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MINUTES OF THE ADVISORY COMMITTEE FOR
GENERAL INDUSTRY SAFETY ORDERS
SECTIONS 3207 and 3277
WALKING WORKING SURFACES
February 12-13, 2020
Sacramento, CA

1. Call to Order.

The meeting was called to order by the Chair, Elisa Koski, Senior Safety Engineer, Occupational Safety and Health Standards Board (OSHSB), at 9:30 am on Wednesday and Thursday, February 12-13, 2020, in Sacramento, CA. The Chair was assisted by Bernie Osburn, Associate Governmental Program Analyst, OSHSB.

2. Opening remarks.

The Chair welcomed the attendees and started the introductions of the committee. She then reviewed the Standards Board policy regarding the use of advisory committees, explaining that the Board has found advisory committees to be an effective way to develop a proposal because of the expertise of the attendees. She also provided general information about the rulemaking process.

3. Summary and Discussion of the proposed rulemaking.

The following is a summary of the proposed modifications to the proposal as a result of the advisory committee meeting and follow-up work by Board staff. Subsections without proposed changes are not mentioned. As recommended, the proposal does not include measurements in metric units. The text in red denotes additional changes not discussed during the advisory committee meeting. The text in [ ] are editorial notes denoting the source of the proposed text or the federal standard counterpart.

§3207. Definitions.

Ladder

Ladder. An appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

Discussion

The definition of ladder was relocated from Section 3277 to Section 3207.

Lower Level

Lower Level. A surface, or area, **of a lesser elevation** to which an employee could fall. Such surfaces or areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, equipment, and similar surfaces and structures, or portions thereof.

Discussion

The proposed definition of "lower level" from the federal standard 29 CFR Section 1910.21(b) was modified to add "of a lesser elevation" (See bolded text). The modification was added to clarify that lower level does not mean falling from the same level, as with a trip and fall situation.

Maximum Intended Load

Maximum Intended Load. The total load (weight and force) of all employees, equipment, vehicles, tools, materials, and other loads**, ~~including loads imposed by a fall protection system,~~** the employer reasonably anticipates to be applied to a walking-working surface or ladder at any one time.

Discussion

The proposed definition is from federal standard 29 CFR Section 1910.21(b). The Division recommended using the term "working load" instead of "maximum intended load" to be defined as "load imposed by employees, equipment, and material" instead of maximum intended load. The Division is of the opinion that the wording "reasonably anticipates" is argumentative when it comes to enforcing the requirement.

The counter argument to the above is "maximum intended load" is used and defined by ANSI and OSHA and existing T8 standards. The committee recommended that the Chair look at the number of separate instances "maximum intended load" is used throughout the Walking-Working Surfaces proposal and Section 3277 and examine if it is the appropriate term to use.

Regarding the definition of "maximum intended load," a committee member suggested to modify the definition from the federal standard by adding "including load imposed by a fall protection system" to ensure that the load imposed by fall protection system is not overlooked. The term "maximum intended load" is used frequently in the General Industry Safety Orders. The Chair was to review how that term is used in Title 8 and to see if it is appropriate to amend the proposed definition. There was a suggestion to apply the modified definition to only fixed ladders.

Below is not an exhaustive list, but based on how the term is used in the proposal and in Title 8, and the larger Walking-Working Surface proposal, Board staff is proposing to leave the definition unmodified. Board staff is of the opinion that the issue with regard to the loads

imposed by fall protection system or ladder safety system is mitigated by proposed Section 3277(j)(5) and (j)(6).

"Maximum Intended Load" as used in the proposal
§3277 Fixed Ladders.
(d) Design and Construction.
(1) All fixed ladders shall be capable of supporting their maximum intended load.

§3209. Standard Guardrails, Toeboards, and Grab Handles.
(f) Grab Handles. The employer shall ensure that each grab handle:
(1) Is not less than 12 inches long;
(2) Is mounted to provide at least 3 inches of clearance from the framing or opening; and
(3) Is capable of withstanding a maximum horizontal pull-out force equal to two times the maximum intended load or 200 pounds whichever is greater.

§3212. Floor Openings, ~~Floor Holes,~~ Skylights, and Roofs.
(b) Covers.
(1) Floor and roof opening covers shall be designed by a qualified person and be capable of safely supporting the greater of 400 pounds or ~~twice the~~ at least twice the maximum intended load ~~weight of the employees, equipment and materials~~ that may be imposed on any one square foot area of the cover at any time.

"Maximum Intended Load" as used in existing regulations
§5004. Crane or Derrick Suspended Personnel Platforms.
(d) Operational Criteria.
(1) Hoisting of the personnel platform shall be performed in a slow, controlled, cautious manner with no sudden movements of the crane or derrick, or the platform.
(2) Load lines shall be capable of supporting, without failure, at least seven times the maximum intended load, except that where rotation resistant rope is used, the lines shall be capable of supporting without failure, at least ten times the maximum intended load. The required design factor is achieved by taking the current safety factor of 3.5 required under Section 4884(b) of these Orders] and applying the 50 percent derating of the crane capacity which is required by Section 5004(d)(5) of these Orders.

§3295. Powered Platform Installations--Equipment.
(e) Suspended Equipment.
(1) General Requirements.
(A) Each suspended unit component, except suspension ropes and guardrail systems, shall be capable of supporting, without failure, at least four times the maximum intended live load applied or transmitted to that component.

Walking-Working Surface

Walking-Working Surface. Any surface on or through which an employee walks, works, or gains access to a work area or workplace location. Walking-working surfaces include, but are not limited to, floors, stairways, steps, roofs, ramps, runways, aisles, scaffolds, dock plates, and step bolts. Walking-working surfaces include horizontal, and inclined or angled surfaces, but **do not include ladders**.

Discussion

The proposed definition was from the federal standard Section 1910.21(b) and the federal final rule, which stated examples of walking-working surfaces. The proposed definition was modified to exclude ladders from the definition of walking-working surfaces, because of the way the term walking-working surface is used in the proposal. If fixed ladder is included in the definition of walking-working surface then Section 3277(i)(1) would not make sense (See below). The term walking-working surface is used 53 times in the proposal. Board staff will review the use of the term in the proposal and the rest of Title 8 to make sure that the use of the term is appropriate.

> **§3277. Fixed Ladders.**
> (i) Fixed ladders that extend more than 20 feet above a lower level.
> (1) The distance shall be measured from the lower walking-working surface to the next higher walking-working surface.

Working Level

Working Level or Working Area. ~~A platform, walkway, runway, floor or similar area fixed with reference to the hazard and used by employees in the course of their employment. This does not include ladders or portable or temporary means used for access, repair or maintenance, provided such means are removed immediately upon completion of the work.~~ (See Walking-Working Surface).

Discussion

During the discussions, it was said that the term working level is defined and used in Title 8. The Chair was asked to review the instances where the term working level was used and determined that the terms walking-working surface and working level are synonyms, but appear to be used in association with elevation or height distances. Board staff will review the use of the term in the proposal and the rest of Title 8 to make sure that the use of the term working level should be retained or replaced with walking-working surface.

> **§3207. Definitions.**
> Platform. An elevated ~~working level~~ walking-working surface for persons. Storage platforms, balconies and open-sided floors are considered platforms for the purpose of these orders.

§3210. Guardrails and Fall Protection at Elevated Locations.
(a) Buildings. Guardrails shall be provided on all open sides of unenclosed elevated work locations, such as: roof openings, open and glazed sides of landings, balconies or porches, platforms, runways, ramps, or ~~working levels~~ other walking-working surfaces more than 30 inches above ~~the floor, ground, or other~~ ~~working areas~~ a lower level of a building. ~~as defined in Section 3207 of the General Industry Safety Orders.~~ Where overhead clearance prohibits installation of a 42-inch guardrail, a lower rail or rails shall be installed. The railing shall be provided with a toeboard where the platform, runway, or ramp is ~~6 feet or more~~ above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material, or equipment.

§6632. Access to the Walking Beam.
(a) When employees are required to go on top of a walking beam, access shall be provided to the top of the beam (preferably at the samson post) if the top of the beam is more than ~~seven and one-half feet (7 1/2')~~ four feet (4') above the working level. The access shall be by means of a fixed ladder. ~~The ladder shall be continuous from the working level to a point not more than eighteen inches (18") below the top of the beam and not more than twelve inches (12") horizontally from the side of the beam.~~ The ladder shall comply with Section 3277 of the General Industry Safety Orders. Ladders shall be outside of the guards for moving parts of machinery.

§3277. Fixed Ladders.
Subsection (a) Application.
(a) ~~All fixed ladders shall be approved as defined in Section 3206 of the General Industry Safety Orders.~~ Application. This section covers all fixed ladders.**~~, except when the ladder is~~**:
EXCEPTION:
~~(1)~~ Ladders used in emergency operations such as firefighting, rescue, and tactical law enforcement operations.~~, or training for these operations; or~~
~~(2) Designed into or is an integral part of machines or equipment.~~

NOTE: Manhole ladders, underground vault ladders, step bolts (pole steps), manhole steps, and underground vaults steps shall comply with Section 3279 of these orders.

Discussion
There were no comments to the proposed amendments to move the application to subsection (a).

The proposed exceptions came from federal standard Section 1910.23 (a)(1) and (a)(2). There was no objection to the proposed addition of exception 1, regarding ladders used in emergency operations such as firefighting, rescue, and tactical law enforcement operations. However, there were questions and concerns as to what is considered emergency operations. There was a comment that fixed ladders used in the training of emergency personnel should not be

included the exception. Board staff will not propose a definition for emergency operations and defer to the dictionary definition of emergency.

The committee rejected the addition of exception 2 regarding ladders designed into and is an integral part of machines or equipment except a marine cargo industry representative who is opposed to removing the exception as it applies to mobile equipment. Exception 2 is in conflict with the definition of fixed ladder. The existing definition of fixed ladder is "a ladder permanently attached to a structure, building, or equipment. Ladders referred to in this code shall be construed to be fixed ladders."

The representative for the marine cargo industry stated that ladders for fixed industrial trucks as well as cranes are built to ASME standards. After the AC, Board staff looked into the ladder requirements for ASME standard. ASME B30.2, Overhead and Gantry Cranes (Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist), 1996, 2005, and 2011 editions references the ANSI 14.3 standard. The federal standards regarding fixed ladders relied on American National Standard Institute (ANSI) A14.3–2008, American National Standard for Ladders-Fixed Safety Requirements (ANSI A14.3–2008).

According to a construction industry representative, tower cranes are currently being retrofitted to provide fall protection. Construction equipment outside of California had to follow the federal standard. The retrofitting was difficult, but was completed. New equipment is being manufactured with climbing devices.

The Chair commented that there is an exception for guardrails in Section 3210, which is not proposed to be deleted.

> **§3210. Guardrails <u>and Fall Protection</u> at Elevated Locations.**
> (b) Other Elevated Locations. The unprotected sides of elevated work locations that are not buildings or building structures where an employee is exposed to a fall of 4 feet or more shall be provided with guardrails. Where overhead clearance prohibits installation of a 42-inch guardrail, a lower rail or rails shall be installed. The railing shall be provided with a toeboard where the platform, runway, or ramp is ~~6 feet or more~~ above places where employees normally work or pass and the lack of a toeboard could create a hazard from falling tools, material, or equipment.
>
> EXCEPTIONS:
> 9. On mobile vehicles/equipment, where the design or work processes make guardrails impracticable, the use of sufficient steps and attached handholds or structural members which allow the user to have a secure hand grasp shall be permitted. Work from the decks, permanent/stationary platforms, runways, or walkways of mobile vehicles/equipment shall be excluded from the requirements of subsection (b) where it

can be shown that guardrails or handholds are impracticable by the design or work processes.

The committee supported the creation of a new Section 3279. Subsection (a) was modified to add a note to refer readers to a proposed new Section 3279 for manhole ladders, underground vault ladders, step bolts (pole steps), manhole steps, and underground vaults.

Subsection (b) Definitions.
Cleats
Cleats. ~~Cleats are ladder crosspieces of rectangular cross section placed on edge on which a person may step in ascending or descending.~~ (See Rung, Step, or Cleat).

Discussion
No comment, no change.

Fixed Ladder
Fixed Ladder. ~~A fixed ladder is a ladder permanently attached to a structure, building, or equipment. Ladders referred to in this code shall be construed to be fixed ladders.~~ 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 (ship ladder), step bolts, or manhole steps. *[§1910.21(b)]*

Discussion
The existing definition of fixed ladder is proposed to be replaced by the federal definition. Comments did not lead to amendment of the proposal.

Host Employer
Host employer: An employer who has general supervisory authority over the worksite, including controlling the means and manner of work performed and having the power to correct safety and health hazards or require others to correct them. [From https://www.osha.gov/shpguidelines/communication.html]

Discussion
The meeting concluded with follow-up work for the Chair to provide a definition for host employer. The term used in proposed new subsection (*l*)(1).

Individual Rung Ladder
Individual Rung Ladder. ~~An individual-rung ladder is a fixed ladder each rung of which is individually attached to a structure, building, or equipment.~~ A ladder that has rungs individually attached to a building or structure. An individual rung ladder does not include manhole steps. *[§1910.21(b)]*

Discussion
The existing definition is proposed to be replaced by the federal definition. There was no comment, no change.

Ladder
Ladder. ~~A ladder is an appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.~~ **~~A device with rungs, steps, or cleats used to gain access to a different elevation~~**. See Section 3207. *[§1910.21(b)]*

Discussion
Delete the definition and provide a cross reference to Section 3207 for the definition of ladder. The Chair relocated the existing definition of ladder to Section 3207, not the federal definition "A device with rungs, steps, or cleats used to gain access to a different elevation."

Ladder Safety System
Ladder Safety System. An approved assembly of components whose function is to arrest the fall of a user. The ladder safety system shall include the carrier and its associated attachment elements (brackets, fasteners, etc.), safety sleeve, full body harness and connectors, wherein the carrier is permanently attached to the climbing face of the ladder or immediately adjacent to the structure. Cages and wells are not ladder safety systems. *[§1910.21(b)]*

Discussion
The additional text clarifies that cages and wells are not ladder safety system was from the federal standard. Comments did not lead to amendment of proposal.

Rungs
~~Rungs. Rungs are ladder crosspieces on which a person may step in ascending or descending.~~ Rung, Step, or Cleat. The crosspiece of a ladder on which an employee steps to climb up and down. *[§1910.21(b)]*

Discussion
The existing definition is proposed to be replaced by the federal standard 29 CFR 1910.21(b). Comments did not lead to amendment of proposal.

Side-Step Ladder
Side-Step Ladder. A side-step ladder is one from which a person getting off at the top must step sideways from the ladder in order to reach ~~the landing~~ a walking-working surface, such as a landing, such as shown in Figure 3277-3.

Discussion
Comments regarding the use of walking-working surface did not lead to amendment of proposal.

Steps
Steps. ~~Steps are the flat crosspieces of a ladder on which a person may step in ascending or descending.~~ (See Rung, Step, or Cleat).

Discussion
No comment, no change.

Through Ladder
Through Ladder. A through ladder is one from which a person getting off at the top must step through the ladder in order to reach ~~the landing~~ a walking-working surface, such as shown in ~~Fig. 2~~ Figure 3277-2.

Discussion
Comments regarding the use of walking-working surface did not lead to amendment of proposal.

Well
Well. A well is a permanent complete enclosure around a fixed ladder, which is attached to the walls of the well. Proper clearances for a well will give the person who must climb the ladder the same protection as a cage. (See (g)~~(6)~~(10) and Figure 3277-1.)

Discussion
No comment, no change.

Subsection (c) Approval.
(c) Approval. All fixed ladders shall be approved as defined in Section 3206 of these orders. ~~**Step bolts (pole steps), manhole steps, and underground vaults steps shall comply with Section 3279 of these Orders**~~. *[Moved from (a)]*

~~(a) All fixed ladders shall be approved as defined in Section 3206 of the General Industry Safety Orders.~~

Discussion
Proposed subsection (c) was derived from existing subsection (a). The second sentence was deleted because was no need for the cross reference to Section 3279 because this is covered in subsection (a).

Subsection (d) Design and Construction.
(d) Design and Construction.

~~(c) Design Considerations. All ladders, appurtenances, and fastenings shall be designed to meet the following load requirements:~~

Discussion
There were no comments regarding reorganizing subsection (d) by moving the contents of existing subsection (c) to new subsection (d).

Subsection (d)(1)
(d) Design and Construction.
~~(2)~~(1) All fixed ladders shall be capable of supporting their maximum intended load. *[§1910.23(d)(1)]*

~~(c)(4) The weight of the ladder and attached appurtenances together with the live load shall be considered in the design of rails and fastenings.~~

Discussion
Board staff moved proposed subsection (d)(2) to (d)(1) in order to group all the design load requirements together. The proposed text was from federal standard Section 1910.23(d)(1). The discussions did not lead to revision of the text as proposed. Maximum intended load takes into account the weight of the ladder and attached appurtenances as required in existing subsection (c)(4), therefore existing subsection is proposed to be deleted.

Subsection (d)(2)
(d) Design and Construction.
~~(3)~~ (2) Live Loads.
(A) The live loads imposed by persons occupying the ladder shall be considered to be concentrated at such point or points as will cause the maximum stress in the structural member being considered.
(B) Ladders installed prior to [OAL to insert effective date]:
1. The minimum design live load shall be a single concentrated load of 200 pounds. *[From existing (c)(1)]*
2. The number and position of additional concentrated live load units of 200 pounds each as determined from anticipated usage of the ladder shall be incorporated into the design. *[From existing (c)(2)]*
(C) Ladders installed on or after [OAL to insert effective date]:
1.The minimum design live load shall be two loads of 250 pounds each concentrated between any two consecutive attachments and each step or rung in the ladder shall be designed for a single concentrated live load of 250 pounds minimum. *[ANSI 14.3, 1974 – 2018 edition]*

2. The number and position of additional concentrated live load units of 250 pounds each, determined from anticipated usage of the ladder, shall be incorporated into the design. *[ANSI 14.3 1974-2018 edition]*

~~(c) Design Considerations. All ladders, appurtenances, and fastenings shall be designed to meet the following load requirements:~~
~~(1) The minimum design live load shall be a single concentrated load of 200 pounds~~
~~(2) The number and position of additional concentrated live load units of 200 pounds each as determined from anticipated usage of the ladder shall be considered in the design.~~
~~(3) The live loads imposed by persons occupying the ladder shall be considered to be concentrated at such point or points as will cause the maximum stress in the structural member being considered.~~

Discussion
Committee opted to differentiate between fixed ladders that are already installed versus fixed ladders that will be installed after the effective date of the standard. If the proposal did not grandfather the design criteria for already installed ladders before the effective date of the standard, then all existing fixed ladders would have to be reviewed to determine if they need to be removed from service because of the deferring live load design criteria, 200 lbs vs. 250 lbs. Proposed subsections (d)(2)(A) and (B) were relocated from existing subsections (c)(1) and (c)(2). Subsection (d)(2)(C)1. and (d)(2)(C)2. are consistent with ANSI 14.3, 2018 edition, Section 4.2.1. Board staff noted that the ANSI 250 lb design live load requirement has been in place as late as the 1974 standard.

Subsection (d)(3)
(d) Design and Construction.
~~(4)~~ (3) All wood parts of fixed ladders shall meet the design and construction requirements for portable wood ladders in Section 3276(c). *[From existing (c)(5)]*

~~(c) Design Considerations. All ladders, appurtenances, and fastenings shall be designed to meet the following load requirements:~~
~~(5) All wood parts of fixed ladders shall meet the design and construction requirements for portable wood ladders in Section 3276(c).~~

Discussion
Proposed subsection (d)(3) was relocated from existing subsection (c)(5). No comments, no change.

Subsection (d)(4)
(d) Design and Construction.
~~(5)~~ (4) For fixed ladders consisting of wood side rails and wood rungs or cleats, used at a pitch in the range 75 degrees to 90 degrees, and intended for use by no more than one person per

section, single ladders or cleat ladders as described in Section 3276 are acceptable. *[From existing (c)(6)]*

~~(c) Design Considerations. All ladders, appurtenances, and fastenings shall be designed to meet the following load requirements:~~
~~(6) For fixed ladders consisting of wood side rails and wood rungs or cleats, used at a pitch in the range 75 degrees to 90 degrees, and intended for use by no more than one person per section, single ladders or cleat ladders as described in Section 3276 are acceptable.~~

Discussion
Proposed subsection (d)(4) was relocated from existing subsection (c)(6). No comments, no change.

Subsection (d)(5)
(d) Design and Construction.
~~(6)~~ (5) All rungs shall have a minimum diameter of 3/4 inch for metal ladders, except as covered in (e)(1) and a minimum diameter of 1-1/8 inches for wood ladders. Materials other than steel, aluminum, and wood are acceptable provided the design, fabrication, and erection are in accordance with recognized design practice and meet the design requirements of this section when applicable. *[From existing (d)(1)]*

~~(d) Specific Features.~~
~~(1) All rungs shall have a minimum diameter of 3/4 inch for metal ladders, except as covered in (e)(1) and a minimum diameter of 1 1/8 inches for wood ladders. Materials other than steel, aluminum, and wood are acceptable provided the design, fabrication, and erection are in accordance with recognized design practice and meet the design requirements of Section 3277(c) and Section 3277(d)(11) when applicable.~~

Discussion
Proposed subsection (d)(5) was relocated from existing subsection (d)(1). No comment, no change.

Subsection (d)(6)
(d) Design and Construction.
~~(1)~~ (6) Ladder rungs, steps, and cleats shall be parallel, and level.~~, and uniformly spaced~~. *[1910.23(b)(1)]*

Discussion
Proposed subsection (d)(1) is from federal standard 29 CFR Section 1910.23(b)(1). Upon review, Board staff is revising subsection (d)(1) and relocating the subsection to (d)(6) for better organization. The requirement for the uniform spacing is deleted because the requirement is already mentioned in proposed subsection (d)(7).

Subsection (d)(7)

(d) Design and Construction.
(7) The distance between the top surfaces of rungs, cleats, and steps shall not be less than 10 inches nor exceed 12 inches and shall be uniform throughout the length of the ladder. *[§1910.23(b)(2), from existing (d)(2)]*
EXCEPTION to Subsection (d)(7):
The vertical distance of the first rung from ground level may be as high as 14 inches.
~~(d) Specific Features.~~
~~(2) The distance between the top surfaces of rungs, cleats, and steps shall not exceed 12 inches and shall be uniform throughout the length of the ladder.~~
~~Exceptions:~~
~~1. Manholes and Underground Vaults. Step spacing shall not exceed 16 inches between the top surfaces of rungs and shall be uniform throughout the length of the ladder.~~
~~2. The vertical distance of the first rung from ground level may be as high as 14 inches.~~

Discussion

Proposed subsection (d)(7) was relocated from existing subsection (d)(2) with modifications to be consistent with federal standard 29 CFR Section 1910.23(b)(2). Exception 1 was deleted because of the creation of proposed new Section 3279. Exception 2 was retained.

Subsection (d)(8)

(d) Design and Construction.
(8) Width. The minimum clear ~~length~~ width of rungs or cleats shall be 16 inches. *[From existing (d)(3)]*
~~(d) Specific Features.~~
~~(3) The minimum clear length of rungs or cleats shall be 16 inches.~~
~~Exception:~~
~~Manholes and Underground Vaults. Clear length of rungs or cleats shall not be less than 14 inches.~~

Discussion

Proposed subsection (d)(8) was relocated from existing subsection (d)(3) with minor edits. The exception was not relocated because of the creation of proposed new Section 3279.

Subsection (d)(9)

(d) Design and Construction.
(9) Rungs, cleats, and steps shall be free of splinters, sharp edges, burrs, or projections which may be a hazard. *[§1910.23(b)(7), from existing (d)(4)]*

~~(d) Specific Features~~

~~(4) Rungs, cleats, and steps shall be free of splinters, sharp edges, burrs, or projections which may be a hazard.~~

Discussion
Proposed subsection (d)(9) was relocated from existing subsection (d)(4). No comments, no change.

Subsection (d)(10)
(d) Design and Construction.
(10) The rungs of an individual-rung ladder shall be so designed that the climber's foot cannot slide off the end of a rung. A suggested design for metal rungs is shown in Figure 3277-4. *[§1910.23(d)(10), from existing (d)(5)]*

~~(d) Specific Features.~~
~~(5) The rungs of an individual-rung ladder shall be so designed that the climber's foot cannot slide off the end of a rung. A suggested design for metal rungs is shown in Fig. 4.~~

Discussion
Proposed subsection (d)(10) was relocated from existing subsection (d)(5). No comments, no change.

Subsection (d)(11)
(d) Design and Construction.
(11) Side Rails. Side rails which might be used as a climbing aid shall be of such cross sections as to afford adequate gripping surface without sharp edges, splinters, or burrs. *[From existing (d)(6)]*

~~(d) Specific Features.~~
~~(6) Side Rails. Side rails which might be used as a climbing aid shall be of such cross sections as to afford adequate gripping surface without sharp edges, splinters, or burrs.~~

Discussion
Proposed subsection (d)(11) was relocated from existing subsection (d)(6). No comments, no change.

Deletion of existing Subsection (d)(11)
~~(d) Specific Features.~~
~~(11) Embedment. Individual rungs of ladders installed in manholes and underground vaults having a wall thickness which will not permit at least 6 inches of embedment shall have anchoring devices that will provide the minimum design load requirements of Section 3277(c) in addition to the following requirements:~~
~~(A) The minimum design live load shall be a single concentrated load of 300 pounds.~~

~~(B) Steps or rungs shall be embedded in the wall a minimum distance of 3 inches.~~

Discussion
Subsection (d)(11) is proposed to be deleted and relocated to proposed new Section 3279 as discussed in subsection (a).

Subsection (d)(12)
(d) Design and Construction.
(12) Fastenings. Fastenings shall be an integral part of fixed ladder design. *[From existing (d)(7)]*

~~(d) Specific Features.~~
~~(7) Fastenings. Fastenings shall be an integral part of fixed ladder design.~~

Discussion
Proposed subsection (d)(12) was relocated from existing subsection (d)(7). No comments, no change.

Subsection (d)(13)
(d) Design and Construction.
(13) Splices. All splices made by whatever means shall meet design requirements of this Section. All splices and connections shall have smooth transition with original members and with no sharp or extensive projections. *[From existing (d)(8)]*

~~(d) Specific Features.~~
~~(8) Splices. All splices made by whatever means shall meet design requirements as noted in (c). All splices and connections shall have smooth transition with original members and with no sharp or extensive projections.~~

Discussion
Proposed subsection (d)(13) was relocated from existing subsection (d)(8) with minor edits. No comments.

Subsection (d)(14)
(d) Design and Construction.
(14) Electrolytic Action. Adequate means shall be employed to protect dissimilar metals from electrolytic action when such metals are joined. *[From existing (d)(9)]*

~~(d) Specific Features.~~
~~(9) Electrolytic Action. Adequate means shall be employed to protect dissimilar metals from electrolytic action when such metals are joined.~~

Discussion
Proposed subsection (d)(14) was relocated from existing subsection (d)(9). No comments, no change.

Subsection (d)(15)
(d) Design and Construction.
(15) Welding. All welding shall be in accordance with procedures of the American Welding Society, or equivalent. *[From existing (d)(10)]*

~~(d) Specific Features.~~
~~(10) Welding. All welding shall be in accordance with procedures of the American Welding Society, or equivalent.~~

Discussion
Proposed subsection (d)(15) was relocated from existing subsection (d)(10).
No comments, no change.

Subsection (d)(16)
(d) Design and Construction.
(16) The side rails of through or sidestep ladders shall extend at least 42 inches above the top of the access level or landing platform served by the ladder and the top step or rung shall be level with the access/egress level or landing platform For parapet ladders, the access level is: *[§1910.23(d)(4), from existing (k) with modifications]*
(A) The roof, if the parapet is cut to permit passage through the parapet; or *[§1910.23(d)(4)(i)]*
(B) The top of the parapet, if the parapet is continuous. *[§1910.23(d)(4)(ii)]*

~~(k) Ladder Extensions. The side rails of through or side-step ladder extensions shall extend 3 1/2 feet above parapets and landings. For through ladder extensions, the rungs shall be omitted from the extension and shall have not less than 18 nor more than 24 inches clearance between rails (Figure 2). For side-step or offset fixed ladder sections, at landings, the side rails and rungs shall be carried to the next regular rung beyond or above the 3 1/2 feet minimum (Figure 3).~~

Discussion
Existing subsection (k) is proposed to partially replaced by proposed subsection (d)(16).
Proposed subsection (d)(16) is from federal standard 29 CFR Section 1910.23(d)(4).

Subsection (d)(17)
(d) Design and Construction.
(17) For through ladders, the steps or rungs shall be omitted from the extensions, and the side rails shall be 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 side rails of the extensions shall not exceed 36 inches. *[§1910.23(d)(5), from existing (k) with modifications]*

~~(k) Ladder Extensions. The side rails of through or side-step ladder extensions shall extend 3 1/2 feet above parapets and landings. For through ladder extensions, the rungs shall be omitted from the extension and shall have not less than 18 nor more than 24 inches clearance between rails (Figure 2). For side-step or offset fixed ladder sections, at landings, the side rails and rungs shall be carried to the next regular rung beyond or above the 3 1/2 feet minimum (Figure 3).~~

Discussion
Existing subsection (k) will be partially replaced by subsection (d)(17). Proposed subsection (d)(17) is from federal standard 29 CFR Section 1910.23(d)(5). Existing ladders will need retrofit.

Subsection (d)(18)
(d) Design and Construction.
(18) For side-step ladders, the side rails, rungs, and steps shall be continuous in the extension (see Figure 3277-3 of this section). *[§1910.23(d)(6), from existing (k) with modifications]*

~~(k) Ladder Extensions. The side rails of through or side-step ladder extensions shall extend 3 1/2 feet above parapets and landings. For through ladder extensions, the rungs shall be omitted from the extension and shall have not less than 18 nor more than 24 inches clearance between rails (Figure 2). For side-step or offset fixed ladder sections, at landings, the side rails and rungs shall be carried to the next regular rung beyond or above the 3 1/2 feet minimum (Figure 3).~~

Discussion
Existing subsection (k) will be partially replaced by subsection (d)(18). Proposed subsection (d)(18) is from federal standard 29 CFR Section1910.23(d)(6). Figure 3277-3 will be replaced or redrawn. Federal OSHA's image of Figure 3277-3 appears out of focus and it includes metric units of measurement.

Subsection (d)(19)
(d) Design and Construction.
~~(19) The step-across distance for side-step ladders from the centerline of the rungs or steps shall be not less than 15 inches and not more than 20 inches to the access points of the platform edge.~~

Discussion
Proposed subsection (d)(19) is from federal standard 29 CFR Section 1910.23(d)(12). The proposed is to be relocated to subsection (f)(7) under Clearances for better organization.

(d) Design and Construction.
~~(20)~~ (19) Grab bars.

(A) Grab bars shall extend 42 inches above the access level or landing platforms served by the ladder. *[§1910.23(d)(7)]*
(B) Grab bars shall be spaced by a continuation of the rung spacing when they are located in the horizontal position. Vertical grab bars shall have the same spacing as the ladder side rails. Grab bar diameters shall be the equivalent to the round-rung diameters or shall **be of equal dimension as the side rails of the ladder.** *[Moved from existing (l) with modifications]*

~~*(l)* Grab Bars. Grab bars shall be spaced by a continuation of the rung spacing when they are located in the horizontal position. Vertical grab bars shall have the same spacing as the ladder side rails. Grab bar diameters shall be the equivalent of the round-rung diameters.~~

Discussion
Proposed subsection (d)(20) will be renumbered to proposed subsection (d)(19).

Proposed subsection (d)(19(A) is from federal standard 29 CFR Section 1910.23(d)(7) and was renumbered due to the relocation of proposed subsection (d)(19).

Subsection (d)(19)(B) is relocated from existing subsection (*l*) and modified to add "shall be equal dimension as the side rails of the ladder" as suggested by the committee for consistency with the requirements relating to grab bars.

Subsection (d)(20)
(e) Protection from Deterioration.
(20) The top step or rung of a ladder shall be at the same level with the top of the walking working surface served by the ladder.

Discussion
Committee suggested that the Chair develop language stating that the top rung of the ladder be the same level as what you are stepping out on.

Subsection (e) Protection from Deterioration.
Subsection (e)(2)(e) Protection from Deterioration.
(2) Wood. Wood ladders, when used under conditions where decay may occur, shall be treated with a nonirritating preservative, and the details shall be such as to prevent or minimize the accumulation of water on wood parts. Wood ladders shall not be painted but may be coated with a clear sealant after inspection has assured that all requirements of ~~3278~~ Section 3276 have been met.

~~NOTE: Paint does not act as a wood preservative.~~

Discussion
No comments, no change.

Subsection (f) Clearance.
Subsection (f)(1)
(f) Clearance.
(1) On fixed ladders, the perpendicular distance from the center line of the rungs to the nearest permanent object on the climbing side of the ladder shall be 36 inches for a pitch of 76 degrees, and 30 inches for a pitch of 90 degrees (~~Fig. 5~~ Figure 3277-5), with minimum clearances for intermediate pitches varying between these two limits in proportion to the slope, except as provided in (3) and (7). *[§1910.23(d)(13)(ii)]*
~~Exception: Manholes and Underground Vaults.~~

Discussion
Exception was deleted because of the creation of proposed new Section 3279.

Subsection (f)(2)
(f) Clearance.
(2) A clear width of at least 15 inches shall be provided each way from the center line of the ladder in the climbing space, except when cages or wells are necessary. (See (g)~~(2)~~(3) and ~~Fig. 5.~~Figure 3277-5) *[§1910.23(d)(13)]*
~~Exception: Manholes and Underground Vaults.~~

Discussion
Exception was deleted because of the creation of proposed new Section 3279. No comments, no change. Cross reference was corrected due to the addition of new (g)(2).

Subsection (f)(3)
(f) Clearance.
(3) Ladders equipped with cage or basket shall be excepted from the provisions of (1) and (2), but shall conform to the provisions of (g)~~(5)~~(9). Fixed ladders in smooth-walled wells shall be excepted from the provisions of (1), but shall conform to the provisions of (g)(~~6~~)(10).

Discussion
Correction to cross references.

Subsection (f)(4)
(f) Clearance.
(4) The distance from the center line of rungs, cleats, or steps to the nearest permanent object in back of the ladder shall be not less than 7 inches (~~Fig. 5~~ Figure 3277-5), except that when unavoidable obstructions are encountered, minimum clearances as shown in ~~Fig. 6~~ Figure 3277-6 shall be provided.

EXCEPTION~~S~~:

~~Manholes and Underground Vaults. The clearance from the center line of rungs or steps shall not be less than 5 inches.~~
Obstructions. At those locations where unavoidable obstructions are encountered, minimum clearances shall be as shown in Figure 3277-6.

Discussion
First exception was deleted to be addressed in Section 3279.

Subsection (f)(5)
(f) Clearance.
(5) The distance from the center line of the grab bar to the nearest permanent object in back of the grab bars shall be not less than ~~4~~ 7 inches. Grab bars shall not protrude on the climbing side beyond the rungs of the ladder which they serve. *[§1910.23(d)(3)]*

Discussion
The proposed amendment is to be as effective as federal standard 29 CFR Section 1910.23(d)(3).

Subsection (f)(6)
(f) Clearance.
(6) The step-across distance for through ladders from the center line of the top rung ~~from the nearest edge of ladder~~ to the nearest edge of ~~equipment or structure~~ the walking-working surface shall be not more than 12 inches, nor less than 2 1/2 inches ~~(Fig. 7~~ Figure 3277-7). *[§1910.23(d)(12)]*

Discussion
Board staff is adding "for through ladders" for clarification.

Subsection (f)(7)
(f) Clearance.
(7) The step-across distance for side-step ladders from the centerline of the rungs or steps shall be not less than 15 inches and not more than 20 inches to the access points of the platform edge. *[§1910.23(d)(12) and (d)(12)(ii) with modifications]*

Discussion
Board staff relocated proposed subsection (f)(7) from proposed subsection (d)(19). The proposed new subsection was from federal standard 29 CFR Sections 1910.23(d)(12) and (d)(12)(ii) with editorial amendments.

Subsection (f)(8)
(f) Clearance.

~~(7)~~ (8) All hatch covers shall open a minimum of ~~60~~ 70 degrees from the horizontal. The distance from the center line of rungs or cleats to the edge of the hatch opening on the climbing side shall be not less than 24 inches for offset wells or 30 inches for straight wells. There shall be no protruding potential hazards within 24 inches of the center line of rungs or cleats; any such hazards within 30 inches of the center line of the rungs or cleats shall be fitted with deflector plates placed at an angle of ~~60~~ 70 degrees from the horizontal as indicated in ~~Fig. 8~~. Figure 3277-8. The relationship of a fixed ladder to an acceptable hatch cover is illustrated in ~~Fig. 9.~~ Figure 3277-9 *[§1910.23(d)(9)]*

Discussion
Existing subsection (f)(7) was renumbered to subsection (f)(8). The 60 degrees requirement was replaced with 70 degrees in order to be as effective as federal standard 29 CFR Section 1910.23(d)(9).

Subsection (g) Cages or Wells.
(See Subsection (j) for ladder safety system phase-in requirements)

Discussion
No comments from the Committee to the addition of the Note.

Subsection (g)(1)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)
(1) Construction. Cages or wells shall be built as shown on the applicable drawings, covered in detail in ~~Figs. 1, 10, and 11~~ Figures 3277-1, 3277-10, and 3277-11, or of equivalent construction.

~~Exception: Chimney ladders and manholes and underground vaults.~~

Discussion
Removed exception. Utility company representatives will look into the removal of the exception and may comment at a later time.

Subsection (g)(2)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)
(2) Cages and wells shall be continuous throughout the length of the fixed ladder, except for access, egress, and other transfer points. *[§1910.29(g)(2)]*

Discussion
New subsection (g)(2) was from federal standard 29 CFR Section 1910.29(g)(2).

Subsection (g)(3)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)

~~(2)~~(3) Dimensions and Maximum Length. Cages or wells conforming to the dimensions shown in ~~Figs. 1, 10, and 11~~ Figures 3277-1, 3277-10, and 3277-11 shall be provided on ladders of more than 20 feet to a maximum unbroken length of 30 feet.

EXCEPTIONS:
~~(1)~~1. Fixed ladders on fire hose drying towers are not required to have a cage, well, offset platform, or ladder safety device if they do not exceed 30 feet in length and provided their use is restricted to trained fire fighters or others equally trained in ladder use.

~~(2) Fixed ladders on outdoor advertising structures covered by Article 11.~~

~~(3)~~2. Ladders equipped with ladder safety systems as provided under Subsection ~~(m)~~ (j).

Discussion
With the addition of a new subsection (g)(2), this was renumbered to subsection (g)(3). There was no comment on the removal of the exception to outdoor advertising. The federal standard 29 CFR does not have an exception for outdoor advertising.

Subsection (g)(4)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)
(4) Cages and wells shall be designed, constructed, and maintained to contain employees in the event of a fall, and to direct them to a lower landing. *[§1910.29(g)(3)]*

Discussion
New subsection (g)(4) from federal standard 29 CFR Section 1910.29(g)(3). No comments.

Subsection (g)(5)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)
(5) A cage or well in combination with a personal fall arrest system or ladder safety system may be provided such that the cage or well does not interfere with the operation of the system. *[§1910.28(b)(9)(iv)]*

NOTE: Using a cage and a personal fall arrest or ladder safety system together can have an added safety benefit. However, the employer should be aware of potential difficulty of rescuing an incapacitated user and develop procedures for such an event.

Discussion
New Subsection (g)(5) was from federal standard 29 CFR Section 1910.28(b)(9)(iv). The Note was added based on industry's experience regarding the difficulty of extracting a person wearing personal protective equipment inside the caged ladder. The space inside a caged ladder is very limited. If both systems are used, a cage and personal protective equipment, the

employer must have a rescue plan. Davits or an anchor may have to be installed because there is nothing to attach to for the person performing the rescue.

Subsection (g)(6)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)
(6) Platforms used with fixed ladders shall provide a horizontal surface of at least 24 inches by 30 inches. *[§1910.29(g)(4)]*

Discussion
New subsection (g)(6) was from federal standard 29 CFR Section 1910.29(g)(4).

Subsection (g)(7)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)
~~(3)~~(7) Top of Cage. Cages shall extend a minimum of 42 inches above the top of landing, unless other acceptable protection is provided.

Discussion
With the addition of new subsections (g)(4)-(g)(6), this was renumbered to subsection (g)(7).
No comments.

Subsection (g)(8)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements)
~~(4)~~(8) Bottom of Cage. Cages shall extend down the ladder to a point not less than 7 feet nor more than 8 feet above the base of the ladder, with the bottom flared not less than 4 inches. When the ladder terminates on a landing platform or ~~walkway~~ walking-working surface at an elevation greater than 30 inches above the ground, a ladder cage extension shall be provided from the bottom of the cage to the top of the guardrail when the distance from the plane of the ladder rungs to the guardrail is equal to or less than that shown in Figure 3277-11, "Ladder Cages at Elevated Locations."

(A) When the guardrail is located at a distance greater than that shown in Figure 3277-11, a ladder cage extension need not be provided.

(B) The ladder cage extension or equivalent shall be constructed as follows:

1. The ladder cage extension or equivalent shall be capable of withstanding a force of at least 200 pounds applied horizontally at any point.

2. The ladder cage extension or equivalent shall be of solid construction, grille work with vertical bars located at a maximum spacing of 9-1/2 inches, center-to-center, or of slat-work with openings between slats not more than 4 vertical inches.

3. The ladder cage extension or equivalent shall be free of hazardous projections.

4. The ladder cage extension or equivalent shall be provided not less than two feet each side of the ladder center line where there is an exposure.

5. Vertical guardrail extensions may be used as equivalent construction for the ladder cage extension provided they are as high as the bottom of the cage opening and they comply with the provisions of (g)~~(4)~~(8)(B)1.-5.

Discussion
With the addition of new subsections (g)(4)-(g)(6), this was renumbered to subsection (g)(8) with an edit to replace the word "walkway" with "walking-working surface". The cross reference in (g)(8)(B)1.-5. was corrected.

Subsection (g)(9)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements) ~~(5)~~(9) Size of Cage. Cages shall not extend less than 27 nor more than 30 inches from the center line of the rungs of the ladder. The cage shall not be less than 27 inches in width. The inside shall be clear of projections. Vertical bars shall be located at a maximum spacing of 9-1/2 inches, center-to-center around the circumference.

Discussion
With the addition of new subsections (g)(4)-(g)(6), this was renumbered to subsection (g)(9). No comments.

Subsection (g)(10)
(g) Cages or Wells. (See Subsection (j) for ladder safety system phase-in requirements) ~~(6)~~(10) Ladder Wells. Ladder wells shall have a clear width of at least 15 inches measured each way from the center line of the ladder. (See ~~Fig.1.~~ Figure 3277-1) Smooth-walled wells shall be a minimum of 27 inches and a maximum of 30 inches from the center line of rungs to the well wall on the climbing side of the ladder. Where other obstructions on the climbing side of the ladder exist, there shall be a minimum of 30 inches from the center line of the rungs.

Discussion
With the addition of new subsections (g)(4)-(g)(6), this was renumbered to subsection (g)(10). No comments.

Subsection (h) Pitch.
Subsection (h)(4)
(h) Pitch.
(4) Pitch Greater Than 90 Degrees. Ladders having a pitch in excess of 90 degrees with the horizontal shall not be permitted.

~~Exception Manholes and Underground Vaults. Individual rung ladders installed in the walls of conical top sections of manholes and underground vaults shall be allowed to exceed a pitch of 90 degrees for a distance of not more than 2 rungs or steps in the conical top sections. The deviation from 90 degrees shall not exceed 6 inches. (See Figure 13.)~~

Discussion
Exception was removed because of the creation of new Section 3279.

Subsection (i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.
[§1910.28(b)(9)(i)(A)]
Subsection (i)(1)
(i) ~~Maintenance~~ *[Addressed in (k)]* Fixed Ladders that Extend More than 20 Feet Above the Lower Level.
(1) The distance shall be measured from the lower walking-working surface to the next higher walking-working surface. *[§1910.28(b)(9)]*

Discussion
Maintenance requirements is proposed to be relocated and addressed in subsection (k). In California, existing ladders are required to have a cage at 20 feet. The federal standard 29 CFR requires existing fixed ladders that extend more than 24 feet to be equipped with a cage, personal fall protection, ladder safety system. The committee decided to retain the 20 feet and there was preference to keep the trigger height uniform for cages and ladder safety system, or well (§1910.28(b)(9)(i)(A)). Instead of using the federal language "extend more than", the committee also clarified how the height of the ladder is to be measured.

Subsection (i)(2)
(i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.
(2) Ladder Safety System Phase-In Dates and Platforms.
(A) Existing fixed ladders. Each fixed ladder installed before **[2 years after OAL effective date]** shall be equipped with a personal fall arrest system, ladder safety system, cage, or well. *[§1910.28(b)(9)(i)(A)]*

1. Where no cage, well, or ladder safety system is provided, landing platforms shall be provided for each 20 feet of height or fraction thereof.
   Note: Subsection (i)(2)(A)1. applies to fixed ladders that are exempt from installing cages, see subsection (g)(3). *[From (j)(1)(A)]*
2. Where a cage or well is provided and no ladder safety system is provided, landing platforms shall be provided for each 30 feet of height or fraction thereof. *[From (j)(1)(B)]*

(B) New fixed ladders. Each fixed ladder installed on and after **[2 years after OAL effective date]** shall be equipped with a personal fall arrest system or a ladder safety system. *[§1910.28(b)(9)(i)(B)]*

(C) Replacement. When a fixed ladder, cage, or well, or any portion of a section thereof, is replaced, a personal fall arrest system or ladder safety system shall be installed in at least that section of the fixed ladder, cage, or well where the replacement is located; and *[§1910.28(b)(9)(i)(C)]*
(D) Final deadline. On and after November 18, 2036, all fixed ladders shall be equipped with a personal fall arrest system or a ladder safety system. *[§1910.28(b)(9)(i)(D)]*

~~(j) Landing Platforms.~~
~~(1) When ladders are used to ascend to heights exceeding 20 feet landing platforms shall be provided as follows:~~
~~(A) Where no cage, well, or ladder safety system is provided, landing platforms shall be provided for each 20 feet of height or fraction thereof~~.
~~(B) Where a cage or well is provided and no ladder safety system is provided, landing platforms shall be provided for each 30 feet of height or fraction thereof.~~

~~(m) Ladder Safety Systems. Ladder safety systems may be used on tower, water tank, and chimney ladders over 20 feet in unbroken length in lieu of cage protection. No landing platform shall be required in these cases. All ladder safety systems shall meet the design requirements of the ladders which they serve [See subsection (c)].~~ *[Addressed in (i)]*

Discussion
Board staff amended the title of Subsection (i)(2) by adding "and Platforms". Subsection (i)(2)(A), (B), (C), and (D), were from federal standard 29 CFR Section 1910.28(b)(1)(9)(i)(A), (B),(C), and (D) with modifications. Subsections (i)(2)(A)1., and (i)(2)(A)2. were relocated from subsections (j)(1)(A) and (j)(1)(B).

The Committee pondered if existing cages should be removed after ladder safety systems are installed. The Committee decided that it should be up to the employer, because there are benefits to having a ladder cage.

Cages do not require the climber to do anything. They are protection against loss of handhold and fall rearward. The loss of handhold and foothold on one side normally causes a rotation of the climber without a cage. The cage act as continuous rest area of the climb. The Committee already added a caveat regarding the difficulty of rescue when you have both.

There was a discussion that grandfathered ladders will likely not meet the structural requirements the installation of a ladder safety system. For older ladders, a fall arrest system may be the only option.

Subsection (i)(3)
(i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.

(3) When a one-section fixed ladder is equipped with a personal fall protection or a ladder safety system or a fixed ladder is equipped with a personal fall arrest or ladder safety system on more than one section: *[§1910.28(b)(9)(ii)]*
(A) The personal fall arrest system or ladder safety system shall provide protection throughout the entire vertical distance of the ladder, including all ladder sections; and
[§1910.28(b)(9)(ii)(A)]
(B) The ladder shall have rest platforms provided at maximum intervals of 50 feet.
[§1910.28(b)(9)(ii)(B)]

~~(m) Ladder Safety Systems. Ladder safety systems may be used on tower, water tank, and chimney ladders over 20 feet in unbroken length in lieu of cage protection. No landing platform shall be required in these cases. All ladder safety systems shall meet the design requirements of the ladders which they serve [See subsection (c)].~~ *[Addressed in (i)]*

Discussion
Subsection (i)(3) was from federal standard 29 CFR Sections 1910.28(b)(9)(ii), (b)(9)(ii)(A) and (b)(9)(ii)(B with a modification to require a rest platform every 50 feet, not 150 feet as required by the federal standard.

Currently, for ladders with cages, landing platforms are required every 30 feet. ANSI requires landing for ladders with cages and no ladder safety system every 50 feet. The federal standard requires a landing platform every 150 feet for fixed ladders with a ladders safety system. Eventually, the employer will either add a fall protection or ladder safety system to these existing ladders. The question was asked if California should require a rest platform to be installed every 50 feet instead of every 150 feet. Climbing a straight ladder for 150 feet without an opportunity to completely rest is physically demanding. Ultimately, the Committee decided to require a rest platform every 50 feet.

The proposal for a landing platform every 50 feet will incur additional cost for fixed ladders serving towers. The same may be true for ladders serving wind towers and windmills. A commenter stated that resting platforms are currently being built into fixed ladders serving wind turbines.

Fixed ladders serving silos will be affected if they do not have platforms. The committee recommended deleting existing subsection (m) thereby deleting the exception for tower, water tank, and chimney ladders.

Subsection (i)(4)
(i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.
(4) Each ladder section shall be offset from adjacent ladder sections at each landing.
[§1910.28(b)(9)(A), Moved from (j)(1)(C)]

~~(j) Landing Platforms.~~
~~(1) When ladders are used to ascend to heights exceeding 20 feet, landing platforms shall be provided as follows:~~
~~(C) Each ladder section shall be offset from adjacent ladder sections at each landing.~~

Discussion
Proposed subsection (i)(4) was from existing subsection (j)(1)(C).

Subsection (i)(5)
(i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.
(5) Where installation conditions (even for a short, unbroken length) require that adjacent sections be offset, landing platforms shall be provided at each offset. *[From (j)(1)(D)1. and 2.]*
EXCEPTIONS:
1. Ladders used primarily in construction operations, fire escape ladders, and ladders equipped with treads.
2. Ladders on high-voltage transmission towers, chimneys, smoke stack ladders, water tower ladders and similar fixed ladders on permanent installations which are used either infrequently or for emergency only, provided the employee who uses the ladder is supplied with and wears approved personal fall protection equipment, which can be utilized if a rest period is required.

~~(j) Landing Platforms.~~
~~(1) When ladders are used to ascend to heights exceeding 20 feet landing platforms shall be provided as follows:~~
~~****~~
~~(D) Where installation conditions (even for a short, unbroken length) require that adjacent sections be offset, landing platforms shall be provided at each offset~~
~~Exceptions to Subsection (j)(1):~~
~~1. Ladders used primarily in construction operations, fire escape ladders, and ladders equipped with treads.~~
~~2. Ladders on high-voltage transmission towers, chimneys, smoke stack ladders, water tower ladders and similar fixed ladders on permanent installations which are used either infrequently or for emergency only, provided the employee who uses the ladder is supplied with and wears approved personal fall protection equipment, which can be utilized if a rest period is required.~~
~~3. Ladders in underground mines as covered by the Mine Safety Orders.~~

Discussion
Subsection (i)(5) was relocated from subsections (j)(1)(D)1. and (j)(1)(D)2. Exception from subsection (j)(1)(D)3. was deleted because mining operations are not part of general industry.

Subsection (i)(6)
(i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.

(6) Where an employee has to step a distance greater than 12 inches from the center line of the rung of a ladder to the nearest edge of structure or equipment, a landing platform shall be provided. Landing platforms shall not only be located behind the climber. The minimum step-across distance shall be 2 1/2 inches (Figure 3277-7). *[From (j)(2) with modifications]*

~~(j) Landing Platforms.~~
~~(2) Where an employee has to step a distance greater than 12 inches from the center line of the rung of a ladder to the nearest edge of structure or equipment, a landing platform shall be provided. The minimum step-across distance shall be 2 1/2 inches (Figure 7).~~

Discussion
Subsection (i)(6) was relocated from subsection (j)(2) with an amendment to add "Landing platforms shall not be located behind the climber." The Division commented that they have run across this situation and it makes the stepping in and out of landing awkward.

Subsection (i)(7)
(i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.
(7) All landing platforms shall be equipped with guardrails and toeboards, so arranged as to give safe access to the ladder. Platforms shall be not less than 24 inches in width and 30 inches in length. *[From (j)(3)]*

~~(j) Landing Platforms.~~
~~(3) All landing platforms shall be equipped with guardrails and toeboards, so arranged as to give safe access to the ladder. Platforms shall be not less than 24 inches in width and 30 inches in length.~~

Discussion
Subsection (i)(7) was relocated from subsection (j)(3). No comments.

Subsection (i)(8)
(i) Fixed Ladders that Extend More than 20 Feet Above the Lower Level.
(8) One rung of any section of ladder shall be located at the level of the landing laterally served by the ladder. Where access to the landing is through the ladder, the same rung spacing as used on the ladder shall be used from the landing platform to the first rung below the landing (Figure 3277-10). *[From (j)(4)]*

~~(j) Landing Platforms.~~
~~(4) One rung of any section of ladder shall be located at the level of the landing laterally served by the ladder. Where access to the landing is through the ladder, the same rung spacing as used on the ladder shall be used from the landing platform to the first rung below the landing (Figure 10).~~

Discussion
Proposed subsection (i)(8) was relocated from existing subsection (j)(4).

Subsection (j) Ladder Safety Systems/Personal Fall Arrest Systems.
(j) Ladder Safety Systems/Personal Fall Arrest Systems.

(1) Each ladder safety system shall allow the employee to climb up and down using both hands and shall not require that the employee continuously hold, push, or pull any part of the system while climbing. *[§1910.29(i)(1)]*
(2) The connection between the carrier or lifeline and the point of attachment to the body harness shall not exceed 9 inches. *[§1910.29(i)(2)]*
(3) Mountings for rigid carriers shall be 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. *[§1910.29(i)(3)]*
(4) Mountings for flexible carriers shall be attached at each end of the carrier and cable guides for flexible carriers shall be installed at least 25 feet apart but not more than 40 feet apart along the entire length of the carrier. *[§1910.29(i)(4)]*
(5) The design and installation of mountings and cable guides shall not reduce the design strength of the ladder. *[§1910.29(i)(5)]*
(6) Ladder safety systems and their support systems shall be capable of withstanding, without failure, a drop test consisting of an 18-inch drop of a 500-pound weight. *[§1910.29(i)(6)]*

Discussion
The entirety of subsection (j) was from federal standard 29 CFR Section 1910.29 (i)(1) to (i)(6) verbatim. Committee discussions did not lead to amendments.

Subsection (k) Maintenance and Inspection.
Subsection (k)(1)
(k) Maintenance and Inspection.
(1) All fixed ladders and ladder safety systems shall be maintained in a safe condition. *[From (i)]*

~~(i) Maintenance. All ladders shall be maintained in a safe condition. All ladders shall be inspected regularly, with the intervals between inspections being determined by use and exposure.~~

Discussion
Proposed subsection (k)(1) was relocated from existing subsection (i).

Subsection (k)(2)
(k) Maintenance and Inspection.

(2) All fixed ladders shall be inspected before initial use in each work shift, and more frequently as conditions warrant, to identify any visible defects that could cause employee injury. *[§1910.23(b)(9)]*

~~(i) Maintenance. All ladders shall be maintained in a safe condition. All ladders shall be inspected regularly, with the intervals between inspections being determined by use and exposure.~~

Discussion
Subsection (k)(2) was from federal standard Section 1910.23(b)(9), requiring the deletion of subsection (i) to prevent duplication. There was consensus that the ladder does not need to be inspected if the ladder is not going to be used in that same shift. There was consensus in adding "more frequently as conditions warrant", which is a performance based language. Some ladders may need to be inspected more than others. Fixed ladders are installed in different workplace settings, different environments, or different climates.

There was a suggestion to require a qualified person to inspect the ladders, but the committee decided against that because it may add more confusion. Any user should be able to inspect the ladder for visual defects. The inspection by a competent person was reserved for the annual inspection in proposed subsection (k)(3).

Subsection (k)(3)
(k) Maintenance and Inspection.
(3) Ladders that extend more than 20 feet above a lower level shall be inspected at least annually by a competent person.

Discussion
There was a discussion regarding the frequency of inspection and qualified versus competent person. The committee settled on competent person because a competent person as defined in Section 3207 has authority to take prompt corrective action and a qualified person does not necessarily have the same authority. The Committee came to the conclusion that inspection by a qualified person along with the requirement to inspect the fixed ladder prior to initial use per shift would be sufficient in detecting the deficiencies in the ladder and the ladder safety system.

Subsection (k)(4)
(k) Maintenance and Inspection.
(4) Ladder inspections shall include inspecting all the major ladder components such as rungs, side rails, supports, fasteners/anchors, ladder safety system, backside obstructions/clearances, front side clearances/obstructions, hatches, hatches opening arms, grab bars or rails, platforms and side rail extension anchors. *[Consistent with ANSI 14.3, Section 9.3]*

Discussion
The Division proposed adding inspection requirements consistent with ANSI and the Committee agreed. The Chair added the above language post AC.

Subsection (k)(5)
(k) Maintenance and Inspection.
(5) Any ladder with structural or other defects shall be immediately tagged ‘‘Danger: Do Not Use’’, or similar language prohibiting use, and removed from service until repaired or replaced. *[§1910.23(b)(10)]*

Discussion
Proposed subsection (k)(5) was from federal standard 29 CFR Section 1910.23(b)(10).

Subsection (k)(6)
(k) Maintenance and Inspection.
(6) When any correction or repair involves the structural integrity of the ladder, a qualified person shall perform or supervise the correction or repair. *[§1910.23(b)(10)]*

Discussion
Subsection (k)(6) was from federal standard 29 CFR Section 1910.23(b)(10).

Subsection (k)(7)
(k) Maintenance and Inspection.
(7) The ladder safety system shall be inspected in accordance with the manufacturer’s instructions by the authorized person before each use. Additionally, inspections shall be conducted periodically by a competent person other than the user.

(A) In addition to the inspection requirements set forth in the manufacturer’s instructions, the equipment shall be inspected for: *[Derived from ANSI 14.3, Section 6.1.5]*

1. Absence or illegibility of markings or tags;

2. Absence of any elements affecting the equipment form, fit or function;

3. Evidence of defects in, or damage to, hardware elements including cracks, sharp edges, deformation, corrosion, chemical attack, excessive heating, alteration and excessive wear;

4. Alteration, absence of parts, or evidence of defects in, damage to, or improper function of mechanical devices and connectors;

5. Any other condition that calls to question the suitability of the equipment for its intended purpose.

Discussion
The Committee recommended adding inspection criteria consistent with ANSI standard Section 6.1.5.

Subsection (*l*) Recordkeeping.
Subsection (*l*)(1)
(*l) Recordkeeping.*
(1) The host employer shall ensure that a record of the annual inspection as required by Subsection (*l*) of this Section is maintained in accordance with Section 3203.

Discussion
The Committee recommended that the host employer ensure that records of the annual inspection of the ladder safety system be kept by the host employer. Employees other than those of the host employer may need to climb the fixed ladder. Any employee that will climb a fixed ladder should have assurance that the ladder safety system has been inspected within a year before climbing the ladder. Fixed ladder may serve a building where multiple employers rent the space. Fixed ladders are often used to gain access to roof to service equipment for ventilation or window washing.

Subsection (*l*)(2)
(*l*) Recordkeeping.
(2) The record shall include at a minimum, the identity of the system site, inspection date, name of the qualified person conducting the inspection, the date of the inspection, and the results of the inspection. The inspection record shall be made available for review by the Division and by other site employers whose employees may use the system.

Discussion
The Committee recommended the list of information that needs to be documented.

Section 3277. Fixed Ladders. Figures.
Figure 3 will need to be redrawn because the image from the federal standard is not sharp.

Generally, all the Figures need to be updated to improve the quality of the image, to make sure that the dimensions match the proposed text and are correctly referenced. Figures will be renamed to follow the new naming convention to associate the image with a Section number. The figures appear to have dimensions that were not referenced in a particular subsection. Please provide me with feedback and let me know if we should add additional subsections to Section 3277. Figure 13 will be moved to Section 3279.