

Section 517 Paint and Painting

517.1 Description

- (1) This section describes furnishing paint materials and applying paint to steel or timber structures, including structural steel, miscellaneous metal or lumber, or timber parts of other structures. This work also includes, unless specified otherwise in the contract, preparing surfaces for painting, applying paint, protecting and drying the paint coatings; protecting traffic and property upon and in the vicinity of the structure; and protecting of all portions of the structure against disfigurement by paint or paint materials.
- (2) This section also describes shop cleaning; the furnishing and shop application of a complete epoxy coating system on new structural steel; the field cleaning and repair of surfaces field welded or damaged in shipping, handling and erecting the structural steel; and providing a field-applied urethane top coat on exterior girders.

517.2 Materials

517.2.1 General Requirements

- (1) All coatings or paints shall conform to the requirements specified for the type of coating or paint named.
- (2) Furnish factory mixed paint or field mix according to the manufacturer's directions and as the contract directs.
- (3) Ready-mixed paints shall not settle or cake in the container, but should break up readily with a paddle to a smooth, uniform paint of good brushing consistency that dries without streaking, wrinkling, running, or sagging if painted on smooth, vertical surfaces. Prime and undercoats shall dry to a dull gloss, and finish coats to a full gloss. If required, colors and hiding powers shall equal those of samples the department furnished. Any proportions specified in formulae are by weight, unless indicated otherwise in the requirements for specific paint.

517.2.2 Containers

- (1) Generally, paint shall arrive packaged in strong, tight, standard commercial, 5 US standard-gallon capacity metal containers, except for the fractional parts of units. Package the fractional parts in one US standard-gallon capacity metal containers. If mechanical means for mixing and stirring are provided at the job site or painting facility, then the contractor may furnish the paint in 30 gallon or other suitable size metal containers.
- (2) Mark each container with the name and address of the manufacturer, the type of paint contained, and the date of manufacture. Use tight-fitting covers on the containers and arrange them so that the inspector may attach wire-lead seals.
- (3) Except as specified above for mixing paint mechanically, mix paint on the job in containers with not more than 15 gallons capacity.

517.2.3 Inspection, Sampling, and Testing

- (1) Paint sampling and inspection normally takes place at the point of manufacture; the department may sample the paint at the fabricating shop or in the field. The engineer will obtain samples of paints purchased directly by the state, either for approval at their point of manufacture, or at their destination as indicated, either at the time contracts are awarded, or in the invitation for bids.
- (2) If inspecting paints at the point of manufacture, the manufacturer shall furnish, if requested, any formulae required to determine the ingredients before making the paints. The manufacturer shall allow the inspector to check the makeup and grinding of paint batches and shall allow test sampling of any or all batches. The manufacturer also shall furnish, if requested, any formulae required to determine specification conformance.
- (3) Take representative samples of ready-mixed paints after thoroughly mixing the paints. Consider one container chosen at random from each lot or batch for each coat, or if a batch or lot exceeds 500 gallons, one container for each 500 gallon increment or fraction thereof, as representative. Take a one-pint sample from the representative container in the inspector's presence. It is the contractor or manufacturer's responsibility to ensure paint mixing occurs in a container that allows sampling of the paint it contains. Take field samples only from paint that is on the job. Take samples in fabricating shops from containers of paint proposed for the specific bid item of work.
- (4) Perform tests according to applicable standard methods of ASTM or AASHTO.
- (5) The engineer may waive sampling and testing requirements for quantities of 5 gallon or less of paint of any single formulation required for each project, provided the paint purchased is from stock that demonstrated a satisfactory service record.

517.2.4 Structural Steel Paint-Epoxy System

517.2.4.1 General

- (1) The epoxy system consists of a prime or shop coat of organic zinc-rich paint, an intermediate shop coat of high-build epoxy paint, and a protective shop coat of urethane paint.
- (2) The contractor shall furnish and apply paints conforming to the requirements of the epoxy system as specified in the special provisions.

517.2.4.2 Coating System

- (1) Furnish an epoxy coating system from the department's approved products list for new structural steel. Use a white epoxy and a urethane that matches the color represented by the number the plans show according to Federal Standard 595. Submit product data sheets to the engineer before applying coatings. Ensure that product data sheets indicate mixing and thinning directions; recommended spray nozzles and pressures; minimum drying times for shop and field applied coats; recommended procedures for painting galvanized bolts, nuts, and washers; and a telephone number for technical service.

517.2.4.3 Zinc Coating

- (1) Zinc coat the bearing assemblies specified in [506.2.8](#). Coat any other structural members and parts that require zinc coating according to [ASTM A123](#), after blast cleaning.
- (2) High-strength bolts, nuts, and washers shall conform to the material requirements of [506.2.5](#) and be hot-dip zinc coated as specified in [506.2.5.1](#).

517.2.5 General-Purpose White Exterior Alkyd Wood Primer

517.2.5.1 General

- (1) This subsection covers a ready-mixed modified alkyd prime coat used as a primer in a 3-coat system on highway posts. This is a lead free paint.
- (2) The paint shall not skin, liver, curdle or thicken materially in the container. It shall brush easily at package consistency and allow lapping without difficulty. It shall conform to or exceed the performance requirements, not necessarily the composition, of Commercial Item Description A-A-2336A.

517.2.5.2 Composition and Properties

- (1) Furnish material conforming to the following:

| | |
|---|---|
| PIGMENT | |
| Percent by weight | 49.0% |
| Titanium dioxide..... | 16.0% |
| Calcium carbonate, silica/silicates | 33.0% |
| VEHICLE | |
| Percent by weight | 51.0% |
| Soya and tall alkyd resin..... | 24.0% |
| Aliphatic hydrocarbon solvent..... | 23.0% |
| Driers and additives | 4.0% |
| Total..... | 100% |
| FINISHED PAINT TECHNICAL DATA | |
| Generic type | Alkyd Resin, flat finish, exterior primer |
| Color | White |
| Gloss or sheen | Flat 0-15 units at 59 F |
| Dry time | Touch: 4-8 hours |
| At 77 F, 50% RH..... | Recoat: 24 hours |
| Flash point, closed cup | 108 F |
| VOC, Maximum as packaged | 2.92 lb/gal |
| Solids by Volume (percent)..... | 56% +/- 2% |
| Solids by Weight (percent)..... | 74% +/- 2% |
| Weight per gallon, pounds | 3 |
| Coverage | 108 sq ft/gal at 4 mils wet, 2.4 mils dry |
| Clean-up Solvent | Mineral Spirits |
| Type of Cure..... | Oxidation |

517.2.6 White Paint for Wood - Intermediate and Finish Coat

517.2.6.1 General

- (1) This subsection covers a ready-mixed, ready-to-apply white paint for exterior exposure, used for an intermediate and finish coat in a 3 coat system on marker posts or other wooden structures. This is a lead-free paint.

517.2.6.2 Composition and Properties

- (1) Furnish material conforming to the following:

PIGMENT

| | |
|-------------------------|------------------------|
| Percent by weight | 48.0% min to 51.0% max |
| Titanium dioxide..... | 38.0% min to 41.0% max |
| Zinc oxide | 16.5% min to 18.5% max |
| Calcium carbonate..... | 40.5% min to 45.5% max |

VEHICLE

| | |
|------------------------------------|------------------------|
| Percent by weight | 49.0% min to 52.0% max |
| Long oil soya alkyd resin | 32.0% min to 35.0% max |
| Linseed oil, heat bodied..... | 29.0% min to 32.0% max |
| Mineral spirits | 32.0% min to 34.0% max |
| Linseed/tung oil, heat bodied..... | 1.0% min to 2.0% max |
| Driers and rheology agents..... | 2.5% min to 3.5% max |

FINISHED PAINT TECHNICAL DATA

| | |
|---------------------------------------|--------------------------------------|
| Viscosity - Krebs units at 77 F | 95 min to 100 max |
| Drying time | 18 hours max |
| Total solids by weight | 82.0% min to 84.0% max |
| Total solids by volume | 67.0% min to 71.0% max |
| Weight per gallon..... | 11.77 lb/gal min to 12.02 lb/gal max |
| Gloss at 59 F | 80% minimum |
| Clean-up solvent..... | Mineral spirits |
| Type of cure..... | Oxidation |

517.2.6.3 Condition in Container

- (1) The ready-mixed paint as received shall not liver, skin, lump, or separate, or corrode the container, or contain hard settled pigment. Pigment shall disperse easily in the liquid portion by hand stirring to form a smooth, homogeneous paint, free from lumps, particles, or foreign material.

517.2.7 (Vacant)

517.2.8 Black Paint for Wood - Intermediate and Finish Coat

517.2.8.1 General

- (1) This subsection covers a ready-mixed, ready-to-apply black paint for exterior exposure, used for an intermediate and finish coat in a 3-coat system on marker posts or other wooden structures. This is a lead-free paint.

517.2.8.2 Composition and Properties

- (1) Furnish material conforming to the following:

PIGMENT

| | |
|-------------------------|------------------------|
| Percent by weight | 40.0% min to 42.0% max |
| Lampblack | |
| Nephaline Syenite | |

VEHICLE

| | |
|---|--------------------------|
| Percent by weight | 58.0% min to 60.0% max |
| Long oil alkyd resin | 16.0% min to 17.0% max |
| Linseed oil, heat bodied..... | 17.75% min to 18.25% max |
| Mineral spirits | 23.20% min to 25.60% max |
| Linseed/tung oil, heat bodied..... | 9.75% min to 10.25% max |
| Driers and rheology agents..... | 1.40% min to 1.60% max |
| Fungicide- tetrachloroisophthalonitrile | 0.70% min |

FINISHED PAINT TECHNICAL DATA

| | |
|---------------------------------------|--------------------------------------|
| Viscosity - Krebs units at 77 F | 95 min to 100 max |
| Drying time | 18 hours max |
| Total solids by weight | 80.0% min to 82.0% max |
| Total solids by volume | 68.0% min to 70.0% max |
| Weight per gallon..... | 10.27 lb/gal min to 10.52 lb/gal max |
| Gloss at 59 F | 80% minimum |
| Clean-up solvent..... | Mineral spirits |
| Type of cure..... | Oxidation |

517.2.8.3 Condition in Container

- (1) The ready-mixed paint as received shall not liver, skin, lump, or separate, or corrode the container, or contain hard settled pigment. Pigment shall disperse easily in the liquid portion by hand stirring to form a smooth, homogeneous paint, free from lumps, particles, or foreign material.

517.2.9 Brown Stain for Wood

517.2.9.1 General

- (1) This subsection covers using a brown stain on rustic wood fences and other similar rustic materials. If the contractor cannot obtain stain conforming to these specifications because of the small quantities required, it may use an equal dark brown semi-transparent oil stain the engineer finds acceptable. This is a lead-free stain.

517.2.9.2 Composition and Properties

- (1) Furnish material conforming to the following:

PIGMENT

| | |
|---------------------------------|------------------------|
| Percent by weight | 11.0% min to 13.0% max |
| Black Synthetic Iron Oxide..... | 59.0% min to 61.0% max |
| Dark Brown Iron Oxide | 39.0% min to 41.0% max |

VEHICLE

| | |
|---|------------------------|
| Percent by weight | 87.0% min to 89.0% max |
| Linseed oil, raw | 69.0% min to 71.0% max |
| Mineral spirits | 25.0% min to 27.5% max |
| Driers and rheology agents..... | 0.09% min to 0.12% max |
| Fungicide- tetrachloroisophthalonitrile | 0.50% min to 0.75% max |
| Water repellent: poly-oxo aluminum stearate | 2.0% min to 2.5% max |

FINISHED PAINT TECHNICAL DATA

| | |
|---------------------------------------|------------------------------------|
| Viscosity - Krebs units at 77 F | 45 min to 50 max |
| Drying time | 48 hours max |
| Total solids by weight | 76.5% min to 79.0% max |
| Total solids by volume | 70.0% min to 72.5% max |
| Weight per gallon..... | 8.18 lb/gal min to 8.35 lb/gal max |
| Clean-up solvent..... | Mineral spirits |
| Type of cure..... | Oxidation |

517.3 Construction

517.3.1 Coating or Painting Metal

517.3.1.1 General

- (1) Clean and prepare the surfaces of metal parts before coating or painting.
- (2) The contractor or fabricator shall furnish and erect scaffolding, meeting the engineer’s approval, to allow steel inspection before and after coating.
- (3) Use rubber rollers or other protective devices, meeting the engineer’s approval, on scaffold fastenings. The contractor shall not use metal rollers or clamps and other type fastenings that mar or damage freshly coated surfaces.
- (4) For all colors, conform to the standard color samples the department furnished, or as specified.
- (5) For structural steel, including weathering steel, and miscellaneous metals that will be encased in concrete, apply only zinc-rich primer as specified in [517.3.1.7.2](#). The contractor is not required to prime or paint welded stud shear connectors and anchor bolts.

517.3.1.2 Weather Conditions

517.3.1.2.1 General

- (1) The contractor shall not apply paint if the air is misty or if conditions are otherwise unsatisfactory for the work. Do not apply paint on damp or frosted surfaces.
- (2) If coating or painting material under cover in damp or cold weather, it shall remain under cover until dry or until weather conditions allow its open exposure. The contractor shall not perform coating or painting if the metal is hot enough to cause the coating to blister and produce a porous paint film.

517.3.1.2.2 Temperature

- (1) Do not expose coated surfaces to temperatures below 35 F until after dry enough for recoating or applying the top coat.
- (2) Do not apply zinc-rich coatings if the temperature of either the air or the steel is below 40 F.
- (3) Do not apply epoxy and urethane coatings if the temperature of either the air or the steel is below 50 F.

517.3.1.2.3 Humidity

- (1) Do not apply the epoxy coating system if the relative humidity is greater than 90 percent, or unless the steel temperature is at least 5 F higher than the dew point temperature.

517.3.1.3 Surface Cleaning

517.3.1.3.1 General

- (1) Clean metal surfaces before painting and surfaces in contact because of bolting, removing rust, mill scale, dirt, oil, or grease and other foreign substances. Unless blast cleaning, neutralize weld areas with a proper chemical and rinse with water, before cleaning.
- (2) Blast clean non-machined surfaces of a casting before machining the casting.
- (3) Blast clean structural steel, including steel encased in concrete.

517.3.1.3.2 Hand and Power Tool Cleaning

- (1) If the engineer allows, use metal brushes, scrapers, chisels, hammers, power tools, or other effective means to remove rust, scale, and dirt. The contractor shall not use tools that excessively scar the metal. Remove oil and grease by solvent cleaning according to SSPC-SP 1. Remove dust or other loose material.

517.3.1.3.3 Blast Cleaning

517.3.1.3.3.1 General

- (1) Blast clean metal surfaces to remove mill scale, rust, dirt, and other substances until the specified profile is obtained. Grind or plane flame-cut edges before blast cleaning to remove flame-hardened material as required to ensure that blast cleaning will produce the specified profile. Ensure that corners and re-entrant angles are adequately cleaned. Remove sand, grit, or shot before painting. Obtain the engineer's approval of the cleaning before painting. Apply paint before rust forms.

517.3.1.3.3.2 Epoxy Coating System

- (1) Blast clean structural steel receiving this coating to a near-white finish according to SSPC-SP 10.
- (2) Solvent clean oil and grease on surfaces receiving this coating according to SSPC-SP 1 and blast clean to a near-white finish according to SSPC-SP 10.
- (3) Remove fins, tears, slivers, and burred or sharp edges present on any steel member, or that appears during blasting, by grinding then re-blast the area to a one to 2 mils surface shape.
- (4) If using abrasives for blast cleaning, use either clean dry sand, steel shot, mineral grit, or manufactured grit of a gradation that produces a uniform one to 2 mils profile as measured with a department-approved impregnated surface profile tape.
- (5) Remove abrasive and paint residue from steel surfaces with a commercial grade vacuum cleaner equipped with a brush-type cleaning tool, or by double blowing. If using the double blowing method, vacuum the top surfaces of structural steel, including top and bottom flanges; longitudinal stiffeners, splice plates, and hangers after completing the double blowing operations. Ensure that the steel is dust free when applying primer. Apply the primer within 8 hours after blast cleaning.
- (6) Protect all freshly coated surfaces from later blast cleaning operations. Brush any blast damaged primed surfaces with a non-rusting tool, or if visible rust occurs, re-blast to a near white condition. Clean the brushed or blast cleaned surfaces and re-prime within the manufacturer's recommended time.

517.3.1.3.3.4 Unpainted Weathering Steel

- (1) Clean and surface prepare unpainted weathering steel as specified for this steel in [506.3.31.3](#).

517.3.1.4 Paint Mixing

517.3.1.4.1 General

- (1) During use, stir the paint or coatings to keep the solids uniformly suspended. Mix the paint or coatings according to the manufacturer's directions to a smooth lump free consistency, use a high shear mixer. The contractor shall not use paddle mixers or shakers. Perform mixing, as much as practicable, in the original container and continue until all the metallic powder or pigment is suspended. Equip air container paint pots with agitators.
- (2) Insure thorough dispersion of all pigment or solids that settle to the bottom of the container.

517.3.1.4.2 Zinc-Rich Primers

- (1) After mixing, strain the coating through a screen with openings no larger than those for a No. 50 sieve. After straining, continuously agitate the mixed primer up to and during the application.

517.3.1.5 Application

517.3.1.5.1 General

- (1) Perform painting in a neat and skillful manner. Apply epoxy system coatings by spraying. Apply the coating smoothly and uniformly so no excess paint collects at any point. Provide a finished surface free of streaks, pitting, wrinkling, or other irregularities.
- (2) Use power spraying equipment that applies the coatings in a fine, even spray without adding any thinner. If applying paint with spray equipment, immediately brush it smooth, if necessary, to provide uniform coverage and to eliminate wrinkling, blistering, and air holes.
- (3) In cool weather, the contractor may warm the paint to reduce the viscosity. Heat the paint by placing the paint containers in water or on steam radiators.
- (4) Thin the paint, if necessary for proper application during cool weather, according to the manufacturer's recommendations.

517.3.1.5.2 Epoxy System

- (1) Apply coating in a neat and skillful manner according to SSPC-PA 1, producing a uniform, even coating.
- (2) Transfer or preserve erection marks, for the field identification of members, and weight marks with a compatible paint on zinc-rich primer, or mark with soapstone on an epoxy coated surface.
- (3) Apply the coating with the spray nozzles and pressures the coating system manufacturer recommends to attain the specified film thickness. Apply coating to faying, contact, surfaces of bolted shop and field splices.
- (4) Depending on site conditions, paint may require additional time beyond that specified in the product data sheets to ensure proper drying before applying a succeeding coat. For maximum time between coats, adhere to the manufacturer's recommendations except, let no more than 60 days elapse between coats.
- (5) Determine the dry film thickness by using magnetic film thickness gauges calibrated for dry film thickness measurement according to SSPC-PA 2. The engineer will reject the coating system if minimum dry film thicknesses are less than specified.

517.3.1.6 Paint Removal

- (1) The contractor shall remove coating that does not conform to specifications or is unsatisfactory; and thoroughly clean and recoat, or correct the metal at no expense to the department.

517.3.1.7 Shop Painting

517.3.1.7.1 General

- (1) If welding structural steel, complete welding before coating the metal. If welding in the fabricating shop and later erecting by bolting, coat it after completing shop welding. Give steel surfaces welded in the field one coat of weldable primer or other department-approved protective coating after shop welding and shop fabrication.
- (2) Apply one coat to the surfaces of iron and steel castings, either milled or finished.
- (3) Upon fabrication and acceptance, coat pins and pinholes with a plastic or other department-approved coating before removing from the shop.
- (4) Remove dry spray by vacuuming or sanding, if necessary, before shipment.
- (5) Do not load material for shipment until the final shop coating cures and inspection is complete. Mark the components, "RECOMMENDED FOR USE," only after completion and approval of loading.

517.3.1.7.2 Organic Zinc-Rich Primer

- (1) After the inspector approves the entire cleaned surface to be coated, apply a prime coat uniformly to the entire surface. Either before or after applying the prime coat, brush or spray a stripe coat of primer on all plate edges, bolt heads, nuts, and washers. Apply succeeding coats as the product data sheet shows.
- (2) The organic primer color shall contrast markedly with the blasted surface color. The fabricator shall submit primer color samples to the engineer for approval.
- (3) The primer coat shall have a dry film thickness on the bolted friction splices of the main members of not less than one mil or greater than 2.5 mils. Apply a coating of primer, of not less than 3 mils dry film thickness, to the top of the top flange where the stud shear connectors will be welded.
- (4) On all other areas, including the outside surfaces of splice plates, ensure that the dry film thickness above the surface profile for the primer coat is 3 mils to 7 mils.
- (5) Remove bolted shop connections before blasting and coating the members. Blast and prime the parts separately then reassemble and torque the bolts fully.
- (6) If applying the coating at the required thickness in one coat produces runs, bubbles, or sags, apply the coating in 2, wet, even coats, using a 50 percent overlap with minimum dry or overspray. If excessive coating thickness produces mud cracking, remove the coating back to soundly bonded coating and recoat the area to the required thickness.
- (7) In areas lacking in primer thickness, clean the areas with power washing equipment to remove dirt; then brush the areas with a non-rusting tool, vacuum and recoat.

517.3.1.7.3 Epoxy System Intermediate and Protective Coats

- (1) Mask the faying surfaces of bolted field splices and the top of the top flanges where welding the stud shear connectors during coat application. On all other areas including the outside surfaces of splice plates, ensure that the dry film thickness conforms to the following:
 1. For the white intermediate coat, 3.5 mils to 8 mils.
 2. For the protective coat, sufficient thickness to provide a uniform color and appearance but not less than one mil or more than 3 mils.

517.3.1.7.4 Handling Coated Steel

- (1) Exercise extreme care in handling the steel in the shop, during shipping, during erection, and during subsequent construction of the bridge. Insulate the steel from the binding chains by engineer-approved softeners. Use padded hooks and slings to hoist steel. Pack diaphragms and similar pieces so that no rubbing occurs during shipment that damages the coating. Store the steel at the job site on pallets or other engineer-approved supports, free of the ground or water, and stabilize to preclude falling or contact between members.

517.3.1.8 Field Painting

517.3.1.8.1 General

- (1) After completing erection, including all bolting, welding, and straightening, remove all adhering rust, scale, dirt, grease, or other foreign material as specified for cleaning surfaces in [517.3.1.3](#).
- (2) Coat surfaces inaccessible after erection with the field coats the plans show. If the retouch coating applied to the shop coat dries thoroughly and the field cleaning is satisfactorily complete, then apply the field coats as called for.
- (3) If traffic produces visible dust, control the dust, at no expense to the department, as necessary on each side of the site and take necessary precautions to keep dust and dirt off freshly painted surfaces or those awaiting paint.
- (4) Complete adjoining concrete work including form removal before applying the last field coat. If concrete operations damage the paint, reclean and repaint the surface.
- (5) If the precautions taken to protect the work required in [517.3.3](#) are inadequate, or the atmospheric conditions cause paint drift to become a problem, the engineer may require that the contractor discontinue spraying until taking adequate precautions or until favorable atmospheric conditions exist.

517.3.1.8.2 Field Repair of Shop-Applied Epoxy Systems

- (1) Provide a way to inspect structural steel as specified for erecting scaffolding in [517.3.1.1](#).
- (2) Make field repairs according to the coating supplier's recommendations, supplied to the engineer by the steel fabricator. Field repairs include preparing the surface of damaged or welded areas by blast cleaning, and applying the complete 3-coat system of primer, intermediate coat, and protective coat.
- (3) Repair and recoat surfaces, that cannot be accessed after erection, before erection.

- (4) After completing erection, including all connections and any bent metal straightening, prepare the steel for repairs. Remove adhering scale, dirt, grease, form oil or other foreign matter by appropriate means, and blast clean any rusted or uncoated areas to a near-white finish according to SSPC-SP 10. Remove abrasive and paint residue from steel surfaces by vacuuming or double blowing, except, if double blowing, vacuum the top surfaces of structural steel, including top and bottom flanges, splice plates and hangers afterward. Brush the coating surrounding the blasted area with a non-rusting tool, and recoat with an organic zinc-rich primer produced by the manufacturer that produced the organic zinc-rich primers used in the shop. These requirements for cleaning, mixing, and applying the coating, shall govern applying coating to repaired areas. Dry film thickness requirements for repair coats are the same as for the shop coats. Ensure proper drying conditions exist between coating applications.
- (5) Zinc coat bearings, nuts, and bolts according to the coating system manufacturer's recommendations. This procedure includes removing any residuals that might impair application, and applying a wash primer or tie coat before the shop coats.
- (6) Any temporary attachments or supports for scaffolding or forms shall not damage the coating system. Use support pads of sufficient size on the fascia where using bracing. Repair any damage that occurs from these devices by the above procedures.

517.3.1.8.3 Urethane Top Coat for Exterior Girders

- (1) Field apply a second coat of urethane as a fourth coat to the exterior girder fascia and bottom exterior girder flange surfaces after completing adjoining concrete work, form removal, and repairing field damage as specified in [517.3.1.8.2](#). Immediately before applying the second coat of urethane, clean 3-coat surfaces to be top coated using a light water blast and allow them to fully dry. Do not apply paint until the engineer has approved the cleaning.
- (2) Apply the urethane top coat conforming to [517.3.1.2](#) and [517.3.1.5](#) except the top coat may be applied more than 60 days after the first coat of urethane. Use enough urethane to provide a uniform color and appearance, but do not provide less than 1.0 mil or more than 3.0 mils of dry film thickness.

517.3.2 Painting Lumber and Timber

517.3.2.1 General

- (1) If painting lumber and timber, unless the contract provides otherwise, prepare the surface; apply, protect, and dry the paint coatings; also, protect traffic and the property upon and in the vicinity of the structure; and protect all portions of the structure against disfigurement by paint or paint materials.
- (2) Clean surfaces being painted to ensure they are free from dust, dirt, or other loose or adhering foreign material.
- (3) Unless the plans, the specifications, or the contract provides otherwise, apply 3 coats of paint to surfaces requiring paint, consisting of a prime, second and finish coat, with paint conforming to [517.2](#) for paint for wood surfaces. Ensure each coat conforms to the type of paint the plans, the specifications, or the contract designates, or as the engineer directs.

517.3.2.2 Weather Conditions

- (1) If painting wood surfaces, conform to the general weather conditions specified in [517.3.1.2](#). Do not apply paint if the air temperature is below 40 F.

517.3.2.3 Paint Mixing

- (1) Mix paint as specified in [517.3.1.4](#).

517.3.2.4 Application

- (1) Apply paint as specified in [517.3.1.5.1](#) and in the following:
 - If using brushes, apply paint to produce a smooth, uniform, even coating over the wood or previously applied paint and work it into all corners and crevices.
 - Do not apply the following coat until the previous coat dries throughout, provided, that at least 3 days elapse before applying any later paint coat.

517.3.3 Protection

- (1) The contractor shall remain responsible and shall take precautions, during painting operations, for protecting traffic, parked vehicles, and the property upon and in the vicinity of the structure against damage by paint drift, drops, or spatters; and for protecting all portions of the structure against disfigurement by paint or equipment. The contractor shall also maintain responsibility for protecting the paint coating during the life of the contract as specified for the contractor's responsibility for work in [107.14](#).

517.3.4 Structure Repainting

- (1) The contractor shall clean and repaint existing structures or parts of existing structures as specified in the special provisions.

517.4 Measurement

- (1) The department will measure the Painting Epoxy System bid items as a single lump sum unit for each structure acceptably completed.

517.5 Payment

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

| <u>ITEM NUMBER</u> | <u>DESCRIPTION</u> | <u>UNIT</u> |
|--------------------|---|-------------|
| 517.0600 | Painting Epoxy System (structure) | LS |
| 517.1000 | Painting Epoxy System Steel Truss (structure) | LS |

- (2) Payment for the Painting Epoxy System bid items is full compensation for surface preparation; for furnishing and applying paint materials; for protecting traffic and property; for field repairs; and for applying a urethane top coat to exterior girders.
- (3) Unless the plans or special provisions specify otherwise, the department will not pay for priming steel encased in concrete; for painting weathering steel as required under [506.3.32](#); or for painting steel grid floors, steel railing, steel piling and pile shells, steel sheet piling, drains, downspouts, and miscellaneous steel. This work, including surface preparation, furnishing and applying paint materials, and protecting traffic and property, is incidental to the bid items for the various steel components.
- (4) The department will not pay for painting timber structures, timber parts of steel structures, and miscellaneous wooden objects. This work, including surface preparation, furnishing and applying paint materials, and protecting traffic and property, is incidental to the bid items for the various lumber and timber components.