
SUBJECT AREA CONTENT

Fixed Ladders, Design, Inspection, and Use Subject Area

Effective Date: **Aug 5, 2015** ([Rev 1.0](#))
Periodic Review Due: **Aug 5, 2018**



This subject area applies to all personnel who climb a fixed ladder on the BNL site including BNL employees and contractors.

Introduction

This subject area provides procedures to ensure that all staff that use a fixed ladder as defined by 29 CFR 1910.27, use a ladder that has been inspected for compliance to industry standards and follow proper prescribed work controls to allow safe use. This procedure is applicable to all permanently installed fixed vertical ladders, including those to access manholes and elevator pits. It is not applicable to stairs or ship's stairs (also known as ship's ladders) or portable ladders.

Standards of Performance

Managers shall manage work to control risks and hazards, detect wrongdoing, ensure customer satisfaction, and provide a benefit to BNL.

All staff and users shall identify, evaluate, and control hazards in order to ensure that work is conducted safely and in a manner that protects the environment and the public.

Managers shall analyze work for hazards, authorize work to proceed, and ensure that work is performed within established controls.

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Design Requirements

All new and significantly modified fixed ladders must be reviewed and approved by Safety Engineering to ensure compliance with laboratory standards for design and installation. Laboratory requirements incorporate those listed as 29 CFR 1910.27 (OSHA) including those requirements incorporated in the current proposed change listed in FR: 75:28862-29153, May 2010. Applicable industrial standards (i.e., ANSI A14.3 – Fixed Ladders, ASTM C478 – Precast Manholes, ANSI 17.1 – elevators) must also be considered as best practices. All ladders must be inspected, classified, and used as prescribed by this subject area. In addition to the design requirements of OSHA for Fixed Ladders, the applicable requirements of the OSHA standards for Walking-Working Surfaces part 1910.22 must be incorporated. For fixed ladders that are used only for firefighting or rescue operations and ladders that are designed into (an integral part of) a machine or piece of equipment, laboratory standards will be tailored as applicable. For assistance, contact the [Manager, Facilities Engineering Group](#) in the Modernization Project office (MPO).

Design and Approval

The [Engineering Design](#) Subject Area provides the process for designing and approving engineering designs, which is also applicable to fixed ladders.

Design Review

See the section [Design Review](#) in the [Engineering Design](#) Subject Area.

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Inspect and Classify

1. Perform ladder inspections as either Prescribed Work or Permitted Work as defined in the [Work Planning and Control for Experiments and Operations](#) Subject Area. Work planning includes the following:

- Inspectors have completed TQ-LADDER-INSPECT or TQ-LADDER-ADDEND training;
- Ladder inspections are performed as specified in the organization's work planning process.

Note: The [Job Risk Assessment \(JRA\) for Vertical Fixed Ladders](#) is provided for work planning and can be found on the [BNL EMS & OSH](#) website.

2. Inspect each fixed ladder using the approved inspection ladder checklist.

Note: If the ladder does not have a unique identification number, contact the [F&O Chief Engineer](#). See the exhibit [Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits](#). Record the inspection on a copy of the checklist, taking digital photos of the ladder and any issues evaluated. The ladder location must be annotated on the checklist and on a copy of the building key plan to ensure proper identification.

3. Once the inspection has been completed and the ladder is classified and visually marked, inspector will submit a copy of the results to the office of the F&O Chief Engineer (for both infrastructure and programmatic ladders).

4. The office of the F&O Chief Engineer is responsible for managing the results of the ladder inspection to include:

- Entering the results of the inspections into a centralized database;
- Assigning a unique identifier (such as an asset tag) to each ladder inspected;
- Updating building Key Plans to note the unique ladder identification.
- Ensuring this information is captured in Maximo along with the frequency of reinspection as noted in the section [Reinspections](#).

Tag and Mark

All ladders must be assigned a unique ladder identification number by the F&O Chief Engineer.

1. If all applicable items are evaluated as "Satisfactory" on the checklist, the inspection team must identify the ladder by painting (typically) a Green mark on the ladder side rail (right side when facing the ladder) on all access points.

Note: If there are multiple access points to use the ladder (such as alternate stairs or ladders), then the top and bottom of the ladder needs to be visually marked. If the ladder is of the same color as the marking, the ladder will first be painted black on the side rail and then the green paint color applied. A band that is approximately 2 inches wide must be left on the top and bottom side of the marking so as to clearly denote the change in color.

2. If any applicable items are evaluated as "Unsatisfactory" that have been identified as safety critical (Red) or if the inspection

team considers due to a number of other issues the ladder is not safe to climb; the inspection team must identify the ladder by painting (typically) a Red mark, on the ladder side rail (right side when facing the ladder) and install an "Out of Service" Warning on all access points.

Note: If there are multiple access points to use the ladder (such as alternate stairs or ladders), then the top and bottom of the ladder needs to be marked. If the ladder is of the same color as the marking, the ladder will first be painted black on the side rail and then the red paint color applied. A band that is approximately 2 inches wide must be left on the top and bottom side of the marking so as to clearly denote the change in color.

3. If applicable items are evaluated as "Unsatisfactory" that have not been identified as safety critical (Red) and the inspection team considers the safe use of the ladder can be accomplished with other controls in place (i.e., work planning), the inspection team must identify the ladder by painting (typically) a Yellow mark, on the ladder side rail (right side when facing the ladder) and install a Caution tag/posting conspicuously on or near the ladder (e.g., the wall or right side rail at eye level) on all access points.

Note: If there are multiple access points to use the ladder (such as alternate stairs or ladders), then the top and bottom of the ladder needs to be marked. If the ladder is of the same color as the marking, the ladder will first be painted black on the side rail and then the yellow paint color applied. A band that is approximately 2 inches wide must be left on the top and bottom side of the marking so as to clearly denote the change in color. The Caution tag/posting must indicate what noncompliances have been identified. See the exhibit [Yellow Ladder Caution Posting](#) for the approved posting design and configuration.

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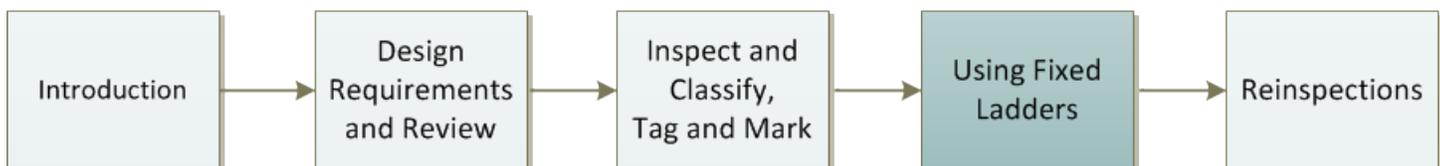
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Using Fixed Ladders

1. All fixed ladder users must have taken Ladder Safety (TQ-LADDER) training and need to be in adequate physical condition (as determined by the Occupational Medicine Clinic) to climb and work at height. The user must evaluate their personal health

condition before climbing a fixed ladder each time. If they are uncomfortable climbing the ladder or are not fit that day to perform that task, they need to contact their supervisor.

2. Prior to use of any fixed ladder, the user needs to verify that the ladder has been inspected and classified as described below. Every user performs a pre-use inspection to verify the ladder is operational and not physically damaged; the rungs are clean (no oil/grease) and there are no obstructions.
3. Ladders inspected by this procedure will be indicated by a painted color on the right side rail, visible by the point of use. Ladders are classified by the following
 - Green: Ladder was inspected and found in compliance with standards;
 - Yellow: Ladder was inspected and some noncompliances with standards were noted, however, with the use of additional provisions, the ladder can be used safely. A Caution tag/posting is attached to the ladder providing additional details. (Do not use the ladder if the Caution tag/posting is not attached; contact your immediate supervisor.)
 - Red: Ladder was inspected and one or more noncompliances with standards were noted and the ladder has been taken out of service. An "Out of Service" warning tag is attached to the ladder.

Ladders without evidence of inspection must not be used until the ladder has been inspected and approved for use. Contact the cognizant Facility Complex Engineer or Research Space Manager to have the ladder inspected and determine ladder classification.

If it is determined that no other means of access to the area is feasible, then the use of a ladder classified as "Out of Service" requires enhanced work planning (such as a fall protection plan) and the approval of both the Fixed Ladders SME and Department Chair/Division Manager (or their designees).

Note: If the ladder is classified as Green, staff may climb the ladder with no additional work planning.

4. If the ladder is classified Yellow (only minor safety issues have been noted), staff may use the ladder with the following conditions:
 - The Department/Division has a process for identifying the specific hazard(s) of each ladder and established mitigation strategies to control the hazards to an acceptable risk;
 - Supervisors (or their designee) ensure their staff have been trained to Laboratory requirements and Department/Division process and are authorized to climb fixed vertical ladders prior to being assigned to use a fixed vertical ladder.
 - Staff is trained to the Department's/Division's process and implementation of controls identified to safely use the ladder.

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Reinspections

1. Line Organization/Owners must ensure fixed ladders are reinspected using the criteria in the section [Inspect and Classify, Tag and Mark](#) when changes to the ladder or to the surrounding area are performed and to the following *schedule:

- Indoor fixed metal ladders - five (5) years;
- Outdoor fixed metal ladders with corrosion resistant finishes, e.g., aluminum, galvanized, painted (coating good condition) - five (5) years;
- Outdoor fixed metal ladders with failing coatings that show significant corrosion/loss of material - annually;
- Wooden fixed ladders - annually.

***Note:** Dimensional tolerances recording not required if no physical changes to ladder/area are noted. If the inspector determines the need for increased inspections due to deteriorating conditions, they must notify the Facilities Operations Center to increase the PM frequency.

2. Owners are responsible for having the ladder reinspected if any modifications are performed on the ladder or in the ladder envelope (see the section [Inspect and Classify, Tag and Mark](#)).

The ladder envelope is defined as 15 inches on either side of the side rails, 30 inches from the rung on the climbing side, and 7 inches from the rung to the back side of the ladder.

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TRAINING CONTENT

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Training

Inspectors have completed TQ-LADDER-INSPECT or TQ-LADDER-ADDEND training.

All fixed ladder users must have taken Ladder Safety (TQ-LADDER) training.

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CHANGES CONTENT

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Revision History

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Revision Number	Revision Type	Revision Date	Revision Description
1.0	Major	08/05/2015	The new subject area on Fixed Ladders, Design, Inspection, and Use was published using the new user-friendly format. It is applicable to all personnel who climb a fixed ladder on the BNL site, including BNL employees and contractors. The procedures on the proper design, inspection and use of fixed ladders, as defined by 29 CFR 1910.27, pertain to all permanently installed fixed vertical ladders, including those to access manholes and elevator pits. They are not applicable to stairs or ship's stairs (also known as ship's ladders) or portable ladders. This subject area replaces Interim Procedure 2012-002, "Fixed Ladders, Design, Inspection, and Use".

NOTE: The dates for "Major Revisions" match the Subject Area Effective Date. Major and/or Minor revisions may not always match with the "Last Modified Date", since this date could reflect changes to links or spelling. Records of changes are maintained in the SBMS documentation for each subject area.

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DEFINITION CONTENT

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Definitions

Term	Definition
fixed ladder	A fixed ladder is a ladder permanently attached to a structure, building, or equipment, installed at an angle between 75 degrees to 90 degrees from the ground.

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FORMS/EXHIBITS CONTENT

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Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits

Effective Date: **Aug 05, 2015**

[Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits](#)

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Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits

Evaluated by:	Location description:		
Building #:	Ladder ID#:		
Height of Ladder (feet):	Date:		
<input type="checkbox"/> Roof Access <input type="checkbox"/> Roof Access with cage <input type="checkbox"/> Equipment Access (including cranes) <input type="checkbox"/> Roof Level Change <input type="checkbox"/> Other: _____	<input type="checkbox"/> External Ladder <input type="checkbox"/> Internal Ladder <input type="checkbox"/> Manhole Ladder/rungs <input type="checkbox"/> Hinged ladder guard present <input type="checkbox"/> Key plan marked up with location <input type="checkbox"/> Deficiencies photographed	FINAL STATUS OF LADDER	
		<input type="checkbox"/> Compliant (GREEN) <input type="checkbox"/> Non-Compliant - CAUTION (YELLOW) <input type="checkbox"/> Non-Compliant - OUT OF SERVICE (RED)	

Note: Cleats serving manholes can use deviations from OSHA 1910.27 found in ASTM C478-12 (an accepted OSHA consensus standard) as long as all ASTM conditions are present. Elevator pit ladders can use ANSI 17.1 -10 (an accepted OSHA consensus standard) deviations as long as all ANSI conditions are present.

Item	OSHA Ref.	Sat.	Unsat	N/A	Comments
1	Ladder/Manhole Access Design:				
1a.	Mechanically sound and in good condition - for components required for stability are secure and not broken.	1910.27(a)			
1b.	Fasteners are an integral part of fixed ladder design.	1910.27(b)(3)			
1c.	All splices and connections have smooth transition with original members and with no sharp or extensive projections.	1910.27(b)(4)			
1d.	Dissimilar metals are protected from electrolytic action where such metals are joined.	1910.27(b)(5) ASTM C478-12 16.3.2.1			
1e.	Side rails (on ladders) which might be used as a climbing aid are of such cross sections to allow adequate gripping surface without sharp edges, splinters, or burrs. For "C" Channel Side Rails, hand grip spans should not exceed 3" (palm side) by 1-3/8" (finger reach). L channels are not acceptable by OSHA interpretation.	1910.27(b)(2) ASTM C478-12 16.3.2.2			
1f.	For Manholes: Steps in base section, riser and conical top sections shall be aligned in each section so as to form a continuous ladder with rungs equally spaced vertically in the assembled manhole. (The vertical spacing and vertical alignment between adjacent manhole steps may vary 1 inch from the design dimension. See below for maximum manhole rung spacing)	ASTM C478-12 16.4.1; 16.5.5			

Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits

2 Rungs and cleats:						
2a.	Ladder minimum diameter 3/4 inch (round metal rungs) or 1 1/8 inch diameter (round wood rungs). Note: if it is a flat hollow or "C" channel construction > 1.5 inches, is acceptable, otherwise it must be evaluated by an engineer for load concentrations.	1910.27(b)(1)(i)				Enter dimension:
2b.	Individual metal rungs embedded in concrete (pits) minimum 1 inch diameter where corrosion potential exists, otherwise 3/4 inch minimum diameter rungs that are protected from corrosion or where no corrosion potential exists.	1910.27(b)(7)(i) ASTM C478-12 16.5.1				Enter dimension:
2c.1	For Ladders: The distance between rungs, cleats, and steps does not exceed 12 inches and is uniform throughout the length of the ladder. Note: the first rung is permitted to be maximum 14 inches from base surface per ANSI A14.3 Sect 5.1.1.	ASTM C478-12 16.5.1				Enter spacing:
2.c.2	For Manholes: The distance between rungs, cleats, and steps does not exceed 16 inches and is uniform throughout the length of the ladder. (Note: The vertical spacing and vertical alignment between adjacent manhole steps may vary 1 inch from the design dimension. The first rung is permitted to be maximum 14 inches from base surface per ANSI A14.3 Sect 5.1.1.	ASTM C478-12 16.4.1				Enter spacing:
2d.1	For Ladders: Minimum clear width of rungs or cleats is 16 inches.	1910.27(b)(1)(iii)				Enter clear rung width:
2d.2	For Manholes: Minimum clear width of rungs or cleats is 10 inches.	ASTM C478-12 16.5.2				Enter clear rung width:
2e.	Rungs, cleats, and steps are free of splinters, sharp edges, burrs, or projections which may be a hazard.	1910.27(b)(1)(iv) ASTM C478-12 16.3.2.2				
2f.	Are rungs designed so that the foot cannot slide off the end. See figure D-1 for reference.	1910.27(b)(1)(v)				
3 Protection from deterioration						
3a.	Metal ladders and appurtenances are painted or otherwise treated to resist corrosion and rusting.	1910.27(b)(7)(i)				
3b.	Wood ladders, when used under conditions where decay may occur, are treated with a nonirritating preservative, and the accumulation of water on wood parts is minimized. (Note: the use of wood is prohibited from manhole access systems)	1910.27(b)(7)(ii)				
3c.	If different materials are used, are they compatible?	1910.27(b)(7)(iii)				

Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits

4 Clearance						
4a.	For Ladders: The perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder is 36 inches for a for a pitch of 76 degrees, and 30 inches for a pitch of 90 degrees (Figure D-2).	1910.27(c)(1)				Enter distance if not satisfactory:
4b.	A clear width of at least 15 inches is provided each way from the centerline of the ladder in the climbing space. (Does not apply when cages or wells are necessary).	1910.27(c)(2)				Enter distance if not satisfactory:
4c.1	For Ladders: Minimum 7 inches clearance from the centerline of rungs, cleats, or steps to the nearest permanent object in back of the ladder (Figure D-3). Note 1: Using ASTM C478-12 as guidance for ladders with restricted access for use, mark ladder out of service (Red) if less than 4 inches & mark caution (Yellow if at least 4 inches but less than 7 inches). Note 2: Using OSHA 1910.27 exemption, if object is within permitted area in Figure D-3, then caution tag ladder (Yellow).	1910.27(c)(4)				Enter distance & describe if not satisfactory:
4c.2	For Manholes: The rung or cleat shall project a uniform clear distance of 3 3/4 inches (minimum) to 6 1/4 inches (maximum for round) or 7 inches (maximum for rectangular) from the wall of the base, riser, or conical top section measured from the point of embedment to the embedment side of the rung. (Mark rungs less than 3 3/4 inches as red, over 6 1/4 inches for round or 7 inches for rectangular to 9 inches as yellow and over 9 inches as red). NOTE—Embedment point is considered the junction of the centerline of the step leg and the wall of the base, riser or conical top section.	ASTM C478-12 16.5.3				Enter distance & describe if not satisfactory:
4c.3	For Elevator Pits: 4.5 in. dimension behind the ladder complies with OSHA 1925.1053(a)(13) and ANSI 17.1-10. (See Diagram on ANSI 17.1 Elevator Pit Ladders). Note: If object is within permitted area for fixed ladders then caution tag the ladder (Yellow). Otherwise mark the ladder Red.	1925.27c; ANSI 17.1-10, 2.2.4.2				Enter distance & describe if not satisfactory:
4d.	When grab bars are provided for ladders: Minimum 4 inches clearance from the centerline of the grab bar to the nearest permanent object in back of the grab bars.	1910.27(c)(5)				
4e.	When grab bars are provided for ladders: Grab bars do not protrude on the climbing side beyond the ladder rungs.	1910.27(c)(5)				
4f.1	For Ladders: The step-across distance from the nearest edge of ladder to the nearest edge of equipment or structure is between 2 1/2 and 12 inches for forward step through motion (fig. D-4), or 15" to 20" for side step to a platform from center of the rung. Note: Ladder out of service if greater than 12 inches (or 20 inches side step) or if edge projects beyond rungs. Less than 2 1/2 inches is "Yellow" criteria for forward motion step offs.	1910.27(c)(6)				
4f.2	For Elevator Pits: The step-across distance from the nearest edge of ladder to the nearest edge of equipment or structure between 2 1/2 and 24 inches (See Diagram of ANSI 17.1 Elevator Pit Ladders). Note: Ladder is out of service if greater than 24 inches	ANSI 17.1-10, 2.2.4.2				
4g.	Counterweighted hatch covers open a minimum of 60 degrees from the horizontal (Figure D-6).	1910.27(c)(7)				

Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits

4h.1	For Ladders: The distance from the centerline of rungs or cleats to the edge of the hatch opening on the climbing side is at least 24 inches for offset wells or 30 inches for straight wells. Note: Mark ladder out of service (Red) if less than 18 inches. Mark caution (Yellow) if at least 18 inches but less than the above prescribed clearance.	1910.27(c)(7)				
4h.2	For Manholes: The minimum clear distance between the rung or cleat and the opposite wall of the base, riser, or conical top shall be 18 in. measured at the center face of the rung or cleat. (Note: The horizontal distance from the inside wall to the centerline of a manhole step may vary 1 inch from the design dimension.	ASTM C478-12 16.5.4; 16.5.5				
4i.	For Ladders: No protruding potential hazards within 24 inches of the centerline of rungs or cleats.	1910.27(c)(7)				
4j.	Deflector plates installed when protrusions within 30 inches of the centerline of the rungs or cleats (Figure D-5).	1910.27(c)(7)				
5	Cages or wells					
5a.	Cages, wells or a ladder safety system is provided on ladders of more than 24 feet (ANSI A14.3 4.1.1). See the dimensions shown in figures D-7, D-8, and D-9.	1910.27(d)(1)(ii)				
5b.	Cages extend a minimum of 42 inches above the top of landing, unless other acceptable protection is provided.	1910.27(d)(1)(iii)				
5c.	Cages extend down the ladder to a point not less than 7 feet nor more than 8 feet above the base of the ladder.	1910.27(d)(1)(iv)				
5d.	Cage bottom flared at least 4 inches, or portion of cage opposite ladder extends to the base.	1910.27(d)(1)(iv)				
5e.	Cage is minimum 27 inches in width.	1910.27(d)(1)(v)				
5f.	Cages extend between 27 and 28 inches from the centerline of the rungs of the ladder.	1910.27(d)(1)(v)				
5g.	The inside of the cage or well is clear of projections.	1910.27(d)(1)(v)				
5h.	Maximum spacing of vertical bars approximately 9 1/2 inches, center to center (40 degrees).	1910.27(d)(1)(v)				
5i.	Ladder wells have a clear width of at least 15 inches measured each way from the centerline of the ladder.	1910.27(d)(1)(vi)				
5j.	Smooth-walled wells are a minimum of 27 inches from the centerline of rungs to the well wall on the climbing side of the ladder. If other obstructions on the climbing side of the ladder exist, a minimum of 30 inches from the centerline of the rungs is required.	1910.27(d)(1)(vi)				

Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits

6 Landing Platforms & Extensions						
6a.	Is ladderway floor opening or platform guarded by a standard railing with standard toeboard on all exposed sides (does not apply to roof hatches, elevator pits and manholes)?	1910.23(a)(2)				
6b.	Is passage through the railing protected with a swinging gate or so offset (such as a compliant raised landing) that a person cannot walk directly into the opening? (Note: If chains are found on existing ladders with posting to ensure they are closed when not in use, the ladder is in compliance based on OSHA Proposed Rule changes, but note in comment section for replacement when funds become available)	1910.23(a)(2) (OSHA Proposed Rule 68:23527-23568)				
6c.	For ladders over 20 feet, landing platforms (are) provided.	1910.27(d)(2)				
6d.	On ladders with landing platforms, sections are offset (Note: applies to multiple landings only).	1910.27(d)(2)				
6e.	Landings provided at each offset ladder.	1910.27(d)(2)				
6f.	Landing platforms provided every 30 feet when cage is present.	1910.27(d)(2)				
6g.	Landing platform (intermediate) step off distance 12 inches or less from the centerline of the rung of a ladder to the nearest edge of structure or equipment (for through step off) and no greater than 20 inches from center of the rung to landing platform (for side-step ladders).	1910.27(d)(2)(i) and ANSI 14.3 Figure 6				
6h.	Landing platform step off distance is minimum 2 1/2 inches from the centerline of the rung of a ladder to the nearest edge of structure or equipment.	1910.27(d)(2)(i) and ANSI 14.3				
6i.	Is the top of a step or rung of a ladder shall be level with the top of the access/egress level or landing platform served by the ladder. (does not apply to roof hatches, elevator pits and manholes).	1910.27(d)(2)(i) and ANSI 14.3				
6j.	Landing platforms are equipped with standard railings and toeboards.	1910.27(d)(2)(ii)				
6k.	Platforms minimum 24 inches in width and 30 inches in length.	1910.27(d)(2)(ii)				
6l.	At intermediate platforms, one rung of any section of ladder is 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 must be used from the landing platform to the first rung below the landing.	1910.27(d)(2)(ii)				
6m.1	The side rails of through or side-step ladder extensions (are provided on ladders and) extend 3 1/2 feet (42 inches) above parapets and landings. (Note: does not apply to manholes, roof hatches; See below for elevator pits).	1910.27(d)(3)				
6m.2	For Elevator Pits: The ladder rails or hand grips extends a minimum of 48 inches above the landing sill. See ANSI 17.2 Figure 2.2.4.2A	ANSI 17.1-10, Figure 2.2.4.2A				

Fixed Ladder OSHA Checklist Including Ladders in Manholes and Elevator Pits

6n.	Width of through ladder extensions (does not apply to roof hatches, elevator pits and manholes): <ul style="list-style-type: none"> • Between 24 and 30 inches wide (ANSI 14.3 and OSHA proposed rule) Acceptable (GREEN). • Between 18 and 24 inches (current OSHA 1910.27(d)(3) requirement) YELLOW due to recognized safety hazard as indicated by OSHA proposed rule and current ANSI Standard. • Less than 18 inches or greater than 30 inches, RED -OUT OF SERVICE. 	1910.27(d)(3) and ANSI 14.3				Record width between extensions:
6o.	For side-step or offset fixed ladder sections, at landings, the side rails and rungs are carried to the next regular rung beyond or above the 3 1/2 feet minimum (42 inches) (Figure D-10).	1910.27(d)(3)				
6p.	When provided in place of ladder side rails, grab bars are spaced as a continuation of the rung spacing when they are located in the horizontal position.	1910.27(d)(4)				
6q.	When provided in place of ladder side rails, vertical grab bars have the same spacing as the ladder side rails.	1910.27(d)(4)				
6r.	When provided in place of ladder side rails, grab-bar diameters are the same as the round-rung diameters.	1910.27(d)(4)				
6s.	The preferred pitch of fixed ladders is considered to be in the range of 75 degrees and 90 degrees with the horizontal (fig. D-11).	1910.27(e)(1)				Record pitch of ladder:
6t.	Is pitch greater than 90 degrees? Ladders having a pitch in excess of 90 degrees with the horizontal are prohibited.	1910.27(e)(4)				

Summary list of needed actions:

Return completed forms to Ed Murphy, with photographs and locations denoted on key plans.

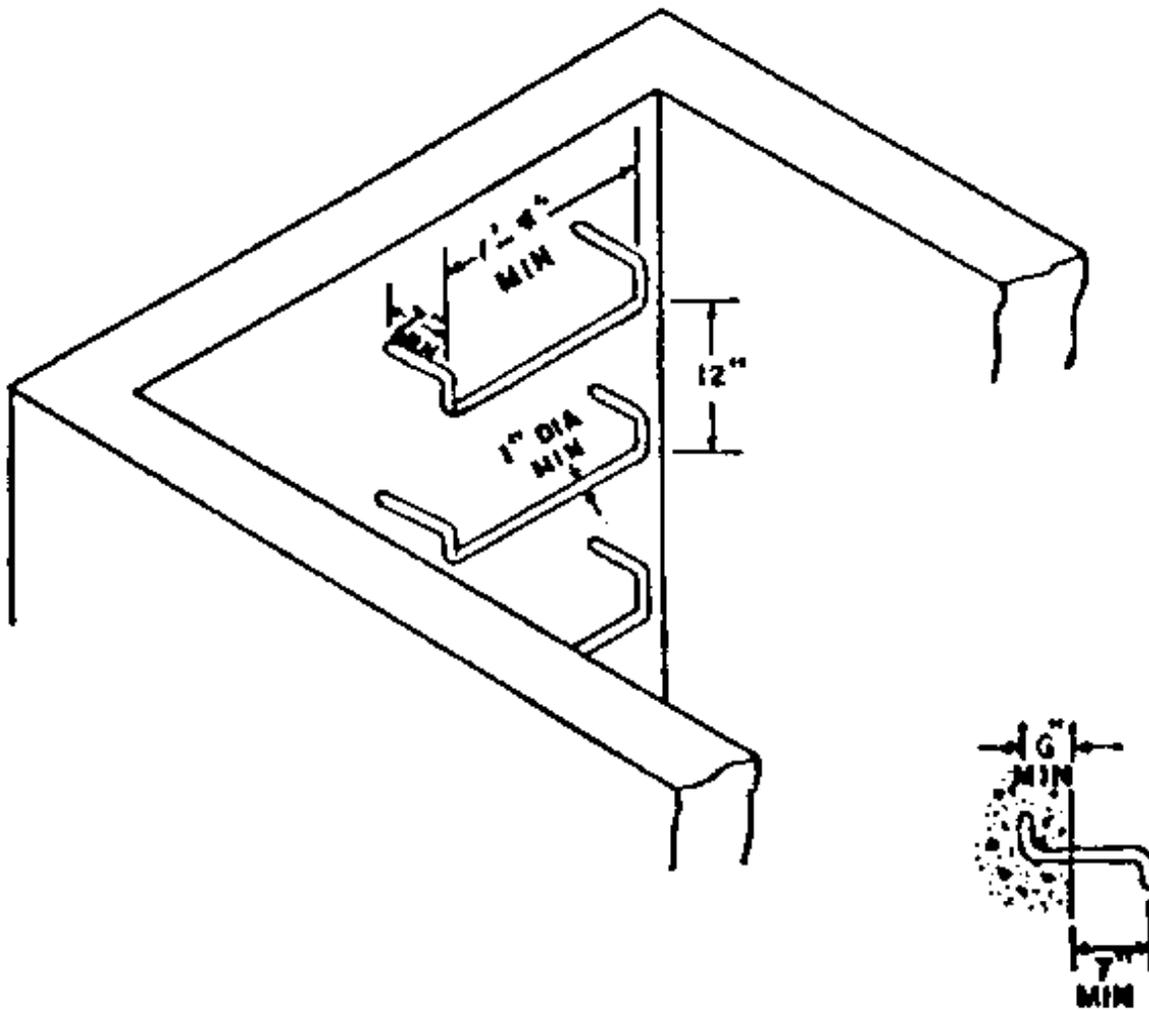


FIGURE D-1.—Suggested design for rungs on individual-rung ladders.

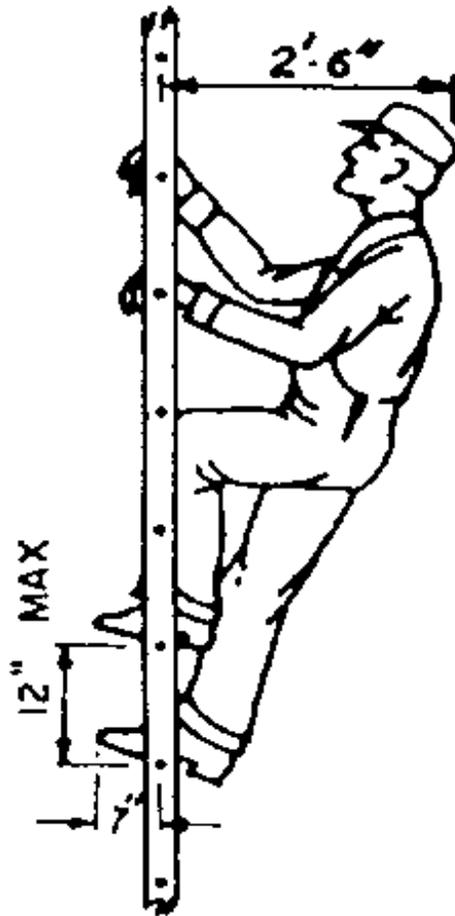
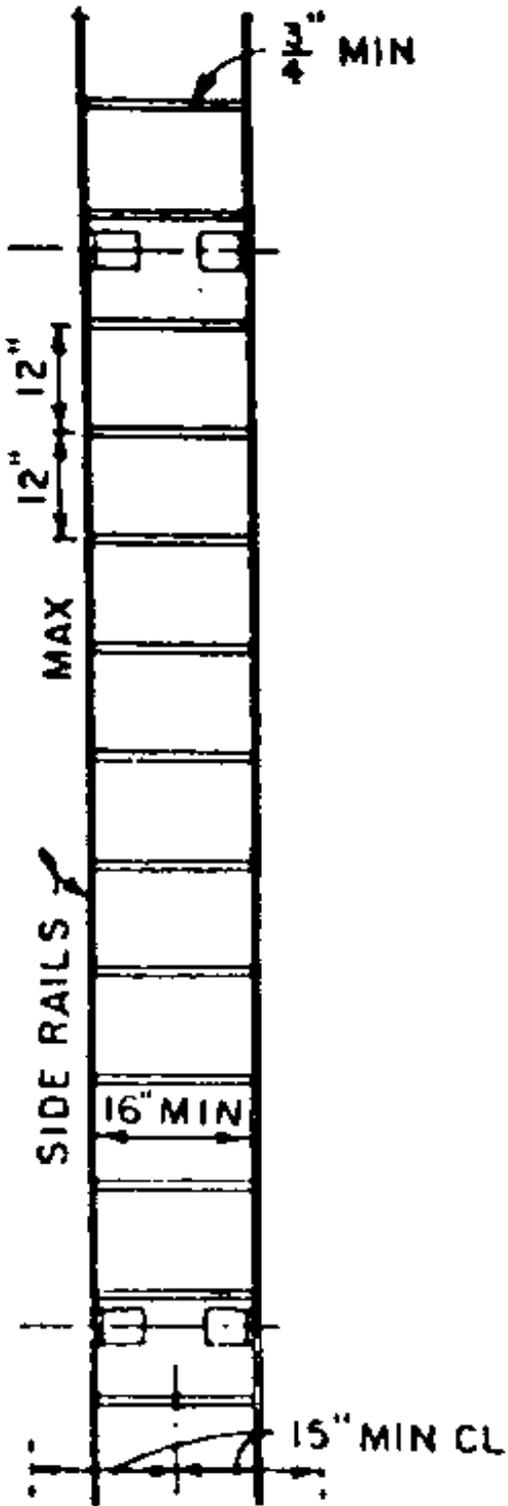
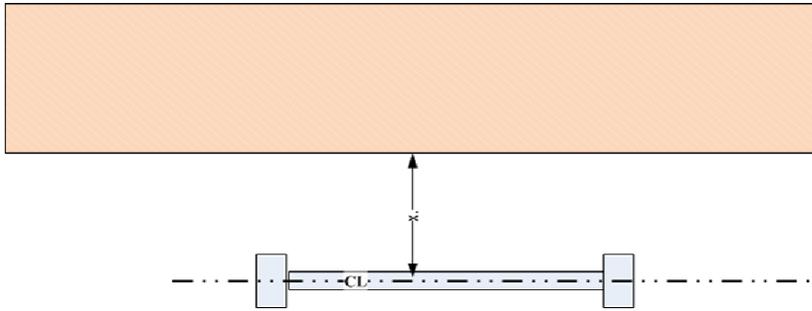


FIGURE D-2.—Rail Ladder With Bar Steel Rails and Round Steel Rungs



$X \geq 7$ " Compliant (Green)

$7" > X \geq 4"$ Non-Compliant (Yellow)*

$X < 4"$ Out of Service (Red)

* Applies to non-public access ladders (i.e., controlled work zones),.

Minimum Ladder Clearances

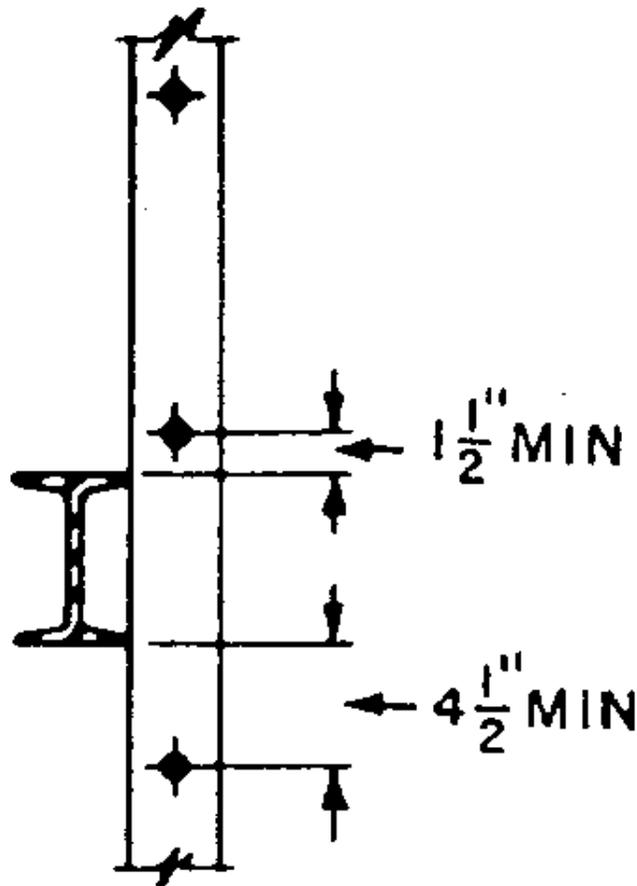


FIGURE D-3.—Clearance for Unavoidable Obstruction at Rear of Fixed Ladder

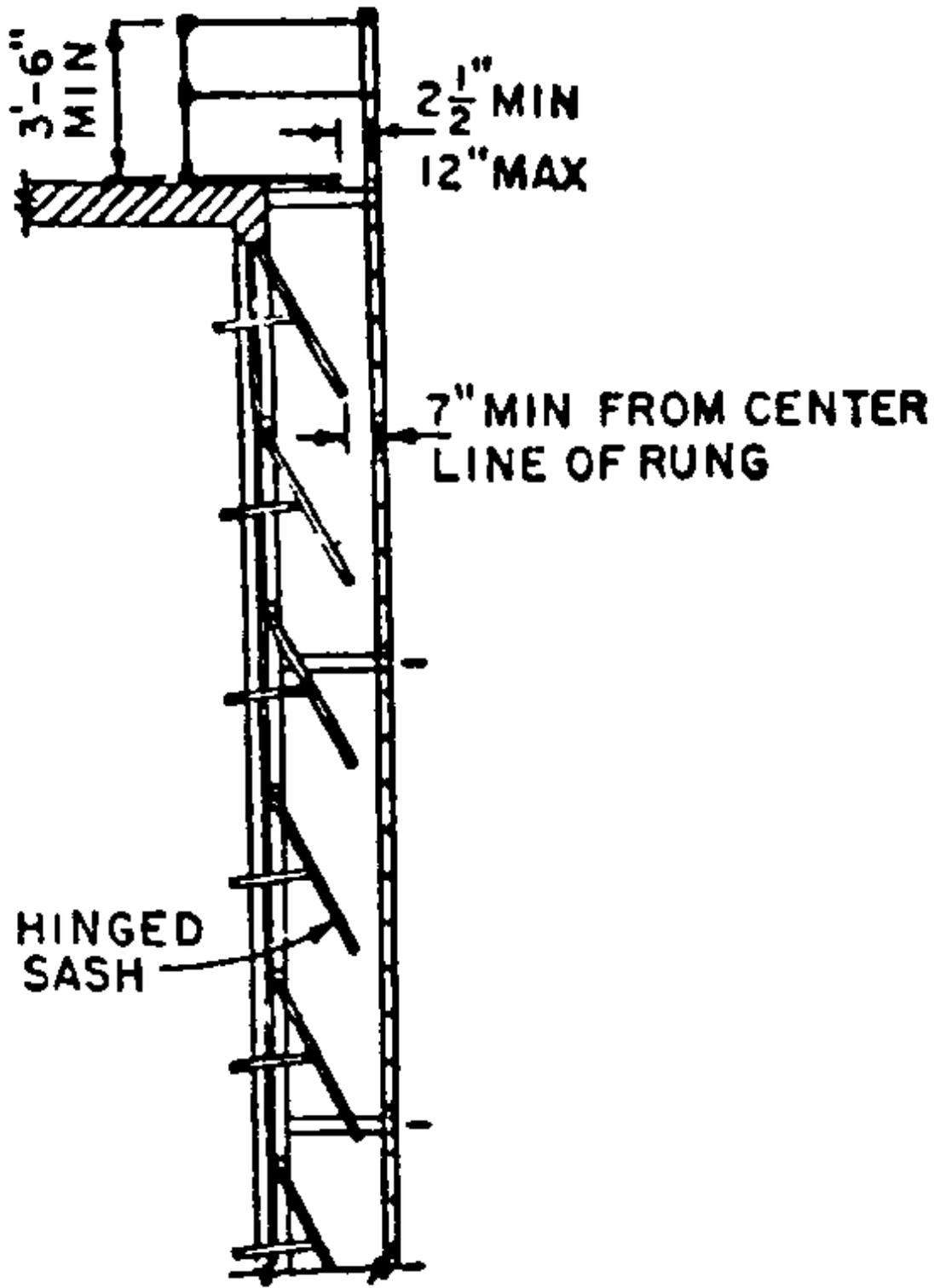


FIGURE D-4.—Ladder Far from Wall

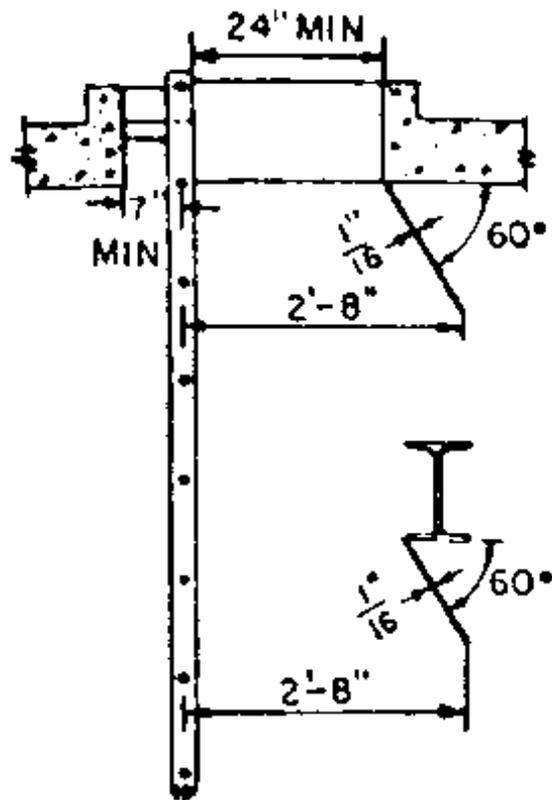


FIGURE D-5.—Deflector Plates for Head Hazards

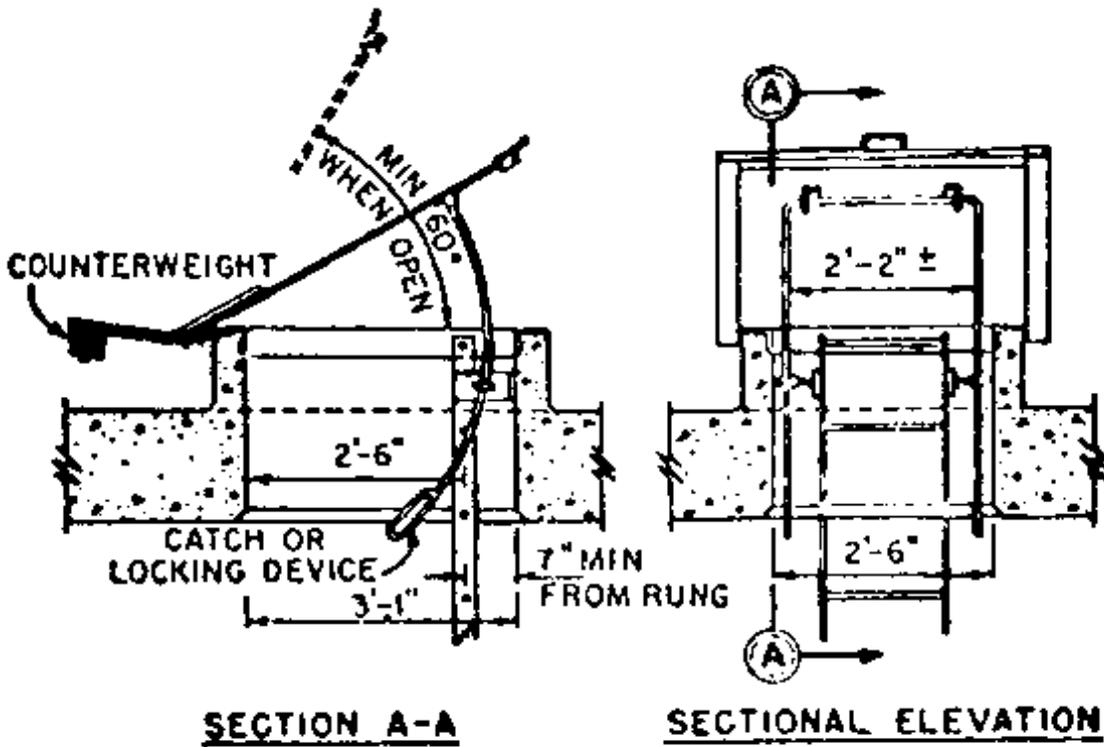


Figure D-6.—Relationship of Fixed Ladder to a Safe Access Hatch

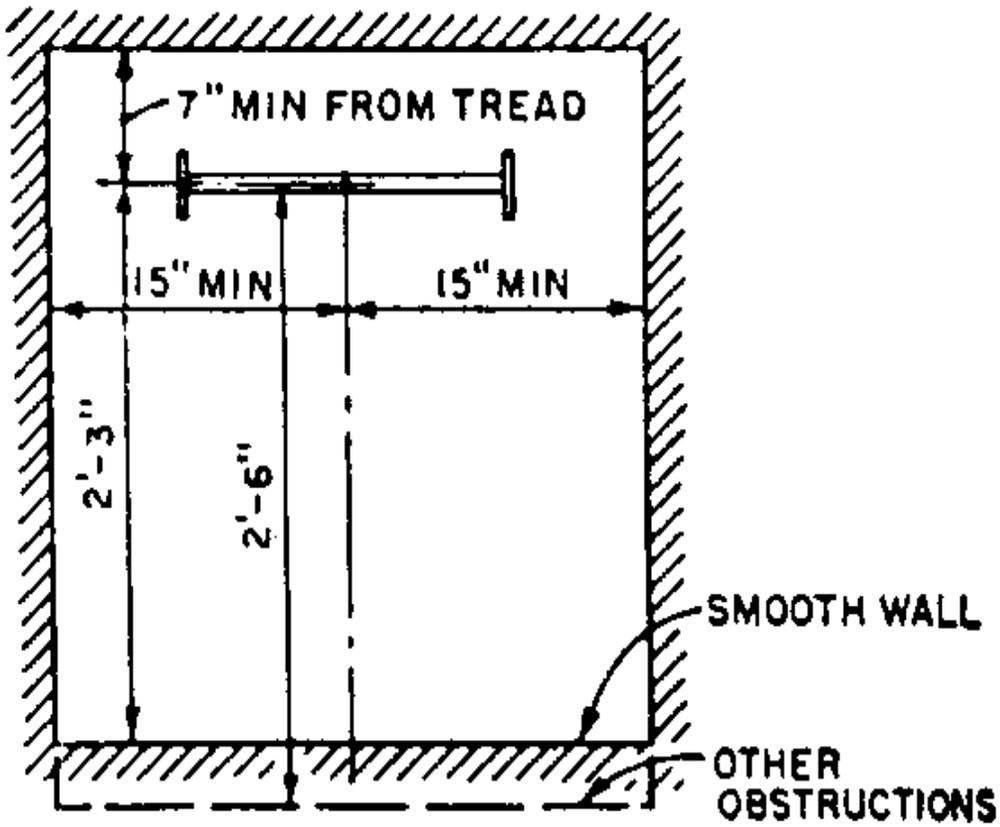


FIGURE D-7.—Cages for Ladders More Than 20 Feet High

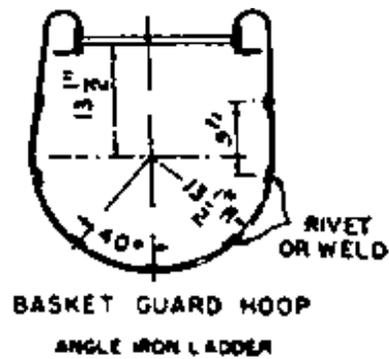
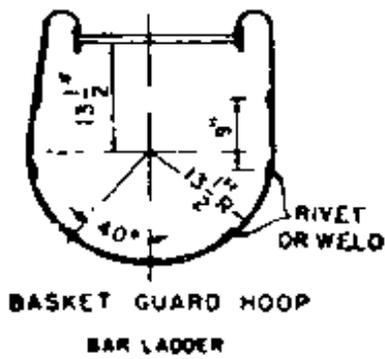
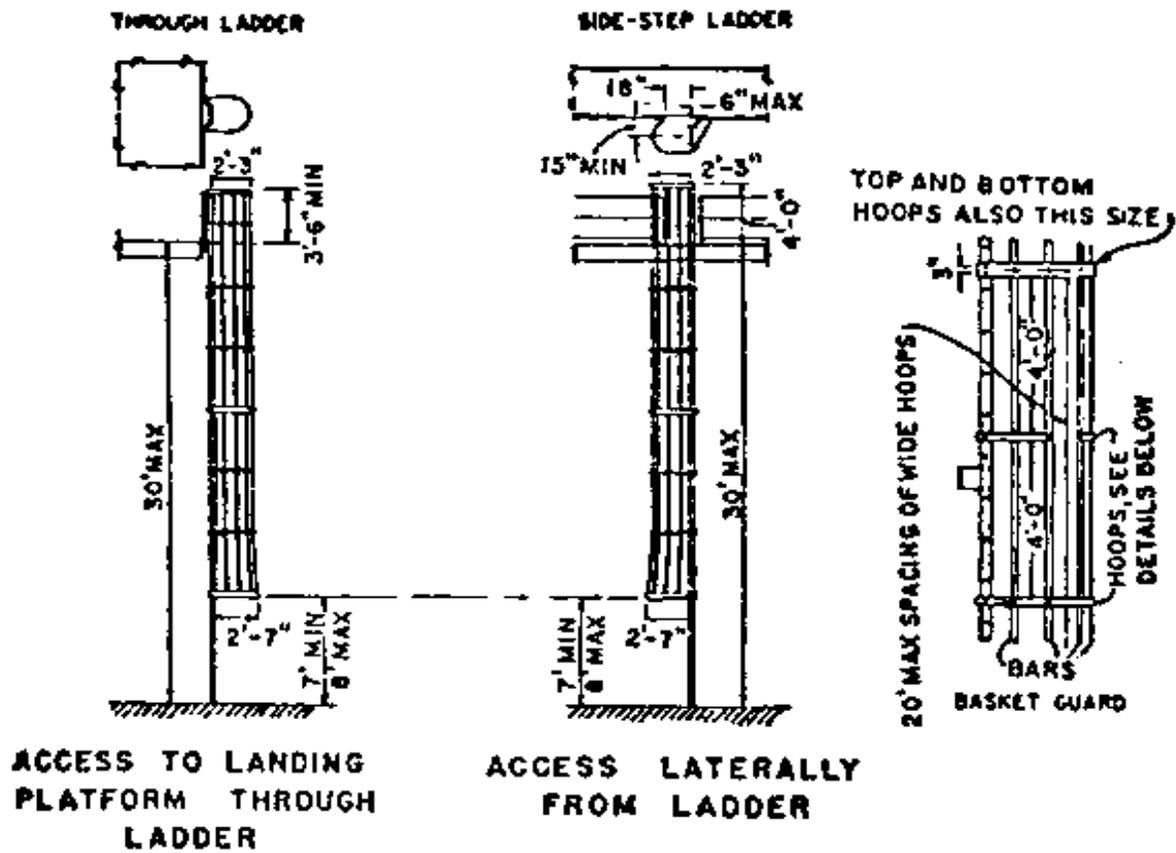


FIGURE D-8.—Clearance Diagram for Fixed Ladder in Well

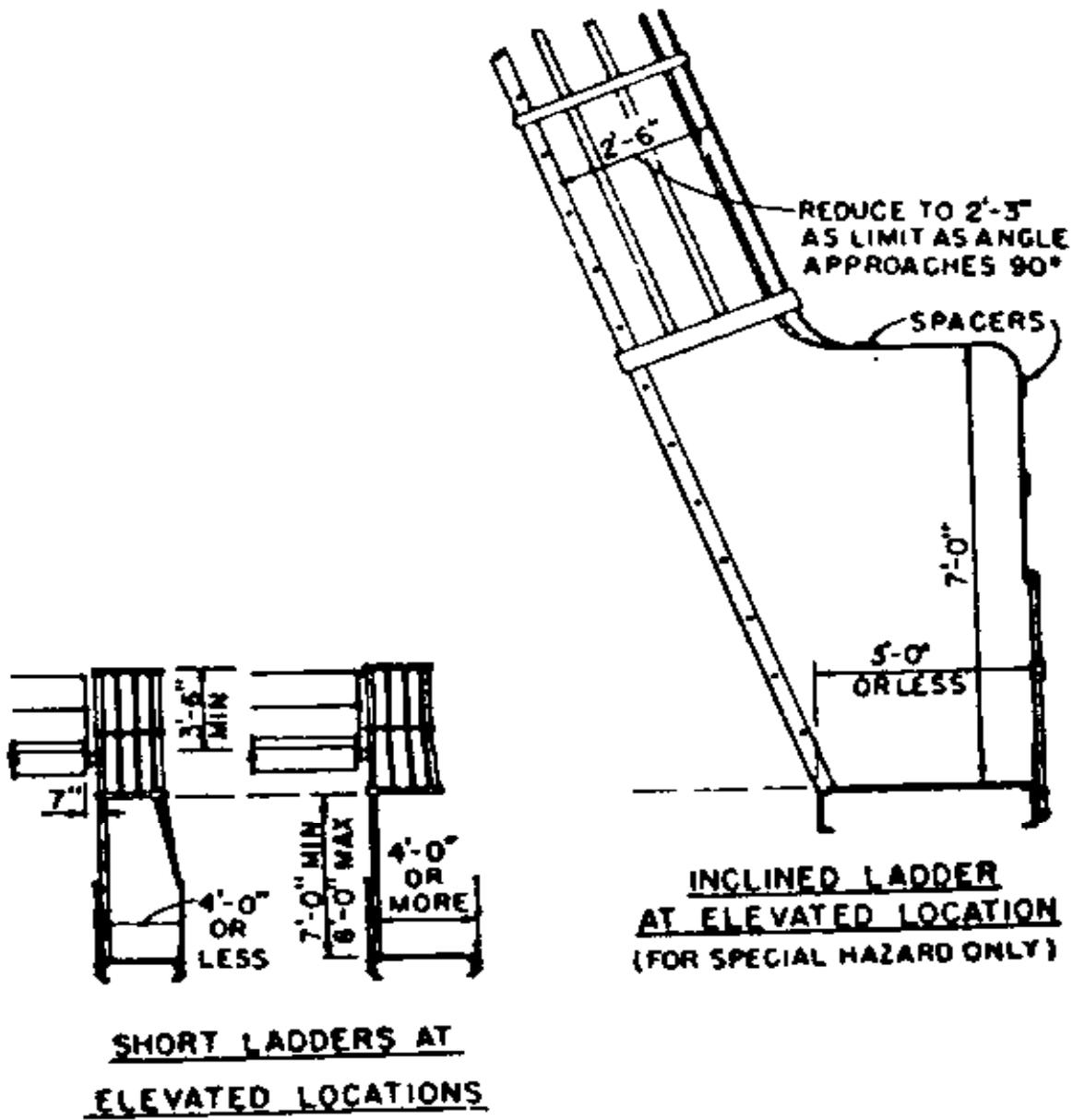
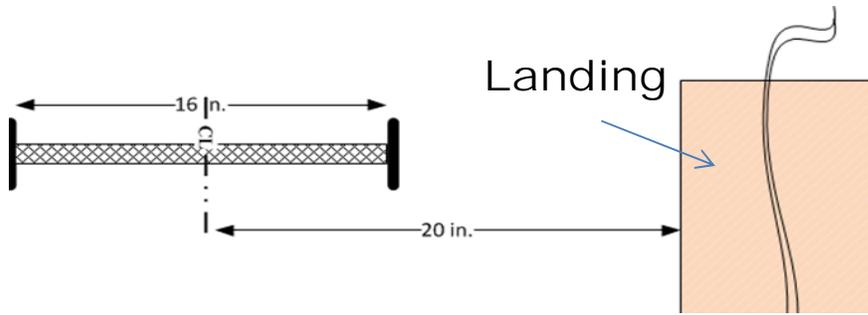


FIGURE D-9.—Cages—Special applications.



>20": Place ladder out of service (Red)
 (Not applicable for Elevator Pit Ladders)

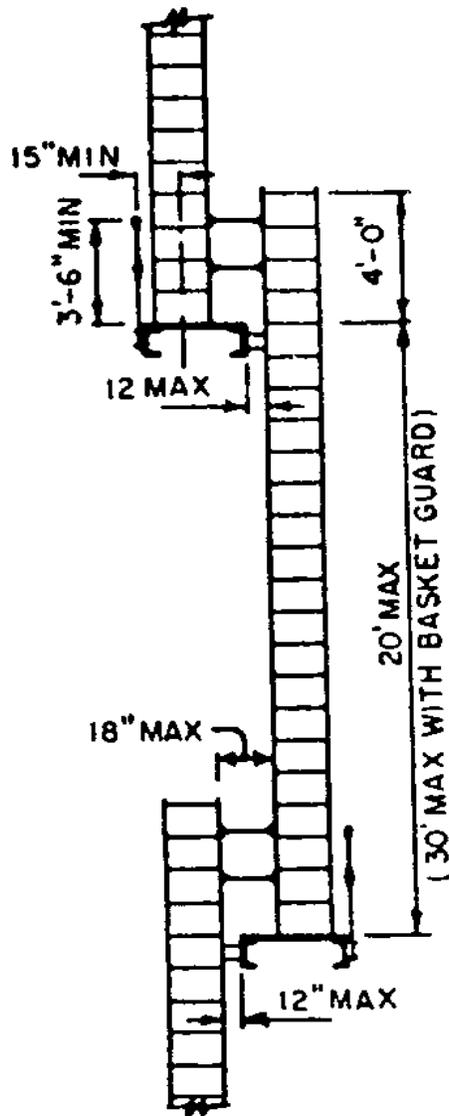


FIGURE D-10.—Offset Fixed Ladder Sections

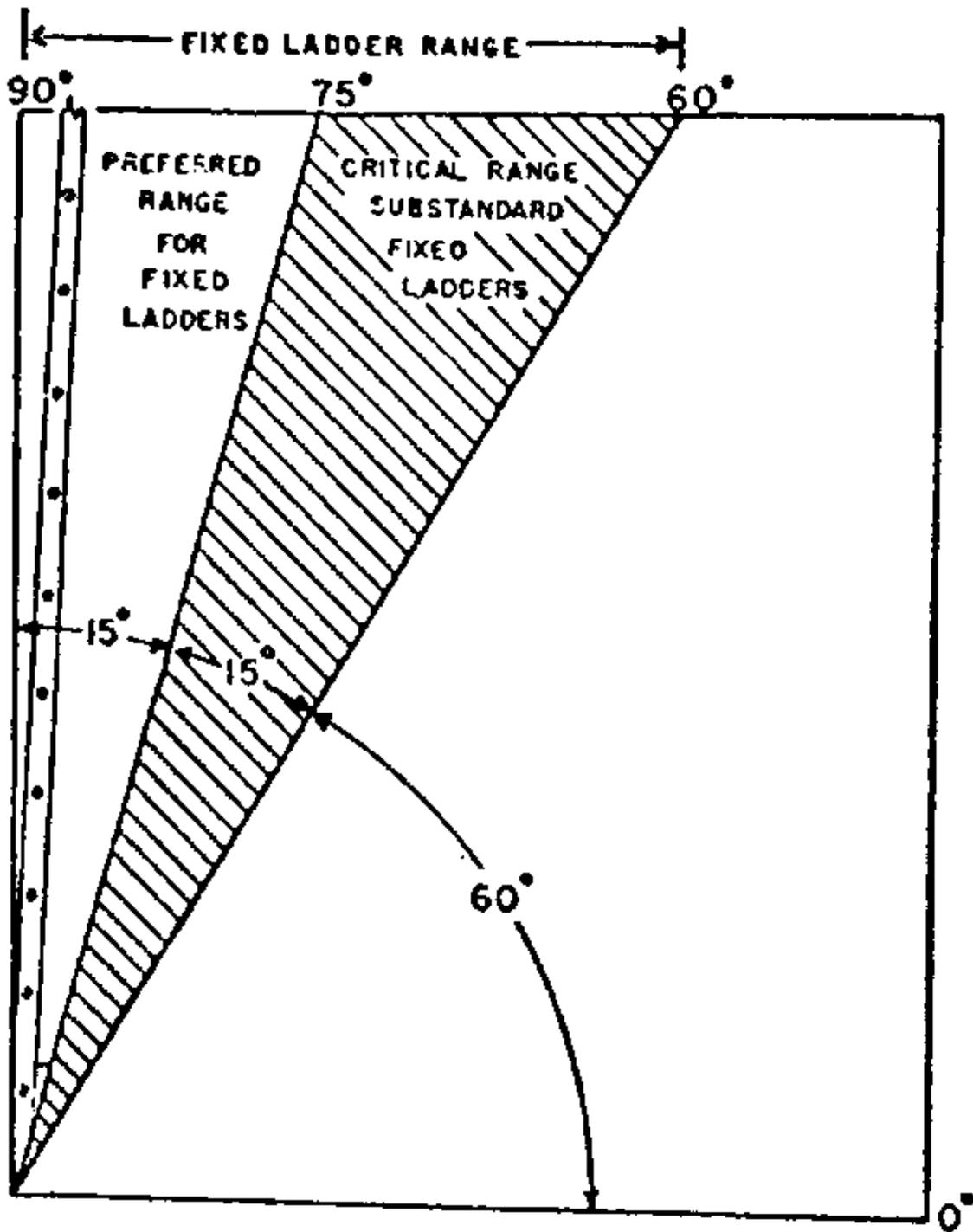
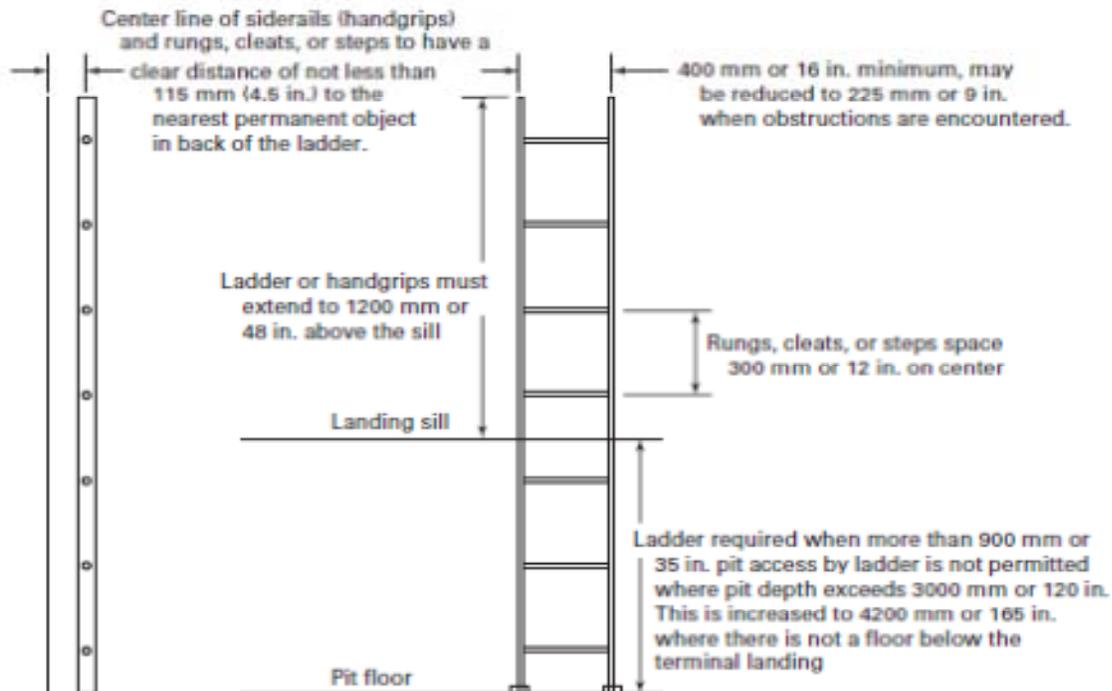


Figure D-11.—Pitch of Fixed Ladders

The 4.5 in. dimension behind the ladder has withstood the test of time and complies with OSHA 1925.1053(a)(13). See Diagrams 2.2.4.2(a) and 2.2.4.2(b).

Note, per ANSI A17.1 section 2.2.4.2, ladders need to be located with reach of access door. Ladders may be used and marked "Yellow" if the step off distance is between 12 to 24 inches. The ladder should be placed out of service if the step off distance is greater than 24 inches.

Diagram 2.2.4.2(a) Pit Nonretractable Ladder Requirements
(Courtesy Louis M. Capuano, Elevator Engineering Services, LLC)





Yellow Ladder Caution Posting

Effective Date: **Aug 05, 2015**

The Yellow Ladder Caution Posting will be affixed to either the ladder itself or a structure near the ladder. The posting is two sided. If the posting is not legible or if you have any questions concerning the posting, please contact your supervisor before use. Examples of the ladder posting (front and back) are provided below.

Front: [Yellow Ladder Caution Posting \(Front\)](#)

- Ladder ID (Building and serial number)
- Description (Hallway, general use)
- Photo with non-compliances identified (reference to ladder inspection checklist item)

Note: Significant items will have a red box around the noncompliance.

Back: [Yellow Ladder Caution Posting \(Back\)](#)

Identified noncompliance and acceptable mitigations.

Note: Departments/Divisions may use this posting to satisfy the requirement to identify the specific hazard of each ladder and establish mitigation strategies to control the hazard to an acceptable risk (see the section [Using Fixed Ladders](#)).

The only official copy of this document is this online version in SBMS.

Before using a printed copy, verify that it is the most current version:
compare the *effective date* of the printed copy to the effective date of the document online in SBMS.

Questions/Comments

Yellow Ladder Caution Posting (Front)

CAUTION

LADDER ID: 0480-LDR-01

Ladder Location: Hallway to
Roof over TEM



6b Hazard: The passage through the railing is not protected with a swing gate or offset

6a Hazard: The ladder way floor opening or platform is not protected by standard railings on all exposed sides

6a Hazard: The ladder way floor opening or platform is not protected by standard toe board on all exposed sides

4a Hazard: The perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder is less than 36" for a pitch of 76° and 30" for a pitch of 90°

2d.1 Hazard: Clear width of rungs is less than 16 inches

1e Hazard: Side rails do not have good "grippability"

If ladder conditions are different from the ones identified, do not use the ladder.
Notify your supervisor

Highest Hazard

CAUTION

HAZARDS AND MITIGATIONS

2d.1 Hazard: Clear width of rungs is less than 16 inches

Mitigations: Do not wear tool belt while climbing ladder, hand tools up or bring up with a bucket and rope

4a Hazard: The perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder is less than 36" for a pitch of 76° and 30" for a pitch of 90°

Mitigations: Do not wear tool belt while climbing ladder, hand tools up or bring up with a bucket and rope. DO NOT wear any items on belt or body that could get caught such as cell phone or back pack.

6a Hazard: The ladder way floor opening or platform is not protected by standard toe board on all exposed sides

Mitigations: Situation Awareness – Ensure tools and equipment are not placed near the edge of the landing or platform where they can fall through opening. Place tools on lanyard if feasible.

1e Hazard: Side rails do not have good "grippability"

Mitigations: Wear gloves while climbing ladder, do not use side rails, use ladder rungs for handhold.

6a Hazard: The ladder way floor opening or platform is not protected by standard railings on all exposed sides

Mitigations: Situational Awareness – there may not be adequate fall protection once on platform

6b Hazard: The passage through the railing is not protected with a swing gate or offset

Mitigations: Situational Awareness - be cognizant of where you are in relation to opening when working on the roof.

If ladder conditions are different from the ones identified, do not use the ladder. Notify your supervisor

Least Hazard