

710.8

710.8-SERVICE AND LIGHTING POLES:

710.8.1: Wood Service or lighting poles shall be ANSI Class 5, or larger, or as called for on the contract plans. Lighting poles shall be southern yellow pine and service poles shall be either southern yellow pine or Douglas fir. The poles shall be pressure-treated with copper chromium arsenate (CCA) to meet the requirements of AWPA C-14.

SECTION 711 PAINTS, COATINGS, OILS, AND INKS

Paints shall consist of pigments and vehicles conforming to the general requirements of these specifications, proportioned and treated to produce materials possessing the detailed composition and physical properties.

General Requirements: The finished products shall not settle excessively nor cake in the container, shall be readily mixed with a paddle to a smooth uniform paint of specified consistency and working properties. The product shall not thicken, liver, skin, or curdle. The paint shall have a storage life of at least 12 months.

All ready mixed paints shall be furnished in containers holding not more than five gallons (20 liters) , unless authorized by the Engineer. Shop paints may be furnished in larger containers providing approved mechanical agitation is available.

Each container shall bear a label with the following information: Name and address of the manufacturer, trade name or trade mark, type of paint, reference to the Division's Standard Specification Number, number of gallons (liters), lot or batch number, date of manufacture, and flash point. The label of two component systems shall include mixing instructions.

Sampling and testing shall be in accordance with MP 711.00.20. Quantities of 50 gallons (200 liters) or less may be accepted on manufacturer's certification.

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711.2-BOILED LINSEED OIL:

Boiled linseed oil shall conform to the requirements of ASTM D 260.

711.3 THROUGH 711.4-BLANK

711.5-MINERAL SPIRITS:

Mineral spirits shall conform to the requirements of ASTM D 235.

711.6-FIELD PRIMER:

711.6.1-General: Acceptance shall be based on batch testing. Initial approval of all material will be based on complete testing to assure specification compliance. This primer may be used in the shop on new steel or in the field on existing steel. The shop primer shall have a minimum slip coefficient of 0.50 (Class B) when tested in accordance with "Test Method to Determine the Slip Coefficient for Coatings used in Bolted Joints" as adapted by the Research Council on Structural Connections. The steel shall be capable of being blast cleaned to a near-white finish, SSPC-SP-10, for new steel, and to a commercial finish, SSPC-SP-6, for existing steel. This primer may be top coated in accordance with Section 711.20.1. The dry film thickness requirement for this material is three mils (75 μm) minimum unless specified otherwise.

711.6.2-This primer shall meet the requirements of SSPC, Paint Specification Number 20, Type 2.

711.7-FIELD OR SHOP PRIMER:

711.7.1-General: Acceptance shall be based on batch testing. Initial approval of all material will be based on complete testing to assure specification compliance. Subsequent approval of initially accepted products may be based on random testing (all tests not required on each batch) at the option of the Division. This specification provides the requirements for a fast drying shop or field primer. This primer may be used on new steel painted in the shop or as a field primer on existing bridges. In both cases, the steel must be capable of being blast cleaned to a near white condition, SSPC-SP-10. The dry film thickness requirement for this material is two mils (50 μm) minimum unless specified otherwise.

711.7.2-This primer shall meet the requirements of Federal Specification TTP-664 (C) with the exception that the minimum dry to touch time shall be deleted and the maximum increased to 10 minutes.

711.8-FIELD PRIMER-SLOW DRYING:

711.8.1-General: Acceptance shall be based on batch testing. Initial approval of all material will be based on complete testing to assure specification compliance. Subsequent approval of initially accepted products may be based on random testing (all tests not required on each batch) at the option of the Division. This specification provides the requirements for a slow drying field primer. This primer is to be used on existing structures which are corroded to such an extent that they cannot be blast cleaned to a commercial condition, SSPC-SP-6. The primer has the ability to "wet" hand cleaned steel. The dry film thickness requirement for this material is two mils (50 μm) minimum unless specified otherwise.

711.8.2-This primer shall meet the requirements of SSPC, Paint Specification Number 25 with the following exceptions:

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- i. DELETE Tack Free Dry Time. SUBSTITUTE Set-To-Touch Time.
- ii. DELETE II-R266, Type II. SUBSTITUTE TT-R266, Type I, Class A or Class B.
- iii. CHANGE Maximum dry hard from 24 to 36 hours.

711.9-BLANK

711.10-INTERMEDIATE FIELD COAT:

711.10.1-General-Acceptance shall be based on batch testing. Initial approval of all material will be based on complete testing to assure specification compliance. Subsequent approval of initially accepted products may be based on random testing (all tests not required on each batch) at the option of the Division. This specification provides the requirements for an intermediate field coat or coats for use in mild or average atmospheric conditions. This paint may be applied over 711.7 or 711.8 primers. It is to be top coated with a pigmented finish coat meeting 711.11. The dry film thickness requirement for this material is two mils (50 µm) minimum unless specified otherwise.

711.10.2-This paint shall meet the following requirements:

	<u>Minimum</u>	<u>Maximum</u>
i. Viscosity (KU)	75	90
ii. Fineness of Grind	4	
iii. Drying Time (hours)		
Set to Touch		6
Dry Hard		18
iv. Gloss @ 60°		50
v. Pigment, percent		
by weight	38	
vi. Non-Volatile,		
percent of vehicle	40	
vii. Color shall be		
light gray		
viii. Weight - The weight per gallon (liter) of the paint shall be within ±0.5 pounds (±225 grams) of the initial qualification sample.		
ix. Adhesion - When tested in accordance with ASTM D3359 the adhesion shall not be less than 3B when the total film thickness is 5 mils (125 µm) or less. Thickness in excess of 5 mils (125 µm) require a minimum adhesion of 3A.		

711.11-PIGMENTED FINISH COAT:

711.11.1-General: Acceptance shall be based on batch testing. Initial approval of all material will be based on complete testing to assure specification compliance. Subsequent approval of initially accepted products may be based on random testing (all tests not required on each batch) at the option of the Division. This specification provides the requirements for a

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pigmented finish coat or coats for use in mild or average atmospheric conditions. This finish coat is to be applied over 711.10. The field adhesion of the system (primer, 711.10, 711.11) shall be at least 90 percent when tested in accordance with MP 711.00.20. The adhesion test shall be conducted approximately 14 days after field application. The dry film thickness requirement for this material is two mils (50 μm) minimum unless specified otherwise

The color choices permissible are from Federal Standard 595. The color difference, ΔE , of the acceptance samples shall not be more than five ΔE units from the standard listed below.

Federal Standard Number	x Coordinates	y Coordinates	Y Coordinates
14062	.2361	.4376	04.13
14223	.2883	.3911	20.24
17178	.3059	.3169	31.46
14241	.2915	.3382	27.75

711.11.2-Physical Requirements:

	<u>Minimum</u>	<u>Maximum</u>
i. Viscosity (KU)	70	80
ii. Fineness of Grind	6	
iii. Drying Time (hours)		
Set to Touch		4
Dry Hard		18
iv. Gloss @ 60°	50	
v. Pigment, percent by Weight	25	
vi. Non-Volatile, percent of vehicle	44	
vii. Accelerated Weathering - Color change shall not exceed the five ΔE units after 500 hours exposure.		
viii. Weight - The weight per gallon (liter) of the paint shall be within ± 0.5 pounds (± 225 grams) of the initial qualification sample.		
ix. Flexibility - There shall be no apparent failure when viewed under 8X magnification after bending around $\frac{1}{4}$ inch (6 mm) mandrel.		
x. Adhesion - When tested in accordance with ASTM D3359 the adhesion shall have minimum rating of 3A.		

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711.12-EPOXY MASTIC MAINTENANCE COATING:

711.12.1-General: This specification provides the requirements for a two components, modified epoxy coating for use as a spot primer or a one coat system for use on poorly prepared surfaces on most existing structures. All ingredients are not specified, however, the finished product shall comply with the requirements prescribed.

711.12.2-Composition: The pigment shall be flake metallic aluminum. The vehicle shall be modified epoxy resin and curing agent. The vehicle shall be formulated to permit trouble free application during normal humidity conditions.

711.12.3-Physical Requirements:

- | | | |
|------|---|-------------------|
| i. | Dry to touch @ 5 mils (125 μ m) dry | 24 Hours Maximum |
| ii. | Dry hard @ 5 mils (125 μ m) dry | 72 Hours Maximum |
| iii. | Weight per gallon (liter) | 10.5 Lbs. Minimum |
| iv. | Corrosion resistance | |

Steel panels meeting the requirements of MP 711.00.20, Section 5.2 shall be sandblasted to a white metal finish in accordance with SSPC-SP-5, exposed to the atmosphere for 30 days so uniform rusting occurs, and then hand cleaned with a wire brush in accordance with SSPC-SP-2. The panel shall then be spray applied with epoxy-mastic according to manufacturers' recommendations.

Fresh Water Resistance: The coated panels shall be scribed to the base metal with an X of at least two inch (50 mm) legs and shall be immersed in fresh tap water at $75 \pm 5^\circ$ F ($24 \pm 3^\circ$ C). Upon examination after 30 days immersion, the panels shall be unaffected except for discoloration's of the epoxy-mastic coating. There shall be no blistering, softening, or visible rusting beyond 1/16 inch (2 mm) from the edge of the scribe mark.

Salt Water Resistance: Panels shall be scribed to the base metal with an X of at least two inch (50 mm) legs and shall be immersed in five percent sodium chloride solution at $75 \pm 5^\circ$ F (24° C $\pm 3^\circ$ C). The panels shall be unaffected except for discoloration of the epoxy-mastic coating, upon inspection after 30 days. There shall be no blistering, softening or visible rusting beyond 1/16 inch (2 mm) from the center of the scribe mark. The sodium chloride solution shall be replenished with fresh solution each week.

Weathering Resistance: Panels shall be tested in accordance with ASTM G 53. After 1,000 hours exposure, the coating shall show no rusting, blistering, or loss of adhesion to the test panel.

Salt Fog Resistance: Panels shall be scribed to the base metal with an X of at least two inch (50 mm) legs. The test panels shall then be tested in accordance with ASTM B 117. After 1,000 hours of continuous exposure, the coating shall show no loss of bond, nor shall it show rusting or blistering beyond 1/16 inch (2 mm) from the center of the scribe mark.

v. Flexibility

The epoxy-mastic coating shall possess such flexibility that when applied at a five mil (125 μm) dry film thickness to a 1/8 inch (3 mm) steel panel which has been blast cleaned in accordance with SSPC-SP-5, and dried for two weeks at $75 \pm 5^\circ\text{F}$ ($24^\circ\text{C} \pm 3^\circ\text{C}$) shall display no signs of cracking or loss of adhesion when the panel is uniformly bent 180 degrees around a 1/8 inch (3 mm) diameter mandrel.

vi. Application Properties

The paint shall be suitable for use over properly prepared zinc rich primers. The mixed paint, when thinned in accordance with manufacturer's recommendations, shall be capable of being sprayed in one coat at a 10 mil (250 μm) wet film thickness without runs or sags. The properly thinned paint shall be capable of brush and roller application. The manufacturer's current printed instructions for application of epoxy-mastic coating shall be submitted to the Division for review and approval prior to application.

711.12.4-Packaging and Labeling: The epoxy-mastic coating shall be packaged in two containers, labeled Part A and Part B. Each container shall bear a label on which shall be clearly shown the manufacturer and brand name of paint, the lot number, and the date of manufacture. The label on the containers shall also include complete instructions for the use of this paint. The inside of the container shall be coated, if necessary, to prevent attack by the paint components.

711.12.5-Acceptance Procedure: The Division will develop an approved list of products meeting this specification.

The list shall be based upon testing performed by the Division or by certified test data supplied by the manufacturer. The manufacturer shall supply the Materials Division the following for each product.

- i. Two one gallon (4 liter) kits of the product
- ii. One gallon (4 liter) thinner
- iii. Instructions for mixing, thinning and application

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- iv. Materials Safety Data Sheet for both the paint and thinner
- v. Company data sheet on the product

After successful testing, the Materials Division will inform the manufacturer of inclusion on the approved list. Upon approval by the Division, further testing will not be required of the brand name of paint, unless random samples tested by the Division show non-compliance with any of the specification requirements. The manufacturer shall submit certified test data anytime the formulation or manufacturing process changes.

711.12.6 – Colored epoxy-mastic shall meet the above requirements with the following changes:

- i. The metallic aluminum pigment shall be replaced by other pigments and coloring agent necessary to provide the specified color. The color difference, ΔE , of the acceptance samples shall not be more than 5 ΔE units from the standards listed below.

FEDERAL STANDARD NUMBER	X Coordinates	y Coordinates	Y Coordinates
14062	.2361	.4376	04.13
14223	.2883	.3911	20.24
14241	.2915	.3382	27.75
17178	.3059	.3169	31.46
30045	.3555	.3324	6.88

- ii. Due to the fading tendencies of the colored epoxy-mastics, all material must come from the same batch.

711.13-INKS:

Inks for use on reflective sheeting shall be as recommended by the manufacturer of the reflective sheeting.

711.13.1-Transparent Ink:

711.13.1.1-Color: The color shall meet the requirements of Table 1 and be tested in accordance with Section 7.1 of AASHTO M268.

711.13.1.2-Black Ink: Black Ink shall be opaque process ink made with synthetic resin.

711.13.3-Clear Transparent Ink: Clear transparent ink for application as a final protective coat shall be as recommended by the manufacturer of the

reflective sheeting.

711.14 – OVERCOAT SYSTEMS:

711.14.1 – General: This specification provides paint systems which may be used with minimal surface preparation.

711.14.2 – Cleaning and Painting: Surface preparation will be limited to hand or power tool cleaning meeting SSPC-SP-2 or SSPC-SP-3. Application of the paint system shall be in accordance with the manufacturer's recommendations.

711.14.3 – Acceptance: The Division will maintain an approved list of overcoat system.

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711.20-INORGANIC ZINC RICH SYSTEM:

711.20.1-General: Acceptance shall be based on batch testing. Initial approval of all material will be based on complete testing to assure specification compliance. Subsequent approval of initially accepted products may be based on random testing (all tests not required on each batch) at the option of the Division. This specification provides the requirements for an inorganic zinc rich system. The primer is to be spray applied over a near white blasted surface, SSPC-SP-10. An intermediate coat meeting 711.20.3 may be needed to tie the primer and the top coat together. **The use of an intermediate coat shall be the option of the top coat manufacturer.** In either case, the field adhesion of the system shall be at least 90 percent when tested in accordance with MP 711.00.20. The adhesion test shall be conducted approximately 14 days after field application.

711.20.2-Primer: This primer shall meet the requirements set forth in MP 711.20.59 with the following changes (number refers to sub-section of AASHTO M 300):

- 4.2.2** Delete X-ray diffraction
- 4.6.8** Delete accelerated weathering
- 4.6.9** Delete bullet hole immersion test
- 4.6.10** Delete humidity test
- 4.7** Delete primer field performance requirement
- 4.8.5** Delete infrared spectrum

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4.8.6 Delete the VOC (volatile organic compound) requirement and substitute the following: The VOC shall not exceed 3.5 lbs / gal (420 kg / m²) for shop or field application

The primer shall have a minimum slip coefficient of 0.50 (Class B) when tested in accordance with "Test Method to Determine the Slip Coefficient for Coatings used in Bolted Joints" as adapted by the Research Council on Structural Connections.

711.20.3-Intermediate Field Cost: The material shall meet the requirements set forth in MP 711.20.60.

711.20.4-Top Coat: This top coat shall meet the manufacturer's specifications and shall meet the physical requirements of 711.20.4.1.

711.20.4.1-Physical Requirements:

	Minimum	Maximum
i. Drying Time (hours)		
Set-to-touch	---	1
Dry for recoating	---	3
Dry Hard	--	24
ii. Flexibility		
(½ in. (13 mm) mandrel)		No Failure
iii. Compatibility - 50 cu. cm. of the coating shall be able to be mixed with 50 cu cm of the manufacturer's thinner without curdling, livering, separating, or otherwise affecting the coating except to thin it.		

Color - The color choices permissible are from Federal Standard 595.

The color difference, ΔE, of the acceptance samples shall not be more than five units from the Standards listed below:

Federal Standard Number	x Coordinates	y Coordinates	Y Coordinates
14062	.2361	.4376	04.13
14223	.2883	.3911	20.24
14241	.2915	.3382	27.75
17178	.3059	.3169	31.46
30045	.3555	.3324	6.88

iv. Accelerated Weathering - After cycling 1000 hours there shall be no evidence of checking, cracking, rusting, or blistering. The degree of

chalking shall not be less than No. 6 when tested according to ASTM D6549. The color difference after 1000 hours shall be no more than five ΔE units.

- v. Chemical Resistance - The top coat shall show no visual deterioration, other than minor discolorations, after seven days exposure to:
 - a. Ten percent sulfuric acid solution
 - b. Ten percent sodium hydroxide solution
- vi. Adhesion - When tested in accordance with ASTM D3359 the adhesion shall have minimum rating of 3A.
- vii. Gloss - less than 25 (for color 30045 only).

711.21-GALVANIZE REPAIR (ZINC RICH PRIMER):

Acceptance shall be based on batch testing. Initial approval of all material will be based on complete testing to assure specification compliance. Subsequent approval of initially accepted products will be based on random testing (all tests not required on each batch) at the option of the Division. This primer shall meet the requirements of Military Specification MIL-P-21035, Federal Specification TTP-641, Section 711.6, or Section 711.20.2.

711.22-INORGANIC ZINC RICH LOW VOC SYSTEM:

711.22.1-General: Initial approval for all material will be based on complete testing of the system for specification compliance. Subsequent approval of initially accepted products may be based on random testing (all tests not required on each batch) or from an approved list at the option of the Division. Each product in the system shall have a maximum Volatile Organic Compound (VOC) content. Each product in the system shall be from the same manufacturer. The primer is to be spray applied over a near white blasted surface, SSPC-SP-10. An intermediate coat meeting 711.22.3 may be needed to tie the primer and the top coat together. The use of the intermediate coat shall be at the option of the manufacturer. In either case, the field adhesion of the system shall be at least 3A when testing in accordance with MP 711.00.20. The adhesion test shall be conducted approximately 14 days after application of the top coat.

Two low VOC systems are covered by this specification. They are as follows:

System 1 - All products are to have a VOC of 2.8 pounds per gallon maximum (336 gm per liter).

System 2 - All products are to have a VOC of 2.8 pounds per gallon (336 gm per liter) maximum except the primer has no restrictions on VOC.

All fabricators/contractors will be required to use the same system formulation on a specific structure.

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711.22.2-Primer: This primer shall meet the requirements of 711.20.2.

711.22.3-Intermediate Field Coat: This material shall meet the manufacturer's specification and shall be compatible with the primer (711.22.2) and the top coat (711.22.4).

711.22.4-Top Coat: This material shall meet the manufacturer's specification and shall meet the requirements of 711.22.4.1.

711.22.4.1-Requirements:

- i. Dry Hard - 24 Hours Maximum
- ii. Color - Shall meet the requirements of 711.20.4.1 (iv).
- iii. Gloss @ 60° - 50 Minimum

711.22.5-The system shall be composed of a primer (711.22.2) and topcoat (711.22.4). The use of an intermediate coat is at the option of the manufacturer. The primer shall be applied at a minimum of 3 mils (75 µm) dry. The total coating over the primer shall be a minimum of 4 mils (100 µm) dry.

711.22.5.1-System Requirements:

- i. Intercoat Adhesion - Before and after all tests, the intercoat adhesion shall be at least 3A when tested in accordance with MP711.00.20.
- ii. Accelerated Weathering - After cycling 1000 hours there shall be no evidence of checking, cracking, rusting, or blistering. The degree of chalking shall not be less than No. 6 when tested according to ASTM D6549. The color difference after 1000 hours shall be no more than five ΔE units.
- iii. Salt Spray - After cycling for 1,000 hours, the intercoat adhesion shall meet 711.22.5.1 i.

711.25 THROUGH 711.39-BLANK

711.40 – Temporary White or Yellow Traffic Paint:

Temporary Traffic Paint shall be any commercially available white or yellow paint designed for use on highways. The paint shall be applied at a minimum rate of 15 mils (381 µm) wet film thickness. The paint shall be applied with glass beads at a minimum rate of 6 lbs per gallon (720 grams per liter) of paint. The beads shall be any glass spheres designed to be applied to the above paint. The paint shall have a minimum retroreflective reading of 150 mc/lx/m² within three to ten days after application. During this period readings shall be performed by Division personal. A minimum of three readings shall be taken with the LTL 2000 Retroreflectometer. Testing shall be in accordance

with ASTM E1710 *with the following changes*(number refers to subsection of ASTM E1710).

6.2.2 – DELETE THE SENTENCE AND SUBSTITUTE THE FOLLOWING:

The aperture angle of the light source as determined from the center of the measurement area shall be a maximum of 0.33.

6.3.3 – DELETE THE SENTENCE AND SUBSTITUTE THE FOLLOWING:

As determined from the center of the measurement area the aperture angle of the receiver shall be a maximum of 0.33.

Should the paint fall below 150 mc/1x/m² the contractor shall repaint at no additional cost to the division.

711.41-WHITE OR YELLOW FAST-DRY TRAFFIC PAINT (TYPE II)

711.41.1-General: The pavement marking material shall be formulated as a medium-life pavement marking system capable of providing a minimum of one year of continuous performance. Solvent born paint, methylmethacrylate, chlorinated rubber, or other short duration products will be not approved.

The composition of the paint shall be left to the discretion of the pavement marking manufacturer. The Contractor shall provide a pavement marking system to meet the following performance requirements:

COLOR: Each color installed shall match the following Federal Standards:

Yellow: No. 595A-33538

White : No. 59S A-37875

The color shall show no appreciable discoloration due to aging during the life of this pavement marking. Pavement markings shall be visually checked by the Engineer at any time during the life of this pavement marking, additionally, the Engineer may at any time during the projected life of this marking use a portable colorometer to determine if the markings have faded or darkened beyond the CIE Chromaticity Coordinate Limits.

711.41.2-Sampling and Testing Procedures for Performance Samples:

The pavement marking system installed, shall at all times with maintain a minimum reflectance value of 200 mcd/m²/lx for white pavement markings and 150 mcd/m²/lx for yellow pavement markings when measured with a

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LTL-2000 retroreflectometer or equal 30 meter device approved by the Traffic Engineering Division.

During the pavement marking life-span, the pavement marking materials furnished and installed shall show no signs of failure greater than five (5) percent loss due to blistering, excessive cracking, bleeding, staining, discoloration, smearing or spreading under heat, deterioration due to contact with oil or gasoline, chipping, spalling, poor adhesion to the pavement, damage from traffic and normal wear. Loss due to pavement failure, unless caused by the marking material, will not be considered as a material failure and will not be included in the loss calculations and/or retroreflectivity readings.

The Division may conduct periodic pavement marking reviews throughout the project. These reviews will occur at any time after the markings have been placed. These reviews will evaluate the pavement marking material within the project limits for either day and night acceptability considering all requirements listed above. The following method will be used to measure the retroreflectivity acceptance of the pavement marking material:

Identified deficient areas greater than 1000 ft shall be labeled as zones and these areas shall be checked for retroreflectivity. Areas less than 1000 ft shall be addressed on an individual basis concerning deficient markings.

Zones of less than one mile in length may have from one to three check points at the discretion of the Department. Check points will consist of six skip lines or 300 feet of continuous marking. For each check point eighteen (18) retroreflective readings will be taken over the six skip lines or 300 feet of continuous line. Areas less than 1000 feet shall be checked every 100 feet with the average to be the determination of the retroreflectivity level.

Zones one to three miles in length will have readings taken at a minimum of three check points within the zone. The check points should be located at the beginning, middle and end portions of the zone in question.

Zones greater than three miles in length will have check points at the beginning, end and at three mile intervals within the zone.

Retroreflective readings within each check point and zone will be averaged. If any of the check point averages and/or zone averages fall below the defined minimum retroreflective values, additional zones may be used for further evaluation of the markings to be replaced. The average zone value will be used to determine conformance to the defined minimum values.

During the life of this pavement marking if any markings greater than 1000 feet are found to be deficient for any reason, the Contractor will be given notification stating the locations and the type of deficiency. These notifications will be given at any time during the life of the contract. The Contractor shall completely replace the deficient markings, as directed by the Engineer, within twenty (20) calendar days of the written notification.

If the Contractor Does Not complete the replacement of all of the deficient pavement markings by the end of the twenty (20) calendar day replacement period the Contractor shall be subject to the liquidated damages as described within Section 108.7 of the West Virginia Department of Highway's Standard Specifications until replacement is completed. These liquidated damages shall

not stop during the winter shut-down period. No direct payment shall be made for the replacement of any deficient pavement marking during the one-year warranty period as such work shall be considered as incidental to the work as paid for by the various pavement marking items in the contract.

711.41.2.1- Submission For Approval of Equipment Personnel:

The Contractor (prior to commencement of the project) shall submit to the Engineer a detailed list of all equipment and the resumes of all personnel within the confines of this project. The Contractor shall also provide certification from the binder manufacturer that the Contractor is qualified to apply the manufacturer's material in conformance with these specifications. Drivers and operators with less than one year of experience shall not be used on this project.

The Contractor will be required to fill out the Daily Centerline Report(s) and provide the completed form to the Engineer for payment. The Contractor shall provide the District the collective daily centerline reports on a weekly basis. The Contractor's weekly centerline reports shall be delivered to the Engineer the first work day of the following week. Failure to deliver centerline reports to the District shall invoke daily liquidated damages as described in Section 108.7 of the West Virginia Department of Highway's Standard Specifications for each calendar day that the Contractor fails to deliver these centerline reports.

711.41.2.2-Application of Performance Pavement marking Materials:

The Contractor's striper shall be equipped with electrical foot counters. The counters shall individually tabulate the amount of footage applied by each striping gun whether solid or dashed. The counters shall be six digit types with a reset feature. The Contractor shall determine the accuracy of the foot counters and establish an adjustment factor as required to determine the pay item quantities. The foot counters shall be periodically checked to assure accurate measurements. No paint shall be applied without the accurate operation of the foot counters. The Contractor shall provide the Engineer with a certified document on these calibrations.

The Contractor shall use an accurate dashing mechanism, capable of being adjusted to retrace existing lane or center line markings.

The pavement marking material shall be mixed uniformly throughout and shall have a homogeneous dispersment of color and beads when applied to the pavement. The material shall have a uniformly thick cross-section through its entire length.

Pavement marking lines shall be straight or of uniform curvature and shall conform with the tangents, curves, and transitions as specified in the pavement marking standards and/or as directed by the Engineer.

The finished lines shall have well-defined edges and be free of horizontal fluctuations. The lateral deviation shall not exceed 0.5 inch from the proposed location alignment as specified in the Standards and/or directed by the Engineer.

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When striping interchanges, material will be applied for the full length of all ramps, including all islands, gore areas, etc.

The Contractor shall be responsible for removing all pavement marking materials spilled upon the roadway surface or adjoining area. The Contractor shall use methods acceptable to the Engineer for removing the spilled material.

The Department will be responsible for coding and spotting where old markings cannot be determined or if the Department desires to make changes in existing markings.

SECTION 712 GUARDRAIL AND FENCE

712.1 THROUGH 712.3-BLANK

712.4-GALVANIZED STEEL DEEP BEAM GUARDRAIL, FASTENERS AND ANCHOR BOLTS:

Galvanized steel deep beam guardrail, fasteners and anchor bolts shall conform to AASHTO M180, Type II, Class A.

712.5 THROUGH 712.7-BLANK

712.8-CHAIN-LINK FENCE:

Chain-link fence shall conform to the requirements of AASHTO M 181. Fence height, gage and details shall be as specified on the Plans.

712.9-ZINC-COATED (GALVANIZED) IRON OR STEEL FARM- FIELD AND RAILROAD RIGHT-OF-WAY WIRE FENCING:

This fencing shall meet the requirements of AASHTO M 279 and details shown on the Plans. Either of the following styles and coating classes may be used.

1. Style 1047-6-9 with Class 1 coating
2. Style 1047-6-11 with Class 3 coating

Zinc coating for miscellaneous steel fittings and hardware shall conform to the requirements of AASHTO M 232. Zinc coating for clips used for securing fence or wire shall conform to AASHTO M 279, Class 1 coating.

712.10-COATED STEEL BARBED WIRE:

Barbed wire shall meet the requirements of AASHTO M 280, Class 1 or AASHTO M 305, Type I.