TASK AUTHORIZATION
INFOASSET PLANNER IMPLEMENTATION ASSISTANCE

This Authorization, when executed, shall become part of the On-Call Agreement for Professional Services between City of Greensboro (CITY), and CDM Smith Inc. (CONSULTANT), hereafter referred to as the Agreement, dated November 6, 2019.

1. **The Basic Services of the CONSULTANT as described in the Agreement are supplemented as follows, to provide InfoAsset Planner Implementation Assistance, to be referred to as the PROJECT:**

BACKGROUND

InfoAsset Planner (IAP) is a software package used to aid in the development of a risk-based asset prioritization rehabilitation and replacement (R&R) plan. The City of Greensboro (City) began an in-house implementation for their sewer and water systems assets and is looking for assistance in further developing the sewer system risk model including the implementation of the cost module and rehabilitation plan decision tree. The following asset classes are included in this scope: gravity sewer, force main, manholes, and lift stations.

The following scope of services has been broken down into the following tasks and each are described in further detail below:

- Task 1 – Review Consequence of Failure (CoF) and Likelihood of Failure (LoF) Factors
- Task 2 – Process Risk Scoring
- Task 3 – Develop and Refine Rehab Plan
- Task 4 – Implement Project Prioritization Module
- Task 5 – Documentation and Training

1. SCOPE OF SERVICES

Task 1 - Review CoF and LoF Factors

The initial task in this scope of work is to review and refine the existing CoF and LoF factors with the City and their respective assets. The purpose of the review is to verify alignment with the City's organizational goals and compatibility with IAP capabilities. The City's existing factors will be analyzed for the availability and quality of data to support them. This will include considering both the development of surrogates now (to estimate unavailable data) and recommended future modifications to the factors when additional data becomes available. A workshop will be held (using remote conference technology) to review the recommendations.

CDM Smith will document the existing and recommended new or modified factors, the data sources to be used in each and scoring methodologies in a technical memorandum, and include in the user guidance and training materials as part of Task 5.

Deliverables

- Workshop (using remote teleconference technology) to review the factors, data sources and scoring methodology
- Technical memorandum documenting the factor recommendations, the available data sources and scoring methodology

Task 2 - Process Risk Scoring

CDM Smith will implement the factors developed as part of Task 1 using available data sources from the City, and statewide and national datasets. Each factor will be setup in IAP and documented in a user guide document (see Task 5) for the City to maintain the risk model moving forward. There are several data preprocessing steps that will take place prior to implementing the modules in IAP. This includes not only obtaining the data, but assessing the quality, linking inspections to the assets, processing hydraulic model output and data mining work orders. This data processing work will be conducted by Stewart Engineering under the direction and supervision of CDM Smith. The following modules in IAP will be used for this task.

Survey (Inspection) Data

CDM Smith will import existing NASSCO PACP, MACP survey inspections and any custom inspection scores that can be incorporate with only a few hours effort. This condition data will be used in the LoF scoring.

Deterioration Model

The deterioration model is used to develop asset deterioration and service life curves customized for the City asset classes using empirical data. These curves tend to underestimate the survival probability; therefore the cohort model will be revised to better reflect the City's replacement strategies. CDM Smith will use defects from the Survey Data to adjust the curve values for specific assets based on actual condition issues.

Consequence of Failure (CoF)

The CoF factors defined in Task 1 will be implemented within IAP using the best available data. It is assumed that the City will provide City-specific datasets such as critical infrastructure and/or locations in the electronic format required.

Likelihood of Failure (LoF)

The LoF factors defined in Task 1 will be implemented within IAP. The LoF factors will make use of the Survey Data and Deterioration Model output as well as other factors such as asset material, etc.

Risk

The risk model will be implemented using a matrix to provide graphical representation and grouping of the results and will be developed in accordance with the methodologies defined in Task 1.

Task 3 – Develop and Refine Rehab Plan

CDM Smith will hold a workshop to define the rehabilitation, maintenance, and assessment (RMA) actions the City currently uses and the logic associated with each action. For example, if the City has a rule to pipe burst all 6-inch pipe to 8-inch, the rehabilitation workflow will reflect it. In addition to defining and implementing the logic, the cost module will be built out to reflect planning level costs for each of the RMA actions. CDM Smith will review recent bid documents to develop these costs. The draft results will be presented at a workshop and a TM documenting costs and RMA logic developed. CDM Smith assumes a single round of revisions based on comments from the City to refine and finalize the rehabilitation plan.

CDM Smith is aware that the City has an existing Inflow and Infiltration (I/I) reduction program for which a portion of the rehabilitation budget is used. CDM Smith will make use of the rehabilitation workflow and budget scenarios to allocate a portion of the funding to a risk-based prioritization and a portion to the I/I reduction program which uses basin-wide I/I analysis to develop priorities.

Deliverables

- Workshop to review RMA Actions and Draft Results
- Technical Memorandum documenting costs and RMA logic

Task 4 – Pilot Project Prioritization Module

InfoAsset Planner released a new module in 2021 designed to support the development of Capital Improvement Plan (CIP) projects using the output of the rehabilitation workflow, available budget and user defined rules such as spatial proximity, budget limit and material. These projects could potentially be used as the basis for the City's CIP. CDM Smith will pilot the tool to develop projects that would consume 3 years of risk-based rehabilitation funding. The results of the pilot projects will be presented at a workshop. The highest ranked projects will be compared to projects currently in late-stage design or construction. IAP is blind to projects currently proposed by the City unless explicitly loaded into the rehabilitation plan, allowing for a comparison between the risk model recommended projects and the City's current plan. CDM Smith assumes a single round of revisions based on comments from the City after the workshop. The revisions may include adjustments to the rehabilitation plan, budget constraints on the project and manual adjustments to the assets to be included in projects for the 1-year CIP and 3-year CIP.

Deliverables

- Workshop presenting results of pilot

- Project definitions for the 1-year and 3-year CIP

Task 5 – Documentation and Training

CDM Smith will document the inputs, processing steps and scoring rules for each step within the implementation of the risk model and rehabilitation framework. The document will serve as the City's go-by for maintaining the system in the future. CDM Smith will also provide three (3) days of on-site training to City upon delivery of the IAP Project

Deliverables

- Microsoft Word or OneNote document to support IAP project
- Three days of on-site training

2. CITY'S RESPONSIBILITIES

The responsibilities of CITY as described in the Agreement are as follows:

- Provide the CONSULTANT with all applicable GIS data, InfoAsset Planner data, QAQC'd PACP, MACP or other condition assessment data.
- Timely review and input of deliverables.
- Bear all costs incident to compliance with the requirements of the CITY's Responsibilities.

3. TIME PERIOD FOR PERFORMANCE

The estimated time periods for the performance of basic services as set forth in this Agreement are supplemented as follows:

- Work described in this Task Authorization will begin within two weeks of execution of this Task Authorization and receiving a formal Notice to Proceed (NTP).
- Assuming no schedule delays by the City for data collection, workshop scheduling, review comments provided, or scheduling of training in Task 5, CDM Smith anticipates a schedule of 8 months. Approximate schedule by task is as follows:

TASK	ESTIMATED SCHEDULE BY TASK
TASK 1	1 Month from NTP
TASK 2	4 Months from NTP
TASK 3	6 Months from NTP
TASK 4	7 Months from NTP
TASK 5	1 Month from Task 4

- **COMPENSATION AND PAYMENT**

The method of payment for services rendered by the CONSULTANT shall be as set forth below:

For the Basic Services Task 1-5 performed under Section 1, the CITY agrees to pay the CONSULTANT a lump sum amount of **$198,500**. Partial payments shall be made by the CITY on a monthly basis in proportion to the percentage of work completed.

The CONSULTANT intends to subcontract to Stewart Engineering, an MBE engineering firm, to provide GIS, mapping, and data analysis services for a not-to-exceed amount of $20,000 under Task 2.