

## Advisories/Updates

- **Feb. 25 update: Ground settlement near the viaduct is safe, expected**

Posted on Feb 25 2014 9:52 AM

Keeping the **Alaskan Way Viaduct** safely open to traffic during SR 99 tunnel construction is a top priority. It's one of the main reasons we're boring a tunnel – to minimize disruption at the surface as we replace the viaduct.

Recent media reports have stated that ground settlement due to tunnel construction could cause us to close the viaduct. These reports are inaccurate.

The viaduct is still vulnerable to earthquakes, but it remains safe for everyday use. The viaduct settled as a result of the Nisqually earthquake and we strengthened the viaduct in those areas so it remains safe for drivers.

We have no plans to close the viaduct until after the tunnel opens to traffic. Crews inspect the structure four times per year – the next inspection is scheduled for this weekend – and have taken a number of steps to protect it during construction.

We anticipated some ground settlement would occur during construction of the tunnel, which is taking place near the viaduct. That is why the viaduct has been strengthened in this area and more than 100 monitors have been installed on the viaduct to measure how much the ground beneath the structure moves.

Those monitors told us that the viaduct settled up to four-tenths of an inch at one location along the viaduct near where tunnel construction is underway. This settlement is well within the limits established by WSDOT's structural engineers.

We will continue to carefully monitor the viaduct during construction and will take additional steps to reinforce the viaduct if needed.

We'll be posting additional details soon about the work we've done to protect the viaduct. In the meantime, please feel free to [contact us](#) if you have questions or concerns.

- **Feb. 21 update: Seattle Tunnel Partners will dig access shaft to reach tunneling machine**

Posted on Feb 21 2014 4:52 PM

On Friday, Feb. 21, Seattle Tunnel Partners spoke to the media about their plans to repair or replace the seal system that protects the SR 99 tunneling machine's main bearing.

As expected, they will access the seal system through the front of the machine by digging a 100-foot-deep by 80-foot-wide shaft. Other details about the shaft and plan for fixing the seals will not be available until next week when experts from the machine's manufacturer, Hitachi Zosen, arrive from Japan to help finalize the plan. STP has received proposals from various firms to design the shaft and will likely select a firm next week.

While STP has shared their preferred method for accessing the seal system, they are waiting until after their meeting with Hitachi to provide WSDOT with an official plan. Because this is a design-build contract, STP and their machine manufacturer are responsible for developing and implementing the plan to fix the machine and resume tunneling.

- **Feb. 14 update: Repair plan to be finalized by the end of February**

Posted on Feb 14 2014 12:49 PM

Seattle Tunnel Partners (STP) informed WSDOT today that they expect to receive a plan on potential repairs to the SR 99 tunneling machine from the machine's manufacturer Hitachi Zosen by the end of this month. This will include a schedule for how long the repair work would take. Earlier this week, STP told us the plan may be completed by the end of the week, but said today more time is needed for the Hitachi to prepare it.

It appears likely that repairs will be made by digging a shaft from the surface so the machine can be entered from the front. Entering the back of the machine would require removal of more equipment and likely take longer. STP will begin work next week on the design of the shaft so if that option is selected, some of the necessary work will already be underway.

We will post additional information as we receive it from STP.

## Program Spotlight

- **A tool that's more important than Bertha**

Feb 12 2014 5:24 PM

Bertha, the SR 99 tunneling machine, is easily the most recognizable tool being used on the SR 99 Tunnel Project. But she's not the most important tool.

That distinction belongs to our 1,373-page contract with Seattle Tunnel Partners (STP), the joint venture we hired to design and build the tunnel. The contract can't bore a tunnel or build the highway within it, but it can perform the project's most vital function: protecting taxpayers.

On most highway projects, WSDOT uses the traditional design-bid-build contracting approach – meaning the agency fully designs the project before awarding the construction contract to the lowest qualifying bidder. But WSDOT is increasingly taking advantage of a different, more streamlined contracting approach known as design-build. Design-build contracts are just what they sound like – WSDOT does preliminary design on the project, but final design and construction are up to the contractor.

This approach has been used successfully on the Tacoma Narrows Bridge, I-5 Everett HOV, SR 519 and several I-405 projects. One appeal is that it gives the contractor more flexibility to bring lessons learned from other projects to the table. In the case of the tunnel project, it required STP to take a greater share of the risk than a traditional construction contract. As a result, more than 90 percent of their work is being performed for a fixed price.

That's important for a number of reasons. As an agency, we have a wealth of experience delivering highway projects. But we're not tunneling experts. Because we don't have experience in building and operating a five-story-tall tunneling machine, we brought in STP, who has had success on some of the largest and most complicated tunneling projects in the world. Per our contract, it's their job to purchase the machine and make sure it's working properly. It's their job to build the tunnel and open it to traffic within the schedule they proposed or face financial penalties.

Assuming more risk offered STP a greater opportunity for reward. How much it costs them to build the tunnel is up to them. They were able to choose their construction methods and the type of machine they wanted. If their choices prove successful and the project is completed for less than the contract price of \$1.35 billion, they'll reap the rewards. Similarly, challenges that set the project back will increase the cost of the project at their expense. To date, we haven't seen any evidence from STP that suggests the state or taxpayers will be responsible for cost overruns associated with the current delay.

Building the SR 99 tunnel is a difficult job. STP is using a large, complex, custom-built machine in complex soils. They face space constraints and traffic constraints and time constraints. Nothing about this project is easy. But we all knew that going in. We planned for it. Our entire project management strategy – from initial budget development, through design and construction – is based on managing risk.

Right now, all of our energy is focused on resuming tunneling. We'll continue to work with STP and outside experts as they work to get Bertha moving again. We'll also continue to lean on our contract with STP, which came long before Bertha and will be around to protect taxpayers through the remainder of the project.

# Mystery object blocking Highway 99 tunnel drill

Posted by [Mike Lindblom](#)

Nearly three days after an unknown object blocked tunnel-boring machine Bertha, project managers haven't yet determined the size or how to remove it, according to the state Department of Transportation.

"We don't know what it is. We don't know whether it is man made or natural," DOT spokeswoman KaDeena Yerkan said.

Drilling halted Friday night, about 60 feet deep, along the Seattle waterfront between South Jackson Street and South Main Street. In normal conditions, the team might try a "hyperbaric intervention," meaning that the tunnel machine could retreat 18 inches, and then [divers would explore gaps around the cutting face](#), at high pressure. (Tunnel projects keep specially-trained divers on call, to work in air and soil that exceeds atmospheric pressure – Bertha includes three hatches where drivers can move to the machine face.) But in this case, there is watery sand and weak fill soil immediately above the machine. So if high air pressure were exerted in front of the machine, the air would push or burst through the soil, said Yerkan.

The problem was discovered Friday night, and reported to state DOT Secretary Lynn Peterson, who was updated on Monday.

"STP (Seattle Tunnel Partners) has not made a decision on how they're going to move forward yet," Yerkan said. "They're talking to their experts, we have been talking to ours." Chris Dixon, STP's manager, hasn't yet responded to messages requesting comment.

The cutting face, at 57 feet, 4 inches, is the widest in the world. It's equipped with steel cutting discs to scour and crack boulders, but apparently can't defeat the large obstruction. Fragments less than three feet diameter can slip through openings in the cutter head, and be removed out the back of the conveyor system.

The tunnel route [was intensively sampled](#) by soil engineers from Shannon & Wilson long before the project started, but apparently their narrow test shafts didn't strike this object. The soil at 60 feet down is considered clean, glacial sediment, but most of the soil above is unstable fill, including wood debris from industries more than a century ago, and spoils [from the Denny Regrade](#) in 1898.

# Penalties and bonuses provide backdrop for Bertha delays

If the roadway isn't open in about 21 months, the Highway 99 tunnel contractor faces penalties and the risk of losing bonus pay. Crews drill to look for an obstruction in front of the tunnel-boring machine on Seattle's waterfront. [Washington State Department of Transportation](#)

## Related Stories

Tue, Feb 11, 1 a.m.

### Bertha repairs will take months: WSDOT

The contractor building the Highway 99 tunnel will decide by the week's end whether to access a damaged bearing seal through the back of the machine, or by digging a hole.



By [Bill Lucia](#)

**Traffic is scheduled** to be flowing through the Highway 99 Tunnel in 665 days. If the tunnel is not open by then, the contractor building it will have to pay daily penalties to the state and will edge toward losing millions of dollars in early completion incentives.

When the Washington State Department of Transportation requested proposals for the project in 2010, they asked bidders to complete the project by Nov. 1, 2016. Seattle Tunnel Partners, which won the bid and is now digging the tunnel, said they could finish the job 316 days earlier, on Dec. 21, 2015.

If the contractor fails to meet that deadline, they'll start to pay \$50,000 per day in penalties, known as "liquidated damages." In the project contract, those damages are capped at \$75 million. It would take 1,500 days — more than four years — of penalty payments to reach the cap.

Seattle Tunnel Partners, which is a joint venture between Dragados USA and Tutor Perini, is also **eligible for a \$25 million early completion bonus**. To receive the full bonus they'll need to have the roadway open by Feb. 25, 2016, which is 66 days after the tunnel's currently scheduled completion date, according to the terms of the project's contract. After the 66 days are up, the state will subtract \$100,000 per day from the bonus.

Bertha, the boring machine digging the tunnel, has a set of damaged bearing seals and has moved about 4 feet in the last 11 weeks. The seals protect Bertha's main bearing, which allows the machine's 57.5-foot wide cutter-head to spin. Repairing the seals will involve digging up the front of the machine. State officials expect the fix to take "months."

**When the machine was boring**, Seattle Tunnel Partners submitted monthly schedule updates to WSDOT, according to deputy program administrator Matt Preedy. The agency has not shared these schedules with reporters. Program administrator Todd Trepanier cautioned in a recent conference call that project schedules change constantly and are therefore almost immediately out of date.

Were it not for Bertha's mechanical problems, Preedy said last week that the machine would probably be near a location called "Safe Haven Three," just south of Yesler Way.

Bertha currently sits about 60-feet below Pioneer Square, west of the Alaskan Way. The machine has mined a total of about 1,022 feet from its "launch pit," Preedy said. Measuring 1,022 feet from the front edge of the pit places the machine just beyond the midpoint between South Jackson and South Main Street. From that position, Yesler Way is about 740 feet north and South Washington Street, which is one block south of Yesler Way, is about 415 feet north. Safe Haven Three would lie somewhere between these two points.

In early February, shortly after Seattle Tunnel Partners discovered the failed bearing seals, project manager Chris Dixon said he believed it would still be possible to finish mining the tunnel as scheduled, on Sept. 30, 2014. The planned tunnel drive is 1.7 miles, or about 9,000 feet, and ends in South Lake Union. So far, Seattle Tunnel Partners has installed 923 feet of concrete tunnel liners behind Bertha, according to WSDOT. The contractor has said that when the machine is running smoothly it can tunnel 65 to 72 feet per day.

The contractor's bid price for the deep bore tunnel was \$1.08 billion. The state awarded \$71 million in technical credits, lowering the originally proposed price to \$1.01 billion. Of those credits, \$15.8 million would've been awarded for the early completion date. The equation used to calculate credits valued each day of early completion at \$50,000.

Seattle Tunnel Partners' bid was about \$32 million less than the one submitted by Seattle Tunnel Group, the only other competitor for the project. Even without the credits for early completion the bid still would've been \$16.2 million lower.

State officials have said repeatedly that Seattle Tunnel Partners has not presented any evidence that indicates that taxpayers will get stuck paying for cost overruns associated with the current repairs and delays. The contractor and the state do disagree however, about whether a steel well pipe, left in the ground by a WSDOT contractor in 2002, could have contributed to Bertha's current mechanical woes. As of Dec. 31, 2013, according to WSDOT, the state had paid Seattle Tunnel Partners \$832 million.