

ITEM 708 PAINT

708.01 Inorganic Zinc Silicate Primer Paint. Provide inorganic zinc silicate primer paint conforming to AASHTO M 300, Type I or Type IA, and the following modification:

5.1 A green colorant approximately No. 34159 of FS 595B.

Follow the submittal requirements of ODOT Supplement 1084 to obtain approval of materials conforming to this specification.

Once the City approves the paint, the City will not require further performance testing by the manufacturer unless the formulation or manufacturing process changes, in which case the City will require new certified test results.

Furnish materials certified according to ODOT Supplement 1084 and listed on the City's QPL.

708.02 OZEU Structural Steel Paint. This specification covers the formulation and testing of a three-coat structural steel paint system consisting of an organic zinc prime coat, an epoxy intermediate coat, and a urethane finish coat (OZEU). Meet the following material requirements for the respective coats:

A. General. For each lot of all coatings, furnish a coated card (Drawdown card) that shows the color, gloss, and general appearance of the material covered by the lot. Use a minimum card size of 3-inches by 5-inches. Ensure that the color matches the color card furnished for the Contract or order within visual limits determined by the Engineer. In case of disagreement, provide test data according to ASTM D 2244 showing a color difference of no greater than 2.0, ΔE^* (CIE 1976 L*a*b*).

B. Organic Zinc Prime Coat. Provide an organic zinc prime coat consisting of a zinc dust filled, two or three-component epoxy polyamide, and selected additives as required. Ensure that the coating meets the following:

1. Physical Requirements.

- a. Total solids, % by weight of paint, ASTM D 2369. 70 percent minimum.
- b. Pigment, % by weight of total solids, ASTM D 2371. 83 percent minimum.
- c. Total zinc dust, % by weight of pigment. ASTM D 521. 93 percent minimum.
- d. Total zinc, % by weight of total solids (by calculation) ASTM D 521. 77 percent minimum.
- e. Total solids, % by volume, ASTM D 2697. 45 percent minimum.
- f. Color. Greenish gray, approximating FS-595B-34159, visual comparison.
- g. Pot life. SSPC-Paint 22, Section 5.5 with the following exception: 6 hours minimum at 77+/-3 °F (25+/-2 °C) with no evidence of gellation. Free-flowing and easily sprayed .

2. Qualitative Requirements.

- a. Mixing. Section 5.2, SSPC-Paint 20 using only a high shear (Jiffy) mixer.
- b. Storage Life. Section 5.4, SSPC-Paint 20.
- c. Mudcracking. Section 5.7, SSPC-Paint 20.

3. Material Quality Assurance. Analysis for each component.

Material Quality Assurance that conforms to the requirements of ODOT Supplement 1084.

C. Epoxy Intermediate Coat. Provide a two-part epoxy intermediate coat composed of a base component and a curing agent suitable for application over the epoxy-polyamide zinc rich primer.

Use a base component that contains an epoxy resin together with color pigments, mineral fillers, gellant, leveling agent, and volatile solvents. Use a curing agent component contains a liquid polyamide resin and volatile solvent. Ensure that the coating meets the following:

1. Physical Requirements.

- a. Color. White, meeting or exceeding, FS-595B-37875 as per ASTM E 1347.
- b. Components. Two, mixed before application.
- c. Volume solids, ASTM D 2697. 50 percent minimum.
- d. Pot life. SSPC-Paint 22, Section 5.5 with the following exception: 6 hours minimum at 77+/-3 °F (25+/-2 °C) with no evidence of gellation. Free-flowing and easily sprayed
- e. Curing time.
 - (1) Set-to-touch, ASTM D 1640. 4 hours, maximum at 77 °F (25 °C).
 - (2) Dry-to-recoat, ASTM D 1640. 24 hours, maximum at 77 °F (25 °C).
 - (3) Full cure. 7 days, maximum at 50 °F (10 °C).
No pick-up when rubbed with a cloth soaked in Methyl Ethyl Ketone.
- f. Fineness of grind, ASTM D 1210. Hegman 3 minimum.
- g. Volatile Organic Compounds (VOC), maximum, ASTM D 3960. 2.83 lb/gal(340 g/L), as applied.

2. Material Quality Assurance. Material Quality Assurance conforming to the requirements of ODOT Supplement 1084.

D. Urethane Finish Coat. Provide a two-component urethane finish coat composed of a polyester and/or acrylic aliphatic urethane and suitable for use as a finish coat over

708.02

the white epoxy polyamide intermediate coat. Ensure that the coating meets the following:

1. Physical Requirements.

a. Finish, Specular gloss, ASTM D 523. Use Fed Std 595B-16440 Gray: 70 % minimum after 3000 hours weathering resistance. Color change less than 2.0 ΔE*, (C.I.E 1976 L*a*b*) ASTM D2244.

b. Volume solids, ASTM D 2697. 42 percent minimum.

c. Curing time, at 77 °F (25 °C) and 50% RH. Set-to-touch, ASTM D 1640: 30 minutes, minimum; 4 hours, maximum.

d. Pot life. SSPC-Paint 22, Section 5.5 with the following exception: 4 hours minimum at 77+/-3 °F (25+/-2 °C) with no evidence of gellation. Free-flowing and easily sprayed

e. Volatile Organic Compounds (VOC), maximum, ASTM D 3960. 2.83 lb/gal(340 g/L), as applied.

f. Colors.

(1) Specified.^[2]

Brown	FS-595B, 10324
Green	FS-595B, 14277
Blue	FS-595B, 15526

[2] Contractor’s choice unless specified on plans

(2) Elective. As specified on the plans.

g. Gloss requirements, ASTM D 523.

Full gloss	minimum 80% unless specified on the plans
Semi-gloss	30 to 45%
Lusterless (Matte)	maximum 6%

2. Material Quality Assurance.

Material Quality Assurance conforming to the requirements of ODOT Supplement 1084.

Performance Requirements. Prior to use, test the coating system consisting of the organic zinc prime coat, the epoxy intermediate coat, and the urethane topcoat.

Prepare three panels for each of the specified tests according to ASTM D 609, except provide a minimum thickness of 1/8 inch (3 mm) and use ASTM A 36/A 36M hot rolled steel. Blast clean (using coal slag abrasive) the surface to equal, as nearly as practical, the standard Sa 2 1/2 of ASTM D 2200 (Steel Structures Painting Council SSPC-SP10 meets this requirement). Ensure that the surface has a nominal height of profile of 1 to 3.5 mils (25 to 88 μm) verified by using appropriate replica tape. Coat and cure the panels according to the manufacturer’s printed instructions. Provide a dry film coating thickness for the system to be tested as follows:

Organic Zinc:	3.0 to 5.0 mils (75 to 125 μm)
Epoxy:	5.0 to 7.0 mils (125 to 175 μm)
Urethane:	2.0 to 4.0 mils (50 to 100 μm)

Ensure that the coating system passes each of the following tests:

A. Fresh Water Resistance Test (ASTM D 870). Scribe the panels according to ASTM D 1654 to the depth of the base metal in the form of an “X” having at least 2-inch (50 mm) legs, and immerse panels in fresh tap water at 75 ± 5 °F (25 ± 3 °C). After 30 days of immersion, examine the panels to verify that they show no rusting and that the coating shows no blistering, softening, or discoloration. Rate blistering according to ASTM D 714.

B. Salt Water Resistance Test (ASTM D 870). Scribe the panels as specified in “A” above, and immersed panels in a water solution of 5 percent sodium chloride at 75 ± 5 °F (25 ± 3 °C). After 7, 14, and 30 days of immersion, examine the panels to verify that they show no rusting and that the coating shows no blistering or softening. Rate blistering according to ASTM D 714. Replace the sodium chloride solution with a fresh solution after examination at 7 and 14 days.

C. Weathering Resistance Test. Test the panels according ASTM D 4587, Method D, using Ultra Violet A 340 bulbs. Start the test at the beginning of a wet cycle. After 3000 hours of continuous exposure, examine the panels to verify that they show no rusting and that the coating shows no blistering or loss of adhesion. Perform the 60 degree specular gloss measurements on the sprayed panels used for this test. Average the three initial measurements (one per panel) together. Also, average the three final measurements together.

D. Salt Fog Resistance Test. Scribe the panels as specified in “A” above, and test them according to ASTM B 117. After 3000 hours of continuous exposure, examine the coating to verify that it shows no loss of bond and that it shows no rusting or blistering beyond 1/16 inch (2 mm) from the center of the scribe mark. Rate blistering according to ASTM D 714.

E. Adhesion Test, ASTM D 4541 Type IV. Test the panels according to the following:

1. Lightly sand the coating surface and aluminum dolly, and apply a quick set adhesive.
2. Allow adhesive to cure overnight.
3. Scribe the coating and adhesive around the dolly before testing.
4. Make a minimum of 4 trials to failure, and report the 4 trials. Make each trial greater than 400 pounds per square inch (2.8 MPa). Reject trial if fracture at the primer-blast interface occurs.

Prequalification. Before approval, submit copies of the manufacturer’s certified test data to the Laboratory showing that the coating system complies with the performance requirements of this specification. Provide certified test data that states the following physical properties for each coating: Density, pounds per gallon (g/mL); Solids, percent

708.02

by weight; Solids, percent by volume; Viscosity; Drying time; and VOC content, pounds per gallon (g/mL).

Use an independent testing laboratory, approved by the Laboratory, to develop the test data. Include with the test data the brand name of the paint, name of manufacturer, number of lots tested, and date of manufacture.

Once the Engineer approves the coating, the City will not require further performance testing by the manufacturer unless the formulation or manufacturing process changes, in which case the City will require new certified test results.

Sampling. The Laboratory will establish acceptance variances.

Furnish materials certified according to ODOT Supplement 1084 and listed on the City's QPL.