

PMPC

Materials and QA STG - Meeting Agenda
 Date: Wednesday – December 2, 2020
 Time: 10:00 AM – 12:00 PM
 Webex: [Join meeting \(click here\)](#)

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 (Deepak Maskey, Lance Li, Dominika Pekala)*

Time	Topics
10:00 am	1. Introductions
10:10 am	2. Project Updates/Briefing by WG Chairs <ul style="list-style-type: none"> • Tracking Concrete Mix Designs in DIME (Dominika) • Impact of Portland Limestone Cement (PLC) on Concrete Performance (Lance) • Recycled Crushed Concrete Aggregate for use in Cast In-Place Concrete Pavement (Deepak)
10:40 am	3. Other Project Updates <ul style="list-style-type: none"> a. Heat of Hydration/Mass Concrete b. Revise Corrosive Environment Specifications c. 4x8 cylinder roll out d. Short SD review <ul style="list-style-type: none"> i. Performance based ASR mitigation ii. Blended SCMs
11:30 am	4. Open Discussion (Hot Topics) <ul style="list-style-type: none"> • Fly Ash Shortage Status Update (CTG Effort) • 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 Pekala (METS) 2. David Lim (Pavement) 3. Tom Collins (OSC) 4. Jeff Goronea (SP&I, as needed)	1. Nathan Forrest (CNCA) 2. Ken Sears (Polaris Aggregate) 3. Hernan Jose Perez Rodriguez (Cemex) 4. Patrick Frawley (Central)

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.*TBD	
Blended SCMs	1. *TBD	

**Chair*

Attendees: Patrick Lo, Nathan Forrest, Dominika Pekala, Hamed Sadati, Robert Hightower, Samir Ead, Randy Romeo, Michael Mifkovic, Reimond Garcia, Katha Rodmon, Lance Li, David Lim, Deepak Maskey.

Meeting Notes:

1. Introductions

- A new member of the STG introduced themselves: Randy Romeo who has been working as a cement and technical services specialist with CalPortland for the last 4 years. Randy brings 30 years of industry experience to the STG.
- A new guest member attended this meeting, Hamed Sadati, who has joined the CMTB recently. Prior to Caltrans, Hamed was working as a concrete research engineer with the National Concrete Pavement Technology Center.
- Patrick mentioned that Reimond from Caltrans' Office of Concrete Pavements took over for Ron Jones who is retired.

2. Project Updates/Briefing by WG Chairs

a. Concrete Mix Design Naming System (Dominika)

- The short version of the scoping document (SD) was submitted to the STG for review. Hamed is working on the full scoping SD. Dominika and Nathan will review this version and send it to other STG members for their feedback.
- There might be some questions on interactions between the new tracking system and EPDs in case of a change in materials and sources.
- There are positive feedbacks from ready mix industry but would be great to seek general contractors' response too. Kirk is retiring and George B. is taking over for him on the CTG. He will have eyes on it for his industry.

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

- Milestone 1-A is submitted, received no comments on that. Milestone 1-B was also submitted for STG members' review last week. No comments on that yet, except for Nathan who will submit responses to the STG and Lance.
- Next milestone is due in January 2021. OSU has not submitted the interim reports yet. Lance has been in contact with them and they will send the reports by end of December. Based on the data submitted in OSU's quarterly reports, no negative observations have been made so far and no detrimental effects are expected. The research project is expected to finish by April 2021, when a more comprehensive conclusion can be drawn on how to develop spec revisions.
- Even though retired from his daily duties, Kirk still works in a consulting capacity and will continue his contribution to the work group to the end of the project.

c. Recycled Crushed Concrete Aggregate for use in Cast In-Place Concrete Pavement (Deepak)

- Concrete task group has no comments on the final report. The STG members are encouraged to email their comments, or Deepak considers it complete at this point.
- The Pavement STG might have concerns regarding the feasibility of using RCA in two-lift pavement construction.
- As the chair of the newly formed pavement foundation STG, Deepak discussed the need for a platform to discuss pavement foundation topics including but not limited to base, drainage, geotextiles, geogrid, etc. The Materials & QA STG members are invited to share ideas and contribute to the missions of pavement foundation STG.

3. Other Project Updates

a. Heat of Hydration/Mass Concrete

- The DES Concrete Committee is working on some concerns regarding the CIP elements with dimensions not larger than 7 ft, yet large enough to exhibit mass concrete issues. The goal is to provide simple design tools that consider compressive strength, ambient temperature, and element dimensions and assist with thermal control plan.
- Also, a tool for METS: it is intended to use the ConcreteWorks software (Developed by TxDOT) to work on the thermal control plans received by the Construction. Patrick is working towards adding this software to the Caltrans' approved software list.

- The industry might have concerns about adding complexity of mix approvals (change from a simple mix to mass concrete requirements). However, this tool is an additional option to the existing specification requirements for mass concrete and is especially intended to add flexibility with the fly ash shortage situation.

b. Revise Corrosive Environment Specifications

- Updates was provided on progress and the direction of the proposed work was discussed. Literature review is in progress. Moreover, it is proposed to employ an open-source service life design software (Life-365) for further investigating the potential concrete mixture scenarios.
- Still trying to go for zoning based on corrosion risk, the initial suggestion is to consider “marine”, “freeze/thaw”, and “low risk” exposures across the state and come up with recommendations for each category.
- Previous experience of using service life prediction models was mentioned by industry and the use of such models for state applications was encouraged.

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

- Updates on the corresponding sections of the standard specification are already considered for the next revision. Exact release time is not determined yet.
- The updated test methods will be published online on CTM website on January 4th.

d. Short SD Review

I. Performance-based ASR Mitigation

- The SD is already shared with the STG members, awaiting feedback. The outcome of this effort is expected to be provide additional options to the existing SCM recommendations of the standard specifications.
- Some slight modifications to language were proposed. Also, industry tends to like the ASTM C1778 as it provides a flowchart, so might be a good idea to refer to such standards in the SD.
- Given the potential overlaps, question was raised about the need for having two separate work groups for performance-based ASR mitigation and blended SCMs. Both the industry and Caltrans sides agreed that having two different work groups is necessary to manage the work group’s size and timing. Also, it was agreed that when it comes to ASR mitigation, one will

have the option of using SCM combinations as already discussed in the standard specification, without the need for consideration as a performance-based approach.

II. Blended SCMs

- The SD is already shared with the STG members, awaiting feedback.
- Questions are being made regarding the use of alternate SCM types, including natural pozzolans, calcined clays, etc. by the industry.
- It was mentioned that there are no prohibitions against blending the SCMs if done during concrete batching in a ready-mix plant. However, different SCM types (fly ash and slag cement) are not allowed to be mixed by the supplier and delivered as a blended SCM to the plant. So, there is hope that this work group can address this point and provide the opportunity of having only one silo of blended SCM in plants, instead of several silos of cementitious materials. Industry supports the idea, considering that not all plants are equipped (or can be equipped) with more than 2 silos for cementitious materials.

4. Open Discussion (Hot Topics)

a. Fly Ash Shortage Update (CTG effort)

- Queries were made on industry's perspective on the issues and if members were aware of any significant delays to the Caltrans projects due to the fly ash shortage.
- It was mentioned that interest is expressed by industry for permission to employ precast concrete requirements to CIP cases, where zero SCM might be applicable. It was mentioned, as a response, that the idea of zero SCM for extreme shortage situations has been already discussed in METS and some ideas are developed. However, this will is not currently permitted.
- The sustainability aspect was mentioned as a potential drawback if fly ash is shipped from other countries like China or India. Further investigation towards adoption of natural pozzolans (prevalent in the Western US) can be an option for long-term.
- No significant delays or problems were reported by the industry, expect for one project were a specific plant has not been able to switch from fly ash to slag yet. Overall, there are talks about more fly ash supply around late January-February 2021, but not for sure.
- It was brought to the STGs attention that some cities and municipalities have experienced difficulties in projects with no Caltrans oversight, as no communications were made regarding such options as switching to slag. No such problems were observed in a project where oversight and help by METS was provided.

- It was requested from the industry members to contact MET Reps in case of potential problems and delays due to fly ash shortage, so the METS team could also get involved and help with solving the issues in a shorter time.

b. Round Table

- The STG members were asked for their experience on using the NITROcrete technology for cooling the aggregate for hot weather concreting or mass concrete applications.
- Robert Hightower shared his experience on the technology, based on a demonstration project. No concerns were reported regarding the potentially negative impacts of the thermal shock on aggregate properties. The system's efficiency was judged to be somewhere between the ice application and injection of liquid nitrogen to drum. However, the system is expensive and not justifiable for all plants and project. Depending on the project size and temperature reduction requirements, might be the economic choice in comparison with ice. The other concern is that section 90 of the standard specification does not allow use of frozen aggregate in concrete production, something that may occur with this technology.
- In general, there are concerns about direct injection of liquid nitrogen to drum as it can cause cracking and damage the drum. Even though members mentioned examples of projects where liquid nitrogen was used for temperature control, the members were not sure of employment of this specific technology in Caltrans' projects.
- Lance provided some information on CarbonCure concrete in response to the questions on the topic. Caltrans has done some preliminary investigations on the technology and explored the CO₂ uptake by CarbonCure concrete in comparison to normal mixtures. The obtained data could not demonstrate a significant difference between the two mixtures. However, 7%-9% increase in compressive strength were reported with no detrimental effects on such properties as electrical resistivity.

5. Action Items:

The STG members are requested to provide feedback on Deliverable 1-B of PLC work group by Monday (December 7th)

The STG members are requested to provide feedback on short scoping documents on performance-based ASR mitigation and blended SCMs by COB on Monday (December 7th) so there will be enough time to integrate comments before the CTG meeting on December 9th.

6. Adjourn