



Existing Structures – Modifying Structures – Coring Concrete

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	12-22-2022	Original Issue	Richard Foley

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Background

This process establishes Structure Construction (SC) responsibilities for review and authorization of operations for coring concrete, including submittals, materials, construction, and payment.

Cored holes greater than 10 feet in length require submittals for a work plan and the labeled cores. Cored holes that cut reinforcement designated not to be cut in the contract documents require submittals for a work plan to repair reinforcement and prevent additional cutting of reinforcement.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the [Contract Specifications](#), Section 60-4.04, *Existing Structures – Modifying Structures – Coring Concrete*, 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.

For specific requirements pertaining to coring through a CIDH pile due to a blocked vertical inspection pipe, refer to the *Contract Specifications*, Section 49-3.02C(5), *Piling – Cast-In-Place Concrete Piling – Cast-In-Drilled-Hole Concrete Piling – Construction – Vertical Inspection Pipes*.

Process Inputs

1. Contract requiring cored holes in existing structures

2. Concrete coring work plan submittal (when applicable)
3. Work plan for repair of cut reinforcement (when applicable)

Procedure

1. All work associated with this process is charged as: [Project Direct – Construction](#).
2. Inspection of field work for this process is:
 - a. [Intermittent](#) for inspection of coring operations unless otherwise noted by the Structure Representative.
3. Before construction begins, the Structure Representative or delegate must:
 - a. Review the [contract documents](#) and Resident Engineer's Pending File items related to coring concrete in existing structures.
 - b. Review as-built drawings to avoid cutting rebar, utilities, etc.
 - c. For cored holes greater than 10 feet in length, discuss submittal requirements with the Contractor.
 - i. Review and authorize the work plan for coring activities as required by the *Contract Specifications*.
 - d. Ask the Contractor to identify the source of water for coring:
 - i. If not a municipal water supply, obtain test results to verify water impurities do not exceed limits specified in the Contract.
 - e. Discuss containment of coring water and unique Storm Water Pollution Prevention Plan/Water Pollution Control Program (SWPPP/WPCP) requirements with the Contractor.
 - f. Prior to concrete coring:
 - i. Discuss planned activities with the Contractor along with SWPPP/WPCP requirements.
 - ii. If an authorized coring submittal is in effect, verify equipment and methods conform to the submittal.
 - iii. Notify Materials Engineering and Testing Services (METS) if assistance is needed evaluating existing concrete (for investigative coring, METS may have the required tools and expertise to assist SC staff).
 - iv. Verify coring location:
 1. Considering access and footprint needed for coring equipment.
 2. Has been laid out (e.g., painted or marked with lumber crayon) per contract requirements.

3. Record selected core location on a layout sketch:
 - a. Include sufficient horizontal and/or vertical distances measured from known reference points.
 - b. When possible, authorize adjustments to core locations to avoid rebar. Allow for permissible drift.
- g. Verify containment system for coring water is in place and functioning.
- h. When entry into a confined space is necessary (e.g., bridge cell), review project-specific *Code of Safe Practices* and the Contractor's Injury and Illness Prevention Program. Verify the Contractor's confined space procedure.
4. During construction, the Structure Representative or delegate must:
 - a. Verify that the Contractor cores concrete in accordance with the contract documents and any authorized work plans by taking the following steps, as applicable:
 - i. Be present when the Contractor extracts concrete core sample from the coring barrel, and:
 1. Have receptacles for collecting concrete core samples available if needed.
 - ii. For cored holes greater than 10 feet in length, verify that the Contractor is labelling the cores as required by the *Contract Specifications*.
 - iii. Observe and document the quality of concrete along the core:
 1. Verify each core is labeled with its location and required information with permanent marker.
 2. Keep track of which end of the core is top and bottom, or other reference orientation.
 3. When the cored concrete is part of a long, cored hole, document its position (dimension) along the cored hole.
 - a. If anomalous concrete is observed, take care to recover and preserve any loose contents with the core. Note the limits of any anomalous region. Contact Bridge Design and discuss the observations.
 - iv. Verify and document the cored hole length as specified in the contract documents by:
 1. Measuring the depth of the hole.
 2. Measuring the length of the core pieces. If there are multiple pieces of coring, lay them out and fit them together, then measure to obtain the entire length of core.

- v. If the core barrel drifts beyond the allowable deviation specified in the Contract or authorized work plan, stop the operation. Consult with Bridge Design to select a new representative coring location:
 1. To avoid excessive drifting, verify anchor is secured at the base of the coring apparatus. Check plumbness of the steel casing during drilling.
 2. Drifting can also be caused by encountering steel or very hard aggregate.
 - vi. Maintain communication with the operator during coring. Stop the operation if the core bit cuts rebar specified as “not to be cut”, unanticipated utilities, prestress ducts, etc.
 1. Perform the following activities before resuming the coring operation:
 - a. Request a work plan from the Contractor that includes measures to repair the cut reinforcement, and prevent cutting additional reinforcement.
 - b. Review and authorize the work plan.
 - c. Verify damaged reinforcement is satisfactorily repaired.
 - vii. If core barrel breaks and becomes lodged inside cored hole:
 1. Extract if feasible.
 2. Consider using a larger diameter core barrel.
 3. If not feasible, abandon in place and select a new core location.
 4. Consult with the designer when necessary.
 - b. Verify the cored hole is correctly filled if required by the Contract (e.g., high strength grout, dry pack, etc.).
 - i. If concrete coring damages an adjacent concrete surface (e.g., bridge deck, face of walls, etc.), sawcut a neat line before patching.
 - c. Document all inspection, construction, and quality assurance activities, pertinent to this BCM, in the daily reports per [BCM C-7](#), *Daily and Weekly Reports*.
5. Following construction, the Structure Representative or delegate must:
- a. Evaluate the core sample and coring log.
 - b. As-built the core locations:
 - i. When cores deviate from the locations shown on plans
 - ii. For retrofit projects

- c. File all test results and Daily Reports in the appropriate category in the project records as specified in the *Construction Manual*, [Section 5-102](#), *Organization of Project Documents*.

Process Outputs

1. Authorized submittals (when applicable)
2. Completed concrete cores
3. As-builts (when applicable)
4. Daily Reports

Attachments

None