

Therefore, the Seismology Committee supports the IBC documentation requirements in principle. However, it is the opinion of the Seismology Committee that only the parameters used to derive the seismic response coefficient(s) C_s need to be listed; the calculated value V and the building's estimated weight W should not.

For designs based on the UBC (or CBC), it is the position of the Seismology Committee that similar information should be shown on drawings unless it does not apply to the design, for example, where simplified design or conventional light-frame construction is used. For UBC-based designs, seismic zone factor Z , seismic source type, and the distance to the seismic source should replace the corresponding items in the IBC list.

Regardless of the model code used, it is the position of the Seismology Committee that, in general, the basis for the earthquake design should be stated and that the following information related to earthquake design should be shown on structural drawings:

- The date and edition of the governing building code
- Material properties used, including soil properties
- Seismicity parameters (2003 IBC, 2006 IBC, 2003 NFPA 5000)
- Parameters needed to establish the seismic response coefficient (2003 IBC)
- The basic seismic force-resisting system(s), as tabulated in 1997 UBC Table 16-N or ASCE 7-02 Table 9.5.2.2 or ASCE 7-05 Table 12.2-1 (2003 IBC, 2006 IBC, 2003 NFPA 5000)
- Data needed for design by others (for example, seismic relative displacements per ASCE 7-02 section 9.6.1.4, or ASCE 7-05 section 13.3.2 needed for the design of nonstructural components and their attachments).

Designs that go beyond the minimum requirements of the governing code, such as those based on optional analysis procedures, should supplement this list as appropriate.

Structural Calculations

While the words “engineering calculations” are absent from the definition of construction documents in ASCE 7-02, ASCE 7-05, and in model building codes, their production is implied and necessary for validation of code compliance. Structural calculations for earthquake design are mandated indirectly by ASCE 7-02 section 9.1.2.4: “When required by the authority having jurisdiction, design documents shall be submitted to determine compliance with these provisions.” Model code provisions that call for structural calculations include 1997 UBC section 106.3.2, 2003 IBC section 106.1 (“other data”), and 2003 NFPA 5000 section 1.7.6.2.1 (“other information”). These model code provisions presume that design documents will include structural calculations that demonstrate the adequacy of all vertical and lateral load path elements. However, the codes do not specify how calculations should be presented or what they should contain.

In general, the content and format of structural calculations should be left to the engineer of record. Some general guidelines are appropriate, however. Structural calculations should be sufficiently annotated so as to be understandable by most engineers and plan checkers. Specific building code sections should be cited to demonstrate compliance. Calculations should be sufficient to allow minor field revisions to the original design without reanalysis. The methodology used in the design calculations should be clearly presented so that results are reproducible. Design decisions, which may involve judgment, regarding member sizing and the acceptability of trial designs should be clearly stated. The final product should constitute a traceable link between design assumptions and construction drawings.

Computer-generated calculations. In general, documentation generated by computer should meet the same standards as hand-calculations. That is, they should be well annotated and results should be reproducible. The keys to good design documentation with computer-generated calculations are a clear graphical description of the computer model and tabular summaries of key results.

For traditional computer analyses that take a single input file and generate self-contained output files, the Seismology Committee recommends that the following items be included in the calculation package: