



SQS Supplement B

MnDOT Supplier Qualification Standard

Shop Application of Complex Coatings



Standard supports the Department's Approved Supplier Program for Structural Metals Suppliers as described in the current Standard Specification for Construction



Supplier Qualification Standard for Suppliers of Fabricated Structural Metal Products



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MnDOT Supplier Qualification Standard



Documentation Requirements

Supplier Quality Management System

Supplement B

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1 General Information

The purpose of this Supplement to the Supplier Qualification Standard is to outline the criteria for qualification to the Minnesota Department of Transportation (MnDOT) Metals Supplier Qualification Program for Shop Application of Complex Coatings.

This supplement does not address preparation by blasting. Shop Painting/Coating Suppliers who provide blasting also need to comply with Supplement BB Blasting Services.

Blasting Only Service Suppliers need to comply with the Supplier Qualification Standard and the requirements of Supplement BB Blasting Services.

Several sections of the MnDOT SQS address requirements for aspects of Supplier Quality Management Systems that differ between the listed Supplier Category Processes. These sections have been omitted from the core Supplier Qualification Standard and are included in the applicable Supplier-specific Supplement. The omitted sections include:

- Section 6: Contract Review
Section 7: Communicating Project Requirements to Production
Section 11: Material Identification
Section 12: Manufacturing Process Control

3 References/Library

Reference documents, standards, codes, contract-specific Special Provisions and revisions and other applicable documents must be readily accessible to the individuals who need them to perform their work.

The following list of references may increase to cover the Supplier’s products, materials, and services and contract-specific requirements.

Required references:

All suppliers

- MnDOT Standard Specification for Construction
MnDOT Special Provisions
ASTM Standards for materials used by the company

Coating Contract Suppliers and Bridge Suppliers supplying complex coatings

SSPC: The Society for Protective Coatings

- SSPC PA1 Shop, Field, and Maintenance Painting of Steel
SSPC PA2 Measurement of Dry Coating Thickness with Magnetic Gages
SSPC SP1 Solvent Cleaning
SSPC SP10 - NACE No 2 Near-white BlastSSPC

- QP3 Certification Program (Shop Painting Certification Program)

Coating Manufacturer

- Equipment and Coating Manufacturer’s Published Instructions and Product Data Sheets (PDS)

American Association of State Highway and Transportation Officials (AASHTO)

- AASHTO/NSBA S4.1 - Steel Bridge Fabrication QC/QA Guide Specification
AASHTO/NSBA S 8.4 - Guide Specification for Coating Systems with Inorganic Zinc-Rich Primer
AASHTO/NSBA S8.1 - Guide Specification for Application of Coating Systems with Zinc-Rich Primers to Steel Bridges

American Society for Testing and Materials (ASTM)

- ASTM D4285 Standard Test Method for Indicating Oil or Water in Compressed Air

American Institute for Steel Construction (AISC)

- AISC/SSPC Certification Standard for Shop Application of Complex Protective Coating Systems

Suggested References:

Note: Specific Suggested References may be required if the tests covered are mandated by contract.

American Association of State Highway and Transportation Officials (AASHTO)

- AASHTO M 300, Standard Specification for Inorganic Zinc-Rich Primer
AASHTO R 31, Standard Practice for Evaluation of Coating Systems with Zinc-Rich Primers

American Society for Testing and Materials (ASTM)

- ASTM D 660 Standard Test Method for Evaluating Degree of Checking of Exterior Paints
ASTM D 3276, Standard Guide for Painting Inspectors (Metal Substrates)
ASTM D 3359, Standard Test Methods for Measuring Adhesion by Tape Test
ASTM D 4138, Standard Test Method for Measurement of Dry Paint Thickness of Protective Coating Systems by Destructive Means
ASTM D 4414, Standard Practice for Measurement of Wet Film Thickness by Notch Gages
ASTM D 4417, Standard Test Methods for Field Measurement of Surface Profile of Blast Cleaned Steel
ASTM D 4541, Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
ASTM D 4752, Standard Test Method for Measuring MEK Resistance of Ethyl Silicate Zinc-Rich Primers by Solvent Rub





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- ASTM D 6386: Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting

SSPC: The Society for Protective Coatings

- SSPC-Paint 29, Zinc Dust Sacrificial Primer, Performance-Based
- SSPC-Paint 30, Weld-Through Inorganic Zinc Primer
- SSPC-PS 12.00, Guide to Zinc-Rich Coating Systems
- SSPC-PS Guide 12.00, Guide to Zinc-Rich Coating Systems
- SSPC-PS Guide 17.00, Guide for Selecting Urethane Painting Systems
- SSPC-Paint 20, Zinc-Rich Coating, Type I–Inorganic, and Type II–Organic
- SSPC-SP 2, Hand Tool Cleaning
- SSPC-SP 3, Power Tool Cleaning
- SSPC-SP 11, Power Tool Cleaning to Bare Metal
- SSPC-SP 15, Commercial Grade Power Tool Cleaning
- SSPC SP16 Brush-Off Blast Cleaning for Galvanized-Ungalvanized
- SSPC Steel Structures Painting Manual, Volume I, Good Painting Practice
- SSPC Steel Structures Painting Manual, Volume II, Systems and Specifications

American Association of State Highway and Transportation Officials (AASHTO)

- AASHTO/NSBA S4.1 - Steel Bridge Fabrication QC/QA Guide Specification

6 Contract Review, Order Review and Project Management

6.1 Contract documents

Maintain a current copy of the contract documents at the Supplier's facility. Describe a method to track the current status of contract drawings, specifications, addendums, and other documents that affect the final product. Include signatures, stamps, logs, files or lists. Clearly show the status, date received and revision date of owner design drawings and specifications.

6.2 Notification to the Owner

Describe the plans for transmitting project documentation to the Engineer or the QAI as appropriate, including the recording the transmittal of purchasing data (purchase orders, MTRs and other documentation) to assure that the information is furnished.

Identify the personnel positions responsible for assembling and transmitting these records and establishing appropriate time targets.

Document a method for Owner notification.

MnDOT specific requirement

For MnDOT projects, assure that methods allow notifying the State Representative at least 5 business days before the coating operation begins so that the State Representative can perform verification inspections if desired. Do not begin work before this notification is received and acknowledged.

Describe the internal controls to prevent material ordering until the Engineer approves of the shop drawings; or if materials must be ordered before all shop drawings are approved, describe the methods to prevent improper materials and schedule delays from affecting the project.

6.3 Contract and Order Review

Describe the responsibility for conducting and organizing the review and the methods to communicate the review results to the next steps in the process. Identify who is responsible for reviewing the contract documents, plans and specifications, including addenda and special instructions, and the order information received from the contractor.

Describe how all applicable original contract documents, special provisions and order information are thoroughly reviewed at the time a project is accepted, and incorporated in shop practice documentation and scheduling for the project. Perform the review process when contract documents are revised, when changes or clarifications from a Supplier proposal or an RFI (request for information) or other official communication is received from the owner or customer's authorized representative. Review only for the areas affected by the changes and convey appropriately amended documents to production personnel.

Address these specific documents/criteria at a minimum:

- Contract documents (design drawings and specifications, Special Provisions and documented communications)
- Change orders and contract revisions
- Order documentation from the contractor, particularly the required schedule information
- Transmittals from the owner and contractor
- Answers to requests for information (RFI)
- Schedule required for completion of entire project or specific segments

In the review, identify, determine, plan, and record the specific project requirements. Define distribution of the record to the responsible individuals in the organization, and identify new documented quality procedures that must be created for the work. Consider any issue that affects the Supplier's capability to perform the work. Include scheduling for multiple coat requirements, and create records showing consideration of the requirements of this clause at a minimum.





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Contract Review Record

Verify that your quality management system does address all requirements in the specification. Record the areas where the specification is unclear or where the specification requirements cannot be met by the Supplier’s standard practice. Describe the method by which this information is conveyed to the responsible planning, detailing, procurement, production, or quality functions.

6.4 Quality Records

- Contract review record.
Schedules
Contract Clarifications

7 Communication of Project Requirements

7.1 Project Communication

Determine the means of communication with the Owner and Contractor representatives as part of the Contract review and before work begins. Record contact information for the Owner and Contractor Representatives, and any specific communication requirements mandated by contract documents.

7.2 Communicating Project Requirements

Create a method/procedure/instruction/form to effectively communicate coating system requirements to the personnel/departments in the organization that need the information to do their work.

Specific details and directions are typically communicated to shop personnel via shop drawings; however, other methods and lists may be described.

Assure that project information is accurately communicated in a timely manner to these groups at a minimum:

- Purchasing
Scheduling
Applicators and blasters
Inspection personnel

Use written or electronic documents to communicate throughout the organization on these specific characteristics at a minimum:

- Verifying Surface preparation (per SSPC standards),
Coating type
Dry film thickness requirements
Coating step backs
Masking
Reduced-DFT zones
Verify coated surfaces designated slip critical meet manufacturer’s application criteria
Planning for third party inspection

11 Material Identification

11.1 Coatings system components

The requirements for identification of qualified coatings system components are detailed in the purchasing clause of the Supplier Qualification Standard.

MnDOT specific requirement

For MnDOT projects, assure that systems and components are accepted by the Department

11.2 Coated material identification

Document how coated product maintains its identity during the coating process in a shop application process. Address customer requirements for permanent and temporary marking on the final product delivered to the field.

Demonstrate how existing structures are identified in a field painting operation for the purpose of surface testing, surface preparation, application records and inspection records.

12 Coating Process Control

Address the below requirements in the Quality Management System Documentation. Assure Process Control documentation is readily available to appropriate personnel who need it.

12.1 Required Documented Processes

Address in the documentation the requirements of this standard for the processes described in this clause.

- Surface Preparation
Application

12.2 Coating Personnel

Require that only employees who have received training and have demonstrated competence in coating preparation and application perform coating preparation and application. Describe how newly assigned painters without experience are taught the proper techniques and terminology.

Identify the position that is the top individual at the facility with documentation of required qualification and the technical knowledge of the complex coating process.

12.3 Surface Preparation (excluding Blasting) and Coating Process Control

Provide pertinent portions of the contract specifications and special provisions as well as the product data sheets from the manufacturer to the applicators. Assure that they have received training and can follow contract requirements and the manufacturer’s recommendations. (Contract provisions supersede manufacturer PDS.)





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Address in a procedure on application:

- Limitations on minimum and maximum film thickness
- Ambient conditions (temperature, humidity) and how often they are checked and recorded
- Direction to the applicator for mixing and agitation to achieve uniformity.
- Curing times to recoat, move and transport
- How piece marks are maintained or transferred as pieces are painted
- Appropriate technique to prevent defects
- How difficult part geometries such as crevices and other restricted access areas are to prepared and coated

12.3.1 Application Records

Address the content and frequency of checks entered in application records.

Before Application

- Identification of the paint system including catalysts, curing agents, hardeners and thinners
- Compressed Air Checks; including frequency and frequency adjustments when humidity changes. Compressed air checks shall be documented.
- Surface Profile; including how abrasive blasted surfaces are assessed for cleanliness, the method and frequency of checks.

MnDOT specific requirement

Include in the record how a check is made for the MnDOT Engineer's inspection and approval of the work before coating begins. The record will show the hold point for blast before painting

Surface Check

- Ambient temperature
- Dew point and humidity
- Surface temperature
- Date and time
- Piece mark and bundle
- SSPC Surface Prep (SP) standard met
- Visual inspection

Primer coat

- Primer coat batch number
- Verification of surface cleanliness
- Temperature of mixed primer
- Proper mixing and straining
- Primer introduction time
- Primer pot life
- Primer cure time for recoat
- Proper use of stripe coats
- Primer coat evaluation and repair
- Primer application completion time

Intermediate Coat:

- Intermediate coat batch number
- Verification of surface cleanliness
- Temperature of mixed intermediate coating

- Proper mixing and straining
- Intermediate induction time
- Intermediate pot life
- Intermediate cure time prior to recoat or for handling as applicable
- Proper use of stripe coats
- Intermediate coat evaluation and repair
- Intermediate coat application completion time

Finish Coat

- Finish coat component batch number
- Verification of intermediate coat surface cleanliness
- Temperature of mixed finish coating
- Finish coat mixing, straining, or both
- Finish coat pot life time
- Finish coat induction time
- Finish coat cure time prior to handling
- Proper use of stripe coats
- Adhesion
- Coating system final evaluation and repair
- Final coat application completion time

12.3.2 Handling

Describe methods for blocking or hanging materials during coating and curing. Describe methods for verifying adequate cure prior to handling. Address methods for handling coated materials to prevent damage. Include the requirements for preventive measures that may include nylon straps, edge softeners, padded hooks, slings, or other non-metallic lifting devices to protect coated components or products during handling and loading.

12.3.3 Special Process Control for Duplex Coatings

- Special preparation of hot-dip galvanized coated steel products
- color approvals and paint drawdowns when specified

12.3.4 Repair Procedure

Define methods for repair or touch up on coated steel that has been damaged in handling, in accordance with the contract requirements and manufacturer product data sheets.

MnDOT specific Requirement:

Record the preapproval of these methods or procedures in advance of starting the coating process.

12.3.5 Quality Records

- Surface condition records
- Batch numbers for all components
- Component Mixing and Application Records
- Training records for blasters, applicators and inspectors.





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Supplement B Painting—Shop and Field



Minnesota Department of Transportation:
Metals Supplier Qualification Program

