

VandenBerghe, Alissa (Consultant)

From: Auyoung, Dillon
Sent: Thursday, February 05, 2009 10:22 AM
To: White, John; Leiste, Willy
Cc: Paananen, Ron; Grotefendt, Amy (Consultant)
Subject: RE: Constituent question re: tunnel replacement for Alaskan Way Viaduct

Thanks, John and appreciate your help and know that you and everyone involved with these high-profile projects are being pulled in multiple directions at the same time. Thanks again.

From: White, John
Sent: Thursday, February 05, 2009 10:02 AM
To: Leiste, Willy; Auyoung, Dillon
Cc: Paananen, Ron; Grotefendt, Amy (Consultant)
Subject: RE: Constituent question re: tunnel replacement for Alaskan Way Viaduct
Importance: High

Willy & Dillon,

Many questions and briefing preparations happening all at once, my apologies to Rep. Orwell for the extra day on this one:

While it may seem counter-intuitive, tunnels, and in particular deep tunnels, are one of the safest places you could be during an earthquake. Earthquake waves are amplified as they reach the surface of the earth. Above ground structures are affected by earthquakes because of a whiplash effect as the waves reach the surface causing the structure to sway. Because the deep tunnel would be 100 to 200 feet below ground, in undisturbed glacial soils, the tunnel would move as a unit with the earth, subject to far less violent movement than is experienced at the ground surface.

For many decades tunnels have been constructed and safely operated around the world in very active earthquake zones and in far worse soils and groundwater conditions than exist here in Seattle. Local examples include the BNSF rail tunnel under downtown Seattle, which is over 100 years old and has safely operated through numerous earthquakes. Other more recent local examples include the I-90 Mount Baker Ridge tunnels, the Seattle Metro transit tunnel, and the Beacon Hill and University Link tunnels currently under construction and planned by Sound Transit. One of the best international examples is the Trans-Tokyo Bay tunnel which is in one of the most active earthquake zones in the world and is underwater for essentially all of its length. Our tunnel will be below the groundwater level but not underwater. National examples include the BART Trans-Bay Tunnel in San Francisco. It was not the same type of construction since it was an immersed tube, but there were bored tunnel connections to the tube and very important connections between immersed tube and tunnel which allow significant earthquake action. The BART tunnel system was virtually undamaged as a result of the 1989 6.9 magnitude Loma Prieta earthquake, which caused 62 deaths and over \$6 billion in damage (including the collapse of sections of the I-880 Cypress Viaduct in Oakland, and crippling damage to the elevated Embarcadero Freeway and Route 101 Central Freeway). The BART tunnels were promptly inspected after the quake and it re-opened for service within 24 hours.

We can provide further engineering details as necessary.

John

John H. White, P.E.
Program Director
Alaskan Way Viaduct and Seawall Replacement Program
WSDOT Urban Corridors Office
Business: (206) 382 - 5270
Cell: (206) 450 - 2975

From: Auyoung, Dillon [mailto:AuyounD@wsdot.wa.gov]
Sent: Wednesday, January 28, 2009 10:40 AM
To: Soderlind, Mary
Cc: Leiste, Willy
Subject: RE: Constituent question re: tunnel replacement for Alaskan Way Viaduct

Hi Mary,

Thank you for relaying this constituent inquiry. We will check with our Urban Corridors Office to provide you with the information requested.

If you have any other questions, please let me know.

Sincerely,
Dillon

From: Soderlind, Mary [mailto:Soderlind.Mary@leg.wa.gov]
Sent: Wednesday, January 28, 2009 10:26 AM
To: Auyoung, Dillon
Subject: Constituent question re: tunnel replacement for Alaskan Way Viaduct

Hi Dillon,

A constituent called with a concern about the design of the tunnel replacement for the Alaskan Way Viaduct and the Richter scale/earthquakes. Is there someone within your department who can provide information about that?

The constituent is concerned that the tunnel will have leaks, people will drown and the tunnel will be unusable.

Thanks,
Mary

Mary Soderlind

Legislative Assistant to Rep. Tina Orwall
33rd Legislative District
soderlind.mary@leg.wa.gov

District Office
22525 Marine View Drive S., Suite 204
Des Moines, WA 98198
206-824-5097

Olympia Office
P.O. Box 40600
Olympia, WA 98504-0600

7/14/2009

360-786-7834