



# SR 520 Bridge Replacement and HOV Program



## Pontoon Construction Project

### Progress continues on pontoon casting basin

July 2011

Construction of the pontoons that will form the floating foundation of the SR 520 bridge in Seattle is ramping up. Before the Washington State Department of Transportation (WSDOT) and design-build contractor Kiewit-General Joint Venture (K-G) can start placing the 140,000 cubic yards of concrete for the 33 pontoons, crews must first excavate and construct a casting basin.

The enormous casting basin uses about four acres of the 55-acre construction site in Aberdeen. The \$367 million contract with K-G includes this work as well as the pontoon construction.

Here are the steps we will take to built the casting basin:

#### Step one: Dewatering the site

Aberdeen is an extremely wet area, even by Pacific Northwest standards. In fact, Aberdeen's 84 inches of average annual rainfall more than doubles that of Seattle, which averages about 38 inches per year.

When work started in February, as expected, the crews first had to deal with the large amount of water on site and had to be dealt with quickly and efficiently.

By building a huge network of wells, pumps and pipes, WSDOT and K-G began to dewater the site. On-site water was treated in detention ponds, ensuring the environment in nearby Grays Harbor was not impacted by the work. The wells are removed as excavation moves to those areas. Other wells on the basin perimeter will be decommissioned when the basin is complete.



During the wet winter in Aberdeen, crews worked to dewater the site by constructing wells using PVC pipe.



Vicinity map

#### Step two: Constructing the foundation

Before the area is excavated, crews must first construct the basin's foundation. This effort was accomplished by driving more than 900 steel piles measuring up to 150 feet in length into the ground. The piles measure between 18 and 24 inches in diameter and are driven in 75-foot long sections, allowing crews to attain the desired depth. After the first length is driven, crews then weld the second section on top. Both are then driven down to the 135-foot mark.

A specialized pile cutting device is then lowered into the empty piling and severs the section about three stories below grade.



A steel worker uses precision instruments to create a clean cut on a recently driven pile.

### Step three: Excavating and leveling

Once the remainder of the piling is removed, excavation work can begin. Two excavators are working simultaneously to remove more than 260,000 cubic yards from the casting basin. One of the excavators is the workhorse and has the capability of filling an entire dump truck with single scoop. The second ensures the basin is excavated to a precise depth by exposing the tops of the driven pilings.



Crews use heavy machinery to excavate the casting basin one scoop at a time.

### Pontoon casting basin by the numbers

- Drive 900 steel piles for casting basin foundation.
- Excavate 260,000 cubic yards of material for basin.
- Complete basin will measure 900 feet long, 200 feet wide and 30 feet deep.
- Place 16,000 yards of concrete to complete casting basin.
- Construct a 30-foot tall by 300-foot long gate between the basin and Grays Harbor.

### Step four: Pouring concrete

Exposed pilings are then prepared for concrete placement and the final steps of casting basin construction.

Approximately 16,000 yards of concrete will be placed to form the base slab of the casting basin, which will be completed in four pours. To reduce costs of concrete delivery and placement, K-G is constructing its own concrete batch plant on site. By doing so, it eliminates the need to bring 2,000 cement truck-loads to complete the work.

Driving and cutting pilings, excavating material and placing concrete concurrently is helping WSDOT and K-G maintain their rapid timeline for the Pontoon Construction Project. The casting basin is scheduled to be completed at the end of October 2011.



Concrete workers place 660 cubic yards of concrete to form the first base slab of the casting basin.

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