



# LADDER SAFETY PROGRAM

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# LADDERS

## I. Scope:

- A. The following safety program applies to the use of any ladder used on Towson University Campus. Included are portable ladders (which include step ladders; straight ladders; extension ladders and extension trestle ladders); fixed ladders; job made ladders and rolling ladders. It applies to all Towson University employees. Allowing non-Towson University personnel the use of ladders owned by Towson University is **strongly** discouraged unless proper training has been provided and a waiver signed. Documentation of these requirements is the responsibility of the lending personnel.
- B. Ladders are one of the most commonly used tools. Ladders allow access to various levels or heights necessary to carry out work functions. Unfortunately the use of ladders is a major source of injury and fatalities every year. The National Safety Council (NSC) has reported that falls from ladders accounts for 16% of all fatal injuries in construction and 24% of non-fatal injuries involving days away from work. It is also one of the ten most frequently cited standards every year by OSHA.
- C. The very use of ladders presents many potential hazards in addition to falls. Other hazards are pinches, cuts, struck by, sprains and strains as well as bump hazards and contact with or arcing of live conductors resulting in electrical shock/electrocution.
- D. Users must be aware of possible hazards and take proper precautions to reduce these risks. Proper use and work practices eliminate or mitigate these hazards providing a safe work environment. Below are recommended items that the user should perform before and after using a ladder.

## II. Selection:

- A. Use the ladder designed for your tasks.
  - 1. Consider the ladder rating
  - 2. Type of ladder necessary (step ladder, extension, etc.)
  - 3. The height which needs to be achieved
  - 4. Material the ladder is made of
- B. For step ladders, the top of the ladder must be within 3 feet of the highest point you must reach to perform the work.
- C. Never stand on the top cap and top step of a step ladder
- D. Never use the top three steps of a straight or extension ladder

- E. Step ladders cannot exceed 20 feet in length
- F. Straight (single) ladders cannot exceed 30 feet in length
- G. Extension ladders cannot exceed 60 feet in length
- H. For maximum working heights for a specific length ladder... (*See Chart 1*)
- I. The amount of overlap between the fly and base section of an extension ladder is dependent upon the length of the ladder .....(*See Chart 2*)
- J. Do not exceed the duty rating for the classification ladder being used (*See Table 1*)

**Working Height Chart:**

**Maximum Use Height**

Chart 1

| STEP LADDER HEIGHT SELECTION GUIDE |                                | EXTENSION LADDER LENGTH SELECTION GUIDE |                         |                               |                                       |
|------------------------------------|--------------------------------|---|-------------------------|-------------------------------|---------------------------------------|
| STEPLADDER SIZE                    | APPROX. HIGHEST STANDING LEVEL | LADDER SIZE                             | MAXIMUM EXTENDED LENGTH | *WORKING RANGE TO TOP SUPPORT | *MAXIMUM ACCESSIBLE ROOF HEIGHT RANGE |
| 4'                                 | 1' 11"                         | 16'                                     | 13'                     | 7½'-12 ½'                     | 4½'-9½'                               |
| 5'                                 | 2' 10"                         | 20'                                     | 17'                     | 9½'-16 ½'                     | 6½'-13½'                              |
| 6'                                 | 3' 9"                          | 24'                                     | 21'                     | 11½'-20'                      | 8½'-17'                               |
| 7'                                 | 4' 9"                          | 28'                                     | 25'                     | 13½'-24'                      | 10½'-21'                              |
| 8'                                 | 5' 8"                          | 32'                                     | 29'                     | 15½'-28'                      | 12½'-25'                              |
| 10'                                | 7' 7"                          | 36'                                     | 32'                     | 17'-31'                       | 14'-28'                               |
| 12'                                | 9' 6"                          | 40'                                     | 35'                     | 19'-33½'                      | 16'-30½'                              |
| 14'                                | 11' 5"                         | 44'                                     | 39'                     | 21'-37½'                      | 18'-34½'                              |
| 16'                                | 13' 4"                         | 48'                                     | 43'                     | 23'-41½'                      | 20'-38½'                              |
| 18'                                | 15' 3"                         | 60' <sup>(1)</sup>                      | 48'                     | 23'-46½"                      | 20'-43½'                              |
| 20'                                | 17' 2"                         |   |                         |                               |                                       |

\*When set up at the proper 75° angle      <sup>(1)</sup> Three-section extension

**Extension Ladder Overlap**

Chart 2

| LADDER SIZE (FEET)                | OVERLAP (FEET)* |                 |
|-----------------------------------|-----------------|-----------------|
|                                   | TYPE I AND IA   | TYPE II AND III |
| UP TO AND INCLUDING 32'           | 3'              | 3'              |
| OVER 32', UP TO AND INCLUDING 36' | 4'              | 4'              |
| OVER 36', UP TO AND INCLUDING 48' | 5'              | 5'              |
| OVER 48'                          | 6'              | —               |

\* The tolerance on the overlap is ±2" for two-section ladders and ±3" for extension ladders other than two-section.

## Duty Rating Table:

Table 1

| <b>Ladder Duty Rating</b> |                    |                     |                          |
|---------------------------|--------------------|---------------------|--------------------------|
| <b>Rating</b>             | <b>Description</b> | <b>Intended Use</b> | <b>Capacity (pounds)</b> |
| <b>Type IAA</b>           | <b>Industrial</b>  | <b>Heavy Duty</b>   | <b>375</b>               |
| <b>Type IA</b>            | <b>Industrial</b>  | <b>Heavy Duty</b>   | <b>300</b>               |
| <b>Type I</b>             | <b>Industrial</b>  | <b>Heavy Duty</b>   | <b>250</b>               |
| <b>Type II</b>            | <b>Commercial</b>  | <b>Medium Duty</b>  | <b>225</b>               |
| <b>Type II</b>            | <b>Household</b>   | <b>Light Duty</b>   | <b>200</b>               |

### III. Use:

- A. Do not use a ladder which does not have an ANSI duty rating sticker attached to the side.
- B. Get help when handling a heavy or long ladder (10 feet or more).
- C. When using straight ladders or extension ladders, set up the ladder using the 4 to 1 rule (approximately  $75\frac{1}{2}^{\circ}$  angle from the horizontal)
- D. Keep ladder away from electrical wires. Check for overhead electrical wires before setting up.
- E. Ensure that all electrical equipment used during ladder work is in good working condition and properly grounded.
- F. Clear the area around the base and top of the ladder of debris, tools and other objects.
- G. Set up barricades and warning signs when using a ladder in a doorway or passageway.
- H. Do not place a ladder against flexible or moveable surfaces or erect on unstable surfaces.
- I. Tie off ladder at the top and secure bottom to prevent it from slipping
- J. When accessing a roof or other working/walking surface, extend the ladder three feet beyond the access surface.
- K. Keep step ladders close to your work; don't overreach.
- L. When accessing a ladder observe the following guidelines:
  - 1. Ensure proper footwear is in good condition
  - 2. Avoid climbing with wet, muddy or slippery shoes.
  - 3. Ensure only one person is on a single width ladder at any given times.

4. Face the ladder when ascending or descending and when working from the ladder.
5. Keep the center of your body within the side rails.
6. Maintain “three points of contact” (two hands and one foot or two feet and one hand) at all times.
7. Grasp the rungs when climbing; not the side rails.
8. Do not carry objects in your hands while climbing.
9. Ascend and descend the ladder slowly so as not to cause the ladder to “bounce”.

#### **IV. Inspection:**

- A. Ladders should be inspected before and after each use.
- B. The ladder should be inspected whenever it has tipped over or subjected to any possible damage.
- C. Reject and tag out of service any defective ladder.
- D. If the ladder cannot be repaired, remove all identification labels, discard and remove from inventory. When discarded, the ladder should be marked “Destroy”/ “Can Not be Repaired” or render it completely inoperable. Notify EHS.
- E. The ladder inspection report must be completed annually and the record of each ladder submitted to EHS. A copy of the inspection report is attached as *“Appendix A”*.

#### **V. Storage & Care:**

- A. Store ladders to prevent damage from extreme heat and cold.
- B. Do not store ladders where they will come into contact with water or other chemicals.
- C. Store ladders where they will not be struck by moving objects or otherwise damaged.
- D. Store ladders in areas where they do not impede egress.
- E. Never paint a wooden ladder.
- F. Store extension ladders horizontal and supported every six feet.
- G. When transporting ladders, secure both ends.

#### **VI. Training:**

- A. All employees that utilize ladders should participate in the University “Ladder Safety Training Program”.
- B. Employees should receive training when:
  1. First hired;

2. Observed using a ladder incorrectly or using the wrong type of ladder for the intended use;
- C. Training can be requested through the Department of Environmental Health and Safety by:
1. calling 410-704-2949;
  2. e-mail at [safety@towson.edu](mailto:safety@towson.edu); or
  3. through the department's website at [www.towson.edu/ehs/index.html](http://www.towson.edu/ehs/index.html).
- D. The training program is developed to ensure each employee can recognize all hazards related to the selection, use, handling and environmental surroundings affecting the safe use of ladders.
- E. Employees will receive information on the proper procedures and work practices to minimize these hazards.
- F. The program is designed to train each employee in the following areas, as applicable:
1. The nature of fall hazards in the work area;
  2. The correct procedures for selecting, erecting, using and maintaining equipment;
  3. The proper construction, use, placement, and care in handling of ladders;
  4. The maximum intended load-carrying capacities of ladders used;
  5. Inspection of ladders;
  6. Work practices;
  7. Possible PPE;
  8. Other hazards presented by environmental conditions;
  9. Ergonomic concerns associated with the use of ladders;
  10. Hazard to others;
  11. Reference for information on ladder selection and use;

## VII. References:

- A. OSHA help documents
1. [OSHA Construction e-tool](#)
  2. [OSHA Stairs and Ladder Booklet \(osha3124\).pdf](#)
  3. [OSHA Stairways and Ladder Safety Outreach](#)
  4. [OSHA Standards-\(Link to standards covering Ladders\):](#)
- B. [American Ladder Institute:](#)
1. Develops seven ANSI standards currently
  2. Published according to a 5-year renewal cycle:
  3. ANSI standard number and content:
    - a) A14.1 - Wood Ladders
    - b) A14.2 - Portable Metal Ladders
    - c) A14.3 - Fixed Ladders
    - d) A14.4 - Job Made Wooden Ladders

- e) A14.5 - Portable Reinforced Plastic Ladders
  - f) A14.7 - Mobile Ladder Stands and Mobile Ladder Stand Platforms
  - g) A14.9 - Disappearing Attic Stairways
- C.** Werner Fiberglass Ladder Technical Manual (available through EHS)
- D.** Louisville Employee Safety Training Handbook (available through EHS):

By following these simple procedures, ladder injuries can be prevented. For additional information, please contact the Department of Environmental Health and Safety at x4-2949 or via e-mail at [safety@towson.edu](mailto:safety@towson.edu).



# Appendix A

(Ladder inspection sheet)



# LADDER INSPECTION

Area \_\_\_\_\_

Ladders shall be inspected for the following items frequently or if the ladder tips over. Any ladder found defective (except for missing ID label) shall be tagged out of service immediately (i.e., not used) until such time it is repaired. A ladder that cannot be repaired shall be discarded. Check YES (Indicates a defect) or NO (Indicates no defect) in the boxes provided.

| YES                      | NO                       | General—Inspect ALL ladders for:  |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | Missing or loose steps or rungs (They are loose if they can be moved by hand.). |
| <input type="checkbox"/> | <input type="checkbox"/> | Loose nails, screws, bolts or other metal parts.                                |
| <input type="checkbox"/> | <input type="checkbox"/> | Cracked, split, worn or broken rails, braces, steps or rungs.                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Rough or splintered surfaces.   |
| <input type="checkbox"/> | <input type="checkbox"/> | Damaged or worn non-slip feet.  |
| <input type="checkbox"/> | <input type="checkbox"/> | Twisted or distorted rails.   |
| <input type="checkbox"/> | <input type="checkbox"/> | Missing identification label (Assign an ID#).                                   |
| <input type="checkbox"/> | <input type="checkbox"/> | Corrosion, rust, oxidization and excessive wear, especially on treads.          |
| <input type="checkbox"/> | <input type="checkbox"/> | Sharp edges on rails and rungs.   |

In addition to the above, the following shall be inspected:

| YES                      | NO                       | Step Ladders                   |
|--------------------------|--------------------------|--------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Wobble.                        |
| <input type="checkbox"/> | <input type="checkbox"/> | Loose or bent hinge spreaders. |
| <input type="checkbox"/> | <input type="checkbox"/> | Broken stop on hinge spreader. |
| <input type="checkbox"/> | <input type="checkbox"/> | Loose hinges.                  |

| YES                      | NO                       | Extension Ladders  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Loose, broken or missing extension locks.                          |
| <input type="checkbox"/> | <input type="checkbox"/> | Defective locks that do not seat properly when ladder is extended. |
| <input type="checkbox"/> | <input type="checkbox"/> | Insufficient lubrication of working parts.                         |
| <input type="checkbox"/> | <input type="checkbox"/> | Defective cords, chains and ropes.                                 |
| <input type="checkbox"/> | <input type="checkbox"/> | Missing or defective pads or sleeves.                              |

| Ladder Type | Serial / Identification Number | Location (Bldg.) |
|-------------|--------------------------------|------------------|
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |
| _____       | _____                          | _____            |

Note: One form may be used to record up to 10 inspections of SAFE ladders. Each defective ladder must be recorded on a separate sheet.

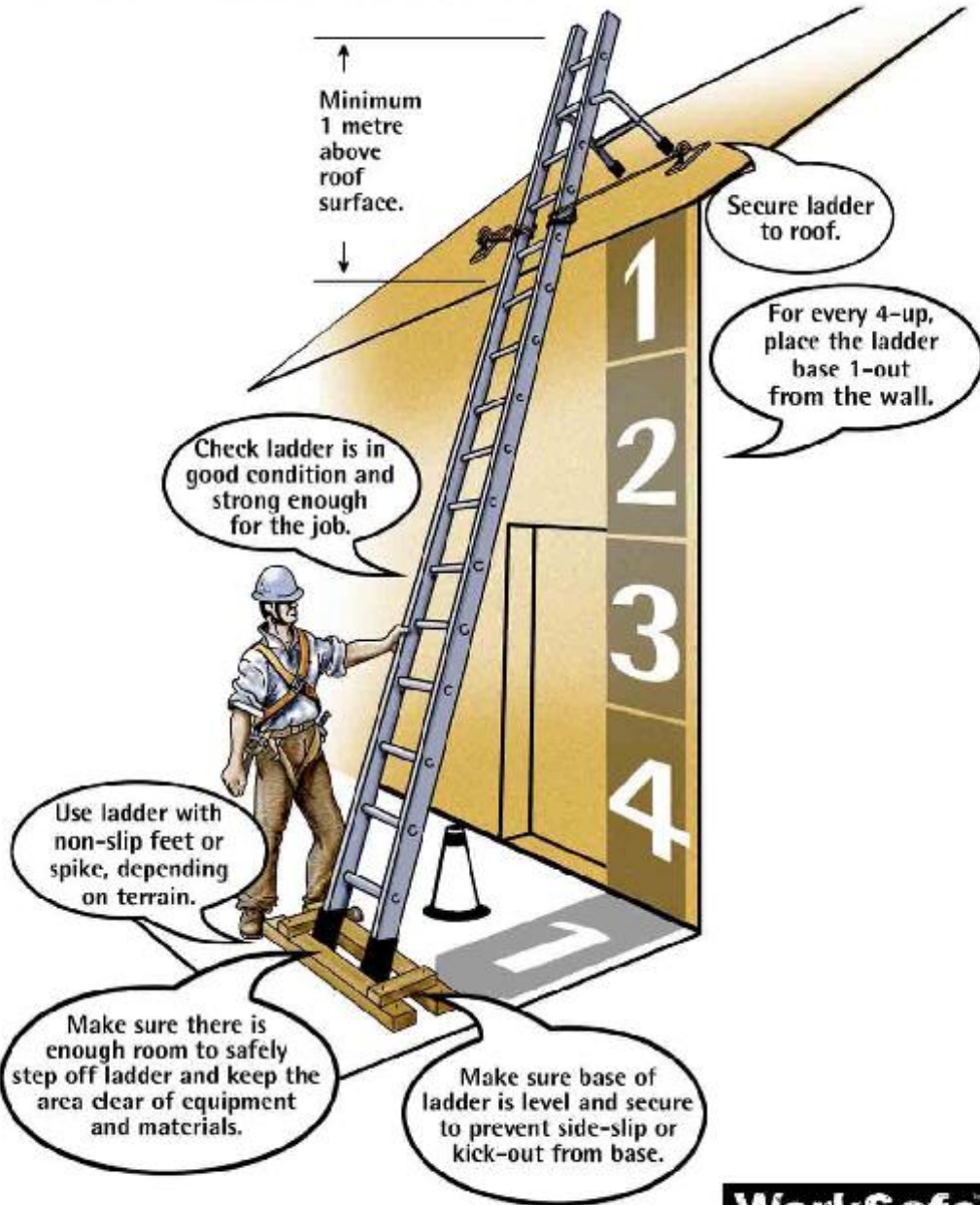
Signed \_\_\_\_\_

Date \_\_\_\_\_

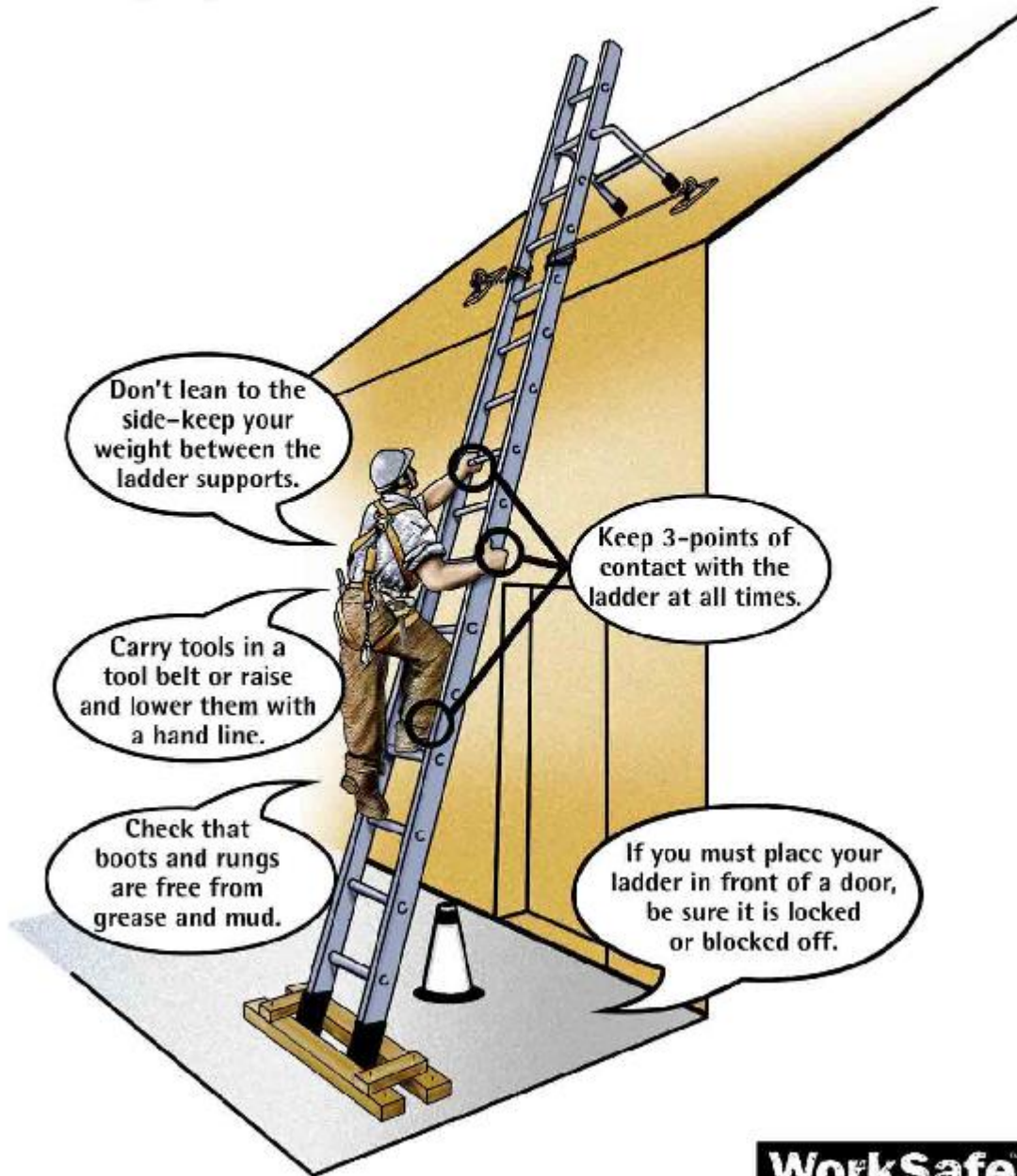
# Appendix B

(Safety Tips)

Safety Tip 1: Ladder Set-up



**Safety Tip 2: Ladder Use**



Don't lean to the side—keep your weight between the ladder supports.

Carry tools in a tool belt or raise and lower them with a hand line.

Check that boots and rungs are free from grease and mud.

Keep 3-points of contact with the ladder at all times.

If you must place your ladder in front of a door, be sure it is locked or blocked off.



Safety Tip 3: Stepladder Use

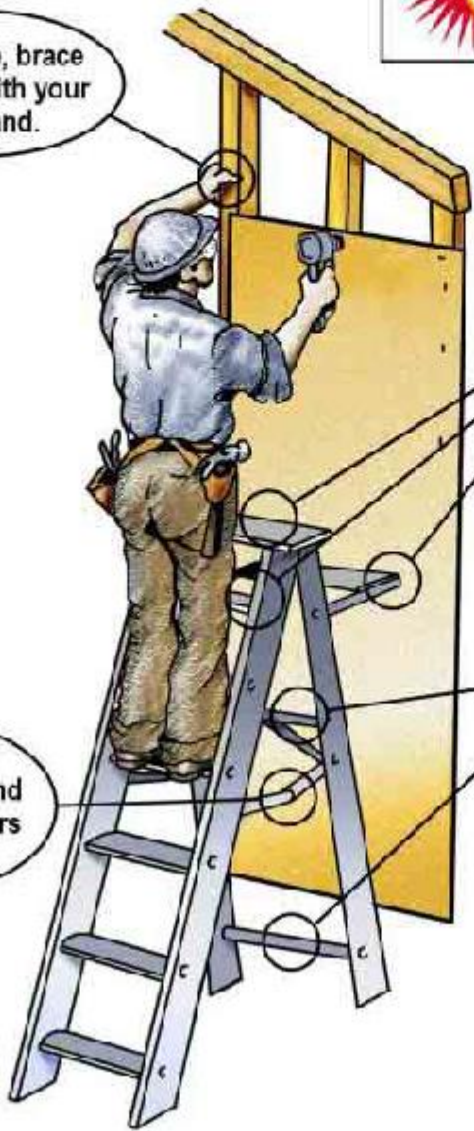
 Stepladders should **NEVER** be used folded up and leaning against a surface.

If possible, brace yourself with your free hand.

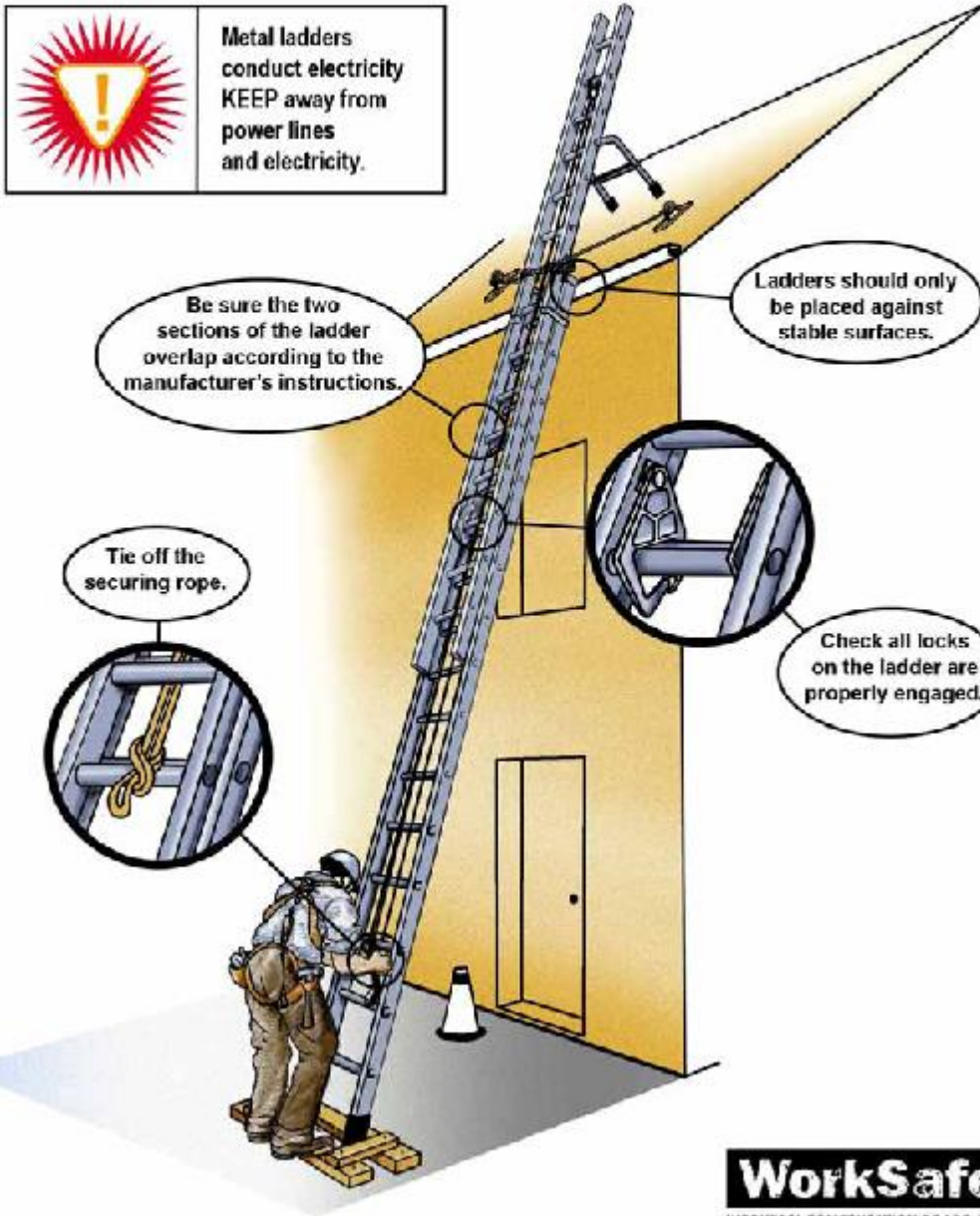
The top two steps and bucket shelf are not safe to stand on.

Climbing or standing on the rear part of the ladder can cause it to collapse or tip over.

Fully open stepladder and lock spreaders in place.



### Safety Tip 4: Extension Ladder Use



# Appendix C

(Step Up to Ladder)



# **STEP UP TO LADDER SAFETY**

**CHOOSE** a ladder tall and strong enough for the job.

**CHECK** that ladders have all parts in good condition, including:

- Slip-resistant steps or rungs
- Braces, bolts, screws and spreaders
- Rope
- Safety feet

**TAG AND TURN IN** any damaged or defective ladder.

**POSITION** the ladder for steadiness with:

- Ground surface level.
- Feet parallel to the wall at a distance that is equal to one-fourth the ladder length.
- At least three feet above top support with top anchored, and bottom tied or held.

**WORK** cautiously on a ladder to prevent falls.

Remember to:

- Allow one person only on a ladder, wearing shoes with clean, nonskid soles.
- Face the ladder and hold both rails while climbing.
- Carry tools on a belt, rope or hoist.
- Stay below the top two stepladder steps or four top ladder rungs.
- Work with body centered, one hand on rail and tools in hanger or holder.

**WARNING:**

**Don't use a metal ladder around electricity!**

# Appendix D

(OSHA Quick Card)

## Portable Ladder Safety Tips



Falls from portable ladders (step, straight, combination and extension) are one of the leading causes of occupational fatalities and injuries.

- Read and follow all labels/markings on the ladder.
- Avoid electrical hazards! – Look for overhead power lines before handling a ladder. Avoid using a metal ladder near power lines or exposed energized electrical equipment.
- Always inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.



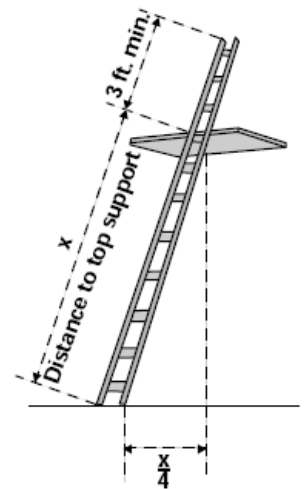
3-Point Contact

- Always maintain a 3-point contact (two hands and a foot, or two feet and a hand) contact on the ladder when climbing. Keep your body near the middle of the step and always face the ladder while climbing (see diagram).
- Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.
- Ladders must be free of any slippery material on the rungs, steps or feet.

- Do not use a self-supporting ladder (e.g., step ladder) as a single ladder or in a partially closed position.
- Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.

(continued on reverse)

- Use a ladder only on a stable and level surface, unless it has been secured (top or bottom) to prevent displacement.
- Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- Do not move or shift a ladder while a person or equipment is on the ladder.
- An extension or straight ladder used to access an elevated surface must extend at least 3 feet above the point of support (see diagram). Do not stand on the three top rungs of a straight, single or extension ladder.
- The proper angle for setting up a ladder is to place its base a quarter of the working length of the ladder from the wall or other vertical surface (see diagram).



- A ladder placed in any location where it can be displaced by other work activities must be secured to prevent displacement or a barricade must be erected to keep traffic away from the ladder.
- Be sure that all locks on an extension ladder are properly engaged.
- Do not exceed the maximum load rating of a ladder. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment.

For more complete information:

**OSHA** Occupational Safety and Health Administration  
U.S. Department of Labor  
[www.osha.gov](http://www.osha.gov) (800) 321-OSHA

OSHA 3246-11N.05