Material Round Table

WASHTO COCM – Missoula, MT

3-28-23

Tyler Lay research on rebounding air and testing at the truck rather than at the end of the pump.

Matt Romero Oklahoma – Hardened air did not reflect the fresh air properties. Safety was a factor in the decision to collect from the truck. It is a choice that should be based on the industry within their representative states.

Craig Colorado – sample from the truck, they focused on the pumping to detail how the concrete should be pumped. Glenwood springs deck there were issues with the air and repeatedly air was added to get results at the end of the pump. Hardened

Scott – pilot projects showed mixed results, there was more evidence coming in. Pumping practices are key, they are still working on a certification program for the pumps. Some of the loss of air is temporary.

Larry Oregon – Is there is an inconstancy with FHWA? Several states moved without pushback. Oregon tests at the truck.

Matt – FHWA – If Mike has changed his perspective that is not prevalently out there. More data Is needed predominately. Even within a state there is discontinuity, so it would make sense that there is some discontinuity between FHWA offices.

Tanner South Dakota – still point of discharge waiting on more research to make an informed decision.

Charlie Nevada – on paper it is sampled from point of placement. In practice they wrote a field sample procedure accounting for safety and there is a mix of in-place

Jesus – Arizona – point of discharge predominately. Different opinions and potentially not the knowledge base in some cases to make the right decision. They are waiting for pilot projects to occur in the right region.

There is a rebound but there are many variables that will affect how the air rebounds and to what extent.

Matt Romero – Has anyone thought about putting together a generic special provision to address buy America? Oklahoma and Montana both have a special provision and rely on the contractor and manufacturer to verify the project and retain information for a period of 5 years.

Craig – Colorado breaks down the items and requires certification for specific items. This made an America office should be consistent and provide guidance. 90% steel or iron by weight, needs to be compliant with BA.

Larry Oregon – what about the contractor taking responsibility. Their state is looking at including all state funded Projects to meet the baba requirements as well.

Many states used their bid item list and QPL list to vet products.

Scott – failure to certify will lead to a stricter policy.

Matt FHWA – the de minimis waiver is forthcoming. There is also a notice for comments on continuing the manufactured product waiver. It is not likely that it will be established before this construction season is complete. FHWA doesn't have a lot of clout in this arena. The office of materials and budget must approve any changes. No project specific waivers have been approved since 2017.

Tanner South Dakota – they are waiting for the de minimis requirement to be established before they go through the process of removing projects for non baba compliance. Asking for each individual item inclusive of things like spacers and ties for concrete to be listed.

Enad Texas - fill the form for each item rather than a total project level.

North Dakota- pumps are a difficulty and utility pumps. Oklahoma tried to pay with state funds which did not work.

Scott – Colorado – Field materials manual that details the method of testing and acceptance. Because it is a materials manual the project staff is making the materials staff spend time chasing paper rather than performing materials testing. The differentiation of duties does cause issues with the type of work and lack of personnel wanting to perform the testing.

Matt Montana – We have columns within our standards that define who does the inspection or who is responsible for checking the certifications.

Jesus – All sampling is performed by the field crew and testing is performed by materials. They have pilot projects on which the DOT is overseeing the QC testing of the contractor with verification of the DOT.

Sean and Larry Oregon DOT – field guide that makes a specific separation of who will review the documentation. Contract Admin unit – review of documentation

Field testing unit – performs the testing of materials.

Five regional labs with 3 to 5 technicians. The lab manager coordinates what work is going on the projects, where they are on the tonnage, and coordinates when testing is needed and performs testing and quality assurance simultaneously. They work with the contractors to verify their QC and then they use the QC tests for acceptance. Field test procedures are defined for contractor QC that needs to be performed and then Oregon performed QA at a frequency. Lab certification program is part of their QA. Individuals must be certified. Sean performs all of the certification for all internal and external staff. ACI is accepted with an add on of Oregon specific test.

Inspection staff – also have 6 to 10 certifications that they must have. General inspector course, Drilled Shaft, environmental, erosion control. Need to put a construction math class together. Colorado has a construction math course.

Larry – as an owner he would prefer to do their own acceptance testing.

Washington DOT – Materials Documentation - engineers and field inspection staff split. Series of 4 selfstudy courses for things like plan reading, math, basic survey.

Robert Nebraska DOT – seems like CDOT and MDT where their staff perform all the tasks.

Portland Limestone Cement – Craig with Colorado

There will be no other cements available soon.

Matt Romero – Oklahoma had plans to move forward with it before the issue was forced. There were notification issues and some questions.

Craig with Colorado – precast concrete will be an issue.

Washington – PLC for a while. Getting more questions from private engineering forms and local municipalities.

Scott – they reviewed the information and reviewed the data and allowed changes in approved mix design with a direct substitution.

4x8 cylinders vs 6x12. South Dakota uses 6x12.

Colorado uses beams for acceptance, no other states in the room.

Oklahoma moved to smaller beams for acceptance. They want to move AASHTO RE:Source to accept the smaller molds.

Jesus – 4x8 cylinders and no beams.

Oregon - how do you cure cylinders for the first 48 hours?

Montana - cure boxes (temp controlled)

Colorado – first 48 hours are cured in the same condition as the member

Scott – field cured - there are some specs that require them. Otherwise, they require temp controlled cure boxes and predominately use rain rooms.

Nevada – when do you see the most failures? First 24 hours are covered, what about transportation? Concrete early age curing, if the temps are high the 28-day strengths will be low. Summertime seems to increase the number of failures. Is it the cement?

South Dakota -

Ignition calibration – how many have pulled out the rap from the ignition calibration?

Montana does not include rap in our burns.

Scott – they do the mix with the rap in the mix and do the correction factor in the same manner.

Larry Oregon – they do it in mix design but pull the rap out for ignition oven calibration. Oregon uses a meter check method.

Charlie Nevada – They run correction factors to use the hot produced mix to set the correction factor for each different oven.

Local agency – they cannot be involved in the testing for local agencies as far as their acceptance. CDOT won't do it.

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3-29-23

Steve with Washington DOT – Ideal CT ready to move forward but struggling with the long-term aging. Study ongoing with Washington University. What is going to work best for WASHDOT? The difficulty is space for ovens. Who else is running ideal CT with long term aging?

Oak with Montana – the task force for long term oven aging is going to propose a new standalone standard that will have the 5 major long term aging protocols. It will be up to the individual states to determine what works for them. WE (MDT) are 6-hour aging at 135 degrees. This is based on NCAT work in Auburn to address the concerns that Steve brought up. (Same protocol as Wisconsin from work done on the NRRA track in conjunction with NCAT) NCHRP recommended aging protocol can be quite long. In some areas the aging could take as long as 3 weeks. Based on discussions within the task force the potential for chemical alteration due to elevated temperature is not a strong consideration at this point. This mirrors how Wisconsin is going forward currently. MDT is going to age the compacted specimens for 8 hours and loose mix for 6 hours. A note: R83 may not be applicable for this effort as far as determining sample volume to achieve a specific air void content. Ideal CT vs Ideal RT – Ideal RT is proving to be very repeatable and correlates well with the Hamburg. We may move toward using the longer-term tests in the laboratory, i.e., the DCT (for cold temperature cracking) and Hamburg for approval of a mix design. Then use the Ideal CT and Ideal RT as part of acceptance on project delivered materials. We submitted information to turner Fairbanks as well and the information was presented at TRB. They did some extracted binder testing with the double edge notch test and our results seemed to be very high in comparison to others. Many of our binders are polymer modified which indicates the benefit that we may be getting from using those types of binders. Implementing multiple stress creep recovery and we determined that our existing 64-28 are performing as a 58V-28. We are moving toward 58V-34 as our standard.

Matt with MDT – happy to share the spreadsheet that we used to develop specimens.

Enad with TxDot - 20 hours of aging at 135 degrees (TTI's recommendation). TTI presented balanced mix design information and aging a few weeks ago. Texas is continually presenting the information they are gathering as part of this effort.

Robert Nebraska DOT – the timeframe for 20 hours seems to make sense from a functionality point of view. It seems to work into the workflow of personnel. This summer they are going to test every mix and gather data (ideal CT's) for a variety of mixes with a wide variety of flexibility numbers. The ideal RT worked well for them as well.

Jesus with Arizona DOT- mirrored that there are a variety of values in Arizona as well.

Craig with Colorado DOT – they use 4 inch pucks and there is some variability within results and have moved to a 5 sample set vs. 3 to account for some of the variability. They had wide variability in flexibility results. PG 64-28 are not showing positive results at this point.

Workhorse binder?

Robert Nebraska- 58H-34

Washington – 58H-22 west side 64H-28

Oregon typically 64-22, 64-28 depending.

Colorado – 58-28, 64-22. Moved to modified 76-28 and 58-34 in urban and mountainous area.

MDT - 64-28 is our workhorse and we are also moving to using a -34. Do we need to maintain the V is the question we are considering. Can we get away with H?

South Dakota 58-34 and 64-34 on occasion on their top courses.

UDOT 64-34. For SMA's generally use 70-28 and in the St. George area.

Oak noted that HIMA (highly modified asphalt binder) is being used more and more. Zero void, 6-inch lift with 76-34 binder and they are getting phenomenal results in the Hamburg and in function. Concrete has already been overlayed with this in 3-inches and is performing well at this point. The polymer loading for this does not seem as intensive as originally thought. Air voids are around 2%, not necessarily 0%

Charlie – brought up that need to make sure the percent recovery portion is tied to the DSR in some fashion as the percent recovery ensures polymer modification. A binder can meet the high temp requirements (G^*) but not have the polymer in it.

Enad Texas DOT– HIMA projects coming this year. 76-22 will likely be used along with additional recovery requirements. They are not doing a zero-air void mix. 64-22 is the most used.

76-22 is used at times with 76-28 used as well.

Oklahoma uses the same as Texas.

Florida is also working on the HIMA and seems to have more experience with this type of material.

Nevada uses 100% polymer modified. On the HIMA, the most critical thing is to specify minimum of 7% polymer, if this is done, they need to waive the 135 temperature specification for viscosity purposes. These two concepts are interrelated and should be considered.

Arizona – north side 64-38, southwest 70-22, 70-10 is also used in appropriate areas.

North Dakota – 58S-34 and 58H-34. Very limited experience with balanced mix design. They had a highly modified asphalt with very high results but have a limited data set. They will share their results as they get them.

New topic -

Enad, looking at replacing BBR with DSR low temperature testing.

Has anyone else done this?

They use an extra couple... and are running them and the correlation seems good at this point.

Robert with Nebraska DOT– each supplier had to have specific thresholds and use it as a screening test. If it fails, they would run the BBR. They found it was very supplier dependent. More data is needed to use this as a screening device.

New topic – supply chain issues, coming out of covid and inflation, are people dealing with materials shortages?

Charlie – Everyday

Oregon Dot – paint and striping seems to be a constraint that may not be a reality.

Arizona DOT – Concrete has been said to be a concern, but tit has not really come to fruition.

Oklahoma – seems to be a contractors issue and they don't really have a pulse on what the issue is.

Colorado – claims about supply issues seem to be based on trucking issues.

Enad – Texas sees the same issue with CDL driver shortages which cause delivery issues. Had a few projects where the shipment issues caused delays to chip seal projects.

Colorado, Oklahoma, and Montana have CDL training programs in place.

Utah – dealing with cement rationing last year, but with the combination of PLC the supply issue seems to be addressed. Most of the issue has been eased. Glass beads for pain are high clarity beads and this has not fully come back.

Colorado- binder has been a constraint as they struggle to utilize outside

Washington – Fly Ash is becoming a struggle.

Charlie – has any other state received pressure to lower the loss on ignition for natural pozzolanic materials?