**Design Standards Letter**

**Letter Number: S-2019-03**

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**Section: 104, 106, 109, 203, 216, 413, 502, 610, 616, 702, 703, 712, 724, 806, 1042, 1063, 1065, 1080, 1081**

**Subject: Revised Supplement to the 2018 Standard Specifications and the New Publication of the 2019 Standard Specification**

**TO:** All Central and District Offices

**FROM:** Sarah Kleinschmit

**DATE:** May 24, 2019

**SUBJECT:** Standard Specifications Letter No. 3, 2019

The Supplemental Revisions to the *2018 Missouri Standard Specifications for Highway Construction* are now included in the new publication of the *2019 Missouri Standard Specification for Highway Construction* along with the following additional revisions listed below. The 2019 *Missouri Standard Specification for Highway Construction* effective July 1, 2019 is now available on MoDOT’s website.

Questions regarding the Supplemental Revisions to the Missouri Standard Specification should be directed to Tim Oligschlaeger, Central Office, Engineering Policy Services, at 573-751-3813 or myself at 573-751-7412.

**MINOR REVISIONS:**

**SECTION 104 SCOPE OF WORK**

*Sec 104.6* Deleted “or underrun contract items” from the end of the second sentence and added the following sentence as the third sentence in the section, “Using an existing item in place may include an underrun of quantities, but in accordance with Sec 105.4.1, the underrun may not be an apparent error or omission in the plans, as determined by the engineer”.

**SECTION 106 CONTROL OF MATERIAL**

*Sec 106.9* Deleted “titled” and replaced with “635.410” behind Title 23 CFR in the first sentence.

*Sec 106.9.3* Deleted the entire section and replaced with the following:

Buy America requirements include a step certification for all fabrication processes of all steel or iron materials that are accepted per Sec 1000.

*Sec 106.9.3.1* Added as new section.

Items designated as Category 1 will consist of steel girders, piling, and reinforcing steel installed on site. Category 1 items require supporting documentation prior to incorporation into the project showing all steps of manufacturing, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements. This includes the Mill Test Report from the original producing steel mill and certifications documenting the manufacturing process for all subsequent fabrication, including coatings. The certification shall include language that certifies the following. That all steel and iron materials permanently incorporated in this project was procured and processed domestically and all manufacturing processes, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410.

*Sec 106.9.3.2* Added as new section.

Items designated as Category 2 will include all other steel or iron products not in Category 1 and permanently incorporated in the project. Category 2 items shall consist of, but not be limited to items such as fencing, guardrail, signing, lighting and signal supports. The prime contractor is required to submit a material of origin form certification prior to incorporation into the project from the fabricator for each item that the product is domestic. The Certificate of Materials Origin form ([link to certificate form](http://epg.modot.mo.gov/forms/CM/CERTIFICATE_OF_MATERIALS_ORIGIN.pdf)) from the fabricator must show all steps of manufacturing, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements and be signed by a fabricator representative. The Engineer reserves the right to request additional information and documentation to verify that all Buy America requirements have been satisfied. These documents shall be submitted upon request by the Engineer and retained for a period of 3 years after the last reimbursement of the material.

*Sec 106.9.3.3* Added as new section.

Any minor miscellaneous steel or iron items that are not included in the materials specifications shall be certified by the prime contractor as being procured domestically. Examples of these items would be bolts for sign posts, anchorage inserts, etc. The certification shall read “I certify that all steel and iron materials permanently incorporated in this project during all manufacturing processes, including coating, as being completed in the United States and in accordance with CFR Title 23 Section 635.410 Buy America Requirements procured and processed domestically in accordance with CFR Title 23 Section 635.410 Buy America Requirements. Any foreign steel used was submitted and accepted under minor usage”. The certification shall be signed by an authorized representative of the prime contractor.

*Sec 106.9.3.4* Deleted in its entirety and renumbered subsequent sections accordingly.

**SECTION 109 MEASUREMENT AND PAYMENT**

*Sec 109.15.1.1* Deleted “1.0” from the end of the first sentence and replaced with “Sec 109.15.1.

**SECTION 216 REMOVALS FOR BRIDGE STRUCTURES**

*Sec 216.50.2.2* Added the following sentence as the fourth sentence in the section, “SSPC Certified Contractor QP qualification will not be required for the coating of the top flanges prior to placement of the new concrete deck”.

**SECTION 413 SURFACE TREATMENTS**

*Sec 413.50.2* Deleted “AASHTO M 324” from the first sentenced and replaced with “Type II sealant requirements in ASTM D 6690”.

**SECTION 502 PORTLAND CEMENT CONCRETE BASE AND PAVEMENT**

*Sec 502.11.2.3 Entrained Air Content.* Changed the third sentence from, “The minimum air content in front of the paver shall be 5.0 percent plus the air loss through the paver” to “The air content shall be in accordance with Sec 501.10.2, except that the minimum air content in front of the paver shall be 4.5 percent plus the air loss through the paver”.

*Sec 502.11.3.3 Slump, Air Content, and Absorption.* Removed “Air Content” from this subsection title and removed the entire row for Air Content from the table.

**SECTION 616 TEMPORARY TRAFFIC CONTROL**

*Sec 616.5.1.* Deleted the entire section and replaced with the following.

*616.5.1 Amber or Amber and White Warning Lights.*All on-road construction-related vehicles and equipment shall operate with amber or amber and white warning lights having 360 degrees of total coverage and as follows:

(1) For daytime operations, SAE Class 1 or 2 lights shall be used.

(2) For dusk to dawn operations, SAE Class 2 lights shall be used, or SAE Class 1 lights with dimming capabilities to minimize glare experienced by travelers.

*616.5.1.1 Red or Red and Blue Warning Lights.* Added as a new subsection.

*616.5.1.1 Red or Red and Blue Warning Lights.* The contractor may elect to use red or red and blue warning lights in accordance with Missouri law and the following requirements:

(1) Use of red or red and blue lights shall be limited to use on a total of two vehicles per work zone and/or project.

(2) Use of red or red and blue warning lights shall be limited to areas in advance of tapers or lane shifts and at the active work location.

(3) Lights shall be SAE Class 2 or SAE Class 1 with dimming capabilities to minimize glare experienced by travelers.

The awarded contract will serve as a permit by the Commission, granting the prime contractor and approved sub-contractors to utilize red or red and blue lights as required by Missouri law.

**SECTION 702 LOAD-BEARING PILES**

*Sec 702.2 Material* Changed “ASTM A 25, Grade 2 or 3” to “ASTM A 252, Grade 3” in the second row of the table.

Changed “Structural Steel Pile” to “Structural Steel (HP) Pile” and changed “Grade 50” to “Grade 50S” in the fourth row of the table.

Changed 1080 to 1081 in the eighth row of the table.

Changed “Galvanizing Repair” to “Field Galvanizing and Galvanizing Repair” in the ninth row of the table.

*Sec 702.2.1 Cast-In-Place Concrete Piles.* Deleted metal and replaced with steel throughout the entire subsection. Changed the last sentence from, “ Metal shells shall hold the original form without distortion after being driven, and shall be free from water, soil and other deleterious matter when concrete is cast in the shells” to “Steel shells shall be free from water, soil and other deleterious matter when concrete is cast in the shells”.

*Sec 702.2.2 Structural Steel Piles* Changed subsection tile to “Structural Steel (HP) Piles”. Changed “Steel piles” to “Structural steel piles” in the last sentence.

*Sec 702.2.5 Test Piles.* Changed subsection tile to “Probe Piles”. Deleted test and replaced with probe throughout the entire subsection. Added, “Probe piles used as permanent piles in place shall conform to Sec 702.4.8.” to the end of the subsection.

*Sec 702.2.6 Certification* Removed the word “thick” from the subsection when describing shells.

*Sec 702.3.5 Hammer Energy.* Deleted the entire section and replaced with the following:

The contractor is responsible for determining the hammer energy required to successfully drive the pile to the minimum tip elevation and to reach the minimum nominal axial compressive resistance specified on the plans. When specified in the contract documents, the contractor shall perform a drivability analysis to select an appropriate hammer size to ensure the pile can be driven without overstressing the pile and to prevent refusal of the pile prior to reaching the minimum tip elevation. The contractor shall plan pile driving activities and submit hammer size and hammer energy requirements to the engineer for approval before driving.

*Sec 702.4.1 Test Piles.* Changed subsection tile to “Probe Piles”. Deleted test and replaced with probe throughout the entire subsection.

*Sec 702.4.2 Load-Bearing Piles.* Added, “Steel shells and structural steel piles shall hold the original form without distortion after being driven and after adjacent piles have been driven” as the fourth sentence. Changed, “Any pile broken” to “Any load-bearing pile broken”.

*Sec 702.4.5 Pile Point Reinforcement* Changed, “ASTM A 27 Grade 65-35 (450-240)” to ASTM A 27 Grade 65-35” in the first row of the table. Changed, “ASTM A 148 Grade 90-60 (620-415)” to ASTM A 148 Grade 90-60” in the second row of the table.

*Sec 702.4.6 Splices.* Deleted, “splices shall be made as follows” from the end of the first sentence and changed, “cast-in-place shells” to “steel shells” throughout the entire subsection.

*Sec 702.4.8.2 Galvanizing.* Changed the first sentence from, “Steel shells for cast-in-place piles, structural steel piles, and bracing shall be galvanized as shown on the plans and in accordance with ASTM A 123 and Sec 1080” to Steel shells for cast-in-place piles, structural steel piles, and structural steel bracing shall be galvanized as shown on the plans and in accordance with this specification”. Deleted “ASTM A 780” from the third and ninth sentence and replaced with “this specification”. Deleted the fourth sentence,”Zinc rich paints will not be allowed”.

*702.4.8.3* Added as a new subsection. Bitumen and paint protective coatings will not be required for galvanized piles and bracing.

*702.4.10 FHWA-modified Gates Dynamic Formula.* Changed subsection title to, “*FHWA-modified Gates Dynamic Pile Formula”.*

*Sec 702.5.1 Test Piles.* Changed subsection tile to “Probe Piles”. Deleted test and replaced with probe throughout the entire subsection.

*Sec 702.5.2 Load-Bearing Piles.* Deleted test and replaced with probe in the first sentence.

*Sec 702.6.1 Test Piles.* Changed subsection tile to “Probe Piles”. Deleted test and replaced with probe throughout the entire subsection.

*Sec 702.6.7 Protective Coatings.* Deleted “and bracing” from the first sentence. Added, “Galvanized bracing in place will be paid for at the contract unit price for miscellaneous fabricated structural steel” as the second sentence. Deleted “and sway bracing” from the existing second sentence.

**SECTION 703 CONCRETE MASONRY CONSTRUCTION**

*Sec 703.3.6.3.2.4 Open to Traffic.* Added as new subsection. Structures shall not be opened to any public vehicular traffic adjacent to curbs, parapets, medians and bridge barrier until such time that the concrete has attained the compressive strength specified on the plans. The requirement for reaching compressive strength prior to adjacent traffic will be waived for curb blockouts placed on existing curbs.

**SECTION 712 STRUCTURAL STEEL CONSTRUCTION**

*712.5.3 Anchor Bolts.* Deleted “reinforcing steel” in the second sentenced and replaced with reinforcements.

*712.11.3 Coatings.* Added “or repairs” to the last sentence, as there will be no direct payment for field touch-ups or repairs specified in Sec 1081.

**SECTION 724 PIPE CULVERTS**

*724.1.1* In the table under Flexible Pipe-Thermoplastic for Double Wall Polypropylene Pipe Group B and Group C the size was changed from ≤ 30” to ≤ 60”.

**SECTION 806 POLLUTION, EROSION AND SEDIMENT CONTROL**

*806.100.2 Construction Requirements.* Changed the fourth sentence from, “Fill material, if allowed by the Corps of Engineer permit, shall be clean rock of sufficient size to withstand normal stream flows” to “Fill material shall be clean rock of sufficient size to withstand expected high flows”. Added, “Only graded rock and/or quarry-run rock shall be used.  The rock must be reasonably well graded, with no particle dimension greater than approximately 12 inches, and no particle dimension less than approximately 9 inches.  Gravel and dirt should not exceed 15% of the total fill volume.” to the end of the subsection.

*806.100.2.1* Deleted, “as needed for the issuance or modification” from the first sentence and replaced with “to ensure that it meets the terms and conditions”

**SECTION 1080 STRUCTURAL STEEL FABRICATION**

*1080.3.1.6 Certifications.* Added,” (g) Fabricators that apply steel painted coatings in the fabrication shop shall be certified to the AISC Applicators of Complex Coatings Endorsement (SPE) or SSPC QP3 – Shop Painting Certification Program” to the subsection.

*1080.3.4 Shear Connector Studs.* Added, “Where galvanized steel beams or girders are specified, galvanizing material shall be omitted or removed one inch clear of weld locations.  The method used to omit or remove the galvanizing material shall be masking, grinding or other methods approved by the engineer.  After completion of the welding operations, the ungalvanized areas of the beam or girders shall be coated with epoxy mastic paint (non-aluminum).” to the end of the subsection.

**SECTION 1081 COATING OF STRUCTURAL STEEL**

*1081.10 Protective Paint Systems.* Added as new subsection and renumbered subsequent sections accordingly.

*1081.10.1 Scope.* Added, “with protective paint systems” to the end of the subsection.

*1081.10.3.2 Certification.* Added as new subsection and renumbered subsequent sections accordingly.

Contractors performing coating operations for new structural steel shall be certified prior to the start of coating operations under the following SSPC Certified Contractor QP programs as follows:

(a) For field application of intermediate and finish coats, the contractor shall be certified to the SSPC QP1 – Field Application to Complex Industrial and Marine Structures.

(b) For shop application of any coats by the steel fabricator, the fabricator shall be certified in accordance with Sec 1080.3.1.6 (g).

(c) For field application of gray epoxy mastic primers to new steel and contact surfaces between the new steel and existing steel, no SSPC QP certification will be required.

*1081.10.3.3.2 Preparation for Coating.* Added, “Sharp fins resulting from the blast cleaning operation shall be removed with an approved method that will maintain the minimum anchor profile for the prime coat.” as the second sentence of the subsection.

*1081.10.3.9 Application.* Added, “Stripe coating, as defined by SSPC-PA1 shall be required for all applied coating layers.” as the second sentence of the subsection.

*1081.10.4.2 Certification.* Added as new subsection and renumbered subsequent sections accordingly.

Contractors performing coating operations for field applied recoating shall be certified prior to the start of the coating operations under the appropriate category of the SSPC Certified Contractor QP program as follows

(a) For coating operations where there is no presence of lead, heavy metals, or other hazardous materials, the contractor shall be certified to the SSPC QP1 – Field Application to Complex Industrial and Marine Structures.

(b) For coating operations where lead, heavy metals, or other hazardous materials are present, the contractor shall be certified to the SSPC QP2 - Field Removal of Hazardous Coatings.

*1081.10.5.2 Certification.* Added as new subsection and renumbered subsequent sections accordingly.

Contractors performing coating operations for field applied overcoating shall be certified prior to the start of the coating operations under the appropriate category of the SSPC Certified Contractor QP program as follows:

(a) For coating operations where there is no presence of lead, heavy metals, or other hazardous materials, the contractor shall be certified to the SSPC QP1 – Field Application to Complex Industrial and Marine Structures.

(b) For coating operations where lead, heavy metals, or other hazardous materials are present, the contractor shall be certified to the SSPC QP2 - Field Removal of Hazardous Coatings.

*1081.6 Galvanized Metal.* Deleted entire subsection and renumbered subsequent sections accordingly.

*1081.20 Galvanizing of Structural Steel.* Added as new subsection.

*1081.20.1 Scope.* Added as new subsection. This specification covers galvanizing new and existing bridges and structures made of structural steel and miscellaneous metals.

*1081.20.2 Material.* Added as new subsection. All material shall be in accordance with Division 1000, Material Details, and in conjunction with:

|  |  |
| --- | --- |
| **Item** | **Specification** |
| Galvanizing | ASTM A 123 |
| Galvanizing Repair | ASTM A 780 |

*1081.20.3 Galvanized Metal.* Added as new subsection. Structural steel beams or girders, bracing and diaphragms shall be galvanized as shown on the plans and in accordance with this specification. Galvanizing shall be applied after fabrication. Galvanized material on which the galvanizing has been damaged will be rejected or may, with approval from the engineer, be repaired in the field, fabrication shop, or at the galvanizing facility by the zinc alloy stick method in accordance with this specification. Required field welds and adjacent areas on which galvanizing has been damaged shall be galvanized by this same repair method. The area to be regalvanized shall be thoroughly cleaned, including the removal of slag on welds. Touch-up of galvanizing of sheet material less than 3/16 inch may be completed by the use of an approved aluminum epoxy mastic coating if the material will not be in direct contact with concrete or with an approved non-aluminum epoxy mastic coating if the material will be in direct contact with concrete. Other protective coatings specified in ASTM A780 will not be permitted for galvanized beams, girders, bracing and diaphragms.

*1081.20.4 Acceptance Criteria.* Added as new subsection. All galvanized steel products shall be free from any bare steel, blisters, flux deposits, and dross inclusions. The minimum average coating thickness shall be 3.9 mils and the maximum average coating thickness shall be 25 mils. The finished galvanized product shall be uniform in appearance with no lumps, projections, indentations, globules, runs, sags, or heavy build-up at welded joints.

**MAJOR REVISIONS:**

**SECTION 109 MEASUREMENT AND PAYMENT**

*Sec 109.16* Deleted rows 2 through 7 on Class C Excavation and replaced with one row of Class C Excavation ≤500 cy with a fixed price of $75.00.

**SECTION 203 ROADWAY AND DRAINAGE EXCAVATION, EMBANKMENT AND COMPACTION**

*Sec 203.9.4* Added, “, except that payment will be determined in accordance with Sec 109.4 when the quantity exceeds 500 cubic yards” to the end of the subsection.

**SECTION 413 SURFACE TREATMENTS**

*Sec 413.30.2.4* Added, “or PG70-28” to the end of the subsection.

*Sec 413.30.4.1 Asphalt Amount* In the table, changed the Asphalt Content, % for Type A from 5.3 – 5.8 to 5.4 – 5.8, Type B from 5.1 – 5.6 to 5.3 – 5.7, and Type C from 4.9 – 5.6 to 5.2 – 5.6.

*Sec 413.30.5.4.2 Application Rate of Membrane.* In the table, changed the Field Application Rate for Type A from 0.15 to 0.17 and Type B and C from 0.19 to 0.20.

*Sec 413.30.6.2 Gradation and Asphalt Binder Tolerances.* Deleted “and asphalt content” and section reference to Sec 413.4.1 in the first sentence.

**SECTION 610 PAVEMENT SMOOTHNESS**

*Sec 610.1 Description.* Added “greater than 3 inches” to (a) and added “or multi-lift asphalt construction less than or equal to 3 inches” to (c).

*Sec 610.4.2.2* Deleted “with special grade transition” from (f).

*Sec 610.4.5 Full Depth Pavement and Multi-lift Overlays.* Added > 3 Inches to subsection title.

*Sec 610.4.5.4 Method of Correction.* In the table, added Sec 610.1 (a) and 610.1 (b) to the first row under Treatment Type. Added Multi-Treatment in the second row under Treatment Type. Changed 125 to 175 under Maximum ALR IRI (in/mi) for Posted speed > 45 mph in the last row.

*Sec 610.4.6 Multi-treatment Overlays.* Added “or Multi-lift Overlays ≤ 3 Inches” to subsection title.

*Sec 610.4.6.3 Areas of Localized Roaughness.* Changed subsection from “All ALRs, defined in Sec 610.4.5.3 exceeding 175.0 inches/mile shall be corrected” to “All ALRs, as defined in Sec 610.4.5.3, that exceed the maximum threshold set in Table 1 shall be corrected.”

**SECTION 1042 HIGHWAY SIGN MATERIAL**

*Sec 1042.2.7.2* Added Sign Sheeting to subsection title.

*Sec 1042.2.7.3 Channelizers.* Added as new subsection. All reflective sheeting for channelizers and drum-like channelizers shall be in accordance with ASTM D 4956 Type IX or XI for fluorescent orange sheeting and in accordance with ASTM D 4956 Type IV for orange or white sheeting. All retroreflective marking on channelizers shall be in accordance with ASTM D 4956, Supplemental Requirements, and Section S2. Reflective sheeting applied to channelizers shall be reboundable in accordance with ASTM D 4956. Retroreflective marking on cones will not be required.

*Sec 1042.2.7.4 Advanced Warning Rails.* Added as new subsection. All reflective sheeting for advanced warning rails shall be in accordance with ASTM D 4956 Type IV.

*Sec 1042.2.7.5 Delineators.* Delete entire existing subsection and add as new *Delineators* subsection and renumbered subsequent sections accordingly. All retroreflective sheeting for delineators shall be in accordance with ASTM D 4956 Type IX or XI requirements, except permanent and temporary tubular delineators, which shall be ASTM D 4956 Type IV requirements. All permanent and temporary tubular delineators’ reflective sheeting shall be reboundable in accordance with ASTM D 4956.

**SECTION 1063 TEMPORARY TRAFFIC CONTROL DEVICES**

*Sec 1063.3 Channelizers and Tubular Markers.* Deleted “and Tubular Markers” from subsection title. Changed “All channelizers and tubular markers” to “All trim-lines and drum-like channelizers” in the first sentence. Deleted sentences 2 through 6.

*Sec 1063.3.1 Temporary Tubular Delineators* Added as new subsection. Temporary tubular delineators shall be a nominal height of 28 inches and manufactured from a non-metallic material, pigmented and molded of a Highway Orange color throughout and stabilized against fading by ultraviolet or other light rays by incorporation of adequate inhibitors. All reflective sheeting for temporary tubular delineators shall be in accordance with Sec 1042.2.7.5.

*Sec 1063.4.1.2 Sign Sheeting.* Deleted, “Type 4 or fluorescent orange and yellow, as shown on the plans” from the end of the first sentence.

*Sec 1063.4.6 Advance Warning Rails.* Changed section reference from 1042.2.7.3 to 1042.2.7.4.

**SECTION 1065 DELINEATORS**

*Sec 1065.2 Delineator Body.* Changed Section reference from 1042 to 1042.2.1 and added “meet” before dimensions as shown on the plans.

*Sec 1065.3 Permanent Tubular Delineators.* Added as a new subsection. Permanent tubular delineators shall be a nominal height of 36 inches and manufactured from a non-metallic material, pigmented and molded to match the color of the closest pavement or curb marking, and stabilized against fading by ultraviolet or other light rays by incorporation of adequate inhibitors.

*Sec 1065.4 Temporary Traffic Barrier Delineators.* Added as a new subsection. Temporary tabs shall be manufactured from a thermoplastic material and meet dimensions as shown on the plans.

*Sec 1065.3 Retroreflective Sheeting.* Renumbered subsection to 1065.5, deleted the first sentence and changed section reference from 1042.2.7 to 1042.2.7.5.

SKK/TMO