Structural Steel Coatings – Thermal Spray Coat Structural Steel

Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	03-30-2023	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 testing, materials, and construction of thermal spray coatings for structural steel.

Review and authorization of submittals for thermal spray coating (TSC) of structural steel are necessary to confirm the surface to be coated is properly prepared, the coating is applied correctly, uniformly, and in a manner that protects the public and the environment.

Thermal spray coating involves the application of molten metal onto a steel substrate that has been blast cleaned to a near white finish. The molten metal is blasted onto the surface where it bonds with the base metal. Several different tests are performed to assure that the desired thickness and bond strength are achieved. This is not a wet applied coating. Afterward, a seal coating is applied.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the *Contract Specifications*, Section 59-5, *Thermal Spray Coat Structural Steel*, 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. Coating quality work plan submittal
2. Form CEM-3101, *Notice of Materials to be Used*
3. Materials certifications (certificates of compliance)

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 containment system construction and work area monitoring.
   b. Benchmark for surface preparation and thermal spray coating application.
3. Before construction begins:
   a. Prior to meeting with the Contractor at the start of the project:
      i. Review the coating quality work plan (CQWP) requirements.
      ii. Meet with the Materials Engineering and Services Representative (METS Rep) to discuss the contract documents, the thermal spray requirements, and establish the roles and responsibilities regarding quality assurance inspection.
   b. Attend the precoating meeting with the METS Rep, the Contractor, and all thermal coating sub-contractors.
   c. Review and authorize or reject for resubmittal, the CQWP for thermal spray coating activities to verify the CQWP includes all components listed in the *Contract Specifications*. Some review considerations include:
      i. Verify the TSC operator certifications are current.
      ii. Protective measures may include:
         1. Fire protection (e.g., private land, public land, forest service, etc.).
         2. Environmental protections (e.g., water bodies, forest, etc.)
      iii. Communication plan (if applicable) for coordination with interested parties (fire marshal, forestry, permitting agencies, railroad etc.)
      iv. Obtain and review applicable industry standards from the Contractor (e.g., American Society for Testing and Materials (ASTM) standards, Society for Protective Coatings (SSPC) standards).

d. Discuss any questions regarding the coating systems and application methods with the Structure Maintenance & Investigations (SM&I) Bridge Paint Program Manager, METS Rep, and/or the Bridge Construction Engineer (BCE).

e. Contact the Resident Engineer (RE) and/or the District Environmental Branch regarding any issues with environmental permit for the following:

   i. Required permits are in place (when applicable).

   ii. Workspace, lead compliance, and traffic control requirements.

   iii. Contact the Contractor should an environmental noncompliance occur.

f. Review and verify requirements for water used for cleaning, sealing compounds, and abrasives are being met as they are delivered to the work site.

g. Coordinate the inspection and release of materials with the METS Rep.

h. Review manufacturer's recommendations and material safety data sheets. Consult with the METS Rep, BCE, SM&I Paint/Coating Program Manager, and/or SC Technical Team when manufacturer's recommendations conflict with contract requirements. Communicate with the Contractor and resolve should a conflict exist.

i. Communicate coating issues and concerns and how to address them with the Assistant Structure Representative.

j. Contact the SC Falsework Engineer if the thermal spray coating activities are within the railroad right of way to coordinate communication with the railroad company.

k. Procure necessary personal protective equipment (PPE), paint inspection tools, calibrate equipment, and arrange for training with assistance from the BCE.

4. During construction:

   a. Coordinate between project stakeholders, environmental permits, and project schedule.

   b. When materials arrive at the jobsite, collect certificate of compliance (e.g., blast cleaning abrasives, wire feedstock, coating material).

   c. Verify proper material storage, handling, and disposal of coating products.

   d. Monitor expiration dates for TSC operator certifications.

e. Per *CS*, Section 59-5.03, *Structural Steel Coatings – Thermal Spray Coat Structural Steel – Construction*, verify the surface is prepared per the *CS*, Section 59-2.01C(3)(a), *Structural Steel Coatings – Painting Structural Steel – General –Construction – Surface Preparation – General*.

f. Verify that the work performed complies with the contract documents and the authorized CQWP for the:

   i. Soluble salts test

   ii. Surface cleanliness (visual and physical inspection)

   iii. Surface profile roughness

   iv. Monitoring and maintaining of ambient conditions for TSC application

g. Witness each test coupon for bend testing before each work shift, and document results, which includes:

   i. Coating thickness

   ii. Adhesion

   iii. Bend test

   iv. Cut test

h. Verify testing of TSC application for:

   i. Coating thickness

   ii. Cut testing

   iii. Adhesion testing

i. Verify that areas represented by failed cut and adhesion testing are removed with new coating applied.

j. Verify application of seal coating.

k. Verify overcoat paint (when specified).

l. Contact the MR for technical support, including but not limited to addressing coating deficiencies.

m. Document all daily TSC application activities per BCM 59-1, *Structural Steel Coatings – General*.

n. 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 on record of completion and as-built project plans.

6. 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*, Chapter 5, Section 5-102 , *Contract Administration – Project Records and Reports – Organization of Project Documents*.

Process Outputs

1. Daily reports
2. As-built project plans
3. Authorized coating quality work plan

Attachments

None