

WSDOT/ACEC Structures/Geotechnical Team

MEETING Minutes

January 21, 2022 -- 10:00 AM - 12:00 PM

MS Teams Meeting

WSDOT	Mark Gaines, PE	WSDOT – Bridge Design (co-chair)	
	Tony Allen, PE	WSDOT – Geotechnical Office	X
	Jeri Bernstein, PE/SE	Washington State Ferries	X
	Craig Boone, PE/SE	WSDOT – Bridge Design	
	Andrew Fiske, PE	WSDOT – Geotechnical Office	X
	Bijan Khaleghi, PE/SE	WSDOT - Bridge Design	X
	Katie Olleman, PE	WSDOT - Bridge Design	X
	Nick Rodda, PE/SE	WSDOT - Bridge Design	X
Scott Sargent, PE	WSDOT - HQ Construction Office	X	
ACEC	Joan Zhong-Brisbois, PE/SE	CDM Smith (co-chair)	X
	Lee Andrews, PE/SE	HDR	X
	Matt Barber, PE	WSP	X
	Matt Baughman, PE, SE	COWI	X
	Stan Boyle, PE	Shannon & Wilson	X
	Brice Exley, PE	Hart Crowser	X
	Eric Herzstein, PE/SE	Parsons	X
	Matthew Lengyel, PE/SE	FIGG Bridge Engineers	
	Reza Sehhati, PE	Stantec	X
	Yang Jiang PE/SE	HNTB Corporation	X
	Scott Phelan PE/SE	David Evans and Associates, Inc.	X
	Bob Mitchell PE(visiting)	Shannon & Wilson	X

1. Review meeting agenda (5 minutes) – All

- a. There were no proposed changes to the agenda.

2. Review minutes from September 17 meeting (5 minutes) – All

- a. No comments on November Minutes

3. Welcome new members Scott Phelan and Yang Jiang (10 minutes) – Joan/All

- a. Group Intro's – Name, New Year's Resolution, & Structures/Geotech/Etc.

4. COVID-19 Update (15 minutes) – Bijan/Joan/All

a. WSDOT Situation Report (Bijan)

- i. Covid HQ Situation Report

b. Governor's vaccination mandate and Bridge Office staffing (Bijan)

- i. Was Oct 18th – WSDOT lost 400 people + 100 Retirements = 500 people.
ii. No update on booster shot requirement

c. Federal contractor & OSHA vaccine mandate (Joan)

- i. OSHA Mandate vaccine that any large >100 employees required to have vaccination.

1. Jan 13th OSHA's mandate blocked.
- ii. Fed required if have federal contract.
 1. Unknown future result
- iii. WSDOT requires vaccines.
- iv. Many companies are requiring vaccinations and verification although sometimes this is project specific.

d. Return to the office (Bijan/all)

- i. WSDOT Bridge and Structures Office is holding at 25% occupancy - Have held off on further return to office. In the office, masks and social distancing required. Meetings are teams-only (not hybrid) until future notice.

e. Travel/conferences (Bijan/all)

- i. Bijan Khaleghi: Travel to conferences is allowed. Mark Gains, Geoff Swett, and Bijan Khaleghi recently attend TRB.
- ii. Jeri Bernstein: Ferries Structures back to office is also on hold. Most of the office is working from home, except field excursions.
- iii. Andrew Fiske: Very few in WSDOT Geotech office except for field excursions.

f. Future ACEC/WSDOT Structures & Geotech meetings (All)

- i. See end of meeting notes for future dates.
- ii. With regards to meeting length: 2-3 hours is considered acceptable. However, it is requested that attendees plan for meeting to run three hours.

5. Seismic ground motion directionality effort (15 minutes) – Reza/All

Reza presented Seismic Ground Motion Directionality last time. Afterwards, Reza asked if there is consensus that there is a lack of clarity and consensus around the topic that is worth pursuing. And if so, how should this be proposed to AASHTO. Since then and during today's meeting it was agreed that this is worth pursuing. The two options of pursuit are: 1) Wait for next AASHTO session and table this topic until then. 2) Simplify the discussion by posing question to AASHTO noting Caltrans approach and seeing what their response is.

It was suggested to include a summary including what Caltrans is doing on the topic along with WSDOT and ODOT. Bijan and Tony suggested to send this as an agenda item to AASHTO T3. **Bijan volunteered to send Reza the format for the agenda item for AASHTO.** And ACEC/WSDOT will assist Reza in developing the right language for the agenda item.

ACTION: Bijan to provide AASHTO template Reza to draft the agenda items Bijan/Tony to review the draft

6. Break (10 minutes)

7. NCHRP Report 949 Proposed AASHTO Guidelines for Performance-Based Seismic Bridge Design (PBSD) (25 minutes) – Presented by Bijan Khaleghi – (See attachment 1)

- a. Synthesis 440 ID'd gaps. It developed a proposal for Performance Based Seismic Design (PBSD), involving Consultants, DOTs and USGS. NCHRP Research Report 949 is out.
- b. Guide spec not published yet.
- c. NCHRP Report 949 Purposes is to characterize:
 - i. Seismic Hazard, Structural response, Potential damage, and Potential loss
- d. PBSD as a tool covers a lot of things not yet in AASHTO. These include: S.A. Cascadia Subduction Zone, M9 Subduction Mega EQ, Basin effect.
- e. Operational Classification – AASHTO LFRD.
 - i. Open to traffic after 100 yr, open to emergency after 1000 yr
- f. PBSD used on a case-by-case basis
- g. Updated Material Modeling to be more accurate
- h. Review of Force base design.
- i. Review of LFRD SGS Displacement-Based Method (DBM) base design
- j. PBSD starts with desired performance and works toward design that delivers that performance
- k. Performance Levels: PL1 Life Safety, PL2 Operational, PL3 Fully Operational
- l. PBSD Flowchart
- m. Intro “Substitute Structure Method” and “Direct Displacement Based Design DDBD”
- n. PBSD allows for innovative materials and systems such as: Shape Memory Alloy and Engineered, Cementitious Composites, Self centering using unbonded PT tendons in Bridge in columns, Grade 80 steel and other reinforcement types, UHPC, Fiber Reinforced Polymer wraps, Alternative dissipator connection technologies.
- o. WSDOT welcomes to discussion of innovative designs every biennium - in particular, WSDOT is pursuing both self-centering columns and tsunami design.

Followed by Q. and A. Excerpt Below

Reza S. Q: How often we will use DDBD?

Is for meeting expected performance directly. Go by that ductility concept.

TBD what the advantage is. Guide Spec Appendix B.

Jeri B. ASCE uses this for ferries. Continuation from ASCE 16 publication.

ASCE 61 used by ferries.

Yang J. Q: When do you anticipate NCHRP 949 become part of AASHTO?

Needs to be cleaned up by T3

Bijan: This is intended to always stand alone. Not going to change current code.

Yang J. Q: Does AASHTO have less authority than Guide Spec?

Bijan: Gives owner more of leeway to decide which to use.

8. Adding UHPC to WSDOT Bridge Design, Construction, and Specifications (20 minutes) – Presented by Bijan Khaleghi – (see attachment 2)

- a. Overview of history of cement. UHPC first used in 1997.
- b. WSDOT did development of UHPC mix with WSU and UW.
- c. UHPC Design Spec on 2023 ballot

- d. PGSuper enabled to do UHPC design
 - e. FHWA EDC-6 UHPC for preservation and strengthening.
 - i. Duane Wilson explored UHPC expansion joints
 - f. What is UHPC? Sand, cement, silica fume, water, superplasticizer & STEEL FIBERS
 - g. WSU developed ASTM standard for DTT (Direct tension test) of UHPC
 - h. UW studied development length – how to reduce closure length using non-contact splice
 - i. Deck bulb Tee Girder Bridge with UHPC Cross Beam and deck bulb-T closure pour.
 - i. Longitudinal and transverse closure
 - j. Implementation challenges
 - i. How to specify mix design
 - ii. Determine construction requirement
 - iii. Sole sourcing required
 - iv. Adequate batching, materials availability
 - v. Determine Prescriptive Mix vs. Performance Mix
 - 1. Used prescriptive, commercially available mix.
 - a. Scott Sargent noted, performance mix would work better in urban setting where larger plants would be available to mix performance mix.
 - vi. UHPC has led to a new generation of deck bulb tea girders designed for UHPC.
 - 1. Dropping girder web from 6” to 4” & Just one line of harped strand
 - vii. UHPC beyond WA – ASHTO T-10. 2023 AASHTO COBS Ballot Item.
 - 1. Guide Spec for UHPC - Draft
 - 2. Standard Method of Test for Uniaxial Response of UHPC – Draft
- 9. Ran out of Time to Discuss: ~~Impact from supply chain commodity disruption (15 minutes)~~—
Joan/All**

10. Adjourn

Future meeting dates:

Friday, March 18, 2022

Friday, May 20, 2022

ATTACHMENTS

1. Performance-Based Seismic Bridge Design

2. Adding UHPC to WSDOT Bridge Design, Construction and Specifications