



Piling – General – Quality Assurance – Dynamic Monitoring

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	09-04-2018	Original issue.	Steve Altman

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Background

This process establishes Structure Construction (SC) responsibilities and procedures for review and administration of dynamic monitoring of driven piling, which includes coordination with the Contractor, coordination with Geotechnical Services (GS), and authorization of bearing acceptance criteria for contract piling.

Dynamic monitoring of driven piling is specified in the contract documents:

1. When the piles to be driven are too large (typically 18-inch to 36-inch diameter) to use the Gates Formula per [BCM 49-2.01A\(4\)\(c\)](#), *Driven Piling – Quality Assurance – Department Acceptance*, for bearing acceptance criteria.
2. When ground conditions are not well known and bearing acceptance criteria needs to be established for the control zone.
3. To monitor driving stresses in order to prevent pile damage.

Dynamic monitoring may be required with pile load testing per [BCM 49-1.01D\(3\)](#), *Piling – General – Quality Assurance – Load Test Piles*:

1. To calibrate bearing acceptance criteria to the pile load test.
2. To evaluate capacity of static load test anchor piles.

Process Inputs

1. Dynamic Monitoring specified in the contract documents
2. Form [CEM-3101](#), *Notice of Materials to be Used*
3. Authorized Pile Handling Work Plan per [BCM 49-1.01C](#), *Piling – General – Submittals*

4. [Pile Driving Analysis Test Request Form](#)
5. Authorized Driving System Submittal per [BCM 49-2.01A\(3\)](#), *Driven Piling – General – Submittals*

Procedure

1. All work associated with this process is charged as [Project-Direct – Construction](#).
2. Inspection of field work for this process is:
 - a. [Continuous](#) for inspection of piles driven with dynamic monitoring.
3. Prior to pile dynamic monitoring:
 - a. Review contract documents and identify control zones for piles to be dynamically monitored.
 - b. If pile load testing is required in conjunction with dynamic monitoring, review the requirements of [BCM 49-1.01D\(3\)](#), *Piling – General – Quality Assurance – Load Test Piles*.
 - c. Notify Foundation Testing and Instrumentation (FTI) of scheduled pile dynamic monitoring using the [Pile Driving Analysis Test Request Form](#).
 - d. Discuss requirements for pile dynamic monitoring with FTI prior to the preconstruction conference.
 - e. Discuss requirements for pile dynamic monitoring with the Contractor at the preconstruction conference.
 - f. Discuss Contractor's planned production pile driving procedures with FTI to confirm pile installation procedures for production piling match those used during dynamic monitoring.
 - g. Review authorized Pile Handling Work Plan, see [BCM 49-1.01C](#), *Piling – General – Submittals*.
 - h. Review Contractor's schedule to make sure that there is a sufficient window to perform pile dynamic monitoring, generate a report, and generate bearing acceptance criteria.
 - i. Discuss logistical requirements for performing dynamic monitoring with the Contractor according to the [Foundation Manual](#) Chapter 8-3, *Contract Administration of Static Pile Load Testing & Pile Dynamic Analysis*.
 - j. Review the Project-specific Code of Safe Practices for pile driving operations.
 - k. Assist the Contractor and FTI with preparing the pile(s) for dynamic monitoring according to the [Foundation Manual](#) Chapter 8-4).
4. During pile dynamic monitoring:

- a. Discuss pile driving operation safety at a Tailgate Safety meeting prior to start of field work.
 - b. Inspect and verify construction of the pile being dynamically monitored according to [Foundation Manual](#) Chapter 8-4, *Inspection Requirements during Static Load Testing and PDA*.
 - i. Assist FTI with pile dynamic monitoring as needed.
 - ii. Document inspection of construction of the pile being dynamically monitored in the daily reports.
 - iii. Log pile details, blow count and stroke on [Form SC-4805](#), *Log Pile Sheet*, and provide to FTI.
 - c. Suspend any of the Contractor's operations in conflict with the pile dynamic monitoring work until dynamic monitoring is completed.
5. Following pile dynamic monitoring:
- a. Receive the Dynamic Monitoring Test report and bearing acceptance criteria from FTI.
 - b. Review the Dynamic Monitoring Test report and coordinate with the Geotechnical and Structural Designers to obtain final specified tip elevations.
 - c. Notify the Contractor of final specified tip elevations and bearing acceptance criteria in writing.
 - d. If necessary, issue a change order to implement revised specified tip elevations.

Process Outputs

- 1. [Pile Driving Analysis Test Request Form](#)
- 2. [Form SC-4805](#), *Log Pile Sheet*
- 3. Daily reports:
- 4. Dynamic Monitoring Test report
- 5. Bearing acceptance criteria
- 6. Revisions to specified tip elevations
- 7. Change Order to implement revised specified tip elevations

Attachments

None