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NEW ENGLAND CONSTRUCTION

Site Conditions Challenge J. Masterson Construction During Brightview Development Project

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J. Masterson Construction

Overcomes Tight Site, Unsuitable Soil and Deep Building Grade on Brightview Development

By Paul Fournier

The site of a major retirement community development being built in Wakefield, Massachusetts, is posing significant challenges to the construction team.

Manchester, New Hampshire-based PROCON has the design-build contract with Shelter Development for the four-story, 130-unit Brightview Senior Living Facility, which is located in downtown Wakefield. This will be PROCON's sixth Brightview Senior Living community designed and built in Massachusetts for Baltimore-based Shelter Development. PROCON's Project Manager is Lynn Kramer.

Due to its location, the Wakefield site offers very limited working space, according to William Peach, Vice President of J. Masterson Construction, the Danvers, Massachusetts-based site subcontractor. Masterson began excavation in earnest early in spring 2016 once subcontractor New Hampshire Demolition had razed six houses and a commercial building in the project area.

"We're working in a relatively small area that lies between a commercial district and a residential neighborhood, so it's a very tight site, and we've got a lot of work to do," Peach said. "As site contractor, we're responsible for general excavation, building foundation excavation, backfilling foundations and constructing parking lots, driveways and sidewalks. Our responsibility also includes the removal and replacement of unsuitable soils, and constructing a temporary earth retention system.

Deep Sewer Relocation

"In addition, we had to relocate a live 12-inch sewer carrying about 1.3 million gallons of sanitary sewage from downtown. The sewer ran right under the new building site, so we had a temporary bypass sewer system installed to allow the relocation work. The new sewer is about 16 feet deep in some sections, requiring us to enclose the new 12-inch PVC inside an 18-inch ductile iron pipe," Peach said.

Xylem Inc. provided wastewater pumps and about 700 feet of 8-inch HDPE pipe for the sewer bypass system.

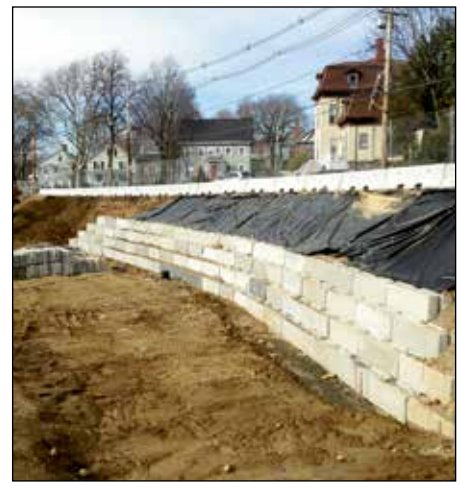
To expedite deep sewer excavation and installation at the crowded site, Masterson is using a Mabey Inc. Slide Rail System. The "dig and push" shoring system installs quickly and provides solid support for trench walls and any adjacent structures. It consists of five basic steel components: corner posts, spreader posts, side panels, spreader beams and roller beams. The system is installed from the top down and removed from the bottom up. An excavator pushes the corner posts and side panels down through the soil and is also used to remove the posts and panels as trench backfilling is accomplished.

Other utility work consisted of installing about 500 feet of 12-inch to 24-inch ADS corrugated HDPE drainage pipe. The pipe was supplied by EJ Prescott.

On-Site Equipment

Peach explained that since the site was so tight, they used a Topcon GPS surveying system to precisely lay out the excavation by their fleet of heavy equipment for all building and utility structures.

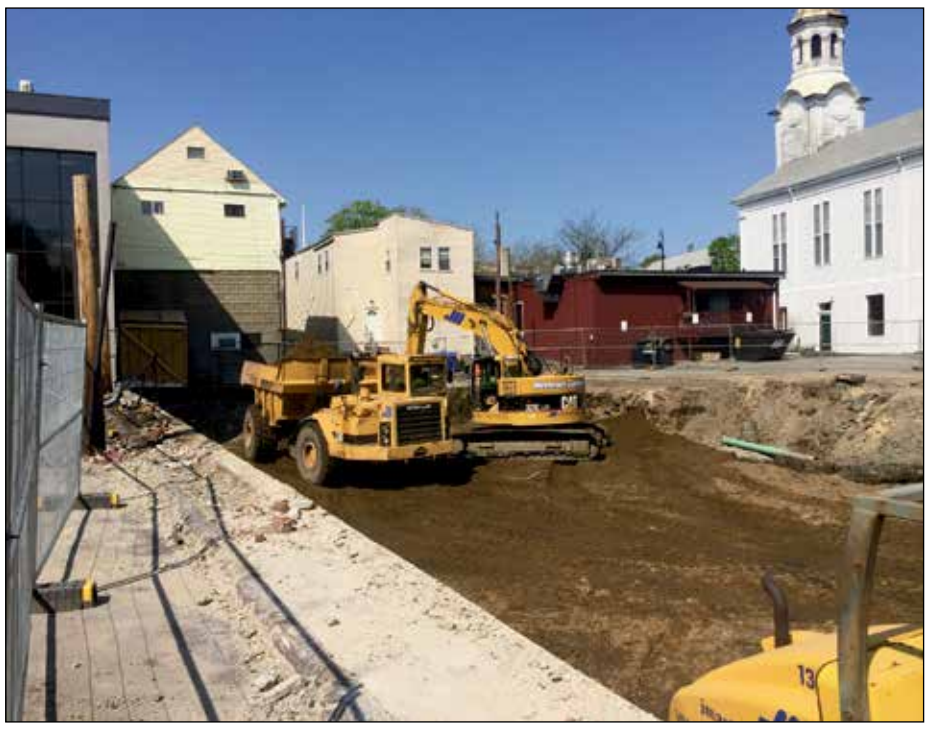
Masterson is employing three Caterpillar excavators at the site: a Caterpillar 345 to perform deep sewer digging, a Caterpillar 330 for excavating general soil and drainage pipe trench, and a Caterpillar 321 equipped with a compactor attachment to consolidate trench backfill. Compaction of roads and parking lot materials is being performed by a JCB Vibromax with a 60-inch steel drum. The Danvers contractor is also using a Caterpillar IT38 Integrated Tool Carrier, a Volvo L70 loader, and two off-highway trucks, a Caterpillar D25 and a John Deere 250, to move excavated material.



Masterson built battered earth retention wall with 3,000-pound blocks provided by MacLellan Concrete Co., while Shea Concrete highway barriers line edge of adjacent street for safety.

New Hampshire Demolition razes a commercial building at Brightview development in downtown Wakefield.

A Caterpillar 345 excavates for deep 12-inch PVC sewer within two end-to-end Mabey Slide Rail installations.



A Caterpillar 321 Excavator works with a Caterpillar D25 off-highway truck to backfill the site of a building razed by New Hampshire Demolition.

Battered Gravity Wall

Excavation for the building foundation took place extremely close to an adjacent local street, necessitating some kind of earth retention system since the bottom of the foundation lies about 16 feet below street level. Masterson crews built a battered gravity retention wall using hundreds of concrete blocks supplied by J. G. MacLellan Concrete Company Inc. of Wakefield.

The 6-foot by 2-foot by 2-foot blocks weigh about 3,000 pounds apiece. At the top of the cut, the site contractor used concrete highway barriers provided by Shea Concrete to line the edge of the street as a safety precaution.

Boosting Soil Bearing Capacity

The subsurface of the existing soil in the footprint of the new building included a layer of fill determined to be unsuitable for traditional shallow footing and slab-on-grade support, according to Derek Simpson, P.E., Project Manager for Helical Drilling Inc., a geotechnical design-build firm based in Braintree, Massachusetts.

Simpson said that excavating and replacing the unsuitable fill with imported fill was not a practical option due to anticipated premium offsite fill disposal costs. As an alternative, Helical is designing and installing Geopier Rammed Aggregate Pier elements using a displacement method that generates little or no excess spoils. Helical is installing more than 400 of the rammed aggregate piers. After the existing fill soils are improved with RAP elements, foundation excavation and construction can proceed using traditional methods.

Regulated Excess Soil

The Brightview site has surplus excavated soil, with approximately 7,000 tons of the material being taken by Charter Contracting of Boston to different facilities depending on the nature of the soil as regulated by the Massachusetts Department of Environmental Protection (MassDEP).

Some of the surplus material is regarded as reclamation soil under an interim MassDEP policy on the "Re-Use of Soil for Large Reclamation Projects," and is being hauled to one of several Massachusetts facilities, which were recently approved by MassDEP in the form of a signed Administrative Consent Order, that will accept 100,000 cubic yards or more of reclamation soil. The regulated facilities are St. Mary's Cemetery in Tewksbury, Jordan Overlook Farm in Rutland, and Dudley Reclamation Project in Dudley.

According to MassDEP, the interim policy is part of a comprehensive approach to managing soil in Massachusetts. The agency points out that the new policy institutionalizes a site-specific review and approval process that has been successfully used on an ad hoc basis to expand opportunities for the re-use of excess soil excavated from development sites.

By providing a mechanism for safely managing soil at quarry reclamation projects, the policy addresses two issues. First, it facilitates the filling and re-use of spent (or abandoned) quarries, sand pits and gravel pits. These locations are often safety hazards and their reclamation can provide opportunities for beneficial new uses, including parks. Second, it provides increased in-state options for the re-use of soil excavated from new development projects. Such soil often must be shipped out-of-state at substantial cost.