

JDB CODE SERVICES, INC.

Date: August 13, 2013

To: Florida Building Commission
C/O Mo Madani, DBPR

From: Joe Belcher for the Aluminum Association of Florida (AAF)

Subject: Description of Research Project for AAF Request for Funding – Aluminum Screen Enclosures

This is to provide data on the research approach for the requested project funding and how the outcomes will be used to improve the Florida Building Code (FBC). Aluminum Association of Florida requests up to \$50,000.00 for full scale testing of the wind resistance of screen enclosures. Full scale testing will occur at the Insurance Institute for Business and Home Safety (IIBHS) Research Center at 5335 Richburg Road, Richburg, SC 29729.

Past storms have identified problems with screen enclosures in high wind events. The AAF has addressed the problems through scale model wind tunnel testing and extensive engineering analysis. The testing and analysis led to the development of the Guide to Aluminum Construction in High Wind Areas (Guide) by AAF and a large group of engineers practicing in the aluminum industry. The Guide was subsequently adopted as a prescriptive standard by the Florida Building Commission within the Florida Building Code. The industry is requesting assistance in the form of funding to test the efficacy of the Guide and to evaluate a sample of popular engineering currently employed in the field.

The research proposal is to review erect two full scale screen enclosures attached to a host structure and test them using a predetermined wind speed. The enclosures will be tested separately using a uniform wind that follows an open country mean profile with typical small scale turbulence. AAF is currently discussing the engineering to be used, but the current thought is to obtain the engineering from an AAF member for a project that has been issued a building permit and duplicating the structure. A separate screen enclosure using the same parameters for size will be designed and built in accordance with the Guide. While there are still details to be worked out between AAF and IIBHS, the technical approach of the project will involve:

1. The IIBHS facility has a turntable with a 55-ft. diameter. A common screen enclosure size is 24-ft by 4-ft by 10-ft with a mansard style roof.

2. AAF will find a project as close to these dimensions as possible that an AAF member has permitted and will obtain the engineering used to permit the project. Participants will be kept confidential if so desired.
3. AAF will provide a work crew of six workmen to construct the screen enclosures on the IIBHS Research Center grounds.
4. AAF will provide all materials and transportation for the materials to be used in the construction.
5. IIBHS will provide a host structure to which the screen enclosure will be attached. IIBHS has indicated there is a 30-ft by 40-ft building available for this purpose.
6. IIBHS will provide steel I-beams to serve as foundations for the screen enclosures and the host building.
7. IIBHS will provide the facilities for moving the building and the screen enclosure into the lab and onto the turntable.
8. The details of the actual test program are still being worked out between AAF and IIBHS. Current thinking is the testing will begin with exposure of the side wall as this is the typical point where post event investigation has determined failure is initiated. Consideration is being given to testing from various directions utilizing the ability of the turntable to change the configuration. Testing may involve halting testing once failure is initiated at a particular wind direction to allow repair of the damage and changing of the position of the structure.
9. A wind speed of 125 to 130 mph for the tests is the target based on the research center capability.
10. Sensors will be included to record the deflection of beams.
11. There will be investigation after the test to determine failure mode, if applicable.
12. The set-up and clean-up after the testing will be a joint effort by AAF and IIBHS. IIBHS has expressed a willingness to approach their Board of Directors for in-kind support in these tasks. Should there be any cost to the project, \$2,000.00 to \$2,500.00 is the maximum anticipated cost to load and haul away debris.
13. Costs.
 - a. Research Center. Funding of \$16,800.00 per day for two days totaling \$33,600.00 are requested to fund the use of the IIBHS Research Center facility.
 - b. Personnel. Funds are requested to cover nine persons for seven days lodging and meals. This includes two days for travel, two days for construction, two days of testing, and one day for clean-up. Covered persons include the construction crews and supervisors, the AAF President, the AAF Chairman of the Technical Committee, and the AAF code consultant.
 - i. Based on hotel room rates in the Richburg area we estimate \$5,000.00 to \$6,000.00 in lodging costs.
 - ii. Estimated travel costs are \$4,500.00 to \$5,500.00.
 - iii. Estimated meal costs are \$2,250.00 to \$3,250.00.
14. The observation area of the facility will accommodate eighty people. IIBHS has said the audience will be as determined by AAF. Others will be afforded the opportunity to attend by invitation only at their own cost. AAF will work with the Commission to

include any persons the Commission may designate to attend.

15. The data generated by the testing will be used to:

- a. Verify or invalidate current practices.
- b. If indicated by tests as needed, modify existing provisions of the Guide and submit for adoption into the code.
- c. Explore possibility of using data garnered to develop provisions for retrofitting existing screen enclosures to improve their ability to withstand high winds.
- d. Advise the Florida Engineering community of the results of the testing.

Thanking you in advance for your consideration in this matter.

Respectfully submitted,

A handwritten signature in black ink that reads "Joseph D. Belcher". The signature is written in a cursive, flowing style.

Joseph D. Belcher
Code Consultant

Cc: David Johns, President AAF
Dr. Timothy Reinhold, P.E., IIBHS Senior VP, Research, Chief Engineer
David W. Miller, Chairman, AAF Technical Committee