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June 11, 2020

VIA EMAIL

Mr. Miles Bingham, Director
St. Charles Parish Public Works
100 River Oaks Drive
Destrehan, LA 70047
EMAIL: mbingham@stcharlesgov.net

Re: St. Charles West Bank Sewer Master Plan
A/E Project No. 20-2033

Dear Mr. Bingham:

Enclosed is Exhibit A to the Agreement between Owner and Engineer for Professional Services for the above referenced project.

Should you have any questions or concerns, please advise.

Sincerely,

Meyer Engineers, Ltd.

Donovan P. Duffy

Donovan P. Duffy, P.E.

DPD/tmt

Enclosures

cc: Mr. Michael Palamone, St. Charles Parish CAO
Mr. L.J. Brady, St. Charles Parish Director of Wastewater

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EXHIBIT A to AGREEMENT
BETWEEN OWNER AND ENGINEER
FOR PROFESSIONAL ENGINEERING SERVICES

FURTHER DESCRIPTION OF CONSULTING AND RELATED MATTERS

This is an exhibit attached to and made part of the Standard Form of Agreement dated _____, 20__, between St. Charles Parish ("OWNER") and Meyer Engineers, Ltd. (ENGINEER) for the provision of **the Westbank Sanitary Sewer Master Plan,** referred to as "the Project."

1.0 The Basic Services of ENGINEER as described in Item I "Basic Agreement" of said Agreement are amended and supplemented as follows:

Scope of Work

St. Charles Parish (SCP) has directed Engineer develop a master plan and capital improvements plan for their sanitary sewer system on the Westbank. The project limits can be found on Exhibit 1. The goals of this project are as follows:

1) To develop a master plan of the Westbank sanitary sewer system for which the basis and assumptions are clear and well-documented.
2) To identify and prioritize capital improvements to address capacity limitations through system upgrades or rehabilitation projects to address infiltration and inflow (I/I).
3) Identify and prioritize capital improvements required at the lift stations and treatment plants to handle the current, 5-year and 20-year expected flows. (Preliminary Results to be validated in future phases of contract.)

The following tasks have been developed to describe the scope of work for this project:

Phase 1: Data Gathering and Evaluation

Task 1- Kickoff Meeting and Data Collection

Task 1.1- Project Kick-off Meeting - Engineer will conduct a meeting with Parish staff including representatives from appropriate departments. The purpose of the workshop will be to clearly define the goals, objectives, and priorities to help focus the work effort to be accomplished in this project. The meeting will identify the primary objectives of the wastewater collection system master plan so that the methodology described under subsequent tasks may be tailored to achieve those objectives. During the meeting, Engineer will facilitate a discussion to identify criteria and available information that will be utilized through the future development of the hydraulic model and Sewer System Master Plan Report.

Task 1.2 - Review of Data - Engineer will review existing studies, pump station data, GIS data, overflow records, complaint logs and other available documentation. Engineer will spend up to 2 days interviewing Parish staff to obtain required information and answer questions on information received. Engineer will also perform multiple site visits to assess the condition of the existing lift stations (approximately 103).

Task 2 - Wastewater Flow Projections

Engineer will review available information (planning reports, water use records, etc.) on the basin service areas to understand the basis for available population/flow projections and determine if additional information is necessary for project accuracy. Engineer assumes that the information will be sufficient and that no additional data collection effort for flow/population projections will be necessary.

Future populations and base wastewater flows will be projected by using local land use and population projections in conjunction with unit flow factors. Engineer will apply unit flow factors developed from the flow monitoring data and industry averages with flow factor development for other area utilities. Wastewater flow projections will be developed for a 5-year planning period to capture known or anticipated growth areas and a 20-year planning period.

Task 3 Identify Infiltration and Inflow Problem Areas

Engineer will identify the areas of I&I using the existing lift station run times and overflow data provided by the Owner. Engineer's report shall include approximate dry and wet weather flows for each lift station in the study area. The report shall also make suggestions as to which areas should be prioritized and the necessary process to determine the I&I in those specific areas (level gauges, flow meters, smoke testing, etc.).

Task 4: Preliminary Modeling

Engineer will create a dynamic hydraulic model of the Parish's Westbank sanitary sewer system for all lift stations and gravity system for pipes greater than 8-inches in diameter using the Parish's existing GIS information. **The full model will be created in Phase 2 of the project; however, Engineer will coordinate model parameters and setup with Owner in Phase 1.** It is assumed that the GIS data provided by Owner will include adequate pipe information, manhole invert elevations, and manhole rim elevations for the gravity sewer infrastructure to be included in the model. All pump stations will be included in the model. Available information regarding these modeled stations, including pump curves, hydraulic capacity information, wet well volumes or drawings, pump on/off settings, and force main information, will be provided by the Parish for use in the model. It is assumed that the information provided will be adequate to describe the stations' operation. This model will serve as the basis for future project phases and capital improvement decisions.

If additional pump station data (excluding data collected in conjunction with the flow monitoring task) or surveying data to describe the sewer system infrastructure is required to meet project objectives, these needs will be discussed with the Parish. These services are not included in this initial scope of work.

The model will be created using software agreed upon by Engineer and the Owner. Model files will be provided to Owner, but software license will not be provided to the Parish as part of this initial scope of work.

Engineer will provide a list of information required from Owner and proposed model assumptions in the phase 1 report.

Task 5 Prepare Technical Memorandum

Engineer will prepare a draft technical memorandum that will present the results of the study and the recommended path forward. The report will serve as a reference document that the Parish can use as a guide to focus future sewer collection system improvements. Comments received from the Parish on the draft memorandum will be incorporated into a final memorandum, which will be electronically submitted in pdf format. In addition to a CD of the report, two (2) hard copies of the draft and final report will be given to the Parish.

2.0 The Responsibilities of OWNER as described in Section _ of said Agreement are amended and supplemented as follows:

The Responsibilities of OWNER are as follows:

OWNER will make available any information required to complete this project.

3.0 The Time for Rendering Services as described in _ of said Agreement are amended and supplemented as follows:

The Time for Rendering Services shall be four (4) months from the notice to proceed.

4.0 Compensation to ENGINEER

Partial payments are to be made monthly in proportion to the percentage of work completed.

Total lump sum payments are not to exceed the fee amounts in the following table.

Task	Lump Sum Fee
Task 1 - Project Kickoff and Data Collection	$22,000
Task 2 - Wastewater Flow Projections	$15,000
Task 3 - Identify Infiltration and Inflow Problem Areas	$35,000
Task 4 - Pump Station Force Main Modeling	$14,000
Task 5 - Prepare Technical Memorandum	$10,000
Lump Sum Fee Total	**$96,000**

Tasks Not Included in Phase 1 (Fees and final scope to be determined at a later date):

PHASE 2:

Task 2.1 - Flow Monitoring Data Collection –

Engineer will develop a flow monitoring plan to collect pertinent flow and rainfall data for the Parish's Westbank service area. Engineer will make recommendations regarding flow monitor locations, pump station monitoring locations, rain gauge locations, duration of monitoring, and criteria for completion of the monitoring study including suggestions regarding minimum number of rainfall events required for wet weather flow analysis.

This scope of work will include an allowance for a flow-monitoring program based on the estimated cost for mobilization and planning of temporary flow monitors, pump station monitors, and rain gages installed for 60 days. Should the flow monitoring require a time extension due to lack of rainfall, additional weeks may be added to the contract at an additional cost.

Engineer intends to subcontract the field flow monitoring. The temporary flow monitoring equipment will be capable of measuring the depth and velocity of wastewater flows at synchronized time intervals of 5 minutes. Pressure sensors will be installed with the capability of measuring depth of surcharging at flow monitoring locations. Temporary depth monitors will be capable of measuring depth of flow at 5-minute time intervals. Temporary pump station monitors will be installed at select stations to provide a continuous record of pump starts and stops during the monitoring period. Pump drawdown tests will be conducted at these stations in order to calibrate the pump station monitor and translate pump run times into estimated flow rates to the nearest 1 gallon per minute. Up to eight (8) additional drawdown tests will be conducted at unmonitored stations to support the development of the hydraulic model. The rain gage equipment shall be capable of measuring rainfall depth in increments of 0.01 inches at preset synchronized time intervals of 5 minutes.

Engineer will review the raw data from all temporary meters at the start date of the flow monitoring period to ensure that the flow monitor site hydraulics are conducive to collection of quality data and that the equipment is functioning properly. During the flow monitoring period, Engineer will also review data bi-weekly thereafter to monitor any potential change in conditions.

Task 2.2: Hydraulic Model Development and Calibration

Engineer will create a dynamic hydraulic model of the Parish's Westbank sanitary sewer system for pipes greater than 8-inches in diameter using the Parish's existing GIS information. It is assumed that the GIS data includes adequate pipe information, manhole invert elevations, and manhole rim elevations for the gravity sewer infrastructure to be included in the model. Critical pump stations will be included in the model; these stations will be selected in conjunction with the Parish. Available information regarding these modeled stations, including pump curves, hydraulic capacity information, wet well volumes or drawings, pump on/off settings, and force main information, will be provided by the Parish for use in the model. It is assumed that the information provided will be adequate to describe the stations'operation.

Engineer will breakdown wastewater flow meter data (collected in Task 6) into base flow, groundwater infiltration, and rainfall dependent infiltration and inflow (RDI/I) components for up to 3 storm events observed during the monitoring period. This decomposition will reveal the relative RDI/I contributions of various portions of the service area. Engineer will then develop a hydrologic model using a unit hydrograph approach (RTK approach). RDI/I hydrographs will be developed that are calibrated to actual flow monitoring data and used to project the system response from design storm events.

Existing dry weather wastewater flows generated from the observed flow monitoring data will be input into the model at a "load point" based on sewershed delineations. This task will include calibrating the hydraulic model to both dry weather and wet weather existing flows. The model will be calibrated to a minimum of one storm event from the flow monitoring period and verified using 1-2 other storm events, depending on the number of events captured during the flow monitoring period.

Task 2.3: Capacity Analysis

Engineer will perform a rainfall-frequency analysis of historical rainfall records to determine the appropriate rainfall intensity, duration, and distribution for planning conditions. The unit hydrograph parameters determined in Task 7 will be applied to up to two design storm events (e.g. 2-year and 5- year storm events) and the resulting hydrographs input at each load point on the hydraulic model for the wet weather analysis.

For each model scenario, the calibrated hydraulic model from Task 7 will be used to determine available sewer capacity and potential areas needing additional capacity. Model scenarios will include existing and future dry and wet weather flows. The sewer capacity analysis will result in maps illustrating the percent of full pipe capacity that is used under existing and future conditions. Engineer will also analyze modeled lift stations and force mains to understand capacity limitations with these facilities under the design storm conditions. Maps illustrating the capacity analysis will guide development of the sewer system improvement alternatives that will be evaluated under future project tasks. The sewer capacity analysis will also identify hydraulic restrictions in the system that may lead to capacity problems under wet-weather or future flow conditions.

Engineer will meet with the Parish to discuss the results of the capacity analysis and discuss improvement alternatives.

Task 2.4: Identify and Evaluate Improvement Alternatives

The hydraulic model will be used to evaluate planning level improvement alternatives needed to meet existing and future sewer requirements. The improvements will focus on addressing sewer system capacity concerns identified in Phase 1. Improvements may consist of increased system capacity (relief sewers and/or pump stations), I/I reduction through sewer rehabilitation, flow equalization storage, or various combinations of these improvements. Maps illustrating the resulting percent of full pipe capacity and level of surcharging from the various improvement alternatives will be prepared. Planning level conceptual cost estimates will be developed as a means of comparing viable alternatives under consideration.

Engineer will identify potential implementation problems or other non-cost related factors for improvement alternatives, such as permitting, constructability, operational flexibility, etc. A meeting will be held with Parish staff to review the results of the alternatives analysis. With Parish staff member input, Engineer will select and recommend appropriate improvement alternatives to meet overall planning objectives.

Planning level recommendations for sewer system improvements will include preliminary routing, pipe lengths, and diameters of gravity sewer alternatives, capacities of pump station alternatives, and length of sewers to be rehabilitated.

Task 2.5: Sanitary Sewer Design

Engineer will provide final design of recommended improvements on an as-needed basis.