

A. Glossary

A

Acceleration-sensitive nonstructural component: A nonstructural component sensitive to and subject to damage from inertial loading. Once inertial loads are generated within the component, the deformation of the component may be significant; this is separate from the issue of deformation imposed on the component by structural deflections (see deformation-sensitive nonstructural components).

Acceptance criteria: Permissible values of such properties as drift, component strength demand, and inelastic deformation, used to determine the acceptability of a component's projected behavior at a given Performance Level.

Action: Sometimes called a generalized force, most commonly a single force or moment. However, an action may also be a combination of forces and moments, a distributed loading, or any combination of forces and moments. Actions always produce or cause displacements or deformations; for example, a bending moment action causes flexural deformation in a beam; an axial force action in a column causes axial deformation in the column; a torsional moment action on a building causes torsional deformations (displacements) in the building.

Allowable bearing capacity: Foundation load or stress commonly used in working-stress design (often controlled by long-term settlement rather than soil strength).

Aspect ratio: Ratio of height to width for vertical diaphragms, and width to depth for horizontal diaphragms.

Assembly: A collection of structural members and/or components connected in a such manner that load applied to any one component will affect the stress conditions of adjacent components.

B

Balloon framing: Continuous stud framing from sill to roof, with intervening floor joists nailed to studs and supported by a let-in ribbon. (See platform framing.)

Base: The level at which earthquake effects are considered to be imparted to the building.

Beam: A structural member whose primary function is to carry loads transverse to its longitudinal axis, usually a horizontal member in a seismic frame system.

Bearing wall: A wall that supports gravity loads of at least 200 pounds per linear foot from floors and/or roofs.

Bed joint: The horizontal layer of mortar on which a masonry unit is laid.

Boundary component (boundary member): A member at the perimeter (edge or opening) of a shear wall or horizontal diaphragm that provides tensile and/or compressive strength.

Boundary members: Portions along wall and diaphragm edges strengthened by longitudinal and transverse reinforcement and/or structural steel members.

Braced frame: An essentially vertical truss system of concentric or eccentric type that resists lateral forces.

BSE-1: Basic Safety Earthquake-1, which is the lesser of the ground shaking at a site for a 10%/50 year earthquake or two-thirds of the Maximum Considered Earthquake (MCE) at the site.

BSE-2: Basic Safety Earthquake-2, which is the ground shaking at a site for an MCE.

BSO: Basic Safety Objective, a Rehabilitation Objective in which the Life Safety Performance Level is reached for the BSE-1 demand and the Collapse Prevention Performance Level is reached for the BSE-2.

Building Performance Level: A limiting damage state, considering structural and nonstructural building components, used in the definition of Rehabilitation Objectives.

C

Capacity: The permissible strength or deformation for a component action.

Cavity wall: A masonry wall with an air space between wythes. Wythes are usually joined by wire reinforcement, or steel ties. Also known as a noncomposite wall.

Chevron bracing: See V-braced frame.

Chord: See diaphragm chord.

Clay tile masonry: Masonry constructed with hollow units made of clay tile. Typically, units are laid with cells running horizontally, and are thus ungrouted. In some cases, units are placed with cells running vertically, and may or may not be grouted.

Clay-unit masonry: Masonry constructed with solid, cored, or hollow units made of clay. Hollow clay units may be ungrouted, or grouted.

Coefficient of variation: For a sample of data, the ratio of the standard deviation for the sample to the mean value for the sample.

Collar joint: Vertical longitudinal joint between wythes of masonry or between masonry wythe and back-up construction that may be filled with mortar or grout.

Collector: See drag strut.

Column (or beam) jacketing: A method in which a concrete column or beam is covered with a steel or concrete “jacket” in order to strengthen and/or repair the member by confining the concrete.

Components: The basic structural members that constitute the building, such as beams, columns, slabs, braces, piers, coupling beams, and connections. Components, such as columns and beams, are combined to form elements (e.g., a frame).

Component, flexible: A component, including its attachments, having a fundamental period greater than 0.06 seconds.

Component, rigid: A component, including its attachments, having a fundamental period less than or equal to 0.06 seconds.

Composite masonry wall: Multiwythe masonry wall acting with composite action.

Composite panel: A structural panel comprising thin wood strands or wafers bonded together with exterior adhesive.

Concentric braced frame (CBF): A braced frame in which the members are subjected primarily to axial forces.

Concrete masonry: Masonry constructed with solid or hollow units made of concrete. Hollow concrete units may be ungrouted, or grouted.

Condition of service: The environment to which the structure will be subjected. Moisture conditions are the most significant issue; however, temperature can have a significant effect on some assemblies.

Connection: A link between components or elements that transmits actions from one component or element to another component or element. Categorized by type of action (moment, shear, or axial), connection links are frequently nonductile.

Contents: Movable items within the building introduced by the owner or occupants.

Continuity plates: Column stiffeners at top and bottom of the panel zone.

Control node: The node in the mathematical model of a building used to characterize mass and earthquake displacement.

Corrective measure: Any modification of a component or element, or the structure as a whole, intended to reduce building vulnerability.

Coupling beam: Flexural member that ties or couples adjacent shear walls acting in the same plane. A coupling beam is designed to yield and dissipate inelastic energy, and, when properly detailed and proportioned, has a significant effect on the overall stiffness of the coupled wall.

Cripple studs: Short studs between header and top plate at opening in wall framing or studs between base sill and sill of opening.

Cripple wall: Short wall between foundation and first floor framing.

Critical action: That component action that reaches its elastic limit at the lowest level of lateral deflection, or loading, for the structure.

Crosstie: A beam or girder that spans across the width of the diaphragm, accumulates the wall loads, and transfers them, over the full depth of the diaphragms, into the next bay and onto the nearest shear wall or frame.

D

Decay: Decomposition of wood caused by action of wood-destroying fungi. The term “dry rot” is used interchangeably with decay.

Decking: Solid sawn lumber or glued laminated decking, nominally two to four inches thick and four inches and wider. Decking may be tongue-and-groove or connected at longitudinal joints with nails or metal clips.

Deep foundation: Piles or piers.

Deformation: Relative displacement or rotation of the ends of a component or element.

Deformation-sensitive nonstructural component: A nonstructural component sensitive to deformation imposed on it by the drift or deformation of the structure, including deflection or deformation of diaphragms.

Demand: The amount of force or deformation imposed on an element or component.

Design displacement: The design earthquake displacement of an isolation or energy dissipation system, or elements thereof, excluding additional displacement due to actual and accidental torsion.

Design resistance: Resistance (force or moment as appropriate) provided by member or connection; the product of adjusted resistance, the resistance factor, confidence factor, and time effect factor.

Diagonal bracing: Inclined structural members carrying primarily axial load, employed to enable a structural frame to act as a truss to resist horizontal loads.

Diaphragm: A horizontal (or nearly horizontal) structural element used to distribute inertial lateral forces to vertical elements of the lateral-force-resisting system.

Diaphragm chord: A diaphragm component provided to resist tension or compression at the edges of the diaphragm.

Diaphragm collector: A diaphragm component provided to transfer lateral force from the diaphragm to vertical elements of the lateral-force-resisting system or to other portions of the diaphragm.

Diaphragm ratio: See aspect ratio.

Differential compaction: An earthquake-induced process in which loose or soft soils become more compact and settle in a nonuniform manner across a site.

Dimensioned lumber: Lumber from nominal two through four inches thick and nominal two or more inches wide.

Displacement: The total movement, typically horizontal, of a component or element or node.

Displacement restraint system: Collection of structural components and elements that limit lateral displacement of seismically-isolated buildings during the BSE-2.

Displacement-dependent energy dissipation devices: Devices having mechanical properties such that the force in the device is related to the relative displacement in the device.

Dowel bearing strength: The maximum compression strength of wood or wood-based products when subjected to bearing by a steel dowel or bolt of specific diameter.

Dowel type fasteners: Includes bolts, lag screws, wood screws, nails, and spikes.

Drag strut: A component parallel to the applied load that collects and transfers diaphragm shear forces to the vertical lateral-force-resisting components or elements, or distributes forces within a diaphragm. Also called collector, diaphragm strut, or tie.

Dressed size: The dimensions of lumber after surfacing with a planing machine. Usually 1/2 to 3/4 inch less than nominal size.

Dry service: Structures wherein the maximum equilibrium moisture content does not exceed 19%.

Dual system: A structural system included in buildings with the following features:

- An essentially complete space frame provides support for gravity loads.
- Resistance to lateral load is provided by concrete or steel shear walls, steel eccentrically braced frames (EBF), or concentrically braced frames (CBF) along with moment-resisting frames (Special Moment Frames, or Ordinary Moment Frames) that are capable of resisting at least 25% of the lateral loads.
- Each system is also designed to resist the total lateral load in proportion to its relative rigidity.

E

Eccentric braced frame (EBF): A diagonal braced frame in which at least one end of each diagonal bracing member connects to a beam a short distance from a beam-to-column connection or another brace end.

Edge distance: The distance from the edge of the member to the center of the nearest fastener. When a member is loaded perpendicular to the grain, the loaded edge shall be defined as the edge in the direction toward which the fastener is acting.

Effective damping: The value of equivalent viscous damping corresponding to the energy dissipated by the building, or element thereof, during a cycle of response.

Effective stiffness: The value of the lateral force in the building, or an element thereof, divided by the corresponding lateral displacement.

Element: An assembly of structural components that act together in resisting lateral forces, such as moment-resisting frames, braced frames, shear walls, and diaphragms.

Energy dissipation device (EDD): Non-gravity-load-supporting element designed to dissipate energy in a stable manner during repeated cycles of earthquake demand.

Energy dissipation system (EDS): Complete collection of all energy dissipation devices, their supporting framing, and connections.

F

Fault: Plane or zone along which earth materials on opposite sides have moved differentially in response to tectonic forces.

Flexible connections: Connections between components that permit rotational and/or translational movement without degradation of performance. Examples include universal joints, bellows expansion joints, and flexible metal hose.

Flexible diaphragm: A diaphragm that meets requirements of Section 3.2.4.

Footing: A structural component transferring the weight of a building to the foundation soils and resisting lateral loads.

Foundation soils: Soils supporting the foundation system and resisting vertical and lateral loads.

Foundation springs: Method of modeling to incorporate load-deformation characteristics of foundation soils.

Foundation system: Structural components (footings, piles).

Framing type: Type of seismic resisting system.

Fundamental period: The first mode period of the building in the direction under consideration.

G

Gauge or row spacing: The center-to-center distance between fastener rows or gauge lines.

Glulam beam: Shortened term for glued-laminated beam.

Grade: The classification of lumber in regard to strength and utility, in accordance with the grading rules of an approved agency.

Grading rules: Systematic and standardized criteria for rating the quality of wood products.

Gypsum wallboard or drywall: An interior wall surface sheathing material sometimes considered for resisting lateral forces.

H

Hazard level: Earthquake shaking demands of specified severity, determined on either a probabilistic or deterministic basis.

Head joint: Vertical mortar joint placed between masonry units in the same wythe.

Hold-down: Hardware used to anchor the vertical chord forces to the foundation or framing of the structure in order to resist overturning of the wall.

Hollow masonry unit: A masonry unit whose net cross-sectional area in every plane parallel to the bearing surface is less than 75% of the gross cross-sectional area in the same plane.

I

Infill: A panel of masonry placed within a steel or concrete frame. Panels separated from the surrounding frame by a gap are termed "isolated infills". Panels that are in tight contact with a frame around its full perimeter are termed "shear infills."

In-plane wall: See shear wall.

Inter-story drift: The relative horizontal displacement of two adjacent floors in a building. Inter-story drift can also be expressed as a percentage of the story height separating the two adjacent floors.

Isolation interface: The boundary between the upper portion of the structure (superstructure), which is isolated, and the lower portion of the structure, which moves rigidly with the ground.

Isolation system: The collection of structural elements that includes all individual isolator units, all structural elements that transfer force between elements of the isolation system, and all connections to other structural elements. The isolation system also includes the wind-restraint system.

Isolator unit: A horizontally flexible and vertically stiff structural element of the isolation system that permits large lateral deformations under seismic load. An isolator unit may be used either as part of or in addition to the weight-supporting system of the building.

J

Joint: Area where two or more ends, surfaces, or edges are attached. Categorized by type of fastener or weld used and method of force transfer.

K

King stud: Full height stud or studs adjacent to openings that provide out-of-plane stability to cripple studs at openings.

L

Landslide: A down-slope mass movement of earth resulting from any cause.

Lateral support member: Member designed to inhibit lateral buckling or lateral-torsional buckling of a component.

Lateral-force-resisting system: Those elements of the structure that provide its basic lateral strength and stiffness, and without which the structure would be laterally unstable.

Light framing: Repetitive framing with small uniformly spaced members.

Linear procedure: Analysis based on a straight-line (elastic) force-versus-displacement relationship.

Link: In an EBF, the segment of a beam that extends from column to brace, located between the end of a diagonal brace and a column, or between the ends of two diagonal braces of the EBF. The length of the link is defined as the clear distance between the diagonal brace and the column face or between the ends of two diagonal braces.

Link intermediate web stiffeners: Vertical web stiffeners placed within the link.

Link rotation angle: The angle of plastic rotation between the link and the beam outside of the link derived using the specified base shear, V .

Liquefaction: An earthquake-induced process in which saturated, loose, granular soils lose a substantial amount of shear strength as a result of increase in pore-water pressure during earthquake shaking.

Load duration: The period of continuous application of a given load, or the cumulative period of intermittent applications of load. (See time effect factor.)

Load path: A path that seismic forces pass through to the foundation of the structure and, ultimately, to the soil. Typically, the load travels from the diaphragm through connections to the vertical lateral-force-resisting elements, and then proceeds to the foundation by way of additional connections.

Load sharing: The load redistribution mechanism among parallel components constrained to deflect together.

Load/slip constant: The ratio of the applied load to a connection and the resulting lateral deformation of the connection in the direction of the applied load.

LRFD (Load and Resistance Factor Design): A method of proportioning structural components (members, connectors, connecting elements, and assemblages) using load and resistance factors such that no applicable limit state is exceeded when the structure is subjected to all design load and resistance factor combinations using load and resistance factors such that no applicable limit state is exceeded when the structure is subjected to all design load combinations.

Lumber: The product of the sawmill and planing mill, usually not further manufactured other than by sawing, resawing, passing lengthwise through a standard planing machine, crosscutting to length, and matching.

Lumber size: Lumber is typically referred to by size classifications. Additionally, lumber is specified by manufacturing classification. Rough lumber and dressed lumber are two of the routinely used manufacturing classifications.

M

Masonry: The assemblage of masonry units, mortar and possibly grout and/or reinforcement. Types of masonry are classified herein with respect to the type of the masonry units such as clay-unit masonry, concrete masonry, or hollow-clay tile masonry.

Mat-formed panel: A structural panel designation representing panels manufactured in a mat-formed process, such as oriented strand board and waferboard.

Maximum Considered Earthquake (MCE): An extreme earthquake hazard level used in the formation of Rehabilitation Objectives. (See BSE-2.)

Maximum displacement: The maximum earthquake displacement of an isolation or energy dissipation system, or elements thereof, excluding additional displacement due to actual or accidental torsion.

Mean return period: The average period of time, in years, between the expected occurrences of an earthquake of specified severity.

Model Building Type: Fifteen common building types used to categorize expected deficiencies, reasonable rehabilitation methods, and estimated costs. See Table 10-2 for descriptions of Model Building Types.

Moisture content: The weight of the water in wood expressed as a percentage of the weight of the oven-dried wood.

Moment frame: A building frame system in which seismic shear forces are resisted by shear and flexure in members and joints of the frame.

N

Narrow wood shear wall: Wood shear walls with an aspect ratio (height to width) greater than two to one. These walls are relatively flexible and thus tend to be incompatible with other building components, thereby taking less shear than would be anticipated when compared to wider walls.

Nominal size: The approximate rough-sawn commercial size by which lumber products are known and sold in the market. Actual rough-sawn sizes vary from the nominal. Reference to standards or grade rules is required to determine nominal to actual finished size relationships, which have changed over time.

Nominal strength: The capacity of a structure or component to resist the effects of loads, as determined by computations using specified material strengths and dimensions and formulas derived from accepted principles of structural mechanics, or by field tests or laboratory tests of scaled models, allowing for modeling effects, and differences between laboratory and field conditions.

Nonbearing wall: A wall that supports gravity loads less than as defined for a bearing wall.

Noncompact member: A steel section in compression whose width-to-thickness ratio does not meet the limiting values for compactness, as shown in Table B5.1 of AISC (1986).

Noncomposite masonry wall: Multiwythe masonry wall acting without composite action.

Nonlinear procedure: Analysis based on and including both elastic and post-yield force-versus-displacement relationships.

Nonstructural component: An architectural, mechanical, plumbing, or electrical component, or item of interior equipment and furnishing, permanently installed in the building, as listed in Table 11-1.

Nonstructural Performance Level: A limiting damage state for nonstructural building components used to define Rehabilitation Objectives.

O

Ordinary Moment Frame (OMF): A moment frame system that meets the requirements for Ordinary Moment Frames as defined in seismic provisions for new construction in AISC (1994a), Chapter 5.

Oriented strandboard: A structural panel comprising thin elongated wood strands with surface layers arranged in the long panel direction and core layers arranged in the cross panel direction.

Out-of-plane wall: A wall that resists lateral forces applied normal to its plane.

Overturning: When the moment produced at the base of vertical lateral-force-resisting elements is larger than the resistance provided by the foundation's uplift resistance and building weight.

P

Panel: A sheet-type wood product.

Panel rigidity or stiffness: The in-plane shear rigidity of a panel, the product of panel thickness and modulus of rigidity.

Panel shear: Shear stress acting through the panel thickness.

Panel zone: Area of a column at the beam-to-column connection delineated by beam and column flanges.

Parametric analysis: Repetitive analyses performed in which one or more independent parameters are varied for the ultimate purpose of optimizing a dependent (earthquake response) parameter.

Parapet: Portions of a wall extending above the roof diaphragm. Parapets can be considered as flanges to roof diaphragms if adequate connections exist or are provided.

Partially grouted masonry wall: A masonry wall containing grout in some of the cells.

Particleboard: A panel manufactured from small pieces of wood, hemp, and flax, bonded with synthetic or organic binders, and pressed into flat sheets.

P- Δ effect: Secondary effect of column axial loads and lateral deflection on the shears and moments in various components of a structure.

Perforated wall or infill panel: A wall or panel not meeting the requirements for a solid wall or infill panel.

Pier: Similar to pile; usually constructed of concrete and cast in place.

Pile: A deep structural component transferring the weight of a building to the foundation soils and resisting vertical and lateral loads; constructed of concrete, steel, or wood; usually driven into soft or loose soils.

Pitch or spacing: The longitudinal center-to-center distance between any two consecutive holes or fasteners in a row.

Plan irregularity: Horizontal irregularity in the layout of vertical lateral-force-resisting elements, thus producing a differential between the center of mass and center of rigidity, that typically results in significant torsional demands on the structure.

Planar shear: The shear that occurs in a plane parallel to the surface of a panel, which has the ability to cause the panel to fail along the plies in a plywood panel or in a random layer in a nonveneer or composite panel.

Platform framing: Construction method in which stud walls are constructed one floor at a time, with a floor or roof joist bearing on top of the wall framing at each level.

Ply: A single sheet of veneer, or several strips laid with adjoining edges that form one veneer lamina in a glued plywood panel.

Plywood: A structural panel comprising plies of wood veneer arranged in cross-aligned layers. The plies are bonded with an adhesive that cures upon application of heat and pressure.

Pole: A round timber of any size or length, usually used with the larger end in the ground.

Pole structure: A structure framed with generally round continuous poles that provide the primary vertical frame and lateral-load-resisting system.

Pounding: Two adjacent buildings coming in contact during earthquake excitation because they are too close together and/or exhibit different dynamic deflection characteristics.

Prescriptive ultimate bearing capacity: Assumption of ultimate bearing capacity based on properties prescribed in Section 4.4.1.2.

Preservative: A chemical that, when suitably applied to wood, makes the wood resistant to attack by fungi, insects, marine borers, or weather conditions.

Pressure-preservative treated wood: Wood products pressure-treated by an approved process and preservative.

Presumptive ultimate bearing capacity: Assumption of ultimate bearing capacity based on allowable loads from original design.

Primary (strong) panel axis: The direction that coincides with the length of the panel.

Primary component: Those components that are required as part of the building's lateral-force-resisting system (as contrasted to secondary components).

Primary element: An element that is essential to the ability of the structure to resist earthquake-induced deformations.

Punched metal plate: A light steel plate fastening having punched teeth of various shapes and configurations that are pressed into wood members to effect transfer shear. Used with structural lumber assemblies.

R

Redundancy: Quality of having alternative paths in the structure by which the lateral forces are resisted, allowing the structure to remain stable following the failure of any single element.

Re-entrant corner: Plan irregularity in a diaphragm, such as an extending wing, plan inset, or E-, T-, X-, or L-shaped configuration, where large tensile and compressive forces can develop.

Rehabilitation Method: A procedural methodology for the reduction of building earthquake vulnerability.

Rehabilitation Objective: A statement of the desired limits of damage or loss for a given seismic demand, which is usually selected by the owner, engineer, and/or relevant public agencies. (See Chapter 2.)

Rehabilitation strategy: A technical approach for developing rehabilitation measures for a building to reduce its earthquake vulnerability.

Reinforced masonry (RM) wall: A masonry wall that is reinforced in both the vertical and horizontal directions. The sum of the areas of horizontal and vertical reinforcement must be at least 0.002 times the gross cross-sectional area of the wall, and the minimum area of reinforcement in each direction must be not less than 0.0007 times the gross cross-sectional area of the wall. Reinforced walls are assumed to resist loads through resistance of the masonry in compression and the reinforcing steel in tension or compression. Reinforced masonry is partially grouted or fully grouted.

Repointing: A method of repairing a cracked or deteriorating mortar joint in masonry. The damaged or deteriorated mortar is removed and the joint is refilled with new mortar.

Required member resistance: Load effect (force, moment, stress, action as appropriate) acting on an element or connection, determined by structural analysis from the factored loads and the critical load combinations.

Required strength: Load effect (force, moment, stress, as appropriate) acting on a component or connection determined by structural analysis from the factored loads (using most appropriate critical load combinations).

Resistance: The capacity of a structure, component, or connection to resist the effects of loads. It is determined by computations using specified material strengths, dimensions, and formulas derived from accepted principles of structural mechanics, or by field or laboratory tests of scaled models, allowing for modeling effects and differences between laboratory and field conditions.

Resistance factor: A reduction factor applied to member resistance that accounts for unavoidable deviations of the actual strength from the nominal value, and the manner and consequences of failure.

Retaining wall: A free-standing wall that has soil on one side.

Rigid diaphragm: A diaphragm that meets requirements of Section 3.2.4

Rough lumber: Lumber as it comes from the saw prior to any dressing operation.

Row of fasteners: Two or more fasteners aligned with the direction of load.

Running bond: A pattern of masonry where the head joints are staggered between adjacent courses by more than a third of the length of a masonry unit. Also refers to the placement of masonry units such that head joints in successive courses are horizontally offset at least one-quarter the unit length.

S

Seasoned lumber: Lumber that has been dried. Seasoning takes place by open-air drying within the limits of moisture contents attainable by this method, or by controlled air drying (i.e., kiln drying).

Secondary component: Those components that are not required for lateral force resistance (contrasted to Primary Components). They may or may not actually resist some lateral forces.

Secondary component: Those components that are not required for lateral force resistance (contrasted to primary components). They may or may not actually resist some lateral forces.

Secondary element: An element that does not affect the ability of the structure to resist earthquake-induced deformations.

Seismic demand: Seismic hazard level commonly expressed in the form of a ground shaking response spectrum. It may also include an estimate of permanent ground deformation.

Shallow foundation: Isolated or continuous spread footings or mats.

Shear wall: A wall that resists lateral forces applied parallel with its plane. Also known as an in-plane wall.

Sheathing: Lumber or panel products that are attached to parallel framing members, typically forming wall, floor, ceiling, or roof surfaces.

Short captive column: Columns with height-to-depth ratios less than 75% of the nominal height-to-depth ratios of the typical columns at that level. These columns, which may not be designed as part of the primary lateral-load-resisting system, tend to attract shear forces because of their high stiffness relative to adjacent elements.

Shrinkage: Reduction in the dimensions of wood due to a decrease of moisture content.

Simplified Rehabilitation Method: An approach, applicable to some types of buildings and Rehabilitation Objectives, in which analyses of the entire building's response to earthquake hazards are not required.

Slip-critical joint: A bolted joint in which slip resistance of the connection is required.

Solid masonry unit: A masonry unit whose net cross-sectional area in every plane parallel to the bearing surface is 75% or more of the gross cross-sectional area in the same plane.

Solid wall or solid infill panel: A wall or infill panel with openings not exceeding 5% of the wall surface area. The maximum length or height of an opening in a solid wall must not exceed 10% of the wall width or story height. Openings in a solid wall or infill panel must be located within the middle 50% of a wall length and story height, and must not be contiguous with adjacent openings.

Special Moment Frame (SMF): A moment frame system that meets the special requirements for frames as defined in seismic provisions for new construction.

SPT N-Values: Using a standard penetration test (ASTM Test D1586), the number of blows of a 140-pound hammer falling 30 inches required to drive a standard 2-inch-diameter sampler a distance of 12 inches.

Stack bond: In contrast to running bond, usually a placement of units such that the head joints in successive courses are aligned vertically.

Stiff diaphragm: A diaphragm that meets requirements of Section 3.2.4.

Storage racks: Industrial pallet racks, movable shelf racks, and stacker racks made of cold-formed or hot-rolled structural members. Does not include other types of racks such as drive-in and drive-through racks, cantilever wall-hung racks, portable racks, or racks made of materials other than steel.

Strength: The maximum axial force, shear force, or moment that can be resisted by a component.

Stress resultant: The net axial force, shear, or bending moment imposed on a cross section of a structural component.

Strong back system: A secondary system, such as a frame, commonly used to provide out-of-plane support for an unreinforced or under-reinforced masonry wall.

Strong column-weak beam: The capacity of the column at any moment frame joint must be greater than those of the beams, in order to ensure inelastic action in the beams, thereby localizing damage and controlling drift.

Structural Performance Level: A limiting structural damage state, used in the definition of Rehabilitation Objectives.

Structural Performance Range: A range of structural damage states, used in the definition of Rehabilitation Objectives.

Structural system: An assemblage of load-carrying components that are joined together to provide regular interaction or interdependence.

Structural-use panel: A wood-based panel product bonded with an exterior adhesive, generally 4' x 8' or larger in size. Included under this designation are plywood, oriented strand board, waferboard, and composite panels. These panel products meet the requirements of PS 1-83 or PS 2-92 and are intended for structural use in residential, commercial, and industrial applications.

Stud: Wood member used as vertical framing member in interior or exterior walls of a building, usually 2" x 4" or 2" x 6" sizes, and precision end-trimmed.

Subassembly: A portion of an assembly.

Subdiaphragm: A portion of a larger diaphragm used to distribute loads between members.

Systematic Rehabilitation Method: An approach to rehabilitation in which complete analysis of the building's response to earthquake shaking is performed.

T

Target displacement: An estimate of the likely building roof displacement in the design earthquake.

Tie: See **drag strut**.

Tie-down: Hardware used to anchor the vertical chord forces to the foundation or framing of the structure in order to resist overturning of the wall.

Tie-down system: The collection of structural connections, components, and elements that provide restraint against uplift of the structure above the isolation system.

Timbers: Lumber of nominal five or more inches in smaller cross-section dimension.

Time effect factor: A factor applied to adjusted resistance to account for effects of duration of load. (See load duration.)

Total design displacement: The BSE-1 displacement of an isolation or energy dissipation system, or elements thereof, including additional displacement due to actual and accidental torsion.

Total maximum displacement: The maximum earthquake displacement of an isolation or energy dissipation system, or elements thereof, including additional displacement due to actual and accidental torsion.

Transverse wall: A wall that is oriented transverse to the in-plane shear walls, and resists lateral forces applied normal to its plane. Also known as an out-of-plane wall.

U

Ultimate bearing capacity: Maximum possible foundation load or stress (strength); increase in deformation or strain results in no increase in load or stress.

Unreinforced masonry (URM) wall: A masonry wall containing less than the minimum amounts of reinforcement as defined for masonry (RM) walls. An unreinforced wall is assumed to resist gravity and lateral loads solely through resistance of the masonry materials.

V

V-braced frame: A concentric braced frame (CBF) in which a pair of diagonal braces located either above or below a beam is connected to a single point within the clear beam span. Where the diagonal braces are below the beam, the system also is referred to as an “inverted V-brace frame,” or “chevron bracing.”

Velocity-dependent energy dissipation devices (EDDs): Devices having mechanical characteristics such that the force in the device is dependent on the relative velocity in the device.

Vertical irregularity: A discontinuity of strength, stiffness, geometry, or mass in one story with respect to adjacent stories.

W

Waferboard: A nonveneered structural panel manufactured from two- to three-inch flakes or wafers bonded together with a phenolic resin and pressed into sheet panels.

Wind-restraint system: The collection of structural elements that provides restraint of the seismic-isolated structure for wind loads. The wind-restraint system may be either an integral part of isolator units or a separate device.

Wythe: A continuous vertical section of a wall, one masonry unit in thickness.

X

X-braced frame: A concentric braced frame (CBF) in which a pair of diagonal braces crosses near the mid-length of the braces.

Y

Y-braced frame: An eccentric braced frame (EBF) in which the stem of the Y is the link of the EBF system.

