

Pavement & Materials Partnering Committee
Work Product Scoping Document
Revised
Precast Pavement – Phase II Enhanced Jobsite Quality
November 29, 2018

Task Group

Concrete Task Group

Title

Precast Pavement – Phase II Enhanced Jobsite Quality

Problem Process

- Annual
- Expedited
- Emerging Initiative

Statement of Effort/Improvement

Department now has almost 15 years of history with the first precast pavement demonstration in 2004. Despite this history, it has been difficult to standardize as majority of the projects are done under unique alternative design. The Department developed plans and specifications for precast concrete pavement “pilot” projects including precast prestressed concrete pavement (PPCP), precast jointed concrete pavement (PJCP), and individual precast slab replacement (IPSR). PPCP and PJCP are used for lane replacement (long-life performance) and IPSR is used for slab replacement (short-term repair). Precast pavement projects were designed, constructed, and are now operational using these standards. There is a need for guidance and training of the precast concrete pavement technology, internally and externally, in order to assure the quality of the product installation.

Gather information from phase I work and completed projects to develop best practices for installation and fabrication is crucial for this technology viability including prioritize improvements, develop recommendations for grout and joint filler materials, update current specification for materials and field installation, refine guidance for reviews of alternative design submittals and incorporate pavement management strategies to capture long-term performance. To promote the use of this strategy and encourage innovation, cost data and procedures needs to be improved for implementing new and/or alternative systems and component parts.

Purpose

The main purpose of Phase II is to improve the quality of precast pavement projects by improving precast pavement standards, including field handling and installation, providing guidance and training, and streamlining contract administration.

Background

The result of Phase I of precast pavement project was development of non-standard special provisions (NSSPs) and draft contract construction plans for PPCP and IPSR. A number of “pilot” projects were designed and constructed during Phase I. Due to the need of these “pilot” projects, another version of NSSPs was created for lane replacement with precast jointed concrete pavement (PJCP).

To allow flexibility in the use of different precast pavement systems, a study was completed for the Department by a consultant on the design methodology for precast pavement, the result of which was published under “Proposed Process for Design of Precast Concrete Pavement”. A national study on precast concrete pavement technology was completed under SHRP2 program, which was summarized in a report entitled “Precast Concrete Pavement Technology, Project R05 – Modular Pavement Technology.” In addition, to better understand some of the field issues another study was conducted by consultant titled as “56A0418-007: Field Performance Evaluation of Precast Concrete Pavement” in January 2018.

A number of presentations, webinars and workshops have been conducted on this topic within the state and nationally to exchange information and improve the knowledge and communication between all stakeholders.

Approach

1. Street Ready Assurance

- Based on review all the above information, develop risk register to address high value issues, some of those are listed below
 - Assess under-slab grout and joint filler materials quality and determine multiple acceptable alternatives.
 - Create a checklist for field verification, and also approval of alternative designs and shop drawings.
 - Improved guidelines for lane closure process.
 - Improved guidelines for matching of existing grade and dimension.
 - Acceptance limits and contingency plans developed by the contractor and reviewed by Caltrans (submittal).

2. Performance Tracking/Management

- Create a list for all completed projects to capture lessons learned in the future for further refinement.

3. Consistently Implemented

- Develop a report that summarizes best practices and improvements for each of the issues that are incorporated as part of the standards.

- Create a field installation guide for precast pavement project to assist consistent implementation.
 - Update performance criteria for joint and under slab grout material allowing multiple options.
4. Pilot Projects (if anticipated)
 None at this time.
5. Research Needs (if necessary)
 None at this time.

Team Members (Indicate CT Chair and Industry Lead)

CT/Industry	Division/Firm Name	Member Name
CT Chair	HQ Pavement – Division of Maintenance	Dulce Rufino Feldman
CT	District 7 – Maintenance	Deborah Wong
CT	District 4 – Materials	Tinu Mishra
CT	District 7 – Construction	Mike Wang
Industry Lead	ProCast	Warren Taylor
Industry	OldCastle	Arshad Vali
Industry	Flatiron	George Butorovich
Industry	Baltazar Construction, Inc	Baltazar Siqueiros

Objectives/Deliverables/Due Dates

Description:

The purpose of this scoping document is to build on existing body of knowledge from best practices developed during current and past projects and develop improvements to project specifications and standard details in collaboration with industry. Existing projects in the last 15 years provide for a sample population of installed panels under service load. Risk assessment can now be tied to final behavior of panels at service and long-term cost impacts. Activities as part of Phase 2 are summarized, as follows:

- Develop a risk register based on past projects to prioritize items based on high value (highest risk factor) to be addressed. Summarize this agreement in risk register priority agreement report and submit it to the Precast Sub-Task Group (STG), Concrete Task Group (TG) and Execute Committee (EC) for review.
- Revise the standards, including plans and specifications, based on lessons-learned, minimizing need for alternative design.
- Update specifications for field installation, materials, and quality assurance.
- Customize Just-In-Time Training (JITT) to better assess preparedness of contractor. Ensure that training is prepared based on contractor's installation and QC/QA plan and includes specific discussion on potential issues and their mitigation plan for specific project conditions.

Deliverables from this scoping document are useful to both industry and Caltrans. Most importantly, they are intended to improve public safety, viability and efficiency of Precast Concrete Pavement (PCP) projects. Deliverables will be presented in form of a risk register and updates to specifications, manuals and guidelines.

In order to keep this scoping document manageable, the Sub-Task Group on Precast intends to have a Phase III scoping document to address the best practices in a final implementation report to include a wide range of topics like grouting, JITT, quality control/quality assurance, field layout, issues in field cutting of slabs and excessive joints.

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This work is expected to be completed by June 2020. The proposed timeline is as follows:

Milestones	Name - Responsible Party	Due Date (Start/Complete)
Develop Risk Register and summarize priority agreement in the report and submit it to Precast STG, Concrete TG and EC for review	Dulce Rufino Feldman and Divyesh Vora	December 2018/June 2019
Recommend changes and draft specifications to mitigate risks	Dulce Rufino Feldman	December 2018/December 2019
Revise field installation guidance and JITT	Tinu Mishra and Mike Wang	June 2019/December 2019
Centralized PCP project list maintained by the Pavement Program	Dulce Rufino Feldman	December 2019/June 2020
Final Summary Report	Dulce Rufino Feldman and Divyesh Vora	December 2019/June 2020

Resources To Develop and Implement

	Caltrans Hours		Industry Hours	
	PY 18/19	PY 19/20	PY 18/19	PY 19/20
Development	210	360	74	126
Implementation	124	211	55	95

Benefits

The results of this phase will help with the design and contract administration of PCP projects, increase the overall quality of PCP projects and provide information for using this strategy in the most cost-effective way.

Estimated Impact to Caltrans and Contractor

The impact would be a statewide policy and standard for application of PCP projects. Impacted stakeholders include the following:

Districts	Pavement Program
Division of Construction	Division of Maintenance
Traffic Operations	DES-METS
DES-OE	Industry
Local Agencies	Travelling Public
FHWA	National Precast Concrete Pavement Community

Impediments to Completion of Deliverables

The following are factors that could impede/jeopardize the effective completion of this phase of precast concrete pavement project:

- Lack of national design guidance to appropriately evaluate long term performance with Precast Pavement (impact of prestressing and higher modulus of rupture)
- Lack of coordination and contribution of team members
- Unavailability of required resources
- Proprietary/patent issues

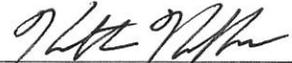
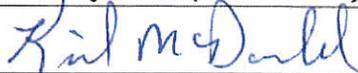
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Recommendation and Approval

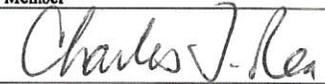
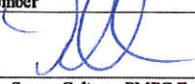
This scoping document for *Precast Concrete Pavement – Phase II Enhanced Jobsite Quality* was prepared by *Precast Sub-Task Group* to address a priority issue with statewide significance and is within the Pavement & Materials Partnering Committee mission as described in the Pavement & Materials Partnering Committee Charter. The Subtask Group members have determined the scope, resources required and timeline for delivery of this project to attempt to ensure that the deliverables are achievable. A signature here indicates that each Task Group and PMPC Executive Committee is committed to providing the resources to support this effort within the prescribed timeframes. Furthermore, it is everyone’s responsibility to ensure that the final effort/improvement will be:

- 1) Street-Ready,
- 2) Monitored and reported for performance,
- 3) Successfully implemented statewide as appropriate.

Scoping Document Recommendation and Industry Concurrence by (name and date):

Caltrans Name (Recommendation)	Date	Industry Name (Concurrence)	Date
 Keith Hoffman, Caltrans Task Group Chair	11/30/18	 Kirk McDonald, Industry Task Group Lead	11/30/18
 Kuo-Wei Lee, Caltrans Task Group Member	11/30/18	 Mark Hill, Industry Task Group Co-Member	11/30/18
 Blair Anderson, Caltrans Task Group Member	11/30/18		

Scoping Document Approval and Industry Concurrence by (name and date):

Caltrans Name (Approval)	Date	Industry Name (Concurrence)	Date
 Sergio Aceves, Caltrans PMPC Executive Committee – Chair	12/11/18	Russ Snyder, Industry PMPC Executive Committee - Member	
 Ray Hopkins, Caltrans PMPC Executive Committee – Member	12/6/18	 Charley Rea, Industry PMPC Executive Committee - Member	12/6/18
 Tom Ostrom, Caltrans PMPC Executive Committee - Member	12/6/18		
 Dan Speer, Caltrans PMPC Executive Committee Member	12/6/18		

Approval Date: _____