

WACA/WSDOT Meeting Agenda For Wednesday, March 6, 2024

Day/Time: Wednesday, March 6, 2024, on Microsoft Teams, 10:00 AM – 12:00 PM.

Next WACA Meeting Date: *Wednesday, June 12, 2024, on Microsoft Teams, 10:00 AM – 12:00 PM*

Future WACA Meeting Dates: *Wednesday, September 4, 2024, on Microsoft Teams, 10:00 AM – 12:00 PM*

Meeting Minutes:

The link below will take you to past meeting minutes and show upcoming WACA meeting dates.

<https://partners.wsdot-sites.com/washington-aggregates-concrete-association/>

Donny Henderson - WSDOT

Well, we have quite a bit to cover today, so I'm going to go ahead and get started and have to catch up with Bruce on any updates that he had missed. Kind of kick off things here. I think the last agenda that went out had June 5th on for the next meeting, but that actually will be on June 12th. We have a FHWA audit going on the first week of June, so we will need to push that out. I'll send that invite out after later today or tomorrow for the next meeting and go from there. So, the one after that would be Wednesday, September 4th. All the meeting minutes from the last meeting that we had in December are posted, so feel free to go take a look at those and that link on the agenda does work. To kick things off today we'll have Steve Davis and Josh go over the CAPS program update.

New Business topics:

- **Cement / CAPS Program Update:** Steve Davis / Josh Sears update.
 - **Steve Davis – WSDOT**
I am extremely pleased to announce that at least for the first time and since I've been in this position, everything is either in or accounted for. I think at the last meeting in December, we spent quite a bit of time talking about communication with us and our Caps e-mail box and phone calls to Katie Defoe, etc. So, I think that the message was well received. We've had some great communication with different folks and so everything is either in or accounted for.
 - **Donny Henderson – WSDOT**
I wanted to thank you, and Steve Landers. I know Katie's not here today. With all the ASA samples coming in, the process is working really smooth. All the lab support with testing has been great. So just a quick thanks to all of you.
 - **Steve Davis – WSDOT**
Does anybody have questions on any of that?
 - **Donny Henderson – WSDOT**
We just went over the upcoming schedule and Steve gave an update on the CAPS program, which is looking pretty good right now.

- **E-Ticketing, E-Construction and Environmental Permit Concerns with using RCA in Construction:** Cecilia McNeil-Hardwick update.
 - **Donny Henderson – WSDOT**
So we're on to the second bullet item for E-ticketing and E-construction with Cecilia.

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- **Cecilia McNeil-Hardwick – WSDOT**

OK, good morning, everyone. So, an update on E-ticketing - we've been working, testing. We did some pilot projects with the Haul Hub portal last summer and we are moving forward. I'm going to put here in the chat if you haven't heard or seen about the construction bulletin. The link should be there and so we have sent this construction bulletin out. We have some new GSP's that are going on new projects. Our plan in 2024, if there's HMA on the Contract then the GSP's are supposed to be in that project so that the HMA tickets come in through this WSDOT Portal that we have set up. So going forward in 2025, we would be looking at all electronic tickets using the portal. And just to give a little bit of background, as I said, we did a pilot with Haul Hub last year. We ended up with 25 projects using the portal and we had pretty good success. We ended up with over 7000 electronic tickets coming in. We had over 200 WSDOT staff interacting with the tickets and receiving those. So, the construction bulletin has as a little bit more information there and going forward in 2024 all HMA Tickets are supposed to use the portal. And then we've been doing some internal webinars. We had one in February with over 100 staff attending and you know the intent of that is to, you know, inform all the inspectors of what the tickets should be looking like and what they need to do. You know, actually marking them received on site. We have another one coming up in April, so hopefully we will have everybody on board on the WSDOT side for that. So, the portal no cost for contractors. It's a contract we have with Hall Hub, so you must have internet connection and a couple of general computer things. It doesn't run on the old DOS program or anything, so you need to be slightly updated to be able to connect in. One thing I'd like to put out there is that the concrete tickets aren't necessarily going to be required, but if you are willing to help us test out the program a little bit more before it becomes required, we really encourage that. So, feel free to reach out to me or you can also go to the landing page and directly with the hub and get connected in that way. Are there any questions about E ticketing?
- **Bruce Chattin – WACA**

For helping test the concrete out with you folks, is that something you want to formally consider moving forward or talk about or checking in like we've talked about our quarterly meetings? Do you want to set something up to keep things moving forward?
- **Cecilia McNeil-Hardwick – WSDOT**

So we have GSP's out there. We have the GSP that all HMA tickets need to be used in the portal. There are some project offices that might decide to just say all tickets. So that is something that we'll have to keep an eye on, so even if you don't have HMA going, you might still end up with a project that is requiring the portal. My encouragement is that this is something that is moving forward. If you want to get on earlier before it does become mandatory, we can definitely continue to talk about that, but there is a possibility that it could end up on a project as a requirement.
- **Bruce Chattin – WACA**

Ok, without any advanced notice on that and any orientation, that could be really challenge, I think sometimes especially for the smaller guys. What orientation did HMA have to be able to get to this point and/or should we try to duplicate/replicate that going forward so that we're all prepared as well? Because we're not going to be, we're not the contractors, we're just the material suppliers. I just want to make sure our folks have the same opportunity to be equally as successful.
- **Cecilia McNeil-Hardwick – WSDOT**

Yeah. So that's why I would encourage the suppliers to reach out and get connected into the portal if that's a possibility. I'll put the link in the chat when I'm done talking here so that it's available and if you have any questions about it, please reach out to me.

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- **Bruce Chattin – WACA**
Ok yeah, I'm sure we will, I appreciate your help.
- **Donny Henderson – WSDOT**
Was there any training provided by Haul Hub to help navigate as well? I know there's different reps that you deal with on a regular basis, right?
- **Cecilia McNeil-Hardwick – WSDOT**
Yeah so Haul Hub has an online, they call it the Haul Hub University. So, they have several courses online that you just have to create an account username and password to be able to access those videos, and they've been really helpful in working with everybody that we have connected them with so far so.
- **Kim Schofield – WAPA**
Well, I was just going to add on that. WAPA has our WSDOT/WAPA joint training coming up next week and we do have Haul Hub and Cecilia on the agenda for some HMA training for the folks that will be attending that. Besides the stuff that's online, we're doing what we can to help people that haven't used it yet to learn a little bit more.
- **Cecilia McNeil-Hardwick – WSDOT**
Right. And we've been trying to do outreach. You know, we've been talking about this for a couple of years. We did a peer exchange early last year, and so several industries were participating in that. So, it really shouldn't be something too new, we've been talking about this. It's becoming an industry thing going forward. You know technology is always evolving. This update is to make sure that you guys know it is coming and we are moving forward. If there are any issues or concerns, you know we definitely don't want to leave the little guys out but there are some updates that you might have to do in order to be able to keep up with some of the technology.
- **Bruce Chattin – WACA**
Yeah, we've been doing haul tickets for quite a while, working off of what Marco set up and, you know, playing with it for about the last year, but once you start getting to where things become official, you know the ground rules sort of change, and that's when it really counts, and that's what I want to make sure as we glide into this, we're going to be as successful as we can be.
- **Cecilia McNeil-Hardwick – WSDOT**
Right. Yes, we definitely want you to be successful that's for sure and that's why this is coming out as a GSP. It's not going straight into the Standard Specifications, not going straight into the Spec book. So, it will be project specific in the Special Provisions. If there's a specific situation, you know there might be a possibility of writing a change order to take that Special Provision out. There's always a possibility.
- **Bruce Chattin – WACA**
Ok. If a project office goes, let's say goes in their own direction, right? Or they make the determinations, you know, beyond what you're anticipating now as you say. How do we deal with that? How do we let you folks know that this project office has begun to require this and there's not quite enough preparation. Consistency across statewide across all the regions would be great, but how do we manage differences amongst the regions?
- **Cecilia McNeil-Hardwick – WSDOT**
So what kind of preparation are you anticipating needing?
- **Bruce Chattin – WACA**
Just as you say, offices may require it but yet we're not up yet. HMA is up yet, we're not official yet. So, I'm making an assumption that what we've done so far is good. However, as we get closer to it being required. Making sure that we're on the same page as what a project office may require between now and when it becomes official for us.

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- **Cecilia McNeil-Hardwick – WSDOT**
So one thing, you know we've been requiring electronic tickets for several years now. The portal here is just the electronic ticket- There's just going to need to be a connection from the supplier's ticket, and it's going to transfer over into this portal. So, the technology, you know, your IT department, it's going to be whatever little tweaking, software code or whatever they need to be able to transfer the already existing electronic ticket into this WSDOT portal. So, it's making it so that the inspectors are going to have one sign in to be able to access all the tickets in that portal. So, I'm hoping that it's not going to be that much of a transition. Because you're already doing electronic tickets, you should already be doing electronic tickets, so this is just going to be connecting those electronic tickets into this one log in access.
- **Bruce Chattin – WACA**
Ok, thank you.
- **Donny Henderson – WSDOT**
Kevin mentioned- was there an update with the environmental concerns or anything on the permitting that he had for this, I know he wasn't going to be able to attend, but he might have had something. If not, I'll see if he can give an update in the next meeting.
- **Cecilia McNeil-Hardwick – WSDOT**
Yeah, he told me he sent it, I think he sent it to Bruce on the on the recycled concrete. I'm not up on that.
- **Donny Henderson – WSDOT**
Ok, no problem. I appreciate it. Thanks. Any questions on E-ticketing from anyone?

- **Synthetic Fiber Reinforced Bridge Deck Concrete Update: Anthony Mizumori – update**
 - **Donny Henderson – WSDOT**
So up next, Anthony with an update on the synthetic fiber reinforced bridge deck concrete.
 - **Anthony Mizumori – WSDOT**
Good morning. I just have a brief update on this topic. So just as a reminder, we have two bridge deck projects under construction right now that are using this synthetic fiber and to date, neither of them have been/none of the production work has been done, but we do have a test pour scheduled later this month on the project on SR16. So that's just the standard deck test pour, but that will incorporate the fibers as well. So, we'll get some feedback from that and hopefully can report on test pours and maybe even some production work on one project at our next meeting. There's a third project that's pretty much designed, but it's awaiting funding on State Route 9 over the Snohomish River. So hopefully that project will get out to bid sometime this year, but it's kind of been dormant recently.

- **Research Project for CSA Cements: Anthony Mizumori update.**
 - **Donny Henderson – WSDOT**
So, Anthony do you have an update for the CSA cements? I know it was something you wanted to put on the radar, but I didn't know if you had any additional information.
 - **Anthony Mizumori – WSDOT**
Yeah, I'm here with Fred Aguayo from University of Washington and so this project did get funding and it's currently in progress in the very early stages, but this was WSDOT research money to look into developing higher early strength overlay mix using CSA cement specifically. And this is a potential alternative for modified concrete overlays.

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Some of the benefits are the rapid strength gain. Two, it might help address shortages for fly ash in the future for our typical modified concrete overlays, which are bonded but not structural. And thirdly, there's potential for greenhouse gas reduction using CSA cements over Portland Cements. So, there's some potential benefits there. So yeah, we're getting this project kicked off and we've got a research team at University of Washington, led by Fred Aguayo, who is the PI for this. Fred, I'll turn it over to you if you want to give a quick overview of the project.

- **Fred Aguayo – University of Washington**

Hi, everyone. I'm new to Seattle. I'm actually from originally from Texas and joined UW in 2021. Good to see you too, Bruce, who I've been able to have the pleasure of meeting quite a bit now since being in Seattle. So as Anthony mentioned, I think he did a quick summary, a nice quick summary of the project. We're essentially looking at sort of a rapid based binder for overlays in bridges. And I've worked with this particular type of binder system in Texas for quite some time and we actually have a similar project in Texas looking at sort of similar things. In Texas, we're looking more as far as performance-based specifications. I think this is kind of more prescriptive based option. Just another tool in the toolbox if you will. Some of the benefits as far as this binder system is rapid repair, rapid turn-around, rapid construction. The other benefit as far as the other side is there's definitely some potential greenhouse reductions as far as the binder system itself has less carbon emissions when it's produced. But there's higher cost associated with this type of binder system, which may be an issue. And durability concerns as well around erosion and things like that, that we are also looking at in this project.

- So that's kind of a quick summary on that. I think some of the things that I would be very interested in hearing about from everyone here and anyone who wants to chime in on practice in the field. You know a big issue with overlays is the actual laboratory and field disconnect. You have surface prep that has a big impact on the performance and it's really difficult to get a sort of hydro demo at a lab scale and so we want to do whatever we can on a field scale if that's possible or at least, do whatever we can even in the future on doing some test pours if there's a chance with some future funding from this kind of work that hopefully is successful. The last thing I'll say also is there's a lot of/ there's also another project that we're working with WSDOT that is more pavement, but it's again on repairs for pavement panels. And so, there's a lot of synergy on these two projects on just repair systems and developing guidance best practices and things like that. So yeah, that's kind of I think a nice summary of where we're at.

- **Donny Henderson – WSDOT**

I guess since you're already here, Anthony and will you go over the EDC 7 enhancing performance with internally cured concrete with Karen and you guys if you wanted to cover that since we're already working through this?

- **Anthony Mizumori – WSDOT**

On the CSA. Part of it I maybe pose a question to WACA- is this something that kind of falls under the purview of WACA? Is it something, a material that the group deals with directly? Or is there representation in that group and you know some of our questions for the field work is delivery and batching on site and I'm just curious if there's experience using that locally here for not necessarily overlays, but any sort of related concrete work?

- **Mike Tomlinson – American Rock Products**

Yeah, that was one of the questions I had. With the delivery method that you're proposing for that particular cement, if it's a very rapid set, it would be difficult to do any sort of standard batch plant and delivery time you know if it's 1/2 an hour, you can only add 5 minutes or what are you looking at with the set times on that particular cement?

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- **Fred Aguayo – University of Washington**

Yeah, that's a great question. This has been successfully used both in ready mix and volumetric mixing. I'm very familiar with Texas in terms of just their capabilities and so in Texas, we have a lot of volumetric mixing and I'm not 100% aware of what's the capability here in the state of Washington. I know there is volumetric mixing. I don't know how much of that is WSDOT versus just kind of residential type work or smaller projects. But yeah, I mean you know I think there's potential in both in mix and volumetric mixing. There's definitely a higher percentage of volumetric mixing in which it's used. The Ready mixed side of it, it really has to depend on how far the project is going to be. So obviously I think you know in terms of just the environment in Washington, parts of Eastern Washington probably have a hard time for that kind of thing. Distances are going to be longer I think perhaps in sort of more urban areas around Seattle maybe. And again, I'm not 100% totally familiar with the landscape across Washington, but that's just my so far two years of being here, how I've seen things kind of happen. But those are the things I want to learn more about from everyone here who, if there is that experience and that knowledge that I would love to have and try to talk more beyond this, if that's possible.
- **Dave Fisher – Interstate Concrete & Asphalt**

Yeah, Mike I don't know, we're doing a currently doing a job at Prosser, second phase of this bridge project overlay and our batch plants is less than 5 minutes away. And you know by the time we get done testing and doing everything else, no matter what you're looking at probably half an hour or 45 minutes after initial batch time before you're actually placing it. So, I guess that's probably one of the challenges you might have with using a rapid set, even with locations really close. As far as I know, in the state of Washington, the volumetric isn't really a standard method of placement for larger pours, so that could be a significant challenge.
- **Fred Aguayo – University of Washington**

And we've been in contact with some folks over at Oregon DOT and David Dobson, who's been my primary contact there, he's been trying a little bit about volumetric mixing, and they've had some success there too. And I think near Portland they have a vendor that they've used, that they've seen success with. I don't know if they'll do work up here, like Western Washington as well, but yeah, that definitely poses a big challenge. And yeah, I mean working times are you know 30 to 90 minutes. I think that could be a potential for ready mix production, but you know again a lot of it's a really big learning curve and a lot of it's also just risk on the producer and being able to do that kind of work. So definitely a lot of challenge.
- **Dave Fisher – Interstate Concrete & Asphalt**

I think there is probably a little bit more value on smaller projects rather than larger ones. We're looking at this particular bridge deck 300 yards. Typically, every day you're doing between 20 and 30 yards a day, so you know whether you can or not, it's something you have to plan out and see whether it's feasible. So that's kind of my take on it.
- **Donny Henderson – WSDOT**

I think that's Dave's hands up there. Are there any other questions? Regarding this or comments?
- **Dave Burg – Ash Grove**

Yeah. I was wondering, are there going to be shrinkage specifications and permeability numbers that have to be reached on that?
- **Fred Aguayo – University of Washington (30:20)**

Yeah, a big part of the work that we're doing here is a lot of a prescriptive based design I think as far as mix, but there's also performance requirements that we're trying to obtain

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with these prescriptive mixes. So, it's kind of a hybrid standard, I think between prescriptive and performance. Correct me if I'm wrong Anthony, but there is definitely the laboratory work that we'll do, you know, shrinkage data, permeability data and things like that. So, there's definitely that work that will be part of it.

- **Anthony Mizumori – WSDOT**

Yeah, we'll look into the performance of both of those elements and more. So currently, viewing this as a possible alternative to a modified concrete, those materials are all specified with the prescriptive mix. And I think we can certainly be open to approaching it the same way with this if we ultimately end up with a mix from this research or potentially future projects that would follow along to develop that mix and spec. more, and there could always be a performance avenue too. You know as sort of a parallel way to get a material qualified, but I should add too that we're not necessarily looking to go into production work after this one project. It's possible, but there's definitely some additional constructability aspects that we probably want to look a little closer at before going into production.
- **Dave Burg – Ash Grove**

Anthony, this is Dave Burg. The motivation for this, is it mostly for opening things to traffic quicker? Is that the main motivation here? I mean generally on repairs you know you're trying to get traffic on it in a few hours or something. Is that the goal?
- **Anthony Mizumori – WSDOT**

I think it's one of the attractive things with this cement in general, we're not trying to hit specific traffic windows necessarily. And one thing that you know we've discussed is potentially slowing down the strength gain to maintain workability at the at the expense of that rapid strength gain. The shortages of fly ashes and other it's kind of a hedge on that as well and then the greenhouse gases. So, it's not necessarily just the speed that's driving it, but certainly I mean if it's able to open up much more rapidly than the modified concretes and all the durability aspects look good then yeah, we will probably look to spec that on sites where the time constraints are pretty tight.
- **EDC-7: Enhancing Performance with Internally Cured Concrete – Karen Carlie, Anthony Mizumori and Fred Aguayo with the University of Washington.**
 - **Donny Henderson – WSDOT**

Moving on to enhancing performance with internally cured concrete.
 - **Karen Carlie – WSDOT**

Good morning I'm Karen Carlie with the State Pavement Office. Before we move on to the ICC stuff, I wanted to share that the State Pavement Office is also working with Fred on a project for a rapid cement based concrete panel repair type product as well. Just a little bit of background on that. They mentioned this earlier but our concrete pavements are, many of them are well beyond the design life right now, and from previous research we determined that slab replacements can be a really cost effective way to deal with this and also they minimize impact to traffic so when we are doing slab replacements right now we're planning on those to last at least seven years and from our programming perspective we're not really seeing that performance consistently. So that's part of the goal of this project is to help look at maybe some of the materials and to help give us some guidelines and some training to help our slab replacements be a little bit more successful. Again, we're ready to begin this project as well, working on the same timeline as Anthony is on his CSA project. So, we're just starting off so if you have anything you want to share today on that Fred or not?

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- **Anthony Mizumori – WSDOT**

No, I think you know, luckily, I think both projects kind of vary. There's a lot of synergy between them, obviously different applications. But in terms of just repair options. Again, I think as far as what I would like to call this, kind of looking at different tools for the toolbox that kind of thing. But again, I think generally the last question that was asked about the goal for this project and then you know as the rapid turnaround, what are those main goals? I think I would say that that's definitely part of it. But the big part of it I think between the two is just kind of better guidance and better documents that could help for better practices in these kinds of situations. So regardless there's definitely different challenges between the two, but they all have a lot of similar challenges as well. The goal at the end of the day is to make it long lasting. I always say get in, get out and stay out rather than get in, get out and come back again. So that's kind of the goal for these projects to tame that. But yeah, in summary, we're getting these projects started in the last few weeks, I guess the last few months, maybe now. A lot of what we've been doing is procuring materials at this point, talking to vendors and things like that and getting ready for the experimental work that we're getting started here in the spring.

- **Karen Carlie – WSDOT**

So Donnie, I can talk about whatever you want to do as far as moving on to the next agenda item and then we can do EC7 later on. That one's really just me, I think and if Anthony wants to weigh in, he's more than welcome to. But I do have some slides on that.

- **Donny Henderson – WSDOT**

OK, if you want to, feel free to present those now and we can go through that and then we'll go to the natural pozzolan. I'll stop sharing.

- **Karen Carlie – WSDOT**

So today I'm just going to talk about internally cured concrete and how we might use it in Washington? Uh, the reason we're talking about this today is because FHWA Everyday Counts program is. . . this is one of their initiatives. Basically, Everyday Counts is a state-based model that identifies and deploys proving yet underutilized innovations. The idea is that we can get more projects out with the limited resources that we have. That's kind of what Everyday Counts is and right now we're on the seventh round of Everyday Counts initiatives. The one I'm working on in particular is called Epic Squared, and that stands for enhancing performance with internally cured concrete. Basically, the concept is that shrinkage cracking can limit the long-term performance of concrete, and internal curing can mitigate shrinkage cracking thereby increasing our service life for bridge decks, pavements, and pavement repairs. That helps support WSDOT's strategic goal of resiliency by supporting our sustainable and resilient infrastructure. More specifically, as far as internal cure, we're talking about using lightweight aggregate. Some of the materials we can use for that are expanded shale, clay, slate, and slag. And the mechanism we would be using would be replacing part of the fine aggregate with the lightweight aggregate in the concrete mix and that lightweight aggregate is pre-soaked to hold the water for curing. So rather than just using a surficial based water for curing it's actually the water within the lightweight aggregate that is absorbed during the curing process for a little bit more complete hydration. So, the mixing and placement of the concrete are the same. Some of the benefits are improved durability, less shrinkage cracking, more efficient use of cement, reduced joint damage, reduced ASR damage and improved fatigue resistance. So basically, what we get is like fewer and tighter cracks in our pavement which would result in reduced maintenance costs over the life of the project. For applications, typically it's being used in bridge decks, and it's my understanding we have used lightweight aggregate in bridge decks in Washington, but

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not really for the internal curing benefit, more on reducing the load benefit. For pavements, we have not done that. Texas has done some continuously reinforced pavement using lightweight aggregate. That's not one I'm super excited about just because I've heard of some of the challenges including for the concrete producers to be able to keep up production is pretty challenging because they need to soak the aggregate prior to mixing. What I see is an opportunity maybe as pavement patches, so that's kind of what I want your input on I guess today if that's something that we could pursue. Our next steps are trying to get industry feedback, which is why I'm here talking to you today. And then internally, we're going to continue having discussions and research on this, whether it's something that we think makes sense to WSDOT, that to move forward with. And then our next step would potentially be a pilot project. I guess my questions for you guys today, you can either share now or e-mail me later, are do we have any lightweight aggregate suppliers in Washington or the northwest? I believe the previous bridge projects used an aggregate source from Utah, so I'm not sure if that's the closest one or not. And then do you guys have any experience with lightweight aggregates that you would like to share. We'd definitely be interested to hear. All right I see hands up.

- **Mike Tomlinson – American Rock Products**

Yeah, we did the Interstate 82 bridge between Washington and Oregon several years ago. I think it was six years ago. That was probably a bridge deck replacement, Oregon's Specification that WSDOT used. Real key on what time of year you're doing your placements. And yes, out of Salt Lake is the closest supply. So consequently, that raised the cost considerably using the lightweight aggregate just so you know and I'm pretty sure it's probably not going to get any cheaper. It was a little bit of a challenge to keep the aggregate soaked in a timely fashion, especially in the summer months. We actually had some placements in the earlier spring. You know, it's just like you can't soak if it's in the middle of winter. You don't really want to place depending on if you're on the western side of the Cascades, you can pretty much get away with, you know, anytime it's not freezing, but you have heat issues. We didn't have any problems with meeting cool temperatures. But you know you have really no way of cooling the mix down further because the aggregates are completely soaked so. I think we had a couple requirements that WSDOT had set out for ring test-for shrinkage I believe. You guys should have results on that from that particular job. So, I know there's some data out there for you that you can use. Otherwise overall it was a little bit of a challenge, but that was probably the largest lightweight job we've done in . . . well that I've done in a long time, and I've been around a while. Otherwise, yeah, I mean getting supply out of Salt Lake wasn't bad, but if you're trying to get product in the winter that could be an issue of just getting it. You know they'll have it, but they just can't get it to you, so timing is probably a real key on the successful project. I'll see if we've got some data that I can send you. There's kind of. . . we had a changeover so I don't know what's available, but I can most certainly send that over to Donny and he can move it on to you.

- **Karen Carlie – WSDOT**

Thank you. Mike, any thoughts on pavement repair? It would be a really small quantity probably of aggregate, right? That's one of my other challenges I see with using it for pavement repair. Any thoughts on that?

- **Rob Shogren - Lafarge**

Actually they have that as a standard specification. We've done probably a dozen bridge jobs with lightweight aggregate, either pumice or other stuff that are closer. Dave Burg is probably more familiar with this than anybody here.

- **Mike Tomlinson – American Rock Products**

We typically don't have a problem with small jobs. We're doing quite a few elevated

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decks for Amazon in the in the Hermiston Umatilla area, so we usually have it on hand all the time for smaller jobs. So, it's usually not a problem for us, but I don't know about anybody else.

○ **Anthony Mizumori – WSDOT**

One point I can add regarding the bridge work is we've typically used it for the lightweight, so that's generally been the coarse aggregate that's been the key component of that. I don't recall if on the I-82 Umatilla job we had lightweight fines in that or not. Karen I'm not sure on the pavement side, are you looking at lightweight fines, course, or both?

○ **Karen Carlie – WSDOT**

Just fines, yeah, it replaces part of the fine aggregate that's normally in the mix.

○ **Dave Burg – Ash Grove**

I was going to say Oregon's done a lot of internal curing projects and yeah, you've got to plan if you're doing pavement repairs with a volumetric mixer, that could be a challenge. They only have so many bins on the trucks and that's the hassle for the ready-mix people. They only have so many bins at the ready-mix plants and so. . . You know, if you're doing a small amount with the volumetric mixer, I'm not sure they could do it. I don't know the configuration. I think there's a lot of good research and a lot of good reasons to do it. I'm not sure, I guess Oregon's done it in bridge decks, so I haven't seen any pavement repairs with it. Is the main failure method too much shrinkage? Is that what you're trying to fix in the pavement repairs?

○ **Karen Carlie – WSDOT**

Yeah, that's probably one aspect. I'm not sure if I know exactly why all the repairs are failing. I guess I don't know if they've identified the cause of that yet. This is coming forward because it's an FHWA initiative right now and they're kind of pushing all the states to look at these things and figure out are there any of these technologies that we can apply that there's already been a quite a bit of research done on them, but maybe they're not widely used? And this one that we can implement and that's what we're trying to figure out now- is this a worthwhile strategy to implement for us?

○ **Dave Burg – Ash Grove**

Ok, I was just curious on this. You know, I'm not sure about the pavement repair end of it. If it's been used or effective, but I know Oregon is very high on the bridge deck part of it.

○ **Karen Carlie – WSDOT**

Great. Thanks, Dave. That's a good resource. Thanks.

○ **Anthony Mizumori – WSDOT**

On the bridge side, I think one potential benefit too is the ability to reduce cure times in general and maybe if there's enough inherent durability, we can sort of reduce the cure time and still achieve the durability that we need. I know New York State has used it quite a bit for high early mixes where they're cutting off the cure quicker than they would ideally and that's been successful for them, for what I understand. But I believe they've got multiple suppliers within the state there, so probably a bit more economical.

○ **Dave Burg – Ash Grove**

I know there's a company in Tacoma that has a terminal that supplies. And then the Utah one I think has probably been the main source. But there are pumices available, I don't know if those have been used or not but there are pumice people that have supplied lightweight aggregates. I don't know if they've done it for sand on projects, but they may have that I don't know of.

○ **Michael Gardner – Stoneway Concrete**

So Stoneway just brings in a structural lightweight coarse aggregate and there's been

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shortages on the West Coast. So, we don't buy sand just due to there being very little demand for it. But the coarse aggregate comes out of Colorado and is brought into Tacoma via rail, and they don't have any product currently. So, we're bringing it in from South Carolina currently. So, it would be a very expensive mix and not including the handling of the material and storage and so forth like everyone brought up.

- **Pat Norton – WSDOT**

About 15 years ago, talking about lightweight aggregate, we went to the Cascades at a certain pit. I'm looking at pictures of it right now and I can't remember which one, where we loaded up 55-gallon barrel drums and sent it back to I believe DC. So, there are some lightweight aggregates in the Cascades, but it's been a while since I dug up that memory so.

- **Standard Specifications 9-23.12 Natural Pozzolan:** Presentation by Jason Grieser - Geofortis. And Rob Shogren -Lafarge.



WACA

Presentation.pptx

- **Donny Henderson – WSDOT (50:42)**

Next up we have Jason Grieser from Geofortis to go through a natural pozzolan presentation that he put together, followed up by Rob Shogren.

- **Jason Grieser - Geofortis**

Hello, thanks for having me and giving me the opportunity to make a presentation to you guys. I'm going to turn my camera off just to save some bandwidth on my end here. So yeah, just a little bit of background with me. I'm the plant manager over here at Geofortis. We manufacture a natural pozzolan that comes from a volcanic ash. Tephra is the geologic term used to describe it. My presentation will primarily focus on covering some terminology and some definitions, and really focus just on the specification that currently applies to natural pozzolans for Washington. The big crux of it is, in my opinion, from what I'm seeing is that the natural pozzolan specification states ground pumice while also referencing AASHTO M295. AASHTO M295 allows for multiple different types of geologic deposits that all perform similarly, and all meet the classification of a natural pozzolan. The presentation really is going to kind of focus around defining or showing examples of definitions, both with regard to ASTM and AASHTO that show similarities between fly ash performances, ground pumices, tufts, shales, tephra, and those sorts of things. I'll touch on very briefly, some geologic terminology, some ASTM terminology and specifications for reference, some actual specifications. And then I'll spend a little bit more time on material classifications. I'll show some examples of some adjoining DOT's that are nearby in the western United States and how they're dealing with multiple sources of natural pozzolans. And then I'll show just some of our general testing results showing that we have a record of meeting AASHTO and ASTM requirements and successful deployments and use of our materials. Natural pozzolans are volcanics, they're going to come from volcanic sources for the most part. You're going to really be looking for items that are quenched rapidly and cooled allowing them to be amorphous. Some other terms that you'll see used around is calcite, so a calcium carbonate or calcium source in a mineral form. You will also hear terms about a highly siliceous material. Those will be materials that have silica that is available for chemical reaction. An example of that would be shale or chert.

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- What it really comes down to is tephra right? The differences between tephra, tufts, pumice, pumicite and even as an example of diatomaceous earth. So, tephra in our case is fragmented material, it's a volcanic source that's generally really fine. It's been quenched very rapidly and generally comes in as a sand or something that can be broke apart in class deposits. Tufts are generally rocks, compacted volcanic fragments or stone or magma of that kind. They generally are harder, they come out more like your gravel or rock. Sometimes they need to be blasted to be handled. And then pumice, a lightweight volcanic rock - sounds like everyone up there is pretty familiar with pumice and pumicites, a very usable natural pozzolan. And then diatomaceous earth or diatoms are naturally occurring, pretty soft, salacious sedimentary rock, very high internal surface structure. One common theme between all of those materials though is that we're looking for chemistries, a balance between the calcium, silica, aluminum, and iron oxides that are available.
- With fly ashes, that chemistry is achieved by the combustion process and regulation of how hot they're running the burners and the ratios of fuel to air, as well as how efficient the electrostatic precipitators are. For natural pozzolan, it's the chemistry of the geologic event, but it's all very similar in that we're watching very closely the calcium, silica, aluminum, and iron. Mineralogy is another common thing, we're talking about needing something that's amorphous, so it goes into the reactive phase. It can go into solution; it can help with the hydration process. Rapid cooling or quenching is generally needed to achieve this. For fly ash, again that's achieved in the electrostatic precipitator. As we pull the fly ash out of the flue stream. For volcanics, it's water exposure or exposure to air rapidly from a rapid eruption. Another common item between all of these is that there's an energy needed, a pyro process that instigates this formation. For fly ash it's coal combustion. For natural pozzolans it's geologic activity, lava eruptions, volcanic eruptions, any of those. And all three of those initial phases lead us to the final point which for pozzolans is that you need lime reactivity. We want the materials to be able to consume calcium hydroxide to hydrate, to enter a more stable state and give us that helpful CSH reaction that we want.
- So, ASTM looks at this through the eyes predominantly of C618 and 311 is where those test methods are spelled out. How you test for the chemical requirements, the physical requirements, and any other optional requirements that are placed on coal ash or natural pozzolans, raw calcine. ASTM C-125 is the place where ASTM designates all the definitions for these. So supplementary cementitious materials are clearly defined there. Pozzolans are defined and then natural pozzolans are further subcategorized. We start off with SCM's being a very broad term where you can have both hydraulic and pozzolanic reactivity. Pozzolan further defines and states that it needs to be a salacious or a salacious aluminous material that won't react with water necessarily but does need lime calcium hydroxide to react and then natural pozzolans are further narrowing of pozzolans down to a naturally occurring mineral whose specifications and performance requirements are spelled out in C618. So, there's a hierarchy of terminologies for these materials.
- Here are the requirements for C618. The big thing to note is there's a very big similarity between the key components that are of interest. So, the sum of the oxides being the silica, the aluminum, and the iron. The limits or the report requirements on calcium, the maximum tolerance for sulfur, loss on ignition requirements and finesses, as well as strength activity requirements are very similar between each of these classifications of materials. AASHTO uses M295 as the specification for coal fly ash and raw natural pozzolans or calcine natural pozzolans where the chemical requirements, physical requirements, and optional requirements are spelled out. M295 is a reflection of C618 with some minor changes put in place to help address additional requirements for

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durability and just general material performances and usability for air entraining and those things. AASHTO T303, as everybody is aware, durability is an increasing issue is where accelerated mortar bar testing for ASR Falls. Which again references M295 and C618 type materials and then R-80 also is a repository for how we can help test and determine what needs to be done to prevent deleterious expansion for concrete using these materials.

- So here are the requirements for M295, very similar. With the difference on this table being the loss on ignition. Loss on ignition, in AASHTO M295 is limited to 5% across the board. In an attempt to create a uniform air entrainability for freeze/thaw, durability and just longevity of concrete service structures and those things. There are some other changes in AASHTO M295 such as soluble alkali reporting and testing. But this is the primary one off of the 1st two tables in AASHTO M295. For the most part, all the other requirements for what defines a Class N between C618 and AASHTO M295 are identical. And here comes what I would call, one of the big cruxes of this is that in this hierarchy we have. . . SCM's is a big umbrella where you can have slag cements, pozzolans, and other types of materials. Then within pozzolans you can have silica fume, natural pozzolans, fly ashes, rice hull ash and other items like that. But underneath natural pozzolans you have the ability, and it's called out in C 618 to tough pumice, shale, diatomaceous earth, calcined clays, and tephra. To me, what it seems like is that the specification and the standard as it currently stands seems to be artificially limiting the options for concrete producers to only use one of a multitude of natural pozzolans to solve durability issues, to reduce greenhouse gases and to just generally help solve durability constraints. So, what I'm really hoping to do here is expand and show that more than just pumice can meet the requirements spelled out in AASHTO M295 and ASTM C618 to give more options for concrete producers and specifiers and engineers in Washington to help meet these construction challenges.
- Speaking of that, this is a copy of the Nevada DOT specification. As you can see here in 702.O3.O5 pozzolans, they spell out and state that class CF or N conforming to C618 will be accepted, but they limit the loss on ignition to be identical to AASHTO M295.
- This is a copy of California's requirements and in section 90-01.02B, subsection 3, Raw or calcine natural Pozzolans shall meet AASHTO M295 class N except the maximum allowable loss on ignition is 10%, so they went backwards. They specified M295 and then pulled the loss on ignition content to match the ASTM requirement, while also still specifying that they tighten the limit on the available alkalis there in subsection 3.1 and 3.2. So just another example of the states relying on AASHTO or ASTM requirements not necessarily adding another geologic limit, but still limiting material performances in the direction that they wanted. This is a copy of Idaho. This is a fairly new revision. They just straight say need to meet AASHTO M295 class N, they didn't add any extenuating circumstances. I believe also that new blended secondary cementitious materials also change slightly, which is why I highlighted that. This is a very zoomed out example of the Colorado DOT. They accept natural pozzolans under a high reactivity spec, so they're actually referencing AASHTO M321, so they're using a high reactivity pozzolan specification there instead of using M-295, a valid approach. Again, very similar chemical requirements. Just added strength activity requirements to meet their specification. And then finally Arizona. Arizona references ASTM C618 and further limits loss on ignition for class F and C ashes to 3%. Again, trying to tighten down on that and ensure that they can get proper air entraining and that they don't have a large amount of carbon inside of the fly ashes that they're using.
- Here's a snapshot and it reflects each one of those DOT's that I showed examples for. Each of these is a hyperlink. I can provide this presentation to anyone who would be

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interested. I can put my e-mail address in the chat at the end of the presentation so people can e-mail me, and I can send this out. Donny, also feel free to send it out to whomever would like it. These are hyperlinked to each one of our approved or each one of our listings on an APL or QPL, depending on which Department of Transportation you're referring to. Donny you can just flip through this fairly quickly. So again, just real quick snapshots of us having an approved listing and a subcategory meeting each and every one of those requirements that I already showed. Again, now we're going to get into some of our detailed data here. We use a third party approved laboratory to perform mill certification tests and we check against both C618 and AASHTO M295 requirements. We have a long track record of passing submittals and passing tests. Furthermore, we have done extensive initial setting time both in the field as well as in laboratory tests showing a pure Portland cement initial setting time of roughly 230 minutes, a fly ash control, and F ash that's readily available in this region. 250 minutes average with our material coming in around 210 minutes average. Standard deviations on the bars show that it's pretty identical across the board, just showing again a cross compatibility and similarity between fly ash performance and a natural pozzolan performance. ASR testing- this is the 1293 testing, so the longer term slower non accelerated testing. You can see 100% control expansion in potentially deleterious and a 20% replacement using our material mitigating very adequately out to the length of the test. And then finally an accelerated test using the same materials again showing the cement control having a high potential for deleterious expansion with our material at 14 days. Again, very clearly showing that we mitigate the potential reaction. Some sulfate resistance here, this table is a little hard to see. I couldn't expand it without getting it too crazy, but this is sulfate expansion testing and overall, it shows acceptable performance and mitigation and prevention of sulfate attack and deterioration. The next example, the next one is a graph of a different test, but again it shows more graphically a good performance and acceptable passing performance of mitigating that expansion on those issues. And then finally, we have completed an EPD as we know there's more and more effort and more and more focus being placed on trying to reduce greenhouse gas and carbon CO2. They're showing that we have already gone through a life cycle impact assessment and will continue to update and do so. It is an option and is a resource that's available and it's something that will give more options to concrete producers to solve some of these issues in the future.

- In summary and conclusion, from my takeaway, really there's about five words in here that limit, that potentially limit the number of materials and options that are presented on the table for producers and for engineers and specifiers. And it's really that “shall be ground pumice”. Removal of that would allow AASHTO M295 to stand to stand on its own. There are already some additional supplementary chemical requirements, alkali requirements, that are specified that are already being tested for pumices in your state and those don't need to be changed. It would just allow other types of natural pozzolans to become available for construction projects and producers. Any questions or comments or anything like that from anybody?
- **Donny Henderson – WSDOT**
I appreciate you going over that Jason. If there's any questions or comments that come in after the fact to me, I'll get them over to you and we can discuss them then.
- **Anthony Mizumori**
Donny, I've got a question. I'm just curious, if it were allowed today, would we expect to see it used in mixes or would that require other Standards or specs to see it used?
- **Donny Henderson – WSDOT**
The reason we wanted to present this was to kind of consider all those facts and get some

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more information and then maybe meet to discuss it further to try to figure out how best to move forward with this and what the effects would be and all that. So that was the direction I was given, to get this information out to everyone, so we could try to consider all those different factors.

- **Rob Shogren – Lafarge**

We've use natural pozzolans in this market before they just haven't been on the QPL they give you some history on that specification that Geofortis was talking about. Kurt Williams and I put that spec together about 15 years ago, and the reason we only did pumice was because that was the only natural pozzolan available and they didn't want to expand it past that. We developed this particular SCM, the pumas 15 years ago. It's been on the QPL since then, but this is just some general information that Lafarge put together on the supply demand of SCM's. In the Pacific Northwest and Western Canada, we call our area Western Canada, its French geography, I guess, but you can see that the black line is going up and the supply of pozzolans and slags are going down. This is just a general snapshot of most of the fly ash and slags in the market. You can see that the fly ashes are disappearing, slags are still there. So, the whole premise behind this was to get other supplementary Cementitious materials available for use, so I was approached by Acme and some other producers to present at the pavement meeting about a month ago, and then it expanded into this. And Geofortis which I've trial batched, and it works very well as another option. So, it's time for WSDOT to consider other supplementary cementitious materials to mitigate ASR sulfate attack and everything else because there is going to be shortages in the market depending on where you're at. So, I had all the same stuff prepared too. Geofortis and I approached the WSDOT the exact same time. So, this is a this is a volcanic tuft that we grind out of Kamloops that is not on the QPL because there isn't a standard class N pozzolan. We've been using it up there for about 9 years in Central British Columbia, you can see that the strength activity index is in the mid to high 80s and there's other good quality natural pozzolans that I've trialed in Nevada and other markets. There are additional supplementary cementitious materials. We're working with the company called Progressive Planet out of Central British Columbia that's making a ground glass product. And there's other guys in Portland, Alberta, the Midwest that are working on these technologies as well. So, the standard for ground glass is 1866 and we've used a lot of it in Canada, it works out pretty well. There's two different classifications GS and class GE and it all comes down to the alkali loading of the glass. So, the higher alkali is like the beer bottles, pop bottles and the lower alkalis is the glass that goes into your buildings and they're both reactive and believe it or not, they both mitigate ASR pretty well. And the cool thing about Progressive Planet is these alkalis are available water soluble. So, what they do is they grind it up, they bubble CO2 through it, and they precipitate out sodium carbonate and Progressive Planets is a fertilizer company, and they need sodium carbonate for their fertilizer. So, they suck the alkalis out and they come out with the lower alkali glass. And we've been using this for about 5 to 6 years, and it works out pretty well. So that's another potential standard for WSDOT to consider for the supplementary cementitious material needs. If anybody's got any questions past this feel free to ask me if you want as well. I think it's important for WSDOT to start considering some other alternatives.

- **Rob Shogren – Lafarge**

On a second note, there's some pretty great natural pozzolans. There's some diatomaceous earth in Eastern Oregon just South of Clarkston that are pretty awesome. And there's lots of pumice and other volcanic hills that are available. So, it isn't going to be just two suppliers. There's lots of other producers probably on this call that looking at the same deposits.

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- **Jason Grieser – Geofortis**

Yeah, I'd like to 2nd that. As fly ash goes away, as Rob pointed out, as that resource disappears there's a lot of volcanics along the western United States between the Rockies and the Sierras and all those mountain ranges and formations, there's a lot of natural minerals that have been overlooked due to economic pressures that are slowly going away and are shifting, especially as technology advances and fly ash supplies go away, so definitely an opportunity to open up options and to push ahead and capitalize on some good opportunities.
- **Donny Henderson – WSDOT**

Great. I really appreciate you guys presenting.
- **RCA Tier 4 Update:** We are working on the GSP now along with the 2025 Standard Specification update.
 - **Donny Henderson – WSDOT**

Next topic that I just wanted to do a quick update on is - Garrett (Webster) wasn't able to be here today, but he's working on the RCA Tier 4 update and that's going to be coming out in the 2025 spec update, so it's in the process of going through and getting finalized and that should be out in the 2025 Standard Spec.
 - **Bruce Chattin – WACA**

So my question is- I appreciate all your help in Garrett's work of making this come together. I think we've added a whole new tier that really opened up some opportunity for some uses in non-concrete materials. Got the that is coming out in the 2025 spec. They talked a little bit about GSP's. Is the material under a Tier 4 in the GSP or some other method going to be available for use in 2024?
 - **Donny Henderson – WSDOT**

I would have to speak with Garrett a little bit more about that. I think that may be. Looking at this, I think that was a discussion that him and Kurt had in the past on moving in that direction. But I don't have clear information on that right at the moment. But when he gets back, I can ask him and see if that is the plan and get back to you.
 - **Bruce Chattin – WACA**

That'd be great. Appreciate it, Donny.
- **Possible Standard Specifications Update:** Specifications below call out the use of Type I/II cements. Should these specifications be updated to allow Type IL?
 - 9-20.3(4) Grout Type 4 for Multipurpose Applications
 - 9-20.4(2) Mortar Type 1 for Concrete Surface Finish
 - 9-20.4(3) Mortar Type 2 for Masonry Applications
- **Donny Henderson – WSDOT**

The last topic here on the agenda was just a question on possible Standard Spec updates. I received an e-mail from Kurt and there's some questions that came through in the areas listed - 9-20.3(4), 9-20.4(2) and 9-20.4(3) indicated type one and two cements and I was asked to propose a question to everybody - should that also allow type 1L cements as well? We're looking at getting all the Specification updates rounded up. These may have slipped through and didn't get updated when some other Specifications were updated. So, any feedback on that would be great. If not today, feel free to follow up. We'll be looking into it further and updating if there's any changes made in future meetings. Before the

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meeting started, Steve Landers had a topic he wanted to cover that is not on the agenda. So, take it away, Steve.

- **Degradation Test Method update to Include AASHTO T210 Sieve Shaker.** Steve Landers
 - **Donny Henderson – WSDOT**

Before the meeting started, Steve Landers had a topic he wanted to cover that is not on the agenda. So, take it away, Steve.
 - **Steve Landers – WSDOT**

Alright, this will be quick. I just wanted to let the group know anybody that's working with aggregates that we are currently looking to update the degradation test method to include AASHTO T210 sieve shaker. We're aware that the Tyler Portable sieve shaker that's called out in the test method is no longer available and required modification to get it to work to begin with, and like any method we don't want to be prescriptive in the equipment we use, we want to be prescriptive in the effect that they have. The AASHTO T210 shaking device, the agitator is what we're looking at. We have a couple of them in the lab. It doesn't have the same number of cycles per minute, so we're adjusting the time to accommodate that. It has the same throw. So, we're seeing what the effect is. We don't want to change our specification; we don't want to adopt a new test. But we want to be able to allow industry, if they want to get into this testing, to buy an off the shelf type of a shaker and hopefully that will ease the barrier of entry into this type of testing. Not ready to make any determinations at this point, but if you have any questions, you can certainly contact me, and we'll have updates on this in the future as this progresses.
 - **Heidi Forsyth – Heidelberg Materials**

Can we make a point to discuss the degradation testing for the next WACA meeting? We really want to kind of dive in on that and maybe talk about other possible alternatives or adjusting the test method for repeatability. How do you send the samples out for deg testing and I get different results at all my labs. Usually, they can be as much as like 20 and 10 points different. Might need to really kind of re-evaluate this and I'd love to open a dialogue for our next meeting.
 - **Donny Henderson – WSDOT**

It may be a good idea to meet with a smaller group to discuss your questions and concerns. So, we could go through those prior to the next meeting too if you're up for that.
 - **Heidi Forsyth – Heidelberg Materials**

Yeah, absolutely.
 - **Steve Landers – WSDOT**

Yeah, we're always up to talk about the test method and ways to make the test more repeatable. We've had people come into the lab and we've demonstrated the test for them as well. So, anything we can do to help with that, obviously we want to do that. We want this test to be repeatable, but we do recognize that there have been some challenges with repeatability from lab to lab.
 - **Donny Henderson – WSDOT**

Alright, thanks, Steve. I appreciate it. Well, that covers the topics that we have updates on for this meeting. Is there any other new business topics that we need to add on and do some research on?
- **Chip Seal Aggregate Specification Update. Single Fractured Face to Double Fractured Face – Kim Schofield and Steve Davis.**

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- **Donny Henderson - WSDOT**

Kim, did you have a question, comment, or addition to the meeting?
- **Kim Schofield – WAPA**

Yeah, I was hoping that I could ask a question here about chip seal aggregate. I don't know if you remember us bringing that up or not, but I don't know what the best time is now or?
- **Donny Henderson – WSDOT**

Now would be fine. I think Steve Davis had some insight on this as well.
- **Kim Schofield – WAPA**

Awesome. So, we have a chip seal task force that we've been talking about some potential spec changes and some other things. And one thing that came up when we were looking at our Specifications for chip seals is that we have currently a single face fracture requirement for our chip seal aggregate and it's not very often that we don't get double face fracture for our chip seals, but I would say it's critical that we get. Thank you, Steve, I think Steve brought that up. I think it's critical to have that double face fracture. So, one of the things that we wanted to run by aggregate suppliers today is that if we changed this Specification from one fractured face to two, would that cause a lot of heartache with anyone? Like I said, I think we're getting it a lot of the time. But the times that we don't it really does not help the chip seal at all any time we don't have that cubicle aggregate. That aggregate tends to roll and causes flushing issues right away and things like that. So that's my question. Steve, did you have anything to add to that?
- **Steve Davis – WSDOT**

No, I think you handled it pretty well. You actually beat me to it. I was going to bring it up this morning as well. I was kind of waiting too. So, does anybody have any questions on that or like Kim said, is there any heartache over this? We do see just kind of based on crushing operations, we do see double face most of the time. But we want to make sure before we make what we feel is a. Any spec change would be pretty simple, just a little change in the verbiage, but it could have an effect on producers as well as users.
- **Sterling Frye – Heidelberg Materials**

I mean, I think anytime you make a specification change like that, it's just going to bottleneck the producers slightly. Like you said, I think most people are getting the two-faced aggregate already, so I don't think it's going to make too much of a difference. But if the specification tightens things up a little bit, I think you may . . . We made chip seal up in Granite Falls and that seems to be a pain product to make already. But I guess I'd have to talk with the team to see if they have any objections to that or not.
- **Steve Davis – WSDOT**

OK. Yeah, that that'd be great to get some feedback. And again, like most of these other subjects, it's not a change we're going to make tomorrow, so it would be great if. I think we have until the end of the month or maybe even the end of April before we need to get it in if we want to make it part of the 25 book. It would be great to get there with this but if there's further conversation that needs to be had we're certainly open to that. So, if we get some feedback on that, that'd be great.
- **Donny Henderson – WSDOT**

I believe for the 25 book it would be like April 26th or something like that, somewhere around there is what I'm thinking the date is.
- **Kim Schofield - WAPA**
- I think that's what Kevin Waligorski has been talking about, the mid to late April time frame.

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- **Sterling Frye – Heidelberg Materials**
Yeah, I'll get you guys some production feedback from the Heidelberg Granite Falls team being produced and see if they have any pushback on it.
- **Kim Schofield – WAPA**
We know that chipseal rock is slow already to produce. I don't think that this would change it. It would be more of a possible change in the crusher operation, but I don't think it would slow anything down per se, but we would love to have the feedback.
- **Donny Henderson – WSDOT**
If there's any research or data or anything that you want to share with Kim and Steve, you can send it to me, and I'll get it to them. Whatever works best. Alright, I appreciate it.

- **RCA and concrete greater than 3000 PSI – Topic mentioned by Sterling Frye.**
 - **Sterling Frye – Heidelberg Materials (1:30:57)**
Donny, one last thing before we adjourn here. For the next meeting, is there a possibility to put on the meeting agenda use of RCA and concrete greater than 3000 PSI per WSDOT?
 - **Donny Henderson – WSDOT**
Yeah, I'll put that on there.
 - **Sterling Frye Heidelberg Materials**
I'll put together some questions for it next time. That way it's not just an open-ended subject with no direction.
 - **Donny Henderson – WSDOT**
Yeah, that sounds good. I'll add that on there. Alright, with that, that's all I have. If there's any other questions or comments, feel free to share. Otherwise, we'll adjourn the meeting. Appreciate everyone. who presented and contributed.

No Update:

- **Discussion on Global Warming Potentials (GWPs) for Portland Cement:** Update
- **Naturally Occurring Asbestos in Aggregates:** Update.

Old Business: The topics listed below will be removed from future meeting agendas unless there needs to be additional discussion.

- **Recycled Concrete Aggregates with MSE Walls:** Dan McKernan