shall be protected from the intermediate and finish coats. Damage to the coating of galvanized bolts, nuts and washers where bare steel is exposed shall be repaired in accordance with these specifications or, the connection may be prepared as specified in Sec 1081.10.3.3, followed by a touch-up field coat application of the required coating system.

1081.10.3.11.1 Field Touch-up of Galvanized Bolts. The galvanized coating of nuts, bolts and washers damaged during installation shall be repaired. Lubricants shall be removed in accordance with SSPC-SP1. Rust shall be removed in accordance with SSPC-SP-2 or SSPC-SP-3. Touch-ups shall consist of the application of an approved gray epoxy mastic. The touch-up material shall be compatible with and from the same manufacturer as the coating system to be used for the structure. Prior to field coating operations, the contractor shall submit information on the specific products to be used, including compatibility data and applicable recoating times, to the engineer for review. Subsequent coatings shall be applied within the recoat time recommended by the manufacturer.

1081.10.3.11.1.1 Touch-up Color. For areas of the structure that will not receive a field coat, the color of the touch-up material for bolts specified in Sec 1081.10.3.11.1 shall be similar to galvanized metal.

1081.10.3.11.1.2 Previously Repaired Material. If repairs to the galvanized coating of shop-installed nuts, bolts and washers have previously been performed in accordance with Sec 1081.10.3.10.3 or if epoxy mastics are otherwise shop-applied to structural steel, the contractor shall be responsible for any special field preparation required for proper adhesion of subsequent field coats to the epoxy coating. Prior to field coating operations, the contractor shall submit the manufacturer's recommendations to the engineer.

1081.10.3.11.1.3 Masking. Previously coated or adjacent areas shall be masked or otherwise protected from material used to touch-up the galvanized coating of fasteners.

1081.10.3.11.2 Sequence of Work. Field coatings, except for touch-up and coating of inaccessible surfaces, shall not be applied until the concrete deck has been placed, the forms removed and all concrete spatter, foreign material and contaminants are removed from existing coatings, unless otherwise approved by the engineer. Prior to submittal of alternative application methods, the contractor shall present methods to be used to prevent damage to the intermediate and final field coatings. The sequence of work shall be arranged to provide ample time for each coat to cure before the next coat is applied. The intermediate field coats shall be free of all oil, grease, dust or dirt prior to application of the next coat. Intermediate or prime coats that have been exposed to chlorides used in snow removal operations shall be cleaned by power washing as defined in Sec 1081.10.5.4.2.2 prior to application of the subsequent intermediate or final coats. In no case shall a coat be applied until the previous coat has been approved by the engineer. Excessive rust streaks or coatings on concrete masonry shall be removed by sandblasting or by other approved methods without damage to the masonry.

1081.10.3.11.3 Work Under Stage Construction Contracts. If complete field coating is not included in the contract for erection of structural steel, the touch-up coating of newly erected work and the coating of surfaces that will be inaccessible after erection shall be included as part of the work to be performed under the contract for erection. Field coating under any contract that does not include the erection shall include cleaning, preparation of any previously applied coatings, repairs and spot application of coatings required at the time the work is performed. Prior to field coating structural steel that was erected under a previous contract, the contractor shall submit the manufacturer's recommendations to the engineer, outlining requirements for cleaning and preparation of all existing coatings. The manufacturer’s recommendations shall include requirements for preparation of epoxy mastics previously applied for touch-up or other purposes.

1081.10.3.11.4 Partial Applications. If partial applications of the field finish coats to a structure as provided in Sec 1081.10.3.4 is required or permitted, the contractor shall perform field touch-up coating to areas of the structural steel outside the limits to receive the intermediate and finish coats. Touch-up shall be in accordance with in Sec 1081.10.3.11 and at the contractor’s expense.

1081.10.3.12 Identification. The contractor shall, at the completion of the coating application, stencil in black paint on the structure the number of the bridge, the word "COATED", the system used and the month and year the coating was completed. The letters shall be capitals approximately 3 inches high. The legend shall be stenciled on the outside face of an outside stringer or girder near each end of the bridge as directed by the engineer.

1081.10.3.13 Property and Traffic Protection. The contractor shall protect pedestrian, vehicular, railroad and

other traffic, persons and property, upon, beneath and in the vicinity of the structure and all portions of the bridge against damage or disfigurement by blast media, blast residue, coatings, coating material, equipment or by any other operations.

1081.10.4 Recoating of Structural Steel (System G , H or I).

1081.10.4.1 Scope. This specification covers the field preparation of structural steel surfaces to be recoated, furnishing and applying specified coatings, protection and drying of coatings, furnishing protection from coating spatter and disfigurement, and final cleanup.

1081.10.4.2 Certification. 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.

1081.10.4.3 Systems of Protective Coatings. All structural steel shall be recoated by the contractor in the field using one of the complete systems, including prime coats, in accordance with Sec 1081.10.2, unless noted otherwise. Recoating of structural steel, including surface preparation, weather conditions, application, touch-up and protection, shall be in accordance with all requirements of Sec 1081.10.3 unless in conflict with Sec 216, which shall control.

1081.10.4.4 Surface Preparation. Cleaning and coating of structural steel shall proceed in areas or sections as approved by the engineer, usually consisting of one or more complete spans. The cleaning and application of the coatings for each specified section shall be entirely completed and accepted by the engineer prior to proceeding with additional cleaning or coating. Surface preparation shall be in accordance with Sec 1081.10.3.3. All existing coatings and paint shall be removed by blast cleaning unless specifically indicated otherwise in the contract.

1081.10.4.4.1 Approved Blast Media. Only silica sand and steel abrasive shall be allowed for use as approved blast media for paint removal. A safety data sheet (SDS) for the blast media selected for use shall be submitted for approval at the pre-construction conference held with the contractor. The SDS shall be maintained on site by the contractor and shall be available for review upon request. All paint removed with approved blast media shall be sent to the Doe Run lead smelter for recycling and is not considered a solid or hazardous waste in accordance with 40 CFR 261.2(e)(1)(ii). Surface preparation areas cleaned with unapproved blast media shall be at the contractor's expense. The collected residue shall consist of media no larger than one inch and removed paint chips.

1081.10.4.4.2 Environmental Regulations. The paint removal operation shall comply with all local, state and federal regulations, including but not limited to, the EPA, OSHA Standards 29 CFR 1910 and 1926.62, and the Missouri Code of State Regulations, including 10 CSR 10 Air Conservation Commission, 10 CSR 20 Clean Water Commission, 10 CSR 25 Hazardous Waste Commission, and 10 CSR 80 Solid Waste Management. The contractor shall have all necessary licenses and certifications as required by the Missouri Department of Health including necessary licenses and certification for lead abatement/removal workers prior to commencement of the cleaning operation. If hazardous waste will be generated at the site, the contractor shall notify the engineer and Environmental Section in Design Division and comply with all applicable hazardous waste generator requirements.

1081.10.4.4.3 Containment and Collection of Blast Residue. A containment system, or enclosure, is required to prevent the release of blast media residue and other debris generated during surface preparation activities from entering the environment. Enclosures are typically made up of combinations of cover panels, scaffolds, supports, screens, and tarps. The complexity of any given enclosure will vary depending on the method of paint removal being employed and the degree of surface preparation that is specified. For a simple scraping operation ground-covering tarps may be sufficient while for a blasting operation, the enclosure could be a designed structure with a negative pressure ventilation system. The contractor shall collect all blast residue (paint residue/blast media) from the cleaning operations for recycling. All blast media and residue shall be contained

or collected; should an accidental release occur, the contractor shall complete all necessary cleanup efforts as directed by the Engineer. Blast residue shall be managed as a recyclable material. Container management shall be in accordance with Sec 1081.10.4.4.3.3. Analytical testing required for the disposal of blast residues shall be the responsibility of the contractor.

1081.10.4.4.3.1 Waste Solvent Management. All waste solvent generated from painting operations shall be containerized, sampled, and submitted for analytical testing to enable a hazardous waste determination.

1081.10.4.4.3.2 Hazardous Waste Notification. The contractor shall submit a "Notification of Regulated Waste Activity" form to MDNR Hazardous Waste Program to obtain the EPA identification number. Requests shall be submitted as soon as hazardous waste is determined or at least 30 days prior to shipping hazardous waste. The cost of obtaining the EPA identification number will be considered as part of the surface preparation cost and the engineer will subtract the cost from the contract. Hazardous waste shall not be shipped offsite until the EPA identification number has been received. The contractor will file the quarterly and annual hazardous waste reports in accordance with 10 CSR 25-5.262(2)(D)1 and will deactivate the EPA identification number upon contract completion. The contractor shall submit copies of all hazardous waste manifests and quarterly/annual reports to MoDOT's Environmental Section.

1081.10.4.4.3.3 Container Management.

1081.10.4.4.3.3.1 The blast residue from cleaning operations shall be stored in contractor furnished, watertight 55-gallon steel drum containers stacked on wooden pallets with labels facing outward. The containers shall be free of structural defects and all other materials including but not limited to construction debris, solvents, flammables, aluminum, magnesium, aerosol cans, rags and any ferrous or non-ferrous metals larger than one cubic inch. The containers shall have removable lids complete with a bolt ring, bolt and nut. Containers shall remain closed at all times, except when necessary to add blast residue. Material other than the blast residue from the cleaning operations shall not be placed in the containers. At the end of each day's work, the containers shall be stored outside the 100-year floodplain in a secure area as approved by the engineer. Containers of approved blast residue destined for recycling, shall be marked with a "Blast Residue" label provided by the Engineer or Environmental Section in the Design Division and marked with the following information:

(a) Blast Residue.

(b) Marked with one of the following:

(1) Contains Heavy Metals/Lead Compounds.

(2) Contains Non-Lead Compounds.

(c) Generator: MoDOT.

(d) Bridge Site Number.

(e) Date Container was Filled.

1081.10.4.4.3.3.2 Containers of hazardous waste shall be packaged, marked and labeled according to hazardous waste regulations 10 CSR 25-5.262(2)(C)1. Containers of hazardous waste shall be stored separate from containers of non-hazardous waste and approved blast media destined for recycling. The contractor shall maintain an inventory of the quantity of the containers stored at the site and the quantity delivered to an approved facility. All containers shall be delivered to the approved facility within 30 days upon completion of the surface preparation. Copies of container inventories, all test results, shipping papers, hazardous waste manifest signed by the receiving facility, solid waste disposal request, recycling certificates and any other disposal documentation shall be submitted to the engineer with a copy to the Environmental Section in the Design Division within 30 days upon delivery to the approved facility.

1081.10.4.4.3.4 Shipment of Residue. Approved blast media containing paint residue shall be shipped with a bill of lading to the Doe Run smelter for recycling. The contractor shall obtain appropriate shipping papers (bill of lading), if required, from the Engineer or Environmental Section in the Design Division. These shipping forms shall be completed prior to shipment. The Doe Run smelter will reject any shipment received without the proper shipping papers. The contractor shall notify the Doe Run smelter at least 2 days prior to shipment to

ensure the receiving facility will be able to accept the material.

1081.10.4.4.3.5 Personal Protective Equipment. Clothing, tarps, hoses and other cleaning material containing blast residue shall be managed as a hazardous waste unless determined non-hazardous. Personal protective equipment being disposed, such as tyvek suits, respirator cartridges, boots, etc. but not tarps, shall be placed into 55-gallon steel drums. Spent tarps shall be placed into DOT approved cardboard boxes and stacked on wooden pallets. Container management shall be in accordance with Sec 1081.10.4.4.3.3.

1081.10.4.4.3.6 Invoices and Payment. The contractor shall dispose of all paint residue/blast media and personal protective equipment in accordance with all Federal and State regulations at the Doe Run smelter. Spent solvents shall be disposed of at an EPA approved hazardous waste treatment, storage and disposal facility. Transporting and disposal cost shall be the contractor's responsibility. A copy of the disposal manifest and paid receipt shall be given to the engineer. Failure to provide proper documentation will result in withholding payment. For more information concerning management of blast residue or approved hazardous waste treatment, storage and disposal facilities, contact the Environmental Section in the Design Division.

1081.10.4.5 Joints. All seams and joints that cannot be satisfactorily sealed or coated shall be adequately caulked with compounds compatible with the coating system being applied. Caulking material shall be in accordance with the coating manufacturer's recommendations and shall meet the approval of the engineer. Caulking shall be satisfactorily completed for an entire joint or seam after application of the prime coat and before application of any specified finish or intermediate coats.

1081.10.4.6 Identification. At the completion of recoating, the contractor shall stencil in black paint on the structure the number of the bridge, the word "RECOATED", the system used and the month and year the coating was completed. The letters shall be capitals approximately
3 inches high. The legend shall be stenciled on the outside face of an outside stringer or girder near each end of the bridge as directed by the engineer.

1081.10.4.7 Property and Traffic Protection. The contractor shall provide protection in accordance with Sec 1081.10.3.13.

1081.10.5 Overcoating of Structural Steel (Calcium Sulfonate System).

1081.10.5.1 Scope. This specification covers the field preparation of structural steel surfaces to be overcoated, disposal of paint residues and power washing water, furnishing and applying the specified coatings, protection and drying of the coatings, furnishing protection from coating spatter or disfigurement and final cleanup.

1081.10.5.2 Certification. 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.

1081.10.5.3 System of Protective Coatings. All exposed and accessible surfaces of structural steel and steel bearings shall be coated with the Calcium Sulfonate paint system in accordance with Sec. 1081.10.2 unless otherwise noted. The color of the topcoat shall be as shown on the plans. Overcoating of structural steel shall be in accordance with all requirements of Sec 1081.10.3 except surface preparation and unless in conflict with Sec 216, which shall control.

1081.10.5.4 Surface Preparation. Surface preparation shall be in accordance with Sec 1081.10.4.4, except that blast cleaning will not be required.

1081.10.5.4.1 Removal of Existing Paint. The existing steel shall be cleaned by approved methods in accordance with Sec 1081.10.5.4.2.

1081.10.5.4.1.1 Environmental Regulations. The paint removal operation shall be in accordance with all local,