WACA/WSDOT Meeting
Minutes
For Wednesday, Sept. 2, 2015

Day/Time: Wednesday, September 2, 2015 at 9:30 AM – Noon
Location: WSDOT HQ State Materials Laboratory, Crimson Conference Room

In attendance:

David Jones, WSDOT
Rob Molohon, WSDOT
Allan Kramer, Lehigh NW Cement Co.
Greg M^{c}Kinnon, Stoneway
Tamson Orps, CalPortland
Leif Backstrom, Columbia River Carbonates
Dave Burg, Ash Grove Cement
Jeff Huff, BASF
Mark Gaines, WSDOT
Katie Mozes, WSDOT
Robert Raynes, Cemex
Craig Matteson, Old Castle CPM
Bruce Chattin, WACA
Scott Diloreto, BASF
Monica Jones, Lafarge

Next WACA Meeting Date:
Wednesday, December 2, 2015 at WACA's Office in Des Moines, 9:30 AM – Noon

Future WACA Meetings Dates:
Wednesday, March 2, 2016 at WSDOT HQ Mat Lab, Crimson Conference Room, 9:30 AM – Noon
Wednesday, June 1, 2016 at WACA's Office in Des Moines, 9:30 AM – Noon
Wednesday, September 7, 2016 at WSDOT HQ Mat Lab, Crimson Conference Room, 9:30 AM – Noon
Wednesday, December 7, 2016 at WACA's Office in Des Moines, 9:30 am – Noon

Meeting Minutes are available at:
http://www.wsdot.wa.gov/Business/MaterialsLab/WACAMinutes.htm

New Business:

AASHTO accreditation for cement producers/suppliers testing laboratory used for the quality management program per WSDOT Standard Practice QC 1 – David Jones

9/2/15 – David Jones of the WSDOT handed out copies of QC-1 to the group. He then explained that the only laboratory that will be required to be accredited is the laboratory that certifies the program for the producer/supplier.

Deleterious Substance Specification – David Jones

9/2/15 – David Jones handed out copies of the proposed revisions to Sections 9-03.1(2) and 9-03.1(4). Dave asked the group if they test for this and at what frequency. Robert Raynes stated that Cemex performs this testing annually. Robert also asked about AASHTO's requirement for deleterious substances and handed the WSDOT representatives copies of AASHTO M 80's requirements for deleterious substances. David Jones stated that the WSDOT will look into this. David Jones made it clear that deleterious substances testing will be required in the QCP for concrete. The Deleterious test results will need to be submitted with the mix design and should be no older than one year.

Coarse Concrete Aggregate and Grading Requirements, Section 9-03.1(4) – Robert Raynes

9/2/15 – Robert Raynes had questions about the grading requirements in Section 9-03.1(4)C. WSDOT specifies AASHTO Grading No. 467 for PCCP. Robert explained that his company satisfies this grading requirement by blending AASHTO Grading No. 4, Grading No. 67, and some Grading No. 8. Robert recommended that Section 9-03.1(4)C should have a note referencing AASHTO M 80. AASHTO M 80 has a note in Section 5 that states the following; "Where coarse aggregate sizes numbers 357 and 467 are used, the aggregate should be furnished in at least two separate sizes." WSDOT Project Engineer Offices are refereeing this grading either as separate stock piles or as combined gradation. Robert is asking WSDOT to be consistent in refereeing this grading. David Jones stated that the WSDOT will look into this. Robert stressed that there should be an option for either grading by AASHTO designated sizes or combined. David Jones agreed. Allan Kramer stated that No. 467 can't be mixed in a volumetric mixer.

Review of Proposed Specification for Permanent Shotcrete Retaining Walls – Mark Gaines

9/2/15 – Mark Gaines explained that the typical applications for shotcrete are permanent fascia. The concern with shotcrete is air content, as the air content is lost during placement. Mark then handed out the drafted specification. Mark explained that this new specification requires a performance based concrete. He also explained the proposed test panels and these test panels should be reflective of the actual application. The specification also requires each nozzle operator to be qualified and perform a test panel. The test panels will be evaluated for consolidation, air content, and compressive strength. Robert Raynes stated that there is concern with air content after pumping because his trucks will have 12% air, but after the concrete is pumped they are out of specification requirement. Tamson Orps stated that her company has the same challenges because they have no control of the nozzle. Mark Gaines stated the test panels are evaluated prior to production and this way some type of correlation factor can be established. Tamson responded that she liked the concept, but the correlation does not stay constant. Allan Kramer stated that with 7000 psi concrete in a vertical application, freeze-fall should not be a concern. Mark responded that he liked the idea. Allan Kramer stated that ACI permits lower air in higher strength concrete. Mark Gaines stated that WSDOT has some research money that could fund a durability study comparing shotcrete with no or little air and shotcrete with specified air content. Craig Matteson stated that there is a concern with nominal aggregate size and curing can be challenging.

Stream Restoration Gradations – Bruce Chattin

9/2/15 – Bruce stated that there have been challenges throughout state meeting this grading requirement. Craig Matteson reported that his company has a hard time meeting this grading requirement. Katie Mozes explained the concept of streambed restoration and the challenges of getting enough fines to prevent sub-surface flow. Rob Molohon explained how this grading requirement was developed and how successful it performed. Rob stated that he has heard concerns from industry about this grading requirement. Rob explained that he has asked industry to propose gradations that when analyzed on a 0.45 gradation power curve, would in theory provide a voidless gradation structure. He also stressed that this material has to be made up from water rounded aggregates, and that fractured rock cannot be used in this application. At this time Rob had not seen any proposals from industry. Bruce stated that he would like to be able to chart a path that would work. Katie Mozes stated that each mix sediment and cobbles are tailored for each stream and would like to set parameters that industry can meet for each specific stream.

Bruce Chattin asked Rob to provide contact information for him and Katie so that he can put them in contact with members of WACA to get this issue resolved.

Old Business:

Bridge Deck Cracking Study – Mark Gaines

9/2/15 – Mark Gaines reported to the group that the Bridge Deck Cracking Study is a formal WSDOT report. Mark gave a briefing of the findings of this report and stated that the use of performance concrete has 40% less cracks than conventional concrete. Mark stated that he would send the report to the group and that he is looking for input. Allan Kramer asked Mark about joints and tinning. Allan stressed that cutting exposes aggregate and deleterious materials which could lead to premature failure. If cutting the concrete is the process Allan recommended that cuts be treated with a xylene coating. Mark indicated that he would look into this.

6/3/15 – Mark Gaines of the WSDOT Construction Office gave a presentation on the status of the comparison study conducted by the WSDOT Bridge Office of Performance Class 4000D and Prescriptive Class 4000D. At this time 5 bridges with Performance Class 4000D and 3 bridge decks with Prescriptive Class 4000D were evaluated. The Prescriptive Class 4000D had cracks about every 2 feet, while the Performance Class 4000D showed either no cracks or very few cracks. At this time this study is only 30% complete. Bruce Chattin of WACA asked Mark if age of the concrete deck was taken into consideration. Mark stated "No", cracking occurs early during shrinkage. Another WACA member asked if all bridges have same quantity of de-icers used on them. Mark responded, I am not sure if de-icers contribute to bridge deck cracking.

Update on Self-Consolidating Concrete (SCC) – Mark Gaines

9/2/15 – David Jones informed the group that SCC will be in the 2016 Standard Specifications. Mark Gaines stated that SCC is not allowed for Class 4000D.

Issue resolved.

6/3/15 – Mark informed the WACA members that SCC will be part of the 2016 Standard Specifications. He then explained that cast-in-place will require the same testing as pre-cast. Forms will need to be stronger. The specifications will require mock-ups. Placing sequence will be the same as the mock-up. Greg M^{C}Kinnon of Stoneway asked how will you simulate mock-ups with reinforcement? Mark stated that mock-ups will need to have reinforcement. Allen Kramer of Lehigh NW Cement Company asked about vertical pours. Mark indicated that small mock-ups will be required. For pre-stressed concrete ASTM C 1712 Standard Test Method for Rapid Assessment of Static Segregation Resistance of Self-Consolidating Concrete Using Penetration Test is important. Mark then asked the group to send their comments to him.

Recycled concrete aggregate Specification – David Jones & Bruce Chattin

9/2/15 – David and Bruce updated the group on Engrossed Substitute House Bill 1695 and its implementation into WSDOT Standard Specifications. The goal is 25% usage on the aggregate materials identified in Section 9-03.21. The Contractor has an option to use recycled materials depending on availability and economic feasibility. They also explained to the group about the concept of reclaimed aggregate and re-used aggregate. David explained how recycled materials submittal plans will be similar to Type 1 work drawings as identified in Section 1-05.3. Craig Matteson stated that he had a hard time meeting the SE requirement for some CSBC. David Jones informed the group that WSDOT is looking at using crushed recycled concrete in Commercial concrete and CDF. Bruce Chattin stressed the importance of WSDOT and Industry working in a collaborative effort to incorporate House Bill 1695. Bruce also explained the challenges of implementing this bill at the Local Agency level. David Jones asked the group if there is a list of recyclers and that it would be good to know where they are located. This would help determine recycling goals. Jeff Huff explained how Pierce County does not allow storage of concrete rubble unless some type of water mitigation is in place. David Jones informed the group that he will be meeting with PCCP people. He also stated that the PCCP group is concerned with GOK stockpiles. Robert Raynes stressed the importance of a good QCP when handling recycled concrete. David Jones indicated that the WSDOT is concerned about recycled concrete from non-WSDOT projects. Robert Raynes informed the group that concrete rubble has already been ASR (Alkali Silica Reactivity) mitigated; therefore ASR should not be a concern.

6/3/15 – David Jones of the WSDOT introduced the topic. Mark Gaines presented the bill which was recently passed require the use of recycled concrete. Bruce Chattin of WACA stated bill will be effective January 1, 2016. Bruce brought the following items ups;

- *What does WSDOT need to do this work?*
- *Where the DOT goes, the Local Agencies will follow.*
- *Do we need to look at the tables in Section 9-03.21 of the Standard Specifications?*
- *I don't think that many folks (WSDOT, Local Agencies, and Commercial) are using these tables.*

Mark Gaines asked the group for input on these tables and indicated there good applications to use recycle concrete. Greg M^{C}Kinnon of Stoneway stated there is concern with the term "Concrete Rubble" that used in the tables of Section 9-03.21. Mark Gaines suggested that the

term "Recycled Concrete" should be used. Greg M^C Kinnon stated that WSDOT should allow 100% use in Fine and Coarse concrete aggregates. Mark Gaines stated that AGC is concerned about its use. Greg M^C Kinnon indicated there are two uses; Crush it for concrete aggregate and mineral aggregate or wash the paste out concrete and reuse the aggregates. Bruce Chattin stated that pH is the concern, measuring the rubble or pavement on site is misleading. How do we manage on-site use? David Jones stated we have 25% usage goal and he stated that WSDOT may set goals higher or lower on WSDOT projects in specific areas based on availability. Bruce indicated there is a high availability of recycled concrete in the Puget Sound area and NE Washington in the Colville area. Greg M^C Kinnon stated that ideally re-using plastic concrete (returned) is easier to manage pH and water usage. Between 5 to 7% is shipped back to the supplier and 98% of that is cured concrete. Mark Gaines stated that goals would be set depending on the location of the project. Mark recommended that Class 3000 and control density fill (CDF) would be good products to use recycled concrete. Greg M^C Kinnon stated there is not enough volume for Class 3000, due to the AASHTO No. 57 grading. PCCP is the best place to use this material. David Jones explained that we will be working with American Concrete Pavement Association and WSDOT Pavement Team to discuss the use of recycled concrete. Greg M^C Kinnon explained that paving concrete uses AASHTO gradings No.467, No.4, and No.57 and the big markets are WSDOT, City of Seattle, King County, Snohomish County, and Pierce County. Mark Gaines asked if there was a cost savings using recycled concrete. Greg M^C Kinnon stated "yes". Bruce Chattin stated that using recycled concrete is a necessity. Greg M^C Kinnon asked WSDOT what is the risk using recycled concrete in structural applications such as Noise Walls. Mark Gaines stated he could see recycled aggregates used in footings. Greg M^C Kinnon asked WSDOT what is risk of using recycle concrete in structures. Mark Gaines stated the following;

- *I don't know, we don't have data for these applications.*
- *We have models of elasticity, but we don't have any historical data.*
- *We need a bigger discussion on this topic.*

Tom Weist of Oldcastle asked Mark if we should use the same process as we did with Self-Consolidating Concrete. Mark said this might be a good route to go. Bruce Chattin ended this discussion with the following statement; CDF and commercial concrete will not help WSDOT achieve its recycling goals.

3/4/2015 – David Jones of the WSDOT State Materials Laboratory explained that commercial concrete is a good application to use recycled concrete. He also explained there has been research using recycled concrete aggregates in pavement. Bruce Chattin explained that the concept of recycling is getting a better view. David Jones suggested that small groups be formed to address the different uses of recycle concrete and reclaimed aggregate. WACA explained that other entities (Local Agencies, Industry, and Commmerical) don't understand commercial concrete and they think it is class 3000. Bruce Chattin asked about using recycled in other mixes. David Jones explained that structural concrete would not be a good fit. WACA indicated that most of their work is structural concrete. WACA also stated that pavement would be good application for recycle concrete and reclaimed aggregate. David Jones asked if some of their members could review the specification that WSDOT has drafted. WACA asked if these new specification would be revised to address reclaimed aggregates. David Jones answered "yes". WACA also stated that City of Seattle will allow 10% recycle. Concrete suppliers have tried guarantees for using recycled materials in pavement in the City of Seattle

but this has not gone very far. WACA stated that City of Seattle is the largest paving market in Washington and recommends that WSDOT make contact with them. David Jones asked WACA to provide contacts from Seattle.

Concrete Mix Designs on Qualified Products List – David Jones

9/2/15 – David Jones presented the drafted revisions for Sections 5-05.3(1,) Contractor Mix Design for Paving and 6-02.3(2)A, Contractor Mix Design, to the group and asked for input about these revisions. Tamson Orps stated that yield adjustments are not addressed in the specifications. She explained that changes in the aggregates grading causes changes in yield, even though the aggregate is from the same source. Changes in the gravity of the fly ash may also contribute to change in yield. Mark Gaines asked if the tolerances were not broad enough to address changes in yield. Tamson stated that this was correct. Allan Kramer asked if there is a reason why WSDOT does not run unit weight. Mark proposed to allow yield adjusted mixes on the QPL. WACA members supported this. Mark then indicated that the specifications will need some contract language to address yield adjustments.

6/3/15 – David Jones of the WSDOT handed out the drafted specifications for Section 5-05.3(1) and 6-02.3(2)A and QC XX Standard Practice for Concrete Mix Designs to the WACA group and he asked for input from the group. David explained there will be two processes for approval of concrete mix designs; 1) Review thru the Project Engineer. 2) Or thru the QPL. Tamson Orps of CalPortland stated that we have a hard time getting strength data from the Project Engineer Offices. David Jones explained that strength data can be acquired through the SAM program for statistically accepted concrete mixes, such as Design Build and Portland Cement Concrete Pavement projects. He also mentioned that MATS has the ability to create an email list for test reports. Contact your local project office through the Contractor and ask to be added to the list. WACA indicated they want the actual test report. David Jones explained this information is in MATS and at this time Contractor do not have the ability to access MATS. David Jones stated the he would look into allowing Contractor the ability retrieve test reports from MATS. Tamson Orps stated that WSDOT does not address yield adjustments. Bruce Chattin stated we need latitude for change. Allan Kramer of Lehigh NW Cement Co. stated that a producer should be able to explain change and have time for change. David Jones ended session by reminding the group to review the revisions and QC XX and their input is important.

3/4/15 – David Jones explained the process of listing concrete mix designs on the QPL. Mix designs that are listed on the QPL will be approved for five years if there are no changes to the mix design. WACA asked if the WSDOT laboratory will verify the mix designs. David Jones stated "no" the process will be the same except the review of the mix designs will be performed by the WSDOT's QPL Engineer. Bob Raynes of Cemex stated that ODOT verifies mix designs which can be used on multiple projects. David Jones indicated we are in the process of drafting these requirements.

Issue: Pumping – Bruce Chattin

9/2/15 – Bruce stated that pumping can be resolved if these three following points were required to be addressed in the pre-pour meeting; 1) Require ACPA (American Concrete Pumping Association) certification for the pumper 2) a meeting every time before pumping, and 3) increase the participation of the pre-pour meeting to require the attendance of the Contractor, Pumper, and the supplier. Mark Gaines explained the challenges with putting these meetings together. Bruce stressed that meetings are important. Mark Gaines asked if there should be a meeting for each aspect of placement or just one meeting. Craig Matteson stated that it should be for each aspect of the work when anything comes out of the pump. Mark stated that he would look into the aspects of having a pre-pour meeting prior to pumping. Mark stated that ACPA certification is in place, and asked the group if they were still seeing problems. Bruce Chattin stated that they would still like to see the certification. Mark stated that ACPA certification addresses safety not materials quality, and inquired as to what benefit is added by requiring the certification. Bruce stated that still it would not hurt verifying this certification. Mark suggested making it a requirement that the pumper supplies a copy of their certification. Bruce responded that they just need to verify the pumper is ACPA certified. Mark stated that he will draft a specification and have it reviewed by the WSDOT and the AGC. Mark then asked the group as to why trucks are being rejected, can data be provided and what were the reasons for rejection. Craig Matteson stated that 1 out of 20 trucks are rejected for slump. Tamson Orps stated that she had three years of data of trucks being rejected. Mark Gaines proposed that air content be increased on the high end. Tamson stated that as the air content increases the strength of the concrete mixture decreases. Bruce Chattin stressed the importance of very robust pre-pour meetings at the worksite.

6/3/15 – Bruce Chattin updated the group about the second meeting with AGC. Bruce indicated that pre-construction meetings are very important and seemed to reduce the problems. Bruce brought up the following points of concern;

- *Pre-construction meetings*
- *The Supplier, Pumper, and Contractor need to work together.*
- *There are no specification requirements on pumping. The guidance there is pertains to safety and maintenance only.*
- *The concern with pumping is air.*

Mark Gaines stated there are things we can do. We would allow the air to go down to 3% if the mix design satisfies freeze/thaw requirements. Tamson Orps of CalPortland indicated it was not uncommon for the first truck to get rejected because WSDOT is testing pump truck slurry. Bruce Chattin stressed that the Contractor needs to be part of the process. Mark Gaines stated that we have the requirements for pre-pour meetings, does this need to occur before every pour. Bruce Chattin indicated there are changes every day. Mark Gaines asked WACA to look at the specification requirements and provide input. Bruce stated we need clarity in the specifications. Mark Gaines indicated that we need feedback. Greg M^{C}Kinnon of Stoneway explained the challenges they had on a project that changed pump trucks which caused the concrete to go out of specification compliance. Mark Gaines indicated this is something we can address.

3/4/15 – Bruce Chattin indicated that some headway has been made in this area. The American Concrete Pumping Association (ACPA) is also concerned about quality. Bruce explained that the ACPA certification addresses maintenance and safety but not quality. The pumpers will be at the AGC meeting this April.

12/3/14 – David Jones indicated that he did not want to discuss this topic since Mark Gaines from the WSDOT Construction office was not in attendance. Mark had been working with WACA on this topic. Bruce Chattin informed the group about ACPA (American Concrete Pumping Association) program certification. Bruce briefly explained the requirements of this certification. He recommended that WSDOT require this certification for concrete pumping. Pump operators have to learn about sampling and testing concrete. Bruce Chattin stressed that the following points need to be required; Safety, Sampling, Certification, Pre-Construction meetings, and Shared responsibility.

Issue: Quality Control Plans – David Jones

WSDOT is moving towards requiring QC Plans from material suppliers. Discuss how this will affect WACA members.

9/2/15 – David Jones updated the group on implementation of the WAQTC program within WSDOT.

6/3/15 – David Jones asked WACA for input on Quality Control Plans for concrete mix and aggregates.

3/4/2015 – David Jones explained the status of WSDOT's adoption of the WAQTC system. David explained that WSDOT IAIs (Independent Assurance Inspectors) will be WAQTC qualified by this fall. The IAIs will qualify WSDOT testers in WAQTC test methods and the goal is have this completed by 2018. David Jones also explained that ACI certification will be accepted for concrete testing. David Jones stated that we anticipate that we will need a partner from the AGC to assist in qualifying Contractor personnel. David Jones explained by 2017 most of WSDOT will be WAQTC qualified and then WSDOT will have an interest in quality control plans from concrete suppliers.

12/3/14 – David Jones explained that requiring QCPs from industry will be sometime after 2018. WSDOT's goal is get all of the department's testers WAQTC qualified by 2018. WACA asked if ACI qualifications would be recognized by WAQTC. David Jones stated yes for concrete testing. WACA indicated that ACI also addresses aggregate testing. David Jones explained what states are participating in WAQTC and what the WSDOT systems would look like. Bruce Chattin stated that WACA would like to participate in these meetings and we have very talented people within our organization and we could help. David Jones explained that currently WSDOT has two programs; Design Build and Design Bid Build and WSDOT needs them to do the same thing. Bruce indicated that WACA would like to assist in the ACI portion of this program. He also asked David to send him list of WSDOT personnel who would be interested ACI certification. David Jones indicated that would be WSDOT's Regional Materials Engineers. David Jones reminded the group that WSDOT is just looking at adopting WAQTC test methods for field testing only.