Hazen and Sawyer
4000 Hollywood Boulevard, Suite 750N • Hollywood, FL 33021 • 954.987.0066

CITY OF HALLANDALE BEACH
FY 2018-2019-012 Continuing Professional Architectural and Engineering Services and Other Services
Discipline: Water Resources/Stormwater/Wastewater

HAZEN AND SAWYER
WORK AUTHORIZATION No. W2025-002

Miami-Dade County - Sewer Trunk Line (CIP2607)
Scope of Services: May 6, 2025

*In accordance with Resolution No. 2020-054, RFP #FY 2018-2019-012 Continuing Professional Architectural and Engineering Services and Other Services, the following scope of services is provided by Hazen and Sawyer (*CONSULTANT) *as requested by the CITY.*

BACKGROUND

The City of Hallandale Beach (CITY) owns, operates, and maintains a wastewater collection and transmission system including lift stations, monitoring systems, gravity sewers and force mains. Wastewater is collected primarily from residential and commercial connections and pumped to the City of Hollywood's Southern Regional Wastewater Treatment Plan (SRWWTP) for treatment and disposal through four metered connections. Fifteen lift stations are owned, operated, and maintained by the CITY. Lift Station 18 is owned, operated, and maintained by the City of Hollywood. In addition to the lift stations, the CITY maintains a network of 12 miles of force main and 57 miles of gravity sewer.

In an effort to most effectively fulfill its responsibilities, provide a high level of service to its residents and customers, accommodate growth and economic development, and protect public health, safety, and the environment, the CITY developed a Wastewater Master Plan in 2017. The Master Plan considered factors such as population growth, new development, aging of existing infrastructure, and new regulatory requirements. Based on recommendations of the Master Plan, the CITY has completed much of the recommended program to address capacity and aging infrastructure issues of the existing transmission system. This includes upgrades at various lift stations as well as improvements to the force main network.

The CITY desires to update the wastewater hydraulic model to reflect current and future conditions for use by its consulting engineers for refining pump and force main selections. Further, to ensure the CITY does not exceed its reserved capacity with the City of Hollywood, the CITY is exploring an option of conveying a portion of the wastewater to the south towards the Miami-Dade County wastewater collection, transmission, and treatment systems.

The purpose of this work authorization is to update the existing wastewater hydraulic model for use by the CITY's other consultants as well as to establish baseline modeling criteria for uniformity across the CITY.

SCOPE OF SERVICES

Task 1: Update Wastewater Transmission System Hydraulic Model

1.1 Data Collection

The CITY's existing wastewater transmission system hydraulic model was updated and calibrated in 2015. The model was developed using the SewerCAD version v8i hydraulic modeling software by Bentley Systems. CONSULTANT will utilize the CITY's existing GIS to update the wastewater transmission hydraulic model. The updated hydraulic model will be developed within in the InfoWorks ICM platform. Current model files will be converted to InfoWorks ICM to be used as the starting point prior to the update.

CONSULTANT will gather, and compile it into a usable format from the CITY, the data required for updating the wastewater hydraulic model. These data include the following:

- Record drawings of any wastewater facilities and infrastructure constructed in the last five years, including those facilities and infrastructure that may have been built as part of approved development applications
- Updated records detailing any CITY rehabilitation efforts, such as lift station pump replacement or force main pipe lining activities
- Updated pump curves, if applicable, for lift stations
- CITY lift station SCADA flow and pressure data for the years 2016 through 2025
- CITY interconnect SCADA flow data for the years 2016 through 2025

CONSULTANT will gather additional data from outside sources for model updating activities. These data include the following:

- Rainfall data
- Population projection data through the year 2040 from the Broward County and Municipal Forecast and Allocation Model (PFAM)

1.2 Field Calibration

1.2.1 Continuous Pressure Data Collection

CONSULTANT, with the assistance of CITY staff, will conduct pressure measurements at strategic locations along the distribution network for model calibration. CONSULTANT will develop a field-testing plan to identify:

- The location and number of pressure monitoring locations.
- The time periods and time steps of the system pressure monitoring data collections.

CONSULTANT will provide up to 18 Telogger digital pressure recorders to be installed at pre-planned locations to monitor diurnal variations in water pressure at key locations throughout the CITY's service area. Teloggers will be deployed for up to fourteen (14) consecutive days. After the deployment, CONSULTANT will download and summarize the collected data to be used

during the model development activities described in the tasks that follow.

1.2.2 Gravity Flow Monitoring

CONSULTANT will install temporary flow meters within the system to monitor wastewater flows over approximately one month (preferably during wet weather conditions) at up to 18 locations. Field monitoring will also include installing 18 HOBO data logger devices to record pump start and stops. System field monitoring services will be performed by a combination of CONSULTANT staff and sub-consultant specializing in flow monitoring. CITY personnel shall provide access to and assist in the installation of the field monitoring devices.

1.3 InfoWorks ICM Calibration

CONSULTANT will use the flow monitoring information to perform a hydrologic calibration of the wastewater collection and transmission model. CONSULTANT will apply the HazenQ tool to derive Dry Weather Flow (DWF) parameters for each lift station service area. Also applying HazenQ , and in combination with InfoWorks ICM modules, CONSULTANT will derive the parameters required to characterize the Rainfall Dependent Infiltration and Inflow (RDII), which is the main driver of the Wet Weather Flows (WWF). Those parameters include the variables (R, T, K) used to define a unit hydrograph to represent the inflow portion of the RDII, and the Groundwater module parameters used to describe the infiltration portion of the RDII.

1.4 Model Update

CONSLTANT will use the latest GIS database along with latest data collected as part of Task 1.1 to update the existing hydraulic model to reflect the current system state. This update will include any changes to the model geometry or operation. CONSULTANT will meet with the City to seek clarifications in case of discrepancies between the existing model and the GIS data. CONSULTANT will develop a baseline scenario to reflect existing conditions that will be used for the model calibration.

Task 2: Establish Model Criteria for Future Simulations

It is the intention of the CITY to provide the updated wastewater hydraulic model to its consultants for use in refining pump and force main selections for capacity improvement projects. CONSULTANT will develop minimum software system requirements, hydraulic system criteria, and simulation guidelines for use in all modeling efforts for CITY infrastructure. CONSULTANT will document these requirements, criteria, and guidelines in a technical memorandum for general distribution at the CITY's discretion. The purpose of this task is to establish uniform requirements for all future development and infrastructure improvements that are in line with the CITY's goals of accommodating growth and economic development while protecting public health, safety, and the environment in accordance with regulatory requirements.

Task 3: Population and Flow Projections

CONSULTANT will evaluate the present population and future service area (if any) for the CITY's wastewater service areas. CONSULTANT will utilize the population forecasts based on Broward

County Population Forecast Allocation Model (PFAM).

CONSULTANT will determine current system-wide flows using a combination of available population projections, historical data, current water billing data, and flow monitoring data. CONSULTANT will develop wastewater flow projections for 2025, 2030, 2040 and 2050 using the following methodology:

a. CONSULTANT will delineate the wastewater service area boundaries by each collection sub-catchment and create a sub-catchment boundary layer shape file in GIS format.

b. CONSULTANT will perform an evaluation by linking wastewater flow generation to projected population growth patterns.

CONSULTANT will generate system-wide wastewater flow peaking factors from the historical flow data. This will include evaluation of historical flows to identify and wastewater flow components: base sanitary flow, groundwater infiltration and rainfall derived infiltration, and inflow. CONSULTANT will prepare aggregate wastewater flow forecasts for the wastewater service area for the years 2025, 2030, 2040 and 2050. Forecasts will be derived considering population growth forecasts.

Task 4: LS 8 Runs

CONSULTANT will apply the calibrated wastewater collection and transmission hydraulic model to evaluate the hydraulic feasibility of conveying the discharge of LS8 to the Miami-Dade County wastewater system. CONSULTANT will define a corridor for the required forcemain and will add this forcemain to the InfoWorks ICM hydraulic model. CONSULTANT will coordinate with the planning section at the Miami-Dade Water and Sewer Department (WASD), with two main objectives:

1) Define the pressure at the point of connection that the CITY will use to size the required forcemain and evaluate the capacity of the current LS8 pumping equipment and
2) Evaluate the effect that the additional flows the CITY sends to WASD's system will have on the Miami-Dade transmission and treatment system.

This coordination will consist of several iterations between the two models (CITY's and WASD's). Three operational scenarios will be evaluated. These scenarios might change after the hydrologic calibration of the CITY's model is completed:

- Scenario 1: Only the discharge of LS8 will be routed to the proposed forcemain, consequently being redirected to WASD's system. In this scenario, LS8 will pump only the flows collected by its gravity collection system.
- Scenario 2: Only the discharge of LS8 will be routed to the proposed forcemain, consequently being redirected to WASD's system. In this scenario, in addition to the flows being collected by its gravity collection system, additional flows will be diverted to LS8 to maximize the current capacity of the Lift Station. Flows conveyed to the WASD system will correspond to LS8 flows plus the additional flows diverted from the central system.
- Scenario 3: Based on the results of Scenarios 1 and 2, and if the impacts on WASD's system of those scenarios are unacceptable for WASD. Scenario 3 will be developed to

define the maximum flows that could be conveyed to WASD's system to achieve a level of impacts that WASD could consider acceptable. In other words, this scenario will define the maximum flows that WASD's system could accept.

CONSULTANT will attend up to three coordination meetings with WASD staff. CONSULTANT will prepare a technical memorandum (TM) summarizing the results of the evaluations. CONSULTANT will review the TM with the CITY and prepare a final TM based on the results of the meeting.

Task 5: Existing and Future Conditions Model Runs (up to 3 scenarios)

CONSULTANT will develop a model scenario with wet weather peak flow conditions corresponding to a 2-year storm event and run the model to identify, if any, current hydraulic deficiencies of the system. CONSULTANT will develop future model baseline condition for use to evaluate the effect of infrastructure or development projects in the system. This future model will incorporate major developments and population projection data described in Subtask 1.1. CONSULTANT will prepare and submit a brief memorandum summarizing the results of this modeling scenario for the CITY.

ASSUMPTIONS

The following assumptions were assumed in preparation of the above scope:

1. Projections for future population growth and development will be determined by the CITY and given to CONSULTANT for development into wastewater flow projections. CONSULTANT will not be responsible for the accuracy of the population growth and development projections.
2. CONSULTANT will utilize a subconsultant for data collection services. These services will be charged to reimbursables as a direct charge with no markup by the CONSULTANT. Total charges will not exceed the upper limit allowance established for the reimbursables.

SCHEDULE OF COMPLETION

The anticipated duration for the major work tasks is summarized in the table that follows. The model will be developed within 120 days and the TM for LS 8 will be delivered within 150 days of receipt of notice to proceed.

Task	Description	Approximate Task Duration (days)
1	Update Wastewater Transmission System Model	120
2	Establish Model Criteria for Future Simulations	30
3	Population and Flow Projections	30
4	LS 8 Runs	30
5	Existing and Future Conditions Model Runs	TBD
	Total Calendar Days for Completion	TBD

COMPENSATION

Compensation will be made to CONSULTANT on a lump sum basis for Tasks 1 through 4 of $295,444 and a not to exceed basis for Task 5 and reimbursables of $43,668 for a total project cost not to exceed $339,112. CONSULTANT will bill the CITY on a monthly percent complete by task basis as indicated in the table below for Tasks 1-4 and at the hourly rate times hours actual spent for Task 5.

Task	Description	Lump Sum Fee By Task (to be billed by Percent Complete)
1	Update Wastewater Transmission System Model[1]	$220,480
2	Establish Model Criteria for Future Simulations	$9,520
3	Population and Flow Projections	$21,924
4	LS 8 Runs	$43,520
	Total Lump Sum	**$295,444**
		Not to Exceed Fee by Task (to be billed by hour up to the limits of the Task)
5	Existing and Future Conditions Model Runs	$43,468
	Reimbursables	$200
	Total Not to Exceed	**$43,668**
	Total Project Not to Exceed	**$339,112**

AUTHORIZATION - HAZEN AND SAWYER

Accepted: Janeen M. Wietgrefe, P.E.
Vice President

May 6, 2025
Date:

CITY OF HALLANDALE BEACH
FY 2018-2019-012 Continuing Professional Architectural and Engineering Services and Other Services
Discipline: Water Resources/Stormwater/Wastewater

HAZEN AND SAWYER
WORK AUTHORIZATION No. W2025-002

Miami-Dade County - Sewer Trunk Line (CIP2607)
Fee Estimate: May 5, 2025

Task	Description	Director, Engineering	Project Manager	Project Engineer	Engineer	Hours	Hazen Fee Fee	Sub-Consultant Fee	Task Totals
	Hourly Rates:	**$247.00**	**$232.00**	**$214.00**	**$183.00**				
Task 1: Update Wastewater Transmission System Model									**$220,480**
1.1	Data Collection	4	8	24	60	96	$18,960		
1.2	Field Data Collection	16	8	40	120	184	$36,328		
	Flow Monitoring by Sub-Consultant							$82,000	
1.3	Model Calibration	32	4	80	120	236	$47,912		
1.4	Model Update	8	12	40	120	180	$35,280		
Task 2: Establish Model Criteria for Future Simulations		16	4	8	16	44	$9,520		**$9,520**
Task 3: Population and Flow Projections		16	8	24	60	108	$21,924		**$21,924**
Task 4: LS 8 and System Evaluation Model Runs		32	4	80	96	212	$43,520		**$43,520**
	Total Lump Sum (Tasks 1 -4)								**$295,444**
Task 5: Existing and Future Conditions Model Runs (up to 3 scenarios)		32	8	72	100	212	$43,468		**$43,468**
Reimbursables									**$200**
	Total Not to Exceed (Tasks 5-6 and Reimbursables)								**$43,668**
	Total Project	**156**	**56**	**368**	**692**	**1,272**	**$256,912**	**$82,000**	**$339,112**