

**Interim Report for Project Entitled:
Corrosion of Roofing and Screen Enclosure Fasteners Systems**

Performance Period: 10/10/2014 – 6/30/2015

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DRAFT

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State of Florida Department of Business and Professional Regulation

by

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1. Relevant Sections of the Code (and Related Documents)

- 1622.1.2, Florida Building Code—Building
- 1506.4 – 1506.7, Florida Building Code—Building
- 1517.5.1 – 1517.5.2, Florida Building Code—Building
- Guide to Aluminum Construction in High Wind Areas
- TAS 114 Appendix E
- ASTM A 90
- ASTM A 641
- ASTM B117-11
- ASTM G85-11

2. Progress Summary

The project goal is to experimentally evaluate the corrosion resistance of metal fasteners for roof systems and screen enclosures. This requires the purchase of a cyclic corrosion tester that is compliant with the ASTM standards G85 and B117. The appropriate equipment was identified and a quote secured from Q-LAB Corporation on July 23, 2014. The DBPR contract with UF was executed in the fall of 2014, with a start date of October 10, 2014. As stated in the original Scope of Work in the contract, DBPR was to purchase the Q-LAB equipment directly, and loan it to UF for the duration of the project. In late November the DBPR directed UF to purchase the equipment directly. This required contract amendments that were initiated in December. It was then determined that there was a policy difference between UF and DBPR regarding the inclusion of indirect cost on the purchase of equipment. A negotiation ensued, resulting in further delays in the equipment purchase. UF and DBPR agreed to terms in late January, and a purchase order was issued for the Q-LAB equipment on February 3rd, 2015. The expected shipping date for the equipment is March 19, 2015. Q-LAB released the equipment manual to UF upon receipt of the P.O., and it is now being reviewed to determine the time frame needed to conduct the ASTM corrosion testing protocol.

The issues to be investigated are: 1) the performance of screen enclosure fasteners as-installed in concrete and aluminum substrates, 2) compare the performance of ASTM A 641 Class 1 and Class 2 fasteners, 3) evaluate the relative corrosion resistance of US and non-US made roof system fasteners, 4) and investigate the effects of fastener installation on corrosion resistance (see Section 5 below). There are many possible variations of these basic test regimes (which specific fasteners, how many test repeats, etc.). The project is now at the stage where a test matrix is being created. Stakeholder have been contacted to elicit their input regarding a prioritization of the possible variations. The current schedule is to create a comprehensive test matrix of products to be tested and comparisons to be performed, accompanied by a hierarchy of priorities. This will be completed by March 13, upon which test samples will be procured and test protocols established. Upon arrival of the testing equipment after March 19, the test matrix will be executed in the prioritized order (informed by stakeholders) as time allows until the end of the project performance period.

3. Description of Issues

- Anecdotal information indicates that corrosion of fasteners has been observed across a range of installations
- The problem is more serious in coastal environments due to presence of chloride ions
- Increased manufacturing of these products outside the United State may be contributing to the problem
- The 2013-2014 survey study of roofing contractors regarding their observation of roof fastener corrosion corroborated each of the above three issues
- The 2013-2014 survey study report recommended a follow up fastener corrosion test program to isolate the primary causes and provide evidence to support the pursuit of code changes
- It is not known whether the process of installation negatively affects the corrosion resistance of

fasteners

4. Recommendations for the Code

No recommendations at this stage

5. Scope of Work

- Cyclic Corrosion Testing equipment (Q-Lab Corporation) will be purchased UF's use through the duration of this project
- Evaluate the degree of corrosion resistance for screen enclosure fasteners embedded in aluminum and concrete substrates. Withdrawal tests will be performed to evaluate the change in mechanical resistance. New, installed, and installed/removed fasteners will be evaluated
- Apply TAS 114 Appendix E testing (Section 2.6.1) to evaluate the relative degree of corrosion resistance for a random sample of US and non-US manufactured ASTM A 641 Class 1 fasteners. Testing will be conducted on both new and installed/removed fasteners to determine the influence of installation on corrosion resistance
- Repeat the above TAS 114 testing on ASTM A 641 Class 2 fasteners as a means of determining whether a thicker zinc coating will provide better corrosion resistance
- Interpret results, determine if additional Code changes are necessary, and produce a report that explains the results and implications for the Code

6. Deliverables

- An interim report detailing the current status and progress toward completing the scope of work will be submitted by February 15, 2015. The interim report will be presented to the Commission's Roofing Technical Advisory Committee at a time agreed to by the Contractor and the Department's Project manager.
- A final report providing technical information on the problem background, results and implications to the Code submitted to the Program Manager by June 1, 2015. The final report will be presented to the Commission's Roofing Technical Advisory Committee at a time agreed to by the Contractor and the Department's Project manager.
- Recommendation(s) that may require revision to future edition of the FBC will be analyzed using the criteria outlined in the currently adopted code modification form.
- A breakdown of the number of hours or partial hours, in increments of fifteen (15) minutes, of work performed and a brief description of the work performed. The Contractor agrees to provide any additional documentation requested by the Department to satisfy audit requirements.

7. Appendices

None at this stage