above the isolation system combined with gravity forces shall be investigated if the story drift ratio exceeds $0.010/R_I$.

17.7 DESIGN REVIEW

A design review of the isolation system and related test programs shall be performed by an independent engineering team including persons licensed in the appropriate disciplines and experienced in seismic analysis methods and the theory and application of seismic isolation. Isolation system design review shall include, but not be limited to, the following:

1. Review of site-specific seismic criteria including the development of site-specific spectra and ground motion histories and all other design criteria developed specifically for the project.
2. Review of the preliminary design including the determination of the total design displacement, the total maximum displacement, and the lateral force level.
3. Overview and observation of prototype testing (Section 17.8).
4. Review of the final design of the entire structural system and all supporting analyses.
5. Review of the isolation system quality control testing program (Section 17.2.4.9).

17.8 TESTING

17.8.1 General

The deformation characteristics and damping values of the isolation system used in the design and analysis of seismically isolated structures shall be based on tests of a selected sample of the components prior to construction as described in this section.

The isolation system components to be tested shall include the wind-restraint system if such a system is used in the design.

The tests specified in this section are for establishing and validating the design properties of the isolation system and shall not be considered as satisfying the manufacturing quality control tests of Section 17.2.4.9.

17.8.2 Prototype Tests

Prototype tests shall be performed separately on two full-size specimens (or sets of specimens, as appropriate) of each predominant type and size of isolator unit of the isolation system. The test specimens shall include the wind-restraint system as well as individual isolator units if such systems are used in the design. Specimens tested shall not be used for construction unless accepted by the registered design professional responsible for the design of the structure and approved by the authority having jurisdiction.

17.8.2.1 Record

For each cycle of each test, the force-deflection and hysteretic behavior of the test specimen shall be recorded.

17.8.2.2 Sequence and Cycles

The following sequence of tests shall be performed for the prescribed number of cycles at a vertical load equal to the average dead load plus one-half the effects due to live load on all isolator units of a common type and size:

1. Twenty fully reversed cycles of loading at a lateral force corresponding to the wind design force.
2. Three fully reversed cycles of loading at each of the following increments of the total design displacement—$0.25D_D$, $0.5D_D$, $1.0D_D$, and $1.0D_M$ where D_D and D_M are as determined in Sections 17.5.3.1 and 17.5.3.3, respectively, or Section 17.6 as appropriate.
3. Three fully reversed cycles of loading at the total maximum displacement, $1.0D_{TM}$.
4. $30S_{D1}/S_{DS}B_D$, but not less than 10, fully reversed cycles of loading at 1.0 times the total design displacement, $1.0D_{TD}$.

If an isolator unit is also a vertical-load-carrying element, then item 2 of the sequence of cyclic tests specified in the preceding text shall be performed for two additional vertical load cases specified in Section 17.2.4.6. The load increment due to earthquake overturning, Q_E, shall be equal to or greater than the peak earthquake vertical force response corresponding to the test displacement being evaluated. In these tests, the combined vertical load shall be taken as the typical or average downward force on all isolator units of a common type and size.

17.8.2.3 Units Dependent on Loading Rates

If the force-deflection properties of the isolator units are dependent on the rate of loading, each set of tests specified in Section 17.8.2.2 shall be performed dynamically at a frequency equal to the inverse of the effective period, T_D.

If reduced-scale prototype specimens are used to quantify rate-dependent properties of isolators, the