September 10, 2010 Meeting

Jacobs Office
600 108th Avenue NE, Suite 700
Bellevue, WA

Attendees:

WSDOT	ACEC	Guests
Geoff Swett	Mark Johnson (CH2M HILL)	Bijan Khaleghi
Eric Schultz	~~Paul Bott (HDR)~~	
Jesse Beaver	Yuhe Yang (PB)	
~~Scott Sargent~~	David Goodyear (TY Lin)	
Jeri Bernstein	Jim Schettler (Jacobs)	
	Jake Menard (DEA)	
	Bill Elkey (Parsons)	
	Richard Patterson (AECOM)	
	Chester Werts (HDR)	
	Paul W. Guenther (CH2M HILL)	

Agenda:

1. Welcome new members Chester and Paul and bid a thankful farewell to Mark who will be rotating off the team.
2. Review and approve meeting minutes
3. Update contact list
4. Discussion on Non-standard abutments at MSE walls (Team)
    a. Non-standard meaning abutments perched up on MSE walls, MSE walls constructed behind abutments to reduce lateral loads and/or abutments incorporated within an MSE wall. Any team members with past experiences with these types of situations please bring examples to the meeting.
5. Discussion on balanced stiffness requirements for columns – Again, please bring examples of any experiences with this situation where extra design and/or construction measures were required to meet the balanced stiffness requirements. (Team)
6. Eastbound Nalley Valley Project – discussion and team feedback on ABC precast elements currently being designed for this upcoming project. (Geoff)
7. Update on Design-Build Issues List (Richard)
8. Update on BDM chapter for segmental bridges (Eric)
9. Update on Seismic Design Example (Geoff)

9:00 to 9:15		• Welcome new members

New members Chester Werts (HDR) and Paul Guenther (CH2M HILL) were welcomed to the team. All team members made introductions and a brief discussion on the team goals was given. Mark Johnson (CH2M HILL) will be rotating of the team after this meeting. Thanks to Mark for all his contributions over the last 4+ years. David Goodyear (TY Lin) will complete his four year rotation on team next meeting and will be rotating off the team in November. Previous members are always welcome as guests for future meetings if there is a specific topic they are interested in.

9:15 to 9:45 am		• Review Minutes of Previous Meeting • Review Action Items

The previous meeting minutes were reviewed and briefly discussed. Minutes were approved and will be posted on the Website. The minutes include several topics/issues that were identified during the brainstorming session in June and will act as a record of these items. The Team agreed to go back and review the issues list periodically to see if there are items that need to be addressed that have not been chosen as topics to work on in 2010-2011.

<u>Action Items from Previous Meeting:</u>

1. Review draft BDM chapter on ABC and send comments to Mark by mid-July. (Team) *Several comments were received and John Young in the Bridge Office is in the process of compiling the comments. The draft BDM chapter on ABC is a work in progress.*
2. Review draft BDM chapter on segmental bridges and send comments to Eric (Team) A *few members provided comments to Eric. Eric has compiled and the team agreed to go over the comments in a future meeting.*
3. Review draft seismic design example and send comments to Yuhe (Team) A *few comments were provided and were incorporated into the design example. The final example is now part of Chapter 4 in the BDM and will be posted on the web the week of September 13th.*
4. Compile I-405 and SR 519 D/B issues lists for September meeting (Richard) *Richard compiled all the comments. The list will be reviewed at the next meeting. The purpose of the list is to identify issues that may require some editing to the BDM in order to avoid problems with future design-build contracts.*
5. Bring in examples of projects to discuss balanced column stiffness requirements and MSE wall abutments (Team) *Several members brought in examples, which will be discussed during the meeting. See notes below.*
6. Invite John Stanton to speak at our October 15th meeting regarding ABC at AECOM in Bellevue (Geoff) – *John welcomed the invitation to come speak to the group. He has a graduate class on October 15th and asked if the students could attend the meeting. The team agreed it would be a good idea. Richard was going to work on securing a conference room that could hold 35+ people. Geoff will coordinate the details with John*

9:45 to 11:00		Discussion on Abutments/MSE Walls

The main focus of the topic is to discuss the placement of abutments on top of MSE walls, which are either on founded on spread footings or some type of deep foundation (piles or shafts). Placing an abutment on top of an MSE wall can eliminate the need for an additional span in the structure or can eliminate the need for a tall abutment wall. This is not normal practice within WSDOT. Cost savings is the primary reason for considering this technique.

Jim presented a case study of a bridge constructed on an I405 design build project. The structure was I405 SB over I90. An L-type abutment on a spread footing was placed on top of an MSE wall. The MSE wall was constructed in front of the abutment and along one side. Some of the challenges with the project were establishing criteria for design of the abutment and the MSE wall. Extensive coordination was required between the design team and the WSDOT State Geotechnical Engineer, Tony Allen. Another challenge was the loading on the wall. The bridge structure was designed using AASHTO LRFD, while the wall manufacturers were still using the AASTHO Std. Specifications. Loads were converted from LRFD to ASD, which was the design method used by the wall manufacturer. Setback of the footing from the wall and the distribution of bridge inertia loads also had to be established. Settlement is also a concern when considering this method, especially with a spread footing abutment.

The team felt that this technique could be useful in the future and should at least be made available as a tool for the designer's "toolbox". The next step is to discuss with the State Bridge Design Engineer, Bijan, and the State Geotech, Engineer, Tony. If they were amenable to considering this approach in the future, than the team would take on the effort of developing guidelines to be added to the BDM. The GDM also needs to be reviewed to see if there are any current guidelines already established.

Yuhe and Bill presented additional case studies. Both of the cases involved placing a pier out in front of the MSE wall, essentially eliminating the abutment, and then a "jump" span was placed from the pier onto grade (i.e. a more robust approach slab). The team discussed the pros and cons of this approach; the primary con being the aesthetics. The biggest pro was the fact that seismic loads could now be distributed to two additional bents instead of being resisted by the other interior piers. The team felt there were no significant design challenges with this approach and the real issue was the "devil in the details". The team also felt that although it is not common, there was no reason it couldn't be utilized in the future. The focus of our efforts will remain with abutments perched up on or behind MSE walls.

Jake discussed briefly a case study in Maryland where the abutment was behind the MSE wall but supported on H-piles. The contractor ran into several constructability problems, including compaction around the piles, downdrag on the piles from post settlement, which was likely due to the poor compaction. The project required re-design.

The team also discussed alternate strap arrangements in the vicinity of the MSE wall and abutment. Straps could be attached from the wall directly into the abutment. Concern

was raised about mixing trades with the Contractors. On idea was also brought up about attaching straps to the backside of the wall, which could potentially reduce the heel requirements on the abutment. This idea will also be discussed with Tony and Bijan.

11:00 to 12:00		Discussion on column balanced stiffness

Bijan joined the meeting.

The team discussed the balanced stiffness requirements, which are now recommended in the new Seismic Guide Specifications and required in the BDM, unless approved by the Bridge Design Engineer. Bijan explained the motivation for making this code recommendation a requirement, which was to make sure all the designers performed the check and made every effort to meet the code. If it became unpractical or expensive, deviations have been granted. The team explained that this approach is difficult with design-build projects, because they need to establish their bids/proposals assuming they have to meet the requirement.

Mark presented a case study (Pacific Ave. Bridge), which showed that meeting the balanced stiffness requirements resulted in an increase in bridge cost of 6%. Additional case studies were also discussed, but no cost figures were available. The team made suggestions on adding language to the BDM that would make in clear what steps a designer would need to go through prior to requesting a deviation. The team also suggested that language be added to preclude certain techniques (such as adjusting concrete strength, or long silos around columns) as a method for achieving balanced stiffness. The guide spec does discuss various methods that would be acceptable. A suggestion was made to add language that states if balanced stiffness cannot be achieved, than an additional percentage, or factor, is added to the displacement demand based on the degree of noncompliance (i.e. a sliding scale.) For example, a linear scale 1.2 at 55% (the minimum allowed) up to 1.0 at the Guide Spec recommended 75%. Other codes should also be reviewed to see if there is alternative language or procedures that could be used as a model.

Bijan stated that WSDOT would draft up some new language and pass it by the team for review.

12:15 to 12:50		Review EBNV precast column/crossbeam details

Geoff passed out draft plans for precast columns and crossbeams that are currently being designed for the upcoming Eastbound Nalley Valley Project. Geoff explained that the precast option would be added to the plans as an alternative for 4 bridges and as a requirement for 1 bridge. The EBNV project is also going to be presented at the next WSDOT/AGC structure meeting (Sept 24th).

The team provided several comments regarding the plans. These comments will be taken back to the design team for consideration. The team was also asked to email additional comments they may have to Geoff.

12:50 – 1:00 pm		Schedule Future Meetings

The next meeting will be help on **Friday, October 15th** at 9:00 am at a location in Seattle to be determined. John Stanton will give a presentation on his work related to Accelerated Bridge Construction.		
1:00 pm		Adjourn

Action Items:

1. Coordinate details with John Stanton for October 15th meeting. (Geoff)
2. Reserve a conference room with a capacity of 35+ for the Oct 15th meeting (Richard)
3. Discuss Abutment/MSE wall issues with Bijan and Tony (Geoff)
4. Consolidate and then forward compiled design-build issues list to the team (Richard)
5. Forward comments on EBNV plans to Geoff (Team)
6. Review the Team Charter and provide comments at the next meeting (Team)
7. Update the Team Contact List and post on the Website (Geoff)
8. Provide comments to Jeri on the Transfer Span draft design criteria distributed to the team over the summer (Team)