

**Madani, Mo**

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**From:** Bruce Wingfield <bruce.wingman@gmail.com>  
**Sent:** Monday, August 8, 2022 1:29 PM  
**To:** Madani, Mo  
**Subject:** Scientific Testing Protocols for Senate Bill 4-D  
**Attachments:** Florida Building Commission.docx; Can Exterior Paint be considered a Construction Defect (2).docx

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Mo,

Attached is information that can be used to provide scientific testing protocols that engineers and architects can use to provide consistent, uniform, and equal evaluations of Condominiums in the State of Florida.

Also attached is an article that I have written related to what I consider to be the most fundamentally important decision the State of Florida can make as it relates to Condominium Safety.

This information is being sent to you as a concerned citizen of Florida.

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Regards,

Bruce Wingfield

August 8, 2022

Mo Madani  
Florida Building Commission  
[Mo.Madani@myfloridalicense.com](mailto:Mo.Madani@myfloridalicense.com)

Re: Senate Bill 4-D

Mo,

As you are aware Senate Bill 4-D requires all associations existing on or before July 1, 2022 to complete a structural integrity reserve study by December 31, 2024. The purpose of this document is to provide scientific testing protocols that engineers or architects would utilize in order to provide consistent, uniform, and equal recommendations. Most of these protocols will be utilized in Phase 2, however I must emphasize that there are no protocols or industry standards that I am aware of that comply with just looking at concrete. There are some protocols and industry standards for visual inspections of windows, under AAMA 511. It has been my experience that these visual inspections/observations must be followed by all of the protocol of AAMA 511, which requires pressure testing at 2/3 of the design pressure of the original window specifications.

My expertise is related to roofs, concrete, waterproofing and exterior painting and windows. Therefore this document is not a complete review of other components. These are the recommendations for engineers and architects to follow using their own personnel or subcontractors.

**Roofs** – Electronic Leak Detection per ASTM D8231 finds pinholes that cannot be seen with the naked eye on low-slope roofing. ELD is also able to seam failures of typical TPO. ELD works on most roofing membranes.

After completion of the ELD, Thermography per ASTM C 1153 should be utilized to provide a non-invasive means of diagnosing the condition of the roof system. Should anomalies be identified, core samples shall be taken to document the condition of the roof. All cores to be patched immediately. If under warranty the original roofing installer will make repairs.

#### **Concrete -**

Factors such as the rate of steel corrosion can contribute to concrete deterioration resulting in structural collapse, especially in a salt-laden environment. New technology can electronically scan concrete up to a depth of 6 inches and measure and detect corrosion potential, corrosion rate, and in-situ electrical resistivity without drilling into concrete or providing destructive testing. ASTM C876 (Half-cell) is the applicable testing protocol to follow. ASTM F1869 is a chloride test that is also very important in the overall evaluation/condition of concrete especially near the coastline.

#### **Waterproofing and exterior painting -**

Excessive water penetration of masonry may degrade masonry wall performance with respect to thermal conductivity, durability, efflorescence, staining, corrosion of embedded metal items, and water leakage. ASTM C 1601 tests for water penetration of a masonry wall. ASTM E 2128 is a standard guide for evaluating known water leakage of building walls, and can be utilized after conducting ASTM C 1601.

Balconies should follow ASTM D 5957 flood testing to check the existing horizontal waterproofing followed by thermography compliant with ASTM C 1153.

Exterior paint/coatings adhesion can be measured utilizing a Type 2 pull testing device compliant with ASTM D 4541, and ASTM D 7234 to determine the adhesion to the substrate. If the paint/coating is not adhered well, water can infiltrate the substrate and create corrosion.

Stucco not adhered well to concrete or concrete masonry units can be tested per ASTM D 4580. This simple roller test can “ping” test to find deteriorated stucco.

### **Windows -**

Per AAMA 511, windows that are older than six months should follow all protocols to determine if the window passes the intended design pressures and/or does water pass the inner-most plane and leak into the building. AAMA 511 protocols require diagnostics for failed fenestrations. ASTM E1105 does not require diagnostics in the protocols for failed fenestrations. All fenestrations are to be isolated during testing.

AAMA 511 requires visual observations including Bent Frames, Broken Window Balance, Broken Glass, Frame Deflection, Frame Displacement, Frame Damage, Frame Movement, Frame Rotation, Frame Separation, Damaged or Missing Glazing Bead, Glazing Gasket Damage, Glass Edge Exposed, Hardware Damage, Hard To Operate, Insulated Glass Failure, Inoperable, Loose Fastener, Loose Glass, Missing Fastener, Scratched Glass, Damaged Weather-stripping.

Respectfully submitted as a citizen of Florida for review.

Regards,

Bruce Wingfield  
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Palmetto, Florida 34221

## **Can Exterior Paint be considered a Construction Defect?**

**By Bruce Wingfield**

When selecting the proper protection for direct-applied stucco, consideration should be given to the exterior weather elements possible. If a reasonably educated person researched wind-driven rain or salt-laden air they might conclude that paint is totally inadequate for the protection of embedded concrete reinforcement when applied to a direct-applied stucco substrate.

Since concrete-based stucco is not waterproof or even water-resistant to a great extent, it is imperative to select a method of protection. For the East and West Coasts of Florida "paint" is the preferred product. While the panhandle of Florida is a "coatings" marketplace. Why the difference?

Exterior acrylic latex paint can be typically less than even two mils dry per coat or two-thousands of an inch in thickness when applied to stucco. Because it is so thin, with less acrylic solids by volume in comparison to coatings, application can easily produce areas that have less thickness known as "Holidays." Spraying can make the problem even worse, requiring competent applicators to brush and back-roll.

While a typical coating made of acrylic, or silicone-modified acrylic is typically eight to as high as fifteen mils in thickness, or up to six times more. In addition, no paint is able to pass the Federal Specification TT-C-555B, Type II which is a test of wind-driven rain of 98 miles per hour. Most coatings pass this Federal Specification and can resist wind-driven rain, a frequent event in most states.

In addition, for decades Wal-Mart has used high-build coatings on their own buildings and has specified that the manufacturer field test the pin-hole free coating using a Rilem or Karsten water uptake tube.

According to research by atmospheric chemist Joel Thornton, salt can travel by air up to 900 miles from the coastline and has been found as far as distant Denver, Colorado. Since salt is one of the main elements of corrosion for embedded concrete reinforcement, a prudent person would require protection.

Coastal zones remain the biggest corrosion threat, but in places like Florida they find highly corrosive conditions as far as 100 miles inland, and the Florida peninsula is only 160 miles wide. It is a fact that 40% of the United States Population lives near the coastline.

There are several coatings manufacturers who have the ability to retard the carbonation of concrete and effectively provide carbon dioxide diffusion barrier, protecting embedded steel from corrosion. Testing for CO<sub>2</sub> using the Engelfried test method at only ten dry mils produces positive results for anti-carbonation. This is something paint is not able to achieve. The thickness and the chemistry of basic acrylics are challenged by sun, and wind-driven rain. Anti-carbonation coatings resist sun, wind-driven rain and are effective in protecting embedded steel extending the service life of concrete structures.

So when comparing paints vs. coatings it would be remiss not to mention cost. Acrylic paint is much less expensive versus a typical high-building coating and extremely less than an anti-carbonation coating. However using a paint versus a coating accelerates the corrosion of embedded steel. This can be easily proven. Some exterior coatings have even passed 4,000 hours of accelerated weathering. Are some paint formulas the same whether sold in Miami or Fairbanks Alaska?

The question remains why continue the use of paint, given the defective nature of the product as it relates to 98 mph wind-driven rain, carbonation, and ultraviolet sunlight? Isn't the goal, when building a structure, to construct something that lasts? If this goal is not obtained is the building considered defective?

Paint versus anti-carbonation thicker coatings are like night and day in differences. Paint works best indoors. Coatings work best outdoors. So the question remains, given this easily provable knowledge, is the use of exterior paint applied to either stucco or concrete a mistake and should its use be considered a construction defect to be remedied in a court of law?

This information in this article has been peer-reviewed with an affirmative answer of yes to the previous question. It was written to provoke debate and to hopefully see the use of more coatings in the marketplace. As the author I do not financially benefit if more coatings are used.

Mr. Wingfield is currently employed as a Building Envelope Consultant and has decades of experience as a manufacturer of building products, an exterior restoration contractor, and a waterproofing and concrete repair expert.

To learn more contact me at 386-631-3631.