

CITY OF HIGH POINT

AGENDA ITEM



TITLE: Shadybrook Sewer Improvements – Professional Engineering Services HDR Engineering Inc.	
FROM: Robby Stone – Public Services Director Derrick Boone – Asst. Public Services Director	MEETING DATE: February 5, 2024
PUBLIC HEARING: N/A	ADVERTISED DATE/BY: Master Agreement - Task Order
ATTACHMENTS: Attachment A – Scope of Services Attachment B- Map	

PURPOSE: To approve a task order with HDR Engineering for the professional engineering services to evaluate the Shadybrook sanitary sewer system. The city has a master on-call agreement with HDR Engineering.

BACKGROUND: The Public Services Department utilized CDM-Smith to update the 2019 Wastewater Master Plan, which included the Shadybrook sanitary sewer system due to known capacity issues with the Shadybrook Lift Station. The expanded master plan includes a more detailed analysis of the Shadybrook sub-basin following the collection of additional data and hydraulic modeling in this basin. The expanded master plan recommended several improvements in the Shadybrook sub-basin and suggests that a preliminary engineering report (PER) be prepared to further evaluate and detail the anticipated improvements.

The following improvements will be evaluated by HDR and included in the PER:

- Capacity Expansion of the Shadybrook Lift Station.
- Upsizing gravity sewers upstream and downstream of the Shadybrook Lift Station.
- Upsizing the force main downstream of the Shadybrook Lift Station.

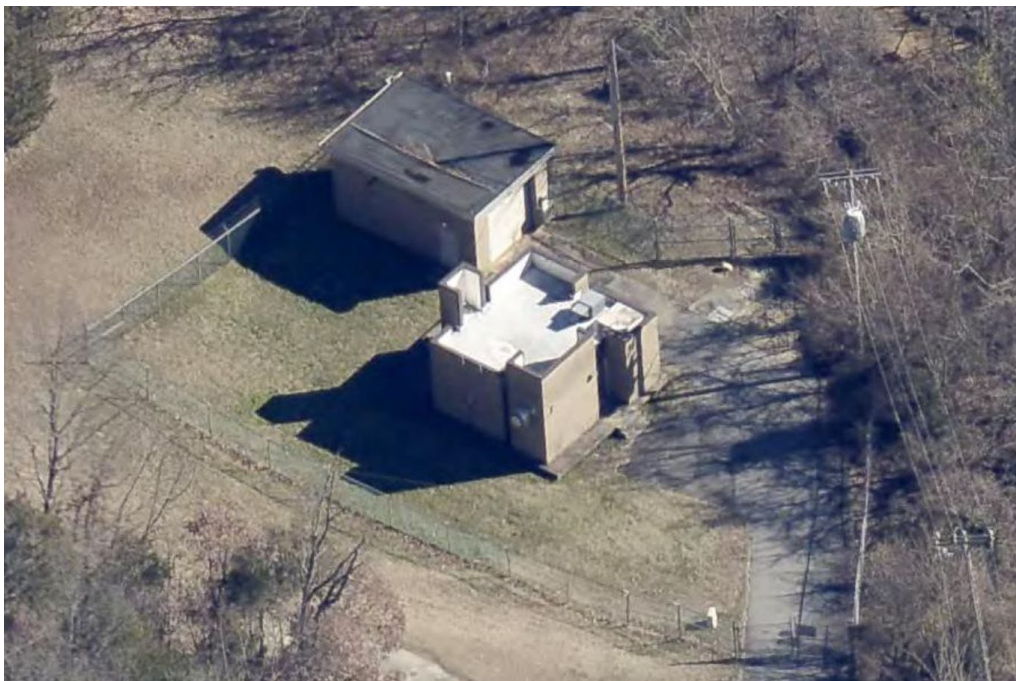
BUDGET IMPACT: Funds for this project are available in the FY 2023-2024 budget.

RECOMENDATION/ACTION REQUESTED: The Public Services Department recommends approval and asks for the Council to award this task order for professional engineering services to HDR Engineering Inc. in the amount of \$378,900 and authorize the appropriate City Official(s) to execute all necessary documents.





Shadybrook Lift Station



Aerial View of Shadybrook Lift Station and Generator Building



Dry Well of the Shadybrook Lift Station





Supplemental Agreement

Exhibit A

Shadybrook Sewer Improvements PER

Introduction

The City of High Point Public Services Department (City) owns, operates, and maintains a permitted wastewater collection and treatment system providing services to a mix of approximately 42,600 residential, commercial, and industrial customers. An estimated 16.8 million gallons of wastewater is generated, conveyed, and treated daily. The collection system includes approximately 680 miles of gravity sewer mainlines, 18 miles of pressurized force main, 17,450 manholes, and 22 lift stations. This collection system conveys wastewater flows to two wastewater treatment facilities – the Eastside Wastewater Treatment Plant with a permitted capacity of 26 million gallons per day (MGD) and Westside Wastewater Treatment Plant with a permitted capacity of 10 MGD.

Scope of Services

The Owner recently completed an addendum, (CDM, November 2023), to the 2019 Wastewater Master Plan. The addendum, in part, included a more detailed analysis of the Shadybrook subbasin following the collection of additional data and hydraulic modeling in this subbasin. The addendum recommends several improvements in the Shadybrook subbasin and suggests that a preliminary engineering report (PER) be prepared to further evaluate and detail these improvements.

The following improvements will be evaluated and included in the PER and are further described in the paragraphs below:

- Capacity Expansion of the Shadybrook Lift Station.
- Upsizing gravity sewers upstream and downstream of the Shadybrook Lift Station.
- Upsizing the force main downstream of the Shadybrook Lift Station.

Task 1: Shadybrook Lift Station

Engineer will evaluate alternatives and provide recommendations for increasing the capacity of the lift station. The analysis will be based on a design capacity of 4.83 MGD as recommended in the 2023 Master Plan Addendum.

TASKS WILL INCLUDE:

- Alternative analysis to compare the expansion of the existing lift station to the construction of a new adjacent lift station, to include:
 - Existing Lift Station
 - Perform a visual condition assessment of the existing lift station to include civil, structural, electrical, mechanical, and instrumentation components.
 - Identify needed improvements to meet capacity requirements and improve any condition issues identified.



- Using existing drawings, provided by the Owner, as background image, markup the existing drawings to identify proposed improvements.
- Prepare an opinion of probable construction costs based on the proposed improvements.
- New Lift Station
 - Perform a site review to consider available land, zoning, setbacks, environmental impacts, access, and constructability.
 - Develop a conceptual layout of a new submersible lift station.
 - Prepare an opinion of probable construction costs based on the conceptual layout.

Task 2: Shadybrook Gravity Sewers

Engineer will evaluate alternatives and provide recommendations for replacing various gravity sewer sections upstream and downstream of the lift station to increase their hydraulic capacity. The gravity sewer sections include the following: 1,800 LF between the lift station and manhole HP24247; 900 LF between manholes HP17980 and HP10882; 1,200 LF between manholes HP24247 and HP18563; and 900 LF downstream of the lift station between manholes HP16869 and HP21383.

TASKS WILL INCLUDE:

- Alternative analysis to compare alternatives for increasing the size and capacity of each gravity sewer section.
 - Alternatives
 - Remove and replace existing pipe along the existing alignment.
 - Install parallel pipe along new alignment and abandoned existing pipe.
 - Pipe burst existing pipe.
 - Analysis to include:
 - Environmental impacts.
 - Property owner impacts.
 - Constructability challenges.
 - Bypass pumping requirements.
 - Estimated construction costs.

Task 3: Shadybrook Force Main

Engineer will evaluate alternatives and provide recommendations for replacing a section of the existing force main downstream of the lift station to increase the hydraulic capacity. The force main section extends from the intersection of Rolling Road and Marywood Drive, along Rolling Road to just south of Parliament Street, and through residential laws to the intersection of Fairmeadow Avenue and Hollyfield Place.

TASKS WILL INCLUDE:

- Alternative analysis to compare alternatives for increasing the size and capacity of the force main section.
 - Alternatives
 - Remove and replace the existing force main along the existing alignment.



- Install parallel force main along new alignment and abandoned existing force main.
- Pipe burst existing force main.
- Analysis to include:
 - Environmental impacts.
 - Property owner impacts.
 - Constructability challenges.
 - Bypass pumping requirements.
 - Estimated construction costs.

Task 4: Planning Data Review & Capital Project Analysis

In parallel with the development of the Shadybrook Sewer Improvements PER, the Engineer will evaluate the methodology, flow monitoring data, and assumptions used to develop the Shadybrook improvements along with the broader Wastewater Master Plan.

TASKS WILL INCLUDE:

- A comprehensive review of the means and methods, along with the associated analysis, used to identify and develop individual projects included in the Capital Improvement Plan (CIP).
 - Model Development Review
 - Review the development of the existing and future system hydraulic model including system loading, network development, model calibration and key assumptions. Compare methodologies and assumptions to regulatory requirements and industry prevalent guidelines and provide a summary of recommendations.
 - Shadybrook Projects
 - Review the hydraulic model, associated flow monitoring data, and modeled loading to confirm the strategy, size, and extent of the Shadybrook sewer improvements.
 - Overall Capital Improvement Plan
 - Review the hydraulic model, associated flow monitoring data, and modeled existing and future system loading for consideration of the overall CIP.
 - This review will identify potential opportunities for additional field activity to confirm, reprioritize, or reconsider CIP projects through targeted monitoring of specific locations or other field activities.
- Evaluation of the full CIP portfolio to identify additional considerations for downstream infrastructure including treatment facilities and opportunities for alternative, cost-saving approaches.
 - Treatment Facilities
 - Confirm coordination of projected loading and future flows identified for the collection system with treatment facility capacity and capacity improvements. Review methodologies for determining treatment plant expansion/improvement triggers and compare to regulatory and industry prevalent guidelines.
 - System Condition



- Review of asset information to identify condition-based risk within the collection system to prioritize condition assessment activities.
- A Sanitary Sewer Evaluation Survey (SSES) approach will be developed to collect condition data on collection system pipes and evaluate repair according to risk-model results..
- Alternative Approaches
 - Identify alternatives to convey and treat approaches associated with increases in collection system flow.
 - Potential options include condition assessment and rehabilitation efforts to reduce inflow, infiltration, peak flow volumes, and other factors driving the need for capital investment.

Project Meetings

To assist with the evaluations and PER development, and to communicate activities with the Owner, the following meetings are anticipated:

- Project Kick-Off Meeting
 - Review project scope and schedule.
 - Discuss initial steps, activities, and data needs.
 - Discuss current operations, concerns, likes/dislikes of the existing lift station and obtain input on expansion of the existing lift station and a new lift station.
 - Meeting to include the Owner's lift station operation staff.
- Lift Station Site Meeting
 - Visit the existing lift station to perform visual assessment.
 - Meeting to include the Owner's lift station operation staff.
 - Meeting will be schedule for same day, and immediately following, the Project Kick-off Meeting.
- Alternative Review and Selection Meeting
 - Review the alternative analysis performed to compare expansion of the existing lift station to construction of a new lift station.
 - Review the alternative analysis performed for the upsizing of the gravity sewers and force main.
 - Make selections of the preferred alternatives.
- PER Review Meeting
 - Discuss findings and recommendations, and receive comments from the Owner on their review of the draft PER.
 - Comments received and discussion will be used to prepare the final PER.

Assumptions & Exclusions

- No flow monitoring or flow projection development is included. Minor hydraulic modeling may be performed to determine potential impacts of alternatives to convey and treat methodologies, but results will be limited to broad recommendations.
- Recommendations for additional field investigation including flow monitoring and detailed hydraulic modeling will be presented as part of Task 4.



- Infrastructure sizing will be based on the recommendations in the Owner's 2019 Master Plan and 2023 Addendum.
- No surveying or geotechnical services are included.
- Deliverable is a Preliminary Engineering Report. No AutoCAD drawing sets will be developed.

Schedule

Engineer's schedule for completing the Scope from Notice to Proceed (NTP) is presented in Table 1:

Table 1 Project Schedule

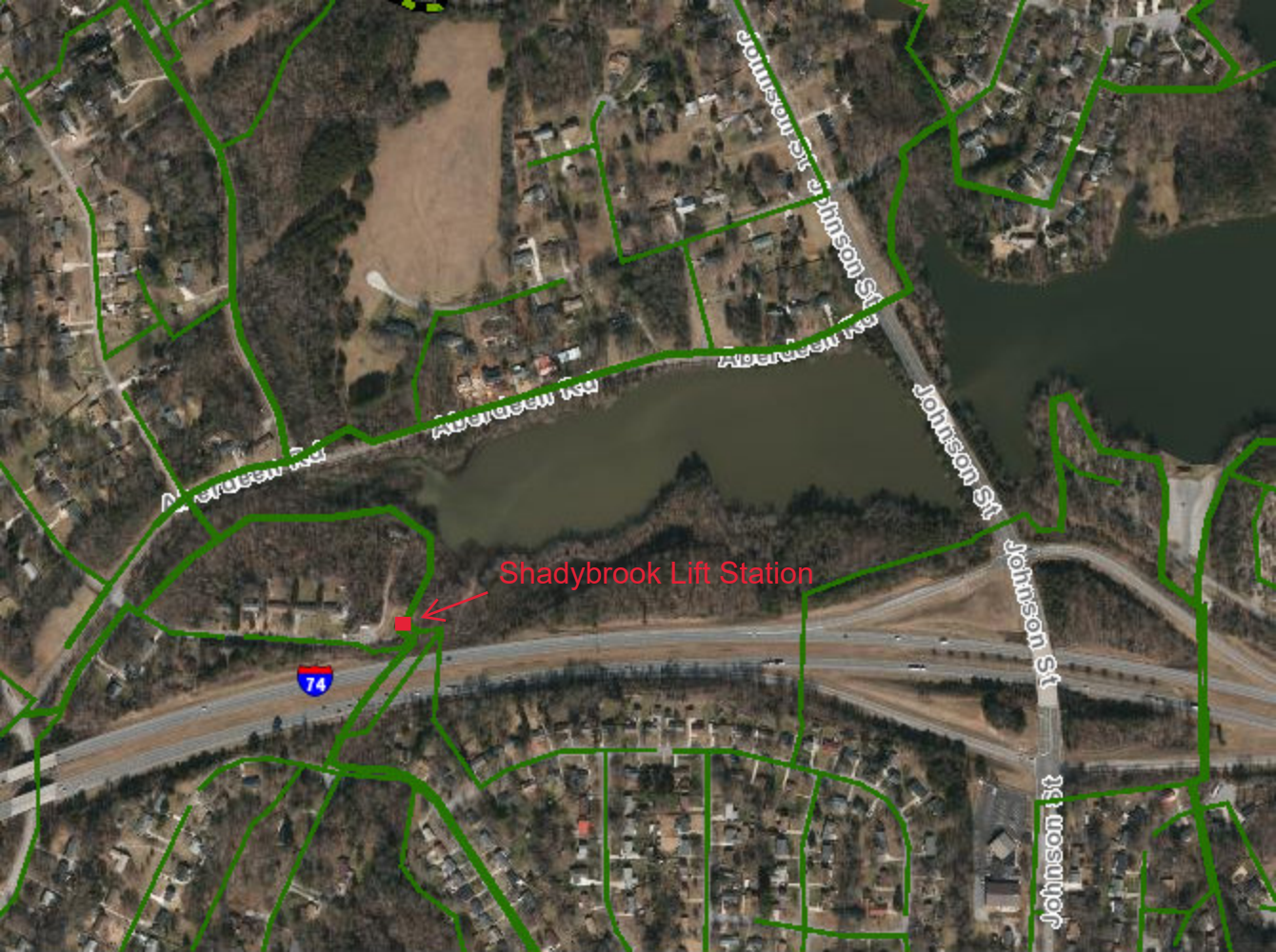
Task	Task Time
Draft PER Submittal	4 months from NTP
Final PER Submittal	3 weeks following the PER Review Meeting and receipt of all Owner comments to the Draft PER
Planning Data Review & Capital Project Analysis TM	5 months from NTP

Compensation

Compensation to Engineer for the Scope of Services shall be for a lump sum value of \$378,900. A breakdown of fees by task and subtasks is presented in Table 2.

Table 2 Project Fee

Task	Labor (\$)	Expenses (\$)	Total (\$)
Subtotal: Task 1 – Shadybrook Lift Station	\$ 184,900	\$ 450	\$ 185,350
Subtotal: Task 2 – Shadybrook Gravity Sewers	\$ 61,800	\$ 275	\$ 62,075
Subtotal: Task 3 – Shadybrook Force Main	\$ 38,400	\$ 275	\$ 38,675
Subtotal: Task 4 – Project Review & Verification	\$ 92,400	\$ 400	\$ 92,800
Project Total	\$ 377,500	\$ 1,400	\$ 378,900



Shadybrook Lift Station

74