

**CITY OF SAN JOSE
PROPOSED AMENDMENTS
TO
THE 2010 CALIFORNIA BUILDING CODE
CCR Title 24, Part 2**

The following is a summary of the City of San Jose (CSJ) proposed changes to the 2010 California Building Standards.

I. CALIFORNIA BUILDING CODE (CBC)

A. Automatic Fire Sprinklers

1. CBC sections 903.2.1 through 903.2.18 delineate the criteria for determining when automatic fire sprinklers are required in a building. CSJ proposes additional criteria for requiring automatic fire sprinklers as follows:
 - Throughout existing buildings and structures where an increase is made to the floor area that results in the building exceeding 10,000 square feet.
 - Throughout existing buildings that are greater than 10,000 square feet wherein a change of occupancy that is more hazardous per the table below is made.

OCCUPANCY HAZARD CATEGORIES

RELATIVE HAZARD	OCCUPANCY CLASSIFICATIONS
1 (Highest Hazard)	H
2	I-2, I-3, I-4
3	A, E, M, R-1, R-2, R-4
4	B, F-1, R-3, S-1
5 (Lowest Hazard)	F-2, S-2, U

- Throughout new one- and two-family dwellings and townhouses.
 - Throughout existing one- and two-family dwellings where an increase of over 500 square feet is made to the floor area that results in the building exceeding 3600 square feet.
 - Throughout buildings and structures that are four or more stories in height, regardless of floor area.
 - Throughout new buildings and structures that exceed 6,200 square feet.
 - In new buildings and structures described in sections 903.2.1 through 903.2.17.2.6.
2. CBC sections 402.9 and 403.3 exempt open-parking garages in covered mall and high-rise buildings automatic fire sprinkler coverage. CSJ proposes to require automatic fire sprinklers in these open-parking garages.
 3. CBC sections 402.9, 403.3, 404.3, 410.6, and 903.3.1.1.1 exempt the following spaces from automatic fire sprinkler coverage:
 - open-parking garages in covered mall and high-rise buildings
 - certain areas adjacent to or above an atrium
 - atriums with ceilings more than 55 feet above the floor
 - under stage areas with less than 4 feet clear height

- stages that are 1,000 square-feet or less in area and 50 feet in height and with curtains, scenery, or other combustible hangings that are not vertically retractable.
- rooms where the application of water, or flame and water, constitutes a serious life or fire hazard
- rooms or spaces where fire sprinklers are considered undesirable because of the nature of the contents
- fire service access elevator machine rooms and machinery spaces
- areas in telecommunications buildings used exclusively for telecommunications equipment, and associated electrical power distribution equipment provided proper separation from adjacent spaces are provided and a smoke-detection fire alarm system is provided.

CSJ proposes to require automatic fire sprinklers in all these spaces.

4. CSJ proposes to add CBC section 903.2.8.1 to require fire sprinkler protection for exterior balconies, decks and ground floor patios of dwelling units where the building is of Type V construction and provided there is a roof deck above.
5. CSJ does not intend to adopt NFPA 13R, the standard the state codes prescribes for multi-family buildings. Instead, CSJ proposes to require automatic fire sprinklers in multi-family buildings to be designed in accordance with NFPA 13.
6. Please see Part III of this document for amendments to NFPA 13D – Sprinkler System Standard for One and two Family Dwellings; NFPA 13 – Sprinkler System Installation Standards; NFPA 14 Standard for Installation of Standpipe and Hosepipe; NFPA 20 – Standard for Installation of Centrifugal Fire Pumps; NFPA 24 – Standard for Private Fire Mains; NFPA 72 – Standard for Fire Alarm Systems; NFPA 2001 – Installation Standard for Clean Agent Extinguishing Systems; and NFPA 318 – Installation Standard for Fire Protection Systems in Clean Rooms.

B. Single Room Occupancy Units

CBC 1208.4 delineates the requirements for Efficiency Dwelling Units. CSJ proposes to replace this section to define the requirements for Single Room Occupancies. The table below presents the differences between the requirements for an Efficiency Dwelling Unit and a Single Room Occupancy.

Efficiency Dwelling Unit	Single Room Occupancy
The unit shall have a living room not less than 220 square-feet of floor area	The unit shall have a living room not less than 150 square-feet of superficial floor area
The unit shall be provided with a kitchen sink, cooking appliance and refrigeration facilities are required in each unit	The unit shall be provided with a kitchen sink; however, SRO living unit facilities and SRO residential hotels may contain partial kitchen facilities as long as a sink is provided and laundry facilities and kitchen facilities are provided on each floor accessible from a public hallway.
The unit shall be provided with a separate bathroom containing a water closet, lavatory and bathtub or shower	Every SRO unit shall be provided with a bathroom equipped with facilities consisting of a water closet, lavatory and either a bathtub or shower; however, that single room occupancy residential hotels may contain partial bathroom facilities. If individual bath facilities are not provided, common bath facilities must be provided as follows: 1. Where private water closets, lavatories and baths are not provided, there shall be provided on each floor, for each sex, at least one water closet and lavatory and one bath, accessible

	<p>from a public hallway.</p> <ol style="list-style-type: none"> 2. Additional water closets, lavatories and baths shall be provided on each floor for each sex at the rate of one for every additional ten guests or fractional number thereof in excess of ten. 3. Such facilities shall be clearly marked for "men" or "women". As an alternative, adequate unisex facilities may be provided. 4. Each sink lavatory and either a bathtub or shower shall be equipped with hot and cold running water necessary for its normal operation.
None	<p>Every building shall be provided with at least one water closet. Every hotel or subdivision thereof where both sexes are accommodated shall contain at least two separate toilet facilities which are conspicuously identified for male and female use, each of which contains at least one water closet. EXCEPTION: SRO Hotel guest rooms may have one unidentified toilet facility.</p>
None	<p>Additional water closets shall be provided on each floor for each sex at the rate of one for every additional ten guests, or fractional thereof, in excess of ten.</p>
None	<p>All SRO units shall comply with all applicable accessibility and adaptability requirements.</p>

C. Structural Design

1. ASCE 7-05

- *P-Delta Effects*: Equation 12.8-16 of section 12.8.7 is $\theta = (P_x \Delta) / (V_x h_{sx} C_d)$. CSJ proposes to modify this equation to $\theta = (P_x \Delta I) / (V_x h_{sx} C_d)$
- CSJ proposes to change the values of 'X' in Table 12.8.2. The proposed table will read as follows:

**TABLE 12.8-2 VALUES OF APPROXIMATE PERIOD
PARAMETERS C_t AND x**

Structure Type	C_t	x
Moment-resisting frame systems in which the frames resist 100% of the required seismic force and are not enclosed or adjoined by components that are more rigid and will prevent frames from deflecting where subjected to seismic forces:		
Steel moment-resisting frame	0.028 (0.0724) ^a	0.8
Concrete moment-resisting frames	0.016 (0.0466) ^a	0.9
Eccentrically braced steel frames and buckling-restrained braced frames	0.03 (0.0731) ^a	0.75
All other structural systems	0.02 (0.0488) ^a	0.75

a – Metric equivalents are shown in parenthesis

- CBC Section 1613.6.7 *Minimum Distance for Building Separation* is $\Delta_M = C_d \delta_{max} / I$. CSJ proposes to modify this equation to $\Delta_M = C_d \delta_{max}$ where: C_d = deflection amplification factor in Table 12.2-1 of ASCE 7
 δ_{max} = maximum displacement defined in Section 12.8.4.3 of ASCE 7

D. Structural Tests and Special Inspections

- CBC section 1704.4 exempts concrete special inspections of isolated spread footings for buildings three stories or less above grade plane that are fully supported on earth or rock. CSJ proposes to limit this exception to the footings designed based on a specified compressive strength (f'_c) of no greater than 2,500 pounds per square inch.

E. Gypsum Board, Gypsum Lath, and Cement Plaster

- CBC sections 2301.2 and 2308.1 allow the provision of the AF&PA WFCM for wood conventional light-frame construction. CSJ proposes to disallow this provision.
- CSJ proposes to add CBC sections 2306.8 and 2306.9 to clearly define the maximum size and shape of diaphragms and shear walls for different type of materials as follows:

2306.8 Diaphragm Aspect Ratios

Size and shape of diaphragms shall be limited to the following aspect ratios:

**MAXIMUM DIAPHRAGM DIMENSION RATIOS
(HORIZONTAL AND SLOPED DIAPHRAGM)**

TYPE	MAXIMUM LENGTH- WIDTH RATIO
Wood structural panel, nailed all edges	4:1
Wood structural panel, blocking omitted at intermediate joints	3:1
Diagonal sheathing, single	3:1
Diagonal sheathing, double	4:1

2306.9 Shear Wall Aspect Ratios

Size and shape of shear walls shall be limited to the following aspect ratios:

MAXIMUM SHEAR WALL DIMENSION RATIOS

TYPE	MAXIMUM HEIGHT- WIDTH RATIO
Wood structural panels, blocked	For other than seismic: 3½:1 For seismic: 2:1^a
Diagonal sheathing, single	2:1
Particleboard, blocked	2:1
Fiberboard	1:1

a – For design to resist seismic forces, shear wall height-width ratios greater than 2:1, but not exceeding 3½:1, are permitted provided the allowable shear values in Table 2306.3 are multiplied by 2w/h.

3. CBC section 2308.3.4 does not differentiate the foundation requirement for one and two story conventional light-framed buildings. CSJ proposes to specify the requirement for one and two story buildings as follows:

2308.3.4 Braced wall line support. Braced wall lines shall be supported by continuous foundations.

Exceptions:

1. **One-story buildings with maximum plan dimension not exceeding 50 feet (15240 mm), may have continuous foundations located at exterior braced wall lines only.**
2. **Two-story buildings with a maximum plan dimension not exceeding 50 feet (5240 mm) may have braced wall lines supported on continuous foundations at the exterior walls only, provided:**
 - a. **Cripple walls do not exceed 4 feet (1219 mm) in height.**
 - b. **Where the first story is supported on a raised wood framed floor, the interior braced wall panels are directly supported by either doubled joists, continuous 4x blocking or minimum 4x floor beams.**
4. CBC section 2308.9.3 allows certain type of construction for the conventional lateral bracing. CSJ proposes to limit the use of certain braced wall construction by amending the whole section to omit diagonal bracing and gypsum board sheathing materials for use in braced wall panels.
5. CSJ proposes to amend section 2308.12.4 for braced wall line sheathing to reflect the CSJ proposed braced wall (Section 2308.9.3 Bracing) construction criteria to specify the maximum spacing of wall studs and the minimum nailing requirements for sheathing.
6. CSJ proposes to amend Table 2308.12.4 to limit fiberboard, particleboard, portland cement plaster, wood structural panels and diagonal wood sheathing to one story non-residential buildings. Table 2308.12.4 footnote 'd' referring to the table's application for one and two family dwellings is deleted.

7. CSJ proposes additional sheathing attachment requirement of section 2308.12.5 to require all braced wall panels to extend to the roof sheathing and attach to the roof framing through mechanical means (e.g. nails and/or metal framing clip angles).

F. Existing Structures

CSJ proposes the following amendments to allow for more ready availability of FEMA assistance in compliance with the Robert T. Stafford Relief and Emergency Assistance Act.

1. CBC section 3405.2.1 establishes the evaluation provisions for buildings that have sustained substantial structural damage to vertical elements of the lateral-force resisting system. CSJ proposes to amend this section to specify that the seismic *evaluation* of existing buildings shall be based on ASCE 31, and that seismic *rehabilitation* of existing buildings shall be based on ASCE 41.
2. CSJ proposes to amend CBC section 3405.2.1 to specify the requirements for meeting CBC level seismic forces or reduced CBC level seismic forces. The table below presents the differences between the requirements.

CBC level seismic forces	Reduced CBC level seismic forces
100% of the values prescribed in the CBC	75% of the values prescribed in the CBC
Values based on ASCE 41	In accordance with the CEBC and chapters in Appendix A of the IEBC: <ol style="list-style-type: none"> 1. The seismic evaluation and design of unreinforced masonry bearing wall buildings in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A1 of CEBC. 2. Seismic evaluation and design of the wall anchorage system in reinforced concrete and reinforced masonry wall buildings with flexible diaphragms in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A2 of IEBC. 3. Seismic evaluation and design of cripple walls and sill plate anchorage in residential buildings of light-frame wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A3 of IEBC.

	<ol style="list-style-type: none">4. Seismic evaluation and design of soft, weak, or open-front wall conditions in multiunit residential buildings of wood construction in Occupancy Category I or II are permitted to be based on the procedures specified in Appendix Chapter A4 of IEBC.5. Seismic evaluation and design of concrete buildings and concrete with masonry infill buildings in all Occupancy Categories are permitted to be based on the procedures specified in Appendix Chapter A5 of IEBC.
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

G. Reference Standards

CSJ proposes to amend the reference standards of CBC Chapter 35 to include ASCE 31-03 for Seismic Evaluation of Existing Buildings, and ASCE 41-06 for Seismic Rehabilitation of Existing Buildings.

II. CALIFORNIA RESIDENTIAL CODE (CRC)

A. Adopted appendices

1. CSJ proposes to adopt the following appendices of the California Residential Code:
 - Appendix E: Manufactured Housing Used as Dwelling (excluding Sections AE101 through AE 307)
 - Appendix G: Swimming Pools, Spas and Hot Tubs
 - Appendix H: Patio Covers
 - Appendix K: Sound Transmission

B. Building Planning

1. CRC section R301.1.1 cites provisions that can be employed as an alternative to CRC section R310.1. CSJ proposes to not allow American Forest and Paper Association (AF&PA) Wood Framed Construction Manual (WFCM) consistent with item E1 above for CBC 2301.2.
2. CRC section R301.2.1.1 cites applicable reference standards for the design of buildings in high wind regions. CSJ proposes to not allow American Forest and Paper Association (AF&PA) Wood Framed Construction Manual (WFCM).

C. Automatic Fire Sprinkler Systems

1. CRC section R313.2 requires that a residential fire sprinkler system be installed in new one- and two- family dwellings only. It does not require an automatic residential sprinkler for additions or alterations to existing buildings that are not provided with an automatic sprinkler system. CSJ proposes to amend this section to require that an automatic residential sprinkler system be installed to existing one- and two- family dwellings where an increase of over 500 square-feet is made to the floor area resulting to a building floor area exceeding 3,600 square-feet.
2. CRC section R313.3 delineates the design and installation requirements for a residential fire sprinkler system with a multi-purpose piping system; that is, one piping system for domestic and fire sprinklers. CSJ proposes to delete this section and to not allow multi-purpose piping systems.

D. Gypsum Board, Gypsum Lath and Cement Plaster

1. CRC section R403.1.3 sets forth the requirement for minimum steel reinforcement in concrete footings. CSJ proposes to delete the exception that would allow detached one- and two- family dwellings which are three stories or less to have plain concrete footings without steel reinforcement.
2. CRC section R602.10, Table 602.10.1.2(2) provides prescriptive required minimum total lengths of braced wall panels for various seismic design categories based on story height and types of braced walls. CSJ proposes to amend the table as follows to not allow braced walls on the lower level of three story dwellings, and to limit the types of braced walls for lower level of two story dwellings. In addition, CSJ proposes to amend the table as follows to increase the minimum required total length of braced wall for the following bracing methods: diagonal wood boards, structural fiberboard sheathing, particleboard sheathing and hardboard panel siding.

Table R602.10.1.2(2)a,b,c
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY
(AS A FUNCTION OF BRACED WALL LINE LENGTH)

SOIL CLASS Da WALL HEIGHT = 10FT 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING ≤ 25 FT			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE			
Seismic Design Category (SDC)	Story Location	Braced Wall Line Length	Method LIB	Methods DWB, SFB, PBS, PCP, HPS	Method WSP	Continuous Sheathing
SDC A and B and Detached Dwellings in C			Exempt from Seismic Requirements Use Table R602.10.1.2(1) for Bracing Requirements			
SDC D ₀ or D ₁		10	NP	3-0 <u>6.0</u>	2.0	1.7
		20	NP	6-0 <u>12.0</u>	4.0	3.4
		30	NP	9-0 <u>18.0</u>	6.0	5.1
		40	NP	12-0 <u>24.0</u>	8.0	6.8
		50	NP	15-0 <u>30.0</u>	10.0	8.5
		10	NP	6-0 <u>NP</u>	4.5	3.8
		20	NP	12-0 <u>NP</u>	9.0	7.7
		30	NP	18-0 <u>NP</u>	13.5	11.5
		40	NP	24-0 <u>NP</u>	18.0	15.3
		50	NP	30-0 <u>NP</u>	22.5	19.1
		10	NP	8-5 <u>NP</u>	6.0	5.1
		20	NP	17-0 <u>NP</u>	12.0	10.2
		30	NP	25-5 <u>NP</u>	18.0	15.3
		40	NP	34-0 <u>NP</u>	24.0	20.4
		50	NP	42-5 <u>NP</u>	30.0	25.5
SDC D ₂		10	NP	4-0 <u>8.0</u>	2.5	2.1
		20	NP	8-0 <u>16.0</u>	5.0	4.3
		30	NP	12-0 <u>24.0</u>	7.5	6.4
		40	NP	16-0 <u>32.0</u>	10.0	8.5
		50	NP	20-0 <u>40.0</u>	12.5	10.6
		10	NP	7-5 <u>NP</u>	5.5	4.7
		20	NP	15-0 <u>NP</u>	11.0	9.4
		30	NP	22-5 <u>NP</u>	16.5	14.0
		40	NP	30-0 <u>NP</u>	22.0	18.7
		50	NP	37-5 <u>NP</u>	27.5	23.4
		10	NP	NP	NP	NP
		20	NP	NP	NP	NP
		30	NP	NP	NP	NP
		40	NP	NP	NP	NP
		50	NP	NP	NP	NP

For SI: 1 foot = 304.8 mm, 1 pound per square foot = 47.89 Pa.

- Wall bracing lengths are based on a soil site class "D." Interpolation of bracing length between the S_d values associated with the seismic design categories shall be permitted when a site - specific S_d value is determined in accordance with Section 1613.5 of the California Building Code.
- Foundation cripple wall panels shall be braced in accordance with Section R602.10.9.
- Methods of bracing shall be as described in Sections R602.10.2, R602.10.4 and R602.10.5.

III. California Plumbing Code (CPC)

CSJ proposes to adopt the CPC without any amendments.

IV. California Mechanical Code (CMC)

CSJ proposes to adopt the CMC without any amendments.

V. California Electrical Code (CEC)

CSJ proposes to adopt the CMC without any amendments.

VI. California Green Building Standards Code (CGBSC)

CSJ proposes to adopt the residential mandatory measures and the nonresidential mandatory measures of the California Green Building Standards Code (CALGreen).