



Title: **Temporary Stairways, Ladders and Portable Ladders**

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**PURPOSE:** To shall ensure that all temporary stairways, ladder and portable ladders are constructed and used properly, safely and in accordance with all manufacturer’s guidelines.

**SCOPE:** Hospital wide.

**DEFINITIONS:**

**Cages:** Cages are guards that are fastened to the side rails of the fixed ladder or to the structure to encircle the climbing space of the ladder for the safety of the person who must climb the ladder.

**Check:** A lengthwise separation of the wood that occurs across the rings of annual growth.

**Cleat:** A rectangular ladder crosspiece placed on edge, upon which a person may step while ascending or descending.

**Competent person:** A person who can identify existing and predictable hazards in the work environment and who has authorization to take prompt measures to eliminate the hazards.

**Decay:** Disintegration due to action of wood-destroying fungi. Also known as dote or rot.

**Double-Cleat Ladder:** A ladder with a center rail to allow simultaneous two-way traffic for employees ascending or descending.

**Extension ladder:** A non-self-supporting portable ladder that is adjustable in length. It consists of two or more sections in guides or brackets that permit length adjustment. Length is designated by the sum of the lengths of each section, measured along the side rails.

**Extension trestle ladder:** A self-supporting portable ladder that is adjustable in length, consisting of a trestle ladder base and a vertically adjustable single ladder with means for locking the ladders together. Length is designated by the length of the trestle ladder base.

**Fastening:** A device that attaches a ladder to a structure, building, or equipment.

**Fixed Ladder:** A ladder that cannot be readily moved or carried because it is an integral part of a building or structure.

**Ladders:** A ladder is an appliance usually consisting of two side rails joined at regular intervals by cross-pieces called steps, rungs or cleats, on which a person may step in ascending or descending.

**Midrails:** A rail approximately midway between the guardrail and platform, used when required, and secured to the uprights erected along the exposed sides and ends of platforms.

**Permanent Structure:** A permanent structure can be either a building or permanent fixture, such as a smokestack.

**Platform:** A working surface for persons, elevated above the surrounding floor or ground; such as an extended step or landing breaking a continuous run of stairs.

**Platform ladder:** A self-supporting ladder of fixed size with a platform at the working level.

**Point of Access:** All areas used by employees for work-related passage from one area or level to another.

**Riser Height:** The vertical distance from the top of a tread or platform/landing to the top of the next higher tread or platform/landing.

**Rungs:** Rungs are ladder cross-pieces of circular or oval cross-section, on which a person may step in ascending or descending.

**Safety Devices:** A device other than a cage or well, designed to eliminate or reduce the possibility of accidental falls and which may incorporate such features as life belts, friction brakes and sliding attachments.

**Sectional ladder:** A non-self-supporting portable ladder, nonadjustable in length, consisting of two or more sections that function as a single ladder. Its length is designated by the overall length of the assembled sections.

**Single (or straight) ladder:** A single section non-self-supporting portable ladder, nonadjustable in length. Its length is measured along a side rail.

**Special-purpose ladder:** A general-purpose portable ladder with modified features for specific uses.

**Stairrail:** A vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels.

**Stair Tread:** The horizontal member of a step.

**Stairways:** A series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks and other equipment that are used more or less continuously or routinely by employees, or only occasionally by specific individuals. A series of steps and landing having three or more risers constitutes stairs or stairway.

**Stepladder:** A self-supporting portable ladder, nonadjustable in length that has flat steps and a hinged back. Length is measured along the front edge of a side rail.

**Steps:** The flat crosspieces of a ladder on which a person steps when ascending or descending.

**Tread:** The horizontal member of a step.

**Tread width:** The horizontal distance from front to back of the tread, including nosing.

**Trestle ladder:** A self-supporting portable ladder, nonadjustable in length, that consists of two sections hinged at the top to form equal angles with the base. Length is measured along the front edge of a side rail.

**Wells:** 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.

## **PROCEDURES:**

### **I. Responsibilities**

**A. Environmental Health & Safety (EH&S)** is responsible to:

1. Assist supervisors in identifying hazardous conditions in regards to temporary stairways and ladders;
2. Provide safety awareness training, as needed; and
3. Review this policy to ensure compliance with current regulations.

**B. Physical Plant, Construction and other Departmental Supervisors** affected by this policy are responsible to:

1. Ensure affected employees follow the prescribed practices within this policy;
2. Ensure inspection and maintenance practices for stairs and ladders are followed in accordance with this policy;
3. Replace damaged equipment or removing from service; and
4. Ensure employees are trained to use equipment properly and in accordance with the manufacturer's instructions.

**C. Physical Plant, Construction and other Employees** affected by this policy are responsible for:

1. Anticipating work hazards;
2. Ensuring that safeguards are utilized;
3. Conducting routine inspections to ensure that equipment is properly maintained;

4. Reporting to their supervisor any equipment that needs to be replaced;
5. Following all safety guidelines for the use of equipment and according to manufacturer's instructions; and
6. Participating in any training provided.

## **II. Egress and Access Requirements**

- A. All work areas shall meet the requirements for egress and access. Whenever a worker's point of access is broken in elevation by 19 inches or more and no ramp, egress, embankment or personal hoist is provided, a stairway or ladder shall be provided.
- B. When there is only one point of access or egress between levels, this shall remain clear from obstruction to permit free passage by workers. If the passage becomes obstructed, then a second point of access or egress shall be provided and used. Where there are more than one point of access or egress between levels, at least one point shall be kept clear.

## **III. Stairways**

- A. All stairways used during the process of construction, renovation or repair, which are not part of the permanent structure, shall be constructed in accordance with the following:
  1. Landings at least 30 inches deep and 22 inches wide at every 12 feet or less of vertical rise;
  2. Stairways shall be installed at an angle of not less than 30 degrees and no more than 50 degrees horizontally, as shown in Figure 3.16A;
  3. Variations in riser height or stair tread depth shall not exceed 1/4 inch in any stairway system, including any foundation structure used as one or more treads of the stair;
  4. When doors or gates open directly onto a stairway, a platform that extends at least 20 inches beyond the swing of the door shall be provided;
  5. When metal pan landings and metal pan treads are used, they shall be secured in place before filling;
  6. The stairway shall be free from all dangerous projections;
  7. Slippery conditions on stairways shall be corrected; and
  8. Spiral stairways are prohibited, unless they are part of the permanent structure.

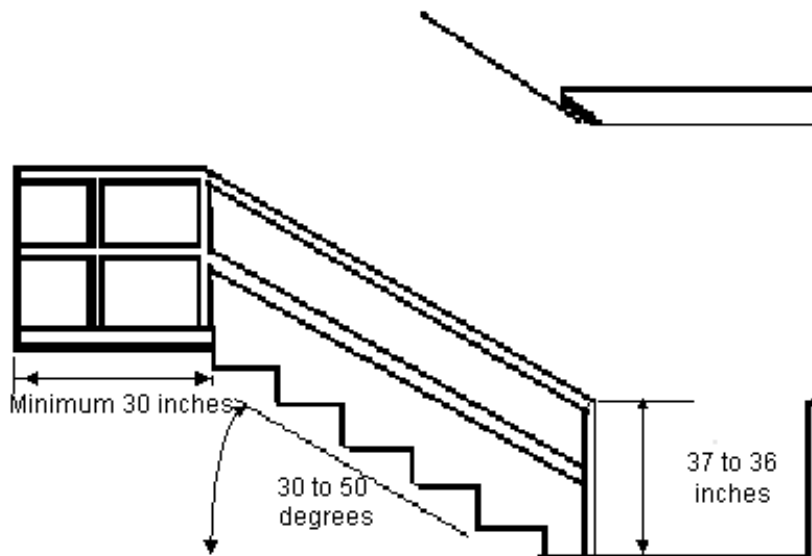


Figure 3.16A

- B. Except during construction of the actual stairway, stairways with metal pan landings and treads shall not be used where the treads and/or landings have not been filled in with concrete or other materials, unless the pans of the stairs and/or landings are temporarily filled in with wood or other materials;
- C. All treads and landings shall be replaced when worn below the top edge of the pan;
- D. Except during the construction of the actual stairway, skeleton metal frame structures and steps shall not be used (where treads and/or landings will be installed later) unless the stairs are filled with secured temporary treads and landings; and
- E. Temporary treads shall be made of wood or other solid materials and installed the full width and depth of the stair.

#### IV. Stairrails and Handrails

- A. Handrails are required on stairways having four or more risers, or rising more than 30 inches in heights, whichever is less. A stairrail shall be installed along each unprotected side or edge. When the top edge of a stairrail system also serves as a handrail, the height of the top edge shall be no more than 37 inches nor less than 30 inches from the upper surface of the stairrail to the surface of the tread, as shown in Figure 3.16A. When required, stairrails and midrails shall be constructed as follows:
  1. On winding or spiral stairways, a handrail shall be provided where the tread width is less than six inches;
  2. Midrails, screens, mesh, intermediate vertical members or equivalent intermediate structural members shall be provided between the top rail and stairway steps to the stairrail system;
  3. Midrails, when used, shall be located midway between the top of the stairway step and along the opening between top rail supports;

4. Intermediate vertical members, such as balusters, when used, shall not be more than 19 inches apart;
5. Other intermediate structural members, when used, shall be installed so that there are no openings of more than 19 inches wide;
6. Handrails and the top rails of stairrail systems shall be able to withstand, without failure, at least 200 pounds of weight applied within two inches of the top edge in any downward or outward direction, at any point along the top edge;
7. The height of handrails shall not be more than 37 inches nor less than 30 inches from the upper surface of the handrail to the surface of the tread;
8. Stairrail systems and handrails shall be smooth surfaced to prevent injuries such as punctures or lacerations and to keep clothing from snagging;
9. Handrails shall provide adequate handhold for employees to grasp to prevent falls;
10. Temporary handrails shall have a minimum clearance of three inches between the handrail and walls, stairrail systems and other objects; and
11. Unprotected sides and edges of stairway landings shall be provided with standard 42 inch guardrail system.

## **V. Ladders**

- A. All ladders constructed on site, including job-made ladders, shall meet the following requirements:
  1. A double-cleated ladder or two or more ladders shall be provided when ladders are the only way to enter or exit a work area having 25 or more employees, or when a ladder serves simultaneous two-way traffic;
  2. Ladder rungs, cleats and steps shall be parallel, level and uniformly spaced when the ladder is in position for use;
  3. Rungs, cleats and steps of portable and fixed ladders shall not be spaced less than ten inches apart, nor more than 14 inches apart, along the ladder's side rails;
  4. Rungs, cleats and steps of step stools shall not be less than eight inches apart, nor more than 12 inches apart, between center lines of the rungs, cleats and steps;
  5. Ladders shall not be tied or fastened together to create longer sections unless they are specifically designed for such use;
  6. A metal spreader or locking device shall be provided on each step ladder to hold the front and back sections in an open position when the ladder is being used;
  7. When splicing side rails, the resulting side rail shall be equivalent in strength to a one-piece side rail made of the same material;

8. Two or more separate ladders used to reach an elevated work area shall be offset with a platform or landing between the ladders, except when portable ladders are used to gain access to fixed ladders;
9. Ladder components shall be smooth surfaced to prevent injury from punctures or lacerations and prevent snagging of clothing; and
10. Wood ladders shall not be coated with any opaque covering, except for identification or warning labels, which may be placed only on one face of a side rail.

**B. Portable ladders shall meet the following requirements:**

1. Non-self supporting and self-supporting portable ladders shall support at least four times the maximum intended load;
2. Extra heavy duty type 1A metal or plastic ladders shall sustain 3.3 times the maximum intended load;
3. The minimum clear distance between side rails for all portable ladders shall be 11.5 inches; and
4. The rungs of portable metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material or treated to minimize slipping.

**C. Fixed ladders shall meet the following requirements:**

1. A fixed ladder shall be able to support at least two loads of 250 pounds each, concentrated between any two consecutive attachments;
2. Individual rung/step ladders shall extend at least 42 inches above an access level or landing platform either by the continuation of the rung spacing as horizontal grab bars or by providing vertical grab bars that shall have the same lateral spacing as the vertical legs of the ladder rails;
3. Each step or rung of a fixed ladder shall be able to support a load of at least 250 pounds applied in the middle of the step or rung;
4. The minimum clear distance between the sides of individual rung or step ladders and between the side rails of other fixed ladders shall be 16 inches;
5. The rungs and steps of fixed metal ladders shall be corrugated, knurled, dimpled, coated with skid-resistant material or treated to minimize slipping;
6. The minimum perpendicular clearance between fixed ladder rungs, cleats and any obstruction behind the ladders shall be seven inches, except that the clearance for an elevator pit ladder shall be four and one-half inches;
7. The minimum perpendicular clearance between the centerline of fixed ladder rungs, cleats and steps and any obstruction on the climbing side of the ladder shall be 30 inches. If obstructions are unavoidable, clearance may be reduced to 24 inches, provided a deflection device is installed to guide workers around the obstruction;

8. The step-across distance between the center of the steps and rungs of fixed ladders and the nearest edge of a landing area shall be no less than seven inches and no more than 12 inches. A landing platform shall be provided if the step-across distance exceeds 12 inches;
9. Fixed ladders without cages or wells shall have at least a 15 inch clearance width to the nearest permanent object on each side of the centerline of the ladder;
10. Steps or rungs for through-fixed ladder extensions shall be omitted from the extension and the extension of side rails shall be flared to provide between 24 and 30 inches clearance between side rails; and
11. When safety devices are provided, the maximum clearance distance between side rail extensions shall not exceed 36 inches.

## VI. Safety Practices When Using Ladders

- A. When using ladders, whether they are fixed or portable, there are several safety practices that shall be followed before and during use.
  1. When portable ladders are used for access to an upper landing surface, the side rails shall extend at least three feet above the upper landing surface as shown in Figure 3.16B. When such an extension is not possible, the ladder shall be secured and a grasping device such as a grab rail shall be provided to assist workers in mounting and dismounting the ladder;

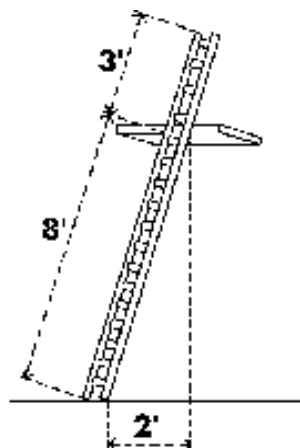


Figure 3.16B

2. Ladders shall be maintained free of oil, grease and other slipping hazards;
3. Ladders shall not be loaded beyond the maximum intended load as identified on the specification label found on the side rail of the ladder;
4. Ladders shall only be used for the purpose for which they were designed;
5. Non-self supporting ladders shall be used at an angle where the horizontal distance from the top support to the foot of the ladders is approximately one quarter of the working length of the ladder, as shown in Figure 3.16B. Wood job-made ladders

- with spliced side rails shall be used at an angle where the horizontal distance is one-eighth the working length of the ladder;
6. Fixed ladders shall be used at a pitch no greater than 90 degrees from the horizontal measured from the backside of the ladder;
  7. Ladders shall be used only on stable and level surfaces unless secured to prevent accidental movement;
  8. Ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement. Slip-resistant feet shall not be used as a substitute for the care in placing, lashing or holding a ladder upon slippery surfaces;
  9. Ladders placed in areas such as passageways, doorways, driveways, or where they can be displaced by workplace activities or traffic shall be secured to prevent accidental movement or a barricade shall be used to keep traffic or activities away from the ladder;
  10. The area around the top and bottom of the ladders shall be kept clear;
  11. The top of a non-self supporting ladders shall be placed with two rails supported equally unless it is equipped with a single support attachment;
  12. Ladders shall not be moved, shifted or extended while in use;
  13. Ladders shall have nonconductive side rails if they are used where the worker or the ladder could contact exposed energized electrical equipment;
  14. The top or top step of a stepladders shall not be used as a step;
  15. Crossbracing on the rear section of stepladders shall not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections;
  16. Single-rail ladders shall not be used;
  17. When ascending or descending a ladder, the workers shall face the ladder; and
  18. A worker on a ladders shall not carry any object or load that could cause him/her to lose balance and fall.

## **VII. Cages, Wells and Safety Devices for Fixed Ladders**

- A. Fixed ladders shall be provided with cages, wells, ladder safety devices or self-retracting lifelines where the length of climb is less than 24 feet but the top of the ladder is at a distance greater than 24 feet above lower levels.
- B. Cages for fixed ladders shall meet the following requirements:
  1. Horizontal bands shall be fastened to the side of rail ladders or directly to the structure, building or equipment for individual rung ladders;

2. Vertical bars shall be on the inside of the horizontal bands and be fastened to them;
  3. Cages shall not extend less than 27 inches or more than 30 inches from the centerline of the step or rung and shall not be less than 27 inches wide;
  4. The inside of the cage shall be clear of projections;
  5. Horizontal bands shall be spaced at intervals not more than four feet apart measured from centerline to centerline;
  6. Vertical bars shall be spaced at intervals not more than 9.5 inches measured centerline to centerline;
  7. The bottom of the cage shall be between seven and eight feet above the point of access to the bottom of the ladder. The bottom of the cage shall be flared not less than four inches between the bottom horizontal band and the next higher band; and
  8. The top of the cage shall be a minimum of 42 inches above the top of the platform or the point of access at the top of the ladder. Provisions shall be made for access to the platform or other point of access.
- C. Wells for fixed ladders shall meet the following requirements:
1. Wells shall completely encircle the ladder;
  2. Wells shall be free of projections;
  3. The inside face of the well on the climbing side of the ladder shall extend between 27 and 30 inches from the centerline of the step or rung;
  4. The inside width of the well shall be at least 30 inches; and
  5. The bottom of the well above the point of access to the bottom of the ladders shall be between seven and eight feet.
- D. Ladder safety devices and related support systems for fixed ladders shall meet the following requirements:
1. All safety devices shall be able to withstand, without failure, a drop test consisting of a 500 pound weight dropping 18 inches;
  2. All safety devices shall permit the worker to ascend or descend without continually having got hold, push or pull any part of the device leaving both hands free for climbing;
  3. All safety devices shall be activated within two feet after a fall occurs and limit the descending velocity of an employee to seven feet per second or less; and
  4. The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed nine inches in length.

5. Mounting for rigid carriers shall be attached at each end of the carrier, with intermediate mounting, spaced along the entire length of the carrier, to provide the necessary strength to stop worker falls;
6. Mountings for flexible carriers shall be attached at each end of the carrier. Cable guides for flexible carriers shall be installed with a spacing between 25 and 40 feet along the entire length of the carrier to prevent wind damage to the system;
7. The design and installation of mounting and cable guides shall not reduce the strength of the ladder; and
8. Side rails and steps or rungs for side-step fixed ladders shall be continuous in extension.

### **VIII. Inspection**

- A. Ladders shall be inspected by a department supervisor or designee for visible defects on a semi-annual basis and after any incident that could affect their safe use. The person performing the inspection shall use the Appendix A – “Ladder Inspection Checklist”. The department shall maintain a copy of the report their records.
- B. Portable ladders with structural defects such as broken or missing rungs, cleats, or steps, broken or split rails, corroded components, or other faulty or defective components shall immediately be marked defective or tagged with “Do Not Use” and withdrawn from service until repaired. Fixed ladders with structural defects such as broken or missing rungs, cleats or steps, broken or split rails, or corroded components shall be withdrawn from service until repaired.
- C. Defective fixed ladders are considered withdrawn from use immediately when they are:
  1. Tagged with “Do Not Use” or similar language;
  2. Marked in a manner that identifies them as defective; or
  3. Blocked such as with a plywood attachment that spans several rungs.

### **XI. Off-site Facilities**

Contractors at off-site facilities should comply with this policy. For specific concerns at off-site facilities, staff shall notify the Off-site Facility Manager at 4-4380 or the Off-site EOC Coordinator at 4-4066 for assistance.

**INQUIRIES/REQUESTS:** Environmental Health and Safety  
L1-059 HSC  
Zip 8017  
Main Office: 444-6783  
FAX: 444-6845

**RELATED FORMS:** Ladder Inspection Checklist, Appendix A

**RELATED DOCUMENTS:** Lockout/Tagout, Policy 3-2

Appendix A

**Ladder Inspection Checklist**

<b>INSPECTION</b>			
Date of Inspection:		Name of Inspector:	
Department/Shop:		Ladder Identification Number:	
Type of Ladder: ( ) Extension ( ) Step ( ) Fixed			
Construction of Ladder: ( ) Wood ( ) Metal ( ) Fiberglass			
<b>QUARTERLY INSPECTION</b>			
1. Are rungs, cleats or steps intact and free from damage?	( ) Yes	( ) No	( ) NA
2. Are rails free from cracks or splitting?	( ) Yes	( ) No	( ) NA
3. Is the ladder free from the accumulation of oil, grease or other material that may create a slipping hazard?	( ) Yes	( ) No	( ) NA
4. Is the ladder free from protruding objects that could cause injury?	( ) Yes	( ) No	( ) NA
5. If ladder is equipped with safety device is the device secured and operating properly on the ladder?	( ) Yes	( ) No	( ) NA
6. If ladder is equipped with locking device, is the service intact and functional?	( ) Yes	( ) No	( ) NA
7. If fixed ladder is equipped with cages, are cages intact and free from broken weld?	( ) Yes	( ) No	( ) NA
8. Is the ladder free from any other defects that may impair its safe usage?	( ) Yes	( ) No	( ) NA
<b>COMMENTS</b>			
Date ladder was repaired and returned to service:			