CASE STUDY

RiverRenew Wastewater Project | Alexandria, Virginia

BILCO Doors Support Historic Virginia City In 8-Year Water Management Project

The Virginia General Assembly passed legislation in 2017 requiring the city of Alexandria to control combined sewer overflows that continually flooded the historic city on the banks of the Potomac River.

AlexRenew wrapped up an 8-year, $615 million project with a celebration on July 1, 2026, and delivered the largest infrastructure project in the city's 277-year history. It is designed to prevent 120 million gallons of combined sewage from polluting the city's waterways each year.

This major environmental initiative, which is the largest infrastructure project in Alexandria's 277-year history, included the construction of a 130 foot deep, 2.2 mile long tunnel along the waterfront; installing a new six foot wide sewer pipeline; building two large diversion facilities; and creating a 12 story underground pumping station at the center of AlexRenew's treatment campus.

When state lawmakers delivered their edict, they set a deadline for July 1, 2025. That deadline was extended for one year due to material delays during the pandemic. Alexandria saw an average of between 30 and 70 overflows each year at its four sewer outfalls.

Combined Sewer Systems (CSS) were established in many cities in the mid-1800s to help communities manage stormwater and wastewater. In CSS systems, just one pipe transported sewage and rainwater to a recovery facility for treatment. The system overflowed frequently, even with minimal rain, releasing untreated human and industrial waste, stormwater and other pollutants into city waterways, degrading water quality and creating health hazards.

Several significant engineering feats helped build the new water management system. The first major project piece to be completed was the 12-foot-wide, 100-feet deep conveyance tunnel. A 380-ton tunnel boring machine crawled along for 16 months, covering an average of 40 feet per day. Workers installed 2,539 precast concrete rings to support the tunnel.

The tunnel feeds into the massive pumping station. It includes two subterranean shafts along with a screening shaft that separates debris from the water before it is pumped. Four wet-weather pumps, each capable of moving 45 MGD, lift sewage for treatment, and two dewatering pumps capable of processing 20 MGD, produce the power to manage the CSO.

BILCO manufactured 11 customized floor doors for the project. At two of the outfall locations, BILCO doors allow access to ventilation control vaults for maintenance of mechanical equipment. Workers at the pumping station also access equipment through the BILCO hatches. Engineered Systems, BILCO's rep for the project, provided the equipment.

All of the doors in the project are reinforced for AASHTO H-20 wheel-loading, which can support an axle load of 32,000 pounds. They are engineered with lift assistance for easy one-hand operation and are constructed with corrosion resistant materials. They also include a 25-year warranty.

"The hatches are required to withstand AASHTO HL-93 truck wheel loading, a common industry standard," said Kevin Pilong, engineering manager. "Despite the large size of some of the hatches, they are relatively lightweight and easy to open and close. The hatches also include integrated drainage components that divert surface water away from the spaces below, helping to protect equipment. Anything that makes access easier and safer is appreciated by our staff."

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