



ADSC/WSDOT Joint Meeting
 January 16th, 2014, 8:30 A.M. – 11:30 A.M.
ADSC/WSDOT Meeting Minutes

Team Members

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¹ Team co-chair

Guests

| Attendee | Company | Phone | E-mail |
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| Bill Bennig | Kiewit Inc. | 253-943-4073 | bill.binnig@kiewit.com |
| Paul England | Rainier Steel | 206-719-0481 | paul@rainiersteel.com |
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Meeting minutes were prepared by Marco Foster, WSDOT Assistant State Construction Engineer.

1. Welcome/Review of Agenda

Mark G. opened the meeting with introductions and reviewed the agenda. Mark reminded team members to send topics if they have them so that we can have full agendas for our upcoming meetings.

2. Review/Approval of October Meeting Minutes

No comments or corrections were provided.

Action Items: Marco will post the minutes to the web as written.

3. Personnel Changes at HQ Construction

Mark discussed recent changes in the Construction Office and went over the newly updated table of organization. Dave Jones will be leaving the HQ Construction Office going to the WSDOT Materials Lab. Fred Tharp, former ASCE, will be coming back to the Construction office and supporting the Olympic Region. Scott Ireland will be joining the Construction office to replace the vacancy after Stuart Bennion's departure. For the first time in several years the office is at a full complement of ASCE's in the Construction office.

Action Items: N/A.

4. Update on dewatering/obstruction removal at AWV Tunnel

Since December 6th, the Tunnel Boring Machine (TBM) has been idle and not mining material on the Alaska Way Viaduct project. There is speculation that something is blocking the machine and Malcolm Drilling has been hired to assist in remedying the situation. Lance provided a presentation highlighting some of the work they are performing

Malcolm was called on a Saturday to help and they began mobilizing equipment on Sunday. Dewatering has been done to alleviate some of the water pressure. Lance showed the location of the 10 dewatering wells that were installed and discussed details of the well casing. It was necessary to pump from specific zones so that the discharge water would be clean enough to discharge to the bay.

The next step was to drill probe holes immediately in front of the machine to determine the existence of an obstruction. Existing utilities complicated this effort. Voids in front of the machine also needed to be filled in – a total of 500CY of grout were placed thru probe holes to fill voids. Filling of the voids was important to insure the drill rig (BG-50) would not settle during the next phase of this remedial work.

Based on the results of the proving, five-foot diameter shafts were installed between utilities to further explore and remove obstructions. The drill operator thought the drill casing (temporary 5' casing) struck well casing at about 70 to 80, then pushed the well casing out of the way. Scars on the side of the drill casing provided some evidence to support the theory. A Go Pro camera was sent down the hole to collect

video – video did not reveal any well casing but did show the operation of the top of the TBM.

Action Items: N/A.

5. SR 520 West Access Bridge North shaft construction

Mark G. provided an update on the SR 520 project. There are approximately 100 shafts in the project with diameters between 8' and 12', all constructed within the lake limits. Preliminarily, approximately \$4.5M will be set aside for force account obstruction removal. Mark expressed concern that it would be unreasonable for a contractor to expend all of this money on critical path force account obstruction removal without additional contract time. Mark asked the team who typically assumes this risk and it was agreed by the group the Prime contractor does. The team agreed that it would be a serious challenge if significant obstructions were encountered. Tom A. suggested we reduce the dollar amount in the obstruction item to a more reasonable value based on the borings. Someone suggested that we providing a specific number of days be identified and included in the contract specific to obstruction removal. This would only apply if the obstruction removal affected the critical path.

Action Items: Mark will bring some proposed language changes for review to the next meeting.

6. Planning for ADSC/WSDOT Joint Training

The team was requested to put forth potential agenda items for next year's joint training workshop. Open discussion on whether we should hold a meeting this spring of fall - the general consensus is that we look at this May (as was done last year). May 7th was identified as a preferred date.

Action Items: Mark to provide Dominic with WSDOT topics by Friday, January 24th. Mark/Dominic will move the agenda building process forward thru emails.

7. Action Items

a) Modifications to the Obstruction Clause

Mark recapped previous discussions on this topic and suggested we try a pilot project to modify the obstruction clause and put more emphasis on the geotechnical data included in the contract. Dominic requested DOT provide an honest base line (truly assess and quantify risk) so that the Contractor's do not have to artificially adjust their numbers. It was noted by ADSC members that there will likely be more DSC claims by doing this. For example, hardness of the boulders may now come into question.

Mark committed that we would bring potential pilot projects to the team for discussion prior to advertising any project with a modified obstruction clause.

Action Items: Mark will develop some language for a test case project in the future. This item will be kept on the agenda for future discussion.

b) ADSC Certification & Drilled shaft submittal

WSDOT is considering revamping contract requirements for submittals. The draft specifications sent to the Team are preliminary and have not gone through WSDOT review. Possible changes to Section 1-05.3 and modifications to the submittal portions of the drilled shaft specification to account for the Section 1-05.3 revisions were discussed. Mark requested team members provide comments on the direction this is moving. The type of submittal will be based on WSDOT's view as to the importance of the submittal. A discussion ensued with regards to the liability associated with WSDOT approving submittals – and that WSDOT wants to get away from this practice. One member pointed out that other organizations (like Sound Transit) never approve submittals; their standard response is “No exceptions taken”. If WSDOT elects to remove approval, the contractor is still required to comply with the submittal requirements and all requirements of the contract.

Jim raised a concern that some submittals may include parts that require engineering and parts that don't. For example, a work trestle being built to support a shaft drill rig. Marco commented these are typically submitted as separate items. It was agreed that this issue does need to be addressed and will be discussed further in the future.

There was discussion about the level of scrutiny a submittal will get whether it is simply reviewed and commented on, or approved. This is a complicated issue that will require further work.

Action Items: Mark will bring this topic back to the group as it progresses.

c) Specification change – slurry level

Mike B. was not in attendance today so this issue will be deferred to next meeting.

Action Items: Edited version will be shared with the Team next meeting.

d) Review of drilled shaft centralizers

Paul updated the group on the work he is doing with regards to the topic. Last meeting Paul brought in an example of an epoxy coated centralizer that he thought might be an acceptable alternative. Pat provided some comment of the use of slab runners for centralizers. There was some discussion with regards to the capacity of the runners in the horizontal direction as they are designed to take load in the vertical direction.

This slab runner proposal from Paul is likely not strong enough for shaft cages. Mark asked Paul consider a modification to the current centralizer detail to make it easier to construct/install as the current detail is more structurally acceptable.

Pat suggested to Paul he may also want to consider flat bar options. The rebar option was thought to be desirable by iron workers but the flat bar option are structurally acceptable as they provide a larger area at the welded connection. Mark asked Paul to work with Pat to modify the current centralizer detail

Action Items: Pat will bring a modified detail forward at the next meeting.

8. Update on Shaft thermal integrity testing

WSDOT had been planning on performing thermal integrity testing on the I-5 Puyallup River Bridge shafts. Unfortunately, this project was pulled off Ad because of right-of-way issues. To get our thermal integrity testing program moving forward, we will be moving this testing to the upcoming I-5 M Street to Portland Ave HOV project. Mark provided the Team with the typical specifications and details we plan to use on this project. These were taken from the Puyallup River Bridge project, but will be similar to what is used on M Street to Portland Ave. Mark asked for any comments the Team has on these specifications. Jim thought the wire specification may need to be updated and he believes the wire manufacturing has changed.

The HOV project will have 53 drilled shafts, 6' to 11' in diameter. The drilled shafts are 30' to 68' deep, and most require temporary casing. Current Ad date is February.

Action Items: N/A

9. Proposed changes to steel escalation clause

WSDOT is considering changes to the steel escalation clause. We are looking at changing the cost index and shifting to a model more like that used by the Oregon DOT. Mark reviewed a graph of different indexes to show the variability between indexes. We plan to use the Bureau of Labor and Statistics Steel Mill Products and Wire index. This index is currently used by ODOT. It is much more sensitive to price fluctuations than the Engineering News Record index that WSDOT currently uses, but it doesn't have the volatility that is seen in the scrap steel indices. Mark also shared that WSDOT is looking at allowing the contractors to opt in or opt out of the steel escalation specifications on a bid item basis. The ADSC members had no additional comment.

Action Items: Mark with move forward with modifying the current specification to reflect the new index.

10. Update on Slurry/spoils disposal

There was some discussion on the Department of Ecology's pending rewrite of waste disposal requirements. Dominic shared that there will be a public comment period so members should stay tuned.

11. Future meeting dates

Future meeting dates were selected as March 27th and May 22nd.

Meeting adjourned at 10:15



ADSC/WSDOT Joint Meeting

December 11th, 2014, 8:30 A.M. - 11:30 A.M.

Lakewood Maintenance Facility

11211 41st Avenue SW

Tacoma, WA 98499-4694

Meeting Minutes

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1. Welcome/Review of Agenda

Mark Gaines opened the meeting with introductions and reviewed the agenda. No additional topics were added to today's meeting.

2. Constructability Review – SR202 Little Bear Creek

Jed Bingle from the WSDOT Bridge and Structures Office gave an overview of this fish barrier replacement project. This project is located on SR202 in the City of Woodinville. The existing, undersized box culvert is to be replaced with a voided slab superstructure with a 30 foot span for improved fish passage. The new structure will be a single span structure that is founded on shaft caps with 3'-0" diameter drilled shafts. Lean concrete shafts will be installed between the structural shafts to provide permanent soil retention for the new structure. The significant constraint with this project is that the existing road can't be closed for extended periods of time (evening closures only).

Jed presented a conceptual construction sequence that uses temporary shoring and a removable roadway surface (i.e. street plates) to allow access for construction of the foundation. Construction of the structural shafts, lean shafts and shaft caps will occur during night closures with the roadway being opened to traffic during the day. Once the shaft construction is complete, a precast shaft cap would be connected to the shafts and the prestressed voided slab superstructure would be built.

To get the precast shaft cap to fit, Jed asked the Team if it would be possible to reduce the drilled shaft tolerance from 4" to 2". The team discussed and concluded that this would be difficult to achieve. It was also noted that the use of the precast cap with discreet openings for the shaft reinforcing steel requires precise control of the cage orientation. The ADSC stated that the cage rotation can't be controlled precisely enough to work with this cap design. The ADSC recommended this detail be re-worked to make it more constructible. It was suggested that a steel beam could be embedded inside the drilled shaft rather than extending the reinforcing steel bars.



Another issue with construction is that some of the new shafts will need to extend through an existing concrete footing. Jed asked the team about the feasibility of coring through the existing footing. The ADSC responded that it would be very challenging, but was doable. Some of the shafts need to be drilled through soils that are supported by a structural earth wall (SEW). It is anticipated that the drilling operations will encounter the SEW reinforcing steel straps. Jed asked if this would present any problems. The ADSC responded that the drilling will pull the straps out of the SEW, and will reduce the capacity of the wall. The Contractor will need to install shoring before drilling through SEW-supported fill.

Action Items: Dominic to provide written ADSC constructability comments within seven days.

3. Constructability Review – Duportail Bridge

A constructability review of the Duportail Bridge was presented by consultants on behalf of the City of Richland. The new structure will be a five-span, 775 foot long structure supported on drilled shaft foundations. The foundations for the intermediate piers are anticipated to be use 8'-0" or 10'-0" diameter drilled shafts. Pier 2 could be supported on either drilled shafts or a spread footing.

Construction access will be provided using either a pile-supported trestle or an earth embankment to provide a work bench. Geotechnical conditions at the site are complex, including a Ringold layer and underlying basalt rock. The project team asked about the feasibility of installing casing shoring and using wet drilling methods through the Ringold, and coring through the basalt. The ADSC expressed concerns about using a 12'-0" diameter casing shoring. Based on the boring logs, oscillator/rotator methods will likely be needed. There is only one Contractor with the ability to oscillate/rotate a 12'-0" diameter casing shoring. There were also some mixed opinions on whether or not the casing would need to be embedded in the basalt. The ADSC agreed that the basalt could be cored, but suggested limiting embedment in the basalt to the minimum necessary.

For the option of installing a spread footing at Pier 2, access to the footing location would be provided by a soldier pile tie-back wall. The project team asked the ADSC about the feasibility of installing a tie-back soldier pile wall at this location. The ADSC responded that the challenge would be site access and establishment of a level workbench. The ADSC suggested looking at replacing the soldier piles with closely-spaced micropiles or increasing the vertical spacing of the tie-backs.

Finally, the project team asked about feasibility of supporting Pier 2 on micropiles. The ADSC responded that this could be done with a Klemm-type drill rig. The only concern is access and impact on the existing irrigation canal.

Action Items: Dominic to provide written ADSC constructability comments within seven days.



4. Review/Approval of June 2014 Minutes

The June 2014 meeting minutes were approved by the Team.

Action Items: Mark to post the meeting minutes to the web site.

5. Action Items

A. Modifications to Obstruction Clause

Mark informed the group that he is still looking at this and doesn't have draft language ready at this time. He shared that he is leaning towards pursuing language that addresses contract time during obstruction work differently than the current process. Current language requires all force account obstruction dollars to be expended before the Contracting Agency will consider giving additional contract time. For major projects with a large number of drilled shafts, it would be difficult or impossible for a low bidder to absorb the schedule delay should a project use the full force account dollars.

The ADSC agreed that the current specification is challenging. Although this is a prime contractor issue, the ADSC agreed that it would be a challenge to include enough schedule float to absorb all of the force account expenditures without additional contract time.

Mark will work on this further, and with work with HQ Geotech in developing new specification language.

Action Items: Mark G. to leave this on the agenda for a future meeting

B. Review of drilled shaft centralizers

Neither Rainier Steel nor Patrick Clarke was at the meeting, so there was no status updated. This item will be kept on the agenda for the next meeting.

Action Items: Mark G. will keep this topic on the action item list for our next meeting.

C. UC Irvine lateral load testing of shafts

Al provided an updated on this research project. The scope of this work will be to gather drilled shaft load test data from many past projects and provide access to this data through a web site. There will be value from having all of this data assimilated and made available through a single source. At this time, DFI/ADSC has not provided any funding, and no progress has been made yet.

Action Items: Al to provide an update at a future meeting.

D. OSU study of high-strength bar as shaft reinforcing

Al gave an update on this research effort. As discussed at the last meeting, this project will focus on the performance of shafts with high-strength steel reinforcing and permanent



casing considered as providing structural capacity. This project is being handled as a collaborative project with contributions from the drilled shaft contracting industry. The research team is looking for drilled shaft contractors who are willing to contribute time, equipment and materials to construct the shafts. AI will be sending out a request to the ADSC members in February or March to ask for their support. He also noted that the reinforcing cages for this project have already been donated.

Action Items: Mark will keep this on the agenda and AI will provide an update at a future meeting.

E. FHWA/Texas A&M base grouting

This project has not progressed as quickly as hoped. Work may start on this in the next couple of months. The plan is to construct five test shafts with one reaction shaft. There is also a chance that this work will move from Texas A&M to a different research facility.

Action Items: Mark will keep on the agenda. AI will provide an update at a future meeting.

6. M Street to Portland Ave. Thermal Integrity Testing Update

Jon Deffenbacher gave an update on the thermal integrity testing being used on this project. With the exception of the first shaft on the project, things have gone fairly well. Issues with the first shaft resulted in almost all of the thermal wires being damaged and not providing useful data. Since the first shaft, WSDOT has been able to use the thermal integrity testing data to assess the shafts and provide shaft acceptance. All shafts to date on this project have been acceptable without any remedial action or repair needed.

In some cases, the thermal integrity testing is picking up characteristics of the shafts that aren't able to be observed with cross-hole sonic log testing. Mark displayed the thermal integrity test report for one of the shafts on the project that showed some excess concrete cover on the outside of the shaft. Thermal integrity testing has also shown some shafts where the cage has shifted slightly during construction. So far, neither of these conditions and been deemed unacceptable by WSDOT.

Jon showed photos from the construction work and highlighted the challenges with protecting the data collection devices (TAP's) during construction. To accommodate the Contractor's means and methods for constructing the shafts, it is necessary to have the TAP's submerged in the slurry below the top of the cage. Jon's office has developed a "tapedo" to house the TAP data collectors during initial shaft construction while there is slurry at the top of the shaft. While it has taken quite a bit of effort to work these details out, things seem to be working well. Jon commented that this has required a bit more labor and effort than originally anticipated.



Moving forward, WSDOT will also be using thermal integrity testing on the I-5 Puyallup River Bridge project. Once both of these projects are complete, WSDOT will assess the results and make decisions on how to use thermal integrity profiling in the future.

Action Items: No further action needed.

7. Payment for soil excavation above the top of shaft

Mark shared that there continues to be concern about how WSDOT is paying for excavation of soils above the top of shaft. On a recent project, a Prime Contractor removed this material using an excavator, and was initially paid for this excavation as Structure Ex. Class A. Months after the work was completed, the Contractor put in a claim asking for this material to be paid as Soil Excavation for Shaft. The difference in cost was about \$30k on this project. While the Contract is clear, it doesn't sit well with many at WSDOT to pay such a large rate for materials that are almost always removed by excavators/loaders.

As a possible solution, Mark handed out language that would provide a new pay item for Soil Excavation Above Top Of Shaft. The Team reviewed this language. Contractually, the Team felt the language would work, however they really weren't interested in creating additional bid items. It was suggested that this soil excavation above the top of shaft be made as incidental to the shaft excavation. Mark agreed that this would work fine.

Action Items: Mark will make the modifications recommended by ADSC, and bring a revised version forward for review.

The meeting adjourned at 10:50. The next meeting is scheduled for February 5th.



ADSC/WSDOT Joint Meeting
 March 27th, 2014, 8:30 A.M. - 11:30 A.M.
 Lakewood Maintenance Facility
 11211 41st Avenue SW
 Tacoma, WA 98499-4694

Meeting Minutes

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1 Team co-chair



Guests

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| Kim Mueller | WSDOT | 360-259-0860 | muellek@wsdot.wa.gov |
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| Lance Rasband | Malcolm | 253-395-3300 | lancerasband@malcolmdrilling.com |

1. Welcome/Review of Agenda

(Marco)

In Mark Gaines' absence, Marco Foster opened the meeting with introductions and reviewed the agenda. Marco introduced Scotty Ireland to the group. Scotty is a new Assistant State Construction Engineer working out of the HQ Construction Office that will be supporting projects and Design/Build policy for WSDOT. Marco reminded team members to send topics if they have them so that we can have full agendas for our upcoming meetings.

2. Review/Approval of January 2014 Minutes

(Marco)

There were no comments or suggested revisions to the January meeting minutes. Marco will have them posted to the web.

3. Constructability Review – SR162 Puyallup R. Br. Replacement (Todd Mooney.)

Todd Mooney of the WSDOT HQ Geotechnical Office opened the discussion by providing a summary overview of the subject project. It includes new bridge construction and requires preservation of the existing historic structure over the Puyallup River. Todd reviewed some of the site constraints and general layout of the structure and shaft details. Piers for the new structure will consist of shafts ranging in depth from 116-122 ft. The soil conditions were reviewed, including profiles, grain particle and water table information. It's expected that wood will be encountered in the lahar and alluvium layers during shaft excavation operations (photos of borings were referenced). Liquefiable soils are present. Axial capacity is critical for seismic down drag forces. Lateral spread is expected to be 4-5 inches. Static down drag is not anticipated. The depths of the shafts are based on the need to be founded in the underlying glacial layer. Shaft constructability issues were identified (cobbles, boulders, wood, etc.). Anticipated access and staging for Pier 2 was discussed at length with the Team. The project is scheduled to go to Ad in September with Work expected to begin after January 2015 (contingent upon remaining RW and utilities issues being resolved). It is anticipated the work will occur above OHMW and no work will occur in water. The following questions were then discussed:

1. The current temporary casing elevation is 84 ft for each shaft. This places the tip of the temporary casing about 5 to 10 ft into the lower alluvium. Does the committee think that



slurry alone will be adequate to maintain the shaft stability below the current temporary casing tip elevation?

Committee response / recommendation - The group agreed that it is and should be at least 84 ft.

2. Does the committee anticipate there will be difficulty in extracting temporary casing?

Committee response / recommendation - Consensus was there would not be issues with extracting the temp casing.

3. Given the likelihood of encountering boulders and logs, are the shaft diameters adequate for obstruction removal?

Committee response / recommendation – With 10-0” shafts, yes - “as long as it’s not a 12 foot diameter boulder”. There is experience in the vicinity of this project where significant wood obstructions were encountered.

4. At Pier 2, the top of the shaft is about 4 ft. below the average ground water elevation. A seal is currently shown in the plans for the Pier 2 shaft. Is there any particular constructability issues associated with inclusion of the seal?

Committee response / recommendation – The detail provided in the informational package showing the external can (serving as a coffer cell) to facilitate the seal and shaft should be optional. Industry recommended leaving this up to the Contractor to determine if it is needed depending on the means and methods.

5. Is there adequate room for equipment staging?

Committee response / recommendation - Consensus was there would be enough room to access pier 2 from the south and recommend that the project permits address temporary embankment (rock pad), ground improvements and possibly a timber trestle platform within the OHWM (but not likely to be within the water) to facilitate shaft construction.

Action Items: Dominic to provide WSDOT with a formal ADSC response for this constructability review.

4. Planning for ADSC/WSDOT Joint Training (Dominic/Marco)

There was general conversation regarding the upcoming joint training. It was confirmed that the training will occur on May 13th, 2014. Local Agency support and participation has been strong in the past.

Action Items: Dominic P. and others from industry will compile the joint training topics and complete the agenda by the end of the week for coordination with WSDOT.

5. Action Items

A. Modifications to Obstruction Clause

(Marco)



Marco recapped previous discussions on this topic. General discussions included:

- i. The dollar value (typically 15% of the shaft value) has been used to establish how much money is included/estimated in the bid item for obstruction removal. Cost history has been tracked and with the exception of a couple of contracts, projects are coming in at 5% or less. WSDOT will be looking at reducing the dollars estimated for obstruction removal to reflect current information and be more project specific and adjusted based on project risk.
- ii. Marco noted there may be a project proposed where obstructions (cobble) are expected (Hedrick Creek) and cobble removal will be considered incidental to the Work without the obstruction clause. The intent is to encourage industry to come prepared with tools to deal with the anticipated obstructions.
- iii. Industry noted that if boulders are expected, then they should come prepared to deal with them, but had concerns about how contract time is not adjusted until planned obstruction costs are exhausted. This makes it difficult to bid. Some noted that the current specifications and obstruction clause are working, so why fix something that's not broken.
- iv. New technologies have evolved to address past issues, risk assessment and ownership. Even though the obstruction clause has been working well there was some recognition that advancements in the drilled shaft industry do support the team continuing this discussion.

Action Items: Mark G. will be evaluating shaft obstruction history on WSDOT projects and provide that information to the team. WSDOT will continue to look a developing draft language for a test project in the future. This item will be kept on the agenda for future discussion.

B. Specification change – slurry level (Mike B.)

This topic was briefly discussed. Mike Bauer coordinated with Stuart Bennion to develop the proposed language regarding this topic. When the revised language was presented to the team last fall there was a minor edit suggested and it was suggested Mike consider the minor modification. Unfortunately neither Mike (or Marco's minutes captured the proposed change.

Action Items: Mark G. to either leave the revision as is and remove the action item or bring revised language back to the team for another review.

C. Review of drilled shaft centralizers (Paul/Pat/All)

General discussion included:

- a) Chuck Olney brought physical examples of alternate centralizers and noted that if there was a specified load capacity, industry could design to the load.
- b) Difficulty with centralizers includes: cages not being perfectly round; casing having the welds/rings on the inside; centralizers rubbing against the casing and deflecting;



and occasional communication issues between the contractors involved (prime, drilling sub and rebar supplier). It's up to the drilling contractor to tell the subcontractor what the depth of the centralizers. Welds for centralizers typically do not meet D1.4 weld code requirements. Fastening to the cage with tie wire will sometimes fail. Centralizers end up being custom made for each job and each shaft diameter.

- c) Good practices for installation include spanning a minimum of two vertical bars (~12-inches at top) and having the sloped legs touching two spirals.
- d) It would be preferred to have a standard detail for different shaft diameters.

Action Items: There was one of Chuck's proposed alternatives that Patrick felt would/could be structurally acceptable. Chuck O. and Patrick C. will collaborate to develop a rebar detail with installation notes to be reviewed at the next meeting.

D. Updated on WABN shaft construction

(Marco)

In Mark G.'s absence, Marco noted that draft language for a linear foot measurement and payment provision had been developed and will be forwarded for review at a later date. There were discussions about what is included in the per foot cost noting that there is often work by Prime/subs/suppliers that has different limits (i.e. casing, rebar, CSL tubes, column reinforcement, shaft concrete and column concrete). This led to discussing whether or not there is any efficiency in administration with this proposal.

Action Items: Mark G. will provide proposed language changes for review to the next meeting.

6. Review of slurry disposal memo (Marco/All)

There was a brief discussion on the topic. Industry representatives will get comments back to Dominic.

Action Items: Dominic P. will forward comments to Mark G.

7. Additional Items (All)

Topics and items of interest included:

- A. ADSC certification – This is a hot topic within industry right now and will be discussed at the long range planning sessions in April. Canada is beginning to require certifications. It is the desire that ADSC should have certified operators for drilling applications (shaft, soil nails, anchors, etc....)

Action Items: Dominic P. and Al R. will provide an update at the next meeting.

- B. Items of Interest -

Al Rasband noted several topics of interest including:



- a. There is interest in the use of A706 hollow bar in shaft construction. Benefits may include its use for CSL tubes;
Action Items: No further action items were identified at this time.
- b. University of California - Irvine is being funded to provide lateral load testing to be used for any agency in the design and construction of drilled shafts.
Action Items: Al R. will provide an update at the next meeting.
- c. There is a project being proposed at Oregon State University investigating the use of higher capacity rebar and steel cased drilled shafts. Funding support is being requested. Benefits would include reducing reinforcement ultimately making lighter cages. It was also noted that WSDOT is looking at applications for using higher strength rebar (90ksi) as well;
Action Items: Al R. will provide an update at the next meeting.
- d. There is a research project with FHWA at Texas AM regarding shaft base grouting field test in June.
Action Items: Al R. will provide an update at the next meeting.
- e. ADSC will have its West Coast Training May 14-15 and is celebrating 30 years.
Action Items: Al R. will provide an update from this conference at the next meeting.

Future meeting date: May 22nd



ADSC/WSDOT Joint Meeting

June 19th, 2014, 8:30 A.M. - 11:30 A.M.

Lakewood Maintenance Facility

11211 41st Avenue SW

Tacoma, WA 98499-4694

Meeting Minutes

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1 Team co-chair



Guests

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1. Welcome/Review of Agenda

Mark Gaines opened the meeting with introductions and reviewed the agenda. No additional topics were suggested to be added to today's meeting.

2. Review/Approval of March 2014 Minutes

There was one comment that the minutes should be clarified to reflect the ADSC did provide a formal response back to WSDOT on the last meetings' constructability review. It was acknowledged that WSDOT did receive a formal response.

Action Items: Mark to revise minutes and post to the web.

3. Review of the ADSC/WSDOT Joint Training

Dominic provided a short overview of the ADSC/WSDOT Joint Training held in Bothell last May. Attendance was slightly over 80 people which is a little lower than in past years. This was primarily due to lower attendance of WSDOT staff. There was an issue with the projector not working this year which resulted in the meeting starting a little late. Lesson learned – need to make sure to have a backup projector in the future. There were some comments that the booklets be restructured so the slides are larger (2 per page).

The Joint Training evaluation forms were reviewed by the group – the feedback from this year's attendees was generally positive and the consensus of the group is the meeting was successful. Based on the feedback – the meeting will be held again next year in April.

Action Items: No further action necessary.

4. Action Items

A. Modifications to Obstruction Clause

Mark recapped past discussions on the topic. The latest annual shaft construction summary (2013) continues to support that the cost of obstruction removal is very low relative to the dollar value of the work being performed. Mark has met with Jeff Carpenter and Craig McDaniel and communicated that overall things are working well with the FA Obstruction removal pay item, and it is his recommendation that we continue with the current policy. Mark is developing a white paper to document/support our business practice of utilizing an obstruction clause.



Damage to equipment – should FA obstruction removal compensate the Contractor for break downs or broken equipment? Al commented that he understands why WSDOT would like the Contractor's to pay for damage to equipment but believes that stand by for the rest of the equipment that is idled should still be paid. There can be a lot of equipment, laborer, and operators idled during obstruction removal. If there is an equipment break down due to obstruction removal that cost is still there. The challenge is determining whether or not the equipment broke due to the obstruction removal or because of a need for routine maintenance.

John D. concurred that this is a challenge during administration of the Contract and he typically needs to evaluate this on a case by case basis.

Geoff O. suggested WSDOT should be careful to not be too prescriptive in our contract language and highlighted an example where we may want the flexibility to pay for certain items if all agree that it is prudent to do so.

Tom A. agreed with Al M. on his perspective/concerns with regards to stand by.

Dominic suggested Kelly bars and cutting teeth should continue to be compensated when damaged/broken while removing an obstruction.

Action Items: Mark G. will draft some language changes and bring back to the group next fall. This topic will remain on the agenda as an action item.

B. Specification change – slurry level

This topic was briefly discussed. Mike Bauer had coordinated with Stuart Bennion last year to develop proposed language changes regarding this topic. When the revised language was presented to the team last fall there was a minor edit suggested and it was suggested Mike consider the minor modification. Unfortunately neither Mike (or Marco's minutes captured the proposed change). Mark reviewed the proposed changes and provided slight modifications to the group.

Jim C. recollection was the group discussed allowing the slurry representative to dictate what the minimum/maximum slurry levels should be.

Several amongst the team commented the 10' minimum requirement is a good practice. The general consensus is the revised specification is acceptable.

Action Items: Mark G. will make the slight modification and this action item is complete.

C. Review of drilled shaft centralizers

Paul E. is working with Patrick to make some further modifications to the centralizer detail. Patrick and Paul are in agreement with the most recent modifications and are implementing the new centralizer design on a Boeing project. Patrick will go to the project



next week to observe installation of the new design. If everything works out the revised design will be brought back to the group next fall.

Action Items: Mark G. will keep this topic on the action item list for our next meeting.

D. ADSC Certification

AI provided an update on this topic as it was recently discussed at an annual ADSC meeting. There are some national ADSC members that have expressed concerns about certification but it appears ADSC as an organization is moving forward with it. Drill Operator Certification is currently being developed.

Agencies and FHWA are very supportive of a certification process however the process is being developed thru ADSC and is moving forward very slowly.

It is yet to be determined who would be providing the certification – it could possibly be the ADSC or an independent company. Canada is already requiring certification for drill rig operators.

Mark G. commented that requiring a certification would be much easier to enforce than our current experience requirements. Mark asked the team if the FHWA specification for drilled shaft construction has been updated regularly. Tom believes that it has not been updated, but that it needs to be. Tom commented that ADSC should push that issue with FHWA.

Action Items: No further action required. ADSC to update as new information is available.

E. Use of hollow core bars in shaft construction

Con-Tech has developed a hollow core rebar that can provide some structural capacity and also provide access for CSL testing. There are a lot of challenges to using these bars (structural concerns, material acceptance, etc....) but Mark wanted to ask the group if they felt this is something worth pursuing. The bars are currently not Buy America compliant. Mark G. mentioned some of the concerns that were recently brought up at AGC on the use of these bars.

Patrick said the use of hollow core bars was discussed about 20 years ago for tip grouting. The hollow bars were never used as there were structural issues with using them (need to design around the bars due to reduced properties, coupler testing failed). Patrick thought there may be some very specific jobs these bars might be useful but these would be an exception.

Geoff confirmed the AGC had concerns with use of the bars and the AGC also felt the bars would only be used on rare occasions.



Al suggested we should be focusing on using higher strength bars to reduce congestions. Patrick offered that the bridge office is looking at HS bars but there are design challenges at the shaft column connection with doing that because of seismic response.

Geoff was concerned about picking large cages with the hollow bars though Patrick felt the bars actually have good structural capacity.

Al commented that he believe the hollow bars have more value for tip grouting than CSL testing.

Action Items: Mark will respond back to Con-tech and let them know we will not make use of hollow core bars a standard but the Contractor's will be allowed the opportunity propose use of the bars.

F. UC Irvine lateral load testing of shafts

Al stated ADSC is funding a research project with the University. They are performing load testing on drilled shafts and they will be compiling test data and make the information will be made available to those that are interested.

Action Items: ADSC will provide the report once completed.

G. OSU study of high-strength bar as shaft reinforcing

Al stated the University wants to conduct some research and testing of drilled shafts. The testing will focus on high strength bars and the use of permanent casing. Unfortunately not all the funding for the research is not in place.

Patrick provided some bridge office perspective on the use of permanent casing and recapped some past discussions on this topic. In his perspective concerns with regards to constructability have resulted in WSDOT not pursuing the use of permanent casing by the Bridge Office.

Tom was under the impression that the University had secured some money from ADSC for this subject research (\$600k).

Patrick then provided more detail on the structural design challenges associated with the use of HS bars. Currently the Bridge office has discontinued analyzing the use of the HS bars due to software issues.

The use of HS bars was almost used on Mannette Bridge – but ASSHTO was not supporting the design at that time.

Mark suggested we may want to consider providing alternate design for the use of HS bars and allow industry to dictate what might be more economical. Paul E. stated that HS



bars were recently used on one of the SR 520 contracts but the availability of the bars has been an issue.

Action Items: Mark will keep this on the agenda and AI will provide an update on OSU research next fall.

H. FHWA/Texas A&M base grouting

AI informed the group that this research is progressing and with a little funding and it will move forward and be completed.

Action Items: Mark will keep on the agenda. AI will provide an update next fall.

I. Summary of ADSC West Coast training

provided a brief AI overview of the 30th annual West Coast Chapter meeting which was recently held. There was some very good training provided to young Managers, past presidents presented at the event. Overall it was an informative event that demonstrates how far the industry advanced over the past 30 years.

Action Items: No action required

5. Thermal Integrity Training presentation

Training was provided to WSDOT staff last week on using thermal integrity testing equipment. WSDOT plans to use Thermal Integrity Testing (TIT) on an upcoming Tacoma HOV project. Mark provided a brief overview of the presentation that was provided by the manufacture/supplier of the TIT equipment. The presentation included;

- equipment overview
- why we need TIT (most frequent anomalies)
- CSL & gamma gamma
- why TIT works
- heat signatures (how to interpret defects)
- yield plots and placement records (WSDOT may be asking for more)
- data correlation (temp vs yield)
- testing windows (temperature vs radius)
- test wire method of testing (Spicing options)
- examples of test data and anomalies
- Soil nail applications

Action Items: Mark to include on the agenda for the next meeting. Discuss modifications to what should be required on the yield plots next fall. Focus should be placed on the difference between conventional and oscillator, 1 concrete truck vs. 2 concrete trucks, etc.... Mark will provide a copy of the presentation and specifications to the ADSC per Tom's request. This item will move forward as an action item.

6. Review of slurry/spoils disposal specification language



The team reviewed standard specification 6-19.3(4)F dealing with the disposal of water slurry. Mark highlighted that WSDOT has been silent on the issue but to insure we are compliant with infiltration requirements – changes have been made pointing the Contractor to 8-01.3(1) dealing with the disposal of process water. Not a lot has changed but emphasis has been placed on managing pH prior to infiltrating waste water upland. There is also reference made to the use of flocculants, existing ground water elevations, spoil containment, and requirements to mark out infiltration locations on the Temporary Erosion and Sediment Control plans (TESC).

The general consensus of the group is that complying with these requirements should not be a concern.

Action Items: Mark will make some minor modifications and finish the new spec.

7. Review of revised Working Drawing language

Mark provided updates on proposed revisions to WSDOT submittal and approval requirements. The goals of the revisions are;

- Consolidate submittal requirements in one location in the spec book
- Allow electronic submittals
- Eliminate WSDOT approval of all submittals.

Submittals will be characterized as Type 1, Type 2, and Type 3 submittals. Only Type 3 submittals will be reviewed and approved by WSDOT. Mark reviewed the draft specification in detail with the group.

There were some clarifying questions asked and open discussion. Patrick raised some concern on structural reviews noting some submittal requires/include both type 1 and type 3 components. Type 1 reviews are proposed 7day turn around and Type 3 reviews can take 30 days.

Action Items: Mark will provide back ground information to Patrick.

8. ADSC/WSDOT Task Force a year in review (Mark)

Mark polled the group to get feedback on how we are doing as a team. Should we make adjustments to team membership?

Jim suggested we may want to consider some of the ground improvement Contractors. Mark is satisfied with WSDOT membership and suggested ADSC consider if they want to invite other for the benefit of the team.

The ADSC members are generally satisfied with the structure of the current team makeup.

Action Items: – Al and Dominic will discuss expanding membership.



9. Additional Items

Please send future agenda items to Mark.

10. Set meeting dates for Fall 2014

October 2nd

December 12th

February 5th

April 2nd

June 4th

Potential annual training date April 16th