



Water and Sewerage Authority Trinidad and Tobago

Design of the Wastewater Collection System Southwest Tobago

Bounded on the north by Plymouth Village, on the south and east by Bacolet Village and on the west by Crown Point, Southwest Tobago encompasses approximately 6,560 hectares. The sewage service area is approximately 3,615 hectares and has an estimated length of 106 km of sanitary sewers.

MAAK Technologies and its team were retained by WASA to design the new Southwest Tobago Wastewater Collection System.

The service area was divided into seven catchment areas to collect and drain wastewater by gravity to a natural low point and then pump it to a main trunk sewer in an adjoining downstream catchment area to the new advanced Crown Point Wastewater Treatment Plant (also designed by MAAK). As a result, primary and secondary treated effluent is no longer discharged into the SW Tobago environment, and the improved high quality effluent can be reused (for example, at golf courses and/or industrial estates) or discharged into an ocean outfall line with a length of over one kilometer.



The project was divided into seven key areas:

1. **Review and Evaluation of Existing Information:** Previous reports and studies, design documents, maps, topographical data and existing geotechnical surveys, as well as land policy maps, census data, water demand data and population projections were reviewed.
2. **Site Investigations, Data Collection and Topographical Surveys:** This included verification of all elements in the conceptual design, preparation of a design synopsis, field investigations to determine all underground field services within the area, including the use of trial pits; liaison with external agencies for the location of current and future infrastructure; and customer surveys to determine the point of existing building connections, the type of business and the operations of the business. In addition, geotechnical surveys were carried out where necessary to determine soil characteristics, level of groundwater, and aggressiveness of the soils.
3. **Review and Evaluation of Technical Design Criteria:** Economic and social analysis of the installation options, design criteria, determination of standard and/or alternative methods of construction (e.g. no-dig trenchless methods), flows to be accommodated, methods of construction, and land acquisition issues were reviewed and evaluated.

Fast Facts:

- Sewage service area of 3,615 hectares
- 106 km of sanitary sewers
- Improved high quality effluent

4. **Preparation of Detailed Designs:** This consisted of the preparation of detailed design drawings for the sewers and lift stations, which included: hydraulic designs, sizes, material type, invert levels, and modelling of the proposed networks including manholes and appurtenances; plans, profiles and layout of the proposed route including the integration of existing sewers, service connections and lift stations in the new design; construction procedures with consideration to traffic management, health and safety of the general public and a public relations programme; and specifications and cost estimates for road restoration
5. **Preparation of Tender Documents and Drawings:** Contract documents (including technical specifications and BOQs); design documents; detailed description of the lift stations and collection system; hydraulic profile, activities preceding construction, schedule of works, and O&M activities were prepared.
6. **Preparation of Recommendations to Mitigate the Impacts Identified During the Construction Phase:** The Environmental Assessment was updated. Recommendations with regard to land acquisition, new access, potential overflows, odours and malfunctions from the system during the construction and operational phases were made. Base-line data on the pertinent physical, social, environmental, and economic elements of the area of construction, and downstream of the project were prepared.
7. **Environmental Impact Assessment (EIA):** Liaison with other consulting agency conducting the EIA and the Environmental Management Authority (EMA) in order to receive the Certificate of Environmental Clearance (CEC). In addition, the Environmental Management Plan was prepared.

- Water/Wastewater Treatment Design, Treatability Studies, Distribution/Collection Systems
- Design/Build – Treatment Plants, Pumping Stations, Distribution/Collection Systems
- Programme/Project Management
- Government Management Support Services
- Master Planning – Water, Wastewater, Drainage
- Automation and SCADA System Design & Development
- Utility Asset Management Planning & Optimization
- Data Management – System Planning & Design
- Training – Knowledge Transfer, Public Education
- Operations Optimization & Modelling
- Energy Management
- GIS Development

