



City of Vacaville
Community Development
Building Division

Residential Window Replacement

INTRODUCTION

The following information is provided as a guide for residential window replacements and new installations using the 2016 California Building Code and the 2016 California Residential Code. Within the City of Vacaville, all window replacements require a building permit regardless of how they are classified. This includes both “Retrofit Windows” and “New construction flanged windows”.

Any changes to an existing non-compliant egress window will trigger compliance with the current applicable code dimensional requirements.

ENERGY REQUIREMENTS

Replacement window installations, without a Performance Energy Analysis, shall comply with the Mandatory Measures Prescriptive requirements. High Performance Windows are required, reducing the U-Factor down to 0.32 and the SHGC down to 0.25 per the 2016 California Energy Code Section 150.1(c)3A.

WINDOW INSTALLATION

Approved corrosion-resistive flashings shall be installed shingle fashion in a manor to prevent entry of water into the wall cavity or structural framing components. All flashings shall be installed following the Window Manufacturer’s Instructions and ASTM 2112 and AAMA installation guidelines. For retrofit windows, the existing moisture barrier is not disturbed allowing the use of sealants and caulking.

EMERGENCY ESCAPE AND RESCUE OPENINGS

Basements, habitable attics and every sleeping room shall have at least one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, emergency escape and rescue shall be required in each sleeping room. The following outlines the minimum dimensions for egress compliance:

- The bottom of the net **clear** opening is not greater than 44 inches measured from the finished floor to the clear opening, **and**
- The minimum net **clear** opening area of 5.7 square feet is provided, **and**
Exception: Net clear opening space of 5 square feet is allowed for windows at grade level.
- The net clear opening height of 24 inches is provided, **and**
- Net clear opening width of 20 inches is provided.

Please note that all four of the above elements are required for egress compliance. While some windows may appear to be compliant when considering the overall opening size, window style and fixed window dimensions may render the open element to not comply. Casement windows without egress hinging may decrease the opening size as the window opens. All considerations must be given to egress window sizing.

GLAZING

Glazing installed in windows and doors shall meet the hazardous locations requirements as specified in CRC R308.6.2. Laminated, Tempered or other approved safety glazing is required in the following locations:

- Glazing in individual fixed or operable panels adjacent to a door where the floor bottom exposed edge of the glazing is less than 60 inches above the floor or walking surface and it meets either of the following conditions (R308.4.2):

- Where the glazing is within 24 inches of either side of the door in the place of the door in a closed position.
- Where the glazing is on a wall perpendicular to the plane of the door in a closed position and within 24 inches of the hinge side of an in-swinging door.
- Glazing in an individual fixed or operable panel when all of the following conditions apply (R308.4.3):
 - The exposed area of an individual pane is larger than 9 square feet, **and**
 - The bottom edge is less than 18" above the floor, **and**
 - The top edge is more than 36 inches above the floor, **and**
 - One of more walking surfaces located within 36 inches measured horizontally and in a straight line of the glazing.
- Glazing adjacent to stairs and ramps where the bottom edge of the glazing is less than 36 inches above the plane of the adjacent walking surface of stairs, landings and ramps. (R308.4.6)
- Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches above the landing and within 60 inches horizontally of the bottom tread.
- Glazing in walls, enclosures or fences facing hot tubs, spas, whirlpools, saunas steam rooms, bathtubs, showers and indoor/outdoor swimming pools where the bottom edge of the glazing is less than 60 inches measures vertically above the standing or walking surface.

OPERATIONAL CONSTRAINTS

Emergency escape and rescue openings shall be maintained free of any obstructions other than those allowed by this section and shall be operational from the inside of the room without the use of keys, tools or special knowledge.

ADDITIONAL REQUIREMENTS

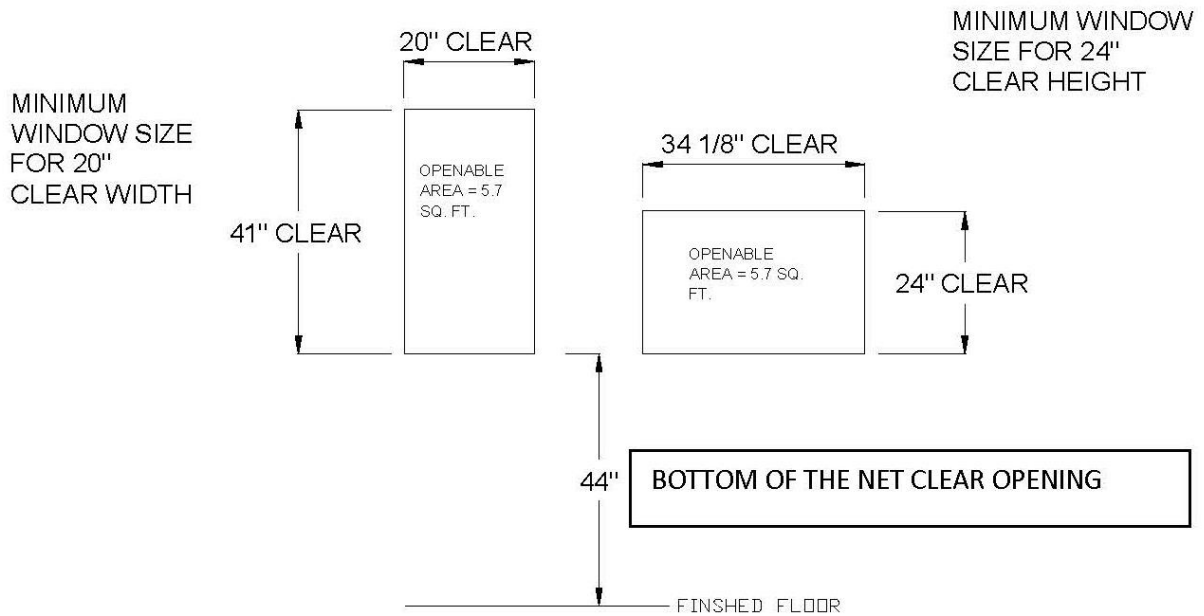
The following details the additional requirements that apply to windows:

- Window wells. The minimum horizontal area of the window well shall be 9 square feet, with a minimum horizontal projection and width of 36 inches. The area of the window well shall allow the emergency escape and rescue opening to be fully opened.

Exception: *The ladder or steps required by Section R310.2.3.1 shall be permitted to encroach a maximum of 6 inches into the required dimensions of the window well.*
- Ladder and steps. Window wells with a vertical depth greater than 44 inches shall be equipped with a permanently affixed ladder or steps usable with the window in the fully open position. Ladders or steps required by this section shall not be required to comply with Sections R311. 7 and R311.8. Ladders or rungs shall have an inside width of at least 12 inches, shall project at least 3 inches from the wall and shall be spaced not more than 18 inches on center vertically for the full height of the window well.
- Bulkhead enclosures. Bulkhead enclosures shall provide direct access to the basement. The bulkhead enclosure with the door panels in the fully open position shall provide the minimum net clear opening required by Section R310.3.2. Bulkhead enclosures shall also comply with Section R311.7.10.2.
- Bars, grilles, covers and screens. Bars, grilles, covers, screens or similar devices are permitted to be placed over emergency escape and rescue openings, bulkhead enclosures, or window wells that serve such openings, provided the minimum net clear opening size complies with Sections R310.1.1 to R310.1.3, and such devices shall be releasable or removable from the inside without the use of a key, tool, special knowledge or force greater than that which is required for normal operation of the escape and rescue opening. The release mechanism shall be maintained operable at all times.

- Where the opening of the operable window is located more than 72" above the finished grade or surface below, the lowest part of the clear opening of the window shall be a minimum of 24" (36" for other R-occupancies per CBC 1015.8) above the finished floor surface of the room in which the window is located. Operable sections of windows shall not allow passage of a 4 inch diameter sphere where such openings are located within 24 inches of the finish floor. (R312.2)
- All habitable rooms shall have windows with their total areas equaling at least 8% of the room's floor area and with their total opening area equaling at least 4% of the room's floor area.
- All windows require a permanent California Energy Commission Certification label.
- Bay windows and similar assemblies require the manufacturer's listed installation instructions for permit issuance. (UL, ICC, or equivalence)

TYPICAL OPENABLE WINDOW DIAGRAM



EMERGENCY ESCAPE AND RESCUE WINDOW

EGRESS

SAMPLE WIDTH / HEIGHT REQUIREMENTS FOR EMERGENCY ESCAPE AND RESCUE

(Dimensions are inches)

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	34.5
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

Note: Using both the minimum sizes for width and height will not obtain the required minimum area (5.7 sq. ft.) The above chart shows the minimum area for a given width or height. This area is larger than the minimum required for ventilation.