

# Pipe Swap

Upsized sewer lines protect the Ohio River

By Kimberly Paggioli

Opportunities sometimes present themselves at the moment they are most welcome. This was the case for a sanitation district that was facing combined sewer overflow (CSO) compliance issues in northern Kentucky.

Sanitation District No. 1 (SD1) serves the sanitary and storm sewer needs of Boone, Campbell and Kenton counties near the picturesque Ohio River. SD1 was in the early planning stages for CSO control when a developer began the submission process for a residential development along the riverfront. This would add a large amount of fill material over SD1's existing Ohio River Interceptor, the main interceptor for the combined sewer system, and it would not be able to support the extra load.

"When these types of opportunities

are identified during the plan review process, SD1 will work closely with the developer to determine feasibility, costs and final design plans," said Peggy Casey, a Communications Department representative for the district. SD1 was able to work with the developer on a larger joint project that not only would attend to the current needs but also help prepare SD1 for the future.

## Choosing a CSO Control

The proposed residential development plan included the cost of replacing existing 24- and 30-in. sewer lines with new pipe of the same diameter. SD1 evaluated the submission, as well as a range of CSO control alternatives and their respective long- and short-term benefits. The district considered that the new residential development would

make future construction in this area virtually impossible.

After reviewing all of the information, SD1 decided that it would be best served by installing an 84-in.-diameter pipe instead of the originally planned smaller sewer lines. The larger pipe would be capable of handling current and future flows and providing adequate storage capacity. The decision to upsize the 8,000-ft line yielded several advantages, including economic incentives, as the developer would pay for a portion of the project.

Sean W. FitzGerald, P.E., senior associate with Hazen and Sawyer P.C., said: "We provided hydraulic design calculations and assisted with the overall alternatives analysis to select the optimum pipe size and design for conveyance and inline storage. We also facilitated and assisted with the materials selection and did the design review. The selection to go with Hobas was done by SD1 and was based on the combination of several things, which included the water tightness of the gasket compared to other pipes, corrosion resistance, known quality, ease of installation, service, contractor preference and cost."

"The final design of the sewer replacement also included new diversion structures that will prevent significant grit accumulation, capture solids and floatables and prevent the intrusion of Ohio River water back into the sewer system during flood events," said Brandon C. Vatter, P.E., director of planning and design for SD1.

The new sewer provides both



Sections of pipe are lined up awaiting installation.

A large-diameter T-base manhole installed near the Ohio River.



conveyance and inline storage, leading to an annual 56-million-gal reduction in CSO volume to the Ohio River.

### Design Challenges

The designers addressed a host of challenges, including evaluating the interceptor for two very different installation conditions. The first involved the initial 10 ft of cover along the river's edge under pre-fill conditions, and the possible floatation of the pipe in the soil of the Ohio River floodplain.

The second condition involved the placement of final fills, where

more than 35 ft of additional soil would be installed over the pipe and the pipe would be subject to the 100-year flood level of the Ohio River. In the event of a 100-year flood, the pipe would be exposed to more than 30 ft of external water pressure. To ensure that the water pressure would not be an issue, Hobas Pipe USA supplied an FWC coupling joint for this project.

"This joint is capable of providing leak-free service in this type of application," said Cliff Henderson, area manager of the Hobas Ohio Valley Region. "[The] couplings are routinely

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Workmen prepare to lay the pipe for the Sanitation District No. 1 installation.

used in high groundwater situations and can withstand internal pressures up to 250 psi and external pressures of over 100 psi.”

The FWC couplings were used to join the many T-base manholes. The

design was complicated and included angles and connections to other materials. Due to the environmental impacts and the need to prevent groundwater infiltration, joint integrity was extremely important.

“This was the only joint we had full confidence in at the time this project was built,” Vatter said.

### Pipe Installation

Through careful planning and evaluation, 8,000 ft of 84-in. pipe was installed on schedule during the driest months of the year. The installation of the centrifugally cast fiberglass-reinforced polymer mortar pipe was trouble-free and eliminated any concern of groundwater entering the line and long-term sewer corrosion.

“Overall, the installation of the pipe went well and Hobas was responsive in addressing any issues that came up,” FitzGerald said. [SWS]

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