

## October News

Drilling shafts, underway now, is a simple concept, dig a hole, drop some rebar in, and fill it with concrete. Crews on this project must do all this on a grand scale and meet exacting standards. Each shaft has a specific diameter and depth unique to its exact location on the site. Some shafts are as narrow as three and a half feet, and others as wide as five feet. Depths vary as well with the deepest being at 100 feet. Drilling the shafts requires an incredible degree of precision, it must be drilled straight down without cutting at an angle.

For each shaft, a rebar cage (weighing between 12,000 and 32,000 pounds) must be built to fit its dimensions and extended a determined distance above the shaft to allow for integration into the floor slab when built. The cages are built at the old Reservoir 4 site, transported over to the new reservoir site, raised by a crane to a vertical position, and then lowered into the drilled shaft. Each cage is equipped with centralizers that keep it centered in the hole.

Each shaft will require 15 to 45 cubic yards of concrete, meaning two to six concrete truck loads. Depending on the location of the shaft, trucks will either navigate their way to the bottom of the site or to a position on the ledge between the two retaining walls to deliver their load. The concrete will be pumped into the shaft using a tremie pipe which is pulled out of the hole as the concrete level rises.

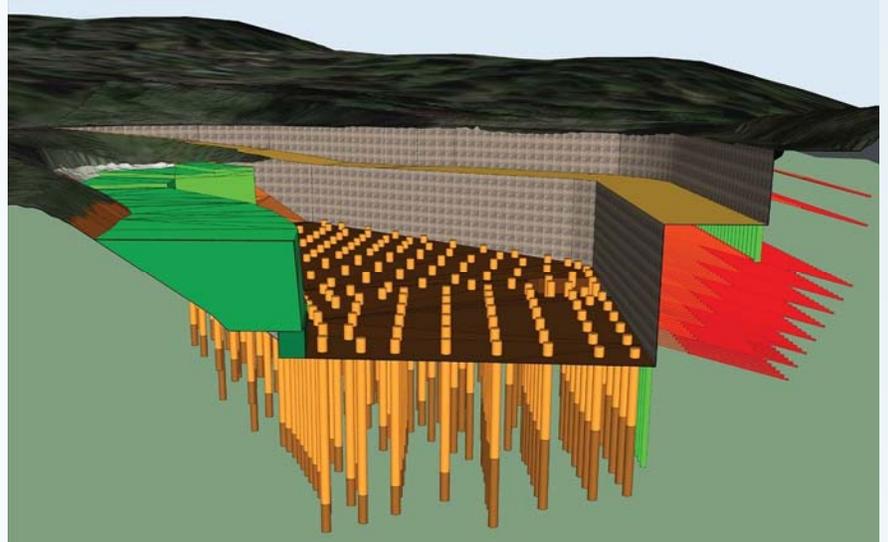
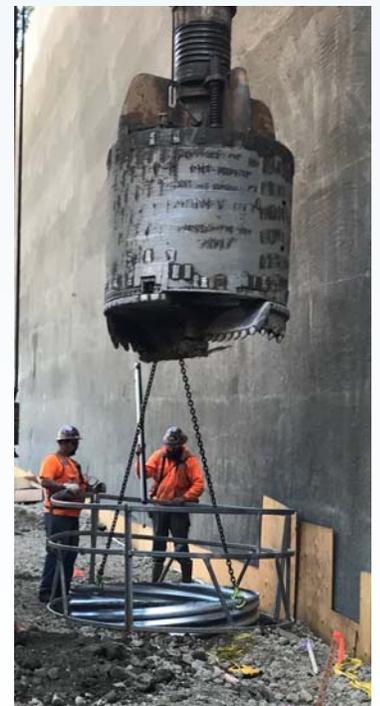


Illustration of the shafts being drilled to support the new reservoir.

Left: Drilling rig being used on site.



Right: The drill bit being used to drill shafts.



Visit us online at [www.portlandoregon.gov/water/wpreservoirs](http://www.portlandoregon.gov/water/wpreservoirs). Take a virtual tour.

### *Forest to Faucet*

*The Portland Water Bureau provides the highest quality water, customer service, and stewardship of the critical infrastructure, fiscal, and natural resources entrusted to our care. We enhance public health and safety and contribute to the economic viability and livability of the Portland metropolitan region. We are a recognized leader among water service agencies across the country.*

Drilling rig drills the shaft.

Crane lowers the rebar cage into place in the shaft.

Concrete truck delivers concrete to the pumper.

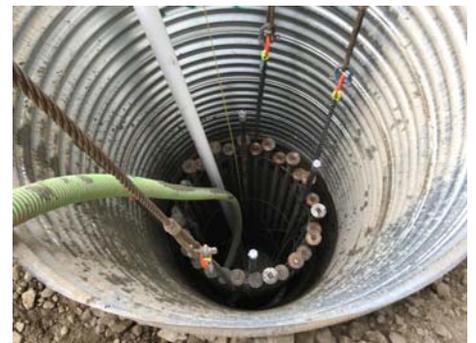
Concrete pumper pumps concrete into the shaft.



Concrete being pumped into the shaft.



Looking down a shaft with the rebar cage in place.



Lowering a rebar cage into a drilled shaft.



## Tower Crane Installation

The first tower crane began arriving, in sections, Monday, September 24, and installation was complete Thursday, September 27. Located adjacent to SW Sacajawea Blvd., the crane features a boom that can be moved, stowed, and operated at upward angles to avoid the surrounding trees.

The tower crane consists of four main parts: base, tower, slewing unit and boom. The base is bolted to a large concrete pad with a foundation of four deep drilled shafts. The base connects to the tower, which gives the crane its height. Attached to the top of the tower is the slewing unit — the gear and motor— that allows the crane to rotate. Rising above the slewing unit are booms. The tower is 137 ft. up to the slewing unit. From the base of the crane it's 80 ft. to the bottom of the reservoir site.

This crane will deliver equipment and supplies to the areas where they are needed inside the reservoir.



Slewing unit of the tower crane. This allows the top of the crane to pivot or turn.

A four person team of steel workers constructed the tower crane, along with two assist crane operators and ground support.



View along the boom and down into the construction site and onto Sacajawea Blvd.

View of downtown Portland from the cab of the tower crane.



*The City of Portland ensures meaningful access to City programs, services, and activities to comply with Civil Rights Title VI and ADA Title II laws and reasonably provides: translation, interpretation, modifications, accommodations, alternative formats, auxiliary aids and services. To request these services, contact 503-823-3028, City TTY 503-823-6868, Relay Service: 711.*

## A Reliable Future

The Portland Water Bureau is building a new 12.4-million gallon, seismically reinforced underground reservoir within the footprint of the former Reservoir 3 (upper) with a reflection pool on top, while retaining the historic look and feel of the original. The new reservoir has been engineered to withstand ongoing landside encroachment and potentially catastrophic effects of a major earthquake.

The new reservoir will supply water to Portland's west side and serve 360,000 people, including all downtown businesses and residents, 20 schools, five hospital complexes, and more than 60 parks. This system of water conveyance and storage makes Portland a livable and thriving community, ensuring public health and economic viability.



Rendering of Lowland Habitat Area (former Res 4)

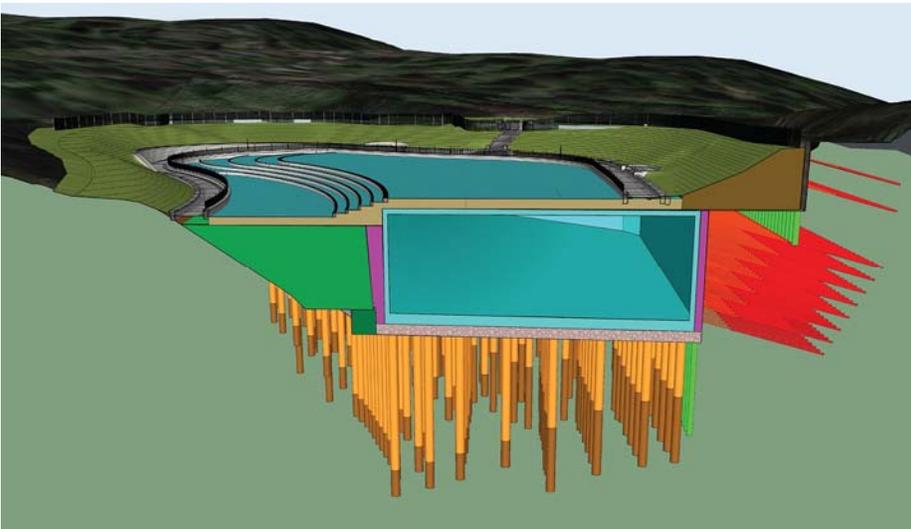


Rendering of aboveground Water Feature (former Res 3)

The first phase of construction focused on reshaping the site. Now in the second phase, the focus will be building the new reservoir structure.



Even today, we still do some things the old-fashioned way.



## Coming Attractions

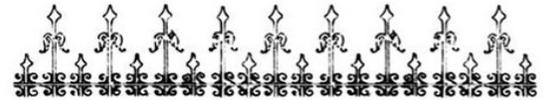
Over the next year, you can expect several changes to occur in the activity around the construction site.

- Second Tower crane will be installed Spring 2019.
- Community site tours return in spring 2019. Watch for dates in email updates and on the webpage: [www.portlandoregon.gov/water/wpreservoirs](http://www.portlandoregon.gov/water/wpreservoirs)
- Virtual tour is online at the project webpage: [www.portlandoregon.gov/water/wpreservoirs](http://www.portlandoregon.gov/water/wpreservoirs)

## Interesting Facts

This project will use:

- 3,000 truckloads of concrete
- 35,000 truckloads of soil
- 7.4 million pounds of rebar



Rhetta Drennan

Portland Water Bureau  
1120 SW 5th Avenue, Rm. #600  
(mailing address only)  
Portland, OR 97204-1926

Phone: 503-823-3028  
E-mail:  
[Rhetta.Drennan@portlandoregon.gov](mailto:Rhetta.Drennan@portlandoregon.gov)