



ADSC/WSDOT Joint Meeting
 January 18th, 2018, 8:30 A.M. - 11:30 A.M.
 WSDOT Lakewood Maintenance Facility

Meeting Minutes

Attended	Member	Company	Phone	E-mail
X	Aldrich, Brian ¹	WSDOT – HQ	360-705-7828	aldricb@wsdot.wa.gov
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	Binnig, Bill	Kiewit	425-255-8333	bill.binnig@kiewit.com
	Carnevale, Robert	Kulchin Found.	253-888-4284	bob@kulchin.com
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	Deffenbacher, Jon	WSDOT	253-589-6100	deffenj@wsdot.wa.gov
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	Lehman, Debbie	FHWA	360-753-9482	Debbie.Lehmann@dot.gov
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X	McCutchan, Tait	Malcolm	253-395-3300	tmccutchan@malcolmdrilling.com
X	Olney, Chuck	Harris Rebar	206-949-7092	colney@harrisrebar.com
	Parmantier, Dominic	CJA	206-575-8248	dparmantier@condon-johnson.com
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¹ Team co-chair



Guests

Jed Bingle	WSDOT Bridge	360-705-7222	binglej@wsdot.wa.gov
Michael Kosa	City of Sumner	253-299-5709	michaelk@sumnerwa.gov
Griffin Lowe	CJA	425-988-2150	glowe@condon-johnson.com
Dan McReynolds	Parametrix	253-208-4938	dmcreeynolds@parametrix.com
Dave Sutfin	Michels	425-250-1505	dsutfin@michels.us
Doug Watt	CJA	425-988-2150	d watt@condon-johnson.com

1. Welcome/Review of Agenda

Brian Aldrich opened the meeting and provided a quick review of the agenda. Everyone introduced themselves. Brian asked if there were any further agenda items to add, but none were suggested.

2. Approval of Minutes

Amy had one minor edit to the Sept. 21st meeting minutes. No one else had comments. Amy will send an email to Brian.

3. SR 410 Traffic Avenue Bridge

A bridge project over SR 410 near the City of Sumner was presented by Michael Kosa from the City of Sumner and Dan McReynolds from Parametrix.

The bridge is a single span bridge that will be constructed between the existing Traffic Avenue Bridge and a BNSF bridge. Substructure will most likely be shafts with full depth temporary casing, possibly 100 feet long.

Dan mentioned that the AGC had been consulted on the same project, and they wanted to verify a few items.

The first was if two 8 foot diameter shafts were more efficient than three 6 foot diameter shafts. All in attendance verified this efficiency.

The second was if the work access for the structure should be dug down. The AGC had recommended a lower work area rather than a raised work area. Maximum work area width between the existing bridge and the BNSF bridge is 55 feet. The initial assumed length is 60 feet, but this can increase. If the work access were dug down then shoring walls would be required next to the existing bridges. These walls could be 20 feet tall.

If the shafts are to be constructed by an oscillator, then at least 60 feet is needed from the edge of the shaft to the edge of the work area. The tip to tail of the oscillator is 54 feet. With only 50 feet in width, an oscillator would not be able to turn within the work access limits. Also, the preferred work distance behind the shafts is 100 feet. A platform is recommended



if shafts are to be built using an oscillator. This platform shall be built via a trestle rather than soil to prevent loading on the existing adjacent bridge piles.

Other helpful hints:

1. Two cranes would be used to pick a rebar cage that is 100 feet long.
2. Approximately one 8 foot diameter shaft could be constructed per weekend. This assumes three nights of work with 10 hour work windows.
3. At least one lane of Traffic Avenue would need to be closed for a lot of the work.
 - a. Delivery of rebar cage
 - b. Possibly for pulling soil from the shaft
4. If there will be shoring along the BNSF bridge, then this should be pre designed, not contractor designed. There is not time during the contract for the approval process when working with BNSF.

If the shafts are to be built without an oscillator then the equipment required is smaller. In that case it may be possible to dig down an access area rather than building a trestle.

The committee would like to see the Geotechnical report, which was not currently available. A recommendation was made to present the project again at a later meeting with the report.

Action Items: Add as Agenda item to the next meeting. Ensure that the geotechnical report is available.

4. Shaft Tolerances and Reinforcement Placement

Brian went through some portions of the Standard Specifications in regards to shaft tolerances and reinforcement placement.

Section 6-02.3(24)C states “The Contractor shall position reinforcing steel as the Plans require and shall ensure that the steel does not move as the concrete is placed.” However, there are tolerances allowed. Currently there is no rotational tolerance. Rotation always occurs and should be expected. Consensus was that the verbiage should change to “The Contractor shall position reinforcing steel as the Plans require and shall ensure that the cage is set within allowable tolerances.”

Within 6-02.3(24)C, the tolerance is given for the drilled shafts top of rebar cage elevation; which currently says +6 in./-3 in. The recommendation is that this tolerance be moved to the Drilled Shaft section 6-19. Referencing back to 6-02.3(24)C for any other tolerances is ok. Also, keep the +6 in./-3 in. as the appropriate values for that tolerance.

Action Items: Brian will work on the Specification modifications.



5. Thickened Casing at Connections

Brian mentioned that there was recently an issue with casing that was thicker at the joints and fitting the rebar cage.

The team verified that the casing can thicken at the joints depending on the size and thickness of the casing. More likely there would be an issue with a smaller shaft that has less concrete cover.

This appears to be more of a project specific issue. Typically multiple cage sizes are listed on the plans when the casing can be undersized.

During the discussion of the smaller concrete cover, a suggestion was made to allow for a centralizer made by C&M manufacturing. This centralizer, or cage clip, only works for 4 inches of cover and less. The extra large clips fits over spiral bars spaced up to 7 inches.

Action Items: Amy to look into allowing the use of C&M centralizers for shafts with cover of 4" or less.

6. Casing thickness for Concrete Filled Steel Tubes

Amy and Jed discussed the maximum casing thickness that may be used. Jed has a project that may require thick casing for a 10 foot diameter shaft.

The response from the group was that the maximum thickness would be based on the steel manufacturer. There are two manufacturers: Skyline and T Bailey (out of Anacortes). Amy had called Skyline previously, and they can produce casing up to 2 1/4".

There will be significant time issues related to welding of the casing. With the thickness, it may take one day to complete one weld.

Since the casing is utilized for strength in Concrete Filled Steel Tubes (CFSTs), the reinforcing cage would be minimal. Minimal reinforcement means a less stiff cage. Jed asked the group if they would stiffen the cages as required. The answer was yes, although that issue has yet to be experienced.

Action Items: None required.

7. Previously Listed Action Items

a. OSU Study of high-strength bar as shaft reinforcement

The report is out, and OSU is planning on coming to Olympia on January 26th for discussion. They also would like to present at the next ADSC meeting.



Action Items: Brian will move to a main agenda item for the next meeting.

b. Providing Grade 80 rebar and CFST as an alternative.

Amy mentioned that there are two jobs that have bid openings soon where WSDOT gave the option of GR80 reinforcement. The group thought that typically GR60 will be cheaper and GR80 would only be chosen if it could help with congestion.

The questions that were previously asked had responses printed in the meeting minutes, so no further action is required.

Action Items: Remove item.

c. FHWA/Texas A&M Base Grouting

The study is complete, and research indicates that base grouting does help. However, more research is recommended. Due to the lack of direct recommendations, WSDOT is not able to implement any changes at this time.

Action Items: Remove item.

d. Force Account Obstruction Removal – rates and cost/time.

The group has not met and are not ready for a presentation.

Action Items: Brian will keep on the agenda for the next meeting. Tom will arrange a time to meet with the committee to develop rates.

8. WSDOT Construction Program Business Plan

Brian passed around the summary for the Construction Program Business Plan. He would like comments by next meeting. This business plan is required by the legislature for WSDOT.

Brian pointed out a few points of interest. Page 2 has language regarding a strong owner, and Page 28 mentions sustainable staffing.

WSDOT will be developing a survey to gather general comments. Additional comments are welcome.

Action Items: Team to review and provide feedback to Brian by the next meeting.

9. Select future meeting dates

Meetings will typically be scheduled every 6 weeks and will be canceled if there is not enough to talk about.



Future meeting dates: March 1st
April 19th
June 7th

Joint training for ADSC/WSDOT was discussed. This training provides education, and information of past project successes and failures. The audience is both WSDOT region employees and consultants. Typically training is held every other year, and 2018 would be the year. An April training would be too early as there is time needed to prepare. Possibly a May meeting or later could work depending on the need.

Action Items: Brian will send out an email checking to see if there is a need for the meeting this year.



ADSC/WSDOT Joint Meeting
 April 19th, 2018, 8:30 A.M. - 11:30 A.M.
 WSDOT Lakewood Maintenance Facility
 11211 41st Ave SW, Lakewood, WA

Meeting Minutes

Attended	Member	Company	Phone	E-mail
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¹ Team co-chair



Guests

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Doug Watt	CJA	425-988-2150	dwatt@condon-johnson.com

1. Welcome/Review of Agenda

Brian Aldrich opened the meeting and provided a quick review of the agenda. Everyone introduced themselves. Brian asked if there were any additional agenda items to add, none were suggested.

2. Approval of Minutes

Brian asked the group if there were any revisions needed to the January 18, 2018 meeting minutes. No revisions were suggested. Brian will post the minutes to the internet.

3. OSU Study of high-strength bar as shaft reinforcing and permanent steel casing for drilled shafts

Armin Stuedlein from Oregon State University presented results of an experimental program focusing on effects of high strength steel reinforcement on lateral resistance, steel casing on axial and lateral resistance, and steel casing without internal reinforcement on lateral resistance. Thermal Integrity Profiling and Crosshole Sonic Logging non-destructive testing was performed including use of fully threaded steel hollow bars. Similarities and discrepancies between the different non-destructive testing were discussed.

During the discussion it was noted that permanent steel casing provides many benefits, but reduces axial capacity. However, this could be beneficial to reduce downdrag loads.

Brian will email Armin's presentation materials to the team. The final report is available at the following website:

http://www.oregon.gov/ODOT/Programs/ResearchDocuments/SPR765_Drilled_Shfts_Response.pdf



4. SR 410 Traffic Avenue Bridge – Revisit Geotechnical Report

Michael Kosa provided a brief overview of the project, which is a bridge over SR 410 near the City of Sumner. The bridge is a single span bridge that will be constructed between the existing Traffic Avenue Bridge and a BNSF bridge. Substructure will most likely be shafts with full depth temporary casing, possibly 100 feet long. The project was previously presented at the January 2018 meeting and at that time the project geotechnical report was requested.

Nicolas Weikel, the project geotechnical engineer, presented the report findings layers of mudflows and older alluviums with an artesian head 20 feet above the existing ground. With the presence of the artesian now known it was recommended that the shafts be drilled from above, from work trestles or the bridge approaches. The work zones for both mainline SR410 and Traffic Avenue were reviewed and the group felt there was enough room to complete the work if a single lane closure was implemented on Traffic Avenue. Spoils and deliveries would need to be managed from Traffic Avenue. The duration of the shift with the lane closure would need to be 10-12 hours. The lower work area adjacent to SR 410 could be reserved for baker tanks and man lifts with no impact to SR 410 mainline.

Action Items: None required.

5. Review of Synthetic Slurry Spec 9-36.2(2)

John Tuttle noted that he has received numerous calls regarding the interpretation of Std. Spec. 6-19.3(4)C concerning density and sand content testing timing.

Section 6-19.3(4)C describes the frequency of viscosity and pH testing as the shaft is excavated. Testing after clean out also includes density and sand content testing. John's concern is that owners are only looking at Section 9-36.2(2) or misinterpreting Section 6-19.3(4)C and requiring testing that can't be realistically achieved during excavation.

Action Items: None required.

6. Guidance Documentation for spoils contaminated with Synthetic Slurry

John Tuttle wanted to reaffirm with the group that that the January 30, 2012 letter regarding slurry disposal guidance and contamination is still in effect. Ben Wilkinson for the WSDOT Environmental Services Office explained that Department of Ecology is currently evaluating changes to solid waste rules that could possibly effect the 2012 guidance. DOE may expand rules on engineered soils, which could include soils that have been in contact with slurry. Ben stated that a pH component could be included.

Additional DOE rule making information:



- Rulemaking has been going on for about 3½ years
- Large stakeholder process – several work groups organized around the different sections of the rule
- Ecology issued “public review draft” (final draft) rule in January 2018. Typically, little is changed from the public review draft to the rule that is adopted.
- Public hearings (4) were held in March in western and eastern WA
- Multiple concerns with final draft of rule (from WSDOT’s perspective) in terms of soils management, disposal of street sweepings and ditch spoils, and constraints to use of recycled concrete.
- Comment letters sent by WSDOT, WACA, Regional Road Maintenance Forum (RRMF), and AGC. Some similarities in comments, especially between WSDOT and the RRMF.
- Executive level meeting held on April 9 between WSDOT and Ecology. They noted concerns, seemed to understand the importance of comments; but not sure whether or how Ecology will revise the rule.
- Intended adoption date was April 25, 2018 – not sure what new adoption date will be.

Action Items: None required.

7. Casing Size: Oversize of 6.75” for the 6’-0” diameter shaft casing required?

Amy told the group that she was working on Bridge Design Manual updates for drilled shafts and asked if the 6.75 inch allowance for 6’ diameter shafts was still necessary. The group agreed that it was no longer necessary. Amy stated that she would remove the oversize language from the BDM.

Action Items: None required.

8. ADSC/WSDOT Joint Training – Spring 2019

Brian told the group that the WSDOT Construction Engineers consensus was that ADSC/WSDOT Joint Training was something that they would like to see continue. Timing of the training was discussed and an April/May date in 2019 appears to be the best time.

Action Items: Brian will discuss with Tom to sort out details. Possible joint training preparation kickoff meeting in December.

9. WSDOT Construction Program Business Plan

Brian asked for feedback on the WSDOT Construction Program Business Plan that was distributed at the previous meeting. Of particular interest to Chis Christopher was



recommendations on strong owner and WSDOT staffing levels. Some responses from members of the Group included:

- A strong owner position is not supported by consultant inspection.
- WSDOT collaboration is appreciated. Notification of problems after the fact with no collaboration is not appreciated.
- WSDOT knows their specifications whereas others administering projects for WSDOT may not.
- WSDOT understands that the drillers are the industry experts.
- WSDOT is focused on finding ways to accept rather than reject and is willing to make judgement calls based on competency and confidence.

WSDOT will be developing a survey to gather general comments. Additional comments are welcome.

Action Items: None required.

10. Action Items

a) Force Account Obstruction removal rates and cost/time

This topic was tabled until the next meeting.

Action Items: Brian will include on the next agenda.

11. Steamboat Creek – Casing installation into glacial till

Brian presented a brief description of the Steamboat Creek project including the soil profile. The question asked of the group was will there be any issues installing the permanent casing in the glacial till to a depth of 50 feet? The group responded that installing permanent casing 50 feet into the glacial till is difficult but possible. They may have to use stepped casing / make the shaft slightly larger to install the casing. Provisions for grouting the voids between the casing and the surrounding ground may be necessary. An oscillator could do it.

The need to provide permanent casing in the glacial till to a depth of 50 feet was questioned. For more typical construction, it was agreed that based on the shaft diameter advancing the permanent casing 10 to 15 feet into the till would not be an issue. If using an oscillator to drill the drill casing could be left in place for the entire depth needed.

Follow up with the Bridge and Structures Office after the meeting revealed that the total shaft length had since been reduced to approximately 55 feet, reducing the amount of permanent casing to be installed into the glacial till to a more manageable depth.



Action Items: None required.

12. East Trent Avenue Bridge Replacement – Casing Installation

Brian told the group that the Trent Avenue project will have 75 foot shafts with temporary casing. Brian asked if there are issues installing the full depth casing to a depth of around 75 feet in the ESU 2 sand, gravel and cobbles? Brian presented the subsurface profile. The group stated that for the oscillator method there would be no issues and that for the conventional method it may not be able possible to advance the casing.

Brian also asked was if there any advantage to up sizing the shafts, beyond what the design required at the abutments, to 8 feet to match the center piers. For the oscillator method it was noted that with two sizes there will be twice the tooling – oscillators, hammergrabs, etc and associated mobilization. The larger diameter shaft would also make obstruction removal easier. The recommendation was to upsize and deal with 1 to 2 feet of diameter of additional spoils.

Action Items: None required.

13. Future Meeting Dates

June 7, 2018; September 13, 2018



ADSC/WSDOT Joint Meeting
November 1st, 2018, 8:30 A.M. - 10:00 A.M.
WSDOT Lakewood Maintenance Facility

Meeting Minutes

Attended	Member	Company	Phone	E-mail
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¹ Team co-chair



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1. Welcome/Review of Agenda

Michael Rosa opened the meeting and everyone introduced themselves. Mike then reviewed the agenda for the meeting.

2. Approval of Minutes

Mike asked the group if there were any revisions needed to the April 19, 2018 meeting minutes. No revisions were suggested. Mike will post the minutes to the internet.

3. Project Question: SR101 Harlow Creek Bridge – Temporary casing recommendation for drilled shafts

David Johnson from the HQ Geotechnical office presented the site data for the Harlow Bridge project. The existing double box culvert is to be replaced with a single span bridge. There will be a detour structure as part of the project. The water table is high.

Assuming 8’-0” diameter drilled shafts at the abutments, David asked if temporary casing would be recommended.

The consensus in the room was that full depth temporary casing would be required. It would be difficult to keep the hole open without the temporary casing.

Action Items: None required.

4. Constructability Review: Canyon Rd East – Shaft size recommendation



Amy Leland introduced the project on behalf of Joe Merth from Parametrix. This is a multi-span bridge where either (4) 8' diameter shaft or (3) 10' diameter shafts are an option at each interior pier. All shafts would be the same length.

Consensus in the room was to utilize (3) 10' diameter shafts. Fewer shafts and minimizing drilled shaft length is generally better when considering benefits of increasing the shaft size.

Another question was regarding the minimum thickness of casing. The casing thickness required would depend on if it were permanent full length or slip in. For permanent full length, casing the minimum thickness would be ~1". For slip in casing, the minimum thickness would be 3/8".

The design of the shaft may include the permanent casing thickness minus a sacrificial thickness due to corrosion.

The recommendation is to specify the minimum thickness required for design of permanent casing.

Action Items: Recommendations will be passed on to Parametrix.

5. Constructability Review: MTS Factoria Crossing – Require Oscillator?

Jake Menard from David Evans & Assoc. presented the MTS Factoria Crossing project. Late in design the location of a large water main pipe was found to be in close contact with an interior shaft. The water main cannot be moved and must remain in service during construction. The shaft was shifted so that the clear spacing between the edge of shaft and edge of water main was 5'-0". In addition to the 5' clear spacing a vibration limit was given for the pipe of 1.5 in./sec. Also, the permanent casing for the shaft was extended to go past the water main.

The question is if an oscillator method should be required for this project. The other option would be to leave it to the contractor with the requirement to monitor the vibrations during construction not exceed the limit specified. The problem with the monitoring option is what to do during contract if the limits could not be met.

Consensus from the group is to require oscillator method GSP in the contract.

A question was raised if all shafts would have the oscillator method requirement or only the one near the water main. Most realized that if an oscillator was to be used in one location, most likely it would be used at every pier. A blanket requirement is acceptable.



Jake also asked if he should be concerned if the oscillator were positioned over the pipe when drilling the shaft. The response on this issue is that the load can be displaced.

It was observed that if the maximum allowed permanent casing diameter is used per the specifications, then the clearance to the water pipe would be less than 5 ft as shown in the plans.

Action Items: None required.

6. Project Question: US 101 Elwha River Bridge – Shaft Installation in Weak Rock

Brian Aldrich presented the US 101 Elwha River Bridge project, which has been presented to ADSC in the past. The question for this meeting is if the shafts can be constructed with an embedment of 3D into the weak rock layer. The shafts are 10' diameter and there will be permanent casing to the top of rock.

Chris Heathman gave further information on the soil data. Per the geotechnical information, the weak rock layer has a compressive strength of 3750psi. However, there are locations where it can be up to 20,000psi. The bulk of the tests broke between 3000 and 4000psi.

If the strength were consistently in the 3750 psi range, then the group had no issue saying that the shafts could extend 3D into the rock. However, they are not sure if the strengths are closer to 20,000 psi. Most likely they could drill, but they would like to review more geotechnical information prior to making a final recommendation.

Action Items: Chris will provide additional Geotechnical data to be given to the ADSC team for review.

7. ADSC/WSDOT Joint Training – Spring 2019

Mike presented the agenda from the last ADSC/WSDOT Joint Training. The group discussed that quite a few of the topics should be repeated, and project specific topics would change. The target audience would be newer employees who do not have a lot of shaft experience.

Mike requested that the group go through the topics, and respond back to him by Friday, November 16th regarding what they would like to see covered.



An April time frame is good for the training. Keep in mind that Superpile '19 will be hosted in Seattle the first week of May. We would not want to overlap those dates.

Action Items: ADSC group provide training topics to Mike by November 16th. Send information to Tom if you want to present. Mike will discuss with Tom.

8. Action Item: Force Account Obstruction Removal rates and cost/time

Tom Armour was not in attendance to discuss. This topic has been tabled a few times. It will be tabled again. Some would like to discuss with Tom.

Action Items: Keep item on agenda for next meeting.

9. Future Meeting Dates

Mike suggested that the meetings be held on a 3 month schedule in the future since every other meeting tends to be cancelled lately.

Due to preparation for the joint training, the group wants to keep the current schedule for now. 3 months would be too long to wait. They like the frequency to discuss issues in a timely manner and are comfortable with cancelling meetings as needed if agenda topics are light.

Action Items: None required.

10. Additional Items

Mike asked if there were any other items to discuss.

Amy asked if the group would like to see Specials that have recently been prepared for a Concrete Filled Steel Tube (CFST) shaft project. The group would like to stay informed.

Action Items: Amy to present at the next meeting.

John asked what it would take to modify the permanent tie back detail that is in the BDM. WSDOT said that as we are the owners of this drawing, it can be modified if warranted. We need to keep in mind the QPL list. It is accepted as a qualified product and any changes may



affect the QPL list. Zack Cane is the owner of the QPL list. WSDOT would review any presented changes and determine if they should be made.

Action Items: John to prepare mark ups/comment on the existing plan and send to Mike Rosa.

John also mentioned that it would be nice to see a list of the future deep foundation jobs that are coming out of WSDOT. These are “looking forward jobs”. The information would include the number of shafts and other pertinent information.

We discussed that this can be done for WSDOT Bridge Design projects. Design Build projects most likely would not be included.

Action Items: Amy to prepare a list of the “looking forward jobs” from the Bridge Office for the next meeting.