

(b) Designated areas shall be established only on surfaces that have a slope from horizontal of 10 degrees or less.

(c) The designated area shall consist of an area surrounded by a rope, wire or chain and supporting stanchions erected in accordance with the criteria in paragraphs (d)(2) through (d)(5) of this section.

(2) *Strength criteria.* (i) After being erected with the line (such as rope, wire or chain) attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion. The force shall be applied 30 inches (76 cm) above the work surface and perpendicular to the designated area perimeter, and in the direction of the unprotected side or edge;

(ii) The line shall have a minimum breaking or tensile strength of 500 pounds (2.2 kN), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in paragraph (d)(2)(i) of this section; and

(iii) The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

(3) *Height criteria.* The line shall be installed in such a manner that its lowest point (including sag) is no less than 34 inches (86 cm) nor more than 39 inches (1 m) from the work surface.

(4) *Visibility criteria.* The line forming the designated area shall be clearly visible from any unobstructed location within the designated area up to 25 feet (7.6 m) away, or at the maximum distance a worker may be positioned away from the line, whichever is less.

(5) *Location criteria.* (i) The stanchions shall be erected as close to the work area as is permitted by the task.

(ii) The perimeter of the designated area shall be erected no less than six feet (1.8 m) from the unprotected side or edge.

(iii) When mechanical equipment is being used, the line shall be erected not less than six feet (1.8 m) from the unprotected side or edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 m) from the unprotected side or edge which is perpendicular to the direction of mechanical equipment operation.

(iv) Access to the designated area shall be by a clear path, formed by two lines, attached to stanchions, which meet the strength, height and visibility requirements of this paragraph.

(e) *Holes.* Covers for holes in floors, roofs and other walking and working surfaces shall comply with the following provisions:

**Note:** See § 1910.27(b)(4) for floor holes provided for the passage of machinery, piping or other equipment.

(1) Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover.

(2) All other covers shall be capable of supporting, without failure, the maximum intended load of employees, equipment and

material to be applied to the cover at any one time, or 250 pounds (114 kg), whichever is greater.

(3) All covers shall be installed so as to prevent accidental displacement.

(f) *Personal fall protection systems.* All body belts and body harnesses and their associated fall protection systems shall meet the applicable requirements of subpart I of this Part.

(g) *Restraint line systems.* Where an employee is tethered, restraint line systems shall meet the applicable requirements of subpart I in order to prevent a fall from an unprotected side or edge or into an opening.

(h) *Safety net systems.* Safety net systems and their use shall comply with the following provisions:

(1) Safety nets shall be installed as close as practicable under the work surface on which employees are working, but in no case more than 30 feet (9.1 m) below such work surfaces.

(2) Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below if subjected to an impact equal to that imposed under the required drop test.

(3) Safety nets shall extend outward from the outermost projection of the work surface as follows:

Vertical distance— (working level to horizontal plane of net)	Minimum required horizontal—distance (net outer edge to working surface edge)
Up to 5 feet (1.5 m) .....	8 feet (2.4 m).
More than 5 feet (1.5 m) up to 10 feet (3 m).	10 feet (3 m).
More than 10 feet (3 m)	13 feet (4 m).

(4) Safety nets and their installations shall be capable of absorbing the impact force of a drop test, consisting of a 400 pound (180 kg) bag of sand  $30 \pm 2$  inches ( $76 \pm 5$  cm) in diameter dropped into the net from the highest work surface on which employees are to be protected. Each safety net and its installation shall be successfully drop-tested to meet this requirement at the job site before being used as a fall protection system.

*Exception to paragraph (h)(4) of this section:*

When the employer can demonstrate that such a drop test is not practicable, the net installation may be used if a qualified person certifies that the installation meets the strength requirements of this paragraph (h)(4) and all other requirements of this paragraph (h).

(5) Safety nets which are in use shall be inspected weekly for mildew, wear, damage or deterioration, and shall be removed from service if their required strength has been substantially reduced.

(6) Any materials, scrap pieces or tools which may have fallen into the safety net shall be removed as soon as possible, but at least before the next work shift.

(7) The maximum size of each safety net mesh opening shall not exceed 36 square inches ( $232 \text{ cm}^2$ ), nor be longer than six inches (15 cm) on any side measured center-to-center of mesh ropes or webbing. All mesh

crossings shall be secured to prevent enlargement of the mesh opening.

(8) Each safety net, or section of it, shall have a border rope or webbing with a minimum breaking strength of 5,000 pounds (22.2 kN).

(9) Connections between safety net panels shall be as strong as integral net components, and shall be spaced at intervals not more than six inches (15 cm) apart.

#### § 1910.29 Wall openings.

(a) *Existing wall openings.* Existing wall openings shall be guarded by a fall protection system meeting the applicable requirements of § 1910.28 if their lower edge is less than 36 inches (91.4 cm) above a work surface, and if they present a hazard to employees of falling through and down more than four feet (1.2 m).

(b) *New wall openings.* Wall openings constructed on or after (insert date 60 days after the effective date of the final rule in the **Federal Register**) shall be guarded by a fall protection system meeting the applicable requirements of § 1910.28 if their lower edge is less than 39 inches (1 m) above a work surface, and if they present a hazard to an employee of falling through and down more than four feet (1.2 m).

(c) *Grab handles.* Wall openings shall be provided with accessible grab handles on each side of the opening whenever the work activity requires employees to work through an unprotected opening by reaching through or around the opening. Each grab handle shall be capable of withstanding a maximum horizontal pull-out force equal to two times the intended load, or 200 pounds (890 N), whichever is greater. In addition, employees shall be provided with a fall protection system meeting the requirements of § 1910.28.

#### § 1910.30 Scaffolds.

(a) *Scope and application.* This section applies to two-point adjustable scaffolds, single-point adjustable suspension scaffolds, mobile manually propelled scaffolds, and boatswains' chairs and components when used in general industry. Any other type of scaffolds not specifically covered in this section shall meet the applicable requirements of 29 CFR Part 1926, subpart L.

(b) *Restrictions.* The use of "lean-to" or "shore" scaffolds is prohibited.

(c) *General requirements.* (1) *Scaffold installation and use.* Scaffold installation and use shall meet the following conditions:

(i) Ladders or makeshift devices shall not be used on top of scaffold platforms to increase the height at which employees work.

(ii) Scaffold suspension ropes or devices shall hang vertically without being pulled laterally unless specifically designed and intended for such use.

(iii) When employees on scaffolds are exposed to falling objects, overhead protection shall be provided in such a manner as to deflect or resist penetration of objects that are likely to fall onto the employees.

(iv) Scaffolds shall not be moved horizontally nor altered while they are in use or occupied by employees, except when a scaffold has been specifically designed for such use.