



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

August 29, 2022

Re: Florida Law SB-04 - Comments during Work Group discussion

Dear Mr Mondani,

This correspondence is in response to the request for comments raised during the first work group discussion in July 16, 2022 regarding Law SB-04 for the structural integrity inspections of buildings. Several comments were made during the meeting by board members of the working group which we'd like to address to add context to our suggestion.

1. One member said that following Hurricane Andrew, they recognized that a similar board was created and that there was an opportunity to advance the industry and make important changes. That board took the opportunity and raised the bar for the industry and that this board has a similar opportunity. We would agree with that thought and we are interested in supporting 'raising the bar' for the industry.
2. A question was raised regarding 'what is the standard of care' that needs to be reached associated with these recommendations from the board.
3. A question was raised as to the 'service life' of a structure.
4. A question was raised about 'substantial structural deterioration' and what that meant.
5. Dr Bridge made the comment that 'there is hidden damage'. Of course, there always are areas that engineers cannot inspect, which raises the potential for undiscovered damage. In some cases, most structural elements can be hidden from inspection. Since it's necessary to understand if there are weaknesses, an effective way to address this concern is critical.

In general, the concerns raised were focused on defining the process so it is thorough and clear. SB-04 states that 'structural integrity is of paramount importance' and the term 'structural integrity' is repeated throughout the Law. Structural integrity has been defined to 'ensure that either a structure or structural component is fit for purpose under normal operational conditions and is safe even should conditions exceed that of the original design'. City, County and State governments elsewhere in the US are passing similar ordinances and laws to assess structural integrity.

The Community Associations Institute recognizes ASCE 11-99 *Guidelines for Structural Condition Assessment of Existing Buildings* (1) as a standard for assessments. This document has been referenced as providing a reasonable 'standard of care' in other municipalities that are enacting changes in law.

Additionally, the design codes (International Building Code, Existing International Building Code, ASCE 7 and other relevant standards (2)) provide performance requirements for new buildings. Of these codes and standards, they all allow for an 'insitu load test' (3) of a structure. This provides an objective measure of a structure's capacity and adds insight into locating weaknesses. An important fact is that the capacity of any structure can vary from what was intended in design based on poor quality materials, unanticipated problems and poor construction quality. Some structures may start out weak. Also, over time each building will lose capacity because materials will degrade and forces as well as the environment will cause weak structures to sustain damage from shock events at an ever increasing rate. As they degrade further they pose an ever increasing high risk to the community. Only through physically measuring the response of a structure, can you understand if the building has the proper capacity and if that capacity changes over time. Objective capacity related metrics are referenced in the codes. We just need to take measurements to validate the performance.

The new law puts engineers in a difficult position; the engineers are required to determine if a building has structural integrity which implies the proper capacity, yet they are not required to use an objective method to verify it. Visual inspections cannot provide any information regarding a structures capacity. However, the codes allow for an 'insitu load test' to provide the objective measure of capacity which could act as a commissioning step for each building, both new and old (4). There seems to be a solution to the concerns raised, and a mechanism which would provide objective validity of a structures capacity, and changes in that capacity over time.

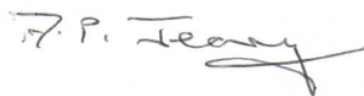
A criticism of the structural engineering community is that as a whole, there has been a very slow adoption of the use of technology. As a technology provider, I can attest to that reality. At a time such as this, using technology to help provide insight into the safety and long term management of each building is essential. A measure of the dynamic characteristics of any structure can occur in a single day, at a reasonable price. We suggest requiring, or at a minimum encouraging, a load test on each structure. We have provided this service for years (5). Such a test would accurately memorialize a structure's performance characteristics. Then they are compared with code requirements as well as for future comparison. From this we can understand if the structure poses a significantly high risk as verified from an objective measurement. It will help engineers make more informed decision and assessments to meet the intent of the new law. This would also apply to specific areas of a structure such as podium slabs.

This Board has an opportunity to raise the bar for the industry across the country. An objective measure of the structure's performance metrics would do just that. It would provide the needed feedback to understand if a structure poses a risk, and an objective method to quantify capacity. We would like to help the board understand the 40 year history of building science that has gone into the development of the techniques and technology that can provide this needed assessment service.

Sincerely,



Thomas Winant, PE



Dr. Alan Jeary

Footnotes and Attachments

- (1) ASCE 11-99. Note that methods for a Load Test are listed on page 87 Table 3.7.13
- (2) Summary Document ‘Standards Relating to STRAAM Dynamic Measurement’ – Several references in the design code which provides performance guidance for structures. In ASCE 7-16, Page 753 and 754 (Section C26) gives exact references to the parameters we measure to in the load test and use in our risk ratio. A fundamental mode of 150/H is the only reference in the ASCE 7-16 to the first mode frequency of existing structures. In the design for new structures, there are other estimates which act as a backstop as well. This 150/H estimate is used across the world as a good estimate. From a capacity perspective it represents a reasonable level of capacity and equates to about a 120 mph wind capacity depending on the type of analysis. Current codes for Florida require higher capacity however this have changed over the years. There are other international sources we draw from as well
- (3) Document titled ‘Insitu Load Test for structures’ – Provides references and insight into performing a measure of a structure’s response to quantify it’s dynamic characteristics.
- (4) STRAAM White Paper on Structural Commissioning. Provides a logical argument to require an Insitu Load Test on new and existing structures. At the end there are several links to provide detailed information regarding the history and application of measuring the dynamic response of structures.
- (5) STRAAM marketing document, Lateral Load Test.