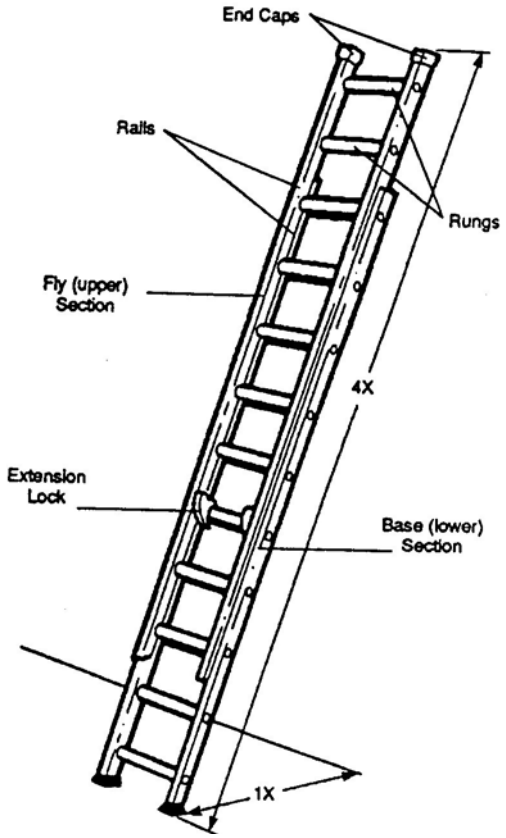
CONSTRUCTION SAFETY ASSOCIATION OF MANITOBA

CONSTRUCTION SAFETY EDUCATION PROGRAM #4

LADDER SAFETY



This education program provides a guideline for ladder safety. It is intended to give contractors and workers practical information relating to the requirements of ladder safety.

This education program contains general information. For specific regulatory requirements, please consult the appropriate regulation(s) adopted under the Workplace Safety and Health Act, the Canadian Standards Association (CSA) Standards, and any applicable Manitoba Guidelines.

LADDER SAFETY

- The majority of all construction trades are required to use ladders of one type or another on most construction sites.

- Unfortunately, in many instances little or no consideration is given to the safety aspects involved or to the possible consequences. Through improper use, poor work habits or inadequate training and supervision, a significant number of workers are seriously injured, permanently disabled or killed each year.

- Many workers believe that a person has to fall from the roof of a building or other high place in order to sustain a serious injury. This belief is entirely false. Injury investigation statistics reveal that fatalities and other permanent disabilities often result from falls of six feet or less.

- Although a number of factors figure into the cause of each and every individual accident there are three serious basic errors common to many incidents involving falls from portable ladders. These are:

  - Failure to set the ladder at the proper working angle

  - Failure to secure the bottom of the ladder to prevent it from sliding away from its support structure

  - Failure to secure the top of the ladder against unexpected movement

- This program reviews the Manitoba construction safety regulations pertaining to these accident causes, illustrates acceptable preventative methods and discusses the special hazards posed by electricity.

LADDER SAFETY CHECKLIST

- Inspect ladders on a regular basis as well as before and after each use. Reject and tag ladders with defects and have them repaired or replaced as necessary. Do not use faulty equipment until it is repaired.

- Do not paint wooden ladders as the paint may conceal defects.

- Check for overhead wires or electrical hazards before erecting or working from any ladder. Do not use metal ladders near any exposed energized electrical circuits or equipment.

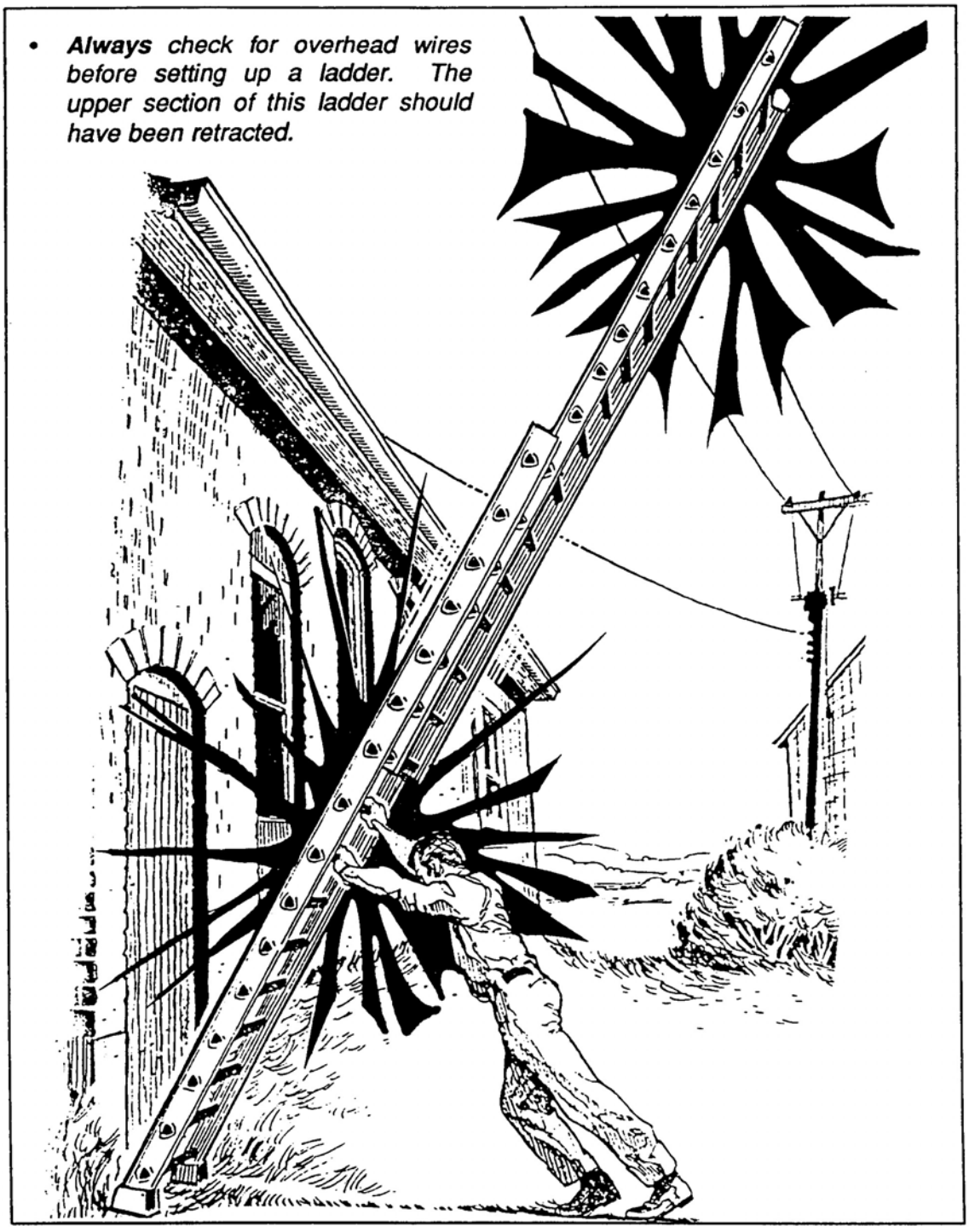
- Use the right ladder for the task you are doing, consider type, strength, length and C.S.A. approval. Ensure length permits a three foot extension beyond all landings.

- Follow the 1 to 4 safety rule for placement of ladders.

- Tie off ladders at the top and secure them at the bottom as required by construction safety regulations.

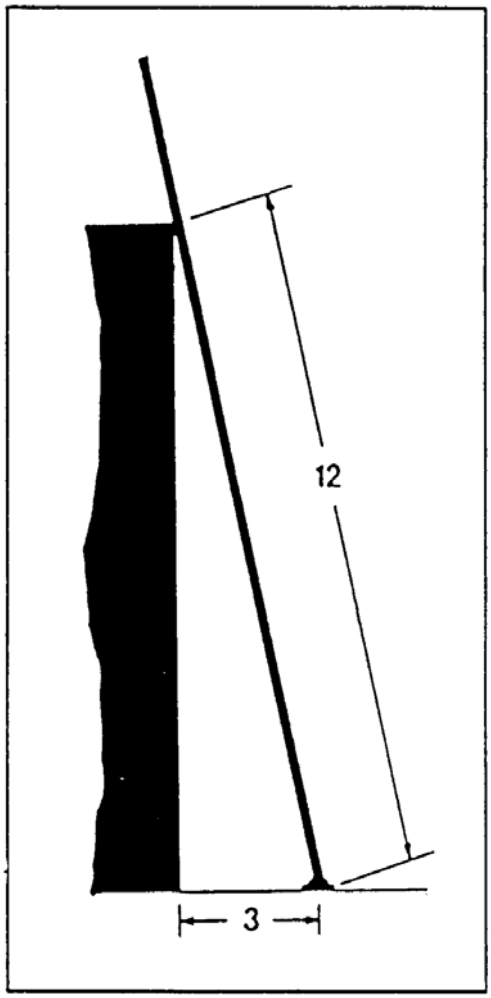
- Station a person at the foot of the ladder when it is not possible to tie it at the top or secure it at the bottom, or if the ladder being used is more than six meters in length.

- Do not climb or work from the top two rungs of a single or extension ladder and the top two steps of a step ladder.



The use of aluminum ladders around live electrical equipment is extremely hazardous and great care must be taken to avoid accidental contact.
The upper section of this ladder should have been retracted and then raised after placing it against the building. The same precautions are required when working with any wire reinforced wood ladders that have become wet.

1. Failure to set the ladder at a safe or proper working angle.



Manitoba construction safety regulations require ladders to be set back at least one foot from the supporting structure for every four feet of the ladder's working length.

Working length is the distance from the ground or base support to the contact point which the ladder is resting on above. For example, if the working length is 12 feet, the bottom of the ladder must be at least 3 feet from the base of the supporting structure. Setting the ladder in accordance with this rule results in the formation of a 75 degree angle between the base of the ladder and its contact point above. This angle permits good forward /

backward balance and reduces the chances of the ladder falling backwards.

2. Failure to secure the bottom of a ladder properly to prevent it from sliding away from its supporting structure.

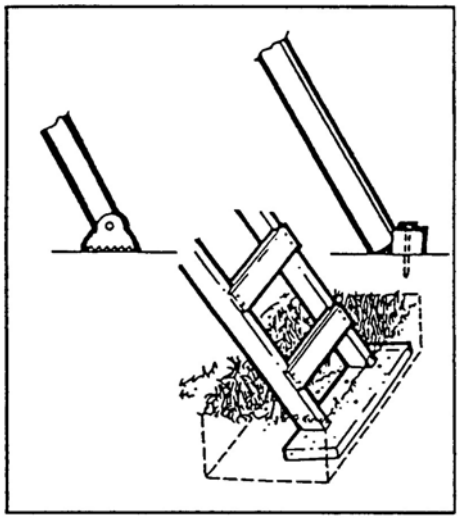
- We have learned from experience that following the 1 to 4 safety rule is not in itself enough to prevent an accident in every situation. Situations and circumstances may vary considerably from job to job. The regulations recognize the reality of this and allow some choices concerning the methods used to secure the bottom of the ladder.

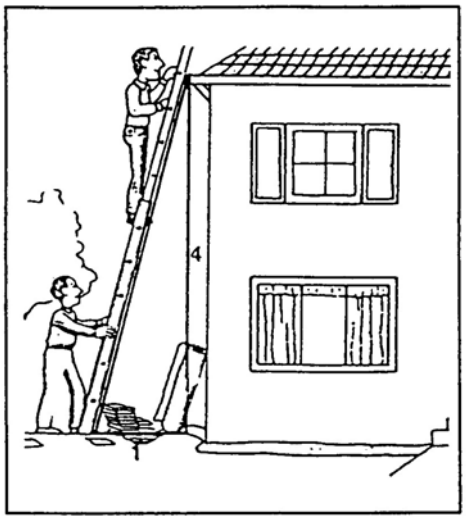
- **The regulation requires portable ladders to be equipped with non-slip type bases, held, tied or otherwise secured to prevent slipping.**

- Unless the appropriate method or methods of securing the base are used in each situation the ladder may slip resulting in an injury to the worker involved.

- Setting the ladder at the proper working angle and securing the base are equally important considerations in ensuring your personal safety.

- The diagrams shown below illustrate a number of acceptable methods which may be used to secure the bottom of a ladder from movement.





A SPECIAL NOTE…

IF THE LADDER IS MORE THAN SIX METERS IN LENGTH AND NOT SECURED AT THE TOP THE REGULATIONS SPECIFICALLY REQUIRE ANOTHER WORKER TO HOLD THE LADDER UNTIL IT IS SECURED OR TIED OFF AT THE TOP.

3. Failure to secure the top of the ladder against sudden movement by using a tie off or other alternatively acceptable method.

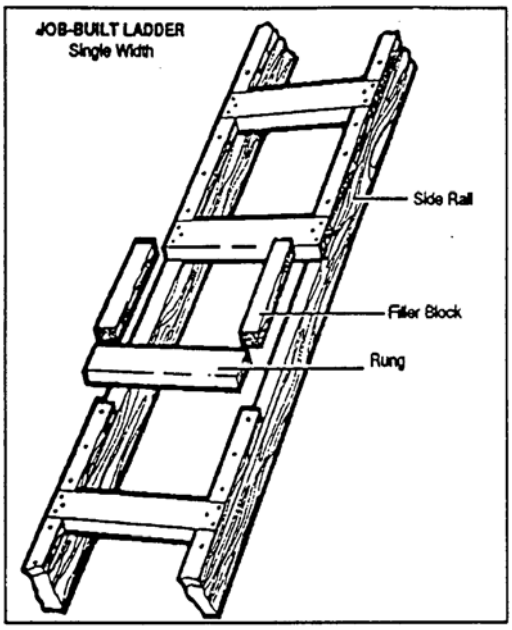
When the aluminum ladder broke the light it became electrified causing current to flow through the man to the damp floor. Lamp cages should be used to prevent similar occurrences.

- **Never** use a metal ladder or a ladder with metal reinforced rails near exposed electrical circuits or insulation.

- **Manitoba construction safety regulations prohibit workers from working from the top two rungs of a single or extension ladder and the top two rungs of a single or extension ladder and the top two steps of a stepladder unless the stepladder is equipped with a railed platform.**

JOB BUILT LADDERS

- In the event that a site requires fabrication of a job built ladder, the ladder must be constructed and installed in accordance with the specifications contained in the Manitoba construction safety regulations. **A properly constructed job built ladder has filler blocks nailed between the rungs as shown in the example right.**



- If a double width ladder is constructed, the regulations require it to be constructed with vertical rails and heavier rungs that those required for single width ladders. A double width ladder must also be securely fastened at all times while being used.

ELECTRICAL HAZARDS

- Death by electrocution is one of the most common fatality causes in the construction industry. Where death is avoided it is only because of circumstances and chance. Even though there are some that survive an encounter with electricity, the injuries sustained can be and often are severe. Electrical burns are extremely painful; flesh, muscle, tendons, nerves and bones – are all affected and some with permanent disability.

- Unlike obvious hazards such as unstable scaffolds or unprotected floor openings, most people do not recognize electrical hazards or appreciate the possible effects of them.

- Electricity travels unseen, unheard and seldom gives any warning of possible or impending danger. For this reason workers must maintain constant awareness to the hazards of electricity.

- As electrical distribution and feed lines are frequently located high above ground or in areas otherwise inaccessible without the use of a ladder, the risk of an electrical contact is increased by virtue of the ladder – therefore using the correct ladder is an extremely important consideration.

- **Manitoba construction safety regulations prohibit the use of metal ladders or metal reinforced rails on ladders near any exposed energized electrical circuits or equipment.** The reasons for this regulation will become clear upon review of the following ladder related incidents, all of which resulted in fatalities to the workers involved.

ACCIDENT REPORT 1

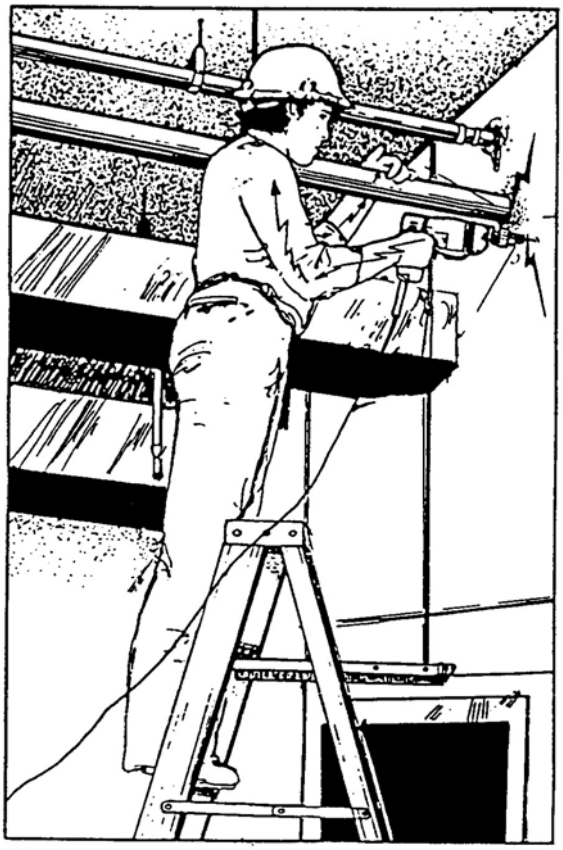
A lather, using a 6 year old electric screw shooter to install large sheets of wallboard, was standing on a step ladder and reaching out to hold a sprinkler pipe in order to gain more leverage while pushing the tool into the work surface. As he squeezed the trigger he received a severe shock, was thrown to the ground and severely injured.

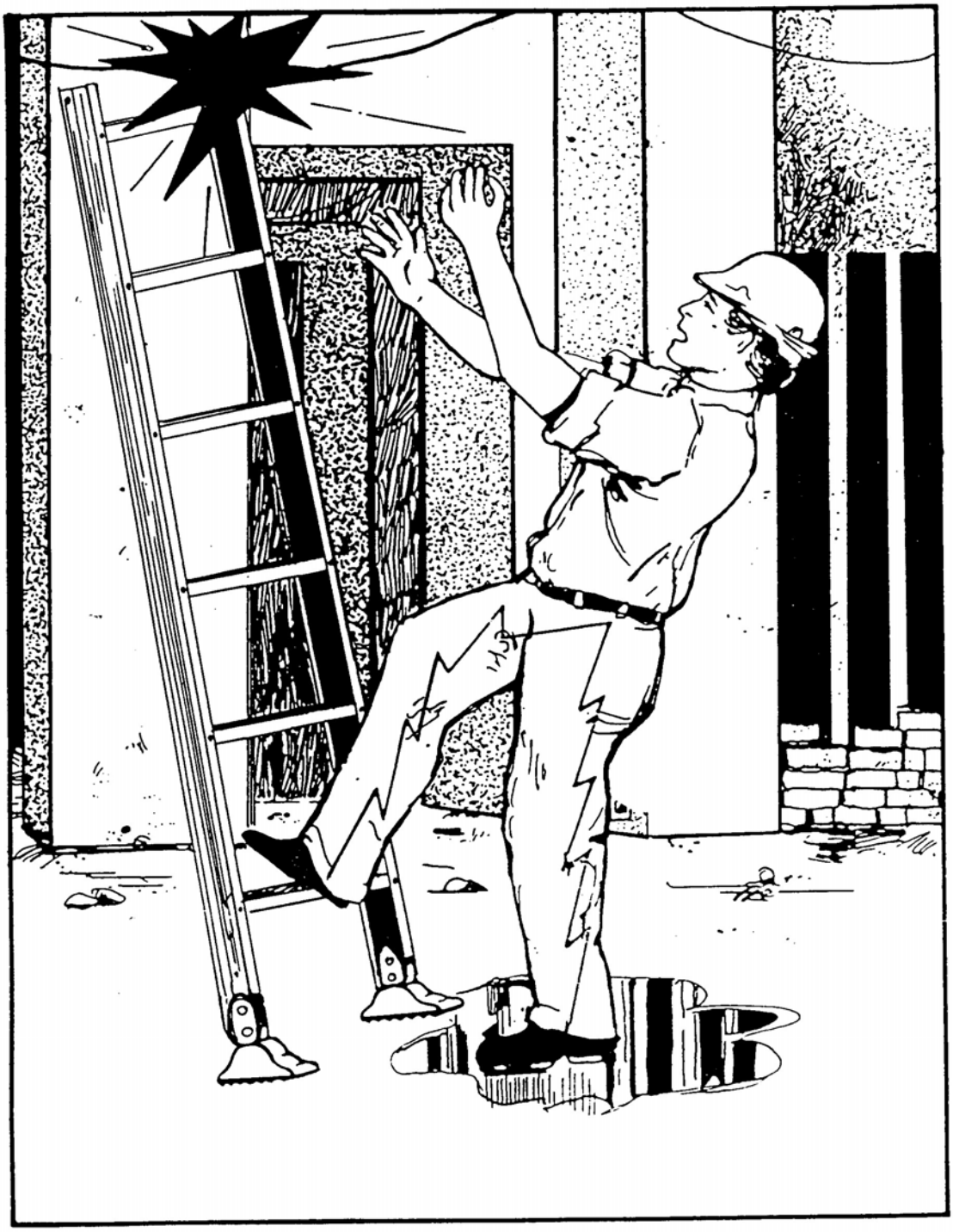
Even though he had felt the tool "tingle" several times on previous occasions he ignored it because the tool was still functioning.

Recommendations:

Never use any tool which arcs or "tingles" no matter how slight as these conditions indicate serious faults. Replace them immediately and arrange for repairs.

Have all electric tools and machines on the job checked regularly to ensure safety. The policy of every company should provide for tool testing devices and trained operators.

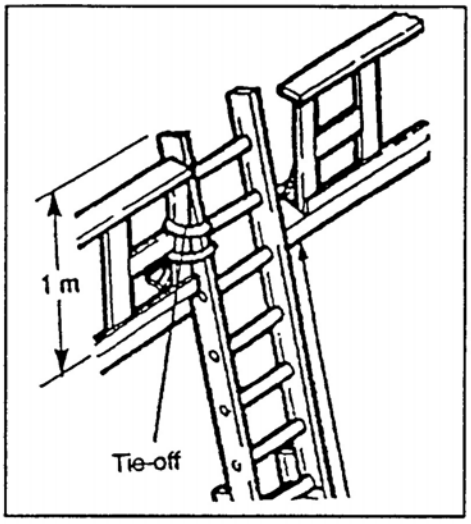


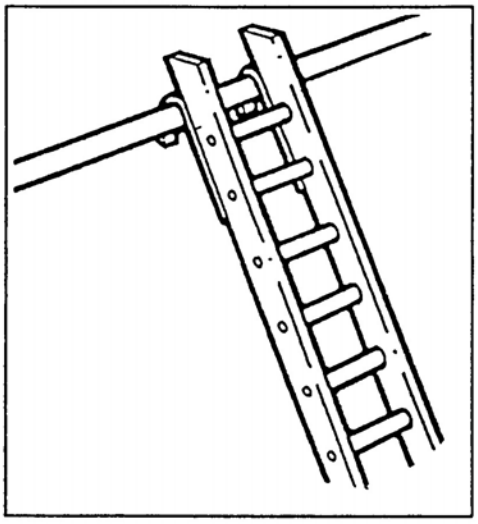


The aluminum ladder broke the wire insulation and became electrified but the rubber feet prevented current flow to the ground. When the workman stepped onto the ladder the current flowed through his legs to the ground.

- Most workers injured by falls of this type recognized the risks involved prior to their accident however for one reason or another they did not heed their subconscious thoughts and carry out the simple procedure which would have prevented the accident.

The ladders shown below are acceptably secured to prevent movement.

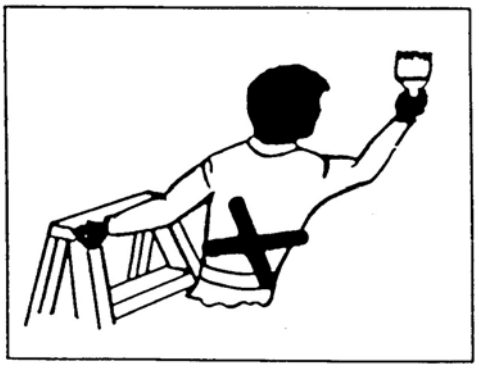




Remember – it's not the fall that hurts, it's the sudden stop or landing at the bottom. So… WORK SAFELY – TIE OFF.

STEPLADDERS

- Stepladders are another source of many injuries due to misuse and as such are of major concern to employers and safety and health professionals. Two of the most serious **unsafe practices** involving stepladders are **working off the top step and over-reaching**.



LADDER SAFETY
REVIEW QUESTIONS

NAME _____
DATE _____

PART 1 FILL IN THE BLANKS WITH THE CORRECT ANSWER

1) Failure to _____ _____ a ladder at the top is one of the most common basic errors involved with many serious falls from portable ladders.

2) In circumstances where a ladder more than six meters in length is being used, Manitoba construction safety regulations require _____ _____ to hold the ladder until it is _____ or _____ at the top.

3) Never use a _____ ladder near exposed electrical circuits and always _____ for _____ wires or other _____ hazards before erecting or working off any ladder.

PART 2 ANSWER TRUE OR FALSE TO EACH OF THE FOLLOWING

T / F 1) Fatalities, permanent disabilities and other serious injuries often result from falls of six feet or less.

T / F 2) To set a ladder at a safe working angle you should follow the 1 to 4 safety rule.

T / F 3) Having another worker hold the base of the ladder is considered an acceptable means of securing the bottom against sudden movement.

T / F 4) Construction safety regulations permit workers to work off the top step of a step ladder for brief periods of time only.

T / F 5) A job built ladder which meets Manitoba construction safety regulations includes filler blocks between the rungs.

T / F 6) Ladders should be inspected on a regular basis as well as before and after each use.

PART 3 CIRCLE THE CORRECT ANSWER

1 (A) Assume the ladder referred to in Part 1, Question 2 above is being used to gain access to a roof top 20 feet above ground. How far from the building should the base of the ladder be in order to comply with the regulations.

3 feet 4 feet 5 feet 6 feet