Designing Rehabilitation of Active Pump Stations

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ABSTRACT

As municipalities and their existing infrastructure ages, the need for rehabilitation and replacement of the facilities increases. Many times distribution and collection lines can be replaced by new lines being constructed adjacent to the existing lines, and the existing lines can be kept in service until the new line is completed and the transfer can be made. Also, many times new facilities can be constructed on available property near the existing facilities if the land is available. But sometimes, the existing buildings and structures need to be utilized for cost savings or due to a lack of available land in fully developed areas. As many municipalities have discovered, updating and rehabilitating existing facilities and structures poses many difficulties in providing non-interrupted services during the construction process.

The City of Garland, Texas, hired Freese and Nichols, Inc. (FNI), to design the rehabilitation of two of their existing pump stations that are regularly utilized in their water distribution system. FNI quickly saw the dilemma in keeping these pump stations in service while attempting to construct and update these facilities for the City. There were many different issues with each pump station that posed problems during the design and phasing of the updated facilities. Both facilities were constructed in the 1960s and ‘70s, with very little improvements made over time. These stations needed major overhauls in equipment, piping, hydraulic standards, safety equipment, access, as well as aesthetic improvements. Both pump stations are located in areas that have been fully developed for quite some time. The availability of adjacent land or excess property was almost non-existent for both stations. The improvements to the facilities had to be done within the existing property, which was not planned for future structures or facilities.

The body of the paper will discuss the design parameters and approach FNI used to provide updated and efficient pump stations while maintaining sufficient water distribution services for the City. The preliminary design of the stations addressed many different rehabilitation options for the City, and FNI was even capable of designing one of the stations to be able to pump to two different pressure planes in case of emergency to a different part of the City’s distribution system. The presented material will focus on the rehabilitation and approach to maintaining services for the City while bringing two aged facilities up to current design standards.

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