PROJECT:
Hood Canal Bridge Retrofit and East Half Replacement

LOCATION:
Port Gamble, Wash.

OWNER:
Washington State DOT

DESIGNERS:
WSDOT and Parsons

CONTRACTOR:
Kiewit-General Joint Venture

COST: $390 million

START DATE: July 2003

COMPLETION DATE:
March 2010

#1

Excellent visibility

Forward thinking, determination fuel Hood Canal job

By Bill Wilson
Editorial Director

One long foghorn lifted a thick anxiety that had settled in the Puget Sound for almost seven years.

It bellowed an "all clear" for hundreds of motorists standing by for the long-awaited opening of the Hood Canal Bridge Retrofit and East Half Replacement—the longest floating bridge over salt water in the world—in Port Gamble, Wash. during the dawning hours of June 3. For them, the release was more entertaining than anything else. For the workers and owner, it was emotional, physical and even a little spiritual.

Phil Wallace, project director for the Kiewit-General joint venture, ended that final therapy session. After working the controls through the last test of the bridge's draw span, he was the one who acoustically christened the achievement.

"I hit that fog horn and laid on it for five minutes," he told ROADS & BRIDGES. "Traffic was building up on both ends, and if something went wrong on that last test we would have had to start over."

Which would have meant 20 more movements, an impossible reality for a team that did nothing but forge ahead en route to claiming the No. 1 Bridge project in 2010.

"Winning this award just means everything for the crew. I watched [the Top 10 Bridges unveiling special] on YouTube, and it was really cool to see that we finished first," said Wallace, who dedicated the award to fallen comrade Eric Soderquist. Soderquist, a Washington State DOT employee, suffered a fatal accident at his home during construction of the Hood Canal Bridge.

The third day of excavation back in July 2003 served as the project's initial and perhaps highest hurdle. That is when crews uncovered the first of more than 300 fully intact remains of the Klallam Indian Tribe.

"When the extent of the ancient burial ground was fully realized, WSDOT shut the project down," said Wallace. "The contract was in danger of being terminated, but we worked with WSDOT and came up with a plan to go forward."

After rescheduling and repricing the job, the first leg of the strategy swung into action. Pontoon construction was moved to Concrete Technology's existing facility 70 miles away in Tacoma, a site that was much smaller than the original and added two years to the project.

Since the graving dock was barely deep enough to float out the pontoons upon completion, additional buoyancy was needed for what Wallace called "the most complex pontoons you can build." This was provided by flexi-floats that were bolted to the perimeter of the pontoons.

The pontoon construction also involved virtually no 90° angles, and crews could not reuse forms because each cell in each pontoon was unique in size and shape. In order to create completely enclosed cells, the formwork that supported the tops of each cell had to be disassembled and removed in small pieces through a 30-in. hatch that was the sole access to each cell.

Work also commenced to widen the approach spans on both sides of the bridge. Crews had to build the road deck and piers alongside the existing bridge and extremely close to

moving traffic to avoid disrupting the commuter flow.

Once complete, preparations were made to replace the old with the new by cutting the old decks, installing hydraulic jacks and placing Hillman rollers that, during two weekend closures, allowed the existing bridge deck to be rolled onto falsework on one side of the bridge and the newly constructed road deck to be rolled into place onto new pier caps.

The DB General, one of the largest derrick barges on the West Coast, removed the existing 500-ton truss bridge portions on the east and west ends of the project during the six-week closure to replace the east half of the bridge. It took three derrick barges to install the new 800-ton truss bridges, which are described as "tubular compliant."

Lowering a total of 20 concrete pontoon anchors into precise positions on the bottom of the Hood Canal required the design and construction of a specialized anchor-lowering device and attaching it to one of the derrick barges. Each anchor was filled with 1,300 tons of rock.

Much of the construction, including the concrete anchors and the road decks on the pontoons, was done while afloat, calling for the use of specialized survey equipment that does not rely on the earth's gravity to determine level.

The bridge was re-opened 10 days ahead of schedule, reducing the economic impact to the adjoining communities. R&B