

General Shop and Work Area Safety:

A. Shop Procedures:

- a. All portable and fixed powered shop machines and tools will be equipped with approved guarding devices. Guards are to be in place while using the machine. Equipment must also be properly electrically grounded before use.
- b. Proper personal protective equipment will be provided (safety glasses, goggles, shields) and used during grinding or other work that may produce flying particles (e.g. drill press, power saws, etc.). Pagoda Electrical, Inc. approved dust respirators will be used for work that produces airborne dust particles. Eye protection is required during electrical or electronic hardware repair, installation and/or open front operation.
- c. The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of this part is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.
- d. Approved face, eye and body protection will be used during any burning or welding operation. Also, sufficient shielding that provides protection to others in the immediate area will be used.
- e. No flammable materials (paints, solvents, chemicals, etc.) will be stored within the immediate area of any burning or welding operation. Flammable materials must be stored in OSHA and Pagoda Electrical, Inc. approved cabinets.
- f. Any employee using portable fixed tools (drill press, jig or band saw, etc.) must not wear loose clothing. Anyone with long hair must tie back the hair or wear acceptable hair protection while operating equipment. All stock must be clamped down (attempting to hold stock with hands will not be permitted).
- g. Before any employee performs service or maintenance on a machine or equipment where the unexpected energizing, start up or release of stored energy could occur and cause injury, the machine or equipment shall be made safe. This will be accomplished by locking out and tagging out energy isolating devices, and otherwise disabling the machines or equipment. (see Lockout/Tagout Policy).

- h. Clean-up after using powered equipment or hand tools must be done immediately following use of the power tool.
- i. All burning or welding operations outside the shops area requires a Hot Work permit from the Safety and Health Manager.
- j. Before any work is started in an area designated as "Restricted" (e.g. high hazard, carcinogens, etc.,) the area must be inspected by the Safety and Health Manager and permission to proceed given to the supervisor.
- k. Before any work is started in any laboratory area, a request will be made to the Laboratory Supervisor, principal investigator and/or Safety and Health Manager to ensure that there will be no danger from hazardous materials in the immediate area of work.
- l. All burning or welding operations outside the shops area requires a Hot Work permit from the Safety and Health Manager.
- m. Good housekeeping will be maintained in the shop area. Material will be stored in such a manner that there is no danger from sliding, falling or presenting a hazard by striking against or cutting. Scrap stock must be cleaned from floor and work benches following each job or at the end of each day.

B. Personal Protective Equipment

Personal protective equipment (PPE) is not a substitute for engineering controls or feasible work or administrative procedures. While these controls are being implemented, or if it has been determined that control methods are not feasible, personal protective equipment is required whenever there are hazards that can do bodily harm through absorption, inhalation, or physical contact. This equipment includes respiratory and hearing protective devices, special clothing, and protective devices for the eyes, face, head, and extremities. All PPE shall be of a safe design and constructed for the work to be performed and shall be maintained in a sanitary and reliable condition.

1. Eye Protection

Eye protection is required when there is a possibility of injury from chemicals or flying particles. Examples of operation requiring the use of eye protection include, but are not limited to:

- Chipping, grinding, and impact drilling.
- Breaking concrete, brick, and plaster.
- Welding or helping in welding of any type.
- Cleaning with compressed air.
- Tinning or soldering lugs or large joints.
- Riveting, grinding, or burning metals.
- Handling chemicals, acids, or caustics.

2. Face shields shall be thoroughly washed with soap and water before being worn by another person.

3. Hearing Protection

Appropriate hearing protection shall be used where employees are in designated hazardous noise areas with operating noise sources, or using tools or equipment which are labeled as hazardous noise producers. The Office of Health and Safety shall be contacted for noise level surveys and guidance on the type of hearing protection required.

4. Hand Protection

a. Rubber protective gloves shall be worn by personnel working in battery shops or where acids, alkalies, organic solvents, and other harmful chemicals are handled.

b. Electrical worker's gloves are designed and shall be used to insulate electrical workers from shock, burns, and other electrical hazards. These gloves shall NOT be the only protection provided and will never be used with voltages higher than the insulation rating of the gloves.

c. Multi-use gloves shall be worn to protect the hands from injuries caused by handling sharp or jagged objects, wood, or similar hazard-producing materials. These gloves are usually made of cloth material with chrome leather palms and fingers or synthetic coating. All-leather gloves are also acceptable.

5. Foot Protection

Non-skid shoes shall be worn where floors may be wet or greasy. Where there is reasonable probability of foot or toe injury from impact and compression forces, safety footwear shall be worn.

6. Respiratory Protection

There are various airborne hazards, e.g., organic vapors, particulates, fumes, etc., that personnel may encounter and respiratory protection may be required. The Safety and Health Manager shall be consulted for guidance on the type of protection required.

7. Head Protection

Hard hats shall be worn by all personnel working below other workers and in areas where sharp projections or other head hazards exist.

8. Body Protection

Natural or synthetic rubber or acid-resisting rubberized cloth aprons shall be worn by personnel handling irritating or corrosive substances. Aprons shall normally be worn with acid sleeves and gloves for greater body protection against skin injuries.

9. Insulated Matting

Insulating matting shall be used by workers for additional resistance to shock where potential shock hazards exist, such as:

- Areas where floor resistance is lowered due to dampness.
- Areas where high voltages (above 600 volts) may be encountered.
- Areas with electrical repair or test benches.

10.Other

- a. Shop supervisors shall ensure that shop personnel use the protective clothing and equipment that will protect them from hazards of the work they perform. It is the responsibility of workers to keep their PPE in a clean, sanitary state of repair and use the equipment when required.
- b. Workers shall keep their hands and face clean, change clothes when they are contaminated with solvents, lubricants, or fuels, and keep their hands and soiled objects out of their mouth. No food or drink shall be brought into or consumed in areas exposed to toxic materials, chemicals, or shop contaminants. Workers shall wash their hands before eating or smoking after exposure to any contaminant.
- c. Workers shall not wear rings, earrings, bracelets, wristwatches, or necklaces in the vicinity of operating machinery and power tools. Additionally, long full beards, unrestrained long hair, and loose clothing can become caught in tools or machinery and cause serious personal injury. Highly combustible garments or coveralls made of material such as nylon shall not be worn in or around high temperature equipment or operations such as boiler operations, welding, and any other work with open flame devices.

C. Shop Layout

Proper layout, spacing, and arrangement of equipment, machinery, passageways, and aisles are essential to orderly operations and to avoid congestion.

1. Equipment and machinery shall be arranged to permit an even flow of materials. Sufficient space should be provided to handle the material with the least possible interference from or to workers or other work being performed. Machines should be placed so it is not necessary for an operator to stand in a passageway or aisle. Additionally, machine positioning should allow for easy maintenance, cleaning, and removal of scrap. Clear zones

shall be established and should be of sufficient dimensions to accommodate typical work. Marking of machine clear zones may be yellow or yellow and black hash-marked lines, 2 to 3 inches wide. Machines designed for fixed locations shall be securely anchored. If pieces of stock to be worked exceeds workplace/clear zone floor markings, rope/stanchions may be used to temporarily extend the workplace. Machines with shock mounting pads shall be securely anchored and installed according to manufacturer's instructions.

2. Passageways/aisles shall be provided and marked to permit the free movement of employees bringing and removing material from the shop. These passageways are independent of clear zones and storage spaces. They shall be clearly recognizable.

3. Where powered materials handling equipment (forklift) is used, facility layout shall provide enough clearance in aisles, on loading docks, and through doorways to permit safe turns. Aisles shall be at least 3 feet wider than the widest vehicle used or most common material being transported.

D. Illumination

Adequate illumination shall be provided to ensure safe working conditions.

1. Portable lamps shall have UL approved plugs, handles, sockets, guards, and cords for normal working conditions.

2. For work in boilers, condensers, tanks, turbines, or other grounded locations that are wet or may cause excessive perspiration, a low voltage lighting system should be used, either from a battery system or low-voltage lighting unit. In situations where these lighting systems are not available, a vapor-proof 110 volt lighting system shall be used.

3. Flashlights for use near energized electrical equipment and circuitry shall have insulated cases.

4. At least 50 foot-candles of illumination shall be provided at all work stations. However, fine work may require 100 foot-candles or more. This

can be obtained with a combination of general lighting plus supplemental lighting.

E. Exits and Exit Markings

1. Every exit shall have "EXIT" in plain legible letters not less than 6 inches high with the strokes of the letters not less than three-quarters of an inch wide.

2. Doors, passageways, or stairways which are neither exits nor ways to an exit (but may be mistaken for an exit) shall be clearly marked "NOT AN EXIT" or by a sign indicating their actual use, for example: "STORAGE ROOM" or "BASEMENT."

3. When the direction to the nearest exit may not be apparent to an occupant, an exit sign with an arrow indicating direction shall be used.

4. Exit access shall be arranged so it is unnecessary to travel toward any area of high hazard potential in order to reach the nearest exit (unless the path of travel is effectively shielded by suitable partitions or other physical barriers).

5. Exit signs shall be clearly visible from all directions of egress and shall not be obstructed at any time. If occupancy is permitted at night, or if normal lighting levels are reduced at times during working hours, exit signs shall be suitably illuminated by a reliable light source.

6. A door from a room to an exit or to a way of exit access will be the side-hinged swinging type. It will swing out in the direction of travel if 50 or more persons occupy the room or the exit is from an area of high hazard potential.

7. Areas around exit doors and passageways shall be free of obstructions. The exit route shall lead to a public way. No lock fastening device shall be used to prevent escape from inside the building.



PAGODA ELECTRICAL inc.

Progressive • Professional • Prestigious

8. Where occupants may be endangered by the blocking of any single exit due to fire or smoke, there shall be at least two means of exit remote from each other.

9. Exits, exterior steps, and ramps shall be adequately lighted to prevent mishaps. Separate lighting will not be required if street or other permanent lighting gives at least one foot-candle of illumination on the exit, steps, or ramp.

F. Housekeeping

Good housekeeping shall be maintained in all shops, yards, buildings, and mobile equipment. Supervisors are responsible for good housekeeping in or around the work they are supervising. As a minimum, the following requirements shall be adhered to:

1. Material shall not be placed where anyone might stumble over it, where it might fall on someone, or on or against any support unless the support can withstand the additional weight.

2. Aisles and passageways shall be kept clear of tripping hazards.

3. Nails shall be removed from loose lumber or the points turned down.

4. Ice shall be removed from all walkways and work areas where it may create a hazard or interfere with work to be done. If ice cannot be removed readily, sand or other approved materials shall be applied.

5. Trash and other waste materials shall be kept in approved receptacles. Trash shall not be allowed to accumulate and shall be removed and disposed of as soon as practicable, at least once per shift (or more often if needed).

6. Disconnect switches, distribution panels, or alarm supply boxes shall not be blocked by any obstruction which may prevent ready access.

7. Machinery and equipment shall be kept clean of excess grease and oil and (operating conditions permitting) free of excessive dust. Pressure gauges and visual displays shall be kept clean, visible, and serviceable at all times. Drip pans and wheeled or stationary containers shall be cleaned and emptied at the end of each shift.

G. Fire Prevention

All shop services personnel shall receive fire prevention training as part of their general training.

1. Supervisors in charge of operations where fuels, solvents, or other flammable liquids are used shall be constantly alert for hazards and unsafe acts. Fuels such as gasoline shall never be used to clean floors or clothing, and open solvent or gasoline containers shall not be kept near electrical equipment. The use of low flashpoint petroleum solvents shall be avoided whenever possible. Open flames, open element heaters, equipment not properly grounded, and nonexplosion-proof electrical equipment used in the presence of flammable or combustible liquids shall be avoided.

2. Fire extinguishers of at least 20 BC or greater rating shall be installed in shop areas. The number of extinguishers depends upon the size and layout of the facility. Fire extinguishers shall meet the following OSHA requirements:

- a. Be kept fully charged and in their designated area.
- b. Be located along normal paths of travel.
- c. Not be obstructed or obscured from view.
- d. Be visually inspected at least monthly to ensure that they:

- 1. Are in their designated places.

- 2. Have not been tampered with or actuated.

3. Do not have corrosion or other impairments.
4. Are accessible and not obstructed.
5. Be examined at least yearly and/or recharged or repaired to ensure operability and safety.
6. Be hydrostatically tested.
7. Be placed so the maximum travel distance, unless there are extremely hazardous conditions, does not exceed 75 feet for Class A or 50 feet for Class B locations.

3. Supervisors shall ensure that employees remove construction debris and rubbish from the job site upon completion of the job, or daily if extended beyond one day. Hazardous materials shall not be left at job sites unless properly stored. Work being performed on job sites shall not endanger building occupants (e.g., exits blocked, fire alarm devices disconnected, etc.).

H. Material Storage

All unnecessary accumulation of materials and supplies in the shop area shall be avoided. The presence of unnecessary material in the shop could cause such incidents as tripping, falling, or slipping. This could be especially hazardous around equipment that is in operation. The only material in the shop area shall be that actually in work. The only place that materials should accumulate in quantity are in storerooms and material holding areas.

H. Material Storage (continued)

1. The storage of materials shall not, of itself, create a hazard. Materials stored in tiers shall be stacked, strapped, blocked or interlocked, and limited in height so they are stable and secure against sliding or collapse. Storage racks shall have sufficient capacity to bear the loads imposed on them.
2. Stored materials shall not obstruct fire extinguishers, alarm boxes, sprinkler system controls, electrical switch boxes, machine operations, emergency lighting, first aid or emergency equipment, or exits.
3. Heavy materials and equipment should be stored low and close to the ground or floor to reduce the possibility of injury during handling.
4. All passageways and storerooms shall be maintained clean, unobstructed, dry, and in sanitary condition. Spills will be promptly removed.
5. Where mechanical handling equipment, such as lift trucks are used, safety clearance shall be provided for aisles at loading docks, through doorways, and wherever turns or passages must be made. No obstructions that could create a hazard are permitted in aisles.

I. Use of Tools

Condition of tools: All hand and power tools and similar equipment, whether furnished by Pagoda Electrical, Inc. or the employee, shall be maintained in a safe condition.

Machine Guards:

Many accidents are caused by machinery that is improperly guarded or not guarded at all. Important factor that must be kept in mind relative to machinery guarding is that no mechanical motion that threatens a worker's safety should be left without a safeguard.

When power operated tools are designed to accommodate guards, they shall be equipped with such guards when in use.

Guards shall be in place and operable whenever the tool is in use. The guard shall not be manipulated or disabled or changed in such a way as to prevent it from protecting as it is intended to protect. Guarding shall meet the requirements of ANSI B15.1.

The following areas of machinery will be provided with barriers and/or enclosures that will effectively prevent personnel from coming in contact with moving components:

- a) Point of operation exposures such as blades, knives and cutting heads.
- b) Power transmission exposures such as belts, pulleys, shaft, gears, etc.
- c) Top, bottom and backside exposures, such as the underside of table saws and the wheels on band saws.
- d) When a point-of-operation guard cannot be used because of unusual shapes or cuts, jigs or fixtures which will provide equal safety for the operator will be used.
- e) Upon completion of an unusual operation, the guard will be immediately replaced.

Whenever a guard is removed for other than an operational requirement, the machine will be shut down and the control switch(es) locked and tagged in the “OFF” position.

Guards will be affixed to the machine. Where possible, the guards will be of the hinged type to enhance maintenance or adjustments.

Personal Protective Equipment:

Proper personal protective equipment will be provided (safety glasses, goggles, shields) and used during grinding or other work that may produce flying particles (e.g. drill press, power saws, etc.). Pagoda Electrical, Inc. approved dust respirators will be used for work that produces airborne dust particles. Eye protection is

required during electrical or electronic hardware repair, installation and/or open front operation.

Employees using hand and power tools and are exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazard.

The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of this part is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

1. Handtools

- a. Incidents at the job site involving hand tools are usually the result of misuse. Hand tools are precision tools capable of performing many jobs when used properly. Prevention of incidents involving hand tools on the job site becomes a matter of good instruction, adequate training, and proper use.
- b. Hand tool safety requires that the tools be of good quality and adequate for the job. All tools shall be kept in good repair and maintained by qualified personnel.
- c. Racks, shelves, or tool boxes shall be provided for storing tools which are not in use.
- d. When personnel use hand tools while they are working on ladders, scaffolds, platforms, or work stands, they shall use carrying bags for tools which are not in use. Workers shall not drop tools.

2. Supervisors shall frequently inspect all hand tools used in the operation under their supervision. Defective tools shall be immediately removed from service. Some common tool defects are:

a. Handles

When handles of hammers, axes, picks, or sledges become cracked, split, broken, or splintered, they shall be immediately replaced. Tool handles shall be well-fitted and securely fastened by wedges or other acceptable means.

Wedges, always used in pairs, shall be driven into the handle when repairing a sledgehammer or maul, to prevent the head from accidentally flying off if the handle shrinks.

b. Tangs

Files, wood chisels, and other tools with tangs shall be fitted and used with suitable handles covering the end of the tang. Ends of the handles shall not be used for pounding or tapping.

2. Supervisors shall frequently inspect all hand tools used in the operation under their supervision. Defective tools shall be immediately removed from service. Some common tool defects are: (continued)

c. Mushroom Heads

Cold chisels, punches, hammers, drift pins, and other similar tools have a tendency to mushroom from repeated poundings. They shall be dressed down as soon as they begin to crack and curl.

1. When dressing tools, a slight bevel of about three-sixteenths of an inch shall be ground around the head. This will help prevent the heads from mushrooming.

2. When tool heads mushroom, the material is highly crystallized and, with each blow of the hammer, fragments are likely to break off.

3. Portable Power Tools

Portable power tools increase mobility and convenience but are frequently more hazardous to use than their stationary counterparts. Personnel who are required to use portable power tools in their work shall be thoroughly trained in safe operating practices. Safe operating procedure shall be set up for each type of tool consistent with the manufacturer's instructions.

J. Use of Compressed Air Sources

1. Compressed air has the appearance of a relatively harmless gas. However, to avoid accidents, compressed air must be used correctly. The improper or inadvertent connection of items not designed for shop air pressure, i.e., equipment, storage vessels, or containers, to a shop air supply may cause serious personal injury and more than likely will damage the item being connected.

2. The maximum air pressure approved for general use in the shops and laboratories is 30 psi (pounds per square inch). This pressure is sufficient for most shop and laboratory operations and is not significantly hazardous. Use discretion and good judgement when using compressed air, even at this low pressure.

J. Use of Compressed Air Sources (continued)

3. The following rules and practices are suggested to avoid personal injury, equipment damage, and potential environmental impact:

- a. All personnel assigned to shops with air compressors shall be familiar with compressor operating and maintenance instructions.
- b. Compressed air is not to be used to blow dirt, chips, or dust from clothing.
- c. Air compressors shall be maintained strictly in accordance with the manufacturer's instructions.
- d. Do not use compressed air to transfer materials from containers when there is a possibility of exceeding the safe maximum allowable working pressure of the container.
- e. The maximum working pressure of compressed air lines shall be identified in psi. Pipeline outlets shall be tagged or marked showing maximum working pressure immediately adjacent to the outlet.
- f. Do not use compressed air to transfer materials from standard 55-gallon drums. Use a siphon with a bulk aspirator on a pump.

WARNING: It is dangerous to pressurize any container not designed for that purpose.

- g. Never use compressed air where particles can be accelerated by the air stream.
- h. Do not use compressed air to clean machinery or parts unless absolutely necessary. Where possible, use a brush. If necessary, use a minimum pressure and provide barriers or clean the area of personnel. Wear goggles to protect your eyes.
- i. Never apply compressed air to any part of a person's body.
- j. Do not use a compressed air line that does not have a pressure regulator for reducing the line pressure.
- k. Keep the hose length between tool housing and the air source as short as possible.
- l. Where possible, attach a short length of light chain between the hose and the housing on air-operated tools. This keeps the hose from whipping should the hose-tool coupling separate.

- m. Inspect air supply and tool hoses before using. Discard and label unfit hoses. Repair hoses where applicable.
- n. Turn valve off and vent pressure from a line before connecting or disconnecting it. Never work on a pressurized line.
- o. Do not connect air supply respirators or supplied-air suits to the compressed air supply system of any building. Such compressed air is unsafe to breathe.
- p. Do not attach pneumatic tools, process, or control instruments to breathing air lines. The potential contamination to personnel and systems is hazardous.

K. Working Safely at Elevations

These procedures are designed to prevent the injury of Pagoda Electrical, Inc. personnel due to falls or slips any time personnel are working on portable stairs, ladders, or scaffolding, or at elevations or more than four (4) feet above grade. Applicable OSHA standards include 29 CFR 1910.21-.68.

1. Ladders

A. Hazards

Falls are the primary hazard associated with the use of ladders. Falls result from a number of unsafe acts and conditions such as:

- 1) Ladders being set on unstable surfaces.
- 2) Personnel reaching too far out to the sides.
- 3) Personnel standing too high to maintain balance.
- 4) Personnel using defective ladders (e.g., broken rails, rungs, missing hardware).

These hazards are minimized if workers adhere to proper ladder safety practices and if supervisors ensure equipment is used, inspected, and maintained in good condition. Tasks which require frequent use of ladders and involve significant climbing effort must be accomplished by workers capable of the physical exertion required under these conditions.

B. Ladder Requirements

1. Procurement

Portable ladders procured for Pagoda Electrical, Inc. shall meet the design and construction specification of OSHA 29 CFR 1910.25 for wood ladders and 29 CFR 1910.26 for metal ladders. Portable ladders constructed of reinforced plastic shall meet the specifications of ANSI A14.5-1974.

2. Allowable Lengths

The maximum allowable lengths of portable ladders are:

Stepladders - 8 feet

Platform stepladders - 12 feet

Straight ladders - 20 feet

Extension ladders - 36 feet – with minimum overlap of 3 feet

3. Wooden Ladders

Wooden parts used in construction of ladders should be straight-grained; thoroughly seasoned; smoothly dressed; and free of sharp edges, splinters, checks, decay and other defects. Rungs must be parallel, level and uniformly spaced. The spacing shall not be more than 12 inches.

Wooden ladders will be coated with a suitable protective coating such as boiled linseed oil, clear varnish or clear lacquer. Wood ladders shall not be painted with an opaque coating, since possible defects may be covered up.

4. Nonslip Bases

Portable ladders shall be equipped with nonslip bases such as safety feet or spikes, depending upon the type of usage.

5. Electrical

Personnel shall not use portable metal ladders when performing work on or near electrical equipment. The side rails of metal ladders will be stenciled in 2-inch (or smaller is necessary to fit on the side rails) red letters: "DANGER - DO NOT USE AROUND ELECTRICAL EQUIPMENT." Wood or reinforced plastic ladders shall be used for work on or near electrical equipment. They will be kept clean. Remove all surface buildup or dirt, grease, or oils to avoid creating a ready path for electrical current.

6. Care of Ladders

- a) Handle ladders with care. Do not drop, jar or misuse them.
- b) Ladders shall be stored in a manner that will provide easy access for inspection and will permit safe withdrawal for use. They shall not be stored in a manner that presents a tripping hazard not where they can fall on someone. They should be stored in a manner that will prevent sagging.
- c) Lubricate metal bearings of locks, wheels, pulleys, etc., as required to keep them working.
- d) Replace frayed or badly worn rope.
- e) Keep safety feet and other parts in good condition to ensure they work.
- f) Maintain ladders in good usable condition. Inspect ladders prior to use.
- g) Ladders with defects which cannot be immediately repaired, shall be removed from service for repair or destruction, and shall be tagged

with a danger tag. Do not attempt to straighten or use a bent ladder made of reinforced plastic.

h) Rungs or steps on metal ladders that are not corrugated, knurled, or dimpled will have skid-resistant materials applied.

C. Proper Use of Ladders

The correct procedures for using ladders are as follows:

- 1) Where possible, portable nonself-supporting ladders will be used at such a pitch that the base of the ladder is placed a distance from the vertical wall that is one-fourth of the working length of the ladder. The ladder shall be placed to prevent slipping, or it will be lashed or manually held in position.
- 2) Ladders shall not be used by more than one person at a time. Ladders specially designed to support greater loads shall be used in combination with ladder jacks and scaffold planks when an operation requires more than one person.
- 3) Place portable ladders so that the side rails have a secure footing. The top rest for portable rung and cleat ladders will be reasonably rigid and will have adequate strength to support the applied load.
- 4) Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.
- 5) Do not place ladders on boxes, barrels, or other unstable bases to obtain additional height.
- 6) To support the top of the ladder at a window opening, attach a board across the back of the ladder, extending across the window to provide firm support against the building walls or window frames.
- 7) When ascending or descending, users shall face the ladder and use both hands.

- 8) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other defects shall not be used. Do not make improvised repairs.
- 9) Do not splice short ladders together to provide long sections.
- 10) Do not use ladders made by fastening cleats across a single rail.
- 11) Do not use ladders as guys, braces, skids, horizontal platforms or scaffolds, or for other than their intended purposes.
- 12) Do not use a ladder to aid access to a roof unless the top of the ladder extends at least 3 feet above the point of support, at eave, gutter, or roof line.
- 13) Always raise extension ladders so that the upper section overlaps and rests on the bottom section. The upper section will always overlap on the climbing side of the extension ladder.

The correct procedures for using ladders are as follows: (continued)

- 14) Nonslip bases are not intended as a substitute for care in safely placing, lashing, or holding a ladder that is being used on oily, metal, concrete, or slippery surfaces.
- 15) The bracing on the back legs of step ladders is designed solely for increasing stability and not for climbing.
- 16) Hooks may be attached at or near the top of ladders to provide added stability.
- 17) When the ladder can be knocked over by others who are working in the area, the ladder will be securely fastened. As an alternative, someone will be

assigned to steady the bottom, or the area around the ladder will be roped off.

18) Workers shall not stand higher than the third rung/ step from the ladder top and shall not attempt to reach beyond a normal arm's length.

2. Scaffolding and Elevated Platforms

a. Only tube and coupler or tubular welded frame scaffolding shall be used by Pagoda Electrical, Inc. personnel. It shall be erected according to OSHA standards, as specified in 29 CFR 1910.22, .23, and .28.

b. All platforms or scaffolds shall be inspected by the supervisor before use.

c. All elevated platforms shall be surrounded by a standard guardrail, securely fastened to a stationary object, and have a floor capable of withstanding a working load of 75 pounds per square foot.

d. Scaffolds with wheels constructed on the base (bottom) section shall not be used unless all wheels are intact and at least one wheel on each side is locked to prevent movement.

e. The following are general scaffolding rules:

1) Know scaffolding safety rules prior to set up, during operations, and for dismantling of scaffolding. Ensure manufacturer's instructions and safety warnings are legible and remain on scaffolding.

2) Inspect the equipment before use for damage or deterioration.

3) Keep equipment in good repair.

- 4) Inspect erected scaffolds regularly to ensure they are maintained in a safe condition.
- 5) Provide adequate sills and posts and use base plates.
- 6) Anchor wall scaffolds securely between structure and scaffold.
- 7) Use caution when working near power lines. Never be any closer than 10 feet to electrical power lines.
- 8) Use adjusting screws instead of blocking to adjust for uneven grades. Use outriggers where so equipped.
- 9) Equip all planked areas with proper guard rails and toe-boards.
- 10) Do not ride rolling scaffolding.
- 11) Do not leave materials and equipment on the platform when moving scaffolding.
- 12) Do not try to move rolling scaffolding without help.
- 13) Do not extend adjusting screws over 12 inches.
- 14) Do not let working platform height exceed four times the smallest base dimension unless guyed or otherwise stabilized.
- 15) Do not overload scaffold.

16) Do not use ladders or makeshift devices on top of scaffolds to increase height.

17) Ensure the footing and anchorage for scaffolds are sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Do not use unstable objects such as barrels, boxes, loose bricks or concrete blocks, etc., to support scaffolds or planks.

3. Rooftop Work

If the rooftop to be worked on is not provided with an adequate guardrail, the following procedures shall apply:

- No employee shall come within 10 feet of the roof's edge without wearing a lifebelt or harness securely attached to a securely anchored rope or line, with the entire system being capable of supporting a minimum dead weight of 5,400 pounds.
- No employee shall work on the rooftop if the windspeed exceeds 20 miles per hour.

L. Shoring and Trenching

The walls and faces of excavations and trenches over 5 feet, where workers may be exposed to danger, shall be guarded by a shoring system, sloping of the ground, or some other equivalent means. Trenches less than 5 feet deep with hazardous soil conditions also shall be effectively protected.

The following guidelines are provided:

1. Appropriate trench boxes and/or shields may be used in lieu of shoring or sloping.

2. Tools, equipment, an excavated material shall be kept 2 feet or more from the lip of the trench. Where employees are required to be in or work in trenches 4 feet deep or more, an adequate means of exit such as ladders or steps shall be provided within 25 feet of travel and used.

3. Daily inspections shall be made of trenches and excavations by the supervisor in charge to ensure adequate slopes, shoring and bracing, and that there is no evidence of possible slides or cave-ins. More frequent inspections may be necessary as work progresses or after inclement weather conditions, such as rain, or where loose compacted or unstable materials are present.

4. Workers shall take extra care when hand excavating in close proximity to utilities to preclude interruption of services an personnel injury and/or equipment damage which can result from breaking electrical, gas, and steam lines.

M. Barricades

Whenever a common area is disturbed by maintenance, repair, or construction operations and presents a hazard to personnel working in or near, or traveling through the area, care shall be taken to warn these personnel and other engineering services personnel of the potential hazard. Appropriate barriers shall be erected around excavations, open manholes, open electrical panels, etc., whenever they are to be left unattended.