780 CMR 34.00 EXISTING BUILDINGS

Deflection Amplification Factor, C_d, for systems not permitted in 780 CMR 1615.0 shall be in accordance with Table 3408-1. Except as provided in Table 3408-1, there are no seismic design or detailing rules for the systems listed in the table.

EXISTING

TABLE 3408-1 DESIGN COEFFICIENTS AND FACTORS FOR SEISMIC FORCE RESISTING SYSTEMS NOT PERMITTED IN 780 CMR 1615.0

Basic Seismic Force Resisting System[1]	Respense Modification Coefficient, R	System Overstrength Factor, Ωo	Deflection Amplification Factor, Cd
Bearing Wall Systems			
Steel concentrically braced frame (CBF) with diagonal[3] or X-bracing			
CBF per 6th Ed SBC[2] except AISC 1992 Seismic Provisions, Sect 9.5	3.5	2	3.5
Otherwise[4]	3	3	3
Steel CBF with V, inverted V, or K bracing			
V or Inverted V bracing per 6th Ed. SBC[2]	3	3	3
V or Inverted V bracing, otherwise[4]	3	3	3
K bracing	1.25	1.25	1.25
Reinforced concrete shear walls with boundary elements and without coupling beams, in accordancre with 780 CMR 1113.5.1.4a, 5th Ed.	5	2.5	5
Reinforced concrete shear walls with reinforcing steel less than required by, or spaced further apart than, that required in ACI 318, Sec. 11.10.9	1.5	1.5	1.5
Unreinforced concrete shear walls	1.25	1.25	1.25
Reinforced masonry shear walls classified in accordance with 780 CMR 3408.10.2.1			
Class A	4.5	2.5	3.5
Class B	2.25	2.25	2.25
Class C	1.25	1.25	1.25
Unreinforced masonry shear walls	1.25	1.25	1.25
Light-framed walls sheathed with wood structural panels or diagonal sheathing	4	2.5	3
Other light-framed walls sheathed with materials permitted in 780 CMR 3408.10.6	2	2	2
Building Frame Systems			
Steel concentrically braced frame (CBF) with diagonal[3] or X-bracing			
CBF per 6th Ed SBC[2] except AISC, 1992 Seismic Provisions, Sect 9.5	4	2	3.5
Otherwise[4]	3	3	3
Steel CBF with V, inverted V, or K bracing			
V or Inverted V bracing per 6th Ed. SBC[2]	3	3	3
V or Inverted V bracing, otherwise[4]	3	3	3
K bracing	1.5	1.5	1.5
Reinforced concrete shear walls with boundary elements and without coupling beams, in accordancre with 780 CMR 1113.5.1.4a, 5th Ed.	6	2.5	5
Reinforced concrete shear walls with reinforcing steel less than required by, or spaced further apart than, that required in ACI 318-02, Sec. 11.10.9	1.5	1.5	1.5
Unreinforced concrete shear walls	1.5	1.5	1.5
Reinforced masonry shear walls classified in accordance with 780 CMR 3408.10.2.1			
Class A	5	2.5	4
Class B	2.25	2.25	2.25
Class C	1.5	1.5	1.5
Unreinforced masonry shear walls	1.5	1.5	1.5
Light-framed walls sheathed with wood structural panels or diagonal sheathing	4	2.5	3
Other light-framed walls sheathed with materials permitted in 780 CMR ~~3408.10.6~~ 3408.9.3	2.5	2.5	2.5

TABLE 3408-1 DESIGN COEFFICIENTS AND FACTORS FOR SEISMIC FORCE RESISTING SYSTEMS NOT PERMITTED IN 780 CMR 1615.0 - continued

Basic Seismic Force Resisting System[1]	Respense Modification Coefficient, R	System Overstrength Factor, Ωo	Deflection Amplification Factor, Cd
Moment Resisting Frame Systems			
Steel moment frames			
Special Moment Frame per 6th Ed. SBC[2]	8	3	5.5
Ordinary Moment Frame per 6th Ed. SBC[2]	3.5	3.5	3.5
Moment frame, otherwise[4]	3	3	3
Reinforced concrete moment frames classified in accordance with 780 CMR 3408.10.2.2			
Class A	5	3	4.5
Class B	2.5	2.5	2.5
Dual Systems (See ASCE 7, Section 9.5.2.2.1)			
Steel concentrically braced frame (CBF) with steel moment frames (MF)			
CBF and Special MF, per 6th Ed. SBC[2]	5	2.5	4.5
CBF and MF, per 1st-5th Ed. SBC[2], except V, Inverted V, or K Bracing	3.5	2.5	3.5
CBF and MF, per 1st-5th Ed. SBC[2], with V or Inverted V Bracing	3	2.5	3
Otherwise	1.5	1.5	1.5
Reinforced concrete shear walls with boundary elements and without coupling beams, in accordancre with 780 CMR 1113.5.1.4a, 5th Ed., with reinforced concrete moment frames in accordance with 780 CMR 3408.10.2.2, Class A.	6	2.5	5
Ordinary reinforced concrete shear wall, as defined in 7th Ed. SBC, with reinforced concrete moment frames in accordance with 780 CMR 3408.10.2.2, Class A	5.5	2.5	4.5

Notes:
1. Systems of previous editions of the State Building Code that meet the ductility requirements of the 7th Edition of the Code are not included in this table.
2. SBC = State Building Code.
3. A diagonal brace is one that frames from a beam to column connection diagonally to another beam to column connection or to a column at its base plate.
4. The seismic resistance of the frame shall be based on its seismic connections being subject to two times the computed forces and moments resulting from seismic load.

3408.10.2.1 Classification of Reinforced Masonry. Existing reinforced masonry shall be classified for Table 3408-1, as follows:

Class A Minimum total cross-sectional area of reinforcement in the vertical and horizontal direction is 0.002 times the gross cross-sectional area of wall, with a minimum in each direction of 0.0007 times the gross cross-sectional area of wall. Maximum spacing of reinforcing steel bars in grouted cells or bond courses is 6'-0" in one direction and 4'-0" in the other direction, but not less than ⅓ of the length or height of the wall, whichever is smaller, in each direction. Otherwise meets requirements for reinforced masonry of the basic code.

Class B Same as Class A, except spacing limits for the reinforcing steel bars are exceeded.

Class C Less than the minimum cross-sectional area of reinforcement required for Class A.

3408.10.2.2 Classification of Reinforced Concrete Moment Frames. Existing reinforced concrete moment frames shall be classified for Table 3408-1, as follows:

Class A Design in accordance with 780 CMR 1113.5.1, 1113.5.1.1, 1113.5.1.2 and 1113.5.1.3, 5th Edition; and ACI 318-83, Sections 11.12.1.1 and 11.12.1.2 for reinforcing of the beam-column joints.

Class B Does not meet all the requirements for Class A.

3408.10.3 Alternate Methods of Analysis and Design. In lieu of the requirements of 780 CMR 1615.0 and 780 CMR 3408.10.2, analysis and design for existing buildings may be in accordance with SEI/ASCE 31 for the loading specified in 780 CMR 1614.0, except that sheathing over light-framed wood walls that is not permitted in 780 CMR 3408.9.3 shall not be used to resist in-plane shear for shear walls, and wood foundations other than piles and poles shall not be used to resist any load. The SER shall document