

**VandenBerghe, Alissa (Consultant)**

**From:** Grotefendt, Amy (Consultant)  
**Sent:** Tuesday, March 10, 2009 3:19 PM  
**To:** 'tracie.sunday@seattle.gov'; Powers, Bob; 'ron.posthuma@kingcounty.gov'; 'christina.oclaire@kingcounty.gov'  
**Cc:** Paananen, Ron; White, John; Lenz, KaDeena (Consultant); Claus, Emily (Consultant)  
**Subject:** RE: AWV Tunnel Q & A - Response to Brightwater Tunnel Sinkhole

A couple questions came yesterday from Bob Donegan and Charles Knutson about this issue...we thought it would be good for the RPs to send the info below to the SAC group. This is what was sent to the legislators by Dave yesterday with a few minor modifications. Please let me know if you have any comments and/or if this is okay with you. Thanks. AJG

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Dear 2008 Stakeholder Advisory Committee Members:

You may have read the story in yesterday's Seattle Times about a sinkhole that appeared above the Brightwater conveyance tunnel yesterday. There was also an incident last week in Cologne, Germany where a shaft being constructed next to an existing bored tunnel caused excessive ground movement and a nearby building to collapse.

We are receiving inquiries from the media and others about whether these incidents affect our plans for the SR 99 bored tunnel. The short answer is no, we do not believe these incidents materially affect plans to move forward with the tunnel project. However, safety is our top priority and we take any news of problems during construction seriously. We will gather information regarding each of these incidents over the coming weeks and will work with the civil engineering community to incorporate lessons learned into the bored tunnel design and construction plans.

Below are answers to the questions we are sharing with others. We hope you find them helpful. Please call Amy Grotefendt at 206-295-9846 if you have any questions or need further information.

Sincerely,

Ron Paananen, Deputy Administrator  
Urban Corridors Office  
Washington State Department of Transportation

Ron Posthuma, Assistant Director  
King County Department of Transportation

Robert Powers, Deputy Director  
Seattle Department of Transportation

**What is being done to prevent sink holes or building collapses during construction of the SR 99 bored tunnel?**

Understanding soil conditions is a high priority for building a bored tunnel under downtown Seattle. We have been and will continue to analyze soil conditions to help inform our design and construction plans. More extensive soils exploration work, beginning next week, will help us pinpoint potential soils challenges and allow us to design construction approaches that will address them. We will drill test holes up to 300 feet deep that will tell us what the soils are like where the tunnel will be constructed. We will also conduct extensive monitoring during construction, which will provide real-time information about how the soils are performing that will allow us to make changes to tunnel boring and grouting as conditions evolve.

**What is WSDOT doing to ensure there aren't problems during construction?**

Safety is the top priority for WSDOT during any construction project and the agency has an excellent safety record. WSDOT maintains a strong oversight role before, during, and after construction to review and monitor safety designs and construction methods. For example, we made a decision earlier this year to proceed with a single bore tunnel design rather than a twin bore tunnel. The single bore tunnel is inherently less risky, because cross connections required in the twin bore design are not required, which virtually eliminates the kind of failure experienced recently in Germany. We are also meeting with national and international tunnel experts to evaluate the current plans and seek input on how best to construct the tunnel. These and other experts will be engaged throughout the design and construction oversight process to help ensure that our plans and construction management approaches are state of the art, and incorporate lessons learned from tunnel projects around the world.

**Is building a bored tunnel more risky than building a new viaduct?**

Building a bored tunnel is no more risky than building a new viaduct and some experts argue that building underground is less risky. Large highway or rail tunnels are found in many countries, including the U.S., Canada, U.K., Netherlands, Denmark, Sweden, Germany, Italy, Portugal, Spain, Switzerland, Czech Republic, Russia, Greece, Turkey, India, China, Malaysia, Hong Kong, Japan, South Korea, Australia and New Zealand. The tunneling machine technology is well established, a majority of the tunnel will be constructed deep underneath downtown Seattle in glacial soils, and disruptions at the surface level will be concentrated at the south and north portals in relatively open areas. There are several recent examples of successful tunnel construction in the Puget Sound area, including Sound Transit's Beacon Hill light rail tunnel and the I-90 Mount Baker tunnel. In contrast a new viaduct would have significant environmental and business impacts on the waterfront during construction. Also, the foundations of the new viaduct would be in more challenging geotechnical conditions, and construction would take several years longer – leading to more risks related to increased scope and cost escalation.