

**INTERPRETATIONS & APPLICATIONS**  
**OF BUILDING CODES & REGULATIONS 21-2**

CODE SECTION: 1604.4 Analysis 2021 IBC



Old 08-3 Rev 10/14/08; 02/12/2013; 01/06/2017; 01/20/2021

**Subject: Submitting structural calculations using structural analysis and design software packages**

**Per IBC 1604.4 Analysis. (Excerpt)**

*“Load effects on structural members and their connections shall be determined by methods of structural analysis that take into account equilibrium, general stability, geometric compatibility and both short- and long-term material properties.*

*Members that tend to accumulate residual deformations under repeated service loads shall have included in their analysis the added eccentricities expected to occur during their service life.*

*Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system that provides a complete load path capable of transferring loads from their point of origin to the load-resisting elements.”*

The City of Scottsdale requires applicants to submit structural calculations to prove that they have performed a rational analysis and have provided a structure capable of transferring both gravity and lateral loads from the point of application to the foundation. Several advanced structural analysis and design software packages are on the market to assist with this process.

- Whether an analysis is performed “by hand” or by computer, the derivation of loads and their path through the structure to the foundation should be made clear and apparent.
- Additional narrative along with the input and output must be provided to explain the analysis.
- In structures with multiple stories, verify that loads are being transferred through each story.
- P-delta effects on load combinations shall be considered in any lateral analysis.
- Define any terms unique to the software package being used.