

**GI Part 3. Fixed Ladders  
Detailed Comparison With  
29 C.F.R. 1910 Subpart D – Walking-Working Surfaces:  
1910.27 Fixed ladders**

The comparisons show only those provisions where MIOSHA rules are different than OSHA or where MIOSHA rules are not included in 29 C.F.R.

<b>MIOSHA</b>	<b>OSHA</b>
<p><b>R 408.10301 Purpose and scope.</b>  <b>Rule 301.</b> This part is intended to provide reasonable safety for life and limb by establishing minimum standards for the design and installation of fixed ladders and safe use by employees. A fixed ladder shall be designed to carry a designed minimum load under varying circumstances depending upon placement, length, method of fastening and other requirements of the installation. Therefore, all parts and appurtenances necessary for a safe and efficient ladder shall necessarily be integral parts of that design. Utility poles and radio, television and transmission towers are excluded from this part.</p> <p><b>R 408.10321. Design.</b>  <b>Rule 321.</b> A fixed ladder, its appurtenances and fastenings shall be designed to meet the following load requirements:            (a) The minimum design liveload shall be a single concentrated load of 300 pounds. A ladder installed before the effective date of this part may have a minimum design load of 200 pounds.            (b) The number and position of additional concentrated live loads units of 300 pounds each, or 200 pounds each if installed before the effective date of this part, as determined from anticipated usage of the ladder shall be considered in the design.</p> <p><b>R 408.10323 Rungs, cleats, and steps; spacing; maintenance; load requirements.</b>  <b>Rule 323</b>            (3) Each step or rung shall be capable of supporting, without deflection, at least a single concentrated load of 300 pounds (136.8 kg) applied in the middle of the step or rung.</p> <p><b>R 408.10324 Rungs and cleats; length; design; diameter of metal rungs; construction of metal cleats; adoption by reference of standards for wood cleats and other wood components.</b>  <b>Rule 324.</b>            (4) Metal cleats shall be made of steel or a material of equal strength and have a bearing surface that is not less than 1/2 of an inch.            (5) Wood cleats and other wood components of a fixed ladder shall be as prescribed in ANSI standard A14.3-1984, fixed ladders, which is adopted by reference in these rules. The standard is available for inspection at the Lansing office of the department of consumer and industry services. The standard may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, or from the Michigan</p>	<p><b>No comparable OSHA provision</b></p> <p><b>1910.27 Fixed ladders.</b>            (a) Design requirements            (1) (i) The minimum design live load shall be a single concentrated load of 200 pounds.            (ii) 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.</p> <p><b>No comparable OSHA provision</b></p> <p><b>No comparable OSHA provision</b></p>

Department of Consumer and Industry Services,  
MIOSHA Standards Division, 7150 Harris Drive, Box  
30643, Lansing, Michigan 48909, at a cost as of the time  
of adoption of this rule of \$13.00.

**R 408.10326. Fastenings.**

**Rule 326.** Fastenings shall be as strong as the rails and shall be sufficient length to allow a minimum distance, as required by rule 335, between a permanent structure and the rungs of a ladder. Fastenings shall be attached to the permanent structure either by being built into it or by through bolts, rivets or expansion bolts grouted, leaded or the equivalent.

**R 408.10331. Protection from deterioration.**

**Rule 331.**

(3) A wood ladder subject to deterioration shall be treated with a transparent preservative. Paint shall not be used as a preservative.

**R 408.10341 Special rules for utility manhole fixed ladders.**

**Rule 341.** (1) A utility manhole fixed ladder shall have:

(a) Rungs of not less than 3/4 inch diameter steel rod or material capable of supporting 300 pounds with not less than 10 inch clear length. Rungs existing before the effective date of this part may be 5/8 inch diameter steel rod or material of equal strength capable of supporting 200 pounds.

(b) Rungs not less than 4 inches from the center of the rungs to the wall on the side opposite the climbing side. The rungs shall be embedded not less than 3 inches in the wall and aligned 1 above another.

(c) Rungs not less than 27 inches from the center of the rungs to the wall or projections on the climbing side.

(d) After November 15, 1971, rung configuration shall be so designed that an employee's foot cannot slide off the end. See figure 1.

(e) Spacing between rungs of not more than 16 inches on center and uniformly spaced throughout the entire length.

(2) A utility manhole with a conical shape shall not be provided with a fixed ladder. Access shall be by a portable ladder only.

**R 408.10342 Step bolts and manhole steps; specifications.**

**Rule 342.** (1) This rule applies to step bolts and manhole steps used on structures such as towers, stacks, conical manhole sections, and vaults. This rule does not apply to individual rung ladders.

(2) Step bolts and manhole steps shall be continuous and spaced uniformly not less than 6 inches (15 cm) and not more than 18 inches (46 cm) apart.

(3) The minimum clear step width of step bolts shall be 4 1/2 inches (11.4 cm). The minimum clear step width of manhole steps shall be 10 inches (25.4 cm).

(4) The minimum toe clearance for manhole steps shall be 4 inches (11.1 cm) from the point of embedment on the wall to the outside face of the step. The toe clearance

**1910.27 Fixed ladders**

(b) Specific features

(3) Fastenings. Fastenings shall be an integral part of fixed ladder design.

**1910.27 Fixed ladders**

(b) Specific features

(7) Protection from deterioration

(ii) 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.

**No comparable OSHA provision**

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in the center of the manhole step shall be a minimum of 4 1/2 inches (11.4 cm) measured to the outside face of the step.

(5) The minimum toe clearance for step bolts shall be 7 inches (17.8 cm). Where obstructions cannot be avoided, toe clearances may be reduced to 4 1/2 inches (11.4 cm).

(6) Step bolts and manhole steps shall be designed to prevent an employee's foot from slipping or sliding off the end of the step bolt or manhole step.

(7) Manhole steps and step bolts which are installed after the effective date of this rule and which are used in corrosive environments shall be constructed of, or coated with, a material that will retard corrosion of the step or bolt.

(8) All manhole steps installed on or after the effective date of this rule shall be provided with slip-resistant surfaces, such as corrugated, knurled, or dimpled surfaces.

(9) Each step bolt shall be capable of withstanding, without failure, not less than 4 times the intended load to be applied to the bolt.

(10) Manhole steps installed before the effective date of this rule shall be capable of supporting their maximum intended load.

**R 408.10345 Design of manhole steps.**

**Rule 345.** (1) An employer shall ensure that manhole steps installed on or after the effective date of this rule are in compliance with all the following requirements:

(a) The manhole steps shall be capable of withstanding, and remaining solidly secured after being subjected to, a separate application of a horizontal pull out load of 400 pounds (1,780 n), and a vertical load of 800 pounds (3,650 n).

(b) The manhole steps shall be capable of sustaining the vertical test load without developing a permanent set of more than 1/2 of an inch (1.27 mm).

(c) The loads shall be applied over a width of 3 1/2 inches (8.9 cm) centered on the step and be applied at a uniform rate until the required rate is reached.

(d) There shall not be visible cracking or fracturing of the step or spalling of the concrete.

(2) Step bolts and manhole steps shall be maintained in a safe condition and be visually inspected before each use.

(3) Step bolts that are bent more than 15 degree below the horizontal shall be removed and replaced with bolts that are in compliance with the requirements of these rules. A manhole step that is bent to an extent that reduces the step's projection from the wall to less than 4 inches (10.1 cm) shall be removed and replaced with a step that is in compliance with the requirements of these rules or replaced with a climbing device that is in compliance with the requirements of this rule.

**R 408.10351. Safety devices.**

**Rule 351.**

4) Cages and wells that are provided for fixed ladders shall be designed to permit easy access to or egress from the ladders that they enclose. The cages and wells

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shall be continuous throughout the length of the fixed ladders, except for access, egress, and other transfer points. Cages and wells shall be designed and constructed to contain employees in the event of a fall and direct them to a lower landing.

**R 408.10354 Personal fall protection systems.**

- Rule 354.** (1) If a personal fall protection system for climbing activities is used, it shall permit the employee who uses the system to ascend or descend without continually having to hold, push or pull any part of the system, leaving both hands free for climbing.
- (2) The connection between carrier or lifeline and the point of attachment to a body belt or harness shall not be more than 9 inches (23 cm) in length.
- (3) A personal fall protection system for climbing activities shall be activated within 2 feet (.61 m) after a fall occurs in order to limit the descending velocity of an employee to 7 feet/sec (2.1 m/sec) or less.
- (4) Mountings for rigid carriers shall be attached to each end of the carrier and shall have intermediate mountings, as necessary, spaced along the entire length of the carrier to provide the strength necessary to stop employee falls.
- (5) Mountings for flexible carriers shall be attached at each end of the carrier. When the system is exposed to wind, cable guides that utilize a flexible carrier shall be installed at a minimum spacing of 25 feet (7.6 m) and a maximum spacing of 40 feet (12.2 m) along the entire length of the carrier to prevent wind damage to the system.
- (6) The design and installation of mountings and cable guides shall not reduce the design strength of the ladder.
- (7) Ladder safety devices and their support systems shall be capable of withstanding, without failure, a drop test that consists of an 18-inch (.41 m) drop of a 500 pound (226 kg) weight.
- (8) All other personal fall protection systems for climbing activities shall be capable of withstanding, without failure, a drop test that consists of a 4-foot (1.2 m) drop of a 250-pound (113 kg) weight.

**R 408.10355 Landing platforms.**

**Rule 355.**

- (2) A ladder section shall be offset from the adjacent sections with a landing platform provided at each offset, except where the climbing space opening in the platform is closed with a hinged part of the platform. A landing platform shall be as specified in this rule, and be not less than 24 inches by 30 inches (61 cm by 76 cm), and have at least the same strength as the ladder.
- (3) Where an employee has to step a distance more than 12 inches from the center line of the rung of a ladder to the nearest edge of a structure or equipment, a landing platform shall be provided. The step-across distance shall be not less than 1 1/2 inches.
- (4) The side step from a fixed ladder to a platform shall be not less than 7 inches and not more than 12 inches measured from the side rail to the platform edge.
- (5) The side rail of an adjacent ladder shall be offset not less than 5 inches from the edge of a platform.

**No comparable OSHA provision**

**1910.27 Fixed Ladders**

**(d)(2) "Landing platforms."** When ladders are used to ascend to heights exceeding 20 feet (except on chimneys), landing platforms shall be provided for each 30 feet of height or fraction thereof, except that, where no cage, well, or ladder safety device is provided, landing platforms shall be provided for each 20 feet of height or fraction thereof. Each ladder section shall be offset from adjacent sections. Where installation conditions (even for a short, unbroken length) require that adjacent sections be offset, landing platforms shall be provided at each offset.

**1910.27(d)(2)(i)**

Where a man has to step a distance greater than 12 inches from the centerline 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.

<p><b>R 408.10357 Ladder extensions.</b>  <b>Rule 357.</b> (1) The side rails of a through or side-step ladder extension shall extend 3 1/2 feet above parapets and landings. On a through ladder extension, the rungs shall be omitted from the extension and shall have not less than 18 nor more than 24 inches clearance between rails. For sidestep 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. See figure 8.  (2) This rule does not apply to a fixed ladder at a hatch cover.</p> <p><b>R 408.10361 Grab bars.</b>  <b>Rule 361.</b> Grab bars shall be spaced by a continuation of the rung spacing when they are placed horizontally. 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. This rule does not apply to a fixed ladder covered with a manhole cover to allow for traffic.</p> <p><b>R 408.10365 Pitch.</b>  <b>Rule 365.</b> (1) The preferred pitch of a fixed ladder shall be between 75 degrees and 90 degrees with the horizontal. (See figure 9.) However, a ladder with a pitch of less than 60 degrees shall have steps and raised hand rails, as specified in the general industry safety standards commission standard, Part 2. Floor and Wall Openings, Stairways and Skylights, being R 408.10201 to R 408.10241 of the Michigan Administrative Code.</p>	<p><b>1910.27(d)(3)</b>  <b>"Ladder extensions."</b> 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. 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 (fig. D-10).</p> <p><b>1910.27(d)(4)</b>  <b>"Grab bars."</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 of the round-rung diameters.</p> <p><b>No comparable OSHA provision concerning a pitch of less than 60 degrees</b></p>
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