STRAAM GROUP

Mr. Mo Mandani
Florida Building Commission
2601 Blair Stone Road
Tallahassee FL 32399

October 3, 2022

Re: Florida Law SB-04 - Comments during Workgroup discussion and Recommendations regarding implementation.

Dear Mr. Mandani,

I am writing this letter to comment on the discussion that took place at the September 14th Existing Building Inspection Workgroup (EBIWG) meeting and the Recommendations on Milestone Structural Inspection Requirements (recommendations) made regarding implementation of Law that passed the Florida Legislature based on Senate Bill 4-D (SB 4-D). We are of course just days after landfall of Hurricane Ian which unleashed unimaginable devastation on southwest Florida. Our condolences go out to all those impacted by the storm. As our heart breaks in seeing this loss, it also heightens the mission and importance of the recommendations from this Workgroup to implement the new law. We understand the recommendations are due tomorrow October 4th.

We applaud the Workgroup for their hard work, and appreciate their concern to not overburden owners with the cost of excessive testing while balancing this with the goal of public safety. The original Miami Dade 40 Year Inspection document (attached) seemed consistent with that same goal but had glaring flaws. It stated that there was no need to verify design and that each building was 'time tested' if it continued to provide the same level of performance. This allowed for the belief that every structure's capacity will never change, which is inconsistent with good engineering principles. We know structures degrade. Yet, this earlier approach allowed for a culture of deferred maintenance and applying patches to hide damage, thereby deferring real structural repairs. We know there were design related problems over the years as well as the use of poor construction materials. This combined with deterioration from aging yields an unfortunate combination of effects that lead to the presence of many weak structures in the general population. SB 4-D specifically states the need to verify 'structure integrity', which by definition includes capacity. This is a change in the standard of care for Florida and can only be verified with testing. Fundamentally, visual inspection is insufficient to fully accomplish this task. Encouraging engineers to apply a commonsense approach to verify capacity will help achieve the defined goals. The problem is that historically, engineers have applied the methods to verify capacity sparingly due to the lax standard of care which existed prior. This Workgroup should consider the challenges of the engineer's new requirement in these recommendations.

Further, a primary aspect of the recommendation is to focus on visual inspection of the primary structural elements and primary structural system. It is well known and discussed in the Workgroup meetings that very often many of the major structural elements are covered with sheetrock and other architectural coverings. Therefore, they can never be visually inspected without invasively exposing them. It seems that inspecting the primary structural system is very often unlikely to be accomplished in practice. However, testing could provide key insight into the performance of the structure to verify how the structural system behaves.

From a testing perspective, the sum total in the current published recommendations is to encourage 6 non-destructive tests in V. Option 5. Yet there are 45 pages of possible tests in ASCE 11-99 including load testing which could give insight into the capacity of each structure. The Workgroup approved the use of ASCE 11-99 as a standard. Also, in a separate vote, 10 of 13 votes were cast to encourage load tests, but that was not sufficient to establish a recommendation under the criteria used. Only three members dissented. The Workgroup seems to generally want to encourage testing, but it is not yet clear in the recommendations. This sends a poor and inconsistent message, which is not very different from the past culture of ignoring the real problem. It's not consistent with adopting ASCE 11-99, which has 45 pages of non-destructive testing listed, including load tests. Building owner have traditionally been resistant to performing testing in their structural inspection. They don't want to take on costs, which is understandable, but more importantly, many don't want to know if they do have problems, since the safety concerns were diminished in the very guidance they were given. This unfortunate reality is a serious problem which cannot be ignored. Many of the Condo Board members are not qualified to make that decision regarding structural integrity, but they will continue to guide the engineers on their scope of work. The engineers now have a higher standard of care to meet based on the new Law. Effective implementation of the Law must give engineers the ability to employ objective methods to assess capacity. Remaining silent on using advanced methods is a mistake and may reflect poorly on this effort in the future.

Regarding Hurricane Ian, unfortunately, many people decided to not heed the warning to leave and they rode out the storm. One Fort Myers resident, a self-described 'hurricane novice' was quoted as saying "We basically had 10 straight hours of hurricane force winds battering the condo building", before adding that the swaying of the condo at one point even made him seasick. He made his decision to stay without any real understanding of the capacity of the structure he was in. These excessive wind forces and flooding will have reduced the capacity of that structure. Thankfully, he was lucky. Many other structures performed much worse. Having objective measures of a structure's capacity translates directly to public safety. Juxtaposed with this is the case of the Champlain Tower which collapsed under its own weight, clearly due to excessive degradation. Reports of poor design had surfaced as well. We know unequivocally that the flooding and forces from wind, as well as salt penetration and aging weaken structures. We also know that in the years and decades to follow, these buildings that survived Ian were damaged and will lose capacity over time. Testing provides objective information on capacity and this approach needs leadership to be more widely implemented. And these methods can help avoid future failure.

The current recommendations are now inherently in conflict, and fall short of the legal requirement provided in SB-D4. The recommendations rely mainly on visual inspections which cannot achieve the very reasonable goal of verifying structural integrity. Over the next several decades, long after the Workgroup members have retired, the structures that get repaired from the recent damage from Ian will be significantly weaker. Encouraging the use of non-destructive testing and load tests as provided in ASCE 11-99, and future advanced testing methods, should absolutely be encouraged by this Workgroup.

Recommendation V Option 5 could simply be modified to include (in bold at the bottom):

V. Option 5 – Ranked 3.08) Phase 2. Require, when testing and at the discretion of the design professional, the use of scientific testing protocols for Phase 2 inspections in addition to visual inspection techniques for determining the structural integrity of a building.
NDT Protocols for existing buildings are as follows for Phase 2:
1. ASTM F1869 – Chloride test for concrete
2. ASTM C876 (half-cell) – Scan of concrete at a depth of 6" to measure rebar deterioration
3. ASTM C1153- Thermography
4. ASTM D8231 modified – Electronic Leak Detection of membrane roofing
5. AAMA 511 – Pressure Testing of Fenestrations
6. ASTM D4580 – Delam roller for Stucco and Concrete

And non-destructive tests and load test referenced in ASCE 11-99, and future approved methods.

We would be happy to provide a presentation regarding the history and value of performing load tests to any of the Workgroup at any time.

Sincerely,

Thomas Winant, PE
Dr. Alan Jeary

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GENERAL CONSIDERATIONS

SCOPE OF STRUCTURAL INSPECTION

The fundamental purpose of the required inspection and report is to confirm in reasonable fashion that the building or structure under consideration is safe for continued use under the present occupancy. As implied by the title of this document, this is a recommended procedure, and under no circumstances are these minimum recommendations intended to supplant proper professional judgment.

Such inspection shall be for the purpose of determining the general structural condition of the building or structure to the extent reasonably possible of any part, material or assembly of a building or structure which affects the safety of such building or structure and/or which supports any dead or designed live load, and the general condition of its electrical systems pursuant to the Building Code.

In general, unless there is obvious overloading, or significant deterioration of important structure elements there is little need to verify the original design. It is obvious that this has been "time tested' if still offering satisfactory performance. Rather, it is of importance that the effects of time with respect to deterioration of the original construction materials be evaluated. It will rarely be possible to visually examine all concealed construction, nor should such be generally necessary. However, a sufficient number of typical structure members should be examined to permit reasonable conclusions to be drawn.

Visual Examination will, in most cases, be considered adequate when executed systematically. The visual examination must be conducted throughout all habitable and non-habitable areas of the building, as deemed necessary by the inspecting professional to establish compliance. Surface imperfections such as cracks, distortion, sagging, excessive deflections, significant misalignment, signs of leakage, and peeling of finishes should be viewed critically as indications of possible difficulty.

Testing Procedures and quantitative analysis will not generally be required for five (5) structural members or systems except for such cases where visual examination has revealed such need, or where apparent loading conditions may be critical.

Manual Procedures such as chipping small areas of concrete and surface finishes for closer examinations are encouraged in preference to sampling and/or testing where visual examination alone is deemed insufficient. Generally, unfinished areas of buildings such as utility spaces, maintenance areas, stairwells and elevator shafts should be utilized for such purposes. In some cases, to be held to a minimum, ceilings or other construction finishes may have to be opened for selective examination of critical structural elements. In that event, such locations should be carefully located to be least disruptive most easily repaired, and held to a minimum. In an event, a sufficient number of structural members must be examined to afford reasonable assurance that such are representative of the total structure.

Evaluating an existing structure for the effect of time, must take into account two, basic considerations; movement of structural components with respect to each other, and deterioration of materials.

With respect to the former, volume change considerations, principally from ambient temperature changes, and possible long time deflections, are likely to be most significant. Foundation movements will frequently be of importance, usually settlement, although upward movement due to expansive soils actually may occur. However, it is infrequent in this area. Older buildings on spread footings may exhibit continual, even recent settlements if founded on deep unconsolidated fine grained or cohesive soils or from subterraneous losses or movements from several possible causes.

With very little qualification, such as rather rare chemically reactive conditions, deterioration of building materials can only occur in the presence of moisture, largely to metals and their natural tendency to return to the oxide state in the corrosive process.

In this marine climate, highly aggressive conditions exist year round. For most of the year, outside relative humidity may frequently be about 90 or 95%, while within air-conditioned buildings, relative humidity will normally be about 35 to 60%. Under these conditions moisture vapor pressures ranging from about 1/3 to 1/2 pounds per square inch will exist much of the time. Moisture vapor will migrate to lower pressure areas. Common building materials such as stucco, masonry and even concrete, are permeable even with these slight pressures. Since most of our local construction does not use vapor barriers, condensation will take place within the enclosed walls of the building. As a result, deterioration is most likely adjacent to exterior walls, or wherever else moisture or direct leakage has been permitted to penetrate the building shell.

Structural deterioration will always require repair. The type of repair, however, will depend on the importance of the member in the structural system and degree of deterioration. Cosmetic type repairs may suffice in certain non-sensitive members such as tie beams and columns, provided that the remaining sound material is sufficient for the required function. For members carrying assigned gravity or other loads, cosmetic type repairs will only be permitted if it can be demonstrated by rational analysis that the remaining material, if protected from further deterioration can still perform its assigned function at acceptable stress levels. Failing that, adequate repairs or reinforcement will be considered mandatory.

Written Reports shall be required attesting to each required inspection. Each such report shall note the location of the structure, description of type of construction, and general magnitude of the structure, the existence of drawings and location thereof, history of the structure to the extent reasonably known, and description of the type and manner of the inspection, noting problem areas and recommending repairs, if required to maintain structural integrity.

EVALUATION

Each report shall include a statement to the effect that the building is structurally safe, unsafe, safe with qualifications, or has been deemed safe by restrictive interpretation of such statements. It is suggested that each report also include the following information indicating the actual scope of the report and limits of liability. This paragraph may be used:

" As a routine matter, in order to avoid possible misunderstanding, nothing in this report should be construed directly or indirectly as a guarantee for any portion of the structure. To the best of my knowledge and ability, this report represents and accurate appraisal of the present condition of the building based upon careful evaluation of observed conditions, to the extent reasonably possible."

FOUNDATION:

If all of 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 probably be uniform and of little practical consequence. In the real world, however, neither is likely. Significant deviations from either of these two idealism 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, in themselves, 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.

ROOFING SYSTEMS:

Sloping roofs, usually having clay or cement tiles, are of concern in the event that the covered membrane may have deteriorated, or that the tiles may have become loose. Large deflections, if merely resulting from deteriorated rafters or joists will be of greater importance. Valley Flashing, and Base Flashing at roof penetration will also be matters of concern.

Flat roofs with built up membrane roofs will be similarly critical with respect to deflection considerations. Additionally, since the will generally be approaching expected life limits at the age when building recertification is required, careful examination is important. Blisters, wrinkling, alligatoring, and loss of gravel are usually signs of difficulty. Punctures or loss of adhesion of base flashing, coupled with loose counterflashing will also signify possible problems. Wind blown gravel, if excessive, and the possibility of other debris, may result in pounding, which if permitted, may become critical.

MASONRY BEARING WALLS

Random cracking, or if discernible, definitive patterns of cracking, will of course, be of interest. Bulging, sagging, or other signs of misalignment may also indicate related problems in other structural elements. Masonry walls where commonly constructed of either concrete masonry remits or scored clay tile, may have been constructed with either reinforced concrete columns tie beams, or lintels.

Steel bar joists are, of course, sensitive to corrosion. Most critical locations will be web member welds, especially near supports, where shear stresses are high possible failure may be sudden, and without warning.

Cold formed steel joists, usually of relatively light gage steel, are likely to be critically sensitive to corrosion, and are highly dependent upon at least normal lateral support to carry designed loads. Bridging and the floor or roof system itself, if in good condition, will serve the purpose.

Wood joists and rafters are most often in difficult from "dry rot", or the presence of termites. The former (a misnomer) is most often prevalent in the presence of sustained moisture or lack of adequate ventilation. A member may usually be deemed in acceptable condition if a sharp pointed tool will penetrate no more than about one eight of an inch under moderate hand pressure. Sagging floors will most often indicate problem areas. 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, with significant deterioration. Floor and roof systems of case 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 for that purpose.

STEEL FRAMING SYSTEM

Corrosion, obviously enough, will be the determining factor in the deterioration of structural steel. Most likely suspect areas will be fasteners, welds, and the interface area where bearings are embedded in masonry. Column bases may often be suspect in areas where flooding has been experienced, especially if salt water has been involved.

Thin cracks usually indicate only minor corrosion, requiring minor patching. Extensive spalling may indicate a much more serious condition requiring further investigation.

Of most probable importance will be the vertical and horizontal cracks where masonry units abut tie columns, or other frame elements such as floor slabs. Of interest here is the observation that although the raw materials of which these masonry materials are made may have much the same mechanical properties as the reinforced concrete framing, their actual behavior in the structure, however, is likely to differ with respect to volume change resulting from moisture content, and variations in ambient thermal conditions.

Moisture vapor penetration, sometimes abetted by salt laden aggregate and corroding rebars, will usually be the most common cause of deterioration. Tie columns are rarely structurally sensitive, and a fair amount of deterioration may be tolerated before structural impairment becomes important. Usually, if rebar loss is such that the remaining steel area is still about 0.0075 of the concrete area, structural repair will not be necessary. Cosmetic type repair involving cleaning, and patching to effectively seal the member, may often suffice. A similar approach may not be unreasonable for tie beams, provided they are not also serving as lintels. In that event, a rudimentary analysis of load capability using the remaining actual rebar area, may be required.

FLOOR AND ROOF SYSTEMS

Cast in place reinforced concrete slabs and/or beams and joists may often show problem due to corroding rebars resulting from cracks or merely inadequate protecting cover of concrete. 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. Type and extent or repair will be dependent upon the results of such investigation.

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

CONCRETE FRAMING SYSTEMS

Concrete deterioration will, in most cases similarly to related to rebar corrosion possibly abetted by the presence of salt-water aggregate or 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, dropping into 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. Especially, since loose material will have to be removed even for cosmetic type repairs, anyway. Fairly reliable quantitative conclusions may be drawn with respect to the quality of the concrete. Even though our cement and local aggregate are essentially 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. Depending upon the structural importance of the specific location, this type of examination may obviate the need for further testing if a value of 2000 psi to 2500 psi is sufficient for required strength, in the event that visual inspection indicates good quality for the factors mentioned.

WINDOWS

Window condition is of considerable importance with respect to two considerations. Continued leakage may have resulted in other adjacent damage and deteriorating anchorage may result in loss of the entire unit in the event of severe wind storms short of hurricane velocity. Perimeter sealant, glazing, seals, and latches should be examined with a view toward deterioration of materials and anchorage of units for inward as well as outward (section) pressures, most importantly in high buildings.

WOOD FRAMING

Older wood framed structures, especially of the industrial type, are of concern in that long term deflections may have opened important joints, even in the absence of deterioration. Corrosion of ferrous fasteners will in most cases be obvious enough. Dry rot must be considered suspect in all sealed areas where ventilation has been inhibited, and at bearings and at fasteners. Here too, penetration with a pointed tool greater than about one eight inch with moderate hand pressure, will indicate the possibility of further difficulty.

LOADING

It is of importance to note that even in the absence of any observable deterioration, loading conditions must be viewed with caution. Recognizing that there will generally be no need to verify the original design, since it will have already been "time tested", this premise has validity only if loading patterns and conditions remain **unchanged**. Any material change in type and/or magnitude or loading in older buildings should be viewed as sufficient jurisdiction to examine load carrying capability of the affected structural system.

SCOPE OF ELECTRICAL INSPECTION

The purpose of the required inspection and report is to confirm with reasonable fashion that the building or structure and all habitable and non-habitable areas, as deemed necessary by the inspecting professional to establish compliance, are safe for continued use under present occupancy. As mentioned before, this is a recommendation procedure, and under no circumstances are these minimum recommendations intended to supplant proper professional judgement.

ELECTRIC SERVICE

A description of the type of service supplying the building or structure must be provided, stating the size of amperage, if three (3) phase or single (1) phase, and if the system is protected by fuses or breakers. Proper grounding of the service should also be in good standing. The meter and electric rooms should have sufficient clearance for equipment and for the serviceman to perform both work and inspections. Gutters and electrical panels should all be in good condition throughout the entire building or structure.

BRANCH CIRCUITS

Branch circuits in the building must all be identified and an evaluation of the conductors must be performed. There should also exist proper grounding for equipment used in the building, such as an emergency generator, or elevator motor.

CONDUIT RACEWAYS

All types of wiring methods present in the building must be detailed and individually inspected. The evaluation of each type of conduit and cable, if applicable, must be done individually. The conduits in the building should be free from erosion, and checked for considerable dents in the conduits that may be prone to cause a short. The conductors and cables in these conduits should be chafe free, and their currents not over the rated amount.

EMERGENCY LIGHTING

Exit signs lighting and emergency lighting, along with a functional fire alarm system must all be in good working condition.

MIAMI-DADE COUNTY

REGULATORY AND ECONOMIC RESOURCES DEPARTMENT

MINIMUM INSPECTION PROCEDURAL GUIDELINES FOR BUILDING STRUCTURAL RECERTIFICATION

INSPECTION COMMENCED
Date: ____________________

INSPECTION COMPLETED
Date: ____________________

INSPECTION MADE BY: ____________________

SIGNATURE: ____________________

PRINT NAME: ____________________

TITLE: ____________________

ADDRESS: ____________________

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1. DESCRIPTION OF STRUCTURE
a. Name on Title:
b. Street Address:
c. Legal Description:
d. Owner's Name:
e. Owner's Mailing Address:
f. Folio Number of Property on which Building is Located:
g. Building Code Occupancy Classification:
h. Present Use:
i. General Description:
Addition Comments:

j. Additions to original structure:

2. PRESENT CONDITION OF STRUCTURE
a. General alignment (Note: good, fair, poor, explain if significant)
1. Bulging
2. Settlement
3. Deflections
4. Expansion
5. Contraction
b. Portion showing distress (Note, beams, columns, structural walls, floor, roofs, other)
c. Surface conditions – describe general conditions of finishes, noting cracking, spalling, peeling, signs of moisture penetration and stains.
d. Cracks – note location in significant members. Identify crack size as HAIRLINE if barely discernible; FINE if less than 1 mm in width; MEDIUM if between 1 and 2 mm width; WIDE if over 2 mm.

e. General extent of deterioration – cracking or spalling of concrete or masonry, oxidation of metals; rot or borer attack in wood.
f. Previous patching or repairs
g. Nature of present loading indicate residential, commercial, other estimate magnitude.

3. INSPECTIONS
a. Date of notice of required inspection
b. Date(s) of actual inspection
c. Name and qualifications of individual submitting report:
d. Description of laboratory or other formal testing, if required, rather than manual or visual procedures
e. Structural repair-note appropriate line:
1. None required
2. Required (describe and indicate acceptance)

4. SUPPORTING DATA

a. ______________________________ sheet written data

b. ______________________________ photographs

c. ______________________________ drawings or sketches

5. MASONRY BEARING WALL = Indicate good, fair, poor on appropriate lines:
a. Concrete masonry units
b. Clay tile or terra cota units
c. Reinforced concrete tie columns
d. Reinforced concrete tie beams
e. Lintel
f. Other type bond beams
g. Masonry finishes -exterior
1. Stucco
2. Veneer
3. Paint only
4. Other (describe)
h. Masonry finishes - interior
1. Vapor barrier
2. Furring and plaster
3. Paneling
4. Paint only
5. Other (describe)
i. Cracks
1. Location – note beams, columns, other
2. Description
j. Spalling
1. Location – note beams, columns, other
2. Description
k. Rebar corrosion-check appropriate line
1. None visible
2. Minor-patching will suffice
3. Significant-but patching will suffice

4. Significant-structural repairs required
l. Samples chipped out for examination in spall areas:
1. No
2. Yes – describe color, texture, aggregate, general quality

6. FLOOR AND ROOF SYSTEM
a. Roof
1. Describe (flat, slope, type roofing, type roof deck, condition)
2. Note water tanks, cooling towers, air conditioning equipment, signs, other heavy equipment and condition of support:
3. Note types of drains and scuppers and condition:
b. Floor system(s)
1. Describe (type of system framing, material, spans, condition)
c. Inspection – note exposed areas available for inspection, and where it was found necessary to open ceilings, etc. for inspection of typical framing members.

7. STEEL FRAMING SYSTEM
a. Description

b. Exposed Steel- describe condition of paint and degree of corrosion
c. Concrete or other fireproofing – note any cracking or spalling and note where any covering was removed for inspection
d. Elevator sheave beams and connections, and machine floor beams – note condition:

8. CONCRETE FRAMING SYSTEM
a. Full description of structural system
b. Cracking
1. Not significant
2. Location and description of members affected and type cracking
c. General condition
d. Rebar corrosion – check appropriate line
1. None visible
2. Location and description of members affected and type cracking
3. Significant but patching will suffice
4. Significant – structural repairs required (describe)
e. Samples chipped out in spall areas:
1. No
2. Yes, describe color, texture, aggregate, general quality:

9. WINDOWS
a. Type (Wood, steel, aluminum, jalousie, single hung, double hung, casement, awning, pivoted, fixed, other)
b. Anchorage- type and condition of fasteners and latches
c. Sealant – type of condition of perimeter sealant and at mullions:
d. Interiors seals – type and condition at operable vents
e. General condition:

10. WOOD FRAMING
a. Type – fully describe if mill construction, light construction, major spans, trusses:
b. Note metal fitting i.e., angles, plates, bolts, split pintles, other, and note condition:
c. Joints – note if well fitted and still closed:
d. Drainage – note accumulations of moisture
e. Ventilation – note any concealed spaces not ventilated:
f. Note any concealed spaces opened for inspection: