



## West Side CSO Swan Island Pump Station

Owner: City of Portland, OR  
Bureau of Environmental Services

Engineer: Carollo Engineers

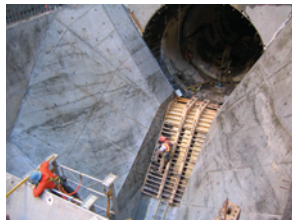
Contractor: Harder Mechanical Contractors, Inc.

### Overview

Many municipal wastewater collection systems were originally designed with combined sewer systems which convey both sewage and storm water through a single pipe system. These systems often overflow during urban wet-weather conditions caused by heavy rainfall or snowmelt. This overflow typically permits untreated sewage and surface contaminants to pollute local waterways. In 1994, in an effort to mandate the upgrading of combined sewer systems, the US Environmental Protection Agency amended the Clean Water Act (CWA) to include the Combined Sewer Overflow (CSO) Control Policy. The objectives of this national policy are: to ensure that if CSOs occur, they are only as a result of wet weather; to bring all wet weather CSO discharge points into compliance with the technology-based and water quality-based requirements of the CWA; and to minimize water quality, aquatic organism, and human health impacts from CSOs.

### West Side CSO

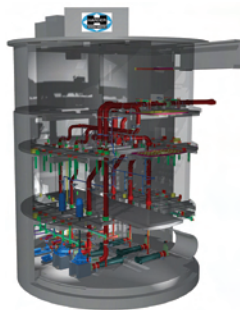
In 1991, prior to the changes to the Clean Water Act, the city of Portland initiated a program to reduce combined sewer overflows (CSO) to the Columbia Slough and Willamette River by 94% by 2011. This program, which is believed to be the largest construction effort in the city's history, includes a \$260 million sewer tunneling project along the west side of downtown and under the Willamette River (West Side CSO). The system includes two gravity-flow tunnels located over 120 feet beneath the city which are designed to collect and store the combined sewage.



### Swan Island Pump Station



The project includes construction of the 220 MGD Swan Island Pump Station to pump wastewater from the tunnel system to the North Columbia Blvd. Wastewater Treatment Plant. The pump station structure is 160 feet deep and over 140



feet in diameter. It is designed for a total of five 2000 HP variable speed vertically mounted dry-pit pumps

with 22-foot intermediate flexible drive shafts. For dry-weather conditions, the station is equipped with two 800 HP variable speed horizontally mounted direct-coupled dry-pit pumps. In addition to reducing or eliminating overflows from the collection system, the design storage capacity of the tunnel system together with the variable output rate of the pump station provide the means to deliver a controlled inflow to the wastewater treatment plant, eliminating disruptive surges that could overwhelm the treatment process.

### Pump Details

#### Wet-Weather Pumps



S.O. 9809287  
Morris Series 7100 NC, VOS,  
Model 24x30-50 4V D6A  
Rated: 29,653 USGPM at 206  
ft. TDH at 590 RPM  
Ductile Iron wet-end, Cast Iron  
impeller, SS wear rings, Ches-  
terton single split seal SC/SC  
w/ Spiraltrac

Motors: 2000 HP, 600 RPM,  
Vertical Solid-Shaft, WP-I,  
3/60/4160, Inverter Duty

Control: 2000 HP Air-Cooled VFD  
System



#### Dry-Weather Pumps



S.O. 9809288  
Morris Series 7100 NC, HBB,  
Model 14x14-25 3V3  
Rated: 11,111 USGPM at 190  
ft. TDH at 1190 RPM  
Ductile Iron w/ 3% Ni. wet-  
end, 410SS impeller, SS wear  
rings, Chesterton single split seal SC/SC w/ Spiraltrac

Motors: 800 HP, 1200 RPM, Horizontal, TEFC, 3/60/4160,  
Inverter Duty

Control: 800 HP Air-Cooled VFD System