Cost Impact Evaluation for FBC Section 707.3.2 Roof Diaphragms – Reroofing

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FBC Roofing TAC Chair
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During the June 26, 2017 Roofing TAC conference call meeting, the committee agreed on the need to establish a cost impact study based on Florida Building Code Existing Building Section 707.3.2 Roof Diaphragm, establish this as a priority for the committee.

Code Section:
Florida Building Code Existing Building Section 707.3.2 Roof Diaphragm
707.3.2 Roof diaphragms resisting wind loads in high-wind regions.
Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the ultimate design wind speed, Vult, determined in accordance with Figure 1609.3(1) of the Florida Building Code, Building, is greater than 115 mph (51 m/s), as defined in Section 1609 (the High-Velocity Hurricane Zone shall comply with Section 1620) of the Florida Building Code, Building, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the Florida Building Code, Building, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting at least 75 percent of those wind load they shall be replaced or strengthened in accordance with the loads specified in the Florida Building Code, Building.

Exceptions:

1. This section does not apply to buildings permitted subject to the Florida Building Code.
2. This section does not apply to buildings permitted subject to the 1991 Standard Building Code, or later edition, or designed to the wind loading requirements of the ASCE 7-88 or later editions, where an evaluation is performed by a registered design professional to confirm the roof diaphragm, connections of the roof diaphragm to roof framing members, and roof-to-wall connections are in compliance with the wind loading requirements of either of these standards or later editions.
3. Buildings with steel or concrete moment resisting frames shall only be required to have the roof diaphragm panels and diaphragm connections to framing members evaluated for wind uplift.
4. This section does not apply to site built single family dwellings. Site-built single-family dwellings shall comply with Sections 706.7 and 706.8.
5. This section does not apply to buildings permitted within the HVHZ after January 1, 1994 subject to the 1994 South Florida Building Code, or later editions, or where the building's wind design is based on the wind loading requirements of ASCE 7-88 or later editions.

Proposed Research:

1. Using six roof deck types as identified by Factory Mutual and NRCA for research:
   A. Wood
   B. Metal on steel bar joists

C. Light weight concrete on bar joists
D. Gypsum on spaced joists
E. Tectum on spaced joists
F. Light weight engineered composite deck system

2. Evaluate six roof deck types by three scenarios each (total of 18) on following conditions:
   A. Enhanced fastening of the roof deck
   B. Roof-to-wall connections enhanced fastening
   C. Entire roof deck replacement

3. Engage a Florida certified Professional Engineer to design a corrective protocol for each roof deck type and enhancement scenario (18 total).

4. Establish estimates for the cost of performing aforementioned engineered protocols for replacement through bids from three Florida licensed roofing contractors for all scenarios (total 18).

5. University of Florida Efforts to include, but not limited to, the following:
   A. Establish a panel of both UF staff and other industry related professionals to review all research information from both the professional engineers and roofing contractors.
   B. Interview and hire a certified professional engineer to design a correctitude protocol roof deck enhancement scenario (18 total).
   C. Solicit bids from 3 professional roofing contractors for all scenarios as established by the professional engineer (total of 18).
   D. Provide a final report indicating all 18 scenarios and methods of mitigation.

Estimated Expenses:

$113,000 - $156,000 – see detailed attachment

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2. Evaluate six roof deck types by three scenarios each (total of 18) on following conditions: A. Enhanced fastening of the roof deck B. Roof-to-wall connections enhanced fastening C. Entire roof deck replacement	
3. Engage a Florida certified Professional Engineer to design a corrective protocol for each roof deck type and enhancement scenario (18 total)	$63,000-81,000
4. Establish estimates for the cost of performing aforementioned engineered protocols for replacement through bids from three Florida licensed roofing contractors for all scenarios (total 18).	$18,000-22,500
5. University of Florida Efforts University of Florida Efforts to include, but not limited to, the following: A. Establish a panel of both UF staff and other industry related professionals to review all research information from both the professional engineers and roofing contractors. B. Interview and hire a certified professional engineer to design a correctitude protocol roof deck enhancement scenario (18 total). C. Solicit bids from 3 professional roofing contractors for all scenarios as established by the professional engineer (total of 18). D. Provide a final report indicating all 18 scenarios and methods of mitigation.	$32,000-43,000
Total	**$113,000-156,500**