



Lateral Load Test

Dynamic Signature Assessment

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STRAAM Group, Inc.

Using Advanced Technology to Measure and Quantify a Structure's Risk Profile



STRAAM Group's patented technology offers a paradigm shift in understanding structural risk. Condominiums, Co-ops and apartment buildings are required to be designed and maintained to a special high standard for public safety which is dictated in building codes. Advancements in technology now allow for the rapid and objective measure of a structure's performance and risk profile. This provides a powerful tool which is needed to avoid problems and protect the public.

Challenges for Real Estate owners and purchasers.

- Since the building collapse in Surfside Florida, the world has changed. Banks and the Government lenders are asking about building safety. Mortgages can depend on property condition reports.
 - Yet, we know many properties have weaknesses and hidden risks. Visual inspections cannot find covered-up damage or structural weaknesses. Ignoring it opens up tremendous liability for owners. There is a fiduciary responsibility to understand these risks.
- Quantifying each structure's risk profile is achievable and needed in this new era.
 - Allocating funds becomes more intuitive with a proactive maintenance and repair schedule based on buildings with a highest risk profile.
- Owners have tremendous liability if they ignore or don't know about high risk conditions.
 - The best approach is to accurately quantify a structures performance to protect your organization and safeguard the public. Purchasers will avoid buying weak buildings.

A simple one-day measurement will memorialize a structure's performance, quantify its structural risk profile, and can be used to identify weaknesses or problems, help prioritize budgets, validate construction work and assess damage after a wind or seismic event. A **STRAAM Baseline Dynamic Signature (BDS)** of a building provides an objective measurement of the performance of a building as well as an engineered assessment of its performance.

The techniques used for a BDS analysis are based on structural dynamics and engineering. Recent advancements in electronics, sensors and cloud computing have converged to allow us to provide this advanced service in a rapid and cost effective manner. We use this advanced technology to help assess and protect important structures for government and private industry. Our unique advanced technology is patented in 45 Countries.

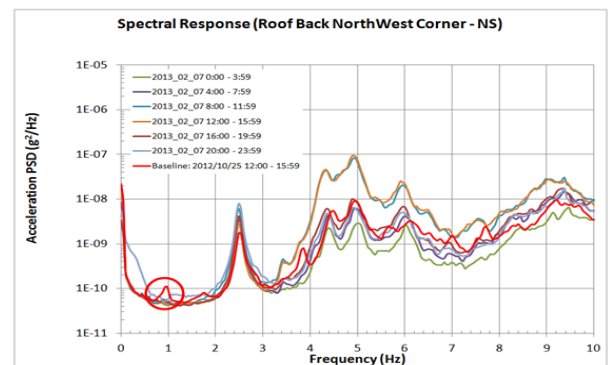


Figure 9: Spectral Response recorded from Roof Back sensor in the N/S direction Comparison between January 6th and February 7th

What is a Baseline Dynamic Signature (BDS)?

- It's an OBJECTIVE method of an 'in-situ load test' to quickly measuring a structures dynamic response.
- It memorializes a structure's performance including; frequencies of resonance, displacements, mode shapes and non-linear damping. These parameters define the structural response.
- The analysis of the response is used to compare with the wind and seismic code requirements. ASCE 11-99 'Guidance for Assessing Existing Buildings' identified these methods. The IBC and ASCE 7-16 gives clear guidance for allowing in-situ load tests. It's appropriate for both new and existitng buildings.
- This is invaluable for assessing a structure's current condition and for quantifying future damage due to aging, earthquakes or wind events. This can be an invaluable decision making tool!
- It's like an 'EKG' for a structure. As with an EKG, a BDS is used to memorialize and assess the dynamic function and behavior of a structure to identify problems and risks. It also is used for future comparison to determine a loss of capacity or damage. We also refer to a BDS as a 'Structuro-cardiogram'TM.

What is the value to the owner?

- Owners receive a **Certificate of Risk Assessment**.
- Helps assure that the building is safe and built as designed. Compares response to design codes.
- Identifies potential structural problems so they can be quantified and repaired correctly.

What does an analysis of the BDS yield?

- Compare the building with the 'bell curve' of structures from our data-base of 700 structures.
- Identifies specific areas of weakness, stiffness anomalies, 'damaged state' and high risk factors.



How does a BDS help purchasers, owners and managers of buildings?

- A BDS provides an objective benchmark of a structure's dynamic performance and risk profile.
- A BDS will identify major flaws which may have been missed through visual inspections.
- Real-time measurements are used to avoid damage during construction and for re-occupancy.

How does this Baseline Dynamic Signature help after an event or terrorist attack?

- A follow up Dynamic Signature after an event will help identify and quantify the level of damage.
- A BDS is used to help expedite re-occupancy of damaged properties.
- After repairs are made, a BDS will validate that the structure is back to its original condition.

How does the process of taking a BDS work?

- Measurements are taken on buildings in hours with an advanced system of sensors and computer hardware. Access is needed to the roof and stairwells. The process is quick and non-invasive.
- Wireless communication and cloud computing, along with advanced algorithms help allow for expedited data processing analysis.
- QA/ QC processes assure data is correct and the report reflects accurate results.
- Final Reports are provided in a few days in the form Certificate of Risk and a supporting detailed report.

Please see our video at our website: www.straamgroup.com/structural-commissioning/

STRAAM Group provides a complete and cost effective service by providing equipment, expertise and professional staff to perform these studies at a competitive price. We are offering licenses of our technology for qualified partners around the globe.