



PLAN CHECK PROCESS

A Step-by-Step Guide



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What is plan check?

The Building Division's plan check review process protects you and your family and the public from dangerous and uninhabitable building designs. Plans examiners review plot plans, roof plans, elevations, structural details, and truss and engineering calculations to ensure they meet the *minimum* local and state laws regulating the construction of a building. That includes all auxiliary components, such as electrical, plumbing, mechanical, and State of California energy requirements.

How and why is building regulated?

Governmental regulation of construction is a consequence of centuries of building experience in all civilized lands; lessons learned from the tragedies of fire, earthquake, wind, flood, and the resultant damage and panic. With the 1927 implementation of the *Uniform Building Code* (Code), the regulation of building construction began. This evolving Code continues today to make life safer and healthier.

The City Building Division is responsible for administering a sound building program under the guidance of the Code. The Code collectively represents all the local laws regulating the construction of a building and, generally, include:

- California Building Code (CBC)
- California Electrical Code
- California Plumbing Code
- California Mechanical Code

Calamities to buildings such as the Great Fire of London in 1666 and the Chicago Fire in 1871 are examples of what the Code aims to prevent!

The Four Phases...

The phases describe how your application and plans travel through the Building Division on the road to approval. If changes are necessary, red-line corrections will be made to your plans and they will be returned to you. You then submit your revised plans with the original red-line set of plans. A second plan check review will be done, but only on the phase(s) where revisions were requested.

I. Zoning and Energy Compliance

Zoning compliance issues are reviewed during the initial plan check of your drawings: building height and orientation, yard setbacks, and lot site and coverage. If plan check discovers any potential zoning noncompliance issues, you will be referred to the Planning Department for a use permit or variance.

Energy compliance is then reviewed: heating, ventilation, and air conditioning. The State of California requires energy calculations if any conditioned space (cooled or heated space) is added to an existing conditioned space in a building.

There are three general options to demonstrate that your project meets the Building Energy Efficiency Standards; prescriptive packages, the point system, and computer methods. The standards are fairly complicated and normally calculated by an energy analyst. However, there are special compliance methods available to simplify the calculations if you are remodeling or building a room addition.

II. Fire and Life Safety

Plans Examiners review the following nonstructural elements of your plans for **minimum** fire-and-life-safety requirements:

- Building location on property; fire-resistive protection of exterior walls and openings.
- Exits and emergency escapes, size and location.
- Room dimensions that ensure a minimum size/habitable space.
- Room ventilation and natural light flows.
- Glazing, vents and sink facilities; proper lighting, ventilation and sanitation.
- Electrical outlets, number and placement.
- Smoke detectors, number and placement.
- Special hazards such as chimneys, heating apparatus, and chemical storage areas.

Attention to these aspects of construction have been proven to prevent injury and preserve life.

III. Structural

The Plan Check Engineers examine the **vertical** and **lateral design** of your structure. This is an important phase because many designers today create unique buildings with structural components that often exceed the limits of traditional construction. The Plan Check Engineers must verify that your designs were computed using the total loads to the building and that you selected the proper size, shape, and strength of members to resist the forces.

The Plan Check Engineers begin examining the vertical engineering with the *roof framing* and work their way down to the *foundation*. They check walls, beams, headers, posts and foundations to make sure they are adequate to support the roof and floors. They verify that the roof and floors can safely support their own weight plus the weight of snow, furnishings, and occupants, as prescribed in the Code.

The Plan Check Engineers then verify the building's ability to resist lateral loads from wind storms and earthquakes as outlined in the Wind and Earthquake Regulations of the Code. Buildings which do not meet conventional bracing requirements must be designed for wind and earthquake loads by an engineer or architect. The engineers check the shear in the walls, the possibility of overturning and the shear transfer details. See the "*When is engineering necessary?*" section of this handout.

IV. Approval

Your plans will now either be approved, or returned to you with red-lined corrections to be made. If your plans were returned, you need to make the necessary revisions and return two sets of your revised plans, along with the red-lined corrections. When your plans are approved, your building permit will be issued and you may begin construction.

When is engineering necessary?

Conventional framed homes do not usually need engineering; home designs with traditional rafters, four-foot-long wall panels at the corners, and studs every 16 inches. But many homes are not designed that way today. California state law requires that a registered engineer or architect design all portions of buildings which do not meet the conventional framing specifications of the Code.

Roof trusses also require engineering design. However, truss manufacturers provide engineering calculations for the trusses they sell, and these calculations must be submitted with your application and plans.

Walls with insufficient conventional bracing require engineering design; engineering is required on a wall-to-wall basis, not necessarily for a whole house. Before you pay to have plans engineered, check with the Building Division to see which walls need it, including the common wall between the house and garage.

If you build your walls using the following conventional bracing requirements, you generally do not need engineering or Wind and Seismic Loads:

- 1** Four-foot-wide bracing panels should be located at least every 25 feet on all exterior walls, including the house/garage common wall. You must use one of the bracing methods described in the *California Building Code* (CBC)2320.11.3 (such as plywood sheathing).

The City provides a handout for alternative garage construction if you want a garage with walls less than four feet wide adjacent to the garage opening.
- 2** A bracing panel must start within an 8'-0" from each end of a braced wall line. Exterior or load-bearing walls offset from the main line of a wall by more than 4'-0" will be considered separate walls and must have bracing panels as stated above.
- 3** Bearing walls should not exceed 10 feet in unbraced height.
- 4** Floor and ceiling framing may not be offset vertically more than 4 times the nominal depth of the joists. Split-level construction requires an engineered design.
- 5** Bracing panels on diagonal walls will not be considered effective for meeting the bracing requirements of CBC 2320.11.3.

For the complete requirements for conventional bracing, see CBC Section 2320.

Plans that contain the conventional bracing requirements generally proceed through the plan-check process faster than those with engineering. The turnaround time for engineered plans increases because Plan Check Engineers must review all engineering calculations and drawings.

Construction Design Criteria
Single-Family Dwellings

A heavy snow storm in 1968 caused some 15 buildings to collapse and prompted the Redding Building Official to increase the **Snow Load** requirement to 30 pounds-per-square-foot.

Residential buildings must meet a 75 mile-per-hour **Basic Wind Load**. In Redding, the wind loads usually require more lateral support than for earthquakes. This is especially true for residential dwellings because houses are lighter than commercial construction materials.

Designers may use the **Class 4 Soil Bearing Value** in the CBC Table 18-I-A, which permits 1,500 pounds-per-square-foot of allowable foundation pressure. Use of the higher design values requires an Engineering Site Soil Report.

Redding homes are required to meet California Building Energy Efficiency Standards of **Microclimate Zone II**. Zone II is characteristic of severe temperature changes, so homes require more energy. That is why energy compliance is critical!

Redding is in **Seismic Zone 3**, for those portions of California that are not near major known faults.