



Window Replacement 2010 California Building Code

INFORMATION GUIDELINE

October 2011

City of Concord • Building Division • 1950 Parkside Drive, MS/51 • Concord, CA 94519 • (925) 671-3107 • Fax (925) 680-4877

Purpose: The purpose of this guideline is to clarify minimum building code requirements when repairing or replacing windows in residential buildings.

Requirements: 2010 California Building Code sections 1029 and 1405.13 & 2406 describes requirements for emergency escape windows in all sleeping rooms below the 4th story and for natural light and ventilation.

When replacing or modifying windows, a building permit is required since such work is not exempted by the California Building Code. EXCEPTION: repairs limited to replacement of glazing only, does not require a building permit.

PERMIT APPLICATION: To apply for a permit, submit three sets of floor plan to the Building Division between the hours of 8:00 a.m. and 4:00 p.m. The floor plan should include the use and size of each room, the size and type (casement, slider, single hung, or double hung) of each existing and proposed replacement/new window.

A **CF-1R-Alt form** is also required to be submitted with the permit application form.

Smoke detectors are required in each bedroom, in the hallways leading to the bedrooms and on each floor level. If applicable, show any pool or spa location on a site plan.

Carbon monoxide alarms shall be installed in the following locations:

1. outside of each separate dwelling unit sleeping area in the immediate vicinity of the bedroom(s).
2. on every level of a dwelling unit including basements.

The replacement or modification of existing windows shall comply with the following requirements:

1. **Replacement of Entire Window (including window frame) unit with a new window:**

- a. **Sleeping rooms below 4th story**—All new work must comply with current code provisions and new windows in sleeping rooms must comply with emergency requirements of the 2010 California Building Code section 1029.
- b. **Rooms other than sleeping rooms**—New windows shall provide required light and ventilation as required by the 2010 California Building Code sections 1203 & 1205.

2. **Partial window replacements (“Insert Windows,” etc.):**

- a. **Sleeping rooms below 4th story**—Insert windows shall also comply with emergency escape requirements of 2010 California Building Code section 1029 including net width, net height, and sill height.

Exception for Dwelling Built Prior to 2008: Where insert windows comply with emergency escape window dimensions of Height, width, and area, they may have sill heights up to 48” above finished floor, provided the applicant applies for and obtains a Code Modification (in accordance with Chapter 1, Division 1, Section 1.8.7, Chapter I, Division II, Section 104.10 of the 2010 CBC) from the Building Official.

Where **existing** sleeping room windows do not comply with emergency escape window dimensions of the prevailing code, insert windows that would result in non-complying dimensions or further reduce window sizes **shall not** be used.

3. **Other window replacement requirements (see section on Hazardous Locations):**

Other requirements for new or replacement windows include:

- a. Bottom edge of glazing on the pool or spa side is less than 60 inches above a walking surface on the pool or spa side of the glazing and the glazing is with 60inches horizontally of the water’s edge of a swimming pool or spa. (2010 CBC section 2406.4 Item #9.9.1 & 9.2)

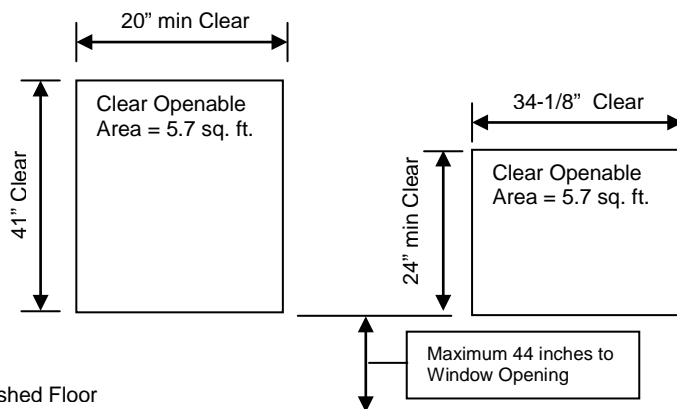
- b. Fixed and openable window panels within two feet (2') of doors and where bottom edge of the glazing is less than 60" above the walking surface shall have safety plate glass.
- c. Replacement windows in other hazardous locations shall be of tempered or safety plate glass.

4. Inspection Requirements

- a. **Entire Window Replacement**
 - 1) Frame (if framing has been modified)
 - 2) Flashing
 - 3) Final Inspection after all work is complete & smoke/carbon monoxide detectors have been installed.
- b. **Partial Window Replacement (Insert Windows, Retrofit, etc.)**
 - 1) Final Inspection

5. Code Modifications: The City will consider granting code modifications for a slight variation in sill height. Requests for Code Modifications shall be in letter format with owner and street address referenced and prepared in accordance with the 2010 California Building Code, Chapter 1, Division 1, Section 1.8.7, Chapter I, Division II, Section 104.10 of the 2010 CBC.

6. Minimum Size for Emergency Rescue or Escape Windows from Sleeping Rooms



Because so many fire-related casualties occur when occupants of residential buildings are asleep at the time of the fire, 2010 California Building Code Section 1029.1 requires that:

- Basements of dwelling units, and
- Every bedroom below the fourth story shall have at least one operable window or door approved for emergency escape and rescue. This exit shall open directly into a public street, public alley, yard or exit court. The units shall be operable to **provide a full clear opening** without the use of separate tools.

Extensive testing by the San Diego Building and Fire Departments established the minimum window size requirements found in Section 2010 CBC Section 1029:

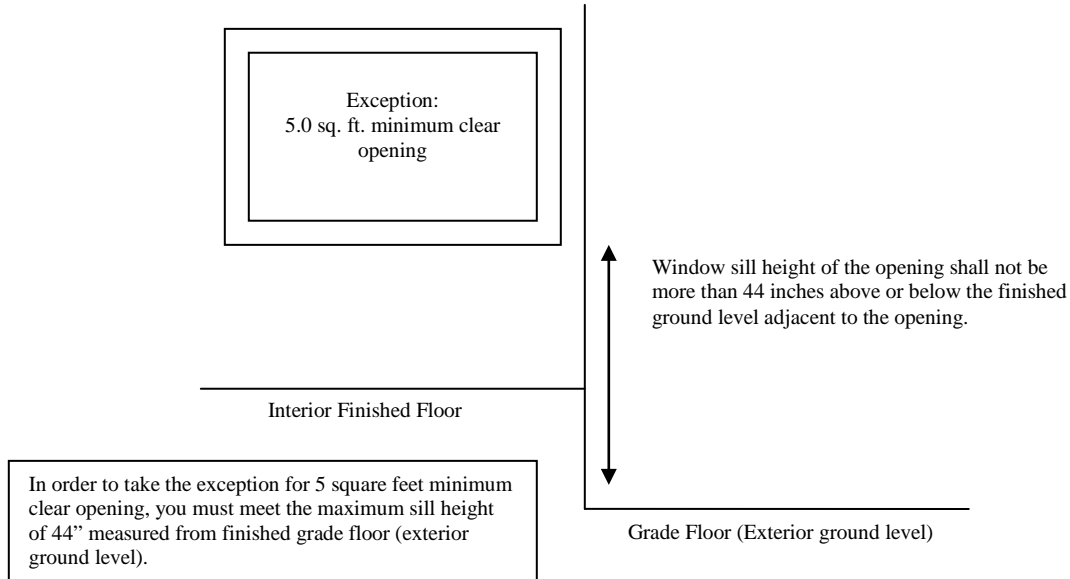
- The net clear opening shall be no less than 5.7 sq. feet.
- In addition to the above requirement, the net clear openable height dimension shall be a minimum of 24 inches. The net clear openable width dimension shall be a minimum of 20 inches. Note that using both minimum figures will not obtain the required area.
- The bottom of the clear opening not greater than 44 inches above the floor.

7. Minimum Width/Height Requirements for Emergency Escape and Rescue Windows

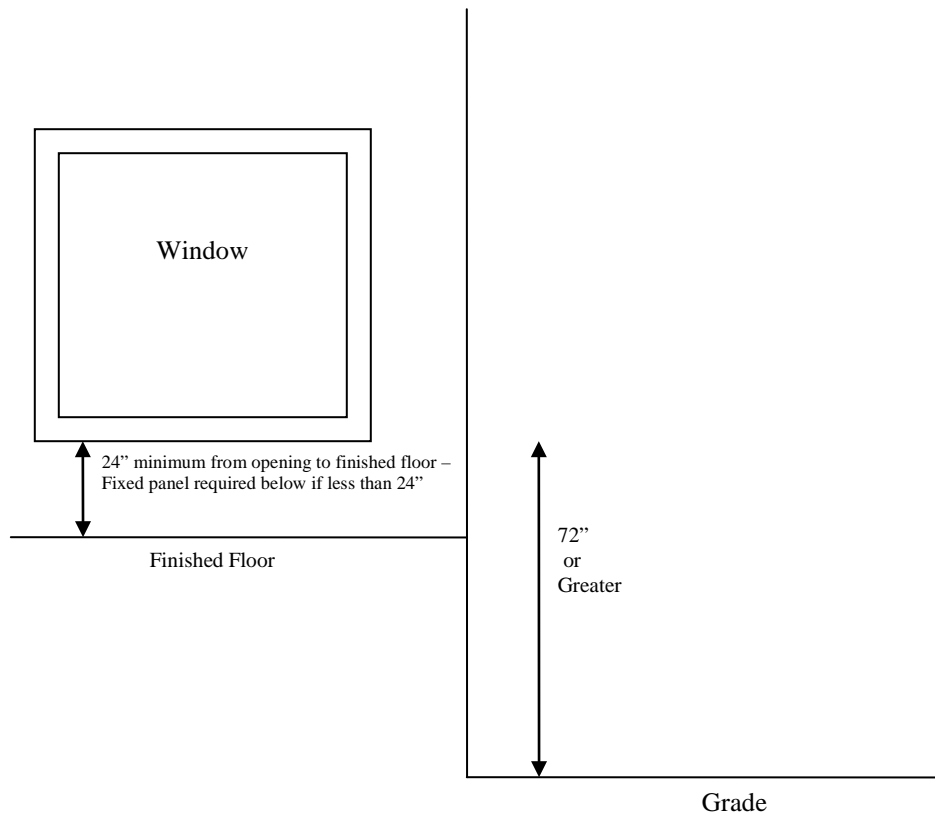
Width	20	20.5	21	21.5	22	22.5	23	23.5	24	24.5	25	25.5	26	26.5	27
Height	41	40	39.1	38.2	37.3	36.5	35.7	34.9	34.2	33.5	32.8	32.2	31.6	31	30.4

Width	27.5	28	28.5	29	29.5	30	30.5	31	31.5	32	32.5	33	33.5	34	34.2
Height	29.8	29.3	28.8	28.3	27.8	27.4	26.9	26.5	26.1	25.7	25.3	24.9	24.5	24.1	24

2010 CBC Section 1029.2 Exception



Additional Requirements for Exterior Windows: 2010 CBC Section 1405.13.2 (Window Sills) – Required for New Dwellings Built after 2007



Occupancy Group R2 & R3, one- and two-family and multiple-family dwellings where the opening of the sill portion of an operable window is located more than 72 inches above the finished grade or other surface below, the lowest part of the clear opening of the window shall be a minimum of 24 inches above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 24 inches shall be fixed or have openings such that a 4 inch diameter sphere cannot pass. Exception: Openings that are provide with window guards that comply with ASTM F2006 or F2090. (See Drawing Below)

2406.4 Hazardous locations. The following shall be considered specific hazardous locations requiring safety glazing materials:

1. Glazing in swinging doors except jalousies (see Section 2406.4.1).
2. Glazing in fixed and sliding panels of sliding door assemblies and panels in sliding and bi-fold closet door assemblies.
3. Glazing in storm doors.
4. Glazing in unframed swinging doors.
5. Glazing in doors and enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers. Glazing in any portion of a building wall enclosing these compartments where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above a standing surface.
6. Glazing in an individual fixed or operable panel adjacent to a door where the nearest exposed edge of the glazing is within a 24-inch (610 mm) arc of either vertical edge of the door in a closed position and where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the walking surface.

Exceptions:

1. Panels where there is an intervening wall or other permanent barrier between the door and glazing.

2. Where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth. Glazing in this application shall comply with Section 2406.4, Item 7.
 3. Glazing in walls perpendicular to the plane of the door in a closed position, other than the wall towards which the door swings when opened, in one- and two-family dwellings or within dwelling units in Group R-2.
7. Glazing in an individual fixed or operable panel, other than in those locations described in preceding Items 5 and 6, which meets all of the following conditions:
- 7.1. Exposed area of an individual pane greater than 9 square feet (0.84 m²);
 - 7.2. Exposed bottom edge less than 18 inches (457 mm) above the floor;
 - 7.3. Exposed top edge greater than 36 inches (914 mm) above the floor; and
 - 7.4. One or more walking surface(s) within 36 inches (914 mm) horizontally of the plane of the glazing.

Exception: Safety glazing for Item 7 is not required for the following installations:

1. A protective bar 1 1/2 inches (38 mm) or more in height, capable of withstanding a horizontal load of 50 pounds plf (730 N/m) without contacting the glass, is installed on the accessible sides of the glazing 34 inches to 38 inches (864 mm to 965 mm) above the floor.
 2. The outboard pane in insulating glass units or multiple glazing where the bottom exposed edge of the glass is 25 feet (7620 mm) or more above any grade, roof, walking surface or other horizontal or sloped (within 45 degrees of horizontal)(0.78 rad) surface adjacent to the glass exterior.
8. Glazing in guards and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface.
9. Glazing in walls and fences enclosing indoor and outdoor swimming pools, hot tubs and spas where all of the following conditions are present:
- 9.1. The bottom edge of the glazing on the pool or spa side is less than 60 inches (1524 mm) above a walking surface on the pool or spa side of the glazing; and
 - 9.2. The glazing is within 60 inches (1524 mm) horizontally of the water's edge of a swimming pool or spa.
10. Glazing adjacent to stairways, landings and ramps within 36 inches (914 mm) horizontally of a walking surface; when the exposed surface of the glass is less than 60 inches (1524 mm) above the plane of the adjacent walking surface.
11. Glazing adjacent to stairways within 60 inches (1524 mm) horizontally of the bottom tread of a stairway in any direction when the exposed surface of the glass is less than 60 inches (1524 mm) above the nose of the thread.

Exception: Safety glazing for Item 10 or 11 is not required for the following installations where:

1. The side of a stairway, landing or ramp which has a guardrail or handrail, including balusters or in-fill panels, complying with the provisions of Sections 1013 and 1607.7; and
2. The plane of the glass is greater than 18 inches (457 mm) from the railing.

2406.4.1 Exceptions. The following products, materials and uses shall not be considered specific hazardous locations:

1. Openings in doors through which a 3-inch (76 mm) sphere is unable to pass.
2. Decorative glass in Section 2406.4, Item 1, 6 or 7.
3. Glazing materials used as curved glazed panels in revolving doors.
4. Commercial refrigerated cabinet glazed doors.
5. Glass-block panels complying with Section 2101.2.5.
6. Louvered windows and jalousies complying with the requirements of Section 2403.5.
7. Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.

2406.5 Fire department access panels. Fire department glass access panels shall be of tempered glass. For insulating glass units, all panes shall be tempered glass.

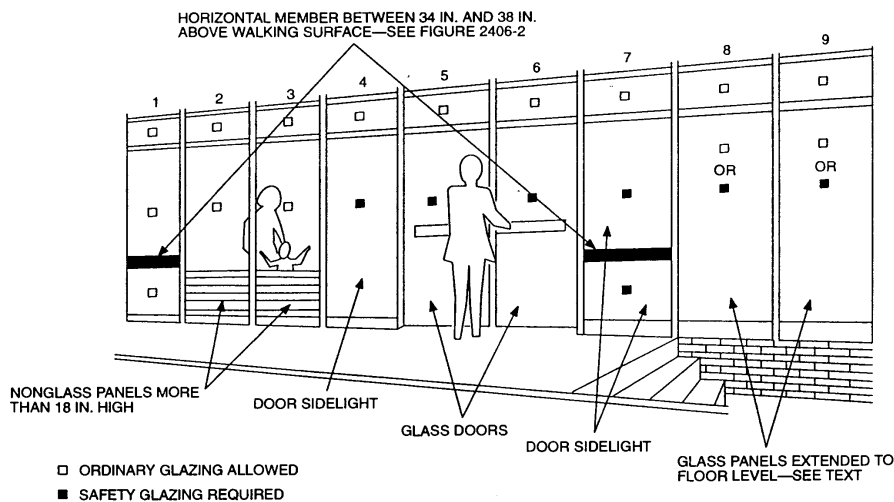
Hazardous Locations – CBC 2406.4 – Example Drawing Below for Clarification

This section lists specific hazardous locations where safety glazing is required. Some of these locations are shown in figure 2406-1 below. In addition to the hazardous locations shown, safety glazing is also required for a number of other conditions, including fixed and sliding panels of sliding door assemblies, storm doors, bathtub and shower enclosures, pool and spa enclosures, and glass railings.

Figure 2406-1 illustrates several locations where safety glazing may or may not be required. To facilitate discussion, each panel has been numbered. Panel 1 is not required to have safety glazing because a protective bar has been installed in compliance with Exception 2. Panels 2 and 3 will be discussed along with Panels 8 and 9. Panels 4 and 7 require safety glazing because they are door side lights. Exception 2 does not apply to panels adjacent to a door, so even though Panel 7 has been provided with a protective bar, safety glazing is still required. Safety glazing is required for panels adjacent to a door. This requirement applies for both fixed and operative panels. Where there is an intervening wall or a permanent barrier, safety glazing would not be required.

Panels 8 and 9, as well as Panels 2 and 3, fall under Item 7 of Section 2406.4. Under this item, all four stated conditions must occur before safety glazing is required. These conditions are:

1. The area of an individual pane must be greater than 9 sq. feet
2. The bottom edge must less than 18 inches above the floor;
3. The top edge must be more than 36 inches above the floor; and



4. One or more walking surfaces must be within 36 inches measured horizontally from the glazed panel.

Panels 2 and 3 do not require safety glazing because their bottom edges are not less than 18 inches from the floor. If Panels 8 and 9 have a walking surface with 36 inches of the interior, safety glazing would be required. Otherwise, it would not. [Remember that from the exterior side as shown in Figure 2406-1, the bottom of the panel appears to be greater than 18 inches above the exterior walking surface, so the exterior condition would have no bearing on the determination.] Panels 5 and 6 are glass doors, which require safety glazing. All ingress and egress doors (except jalousies), unframed swinging doors, and glazing in storm doors require safety glazing. There are several exceptions. If openings in a door will not pass a 3-inch-diameter sphere, the door is exempt, as are assemblies of leaded, faceted or carved glass used for decorative purposes. The latter exception not only applies to doors, but also to side lights and other glazed panels covered by Item 7.

Any questions or comments regarding these guidelines should be addressed to Building Division at (925) 671-3107.