PMPC	**Materials and QA STG - Meeting Agenda** **Date: Thursday – March 4, 2021** **Time: 10:00 AM – 12:00 PM** **Location: WebEx Meeting** **Caltrans Chair:** Patrick Lo **Industry Lead:** Nathan Forrest **Caltrans Members:** Samir Ead, Reimond Garcia, David Lim **Industry Members:** Robert Hightower, Katha Redmon, Randy Romeo ***Guests: Working Group Chairs (Lance Li, Dominika Ercolini), Joe Harline (New CMTB Chief)*** ***Notes: Hamed Sadati***
Time	**Topics**
10:00 am	1. Introductions
10:10 am	2. Project Updates/Briefing by WG Chairs • Tracking Concrete Mix Designs in DIME (Dominika) • Impact of Portland Limestone Cement (PLC) on Concrete Performance (Lance) • Blended Supplementary Cementitious Materials (Reimond) • Performance Based ASR Mitigation (David)
11:10 am	3. Other Project Updates a. 4x8 Update (CT and CPD posted) See attachment A b. Heat of Hydration/Mass Concrete See attachment B c. Revise Corrosive Environment Specifications See attachment C d. SCM 5-year look ahead (Dominika)
11:30 am	4. Open Discussion • Concrete Materials Testing Branch changes • Round table
12:00 pm	5. Adjourn

Work Product Group	Caltrans Members (4, max)	Industry Members (4, max)
Tracking Concrete Mix Designs In DIME	1.*Dominika Ercolini (METS) 2. David Lim (Pavement) 3. Adrian Cortez (OSC)	1. Nathan Forrest (CNCA) 2. Katha Redmon (Graniterock) 3. Patrick Frawley (Central Conc.) 4. Hernan Perez (Cemex)

	4. Paul Fayer (SP&I, as needed)	
Impact of Portland Limestone Cement (PLC) on Concrete Performance	1. *Lance Li (METS) 2. David Lim (Pavement) 3. Craig Knapp (SP&I) 4. Eric Fornera (SSRD)	1. Kirk McDonald (CalPortland) 2. Tom Van Dam (NCE) 3. Morgan Johnson (Lehigh Hanson) 4. Hernan Jose Perez Rodriguez (Cemex)
Performance Based ASR Mitigation	1.*David Lim (Pavement) 2. Lance Li (METS) 3. Ben Grimm (SP&I) 4. Deborah Yost (Construction)	1. Mark Hill (Cemex) 2. Bruce Carter (Southwest Concrete Pavement Assoc.) 3. Nathan Shwiyhat (Calaveras Materials/South Valley Materials) 4. Sydney Wilson (CalPortland)
Blended SCMs	1. *Reimond Garcia (Pavement) 2. Hamed Sadati (METS) 3. Craig Knapp (SP&I) 4. Samir Ead (Construction)	1. Joe Thomas (Natural Pozzolan Association) 2. Jeff Hearne (Salt River Materials Group) 3. Sandeep Singh (3M Industrial Mineral Products) 4. David Imse (Nevada Cement Company)

**Chair*

Attendees: Patrick Lo, Nathan Forrest, Dominika Ercolini, Hamed Sadati, Robert Hightower, Samir Ead, Randy Romeo, Reimond Garcia, Katha Redmon, Lance Li, David Lim.

Meeting Notes:

1. Introductions

- Dominika Ercolini will no longer act as the chief of the concrete materials testing branch (CMTB). She has accepted another position as chief of the Statewide Materials Support Branch with OMMIA. She will still lead the 5-yr SCM look ahead team. But no longer as the Caltrans Chief of the Mix ID workgroup.
- Joe Harline is the new chief of the CMTB. Joe brings over 13 years of experience to the team. Before METS, Joe was working with Structure

Construction at District 3. He joined Caltrans 13 years ago and has done his rotations in structural design and spec writing.

2. Project Updates/Briefing by WG Chairs

a. Concrete Mix Design ID (Dominika)

- The SD is submitted to STG for review and it is expected to have the document forwarded to CTG by next week.
- Nathan mentioned that being the new Caltrans chair of the WG, it is important to make sure that Joe has enough time to go over the SD and to make sure he is comfortable with the document. This was concurred by others. Nathan also suggested that considering the previous attempts on this topic which led to impasses, he would like to discuss the document and purpose of the effort with Joe in more details.
- Patrick and Dominika also discussed the idea of e-ticketing and the potential for having the system integrated into DIME. There might be a potential for synchronization. The potential time savings for data entry with the use of the e-ticketing can be considerable and having such a system will also help with data integrity.
- The scheduled duration was extended to ensure enough time to go through review and publication timelines.
- Dominika will no longer be the Caltrans chair, and Joe Harline will continue working with the WG.

b. Impact of Portland Limestone Cement (PLC) on Concrete Performance (Lance)

- Milestone 2-B was submitted at the end of January, comments were received and addressed in early February. The revised milestone was submitted to Patrick.
- Milestone 3, work on spec language, is due in May. Work started on it. The only potential concern is the timeline of rotation assignments for Lance, which is planned to start in May.
- The WG members provided comments on the Oregon State's report. Lance will integrate the comments and send back to Dr. Weiss.
- Still waiting for conclusion of some long-term testing, including resistivity measurements, ASR test, and thermodynamic modeling. Some of the data

was already provided in quarterly reports and so far, everything seems to be OK and no problems are expected. The draft final report is due in early April.
- Patrick reminded the potential need for having another person take over the task, given Lance's rotation assignments.

c. Blended SCMs (Reimond)

- CT members went through the short SD and shared it with the WG members. Some comments and feedbacks were provided by the WG members.
- The full SD is prepared. It is shared with the WG members for their review and comment. Planning a meeting for next week to discuss the SD with both Caltrans and Industry members of the WG.
- The goal is to finalize the SD in a few weeks.
- Reimond also mentioned that Joe Thomas had a question/concern regarding the inclusion of blended SCMs on AML. Sounds like industry has expressed the desire for inclusion of blended SCMs on AML before, and the request was denied. This might be an option to think about and consider. Nathan also mentioned that this is a question for industry.
- It was mentioned that while Caltrans may not anticipate adopting new categories of SCMS, this question is already being seen in 5-yr SCM study and the blended SCM WG tends to create a home for blends prepared in a blending facility (not in a batch plant).
- Both industry and Caltrans agreed that considering the lead time, having a conditional approval for blended SCMs can be a good option for facilitating the use of blended SCMs. This way there will be opportunity for earlier AML submissions; before official inclusion in the list.

d. Performance-Based ASR (David)

- David mentioned that work is in progress on the gap between the group members on how to address the other performance requirements of the standard specification in terms of sustainability, other durability requirements, etc. Working toward having the full scoping document ready for end of March.
- Patrick mentioned that it is a great idea to have more options available and have more flexibility in addition to Equations 1 and 2 in Standard Specifications. However, even if an aggregate is good enough in terms of ASR which results in no expansion even with no SCMs, we will have other goals to meet (e.g. sustainability)

- Considering exceptions to the minimum SCM requirements in case of high-quality aggregate and SCM shortage is being discussed in the WG.
- Nathan mentioned that considering reduced cementitious materials content in a performance-based optimized mix can be a contributor to sustainability aspects. This was also concurred by David.
- Nathan mentioned that he would like to see the environmental specifications and ASR specifications divorced. Typically, these two may contradict and may not be possible together.
- David mentioned that considering exceptions on minimum SCM requirements might be an option but needs green light from upper management due to the department's sustainability goals.
- Patrick mentioned that performance-based criteria can be beneficial to high-quality aggregates that are not currently on the innocuous aggregate list but can perform well with lower than 25% SCM. Maybe inquiries should be made to CTG and ask for their feedback on the issue.
- Hamed mentioned that even though having a performance-based approach for ASR mitigation is beneficial and is the way to go, there might be some other aspects that need attention. Examples are overall permeability, risk of corrosion, etc. Having no SCMs or lower than min. specified SCMs might be a concern from other aspects.
- Lance also mentioned that having SCMs, regardless of ASR, is beneficial to concrete performance in terms of permeability and log-term durability.
- David mentioned that as we all agree with the minimum SCM requirements, the discussion is focused on cases where SCMs are not available and reducing the minimum requirements might be necessary.

3. Other Project Updates

a. Use of 4x8 Cylinders for Compressive Strength Testing (Patrick)

- Patrick shared the memorandum. One concern was to ensure compliance with rest of the requirements of the specifications. An example was the number of test samples required during the pre-qualification (Section 90-1.01D(5)(b)), where the test data of 5 cylinders are requested to be at least 600 psi higher than 28-d specified strength. The question is if with the change in sample size from 6x12 in. to 4x8 in., and considering the potential for increase in variability of results, there will be a need to increase in number of test cylinders? Maye 8 samples instead of 5?

This seems to be a statistical question, but the group agrees that testing 5 samples will provide enough confidence in performance of a mixture and increase in number of samples during trial batching will not be necessary.

- Samir will ensure that construction manual will also follow the same recommendation of 5 samples during trial batch.
- Samir had a question for the group regarding the experience of having standard cured acceptance samples passing the strength requirements, but (on-site match cured) beams failing the requirements for opening to traffic? No clear answer is available at this point. However, Hamed mentioned that there is a potential for the larger elements to develop higher strength compared to field cured samples. This is due to the higher heat generation in a larger body of concrete which can contribute to curing, while compared to potentials for slower rate of strength gain in the case of a small sample in the same exposure conditions. Hamed will try to find references on this.

b. Heat of Hydration/Mass Concrete (Patrick)

- Patrick shared a nomogram, developed by DES Concrete Design Committee, which is intended to serve as a user-friendly tool for identifying mass concrete elements based on the element dimensions, concrete's design strength, and project location. Having the tool in hand, there will be possibility that more elements could be identified as mass concrete.

c. Revise Corrosive Environment Specifications (Hamed)

- Hamed shared the most recent version of the proposed draft specification and discussed the need for the work and background of analysis and direction of the effort.
- Considering the proposal of silica fume as one of the ingredients of the ternary mixtures in the draft, Katha asked about the safety hazards related to silica fume and mentioned that concrete producers are not comfortable with high dosages of silica fume incorporations.
- Robert also supported Katha's comment and mentioned that with the manual addition to the truck mixer, the plant crew will need to spend considerable effort for addition of silica fume, which is even more difficult with more PPE needed for handling silica fume. Robert also proposed the use of corrosion inhibitors as an option for corrosive environments.
- Nathan mentioned that usually such modifications to specifications go through PMPC, which might be something to consider as we move forward.

- David also mentioned that requirements of corrosive exposure also concern the concrete pavements and any decisions on specifications need to be consulted.
- It was agreed that further feed back should be requested from Caltrans and Industry. So, as the work moves forward the proposed drafts will be shared to review and comment on, so we get sure that all parties are onboard with proposed modifications.
- Patrick mentioned that development of specifications will continue under the DES Concrete Committee, but the STG will be kept up to date with the status of that effort. CTG and its members will be kept apprised of status and draft proposal.

d. 5-year SCM Look Ahead (Dominika)

- Dominika mentioned that the effort was initially focused on fly ash. However, it was decided during the discussions that all SCMs should be included in the investigations and the scope of the work was extended accordingly.
- Joshua Moore (QASI) and Hamed are working on the report, aiming to prepare the draft for Tasks I&II by end of March and sharing with for team member's review in early April.
- Overall, it is planned to have the report finalized by end of June or early July, depending on the comments.
- Dominika will continue leading the effort.

4. Open discussion:

David mentioned the need for decision making on replacements in case Lance could not continue supporting the work groups.

5. Action Items:

N/A

Adjourn