

#### 16.2.4 Response Parameters

For each ground motion analyzed, individual response parameters consisting of the maximum value of the individual member forces,  $Q_{Ei}$ , member inelastic deformations,  $\psi_i$ , and story drifts,  $\Delta_i$ , at each story shall be determined, where  $i$  is the designation assigned to each ground motion.

If at least seven ground motions are analyzed, the design values of member forces,  $Q_E$ , member inelastic deformations,  $\psi$ , and story drift,  $\Delta$ , are permitted to be taken as the average of the  $Q_{Ei}$ ,  $\psi_i$ , and  $\Delta_i$  values determined from the analyses. If fewer than seven ground motions are analyzed, the design member forces,  $Q_E$ , design member inelastic deformations,  $\psi$ , and the design story drift,  $\Delta$ , shall be taken as the maximum value of the  $Q_{Ei}$ ,  $\psi_i$ , and  $\Delta_i$  values determined from the analyses.

##### 16.2.4.1 Member Strength

The adequacy of members to resist the combination of load effects of Section 12.4 need not be evaluated.

**EXCEPTION:** Where this standard requires consideration of the seismic load effects including overstrength factor of Section 12.4.3, the maximum value of  $Q_{Ei}$  obtained from the suite of analyses shall be taken in place of the quantity  $\Omega_0 Q_E$ .

##### 16.2.4.2 Member Deformation

The adequacy of individual members and their connections to withstand the estimated design deformation values,  $\psi_i$ , as predicted by the analyses shall be evaluated based on laboratory test data for similar elements. The effects of gravity and other loads on member deformation capacity shall be

considered in these evaluations. Member deformation shall not exceed two-thirds of a value that results in loss of ability to carry gravity loads or that results in deterioration of member strength to less than the 67 percent of the peak value.

##### 16.2.4.3 Story Drift

The design story drift,  $\Delta_i$ , obtained from the analyses shall not exceed 125 percent of the drift limit specified in Section 12.12.1.

#### 16.2.5 Design Review

A design review of the seismic force-resisting system and the structural analysis shall be performed by an independent team of registered design professionals in the appropriate disciplines and others experienced in seismic analysis methods and the theory and application of nonlinear seismic analysis and structural behavior under extreme cyclic loads. The design review shall include, but need not be limited to, the following:

1. Review of any site-specific seismic criteria employed in the analysis including the development of site-specific spectra and ground motion time histories.
2. Review of acceptance criteria used to demonstrate the adequacy of structural elements and systems to withstand the calculated force and deformation demands, together with that laboratory and other data used to substantiate these criteria.
3. Review of the preliminary design including the selection of structural system and the configuration of structural elements.
4. Review of the final design of the entire structural system and all supporting analyses.