



# Existing Structures – Structure Rehabilitation – Bridge Deck Repair and Preparation

## Revision and Approval

Revision	Date	Nature of Changes	Approved By
1	09-30-2024	Revised	John Lammers
0	07-15-2021	Original issue	Michael Francis

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## Background

This process establishes Structure Construction (SC) roles and responsibilities for bridge deck repair and preparation of the bridge deck for sealing or an overlay. Structure Construction acts to preserve and extend the life of the State’s infrastructure by the most economical and efficient means.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the [Contract Specifications](#), Section 60-3.02, *Existing Structures – Structure Rehabilitation – Bridge Deck Repair and Preparation*, 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. Contract work that includes bridge deck repair or preparation.
2. Submittals required by the *Contract Specifications* for bridge deck repair and preparation.

# Procedure

1. All work associated with this process is charged as: [Project Direct – Construction](#).
2. Inspection of field work for this process is:
  - a. [Benchmark](#) for:
    - i. Removal of bridge deck surfacing, seals, and unsound concrete.
    - ii. Preparing the bridge deck surface for sealing or overlays.
  - b. [Continuous](#) for installing rapid setting concrete patches.
3. Before construction begins:
  - a. Review the following:
    - i. Project plans for limits of bridge deck repair and preparation.
    - ii. *Contract Specifications* requirements for removing concrete deck surfaces, removing asphalt concrete surfaces, removing seals, removing unsound concrete, patching with rapid setting concrete, and preparing concrete deck surfaces.
    - iii. *Construction Manual*, Chapter 4, [Section 4-60](#), *Construction Details - Existing Structures*
    - iv. Documents from the Structures Maintenance and Investigations (SM&I) [BIRIS](#) (Bridge Inspection Records Information System) website for each site planned for preparation or repair, including:
      1. The as-built project plans.
      2. The latest bridge inspection reports.
    - v. Documents from SM&I including recent field pictures, and a street view of the bridge; these may alternatively be accessed thru [BView](#).
    - vi. *Concrete Technology Manual*, [Chapter 6](#), *Structure Concrete Repair and Rehabilitation*.
      1. Note that this information is being incorporated into the *Structure Rehabilitation and Repair Manual*, Chapter 5, *Structure Concrete Repair and Rehabilitation* (pending publication).
  - b. Review and authorize the Contractor's work plan for chip seal removal.
  - c. Verify rapid setting concrete patch repair material meets all contract requirements. Seek Materials Engineering and Testing Services Representative ([METS Rep](#)) assistance as needed.
  - d. Take photos to document the existing condition of all sites that will be repaired or prepared.

- e. Review freeway lane closure charts with the Resident Engineer, and discuss any issues (discrepancies, omissions, etc.) that could affect deck repair and preparation work. Review Contractor's contingency plan if it has been requested per *Contract Specifications, 12-4.02A(3)(c), Temporary Traffic Control – Maintaining Traffic – Traffic Control Systems – General – Submittals – Contingency Plans for Closures*.
  - f. Although not contractually required, it is recommended to schedule a preconstruction meeting to facilitate communication and discuss submittals, quantities, correspondence, requests for information (RFIs), material release, or any issues that may require stakeholder input.
4. During construction:
- a. For bridge deck repair and preparation activities, the following requirements must be complied with:
    - i. For general activities:
      - 1. Verify that equipment used for deck preparation complies with contract requirements.
      - 2. Verify that removal of unsound concrete and placement of rapid setting concrete patches are within the scope of the original contract documents; if not, a change order will be required.
    - ii. For removing concrete deck surface:
      - 1. Verify that the deck surface is cleaned in accordance with the contract specifications before the concrete removal work begins.
      - 2. Verify that the concrete is removed to the depth shown on the plans using equipment specified in the contract documents.
    - iii. For removing asphalt concrete surfacing:
      - 1. Verify asphalt concrete surfacing and reinforced concrete expansion dams are removed as shown in the project plans.
      - 2. Existing asphalt overlays may vary in thickness significantly at locations such as roadway crowns, supports, and mid-spans of structures. Verify underlying deck concrete is not compromised due to excessive removal.
      - 3. When a portion of the asphalt concrete surfacing is to remain, verify a 2-inch-deep saw cut is made along the edge of removal.
    - iv. For removing seals:
      - 1. Verify that grinding or micro milling is used for removal of bituminous chip seals, bituminous slurry seals, and polymer chip seals.

2. Verify chip seal is removed completely but that the deck concrete is not compromised due to excessive removal.
  3. Verify any residual chip seals and other foreign materials remaining in the bridge deck after the grinding or micro milling operation are removed by other authorized means.
- v. For removing unsound concrete:
1. Determine the limits of unsound concrete by chaining the deck, or by use of a pick hammer; refer to Chapter 6, *Structure Concrete Repair and Rehabilitation* of the *Concrete Technology Manual*, which has guidance on this topic.
    - a. See note in procedure step 3.a.vi.1. above.
  2. Mark the areas that require repair and discuss with the Contractor.
  3. Verify equipment and method used by the Contractor does not remove excessive quantities of sound concrete.
  4. For bridges over the railroad, make sure the Contractor stops the removal operation when a train passes under the bridge.
  5. After removal of unsound concrete, verify any exposed reinforcing steel is restored to position, blocked, and tied.
  6. Verify any reinforcing steel damaged by the concrete removal operation is replaced or repaired. Discuss repair options with Bridge Design and the Contractor, and obtain a contingency repair plan.
  7. After unsound concrete is repaired, calculate payment quantities as outlined in the *Contract Specifications*, and document in the daily diaries.
- vi. For rapid setting concrete patch, verify the following:
1. The substrate concrete surface and reinforcing steel is cleaned in accordance with the *Contract Specifications* before placing rapid setting concrete patch.
  2. The surface temperature of the existing concrete is in accordance with *Contract Specifications*.
  3. The appropriate surface condition and tools for the type of patch material being used.
  4. The use of flow-controlled concrete on slopes greater than 5 percent.
  5. The concrete is cured per the *Contract Specifications* and the manufacturer's instructions.

- vii. For preparing concrete deck surface:
  1. After bridge deck repair and prior to deck treatment or concrete overlay, verify the following:
    - a. Abrasive blasting is performed on the deck per *Contract Specifications*.
    - b. The deck is cleaned by vacuuming and blowing with high-pressure, oil-free air.
  2. If the deck is contaminated or traffic is allowed on the clean deck before placing the deck treatment or overlay, verify the bridge deck is prepared again.
- viii. For removal of polyester concrete overlay:
  1. Verify that micro milling is used for removal of polyester concrete overlay.
  2. Verify the depth of polyester concrete before removing the overlay.
  3. Verify conformance with *Contract Specifications*, including requirements for underlying concrete, and removal of residual polyester concrete after micro milling.
- b. Document all inspection, construction, and quality assurance activities, pertinent to this BCM, in the daily reports per [BCM C-7](#), *Daily and Weekly Reports*.
- c. Make monthly progress payment of quantities per [BCM C-9](#), *Preparation of Progress Payment Documents*.
- d. Document as-built changes on the as-built project plans, as outlined in [BCM C-6](#), *Required Documents to be Submitted During Construction*.
5. File all project documentation (correspondence, materials acceptance documentation, daily reports, etc.) in the appropriate category in the project records as specified in the *Construction Manual*, [Section 5-102](#), *Contract Administration – Project Records and Reports – Organization of Project Documents*.

## **Process Outputs**

1. Authorized submittals
2. Required documents including as-builts
3. Daily reports and quantities

# **Attachments**

None