

VandenBerghe, Alissa (Consultant)

From: Grigware, Mike
Sent: Tuesday, February 24, 2009 3:15 PM
To: Williamson, Alec
Cc: Klockenteger, John
Subject: FW: AWW - Span 5C-6C Roadway
Follow Up Flag: Follow up
Flag Status: Red
Attachments: Traffic Barrier in Tunnel.pdf; RE: Tunnel Barrier

Alec, in earlier meetings I had with you on the Bored Tunnel, I discussed that some consideration had been ongoing with using vertical face barrier and that I would talk with our HQ Barrier person (Rod Erickson) to see what the outcome of that consideration had been. The below is an email I received from Rod Erickson on that issue - it seems that the preference is still to have shaped barrier due to impact forces not being as great. Rod has also suggested maybe having the shape barrier be part of the tunnel wall.

I just wanted to share this information with you.

From: Erickson, Rod
Sent: Tuesday, February 24, 2009 2:40 PM
To: Moore, Tim
Cc: Etulain, John (Consultant); Grigware, Mike; Klockenteger, John; Fairrington, Tanner; Olson, Dave
Subject: FW: AWW - Span 5C-6C Roadway

Tim,

I concur with the use of a barrier shape within the tunnel if possible. Although a vertical wall is technically acceptable, the damage to vehicles colliding with the vertical barrier tend to be greater. In addition the impact forces to vehicle occupants are greater in some collisions than one a barrier shape is used.

I also agree with the use of a single slope barrier to preserve valuable shoulder space. However, I am wondering if the single slope barrier can be incorporated into the tunnel wall design?

In addition, I have conducted additional recent research in this area. As a means of gaining additional insight, I contacted Nick Artimovich of the FHWA Office of Safety Design in Washington D.C. Please refer to the attached e-mail to read the valuable information on this proposed design that Nick shared. If you would like to discuss this design further please let me know.

Rod

Rod Erickson P.E.
Roadside Safety Engineer
W.S.D.O.T. Headquarters
360-705-7246
Fax: 360-705-6815

From: Moore, Tim
Sent: Tuesday, February 24, 2009 11:32 AM

6/24/2009

To: Etulain, John (Consultant)
Cc: Erickson, Rod; Fairrington, Tanner
Subject: RE: AWW - Span 5C-6C Roadway

John,

Attached is a barrier that most closely conforms to a crash-tested shape. The 5 1/2" top width of the barrier is a practical minimum for reinforcing bends types and placing concrete.

There are vertical face crash-tested barriers that have not been used in Washington State adjacent to vehicular traffic. These barriers are only 10" wide.

Regards,
Tim

Timothy M. Moore P.E., S.E.
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From: Etulain, John (Consultant)
Sent: Tuesday, February 24, 2009 10:33 AM
To: Moore, Tim
Subject: RE: AWW - Span 5C-6C Roadway

Tim

I have a question. What is the narrowest WSDOT barrier that you know of that was mounted against a wall? We are trying to determine the minimum width required for barrier within the tunnel and the less the merrier.

Thanks
John

From: Moore, Tim
Sent: Sunday, February 22, 2009 5:46 PM
To: Etulain, John (Consultant); Fenedick, John (Consultant)
Cc: Mizumori, Anthony
Subject: FW: AWW - Span 5C-6C Roadway

John,

Please review for acceptance.

Regards,
Tim

From: Mizumori, Anthony
Sent: Sat 2/21/2009 10:02 AM
To: Moore, Tim
Subject: AWW - Span 5C-6C Roadway

6/24/2009

Tim,

I've attached my take on the roadway taper geometry. Some figures differ from the geometry that the project office sent (also attached). Here are some assumptions that they may want to comment on:

- 1) SB = NB + 18.26', 37' LT.
- 2) Bk. of Pav't. Seat is at SB STA 177+72.68
- 3) Bk of Pav't. Seat Brg. = N 89d 44' 11" W

If we agree on the above information, then I'll continue developing the revised preliminary plan according to what I've drafted here. Thanks.

Anthony Mizumori, P.E.
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