NGFA Guidance Document for Compliance with OSHA Update to Subpart D Walking -Working Surfaces

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TABLE OF CONTENTS

TABLE OF CONTENTS

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GUIDANCE DOCUMENT FOR GRAIN HANDLING, FEED MANUFACTURING, INGREDIENT AND PROCESSING FACILITIES

This guide provides a basic overview of the changes made to the general industry standards addressing slip, trip, and fall hazards found in Subpart D of the Occupational Safety and Health Administration (OSHA) standards. As such, it should be viewed as a foundation upon which individual companies can build their own tailored compliance plans specific to their facility, operations, personnel and other conditions. Sample illustrations and documents found in the Appendix (starting on page 46) provide templates that may be used to update your site-specific programs and procedures.

This document is based on federal OSHA standards. More than half the states administer their own job safety and health programs (State Plans). These State Plans operate with the approval of federal OSHA so long as the programs are "at least as effective" as the federal standards. However, these states may have standards more stringent than Federal OSHA. As a result, employers operating in a State Plan jurisdiction must comply with the regulations, standards and policies of the respective State Plan.

I. Background

Fall protection long has been one of OSHA's areas of emphasis. One of the first standards implemented after the agency's founding in 1970 was Subpart D, the general industry standards for walking-working surfaces. Adopted in April 1971, the standard was based upon several pre-1971 editions of American National Standards Institute (ANSI) consensus standards. The general industry standard recognized use of guardrails and barriers as primary methods of protection, but didn't directly recognize personal fall-protection systems.

In 1984, OSHA issued a directive that the use of personal fall-arrest systems would be permitted when workers were exposed to falls of four feet or higher, if the situation was not occurring on a "predictable and regular basis" – defined as at least one every two weeks, or for total of 4 or more man-hours during any sequential four-week period.

In 1994, OSHA published a final rule updating the general industry personal protective equipment (PPE) standards [59 *Federal Register* (FR) 16334 (4/6/1994)]. The final rule added new general provisions requiring that employers conduct hazard assessments; select proper PPE; remove defective or damaged PPE from service; and provide worker training in the proper use, care and disposal of PPE (29 Code of Federal Regulations (CFR) Part 1910.132). It also revised design, selection and use requirements for specific types of PPE. However, the final rule did not apply the new general provisions to personal fall protection systems or include specific requirements addressing such systems.

In 1996, the agency issued an internal memorandum, otherwise known as the "Miles Memo," that directed OSHA inspectors ***not*** to cite falls from rolling stock under Subpart D. The memo specifically states, "…falls from rolling stock would not be cited under the fall protection standard because it was not appropriate to cite exposure to fall hazards from tops of rolling stock unless the stock was inside of or contiguous to a structure where fall protection is feasible."

On May 2, 2003, OSHA published a notice reopening the record on Subparts D and I rulemakings to refresh the record, which had grown stale in the years since OSHA published the 1990 proposed rules (68 FR 23528). Based upon comments and information OSHA received, including information on significant technological advances in fall protection (particularly) personal fall arrest systems, OSHA determined that a new proposed rule was needed.

On May 24, 2010, OSHA published a consolidated proposed rule on Subparts D and I (75 FR 28862). The proposal also requested separate comments on whether specific regulations are needed to address falls from rolling stock and commercial motor vehicles. In the proposal, the agency states that the Miles Memo "…did not result in clear direction to the public or to OSHA's field staff."

On Nov. 18, 2016, OSHA issued a new final rule that updates and revises the general industry Walking-Working Surfaces and Personal Protective Equipment (Fall Protection Systems) standards on slip, trip and fall hazards. Specifically, the rule updates general industry standards addressing slip, trip and fall hazards (Subpart D), and adds requirements for personal fall-protection systems (Subpart I). The final rule applies to all general industry workplaces and covers all walking-working surfaces, which include horizontal and vertical surfaces like floors, stairs, roofs, ladders, ramps, scaffolds, elevated walkways and fall-protection systems.

A. Rolling Stock Fall Protection

Under the Obama administration, OSHA essentially ignored the 1996 Miles Memo and instead cited numerous facilities for not conducting a proper PPE hazard assessment when allowing workers to be on top of rolling stock without fall protection. OSHA's 2010 proposed rule requested separate comments on whether specific regulations were needed to address falls from rolling stock and commercial motor vehicles that would in essence supersede the 1996 Miles Memo. OSHA's proposal asked for information on eight specific questions regarding rolling stock, such as the number of employees who work on rolling stock; the type of fall-protection equipment used; and alternative means that can be used to protect employees in the absence of such fall-protection devices.

NGFA Safety, Health and Environmental Quality Committee Chairman Greg Rowe testified on behalf of the industry at the OSHA public hearing in 2011. In his statement, NGFA highlighted the effectiveness of the Miles Memo and opposed any additional regulatory burden that would have an operational and economic impact on industry. After NGFA submitted comments to OSHA on these issues, there was little dialogue with the agency on this topic.

In the final rule, OSHA did not include any specific fall-protection requirements for rolling stock and commercial motor vehicles in the final updates to Subpart D or Subpart I. This means that the Miles Memo remains in effect. However, OSHA may consider pursuing further action on this topic in the future.

B. Combustible Dust

In addition to rolling stock fall protection, NGFA also addressed OSHA's 2010 proposal to include combustible dust as a slip, trip and fall hazard by modifying the general requirements found in Section 1910.22 of its regulations that obligate employers to keep workplaces, passageways, storerooms and service areas clean and orderly, and in a sanitary condition. Specifically, OSHA proposed to require that floors of workrooms be maintained in a clean and, so far as possible, dry condition to prevent slips, trips, falls and other hazards. It also proposed to require that, where wet processes are used, drainage be maintained, and false doors, platforms, mats or other dry-standing places be provided when practical.

Historically, OSHA has interpreted provisions in Section 1910.22 as applying to combustible dust accumulations associated with fire and explosion hazards. OSHA maintains this section of its regulations provides the agency with one of its most important enforcement tools for preventing accumulations of combustible dust. For these reasons, OSHA sought comment on whether it should include an explicit reference to combustible dust or other hazardous material in the regulatory language of the final rule. Within its comments submitted on the 2010 proposal, NGFA encouraged OSHA to leave the current practices in place without major modifications.

Under its final rule, OSHA will continue to regulate combustible dust hazards on walking working surfaces. Even though the term "combustible dust" was not included in the final language under Section 1910.22(a)(1), the agency contends in the preamble that it will continue to "interpret" combustible dust as a walking working surfaces hazard since excessive accumulation is a slip, trip or fall hazard. In other words, if OSHA inspectors sees "excessive" dust outside of the priority housekeeping area, they could potentially issue a citation under this standard. Therefore, the grain handling industry potentially now can be cited for dust accumulations under 1910.272, 1910.22(a)(1) or the General Duty Clause.

II. Summary of Walking Working Surfaces Standard

1. New Subpart D provides flexible compliance options for standards associated with:
   - Guardrails
   - Designated Areas
   - Safety Net Systems
   - Travel Restraint Systems
   - Personal Fall Arrest (PFA) Systems

2. Subpart I provides criteria on the proper use of (PFA) systems when used by the employer – similar to construction rule 29 CFR 1926.502(d)/(e).

3. The Appendix provides examples of procedures and test methods used by PPE manufacturers to prove compliance with PPE criteria.

   - OSHA imports language from existing Part 1926 (construction), Part 1915 (shipyard), and powered platforms for building maintenance (1910.66) to address criteria and performance requirements for fall arrest systems used.

4. Under new requirements, employers are required to maintain workplace conditions that prevent employees from falling off of overhead platforms, elevated work stations or into holes in the floor and walls.

5. As a baseline, OSHA expects employers to:

   - Inspect and provide working conditions that are free of known fall dangers.
   - Keep floors in work areas in a clean and, so far as possible, dry condition.
   - Select and provide needed PPE at no cost to workers.
   - Utilize guardrail or other permissible systems to engineer out fall hazards, where possible, but otherwise effectively use PFAs, train workers on use of PPE, and maintain and inspect equipment.
   - Provide appropriate ladders or other manlifts to allow workers to safely access work areas (and train them on the use of this equipment).
   - Train workers generally about fall hazards and PPE use in a language that they can understand.

D. Timeline

Most of the rule became effective Jan. 17, 2017, 60 days after publication in the ***Federal Register***. However, some provisions have delayed effective dates, including:

- Ensuring exposed workers are trained on fall hazards (May 17, 2017);
- Ensuring workers who use equipment covered by the final rule are trained (May 17, 2017);
- Inspecting and certifying permanent anchorages for rope descent systems (November 20, 2017);
- Installing personal fall arrest or ladder safety systems on new fixed ladders whose height exceeds 24 feet and on replacement ladders/ladder sections, including fixed ladders on outdoor advertising structures (on and after Nov. 19, 2018);
- Ensuring existing fixed ladders exceeding 24 feet, including those on outdoor advertising structures, are equipped with a cage, well, personal fall arrest system, or ladder safety system no later than Nov. 19, 2018; and
- Having ladder safety or personal fall-arrest systems installed on all fixed ladders exceeding 24 feet by Nov. 18, 2036.

Training is required to be completed on at least an annual basis for the hazardous tasks workers are exposed, as required under OSHA's grain handling standard 1910.272(e). To be in compliance, workers who use personal fall protection and work in other specified high-hazard situations should have been trained by May 17, 2017, and thereafter be retrained as necessary, about fall and equipment hazards, including fall-protection systems. A qualified person must train these workers to correctly:

- Identify and minimize fall hazards;
- Use personal fall-protection systems and rope-descent systems; and
- Maintain, inspect and store equipment or systems used for fall protection.

If a facility has a Rope Descent System (RDS), which consists of a roof anchorage, support rope, descent device, carabiners or shackles, and a chair or seatboard, the facility is required to have the anchorages inspected and certified no later than Nov. 17, 2017. **NOTE: Most grain handling facilities typically do not have or use a RDS.**

E. Final Subpart D Reorganization

When OSHA revised Subpart D, it also changed most of the titles for each of the standard numbers that appear in this subpart. As a result, information that previously was found under the old standard number now is found under a completely different standard number. For those familiar with the old standard reference numbers, this can make it difficult now to locate the new standard numbers that apply to those issues related to the grain handling, feed manufacturing, ingredient, processing and export industry. Wherever possible, this Guidance Document provides the new standard reference numbers and includes the new updated language for each. Table 1 shows the previous standard titles, as well as the new titles.

TABLE 1

PREVIOUS SUBPART D	NEW SUBPART D
1910.21 Definitions	1910.21 Scope and Definitions
1910.22 General Requirements	1910.22 General Requirements
1910.23 Guarding Floor and Wall Openings and Holes	1910.23 Ladders
1910.24 Fixed Industrial Stairs	1910.24 Step Bolts and Manhole Steps
1910.25 Portable Wood Ladders	1910.25 Stairways
1910.26 Portable Metal Ladders	1910.26 Dockboards
1910.27 Fixed Ladders	1910.27 Scaffolds and Rope Descent System
1910.28 Safety Requirements for Scaffolding	1910.28 Duty to Have Fall Protection and Falling Object Protection
1910.29 Manually Propelled Mobile Ladder Stands and Scaffolds (Towers)	1910.29 Fall Protection Systems and Falling Object Protection – Criteria and Practices
1910.30 Other Working Surfaces	1910.30 Training Requirements

II. SUBPART D DEFINITIONS – 1910.21

Various terms used throughout this Guidance Document are defined in this section. These terms and their definitions are derived directly from OSHA standard 1910.21. Please note that this is not an all-inclusive list. Users of the document are encouraged to refer to OSHA standard 1910.21 for the entire list of terms used throughout Subpart D.

Anchorage means a secure point of attachment for equipment, such as lifelines, lanyards, deceleration devices and rope descent systems.

Authorized means an employee who the employer assigns to perform a specific type of duty, or allows in a specific location or area.

Cage means an enclosure mounted on the side rails of a fixed ladder or fastened to a structure behind the fixed ladder that is designed to surround the climbing space of the ladder. A cage also is called a "cage guard" or "basket guard.'

Dockboard means a portable or fixed device that spans a gap or compensates for a difference in elevation between a loading platform and a transport vehicle. Dockboards include, but are not limited to, bridge plates, dock plates and dock levelers.

Fall hazard means any condition on a walking-working surface that exposes an employee to a risk of harm from a fall on the same level or to a lower level.

Fall protection means any equipment, device or system that prevents an employee from falling from an elevation, or mitigates the effect of such a fall.

Fixed ladder means a ladder with rails or individual rungs that is permanently attached to a structure, building or equipment. Fixed ladders include individual-rung ladders, but not ship stairs, step bolts or manhole steps.

Grab bar means an individual horizontal or vertical handhold installed to provide access above the height of the ladder.

Guardrail system means a barrier erected along an unprotected or exposed side, edge or other area of a walking-working surface to prevent employees from falling to a lower level.

Handrail means a rail used to provide employees with a handhold for support.

Ladder means a device with rungs, steps or cleats used to gain access to a different elevation.

Ladder safety system means a system designed to eliminate or reduce the possibility of falling from a ladder. A ladder safety system usually consists of a carrier, safety sleeve, lanyard, connectors and body harness. Cages and wells are not ladder safety systems.

Maximum intended load means the total load (weight and force) of all employees, equipment, vehicles, tools, materials and other loads the employer reasonably anticipates to be applied to a walking-working surface at any one time.

Personal fall-arrest system means a system used to arrest an employee in a fall from a walking-working surface. It consists of a body harness, anchorage and connector. The means of connection may include a lanyard, deceleration device, lifeline or a suitable combination of these.

Personal fall-protection system means a system (including all components) an employer uses to provide protection from falling or to safely arrest an employee's fall if one occurs. Examples of personal fall-protection systems include personal fall-arrest systems, positioning systems and travel-restraint systems.

Platform means a walking-working surface that is elevated above the surrounding area.

Positioning system (work-positioning system) means a system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or window sill, and work with both hands free. Positioning systems also are called "positioning system devices" and "work-positioning equipment."

Qualified describes a person who, by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work or the project.

Rope-descent system means a suspension system that allows an employee to descend in a controlled manner and, as needed, stop at any point during the descent. A rope-descent system usually consists of a roof anchorage, support rope, a descent device, carabiner(s) or shackle(s), and a chair (seatboard). A rope-descent system also is called controlled-descent equipment or apparatus. Rope-descent systems do not include industrial rope access systems.

Side-step ladder means a type of fixed ladder that requires an employee to step sideways from it in order to reach a walking-working surface, such as a landing.

Stair rail or stair-rail system means a barrier erected along the exposed or open side of stairways to prevent employees from falling to a lower level.

Stairway (stairs) means risers and treads that connect one level with another, and includes any landings and platforms in between those levels. Stairways include standard, spiral, alternating tread-type and ship stairs.

Standard stairs means a fixed or permanently installed stairway. Ship, spiral and alternating tread-type stairs are not considered standard stairs.

Through ladder means a type of fixed ladder that allows the employee to step through the side rails at the top of the ladder to reach a walking-working surface, such as a landing.

Travel-restraint system means a combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface.

Unprotected sides and edges mean any side or edge of a walking-working surface (except at entrances and other points of access) where there is no wall, guardrail system or stair-rail system to protect an employee from falling to a lower level.

Walking-working surface means any horizontal or vertical surface on or through which an employee walks, works or gains access to a work area or workplace location.

Warning line means a barrier erected to warn employees that they are approaching an unprotected side or edge, and which designates an area in which work may take place without the use of other means of fall protection.

III. FIXED LADDERS – 1910.23, 1910.27 and 1910.28

Prior to the revision of Subpart D, there was a standard pertaining specifically to fixed ladders found in 1910.27. The revised Subpart D no longer has a fixed-ladder standard. Instead, OSHA standard 1910.23, entitled "Ladders," covers all types of ladders, not just fixed ladders. Unfortunately, not all of the fixed-ladder requirements are addressed in this one standard. To encompass all OSHA requirements for fixed ladders, three different standards (1910.23; 1910.27 and 1910.28) must be consulted. This section of the NGFA Guidance Document consolidates and addresses all the fixed-ladder standards, including the new updates, in one convenient place to assist employers with compliance.

In addition to OSHA, the American National Standards Institute (ANSI) has a standard – ANSI A14.3-2008 – that addresses the safety requirements for fixed ladders. OSHA frequently issues citations even when it does not have an agency standard that addresses the specific hazard. OSHA is able to issue and enforce the citation if it can prove there is another nationally recognized so-called "consensus" safety standard that applies to the hazard being cited. OSHA frequently references ANSI standards as its justification for issuing a citation. Because ANSI standards are updated more frequently than OSHA standards, OSHA recognizes ANSI standards as containing the most current best safety practices and criteria for state-of-the-art employee safety systems and equipment in the industry. Therefore, if an employer is not in compliance with the requirements of an OSHA standard but is complying with the requirements of a current consensus standard that clearly provides equal or greater employee protection, the violation of OSHA's requirement will be treated as a ***deminimis* violation**. *Deminimis* violations do not have a monetary penalty nor are they retained on the employer's permanent record with OSHA.

Although OSHA updated its standards addressing fixed ladders, the ANSI standard for fixed ladders still provides much greater detail and information than OSHA's regarding the installation and design details for fixed ladders. ANSI covers items such as live load and dead load requirements, specifies material type, cross section size and thickness, fabrication methods, shapes and much more. This section of the Guidance Document not only lists each OSHA standard that addresses fixed ladders, but also includes the equivalent ANSI standard that appears in *italicized type*. The requirements for fixed ladders between OSHA and ANSI are virtually identical, with a few minor differences. These differences do not affect compliance with the OSHA standard and are highlighted in more detail later in this section.

When considering fixed-ladder designs for an existing or new facility, or when contracting out the purchase and installation of new or repaired fixed ladders, consider ensuring the ladders comply with the above-referenced ANSI standard, as the ladders also will comply with OSHA. [**NOTE:** As noted previously, all recommendations offered throughout this NGFA Guidance Document are just that, recommendations. Management

at each facility should carefully evaluate and make its own decisions on how to comply with the OSHA standard updates to Subpart D.]

A. Fixed Ladder Requirements - 1910.23

Application

The employer must ensure that each ladder used meets the requirements of this section. This section covers all ladders, except when the ladder is:

1910.23(a)(1) – Used in emergency operations, such as firefighting, rescue, tactical law enforcement operations or training for these operations. *Not addressed in ANSI.*

1910.23(a)(2) – Designed into or is an integral part of machines or equipment. *Not addressed in ANSI.*

General Requirements for All Ladders

1910.23(b)(1) – The employer must ensure ladder rungs, steps and cleats are parallel, level and uniformly spaced when the ladder is in position for use. *ANSI 5.1.3.1(e).*

1910.23(b)(2) – Ladder rungs, steps and cleats are spaced not less than 10 inches and not more than 14 inches apart as measured between the centerlines of the rungs, cleats and steps. *ANSI 5.1.1 allows 1st rung to be adjusted to a maximum height of 14 inches with remaining rungs spaced 12 inches apart and uniform.* **(See Illustration #6)**

1910.23(b)(4) – Ladder rungs, steps and cleats must have a minimum clear width (distance between side rails) of 16 inches (measured before installation of ladder safety systems) for fixed ladders. *ANSI 5.1.2.* **(See Illustration #6)**

1910.23(b)(6) – Metal ladders are made with corrosion-resistant material or protected against corrosion. *ANSI 5.6 – provides more specific details.*

1910.23(b)(7) – Ladder surfaces are free of puncture and laceration hazards. *ANSI 4.1.5.*

1910.23(b)(8) – Ladders are used only for the purposes for which they were designed. *Not specifically addressed in ANSI, as this is implied.*

1910.23(b)(9) – Ladders are inspected before initial use in each work shift and more frequently as necessary to identify any visible defects that could cause employee injury. *ANSI 9.1.4 requires fixed ladders to be inspected routinely to ensure they comply with the requirements of the standard. ANSI 9.3.1 further requires fixed*

ladders and ladder safety systems be inspected for rust, corrosion and deterioration at least annually, with more frequent inspection determined by the employer. Refer to Section III (B)(7) for further details.

1910.23(b)(10) – Any ladder with structural or other defects is immediately tagged "Dangerous: Do Not Use" or with similar language in accordance with 1910.145 and removed from service until repaired in accordance with 1910.22 or replaced. *ANSI 9.3.3.*

1910.23(b)(11) – Each employee faces the ladder when climbing up or down it. *ANSI 9.2.1.*

1910.23(b)(12) – Each employee uses at least one hand to grasp the ladder when climbing up and down it. *ANSI 9.2.1.*

1910.23(b)(13) – No employee carries any object or load that could cause the employee to lose balance and fall while climbing up or down a ladder. *ANSI 9.2.2.*

Requirements for Fixed Ladders

1910.23(d)(1) – The employer must ensure fixed ladders are capable of supporting their maximum intended load. *ANSI 4.2.*

1910.23(d)(2) – The minimum perpendicular distance from the centerline of the steps or rungs, or grab bars, or both, to the nearest permanent object in back of the ladder, is 7 inches. *ANSI 5.4.2.* **(See Illustration #7)**

1910.23(d)(3) – Grab bars do not protrude on the climbing side beyond the rungs of the ladder that they serve. *ANSI 5.4.2.1.*

1910.23(d)(4) – The side rails of through or sidestep ladders extend 42 inches above the top of the access level or landing platform served by the ladder. *ANSI 5.3.2.1.* **(See Illustrations #6 and #8)** For parapet ladders the access level is:

1910.23(d)(4)(i) – The roof if the parapet is cut to permit passage through the parapet. *ANSI 5.3.2.1 Fig.10.* **(See Illustration #10)**

1910.23(d)(4)(ii) – The top of the parapet if the parapet is continuous. *ANSI 5.3.2.1 Fig.10.* **(See Illustration #10)**

1910.23(d)(5) – For through ladders, the steps or rungs are omitted from the extensions, and the side rails are flared to provide not less than 24 inches and not more than 30 inches of clearance. When a ladder safety system is provided, the

maximum clearance between the side rails of the extension must not exceed 36 inches. *ANSI 5.3.2.2 Fig. 9. The last sentence in the above OSHA standard is not specifically addressed in ANSI, but compliance can be achieved by following the first part.*

1910.23(d)(6) – For side-step ladders, the side rails, rungs and steps must be continuous in the extension. (OSHA Figure D-2). *ANSI 5.3.2.3 Fig. 6.* **(See Illustration #6)**

1910.23(d)(7) – Grab bars extend 42 inches above the access level or landing platforms served by the ladder. *ANSI 5.3.3.2 and ANSI 5.3.4.3 for hatch openings.*

1910.23(d)(8) – The minimum size (cross-section) of grab bars is the same size as the rungs of the ladder. *ANSI 5.3.3.3.*

1910.23(d)(9)(i) – When a fixed ladder terminates at a hatch (OSHA Figure D-3), the hatch cover must open with sufficient clearance to provide easy access to or from the ladder. **Note: OSHA Fig. D-3 shows a hatch opening of 30 inches of clearance with no other options for unusual situations, yet the standard states "sufficient clearance." Currently, it is unclear how OSHA is defining "sufficient clearance." This may be clarified once OSHA completes the compliance directive.** *ANSI 5.3.4.1 Fig. 13 allows for a minimum opening of 27 inches and a maximum opening of 30 inches. It also allows for unusual hatch conditions where the opening may be reduced to no less than 24 inches provided a deflector plate is installed. It could be argued that the clearances in ANSI are "sufficient" to provide safe access to and from the ladder.* **(See Illustration #11)**

1910.23(d)(9)(iii) – The hatch must open at least 70 degrees from horizontal if the hatch is counterbalanced. *ANSI 5.3.4.2.*

1910.23(d)(10) – Individual rung ladders are constructed to prevent the employee's feet from sliding off the ends of the rungs. (OSHA Figure D-4). *ANSI Fig. 8.* **(See Illustration #14)**

1910.23(d)(11) – Fixed ladders having a pitch greater than 90 degrees from the horizontal are not used. *ANSI 1.4.3.*

Step-Across Distance

1910.23(d)(12)(i) – The step-across distance from the centerline of the rungs or steps for through ladders is not less than 7 inches and not more than 12 inches to the nearest edge of the structure, building or equipment accessed from the ladder. *ANSI 5.4.2.2.*

1910.23(d)(12)(ii) - The step-across distance from the centerline of the rungs or steps for side-step ladders is not less than 15 inches and not more than 20 inches to the access points of the platform edge. *ANSI 5.4.3.2.* **(See Illustration #6)**

Fixed Ladders Without Cages or Wells
1910.23(d)(13)(i) – Fixed ladders that do not have cages or wells must have a clear width of at least 15 inches on each side of the ladder centerline to the nearest permanent object. *ANSI 5.4.3.1.* **(See Illustration #6)**

1910.23(d)(13)(ii) – Fixed ladders that do not have cages or wells must have a minimum perpendicular distance of 30 inches from the centerline of the steps or rungs to the nearest object on the climbing side. When unavoidable obstructions are encountered, the minimum clearance at the obstruction may be reduced to 24 inches provided deflector plates are installed. (OSHA Figure D-5.) *ANSI 5.4.1.1 and 5.4.1.3 Fig. 15.* **(See Illustration #7)**

B. Fixed Ladder Requirements - 1910.28

Protection From Falls
1910.28(b)(3)(iv) – Each employee is protected from falling into a ladderway floor hole or ladderway platform hole by a guardrail system and toeboards erected on all exposed sides, except at the entrance to the hole where a **self-closing gate** or an offset must be used. *[Emphasis added.] ANSI 4.1.4.1(b) Fig. 5a.* **(See Illustration #5)**

Fixed Ladders Extending More Than 24 Feet Above a Lower Level
1910.28(b)(9)(i) – Fixed ladders that extend more than 24 feet or expose a worker to a fall of more than 24 feet to a lower level must adhere to the following:

- **Existing Fixed Ladders**
  1910.28(b)(9)(i)(A) – Employer must ensure each existing fixed ladder installed **before Nov. 19, 2018** that extends more than 24 feet or exposes a worker to a fall of more than 24 feet to a lower level is equipped with a personal fall-arrest system or; ladder safety system or; cage or well. *ANSI 4.1.1 has same requirement as OSHA but does not have the specific implementation date, which applies only to OSHA.* **(See Illustration #2)**

- **New Fixed Ladders**
  1910.28(b)(9)(i)(B) – Each fixed ladder installed **on or after Nov. 19, 2018** must be equipped with a personal fall-arrest system or a ladder-safety system. ***[Note: Safety cages are not required but may be installed by the employer as long as they do not interfere with the operation of the personal fall arrest or ladder***

safety system.] *ANSI 4.1.3 requires a ladder safety system, but does not mention the use of personal fall-arrest systems. ANSI does not have a specific compliance date.* **(See Illustration #4)**

- **Replacing Ladders after Nov. 19, 2018**
  1910.28(b)(9)(i)(C) – When a fixed ladder, cage or well, or any portion or section thereof is replaced, a personal fall-arrest system or a ladder safety system must be installed in at least that section of the fixed ladder, cage or well where the replacement is located. *ANSI 1.6.2. Refer to Section III (B)(4) for further details.*

- **Final Deadline**
  1910.28(b)(9)(i)(D) – **On and after Nov. 18, 2036**, all fixed ladders must be equipped with a personal fall-arrest system or a ladder-safety system. ***[Note: Safety cages and wells no longer are required.]*** [See 1910.28(b)(9)(iv) below.] *ANSI does not have a specific compliance date.*

Single or Multiple Section Ladders With Fall-Protection or Ladder-Safety Systems

1910.28(b)(9)(ii)(A) – The employer must ensure that personal fall arrest systems or ladder safety systems provide protection throughout the entire vertical distance of the ladder, including all ladder sections. *ANSI does not address this specific requirement, as compliance with the requirements of the standard are implied.*

1910.28(b)(9)(ii)(B) – The employer must ensure the ladder has rest platforms provided at maximum intervals of 150 feet. *ANSI 4.1.4.2.* **(See Illustration #4)**

Ladder Sections With Safety Cages or Wells Installed Before Nov. 19, 2018

1910.28(b)(9)(iii)(A) – The employer must ensure ladders are offset from adjacent sections. *ANSI 4.1.4.1(a).*

1910.28(b)(9)(iii)(B) – The employer must ensure ladders have landing platforms provided at maximum intervals of 50 feet. *ANSI 4.1.4.1(b) and ANSI Fig. 5a.* **(See Illustration #3)**

1910.28(b)(9)(iv) – The employer may use a cage or well in combination with a personal fall-arrest system or ladder-safety system provided that the cage or well does not interfere with the operation of the system. *ANSI 4.1.6 states ladder safety systems may be used in conjunction with a cage. It does not state that the cage must not interfere with the operation of the system, as this is implied.*

C. Fixed Ladder Requirements - 1910.29

Safety Cages, Wells and Platforms used with Fixed Ladders

1910.29(g)(1) – The employer must ensure that cages and wells installed on fixed ladders are designed, constructed and maintained to permit easy access to, and egress from, the ladder that they enclose. (OSHA Figures D-14 and D-15) ***[Note: Figure D-15 is the exact same figure from the previous standard and contains inaccurate information, as it shows the maximum cage length being 30 feet whereas the revised standard now allows a ladder with a cage to have a maximum length of 50 feet. [1910.28(b)(9)(iii)(B).]*** *ANSI Figures 17 and 18 are essentially the same as OSHA's. OSHA lists a cage diameter of 27 inches, whereas ANSI allows for a cage diameter of between 27 and 30 inches, which will comply with OSHA.* **(See Illustration #12)**

1910.29(g)(2) – Cages and wells must be continuous throughout the length of the fixed ladder, except for access, egress, and other transfer points. *ANSI does not specifically state this, as compliance is implied.*

1910.29(g)(3) – Cages and wells are designed, constructed and maintained to contain employees in the event of a fall, and to direct them to a lower landing. *ANSI does not specifically state this, as compliance is implied.*

1910.29(g)(4) – Platforms used with fixed ladders provide a horizontal surface of at least 24 inches by 30 inches. *ANSI 6.3.2 requires platforms to have a depth of 30 inches minimum from the centerline of the ladder on the climbing side and a width of not less than 30 inches. Since these dimensions are not less than OSHA's, the ANSI standard also will comply with OSHA requirements.*

Ladder-Safety Systems

1910.29(i)(1) – Employers must ensure that each ladder-safety system allows the employee to climb up and down using both hands and does not require that the employee continuously hold, push or pull any part of the system while climbing. *ANSI 7.3.1*

1910.29(i)(2) – The connection between the carrier or lifeline and the point of attachment to the body harness or belt does not exceed 9 inches. *ANSI 7.3.3.* **(See Illustration #13)**

1910.29(i)(3) – Mountings for ridged carriers are attached at each end of the carrier, with intermediate mountings spaced, as necessary, along the entire length of the carrier so the system has the strength to stop employee falls. *ANSI 7.3.4.*

1910.29(i)(4) – Mountings for flexible carriers are attached at each end of the carrier and cable guides for flexible carriers are installed at least 25 feet apart, but not more than 40 feet apart along the entire length of the carrier. *ANSI 7.3.5.*

1910.29(i)(5) – The design and installation of mountings and cable guides do not reduce the design strength of the ladder. *ANSI 7.1.4.*

1910.29(i)(6) – Ladder-safety systems and their support systems are capable of withstanding, without failure, a drop test consisting of an 18-inch drop of a 500-pound weight. *ANSI 7.1.3.*

Personal Fall-Protection Systems

1910.29(j) – Body belts, harnesses and other components used in personal fall arrest systems, work-positioning systems and travel-restraint systems must meet the requirements of 1910.140 Personal Fall Protection Systems. *The ANSI fixed ladder standard references specific ANSI standards that cover fall-arrest systems, harnesses, ladder safety systems, work positioning systems, hardware, anchor points, etc., which are covered in 1910.140. [**Note: These ANSI standards provide far more information and details regarding the design, construction, materials, load-test requirements, etc., than OSHA 1910.140, and all fall-protection equipment manufacturers follow these ANSI standards.]***

Grab Handles

1910.29(l)– The employer must ensure that each grab handle is:

(1) not less than 12 inches long. *ANSI does not address or use the term "Grab Handle" anywhere in its standard, but does use the term "Grab Bar" and provides Figure 11, which shows examples of both horizontal and vertical grab bars. There are four instances in the OSHA standard where the term "Grab Bar" is used and all four of these requirements are the same as ANSI's. OSHA defines the term "Grab Bar" but does not define "Grab Handle," so it is unclear what if any differences there are between the two. OSHA also does not provide an illustration or picture to reference these specific requirements.* **(See Illustration #9)**

(2) mounted to provide at least 3 inches of clearance from the framing or opening. *ANSI – See above comments.*

(3) capable of withstanding a maximum horizontal pull-out force equal to two times the maximum intended load or 200 pounds, whichever is greater. *ANSI – See above comments.*

D. Fixed-Ladder Analysis

This section is intended to further assist employers with assessing fixed ladders at their facilities to determine which existing ladders currently comply with the updated requirements and which do not. This analysis also will assist employers in developing a long-term phase-in plan to ensure that by the final deadline date of Nov. 18, 2036, all fixed ladders are in compliance with the new standard's requirements. ***[NOTE: At the time of this Guidance Document's publication, OSHA had not published the compliance directive yet for the update to Subpart D, which may affect some of the analyses in this section. The analyses that appear in this section were conducted using the best information available at publication time.]***

1. **Fixed-Ladder Fall-Protection Requirements**

   Under the revised standard, fixed ladders that extend more than 24 feet or exposes a worker to a fall of more than 24 feet to a lower level:

   - Must be equipped with a personal fall-arrest system or; ladder-safety system or; cage or well. OSHA 1910.28(b)(9)(i).

   Analysis

   Under the previous standard, safety cages or wells were required if the fixed ladder or fall to a lower level exceeded 20 feet. That now has been increased to more than 24 feet. No action is necessary for currently installed ladders that extend between 20 and 24 feet and/or have fall distances to a lower level of between 20 to 24 feet with safety cages properly mounted that meet the specified design criteria (safety cage design requirements have not changed in the revised standard) and were compliant with the previous standard, as these ladders are in compliance with the revised standard. Personal fall-arrest or ladder-safety systems **will not** have to be installed on these ladders at all.

   Currently installed ladders that are between 20 and 24 feet and/or have fall distances to a lower level of between 20 to 24 feet or less that do not have safety cages installed and were in violation of the previous standard now comply. If the ladder does not extend more than 24 feet or expose a worker to a lower level fall of more than 24 feet, no protection is required under the OSHA standard.

   However, employers may wish to consider installing personal fall-arrest or ladder-safety systems from the ground up as a best safety practice in any event, particularly given that such systems will be required on most fixed ladders by Nov. 18, 2036.

[Note: It is quite common to encounter fixed ladders that are not mounted flush to the ground or platform with the bottom of the ladder sometimes as high as two feet or more off the ground. For such ladders that extend more than 24 feet from the ground or platform, cages, wells, personal fall-arrest systems or ladder-safety systems will need to be installed since the actual fall distance is greater than 24 feet. All ladders must be mounted such that they are flush with the ground or platform so that employees can safely access or exit ladders. Refer to ANSI Standard A14.3-2008 section 5.1.1 for guidance on mounting ladders. If the ladder section has been elevated to discourage ladder access to the public or other unauthorized users, refer to ANSI Standard A14.3-2008 section 9.4 on the installation of a ladder security system.]

2. Existing Fixed Ladders

Under the revised standard, existing fixed-ladder sections installed before Nov. 19, 2018 that extend more than 24 feet or exposes a worker to a fall of more than 24 feet to a lower level having safety cages or wells must:

- Have landing platforms provided at maximum intervals of 50 feet. OSHA 1910.28(b)(9)(iii)(B). ***[Note: Previous standard was 30 feet.]***
- Ensure ladders are offset from adjacent sections. OSHA 1910.28(b)(9)(iii)(A).
- Personal fall-arrest systems or ladder safety systems may be installed and used in combination with a safety cage as long as the cage does not interfere with the operation of the system. OSHA 1910.28(B)(9)(iv).

Analysis

All existing fixed-ladder sections installed before Nov. 19, 2018 that complied with the previous OSHA standard requirement of 30-foot maximum offset ladder sections with landing platforms and a properly mounted safety cage meeting the specified design criteria currently are in compliance with the revised standard. However, these ladders will require the installation of a personal fall-arrest or ladder-safety system by Nov. 18, 2036, at which time safety cages or wells used as fall protection no longer will be acceptable.

Existing fixed-ladder sections installed before Nov. 19, 2018 that currently are more than 30 feet and not more than 50 feet and/or have offset ladder sections with landing platforms and a safety cage properly mounted that meet the specified design criteria that were in violation of the previous standard now comply with the revised standard. However, these ladders will require the installation of a personal fall-arrest or ladder-safety system by Nov. 18, 2036, at which time safety cages or wells used as fall protection no longer will be acceptable.

[Note: By Nov. 19, 2018, ALL existing fixed ladders that extend more than 24 feet or expose a worker to a fall of more than 24 feet to a lower level must be equipped with a personal fall-arrest system or; ladder-safety system or; cage or well.] 1910.28(b)(9)(i)(A)

3. <u>Replacing Existing Ladders after Nov. 19, 2018</u>

Under the revised standard, when replacing any portion or section of safety cages, wells or fixed ladders that extend more than 24 feet or exposes a worker to a fall of more than 24 feet to a lower level:

- A personal fall-arrest system or ladder-safety system must be installed in at least that section of the fixed ladder, cage or well where the replacement is located. OSHA 1910.28(b)(9)(i)(C).

<u>Analysis</u>

Although this requirement applies only to that portion or section being replaced, best safety practices entail installation of a personal fall-arrest or ladder-safety system on the entire fixed ladder installation any time replacement or repair to a section occurs. Doing so will bring that entire ladder installation into compliance prior to the Nov. 18th, 2036 deadline. ***However, each employer is responsible for deciding how they want to deal with these occurrences.*** Remember, if the fixed ladder has a personal fall-arrest or ladder-safety system installed, safety cages no longer are required. If the safety cage is removed prior to Nov. 19, 2036, employers must provide employees with access to full body safety harnesses, train them on how to inspect and properly wear the harness and how to use the personal fall-arrest system or ladder-safety system. Employers also are required to enforce this requirement. If the safety cage is to remain on the ladder, it is required to not interfere with the operation of the personal fall-arrest system or ladder-safety system. Employees are not required to use the personal fall arrest system or ladder safety system until Nov. 19, 2036, as long as there is a safety cage or well installed on the ladder.

4. <u>Installing New Fixed Ladders on or After Nov. 19, 2018</u>

Each fixed ladder that extends more than 24 feet, or exposes a worker to a fall of more than 24 feet to a lower level, must:

- Be equipped with a personal fall-arrest system or a ladder-safety system. OSHA 1910.28(b)(9)(i)(D).
- The personal fall-arrest system or a ladder-safety system must provide protection throughout the entire vertical distance of the ladder, including all ladder sections. 1910.28(b)(9)(ii)(A).

- The ladder has rest platforms provided at maximum intervals of 150 feet. OSHA 1910.28(b)(9)(ii)(B).

Analysis

As of Nov. 19, 2018, new ladders are required to comply with the revised standard. The requirement for safety cages and/or wells is omitted. Employers have the option to install safety cages in addition to the ladder-safety or personal fall-arrest system if they so choose, as long as the cage does not interfere with the operation of the safety system. However, this may not be advisable as the cost to install a cage more than likely exceeds the cost to install a personal fall-arrest or ladder-safety system. In addition, by Nov. 18, 2036, employees will be required to be equipped with fall protection when using fixed ladders. ***The decision to install safety cages in addition to ladder-safety or fall-arrest systems clearly rests with each employer.***

One of the advantages of the revised standard requiring personal fall-arrest or ladder-safety systems is there are no ladder section length limitations or offset requirements as in the past. The ladder can be a straight run from the bottom to the top. The only requirement is that a rest platform be provided at a maximum interval of 150 feet if there are no other points in between where employees have the opportunity to exit the ladder.

One issue that likely will occur during the 20-year phase-in period for the revised standard involves the installation of new ladders that comply with the revised standard and the continued use of existing ladders that may not comply yet. This situation will necessitate employers training employees as to when fall protection is required and when it is not. One recommended practice is to require employees to use the personal fall-arrest or ladder-safety system for every ladder (new or previously existing) that has such a system installed. If such a practice is followed, employees will be protected adequately and the company will be in compliance.

In addition, and as stated previously, it is recommended that a personal fall-arrest system or ladder-safety system be installed on the **entire fixed ladder installation** whenever replacement or repair is required to an existing ladder section installed prior to Nov. 19, 2018. If this recommendation is not followed, an existing ladder installation may be designed to two different standards during the phase-in period. This difference in design may make it more difficult for employees to recognize when fall protection is required and when it is not. ***Again, this is a situation each individual employer should evaluate and determine what is best for their particular situation and employee safety.***

5. **Final Deadline**

On and after Nov. 18, 2036, **ALL** fixed ladders that extend more than 24 feet or expose a worker to a fall of more than 24 feet to a lower level must be equipped with a personal fall-arrest or ladder-safety system. OSHA 1910.28(b)(9)(i)(D).

Analysis

On and after Nov. 18, 2036, OSHA will require employees to be in fall protection when climbing all fixed ladders that extend more than 24 feet or expose a worker to a fall of more than 24 feet to a lower level. Safety cages no longer are considered fall protection and are not required on fixed ladders.

6. **Ladder Landing Platforms**

One item that will need immediate attention under the revised standard is ladder landing platforms. These include platforms provided to assist employees in transitioning from one offset ladder section to another, as well as all other access/egress points from fixed ladders at walkways and other platform areas. Under the revised standard, OSHA added some new definitions and made slight modifications to others. OSHA's revised definition of a *platform* states: "A walking-working surface that is elevated above the surrounding area." In the definition, OSHA added the term *walking-working surface* and defines it as… "Any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location." Related to platforms, under the revised standard, employers are required to:

- Ensure each employee is protected from falling into a ladderway floor hole or ladderway platform hole by a guardrail system and toeboards erected on all exposed sides, except at the entrance to the hole where a **self-closing gate** or an offset must be used. OSHA 1910.28(b)(3)(iv).

Analysis

The standard does not provide any delayed phase-in time period to come into compliance. Therefore, all ladder landing platforms and other ladder access/egress points that expose an employee to a fall of four feet or greater to a lower level should be assessed and self-closing swing gates installed.

7. **Ladder Inspections**

Under the revised standard ladders must:

- Be inspected before initial use in each work shift and more frequently as necessary to identify any visible defects that could cause employee injury. OSHA 1910.23(b)(9).

Analysis

It is uncertain how OSHA will enforce this particular standard, especially for fixed ladders. This standard is located under the section entitled General Requirements for **ALL** Ladders. There does not appear to be an exception for fixed ladders and there is nothing specifically mentioned in OSHA standard 1910.23(d), which covers requirements specifically for fixed ladders. Fixed ladders do not get used every day and in a large operation it is virtually impossible to know which ladders may or may not get used. Operating conditions and situations frequently will dictate the need to use fixed ladders. It seems counterproductive to require a daily inspection of all fixed ladders and the standard doesn't indicate how in-depth of an inspection is required or whether the inspection needs to be documented. For example, it is unclear whether a simple visual inspection of fixed ladders from ground level would be acceptable. More information concerning OSHA's compliance expectations for ladder inspection hopefully will be provided when the agency issues its compliance directive that informs Compliance Officers on how to enforce this particular requirement.

Meanwhile, the inspection requirements in the ANSI standard appear to be more understandable than those issued by OSHA. ANSI A14.3-2008 9.1.4 requires fixed ladders to be "routinely" inspected to ensure they comply with the requirements of the standard. ANSI 9.3.1 further requires fixed ladders and ladder safety systems be inspected for rust, corrosion and deterioration at least annually, with more frequent inspection as determined by the employer.

IV. STAIRWAYS – 1910.25

This section provides information about OSHA requirements for the different types of stairways that may be installed within facilities. Some requirements have changed, while others remained the same.

A. General Requirements - 1910.25(b)

1910.25(b)(2) - Vertical clearance above any stair tread to any overhead obstruction is at least 6 feet, 8 inches (203 cm), as measured from the leading edge of the tread. Spiral stairs must have a minimum of at least 6 feet, 6 inches (2 m) headroom above the treads as measured from the leading edge of the tread.

1910.25(b)(3) - Stairs have uniform riser heights and tread depths between landings.

1910.25(b)(4) - Stairway landings and platforms are at least the width of the stair and at least 30 inches (76 cm) in depth, as measured in the direction of travel. ***[Note:***

The wording in the new standard has changed slightly from the old standard to provide more clarity, but the dimension requirements remain the same.]

1910.25(b)(5) - When a door or a gate opens directly on a stairway, a platform is provided, and the swing of the door or gate does not reduce the platform's effective usable depth to:

- 1910.25(b)(5)(i) - Less than 20 inches (51 cm) for platforms installed before Jan. 17, 2017; and

- 1910.25(b)(5)(ii) - Less than 22 inches (56 cm) for platforms installed on or after Jan. 17, 2017 (see Figure D-7).

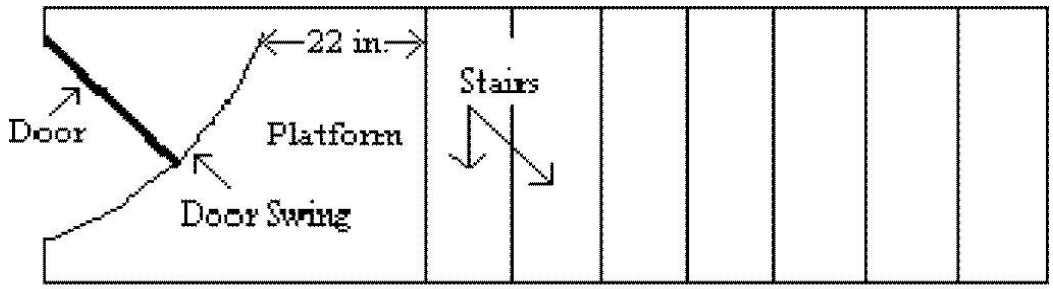


Figure D-7 -- Door or Gate Opening on Stairway

1910.25(b)(6) - Each stair can support at least five times the normal anticipated live load, but never less than a concentrated load of 1,000 pounds (454 kg) applied at any point. ***[Note: The wording in the new standard has changed slightly from the old standard, but the main difference is that it now applies to all stairs covered by this section.]***

1910.25(b)(7) - Standard stairs are used to provide access from one walking-working surface to another when operations necessitate regular and routine travel between levels, including access to operating platforms for equipment. Winding stairways may be used on tanks and similar round structures when the diameter of the tank or structure is at least 5 feet (1.5 m).

1910.25(b)(8) - Spiral, ship, or alternating tread-type stairs are used only when the employer can demonstrate it is infeasible to provide standard stairs.

1910.29(b)(9) - When paragraph (b)(8) of this section allows the use of spiral, ship or alternating tread-type stairs, they are installed, used and maintained in accordance with manufacturer's instructions.

B. Standard Stairs - 1910.25(c)

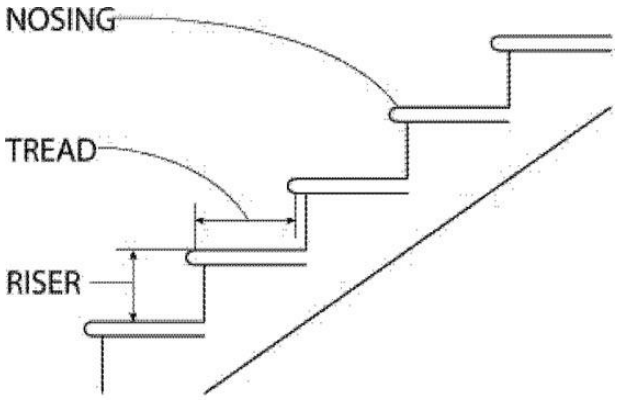
1910.25(c)(1) - Are installed at angles between 30 to 50 degrees from the horizontal;

1910.25(c)(2) - Have a maximum riser height of 9.5 inches (24 cm); (Exceptions apply to standard stairs installed prior to January 17, 2017.);

1910.25(c)(3) - Have a minimum tread depth of 9.5 inches (24 cm); (Exceptions apply to standard stairs installed prior to January 17, 2017.); and

1910.25(c)(4) - Have a minimum width of 22 inches (56 cm) between vertical barriers (see Figure D-8 of this section).

Figure D-8



1910.25(c)(5): Exception to paragraphs (c)(2) and (3) of this section. The requirements of paragraphs (c)(2) and (3) do not apply to standard stairs installed prior to Jan. 17, 2017. OSHA will deem those stairs to be in compliance if they meet the dimension requirements specified in Table D-1 of this section or they use a combination that achieves the angle requirements of paragraph (c)(1) of this section.

TABLE D-1
Stairway Rise and Tread Dimensions

Angle to Horizontal	Rise (in inches)	Tread Run (in inches)
30 deg. 35'	6 1/2	11
32 deg. 08'	6 3/4	10 3/4
33 deg. 41'	7	10 1/2
35 deg. 16'	7 1/4	10 1/4
36 deg. 52'	7 1/2	10
38 deg. 29'	7 3/4	9 3/4
40 deg. 08'	8	9 1/2
41 deg. 44'	8 1/4	9 1/4
43 deg. 22'	8 1/2	9
45 deg. 00'	8 3/4	8 3/4
46 deg. 38'	9	8 1/2
48 deg. 16'	9 1/4	8 1/4
49 deg. 54'	9 1/2	8

C. Spiral Stairs - 1910.25(d)

1910.25(d)(1) - Must have a minimum clear width of 26 inches (66 cm);

1910.25(d)(2) - Must have a maximum riser height of 9.5 inches (24 cm);

1910.25(d)(3) - Must have a minimum headroom above spiral stair treads of at least 6 feet, 6 inches (2 m), measured from the leading edge of the tread;

1910.25(d)(4) - Must have a minimum tread depth of 7.5 inches (19 cm), measured at a point 12 inches (30 cm) from the narrower edge; and

1910.25(d)(5) - Must have a uniform tread size.

D. Ship Stairs - 1910.25(e)

1910.25(e) - In addition to paragraph (b) of this section, the employer must ensure ship stairs (See Figure D-9):

- 1910.25(e)(1) - Are installed at a slope of 50 to 70 degrees from the horizontal;
- 1910.25(e)(2) - Have open risers with a vertical rise between tread surfaces of 6.5 to 12 inches (17 to 30 cm);
- 1910.25(e)(3) - Have minimum tread depth of 4 inches (10 cm); and
- 1910.25(e)(4) - Have a minimum tread width of 18 inches (46 cm).

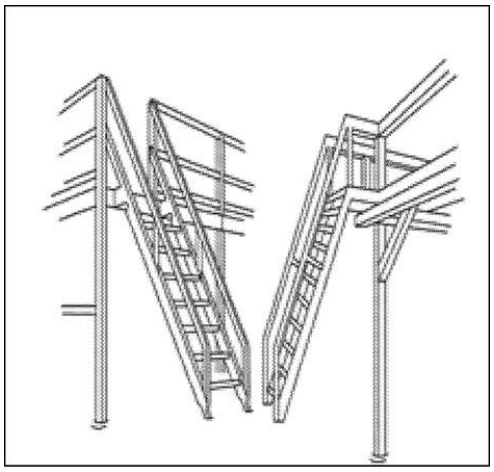
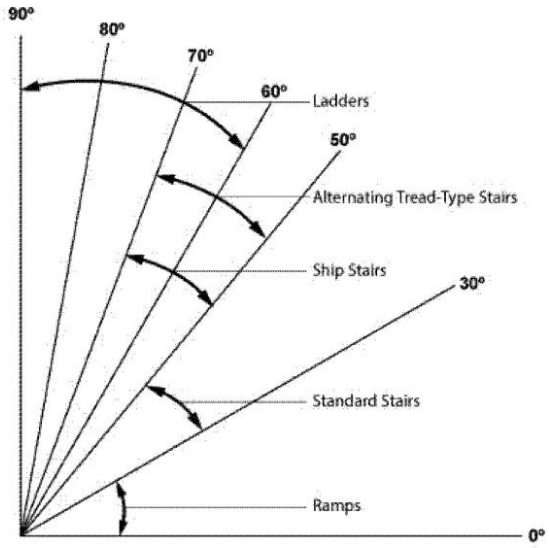


Figure D-9 – Ship Stairs

E. Alternating Tread-Type Stairs - 1910.25(f)

1910.25(f) - The employer must ensure alternating tread-type stairs:

- 1910.25(f)(1) - Have a series of treads installed at a slope of 50 to 70 degrees from the horizontal;
- 1910.25(f)(2) - Have a distance between handrails of 17 to 24 inches (51 to 61 cm);
- 1910.25(f)(3) - Have a minimum tread depth of 8.5 inches (22 cm);
- 1910.25(f)(4) - Have open risers if the tread depth is less than 9.5 inches (24 cm); and
- 1910.25(f)(5) - Have a minimum tread width of 7 inches (18 cm), measured at the leading edge of the tread (*i.e.*, nosing).



Angle	Type
≤ 30°	Ramps
30° – 50°	Standard Stairs
50° – 70°	Ship Stairs
50° – 70°	Alternating Tread-Type Stairs
60° – 90°	Ladders

Figure D-10 – Angles for Stairs, Ramps, and Ladders

V. GUARDRAILS, HANDRAILS AND STAIR RAILS

The revisions to Subpart D discussed in this section of the Guidance Document are found in OSHA standards 1910.28 and 1910.29, and address those items commonly found at grain, feed, ingredient, processing and export facilities. Significantly, this section does not cover all of the OSHA requirements found in both of these standards. Users are encouraged to thoroughly read both 1910.28 and 1910.29 to determine if there are any other requirements identified in these standards that apply to their facility or operations.

A. Protection From Fall Hazards – 1910.28(b)

1910.28(b)(5)(i) - The employer must ensure each employee on a runway or similar walkway is protected from falling four feet (1.2 m) or more to a lower level by a guardrail system.

1910.25(b)(5)(ii) - When an employer can demonstrate that it is not feasible to have guardrails on both sides of a runway used exclusively for a special purpose, the employer may omit the guardrail on one side of the runway provided:

- 1910.28(b)(5)(ii)(A) - The runway is at least 18 inches wide and;
- 1910.28(b)(5)(ii)(B) - Each employee is provided with and uses a personal fall-arrest system or travel restraint system.

B. Dangerous Equipment - 1910.28(b)(6)

1910.28(b)(6)(i) - The employer must ensure that each employee located less than four feet (1.2 m) above dangerous equipment is protected from falling into or onto the dangerous equipment by a guardrail or a travel-restraint system unless the equipment is covered or guarded to eliminate the hazard.

1910.28(b)(6)(ii) - Each employee located 4 feet (1.2 m) or more above dangerous equipment must be protected from falling by:

- 1910.28(b)(6)(iii)(A) - Guardrail systems;
- 1910.28(b)(6)(iii)(B) – Safety-net systems;
- 1910.28(b)(6)(iii)(C) – Travel-restraint systems; or
- 1910.28(b)(6)(iii)(D) - Personal fall-arrest systems.

C. Openings - 1910.28(b)(7)

1910.28(b)(7) - The employer must ensure that each employee on a walking-working surface near an opening, including one with a chute attached, where the inside bottom edge of the opening is less than 39 inches (99 cm) above that walking-working surface and the outside bottom edge of the opening is 4 feet (1.2 m) or more above a lower level is protected from falling by the use of:

- 1910.28(b)(7)(i) - Guardrail systems;
- 1910.28(b)(7)(i) – Safety-net systems;
- 1910.28(b)(7)(i) – Travel-restraint systems; or
- 1910.28(b)(7)(i) - Personal fall-arrest systems.

D. Repair, Service and Assembly Pits – 1910.28(b)(8)

1910.28(b)(8) - Repair, service, and assembly pits less than 10 feet (3 m) deep need not be protected by a fall-protection system provided that the following requirements are met:

- 1910.28(b)(8)(i) - Access to any area within six feet (1.8 m) of the edge of the pit is limited to trained, authorized employees;
- 1910.28(b)(8)(ii) - Floor markings in colors contrasting to that of the surrounding area are applied, or rope, wire, or chain with support stanchions meeting the requirements of 1910.29(d), or a combination of these are placed at a distance of at least six feet (1.8 m) from the edge of the pit; and
- 1910.28(b)(8)(iii) - Caution signs stating, “Caution--Open Floor," or a similar legend, are posted so they readily are visible to employees entering the pit area.

E. Guardrail Systems 1910.29(b)

The employer must ensure guardrail systems meet the following requirements:

1910.29(b)(1) - The top edge height of top rails, or equivalent guardrail system members, are 42 inches (107 cm), plus or minus three inches (8 cm), above the walking-working surface. The top edge height may exceed 45 inches (114 cm), provided the guardrail system meets all other criteria of this section. (See Figure D-11)

1910.29(b)(2) - Midrails, screens, mesh, intermediate vertical members, solid panels or equivalent intermediate members are installed between the walking-working surface and the top edge of the guardrail system as follows when there is not a wall or parapet that is at least 21 inches (53 cm) high:

- 1910.29(b)(2)(i) - Midrails are installed at a height midway between the top edge of the guardrail system and the walking-working surface;

- 1910.29(b)(2)(ii) - Screens and mesh extend from the walking-working surface to the top rail and along the entire opening between top rail supports;

- 1910.29(b)(2)(iii) - Intermediate vertical members (such as balusters) are installed no more than 19 inches (48 cm) apart; and

- 1910.29(b)(2)(iv) - Other equivalent intermediate members (such as additional midrails and architectural panels) are installed so that the openings are not more than 19 inches (48 cm) wide.

1910.29(b)(3) - Guardrail systems are capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied in a downward or outward direction within two inches (5 cm) of the top edge, at any point along the top rail.

1910.29(b)(4) - When the 200-pound (890-N) test load is applied in a downward direction, the top rail of the guardrail system must not deflect to a height of less than 39 inches (99 cm) above the walking-working surface.

1910.29(b)(8) - Steel banding and plastic banding are not used for top rails or midrails.

1910.29(b)(9) - Top rails and midrails are at least 0.25-inches (0.6 cm) in diameter or in thickness.

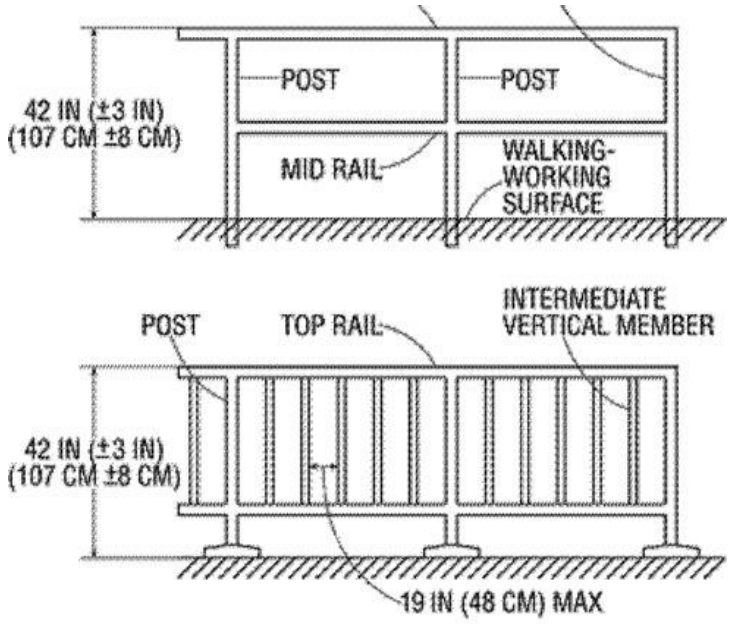


Figure D-11 – Guard Rail Systems

F. Handrails and Stair Rail Systems – 1910.29(f)

The employer must ensure:

1910.29(f)(1)(i) - Handrails are not less than 30 inches (76 cm) and not more than 38 inches (97 cm), as measured from the leading edge of the stair tread to the top surface of the handrail (See Figure D-12).

1910.29(f)(1)(ii) - The height of stair rail systems meets the following:

- 1910.29(f)(1)(ii)(A) - The height of stair rail systems installed before Jan. 17, 2017 is not less than 30 inches (76 cm) from the leading edge of the stair tread to the top surface of the top rail (See Figure D-13); and

- 1910.29(f)(1)(ii)(B) - The height of stair rail systems installed on or after Jan. 17, 2017 is not less than 42 inches (107 cm) from the leading edge of the stair tread to the top surface of the top rail.

1910.29(f)(1)(iii) - The top rail of a stair rail system may serve as a handrail only when:

- 1910.29(f)(1)(iii)(A) - The height of the stair rail system is not less than 36 inches (91 cm) and not more than 38 inches (97 cm) as measured at the leading edge of the stair tread to the top surface of the top rail and;

- 1910.29(f)(1)(iii)(B) - The top rail of the stair rail system meets the other handrail requirements above and were installed before Jan. 17, 2017.

(1910.29(f)(2) - Finger clearance: The minimum clearance between handrails and any other object is 2.25 inches (5.7 cm).

(1910.29(f)(3) - Surfaces: Handrails and stair rail systems are smooth-surfaced to protect employees from injury, such as punctures or lacerations, and to prevent catching or snagging of clothing.

1910.29(f)(4) - Openings in stair rails: No opening in a stair rail system exceeds 19 inches (48 cm) at its least dimension.

1910.29(f)(5) - Handhold: Handrails have the shape and dimension necessary so that employees can grasp the handrail firmly.

1910.29(f)(6) - Projection hazards: The ends of handrails and stair rail systems do not present any projection hazards.

1910.29(f)(7) - Strength criteria: Handrails and the top rails of stair rail systems are capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied in any downward or outward direction within 2 inches (5 cm) of any point along the top edge of the rail.

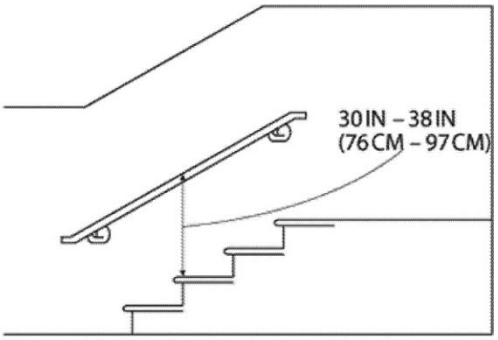


Figure D-12 – Handrail Measurement

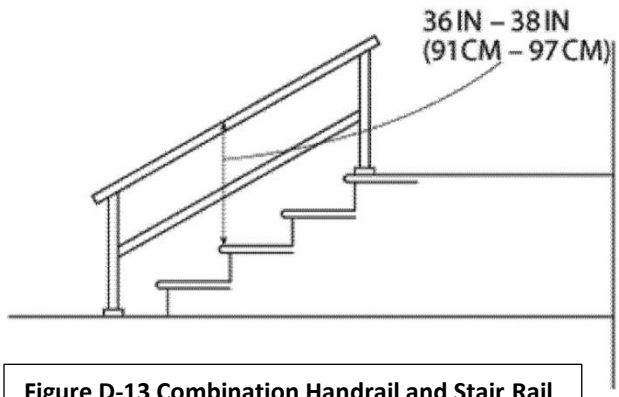


Figure D-13 Combination Handrail and Stair Rail

G. Protection From Falling Objects – 1910.29(k)

The employer must ensure toeboards used for falling object protection are:

1910.29(K)(1)(i) - Erected along the exposed edge of the overhead walking-working surface for a length that is sufficient to protect employees below.

1910.29(K)(1)(ii) - Have a minimum vertical height of 3.5 inches (9 cm) as measured from the top edge of the toeboard to the level of the walking-working surface.

1910.29(K)(1)(iii) - Do not have more than a 0.25 inch (0.5 cm) clearance or opening above the walking-working surface.

1910.29(K)(1)(iv) - Are solid or do not have any opening that exceeds one inch (3 cm) at its greatest dimension.

1910.29(K)(1)(v) - Have a minimum height of 2.5 inches (6 cm) when used around vehicle repair, service or assembly pits. Toeboards may be omitted around vehicle repair, service or assembly pits when the employer can demonstrate that a toeboard would prevent access to a vehicle that is over the pit.

1910.29(K)(1)(vi) - Are capable of withstanding without failure, a force of at least 50 pounds (222 N) applied in any downward or outward direction at any point along the toeboard.

1910.29(k)(2)(i) - Where tools, equipment or materials are piled higher than the top of the toeboard, paneling or screening is installed from the toeboard to the midrail of the guardrail system and for a length that is sufficient to protect employees below. If the items are piled higher than the midrail, the employer also must install paneling or screening to the top rail and for a length that is sufficient to protect employees below; and

1910.29(k)(2)(ii) - All openings in guardrail systems are small enough to prevent objects from falling through the opening

VI. TRAINING REQUIREMENTS – 1910.30

This standard, 1910.30, has been given a new title under the revision to Subpart D and addresses the training requirements for all of the other standards in Subpart D. The information contained in this standard is all new, and employers now are required to comply with these training requirements. These new standard requirements are as follows:

A. Fall Hazards – 1910.30(a)

1910.30(a)(1) - Before any employee is exposed to a fall hazard, the employer must provide training for each employee who uses personal fall-protection systems or who is required to be trained as specified elsewhere in this subpart of the regulations. Employers must ensure employees are trained in the requirements of this paragraph on or before May 17, 2017.

1910.30(a)(2) - The employer must ensure that each employee is trained by a qualified person.

1910.30(a)(3) - The employer must train each employee in at least the following topics:

- 1910.30(a)(3)(i) - The nature of the fall hazards in the work area and how to recognize them;
- 1910.30(a)(3)(ii) - The procedures to be followed to minimize those hazards;
- 1910.30(a)(3)(iii) - The correct procedures for installing, inspecting, operating, maintaining and disassembling the personal fall-protection systems that the employee uses; and
- 1910.30(a)(3)(iv) - The correct use of personal fall-protection systems and equipment specified in paragraph (a)(1) of this section, including, but not limited to, proper hook-up, anchoring and tie-off techniques, and methods of equipment inspection and storage, as specified by the manufacturer.

B. Equipment Hazards – 1910.30(b)

1910.30(b)(1) - The employer must train each employee on or before May 17, 2017 in the proper care, inspection, storage and use of equipment covered by this subpart before an employee uses the equipment.

1910.30(b)(2) - The employer must train each employee who uses a dockboard to properly place and secure it to prevent unintentional movement.

1910.30(b)(3) - The employer must train each employee who uses a rope-descent system in proper rigging and use of the equipment in accordance with 1910.27.

1910.30(b)(4) - The employer must train each employee who uses a designated area in the proper set-up and use of the area.

C. Retraining – 1910.30(c)

1910.30(c) - The employer must retrain an employee when the employer has reason to believe the employee does not have the understanding and skill required by paragraphs (a) and (b) of this section. Situations requiring retraining include, but are not limited to, the following:

- 1910.30(c)(1) - When changes in the workplace render previous training obsolete or inadequate;
- 1910.30(c)(2) - When changes in the types of fall-protection systems or equipment to be used render previous training obsolete or inadequate; or
- 1910.30(c)(3) - When inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee no longer has the requisite understanding or skill necessary to use equipment or perform the job safely.

D. Training Must be Understandable – 1910.30(d)

1910.30(d) - The employer must provide information and training to each employee in a manner that the employee understands.

VII. Frequently Asked Questions

1. ***Why does the final rule exclude agricultural (e.g., farming) operations?***
Although OSHA believes that walking-working surface hazards, particularly fall hazards, are present in agricultural operations, the agency did not propose to cover agricultural operations and did not gather and analyze the type of information necessary to support including agricultural operations in the final rule. In addition, because the proposed rule did not cover agricultural operations, the public, and in particular agricultural stakeholders, did not have an opportunity to comment on any protective measures OSHA might require.

2. ***What are agricultural operations?***
Although the final rule does not define agricultural operations, in the past OSHA has said they include:

   - Activities involved in growing and harvesting (including field sorting) of crops, plants, vines, fruit and nut trees, ornamental plants, egg production, and raising livestock, poultry, fish and livestock products (e.g., on-farm feed manufacturing for livestock on the farm); and

   - Preparation of the ground, sowing, watering and feeding of plants, weeding, spraying, harvesting, raising livestock and all activity necessary for these activities.

   In addition, activities integrally related to these core agricultural operations activities (e.g., delivery of feed to livestock or poultry on the farm) are considered to be agricultural operations. Determining whether an activity is a core agricultural operation is made on a case-by-case basis based upon the nature and character of the specific activity.

3. ***What activities are not core agricultural operations and, therefore, not excluded from the final rule?***
OSHA does not consider post-harvesting activities to be integrally related to core agricultural operations; therefore, they are considered general industry activities that the final rule covers. These general industry post-harvesting activities include:

   - Post-harvesting activities not on a farm, such as receiving, sorting, cleaning, sorting, sizing, weighing, inspecting, stacking, packaging and shipping; and

- Processing of agricultural products that change the character of the product (e.g., canning, making sauces) or involve a higher degree of packaging in a shed or other location (instead of field sorting).

Also, activities performed on a farm that "are not related to farming operations and are not necessary to gain economic value from products produced on the farm" are general industry activities covered by the final rule. These activities include:

- Grain handling operations that store and sell grain grown on other farms;

- Grain milling facilities and the use of milled flour to make baked goods; and

- Food processing facilities and manufacturing operations, such as making cider from apples grown on the farm and processing large carrots into "baby carrots."

4. Who is qualified to certify the anchorage points?

In the final rule, "qualified" describes a person who, by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work or the project.

5. What is a prompt rescue?

Prolonged suspension from fall-arrest systems can cause orthostatic intolerance, which, in turn, can result in serious physical injury, or potentially, death. Research indicates that suspension in a fall-arrest device can result in unconsciousness, followed by death, in less than 30 minutes (SHIB 03-24-2004). In summary, prompt rescue means employers must be able to rescue suspended workers quickly enough to ensure the rescue is successful, *i.e.*, quickly enough to ensure the employee does not suffer physical injury (such as injury or unconsciousness from orthostatic intolerance) or death.

6. What type of ladder repair will require replacing the existing cage with a ladder safety device?

1910.28(b)(9)(i)(C) does not require that employers install ladder safety or personal fall-arrest systems when they make minor repairs to fixed ladders, cages, or wells, such as replacing a bolt or repairing a weld on a cage. However, when employers determine that they cannot simply make a repair to a section or a portion of a section of a fixed ladder, cage or well, but must replace that portion or section, employers must ensure the replacement is equipped with a ladder

safety or personal fall-arrest system. OSHA believes the inspection requirement found in 1910.22(d) will help employers identify when simple repairs or corrections will be adequate and when the situation, such as a condition that affects the structural integrity of the fixed ladder, cage or well, necessitates replacement of the fixed ladder, cage or well section.

OSHA also notes that when "a portion of a section" of a fixed ladder, cage or well needs replacement, the final rule only requires the employer to install a ladder-safety or personal fall-arrest system in that "section of the fixed ladder, cage or well where the replacement is located." The final rule does ***not*** require employers to install a ladder-safety or personal fall-arrest system on the entire fixed ladder when a portion of one section needs replacement. For example, only part of a 50-foot section of a cage, well or multi-section ladder might need replacement because of damage. Section 1910.28(b)(9)(i)(C) of the regulations only requires that the employer replace that 50-foot section of the ladder, cage or well with a ladder-safety system or personal fall-arrest system, not all sections. OSHA believes that a "section" of a fixed ladder equipped with a cage or well most likely will not exceed 50 feet. In this regard, ladder sections are the length of ladder between landings or platforms, and 1910.28(b)(9)(iii)(B) requires that fixed ladders that have cages or wells must have landing platforms at least every 50 feet. Again, this provision does ***not*** prohibit employers from keeping those portions of a cage or well that are functioning properly, or installing a new cage or well, provided the employer also installs a personal fall-arrest or ladder-safety system as 1910.29(b)(9)(i)(B) requires, and the cage or well does not interfere with the fall-protection system as stated in 1910.29(b)(9)(iv). Refer to Section III(D)(3) and Section III(D)(4) of the Guidance Document for additional information on this subject.

7. Since cages and rest platforms no longer are needed, what are the requirements for a one-section fixed ladder?

Section 1910.29(b)(9)(ii) adds new requirements for one-section fixed ladders that are equipped with personal fall-arrest systems or ladder-safety systems and fixed ladders equipped with those systems on more than one ladder section. For these ladders, the final rule requires that employers ensure:

- 1910.28(b)(9)(ii)(A) - The personal fall arrest or ladder safety system provides protection throughout the entire vertical distance of the ladder, including all ladder sections; and

- 1910.28(b)(9)(ii)(B) - The ladder has rest platforms provided at least every 150 feet.

APPENDIX

LADDER ILLUSTRATIONS

Illustration #1

Ladder or Fall to Lower Level 24 Feet or Less –
Cage, Well or Ladder Safety System Not Required

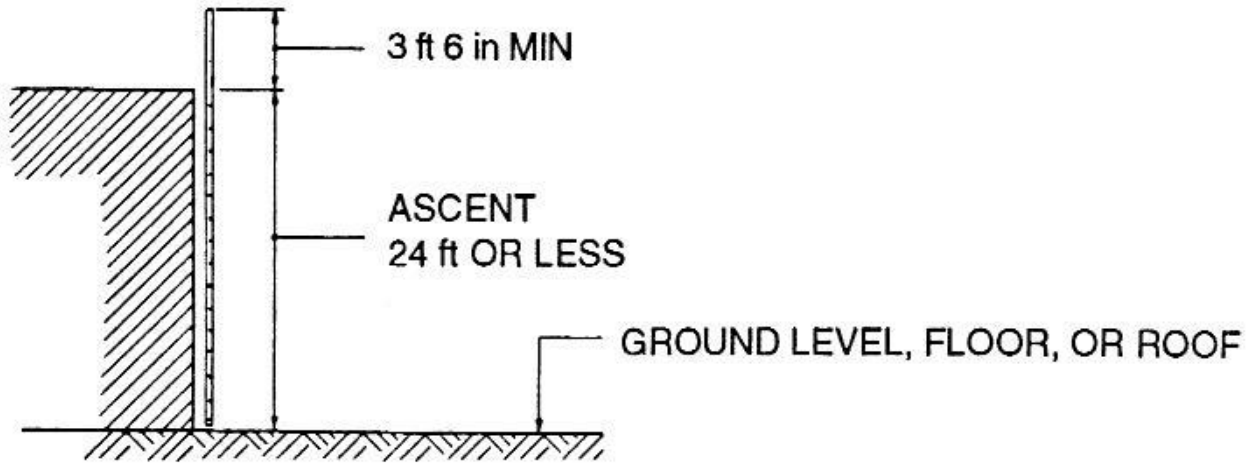
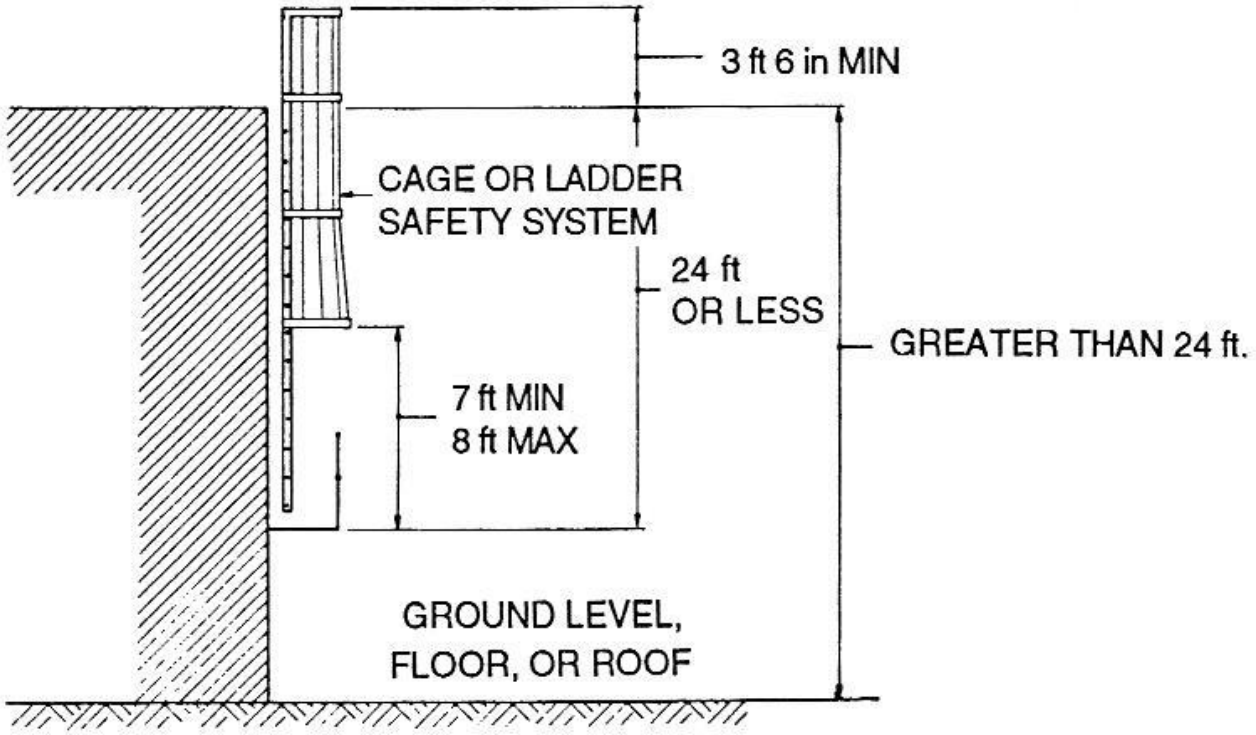


Illustration #2

Elevated Access with Ladder 24 Feet or Less but Fall Distance Greater Than 24 Feet for Existing Ladders Installed Before November 19, 2018:

- **Safety Cage, Well, Ladder Safety System or Personal Fall Arrest System Required**

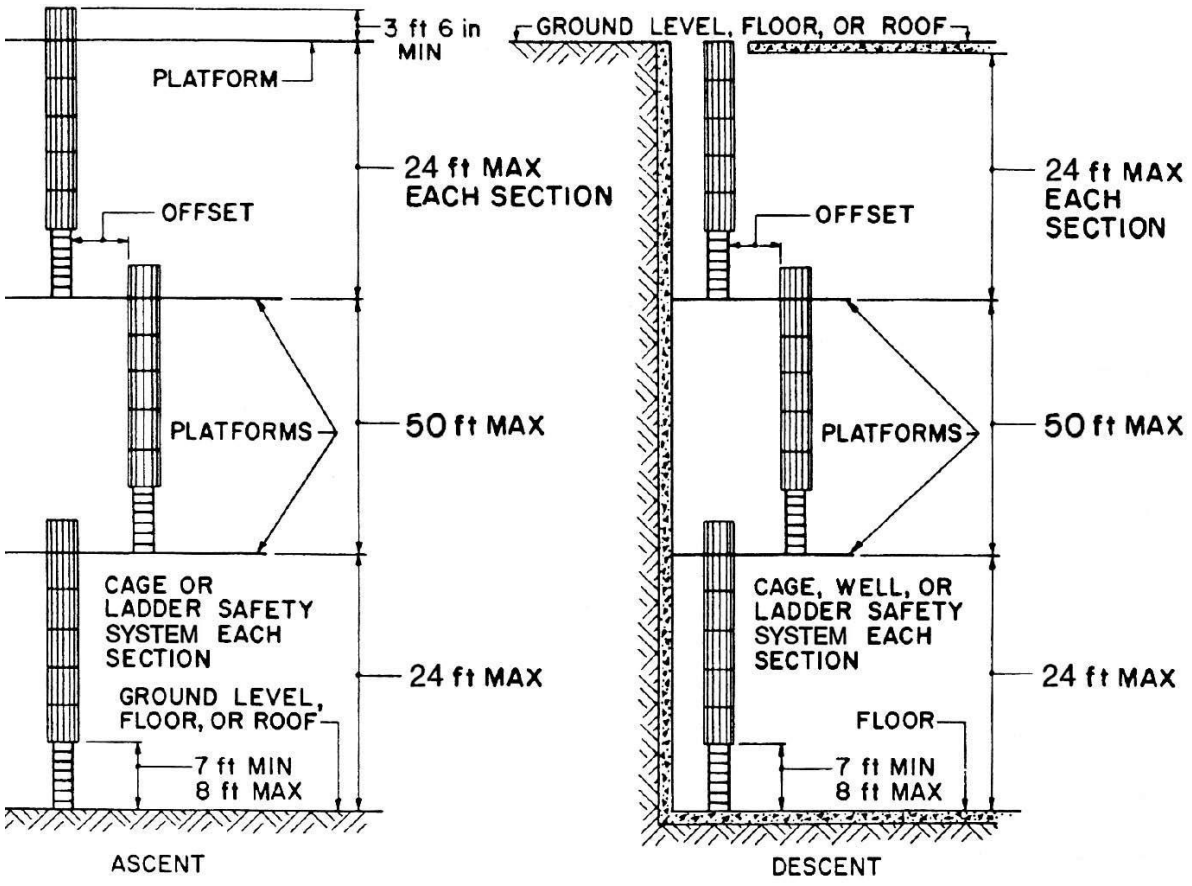


***NOTE: By November 18, 2036 these ladders must have ladder safety systems or personal fall arrest systems installed and employees are required to use them; safety cages and wells may no longer be used for fall protection .**

Illustration #3

Ladder Sections Greater Than 24 Feet up to 50 Feet Maximum Installed Before November 19, 2018:

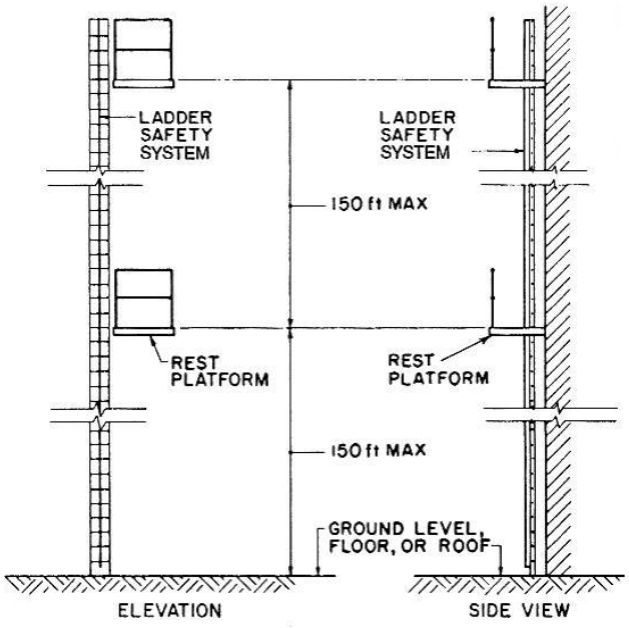
- **Safety Cages, Wells, Ladder Safety System or Personal Fall Arrest System Required Each Section.**
- **Offset Ladder Sections with Rest Platform Required at 50 Foot Maximum Intervals.**



***NOTE: By November 18, 2036 these ladders must have ladder safety systems or personal fall arrest systems installed and employees are required to use;safety cages and wells may no longer be used for fall protection . Safety cages can be installed or left on older existing ladders if they do not interfere with operation of ladder or personal fall arrest system.**

Illustration #4

New Fixed Ladders Installed On or After November 19, 2018 Must Have Ladder Safety Systems or Personal Fall Arrest Systems Installed



***NOTE: Safety cages, wells and offset ladder sections are no longer required for fixed ladders installed on or after November 19, 2018. Safety cages can be installed if they do not interfere with operation of ladder or personal fall arrest system.**

Illustration #5

Example of Fixed Ladder Rest Platform and Guarding of Ladderway Entrance/Exits to Walkways and Work Platforms

Note requirement for self-closing gate.

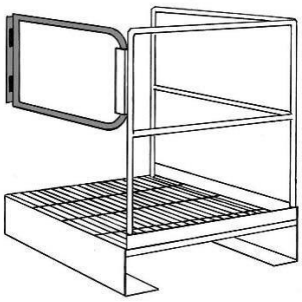
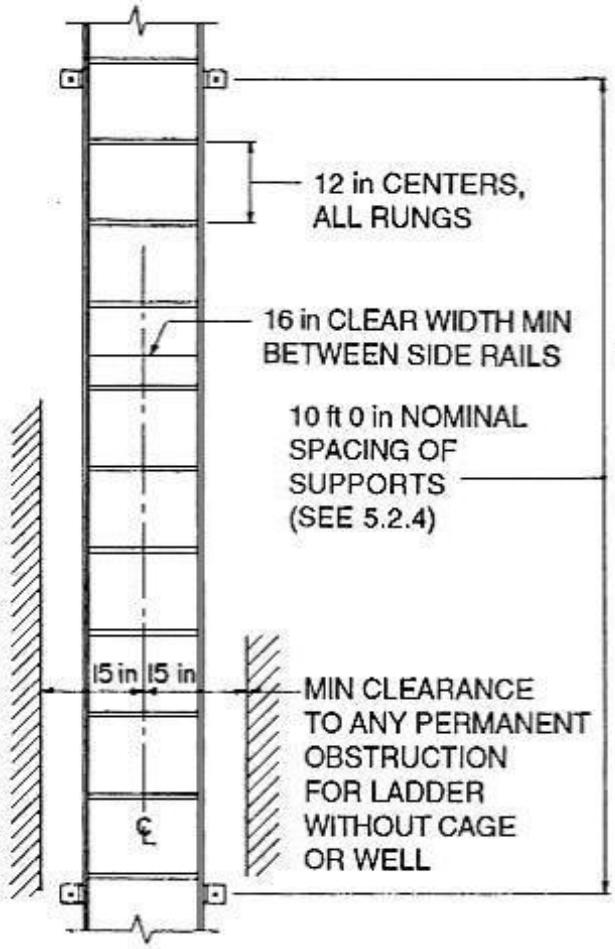
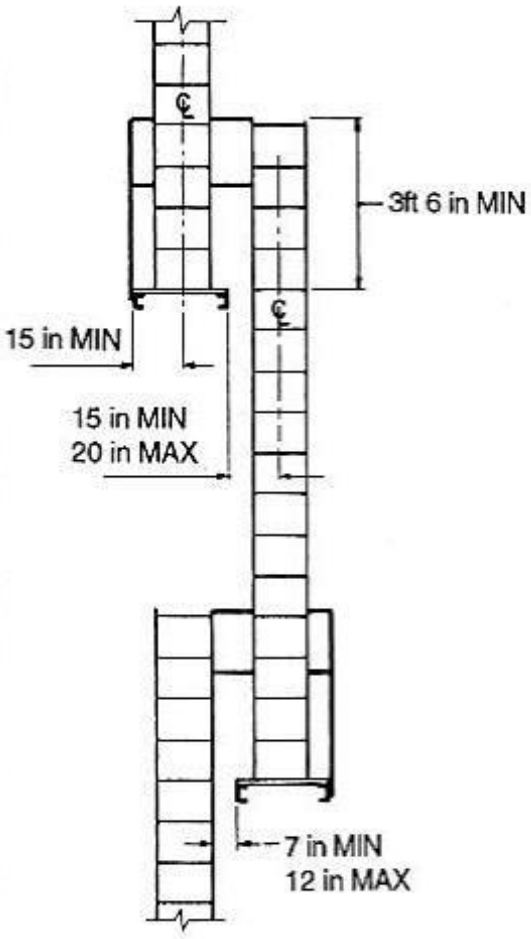


Illustration #6

Ladder Dimensions, Side Clearances and Supports



SUPPORT SPACING, LADDER
DIMENSIONS AND SIDE CLEARANCES



SIDE CLEARANCES
FOR SIDE-STEP LADDERS

Illustration #7

Minimum Ladder Clearances and Floor, Platform, Roof or Other Obstructions

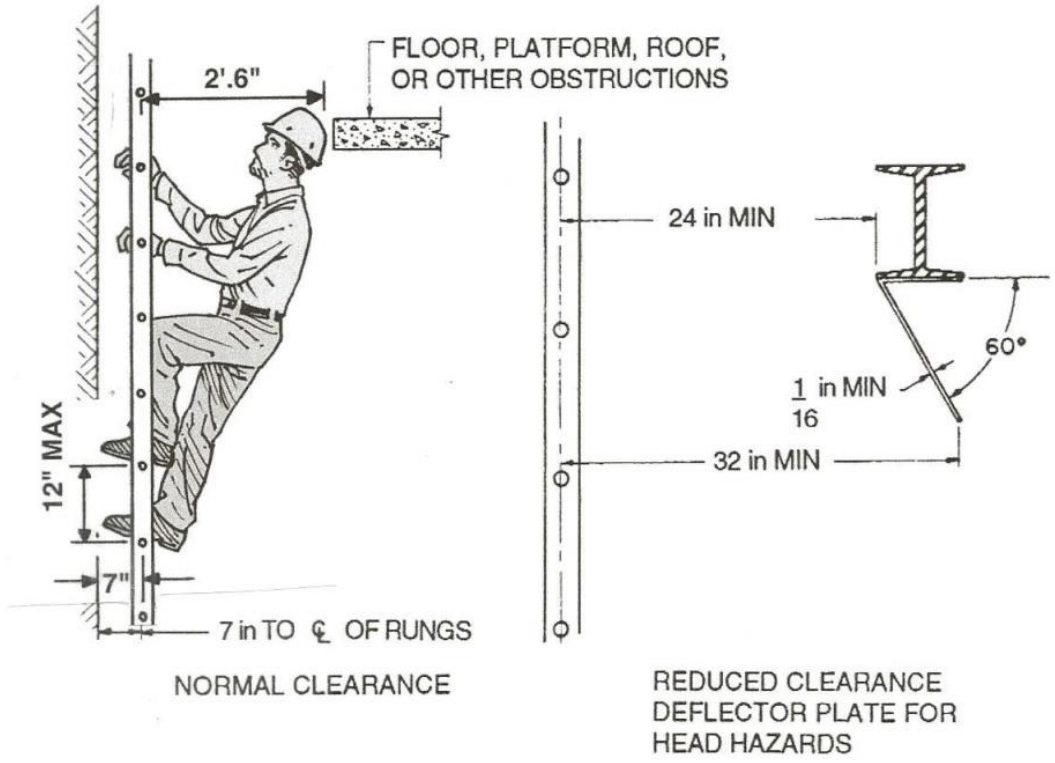


Illustration #8

Termination at Floor or Platform for Through Ladders

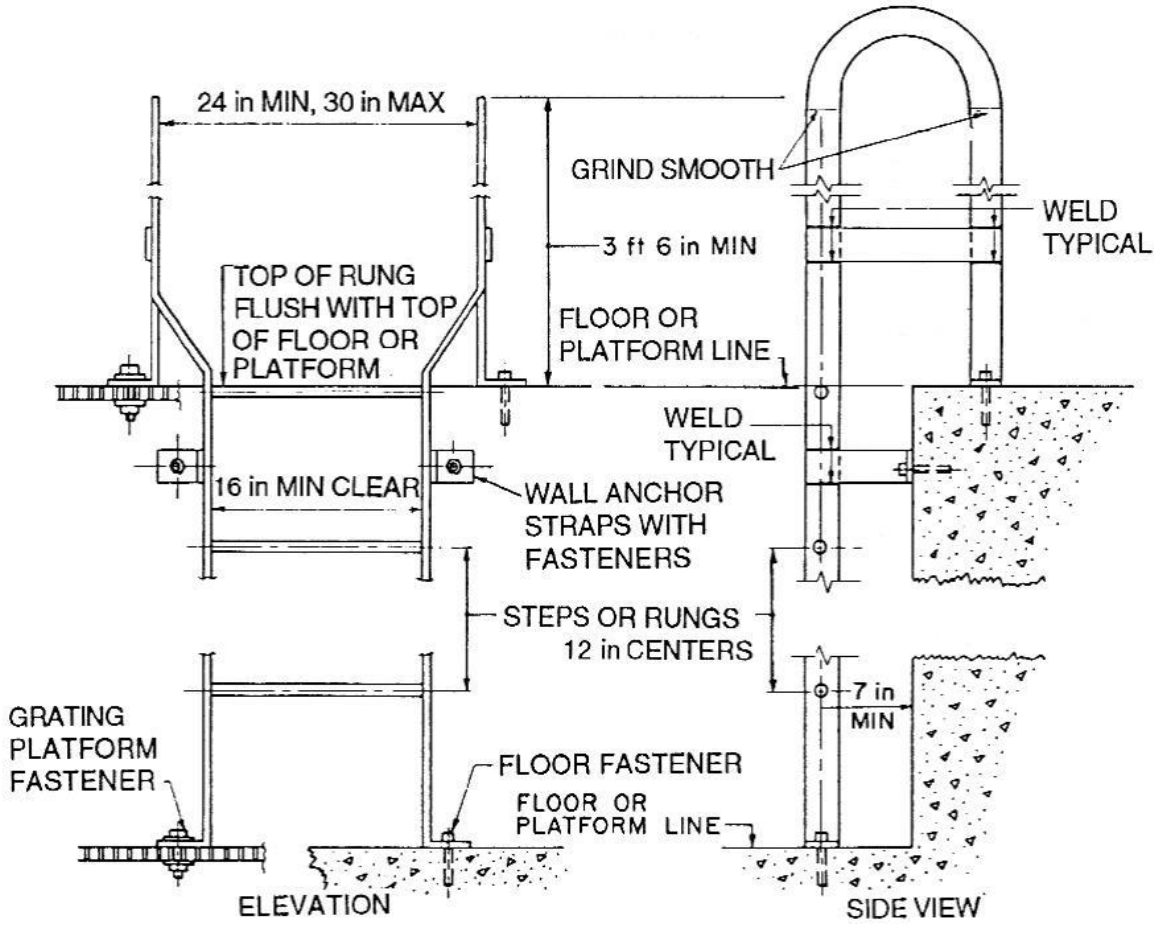


Illustration #9

Horizontal and Vertical Grab Bar Extensions

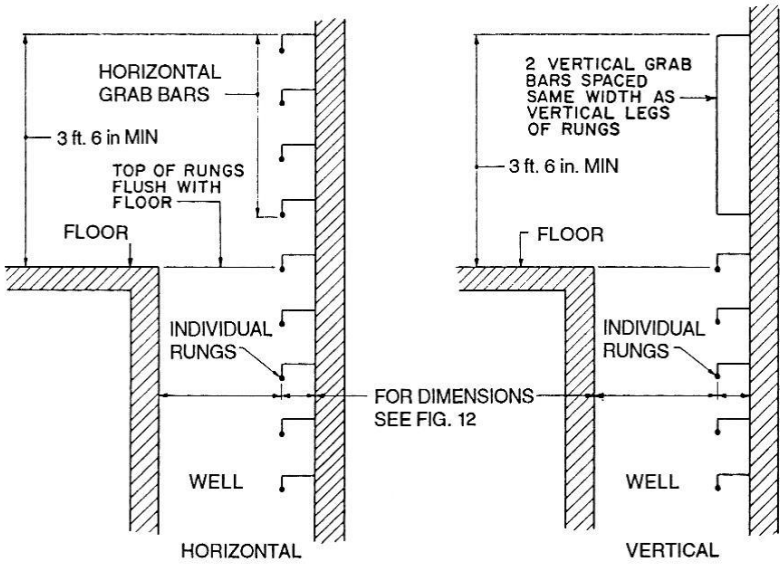


Illustration #10

Ladder Terminations at Roof and Parapets

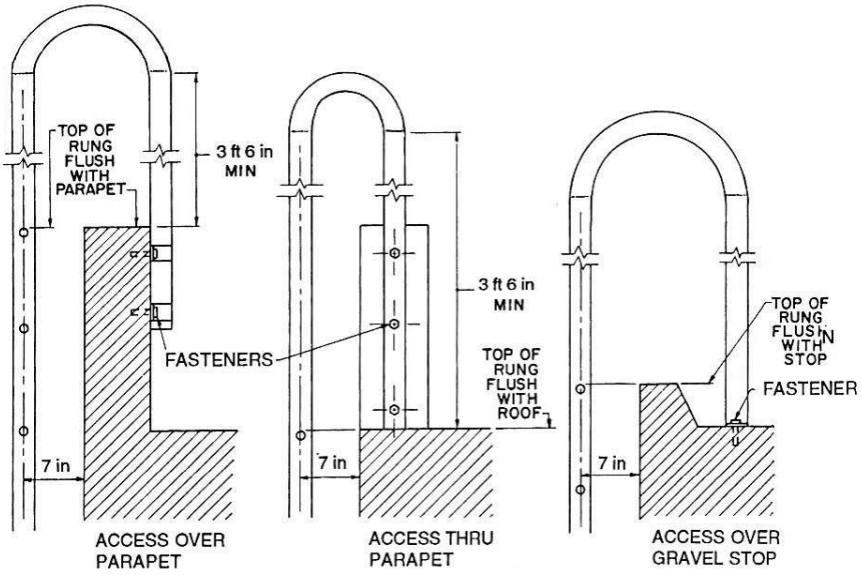
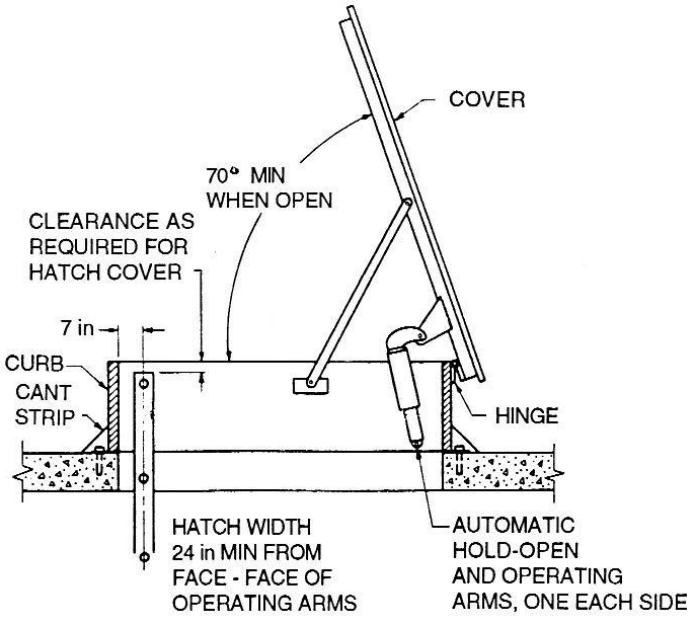


Illustration #11

Counterbalanced Hatch Cover at Roof

Normal Clearance



Reduced Clearance

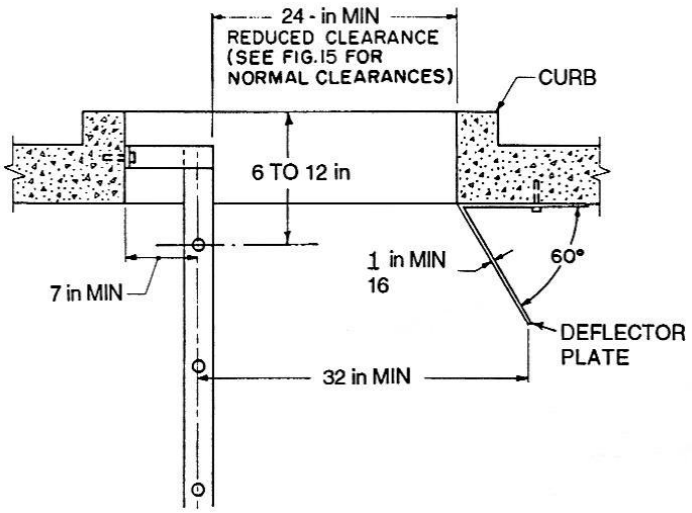
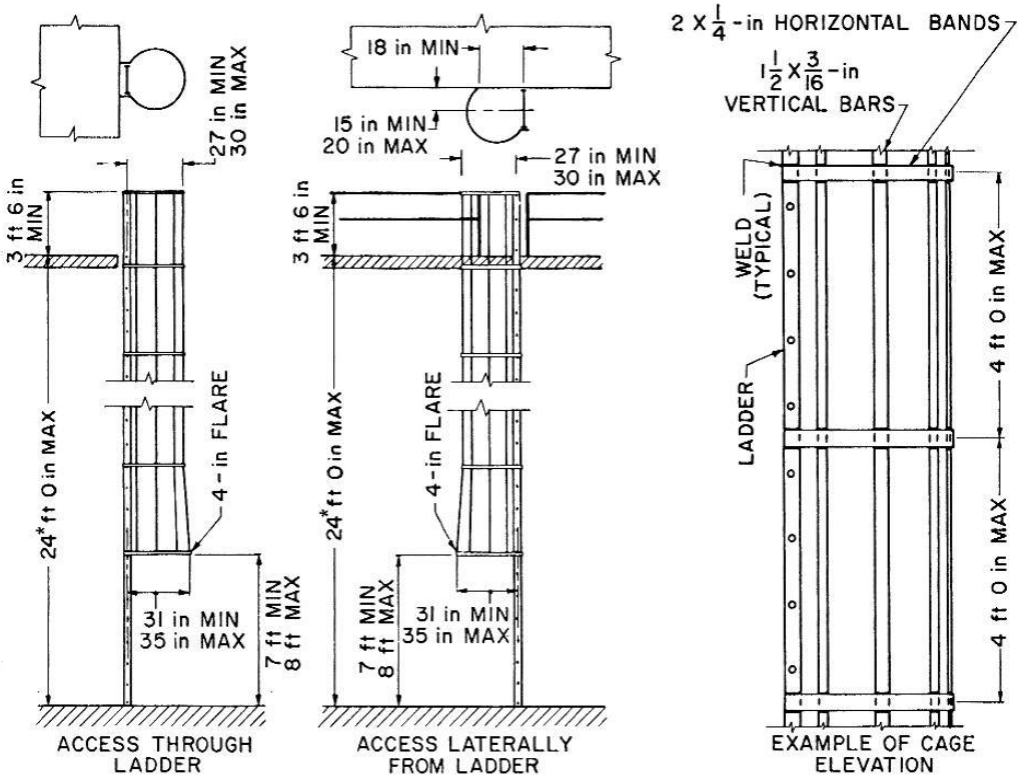


Illustration #12

Safety Cage Construction



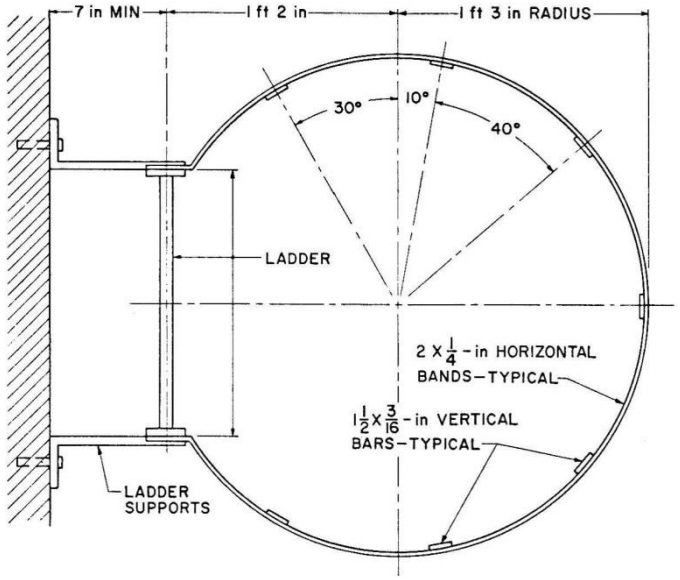


Illustration #13

Connection Length Between Carrier and Safety Sleeve

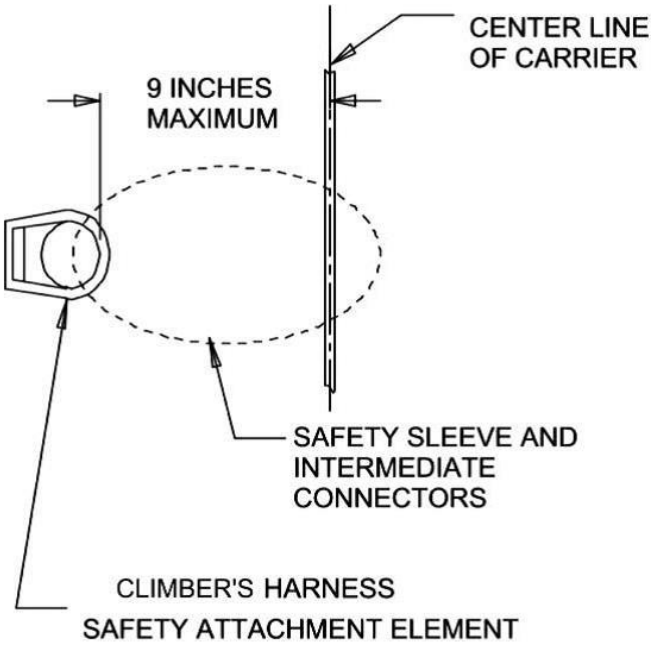


Illustration #14

Individual Rung Ladder