

PART VI
Appendix P

Seismic Design Coefficients and Approximate Period Parameters

P.1 Scope

This appendix contains design coefficients, system limitations and design parameters for seismic load resisting systems (SLRS) that are included in these provisions but not yet defined in the applicable building code for buckling-restrained braced frames (BRBF) and special plate shear walls (SPSW). The values presented in Tables 6.P.1 and 6.P.2 in this Appendix shall only be used where neither the applicable building code nor SEI/ASCE 7 contain such values.

P.2 Symbols

The following symbols are used in this appendix.

C_d	Deflection amplification factor
C_r, x	Parameters used for determining the approximate fundamental period
Ω_o	System overstrength factor
R	Response modification coefficient

P.3 Coefficients and Factors for Basic Seismic Load Resisting Systems

TABLE 6.P.1 Design Coefficients and Factors for Basic Seismic Load Resisting Systems

Basic Seismic Load Resisting System	Response Modification/ Reduction Coefficient R	System Overstrength Factor Ω_o	Deflection Amplification Factor C_d	Height Limit (m)	
				Seismic Design Category	
				B & C	D
Building Frame Systems					
Buckling-Restrained Braced Frames, non-moment-resisting beam-column connections	7	2	5½	NL	48
Special Plate Shear Walls	7	2	6	NL	48
Buckling-Restrained Braced Frames, moment-resisting beam-column connections	8	2½	5	NL	48
Dual Systems with Special Moment Frames Capable of Resisting at Least 25% of the Prescribed Seismic Forces					
Buckling-Restrained Braced Frame	8	2½	5	NL	NL
Special Plate Shear Walls	8	2½	6½	NL	NL

(NL = Not Limited)

P.4 VALUES OF APPROXIMATE PERIOD PARAMETERS

Table 6.P.2 Values of Approximate Period Parameters C_r and x

Structure Type	C_r	x
Buckling-Restrained Braced Frames	0.03	0.75
Special Plate Shear Walls	0.02	0.75

PART VI
Appendix Q
Qualifying Cyclic Tests of Beam-to-Column and
Link-to-Column Connections

Q.1 Scope

This Appendix includes requirements for qualifying cyclic tests of beam-to-column moment connections in special and intermediate moment frames and link-to-column connections in eccentrically braced frames, when required in these Provisions. The purpose of the testing described in this Appendix is to provide evidence that a beam-to-column connection or a link-to-column connection satisfies the requirements for strength and interstory drift angle or link rotation angle in these Provisions. Alternative testing requirements are permitted when approved by the engineer of record and the authority having jurisdiction.

This Appendix provides minimum recommendations for simplified test conditions.

Q.2 Symbols

The numbers in parentheses after the definition of a symbol refers to the Section number in which the symbol is first used.

θ Interstory drift angle (Q.6)

γ_{total} Total link rotation angle (Q.6)

Q.3 Definitions

Complete loading cycle: A cycle of rotation taken from zero force to zero force, including one positive and one negative peak.

Interstory drift angle: Interstory displacement divided by story height, radians.

Inelastic rotation: The permanent or plastic portion of the rotation angle between a beam and the column or between a link and the column of the test specimen, measured in radians. The inelastic rotation shall be computed based on an analysis of test specimen deformations. Sources of inelastic rotation include yielding of members, yielding of connection elements and connectors, and slip between members and connection elements. For beam-to-column moment connections in special and intermediate moment frames, inelastic rotation is computed based upon the assumption that inelastic action is concentrated at a single point located at the intersection of the centerline of the beam with the centerline of the column. For link-to-column connections in eccentrically braced frames, inelastic rotation shall be computed based upon the assumption that inelastic action is concentrated at a single point located at the intersection of the centerline of the link with the face of the column.

Prototype : The connections, member sizes, steel properties, and other design, detailing, and construction features to be used in the actual building frame.