Chapter 15
SEISMIC DESIGN REQUIREMENTS FOR NONBUILDING STRUCTURES

15.1 GENERAL

15.1.1 Nonbuilding Structures

Nonbuilding structures include all self-supporting structures that carry gravity loads and that may be required to resist the effects of earthquake, with the exception of building structures specifically excluded in Section 11.1.2, and other nonbuilding structures where specific seismic provisions have yet to be developed, and therefore, are not set forth in Chapter 15. Nonbuilding structures supported by the earth or supported by other structures shall be designed and detailed to resist the minimum lateral forces specified in this section. Design shall conform to the applicable requirements of other sections as modified by this section. Foundation design shall comply with the requirements of Sections 12.1.5, 12.13, and Chapter 14.

15.1.2 Design

The design of nonbuilding structures shall provide sufficient stiffness, strength, and ductility consistent with the requirements specified herein for buildings to resist the effects of seismic ground motions as represented by these design forces:

a. Applicable strength and other design criteria shall be obtained from other portions of the seismic requirements of this standard or its reference documents.
b. Where applicable strength and other design criteria are not contained in, or referenced by the seismic requirements of this standard, such criteria shall be obtained from reference documents. Where reference documents define acceptance criteria in terms of allowable stresses as opposed to strength, the design seismic forces shall be obtained from this section and used in combination with other loads as specified in Section 2.4 of this standard and used directly with allowable stresses specified in the reference documents. Detailing shall be in accordance with the reference documents.

15.1.3 Structural Analysis Procedure Selection

Structural analysis procedures for nonbuilding structures that are similar to buildings shall be selected in accordance with Section 12.6. Nonbuilding structures that are not similar to buildings shall be designed using either the equivalent lateral force procedure in accordance with Section 12.8, the modal analysis procedure in accordance with Section 12.9, the linear response history analysis procedure in accordance with Section 16.1, the nonlinear response history analysis procedure in accordance with Section 16.2, or the procedure prescribed in the specific reference document.

15.2 REFERENCE DOCUMENTS

Reference documents referred to in Chapter 15 are listed in Chapter 23 and have seismic requirements based on the same force and displacement levels used in this standard or have seismic requirements that are specifically modified by Chapter 15.

15.3 NONBUILDING STRUCTURES SUPPORTED BY OTHER STRUCTURES

Where nonbuilding structures identified in Table 15.4-2 are supported by other structures, and the nonbuilding structures are not part of the primary seismic force-resisting system, one of the following methods shall be used.

15.3.1 Less Than 25 percent Combined Weight Condition

For the condition where the weight of the nonbuilding structure is less than 25 percent of the combined effective seismic weights of the nonbuilding structure and supporting structure, the design seismic forces of the nonbuilding structure shall be determined in accordance with Chapter 13 where the values of R_p and a_p shall be determined in accordance to Section 13.1.5. The supporting structure shall be designed in accordance with the requirements of Chapter 12 or Section 15.5 as appropriate with the weight of the nonbuilding structure considered in the determination of the effective seismic weight, W.