Section 1.3.1.3 requirements, it is not intended that these are the only acceptable approaches. Any methods that evaluate the likelihood of failure considering the potential uncertainties to the satisfaction of the Peer Review and the Authority Having Jurisdiction should be acceptable. This could include the use of procedures contained in the International Performance Code, ASCE 41, and similar authoritative documents.

Since most building officials and other authorities having jurisdiction will not have the expertise necessary to judge the adequacy of designs justified using the Section 1.3.1.3 procedures, independent peer review is an essential part of this process. Such review can help to reduce the potential that the design professional of record will overlook or misinterpret one or more potential behaviors that could result in poor performance. Independent review can also help to establish that an appropriate standard of care was adhered to during the design. For review to be effective, the reviewers must have the appropriate expertise and understanding of the types of structures, loading, analysis methods, and testing used in the procedures.

It is anticipated that the alternative procedures of Section 1.3.1.3 may be used to demonstrate adequacy for one or perhaps a few load types, while the more standard procedures of Sections 1.3.1.1 and 1.3.1.2 are used to demonstrate adequacy for other load types. For example, it is relatively common to use the alternative procedures to demonstrate adequate earthquake, fire, or blast resistance, while the standard prescriptive procedures of Sections 1.3.1.1 and 1.3.1.2 are used for all other loading considerations.

It is important to note that provision of adequate strength is not by itself the only requirement to ensure proper performance. Considerations of serviceability and structural integrity are also important. Use of the alternative procedures of Section 1.3.1.3 is not intended as an alternative to the requirements of Sections 1.3.2, 1.3.3, 1.3.4, 1.3.5, or 1.4 of this Standard.

C1.3.1.3.2 Testing Laboratory testing of materials and components constructed from those materials is an essential part of the process of validating the performance of structures and nonstructural components under load. Design resistances specified in the industry standards used with the Strength Procedures of Section 1.3.1.1 and the Allowable Stress Procedures of Section 1.3.1.2 are based on extensive laboratory testing as well as many years of experience with the performance of structures designed using these standards in real structures. Similarly, analytical modeling techniques commonly used by engineers to predict the behavior of these systems have been benchmarked and validated against laboratory testing. Similar benchmarking of resistance, component performance, and analytical models is essential when performance-based procedures are employed. Where systems and components that are within the scope of the industry standards are employed in a design, analytical modeling of these systems and components and their resistances should be conducted in accordance with these standards and industry practice, unless new data and testing suggest that other assumptions are more appropriate. Where new systems, components, or materials are to be used, laboratory testing must be performed to indicate appropriate modeling assumptions and resistances.

No single protocol is appropriate for use in laboratory testing of structural and nonstructural components. The appropriate number and types of tests that should be performed depend on the type of loading the component will be subjected to, the complexity of the component's behavior, the failure modes it may exhibit, the consequences of this failure, and the variability associated with the behavior. Resistances should be selected to provide an acceptably low probability of unacceptable performance. Commentary to Chapter 2 provides guidance on the calculation of load and resistance factors that may be used for this purpose, when LRFD procedures are employed.

Regardless of the means used to demonstrate acceptable performance, testing should be sufficient to provide an understanding of the probable mean value and variability of resistance or component performance. For materials or components that exhibit significant variability in behavior, as a result either of workmanship, material variation, or brittle modes of behavior, a very large number of tests may be required to properly characterize both the mean values and dispersion. It will seldom be possible to conduct such a large number of tests as part of an individual project. Therefore, for reasons of practicality, this standard permits a small number of tests, with the number based on the observed variability. When high variability is observed in this test data, the minimum requirement of six tests is not adequate to establish either the true mean or the variability with confidence, and appropriate caution should be used when developing component resistance or performance measures based on this limited testing. This is a primary reason why the procedures of this section are limited to use on individual projects and are not intended as a means