

**CONTRACTOR**  
PLAN CENTER  
877-448-2614

PERIODICALS POSTAGE PAID AT CLACKAMAS, ORE.  
AND AT ADDITIONAL MAILING OFFICES

DECEMBER 07, 2009 VOL. 16 No. 49

# CONTRACTOR

## PLAN CENTER

A WEEKLY REPORT ON CONSTRUCTION PROJECTS IN OREGON, WASHINGTON AND THE PACIFIC NORTHWEST

TIME DATED MATERIAL



**PORTSMOUTH FORCE MAIN SEGMENT 1**  
PORTLAND, OREGON

SECANT STRUCTURES BY  
**SCHEFFLER NORTHWEST, INC.**  
GC: MOUNTAIN CASCADE, INC.

PORTSMOUTH FORCE MAIN SEGMENT 1  
 PORTLAND, OREGON  
 SECANT STRUCTURES BY  
**SCHEFFLER NORTHWEST, INC.**  
 GC: MOUNTAIN CASCADE, INC.

Scheffler Northwest, one of the Northwest's largest full-service drilling and shoring firms, is midway through construction of three secant pile jacking and receiving structures for the Portsmouth Force Main Segment 1 project. The project is one of the last in a series of large combined sewer outflow improvements that have been implemented over the past 20 years by the City of Portland. The project includes installation of 66" diameter pressurized pipeline that is being installed from the Swan Island Pump Station to the Basin Avenue cul-de-sac. The pipe is being installed by both open cut and microtunnel boring machines by general contractor Mountain Cascade. In order to install the microtunnel portions of the pipe, large access shafts need to be excavated and shored. Scheffler Northwest has been contracted to design and install three of these shafts using secant pile methods to provide shored pits up to 35 feet in diameter to depths of up to 60 feet below ground surface.

Each of the three secant structures are unique in terms of design and construction due to proximity to adjacent structures and traffic. The first shaft construct, Port Center Way, was a designed as a circular secant structure with a 35' inside diameter. The individual secant piles were 36" in diameter and 55 feet long and were installed using a CSP system mounted to a Soilmec R-930 European style drill rig. The CSP system is very unique in that both a continuous flight auger and outer casing are advanced simultaneously to pile tip elevation and extracted as the concrete is placed for the shaft. Due to the hoop stresses inherent to circular secant structures, the majority of the piles were unreinforced. However, W24X117 piles were set full depth to provide additional strength in the portions of the shaft that will ultimately be subjected to high jacking forces during tunneling operations.

The second structure, the Going Street Shaft, was similar in concept to the Port Center shaft, except that being a receiving shaft it was smaller in size and did not require any steel reinforcement. The shaft, located at the base of the heavily travelled Going Street Bridge, had extremely limited access. As a result, Scheffler chose to construct this shaft using CFA methods. CFA is similar to CSP in that a continuous flight auger is advanced the full depth of the pile and concrete is placed under pressure as the auger is extracted. The difference is that no outer casing is utilized. This simplifies the system to some degree and also allows added flexibility in terms of spoils containment, ultimately the reason that it was chosen as the drilling method at the Going Street shaft location.

The final shaft of the project, the SIPS Shaft, was the most complex in that it was a 39' x 25' x 45' deep rectangular secant structure that connected to the existing Swan Island Pump Station. Given the rectangular shape, the secant structure required two levels of interior bracing as well as steel reinforcement in every other secant pile. Given the depth of the structure and the tremendous pressures, the secant piles extended to a depth of 60' below ground surface and included W24X117 piles. The secant piles were constructed using the CSP system similar to that of the Port Center shaft.

Scheffler Northwest is a part of the Scheffler family of companies, which includes DJ Scheffler, Scheffler Nevada, and Scheffler Canada. These companies work together to provide innovative drilling and shoring solutions for a wide variety of projects throughout the western United States and Canada. They pioneered the use of CFA and CSP drilling methods on the West Coast, particularly in regards to the use of these systems to speed the construction of secant pile walls while also minimizing the risk of subsidence. For more information about Scheffler Northwest, visit [www.schefflernorthwest.com](http://www.schefflernorthwest.com).

