all matters regarding the Contract and requiring the A/E's approval or authorization:

**NAME:** Patrick J. Guise

**TITLE:** Chief Visionary Officer

**ADDRESS:** 1818 Market Street, Philadelphia, PA 19103

**TELEPHONE:** 215-592-4200

**FAX:** \_\_\_\_\_

**EMAIL:** pjguise@mccormicktaylor.com

The term "A/E" means the A/E or the A/E's Representative.

3. Neither the Agency nor the A/E shall change their representatives without ten days written notice to the other party.

**C. A/E RESPONSIBILITIES**

1. The A/E shall provide professional services as set forth in this Contract consistent with the professional skill and care ordinarily provided by A/E's practicing in the same or similar locality region under the same or similar circumstances.
2. The A/E represents that its' team is properly licensed in the jurisdiction where the Project is located to provide the services required.
3. The A/E's responsibilities commence with the award of this Contract and terminate with the payment of the final invoice by the Agency.

**D. INSURANCE**

1. The A/E shall procure and maintain in effect during the term of this Contract the insurance coverages described below, which insurance shall be placed with insurance companies authorized to do business in the State of South Carolina and rated A minus VII or better by the current edition of Best's Key Rating Guide or otherwise approved by Agency.
  - a. Professional Liability Insurance with limits of not less than \$1,000,000 per claim and in the aggregate. A/E shall maintain this coverage in effect during the term of this Contract and for five (5) years after the date of completion of services provided under this Contract. A/E shall give prompt written notice to Agency of all claims made against this policy during the period in which this policy is required to be maintained.
  - b. Worker's Compensation Insurance as required by the State of South Carolina with statutory limits.
  - c. Employers' Liability Insurance with limit of no less than \$1,000,000 per accident.
  - d. Automobile Liability Insurance: Insurance Services Offices (ISO) Form CA 00 01 covering Code 1 (any auto), or if A/E has no owned automobiles, Code 8 (hired) and Code 9 (non-owned), with limits not less than \$1,000,000 per accident for bodily injury and property damage.
  - e. Commercial General Liability Insurance (CGL): ISO Form CG 00 01 12 07 covering CGL on an "occurrence" basis for bodily injury and property damage, including products-completed operations, personal injury, and advertising injury, with limits no less than \$1,000,000 per occurrence. If a general aggregate limit applies, either the general aggregate limit shall apply separately to the project or the general aggregate limit shall be twice the required occurrence limit. This Contract shall be considered to be an "insured contract" as defined in the policy.
2. The A/E agrees to require Consultants to comply with the insurance provisions required of A/E pursuant to this Contract unless A/E and Agency mutually agree to modify these requirements for Consultants whose work is of relatively small scope. The A/E agrees that it will contractually obligate its Consultants to advise A/E promptly of any changes or lapses of the requisite insurance coverages and A/E agrees to promptly advise Agency of any such notices A/E receives from its Consultants. The A/E agrees that it will contractually obligate its Consultants to indemnify and hold harmless the Agency to the same extent that the A/E is required to do so as provided in this Contract.
3. The A/E shall provide certificates of insurance to the Agency that evidence compliance with the requirements in this Section.
4. Additional Insured Obligations
  - a. To the fullest extent permitted by law, the A/E shall cause the primary and excess or umbrella policies for Commercial General Liability and Automobile Liability to include the Agency, its officers, officials, employees, and volunteers, as additional insureds for claims caused in whole or in part by the A/E's negligent acts or omissions. The additional insured coverage shall be primary and non-contributory to any of the Agency's insurance policies and shall apply to both ongoing and completed operations.
  - b. Prior to performing services, and thereafter upon replacement of each required policy of insurance, the A/E shall provide to the Agency a written endorsement to the A/E's General Liability Insurance policy that (i) names the Agency, its officers, officials, employees, and volunteers, as additional insureds, and (ii) states that coverage shall not be cancelled, except with notice to the Agency.
  - c. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the A/E with reasonable promptness.

**E. INDEMNIFICATION**

1. Without limitation and notwithstanding any provision in this Contract, the A/E shall indemnify and hold harmless the Indemnitees for and against claims, damages, losses and expenses (including attorneys' fees) asserted by a third party against an Indemnitee arising out of or resulting from negligent acts or omissions of the A/E, a consultant, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself). The A/E shall not be required to indemnify an Indemnitee to the extent the Indemnitee's damages result from the Agency's own negligence.

2. Such obligation shall not be construed to negate, abridge, or reduce any other rights, including any other obligations of indemnity, which would otherwise exist as to a party or person described in this Section. As used in this paragraph, "Indemnitees" means the State (including its instrumentalities, agencies, departments, boards, and political subdivisions), the contractor, the subcontractors at all tiers, and the officers, agents and employees of all the forgoing.

#### **F. A/E SERVICES**

1. The A/E shall be fully responsible for coordinating all services under this Contract regardless of whether performed by its own employees or by consultants hired by A/E to perform a portion of its' services.
2. The A/E shall be responsible to the Agency for the services furnished to the A/E by any Consultant to the same extent as if the A/E had furnished the service itself. A/E also agrees to coordinate and resolve any inconsistencies in its work and the work of its Consultants. All of A/E's contracts with Consultants shall be in writing, signed by both parties, and shall include the following provision: "The Agency is intended to be a third-party beneficiary of this Contract."
3. The A/E shall prepare and distribute conference memoranda, meeting minutes, summaries of telephone conversations, documentation and reports as required by the Agency to maintain a comprehensive record. The State Project Number and Name as noted above shall be shown on all documents.
4. Any reference in the Contract Documents to the A/E taking action or rendering a decision with a "reasonable time" or "reasonable promptness" is understood to mean no more than ten (10) days, unless otherwise specified in the Contract Documents or otherwise agreed to by the parties.
5. Work Product Documents
  - a. The Work Product to be accomplished and submitted to the Agency shall be as defined in the Contract Documents.
  - b. The A/E shall submit to the Agency, and OSE if required, properly completed documents in the number and form requested for review and approval.
  - c. The Agency and OSE review and approval of all documents or other matters required herein shall not relieve the A/E of his professional duty of care in the preparation of the Work Product for compliance with the requirements of applicable statutes, regulations, codes, or the Manual.
5. Additional Services
  - a. The A/E may provide Additional Services after execution of this Contract without invalidating the Contract. Except for services required due to the fault of the A/E, any Additional Services provided shall entitle the A/E to compensation pursuant to negotiations and an appropriate adjustment in the A/E's schedule.
  - b. The A/E shall not proceed to provide Additional Services until the A/E receives the Agency's written authorization.

#### **G. AGENCY'S RESPONSIBILITIES**

1. The Agency shall review the Work Product and shall submit its written approval to the A/E, and OSE, if required.
2. The Agency shall provide prompt written notice to the A/E if the Agency becomes aware of any fault or defect, including errors, omissions or inconsistencies in the A/E's Work Product.
3. The Agency shall include the A/E in all communications that relate to or affect the A/E's services or professional responsibilities. Communications by and with the A/E's consultants shall be through the A/E.

#### **H. CLAIMS AND DISPUTE RESOLUTION**

1. All disputes, claims, or controversies relating to the Contract shall be resolved exclusively by the appropriate Chief Procurement Officer in accordance with Title 11, Chapter 35, Article 17 of the South Carolina Code of Laws, or in the absence of jurisdiction, only in the Court of Common Pleas for, or a federal court located in, Richland County, State of South Carolina. A/E agrees that any act by the State regarding the Contract is not a waiver of either the State's sovereign immunity or the State's immunity under the Eleventh Amendment of the United States Constitution. As used herein, the phrase "the State" includes the Agency, any governmental entity transacting business with the A/E pursuant to the Contract, and the State Fiscal Accountability Authority.
2. A/E consents that any papers, notices, or process necessary or proper for the initiation or continuation of any disputes, claims, or controversies relating to the Contract; for any court action in connection therewith; or for the entry of judgment on any award made, may be served on A/E by certified mail (return receipt requested) addressed to A/E at the address provided in the Contract or by personal service or by any other manner that is permitted by law, in or outside South Carolina. Notice by certified mail is deemed duly given upon deposit in the United States mail.
3. The A/E and Agency waive claims against each other for listed damages arising out of or relating to this Contract.
  - a. For the Agency, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) costs suffered by a third party unable to commence work, (vi) attorney's fees, (vii) any interest, except to the extent allowed by Section K.5, (viii) lost revenue and profit lost use of the property, (ix) costs resulting from lost productivity or efficiency.

- b. For the A/E, listed damages are (i) lost revenue and profit, (ii) losses resulting from injury to business or reputation, (iii) additional or escalated overhead and administration expenses, (iv) additional financing costs, (v) attorney's fees, (vi) any interest, except to the extent allowed by Section K.5, (vii) unamortized equipment costs; and (viii) losses incurred by the A/E's consultants for the types of damages the A/E has waived as against the Agency.
4. Continuation of Work: Pending resolution of a claim or dispute, the A/E shall proceed diligently with the performance of its services under this Contract, and Agency shall continue to make payments in accordance with this Contract for all services rendered by A/E which are not the subject of the claim or dispute.

#### **I. TERMINATION OR SUSPENSION**

1. Agency Right of Suspension:
  - a. The Agency may, at any time, suspend the Work, in whole or in part, with or without cause for such period of time as determined by the Agency. The A/E shall be compensated for services performed prior to notice of such suspension, except in the event the suspension was due to a default by the A/E.
  - b. When the Work, in whole or in part, is resumed, the remaining amount payable to the A/E may be equitably adjusted to reflect reasonable costs actually incurred by the A/E due to delay or interruption resulting from such suspension.
  - c. If the suspension exceeds ninety (90) consecutive days, the A/E's fees for the remaining services and the time schedules shall be equitably adjusted.
2. Agency Right of Termination:
  - a. Termination for Cause: If the A/E defaults, persistently fails or neglects to perform the services in accordance with the Contract Documents, or fails to perform a provision of the Contract, the Agency shall provide written notice of such default, failure, or neglect to the A/E. If the A/E fails to cure such default, failure, or neglect within ten (10) days from receipt of the Agency's notice, the Agency may, without prejudice to any other right or remedy the Agency may have, terminate the Contract.
  - b. Termination for Convenience: The Agency may, for its convenience, terminate all or any portion of the Work or terminate this Contract by ten (10) days written notice stating the effective date of the termination. Thereafter, the Agency shall pay the A/E for those services actually performed before the date of termination. No payments shall be made for services not actually performed, and no payment shall be made or due for lost profits for portions of the services not actually performed.
3. A/E Right of Termination:
  - a. The A/E may terminate the contract if Work is stopped through no fault of the A/E, or other persons performing work either directly or indirectly for the A/E, for a period of time exceeding sixty (60) consecutive calendar days due to a court order or other public authority having jurisdiction; or a declared National emergency which requires the Work to be stopped.
  - b. Agency Failure to Make Payment: Subject to the Agency's right to withhold payments pursuant to Section K, if the Agency fails to make payments to the A/E as set forth in Section K and any other applicable provisions of the Contract Documents, the A/E may, upon fourteen (14) days prior written notice to the Agency, terminate the Contract and recover from the Agency payment for all services performed, including reasonable overhead, profit and damages applicable to the services performed through the date thereof.
4. In the event of suspension or termination for convenience, upon request of Agency and payment of all fees pursuant to this Section, A/E shall promptly provide Agency with all documents, completed or in progress on the date of termination, in electronic format. The Agency's rights to use the A/E's Work Product in the event of a termination of this Contract are set forth in the Contract.

#### **J. MISCELLANEOUS PROVISIONS**

1. Governing Law: The Contract, any dispute, claim, or controversy relating to the Contract, and all the rights and obligations of the parties shall, in all respects, be interpreted, construed, enforced and governed by and under the laws of the State of South Carolina, except its choice of law rules.
2. This Contract is formed pursuant to and governed by the South Carolina Consolidated Procurement Code and is deemed to incorporate all applicable provisions thereof and the ensuing regulations.
3. Severability: If it is determined that any provision of the Contract violates any law, or is otherwise invalid or unenforceable, such determination shall not impair or otherwise affect the validity, legality, or enforceability of the remaining provision or parts of the provision of the Contract Documents, which shall remain in full force and effect as if the unenforceable provision or part were deleted. In such case the Contract shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

4. **Economic Conflict of Interest:** The A/E shall not have or exercise any official responsibility regarding a public contract in which the A/E, or a business with which he is associated, has an economic interest. A person working for the A/E shall not have or exercise any official responsibility regarding a public contract in which the person, an individual with whom he is associated, or his family members have an economic interest. If the A/E is asked by any person to violate, or does violate, either of these restrictions, the A/E shall immediately communicate such information to the procurement officer. The state may rescind, and recover any amount expended as a result of, any action taken, or contract entered in violation of this provision. The terms "business with which he is associated," "economic interest," "family member," "immediate family," "individual with whom he is associated," "official responsibility" and "person" have the meanings provided in S.C. Code Ann. § 8-13-100.
5. **Drug-Free Workplace:** The A/E must comply with the Drug-Free Workplace Act, S.C. Code Ann. §§ 44-107-10, et seq. The A/E certifies to the Agency that A/E will provide a Drug-Free Workplace, as defined by S.C. Code Ann. §§ 44-107-20(1).
6. **False Claims:** According to SC Code § 16-13-240, "a person who by false pretense or representation obtains the signature of a person to a written instrument or obtains from another person any chattel, money, valuable security, or other property, real or personal, with intent to cheat and defraud a person of that property is guilty" of a crime.
7. **Non-Indemnification:** It is unlawful for a person charged with disbursements of state funds appropriated by the General Assembly to exceed the amounts and purposes stated in the appropriations per S.C. Code Ann. § 11-9-20. It is unlawful for an authorized public officer to enter into a contract for a purpose in which the sum is in excess of the amount appropriated for that purpose. It is unlawful for an authorized public officer to divert or appropriate the funds arising from any tax levied and collected for any one fiscal year to the payment of an indebtedness contracted or incurred for a previous year per S.C. Code Ann. § 11-1-40.
8. **Assignment:** The Agency and A/E, respectively, bind themselves, their agents, successors, assigns, and legal representatives to this Contract. Neither the Agency nor the A/E shall assign this Contract without the written consent of the other. S.C. Code Ann. Reg. 19-445.20180 provides as follows: "No State contract is transferable, or otherwise assignable, without the written consent of the Chief Procurement Officer, the head of a purchasing agency, or the designee of either; provided, however, that a contractor may assign monies receivable under a contract after due notice from the contractor to the State."
9. **Force Majeure:** In the event A/E is hindered, delayed or prevented from performing its obligations under this Contract as a result of any fire, flood, landslide, tornado or other act of God, malicious mischief, theft, strike, lockout, other labor problems, shortages of material or labor, or any other cause beyond the reasonable control of A/E, the time for completion of A/E's work shall be extended by the period of resulting delay.
10. **Open Trade Representation:** By signing this Contract, A/E represents that A/E is not currently engaged in the boycott of a person or an entity based in or doing business with a jurisdiction with whom South Carolina can enjoy open trade, as defined in SC Code § 11-35-5300. During the contract term, including any renewals or extensions, A/E will not engage in the boycott of a person or an entity based in or doing business with a jurisdiction with whom South Carolina can enjoy open trade, as defined in SC Code § 11-35-5300.

## **K. COMPENSATION**

### **1. Basic Services:**

The Agency shall compensate the A/E for the services rendered as described in the Contract Documents in Section A in the amount of:

**\$ 884,992.48**

### **2. Additional Services:**

The Agency shall compensate the A/E for Additional Services rendered as described in the Contract Documents in Section A in the amount of:

**\$ TBD**

### **3. Reimbursable Expenses:**



For Reimbursable Expenses the compensation shall be the actual costs incurred by the A/E and the A/E's consultants. The A/E and the A/E's consultants shall be allowed a reasonable markup not to exceed 10% for administrative cost related to Reimbursable Expenses.

The Agency shall compensate the A/E for Reimbursable Expenses described in the Contract Documents in Section A as a not-to-exceed amount of:

**\$ Included**

- 4. Unless authorized in writing by the Agency prior to incurring the expense, no expense for transportation, travel, or subsistence will be reimbursable to the extent the expense exceeds the amount for which a state employee would be reimbursed under the Travel Regulations. Travel Regulations means the State Fiscal Accountability Authority's Regulations for Reimbursement for Travel and Subsistence Expenses, Disbursement Regulations pdf found at [<https://cg.sc.gov/guidance-and-forms-state-agencies/cgs-accounting-policies-and-procedures>]. There shall be no charge for time spent in travel.
- 5. Progress Payments: Payments for services shall be made monthly in proportion to services performed. The Agency shall make payments to the A/E of undisputed amounts due for services performed by the A/E within twenty-one (21) days of receipt of the A/E's invoice. The A/E shall make progress payments to the consultants within seven (7) days of the receipt by the A/E of each payment from the Agency. Payments due to the A/E and unpaid under this Contract shall bear interest only if and to the extent allowed by S.C. Code Ann. §§ 29-6-10 through 29-6-60. Amounts due to the A/E shall bear interest at the rate of one percent a month or a pro rata fraction thereof on the unpaid balance as may be due.
- 6. The Agency shall not withhold amounts from the A/E's compensation to impose a penalty.

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<b>AGENCY:</b> _____	<b>A/E:</b> _____
<b>BY:</b>  <i>(Signature of Representative)</i>	<b>BY:</b>  <i>(Signature of Representative)</i>
<b>PRINT NAME:</b> <u>Benjamin I. Duncan, II</u>	<b>PRINT NAME:</b> <u>Patrick J. Guise</u>
<b>PRINT TITLE:</b> <u>Chief Resilience Officer</u>	<b>PRINT TITLE:</b> <u>Chief Visionary Officer</u>
<b>DATE:</b> <u>10/17/2022</u>	<b>DATE:</b> <u>10.5.22</u>

# **ATTACHMENT A**

## **Scope of Work**

for

### **Williamsburg and Georgetown Counties Hydrologic and Hydraulic Study**

**State Project # D30-N013-MJ**

#### **PROJECT UNDERSTANDING**

This scope of services is based on the scope of work and deliverables outlined in the Request for Qualifications (RFQ) dated March 4, 2022, and subsequent communications with SCOR. SCOR wishes to complete a hydrologic and hydraulic study within 370 days from receiving notice to proceed. The study is funded by a US Housing and Urban Development (HUD) Community Development Block Grant-Mitigation (CDBG-MIT) grant and is intended to identify flooding issues, conduct assessment of existing stormwater systems, develop, and prioritize projects and establish an implementation strategy for the identified projects. SCOR has provided preliminary focus areas within Georgetown and Williamsburg Counties for consideration, these areas were developed by each county. These preliminary focus areas will be used to initially define focus areas and will be further defined as a result of the stakeholder and public engagement activities. The study will identify and prioritize a list of projects that include traditional infrastructure projects and natural stormwater solutions that could include projects that remove existing structures from the landscape and reclaim natural areas. Each project will meet each of the following criteria:

- Meet the following definition of a Mitigation Activity: Activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life; injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future flood events.
- Meet one of two HUD national objectives:
  - LMI Benefit Area and/or
  - Mitigation Urgent Need
- Benefit Cost Analysis (BCA) of greater than 1

The tasks to be completed under this scope of work will include:

- Develop Public Involvement Plan
- Meeting with SCOR, Counties and Municipalities to identify focus areas
- Public involvement including public meetings
- Focus Area Identification including a list of focus areas and type of modeling required (Stormwater Conveyance, Riverine, or Coastal Compound)
- Conduct research and acquire previously completed stormwater, watershed and flood related studies and data sets (existing GIS datasets, SCDOT Plan Archives, etc.)
- Identify data gaps, locations and scale of field data collection needs required to complete the model development
- Report and formal briefing documenting stormwater drainage issues and historical flood related data gathered
- Field data collection
- Development of current conditions, and future conditions models
- Report and formal briefing documenting findings of the current and future conditions model development
- Development of alternatives mitigation analysis models
- Report and formal briefing documenting findings of the alternatives model development
- Project recommendations and prioritization include Benefit-Cost Analysis and LMI considerations
- Final report

## **SCOPE OF SERVICES**

McCormick Taylor, Inc. (MT) will provide the services set forth below.

### **TASK 1: PROJECT ADMINISTRATION AND MEETINGS**

This task includes attending the kickoff meeting with three MT Team staff, providing SCOR with weekly progress updates via email, monthly formal virtual briefings, and a final briefing at the SCOR office in Columbia, SC that will be attended by three MT Team staff.

### **TASK 2: STAKEHOLDER ENGAGEMENT**

Key stakeholder outreach to identify focus areas of the study will be conducted. MT will coordinate the workshops with SCOR, County and municipal officials and staff. MT Team will inform the stakeholders of the goals of the planning project and seek information related to known flooding issues. Each workshop will last approximately 2 hours and will be located at respective stakeholder offices. To be respectful of the project funds, three meetings a day will be scheduled to limit travel time if possible.

Seven meetings will be conducted:

1. Workshop with Georgetown County staff
2. Workshop with Williamsburg County staff
3. Two Workshops with municipalities (shown in bold) and unincorporated towns, grouped by geographic location
  - a. **Georgetown**, Kensington, Spring Gully, Bell Isle, Graves, Maryville, North Santee, Oatland, **Pawleys Island**, Murrells Inlet, Garden City, Litchfield Beach, DeBordieu, Prince George, Sandy Island
  - b. **Kingstree**, **Greeleyville**, **Lane**, **Andrews**, Sampit, Plantersville, Yauhannah, **Hemmingway**, **Stuckey**, Hopewell, Pleasant Hill

To facilitate the meetings, MT Team will prepare:

1. A Public Involvement Plan
2. Questionnaires: A questionnaire will be developed to seek input from the stakeholders regarding their experiences with flooding within their area of responsibility and to document the location of the flooding, how often it occurs, and the extent to which it may occur.
3. A webmap application to allow stakeholders to input areas under consideration. The link to the webmap will be distributed prior to the meetings to allow adequate time for input.
4. Display maps of the counties and municipalities to be used to mark up and identify reoccurring flood areas.

During the meeting MT Team will facilitate discussion of problematic areas, ascertain the availability of data sets and previously complete studies. The MT Team will attend each workshop meeting.

### **TASK 3: PUBLIC INVOLVEMENT AND PUBLIC MEETINGS**

Public outreach to identify focus areas of the study will be conducted after meeting with the Stakeholders in Task 2. MT Team will coordinate the workshops with SCOR, County and municipal officials and staff. MT Team will inform the public of the goals of the planning project and seek information related to known flooding issues. Each workshop will last approximately 2 hours and will be located at various locations within each county.

Three meetings will be conducted at these locations, using the town hall or other municipal building:

- A. Kingstree
- B. Andrews
- C. Georgetown

To facilitate the meetings, MT Team will prepare:

- A. A Public Involvement Plan



- B. Questionnaires: A questionnaire will be developed to seek input from the public regarding their experiences with flooding within their area of responsibility and to document the location of the flooding, how often it occurs, and the extent to which it may occur.
- C. A webmap application to allow the public to input areas under consideration. The link to the webmap will be distributed prior to the meetings to allow adequate time for input.
- D. Display maps of the counties and municipalities to be used to mark up and identify reoccurring flood areas.

During the meeting MT Team will facilitate discussion of problematic areas, ascertain the availability of data sets and previously complete studies. MT will not be responsible for paying fees associated with the meeting venue rental, postage, or newspaper postings.

#### **TASK 4: FOCUS AREA IDENTIFICATION**

Due to the limited funding, it may not be possible to consider all study areas identified during the stakeholder and public engagement process. Utilizing the information gathered in Task 2 and 3, MT Team will prepare a list of identified focus areas. Utilizing metrics such as severity of flooding, number of repetitive events, number of structures affected, dollar amount of losses, LMI community presence, type of model methodology and additional items as determined, MT Team will rank the focus areas in order of importance to be considered during subsequent tasks. MT Team will meet with SCOR and the Counties to discuss the findings and prioritization to gain approval. The MT Team will attend this singular meeting which will be held with both counties in attendance. MT will prepare a power point and displays to facilitate this meeting. After the meeting MT will take into consideration comments received and prepare the final list of ranked study areas, identifying the key areas that should proceed subsequent phases.

#### **TASK 5: DATA GATHERING AND DATA GAP IDENTIFICATION**

Utilizing the prioritized list prepared in Task 4, MT Team will research and gather available information related to stormwater and flooding issues within the identified study areas including information on historic flooding. Data gathering includes obtaining available information such as GIS data and previously completed models. MT Team will also gather information related to South Carolina Department of Transportation (SCDOT) for the current and planned transportation improvement projects, existing hydraulics unit data within the vicinity of the study areas, as well as all other potential sources of data located within the municipal and County offices, to include, but not limited to water facilities, public works departments, and river gauges. MT Team will locate and utilize existing FEMA cross section data, if appropriate and relatively recent, for hydraulic modeling purposes. Where FEMA cross section data does not exist or requires augmentation, MT Team will obtain field data of cross sections.

Standard Operation Procedure (SOP) and Database: MT will prepare a SOP for collecting and storing information in a GIS database. Using the agreed upon SOP, MT will create a GIS database that will include the information gathered in Task 2, 3, and 4. The database will be updated during Task 7, Field Data Collection, with field collected data and the observed field inventory of the study areas stormwater systems.

Upon completion of the Data Gathering, MT will conduct a data gap analysis and identify the level of field data collection needed.

#### **TASK 6: DRAINAGE ISSUES AND HISTORICAL DATA FINDINGS REPORT AND BRIEFING (Within 90 Days)**

MT will compile the information from Tasks 2 through 5 into a report. The report will include the following:

1. Project goals and objectives.
2. Summary of known historic flooding issues within the two counties and outcomes from the stakeholder engagement meetings
3. Summary of coordination with stakeholders, including applicable agencies and/or organizations.
4. Design criteria.

5. Level of service definitions.
6. Comprehensive list of all study areas considered.
7. Study area ranking metrics and selection criteria.
8. Study area prioritization matrix, including scoring and type of modeling to be utilized
9. Summarization of acquired data and what additional information is required
10. Standard Operation Procedure and Database
11. A general exhibit of the proposed study areas.
12. Public Involvement Plan
13. A digital deliverable of the GIS database to SCOR.

## **TASK 7: FIELD DATA COLLECTION**

MT will conduct a field inventory that will include GPS grade surveying and documenting size, materials, conditions, and locations of existing drainage systems.

### **Standard Operation Procedure (SOP) and Database**

MT will prepare a SOP for collecting and storing information in a GIS database. Using the agreed upon SOP, MT will create a GIS database that will include the information gathered in Task 5 and the feedback obtained in Task 6 above. The database will be updated with survey information and the observed field inventory of the study areas storm water infrastructure that is anticipated to include size, material, location, approximate elevation, and a visual assessment of condition. A photograph of each inventoried item will be collected and included in the GIS database. An initial visual reconnaissance of existing stormwater infrastructure will be performed by MT to identify existing stormwater infrastructure that was not known or included in the available data obtained in Task 5. The reconnaissance will occur on publicly owned property or on private property with prior approval from the landowner.

It is anticipated that the survey will focus on the areas of known or reported flooding as a priority.

### **Field Survey Specifications**

- A. Data collection will be limited to information needed to support modeling included in this Scope of Services.
- B. Data collection will be to GPS grade accuracy and includes:
  - a. Elevations based off of LIDAR DEM, measured from the current ground. Near survey grade GPS units will be utilized
  - b. All data collection will be performed in compliance with the Standards of Practice for Land Surveying in South Carolina as defined for GIS surveys
  - c. The horizontal datum is NAD 83/2011
  - d. The coordinate system is State Plane South Carolina 3200
  - e. The vertical datum is NAVD 88
  - f. The unit of measurement is the US International Feet
- C. If the Consultant cannot resolve Difficult Access Structure issues, the County or SCOR will assist in resolving Difficult Access Structures on this project
- D. The County or SCOR will be responsible to notify property owners of work activities and the need to access drainage easements or private property

### **Stormwater Utility System Mapping**

- A. If during stormwater data collection, the MT's field crews observe odors, sheens, or potential illicit discharges. MT will notify SCOR within the same business day, if possible, but no later than 24 hours from the time of observation.
- B. Open Channel Cross Sections (Major Systems)
  - a. MT will utilize FEMA cross section data, if appropriate and relatively recent, for hydraulic modeling purposes. Where FEMA cross section data does not exist or requires augmentation, MT will obtain field

survey data consisting of 6-point cross sections (left overbank, left top of bank, left bottom of bank, right bottom of bank, right top of bank, right overbank). Cross sectional information outside the limits of the 6-point sections will be based on the best available information (UIS topography, DEMs, etc.). Channel lining and bed type will also be collected. For areas with no FEMA cross-sectional data, MT will collect cross-sections approximately every 200-300 feet (average) and upstream/downstream of stream all crossings.

C. Bridges

- a. Bridges requiring survey for modeling purposes will include dimensional and elevation data as necessary for accurately modeling backwater effects on the hydraulic model. Bridge data will include shots parallel to the road representing the road overtopping elevation, bridge deck thickness, location, and height of railing, pier location and dimensions, and underlying channel and abutment dimensions and elevations.

D. Culverts

- a. Culverts at stream crossings will be characterized by two pipe ends with properties to be collected. Sufficient dimensional and elevation data will be collected to accurately model backwater effects of culverts within the Primary System. Pipe ends will be connected with a pipe object or linework representing the culvert footprint. Multi-barrel culverts shall include two pipe ends for each barrel. Additionally, culverts will include 5 ground shots representing the overtopping profile of the above road/train embankment as follows: one directly above the culvert, 25- and 50- feet up-station of the original shot, and 25- and 50-feet down station of the original shot.

E. Dams and Impoundments

- a. None included in this project.

F. Open Channel Cross Sections (Ditches)

- a. Typical single channel measurement (top width, bottom width, depth, and liner type) will be measured. The channel length and horizontal location will be digitized from best available data (aerial photography, GIS topography, etc.) and the channel measurement will be inferred onto the digitized line as representation of the entire channel length. Channel longitudinal slope will be estimated based on best available information (preferably by using elevational data from upstream/downstream bounding structures).

G. Closed System Structures

- a. Closed systems will consist of a variety of types of structures and will be collected. Structure types include catch basins, drop inlets, junction boxes, pipe ends, slab top inlets, underground pipe junctions, and yard inlets. Properties to be collected include structure type; structure dimensions; unique structure ID number; x and y coordinates; structure elevation; depth of structure; pipe in/out sizes, materials, and invert elevations; and obstruction assessment. In the case of pipe ends, information regarding the end treatment will also be collected (headwall, mitered, flared end section, stub, etc.).

H. Closed System Pipes

- a. Pipes which connect closed system structures will be located and included in field survey data. Pipe properties include upstream structure, downstream structure and pipe shape, size, invert elevations, slopes, and material.

I. Difficult Access (DA) Structures

- a. There will be some structures which cannot be accessed in the field for various reasons. Access limitations could include sedimentation, debris, structure being covered or paved over, access problems, fences/security, etc. A reasonable attempt to access or locate the structure must be made. MT will devote approximately 5 minutes attempting to locate system structures. If accessing or locating is not possible, then an approximate location will be stored for the structure and a report provided to the County for resolution by designated County staff. The County will resolve DA Structure issues. Once the structure is made accessible, MT will re-visit the structure and collect the missing data.

## **TASK 8: DEVELOPMENT OF CURRENT AND FUTURE CONDITIONS MODELS**

MT will develop design criteria targets to determine level of service performance by each of the analyzed systems. The level of service will be defined by local design standards (if any), SCDOT design criteria, SCOR or County input, and/or other published engineering guidelines/standards. MT will prepare hydrologic and hydraulic models to determine discharge values and to model the 2-, 10-, 25-, 50-, and 100-year 24-hour storm using a combination of models depending on the system that

is analyzed. The hydrologic models shall include existing and future conditions, and anticipated changes in rainfall intensities. HEC-HMS, rational method, TR55, or USGS National Stream Flow Statistics will be used to model hydrology. The hydraulic modeling will utilize HECRAS 6.0 for riverine systems and culvert crossings that are in series. Individual culvert locations may be modeled using HY-8. Open channels may be modeled using Manning's equation or FlowMaster. Inlets, closed systems, and overland flow may be modeled using PCSWMM, or similar program. Compound flooding areas may use either HECRAS, PCSWMM or a combination of both. Attenuation may be considered in areas where significant storage behind a large culvert embankment is assumed.

- A. Develop current hydrologic and hydraulic models, including but not limited to:
  - a. Rainfall – runoff; and
  - b. Riverine, Overland, and pipe network flow
- B. Develop future conditions hydrologic and hydraulic models, which account for:
  - a. Future land cover.
  - b. Future hydraulic setting.
  - c. Changes in rainfall patterns.
- C. Problem area identification; and
- D. Development of design criteria targets.

Table 1 and 2 depict initial focus areas SCOR obtained from the Counties, these areas will be validated and further defined during the stakeholder and public engagement process in Task 2 and Task 3.

Table 1. Georgetown County

Georgetown County Drainage Problem Areas		
Problem Area Name	Description of Problem	Modeling Approach
Rustwood Dr.	Water overtops roads during rain events	HECRAS 2D
Sandhole Rd.	Water overtops roads during rain events	HECRAS 2D
Walter Huell & Olmsted	Ditches hold water	PCSWMM
Hamlin Rd	Water overtops roads during rain events	HECRAS 2D
Ethridge Rd	Water overtops roads during rain events	HECRAS 2D
Lanescreek Community Outfall	No access to maintain outfall ditch	Compound/ HECRAS2d
Greentown Rd	No access to maintain outfall ditch	PCSWMM?
Lincolnshire, Savannah (Spring Gully)	Water ponds along roadway and yards	PCSWMM
Giles Rd.	No access to maintain outfall ditch	PCSWMM
False Box Dr.	Water overtops roads during rain events	HECRAS 2D
Peters Creek	water overtops roads during rain events	HECRAS 2D
Calvin Hardee Rd	No access to maintain outfall ditch	HECRAS 2D
Jackson Village Rd/Gillard	No access to maintain outfall ditch	HECRAS 2D

Table 2. Williamsburg County

Williamsburg County Drainage Problem Areas		
Area 1 - Hemingway-Union Crossroad - Outland	Northeastern corner of Williamsburg County, Great Pee Dee River runs along the northeastern border and Black Mingo Creek is on the southwestern border	HECRAS 2D
Area 1A - Donnelly Community-	Near the city limits of the Town of Hemingway, area has had significant growth. This area was evacuated during each major hurricane and remains a problem during normal heavy rain events.	PCSWMM

Area 2 - Indiantown-Stuckey-Morrisville	Area is a long, generally rectangular section, running north and south with Black Mingo Creek across its midsection, once used for mostly farming. Due to this area being nearly level topography, drainage is difficult.	HECRAS 2D
Area 3 - Nesmith-Rhems-Warsaw	Located in the eastern central section of the county. Its areas bordered on the north by the Black Mingo Creek and on the south by the Black River.	HECRAS 2D
Area 4 - Cades-Roper Crossroad-Cedar Swamp	Area is located in the northern central section of the county bordered by Lake Swamp and is covered by a network of swampy drainage either running to Lake Swamp or converging into the upon reaches of Black Mingo Creek to the east.	HECRAS 2D
Area 5 - Millwood, Trio, Sutton's	This area is long and narrow extending south from the center of the County across Black River and is boarder on the South by Santee River. The Black River, passing through the upper portion, provides the natural outlets for tributaries in more than half of this area. The Santee River is the outlet for the southernmost portion.	HECRAS 2D
Area 6 - Bloomingvale, Earles-Wee Tee	This area is very similar to Area 5 in its physical characteristics. Located in the southernmost corner of the county, it is crossed in the upper section of the Black River and bordered on the south by the Santee River. There are several large bay areas in the midsection.	HECRAS 2D
Area 7- Kingtree, Cades-Moores	Area located in the northwestern corner of the county, is comprised almost totally of Kingtree Swamp Watershed, which outlets into the Black River at Kingtree. This area is a constant flood area. During the 1000 Year flood the Kingtree Area (Main Street) was mostly underwater around the railroad track and downstream.	PCSWMM for developed area / HECRAS2D for riverine
Area 8- Kingtree-Boggy Swamp	In this area, just south and east of Kingtree, Boggy Swamp runs from north to south and into the Black River which crosses the southeastern corner. These two main drainage ways provided the outlets for the smaller tributaries of the area.	HECRAS 2D
Area 9-Salters-Lane-Goudine	The western portion in the vicinity of Black River, is covered by undeveloped swampland and swamp tree growth. The low-lying parts have overflowed leading to major flooding.	HECRAS 2D
Area 10- Hebron-Mouzon-Bennette Swamp	On the western side of the county, it divided in the middle by Black River running west to the east which provides the outlet for the upper two thirds of the area. The lower third tributaries drain into Bennett Swamp which runs across the bottom end.	HECRAS 2D
Area 11 - Greeleyville- Heineman	Small area in the southwest corner of the county boarded by Clarendon County line on the east, Santee River on the south and U.S. Highway 52 on the east. The town Greeleyville is located in the center of the block with highway radiating in all directions. Almost of the drainage is towards and into tributaries of the Santee River on the south. Two bays, one southeast and one southwest of Greeleyville, occupy sizeable areas of undeveloped land as well as the Santee River Swamp which has overflowed in the past.	PCSWMM for developed area / HECRAS2D for riverine

Given the varying modeling approaches and data needed to complete the modeling of the areas identified during the public engagement process, which are not know at this time, MT Team will provide modeling on the following types of study areas:

- Stormwater System (stormdrain systems, ditches) modeling utilizing PCSWMM: Up to, not to exceed, 3,500 acres of study area
- Riverine Systems (rivers, single culvert, or bridge crossings) modeling utilizing HEC-RAS 2D: Up to, not to exceed, 3,750 acres of study area

- Compound (coastal, riverine and/or stormwater systems) modeling utilizing HECRAS and/or PCSWMM: Up to, not to exceed, 1,000 acres of study area

Up to, not to exceed, 8,250 acres of study area will be modeled through this proposal.

#### **TASK 9: CURRENT AND FUTURE CONDITIONS REPORT AND BRIEFING (Within 150 Days)**

MT Team will prepare a report and formal briefing detailing Task 8 to the South Carolina Office of Resilience's Mitigation Department and key stakeholders. The briefing will include a power point presentation. This requirement will be completed within 150 days of contract award.

#### **TASK 10: DEVELOPMENT OF ALTERNATIVES MODELS**

This task includes generating a list of priority projects and preparing alternatives analyses to provide options to improve the level of service of those systems including a sensitivity analysis to determine effects on the higher flood frequency events (if alternatives are deemed to be practical by MT ). One alternative will include an assessment of a design that fully meets the defined design standards. Another alternative will include an assessment of a design that meets some but may not meet all the current design standards but will improve the level of service of the infrastructure to address the reported or identified flooding issue. More alternatives may include an option to improve conditions but may not meet some or all of the design standards, including a potential buyout scenario where the flooded infrastructure is removed from the problem area.

Up to five (5) low-impact development retrofit projects may also be identified as part of the alternatives analysis. These projects are anticipated to include cistern. storage and potential reuse, structure control measures within existing impervious areas. and/or pervious pavers as options to reduce and/or treat stormwater runoff from individual sites.

Stream and/or wetland restoration potential will also be evaluated as part of the alternatives analysis.

Items within this task will include:

- A. Create an alternative analysis to remedy the problem areas.
- B. Create Summary Report of findings, including but not limited to:
  - a. GIS Mapping.
  - b. Summary of the existing drainage system.
  - c. List of priority projects (see task 12, below)
  - d. Documentation of methods; and
  - e. Technical data and related information.
- C. Develop a Sensitivity Analysis to study the impact of higher flood frequency events.

#### **TASK 11: ALTERNATIVES REPORT AND BRIEFING (Within 200 Days)**

MT Team will prepare a report to document the methods used for the alternatives analysis, technical data. and the results of the alternative analysis. MT Team will provide a formal briefing to SCOR staff as part of one of the monthly meetings included in Task I.

#### **TASK 12: PROJECT RECOMMENDATIONS AND PRIORITIZATION (Within 230 Days)**

Based on the results of the alternatives analysis and feedback from SCOR from Task 11, MT Team will create a ranking system to prioritize projects which will include a Benefit-Cost Analysis ( BCA ). and assessment of the project's impacts on Low-to-Moderate Income ( LMI) communities. Projects that may be eligible for other sources of funding for project implementation will be noted. An opinion of probable costs (OPCs) will be prepared for each proposed priority project. The OPC will include an estimate of real estate cost for easements ( if easements are required) based on parcel tax value (if available) or as directed by SCOR. The OPC will also include an estimate of design, permitting, and construction costs. The construction costs will be generated using construction cost data from other MT Team projects, SCDOT costs. or other data provided by the Counties or SCOR.

MT Team will prepare up to 15 concept designs (approximately 10% level) to inform the OPC. Survey of the identified project areas, by a PLS, will not be performed, GIS data will be utilized to prepare the concept plans. Recommendations on level of survey needed for detailed design will be made as part of the recommendations. The concept plans will include a proposed plan view and an estimate of work area including an assessment of construction access. A preliminary profile will be designed to estimate grading and the limits of disturbance for the proposed project.

Items within this task will include:

- A. Prepare cost estimates for recommended improvements.
- B. Conduct a Benefit-Cost Analysis on each of the prioritized projects and provide that dataset to the South Carolina Office of Resilience's Mitigation Department. The Benefit-Cost Ratio of recommended projects should be 1.0 or greater.
- C. Conduct a comprehensive assessment of the impact of the determined projects on the Low-to-Moderate Income community. Provide a report and a formal briefing to SCOR.
- D. Create a ranking system to prioritize projects.
- E. Attendance at one meeting, if needed, to explain concepts and proposals.

### **TASK 13: PROJECT RECOMMENDATIONS REPORT AND BRIEFING (Within 230 Days)**

MT Team will prepare a report to document the project ranking matrix, the results of the BCA, and LMI community assessment. MT Team will provide a formal briefing to SCOR staff as a part of one of the monthly meetings included in Task I.

### **TASK 14: FINAL REPORT AND BRIEFING (Within 370 Days)**

MT Team will compile the final written report and facilitated the in-person briefing. The report and briefing will include:

- A. A review of the historical problems associated with systematic flooding associated disasters throughout Georgetown and Williamsburg Counties to include the impact of sustained rainfall draining through surrounding water basins.
- B. A review of the planning parameters associated with this specific assessment and its direct tie to CDBG-MIT funding for mitigation.
- C. A thorough literature study of previously published infrastructure and drainage management problems in the affected areas throughout Georgetown and Williamsburg Counties to include all previous studies which directly impact the problem at hand.
- D. Coordination with all applicable agencies and organizations who are stakeholders in the study area. As a minimum, this will include the US Army Corps of Engineers, any and all watershed management agencies or civilian equivalent, the State Department of Transportation, Department of Natural Resources, Department of Health and Environmental Control, Department of Parks Recreation and Tourism, South Carolina Department of Agriculture, the US Department of Agriculture, and county and local jurisdictions affected.
- E. A comprehensive listing of all projects considered within the parameters of the strategy as well as a thorough review and definition of each screening criteria used to arrive at the recommended projects.
- F. A prioritized list of recommended construction projects resulting from the analysis, each in terms of the highest probability of success against future disasters and their specified budget estimations.
- G. The Benefit-Cost Analysis of each project which reflects the benefit achieved by conducting the project and its direct impact upon Low- to-Moderate Income communities.
- H. A review and assessment of the environmental concerns associated with each project and an estimated timeline for the associated environmental clearance.
- I. Based upon the final prioritized list of projects, a list of homes, including addresses, inside the study area that would be impacted by any recommended infrastructure construction projects and if they are recommended for potential buyout.
- J. A qualitative and quantitative impact statement upon a Low-to-Moderate Income population that each construction project will resolve concerning future disasters.
- K. A holistic risk assessment of each distinct proposed construction project.
- L. Estimate the project delivery cost including all aspects of federal, state, and local permitting as well as all environmental considerations and concerns for each prioritized project.

- M. An analysis of each prioritized project and the benefit it provides for Low-to-Moderate Income citizens throughout Georgetown and Williamsburg Counties concerning future flood events.
- N. A general topographic schematic of the proposed projects.
- O. Geopolitical issues associated with the projects.



## **ADDITIONAL SERVICES**

Any services not specifically provided for in the above scope will be billed as additional services and performed at our then current hourly rates. Additional services we can provide include, but are not limited to, the following:

- Items identified to be completed under Phase 2 services
- Grant applications
- FEMA map updates or permitting
- Water quality modeling
- NPDES Phase II permitting assistance
- P.L.S grade surveying
- Additional concept design beyond identified in this scope
- Final design
- Utility locations and/or Subsurface Utility Exploration

## **SCHEDULE**

We will provide our services as expeditiously as practicable with the goal of meeting the following schedule:

- Task 1 Project Administration and Meetings – Weekly for project duration
- Task 2 Stakeholder Engagement – (Dependent upon Stakeholder availability) 35 days from NTP
- Task 3: Public Involvement and Public Meetings – 70 days from NTP
- Task 4: Focus Area Identification – 80 days from NTP
- Task 6: Drainage Issues and Historical Data Report and Briefing – 90 days from NTP
- Task 7: Field Data Collection – 150 days from NTP
- Task 9: Current and Future Conditions Report and Briefing – 150 days from NTP
- Task 11: Alternatives Report and Briefing – 200 days from NTP
- Task 13: Project Recommendations Report and Briefing – 230 days from NTP
- Task 14: Final Report and Briefing – 370 Days from NTP

## **FEEES AND PAYMENT**

MT will perform the services in Tasks 1-14 for the total lump sum labor fee of \$884,992.48

Lump sum fees will be invoiced based on milestone delivery. Payment will be due within 25 days of your receipt of the invoice and should include the invoice number and MT project number.



# Proposal Summary

Williamsburg and Georgetown Counties Hydrologic and Hydraulic Study  
Job No. TBD

<b>Lump Sum Total</b>	\$	341,000.00 (a)
<b>Direct Costs Other Than Payroll</b>		4,062.50 (b)
<b>Direct Costs of Services and Work Performed by Others:</b>		
Wood, PLC		289,499.98
Moffat and Nic		250,430.00
		539,929.98 (c)
<b>Subtotal (a)+(b)+(c)</b>		884,992.48 (d)
<b>Total Cost</b>	\$	884,992.48 (f)
<b>Total Estimated Man-Hours:</b>	McCormick Taylor, Inc.	2,607
	Subs:	
	Wood, PLC	2,295
	Moffat and Nic	1,872
<b>Total</b>		<b>6,774</b>
<b>Engineer's Name:</b>	McCormick Taylor, Inc. 1441 Main Street Suite 875 Columbia, SC 29201	
<b>Fed. I. D. No.:</b>	23-1683759	
<b>Contact Person:</b>	Jason Hetrick Assistant Director 803.978.2744	
<b>Prepared By:</b>	Jason Hetrick	



Name: Williamsburg and Georgetown Counties Hydrologic and Hydraulic Study

Job #: TBD

Date: September 23, 2022

By: Jason Hetrick

TASK	Hours	
	Total Hours	Total Dollars
Task 01 Project Administration And Project Management	-	-
1 Kick Off Meeting	4	600.00
2 Weekly Updates	50	8,800.00
4 Project Administration And QC/QA	71	12,400.00
Task 02 Stake Holder Involvement And Stake Holder Meetings	-	-
1 Stakeholder Meetings (7 Meetings)	34	5,100.00
2 Stakeholder Meeting Preparation And Post Meeting Tasks	16	2,200.00
Task 03 Public Involvement And Public Meetings	-	-
Public Meetings (5 Meetings)	42	6,000.00
Public Meeting Preparation And Post Meeting Documentation	28	3,900.00
Task 04 Focus Area Identification	-	-
Focus Area Identification	14	1,900.00
Summary Report	21	2,800.00
Task 05 Data Gathering And Data Gap Identification	-	-
Base Data	29	3,900.00
Community Data, Existing Studies	53	7,000.00
Task 06 Drainage Issues And Historical Data Findings Report	-	-
Draft Alternatives Report	25	3,400.00
Alternatives Briefing	17	2,300.00
Task 07 Field Data Collection	-	-
Desk Top	61	8,100.00
Field Inventory	331	40,000.00
Task 08 Development Of Current And Future Models	-	-
Stormwater Systems Current Conditions	541	69,000.00
Stormwater Systems Future Conditions	231	29,400.00
Summary Of Problem Areas	266	33,900.00
Riverine Current Conditions	116	14,800.00
Riverine Future Conditions	46	6,000.00
Summary Of Problem Areas	53	6,900.00
Coastal Current Conditions	1	200.00
Coastal Future Conditions	1	200.00
Summary Of Problem Areas	1	200.00
Summary Of Results	21	2,800.00
Task 09 Current And Future Conditions Models Report	-	-
Draft Alternatives Report	11	1,500.00
Alternatives Briefing	9	1,300.00
Task 10 Development Of Alternatives Models	-	-
Stormwater Systems	174	21,700.00
Riverine	37	4,700.00
Coastal	1	200.00
Stormwater Sensitivity Analysis	51	6,600.00
Summary Of Results	21	2,800.00
Task 11 Alternatives Report And Briefing	-	-
Draft Alternatives Report	11	1,500.00
Alternatives Briefing	9	1,300.00
Task 12 Project Recommendations And Prioritization	-	-
Prepare Concept Designs	57	7,100.00
Prepare Cost Estimates	17	2,100.00
Conduct BCA	41	5,400.00
Conduct LMI Assessment	1	200.00
Create Ranking System And Rank Projects	25	3,300.00
Task 13 Project Recommendations Report And Briefing	-	-
Draft Project Recommendations Report	11	1,500.00
Project Recommendations Briefing	9	1,300.00
Task 14 Final Report And Briefing	-	-
Draft Final Report	20	2,700.00
Final Report (1 Round Of Comments)	20	2,700.00
Final Briefing	9	1,300.00
<b>TOTAL</b>	<b>2,607</b>	<b>\$ 341,000.00</b>

## Proposal Summary

Williamsburg and Georgetown Counties Hydrologic and Hydraulic Study  
Job No. TBD

### 1) Travel

a. Project Site

20 trips @

300 miles r/t x \$0.625 per mile = \$ 3,750.00

b. Client Office

2 trips @

250 miles r/t x \$0.63 per mile = 312.50

**Subtotal**

**\$ 4,062.50**

**TOTAL DIRECT COSTS OTHER THAN PAYROLL**

**\$ 4,062.50**

Signed:



Patrick J. Guise, Chief Visionary Officer

Date:

10/4/22

**Wood Environment and Infrastructure Solutions**  
**Scope of Work**  
for  
**Williamsburg and Georgetown Counties Hydrologic and Hydraulic Study**  
State Project # D30-N013-MJ

**PROJECT UNDERSTANDING**

This scope of services is based on the scope of work and deliverables outlined in the Request for Qualifications (RFQ) dated March 4, 2022, and subsequent communications with SCOR. SCOR wishes to complete a hydrologic and hydraulic study within 370 days from receiving notice to proceed. The study is funded by a US Housing and Urban Development (HUD) Community Development Block Grant-Mitigation (CDBG-MIT) grant and is intended to identify flooding issues, conduct assessment of existing stormwater systems, develop, and prioritize projects and establish an implementation strategy for the identified projects. SCOR has provided preliminary focus areas within Georgetown and Williamsburg Counties for consideration, these areas were developed by each county. These preliminary focus areas will be used to initially define focus areas and will be further defined as a result of the stakeholder and public engagement activities. The study will identify and prioritize a list of projects that include traditional infrastructure projects and natural stormwater solutions that could include projects that remove existing structures from the landscape and reclaim natural areas. Each project will meet each of the following criteria:

- Meet the following definition of a Mitigation Activity: Activities that increase resilience to disasters and reduce or eliminate the long-term risk of loss of life; injury, damage to and loss of property, and suffering and hardship, by lessening the impact of future flood events.
- Meet one of two HUD national objectives:
  - LMI Benefit Area and/or
  - Mitigation Urgent Need
- Benefit Cost Analysis (BCA) of greater than 1

The tasks to be completed under this scope of work will include:

- Develop Public Involvement Plan
- Meeting with SCOR, Counties and Municipalities to identify focus areas
- Public involvement including public meetings
- Focus Area Identification including a list of focus areas and type of modeling required (Stormwater Conveyance, Riverine, or Coastal Compound)
- Conduct research and acquire previously completed stormwater, watershed and flood related studies and data sets (existing GIS datasets, SCDOT Plan Archives, etc.)
- Identify data gaps, locations and scale of field data collection needs required to complete the model development
- Report and formal briefing documenting stormwater drainage issues and historical flood related data gathered
- Field data collection
- Development of current conditions, and future conditions models
- Report and formal briefing documenting findings of the current and future conditions model development
- Development of alternatives mitigation analysis models
- Report and formal briefing documenting findings of the alternatives model development
- Project recommendations and prioritization include Benefit-Cost Analysis and LMI considerations
- Final report

## **SCOPE OF SERVICES**

Wood Environment and Infrastructure Solutions (Wood) will support McCormick Taylor, Inc. (MT) in providing the services set forth below.

### **TASK 1: PROJECT ADMINISTRATION AND MEETINGS**

This task includes attending the kickoff meeting (Wood will attend virtually), attending internal coordination meetings, and internal project management for the Wood team.

### **TASK 2: STAKEHOLDER ENGAGEMENT**

Key stakeholder outreach to identify focus areas of the study will be conducted. MT will coordinate the workshops with SCOR, County and municipal officials and staff. The goal is to inform the stakeholders of the goals of the planning project and seek information related to known flooding issues. Each workshop will last approximately 2 hours and will be located at respective stakeholder offices. One Wood staff person will attend 2 stakeholder meetings with MT staff and provide pre- and post-meeting support to MT.

### **TASK 3: PUBLIC INVOLVEMENT AND PUBLIC MEETINGS**

Public outreach to identify focus areas of the study will be conducted after meeting with the Stakeholders in Task 2. MT Team will coordinate the workshops with SCOR, County and municipal officials and staff. The goal is to inform the public of the goals of the planning project and seek information related to known flooding issues. Each workshop will last approximately 2 hours and will be located at various locations within each county. One Wood staff person will attend each of the 3 public meetings with MT staff and provide pre- and post-meeting support to MT.

### **TASK 4: FOCUS AREA IDENTIFICATION**

Due to the limited funding, it may not be possible to consider all study areas identified during the stakeholder and public engagement process. Utilizing the information gathered in Task 2 and 3, MT Team will prepare a list of identified focus areas. Utilizing metrics such as severity of flooding, number of repetitive events, number of structures affected, dollar amount of losses, LMI community presence, type of model methodology and additional items as determined, MT Team will rank the focus areas in order of importance to be considered during subsequent tasks. MT Team (including Wood) will meet with SCOR and the Counties to discuss the findings and prioritization to gain approval. After the meeting MT will take into consideration comments received and prepare the final list of ranked study areas, identifying the key areas that should proceed subsequent phases. Wood will provide support to MT in alignment with the budgeted level of effort for this task.

### **TASK 5: DATA GATHERING AND DATA GAP IDENTIFICATION**

No scope for Wood.

### **TASK 6: DRAINAGE ISSUES AND HISTORICAL DATA FINDINGS REPORT AND BRIEFING**

MT will compile the information from Tasks 2 through 5 into a report. Study area ranking metrics and selection criteria. Wood will provide input on the report and participate in the briefing with SCOR.

### **TASK 7: FIELD DATA COLLECTION**

The MT Team will conduct a field inventory that will include GPS grade surveying and documenting size, materials, conditions, and locations of existing drainage systems. MT will prepare a SOP for collecting and storing information in a GIS database. MT will also produce the database. The database will be updated with survey information and the observed field inventory of the study areas storm water infrastructure that is anticipated to include size, material, location, approximate elevation, and a visual assessment of condition. A photograph of each inventoried item will be collected and included in the GIS database. An initial visual reconnaissance of existing stormwater infrastructure will be performed to identify existing

stormwater infrastructure that was not known or included in the available data obtained in Task 5. The reconnaissance will occur on publicly owned property or on private property with prior approval from the landowner. Wood will support approximately 50% of the field survey effort, which has been budgeted at 250 hours with an additional 50 hours of GIS support.

**TASK 8: DEVELOPMENT OF CURRENT AND FUTURE CONDITIONS MODELS**

MT Team will develop design criteria targets to determine level of service performance by each of the analyzed systems. The level of service will be defined by local design standards (if any). SCDOT design criteria, SCOR or County input, and/or other published engineering guidelines/standards. MT will prepare hydrologic and hydraulic models to determine discharge values and to model the 2-, 10-, 25-, 50- and 100-year 24-hour storm using a combination of models depending on the system that is analyzed. The hydrologic models shall include existing and future conditions, and anticipated changes in rainfall intensities. HEC-HMS, rational method, TR55 or USGS National Stream Flow Statistics will be used to model hydrology; or NOAS Atlas 14 direct rain-on-mesh for any 2D models. The hydraulic modeling will utilize HECRAS 6.0 for riverine systems and culvert crossings that are in series. Individual culvert locations may be modeled using HY-8. Open channels may be modeled using Manning's equation or FlowMaster. Inlets, closed systems, and overland flow may be modeled using PCSWMM, or similar program. Compound flooding areas may use either HECRAS, PCSWMM or a combination of both. Attenuation may be considered in areas where significant storage behind a large culvert embankment is assumed.

- A. Develop current hydrologic and hydraulic models, including but not limited to:
  - a. Rainfall – runoff; and
  - b. Riverine, Overland, and pipe network flow
- B. Develop future conditions hydrologic and hydraulic models, which account for:
  - a. Future land cover.
  - b. Future hydraulic setting.
  - c. Changes in rainfall patterns.
- C. Problem area identification; and
- D. Development of design criteria targets.

Table 1 and 2 depict initial focus areas SCOR obtained from the Counties, these areas will be validated and further defined during the stakeholder and public engagement process in Task 2 and Task 3.

Table 1. Georgetown County

<b>Georgetown County Drainage Problem Areas</b>		
<b>Problem Area Name</b>	<b>Description of Problem</b>	<b>Modeling Approach</b>
Rustwood Dr.	Water overtops roads during rain events	HECRAS 1D or 2D
Sandhole Rd.	Water overtops roads during rain events	HECRAS 1D or 2D
Walter Huell & Olmsted	Ditches hold water	PCSWMM
Hamlin Rd	Water overtops roads during rain events	HECRAS 1D or 2D
Ethridge Rd	Water overtops roads during rain events	HECRAS 1D or 2D
Lanescreek Community Outfall	No access to maintain outfall ditch	Compound/ HECRAS 1D or 2D
Greentown Rd	No access to maintain outfall ditch	PCSWMM
Lincolnshire, Savannah (Spring Gully)	Water ponds along roadway and yards	PCSWMM
Giles Rd.	No access to maintain outfall ditch	PCSWMM
False Box Dr.	Water overtops roads during rain events	HECRAS 1D or 2D
Peters Creek	water overtops roads during rain events	HECRAS 1D or 2D
Calvin Hardee Rd	No access to maintain outfall ditch	HECRAS 1D or 2D
Jackson Village Rd/Gillard	No access to maintain outfall ditch	HECRAS 1D or 2D

Table 2. Williamsburg County

Williamsburg County Drainage Problem Areas		
Area 1 - Hemingway-Union Crossroad - Outland	Northeastern corner of Williamsburg County, Great Pee Dee River runs along the northeastern border and Black Mingo Creek is on the southwestern border	HECRAS 1D or 2D
Area 1A - Donnelly Community-	Near the city limits of the Town of Hemingway, area has had significant growth. This area was evacuated during each major hurricane and remains a problem during normal heavy rain events.	PCSWMM
Area 2 - Indiantown-Stuckey-Morrisville	Area is a long, generally rectangular section, running north and south with Black Mingo Creek across its midsection, once used for mostly farming. Due to this area being nearly level topography, drainage is difficult.	HECRAS 1D or 2D
Area 3 - Nesmith-Rhems-Warsaw	Located in the eastern central section of the county. Its areas bordered on the north by the Black Mingo Creek and on the south by the Black River.	HECRAS 1D or 2D
Area 4 - Cades-Roper Crossroad-Cedar Swamp	Area is located in the northern central section of the county bordered by Lake Swamp and is covered by a network of swampy drainage either running to Lake Swamp or converging into the upon reaches of Black Mingo Creek to the east.	HECRAS 1D or 2D
Area 5 - Millwood, Trio, Sutton's	This area is long and narrow extending south from the center of the County across Black River and is boarder on the South by Santee River. The Black River, passing through the upper portion, provides the natural outlets for tributaries in more than half of this area. The Santee River is the outlet for the southernmost portion.	HECRAS 1D or 2D
Area 6 - Bloomingvale, Earles-Wee Tee	This area is very similar to Area 5 in its physical characteristics. Located in the southernmost corner of the county, it is crossed in the upper section of the Black River and bordered on the south by the Santee River. There are several large bay areas in the midsection.	HECRAS 1D or 2D
Area 7- Kingstree, Cades-Moores	Area located in the northwestern corner of the county, is comprised almost totally of Kingstree Swamp Watershed, which outlets into the Black River at Kingstree. This area is a constant flood area. During the 1000 Year flood the Kingstree Area (Main Street) was mostly underwater around the railroad track and downstream.	PCSWMM for developed area / HECRAS2D for riverine
Area 8- Kingstree-Boggy Swamp	In this area, just south and east of Kingstree, Boggy Swamp runs from north to south and into the Black River which crosses the southeastern corner. These two main drainage ways provided the outlets for the smaller tributaries of the area.	HECRAS 1D or 2D
Area 9-Salters-Lane-Goudine	The western portion in the vicinity of Black River, is covered by undeveloped swampland and swamp tree growth. The low-lying parts have overflowed leading to major flooding.	HECRAS 1D or 2D
Area 10- Hebron-Mouzon-Bennette Swamp	On the western side of the county, it divided in the middle by Black River running west to the east which provides the outlet for the upper two thirds of the area. The lower third tributaries drain into Bennett Swamp which runs across the bottom end.	HECRAS 1D or 2D
Area 11 - Greeleyville- Heineman	Small area in the southwest corner of the county boarded by Clarendon County line on the east, Santee River on the south and U.S. Highway 52 on the east. The town Greeleyville is located in the center of the block with highway radiating in all directions. Almost of the drainage is towards and into tributaries of the Santee River on the south. Two bays, one southeast and one southwest of Greeleyville, occupy sizeable areas of undeveloped land as well as the Santee River Swamp which has overflowed in the past.	PCSWMM for developed area / HECRAS 1D or 2D for riverine

Given the varying modeling approaches and data needed to complete the modeling of the areas identified during the public engagement process, which are not know at this time, MT Team will provide modeling on the following types of study areas:



- Stormwater System (stormdrain systems, ditches) modeling utilizing PCSWMM: Up to, not to exceed, 3,500 acres of study area. Wood will not support this portion of the task.
- Riverine Systems (rivers, single culvert, or bridge crossings) modeling utilizing HEC-RAS 1D or 2D: Up to, not to exceed, 3,750 acres of study area. Wood will support approximately 87% of this portion of the task, or up to 3,260 acres.
- Compound (coastal, riverine and/or stormwater systems) modeling utilizing HECRAS and/or PCSWMM: Up to, not to exceed, 1,000 acres of study area. Wood will not support this portion of the task.

**TASK 9: CURRENT AND FUTURE CONDITIONS REPORT AND BRIEFING (Within 150 Days)**

MT Team will prepare a report and formal briefing detailing Task 8 to the South Carolina Office of Resilience’s Mitigation Department and key stakeholders. The briefing will include a power point presentation. This requirement will be completed within 150 days of contract award. Wood will provide support to MT for this task in alignment with the budgeted level of effort for this task.

**TASK 10: DEVELOPMENT OF ALTERNATIVES MODELS**

This task includes generating a list of priority projects and preparing alternatives analyses to provide options to improve the level of service of those systems including a sensitivity analysis to determine effects on the higher flood frequency events (if alternatives are deemed to be practical by MT). One alternative will include an assessment of a design that fully meets the defined design standards. Another alternative will include an assessment of a design that meets some but may not meet all the current design standards but will improve the level of service of the infrastructure to address the reported or identified flooding issue. More alternatives may include an option to improve conditions but may not meet some or all of the design standards, including a potential buyout scenario where the flooded infrastructure is removed from the problem area. Up to five (5) low-impact development retrofit projects may also be identified as part of the alternatives analysis. These projects are anticipated to include cistern. storage and potential reuse, structure control measures within existing impervious areas. and/or pervious pavers as options to reduce and/or treat stormwater runoff from individual sites. Stream and/or wetland restoration potential will also be evaluated as part of the alternatives analysis.

Items within this task will include:

- A. Create an alternative analysis to remedy the problem areas.
- B. Create Summary Report of findings, including but not limited to:
  - a. GIS Mapping.
  - b. Summary of the existing drainage system.
  - c. List of priority projects (see task 12, below)
  - d. Documentation of methods; and
  - e. Technical data and related information.
- C. Develop a Sensitivity Analysis to study the impact of higher flood frequency events.

Wood will provide primary support for the Riverine Model portions of the study area as described in Task 8.

**TASK 11: ALTERNATIVES REPORT AND BRIEFING (Within 200 Days)**

MT Team will prepare a report to document the methods used for the alternatives analysis, technical data. and the results of the alternative analysis. MT Team will provide a formal briefing to SCOR staff as part of one of the monthly meetings included in Task I. Wood will support MT in this task.

**TASK 12: PROJECT RECOMMENDATIONS AND PRIORITIZATION (Within 230 Days)**

Based on the results of the alternatives analysis and feedback from SCOR from Task 11, MT Team will create a ranking system to prioritize projects which will include a Benefit-Cost Analysis (BCA). and assessment of the project's impacts on Low-to-Moderate Income (LMI) communities. Projects that may be eligible for other sources of funding for project

implementation will be noted. An opinion of probable costs (OPCs) will be prepared for each proposed priority project. The OPC will include an estimate of real estate cost for easements (if easements are required) based on parcel tax value (if available) or as directed by SCOR. The OPC will also include an estimate of design, permitting, and construction costs. The construction costs will be generated using construction cost data from other MT Team projects, SCDOT costs, or other data provided by the Counties or SCOR.

MT Team will prepare up to 15 concept designs (approximately 10% level) to inform the OPC. Survey of the identified project areas, by a PLS, will not be performed, GIS data will be utilized to prepare the concept plans. Recommendations on level of survey needed for detailed design will be made as part of the recommendations. The concept plans will include a proposed plan view and an estimate of work area including an assessment of construction access. A preliminary profile will be designed to estimate grading and the limits of disturbance for the proposed project.

Items within this task will include:

- A. Prepare cost estimates for recommended improvements.
- B. Conduct a Benefit-Cost Analysis on each of the prioritized projects and provide that dataset to the South Carolina Office of Resilience's Mitigation Department. The Benefit-Cost Ratio of recommended projects should be 1.0 or greater.
- C. Conduct a comprehensive assessment of the impact of the determined projects on the Low-to-Moderate Income community. Provide a report and a formal briefing to SCOR.
- D. Create a ranking system to prioritize projects.
- E. Attendance at one meeting, if needed, to explain concepts and proposals.

Wood will provide approximately one third of the support needed for Concept Designs and Cost Estimates. Wood will provide primary support for the LMI analysis.

### **TASK 13: PROJECT RECOMMENDATIONS REPORT AND BRIEFING (Within 230 Days)**

MT Team will prepare a report to document the project ranking matrix, the results of the BCA, and LMI community assessment. MT Team will provide a formal briefing to SCOR staff as a part of one of the monthly meetings included in Task I. Wood will support MT in this task.

### **TASK 14: FINAL REPORT AND BRIEFING (Within 370 Days)**

MT Team will compile the final written report and facilitated the in-person briefing (Wood will attend virtually). The report and briefing will include:

- A. A review of the historical problems associated with systematic flooding associated disasters throughout Georgetown and Williamsburg Counties to include the impact of sustained rainfall draining through surrounding water basins.
- B. A review of the planning parameters associated with this specific assessment and its direct tie to CDBG-MIT funding for mitigation.
- C. A thorough literature study of previously published infrastructure and drainage management problems in the affected areas throughout Georgetown and Williamsburg Counties to include all previous studies which directly impact the problem at hand.
- D. Coordination with all applicable agencies and organizations who are stakeholders in the study area. As a minimum, this will include the US Army Corps of Engineers, any and all watershed management agencies or civilian equivalent, the State Department of Transportation, Department of Natural Resources, Department of Health and Environmental Control, Department of Parks Recreation and Tourism, South Carolina Department of Agriculture, the US Department of Agriculture, and county and local jurisdictions affected.
- E. A comprehensive listing of all projects considered within the parameters of the strategy as well as a thorough review and definition of each screening criteria used to arrive at the recommended projects.
- F. A prioritized list of recommended construction projects resulting from the analysis, each in terms of the highest probability of success against future disasters and their specified budget estimations.
- G. The Benefit-Cost Analysis of each project which reflects the benefit achieved by conducting the project and its direct impact upon Low- to-Moderate Income communities.
- H. A review and assessment of the environmental concerns associated with each project and an estimated timeline for the associated environmental clearance.

- I. Based upon the final prioritized list of projects, a list of homes, including addresses, inside the study area that would be impacted by any recommended infrastructure construction projects and if they are recommended for potential buyout.
- J. A qualitative and quantitative impact statement upon a Low-to-Moderate Income population that each construction project will resolve concerning future disasters.
- K. A holistic risk assessment of each distinct proposed construction project.
- L. Estimate the project delivery cost including all aspects of federal, state, and local permitting as well as all environmental considerations and concerns for each prioritized project.
- M. An analysis of each prioritized project and the benefit it provides for Low-to-Moderate Income citizens throughout Georgetown and Williamsburg Counties concerning future flood events.
- N. A general topographic schematic of the proposed projects.
- O. Geopolitical issues associated with the projects.

Wood will support MT in preparation of the report.

## **FEES AND PAYMENT**

Wood will perform the services in the tasks above for the total lump sum labor fee of \$289,499.98.

**Wood Environment and Infrastructure Solutions**  
 Williamsburg and Georgetown Counties Hydrologic and Hydraulic Study

Job #: Ttd  
 Date: 9/23/2022  
 By: Todd Kennedy

TASK	Wood Classification	Hours					Subtotal
		Senior 1	Senior 2	Senior 3	Senior 4	Senior 5	
TASK 01	PROJECT ADMINISTRATION AND PROJECT MANAGEMENT						
	Kick Off Meeting	2	2				6 \$ 1,070.00
	Virtual						
	Advisory 13 meetings, 1hr each	18	18				36 \$ 3,060.00
	Advisory 13 meetings, 1hr each	42	42				84 \$ 7,560.00
TASK 02	STAKEHOLDER INVOLVEMENT AND STAKEHOLDER MEETINGS						
	Stakeholder Meetings (7 Meetings)	2	2				4 \$ 2,400.00
	Stakeholder Meeting Preparation and Post Meeting Tasks	1	1				2 \$ 1,430.00
TASK 03	PUBLIC INVOLVEMENT AND PUBLIC MEETINGS						
	Public Meeting (1 Meeting)	2	2				4 \$ 3,600.00
	Public Meeting Preparation and Post Meeting Documentation	1	1				2 \$ 1,430.00
TASK 04	FOOD SECURITY INITIATIVES						
	Area Definition	4	4				8 \$ 7,160.00
TASK 05	DATA GATHERING AND DATA IDENTIFICATION						
	Summary Info, Existing Studies	2	2				4 \$ 3,410.00
TASK 06	PACKAGE SHEET AND HISTORIC DATA FINDINGS REPORT						
	Alternatives Report	2	2				4 \$ 410.00
TASK 07	FIELD DATA COLLECTION						
	Deck Top			50			50 \$ 770.00
TASK 08	DEVELOPMENT OF CURRENT AND FUTURE MODELS						
	Stormwater Systems Current Conditions	1	1				2 \$ 200.00
	Stormwater Systems Future Conditions	1	1				2 \$ 200.00
	Summary of Report Areas	34	34				68 \$ 205.00
	Stormwater Systems	105	105				210 \$ 80,420.00
	Stormwater Systems	115	115				230 \$ 80,420.00
	Summary of Problem Areas	44	44				88 \$ 40,120.00
	Comparing Current Conditions	1	1				2 \$ 200.00
	Comparing Future Conditions	1	1				2 \$ 200.00
	Summary of Problem Areas	2	2				4 \$ 200.00
TASK 09	DEVELOPMENT OF ALTERNATIVES REPORT						
	Current and Future Conditions Report	4	4				8 \$ 1,830.00
	Current and Future Conditions Meeting (Virtual)	2	2				4 \$ 1,450.00
TASK 10	DEVELOPMENT OF ALTERNATIVES MODELS						
	Stormwater Systems	2	2				4 \$ 410.00
	Review	16	16				32 \$ 19,720.00
	Stormwater System Analysis	1	1				2 \$ 200.00
	Summary of Results	8	8				16 \$ 700.00
TASK 11	ALTERNATIVES REPORT AND BRIEFING						
	Alternatives Report	2	2				4 \$ 1,220.00
	Alternatives Briefing (including PPT)	4	4				8 \$ 1,480.00
TASK 12	PROJECT RECOMMENDATIONS AND PRIORITIZATION						
	Prepare concept designs	8	8				16 \$ 7,040.00
	Prepare Cost Estimates	40	40				80 \$ 5,810.00
	Cost Estimation	1	1				2 \$ 200.00
	Conduct LMI Assessment	38	38				76 \$ 5,810.00
TASK 13	PROJECT RECOMMENDATIONS REPORT AND BRIEFING						
	Create Review, Screen and Rank Reports	2	2				4 \$ 1,250.00
	Draft Project Recommendations Report	2	2				4 \$ 1,480.00
TASK 14	FINAL REPORT AND BRIEFING						
	Draft Final Report	8	8				16 \$ 3,530.00
	Final Report (1 round of comments)	2	2				4 \$ 680.00
	Final Briefing	2	2				4 \$ 1,960.00
<b>TOTAL</b>		<b>36,889.00</b>	<b>11,700.00</b>	<b>81,850.00</b>	<b>55,840.00</b>	<b>62,200.00</b>	<b>263,159.00</b>

Expenses	Amount
TASK 2	2 meetings mileage
TASK 3	2 meals
TASK 3	3 mileage mileage
TASK 7	12 G over 2 wks, 2 staff
TASK 7	10 hr days
TASK 7	2 staff
	2 meetings (12 days)
	Meals (12 days)
	Subtotal
	267.18
	30.00
	891.54
	450.00
	800.00
	1,728.00
	445.77
	128.95
	59.00
	5,940.44

Expenses plus G&A \$ 263,159.00  
 Grand Total \$ 263,159.00

**ATTACHMENT A**  
**Scope of Work**  
for  
**Williamsburg and Georgetown Counties Hydrologic and Hydraulic Study**

This scope of services is prepared for Moffatt & Nichol (M&N) to assist McCormick Taylor (MT) in completing the scope of work prepared for the South Carolina Office of Resilience (SCOR) for Williamsburg and Georgetown Counties. It is assumed that M&N assumed that M&N will assist the MT Team in completing the assigned scope of services as outlined in this document.

**SCOPE OF SERVICES**

Moffatt & Nichol will assist in providing the services set forth below.

**TASK 1: PROJECT ADMINISTRATION AND MEETINGS**

One M&N staff will attend a virtual kickoff meeting.

**TASK 2: STAKEHOLDER ENGAGEMENT**

N/A

**TASK 3: PUBLIC INVOLVEMENT AND PUBLIC MEETINGS**

N/A

**TASK 4: FOCUS AREA IDENTIFICATION**

Due to the limited funding, it may not be possible to consider all study areas identified during the stakeholder and public engagement process. Utilizing the information gathered by others in Task 2 and 3, M&N will assist MT Team in preparing a list of identified focus areas. Utilizing metrics such as severity of flooding, number of repetitive events, number of structures affected, dollar amount of losses, LMI community presence, type of model methodology and additional items as determined, M&N will assist the MT Team in ranking the focus areas in order of importance to be considered during subsequent tasks.

**TASK 5: DATA GATHERING AND DATA GAP IDENTIFICATION**

N/A

**TASK 6: DRAINAGE ISSUES AND HISTORICAL DATA FINDINGS REPORT AND BRIEFING**

N/A

**TASK 7: FIELD DATA COLLECTION**

N/A

**TASK 8: DEVELOPMENT OF CURRENT AND FUTURE CONDITIONS MODELS**

M&N will assist MT in developing design criteria targets to determine level of service performance by each of the analyzed systems. The level of service will be defined by local design standards (if any), SCDOT design criteria, SCOR or County input, and/or other published engineering guidelines/standards. M&N will assist MT in preparing hydrologic and hydraulic

models to determine discharge values and to model the 2-, 10-, 25-, 50-, and 100-year 24-hour storm using a combination of models depending on the system that is analyzed. The hydrologic models shall include existing and future conditions, and anticipated changes in rainfall intensities. HEC-HMS, rational method, TR55, or USGS National Stream Flow Statistics will be used to model hydrology. The hydraulic modeling will utilize HECRAS 6.0 for riverine systems and culvert crossings that are in series. Individual culvert locations may be modeled using HY-8. Open channels may be modeled using Manning's equation or FlowMaster. Inlets, closed systems, and overland flow may be modeled using PCSWMM, or similar program. Compound flooding areas may use either HECRAS, PCSWMM or a combination of both. Attenuation may be considered in areas where significant storage behind a large culvert embankment is assumed.

- A. Develop current hydrologic and hydraulic models, including but not limited to:
  - a. Rainfall – runoff; and
  - b. Riverine, Overland, and pipe network flow
- B. Develop future conditions hydrologic and hydraulic models, which account for:
  - a. Future land cover.
  - b. Future hydraulic setting.
  - c. Changes in rainfall patterns.
- C. Problem area identification; and
- D. Development of design criteria targets.

Table 1 and 2 depict initial focus areas SCOR obtained from the Counties, these areas will be validated and further defined during the stakeholder and public engagement process in Task 2 and Task 3. M&N will assist in the modeling of Areas 3, 6, 7, 8, and 9 in Georgetown County and in Area 1A, 7, and 11 in Williamsburg County. The specific areas are subject to change based on feedback from stakeholder and public engagement and available funding, but the overall level of effort is assumed to be the same.

Table 1. Georgetown County

<b>Georgetown County Drainage Problem Areas</b>		
<b>Problem Area Name</b>	<b>Description of Problem</b>	<b>Modeling Approach</b>
Area 1 - Rustwood Dr.	Water overtops roads during rain events	HECRAS 2D
Area 2 - Sandhole Rd.	Water overtops roads during rain events	HECRAS 2D
Area 3- Walter Huell & Olmsted	Ditches hold water	PCSWMM
Area 4- Hamlin Rd	Water overtops roads during rain events	HECRAS 2D
Area 5-Ethridge Rd	Water overtops roads during rain events	HECRAS 2D
Area 6 - Lanescreek Community Outfall	No access to maintain outfall ditch	Compound/ HECRAS2d
Area 7 - Greentown Rd	No access to maintain outfall ditch	PCSWMM?
Area 8 - Lincolnshire, Savannah (Spring Gully)	Water ponds along roadway and yards	PCSWMM
Area 9 - Giles Rd.	No access to maintain outfall ditch	PCSWMM
Area 10 - False Box Dr.	Water overtops roads during rain events	HECRAS 2D
Area 11 - Peters Creek	water overtops roads during rain events	HECRAS 2D
Area 12 - Calvin Hardee Rd	No access to maintain outfall ditch	HECRAS 2D
Area 13 - Jackson Village Rd/Gillard	No access to maintain outfall ditch	HECRAS 2D

Table 2. Williamsburg County

<b>Williamsburg County Drainage Problem Areas</b>		
Area 1 - Hemingway-Union Crossroad - Outland	Northeastern corner of Williamsburg County, Great Pee Dee River runs along the northeastern border and Black Mingo Creek is on the southwestern border	HECRAS 2D
Area 1A - Donnelly Community-	Near the city limits of the Town of Hemingway, area has had significant growth. This area was evacuated during each major hurricane and remains a problem during normal heavy rain events.	PCSWMM

Area 2 - Indiantown-Stuckey-Morrisville	Area is a long, generally rectangular section, running north and south with Black Mingo Creek across its midsection, once used for mostly farming. Due to this area being nearly level topography, drainage is difficult.	HECRAS 2D
Area 3 - Nesmith-Rhems-Warsaw	Located in the eastern central section of the county. Its areas bordered on the north by the Black Mingo Creek and on the south by the Black River.	HECRAS 2D
Area 4 - Cades-Roper Crossroad-Cedar Swamp	Area is located in the northern central section of the county bordered by Lake Swamp and is covered by a network of swampy drainage either running to Lake Swamp or converging into the upon reaches of Black Mingo Creek to the east.	HECRAS 2D
Area 5 - Millwood, Trio, Sutton's	This area is long and narrow extending south from the center of the County across Black River and is boarder on the South by Santee River. The Black River, passing through the upper portion, provides the natural outlets for tributaries in more than half of this area. The Santee River is the outlet for the southernmost portion.	HECRAS 2D
Area 6 - Bloomingvale, Earles-Wee Tee	This area is very similar to Area 5 in its physical characteristics. Located in the southernmost corner of the county, it is crossed in the upper section of the Black River and bordered on the south by the Santee River. There are several large bay areas in the midsection.	HECRAS 2D
Area 7- Kingstree, Cades-Moores	Area located in the northwestern corner of the county, is comprised almost totally of Kingstree Swamp Watershed, which outlets into the Black River at Kingstree. This area is a constant flood area. During the 1000 Year flood the Kingstree Area (Main Street) was mostly underwater around the railroad track and downstream.	PCSWMM for developed area / HECRAS2D for riverine
Area 8- Kingstree-Boggy Swamp	In this area, just south and east of Kingstree, Boggy Swamp runs from north to south and into the Black River which crosses the southeastern corner. These two main drainage ways provided the outlets for the smaller tributaries of the area.	HECRAS 2D
Area 9-Salters-Lane-Goudine	The western portion in the vicinity of Black River, is covered by undeveloped swampland and swamp tree growth. The low-lying parts have overflowed leading to major flooding.	HECRAS 2D
Area 10- Hebron-Mouzon-Bennette Swamp	On the western side of the county, it divided in the middle by Black River running west to the east which provides the outlet for the upper two thirds of the area. The lower third tributaries drain into Bennett Swamp which runs across the bottom end.	HECRAS 2D
Area 11 - Greeleyville- Heineman	Small area in the southwest corner of the county boarded by Clarendon County line on the east, Santee River on the south and U.S. Highway 52 on the east. The town Greeleyville is located in the center of the block with highway radiating in all directions. Almost of the drainage is towards and into tributaries of the Santee River on the south. Two bays, one southeast and one southwest of Greeleyville, occupy sizeable areas of undeveloped land as well as the Santee River Swamp which has overflowed in the past.	PCSWMM for developed area / HECRAS2D for riverine

Given the varying modeling approaches and data needed to complete the modeling of the areas identified during the public engagement process, which are not know at this time, M&N may assist the MT Team in providing modeling on the following types of study areas:

- Stormwater System (stormdrain systems, ditches) modeling utilizing PCSWMM: Up to, not to exceed, 3,500 acres of study area—M&N is assumed to assist on about 34%, or about 1,200 acres of the total stormwater system modeling effort.
- Riverine Systems (rivers, single culvert, or bridge crossings) modeling utilizing HEC-RAS 2D: Up to, not to exceed, 3,750 acres of study area. M&N is not scoped to complete riverine system modeling at this time.
- Compound (coastal, riverine and/or stormwater systems) modeling utilizing HECRAS and/or PCSWMM: Up to, not to exceed, 1,000 acres of study area. M&N is assumed to complete 100% of the compound modeling.

Up to, not to exceed, 8,250 acres of study area will be modeled through this proposal with M&N assisting on about 2,200 acres of the study area model.

#### **TASK 9: CURRENT AND FUTURE CONDITIONS REPORT AND BRIEFING**

M&N will assist the MT Team in preparing a report and formal briefing detailing Task 8 to the South Carolina Office of Resilience's Mitigation Department and key stakeholders. One M&N staff member is assumed to participate in-person or virtually at the briefing. The briefing will include a power point presentation.

#### **TASK 10: DEVELOPMENT OF ALTERNATIVES MODELS**

M&N will assist MT in generating a list of priority projects and preparing alternatives analyses to provide options to improve the level of service of those systems including a sensitivity analysis to determine effects on the higher flood frequency events (if alternatives are deemed to be practical by MT ). One alternative will include an assessment of a design that fully meets the defined design standards. Another alternative will include an assessment of a design that meets some but may not meet all the current design standards but will improve the level of service of the infrastructure to address the reported or identified flooding issue. More alternatives may include an option to improve conditions but may not meet some or all of the design standards, including a potential buyout scenario where the flooded infrastructure is removed from the problem area.

M&N will assist MT with up to five (5) low-impact development retrofit projects that may also be identified as part of the alternatives analysis. These projects are anticipated to include cistern, storage and potential reuse, structure control measures within existing impervious areas, and/or pervious pavers as options to reduce and/or treat stormwater runoff from individual sites.

Stream and/or wetland restoration potential will also be evaluated as part of the alternatives analysis.

Items within this task will include:

- A. Create an alternative analysis to remedy the problem areas.
- B. Create Summary Report of findings, including but not limited to:
  - a. GIS Mapping.
  - b. Summary of the existing drainage system.
  - c. List of priority projects (see task 12, below)
  - d. Documentation of methods; and
  - e. Technical data and related information.
- C. Develop a Sensitivity Analysis to study the impact of higher flood frequency events.

#### **TASK 11: ALTERNATIVES REPORT AND BRIEFING**

M&N will assist the MT Team in preparing a report to document the methods used for the alternatives analysis, technical data, and the results of the alternative analysis. This task also includes one M&N staff in participating in person or virtually at a briefing with SCOR.

#### **TASK 12: PROJECT RECOMMENDATIONS AND PRIORITIZATION**

Based on the results of the alternatives analysis and feedback from SCOR from Task 11, M&N will assist the MT Team in creating a ranking system to prioritize projects which will include a Benefit-Cost Analysis ( BCA ) and assessment of the project's impacts on Low-to-Moderate Income ( LMI ) communities. Projects that may be eligible for other sources of funding for project implementation will be noted. An opinion of probable costs (OPCs) will be prepared for each proposed priority project. The OPC will include an estimate of real estate cost for easements ( if easements are required) based on parcel tax value (if available) or as directed by SCOR. The OPC will also include an estimate of design, permitting, and construction costs. The construction costs will be generated using construction cost data from other MT Team projects, SCDOT costs, or other data provided by the Counties or SCOR.

M&N will assist MT Team will prepare up to 4 concept designs (approximately 10% level) to inform the OPC. Survey of the identified project areas, by a PLS, will not be performed, GIS data will be utilized to prepare the concept plans.



Recommendations on level of survey needed for detailed design will be made as part of the recommendations. The concept plans will include a proposed plan view and an estimate of work area including an assessment of construction access. A preliminary profile will be designed to estimate grading and the limits of disturbance for the proposed project.

### **TASK 13: PROJECT RECOMMENDATIONS REPORT AND BRIEFING**

M&N will assist the MT Team in preparing a report to document the project ranking matrix and concept designs. This task also includes one M&N staff in participating in person or virtually at a briefing with SCOR.

### **TASK 14: FINAL REPORT AND BRIEFING**

M&N will assist the MT Team in compiling the final written report. This task also includes one M&N staff in participating in person or virtually at a briefing with SCOR. The report and briefing will include:

- A. A review of the historical problems associated with systematic flooding associated disasters throughout Georgetown and Williamsburg Counties to include the impact of sustained rainfall draining through surrounding water basins.
- B. A review of the planning parameters associated with this specific assessment and its direct tie to CDBG-MIT funding for mitigation.
- C. A thorough literature study of previously published infrastructure and drainage management problems in the affected areas throughout Georgetown and Williamsburg Counties to include all previous studies which directly impact the problem at hand.
- D. Coordination with all applicable agencies and organizations who are stakeholders in the study area. As a minimum, this will include the US Army Corps of Engineers, any and all watershed management agencies or civilian equivalent, the State Department of Transportation, Department of Natural Resources, Department of Health and Environmental Control, Department of Parks Recreation and Tourism, South Carolina Department of Agriculture, the US Department of Agriculture, and county and local jurisdictions affected.
- E. A comprehensive listing of all projects considered within the parameters of the strategy as well as a thorough review and definition of each screening criteria used to arrive at the recommended projects.
- F. A prioritized list of recommended construction projects resulting from the analysis, each in terms of the highest probability of success against future disasters and their specified budget estimations.
- G. The Benefit-Cost Analysis of each project which reflects the benefit achieved by conducting the project and its direct impact upon Low- to-Moderate Income communities.
- H. A review and assessment of the environmental concerns associated with each project and an estimated timeline for the associated environmental clearance.
- I. Based upon the final prioritized list of projects, a list of homes, including addresses, inside the study area that would be impacted by any recommended infrastructure construction projects and if they are recommended for potential buyout.
- J. A qualitative and quantitative impact statement upon a Low-to-Moderate Income population that each construction project will resolve concerning future disasters.
- K. A holistic risk assessment of each distinct proposed construction project.
- L. Estimate the project delivery cost including all aspects of federal, state, and local permitting as well as all environmental considerations and concerns for each prioritized project.
- M. An analysis of each prioritized project and the benefit it provides for Low-to-Moderate Income citizens throughout Georgetown and Williamsburg Counties concerning future flood events.
- N. A general topographic schematic of the proposed projects.
- O. Geopolitical issues associated with the projects.

## **ADDITIONAL SERVICES**

Any services not specifically provided for in the above scope will be billed as additional services and performed at our then current hourly rates. Additional services we can provide include, but are not limited to, the following:

- Grant applications
- FEMA map updates or permitting
- Water quality modeling
- NPDES Phase II permitting assistance
- P.L.S grade surveying
- Additional concept design beyond identified in this scope
- Final design
- Utility locations and/or Subsurface Utility Exploration

## **SCHEDULE**

We will provide our services as expeditiously as practicable with the goal of meeting the following schedule:

- Task 4: Focus Area Identification – 80 days from NTP
- Task 9: Current and Future Conditions Report and Briefing – 150 days from NTP
- Task 11: Alternatives Report and Briefing – 200 days from NTP
- Task 13: Project Recommendations Report and Briefing – 230 days from NTP
- Task 14: Final Report and Briefing – 370 Days from NTP

## **FEES AND PAYMENT**

MT will perform the services in Tasks 1-14 for the total lump sum labor fee of \$282,565

Lump sum fees will be invoiced based on milestone delivery. Payment will be due within 25 days of your receipt of the invoice and should include the invoice number and M&N project number.

Name: Williamsburg and Georgetown Counties Hydrologic and Hydr  
 Job #: TBD  
 Date: September 23, 2022  
 By: Jeffrey Crump

TASK	Hours						Total Hours	Total Cost
	Senior Engineer	Engineer III	Engineer II	Engineer I	CADD/GIS III	CADD/GIS II		
	\$ 200.00	\$ 175.00	\$ 125.00	\$ 110.00	\$ 185.00	\$ 135.00		
<b>Task 01 PROJECT ADMINISTRATION AND PROJECT MANAGEMENT</b>								
1 Kick Off Meeting		2					2	400.00
2 Weekly Updates								
4 Project Administration and OCOA								
<b>Task 02 STAKEHOLDER INVOLVEMENT AND STAKE HOLDER MEETINGS</b>								
1 Stakeholder Meetings (2 Meetings)								
2 Stakeholder Meeting preparation and post meeting tasks								
<b>Task 03 PUBLIC INVOLVEMENT AND PUBLIC MEETINGS</b>								
Public Meetings (3 Meetings)								
Public Meeting Preparation and Post Meeting Documentation								
<b>Task 04 FOCUS AREA IDENTIFICATION</b>								
Focus Area Identification		2	8			4	12	1,690.00
Summary Report								
<b>Task 05 DATA GATHERING AND DATA GAP IDENTIFICATION</b>								
Base Data								
Community Data, Existing Studies								
<b>Task 06 DRAINAGE ISSUES AND HISTORICAL DATA FINDINGS REPORT</b>								
Draft Alternatives Report								
<b>Task 07 FIELD DATA COLLECTION</b>								
Desk Top								
Field Inventory								
<b>Task 08 DEVELOPMENT OF CURRENT AND FUTURE MODELS</b>								
Stormwater Systems Current Conditions	16	40	200	40			296	39,600.00
Stormwater Systems Future Conditions	8	12	80	30			130	17,000.00
Summary of Problem Areas	4	16	80	20			120	15,800.00
Riverine Current Conditions								
Riverine Future Conditions								
Summary of Problem Areas								
Compound Current Conditions	32	80	300	100			512	68,800.00
Compound Future Conditions	12	32	120	30			194	26,300.00
Summary of Problem Areas	12	32	120	30			194	26,300.00
Summary of Results								
<b>Task 09 CURRENT AND FUTURE CONDITIONS MODELS REPORT</b>								
Draft Current and Future Conditions Report			3				3	375.00
Current and Future Conditions Briefing (including PPT)			6				6	750.00
<b>Task 10 DEVELOPMENT OF ALTERNATIVES MODELS</b>								
Stormwater Systems	4	12	60	16			92	12,160.00
Riverine								
Compound	12	24	80	80			176	23,200.00
Stormwater Sensitivity Analysis	4	12	32				48	6,900.00
Summary of Results								
<b>Task 11 ALTERNATIVES REPORT AND BRIEFING</b>								
Draft Alternatives Report			3				3	375.00
Alternatives Briefing (including PPT)			6				6	750.00
<b>Task 12 PROJECT RECOMMENDATIONS AND PRIORITIZATION</b>								
Prepare concept designs	4	8	8	8		4	32	4,620.00
Prepare Cost Estimates		2		8			10	1,230.00
Conduct BCA								
Conduct LMI Assessment								
Create Ranking System and Rank Projects								
<b>Task 13 PROJECT RECOMMENDATIONS REPORT AND BRIEFING</b>								
Draft Project Recommendations Report			3		3		6	840.00
Project Recommendations Briefing			6				6	750.00
<b>Task 14 FINAL REPORT AND BRIEFING</b>								
Draft Final Report			8		8		16	2,240.00
Final Report (1 round of comments)			2				2	250.00
Final Briefing			6				6	750.00
<b>TOTAL</b>	<b>112</b>	<b>270</b>	<b>1,129</b>	<b>342</b>	<b>11</b>	<b>8</b>	<b>1,872</b>	<b>250,430</b>

