

Rock Products Committee
SCOPING DOCUMENT
Curing Piles for a Corrosive Environment
June 21, 2012

Task Group

Concrete Task Group

Title

Curing Piles for a Corrosive Environment

Problem Statement

For Precast Concrete Prestressed concrete piles that are to be placed in a corrosive environment Caltrans specifications requires wet curing of piles after steam curing. The water curing requirement is no longer practical due to Federal and State water conservation and storm water regulations which require complete separation of process water and stormwater.

Background

Piling specification Section 49-2.04B(2) requires special wet curing of Precast Concrete (PC) Prestressed (PS) concrete piles after steam curing that will be placed in a corrosive environment. These same requirements do not apply to other concrete footings and structural elements placed in corrosive environments.

The addition of prescriptive supplementary cementitious material (SCM) concrete mixes to structural concrete in corrosive environments was introduced by Caltrans in 1998/1999 as a method to reduce permeability of concrete to chloride ions. Prior to the use of SCM's, corrosion mitigation for concrete piles in corrosive environments (Class C piles) included increased cement content and an additional period of wet cure beyond initial steam curing. However, with the exception of silica fume, there is no technical basis for retaining the additional wet cure. A Florida study (FDOT BD 488 Report) & FDOT Std Spec 450-10.8 supports the use of SCM mixes for precast use without additional wet cure, but highlights the need for additional wet cure for silica fume concrete mixes for precast concrete to minimize long-term shrinkage cracking.

If concrete proportioned using the current specification requirement will provide a durable concrete similar to all other concrete specified for use in similar corrosive environments without the additional water curing requirements than the additional water curing requirements for piles to be placed in a corrosive environment should be removed for PC PS piles.

Purpose

With the addition of SCMs to concrete used in PC PS piles the requirement for wet curing piles to be used in corrosive environments is no longer necessary. Removing the requirement for wet curing piles should reduce cost, conserve water and for the pile producer reduce potential non-stormwater discharges.

Objectives/Deliverables

The objective is to remove the additional wet curing requirements for PC PS concrete piles from Piling specification Section 49-2.04B(2) while still providing the necessary concrete durability for structures in a corrosive environment.

The end result of this activity will adjust the current specification requirements to provide relief from the additional wet curing requirements which are difficult to provide while staying in complete compliance with Federal and State water conservation and stormwater regulations.

The deliverables for this activity are as follows:

- Review existing specifications and determine if the proposed change might affect the durability of concrete used in PC PS concrete piles.
- Revise Piling specification Section 49-2.04B(2). Gather and compile feedback from all necessary parties.
- Finalize the specifications and publish

Timeline

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| • Draft specification updates | 30 June 2012 |
| • Gather and compile feedback and responses | 30 Sep 2012 |
| • Finalize specification | 30 Feb 2013 |
| • Publish guidelines and specification updates | 30 June 2013 |

Benefits

The change to the specification will remove unnecessary specification requirements while providing the required concrete quality and durability for PC PS concrete piles in corrosive environments. Removing the requirement for water curing for PC PS piles should reduce pile costs.

Impacts

This proposal will eliminate a specification requirement which will benefit all stakeholders including Industry by avoiding costly and possibly unnecessary requirements during PC PS pile fabrication.

Resource Requirements

Task	Caltrans Staff	Hours/Staff
Revised specification	METS Construction SP&I	0.25
Develop construction guidance including Construction Procedure Directive (CPD)	METS Construction	0.10

Impediments to Completion of Deliverables

None

Recommendation and Approval

This scoping document for Curing Piles for a Corrosive Environment was prepared by Concrete Task Group to address a priority issue that has Statewide significance and is within the Rock Products Committee mission. The Task Group Co-Chairs have determined the scope, resources required and timeline for delivery of this project to ensure that the deliverables are achievable in a timely manner.

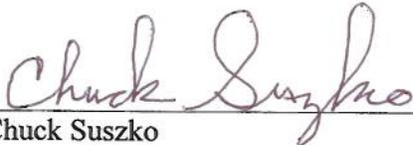
Scoping Document Recommended for Approval by:



Dan Speer
Caltrans Task Group Co-Chair



Bill Farnbach
Caltrans Task Group Co-Chair



Chuck Suszko
Caltrans Task Group Co-Chair

Scoping Document Approved by:



Amarjeet Benipal
Caltrans RPC Co-Chair



Phil Stolarski
Caltrans RPC Co-Chair



Scott Jarvis
Caltrans RPC Co-Chair

Approval Date: 7-23-12