

Subchapter 7. General Industry Safety Orders
Group 1. General Physical Conditions and Structures Orders
Article 2. Standard Specifications

§3212. Floor Openings, Floor Holes, Skylights and Roofs.

(a)(1) Every floor and roof opening shall be guarded by a cover, a guardrail, or equivalent on all open sides. While the cover is not in place, the openings shall be constantly attended by someone or shall be protected by guardrails. Toeboards shall be installed around the edges at openings where persons may pass below the opening.

EXCEPTION: Stairway entrances.

(2)(A) Every ladderway floor opening or platform with access provided by ladderway, including ship stairs (ship ladders), shall be protected by guardrails with toeboards meeting the requirements of General Industry Safety Orders, Section 3209, on all exposed sides except at entrance to the opening. The opening through the railing shall have either a swinging gate or equivalent protection, or the passageway to the opening shall be so offset that a person cannot walk directly into the opening.

EXCEPTION: Ladder openings for entrance/access at perimeter roof edges where guardrail protection is not required by subsection (d) of this section.

(B)1. The uppermost surface or railing member of the swinging gate or other equivalent protection required by subsection (a)(2)(A) shall have a vertical height from the platform or floor level of between 42 to 45 inches plus or minus one inch and;

2. The swinging gate or other equivalent protection shall be capable of withstanding a force of at least 200 pounds applied vertically downward to the uppermost surface or railing member and horizontally outward at any point on the exit side of the ladder opening.

(3) Hatchways and chute floor openings shall be guarded by guardrails or by hinged or removable covers or by removable railings provided such covers or railings will afford protection equivalent to that provided by a guardrail.

This does not apply to chute openings which are effectively covered or protected by machine or equipment during operation. However, such chute shall be covered during repair or maintenance or when otherwise exposing employees to the hazards of unguarded floor openings.

(4) Foundry pits and similar sunken locations in which employees are required to work may be left unprotected during such times as the necessary handling of materials or other work prohibits the use of guardrails or equivalent; but when such pits are not in use they shall be either covered, filled in, or protected with guardrails or equivalent.

(5) Floor holes through which materials or tools may fall and create a hazard or through which parts of a person's body may contact dangerous moving parts, shall be completely covered except when in use unless these floor holes are used to feed machines or receptacles containing hot, toxic or corrosive materials, then these openings shall be guarded by hoppers, guardrails, or grates having openings not exceeding 1-inch by 5 inches. Floor holes through which transmission equipment passes may be guarded by toeboards.

(b) Floor and roof opening covers shall be designed by a qualified person and be capable of safely supporting the greater of 400 pounds or twice the weight of the employees, equipment and materials that may be imposed on any one square foot area of the cover at any time. Covers shall be secured in place to prevent accidental removal or displacement, and shall bear a pressure sensitized, painted, or stenciled sign with legible letters not less than one inch high, stating: "Opening -Do Not Remove." Markings of chalk or keel shall not be used.

(c) Covers shall not project more than one inch above the floor level and all edges shall be chamfered to an angle with the horizontal of not over 30 degrees. All hinges, handles, bolts, or other parts shall set flush with the floor or cover surface. (Title 24, part 2, section 2-1721(c).)

(d)(1) Guardrails as specified in section 3209 shall be required at locations where there is a routine need for any employee to approach within 6 feet of the edge of the roof. When intermittent work is being done safety belts and lanyards, or an approved fall protection system may be provided in lieu of guardrails.

For the purpose of this requirement, routine need means more than four times a year and intermittent work means work not exceeding four times a year.

(2) Guardrails required by subsection (d)(1) shall be provided along the roof edge extending at least 6 feet beyond the areas occupied by persons accessing, servicing or repairing permanently-mounted machinery and/or equipment.

(3) Where fall protection systems are used, safety lines and/or lanyards shall be attached to roof tie-backs meeting the requirements of section 3291(f) or equivalent anchorage. A safe and unobstructed access shall be provided to all roof tie-back locations. (Title 24, part 2, section 1711(h).)

(e) Any employee approaching within 6 feet of any skylight shall be protected from falling through the skylight or skylight opening by any one of the following methods:

(1) Skylight screens installed above the skylight. The design, construction, and installation of skylight screens shall meet the strength requirements equivalent to that of covers specified in subsection (b) above. They shall also be of such design, construction and mounting that under design loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork, with openings not more than 4 inches by 4 inches or of slatwork with openings not more than 2 inches wide with length unrestricted, or of other material of equal strength and similar configuration.

(2) Skylight screens installed below the skylight. Existing screens (i.e. burglar bars) shall meet the following requirements if they will be relied upon for fall protection:

(A) Screens installed at the same level or higher than the walking/working surface shall meet the strength requirements of subsection (b).

(B) Screens installed within 2 feet of the walking/working surface shall meet the strength requirements of subsection (b) with increased strength based on the fall distance below the walking/working surface as determined by a qualified person. In no case shall the strength of the screen below the skylight be less than the strength requirements of subsection (b). A screen more than 2 feet below the walking/working surface shall not serve as fall protection.

(C) A screen shall not be used for fall protection in accordance with subsection (e)(2)(A) or (e)(2)(B) if the broken skylight glazing will pose an impalement hazard to a worker who has fallen through the skylight and is lying on top of the screen. Skylights containing tempered, laminated, or plastic glazing, or similar materials shall not be considered to impose an impalement hazard.

(D) The screen construction shall be of grillwork, with openings less than 12 inches in the least horizontal dimension.

(3) Guardrails meeting the requirements of Section 3209.

(4) The use of a personal fall protection system meeting the requirements of Section 1670 of the Construction Safety Orders.

(5) Covers, including the skylight itself, meeting the requirements of subsection (b) installed over the skylights, or skylight openings. Where the skylight itself serves as a cover, the skylight shall be required to meet only the strength requirements of subsection (b). Further, for skylights serving as covers, the employer shall obtain documentation from the manufacturer that the skylight will meet the strength requirements of subsection (b) for the dates that work will be performed in the vicinity of the skylight. Such documentation shall be obtained prior to the start of work and shall be made available upon request.

(6) Skylight nets.

(A) Materials. Materials used for skylight nets shall be of natural or synthetic fiber of sufficient size, strength, and number to absorb a 400 pound load dropped from 42 inches above the surface of the net. The net hardware shall be drop-forged, pressed, or formed steel, or material of equal or better quality. The maximum size of mesh shall not exceed 36 square inches or be longer than 6 inches on any side, measured center-to-center of mesh ropes or webbing. No mesh member shall exceed 6 inches in length measured center-to-center of mesh crossings. All mesh crossings shall be anchored to eliminate frictional wear and prevent enlargement of mesh openings. Nets shall not be larger than 12 feet by 12 feet.

(B) Inspection.

1. Skylight nets shall be inspected weekly by a competent person utilizing the inspection procedures supplied by the manufacturer.

2. Visual inspections shall be performed daily by an authorized person trained on the manufacturer's inspection procedures before the net is relied upon for fall protection.

(C) Training. Employees shall be trained to recognize the hazards of falling into nets, and on the procedures to be followed in order to limit the potential injury from such falls. The training program shall include, at a minimum:

1. The tested limits of the net

2. Avoiding falls

3. Location of weekly inspection records and the person responsible

4. Procedures for retrieving a worker who has fallen into the net

5. Manufacturer's instructions on the use and limitations of the skylight net

6. Manufacturer's inspection requirements

7. Factors affecting net life, including, but not limited to, sunlight, abrasion, dirt/sand, rust, and airborne contaminants

(D) Care, Maintenance, and Storage. The care, maintenance, and storage of nets shall be in accordance with the net manufacturer's recommendations. Nets shall be protected from sparks, hot slag, or other materials which could compromise the strength of the net.

(E) Nets shall be removed from service under any of the following conditions:

1. The frame becomes warped, bent or distorted.
2. The netting becomes torn, unraveled, cut, or has excessive slippage of the mesh crossings.
3. The net has been modified from the original manufacturer's design or specification.
4. The recommended service life of the net as provided by the manufacturer has expired. Nets without a manufacturer supplied expiration date shall not be used for fall protection in accordance with this section.

EXCEPTION: to subsection (e)(6)(E)4. If the employer effectively records and documents the date that the net was first placed in service, the service life of the net shall begin on the date placed into service instead of the date of manufacture.

5. Other removal criteria specified by the manufacturer.

(F) Nets shall not be left on the skylight for longer than the duration of the job or one year whichever is less.

(G) Nets shall be used with sufficient clearance to prevent user's contact with the surfaces or structures below the skylight.

(7) A fall protection plan as prescribed in Section 1671.1 of the Construction Safety Orders when it can be demonstrated that the use of fall protection methods as contained in subsections (e)(1-6) of this Section is impractical or creates a greater hazard.

EXCEPTION: to subsection (e): When the work is of short duration and limited exposure such as measuring, roof inspection, electrical/mechanical equipment inspection, etc., and the time involved in rigging and installing the safety devices required in subsections (e)(1) through (e)(6) equal or exceed the performance of the designated tasks of measuring, roof inspection, electrical/mechanical equipment inspection, etc., these provisions may be temporarily suspended provided that adequate risk control is recognized and maintained.

(f) Access shall not be permitted on glazed surfaces such as roofs, vaults, canopies, or skylights glazed with transparent or translucent materials unless an engineer currently registered in the State of California and experienced in the design of such glazed structures has certified that the surface will support all anticipated loads. Employees working on such surfaces shall be protected by a fall protection system meeting the requirements of Section 1670 of the Construction Safety Orders.

(g) When glazed surfaces cannot be safely accessed for maintenance in accordance with subsection (f), scaffolds, catwalks, rolling ladders, platforms or other methods of safe access shall be provided.

Note: Authority cited: Section 142.3, Labor Code. Reference: Section 142.3, Labor Code