CIDH Pile Non-Standard Mitigation Meeting

The purpose of the *CIDH Pile Non-Standard Mitigation Meeting* is to bring together the Contractor, the Engineer, and their representatives involved in Cast-In-Drilled-Hole (CIDH) pile mitigation to address a N*on-Standard CIDH Pile Mitigation Plan*[1] in a timely manner. It is intended to quickly eliminate any nonviable mitigation methodology and focus all efforts on finding optimal alternatives to mitigate the pile repair. The meeting will provide a forum for free exchange of information so that one or more viable repair solutions can be identified. Identifying these usable repair strategies should not be viewed as directing a Contractor's work or plan. Ultimately, it is the Contractor's responsibility to select, develop, and submit the pile mitigation plan. In many cases, the completion of the CIDH pile is a critical path item affecting the schedule, and in these circumstances it is imperative that the project team communicate effectively so that a satisfactory mitigation plan can be developed and executed with minimal impact on the schedule and delivery of the project. Attendance of this meeting is mandatory for the following:

- Resident Engineer.
- Structure Representative.
- Assistant Structure Representatives.
- Foundation Testing Branch.
- CIDH Pile Mitigation Committee representatives.
- Structural and Geotechnical Designers who are providing construction support for the project.
- Contractor's Project Manager.
- Project Superintendent.
- Drilling Subcontractor's Project Manager.
- Superintendent/Foreman.
- Mitigation Plan Designer.

Attachment 1 is a general meeting agenda to guide you with understanding the key topics that need to be addressed during this meeting for timely development of a non-standard mitigation plan. However, these are reminders only. Review the general meeting agenda with regard to your specific project and modify the meeting agenda as necessary. Certain topics may or may not be included, depending upon their applicability to a specific project.

[1] See BCM 130-12.0, *Mitigation of CIDH Piling*.

CIDH Pile Non-Standard Mitigation Meeting Agenda Minutes

CIDH Pile Non-Standard Mitigation Meeting **Agenda / Minutes**	Date: Time: Location:	Project Stamp:

Facilitator:	Structure Representative:
Invitees:	**By phone:** Resident Engineer: Assistant Structure Rep.: Foundation Testing Branch Rep : CIDH Pile Mitigation Committee Rep.: Structural Designer: Geotechnical Designer: Contractor's Project Manager: Project Superintendent: Drilling Subcontractor's Project Manager: Drilling Subcontractor's Superintendent/Foreman Mitigation Plan Designer:
Purpose	Bring together the contractor, the engineer, and their representatives involved in CIDH pile mitigation to address a non-standard mitigation plan (replacement, supplementation, or non-standard pile repair) in a timely manner.

Time	Topic*	Who
	1. Welcome and Self Introduction	
	2. Anomaly Description based on GGL, CSL and/or Coring	
	3. PDDF Review (Struc., Geotech. and Corrosion Design Requirements)	
	4. Limitation of Grouting Repair**	
	5. Alternative Repair Methods (i.e. Structural Bridging)	
	6. Supplementation/Replacement	
	7. Discuss successful solution used in past pile mitigation	
	8. Mitigation Plan Design Requirements	
	9. Timelines and Critical Path Activities	
	10. Safety	
	11. Future Meetings	
	12. Adjourn Meeting	

* These topics are reminders only. Items will or will not be included depending upon their applicability to a specific project.

** Any questions regarding a Caltrans decision to not permit grouting may be asked at this time. If a type of repair deemed as non-viable by Caltrans, all further discussions should exclude those options.

Topic 1: Welcome and Self introduction
a. Attendance Sheet (see attachments) b. Introduction statements about each person's responsibilities during construction of CIDH piles.

Topic 2: Anomaly Description based on GGL, CSL, and/or Coring
a. Characterize the defect – Define Nature, Location, and Extent b.

Topic 3: PDDF Review (Struc., Geotech and Corrosion Design Requirements)
a. Discuss the effect on structural resistance and serviceability. b. Discuss the effect on geotechnical resistance and serviceability. c. Discuss the effect on corrosion design and serviceability.

Topic 4: Limitation of Grouting Repair
a. High pressure water jets are capable of nozzle pressures up to 20,000 psi and can cut limited quantities of concrete at close range if the jet can be directed and is not shadowed by reinforcing steel. It is not normally feasible to remove large quantities of concrete or other semi-structural material in this manner. b. This technique can be used to remediate and improve concrete which has inclusions of soil or low strength concrete. Grouting cannot be expected to restore cross sections in zones of high moment demand. Post-treatment cores or cross-hole sonic logs should show improvement, but will not be free of anomalies. c. Grouting within the shaft may not be effective if the defects to be treated include zones on the outside of the reinforcing cage in granular soils below groundwater. In such a case, attempts to hydroblast outside the shaft would erode unstable soils which might be expected to cave. Jet grouting around the perimeter of the shaft is a technique which might be considered. d. If the shaft is structurally sufficient except for concerns regarding the concrete cover on the reinforcement, or if a void exists between the outside of the shaft and the soil, then grouting around the perimeter may be considered.

Topic 5: Alternative Repair Methods (i.e. Structural Bridging)

a. Increase the structural strength of a defective pile without complete removal of the defect.
b. Install structural steel or pipe section cast into the central portion of the pile with regular or high strength concrete.
c. Additional member designed to restore structural strength to meet design requirements.
d. It may be possible to extend a central drilled section into formation below tip to increase geotechnical capacity of the CIDH pile.
e. Structural enhancement can also be accomplished by drilling holes in the shaft and grouting in additional rebar or high strength bars.
f. Micropiles can be installed by drilling through the pile in order to anchor the pile into underlying formation. It may be possible to install these by drilling through existing inspection tubes.

Topic 6: Supplementation/Replacement

a. In some cases where the strength or stiffness of a drilled shaft is less than required, the most effective remediation strategy might be to add additional deep foundation elements (CIDH, driven, micropile). These might be designed to supplement or even completely replace the defective CIDH pile.
b. Incorporating additional deep foundation elements into a common cap with the existing CIDH pile must address the issue of strain compatibility.

Topic 7: Discuss Successful Solution Used in Past Pile Mitigation

Topic 8: Mitigation Plan Design Requirements

a. Provide the Contractor's mitigation plan designer with design information (i.e. moment and shear diagrams) necessary for completion of mitigation plan.

Topic 9: Timelines and Critical Path Activities

Topic 10: Safety

a. Applicable Construction Safety Orders.
b. For CIDH Piles 30 inches or greater in diameter and deeper than 20 ft', Cal-OSHA Mining and Tunneling Safety Orders apply (see BCM 14-5.0).

Topic 11: Future Meetings

a. CIDH Pile Mitigation Plan Review Meeting (see BCM 130-12.0).

Topic 12: Adjourn Meeting		
Action Item No. 1	**Who:**	**Due:**
Action Item No. 2	**Who:**	**Due:**

Bin List

ATTACHMENTS

1. CIDH Pile Non-Standard Mitigation Meeting Attendance Sheet

Attendance Sheet ***CIDH Pile Non-Standard Mitigation Meeting*** *Date:* *Time:* *Location:*		***Project Stamp***	
Name	**Company**	**Phone**	**E-mail**