Chapter 2: Building Codes and Specifications

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2-1 Building Codes

Building codes are legally enforced, minimum regulations governing the design, construction, and maintenance of structures to protect public health, safety, and general welfare. Standards are detailed technical guidelines or specifications—often incorporated into codes—that define exactly how to achieve safety, quality, and performance targets (as defined by the National Institute of Standards and Technology).

The code mandates that fire suppression systems comply with National Fire Protection Association (NFPA) 13, *Standard for the Installation of Sprinkler Systems*, defining both the required installation areas and the design standards, including hydraulic calculations, piping sizes, and sprinkler head placement relative to structural obstructions.

Per NFPA 13, *Standard for the Installation of Sprinkler Systems*, the minimum requirements for the design and installation of automatic fire sprinkler and exposure protection systems are specified.

2-2 California Building Codes

The California Building Standards Commission is an independent commission. It is administratively placed within the State and Consumer Services Agency.

Per the CBSC website: “Established in 1953 by California Building Standards Law (Health and Safety Code, § 18901 et seq.), the California Building Standards Commission (CBSC) is within the Department of General Services under the Government Operations Agency”.

The CBSC was created to review, approve, and publish building standards adopted by state agencies and publish them in one statewide building code–the California Code of Regulations, Title 24, California Building Standards Code.

The goal of the CBSC is to produce for the public, the construction industry, and building officials a sensible and usable set of state building standards and administrative regulations that implement or enforce those standards.

California is a leader in the regulation of its building industry, particularly in the areas of disability accessibility and energy conservation.

The following are some codes and regulations applicable to the building industry:

CBSC – California Code of Regulations (CCR), Title 24, also known as the California Building Standards Code (not to be confused with the commission above), is a compilation of three types of building standards from three different origins:

1. Building standards that have been adopted by state agencies without change from building standards contained in national model codes.
2. Building standards that have been adopted and adapted from the national model code standards to meet California conditions.
3. Building standards authorized by the California legislature that constitute extensive additions not covered by the model codes that have been adopted to address particular California concerns such as historical buildings.

IBC/ICC – International Building Code (IBC) is published by the International Code Council (ICC). The ICC is the merger of the International Conference of Building Officials (ICBO), the Building Officials and Code Administrators (BOCA), and Southern Building Code Congress International (SBCCI) in the year 2000. Each body was responsible for the creation of regional building codes established throughout the United States. The IBC has been established to standardize safe construction procedures across the United States.

Cal/OSHA – found within the California Code of Regulations, Title 8, Industrial Relations. The Cal/OSHA Program is responsible for enforcing California laws and regulations pertaining to workplace safety and health, and for providing assistance to employers and workers related to workplace safety and health issues.

2-3 Americans With Disabilities Act (ADA)

The federal government also makes laws that relate to building construction. These nationwide laws reference various standards for installation requirements. For example, the Americans with Disabilities Act (ADA) is not a building code; it is a civil rights law requiring building accessibility for people with disabilities.

The ADA requires:

1. All new buildings constructed by a State or local government to be accessible for people with disabilities.
2. When a State or local government undertakes alterations to a building, it must make the altered portions accessible for people with disabilities.

A State or local government will be in compliance with the ADA for new construction and alterations if it follows either of two accessibility standards. It can choose either the Uniform Federal Accessibility Standards or the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities, which is the standard that must be used for public accommodations and commercial facilities under Title III of the ADA.

2-4 Additional Codes

Caltrans relies on nationally recognized standards to ensure the structural integrity and material quality of its buildings. These include ASCE 7 for structural loading, AASHTO for transportation-related structures, ASTM for material specifications and testing, and AWS (D1.1 and D1.3) for welding practices and inspections.

2-5 Other Jurisdictions

2-5.01 Utilities

Utility coordination is essential for ensuring that Caltrans buildings are connected to reliable power, water, sewer, gas, and telecommunications services. Early engagement with utility providers helps avoid delays and ensures compliance with local infrastructure standards. A sample of some utility agencies and the services provided is included in the following Table 2-1.

Table 2-1. Utility Agencies and Required Coordination for Building Projects

Utility/Agency	Scope	Coordination Required for:
Pacific Gas & Electric (PG&E) / Southern California Edison (SCE) PacifiCorp	Electrical service	Power supply, EV charging stations
Local Water Districts (e.g., East Bay MUD, LADWP)	Potable and fire water	Water meters, hydrants, backflow prevention
Local Sewer Agencies (e.g., Union Sanitary District, Sacramento Municipal Utility District)	Sanitary sewer connections	Sewer laterals, lift stations
Telecommunications Providers (e.g., AT&T, Comcast)	Data and voice services	Fiber, copper, and wireless infrastructure
Photovoltaic (PV) System Integrators	Solar energy generation and storage	Rooftop or ground-mounted solar panels, inverters, battery
Local Gas Utilities (e.g., SoCalGas)	Natural gas service	Heating, hot water, backup generators

2-5.02 Outside Agencies

These agencies oversee environmental protection, fire safety (included in the following two sections), accessibility, and energy compliance. Their review and permitting processes are often required before construction can begin, especially for projects involving public access, sensitive habitats, or hazardous materials. One or more agencies listed in Table 2-2 may be involved in building construction, and the table below may not be all-inclusive; check project-specific requirements.

Table 2-2. Outside Agencies, their Roles, and Applicable Project Types

Agency	Role	Relevant Projects
Division of the State Architect (DSA)	Reviews accessibility compliance under Title 24	Public-facing buildings, rest areas, offices
Office of the State Fire Marshal (OSFM)	Reviews fire/life safety systems	All occupied buildings
Department of General Services (DGS)	Oversees procurement and project delivery	New construction, major renovations
California Energy Commission (CEC)	Enforces energy efficiency standards (Title 24, Part 6)	All buildings
California Air Resources Board (CARB)	Regulates emissions and air quality	Maintenance stations, fueling facilities
State Water Resources Control Board (SWRCB)	Issues stormwater permits (SWPPP)	Sites ≥1 acre, near waterways
California Coastal Commission	Reviews projects in coastal zones	Coastal-area facilities
California Environmental Protection Agency (CalEPA)	Oversees hazardous materials and remediation	Contaminated or industrial sites
State Historic Preservation Office (SHPO)	Reviews impact to historic or cultural resources	Projects near historic or tribal lands

Agency	Role	Relevant Projects
California Department of Fish and Wildlife (CDFW)	Regulates impacts to streams, wetlands, and wildlife	Projects near creeks, rivers, or habitats
Regional Air Quality Management Districts (e.g., BAAQMD, SCAQMD)	Construction emissions, dust control	Permits for generators, fuel tanks
Local Fire Departments	Fire access, hydrant flow tests	Fire lane design, emergency access
County Environmental Health Departments	Septic systems, hazardous materials	Rural sites, fuel storage, waste handling

2-5.03 California Department of Forestry and Fire Protection (CAL FIRE)

California Department of Forestry and Fire Protection (CAL FIRE) has a mission that emphasizes the management and protection of California's natural resources. This goal is accomplished through ongoing assessment and study of the state's natural resources and an extensive CAL FIRE Resource Management Program.

2-5.04 California State Fire Marshal

The Office of the State Fire Marshal (OSFM) supports the mission of the California Department of Forestry and Fire Protection (CAL FIRE) by focusing on fire prevention in buildings.

OSFM provides support through a wide variety of fire safety responsibilities, including the following:

1. Regulating buildings in which people live, congregate, or are confined.
2. Controlling substances and products which may, by their natural characteristics or misuse, cause injuries, death, and destruction by fire.
3. Providing statewide direction for fire prevention within wildland areas.
4. Regulating hazardous liquid pipelines.
5. Reviewing regulations and building standards.
6. Providing training and education in fire protection methods and responsibilities.

The Office of the State Fire Marshal's Code Development and Analysis Division reviews all of California's regulations relating to fire and life safety for relevancy, necessity, conflict, duplication, and/or overlap. This division also prepares the California State Fire Marshal's fire and life safety regulations and building standards for review and adoption by the California Building Standards Commission.

Fire and life safety are a main concern for the department, which applies laws and regulations related to fire prevention, life safety, fire protection systems, building construction and protection. This is achieved through code compliance plan review and inspections of state-owned and state-occupied buildings and institutions, as well as other types of occupancies under the jurisdiction of the OSFM.

Under the jurisdiction of the Fire and Life Safety Division is the section responsible for building plan review. Plans for projects are submitted for review through the GOVMOTUS system within the Office of the State Fire Marshal website. Plans are logged in using Project DocX based on the receipt date. Review status is tracked through Project DocX. They are reviewed in the order received and returned back to the architect for correction of items identified in the review. When all of the comments have been addressed and corresponding items corrected, the original plans are approved and a letter of approval is given to the architect. The program aims to maintain a 60-day turnaround time for all projects. This is the time period from the receipt date to the date the plans are sent back to the designer or architect after having been reviewed.

2-6 Building Specifications

2-6.01 Building Contract Management

The specifications for building contracts will conform to the following requirements:

1. The *Notice to Bidders*
2. Caltrans standard specifications.

2-6.02 Standard Specifications

For building contracts administered by the standard specifications, buildings are found in Division XII, Section 99, *Building Construction*, and the corresponding project-specific *Special Provisions*. Sections 1 through 14 of the standard specifications will apply to a building contract. Sections 15 through 98 do **not** apply to building construction unless a reference is made to these sections. See *Special Provisions* Section 99-010000, *General Requirements.*

Although in some SC manuals and Bridge Construction Memos (BCMs) the inclusive term *Contract Specifications* is often used in lieu of *Standard Specifications*, this manual will generally refer to the *Standard Specifications* and the *Special Provisions* separately.

Minor B projects are processed by the individual districts and are managed utilizing *Standard Specifications* Sections 1-9, with some modification.

2-6.03 Construction Specifications Institute (CSI)

The Construction Specifications Institute (CSI) is a U.S.-based, non-profit professional association, founded in March 1948, that brings together architects, engineers, contractors, manufacturers, and product representatives to standardize and improve the communication and documentation of construction information.

Caltrans standard specifications now include Division XII, specifically for building construction (Section 99, *Building Construction*), which helps bridge the gap between traditional highway work and vertical building requirements. These specifications conform to the CSI format and style and are produced by the Division of Engineering Services (DES), Structures & Engineering Services, Office of Design and Technical Services (included in the project special provisions).

2-6.03A CSI Format

The basic CSI format is utilized to develop the technical portion of the specifications for all building work items included, and provide building contractors with a more familiar contractual package; the special provisions are prepared in accordance with the system developed by CSI.

2-6.03B CSI Format Divisions

The basic format developed by CSI consists of 16 major divisions.

These divisions, which may be further subdivided, generally separate into groupings that can correlate to classifications of various specialty subcontractors. The following is a list of the 16 major divisions:

Division 0 - Bidding & Contract Requirements

Division 1 - General Requirements

Division 2 - Sitework

Division 3 - Concrete

Division 4 - Masonry

Division 5 - Metals

Division 6 - Wood and Plastics

Division 7 - Thermal and Moisture Protection

Division 8 - Doors and Windows

Division 9 - Finishes

Division 10 - Specialties

Division 11 - Equipment

Division 12 - Furnishings

Division 13 - Special Construction

Division 14 - Conveying Systems

Division 15 - Mechanical

Division 16 - Electrical

2-6.04 Why Two Formats for Building Specifications?

In the past, Caltrans specified building contracts using the standard specifications but found that they did not have many bidders. Inquiries were made, and it was learned that most building contractors were unfamiliar with the Caltrans standard specifications, and as such, were not bidding jobs. Highway and bridge contractors–who were familiar with the standard specifications–were unfamiliar with building work and also did not bid on building projects.

The *Standard Specifications* are fundamentally different from building construction specifications. Building contractors are accustomed to the Construction Specification Institute (CSI) MasterFormat, which breaks down work into divisions such as Concrete (Div 03), Masonry (Div 04), Metals (Div 05), Plumbing (Div 22), and Electrical (Div 26). General building contractors find it difficult to interpret price, and conform to the standard specifications, often leading to higher bid prices (due to risk contingency) or a lack of bidders altogether.

To incentivize more competition, many public agencies, including those managing vertical structures alongside transportation systems (such as Caltrans maintenance buildings or stations), often adapt their special provisions to use the CSI format. This allows building contractors to use their standard estimating systems and familiar work breakdown structures.

While the main Caltrans standard specifications still exist, specialized projects often incorporate CSI-based special provisions to address the technicalities of buildings By speaking the "industry language," Caltrans successfully incentivized more building contractors to bid on state projects.

2-7 Other References

In addition to the Caltrans standard specifications, project requirements may reference a variety of nationally recognized standards and industry associations to ensure quality, safety, and performance.

2-7.01 Other Standards and References

- American National Standards Institute (ANSI)
- Occupational Safety and Health Administration (OSHA)
- Underwriters Laboratories, Inc. (UL)
- American Society for Testing and Materials (ASTM) Standards and Specifications

2-7.02 Associations

- American Concrete Institute (ACI)
- Steel Joist Institute (SJI)
- Steel Deck Institute (SDI)
- Woodwork Institute (WI)

2-7.03 Required Caltrans References

Some additional Caltrans references related to building construction include the following:

1. Caltrans *Construction Manual*. This manual is maintained by Headquarters Division of Construction and provides contract administration guidance for all Caltrans projects.
2. Structure Construction *Bridge Construction Records and Procedures Manual (BCR&P)*. This manual provides Structure Construction staff with necessary information and instructions to guide and assist them in performing their duties as Structure Representative or as an Assistant Structure Representative. Structure Construction memos are issued as Bridge Construction Memos and incorporated into the *BCR&P Manual* (Volumes I and II). Notifications of revisions are distributed through Change Letters via email to all SC staff.
3. Construction procedure directive (CPD) memorandums are issued to clarify information already contained in the *Construction Manual*, introduce a process change, remind readers of existing policy, announce a new form, or inform the reader of a change in address or contact. Manual Change Transmittals (MCT) provide a summary of manual changes followed by the updated section with lines in the margin to indicate changes.

4. Department Deputy Directives[1] and Director's Policies[1], which apply to all Caltrans staff.

2-8 Legal

2-8.01 Building Safety

Ensuring building safety on construction sites is a critical component of project execution and compliance. This section emphasizes adherence to the California Code of Regulations, Title 8, Industrial Relations, and the standards enforced by Cal/OSHA.

These regulations address key safety practices including fall protection for roof-related work, masonry wall erection, scaffolding, and the use of rebar caps and protective covers. These measures are designed to protect workers from common construction hazards and to promote a safe working environment in accordance with state-mandated safety protocols.

2-8.02 Environmental Clearances and Permits

Construction activities often require a range of environmental clearances and regulatory permits to ensure compliance with federal, state, and local laws. These requirements are especially important when projects involve demolition and renovation of existing facilities, or utility rehabilitation, such as water or wastewater systems.

Projects that include rehabilitation of water/wastewater systems will need "P permits"– typically referring to plumbing permits – from the appropriate local agency that are obtained by the Contractor. These permits are commonly required when work involves utility connections or construction within the public right-of-way.

In addition, various other permits may be required depending on the nature and location of the work. For example:

- When work encroaches onto property owned by other jurisdictions (such as counties or cities), permits must be obtained from those entities.
- When demolishing or renovating buildings, a permit must be secured from the local air pollution control district.

While Caltrans is responsible for obtaining all environmental clearances and authorizations under California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), the Contractor is responsible for procuring all other required permits and licenses in a timely manner to avoid delays to the work. This includes coordination with local agencies for construction-related permits.

[1] Caltrans internal link only

In some cases, permits may be obtained during the project development phase. It is the responsibility of the Resident Engineer and the Structure Representative to verify whether these permits are already in place prior to construction.

Although the Contractor typically handles permit acquisition, Caltrans may need to participate in the process. For instance, to obtain an air pollution control district permit, Caltrans must certify that any building to be renovated or demolished is free of hazardous materials, such as asbestos or lead. The District Resource Management staff or facility operators can assist in determining whether such materials are or were present, and whether they have already been removed.

2-8.03 Asbestos Abatement

Project plans, special provisions, and any other bid documents must be reviewed to identify all hazardous or asbestos-related materials designated for removal. Before starting demolition, construction, or alterations, field staff should verify the specific locations and quantities of these materials to ensure the site is prepared for the designated scope of work; assistance can be sought as described in previous section.

Materials identified as hazardous or containing asbestos must be treated strictly as hazardous waste. During the removal process, appropriate containment methods are required to prevent site contamination. Once the materials are extracted, they are loaded into approved containers and hauled directly to a certified disposal facility.

Every stage of the process—including removal, hauling, and final disposal—must comply with all applicable federal, State, and local laws. All activities must align with current ordinances, and the required waste manifests must be signed and filed correctly to maintain legal compliance.

2-8.04 Lead Abatement

This work consists of procedures for removal, repair, and disposal of lead-based materials which are designated on the plans or specified in the special provisions to be removed and disposed of.

Where existing lead-based materials are to be removed during demolition, construction, or alterations, such materials are treated as hazardous waste and removed, hauled, and disposed of in accordance with all applicable federal, State, and local laws and ordinances.

Consult the special provisions for all matters concerning hazardous materials, including but not limited to: notice(s), permits, protection, removal, disposal, and payment.

2-8.05 Codes and Standards

Codes which govern removal and disposal of materials containing asbestos include, but are not necessarily limited to the following:

1. California Health and Safety Code, Division 20, Chapter 6.5, *Hazardous Waste Control*.
2. California Code of Regulations, Title 22, Division 4.5, *Environmental Health Standards for the Management of Hazardous Waste*.
3. California Code of Regulations, Title 8, § 1529, *Asbestos* (within Construction Safety Orders) and § 5208, *Asbestos* (within General Industry Safety Orders).
4. Code of Federal Regulations, Title 29, § 1926.1101, *Asbestos* (OSHA Safety and Health Regulations for Construction).
5. Code of Federal Regulations, Title 40, Part 61, Subpart M, *National Emission Standard for Asbestos* (Environmental Protection Agency).

Codes which govern removal and disposal of materials containing lead include, but are not limited to the following:

1. California Health and Safety Code, Division 20, Chapter 6.5, *Hazardous Waste Control*.
2. California Code of Regulations, Title 22, Division 4.5, *Environmental Health Standards for the Management of Hazardous Waste*.
3. California Code of Regulations, Title 8, § 1532.1, *Lead* (within Construction Safety Orders).
4. Code of Federal Regulations, Title 29, § 1926.62, *Lead* (OSHA Safety and Health Regulations for Construction).
5. Code of Federal Regulations, Title 40, Part 745, *Lead-Based Paint Poisoning Prevention in Certain Residential Structures* (Environmental Protection Agency).