



December 12, 2023

Mr. Chad Austin
City of Kingsport
415 Broad Street
Kingsport, Tennessee 37660

RE: Proposal for Stormwater Mapping and Associated Asset Management - Phase III

Dear Mr. Austin:

Barge Design Services (Barge) encloses the details of our proposed scope of work (Attachment A) for the above-referenced project.

This proposal was prepared based on my understanding of the project description as outlined in Attachment A. If we have not fully addressed your project requirements, or if you have other questions regarding the proposal, please advise me immediately by calling (423) 723-8450.

Sincerely,

Barge Design Solutions, Inc.

Nelson Elam, CSL
Vice President

c: Mr. Brian Hill, Barge design Solutions, Inc.
Mr. Mike Smith, Barge Design Solutions, Inc.

Enclosures

Barge project # P952212

The scope of work is presented in the following elements.

- I. Project Description
- II. Scope of Services
- III. Project Understanding, Assumptions, and Exclusions
- IV. Time of Performance
- V. Client's Responsibilities
- VI. Deliverables
- VII. Compensation

I. Project Description

Barge has been providing assistance to the City of Kingsport (City) with inventory and mapping of their existing stormwater infrastructure since October 2019, referred to as Phase I and Phase II. This proposal includes services for Phase III which will be a continuance of the services where Phase II leaves off.

The City's existing mapping system included numerous catch basins and a majority of the outfalls. Phase I and II have included mapping and attributing missing pipes and open channel features that connect the catch basins, inlets, junction boxes, and other stormwater structures to the outfalls to create a complete database for the City's stormwater system. During the course of Phase I and Phase II to date, Barge found that approximately 16% of the structures and a significant amount of the pipes identified in the field had not been previously included in the City's existing mapping system. Phase III effort and duration anticipates that approximately 16% additional structures than are currently in the City's database will be found and added to the mapping system.

The data has been collected using the City's existing geographic information system (GIS) schema to allow for easy import and integration with the City's existing system, Cartegraph. Based on the current status of what Barge has mapped and inventoried over Phase I and Phase II and what the City had already had mapped prior to Phase I, it is estimated that approximately 20% of the City's entire stormwater infrastructure system will have been mapped after completion of Phase II, leaving approximately 80% to be mapped in Phase III and beyond.

Barge has agreed to map everything 10-inches in diameter and larger.

II. Scope of Services

Barge proposes the following Scope of Services related to the above-noted items.

Project Management

Barge will plan, manage, and execute the work in accordance with the schedule and budget established herein. The project management task will generally include the following activities:

- Facilitate project initiation meeting with City to identify key project stakeholders for distribution of project information, discuss pertinent data, project staffing, and organization, and present project work plan and initial schedule.
- Perform general project management duties including supervising and coordinating the project team and monitoring of project progress, costs, schedule, and work to complete.
- Prepare and submit monthly invoices. Communicate potential scope changes, schedule impacts, and cost risks to allow for timely guidance from City staff to manage change.
- Meet with the City to discuss basin prioritization, existing available data, existing issues, and areas to focus on. Once the meeting has occurred, Barge will prepare a basin prioritization figure and memo that will document the order in which data will be collected. This will be provided to the City for approval before the field inventory work begins.
- Meet with the City at the conclusion of the project effort to discuss inventory collected and associated deliverables and provide final report.

Field Data Collection

Data will continue to be collected and processed as it has been in Phase I and Phase II, which is summarized below.

System connectivity and attributes will be developed by collecting, at a minimum, the stormwater system features necessary to complete a contiguous stormwater system network from the stormwater systems' outfalls upstream to the stormwater structures connected by 10-inch diameter pipes and larger (includes open channels between 10-inch pipes and outfalls). Storm drains smaller than 10-inch diameter, yard piping, and private storm drainage systems are assumed to be excluded from the field data collection effort.

Barge will collect data for structures visited that allows for incorporation into (1) asset management / work order software, (2) regulatory compliance, (3) future stormwater maintenance planning, and (4) future hydraulic capacity analyses. Barge will collect the following attributes for the structures visited as part of the field data collection effort:

- Simple condition grade – include a condition grade while collecting the field data that can be used to prioritize future maintenance planning activities. The proposed format will include guidance protocol for the City's future application: Failed (less than 50% of intended capacity and needs repair), Poor (failing and needs replacement in next ten years), Good (functioning as intended, no near-term replacement needed)
- Invert measurements from rim of structure to pipe inverts. When paired with survey data, this will allow for capacity calculations of individual areas in the drainage system for localized flood mitigation and level of service analyses.

- Horizontal coordinates (x, y) and elevation data (rim elevation for structures and invert elevation of pipes)
 - Horizontal datum for survey data will be NAD83, TN Zone 4100 (NGS National Spatial Reference System). Horizontal data collection accuracy will be SECOND ORDER, as defined in the current Tennessee Department of Transportation (TDOT) Survey Manual.
 - Vertical datum for the survey data is to be NGVD88. Vertical data collection accuracy will be THIRD ORDER, as defined in the current TDOT Survey Manual.

The data collection will be performed by crews equipped with tablet computers and smartphones to identify stormwater structures and collect relevant attributes. The mobile devices will be equipped with Kingsport-specific data forms for populating in the field, which will help with accuracy and provide consistent formatting via dropdown selection menus, checkboxes, and toggle buttons. Spatially-enabled photographs will be taken with the device to automatically tie-in with the data form.

Each structure in the inventory will have a unique numeric identifier, stormwater attributes consistent with the City's current inventory, a photograph, a condition grade, pipe measure downs, and survey-grade horizontal coordinates associated with the structure. The existing identifiers will be maintained for existing data, and the completed stormwater network will include flow direction on conveyance features.

Data collection tasks are anticipated to include:

- Collect field data using project and City standards per outlined procedures to assimilate the required data.
- QC the surveyed data by systematic spot-checks and comparison to existing GIS data.
- Format the collected information for incorporation into the City's GIS database.
- Transfer to the City for continued use.
- Production of overview maps indicating extent of inventory and in a format for incorporation into annual report for the City's MS4 permit.
- Photographs of existing structures and pipe inlets in their current condition.
- The horizontal accuracy for the location data is survey grade (sub centimeter). The vertical accuracy is sub five centimeters. Survey elevations are included.
- Slope will be calculated on pipes.

III. Project Understandings, Assumptions, and Exclusions

- A. Barge will provide the above-noted services based upon a given set of assumptions. These assumptions are as follows.
 1. This proposal estimates the number of structures that can be collected based on past efficiency and what Barge estimates is still unmapped in the City's stormwater system. The proposal also does not guarantee that every single structure that has not been mapped will be located within the proposed budget because of the uncertainty of what the exact number of structures that has not been mapped yet.

2. As a part of the inspection process, Barge staff will identify structures that:
 - Require immediate cleaning.
 - Appear to have an illicit discharge.
 - Appear in immediate threat of collapse.

These priority structures will be flagged during data collection and the City will be notified by email. Once issues are resolved, the City will notify Barge, and Barge will continue the data collection.

3. All structures in the existing inventory require a field visit. The assumed field data collection effort in this Phase III proposal includes an inventory of structures (inlets, outlets) and the associated conveyance connections (pipes) for 10-inch and larger.
4. Barge will not map any outfalls or open channels that have been previously mapped by the City.
5. The stormwater system to be inventoried has easement/right-of-way access and no entry to private property is required.
6. Inaccessible structures will be noted in the geodatabase for informational purposes.
7. The basic condition assessment is assumed to be completed visually during the field data collection. All structures will be investigated with a 360-degree camera.
8. Project duration is assumed to be approximately 18 months. Any delay due to client review may extend the project duration accordingly.
9. Barge will not inventory in TDOT right-of-way or in high traffic areas where increased safety protocols are required such as lane closures.

B. The following excluded services can be provided as an additional service with an appropriate adjustment in fees.

1. Services resulting from significant changes in general scope or character of the project or its design, particularly those resulting from structure access or environmental or safety issues.
2. Scope revisions requested by those outside the project team and stakeholders beyond asset management phase.

IV. Time of Performance

Barge is prepared to begin work within two weeks upon receipt of a signed professional services agreement or written authorization to proceed. For planning purposes, Barge has prepared the following milestone schedule.

Tasks	Duration
Stormwater Mapping and Associated Asset Management	84 weeks

V. Client's Responsibilities

Barge strives to work closely with our clients. In order for the project team to function efficiently, certain information is needed to be provided by the Client and other interested stakeholders in a timely manner. These items and responsibilities are noted below.

- A. Provide information as required to support development of Barge’s scope, as required in the project agreement for services.
- B. Provide data review and GIS access in a timely manner.
- C. Provide single point of contact for project coordination purposes.

VI. Deliverables

The following is the list of what will be produced as a part of this effort.

- A. Basin prioritization figure and memo
- B. Updated stormwater asset management GIS database
- C. Final report on data collected during asset management inventory process.

VII. Compensation

The compensation to be paid to Barge for providing requested services is provided in the Fee Summary Table below.

Fee Summary Table

Items	Fee Type	Fee Amount
A. Stormwater Mapping and Associated Asset Management	Not To Exceed	\$703,000
TOTAL	Not To Exceed	\$703,000

The fees provided above are valid up to three (3) months from the date of this proposal.