

# 2013 CALIFORNIA BUILDING CODE

## California Code of Regulations, Title 24, Part 2

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# CALIFORNIA BUILDING CODE 2013

**California Code of Regulations  
Title 24, Part 2, Volume 1 of 2**  
Based on the 2012 International Building Code®

**California Building Standards Commission**





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Effective Date: January 1, 2014

2013 California Building Code  
California Code of Regulations, Title 24, Volume 1 of Part 2

First Printing: July 2013

ISBN: 978-1-60983-457-9

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California Building Standards Commission  
2525 Natomas Park Drive, Suite 130  
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PRINTED IN THE U.S.A.



## PREFACE

This document is Part 2 of 12 parts of the official triennial compilation and publication of the adoptions, amendments and repeal of administrative regulations to *California Code of Regulations, Title 24*, also referred to as the *California Building Standards Code*. This part is known as the *California Building Code*.

The *California Building Standards Code* is published in its entirety every three years by order of the California legislature, with supplements published in intervening years. The California legislature delegated authority to various state agencies, boards, commissions and departments to create building regulations to implement the state's statutes. These building regulations, or standards, have the same force of law, and take effect 180 days after their publication unless otherwise stipulated. The *California Building Standards Code* applies to occupancies in the State of California as annotated.

A city, county, or city and county may establish more restrictive building standards reasonably necessary because of local climatic, geological or topographical conditions. Findings of the local condition(s) and the adopted local building standard(s) must be filed with the California Building Standards Commission to become effective and may not be effective sooner than the effective date of this edition of the *California Building Standards Code*. Local building standards that were adopted and applicable to previous editions of the *California Building Standards Code* do not apply to this edition without appropriate adoption and the required filing.

Should you find publication (e.g., typographical) errors or inconsistencies in this code or wish to offer comments toward improving its format, please address your comments to:

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## ACKNOWLEDGEMENTS

The 2013 *California Building Standards Code* (Code) was developed through the outstanding collaborative efforts of the Department of Housing and Community Development, the Division of State Architect, the Office of the State Fire Marshal, the Office of Statewide Health Planning and Development, the California Energy Commission, the California Department of Public Health, the California State Lands Commission, the Board of State and Community Corrections, and the California Building Standards Commission (Commission).

This collaborative effort included the assistance of the Commission's Code Advisory Committees and many other volunteers who worked tirelessly to assist the Commission in the production of this Code.

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# CALIFORNIA CODE OF REGULATIONS, TITLE 24

## California Agency Information Contact List

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www.bscc.ca.gov ..... (916) 445-5073  
Local Adult Jail Standards  
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### California Building Standards Commission

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Office Standards

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### Department of Food and Agriculture

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Dairy Standards (916) 654-0773

### Department of Housing and Community Development

www.hcd.ca.gov ..... (916) 445-9471

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www.dgs.ca.gov/dsa. .... (916) 445-8100

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#### **Structural Safety**

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Alternative Building Standards

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Skilled Nursing Facility Standards &  
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Permits

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osfm.fire.ca.gov ..... (916) 445-8200

Code Development and Analysis  
Fire Safety Standards

## Marginal Markings

Solid vertical lines in the margins within the body of the code indicate a technical change from the requirements of the 2009 edition. Deletion indicators in the form of an arrow (➡) are provided in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted.

A single asterisk [\*] placed in the margin indicates that text or a table has been relocated within the code. A double asterisk \*\*[\*\*] placed in the margin indicates that the text or table immediately following it has been relocated there from elsewhere in the code. The following table indicates such relocations in the 2012 edition of the *International Building Code*.

| 2012 LOCATION            | 2009 LOCATION                |
|--------------------------|------------------------------|
| 407.4                    | 1014.2                       |
| 410.6                    | 1015.6                       |
| 424                      | 402.6.3                      |
| 712.1                    | 708.1                        |
| 712.1.2                  | 708.2, Exception 1           |
| 712.1.3                  | 708.2, Exception 2           |
| 712.1.3.1                | 708.2, Exception 2.1         |
| 712.1.3.2                | 708.2, Exception 2.2         |
| 712.1.4                  | 708.2, Exception 3           |
| 712.1.5                  | 708.2, Exception 4           |
| 712.1.6                  | 708.2, Exception 5           |
| 712.1.7                  | 708.2, Exception 6           |
| 712.1.8                  | 708.2, Exception 7           |
| 712.1.9                  | 708.2, Exception 8           |
| 712.1.10                 | 708.2, Exception 9           |
| 712.1.11                 | 708.2, Exception 10          |
| 712.1.12                 | 708.2, Exception 11          |
| 712.1.13                 | 708.2, Exception 12          |
| 712.1.14                 | 708.2, Exception 13          |
| 712.1.15                 | 708.2, Exception 14          |
| 712.1.16                 | 708.2, Exception 15          |
| 712.1.18                 | 708.2, Exception 16          |
| 713.3 through 713.14.1.1 | 708.3 through 708.14.1.1     |
| 909.21 through 909.21.11 | 708.14.2 through 708.14.2.11 |
| 1004.1.1.2               | 1004.6                       |
| 1008.1.9.8               | 1008.1.4.4                   |
| 1013.8                   | 1405.13.2                    |
| 1028.10.1                | 1017.4                       |
| 1028.10.1.1              | 1017.4.1                     |
| 1028.10.1.1              | 1017.4.2                     |
| 1028.10.1.2              | 1017.4.3                     |
| 1210.3.1                 | 2903.1                       |
| 1210.3.2                 | 2903.2                       |
| 1406.2.1                 | 1406.2.1.1                   |
| 1406.2.2                 | 1406.2.1                     |
| 1607.6                   | 1605.4                       |
| 1704.3                   | 1705.1                       |
| <i>continued</i>         |                              |

| <b>2012 LOCATION</b> | <b>2009 LOCATION</b> |
|----------------------|----------------------|
| 1704.4               | 1709.1               |
| 1704.5               | 1710.1               |
| 1705.1.1             | 1704.15              |
| 1705.4.2             | 1704.11              |
| 1705.10              | 1706.1               |
| 1705.11              | 1707.1               |
| 1705.12              | 1708.1               |
| 3313.1               | 3311.4               |



# EFFECTIVE USE OF THE IBC/CBC

Distilling the code review process down to a methodical, sequential list of considerations is generally problematic. In many cases, related provisions from various chapters of the code must be considered simultaneously, or reconsidered later in the process to arrive at the correct classification or determination. Any number of acceptable alternatives may exist for construction of the building and its specific features. Each choice provided by the code must be evaluated for its specific impact on other aspects of the building's analysis. With a basic understanding of the interrelationship of the various chapters, the practiced code user will make an initial assessment of the building as a first step of the code review process. The following outline may be helpful as a guide for the effective use of the IBC, with the understanding that final resolution of each step is often dependant on subsequent steps.

The following process begins with a brief discussion of the key administrative areas of the code. The process addressing technical provisions is divided into two distinct areas of analysis, the nonstructural provisions of the IBC and the structural provisions. Although reference is not made to all provisions set forth in the IBC, the process is intended to be representative of an approach to using the IBC in an effective manner.

## Administrative Provisions

Prior to any analysis based on the technical provisions of the IBC, it is important that the fundamental administrative aspects of the code be reviewed. It is critical that the basis of technical decisions be consistent with the approach established in IBC Chapter 1, including:

- Scope of the IBC
- Intent of the IBC
- Applicability of the IBC
- Duties and powers of the building official
- Alternate materials, designs and methods of construction

## Nonstructural Provisions

**1. Classify the building for occupancy and construction type.** The first step in analyzing a building for code compliance is its proper classification based on anticipated use(s) and construction features.

**Identify the distinct and varied uses of the building.** The uses that will occur within the building must be identified, evaluated and classified into one or more of the distinct occupancy classifications established in the IBC. Some buildings will be classified as single-occupancy, where there is only one applicable occupancy classification. Others will be considered as mixed-occupancy due to the presence of two or more uses that are classified into different occupancy groups.

**Sec. 302.1 Classify the building into one or more occupancy groups.** Although there are 10 general occupancy groups, many of the groups are subdivided into sub-groups to allow for a more exacting analysis of the building under consideration.

|          |         |
|----------|---------|
| Sec. 303 | Group A |
| Sec. 304 | Group B |
| Sec. 305 | Group E |
| Sec. 306 | Group F |
| Sec. 307 | Group H |
| Sec. 308 | Group I |
| Sec. 309 | Group M |
| Sec. 310 | Group R |
| Sec. 311 | Group S |
| Sec. 312 | Group U |

**Identify the building's type of construction based on the materials of construction and degree of fire-resistance for the building's major elements.** The primary structural frame, exterior walls, interior walls, floor construction and roof construction, as applicable, must be evaluated in regard to their degree of fire-resistance and materials of construction in order to classify the building based upon type of construction.

**Sec. 602.1 Classify the building into a single type of construction.** Five general types of construction have been established and further subdivided into nine specific construction types. The classification of construction type is based on a combination of the degree of fire-resistance and the type of materials of the key building elements.

|           |  |
|-----------|--|
| Sec. 602  | Type of construction based on materials of construction            |
| Table 601 | Type of construction based on fire rating of the building elements |
| Sec. 603  | Combustible materials in Type I and II buildings                   |

**Sec. 1505 Verify classification of roof covering.** Roof coverings are typically required to provide protection against moderate or light fire exposures from the exterior. Their minimum required classification is based upon the type of construction of the building.

**2. Determine if the building is to be fully sprinklered.** Many of the code provisions vary based upon the presence of an automatic sprinkler system throughout, or in specific portions of, the building.

**Sec. 903.2 Determine if the building requires a fire sprinkler system.** Many of the mandates for the installation of a sprinkler system are based upon the occupancy or occupancies that occur within the building. The provisions will often require some degree of occupant load and fire area determination. Other conditions may also trigger a required sprinkler installation, such as building height or the lack of exterior openings.

**If a sprinkler system is not required, review for potential code modifications if a sprinkler system is installed.** There are a significant number of benefits provided by the code if a sprinkler system is installed. An initial analysis of the building will typically allow for an early determination of the value of such sprinkler benefits, including:

|             |  |
|-------------|--|
| Sec. 504.2  | Story and height increase (reduced type of construction) |
| Sec. 506.3  | Allowable area increase (reduced type of construction)   |
| Sec. 507.3  | Unlimited area building (reduced type of construction)   |
| Sec. 1018.1 | Elimination of corridor fire-resistance rating           |

**3. Locate the building on the site.** The location of the building(s) on the lot is fundamental to the degree of fire exposure to and from adjoining buildings and lots. In addition, the building's location influences the amount of fire department access that can be provided from the exterior of the building.

**Sec. 503.1.2 Determine the number of buildings on the site.** Where two or more buildings are located on the same lot, they can be evaluated as a single building or multiple buildings. The type of construction requirements may differ based upon which of the two methods is utilized.

**Sec. 602.1 Determine minimum required fire rating of exterior walls.** The fire separation distance is the measurement used in evaluating the necessary fire rating for exterior walls. It is measured from the building to the lot line, to the center line of a public way, or to an imaginary assumed line between two buildings on the same lot. Projections and parapets, if applicable, are also regulated.

**Sec. 704.8 Determine exterior opening protection requirements.** Openings in exterior walls are regulated by the fire separation distance and the rating of the exterior wall in which they are located.

**Sec. 506.2 Determine frontage increase for allowable area purposes.** Utilized primarily for fire department access, open space adjacent to a building's perimeter provides for an increase in the allowable area.

**4. Verify building's construction type by determining the allowable building size.** The permitted types of construction are primarily based upon the occupancy classifications involved, the building's height and the building's floor area. Other conditions may also affect the appropriate construction types, including the building's location on the lot and the intended materials of construction. In buildings with mixed-occupancy conditions, the methods of addressing the relationship between the multiple occupancies indirectly affect construction type.

**Sec. 202 and 502 Calculate actual height of building in both 'feet' and 'stories above grade plane'.** The code specifically describes the method for assigning a building height, measure both in the number of feet and the number of stories above grade plane. The actual height must be compared with the allowable height to determine if the building's type of construction is acceptable.

**Sec. 504 Determine allowable height permitted for 'feet' and 'stories'**

**Sec. 505 Determine if mezzanine provisions are applicable**

**Sec. 504.3 Determine if any rooftop structures are in compliance**

**Sec. 502 Calculate actual floor area of each story of building.** The building area is typically the entire floor area that occurs within the surrounding exterior walls. The building area for each individual story must be calculated, as well as for the building as a whole.

**Sec. 507 Determine if building qualifies as an unlimited area building****Sec. 506 Determine allowable area permitted for each story and building as a whole if:**

- Sec. 506 Single-occupancy building
- Sec. 508.2 Multi-occupancy w/accessory occupancies
- Sec. 508.3 Multi-occupancy building w/nonseparated occupancies
- Sec. 508.4 Multi-occupancy building w/separated occupancies
- Sec. 706.1 Use of fire walls

**Sec. 509 Determine if special provisions are to be applied for height and/or area.** The general requirements for allowable height and area may be modified under limited conditions, typically where a parking garage is located in a building with other occupancies.

**5. Identify extent of any special detailed occupancy requirements.** Special types of buildings, special uses that occur within buildings, and special elements of a building are further regulated through specific requirements found in Chapter 4. Since these provisions are specific in nature, they apply in lieu of the general requirements found elsewhere in the code.

**Chapter 4. Determine special detailed requirements based on occupancy.** A number of the special provisions are applicable to a specific occupancy or group of similar occupancies.

- Sec. 402 Covered mall buildings
- Sec. 403 High-rise buildings
- Sec. 404 Atriums
- Sec. 405 Underground buildings
- Sec. 406 Motor-vehicle-related occupancies
- Sec. 407 Group I-2 occupancies
- Sec. 408 Group I-3 occupancies
- Sec. 411 Special amusement buildings
- Sec. 412 Aircraft-related occupancies
- Sec. 415 Group H occupancies
- Sec. 419 Live/work units
- Sec. 420 Groups I-1, R-1, R-2 and R-3
- Sec. 422 Ambulatory health care facilities

**Table 508.2.5 Determine if building contains any incidental accessory occupancies.** The uses identified in Table 508.5.2 are considered as a portion of the occupancy in which they are located, but special conditions required that they be addressed in a more specific manner.

- Sec. 508.2.5 Provide fire separation and/or fire-extinguishing system

**6. Identify and evaluate fire and smoke protective elements.** Where fire-resistance-rated construction and/or smoke protection is mandated by other provisions of the code, the provisions of Chapter 7 identify the appropriate methods for gaining compliance.

**Chapter 7. Verify compliance w/details of fire and smoke resistance.** The various elements of fire-resistance-rated and smoke-resistant construction are detailed, including walls, horizontal assemblies, shaft enclosures, including openings such as doors and windows, as well as the penetration of such elements by conduit, ducts, piping and other items.

- Sec. 704 Structural members
- Sec. 707 Fire barriers
- Sec. 709 Fire partitions
- Sec. 710 Smoke barriers
- Sec. 711 Smoke partitions
- Sec. 712 Horizontal assemblies
- Sec. 708 Shaft enclosures
- Sec. 713 Penetrations
- Sec. 714 Joint systems
- Sec. 715 Opening protectives
- Sec. 716 Ducts and air transfer openings

**7. Identify additional fire protection systems that may be required.** In addition to automatic sprinkler systems, there are several other types of fire protection systems that may be required in a building.

**Sec. 907.2. Determine compliance with fire alarm provisions.** Fire alarm systems are typically mandated based upon the occupancy classification and the number of occupants.

**Sec. 905.3. Determine if standpipe system is required.** A standpipe system is required in buildings once a specified height is reached to provide for a more effective means of fighting a fire within the building.

**Sec. 905.4.6. Verify location of standpipe hose connections.**

**8. Identify and evaluate materials utilized as interior floor, wall and ceiling finishes.** Finish materials within the building are primarily regulated for flame spread and smoke development characteristics.

**Sec. 803.9. Verify compliance of wall and ceiling finishes.** Interior wall and ceiling finishes are regulated based upon the occupancy classification of the space and their location within the means of egress system. The classification may typically be reduced where sprinkler protection is provided.

**Sec. 804.4. Verify compliance of floor finishes.** While regulated differently than wall and ceiling finishes, floor finishes comprised of fibers are also controlled based upon their use in the egress system, the occupancy classification, and the presence of a sprinkler system.

**9. Evaluate means of egress system based on anticipated occupant loads.** The expected occupant load is the basis for the design of the means of egress system. The egress elements must provide for a direct, continuous, obvious, undiminished and unobstructed path of travel from any occupiable point in the building to the public way.

**Sec. 1004. Determine the design occupant load.** Although the primary use of an occupant load is in the design of the building's means of egress system, occupant load is also occasionally an important factor in occupancy classification, sprinkler system and fire alarm system requirements, and plumbing fixture counts.

**Chapter 10. Verify compliance with means of egress provisions.** The means of egress system is intended to provide the primary occupant protection from fire and other hazards. The system consists of two major components, egress components and egress design.

- Sec. 1005.1 Egress width and distribution
- Sec. 1006.3 Emergency lighting
- Sec. 1007 Accessible means of egress
- Sec. 1008.1.2 Door swing
- Sec. 1008.1.9 Door operations
- Sec. 1008.1.10 Panic hardware
- Sec. 1009.1 Stairway width
- Sec. 1009.4 Stairway treads and risers
- Sec. 1011 Exit signs
- Sec. 1012 Stairway and ramp handrails
- Sec. 1013 Guards
- Sec. 1014.2 Egress through intervening spaces
- Sec. 1014.3 Common path of egress travel
- Sec. 1015.1 Number of exit or exit access doorways
- Sec. 1015.2 Egress separation
- Sec. 1016.1 Travel distance
- Sec. 1018.1 Corridor construction
- Sec. 1021 Number of exits
- Sec. 1022 Vertical exit enclosures
- Sec. 1023 Exit passageways
- Sec. 1025 Horizontal exits
- Sec. 1026 Exterior exit stairways
- Sec. 1027 Exit discharge
- Sec. 1028 Egress from assembly occupancies

**10. Identify any special use features of the building.** The activities that occur within the building pose varying risks to the occupants. Special conditions are applicable when such activities are anticipated.

**Chapter 4. Verify compliance with special detailed requirements.** These provisions are often an extension of the general requirements found elsewhere in the code.

|          |                                   |
|----------|-----------------------------------|
| Sec. 410 | Stages and platforms              |
| Sec. 413 | Combustible storage               |
| Sec. 414 | Hazardous materials               |
| Sec. 416 | Application of flammable finishes |

**11. Determine areas of building and site required to be accessible.** In general, access to persons with disabilities is required for all buildings.

**Chapter 11A and/or 11B. Verify compliance with accessibility provisions.** In order to be considered as accessible, buildings and their individual elements must comply with the applicable technical provisions of Chapters 11A and/or 11B.

**12. Determine extent of other miscellaneous provisions.** Additional provisions may be applicable based upon each individual building and its characteristics.

**Sec. 2406.3. Verify safety glazing provided in hazardous locations.** Safety glazing must be appropriately identified to ensure the proper glazing material is installed in areas considered as subject to human impact.

**Chapter 12. Interior environment.** Provisions regulating ventilation, temperature control, lighting, sound transmission, room dimensions and surrounding materials associated with interior spaces.

**Chapter 14 Exterior walls.** Requirements for installation of wall coverings and the permissible use of combustible materials on the exterior side of exterior walls.

**Chapter 24. Glass and glazing.** General provisions for the installation of glazing materials and skylights.

**Chapter 30. Elevators.** Elevator hoistway provisions, including enclosure of hoistways, emergency operations and hoistway venting.

**Chapter 31. Special construction.** A variety of special conditions are addressed, including membrane structures, temporary structures, pedestrian walkways and tunnels, awnings and canopies, marquees, signs and swimming pool enclosures.

## Structural Provisions

### General Requirements

#### 1. Design Loads.

The 2012 IBC references the national load standard, Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7—10) with Supplement Number 2.

Determine the applicable design loads that the building structure is expected to be subjected to. Code prescribed loads are given in Chapter 16 and the referenced standard, ASCE/SEI 7. The code prescribed minimum live loads are given in IBC Table 1607.1.

The various code prescribed loads are probabilistic in nature. Environmental loads, such as flood, rain, snow, seismic and wind vary based on the location of the building site. The following table gives the IBC section and ASCE/SEI 7 chapter for various types of load.

| REFERENCED IBC SECTIONS AND ASCE/SEI 7 CHAPTERS FOR LOADS |                            |                    |
|---|----------------------------|--------------------|
| TYPE OF LOAD  | IBC SECTION                | ASCE/SEI 7 CHAPTER |
| Dead loads  | Section 1606               | Chapter 3          |
| Live loads  | Section 1607, Table 1607.1 | Chapter 4          |
| Snow loads  | Section 1608               | Chapter 7          |
| Wind loads  | Section 1609               | Chapter 6          |
| Soil lateral loads  | Section 1610               | Chapter 3          |
| Rain loads  | Section 1611               | Chapter 8          |
| Flood loads   | Section 1612               | Chapter 51         |
| Earthquake loads  | Section 1613               | Chapter 11-22      |

1. Section 1612 references ASCE 24 which references Chapter 5 of ASCE/SEI 7

## 2. Structural Materials.

The structural design begins with the selection of the type of structural materials to be used to support the building. Structural framing systems are constructed of concrete, masonry, steel or wood. Some miscellaneous or specialty structures and components, such as awnings, canopies and cladding, are often constructed of aluminum.

The design of various structural materials is covered in specific material chapters in the code which in turn reference design standards for the type of material involved. The referenced standards in the 2012 IBC for the structural materials are shown in the following table:

| STRUCTURAL DESIGN STANDARDS FOR STRUCTURAL MATERIALS <sup>1</sup> |                 |  |
|---|-----------------|--|
| MATERIAL  | IBC/CBC CHAPTER | REFERENCED STANDARD  |
| Concrete  | 19              | ACI 318—11<br>Building Code Requirements for Structural Concrete   |
| Aluminum  | 20              | ADM 1—10<br>Aluminum Design Manual   |
| Masonry   | 21              | TMS 402-11/ACI 530-11/ASCE 5-11<br>Building Code Requirements and Specification for Masonry Structures (MSJC Code)   |
| Steel   | 22              | AISC 360—10<br>Specification for Structural Steel Buildings<br><br>AISC 341—10<br>Seismic Provisions for Structural Steel Buildings<br><br>AISI S100—07/S2-10<br>North American Specification for the Design of Cold-Formed Steel Structural Members, with Supplement 1, dated 2010. |
| Wood  | 23              | AF&PA NDS—12<br>National Design Specification (NDS) for Wood Construction with 2012 Supplement<br><br>AF&PA SDPWS—08<br>Special Design Provisions for Wind and Seismic   |

1. The above table shows the main structural design standards for these structural materials. For a complete list of referenced standards, see IBC Chapter 35.

## 3. Structural Analysis, Design and Detailing.

Once the applicable loads are determined, the structural system of the building must be analyzed to determine the effects of the governing gravity and lateral loads that act on the structure. The structural system of a typical building consists of the roof and floor systems, walls, beams and columns, and the foundation. From the structural analysis, the next step is to design the structural members, elements and systems to provide the minimum level of resistance in accordance with the various load combinations prescribed in Section 1605.

Once the structural elements and systems are designed, the next step is to detail the load transfer connections to provide a complete load path from the point of origin to the resisting element. In general, the ultimate resisting element of buildings and structures is the foundation and supporting ground. The final step is to prepare a complete set of construction documents as required by Sections 107 and 1603. Construction documents are defined in Section 202 as “Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building permit.” In general, construction documents consist of plans, specifications and calculations.

Section 1603.1 requires construction documents to show the size, section and relative locations of structural members with floor levels, column centers and offsets dimensioned. Design loads required by Sections 1603.1.1 through 1603.1.9 must be indicated on the construction documents. If complete construction documents consisting of plans, specifications and calculations are provided, the items listed in Sections 1603.1.1 through 1603.9 are generally included.



The exception permits construction documents for buildings constructed in accordance with the conventional light-frame construction provisions of Section 2308 need only indicate the following:

- Floor and roof live loads
- Ground snow load,  $P_g$ .
- Basic (3-second gust) wind speed (mph) and wind exposure category.
- Seismic design category and site class.
- Flood design data where sited in flood hazard areas
- Design load-bearing values of soils.

## General Requirements

### 1. Occupancy Category (IBC/CBC Table 1604.5).

Determine the occupancy category of the building based on Table 1604.5.

Where a structure is occupied by two or more occupancies that are not the same occupancy category, the building must be classified in the highest occupancy category corresponding to the various occupancies.

Where structures have two or more portions that are structurally separated, each separate portion should be separately classified.

Where a separated portion of a structure provides required access or egress from another portion of the building with a higher occupancy category, both portions of the building must be assigned the higher occupancy category.

Where a separated portion of a structure shares life safety components with another portion of the building with a higher occupancy category, both portions of the building must be assigned the higher occupancy category.

### 2. Floor and roof live loads (IBC/CBC Table 1607.1).

Determine uniformly distributed and concentrated floor live load for the floor areas of the building in accordance with Section 1603.1.1 and Table 1607.1.

Floor live load reduction in accordance with Section 1607.9 should be indicated for each type of live load that is reduced.

Determine the roof live load for roof areas in accordance with Section 1607.11.

Roof live load reduction in accordance with Section 1607.11.2 should be indicated for roof live loads that are reduced.

### 3. Snow load (IBC/CBC Section 1608, ASCE/SEI 7 Section 7).

Determine the ground snow load,  $P_g$ , based on the location of the building site in accordance with Figure 1608.2 for the contiguous United States and Table 1608.2 for Alaska.

In areas where the ground snow load,  $P_g$ , exceeds 10 psf, the following information should be determined:

1. Flat-roof snow load,  $P_f$ .
2. Snow exposure factor,  $C_e$ .
3. Snow load importance factor,  $I$ .
4. Thermal factor,  $C_t$ .

### 4. Wind speed and wind exposure category.

Determine the following information related to wind loads in accordance with Section 1603.1.4:

1. Basic 3-second gust wind speed (mph).
2. Wind importance factor,  $I$ .
3. Wind exposure category (B, C, D). If more than one wind exposure is used, the wind exposure for each wind direction should be determined.
4. The applicable internal pressure coefficient.
5. The design wind pressure (psf) used for the design of exterior component and cladding materials not specifically designed by the registered design professional should be indicated.

## 5. Earthquake design requirements.

Determine the following information related to seismic loads regardless of whether seismic loads govern the design of the lateral-force-resisting system of the building:

1. Seismic importance factor,  $I$ , based on occupancy category.
2. Mapped spectral response accelerations,  $S_S$  and  $S_I$ .
3. Site class.
4. Design spectral response coefficients,  $S_{DS}$  and  $S_{DI}$ .
5. Seismic design category.
6. Basic seismic-force-resisting system(s).
7. Design base shear.
8. Seismic response coefficient(s),  $C_s$ .
9. Response modification factor(s),  $R$ .
10. Analysis procedure used.

## 6. Geotechnical information.

The design load bearing values of soils shall be shown on the construction documents in accordance with Section 1603.1.6.

## 7. Special loads.

Determine any special loads that are applicable to the design of the building, structure or portions thereof along with the specific section of the code that addresses the special loading condition in accordance with Section 1603.1.8.

## 8. Load combinations.

Buildings and other structures and portions thereof are required to be designed to resist the load combinations specified in Section 1605.2 or 1605.3 and Chapters 18 through 23, and the special seismic load combinations with overstrength as required by Section 1605.1 and ASCE/SEI 7.

## 9. Wind and seismic detailing.

Lateral-force-resisting systems are required to conform to the seismic detailing requirements of the code and ASCE/SEI 7 (excluding Chapter 14 and Appendix 11A) even when wind load effects are greater than seismic load effects. See Section 1604.10.

## 10. Serviceability.

Structural systems and members shall be designed to have adequate stiffness to limit deflections and lateral drift. The deflection of structural members shall not exceed the more restrictive of the limitations of Sections 1604.3.2 through 1604.3.6 or that permitted by Table 1604.3. Structural systems shall be designed to have adequate stiffness to limit deformation and lateral drift due to earthquake loading in accordance with Section 12.12.1 of ASCE/SEI 7.

## 11. Foundation.

A foundation system must be designed that provides adequate support for gravity and lateral loads. Walls of buildings of conventional light frame construction, as defined in Section 202, are permitted to be supported by footings constructed in accordance with Table 1809.7. Otherwise, the foundation system must be designed in accordance with other provisions of Chapter 18. The following table gives a summary of applicable sections for foundation systems.

| FOUNDATION REQUIREMENTS                                      |                    |
|--|--------------------|
| SUBJECT  | IBC SECTION        |
| Presumptive load-bearing values of soils                     | 1806, Table 1806.2 |
| Foundation walls, retaining walls and embedded posts & poles | 1807               |
| General requirements for foundations                         | 1808               |
| Minimum concrete specified concrete strength                 | Table 1808.8.1     |
| Minimum concrete cover                                       | Table 1808.8.2     |
| Shallow foundations (footings)                               | 1809               |
| Prescriptive footings for light frame walls                  | Table 1809.7       |
| Deep foundations   | 1810               |

A geotechnical investigation is required where required by Section 1803.2 unless the building official determines that a soils investigation is not required in accordance with the exception. A geotechnical investigation is required for buildings assigned to Seismic Design Categories C, D, E and F in accordance with Sections 1803.5.11 and 1803.5.12.

## 12. Excavation, grading and fill

Requirements for excavation, grading and fill related to foundation construction are covered in Section 1804. General requirements for site grading are covered in Appendix J.

## 13. Flood design data.

Where required by Section 1612.5, buildings located in flood hazard areas as established in Section 1612.3 are required to provide documentation that includes the following information regardless of whether flood loads govern the design of the building:

1. In flood hazard areas not subject to high-velocity wave action, the elevation of the proposed lowest floor, including the basement; and the elevation to which any nonresidential building will be dry flood proofed.
2. In flood hazard areas not subject to high-velocity wave action, the elevation to which any nonresidential building will be dry floodproofed.
3. In flood hazard areas subject to high-velocity wave action, the proposed elevation of the bottom of the lowest horizontal structural member of the lowest floor, including the basement.

## 14. Special inspection.

Where special inspection, special inspection for seismic resistance, or structural testing for seismic resistance is required by Section 1704, 1707 or 1708, the registered design professional in responsible charge is required to prepare a statement of special inspections in accordance with Section 1705. The statement of special inspections must be submitted by the permit applicant as a condition of permit issuance in accordance with Section 106.1.

A statement of special inspections is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308 unless specific components in the structure require special inspection.

The statement of special inspections is permitted to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional.

| SPECIAL INSPECTION REQUIREMENTS                |                    |                                      |
|--|--------------------|--------------------------------------|
| TYPE OF SPECIAL INSPECTION                     | APPLICABLE SECTION | REQUIRED VERIFICATION AND INSPECTION |
| Steel construction                             | 1704.3             | Table 1704.3                         |
| Concrete construction                          | 1704.4             | Table 1704.4                         |
| Masonry construction                           |                    |                                      |
| Level 1  | 1704.5             | Table 1704.5.1                       |
| Level 2  |                    | Table 1704.5.3                       |
| Wood construction                              | 1704.6             | —                                    |
| Soils  | 1704.7             | Table 1704.7                         |
| Driven deep foundations                        | 1704.8             | Table 1704.8                         |
| Cast in place deep foundations                 | 1704.9             | Table 1704.9                         |
| Helical pile foundations                       | 1704.10            | —                                    |
| Vertical masonry foundations                   | 1704.11<br>1704.5  | —                                    |
| Sprayed fire resistant materials               | 1704.12            | —                                    |
| Mastic and intumescent fire resistive coatings | 1704.13            | —                                    |
| Exterior insulation and finish (EIFS) systems  | 1704.14            | —                                    |
| Special cases                                  | 1704.15            | —                                    |
| Smoke control systems                          | 1704.16            | —                                    |

Where required by the provisions of Section 1709.2 or 1709.3, the owner shall employ a registered design professional to perform structural observations as defined in Section 1702. At the conclusion of the work included in the permit, the structural observer shall submit a written statement to the building official that identifies any reported deficiencies that have not been resolved.

**15. Special inspection for wind and seismic resistance.**

Section 1706.1 requires special inspections for wind requirements based on wind speed and exposure category as prescribed in Sections 1706.2 through 1706.4, unless exempted by the exceptions to Section 1704.1.

Section 1707.1 requires special inspections for seismic resistance based on seismic design category as prescribed in Sections 1707.2 through 1707.9, unless exempted by the exceptions of Section 1704.1 or 1705.3.

**16. Structural testing for seismic resistance.**

Section 1708.1 requires specific testing and qualification for seismic resistance as prescribed in Sections 1708.2 through 1708.5, unless exempted from special inspections by the exceptions of Section 1704.1 and 1705.3.

**17. Structural observation.**

Where required by the provisions of Section 1710.2 or 1710.3 the owner is required to employ a registered design professional to perform structural observations as defined in Section 1702. Section 1710.2 requires structural observations for seismic resistance for certain structures assigned to Seismic Design Category D, E or F; Section 1710.3 requires structural observations for wind requirements for certain structures sited where the wind speed exceeds 110 mph.

At the conclusion of the work included in the permit, the structural observer is required to submit a written statement to the building official that identifies any reported deficiencies that have not been resolved.

Prior to the commencement of observations, the structural observer is required to submit a written statement to the building official identifying the structural observations.

At the conclusion of the work included in the permit, the structural observer is required to submit a written statement to the building official indicating what site visits have been made, identifies any deficiencies that have not been resolved.

**18. Contractor responsibility.**

Section 1709 requires each contractor responsible for the construction of a main wind- or seismic-force-resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections is required to submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. (The term “designated seismic system” is defined in Section 1702 and Section 11.2 of ASCE/SEI 7). The contractor’s statement of responsibility is required to acknowledge awareness of the special requirements contained in the statement of special inspections.

**19. Phased approvals.**

Construction of foundations or other part of a building is permitted before the construction documents for the whole building or structure have been submitted, provided adequate information has been filed. The holder of such permit for the foundation or other part of a building proceeds at their own risk and without assurance that a permit for the entire structure will be granted.

**20. Amended construction documents.**

Work must be constructed in accordance with the approved construction documents and any changes made during construction that are not in compliance with the approved construction documents must be resubmitted for approval as amended construction documents.

**21. Deferred submittals.**

Deferred submittals are items that are not submitted at the time of permit application and must have the prior approval of the building official in accordance with Section 107.3.4.2. The registered design professional in responsible charge is required to list the deferred submittals on the construction documents for review by the building official. Documents for deferred submittal items must be reviewed by the registered design professional in responsible charge who will forward them to the building official with a notation indicating that they have been reviewed and are in general conformance with the design of the building.

# **How to Distinguish Between Model Code Language and California Amendments**

To distinguish between model code language and the incorporated California amendments, including exclusive California standards, California amendments will appear in italic font print.

**[BSC]** This is an example of a state agency acronym used to identify an adoption or amendment by the agency. The acronyms will appear at California Amendments and in the Matrix Adoption Tables. Sections 1.2 through 1.14 in Chapter 1, Division 1 of this code, explain the used acronyms, the application of state agency adoptions to building occupancies or building features, the enforcement agency as designated by state law (may be the state adopting agency or local building or fire official), the authority in state law for the state agency to make the adoption, and the specific state law being implemented by the agency's adoption. The following acronyms are used in Title 24 to identify the state adopting agency making an adoption.

## **Legend of Acronyms of Adopting State Agencies**

|           |   |
|-----------|---|
| BSC       | California Building Standards Commission (see Section 1.2)  |
| BSCC      | Board of State and Community Corrections (see Section 1.3)  |
| SFM       | Office of the State Fire Marshal (see Section 1.11)   |
| HCD 1     | Department of Housing and Community Development (see Section 1.8.2.1.1)   |
| HCD 2     | Department of Housing and Community Development (see Section 1.8.2.1.3)   |
| HCD 1/AC  | Department of Housing and Community Development (see Section 1.8.2.1.2)   |
| DSA-AC    | Division of the State Architect-Access Compliance (see Section 1.9.1)   |
| DSA-SS    | Division of the State Architect-Structural Safety (see Section 1.9.2)   |
| DSA-SS/CC | Division of the State Architect-Structural Safety/Community Colleges<br>(see Section 1.9.2.2)   |
| OSHPD 1   | Office of Statewide Health Planning and Development (see Section 1.10.1)  |
| OSHPD 2   | Office of Statewide Health Planning and Development (see Section 1.10.2)  |
| OSHPD 3   | Office of Statewide Health Planning and Development (see Section 1.10.3)  |
| OSHPD 4   | Office of Statewide Health Planning and Development (see Section 1.10.4)  |
| DPH       | Department of Public Health (see Section 1.7)   |
| AGR       | Department of Food and Agriculture (see Section 1.6)  |
| CEC       | California Energy Commission<br>(see Section 100 in Part 2, the California Energy Code)   |
| CA        | Department of Consumer Affairs (see Section 1.6):<br>Board of Barbering and Cosmetology<br>Board of Examiners in Veterinary Medicine<br>Board of Pharmacy<br>Acupuncture Board<br>Bureau of Home Furnishings<br>Structural Pest Control Board |
| SL        | State Library (see Section 1.12)  |
| SLC       | State Lands Commission (see Section 1.14)   |
| DWR       | Department of Water Resources (see Section 1.12 of Chapter 1 of the California<br>Plumbing Code in Part 2 of Title 24)  |

The state agencies are available to answer questions about their adoptions. Contact information is provided on page iv of this code.

To learn more about the use of this code refer to pages xvii and xviii. Training materials on the application and use of this code are available at the website of the California Building Standards Commission [www.bsc.ca.gov](http://www.bsc.ca.gov).

Symbols in the margins indicate the status of code changes as follows:

|| This symbol indicates that a change has been made to a California amendment.

> This symbol indicates deletion of California amendment language.

| This symbol indicates that a change has been made to International Code Council model language.

➡ This symbol indicates deletion of International Code Council model language.