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October 1, 2025

Jessica Trottman
Assistant Town Manager
Town of Black Mountain
160 Midland Ave
Black Mountain, North Carolina 28711

Re: Proposal for Planning and Engineering Services for North Oconeechee Avenue Stormwater Management System Restoration

Dear Jessica,

Anchor QEA of North Carolina, PLLC, is pleased to provide the Town of Black Mountain (Town) with the following proposal for evaluation and conceptual design for the upgrade of the Oconeechee Avenue Stormwater Management System (Project), which was damaged by flooding related to Tropical Storm Helene in September 2024. The purpose of this Project is to perform a thorough post-storm damage assessment and to make recommendations for improvements that can be designed and constructed to increase stormwater conveyance capacity and repair flood damage.

Extreme flooding of the drainage basin crossing Oconeechee Avenue and adjacent roads caused damage to roadways, private property, and stormwater infrastructure. The Town anticipates receiving FEMA-PA (Federal Emergency Management Agency Public Assistance) funding to support the design and implementation of this recovery project, with support from a North Carolina Department of Environmental Quality grant to support stormwater water quality improvements. Anchor QEA will contract with the Town to perform Phase 1 of the restoration to include a damage assessment and develop two recommended methods of restoration. We will then meet with the Town and FEMA representatives to review funding eligibility and then advance through the detailed design under a contract amendment.

The proposed scope of work summarized below is based on our preliminary Site reconnaissance visit, conducted on September 5, 2025, and a *Technical Memorandum, Stormwater Assessment, Oconeechee Avenue Stormwater and Sinkhole Assessment* (Wildlands Engineering 2025). The memorandum identified the recommended area of repair as beginning at the intersection of North Cherokee Avenue and North Fork Road, extending southwest across North Oconeechee Avenue, and terminating in the golf course adjacent to the western side of Hiawassee Avenue.

We understand that repair of one damaged roadway in the drainage basin, North Cherokee Avenue, is being implemented under a separate contract by McAdams. As that portion of the road includes

infrastructure that manages stormwater that flows through the Project area, the recommendations we make may impact the repair of that roadway, or vice versa.

This scope of work for the initial phase assumes that Anchor QEA will perform a detailed Site assessment, produce a damage assessment report, and provide two recommended methods of repair: an option for repair to current codes and standards with potential mitigation, and an option for a repair to improve resiliency. As the proposed solution has not yet been determined, the following scope of work does not include the detailed design (including final hydrologic and hydraulic modeling and subsurface explorations, if required) or subsequent phases of permit finalization, construction specifications and bidding, construction management, and closeout, which will be scoped once the preferred alternative is selected.

This scope of work (SOW) includes the following tasks:

1. Existing Data Review and Preliminary Site Reconnaissance
2. Detailed Site Assessment
3. Damage Assessment Report
4. Recommended Methods of Repair
5. Grant Compliance and Analysis
6. Project Management and Meetings

Scope of Services and Deliverables

Through Phase 1 of this restoration project, Anchor QEA will perform the following tasks.

Task 1—Existing Data Review and Preliminary Site Reconnaissance

This task will consist of collecting and reviewing existing available data and conducting a Site reconnaissance visit for staff orientation.

Subtask 1.1 Existing Data Review

Anchor QEA will request and review available existing data the design team deems necessary for development of the conceptual design alternatives for the Project.

We will rely on Town staff to provide available documentation or contacts for holders of existing data. Anchor QEA will request, or access from publicly available sources, and review the following:

- Historic and current aerial imagery
- Light Detection and Ranging (LiDAR) elevation data
- Soils mapping
- Historic storm and precipitation data
- FEMA mapping and published models
- Pre-storm and existing stormwater system mapping, including ditch and pipe locations, invert elevations, sizes, and materials

- Infrastructure mapping, including electronic mapping of other existing utilities
- Parcel mapping

Data will be summarized for internal use by our team, with data gaps identified that may require additional investigation in Phase 2 (not included in this SOW).

Subtask 1.2. Preliminary Site Reconnaissance

Two Anchor QEA staff will travel to the Site to perform a preliminary Site reconnaissance. Anchor QEA staff will evaluate the Site to determine the appropriate project limits, the nature of the damage and subsequent repairs, infrastructure repair needs, and mitigation potential. This preliminary evaluation will serve as the basis for developing the damage assessment report and recommended methods of repair.

Subtask 1.3. Stakeholder Engagement

As a component of identifying recommended options, Anchor QEA will need to meet with Town staff or its designees to understand goals and any recommendations. Anchor QEA will also attempt to contact select neighbors of the Project to explore options for rights-of-way for stormwater infrastructure.

Assumptions

- Anchor QEA will have access to the Site but will remain on publicly owned right-of-way and properties and will not access private properties.
- Preliminary Site reconnaissance will be limited in scope and will not serve as the detailed Site Assessment, which is described in Task 2 of this scoping document.
- Anchor QEA will spend up to 8 hours researching, connecting to, and engaging with relevant stakeholders.

Deliverables

There are no deliverables associated with this task.

Task 2—Detailed Site Assessment

Subtask 2.1. Site Assessment

Anchor QEA will perform a detailed assessment of the Site. We will collect data relevant to developing our understanding of the stressors that contributed to the flooding of the drainage basin and failure of the drainage network during Tropical Storm Helene.

Anchor QEA staff will photo-document the Site and will collect data required to prepare the design recommendations. This includes documenting the current conditions and sizing of existing stormwater infrastructure components.

Subtask 2.1. Topographic Survey

Cole Surveying & Design, PA, will be subcontracted to prepare a field topographic survey of approximately 1.8 acres including locating visibly apparent utilities and infrastructure. The contour interval to define existing topography will be 1 foot and will be completed on the North Carolina State Plane Coordinate System NAD 83.

Assumptions

- Right of entry will be coordinated by the Town of Black Mountain.
- Two members of the Anchor QEA design team will be on site for up to 1 full day.
- No subsurface explorations will be performed at this time, although we do expect that an subsurface explorations will be required as part of a future contract amendment to support detailed design of the preferred improvements.

Deliverables

There are no deliverables associated with this task.

Task 3—Damage Assessment Report

Anchor QEA will prepare a damage assessment report that aligns with FEMA's Preliminary Damage Assessment (PDA) Guide requirements. This report will document the type, location, extent, and estimated costs of damage, following the standardized framework for FEMA-PA assessments. We will begin with a structured initial damage assessment (IDA), incorporating geotagged photographs, GIS mapping, and field inspections to capture the magnitude of damage to the stormwater network, adjacent infrastructure components, and public structures. We will categorize the Site in accordance with FEMA's PA work eligibility matrices and supporting documentation checklists, resulting in an analysis that provides sufficient technical justification for federal disaster grant consideration.

Our team will prepare impact statements, cost estimates, and supporting documentation that address FEMA's evaluation factors—including uninsured losses, localized impacts, and hazard mitigation opportunities. The final damage assessment report will provide the Town with a defensible and FEMA-ready submittal package that expedites eligibility under the Stafford Act. By aligning with FEMA's documentation standards and validation practices, the report will not only support the Town's immediate recovery needs but also position the Project for hazard mitigation funding to reduce vulnerability to future storm events.

Assumptions

- Anchor QEA will follow FEMA guidance for the development of the damage assessment report.

Deliverables

- Damage Assessment Report in PDF format, via email

Task 4—Recommended Methods of Repair

Anchor QEA will develop and evaluate two recommended methods of repair to the stormwater management system that conveys runoff through the Project area.

We anticipated that the alternatives will include the following:

- **Alternative 1—Repair to Pre-Helene Condition and Current Code/Standards:** The first alternative will propose to return the drainage infrastructure that conveys stormwater through the Project area to the pre-Helene level of service and meet current codes and standards.
- **Alternative 2—Best Resiliency Stormwater Improvements:** The second alternative will propose to increase the capacity and level of service of proposed repairs to provide enhanced resiliency to future flooding events. This may include some combination of storm drain improvements, detention, and other features designed to maximize the capacity and resiliency of the infrastructure.

These recommendations will address FEMA guidance and will support the Town's position to secure FEMA funding for design and implementation.

These conceptual alternatives will be analyzed by completing the following steps:

Step 1: Hydrologic and Hydraulic Analysis

Anchor QEA proposes to develop a model for hydrologic and hydraulic (H&H) analysis using PCSWMM. PCSWMM is stormwater modeling software that is based on the U.S. Environmental Protection Agency's Stormwater Management Model (SWMM). It can simulate the rainfall-runoff response and flows through a stormwater system in two dimensions through the duration of a storm or for an extended period of available precipitation data.

For inputs into the PCSWMM model, Anchor QEA will review and refine the delineation of the drainage basin that contributes runoff to the Project area, characterize and map land cover within the basin, and summarize soil characteristics. Anchor QEA will then use these characteristics and available precipitation data as inputs to develop the PCSWMM model. The model will initially be used to estimate the rainfall-runoff relationship at the Project site for key peak storm events, including the 25-year, 50-year, and 100-year storms. Anchor QEA will then use PCSWMM to model the conveyance of storm flows through the Project area for each of these storm events for the existing condition and for each proposed improvement alternative. The PCSWMM model will be used to simulate hydraulic conditions in the stormwater system through the duration of these key storm events to show when and where flooding occurs and when flooding recedes.

The model will be used to confirm the sizing of storm drains, detention features, and other stormwater controls proposed as part of each alternative to convey runoff through the Project area.

The model will also be used to refine each improvement alternative and compare the effectiveness of the improvement alternatives.

Step 2: Conceptual Design Drawings

As part of this task, Anchor QEA will prepare conceptual drawings for the two recommended methods of repair, including plan and profile drawings showing the proposed repairs and improvements recommended for each alternative. These conceptual design drawings will be prepared based on existing aerial photographs, available infrastructure mapping, and the survey data collection in Task 2. The drawings will include enough information to illustrate the concept and describe the major components of each concept, but will not include details, sections, specifications, or other detailed information that will be provided during the detailed design of the preferred project alternative.

Step 3: Opinion of Probable Cost

A preliminary opinion of probable cost for project implementation will be prepared for each alternative for comparison and evaluation. The cost analysis will identify quantities and unit costs for major elements of work proposed as part of each alternative. The opinions of probable implementation costs will include construction costs, contingencies, and anticipated detailed design and permitting costs. The cost estimate will follow the Association for the Advancement of Cost Engineering (AACE) International Recommended Practices for Cost Estimating System[1] for a Class 4 estimate with an expected accuracy range of -30% at the low end and +50% at the high end to identify the typical variation of expected cost at this level of project definition.

Step 4: Alternatives Evaluation Summary Memorandum

The analyses will be summarized in a memorandum that will include an overview of key conclusions from the detailed drainage assessment, a description of each alternative, a summary of the analysis completed to evaluate the alternatives, and a comparison of the alternatives based on cost, constructability, capacity, resiliency, and other key considerations. The conceptual design drawings and opinions of probable cost will be included as attachments to the memorandum.

Assumptions

- Anchor QEA will identify and evaluate two alternatives. If additional alternatives are identified, those alternatives will be evaluated under an amendment to this SOW.
- Recommendations will be summarized in a memorandum (up to 10 pages with attachments) that incorporates documentation from the damage assessment report.
- Conceptual design drawings will be developed based on existing readily available basemap information, including aerial photography, infrastructure mapping, and parcel mapping.

[1] This system is a series of recommended practices that classifies estimates based on the maturity of the project definition scope and accuracy. The system has five classes of estimates, from Class 5 (Least Defined) to Class 1 (Most Defined).

Deliverables

- Alternatives evaluation summary memorandum (PDF format)
- Conceptual design drawings for two concepts (PDF format, as attachment to memorandum)
- Opinions of probable cost (PDF format, as attachment to memorandum)

Task 5—Grant Compliance and Analysis

The intent of this task is to facilitate efficient and effective discussions with FEMA that allow for the continuation of the restoration services under Phase 2. This task includes the following:

- Meet with representatives and the Town and FEMA to review eligibility of the two recommended repair options (up to 6 hours total labor).
- Develop the SOW and budget for Phase 2 to include the engineering of the selected alternative, including permitting, development of construction specifications, and constructor selection process.
- Summary review of FEMA guidance documents to enable project delivery team to develop documents and recommendations based on stated FEMA requirements and policy in effect at the time of service (up to 9 hours total labor).

Task 6—Project Management and Meetings

The intent of this task is to facilitate efficient and effective work within a defined schedule and budget to meet the project objectives. This task includes the following:

- Update meetings with Town representatives every 2 weeks over an anticipated 3-month period (up to 16 hours total labor over six meetings).
- Develop and maintain a project schedule and conduct budget reviews (up to 12 hours).
- Respond to miscellaneous project communications outside of the scope identified above (up to 4 hours).

Assumptions

Completion of the work in accordance with the estimated budget and schedule is based on the foregoing descriptions and following assumptions:

- Anchor QEA will have access to the Site but will remain on publicly owned right-of-way and properties and will not access private properties.
- If access to private properties is requested by Anchor QEA, the Town will assist to facilitate private owner contact and assist to facilitate access.
- Weather events will not hinder performance of the Project site reconnaissance and the details assessments.
- Pre-design investigations, including geotechnical assessment and topographic surveying is not included in this phase.
- Permit application, pre-permitting meetings, or applicable fees are not included in this phase.

- The development of engineering plans, detailed design (including utility designs or modifications), or specifications is not included in this phase.
- No cultural or archaeological study or threatened and endangered species assessments are included.
- FEMA will accept at least one of the proposed recommendations without discussion or negotiation.
- Modifications or additional iterations of proposed recommendations by FEMA, the Town, or other stakeholders, will require additional scope and budget.

Estimated Costs

Anchor QEA will complete the scope described above on a lump-sum basis as detailed and summarized in Table 1. If, during the work, we identify conditions that differ from those addressed in this proposal, Anchor QEA will notify the Town in advance and obtain written approval prior to continuation of out-of-scope services. Although Anchor QEA will track budgets at the task level, invoicing for work from this Project will be provided monthly based on the lump-sum total.

Table 1
Task and Fee Breakdown

Task Number	Task Name	Estimated Cost
Task 1	Existing Data Review and Preliminary Site Reconnaissance	$10,800
Task 2	Detailed Site Assessment	$14,700
Task 3	Damage Assessment Report	$9,200
Task 4	Recommended Methods of Repair	$65,800
Task 5	Grant Compliance and Analysis	$7,800
Task 6	Project Management and Meetings	$9,800
	TOTAL	**$118,100**

Schedule

Anchor QEA will target completion of the work within 6 months of contract execution; however, we are available to discuss a more rapid timeline if needed by the Town or to meet funding constraints.

If you have any questions regarding these findings, please contact me at 828-450-6435, or via email at rcork@anchorqea.com. We appreciate the opportunity to perform this work.

Sincerely,



Robert Cork, PE, MEng
Program Manager