



## Water and Sewerage Authority Trinidad and Tobago

### Replacement of Navet Distribution Mains and Critical Segments of the Network

The Navet Distribution network in southern Trinidad is supplied by the Navet trunk main that transmits water from Navet Waterworks. The plant produces 86.26 MLD of potable water, supplying the southern region from Rio Claro in the east, to San Fernando in the west and south to Moruga, Rock Road. There are two in-line booster pumping stations with thirteen off-takes on the main between Tabaquite and San Fernando.

WASA retained MAAK Technologies, to provide detailed design engineering for the upgrades of the distribution systems that are connected to the Navet Trunk Main.

The scope of this project required the team to evaluate the existing situation; prepare a water consumers and demand study with forecasts to 2035; formulate alternatives and select recommended alternative for the water supply network; prioritize the pipelines to be replaced up to 100 km and up to 193 km of extensions to provide maximum service benefits; prioritize service reservoirs and booster stations; select the appropriate pipe materials; prepare detailed designs including bills of quantities for the recommended 100 km of pipeline replacement, service reservoirs and booster stations; preliminary designs for 193 km of pipeline extensions; and, prepare complete contract documents with specifications for the execution of works.



Total Project Cost (CDN): \$60 Million

Cost of Assignment (CDN): \$2 Million

Date of Commencement: October 2007

Date of Completion: November 2008

#### ***Fast Facts:***

- *Produces 86.26 MLD potable water*
- *100 km pipeline replace replacement*
- *193 km pipeline extensions*
- *Service reservoirs & booster stations*

Phase 1 – Evaluating the Existing Situation: This phase includes data collection, investigation of the existing piping network and infrastructure, completion of the operation audits (including analyzing consumption trends), estimation of water losses, preparation of the demand forecast, and determination of the peak flow parameters.

Phase 2 – Water Consumers and Demand Study: This includes the review of all water billings and reports for the past five years, creation of a water balance based on losses and with consideration for new developments (commercial, residential and industrial), and the population projection to 2035.

Phase 3 - Formulation of Alternatives for the Water Supply Network: This phase includes preparation of the design criteria, determination of required pressure zones in each distribution system and means for storage and conveyance, verification of pipe network nodes, determination of the optimum diameters for the distribution system pipelines, formulation of the proposed alternatives, and preparation of the conceptual design as well as cost estimates for each proposed alternative.

Phase 4 - Comparison of Alternatives and Selecting the Preferred Alternative for each Supply Zone: The selection process for the preferred alternative for each supply zone includes the evaluation of alternatives, the selection of the preferred alternative (including workshops) and EIA (Environmental Impact Assessment).

Phase 5 - Preparation of Detailed Design: This comprised of preparing final design calculations, detailed design drawings, technical specifications, bills of quantities, cost estimates, and updated Environmental Impact Assessment.

Phase 6 – Preparation of Contract Documents: In this phase, the contract documents are prepared as well as the Project Implementation Schedule and overall Operation Philosophy/Manual.

- Engineering Services
- Concept Development and Studies
- Optimization and Modeling
- Automation and SCADA Development
- Data Management
- Testing and Validation

