



Reinforcement – Splicing

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	01-21-2022	Original Issue	Richard Foley

[Click here](#) to request previous versions Contact [SC Technical Team F](#) for questions

Background

This process establishes Structure Construction (SC) responsibilities for submittals, quality assurance, materials, and construction of bar reinforcement splices, including lap splices, service splices and ultimate butt splices.

Review and authorization of splice qualifications and testing under this process is performed in conjunction with Materials Engineering and Testing Services (METS) and coordinated with the METS Representative (METS Rep). The following Bridge Construction Memos include related processes:

- [BCM 11](#), *Welding*
- [BCM 52-1](#), *Reinforcement – General*

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the [Contract Specifications](#), Section 52-6, *Reinforcement - Splicing*, 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 requires splicing bar reinforcement
2. Submittals required by the *Contract Specifications* for splicing bar reinforcement

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 splice incorporation into the work except mechanical splice.
 - b. [Continuous](#) for mechanical splice installation and splice sampling for Quality Assurance/Quality Control (QA/QC) testing.
3. Before construction begins:
 - a. Review contract documents for:
 - i. Specifications requirements for any bar reinforcement splices and sampling and testing.
 - ii. Contract plans for restriction of splice locations.
 - b. Review [Bridge Deck Construction Manual](#), Chapter 3-2.3, *Reinforcing Steel – Splices* and [Construction Manual](#), Chapter 4-52, *Reinforcement*.
 - c. Review [Attachment 1](#), *Reinforcement Splices*.
 - d. Review [California Test 670](#), *Method of Tests for Mechanical and Welded Reinforcing Steel Splices*.
 - e. Contact the [METS Rep](#) to:
 - i. Discuss any service or ultimate splices for the project.
 - ii. Discuss splice sampling and testing procedures and responsibilities.
 - f. Discuss the following with the Contractor, Quality Control Manager (QCM), rebar subcontractor, representative for the authorized laboratory, and the METS Rep:
 - i. The ultimate and service butt splice specification.
 - ii. The sampling procedures and acceptance criteria.
 - g. Review and authorize Contractor submittals by checking the following items:
 - i. Verify the Contractor has assigned a QCM.
 - ii. Verify the independent testing laboratory chosen by the Contractor for splice testing is on the [Authorized Laboratory List](#):
 1. If information is not available to verify this, contact the METS Rep for assistance.
 - iii. Verify the manufacturer for Ultimate Hoops is on the [Authorized List for Resistance Welding Fabricators](#).

- iv. Verify that the mechanical splice system chosen by the Contractor for use is on the [Authorized List of Couplers for Reinforcing Steel](#).
 - v. Verify that the prequalification of operators and procedures for mechanical splices meet the requirements of the contract documents.
 - vi. Verify that the Splice Prequalification Report submitted by the Contractor conforms to the requirements of the contract documents.
 - vii. Verify the welder and Welding Procedures Qualifications submitted by the Contractor conforms to the requirements of the Contract Documents. Refer to BCM 11, *Welding*, for information on welding requirements.
 - viii. Verify that Weld Flash Removal Process complies with the contract documents.
4. During construction:
- a. Collect all material certifications and verify they meet the requirements of the contract documents.
 - b. For lap splices:
 - i. Calculate the minimum required lap splice using field verified dimension and grade of the reinforcing bar.
 - ii. Measure the lap splice length in the field and verify that the minimum required lap splice length has been met.
 - iii. Verify lap splicing is staggered in accordance with the Contract Documents. For bridge deck construction transverse bars see the [Outline of Field Construction Practices](#), Section 29, *Deck Rebar*.
 - iv. Verify clearance to adjacent bars and lap splice requirements of bundled bars, which can be challenging for congested and/or large diameter reinforcing steel. Note the limitation in the *Contract Specifications*, Section 52-6.03B, *Reinforcement – Splicing – Construction – Lap Splicing*, for reinforcing bar diameter and lap splices.
 - c. For service splices and ultimate butt splices:
 - i. Review Attachment 1, *Reinforcement Splices*.
 - ii. Verify location of splices meets the requirements of the contract documents; for example, identify no-splice zones.
 - iii. Verify that the operators are prequalified per the authorized submittals and that their certifications are current.
 - iv. Verify that the equipment and procedures used conform to the manufacturer’s recommendations and contract documents, for example:

1. For mechanical splices requiring a torque wrench, verify the calibration date and torque setting of the wrench.
 - v. Perform visual inspection of the production of splices.
 - vi. Select the appropriate number of splices to be sampled from the production lots for Quality Control and Quality Assurance Testing.
 - vii. Prepare splicing samples in accordance with Attachment 1, including a completed [Form TL-0101](#), *Sample Identification Card*, for QA test samples.
 - viii. Review the Splicing Quality Control Test Reports submittal and the QA testing reports from METS and authorize or reject splices in accordance with contract documents.
 - ix. Work with the Contractor for resampling and retesting for as required, in the event of failed tests.
 - x. Verify splices are staggered per the requirements of the contract documents.
- d. Verify concrete cover at splices meets the requirement of contract documents.
- e. 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:
 - a. Document the reinforcing splices on the as-built plans per [BCM C-6](#), *Required Documents to be Submitted During Construction*.
6. File all materials testing documentation/results and Daily Reports 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*. A list of items to be recorded in the job files include:
 - a. The Contractor's submitted plan designating the splicing QCM and testing laboratory.
 - b. Laboratory Qualification (record of verification by the Structure Representative).
 - c. Splice Prequalification Report.
 - d. Test reports submitted by the splicing QCM.
 - e. Summary record of production test (Attachment 1).
 - f. Test results of sample splices sent to METS.

- g. Records indicating the resolution of any failed QA test results.
- h. Certification of compliance.

Process Outputs

- 1. Authorized submittals
- 2. Daily reports
- 3. Documented location of splices on as-built plans. Test results and reports.

Attachments

- 1. [Attachment 1](#), *Reinforcement Splices*