

# WACA/WSDOT Meeting Agenda For Wednesday, March 2, 2022

*Day/Time: Wednesday, March 2, 2022, on Microsoft Teams, 10:00 AM – 12:00 PM.*

## **In Attendance: (31 people?)**

Michael Liger

Steve Landers, WSDOT

Donny Henderson, WSDOT

Bruce Chattin

Dan Needer, Sika Fibers

Danika Washington, WSDOT

Michelle Britton, WSDOT

**Next WACA Meeting Date:** *Wednesday, June 1, 2022, on Microsoft Teams, 10:00 AM – 12:00 PM*

**Future WACA Meeting Dates:** *Wednesday, September 7, 2022, on Microsoft Teams, 10:00 AM – 12:00 PM*

## **Meeting Minutes are available at:**

**<http://www.wsdot.wa.gov/Business/MaterialsLab/WACAMinutes.htm>**

## **New Business topics:**

Donny: First quarterly meeting. I spent time since our last meet and greet to see what notes I could find to figure out what topics we would like to talk about and move forward. Representatives from WSDOT will chime in at any time if they have updates on any particular topic, so it's an open forum. He has the agenda up with notes on the different topics I'd like to go over and some old agenda items I found to look over and see if they have been resolved or if there are further questions that need to be gathered. If they are completed, then we can take them off of future agendas and concentrate on current topics. We have tentatively set Wednesday June 1<sup>st</sup> and September 7<sup>th</sup> at the same time. The link that takes you to the meeting minutes is currently not working. We have a new website and we're working through some kinks and updating links and content, so it will be accessible for everybody. Hopefully we'll get this link to work once we have those updates implemented.

Bruce: Prior to Todd leaving, we had a chat and the opportunity with Todd and Darrin to lead the chairs to look at the older items on the agenda as they have been resolved. Really, our goal was to look more into the constructive things we need to address so we can move together as an industry and agency so we're communicating. Unfortunately, over time, a lot of times, material suppliers are not contractors. We don't get the first bite of the apple or even get to see the apple. That's been a frustration over time. My goal is to elevate where we are as materials suppliers and have more of a role. A first responder's type of ability as a stakeholder for things WSDOT moves on. We can do a lot of research around concrete, what's working, what's not working, and the goal is to make this easier. One thing that should go on the list is C94 pulling off the 90 minute time frame. That's an opportunity because one thing that's on our list that I always want to keep there, we can't be rejecting trucks as often as we are. It doesn't mean they're arbitrary, but our ability to take the material back and recycle it is limited. We need to use it more. To get rid of concrete for something fairly minor like 1/10<sup>th</sup> % of air, or an inspector sees this and our

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guys see that, etc, this gives us the opportunity to modernize explore that.

Donny: Sounds good. I want to work with you and be a resource for you guys to reach out to when you have questions. Fortunately, we have a lot of SMEs that work with us on a daily basis that can help provide further information or even make changes necessary to improve the processes going on. I think that's the big value of these meetings, to put these issues to the forefront and address them, and figure out a way to move them forward.

Bruce: Be partners.

Donny: Again, I've been in this position for a few months now. There are a lot of things I'm trying to get up to speed on. With your input, it will help me figure out what direction I need to go to move them forward. Anybody who has information on any of these topics, feel free to chime in. We'll have a good summary of the meeting minutes and what we talked about, and it'll be a good starting point as we move through the rest of this year.

### **Proposed Pea Gravel Specification:**

Donny: The first item that was brought to me was by Garrett Webster. There are some attachments in the email from management on this topic. Discuss with WACA Team on development of a pea gravel specification and as part of that process we can determine where to put the specification in section 9-03.

We have the AASHTO Grading No. 8 would produce a pea gravel mix if there were no requirements for crushed material. See standard spec. This AASHTO number is very close matching to other gradations, should we attach pea gravel or create a standard specification that's based on AASHTO No. 8 gradation. Documentation provided out of our Construction Manual and Standard Spec. This is something we could implement in 9-03.

Bruce: Why are we needing it? What are we trying to produce or solve?

Donny: That's part of the information I don't currently have for the why. It was just a topic brought to my attention that I wanted to bring up with the group.

Bruce: It always helps with the why and how. A lot of guys will have comments on that. Is this an opportunity to recycle concrete aggregates?

Donny: It could be. We can see if it's an opportunity for that.

Bruce: I know Chris and others are looking for ways to use recycled materials.

Bob Raines, Cadman: We use AASHTO Grading No. 8 for pea gravel across all of our businesses. I'm sure the other suppliers do to. It's not a standalone product, it's proportionate to concrete. It is compactable, there are no voids being created by it. I guess I'm not quite understanding what the issue is because we've used it to aid in all over our drill shafts, some people like to put a percentage of that, for example a 57 stone mix that you want to bring the

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middle up a bit, they may bring a couple hundred pounds No. 8 in there to tighten the spec or get the grading closer to the max density curve for bumping purposes. I guess I don't see where the requirement for crushed materials comes in. Our Grading 8 doesn't have any crushed materials in it, it never has. This is kind of surprising. I don't understand what the question is.

Donny: I think this is for a pea gravel mix, if there was no requirements for a crushed material, is what they're trying to accomplish with this potential spec update.

Bob: As it stands right now, it's optional. If you want to make a crushed No. 8, that's fine. You're going to proportion that mix based on its density, voids, and how you want to proportion sands to go with it. It'll work either way. There are gaps in gradation where the supplier is using the crushed portion in that grading band to meet a spec too. I think you're going to see all kinds of combinations on that as far as the crushed section goes.

Donny: Appreciate your input on that.

### **Green Concrete:**

Donny: I did receive an email from Rob Shogren on ASTM C-1157 GU cements that have 25% limestone.

- Kurt Williams checked with Colorado DOT and provided the excerpts below:
- *“For all concrete mix designs with ASTM C1157 cements, the total pozzolan content including pozzolan in cement shall not exceed 30 percent by weight of the cementitious material content. Up to a maximum of 30 percent slag cement by weight of total cementitious material may be substituted for cement.”*
- *“ASTM C1157 Type GU, consisting of no more than 15 percent limestone”*

I want to bring this up with the group if there's any input on what has been discussed in the past as far as green concrete and what's referenced in the agenda. Feel free to share that with the group.

Rob: Lafarge, Lehigh, Ash Grove, St. Mary's, and a few other companies have started a research project with University of Toronto Manitoba, Texas, a few others, looking at ways to decrease their global warming potential, their cements from 2030 to 2050. As you know, we've been working with GU Type IL cements in Washington for over a decade, so I thought I'd bring it up now. We've been producing the cement in Oregon. I've been talking with Oregon DOT as well as ministries up north about these cements. They're starting to become available, so I sent Kurt an email if they have a stomach for any of these things. As some of the ready-mix guys know, they use limestone filler as a replacement in some of their STCs, so I just want to start the conversation about some of these more innovative cements. C150 only allows 5%, 595 allows 15%, 1157 is a performance-based cement spec, it allows people to innovate as long as you can

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get the performances required- abrasion, ASR, sulfate, etc. I want to start the conversation about these other cements because before we know it, there's going to be a demand for them.

Bruce: The other thing that kind of kicked this off, Rob and Todd asked how do we get green concrete? How do we define it? Our goal is to help DOT achieve objectives with green concrete however it may be. Rob and so many other guys in our group have been waiting on the path of this for private contracts. I know you want to be sensitive to what other DOTs do, but it would seem to me that we can get someone from DOT to define what that means. Who is the assistant deputy director? Appointed within the last year?

Donny/Pat: Amy Scarton

Bruce: I sent her a couple of emails trying to introduce myself and present that same information. I didn't hear back. Concern would be before the DOT goes too far down the path of creating something, this is a big deal where constructability is very important. Rob mentioned performance specifications. That's the way we see this going in the private sector. With the materials we have, I'm pretty sure that would be a lot of our preferences as a formidable option. I would like to sit down to put together a small task force of people who can help DOT understand this and what they're looking for so we can move down this path together. I'd love to have Secretary Millar, Chris, and others be able to say that DOT and the working industry has been able to reduce their greenhouse emissions by X percent and are definitely showing some leadership. I would like to help you build that.

Donny: I can work with Garrett and Kurt to talk about the topic and see what our best course of action is to bring it up and move forward with it and see what different challenges there might be, or questions that might come up that we can bounce off of you guys, and get more information on and work through it that way with a group of individuals. Maybe a smaller work group would be a good idea for this, if there's interest.

Rob: Jason Wise at Oregon State is also working on this topic for the cement producers. We have a couple projects going on in the Wilsonville area to work on these cements, in case there's any interest in talking to him

Bruce: Sometimes, especially with agencies, well-intended aspirational goals get in the way of our ability to achieve or goals, because they create things that are not practical for our buyers.

Donny: I think as we work through the process together, those questions and concerns on your guys' end get brought up to the forefront so we can try to address those as we work through the process.

Bruce: Ready to help and grant any resources we have. We need to have a meeting with SME to have a conversation so we can go forward.

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Seth: Just to circle back, about a year ago we sat down and had a beginning conversation on framework around what the DOT was trying to achieve in terms of expectations or how specifications could be expected to be received from the suppliers. I don't know that we connected the two dots there, but that was going to start with some education internally with our group.

Bruce: You're right. It stalled. I think we were also waiting to find out what is DOT looking for. We're going to get pulled in a different direction, so I want to get all of the information out on the table so we can define specifications and material availability. Eg: recycled materials, when, where, and how it's going on outside of Washington. Let's maximize the opportunity sooner than later.

Dave Berg, Ashgrove: There is something happening in our industry that has never happened in my career. I worked for cement companies and we haven't really made new products in the last 20 years. The IL cement has taken off in general, is just the start of things. The cement companies have these aspirational goals to become carbon neutral. That's going to need change. Our way of doing business with Type I/II cement is going away. I don't know when it's going away, maybe next year or 5 years from now. Our company makes a lot of blended cement in Nebraska, and that's because the DOT specifies it for ASR reasons. Normal Portland cement is on its way out. We're going to be adding stuff and part of it is for what we're talking about now, it's for the green movement to be more sustainable and that could change how cements perform, and our expectations on, let's say, 3-day strength. That may be different with that kind of cement. That's kind of a big picture. Things are changing. I've worked for Ash Grove for close to 20 years, and now is the first time we've made a new product, and it's going to keep coming.

Bruce: Constructability is an issue for contractors. Once we get a good understanding of what DOT is talking about, we should bring contractors too. It will enhance or alter performance, and we have to be mindful of their role and considerations.

Steve Landers: When we have meetings, we all want to move toward greener products. One of the problems I see is that our designers and management philosophy is very risk adverse. Until we see these products being used successfully, that's what's going to push us into spec'ing those items on projects. From the industry perspective, we need to see some examples of projects using some of these green products, that way we have actual data to look at. As a department, we're data driven. That's the perspective of a materials guy. That's how things have been approved in the past. It's tough to expect a concrete structure to go up when we've seen issues with concrete in the past and knowing the risk/reward of putting a new product out there. When it goes bad, it's a big black eye.

Bruce: That's a good point. We really need to help and support you with what you need to move forward, and we need to know what it is that you need.

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Donny: Monitor the performance and collect the data for moving forward with things. Thanks, Steve, that's a good point you brought up there.

Anthony Mizumori, WSDOT Bridge & Structures: How far along is the development for the other cements? What sort of progress has been made on the private sector? Specifically, are there cement types that industry thinks could be a substitute for current cements?

Rob: I can talk from Lafarge's standpoint, and I'm involved with the other three on research projects we have going on

From a lot higher limestone percentage standpoint, people get tired of hearing it, but in Europe, they've been using it for 20-30 years. They have different durability classification ranges for higher limestone. I have information and data you could swim in if you want to see it. We're building off of those successes in other countries. This is one time we're ahead of the game in the US. Canada does not have a performance based specification. Theirs are very prescriptive like C150 and C595. The Canadian Research Council/Canadian Standards Association (similar to ASTM) has funded these research projects. They have a goal to be carbon neutral by 2050, and a 30% reduction by 2030. They're trying to accelerate this stuff, so have a lot of data for limestone. From other, alternative SCMs like ground glass, there's lots of data out there. Non-hydraulic cements cured with CO2 is available. There are a lot of stuff out in the industry we're using in blocks and paving that we haven't even brought up in these meetings. There's more than we can talk about in here, but there's a lot of data out there that supports this stuff. We start this process with IL with WSDOT in 2015 and got approval in 2017 after many meetings and showing data from around the world. We're prepared to do that, it might not happen overnight, but it needs to be discussed on a regular basis. Dave Berg is absolutely right on his comments C150 may not be here in a few years.

### **Synthetic Fiber Reinforced Bridge Deck Concrete:**

This topic was discussed in the meeting minutes from September 16<sup>th</sup>, 2020.

- **WACA Meeting Minutes from 9/30/20:** - Anthony Mizumori of WSDOT discussed the current state of the topic after the draft Specification was introduced at a previous WACA/WSDOT meeting. Anthony stated that the intended pilot project was delayed and could be pushed back to June of 2021, and they are looking for other potential pilot projects.
- **Comments (Diego Coca email 2/2/22):** I believe we talked about fibers in the bridge deck mix in a past meeting, but this is the first time I am seeing this in the specials. This is a very specific test and only a few labs in the nation can run it. I have been told by several fiber manufacturers that the mix design has no bearing on the results. Are we going to have to run this test with each mix design or would something like the attached with a generic mix work?

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5. Residual strength ( $f^D_{150}$ ), taken as the average from three 6-inch by 6-inch specimens, shall be greater than 185 psi in accordance with ASTM C1609.

- **Comments (Bruce Chattin email on 2/14/22):** Limited number of labs that can run the test according to Diego Coca.
- **Question (Bruce Chattin email on 2/14/22):** What are we trying to solve and, in this case, is the cost, time to get the test completed and turn around worth it?
- **Comments from Anthony Mizumori (email on 2/14/22) regarding the SR 16 and SR 302 Purdy Creek Project:** Yes, the intent is that this test be run on the actual concrete mix. This is a pilot project, so we feel it is warranted. But we have discussed this with the WACA-WSDOT group in the past and are looking into streamlined processes if the use of fibers is more widely adopted (perhaps through a QPL process).

Anthony: We're looking to use synthetic fibers in our bridge deck mixes to control cracking and we constructed on modified concrete overlay, using fibers where we basically borrowed Oregon DOT's spec and put together a pretty prescriptive spec, and that was successful at significantly reducing cracking and or overlays. We're looking now to roll it into bridge decks, specifically, and we have two pilot projects that are advertised or nearly being awarded- 33 on SR-16 and Cabin Creek I-90 over the past. For both of those pilot projects, we put some of the language requiring a residual flexural strength test for these fiber reinforced mixes to demonstrate this 185 PSI target that we have in mind for building any future specification around. Some of the feedback initially is the difficulty of getting this test performed, which, based on previous discussions, we were aware that that would be a challenge. In the long term, that's probably not the best approach for getting routine bridge deck mixes approved so we will see how these two pilot projects go. They don't seem particularly high risk from my standpoint. We're anticipating success and from there, if we're able to eliminate cracking, look to develop some sort of GSP or standard spec for this to incorporate fibers into the mix. Because fiber seems like it can be incorporated into existing concrete mixes fairly easily, and not entirely mix-dependent, that the QPL route would be a good avenue for incorporating fiber into the deck mixes. The QPL route would eliminate the amount of performance testing that would need to be done on bridge decks in the future. Writing that spec would be something where industry info could certainly be helpful and establishing that playing field for different fiber suppliers

Pat: Would Bridge look at adding fibers as an admixture or would it be added in separately like steel rebar is in a structure?

Anthony: We're not relying on it from any structural standpoint. I think an admixture route could be viable. Personally, I'm not too involved in the mechanics of how it gets incorporated as long as we're getting consistent crack control performance out of it, whether it's QPL or admixture,

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I'm open to any ideas for how the specs ultimately develop.

Dan Neder: We've done numerous breach decks with Caltrans. In Northern Cal, in certain areas where it saves \$10 million in crack repair. We do a blended ratio that's been successful there, so there are alternatives out there to make it easy for the batching plants to do this as well, so they don't have to buy multiple products.

Rob Raynes: So can someone explain to me why residual strength is important in preventing a deck from cracking? I've seen this testing done around tunnel work, overhead, safety factor, etc. of that nature, but I don't really see how that prevents cracking. I'm not saying anything negative against the fiber use. We do that in Oregon in decks, but I don't quite understand why this testing applies to a bridge deck?

Anthony: We aren't looking for residual strength from any of our design practices or equations. This was based on feedback from fiber suppliers on a reasonable test that could be performed to establish an appropriate dosage rate for different types of fibers. Ultimately, we're looking to control shrinkage, cracking, and thermal cracking, not flexural cracking up. This is an around way to get to that performance using a test that's understood to be somewhat standard and the preferred test for measuring crack control and fibers.

Bruce: 1690 - isn't this test designed for different applications versus crack control? And if you're trying to establish mix design proportions, is this the best method?

Rob: The only time we use this, or that I've been involved in, was the light rail tunnel in Portland and going under the South Hills. It was a safety reason. We were using steel fibers and the problem getting specimens that met the spec under flexure. An elaborate gangsaw was created, test panels were built, the whole thing was keeping those cuts parallel, so the beams that you cut out are true and meet the spec of the beam and you're not getting forces that are unintended. So it was fairly complicated. We had to bring special consultants in. They're the ones that proposed the design of the equipment to be able to get a valid test. It was a postmortem safety factor, there's going to be some resistance to a failed situation which is not going to be catastrophic. It was simply their safety test for us. If you want it improve your crack control in your decks, that doesn't seem like the test to do it, and it's a very complicated test that's hard to get good data and and what does it mean once you get it? Maybe there's a better test for what you're trying to achieve, and then that particular one. The guy that we talked with is kind of the expert on this was Rusty Morgan. I don't know if he's still around, but he might be a person to chat with about what your objectives are.

Chris Papich: I think the 1609 test is where the residual strength is specified, because that's what all fibers are judged on. It levels the playing field for everybody. When you say 185 PSI from a manufacturing standpoint, you know what your fiber does or what your dosage rate is going to be to achieve that 185 PSI. That specification is a free for all at that point. My guess is that's why



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the residual strength is specified, the 1609 tests really dictates what that dosage is.

Bruce: Thanks for correcting me on the 1609 versus 1690. The 1609 test has nothing to do with the mix design. It's after the flexural strength has achieved what it's achieved and they're looking to see what the contribution of the fiber is in that condition. We've changed collectively with the DOT with crack control and bridge decks because we know that's the number one, super critical priority application. Mix designs, materials, and all of those other things to get high performance mixes to manage the characteristics of fresh concrete to reduce crack control over bridge decks has been a long term goal. If the test has nothing to do with the mix design yet, is it not the mix design that still drives the outcomes for improved crack control? If this test is for what all fibers are judged on, it may be true for that application, but not true for crack control and you might come up with a number that is meaningless, or it might be helpful, I don't know. Fiber guys would know better. Kevin would know better, but it just seems like we're trying to supplement something that may not apply.

Dan Dieter: We're using ASTM C 1609 testing for all fibers with our Sika brand as it gives a more stringent requirement for us to meet. It also gives a true loading and strength of the actual beam and the fiber on it. Rather than having the old 1399 test where there's an actual steel plate under the specimen, this does not have that, so you have two actual load clients of bite load. That's the test we've been using for the last couple of years, where it's a little more stringent perhaps, but there's more accurate readings.

Bruce: You're creating a very specific application. You're trying to define what the proper addition rate is for your product. That's not necessarily what the goal is for crack control. Then given the limitation of who can do the test, and most of the manufacturers are the ones that can do the test, because there's limited amount of equipment, the manufacturers are not going to be viable third party, independent people that are going to run the test, in addition to the cost and time. It seems we're going in one direction to fix a problem that's not related.

Rob: This may not be related, but you get a bunch of tests like this that are ganged up on mix design and in this world today, we're seeing cement changes, SCM shortages, there's all kinds of things that are happening. With these tests, it's expensive, it takes time. Time is probably the greater thing because we're not getting (early) notification on when changes are being made and it really complicates things. This adds to the problem. If it doesn't give us something that's crucial for the performance of that concrete, then why? Would you use that and it wouldn't matter what the other constituents in the mix are? Or would you have to run that test with the exact mix design? And if you had to change fly ash or take fly ash out and replace it with slag, how does it affect those things? Maybe I'm going down the rabbit hole, but I look at things like this and go, "man, that's going to be another obstacle."

Pat: Earlier I asked, "Should we look at fiber outside of concrete mix design issues and treat it

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more like steel rebar?” for these concerns and reasons.

Bruce: If we're trying to determine addition rates, that's not the purpose of this test. The addition rate of materials is going to be almost innocuous to what the test determines. Because the test is static for any one type of material, the additional range will probably only fluctuate just a little bit. If we're really trying to get something to where we could better analyze fiber products for crack control and get to an addition range, whatever the strategy is going to be, then let's focus on crack control, not on an unrelated test to show that people can determine who's got what addition rate for a test that doesn't apply for what the DOT is trying to manage.

Anthony: I certainly hear all the challenges about the, mix design and approval. That's why we're certainly open to more streamlined versions, whether they be treated as a QPL item or lump it in with admixtures. These pilot projects are trying to validate the target that we would ultimately use to qualify fiber as an admixture, or some other mixed component in the future so that it could be streamlined. While crack control is our main concern, the challenge with running crack control tests are: 1. there's a lot of scatter in the data and 2. those actually are much more dependent on the mix itself, which makes it harder to isolate the fiber from this. This test has the benefit of being less related to the mix itself. We can break it off and set it as a target to achieve for a given fiber type and a dosage rate. It is an indirect measurement of crack control, but it simplifies the specification processes as part of the benefit.

Bruce: I would suggest in the wrong direction. It would seem to me, given the gentleman's comments from Chico, if what you're trying to do is crack control, they presented this test as an alternative way to be able to determine the dosage rate for products. The QPL is the proper place for something like this. I would task the fiber companies to go out and get the data for use of fibers in bridge decks relative to improvement in crack control, and all the other data that sets points that you would like to see, Anthony, so that they can come back with either test results, data, etc., that directly serve what you're trying to accomplish, rather than, "Let's do this and see if it works."

Anthony: In the feedback I've received from the fiber companies, this is the test they've recommended.

Mike, GCP: I think what we're getting at, is that this should be a QPL fiber deal. We have a dosage rate in Oregon that's approved for bridge decks, and it doesn't matter which supplier uses it, versus a mix design in specials on every individual job. I think that's the complaint- each job having to do a test would be much more onerous than having each fiber company establish the data.

Chris Popich: Every DOT has their own. Caltrans is not a performance based, it's just dosage based where they use 3lbs of a macro fiber combined with a 1lb of a microfiber. If you go to Oregon, theirs is 185 residual PSI. If you go to Iowa it's 170. If you go to Colorado, it's 150.

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Everyone has their own specification, but as specification across the board is 100% driven by 1609. I think that's the only standard fiber test everybody participates in. Dan mentioned that the prior testing with ASTM wasn't accurate and was very much mix design driven. The 1609 test is absolutely 0% mixed design driven and 100% based strictly on fiber.

Bruce: What would be a better approach, Anthony, where we can help you utilize the benefits of fibers for potential crack control and other attributes that fibers bring to the mix designs? How do we help get you the data that you want to see on improving crack control in bridge decks? Because of this test doesn't give you good data to improve crack control on bridge decks, their most critical element, we haven't accomplished anything.

Anthony: With these two pilot projects, if they use this spec and can demonstrate that they are effective at controlling cracks, we would look to keel out this residual strength requirement from our concrete mix and develop it as a standalone QPL admixture spec. That's been my strategy.

Bruce: There were a couple pilot projects, given the limited availability to have the tests conducted, it will probably be at significant cost, who is going to pay for that? Is it up to the supplier?

Anthony: From WSDOT's perspective, we're putting that on the contractor.

Bruce: If we're trying to find out fiber dosage rates, we could have those fiber companies do that.

Anthony: If this 185 PSI target works well, we would look to establish that as the target for this test. Fiber providers could target and submit a QPL application for their various fiber products, and then there would be a list that suppliers could choose from without having to do any additional performance testing in the future.

Diego Coca, CalPortland: We're looking at one of the pilot projects. Are we saying these are on the QPL and I only need data from the fiber supplier to show that they've met that before, or are you asking us to do it on our specific case?

Anthony: These two pilot projects are set up to run this test with the actual mix design.

Diego: The problem that I'm running into, I have two different plants that are giving service to these projects. So that's two different mix designs I'm going to have to get testing done. I want to be competitive, so you said 3lbs has worked in the past. If I start at 3lbs, get that tested and then they fall short, it pushes it back. Now I have to try 4lbs. That's already 4 mix designs I have to run this test on, and if it ends up being 5lbs for whatever reason, wouldn't that be six tests? etc. In my specific case, it's the fiber that needs to be tested. If one of the fiber suppliers shows data showing that 4lbs for that particular fiber works, wouldn't that be the best way to do it?

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Pat: I am not sure that there's any fibers on the QPL presently, so it would have to come through the RAM process, request for approval material source, and I will keep our RAM engineer up to date on this.

Anthony: If there's multiple dosage rates that you'd be looking to investigate, they would warrant additional tests. One of the questions we are looking to addresses is, "Is the dosage rate to achieve this residual strength dependent on the mix at all?" Based on the discussions today, I'm hearing it is absolutely not dependent, but I think one value of running these tests on WSDOT specific mixes, is that it provides a couple data points to work on that assumption in the future. We can point to these cases and say, "Yes, you know the performance in our mix matched the testing that the fiber manufacturers have done independently on different, but maybe sometimes very similar, mixes." And that supports our willingness to move forward with the spec and leave it up to the fiber suppliers to test their products on the reference mixes in the future.

Bruce: How are you going to relate the results to crack control?

Anthony: The cracking within the pilot project is essentially going to be the basis there.

Diego: What are we going to be comparing it to?

Anthony: Our typical bridge decks, essentially. Are we getting the benefit of crack control by the inclusion of these fibers? We've surveyed several bridge decks that have been constructed using the more updated 4000b spec and we've got measurements on the frequency of cracking that's still there, and it's obviously much better than prior to us moving to the performance spec, but we're still looking for additional crack control beyond what we're achieving, just with the SRAs. Both projects are parallel bridge structures, so there will be one or more decks constructed without fibers and some bridge decks will have the fiber included.

Bruce: Donny, this is a good example of how there should be a call before something shows up in the addendums or the pink sheets, or what have you. And now we're having a discussion post that. We could have had this conversation in advance, maybe influence what the specifications were going to actually provide.

Donny: Making sure we're doing these meetings on a regular basis, working with Anthony and other individuals, any information of potential pilot projects coming up in the future, we will hopefully be able to talk about these issues and bring them up in the meetings prior to a project being started. I'm hopeful that's how we will move forward with these regularly scheduled meetings, so these questions can be asked up front.

Bruce: Is this going to move forward as it's already been proposed or are we going to take a step back? Consider this before people start going down a path that may or may not have to? So, why and what are we getting out of it? If it's going to be directly applicable, maybe if we're going after crack control, maybe there is a different way to approach this and the use of fibers directly

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benefit that priority for the DOT. Are we already down this path or are we going to consider the discussion we just had?

Anthony: Two pilot projects have been advertised, the spec is out there. One of them will be awarded shortly, so those are in the works and the spec has been written. That's not to say things can't be considered under contract. There's a lot of players in making changes to a contract that's been awarded. If there's alternate proposals, I think we would take a serious look at them to accommodate the testing more readily, or at least reduce the schedule impact of these tests if fiber suppliers have some data they can show that shows that this project-specific mix wouldn't be significantly different than the test results that they've gathered on similar reference mixes.

Bruce: I think I would just do that as a general call, Anthony. Regardless of what happens with this spec now, let's say Diego can provide an alternative. He talks with his fiber supplier or whomever and be able to provide you data beyond or outside of what the specification calls for these two pilots relative to crack control. I would ask the fiber companies to compare the information that can be submitted, because they have great resources available to them, on where fiber has been used for intended purposes of cack control if it exists and/or if not, or if it does, how do we do a pilot project around data specifically for crack control. That way the material guys and the rest of them can participate and at least be going in the right direction.

Anthony: That makes sense to me. If there's alternate tests out there, we can certainly entertain them. Again, this is the test that has come from the communication with fiber suppliers today.

Bruce: I wouldn't make the basis on that, but OK.

### **ASA Work Order Turn around:**

The Business office has hired an individual to process work orders for our evaluations. We have noticed that the lead times for evaluations have been improving.

### **Parent Company & Subcompanies - Reimbursable Agreement / Vendor Number Clarification:**

If the parent company would like to use the parent company's Statewide Vendor # on each agreement, that can be done. But we will have to communicate with the business office if the subcompany's name is listed on the initial letter and budget sheet instead of the parent company's name. Each MEP evaluation will always have its own reimbursable agreement issued.

### **Question from John Emerick (ASA Engineer) on 2/16/22:**

Can a contractor call and set up the vendor number before the budget sheet and letter are sent out?

### **Answer from Kristy Vargas [yargask@wsdot.wa.gov](mailto:yargask@wsdot.wa.gov) with our Business Office on 2/16/22:**

Yes, I encourage contractors to get the vendor number set up so, when they get the letter from you (ASA Engineer), we are all set with a vendor number, and it won't be an additional "hang

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up”.

You (John Emerick: ASA Engineer) can have them email me (Kristy Vargas: [vargask@wsdot.wa.gov](mailto:vargask@wsdot.wa.gov)) and I will give them the Statewide Vendor Form to fill out and directions on where to send it.

### **E-Ticketing Issues with Aggregate and Concrete Tickets / Updates coming to the Construction Manual:**

The WSDOT Construction Office and the State Materials Lab Quality Assurance Section are working on updates to the Construction Manual in Chapter 9 and 10 to incorporate the use of E-Tickets.

Bruce: Is there any way to be able to participate in the language for the construction manual, get a heads up, or have an idea what the direction might be, so if there's any input that the guys need for tickets, that would be the time to do it as opposed to once it gets published?

Pat: Kevin Waligorski from HQ construction is heading up the e-ticketing committee. He took over from Marco, so feel free to reach out to Kevin.

Bruce: Kevin, any way we can help you when this moves forward so we can avoid surprises later?

Kevin Wailgorski, WSDOT: We're not making any adjustments to the spec book. We're just trying to update the manual to reflect what is in the spec book. If you have any suggested changes to the spec, that will create a new conversation. Right now, we are still holding how the spec currently reads.

Bruce: How's it working? Kevin, it would be a good idea to have that conversation at some point now we've got almost a year of eticketing.

Kevin: We did an internal survey on how it's working. Most of the information we're getting on that is based on wait tickets, paving, those types of things rather than the concrete tickets. I'm not sure how many contract vendors are actually using the etickets yet. I'm seeing them take a photograph of the ticket and then emailing those from the concrete side. Some of the comments that we received were with regard to timeliness of receiving tickets. They're not getting them before the material is being incorporated into the work. I think our construction manual still has language that says we need to sign each ticket, but some offices were printing out the electronic ticket, initially or signing them, and then scanning them back in. Those are the types of things that we don't want to be doing, so we want to clean up the construction manual to fix those requirements. I don't have as good of a feel of how it's working on the concrete delivery side of it.

Bruce: That's good information to have. Is there a need to do a check in or check up on etickets coming over time? Maybe at the next meeting or a small group to notes.

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Kevin: We can do that. Each year we have the opportunity to evaluate how things are working and make adjustments to the specs for the upcoming season. If you can get some feedback from the industry side on how things are working, I would certainly be interested in having a conversation.

Bruce: Is that time now?

Kevin: The book is already out for 2022, but we will certainly be looking at stuff for 2023.

Donny: We can talk about who we want involved in that group and set up a meeting. Kevin, I can reach out to you and we can get a list put together internally, then let Bruce put together a list of people that he'd like, and then set up a meeting.

Bruce: Sure, let's at least ask the question if there is a need for discussion, that would be helpful.

Kevin: There's a couple different ways to go about this right now. Our state kind of the puts it on the contractors. Whatever system you're using, modify it or figure out a way to send us the electronic copy of the ticket- in an e-mail or if you have a website or something that you're posting it to so we have access. Other states are either dictating ticketing system vendors to use or using a centralized portal system. There seems to be different ways that different states are doing it. We're just asking for an electronic copy of the ticket. Some states are going a little further and saying give me the electronic ticket data with a specific format. We don't want to force all the contractors into a one size fits all type of thing, but we also need to make sure that we're getting the data or the information that we need in a timely manner.

Bruce: Marco worked hard to get consistency. I haven't heard anything, so maybe we can make the assumption that it's working really well, but there's always opportunities to connect and then keep moving it forward.

Donny: That's end of the kind new business items that I had found. Some of these old business topics were on notes that I found. We can either take them off moving forward or if further discussion needs to be held on any of them, we can do that.

### **Old Business Topics:**

**Recycled Concrete Aggregates with MSE Walls topic from 9/30/20:** - Todd relayed to the group that there have been some questions recently about using Recycled Concrete Aggregate (RCA) for gravel backfill for walls for MSE walls.

- Any comments on this topic?

**Naturally Occurring Asbestos in Aggregates topic from 9/30/20:** – Todd Mittge relayed to the group that they might see something coming from WSDOT regarding naturally occurring asbestos, as it looks like it will be examined more closely as a safety concern.

- Any comments on this topic?

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### **Discussion on Global Warming Potentials (GWPs) for Portland Cement topic from 9/30/20:**

Todd Mittge stated that in January of this past year, a small group met at WACA headquarters to discuss how Environmental Product Declaration (EPD) and Global Warming Potential (GWP) requirements were moving through legislature, and that ultimately, the legislature did not implement any new laws.

- Any comments on this topic?

Bruce: Let's have a conversation on that on the last one- sustainable concrete work group. On the asbestos, I understood at one point, this is another reason to reach out to Amy Scarton, the DOT was developing some form of policy relative to asbestos. They went through a process of coring about 300 holes into the brand new Alaskan Way tunnel project, based on potential and found nothing. Had they asked about the aggregate used for that particular project, they would have found that it would have been an unnecessary concern, because they were looking at it from an aggregate standpoint. This is an important issue. There have been areas of the country where this has come up and it's also been attributable to court liability and folks chasing potential legal issues. If there's something going on policy development wise, we'd like to be plugged into it because we have a number of people from around the country that could speak to it that have been through the battles. If you could find out what the status of any NOA discussion of policy development is, that would be great.

On recycled concrete aggregates, Marco was working on the ability to have RCA used and approved on MSE walls, perhaps with some modifications to materials behind the walls. If there's an update to be able to use recycled materials in that application, that would be great.

Scott Sargent, WSDOT: I have some quick input about the eticketing. I just talked to Michelle Britton, the state specification engineer, and if you guys are proposing changes to the standard specs, those need to be in to her, at least as draft form, by April 15th. She's in charge of the standard specs and pushing through for all approvals.

Donny: I don't know if she was invited to other meetings, but it is something that I could talk with her about. Are there any others topics you would like to cover or discuss?

Elijah (cement products?): Can we jump back to that pea gravel? I think I might have a little bit of context that was missing. This might have to do with the project that we did where I had submitted a No 8 graded pea gravel that fits for gravel backfill for walls. It is not testable for compaction. They did not know what to do with it. It fits the gradation, it fits the SE, but it didn't work out.

Donny: I could do a little more digging see if that's what this is referencing.

Scott: I need to start working again with Michelle on this topic. Originally it came out of some irrigation potential needs where they don't want the crush rock next to water pipes. We also



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mentioned it in a couple other sections of the standard specs. Nowhere is it pea gravel clearly defined within the spec book.

Pat: From my recollection, Scott, from previous conversations and the and the issue of materials approval, I think you're right on that.

Scott: Does anybody here know if we have a way to test compaction on it?

Pat: If it's an issue of having it next to the pipes, would compaction be relevant, or are we mainly using it for drainage?

Scott: My understanding is they want to build some sort of a gravel blanket around the pipes. So you're not getting pointed aggregate, point loads on to whatever that product is. I'd have to research what the structural excavation, 2-09 issue is, and that it's also showing up in 6-05 for pilings. In the irrigation mode, compaction probably is not an issue. It's more to provide a blanket around the pipe before you start backfilling over the pipe to help distribute the backfill loads.

Donny to work with Bruce on the Sustainable Green Concrete Group. Donny will talk to Garrett, Kurt, and Pat about the topic to set up a meeting.

Bruce suggests to check on pre-policy consideration that DOT has at Amy's level or from Secretary Millar to give an indication of what direction to go.

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Adjourned at 11:30AM