



Asphalt Concrete – Hot Mix Asphalt – Hot Mix Asphalt on Bridge Decks

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	03-02-2023	Original issue	Richard Foley

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Background

This process establishes Structure Construction (SC) responsibilities and procedures for the application of hot mix asphalt (HMA) on the bridge deck.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the [Contract Specifications](#) (CS), Section 39-2.06, *Asphalt Concrete – Hot Mix Asphalt – Hot Mix Asphalt on Bridge Decks*, 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

Submittals per [contract documents](#)

Procedure

1. All work associated with this process is charged as [Project Direct – Construction](#).
2. Inspection of field work for this process is:
 - a. [Continuous](#) to ensure delivery of approved mix design, proper temperature of lay down, and ambient temperature.
 - b. [Continuous](#) to observe temperature before, during, and after application of HMA prior to opening to traffic.

3. Before construction begins:
 - a. Review the following:
 - i. [Contract documents](#)
 - ii. *Construction Manual (CM)*, Chapter 4, [Section 4-39](#), *Construction Details – Asphalt Concrete*
 - iii. Structures Maintenance and Investigations [Inspector's Memo 300-03](#), *Inspection Reports – Investigation of Overlay Covered Bridge Decks*
 - iv. Authorized traffic control plan, including contingency plans for late openings
 - v. Environmental compliance (i.e., bats, birds, lead etc.)
 - vi. Authorized HMA job mix formula (JMF)
 - vii. Authorized HMA quality control plan
 - viii. Authorize public safety plan
 - ix. Contractor's calculations for the minimum spray rate of tack coat.
 - b. Verify authorized HMA submittals with the Resident Engineer.
 - c. Verify that Materials Engineering and Testing Services (METS) Representative ([METS Rep](#)) has received [Form CEM-3101](#), *Notice of Materials to be Used*.
 - d. Verify paving operation does not exceed bridge load limits per CS, Section 5-1.37B, *Control of Work – Maintenance and Protection – Load Limits*, and guidance in [Attachment 2](#), *SC Staff Responsibilities for Performing Standard Construction Activities*, of [BCM A-1](#), *Communicating SC Staff Responsibilities for Processes Owned by Others*.
 - e. Verify the project does not impact the permit rating of the bridge per [Attachment 2](#), *Guidance for Complete Required Documents Submitted to SC HQ*, of [BCM C-6](#), *Required Documents to be Submitted During Construction*, and submit final records regarding change in permit rating per BCM C-6.
 - f. Verify that the type of equipment being used by the Contractor is appropriate for the work and is calibrated. If volumetric trucks are used for dispensing HMA, verify that the trucks are certified per [California Test \(CT\) 109](#), *Method for Testing of Material Production Plants*.
 - g. Inspect the bridge deck for existing spalls/unsound concrete and prepare for repairs as needed per:
 - i. The contract requirements in the CS, Section 60-3.02, *Existing Structures – Structure Rehabilitation – Bridge Deck Repair and Preparation*
 - ii. Guidance in [BCM 60-3.02](#), *Existing Structures – Structure Rehabilitation – Bridge Deck Repair and Preparation*.

- h. Verify that the HMA plant has current qualification under the Department's Material Plant Quality Program. Refer to CS, Section 39-2.01B(8)a, *Asphalt Concrete – Hot Mix Asphalt – General – Materials – Hot Mix Asphalt Production – General*.
 - i. Hold a prepaving conference if required per the contract documents. Refer to CM, Chapter 4, [Section 4-3902I](#), *Construction Details – Asphalt Concrete – Before Work Begins – Prepaving Conference*.
 - j. Verify that certifications for the equipment and operator of the inertial profiler have not expired. Refer to CM, Chapter 4, [Section 4-3906](#), *Construction Details – Quality Control*.
 - k. Verify that placement of HMA does not reduce the reported minimum vertical clearance of existing structures such as sign structures. Refer to CM, Chapter 4, [Section 4-3902J](#), *Construction Details – Asphalt Concrete – Paving Operations*.
4. During construction:
- a. Coordinate with the District staff to:
 - i. Verify that Contractor provides advance notification to schedule the plant inspection. Submit the plant inspection request to Construction-Plant Services in the district. If the test results on plant-produced samples do not show compliance with the contract document, notify the Contractor. Verify that corrective actions made by the Contractor produce results that comply with the contract requirements. Obtain and review [Form CEM-3501](#), *Hot Mix Asphalt Production Report*. Refer to CM, Chapter 4:
 - 1. [Section 4-3901C](#), *Construction Details – General – Paving Personnel*,
 - 2. [Section 4-3902H\(1\)](#), *Construction Details – Before Work Begins – Antistripping Treatment of Aggregates – Lime Treatment of Aggregates*
 - 3. [Section 4-3903C](#), *Construction Details – During the Course of Work – Plant Operations*.
 - ii. Verify that the Contractor submits quality control (QC) test results per the contract requirements and the authorized quality control plan. Refer to CS, Section 39-2.01A(3)(d), *Asphalt Concrete – Hot Mix Asphalt – General – General – Submittals – Test Results*.
 - iii. Verify that materials, including aggregates and binders, are sampled at the plant and field at the frequency required in the contract documents. To guide and assist Caltrans construction staff, the material sampling and testing frequency described in contract requirements is summarized in the CM, [Table 6-1.13](#), *Materials Acceptance Sampling and Testing Requirements: Asphalt Concrete*. For aggregates refer to CS:

1. Section 39-2.01A(4)(h)(iii), *Asphalt Concrete – Hot Mix Asphalt – General – General – Quality Assurance – Quality Control – Aggregates*
 2. Section 39-2.02A(4)(b)(ii), *Asphalt Concrete – Hot Mix Asphalt – Type of Hot Asphalt – General – Quality Assurance – Quality Control – Aggregates.*
- iv. Verify that before placing HMA, loose paving particles, dirt, and other extraneous material are removed from the bridge deck. Refer to CS, Section 39-2.01C(3)(b), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – Surface Preparation – Subgrade.*
 - v. If the traffic control measures (lane tapers, CHP enforcement, etc.) implemented are not adequate, request additional assistance from the District.
 - vi. Prior to placement of HMA, verify that the deck is dry, check weather conditions, relative humidity, and deck surface temperature are within the requirements of contract documents. Record temperatures and the time taken on [Form CEM-3502](#), *Hot Mix Asphalt Placement Report*. Notify the Contractor to stop HMA placement when temperatures are below specified limits. Refer to the:
 1. *Contract Specifications*, Section 39-2.01C(1), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – General*
 2. *Construction Manual*, Chapter 4, [Section 4-3903D\(1\)](#), *Construction Details – Asphalt Concrete – During the Course of Work – Paving Operations – Atmospheric and Pavement Temperature.*
 - vii. Verify that loads in trucks are covered with tarpaulins when ambient temperature drops below the minimum temperature specified in the contract document. Also verify that tarpaulin is used when the time “from discharge to the truck until transfer to the paver” exceeds the maximum time specified in the CS, Section 39-2.02C, *Asphalt Concrete – Hot Mix Asphalt – Type of Hot Mix Asphalt – Construction.*
 - viii. Collect the weighmaster certificates for each load delivered. Verify that the HMA is a homogenous mixture of coated aggregates free of any segregation, coarse or fine aggregate pockets, hardened lumps, marks, tearing, and irregular texture. Verify that the temperature of the HMA during placement and compaction are within requirements of the contract. Refer to the:
 1. *Contract Specifications*, Section 39-2.01A(3)(f), *Asphalt Concrete – Hot Mix Asphalt – General – General – Submittals – Liquid Antistrip Treatment*

2. *Construction Manual*, Chapter 4, [Section 4-3903D\(3\)](#), *Construction Details – Asphalt Concrete – During the Course of Work – Paving Operations – Transporting and Spreading*.
- ix. If deck seal is used, verify that HMA is placed within the time and method specified in the CS, Section 39-2.06, *Asphalt Concrete – Hot Mix Asphalt – Hot Mix Asphalt on Bridge Decks*.
 - x. Verify that HMA does not stain the finished surface of any improvement, including pavement per the CS, Section 39-2.01C(1), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – General*.
 - xi. Verify that HMA is placed within the limits shown in contract project plans. Verify that existing facilities such as deck drains or manholes are protected from HMA entering or covering the existing facilities.
 - xii. Verify that tack coat is applied to surfaces to be paved and at a high enough rate to meet the minimum residual rate specified. Refer to the:
 1. *Construction Manual*, Chapter 4, [Section 4-3903D\(2\)](#), *Construction Details – Asphalt Concrete – During the Course of Work – Paving Operations – Tack Coat*
 2. *Contract Specifications*, Section 39-2.01C(3)(f), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – Surface Preparation – Tack Coat*.
 - xiii. Verify that HMA placement provides for HMA thickness, grade and slopes shown in the contract documents.
 - xiv. Verify that HMA is compacted using the method and equipment described in the contract documents and the quality control plan. Verify that the HMA density is tested at the frequency specified in the contract documents. Verify that the HMA density is tested using equipment specified in the contract documents and is calibrated. Verify that HMA density test results meet the minimum in place density requirement specified in the CS:
 1. Section 39-2.01A(4)(i)(ii), *Asphalt Concrete – Hot Mix Asphalt – General – General – Quality Assurance – Department Acceptance – In-Place Density*
 2. Section 39-2.01A(4)(h)(vi), *Asphalt Concrete – Hot Mix Asphalt – General – General – Quality Assurance – Quality Control – Hot Mix Asphalt Density*
 3. Section 39-2.02A(4)(b)(ix), *Asphalt Concrete – Hot Mix Asphalt – Type A Hot Mix Asphalt – General – Quality Assurance – Quality Control – Type A Hot Mix Asphalt Production*.
 - xv. Verify that rolling activities are completed before the surface temperature drops below the minimum temperature specified in the CS, Section 39-

- 2.01C(1), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – General*.
- xvi. Verify that the HMA surface is smooth, and has a uniform surface texture, without tearing, shoving, or gouging. Verify that the HMA surface is also free of marks, ridges, or indentations. Refer to the CS:
1. Section 39-2.01A(4)(i)(iii), *Asphalt Concrete – Hot Mix Asphalt – General – General – Quality Assurance – Department Acceptance – Pavement Smoothness*
 2. Section 39-2.01C(2)(a), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – Spreading and Compacting Equipment – General*.
- xvii. Verify that longitudinal joints in the HMA pavement is constructed per the contract requirements. Refer to the CS, Section 39-2.01C(4), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – Longitudinal Joints*.
- xviii. Verify that mid depth temperature of the new HMA pavement is below the maximum temperature specified in the contract documents before it is open to traffic. Refer to the CS, 39-2.01C(15)(a), *Asphalt Concrete – Hot Mix Asphalt – General – Construction – Compaction – General*.
- xix. Verify that prior to opening to traffic, that the new HMA pavement is stripped per the contract documents.
- xx. Measure the quantity of hot mix asphalt placed and produce pay quantities. Take payment deductions when test results do not comply with the CS in accordance with reduced payment factors described in the contract document.
- xxi. Record temperature and details of HMA placement on the [Form CEM-3502](#), *Hot Mix Asphalt Placement Report*. Refer to the CM, Chapter 4, Section 4-3903D, *Construction Details – Asphalt Concrete – During the Course of Work – Paving Operations*.
- xxii. Document all inspection, construction, and quality assurance activities, pertinent to this BCM, in the daily reports per [BCM C-7](#), *Daily and Weekly Reports*.
- xxiii. Use [Form CEM-3701](#), *Test Result Summary*, to summarize acceptance test frequency and results.
5. File all project documentation (materials acceptance documentation, correspondence, daily reports, etc.) in the appropriate category in the project records as specified in the CM, Chapter 5, [Section 5-102](#), *Contract Administration – Project Records and Report – Organization of Project Documents*.

Process Outputs

1. Authorized submittals
2. Authorized public safety plan
3. Daily reports
4. Materials certifications
5. Constructed facility

Attachments

None