

SPECIFICATION DEVELOPMENT PROCESS

THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR

(The person who receives or originates the issue and needs to forward the issue for action.)

Modify Specification _____975_____.
Section/File number

New Section _____.
Section number

Subject: Elastomeric Coating System

Origination date: March 15, 2005

Originator: Karen Byram

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Problem statement: Section 971 contains coating material requirements for both traffic marking materials and structural coatings. Over the years, the number and types of materials included in this section have grown significantly making the section large and unwieldy.

The structural coatings specified are outdated and many are no longer available. Complete subsections need to be removed and new sections need to be added.

Section 975 is a single structural coating that has been isolated for convenience. Therefore, all structural coatings can be moved into this section.

Information source: Department Staff: Karen Byram, Product Evaluation Administrator

Robert Robertson

Henry Bollmann

Background data: See next page.

**Desired
implementation
date:**

Beginning with the January 2006 letting.



Florida Department of Transportation

JEB BUSH
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

MEMORANDUM

DATE: May 27, 2005

TO: Specification Review Distribution List

FROM: Duane F. Brautigam, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: 9750000 – Structural Coating Materials.

This revision was previously sent for review on March 30, 2005. In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change Structural Coating Materials.

This change is proposed by Karen Byram, Section 971 contains coating material requirements for both traffic marking materials and structural coatings. The structural coatings specified are outdated and many are no longer available. Section 975 is a single structural coating that has been isolated for convenience. Therefore, all structural coatings can be moved into this Section.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DB or duane.brautigam@dot.state.fl.us. Comments received after June 24, 2005 may not be considered. Your input is encouraged.

DFB/jho

Attachment

COMMENTS: _____

STRUCTURAL COATING MATERIALS.
(REV 3-24-055-26-05)

SECTION 975 (Pages 918-919) are deleted and the following substituted:

SECTION 975
STRUCTURAL COATING MATERIALS

975-1 General Requirements.

975-1.1 General: Upon curing, all coatings and/or coating systems must produce an adherent coating that is visually uniform and capable of performing according to its designated purpose for an extended service life of greater than 20 years. ~~The material must be capable of being applied in the manner specified, without undue difficulty, in horizontal, vertical or overhead positions.~~

———The composition of the coating is left to the discretion of the manufacturer but the finished product must meet all requirements of this Section. All coatings must be designed for a marine, coastal environment and must be self-curing.

———Coatings that are multi-component must be prepackaged in required ratios for ease of mixing.

———Any coating not meeting these Specifications will be rejected by the Engineer.

975-1.2 Environmental Requirements: Coating materials *and their waste products* must be characterized as non-hazardous as defined by Resource Conservation and Recovery Act (RCRA) Subarticle C rules, Table 1 of 40 CFR 261.24 Toxicity Characteristic.

Volatile Organic Compounds (VOC) shall be less than 420 g/L (3.5 lb/gal) when tested in accordance with AASHTO R-31.

~~**975-1.3 Manufacturer Certification: The manufacturer must have quality control standards conforming to ISO 9000 Standards.**~~

975-2 Materials.

975-2.1 Qualified Products List: All coating materials and coating systems must be listed on the Departments Qualified Products List (QPL). Submit an application in accordance with Section 6.

975-2.2 Packaging and Labeling: Ship materials in strong containers plainly marked with ~~the weight in pounds per gallon [kilograms per liter], the volume of coating materials content in gallons [liters], color, user information, date of manufacture, LOT or; batch number, and DOT code-QPL number. Each lot or batch manufactured must have a unique number. A true statement of the percentage composition of the pigment, the proportion of pigment to vehicle, and~~ the name and address of the manufacturer; also must be shown. ~~The label must warn the user of any special handling or precautions of the material, as recommended by the manufacturer. Any package not so marked will not be accepted for use under these Specifications.~~

~~**975-2.3 Storage:** Any coating materials which hardens or livers in the containers so that it cannot be readily broken up with a paddle to a smooth, uniform coating consistency will be rejected. All materials must have a container storage life of one year from date of manufacture.~~

~~**975-2.4 Mixing:** Deliver materials to the project ready to be used without additional oil or thinner. Gasoline must not be used for thinner under any circumstances.~~

~~975-2.5 Composition requirements for Sealants/caulking: Sealants must be self-curing. If not top coated, the caulking must match the color of the joint surface being caulked.~~

~~975-2.6 Composition requirements for Clear Coating: When used, the clear coating must be suitable as a final coating over a finish coat and the two coatings used together will constitute the finish coat.~~

~~The clear coat must contain a UV degradable color for inspection purposes. UV degradable color must dissipate in a reasonable time period to allow inspection but not detract from visual impact of the structure.~~

975-3 Samples and Product Testing and Certification of Tests.

~~975-3.1 General: Field samples will be obtained in accordance with the Department's Sampling, Testing and Reporting Guide Schedule.~~

~~The Contractor shall provide the Engineer a certification conforming to the requirements of Section 6 from the manufacturer of the coatings materials confirming that the requirements of this Section are met. Each certification shall cover only one batch of coating.~~

~~975-3.2 Information to Accompany Samples: Manufacturer's submitting QPL applications shall furnish the following product information with according to AASHTO R-31 Section 6 and applicable sections within this specification. all samples. Use Federal Color Standard No. 595B, Table VIII, Shade No. 36622 for the finish coat color on test panels:~~

General Information		
Property	Test Method	Coating
Infrared identification curves	2.5 to 15 μm : ASTM D 2621 and Practice D 3168	coating vehicle component
Volatile Organic Compounds (VOC): Less than 450 g/l	U.S. EPA Federal Reference Method 24	mixed coating
Asbestos, Lead, Cadmium, Chromate: Less than 0.010% by weight dried film	U.S. EPA Federal Reference	mixed coating
Weight	pounds per gallon [kilograms per L] at 77°F [25°C]	mixed coating
Consistency	Krebs Units at 77°F [25°C]	mixed coating
Weight percent volatile liquid	ASTM D 5201	mixed coating
Total solids by volume	ASTM D 5201	mixed coating
Total solids by Weight	ASTM D 5201	mixed coating
Weight percent pigment	ASTM D 5201	mixed coating
Weight percent vehicle solids	ASTM D 5201	mixed coating
Pot life	Per manufacturer	mixed coating
Key Chemistry of the mixed coating		mixed coating
Joint Sealer	Per manufacturer	mixed coating
Substrate for product application and	Per manufacturer	coating system

General Information		
Property	Test Method	Coating
substrate preparation requirements, including profile and dwell time.		
Coverage	Minimum square feet [square meters] that can be covered per gallon [4 L] to a dry film thickness of 1 mil [25 µm]	mixed coating
Application Instructions limitations	Per manufacturer	mixed coating
Thinning materials, instructions and limitations	Per manufacturer	mixed coating
Cleaning materials, instructions and limitations	Per manufacturer	mixed coating
Shelf life	Minimum 12 months	coating packages

Laboratory Performance and Corrosion Tests		
Property	Test Method	Limits
Abrasion Resistance	ASTM D 968, 3000 liters of sand	No loss of coating thickness ASTM D 1005
Salt Spray (fog) resistance	ASTM B 117, 8000 hours ⁵	The coating should not blister, soften or loosen bond at the end of the test period. ⁴
Impact Resistance	ASTM D 2794, 30 inch/lbs	pass
Elongation	ASTM D 522, 1/2 inch cylindrical mandrel	no cracking
Chemical Resistance	ASTM G 20, 180 days: 5% Ammonia, 5% Urea, and Diesel fuel	The coating should not blister, soften or loosen at the end of the test period. ⁴
Accelerated Weathering	ASTM D 6695: Xenon arc with a daylight filter; 20 minute cycle consisting of 17 minutes of light and 3 minutes of salt spray ⁵ plus light; 8000 hours	The coating should not blister, soften or loosen bond at the end of the test period. ^{4,2}
Color and Gloss Retention ^{3,4}	ASTM G 155, 8000 hours	AE ≤ 3, ASTM D 2244; 10 % max gloss loss
Fungal Resistance ³	ASTM D 3273	Rating of 10, ASTM D 3274
Dirt Pick-up ³	ASTM D 3719	Rating of 10, ASTM D 3274

Laboratory Performance and Corrosion Tests		
Property	Test Method	Limits
1 For materials that are identified for corrosion prevention: No primer creep, blistering or loss of adhesion relative to a scribed line applied prior to testing exceeding 0.05 inch at any point at the scribe and no corrosion in the field per ASTM D 610		
2 For materials that are identified as a finish coating: same requirements as Color and Gloss Retention.		
3 Only required for materials that are identified as finishing coatings.		
4 Required for each finish coat color.		
5 For salt spray use ASTM D 1141, adjust pH to 4.7 with dilute H ₂ SO ₄ .		

975-4 Galvanizing Compounds for Field Metallizing and Touch up Repair.

975-4.1 General: Galvanizing compound materials must produce an adherent coating capable of preventing corrosion and specifically intended for use over mechanically-cleaned or blasted steel. All coatings must possess physical properties and handling characteristics that are compatible with the *use and* application requirements of Section 560 and 5620 in this standard. *Furnish product testing information according to AASHTO R-31: the coating should not blister, soften or loosen bond at the end of the test period; there will be no primer creep, blistering or loss of adhesion relative to a scribed line applied prior to testing exceeding 0.05 inch at any point at the scribe and no corrosion in the field per ASTM D 610; color retention, $\Delta E \leq 3$, in accordance with ASTM D 2244; and 10 % max gloss loss in accordance with ASTM D 523. All coating will have a minimum of a Class B Slip Coefficient and be listed on the Departments Qualified Products List (QPL).*

975-4.2 Composition requirements for Zinc Dust Sacrificial Coatings: Zinc dust sacrificial coatings must contain a minimum of ~~50.083~~50% zinc dust pigment by weight in the primer. The zinc dust pigment must be Type II in accordance with ASTM D 520.

975-4.3 Composition requirements for Aluminum Mastic Coatings: Aluminum mastic coatings must contain aluminum pigment and minimum 80 percent volume solids.

975-4.4 Field Qualification: *Attain a numerical rating of not less than 9 in accordance with ASTM D610 and ASTM D1654 and 9F in accordance with ASTM D714 when applied to KTA Composite test panels prepared according to AASHTO R-31 and exposed at the FDOT beach corrosion test site or applied at a test location. The coatings will be evaluated initially following an exposure period of 18 months. The coatings must continue to provide acceptable protection and performance for a period of 5 years. Application characteristics must be judged acceptable prior to beach testing.*

975-4.4 Packaging and Storing: ~~For containers of less than 1 gal [4 L] in content, commercial coating packaging will be acceptable. For 1 gal [4 L] packages, steel pails with metal thickness of 26 gauge [455 μ m] must be used. Not more than 1 gal [4 L] of compound covered by these Specifications must be packed in a single container.~~

975-5 Structural Steel Coatings.

975-5.1 General: Structural steel coatings and coating systems must produce an adherent coating capable of preventing corrosion and specifically intended for use over mechanically-

cleaned steel. All coatings must possess physical properties and handling characteristics that are compatible with the application requirements of Section 560. *Furnish product testing information according to AASHTO R-31: the coating should not blister, soften or loosen bond at the end of the test period; there will be no primer creep, blistering or loss of adhesion relative to a scribed line applied prior to testing exceeding 0.05 inch at any point at the scribe and no corrosion in the field per ASTM D 610; color retention, $\Delta E \leq 3$, in accordance with ASTM D 2244; and 10 % max gloss loss in accordance with ASTM D 523.*

<i>Additional Laboratory Performance and Tests</i>		
<i>Property</i>	<i>Test Method</i>	<i>Limits</i>
<i>Impact Resistance</i>	<i>ASTM D 2794, 30 inch/lbs</i>	<i>pass</i>
<i>Elongation</i>	<i>ASTM D 522, 1/2 inch cylindrical mandrel</i>	<i>no cracking</i>
<i>Chemical Resistance</i>	<i>ASTM G 20, 180 days: 5% Ammonia, 5% Urea, and Diesel fuel</i>	<i>The coating should not blister, soften or loosen at the end of the test period.</i>

All coatings and coating systems that perform as finish coats ~~must create~~ *must create* a finished surface that is resistant to color and gloss degradation. The default finish coat must meet Federal Color Standard No. 595B, Table VIII, Shade No. 36622, unless otherwise specified by the Engineer.

975-5.2 Composition Requirements for Primer Coatings: Meet the requirements of 975-4 galvanizing compounds.

975-5.3 Composition requirements for Intermediate Coatings (Tie Coat): An intermediate coating is optional for a coating system. Coatings must be suitable as an intermediate (tie) coat between the primer and finish coat. Intermediate coatings must contain minimum 40 percent solids by volume as per ASTM D 5201.

975-5.4 Composition requirements for Finish coatings: Finish coatings must provide the final coating containing color and gloss for the coating system. A finish coat may be comprised of a single pigmented coating or a pigmented coating with a clear coat.

975-5.6 Composition requirements for Clear Coating: *When used, the clear coating must be suitable as a final coating over a finish coat and the two coatings used together will constitute the finish coat.*

The clear coat must contain a UV degradable color for inspection purposes. UV degradable color must dissipate in a reasonable time period to allow inspection but not detract from visual impact of the structure.

975-5.7 Joint Sealants: *Manufacturer's of coating systems must identify joint sealants that are compatible with their coating system. Sealants must be self-curing. If not top coated, the caulking must match the color of the joint surface being caulked.*

975-5.8 Field Qualification: *Attain a numerical rating of not less than 9 in accordance with ASTM D610 and ASTM D1654 and 9F in accordance with ASTM D714 when applied to KTA Composite test panels prepared according to AASHTO R-31 and exposed at the FDOT beach corrosion test site or applied at a test location. The coatings will be evaluated initially following an exposure period of 18 months. The coatings must continue to provide acceptable*

protection and performance for a period of 5 years. Application characteristics must be judged acceptable prior to beach testing.

975-6 Class 5 Applied Finish Coatings for Concrete.

975-6.1 General: Use a commercial product designed specifically for this purpose, which upon curing is capable of accommodating the thermal and elastic expansion ranges of the substrate without cracking.

All coatings must possess physical properties and handling characteristics that are compatible with the application requirements of Section 400.

The default finish coat will meet Federal Color Standard No. 595B, Table VIII, Shade No. 36622 unless otherwise specified by the Engineer.

975-6.2 Material Tests: Meet the following requirements:

Property	Test Method	Requirements
Resistance to Wind Driven Rain	ASTM D 6904	No visible water leaks, and if the rear face of the block is damp, the average gain in weight of the three 8 by 16 by 2 inch blocks must be less than 0.2 lb.
Freeze thaw resistance	FM	The coating should not blister, soften or loosen bond at the end of the test period.
Water Vapor Permeance	ASTM D 1653; Method B, Condition C	WVT \geq 10 perms

<i>Laboratory Performance and Tests</i>		
<i>Property</i>	<i>Test Method</i>	<i>Limits</i>
<i>Resistance to Wind Driven Rain</i>	<i>ASTM D 6904</i>	<i>No visible water leaks, and if the rear face of the block is damp, the average gain in weight of the three 8 by 16 by 2 inch blocks must be less than 0.2 lb.</i>
<i>Freeze thaw resistance</i>	<i>AASHTO R-31</i>	<i>The coating should not blister, soften or loosen bond at the end of the test period.</i>
<i>Water Vapor Permeance</i>	<i>ASTM D 1653; Method B, Condition C</i>	<i>WVT \geq 10 perms</i>
<i>Abrasion Resistance</i>	<i>ASTM D 968, 3000 liters of sand</i>	<i>No loss of coating thickness ASTM D 1005</i>
<i>Salt Spray (fog) resistance</i>	<i>ASTM B 117, 5000 hours</i>	<i>The coating should not blister, soften or loosen bond at the end of the test period.</i>
<i>Impact Resistance</i>	<i>ASTM D 2794, 30 inch/lbs</i>	<i>pass</i>
<i>Elongation</i>	<i>ASTM D 522, 1/2 inch cylindrical mandrel</i>	<i>no cracking</i>
<i>Chemical Resistance</i>	<i>ASTM G 20, 180 days: 5% Ammonia, 5% Urea, and Diesel fuel</i>	<i>The coating should not blister, soften or loosen at the end of the test period.</i>
<i>Accelerated Weathering</i>	<i>AASHTO R-31</i>	<i>The coating should not blister, soften or loosen bond at the end of the test period.</i>
<i>Fungal Resistance</i>	<i>ASTM D 3273</i>	<i>Rating of 10, ASTM D 3274</i>
<i>Dirt Pick-up</i>	<i>ASTM D 3719</i>	<i>Rating of 10, ASTM D 3274</i>

975-6.3 Field Qualification: Attain a numerical rating of not less than 9F in accordance with ASTM D714 when applied to concrete test panels prepared and exposed at the FDOT beach corrosion test site or applied at a test location. The coatings will be evaluated initially following an exposure period of 18 months. The coatings must continue to provide acceptable protection and performance for a period of 5 years. Application characteristics must be judged acceptable prior to beach testing.

975-7 Steel Strain Poles, Mast Arm and Monotube Assembly Coatings.

975-7.1 General: All coatings must possess physical properties and handling characteristics that are compatible with the application requirements of Section 649. All top coats must create a finished surface that is visually uniform and resistant to color and gloss degradation. Materials must be specifically intended for use over galvanized steel. *Furnish product testing information according to AASHTO R-31 and using galvanized KTA Flat test panels: the coating should not blister, soften or loosen bond at the end of the test period; there will be no primer creep, blistering or loss of adhesion relative to a scribed line applied prior to testing exceeding 0.05 inch at any point at the scribe and no corrosion in the field per ASTM D 610; color retention, $\Delta E \leq 3$, in accordance with ASTM D 2244; and 10 % max gloss loss in accordance with ASTM D 523.*

<i>Additional Laboratory Performance and Tests</i>		
<i>Property</i>	<i>Test Method</i>	<i>Limits</i>
<i>Impact Resistance</i>	<i>ASTM D 2794, 30 inch/lbs</i>	<i>pass</i>
<i>Elongation</i>	<i>ASTM D 522, 1/2 inch cylindrical mandrel</i>	<i>no cracking</i>
<i>Chemical Resistance</i>	<i>ASTM G 20, 180 days: 5% Ammonia, 5% Urea, and Diesel fuel</i>	<i>The coating should not blister, soften or loosen at the end of the test period.</i>

The default finish coat must meet Federal Color Standard No. 595B, Table VIII, Shade No. 36622 unless otherwise specified by the Engineer.

975-7.2 Composition Requirements: Coating systems must meet the requirements of Section 649 and 975-5 intermediates and finish coats ~~as applicable~~.

975-7.3 Field Qualification: *Attain a numerical rating of not less than 9 in accordance with ASTM D610 and ASTM D1654 and 9F in accordance with ASTM D714 when applied to galvanized KTA Flat test panels and exposed at the FDOT beach corrosion test site or applied at a test location. The coatings will be evaluated initially following an exposure period of 18 months. The coatings must continue to provide acceptable protection and performance for a period of 5 years. Application characteristics must be judged acceptable prior to beach testing.*

975-8 Piling Coatings.

~~**975-8.1 General:** Upon curing, all coatings and/or coating systems must produce an adherent coating capable of preventing corrosion. All coatings must possess physical properties and handling characteristics that are compatible with the application requirements of Section 560 and must be specifically intended for use on pilings.~~

~~**975-8.2 Composition Requirements for Primer:** Meet the requirements of 975-4.~~

~~**975-8.3 Composition requirements for Coal tar epoxy:** Coal tar epoxy coating must have minimum volume solids of 65 percent and must produce a one coat thickness of 585 to 710 micrometers [23 to 28 mils] wet coat or 405 to 510 micrometers [16 to 20 mils] per coat Dry Film Thickness (DFT).~~

975-9.8 Elastomeric Coatings.

975-98.1 General: Use an elastomeric coating system to provide a waterproof barrier over post-tensioning anchorages or other areas designated in the plans. The components of the coating system must be supplied by a single manufacturer and sold as a waterproof coating system. The surface preparation and application of the coating system must be applied in strict accordance with the manufacturer’s specifications.

975-9.8.2 Physical Properties: The use of an epoxy prime coat is dependent upon the requirements of the manufacturer’s waterproofing system. The polyurethane chemistry may be either waterborne aromatic (moisture-curing) or aromatic (moisture-sensitive). The minimum thickness of the system must not be less than 30 mils. The cured coating system must meet the following requirements:

Property	Test Value	Test Method
Hardness, Shore A	Between 60 and 90	ASTM D 2240
Tensile Strength	≥ 750 psi [5.2 MPa]	ASTM D 412
Elongation	≥ 400 %	ASTM D 412
Tear Strength	> 70 pli [12.35 N/mm]	ASTM C 957
Abrasion Resistance H-18 wheels 1000 gm/wheel	≤ 350 mg loss / 1000 revs.	ASTM C 957
Crack Bridging 1000 Cycles	System Passes	ASTM C 957
Elongation Recovery	≥ 94%	ASTM C 957

975-98.3 System Modifications for Use on Bridge Substructure: Supply the elastomeric coating system with an aliphatic polyurethane top coating. ~~When applied to bridge substructures, match the color to the color scheme shown in the plans. If no color scheme is shown on the plans, meet the requirements of Federal Color Standard No. 595B, Table VIII, Shade No. 36622.~~

975-8.4 Field Qualification: *Attain a numerical rating of not less than 9 in accordance with ASTM D610 and ASTM D1654 and 9F in accordance with ASTM D714 when applied to test location and exposed at the FDOT beach corrosion test site or applied at a test location. The coatings will be evaluated initially following an exposure period of 18 months. The coatings must continue to provide acceptable protection and performance for a period of 5 years. Application characteristics must be judged acceptable prior to beach testing.*

975 Coatings Change Justification

Corrosion on steel structures is both prevented and mitigated by the coating system used on the structure. The surface of the coating system must create a physical barrier between the steel and the external environment. Zinc and aluminum based primers sacrificially protect the steel if the barrier is compromised. As coatings age, the coating barrier degrades exposing the sacrificial primer. The total length of time for the coating system to fail is most easily measured by the amount of corrosion breaking through the coating.

Currently, the State can expect a maximum coating service life of 20-25 years. The average coating service life is 10-15 years. It is the desire of the Department to maximize the coating service life to extend well beyond 20 years. This is not possible with the current coating systems in use. Therefore, higher performance coatings, that meet Florida's unique environmental conditions, must be specified.

1. Strong ultraviolet light alone and in conjunction with other environmental factors is fading the colors and degrading the gloss on the surface of the structures within several years of application. There are two failure modes working against the coating systems. The first is the degradation of the coating barrier. Loss of gloss is indicative of surface degradation which results in loss of coating thickness. The sooner the barrier is compromised by loss of coating thickness, the shorter the life expectancy of the coating system. Second, loss of gloss causes the appearance of the structure to look old prematurely. In some areas, D4 and D7, the public has petitioned the Department to repaint these structures ahead of schedule, for aesthetic reasons, even though the system is still performing adequate corrosion protection.

Another factor in color retention is the color shade/hue/tone selected. Different colors and the pigments used to manufacture the color have different service life expectancies. Each color must be tested to verify color retention.

Solution: Coating will be evaluated for color and gloss retention using accelerated weathering and atmospheric exposure methods. Manufacturers will be allowed to use their own formulas and systems to achieve the desired performance results. The use of clear coats will be allowed. The test methods and performance requirements were selected to achieve the maximum color and gloss retention for the longest time period thereby maintaining aesthetic appearance and the integrity of the barrier system. Therefore, the exposure conditions are selected to be severe and long term and the evaluation limitations are selected to be stringent.

2. Mildew, fungus, and algae are growing on the surfaces of structures causing an unsightly appearance. This is the source of two failure modes. The first is the degradation of the coating barrier. The growth of mildew and other fauna on the surface both physically and chemically will degrade the surface over a long time period. Surface degradation results in loss of coating thickness. The sooner the barrier is compromised by loss of coating thickness, the shorter the life expectancy of the coating system. Second, growth of fauna causes unsightly stains and colors on the surface which adversely affect the appearance of the structure. Dirt on the surface of the coating provides a foundation and food for the fauna to grow. Permeability of the coating allows

moisture to be stored in the coating and the substrate which provides moisture for the fauna. The only method of removal of the growth is regular maintenance washing of the structure. Given the Department's lack of funding for cleaning, it is necessary for the coating performance to maintain a clean surface that retards growth.

Solution: Coating will be evaluated for fungus, mildew and algae resistance using accelerated exposure methods. Manufacturers will be allowed to use their own formulas and systems to achieve the desired performance results. The use of clear coats will be allowed. The test methods and performance requirements were selected to achieve the maximum resistance to Florida fungus, mildew and algae for the longest time period thereby maintaining aesthetic appearance and the integrity of the barrier system. Therefore, the tests are selected to be severe and long term and the evaluation limitations are selected to be stringent.

3. High humidity and salt concentrations on the surface of coatings cause the coating systems barriers to breakdown and attack or test the sacrificial primers. Currently the Department has allowed various coating systems to be used depending on the extremity of the environment of the structure. NACE has reported in Paper No. 477 "Updated Protective Coating Costs, Products, and Service Life" that a coating system designed to perform well in a harsh environment will perform longer, even double the service life, in milder environments.

Solution: Require all coating systems to be capable of maximum performance in an environmental rating of coastal, marine.

4. Pollution and other factors in the environment can affect a coating's performance through degradation or other physical mechanisms. Vehicle fumes contain hydrocarbons and other compounds that can react with the coatings and degrade the barrier or react with the sacrificial primer. Animal excrement, from birds and bats, as well as insects and biological debris accumulates on surfaces of the coated structure. Animals, maintenance activities, and debris missiles from storm winds and traffic cause abrasion to the surfaces of the coating systems. Coating systems must be capable of withstanding this "chemical and physical" assault to maximize the service life.

Solution: Require testing for each type of significant pollutant and other factors.