

Pumping & Storage Improvements - Mark B. Whitaker Water Plant

Location: Knoxville, Tenn.

Client: Knoxville Utilities Board

Completion Date: August 2004



PROJECT SUMMARY

This assignment with the Knoxville Utilities Board (KUB) was critical to the continuous supply of water to KUB's customers and for long-term reliability of the high service pumping facilities.

The project required a multidisciplinary effort to design a new high service pump station and clearwell at the site of the existing 60 million gallon per day (MGD) Mark B. Whitaker water plant. The overall scope of the design phase included the design of four 14,000-gallon-per-minute (gpm) intermediate pumps, yard piping and valve modifications, a new pump station structure to house four 14,000-gpm high service pumps and associated building systems, a new 4 MG aboveground clearwell, and related civil, mechanical and electrical engineering services. Bidding and construction phase services included review of contractor's submittals, periodic visits to the site, and other construction phase engineering services.

Electrical system design was extensive, including new dual 15-kV services, double-ended 15-kV distribution switchgear, station service transformers and 480V distribution systems. All pump motors were designed to operate from variable frequency drives with an emphasis on harmonic mitigation, efficiency and power factor.

Communications and security systems design services included integration of a fiber optic local area network (LAN), programmable logic controller (PLC) network, voice communications, access controls and surveillance cameras with KUB's existing systems and standards.

Other design services required included geotechnical evaluation of the site, grading and drainage, and coordination of fencing and entrance gate modifications to maintain plant security while allowing access to the construction site by contractors.

SERVICES PROVIDED

- Four 14,000-gpm high service pumps
- Four 14,000-gpm intermediate service pumps
- 4-million-gallon aboveground clearwell
- 30-, 36-, 42- and 60-inch diameter yard piping modifications

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