

CASE STUDY:

LARGE-DIAMETER RESTRAINED-JOINT PVC PIPE HELPS CHICAGO SUBURB GET RELIEF FROM SEWER BACKUPS

Faced with boring through wetlands and under a creek to improve its sanitary sewer system, the City of Elmhurst, Ill, chose new large diameter restrained-joint PVC pipe and horizontal directional drilling (HDD). The Chicago suburb, which had a history of storm-related backflow problems, undertook the \$10 million Southwest Elmhurst Wet Weather Control Facility project after area homes were affected by sanitary sewer backups following a severe storm in 2010. The main goal was to divert excess sewage generated by extreme weather from overwhelming the Water Reclamation Facility and causing sewer backups. Not only was larger diameter pipe needed, but the project also involved contending with the challenges of working in a residential area and boring in difficult ground conditions.

ELMHURST REDEFINES PUMP STATION

The initiative included the installation of a deeper, 24-in. gravity sewer line that can accommodate higher flow rates delivered to an upgraded lift station, which includes larger pumps, enhanced controls and an expanded wet well. From the station, sewage is currently pumped by way of a 10-in. dry-weather force main to the existing gravity interceptor. A new 18-in. wet-weather force main is also being constructed that zigzags beneath Elmhurst toward a new 2 million-gal storage tank at the City's Water Reclamation Facility.

Catherine Morley, P.E., senior project manager with RJN Group of Wheaton, Ill., said the problematic sanitary overflows required a new approach to the City's sewer system. "Essentially, we redefined the pump station by making it both a dry weather and wet weather station," said Morley. "We will still pump the sewage to the interceptor during small rain events via the dry-weather force main, but when it's overloaded by extreme weather, the addition of an 18-in. force main and the above-ground storage facility will enable the station to pump higher flows without overloading the Water Reclamation Facility and downstream sewers."

LIMITED SPACE & TOUGH CONDITIONS: NO PROBLEM FOR LARGE DIAMETER RESTRAINED-JOINT PVC PIPE INSTALLED VIA HDD

The City needed 5,000 ft. of 18-in. force main with a good portion of the line having to run beneath a flood plain, and under levees, a creek, and wetlands. For these more sensitive areas, RJN specified nearly 2,000 ft. of 18-in. Certa-Lok C905 restrained-joint PVC pipe to be installed via horizontal directional drilling. Morley said they chose Certa-Lok PVC pipe for its ability to hold up in the unstable ground of the wetlands and its easy-to-assemble restrained joints which are more practical to use where space is limited.

Certa-Lok C905/RJ is the industry's original non-metallic, mechanically restrained-joint piping system designed for use in sewer force main systems, water and other applications. It utilizes precision-machined grooves on the pipe and in the coupling which, when aligned, allow a spline to be inserted, locking the pipes together. A flexible elastomeric seal in the coupling provides a reliable hydraulic seal.

SHORTER C905 RESTRAINED-JOINT PVC PIPE PROVED ADVANTAGEOUS

The Salt Creek phase of the project totaled more than 1,000 ft. During this final phase, the crew applied loads close to the max published limit, reaching 67,500 lbs pull force at times. "The limited amount of space we had to work on the west side of the creek to get the pipe back to elevation was interesting," said Garry Sementa, project manager with Archon Construction Co. Inc.

"Certa-Lok's ability to bend was a huge benefit...It's a great pipe...In this project, especially where we needed shorter lengths, it was ideal. The standard length is 40 ft. but for some of the installs, the manufacturer provided 20-ft. pipe sections. We had limited space in which to work so we required a pipe that wouldn't need to be fused together," said Catherine Morley of RNJ.

UNI-BELL PVC PIPE ASSOCIATION

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