Horizontal directional drilling and other trenchless technologies offer practical solutions for installing or rehabilitating below-ground infrastructure.

Underground Today II

Groundbreaking Advancements

Solid solutions support favorable project outcomes

By Erica Bender

WHAT'S INSIDE

stakeholders is also important to NUCA. Last summer, it was invited to exhibit at the first Annual Innovative Housing Showcase held at the National Mall in Washington, D.C. Members of NUCA as well as trenchless equipment suppliers were onsite to educate attendees about how the technology can improve development costs and enhance infrastructure resiliency. The exhibit caught the interest of high-level public officials as well as representatives from affordable housing and urban development organizations—including the National Association of Home Builders (NAHB). According to Rumer, the NAHB responded enthusiastically to the prospect of utilizing trenchless methods, which could exponentially increase the amount of available lots for affordable housing development.

"The use of trenchless technology is one more available mechanism to help us achieve life-sustaining infrastructure," Rumer says. "Too many times, we tend to ignore what is below the ground, so long as we can flush our toilets and what appears to be clean water comes out of our taps. Unfortunately, many of the reports in our country today show that we are dangerously close to not having this anymore. If we do not address these issues soon, we are going to find ourselves in crisis mode."

Ultimately, education about the big-picture value of trenchless technology—including how it minimizes the societal costs associated with construction—will be crucial to helping decision-makers find the best methods to build and maintain community infrastructure. ◆

Spotlight on Silicon Valley's Gravity Pipeline Project

Major progress is being made on the Silicon Valley Clean Water (SVCW) Gravity Pipeline Project in California. The Barnard-Bessac Joint Venture (BBJV), in partnership with design engineer Arup, is tasked with building a fiberglass-reinforced gravity pipeline to replace an aging pressurized wastewater system that serves more than 200,000 people and businesses in the San Francisco Bay area. The new 3.3-mile pipeline will be housed inside of a 16-ft-dia concrete tunnel, which is being excavated using an earth pressure balance (EPB) tunnel-boring machine (TBM) nicknamed "Salus." The first of two tunnel drives was completed in March 2020, marking a major project milestone as Salus traveled 5,200 linear ft to Inner Bair Island. Crews are currently working to disassemble and transport the TBM back to its access shaft near San Carlos Airport, where it will be reassembled to perform a 12,400-linear-ft tunnel drive to SVCW's wastewater treatment plant in Redwood City. Slated for completion in July 2022, these long-awaited infrastructure improvements are part of a massive, multiyear program to upgrade nearly all components within SVCW's existing sewer conveyance system. ◆

A 16-ft-dia tunnel-boring machine is being used to dig the concrete-lined tunnel for a 3.3-mile gravity pipeline owned by Silicon Valley Clean Water.

Permanent Sheet Pile Walls Offer Cost-Saving Value

Hoffler Place, located in the heart of Charleston, S.C., is an impressive new luxury student apartment building owned and developed by Armada Hoffler Properties, a vertically integrated, self-managed real estate investment trust. The zero-lot line development also contains 12,000 sq ft of retail space and is adjacent to operating city streets and other property lines, which made constructing the below-grade parking a challenge.

Initially, the multiuse facility was designed to utilize permanent sheet piles for two sides of its one-level parking structure; however, the design-build team quickly realized that constructing all four foundation walls with permanent sheet piles would provide additional benefits. Armada Hoffler contracted Parker Marine to install the sheet piles and utilized Nucor Skyline for its sheet pile knowledge in below-grade parking structures. Nucor Skyline produced both AZ 14-770 and AZ 26-700 sheets for this project.

Using Nucor Skyline's sheet piles instead of traditional concrete walls cut eight weeks off the construction schedule, resulting in significant monetary savings in time and construction costs through the removal of scope activities, and providing a more consistent sequencing of trade workflow.

For additional information, visit www.nucorskyline.com. ◆

Using AZ sheet piles as permanent walls allows for the excavation to property boundaries after walls are driven.

PHOTOS (FROM LEFT): COURTESY OF BARNARD-BESSAC JOINT VENTURE; COURTESY OF NUCOR SKYLINE/ARMADA HOFFLER

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Look to the Blue

Malcolm's unmatched experience and specialized resources drive the construction state-of-practice, evolving new solutions to meet the demands of our clients. Our Design Build/Assist services offer the most cost-effective solution for virtually every project need in some of the most difficult ground conditions. We combine the most modern equipment fleet with construction and engineering experience for all types of deep foundations. When you have projects that require a higher level of expertise, contact us at **malcolmdrilling.com**

Deep Foundations
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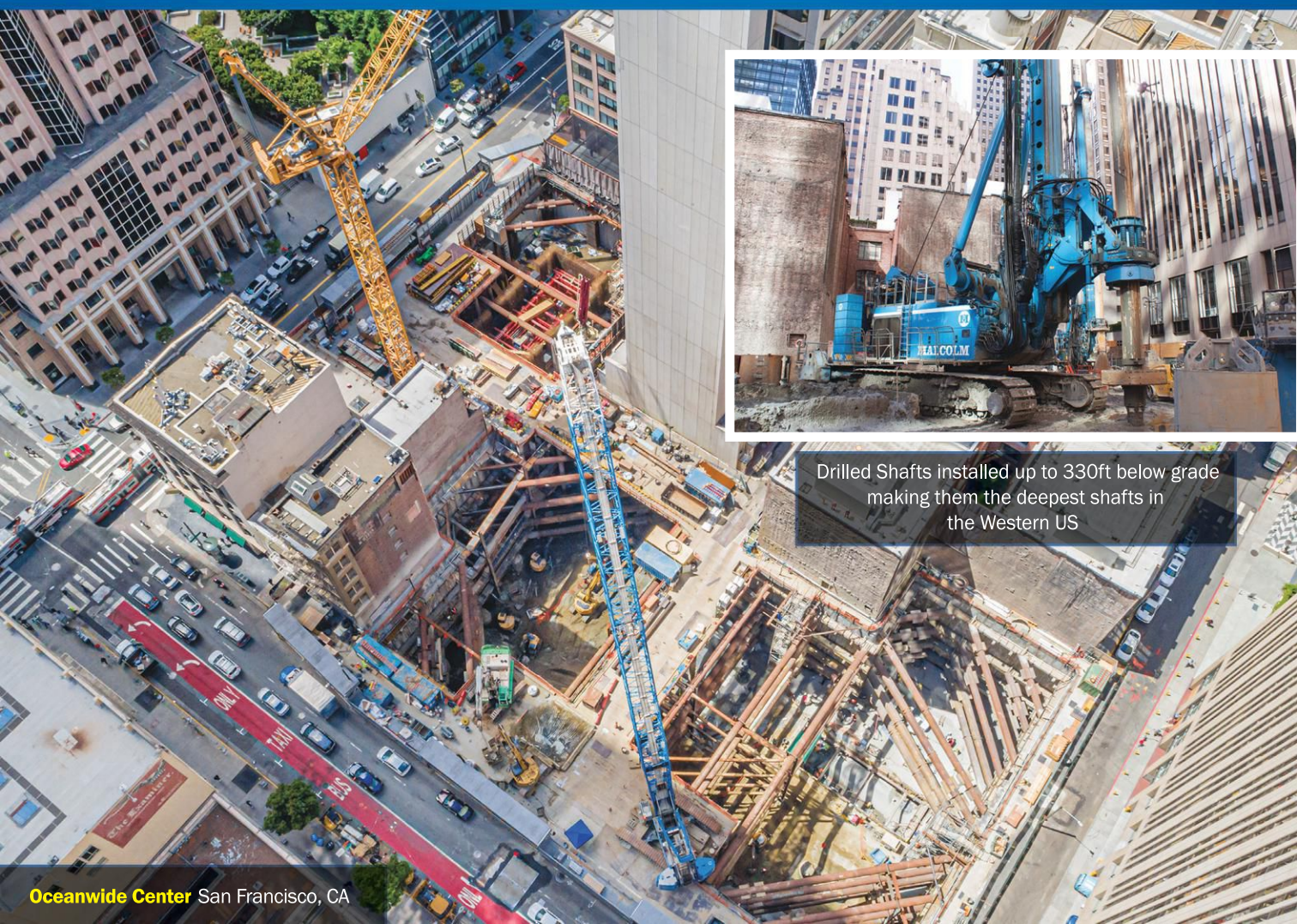

Drilled Shafts installed up to 330ft below grade making them the deepest shafts in the Western US

Oceanwide Center San Francisco, CA

Megaproject Digs Deep to Protect Seattle's Waterways

In the bustling seaport city of Seattle, work is steadily advancing on the Ship Canal Water Quality Project, which aims to prevent an average of 75 million gallons of polluted stormwater and sewage from entering Seattle's waterways each year.

The multiphased undertaking includes construction of a 2.7-mile-long, 29-million-gallon storage tunnel located about 80 ft underground between Ballard and Wallingford. Five large vertical shafts will be built along the tunnel alignment, which will be excavated using a pressurized-face tunnel-boring machine (TBM).

At present, crews are working on the 210-ft-deep, 87-ft-wide drop shaft in Ballard, where the TBM will be launched in 2021. To support the excavation, Malcolm Drilling is installing an 87-ft-dia diaphragm wall to a depth of 210 ft to cut off the groundwater.

The 4-ft-thick shaft ring consists of 18 vertical panels, most of which are reinforced with steel rebar. Fiberglass reinforcement is being employed at the tunnel eye where the TBM will break through to commence its tunnel drive.

Malcolm's scope of work also includes secant pile installation, ground improvements and shoring activities. For additional information about this and other current projects, please visit www.malcolmdrilling.com. ◆

PHOTO: COURTESY OF MALCOLM DRILLING

Diaphragm wall construction at a vertical shaft in Ballard will divert sewer overflows to a new 2.7-mile-long storage tunnel running beneath Seattle.