Mo Madani:

The American Concrete Institute provides the attached comments on Appendix C Existing Safety Inspection Guide (Draft 2.1) for consideration in further development of the guide to be used in Florida.

Thank you in advance for your consideration.

Be well and stay safe!

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Appendix C
Existing Building Safety Inspection Guide
(Working Draft 2.1)

I STRUCTURAL EVALUATION

A. Foundations

If all the supporting subterranean materials were completely uniform beneath a structure, with no significant variations in grain size, density, moisture content or other mechanical properties; and if dead load pressures were completely uniform, settlements would likely appear uniform and of little practical consequence.

Unfortunately, that is typically not the case. Significant deviations are likely to result in unequal vertical movements.

Monolithic masonry, generally incapable of accepting such movements, will crack. Such cracks are most likely to occur at corners, and large openings. Since, in most cases, differential shears are involved, cracks will typically be diagonal.

Small movements are most likely to be structurally important only if long term leakage through fine cracks may have resulted in deterioration. In the event of large movements, continuous structural elements such as floor and roof systems must be evaluated for possible fracture or loss of bearing.

Pile foundations are, in general, less likely to exhibit such difficulties. Where such does occur, special investigation will be required.

Where visual examination indicates a need for further evaluation and assessment of concrete foundation elements, such evaluation and assessment shall be performed in accordance with Chapter 4 of ACI 562 Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures.

B. Roof Construction and Roof Coverings

The construction and anchorage of the roof to the load resisting elements of the building (gravity, uplift and lateral loads) are critical to the building's structural integrity. The roof must not only be designed to resist the imposed loads, but the method of anchoring the roof to the structural elements such as bearing walls and shear walls must be evaluated. As such, the anchorage must be checked for cracks and possible corrosion.

Similarly, roof top units such as chillers and solar panels must be evaluated relative to their anchorage to the roof as well as confirmation of an adequate load path to the supporting elements.

Sloping roofs, constructed of clay or cement tiles, are of concern in the event that the covered membrane may have deteriorated, or the tiles may have become loose. Large deflections, if merely resulting from deteriorated rafters or joists are of greater importance. Valley flashing, and base flashing at roof penetrations need to similarly be investigated.

Flat roofs with built up membrane roofs require investigation with respect to deflection considerations.

Additionally, since roofing materials may be approaching expected life limits at the age when building special inspections are required, careful examination is important. Blisters, wrinkling, and loss of gravel are usually an indication of possible roof problems.

Punctures or loss of adhesion of base flashing, coupled with loose counterflashing will also signify possible problems. Windblown gravel, if excessive, and the possibility of other debris, may result in pounding, which if permitted, may impact the performance of the roof.

Gypsum roof decks will usually perform satisfactorily except in the presence of moisture. Disintegration of the material and the foam-board may result from sustained leakage. Anchorage of the supporting bulb tees against uplift may also be of importance if there is significant deterioration.

Where visual examination indicates a need for further evaluation and assessment of concrete roof elements, such evaluation and assessment shall be performed in accordance with Chapter 4 of ACI 562 Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures.

C. Floor Assemblies

Sagging floors will most often indicate problem areas. Floor and roof systems of cast-in-place concrete with self-centering reinforcing, such as paper backed mesh and rib-lath, may be critical with respect to corrosion of the unprotected reinforcing. Loss of uplift anchorage on roof decks will also be important if significant deterioration has taken place, in the event that dead loads are otherwise inadequate to resist uplift.

Where visual examination indicates a need for further evaluation and assessment of concrete floor systems, such evaluation and assessment shall be performed in accordance with Chapter 4 of ACI 562 Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures.

D. Masonry Bearing Walls

Random cracking, or if discernible, definitive patterns of cracking, as well as bulging, sagging, or other signs of misalignment may also indicate related problems in other structural elements. Masonry walls constructed of either concrete masonry remits or scored clay tile, may adversely impact adjacent reinforced concrete columns tie beams, or lintels.

F. Concrete Framing Systems

Cast in place reinforced concrete slabs and/or beams and joists may often show deterioration due to corroding rebars resulting from cracks or merely inadequate protecting cover of concrete. The same applies to post tensioned slabs at the location where the stressing anchor is applied. Patching procedures will usually suffice where such damage has not been extensive. Where corrosion and spalling has been extensive in structurally critical areas, competent analysis with respect to remaining structural capacity, relative to actual supported loads, will be necessary. The type and extent or repair will be dependent upon the results of such investigation.

Precast members may present similar deterioration conditions. End support conditions including adequacy of bearing, indications of end shear problems, and restraint conditions should be evaluated in at least a few typical locations.

Concrete deterioration can occur due to the presence of salt-water aggregate or in excessively permeable concrete. In this respect, honeycomb areas may contribute adversely to the rate of deterioration. Columns are frequently most suspect. Extensive honeycomb is most prevalent at the base of columns, where fresh concrete was permitted to segregate during placement into the form boxes. This type of problem has been known to be compounded in areas where flooding has occurred, especially involving salt water.

In spall areas, chipping away a few small loose samples of concrete may be very revealing. Fairly reliable quantitative conclusions may be drawn with respect to the quality of the concrete. Even though the cement and local aggregate may be derived from the same sources, cement will have a characteristically dark grayish brown color in contrast to the almost white aggregate. A typically white, almost alabaster

like coloration will usually indicate reasonably good overall strength. The original gradation of aggregate can be seen through a magnifying glass.

Where visual examination indicates a need for further evaluation and assessment of concrete framing systems, such evaluation and assessment shall be performed in accordance with Chapter 4 of ACI 562 Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures.