



Reinforcement – Epoxy-Coated Reinforcement and Epoxy-Coated Prefabricated Reinforcement

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 and procedures for review and authorization of submittals, quality assurance, materials, and construction of epoxy-coated reinforcement and epoxy-coated prefabricated reinforcement.

Review and authorization of epoxy-coated reinforcement submittals under this process are typically performed in conjunction with Materials Engineering and Testing Services (METS) and coordinated with the METS Representative.

Additional unique contract requirements that supplement this process are detailed in *Contract Specifications (CS)*, Section 52-1, *Reinforcement – General*, and additional guidance is contained in [BCM 52-1](#), *Reinforcement – General*.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the CS, Section 52-2, *Reinforcement – Epoxy-Coated Reinforcement and Epoxy-Coated Prefabricated Reinforcement*, that this BCM is based on as identified in the title block above. The information in the CS typically will not be repeated in the text of this BCM.

Process Inputs

1. Contract work requiring the use of epoxy-coated reinforcement or epoxy-coated prefabricated reinforcement
2. Submittals required by the CS including:
 - a. Test samples for:
 - i. Epoxy powder
 - ii. Patching material for epoxy coating repair
 - iii. Epoxy-coated reinforcement
 - iv. Epoxy-coated prefabricated reinforcement
 - b. Certificate of compliance for:
 - i. Each shipment of epoxy-coated or epoxy-coated prefabricated reinforcement
 - ii. Each shipment of patching material
3. [Form CEM-3101](#), *Notice of Materials to be Used*

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 review and authorization of epoxy-coated and prefabricated epoxy-coated reinforcement delivered to the jobsite.
 - b. [Intermittent](#) for storage, handling, and installation of epoxy-coated and prefabricated epoxy-coated reinforcement.
3. Before construction begins, the Structure Representative (SR) or delegate must:
 - a. Review the contract documents to:
 - i. Identify the locations where epoxy-coated reinforcement is required.
 - b. Review various American Society for Testing and Materials (ASTM) specifications, including D3963, A884, and A934, referenced in the CS. These specifications can be accessed using [Accessing ASTM/AASHTO Instructions](#) link in the *Field Resources* tab on the SC Intranet, and provide specific requirements on handling and job site practices for epoxy-coated reinforcement.
 - c. Review unique storage and handling requirements of epoxy-coated reinforcement as outlined in the CS, and in the *Construction Manual (CM)*, [Section 4-5203](#), *During the Course of Work*.

- i. Note that the CS requires compliance with various ASTM specifications referenced in Step 3.b., which include topics such as:
 - 1. Storage requirements including storing above ground on cribbing
 - 2. Time limits and protective storage measures if stored for more than two months
 - 3. Tolerance for damaged coating and rejection criteria
 - 4. Prohibition of flame cutting reinforcement
 - 5. Use of coated tying wire
 - 6. Use of nonmetallic, resilient vibrator heads.
- d. Review [Form CEM-3101](#), *Notice of Materials to be Used*.
- e. Review the following topics with the Contractor at the preconstruction conference and/or before the start of any work requiring epoxy-coated reinforcement:
 - i. Locations where epoxy-coated reinforcement is required.
 - ii. Materials and corrosion protective coverings that must be on the METS [Authorized Materials List](#).
 - iii. Unique storage and handling requirements of epoxy-coated reinforcement as outlined in the CS and in the *Construction Manual (CM)*, [Section 4 - 5203](#), *During the Course of Work*.
 - iv. Method and material for patching to be used for repairing epoxy coating on reinforcement, and suitability for field applications. Obtain manufacturer's data of patching material for review.
 - v. General material sampling and testing requirements. (Note that the METS Representative should be consulted to confirm whether the Contractor's vendor/supplier of epoxy-coated reinforcement is in the [Authorization to Deliver](#) program (AD), which will determine the need for field sampling and testing). Requirements to submit the following test samples to METS and obtain authorization for use prior to reinforcement fabrication:
 - 1. Epoxy powder
 - 2. Patching material
 - 3. Epoxy-coated reinforcement and epoxy-coated prefabricated reinforcement
 - vi. Requirement to transport test samples to METS laboratory.
- f. If the epoxy-coated vendor is not in the AD, coordinate with the METS Representative to verify that all required test samples were received and tested. Verify results meet CS requirements by either:

- i. Accessing results through [Data Interchange for Materials Engineering \(DIME\)](#)
 - ii. Contacting the METS Representative.
4. During construction, the SR or delegate must:
 - a. Verify material inspection, testing and release depending on the AD status as follows:
 - i. If the Contractor's vendor is in the AD as described in step 3.e.v., collect certificates of compliance and/or METS Form TL-0624, *Inspection Release Tag* (orange tag) for each shipment of epoxy-coated or prefabricated epoxy-coated reinforcement, and any patching material, when they arrive to the job site. File the above documents in job records.
 - ii. If the Contractor's vendor is not in the AD, verify that the Contractor prepares test samples for each shipment of epoxy-coated and prefabricated epoxy-coated reinforcement. Coordinate and confirm with the METS Representative to determine what sampling and testing is required.
 1. Verify that the Contractor arranges for transport of test samples to METS for testing per the contract requirements, which are detailed in ASTM D3963. Special handling of epoxy coated reinforcement per ASTM D3963 is required to ensure the epoxy coating is not damaged.
 2. Send samples with completed [Form TL-0101](#), *Sample Identification Card* as specified in the CM, [Section 6-103](#), *Field Sampled Material Identification for Testing*.
 3. Obtain test results from METS Representative or DIME, and notify the Contractor in writing.
 4. Note that *Construction Procedure Directive*, [CPD 22-12](#), *DIME Statewide Implementation*, requires certain test results to be posted in DIME beginning January 2023.
 - b. Verify job site storage of epoxy-coated reinforcement conforms to the requirements of the CS, the CM, [Section 4-5203](#), *During the Course of Work*, and the applicable ASTM specifications as mentioned in step 3.b. and 3.c.
 - c. Verify handling and installation of epoxy-coated and prefabricated epoxy-coated reinforcement is in accordance with the requirements of the contract documents; for example:
 - i. Plastic coated wire ties are typically specified for epoxy coated reinforcements. Check the *Special Provisions*, and/or Procedure step 3.c.i.
 - ii. Epoxy-coated reinforcement is coated with a light green coating and can be field-bent.

- iii. Epoxy-coated prefabricated reinforcement is coated with a gray or purple coating and is not permitted to be field-bent.
 - d. Verify authorized patching material is used for field repair of epoxy coating and conforms to manufacturer's instructions.
 - e. Verify that all mechanical butt splices and butt welds on epoxy-coated reinforcing steel are protected from corrosion, with a corrosion protection system that is on the METS Authorized Material List for corrosion protection coverings.
 - f. Verify that the corrosion protective system is used in accordance with manufacturer and Caltrans requirements. Ensure the cover is installed as a continuous piece with sufficient diameter and length to achieve an adequate seal and bond length. The cover must be free of dirt, grease, sharp edges, tears, or pinholes. After the cover is heated as specified, verify that it extends a minimum of 2 inches onto the epoxy-coated reinforcing steel.
 - g. Verify vibrators used to consolidate concrete containing epoxy-coated reinforcing steel have a resilient covering to prevent damage to the epoxy coating. Refer to CS, 51-1.03D(1), *Concrete Structures – General – Construction – Placing Concrete – General*.
 - i. Note that this is also required by the applicable ASTM as mentioned in step 3.b. and 3.c.
 - h. 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 SR or delegate must:
- a. 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](#), *Organization of Project Documents*.

Process Outputs

1. Authorized epoxy-coated and epoxy-coated prefabricated reinforcement submittals and test results
2. Daily reports

Attachments

None