Cast-In-Drilled-Hole Concrete Piling – Materials

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	08/30/2019	Original issue.	Richard Foley

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Background

This process establishes Structure Construction (SC) responsibilities and procedures for authorizing materials used in the construction of Cast-In-Drilled-Hole (CIDH) concrete piling, as well as slurry sampling and testing requirements for CIDH concrete piling constructed under slurry.

This process is in addition to general activities for cast-in-place concrete piling described in BCM 49-3.01, *Cast-In-Place Concrete Piling – General*.

Additional unique requirements for material review and authorization are detailed in:

- BCM 6-2.01, *Control of Material-Quality Assurance-General*
- BCM 6-2.03, Control of Material-*Quality Assurance-Department Acceptance*

CIDH concrete piling materials may include, but is not limited to, the following:

1. Concrete:
    a. Aggregate
    b. Cementitious Materials
    c. Admixture(s)
2. Permanent Steel Casings
3. Grout
4. Slurry:

a. Mineral
b. Synthetic
c. Water

5. Spacers
6. PVC Inspection pipes

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the contract specifications, Section 49-3.02B, *Piling – Cast-In-Place Concrete Piling – Cast-In-Drilled Hole Concrete Piling - Materials*, that this BCM is based on as identified in the title block above. The information in the contract specifications typically will not be repeated in the text of this BCM.

Process Inputs

1. CIDH Concrete Piling Submittals per BCM 49-3.02A(3), *CIDH Concrete Piling-Submittals*
2. Form CEM-3101, *Notice of Materials to Be Used*
3. Form TL-29, *Report of Inspection of Material*
4. Certificates of compliance
5. Suppliers' test reports on the physical and chemical properties of the slurry and any proposed slurry chemical additives, including material safety data sheets (SDS).

Procedure

1. All work associated with this process is charged as Project-Direct – Construction.
2. Inspection of field work and associated office work for this process is:
   a. Benchmark for inspection and verification of materials used during construction.
3. Before construction begins:
   a. Review the *Foundation Manual*, Chapter 6, *Cast-In-Drilled-Hole Piles;* Chapter 9, *Slurry Displacement Piles*; and Appendix K2, *CIDH Pile Construction Checklist,* for information pertinent to CIDH piling materials.
   b. Discuss with the Contractor CIDH piling materials to be used via Form CEM-3101, *Notice of Materials to be Used*. See BCM 49-3.02A(4)(b), *CIDH Piling – Quality Assurance – Preconstruction Meeting,* for unique tasks related to conducting a preconstruction meeting.

c. Discuss with the Materials Engineering and Testing Services (METS) Representative any materials to be inspected and released via Form TL-0029, *Report of Inspection of Material*, and which materials are to be field released via Form SC-4102, *Material Inspected and Released on Job*. Utilize the forms to justify any Material on Hand payments.

d. Discuss field welding requirements per the contract documents and AWS D1.1, *Structural Welding Code-Steel*, with the Contractor and METS representative.

e. Review and authorize submittals:

   i. Verify concrete mix design, cementitious material content, and aggregate gradation requirements are met:

      1. Refer to BCM 90-1.01C, *Concrete – Submittals*

   ii. Verify cementitious material content, and aggregate gradation requirements are met for the grout mix design or slurry cement backfill mix design for use with permanent steel casings.

   iii. Review certificates of compliance and mill certificates.

   iv. Verify spacers and PVC inspection pipes meet the requirements of the contract documents and are field released via Form SC-4102, *Material Inspected and Released on Job*.

   v. Verify synthetic slurry and any proposed additives are authorized for use as shown in the contract documents, and that appropriate certifications for trained contractor employees are submitted per BCM 49-3.02A(3), *CIDH Concrete Piling-Submittals*. For additional information refer to Attachment 1, *CIDH Concrete Piling – Materials.*

   vi. Verify spacers meet the requirements of the contract documents per Attachment 1, *CIDH Concrete Piling – Materials*.

   vii. Discuss with Foundation Testing and Instrumentation Branch (FTI) any issues related to PVC inspection pipe materials.

f. Verify permanent steel casings are inspected and released by the METS Representative.

4. During construction:

   a. Discuss project-specific issues or concerns regarding materials with the METS Representative, FTI, the SC Substructure Engineer, the Bridge Construction Engineer, or the Area Construction Manager, as applicable.

   b. See BCM 49-3.02C, *Cast-In-Drilled Hole-Concrete Piling – Construction,* for SC responsibilities and procedures for inspection and authorization of CIDH concrete piling materials during construction

c. Document all inspection, construction, and quality assurance activities, pertinent to this BCM (material verification) in the Daily Reports per BCM C-4.04, *Daily and Weekly Reports*.

5. File all materials records and Daily Reports in appropriate category in the project records as specified in the Construction Manual 5-102, *Organization of Project Documents.*

Process Outputs

1. Certificate of compliances and mill certificates
2. Form TL-29 *Report of Inspection of Material*, and orange tags
3. Form SC-4102, *Materials Inspected and Released on Job*

Attachments

Attachment 1*, CIDH Concrete Piling - Materials*