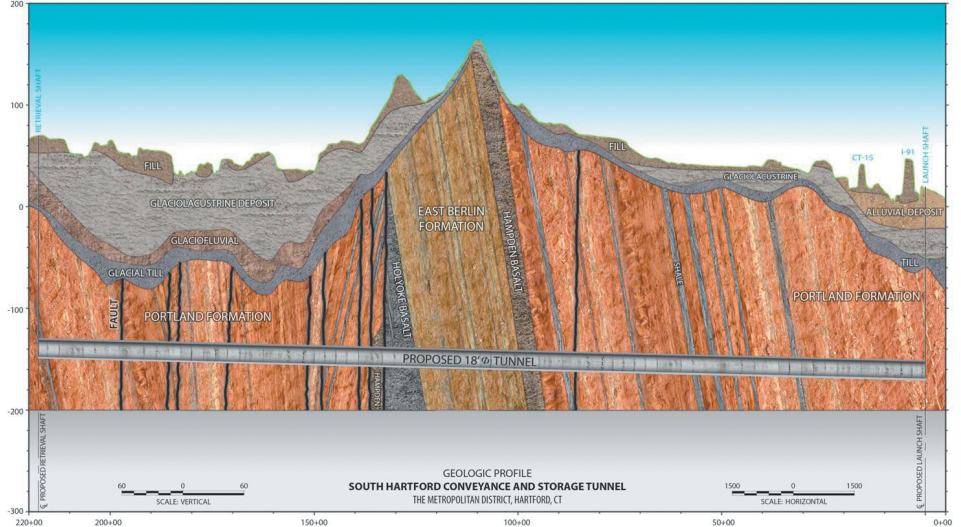


Reprinted from

HARTFORD BUSINESS JOURNAL

November 2, 2015

IMAGES | THE METROPOLITAN DISTRICT



(Above top left) A tunnel-boring machine is expected to be used to dig the four-mile-long, roughly 200-foot-deep South Hartford Conveyance and Storage Tunnel. (Above bottom left) This graphic shows how the tunnel-boring machine will convey extracted rock (top of machine) on a conveyor out of the tunnel and also shows the pipe the machine will place behind it to line the tunnel. (Above right) This graphic shows the geology the tunnel-boring machine will encounter on its dig under south Hartford and West Hartford. The machine will bore through basalt, shale and siltstone and several inactive faults.

\$500M tunnel project aims to preserve CT River

By John Stearns

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Construction is expected to begin next year on a tunnel about four miles long, 18 feet in diameter and 200 feet deep underground that will carry stormwater and sewer overflows to the Hartford sewage facility and help keep untreated water out of the Connecticut River.

The \$500 million South Hartford Conveyance and Storage Tunnel will run from West Hartford to the Hartford Water Pollution Control Facility on Brainard Road, and is a key piece of The Metropolitan District's 20-year Clean Water Project that aims to safeguard the future of the Connecticut River by cleaning up discharges to streams and reducing oxygen-depleting nitrogen in the river, which ultimately flows to Long Island Sound.

The tunnel's designer, Rocky Hill-based AECOM, called the project one of North

America's largest wastewater storage and conveyance projects after it was awarded the design contract in 2011.

"There's nothing else like it in Connecticut," said Nick Salemi, a spokesman at MDC.

MDC has prequalified eight construction firms to bid on the project, Salemi said.

A tunnel-boring machine will chew through shale, siltstone and basalt and travel through several inactive fault zones 175 to 250 feet below ground, according to MDC and a report on the project in Water Practice & Technology from IWA Publishing Online. As it moves along, the machine will simultaneously lay sections of pipe to line the tunnel while moving extracted material out of the tunnel via a conveyor belt. It's up to the contractor to determine where the excavated material will be trucked, Salemi said.

The tunnel-boring machine will start at the Hartford treatment plant and cut slightly uphill to allow gravity to move the

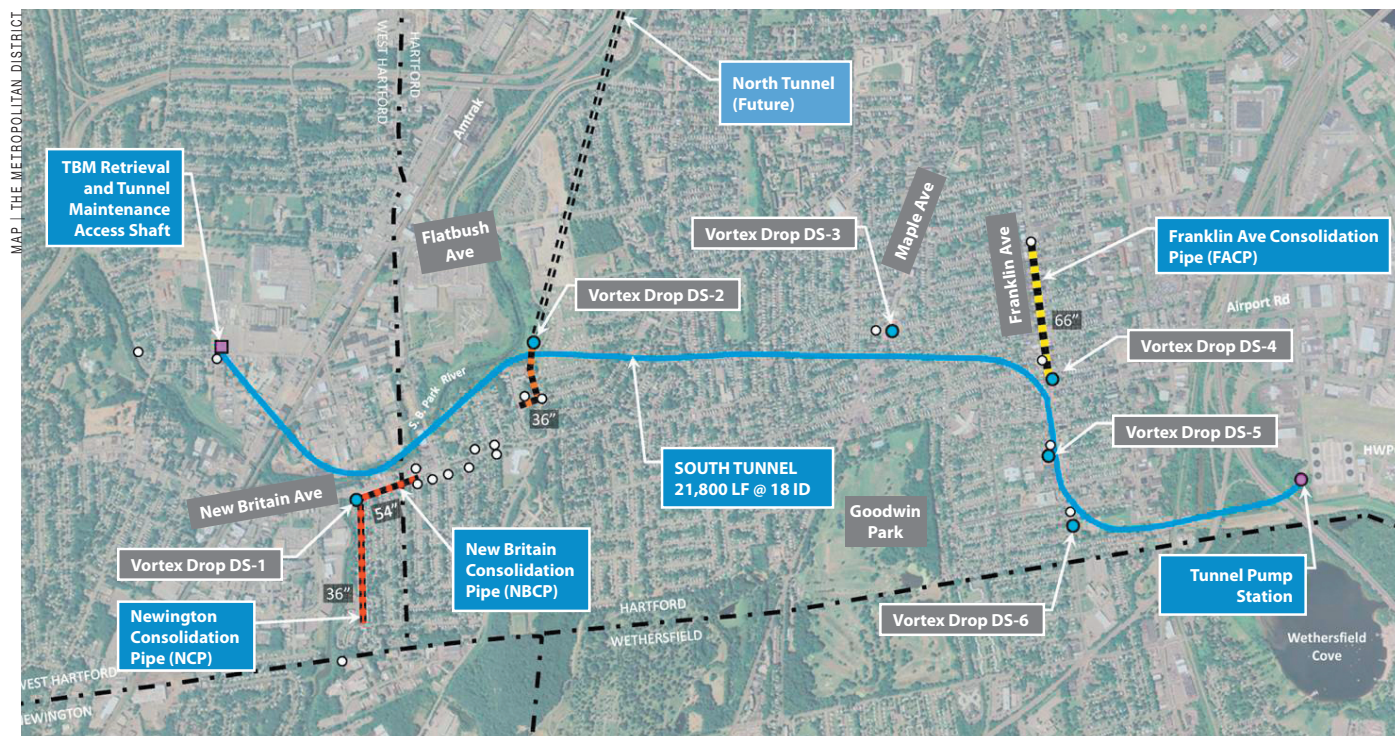
wastewater to the plant. The tunnel will end in a private West Hartford industrial area off Talcott Road, between Quaker Lane and New Park Avenue.

MDC hopes to issue bids for the project soon and award the contract in the first quarter of 2016, with work beginning shortly thereafter.

According to MDC's website, firms prequalified to bid on the project are: J.F. Shea Construction Inc. of Walnut, Calif.; Kenny Construction Co., Northbrook, Ill.; Kiewit Infrastructure Co., Omaha, Neb.; Obayashi Corp., Burlingame, Calif.; S.A. Healy Co., Henderson, Nev.; Salini Impregilo S.p.A., Henderson, Nev.; Skanska USA Civil Northeast Inc., Queens, N.Y.; and Traylor Bros. Inc., Alexandria, Va.

Separate from the \$500 million tunnel is a "wet weather expansion project" at the

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This map shows the path (blue line) of The South Hartford Conveyance and Storage Tunnel from Talcott Road in West Hartford to the Hartford Water Pollution Control Facility and locations for vortex drop shafts that will funnel wastewater from areas prone to sewer overflows to the tunnel.

▶ Continued from previous page

Hartford Water Pollution Control Facility. Already under way, that project will increase the plant's capacity to 200 million gallons per day, up from its current daily capacity of 130 million gallons to process the additional inflow from the tunnel, Salemi said.

Wet weather threats

Wet weather is a major driver of the tunnel project. Areas of south Hartford have only one pipe that carries a combination of sewage and stormwater. So, with as little as 0.25 inches of rain, those singular pipes can become overwhelmed as stormwater surges in, resulting in "combined sewer overflows," or CSOs, into streets and homes, and discharges into streams and the Connecticut River. Those untreated discharges can happen about 50 times a year, depending on weather, Salemi said.

About 1 billion gallons of CSOs flow into the river annually, according to MDC.

One pipe was fine for carrying sewage and stormwater when Hartford's population was much smaller, Salemi said.

"Now, with a bigger population, when there's a big rain event, even not that big of a rain event, the stormwater takes up the capacity in the pipe," he said. "The combined stormwater and sewage — that's how you get backups or overflows."

The massive tunnel will collect those CSOs from south Hartford and sanitary

▶ The tunnel's designer, Rocky Hill-based AECOM, called the project one of North America's largest wastewater storage and conveyance projects.

sewage overflows, or SSOs, from West Hartford and Newington. Those towns have separate pipes for stormwater and sewage, but still experience capacity issues due to groundwater and stormwater infiltration into leaky pipes and from sump pumps and downspouts illegally connected into residential sewer lines that overwhelm the system during storms, Salemi said.

In areas prone to overflows, consolidation conduits will collect the CSOs and serve as feeder pipes to six drop shafts, which then will convey the sewage and stormwater to the tunnel. The shafts, which will be dug from the surface, will prevent odor escapes with odor-control systems.

The tunnel will hold the overflows until

a pump at the tunnel's terminus can move the wastewater up to the plant for treatment, after which the water is discharged into the river in a cleaner state meeting environmental regulations, Salemi said, adding that "in a sense, a sewage treatment plant is manufacturing clean water."

The additional capacity and more controlled tunnel inflow will prevent the plant from being overwhelmed and the diversion of untreated overflows into the river during wet weather.

The project is being paid for largely with revenue bonds, plus low-interest state loans and grants. A "Special Sewer Service Charge," now at \$2.90 per 748 gallons of water used for MDC customers, is generating revenue to help repay the bonds and loans. The special charge took effect in 2008. The charge is in addition to the current water charge of \$2.53 per 748 gallons.

AECOM designed the South Hartford Conveyance and Storage Tunnel and New Jersey-based Black & Veatch worked as a subcontractor. The tunnel's design cost was about \$30 million and is separate from construction costs, Salemi said.

At some point, another tunnel project, a north tunnel, could connect to the south tunnel, but that's still being evaluated as a future component of the Clean Water Project, which is slated for a 2026 completion, Salemi said. ■