CASE STUDY

Minconsult Proposes Optimal Asset Improvement Program for Water Network System

The Project was Completed Within Six Months with Bentley’s WaterCAD

Studying a Mid-Sized Town’s Water Supply System

When the water utility for the state of Pahang, Malaysia needed a comprehensive study conducted of the water supply system for a mid-sized town in the area, it appointed Minconsult Sdn. Bhd. There were nine water treatment plants (WTPs) with a total capacity of 55,470 cubic meters per day, providing water to 20,186 consumers. These plants were old and in poor condition, containing antiquated and inefficient technology. As a result, the Pahang area faced water shortages and supply pressure was low and inconsistent, often taking one week to restore water supply.

Minconsult was responsible for reviewing and studying water demand in the district and making projections of the water demand up to year 2030. The project team also needed to review and analyze the existing WTPs and propose upgrading works to meet water quality standards and increase capacity to serve the projected population growth.

The organization also examined the WTPs and suggested new pipeline installation and storage reservoir refurbishment. These changes to the WTPs would improve the facility to satisfy the projected demand. Additionally, Minconsult proposed new WTPs be erected where necessary to augment the water supply system, and the project team was responsible for surveying the land at these sites. The project had a short deadline of six months.

Developing an Improvement Plan

To overcome these challenges, Minconsult leveraged Bentley’s WaterCAD to develop the improvement plan. To help users consider many different situations and possible design options, the team used the application to analyze 28 various design and renewal options.

Fast Facts

- The aging water infrastructure and inefficient water system resulted in water shortages.
- WaterCAD interoperability helped import a hydraulic network from spatial databases and AutoCAD drawings.
- The Minconsult team analyzed 28 what-if scenarios to assess various design and renewal options.

ROI

- The project was delivered on time within a short period of six months.
- WaterCAD helped reduce the time frame and staff input by more than 50 percent.
- The new system network will improve the water supply, enabling a higher quality of life for the local community.

Predicting Water Demand

Minconsult has provided multi-disciplinary engineering and project management capabilities since 1980 and is one of the most respected firms of independent project managers and consulting engineers in Southeast Asia. Their role in the project was to provide consultancy services to carry out the comprehensive study of the existing water supply system, to identify weaknesses and shortfalls, and to propose economic solutions. The project team’s study and recommendations would alleviate many of the problems with the supply system and ensure that water disruptions and shortages would not reoccur.

The team’s objective was to evaluate, ascertain, and study the entire water supply system and provide recommendations for upgrading the components so that there would be adequate water supply to cater future demand up to 2030. The deliverables and expected outcomes would include the proposed asset replacement and refurbishment and the cost plan with proposed scheduling up to 2030. However, the team faced many challenges, including a very old water network, a tight deadline of six months, and a limited core team of one team leader, one modeling specialist, and two engineers. Team members also needed to schedule asset improvements and construction so that funding would be distributed without straining the financial resources.
Generating a Central Repository for Data

One way that the Minconsult team incorporated successful modeling into the project was to ensure that the data used was accurate and up-to-date. This aspect was important because various groups and stakeholders needed to access the same database for information. By keeping everything in a central location, it decreased confusion and increased confidence in the data. WaterCAD allowed users to export and import data to and from CAD and spatial databases. Exchanging and updating data could occur quickly, without losing data or creating errors. Future refurbishment of water assets could easily be captured and shared across various software platforms.

Improving Network Reliability

By also examining water demand on the existing water pipe network and reservoirs, the projection produced more realistic results based on a more probable water growth demand and consumption. The simulation of the 28 different scenarios also resulted in a more realistic water network improvement. The water asset improvement proposal had the lowest possible cost to the company and a much smaller carbon footprint for the surrounding environment.

The project also resulted in benefits for the local community. The project provided advance-planning capabilities for CAPEX management and planning to the utility company and the state government, which manages all its water supply networks and resources. The state is now quickly aware of any issues with the existing system and able to allocate the necessary resources. Effective water assets will be built on-time, reducing the amount of shortages to the people and industries within the water network. A robust and reliable water infrastructure leads to better economic and industrial growth, which benefits the local community.

Saving Resource Hours

The team saved resource hours because WaterCAD helped reduce the time frame and staff input by more than half. Data import and export made it easy to share data across the team and with stakeholders while isolation valves and criticality features helped to quickly segment models into DMA zones. Leveraging WaterCAD allowed users to automatically develop the hydraulic network from an ArcGIS spatial database and AutoCAD drawings, eliminating the need for manual work. Minconsult completed the project within the original deadline of six months, reducing costs.