Pleasantville Public Schools

Facilities Handbook

2017-2018

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Introduction

The most valuable asset your organization has is its employees. By improving safety and preventing accidents, you can protect your work force while also reducing your workers' compensation costs.

This basic safety and health manual for the NJ construction industry summarizes successful accident-prevention principles and techniques. While application of these techniques may vary according to the size and nature of your company's operations, the basic principles remain the same.

Please note, this manual is not all-encompassing, nor is it a document for compliance. It's always important to customize safety and health programs to meet the particular needs of the workplace.

However, safety isn't the only thing you can do to reduce your workers' compensation costs. You can also lower your costs by proactively managing your workers' compensation claims. This includes incident investigation, early reporting of injuries.

This manual can also provide your company's safety teams with information to meet its goals and obligations. It contains information on incident prevention, together with a complete explanation of its use, and benefits and methods of application.

Fire prevention and protection

Fires require three elements to burn — fuel, oxygen and heat. A construction site contains all three elements, although their quantities and locations change constantly.

Examples include:

- Fuel sources, such as gasoline, diesel fuel, paint thinner, piles of wood scraps, cardboard, straw, paper and other trash;
- Heat sources, such as electricity, cutting, welding, cigarettes, roofers' tar kettles and temporary heaters;
- Oxygen, present in the atmosphere and as a compressed gas.

Fuel sources are the easiest element to remove. Therefore, concentrate on cleanup by disposing of scrap before it accumulates, storing flammable liquids in approved self-closing containers, keeping all flammable and combustible material away from all heating devices or heat sources. Shut engines off to allow hot parts to cool before refueling.

Every worker on a construction site should know:

- Locations of fire extinguishers;
- How to operate fire extinguishers and the hazards involved with the beginning stage of firefighting;
- Classifications of fire extinguishers and classes of fires;
- Location of telephone and how to call the fire department;
- How to make sure that a used fire extinguisher has been recharged before it is returned to its holder;
- Who to notify that the extinguisher has been used and needs recharging.

Fire and fire extinguisher classification

There are four types of fires — Class A, Class B, Class C and Class D.

- Class A fires occur in wood, rubber, paper, cloth and most plastics. The most effective type of extinguishing agent is water or a solution containing large concentrations of water because the quenching-cooling effect reduces the temperature of the burning material to below its ignition temperature.
- Class B fires occur in flammable or combustible liquids, such as petroleum products and greases. A blanketing-smothering effect of an agent that excludes oxygen or inhibits the chemical chain reaction, such as carbon dioxide, dry chemical, halon or foam are most effective.
- Class C fires involve electrical equipment. Carbon dioxide, dry chemical and halon are examples of nonconductive extinguishing agents used to snuff out electrical fires.
- Class D fires involve combustible metals, such as aluminum, magnesium, zirconium and titanium. The use of water and other conventional types of extinguishing agents is ineffective and may even cause a violent reaction. Extinguish these fires with specially-prepared agents.

Fire extinguishers

The ABC dry-chemical fire extinguisher is the most commonly used extinguisher on construction job sites. Maintain in good operating condition and periodically inspect firefighting equipment. Immediately replace defective equipment. Conduct an annual maintenance check of the fire extinguisher and record the maintenance date. Retain this date for one year after the last entry or the life of the shell, whichever is less.

Provide a fire extinguisher rated not less than 2A for each 3,000 square feet of the protected building area or major fraction thereof. Mount each fire extinguisher on the wall, and mark its location. The travel distance from any point of the protected area to the nearest fire extinguisher cannot exceed 100 feet.

Provide one or more fire extinguishers rated not less than 2A on each floor of a multistory building with at least one fire extinguisher located near a stairway. Provide a fire extinguisher, rated not less than 10B, wherever more than five gallons of flammable or combustible liquids or five pounds of flammable gas are being used on the job site.

General rules for fire extinguishers

Use fire extinguishers in the upright position. Discharge the fire extinguisher about eight feet from the fire with the wind at your back, if possible. Attack the fire as you advance.

Quick work is important because most extinguishers empty in about one minute. If you are out in the open, be prepared to retreat in case of a sudden change in wind direction. In enclosed areas, you may be on your knees with your head no higher than the upright extinguisher you are using; the best air to breathe will be between knee level and the floor.

With water-type extinguishers, direct the stream at the base of the fire and move forward. When using dry-chemical extinguishers, attack the nearest edge of the fire and go forward, moving the nozzle rapidly with a side-to-side sweeping motion. When fighting flammable-liquid fires with carbon dioxide (CO^2) extinguishers, use the carbon-dioxide in a sweeping formation to clear the flames off the burning surface. Begin fighting at the near edge of the fire and gradually move forward, waving the discharge slowly from side to side. When using this extinguisher in an enclosed area, be careful because carbon dioxide may produce an oxygen deficit within the area.

When two or more persons are using fire extinguishers on a flammable liquid fire, they must act as a team, working from the same side of the fire and making sure the fire does not re-ignite between them.

Emergency action plans

The employer is responsible for preparing and implementing plans covering the actions that employers and employees must take to ensure employee safety in the event of fire or other emergencies, such as tornadoes, floods, or other natural or manmade disasters. The elements of this plan include:

- Emergency-escape procedures and emergency escape-route assignments;
- Procedures for employees who remain to operate critical equipment before they evacuate;
- Procedures to account for all employees after an emergency evacuation;
- Rescue and medical duties for employees who perform them;
- The preferred means of reporting fires and other emergencies;
- Names and job titles of persons who can be contacted for further information or explanation of duties under this plan.

Fire alarms

In the event of a fire, means should be available for calling the fire department quickly. Post signs instructing personnel how and where to turn on an alarm, whether it is by telephone, siren or horn. Finally, always make sure firefighters have easy access to all parts of the project.

Training

Prior to implementing the emergency action plan, the employer will designate and train sufficient personnel to assist in the safe and orderly evacuation of employees. The employer also will review the plan with each employee when the plan is developed and whenever an employee's duties under the plan are changed.

For further detailed information on fire prevention and protection, consult the OSHA Construction Standards, 29 CFR Subpart F, 1926.150 and 1926.151.

Accident and incident investigation

Accident and incident investigation is primarily a fact-finding procedure; use the facts revealed to prevent similar accidents. Properly handled, these investigations also can increase safety and health awareness in all employees.

Obviously, you can reduce injuries and illnesses by eliminating unsafe or hazardous situations. Although you can never prevent all accidents, it is easier and more effective to make physical and cultural changes to eliminate and to reduce hazards than it is to teach employees to work around these hazards.

Reduce all hazards to the practical minimum. You can accomplish this by changing equipment, installing guards, changing work and material-handling procedures, and substituting less-hazardous processes and chemicals. When investigating accidents, identify the unsafe or hazardous conditions and other pertinent facts. Make efforts to reduce the hazards.

Once an accident does occur, the severity can be a matter of chance. Assume, for example, that two employees are working in an area where carbon monoxide is escaping into the atmosphere from a propane heater. One worker, a laborer, slumps to the floor, is removed from the area and quickly revived. The other, a carpenter, is on a ladder replacing acoustical tile. He falls to the floor, strikes his head and is killed. Both accidents had the same basic causes, but one resulted in a minor non-disabling injury and the other a fatality.

You can even use minor injuries and incidents that do not involve property damage or personal injury to reveal hazards. If corrected, you can use them to prevent serious injuries. Investigate these incidents with the same thoroughness as serious injuries and fatalities.

You may define the principal purpose of accident investigation as primarily a fact-finding procedure that attempts to identify unsafe or hazardous conditions or procedures. Once you identify these factors, take immediate action to eliminate or reduce the hazard as much as possible.

With those objectives in mind, the procedure you should follow immediately after an accident includes:

- Ensuring any injured person receives proper medical care;
- Starting the accident investigation promptly. Maintain all of the conditions that existed at the time of the accident until the investigation is conducted. Allow no one to perform the job function that resulted in the accident or injury until the matter is cleared up;
- Having the supervisor under whose direction the employee worked or the supervisor in whose area the accident occurred conduct the investigation. Persons involved should submit their findings in writing in an accident investigation report. Use a form similar to OSHA 's *Form 301* (Injury and Illness Incident Report) or BWC's *First Report of an Injury, Occupational Illness or Death* (FROI-1).

Have a responsible member of management review reports and take corrective action. The organization should review accident-investigation reports. Direct reports to anyone who is directly involved in making changes. In the case of very serious accidents, you also may appoint a fact-finding committee to thoroughly investigate the accident and submit a report.

Include photographs, sketches or other exhibits in the investigation report to help clarify the accident's facts. Include detailed statements from all witnesses to the accident as well as others who can contribute information.

The past has shown that the largest fault in accident investigations is the lack of follow-up action to correct the conditions and/or behaviors that led to the accident. Note in the report the specific actions that you will take, the name of the management representative responsible for completing each item and the deadline for completion. Later, the responsible member of management should follow up to ensure that the action is taken. Unless this procedure is followed the entire investigation has little value.

After you complete the investigation and take corrective action, bring the findings to the attention of all employees in the accident area and those working in similar areas. Use these findings to provide additional safety training, make operational changes based on the facts involved in the accident, and inform employees about actions taken to protect their safety and health and prevent similar occurrences.

Job safety analysis

The technique called job safety analysis (JSA) is a simple but comprehensive means to determine the hazards involved as well as potentially unsafe procedures most likely to occur in a given task or job. Use this analysis to reduce hazards and to train workers in safe procedures. A JSA is essential to any effective safety program. It should be one of the first steps you take when there is a possibility of worker injury. The best way to efficiently and safely perform a job can be determined only by carefully studying each element involved in its performance.

When considering a JSA, first analyze the tasks with the worst accident experience or the greatest potential to cause injury to the worker and then the tasks with lesser risks. By establishing priorities, you can use the JSA as a focal point of the accident-prevention program.

A JSA serves two valuable purposes. It provides a systematic means of reviewing a workers' previous experience and knowledge to establish safe work procedures, and it promotes employee involvement in establishing safety awareness while developing safe work practices.

To accomplish these objectives management should:

- Understand the objectives and means of analyzing jobs element by element;
- Establish a plan for analyzing job elements on a regular basis;
- Analyze statistical data, accident experience, and management and employee experience to develop the sequence of job elements;
- Devise an action plan to control hazards identified with a timetable for implementing the plan;
- Have supervisors review the results of all JSAs covering job elements for which they have supervision;
- Provide supervisors with a copy of all approved safe job procedures developed as a result of a JSA;
- Train workers in accordance with the conclusions of the JSA both initially and each time the task is analyzed;
- Have supervisors regularly observe the workers and ensure they follow safe work practices;
- Give supervisors the authority and responsibility to enforce adherence to safe work habits.

In practice, the person conducting the JSA must be competent, qualified and practical in assessing each job element, and follow a management-approved breakdown of each job to be analyzed

As you conduct the JSA, it is important to search for the hazards of each element — whether produced by the environment or connected with the job procedure. When properly and thoroughly done, this will assist in making the entire job safer and more efficient.

To assist in gathering the necessary information, we have included a form at the end of this chapter, which will ensure consistent and acceptable procedures are used.

Safety observations

The principal purpose for safety observations is to determine if employees are at risk. This section will help you determine the effectiveness of your employee training program.

Many construction injuries result from operational errors. Good safety observations can reveal and correct these deviations before they lead to accidents. The following are key elements required for good safety observations:

- Make safety observations when you can concentrate all of your attention on safety;
- Observe the work area, making mental and written notes of any potentially dangerous situations or conditions;
- Whenever possible, take immediate corrective action to prevent reoccurrence.

Hearing conservation

Employers in the construction industry are required to use feasible engineering and administrative controls as the primary means of reducing excessive sound levels. Where those controls are not feasible, employers should provide their employees with ear-protective devices. Make sure employees wear the protective devices.

Noise can be more than a nuisance. It may cause you to lose your hearing — either temporarily or permanently. The severity of hearing loss depends on:

- How loud the noise is (intensity);
- How high-pitched the noise is (frequency);
- How long you are exposed to the noise — hourly, daily, weekly, monthly;
- The age of the person exposed to the noise;
- Whether the noise is continuous (impact every second or less) or intermittent;
- Individual susceptibility of the person exposed to the noise.

Permissible noise exposure is based on two factors — intensity of sound and the length of exposure. Noise-related hearing loss results when small hair cells in the inner ear are damaged by repeated exposure to noise. These hair cells bend in response to the amount and intensity of the noise. Too much noise, too often, stresses the hair cells to the point where they no longer spring back to their original position. Over time, the hearing loss becomes more noticeable.

Wearing hearing protection, even when not legally required, can prevent this irreversible loss of hearing.

Hearing protection is generally available in three styles: earmuffs, ear plugs and canal caps. Earmuffs, which consist of two acoustically insulated cups connected with a metal or plastic band, are placed over the outside of the ears.

There are three categories of ear plugs: molded plugs, custom plugs and formable plugs.

Custom-molded plugs are manufactured from silicone rubber or plastic and are usually available in small, medium and large sizes. Formable plugs are made from resilient materials, such as expandable plastic foam and wax-impregnated cotton. The plug material is compressed and inserted into the ear. After a few moments, the material expands, sealing off the ear canal. Canal caps provide protection by sealing off the opening in the outer ear. They consist of two small rubber caps connected together by a semicircular band. The band is fitted behind the neck or under the chin, and the caps are positioned over the canal openings.

Employee training in the proper selection and use of hearing protection is an important part of an effective hearing-conservation program.

The level of noise reduction afforded by a specific type of ear protector is indicated by the Environmental Protection Agency noise reduction rating (NRR). NRRs are established on the basis of laboratory tests. Attenuation levels during actual use are usually less than those achieved in the laboratory.

The OSHA Industrial Hygiene Technical Manual provides some guidance for determining the acceptability of ear protection in the field. Using OSHA's method, 7 decibels (dB) is subtracted from the published NRR to compensate for spectral uncertainty, and the result is divided by two to provide a safety factor. The ear protectors with a published NRR of 27 dB would have a field rating of 10 dB ([27-7] divided by 2=10).

Employers should do audiometric testing annually on workers exposed to excessive noise levels.

Reference:

Standard Number	Title
1926.52	Occupational noise exposure
1926.101	Hearing protection

Mobile equipment

The general principles for safe, productive motor-vehicle operation are applicable to all motor-vehicle operations, including vehicles that operate within an off-highway job site, not open to public traffic.

Safe, productive motor-vehicle operation requires:

- A qualified operator — a person trained and experienced in the operation of the vehicle to which he or she is assigned. This person should be in good physical condition with his or her judgment unimpaired by drugs, alcohol or fatigue;
- An operable, well-maintained motor vehicle — a vehicle in good mechanical condition with all controls identified and fully functional;
- A daily, pre-operation inspection system — to verify the vehicle's condition using a check list specific to the vehicle or using a general, logical system. The operator should:
  1. Check fluid levels (cooling, oil, hydraulic, fuel, etc.);
  2. Check that the emergency brake and parking brake are set and transmission is not in gear;
  3. Start engine and allow the various systems to warm up to operating temperatures;
  4. Check the vehicle to be sure that all glass, mirrors, lights and reflectors are clean and intact;
  5. Check tires to ensure that treads and sidewalls are in good condition, and that they are properly inflated (if pneumatic). Check grousers, idlers and drive sprockets of tracked vehicles;
  6. Check the vehicle's controls for their proper function, i.e., horn, windshield wipers, steering, transmission, etc. If all is in order, proceed;
- An operator's guide — to give the operator an idea of what is expected, such as smooth operation with speeds consistent with the existing job site. Always follow the established traffic patterns and haul routes for the job site;
- A parking/shutdown procedure — to secure the vehicle. Park on as level a surface as possible and as applicable: parking brake set; wheels cramped up-slope and/or blocked; bowl, bucket or blade on the ground and with the tampering or vandalism potential minimized.

Reference:

Standard Number	Title
29 CFR, Subpart N, 1910.176	OSHA General Industry Standards
29 CFR, Subpart O, 1926.600	OSHA Construction Standards

Powered industrial trucks

Powered industrial trucks (PITs), commonly referred to as forklifts, are a vehicle of necessity for many companies on construction job sites. However, they also are involved in many injuries resulting in sprains and strains, amputations, bone fractures, burns, contusions and fatalities.

Because of the recent increase in injuries, the construction industry is mandated to provide adequate, organized and documented training for all employees using PITs. Base the training on the operator's prior knowledge and skill, the type of PIT thathe or she will use, the potential hazards present and the operator's demonstrated ability to operate the PIT.

Employers should require refresher training after an accident, a near-miss incident or observation of the operator using the PIT in an unsafe manner. You also should hold refresher training when there are changes in the work place, new hazards present or when the operator is assigned to a different type of PIT.

Complete an evaluation of each operator at least once every three years, and document and keep on file all initial and refresher training. A basic outline of elements you should incorporate into a training program for PITs follows:

1. A site-specific written training program;
2. Training to cover the minimum required elements, including;
   - Review of the written safety policy related to PITs;
   - Who, when and how initial and refresher training will be conducted;
   - Tests or examinations documentation;
   - Attendance records and results;
3. Written program describing the hands-on testing procedure, including;
   - Who performs the evaluations;
   - Specific training the evaluator received;
   - Hands-on driving exam representative of the actual work environment;
   - Pre-operational safety check of the equipment incorporated into the driving evaluation;
4. The type of physical examination for operators being performed and retention of the records;
5. The company issuance of authorization cards or IDs after completion of training;
6. The specific measures the company has incorporated to handle novice operators.

Hand tools

Construction workers are considered experts in the selection and use of hand tools, yet every year workers are injured on the job as a result of hand-tool accidents. Hand tools are designed to make jobs easier and more efficient. The worker must choose the correct tool for the job being performed, ensure that the tool is in good condition and use the tool properly. Common types of hand tools include striking tools, turning tools, metal-cutting tools, woodcutting tools, screwdrivers, pliers, knives and crowbars.

General requirements

A tool-maintenance procedure is one of the most important factors in any hand-tool safety program. Extensively used hand tools require careful and frequent inspection to maintain them for safe use. When hand tools are not sharpened and dressed, inefficient cutting and glancing off material often cause injuries. Straighten bent shafts, replace broken handles and discard tools you cannot repair. Remove hand tools with defective handles from service immediately.

PPE must protect a person using hand tools who is exposed to hazards, such as falling, flying, abrasive and splashing objects, or exposed to harmful dust, fumes, mists, vapors or gases. Follow guidelines described for PPE in Chapter 20.

Striking tools

Striking tools include carpenter hammers, sledge-hammers, riveting hammers and rubber or rawhide mallets. To guarantee safety, follow these guidelines:

- Choose the most appropriate striking tool for the task. Use carpenter hammers for driving and drawing nails, sledge hammers for driving stakes and pins, riveting hammers for sheet metal and mallets for driving other hand tools, such as a chisel;
- Before using any kind of striking tool, make sure the face of the tool is free of oil or other material that can cause it to glance off the object being struck;
- Check wooden handles to assure they are free of cracks and splits. Replace cracked or split handles;
- Check hammer heads to make sure they are not loose or chipped.

Turning tools

Turning tools, better known as wrenches, are used to exert a twisting force on bolt heads, nuts and pipes. Wrenches include open-end, box, socket, torque, lockjaw and pipe wrenches. Safety principles for use of turning tools include:

- Place the jaws on the nut and pull the wrench toward your body.
  This method will help maintain leverage;
- Use socket wrenches for hard-to-reach places and to loosen and tighten nuts and other fasteners with the aid of a ratchet apparatus;
- Box wrenches have box openings at both ends. Each opening is a different size and is used to free frozen nuts;
- Open-end wrenches, used for a variety of purposes, are made with a 15-degree opening. Never use these wrenches to free frozen nuts;
- When using wrenches, never use hammers or extension pipes to gain leverage on a wrench;
- When using a wrench, always ensure that the gripping surfaces are clean and oil free to prevent slipping;
- It is essential to use the wrench that fits the nut or pipe properly. Be careful when using adjustable wrenches, often called knuckle-busters, because this wrench can slip if not adjusted to fit the nut snugly.

Metal-cutting tools

Snips and shears, bolt-cutters, hacksaws, chisels, and files are metal-cutting tools. Guidelines for the proper use of metal-cutting tools include:

- Oil and adjust snips and shears to make cutting easier and to produce surfaces that are free of burrs;
- When using bolt-cutters, make sure fingers are clear of the jaws and hinges;

- Never use cutters near live electrical circuits;
- Use hacksaws to cut metal that is too heavy for snips or bolt-cutters. Install hacksaw blades so that the teeth point away from the handle of the saw. The main danger in using hacksaws is injury to the hands if the blades break. To operate a hacksaw properly, apply pressure on the downward stroke. After the forward pressure stroke, slightly lift the saw and lightly pull it back in the cut to protect the teeth. Twisting the blade or applying too much pressure may break the blade and result in hand or arm injuries;
- In most cases, you can determine the safety of a hand tool by the condition of its cutting and striking ends, particularly in the case of sharp-edged and pointed tools, such as cold chisels. A cold chisel with a mushroomed or cracked head is a common cause of injury. When a mushroomed head is struck, chips may be knocked off the chisel. You can redress a mushroomed head to its original shape;
- Keep files sharp when not in use by wrapping them in paper or cloth to protect the teeth. A file with a tongue should have a handle attached; make sure that it fits tightly with the file.

Woodcutting hand tools

Examples of woodcutting hand tools are handsaws, planes and wood chisels. Safety tips for these tools include:

- Keep handsaws sharp and free of rust to prevent them from binding or jumping and causing injuries. Always make saw cuts directly across the material, with a slow, careful downward stroke. Crowding or forcing the saw through the cut may cause the saw to buckle or fly out and result in injury to the user;
- Keep the cutting edge on wood planes sharp. Store planes in a rack designed to protect the cutting edges from damage and workers from injury. Hold material being planed securely in a vise, clamp, or other holding device;
- When using a chisel, never cut toward yourself. Always keep the cutting edge sharp.

Screwdrivers

Screwdrivers are designed to drive and remove screws. Never use screwdrivers as pry bars, scrapers or punches. Guidelines for the safe use of screwdrivers include:

- Use the proper size screwdriver so the blade fits the screw properly. This prevents the screw slot from burring, which can cause injury;
- Keep screwdriver tips away from live electrical circuits, and never put any part of your body in front of the screwdriver blade tips while working.

Pliers

Pliers are used for cutting as well as holding and gripping small articles. Guidelines for safe use of pliers include:

- Do not use pliers to cut hard wire unless they are specifically manufactured for this purpose;
- When using pliers, always cut at a right angle;
- Never use pliers as hammers or to remove nuts and bolts.

Knives

Safely use knives by following these guidelines:

- Cut away from the body, or keep the body clear and wear protective clothing. Avoid jerky motions, sudden strains or other movements that might cause loss of balance;
- Keep a knife in a sheath or holder when carrying it on the job. Never leave knives lying on benches or shelves;
- Keep knives sufficiently sharp to do the work for which they are intended.

Crowbars/prybars

Maximize the safe use of crowbars by following these guidelines:

- It is essential to use the correct size crowbar for each job;
- Do not use makeshift tools (cheaters), such as pipe lengths, iron bars or extensions for leverage. To prevent slips, place a block of wood under the head of the crowbar;
- When using spud bars, ensure a firm grip on the handle and stand at the side of the bar to prevent injury caused by recoil.

Power tools

Portable power tools present greater hazards than hand tools. Nearly all power-tool accidents are caused by improper handling and poor maintenance. Use power tools only after becoming thoroughly familiar with their controls, safety requirements and operating procedures. The categories that most power tools fall under are electric power tools, fuel-powered hand tools, fuel-cell tools, pneumatic power tools and hydraulic power tools.

General safety precautions

Employers must provide employees who use hand and power tools, and who are exposed to the hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases with the proper personal protective equipment (See Chapter 20).

You can prevent hazards involved in the use of power tools by following five basic safety rules:

- Keep all tools in good condition with regular maintenance;
- Use the right tool for the job;
- Examine each tool for damage before use;
- Operate according to the manufacturer's instructions;
- Provide and use the proper protective equipment.

Employees and employers have a responsibility to work together to establish safe working procedures. If a hazardous situation is encountered, correct it immediately.

Guards

You need to safeguard the hazardous moving parts of a power tool. For example, you must guard belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating or moving parts of equipment if such parts are exposed to contact by employees.

Provide guards, as necessary, to protect the operator and others from the following:

- Point of operation;
- In-running nip points;
- Rotating parts;
- Flying chips and sparks.

Never remove safety guards when using a tool. For example, you must equip portable circular saws with guards. An upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work.

Safety switches

Equip the following hand-held powered tools with a momentary contact on-off control switch: drills, tappers, fastener drivers, horizontal, vertical and angle grinders with wheels larger than two inches in diameter, disc and belt sanders, reciprocating saws, saber saws, and other similar tools. You also may equip these tools with a lock-on control provided that turn-off can be accomplished by a single motion of the same finger or fingers that turn it on.

Electric tools

Employees using electric tools must be aware of several dangers; the most serious is the possibility of electrocution. Examples of electric power tools are portable drills, grinders and saws.

Among the chief hazards of electric-powered tools are burns and shocks that can lead to injuries or even heart failure. Under certain conditions, even a small amount of current can result in fibrillation of the heart and eventual death. A shock also can cause the user to fall off a ladder or other elevated work surface. To protect the user from shock, tools must either have a three-wire cord with ground and be grounded, or be double insulated.

Follow these general practices when using electric tools:

- Protect tools with a ground fault circuit interrupter (GFCI);
- Operate electric tools within their design limitations;
- Wear gloves and safety footwear when using electric tools;
- When not in use, store tools in a dry place;
- Do not use electric tools in damp locations;
- Work areas should be well lighted;
- Never remove the third prong from the plug.

Fuel-cell powered tools

Cut-off saws and chain saws are examples of fuel-powered tools. Guidelines for the safe use of these tools include:

- Ensuring that the tool has stopped and is cool before refueling, servicing or adjusting;
- Using caution when handling fuel by moving the fuel at least 10 feet from the cutting machine before starting the engine;
- Keeping the handles dry, clean and free of oil or fuel;
- Making sure all guards are on and in good working order;
- Operating the machines only in well-ventilated areas; failure to work in a well-ventilated area can lead to serious injury or death.

Powder-actuated tools

Exercise caution when using powder-actuated tools. Proper use of powder-actuated tools includes:

- Ensuring employees are trained for the specific tool they will use;
- Inspecting and testing each powder-actuated tool in accordance with its manufacturer's recommended procedure before every work shift to ensure that no defects exist and that all safety devices are in proper working order;
- Loading the powder-actuated tool with the correct charge just prior to firing; insert the fastener before inserting the cartridge;
- Never storing a loaded tool and never leaving a loaded tool unattended;
- Treating the powder-actuated tool as a firearm; keep hands and other body parts away from the open barrel end and the tool, whether loaded or unloaded, and never aim at anyone;
- Following the manufacturer's recommended procedures in the event the load fails to ignite;
- Never attempting to fasten at an angle to the work surface or fasten through a pre-drilled hole unless adequate guidance is provided;
- Not fastening into a spalled area on concrete;
- Never using the tool in an explosive or flammable atmosphere;
- Not attempting to fasten into very hard or brittle material, such as cast iron, glazed tile, surface-hardened or high-tensile-strength steel, glass block, rock, face brick or hollow tile;
- Inspecting the area before using the tool;
- Wearing appropriate personal protective equipment in accordance with manufacturer's recommendations.

Pneumatic power tools

These guidelines apply to the safe use of pneumatic power tools:

- Ensure the supply pressure meets rated pressure; if not, use pressure regulators;
- Relieve air hoses and lines of compressed air before being disconnected or disjointed;
- Do not use synthetic lubricants, which can cause deterioration of elastomer seals, in air systems for tools;
- Secure pneumatic power tools to the hose by a positive locking clamp or other means;
- Install safety clips or retainers on pneumatic impact tools to prevent attachments from being forced out;
- Ensure all pneumatically driven nailers, staplers and other tools, which operate at more than 100 psi of pressure, have a muzzle device to prevent the tool from ejecting fasteners, unless the muzzle is in contact with the work surface;
- Inspect, lubricate and maintain the equipment in accordance with manufacturer's recommendations.

Hydraulic power tools

The fluid used in hydraulic-powered tools must be fire-resistant fluid and retained in the tool. The operating characteristics of the hydraulic-powered tool must withstand the most extreme temperatures at which the tool will be exposed. Follow the manufacturer's directions, especially to ensure that safe operating pressures of hoses, valves, pipes, filters and other fittings are not exceeded.

Ladders

The frequent use of ladders at home and on construction sites tends to dull awareness of the dangers involved in their use. Although there are varieties of ladders, many of the same requirements and safe work practices apply.

The following information applies to all portable ladders used in construction, alteration, repair (including painting and decorating), and demolition of work sites covered by OSHA's construction safety and health standards. When using ladders for such use, make sure they are a minimum Type I (250 lb. rating) or greater.

The following general requirements apply to all portable ladders and job-made ladders:

- You must provide a double-cleated ladder or two or more ladders when ladders are the only way to enter or exit a work area for 25 or more employees, or when a ladder serves simultaneous two-way traffic;
- Ladder rungs, cleats and steps must be parallel, level and uniformly spaced when the ladder is in position for use;
- Space rungs, cleats and steps of portable ladders not less than 10 inches apart, nor more than 14 inches apart, along the side rails;
- Provide a metal spreader or locking device on each stepladder to hold the front and back sections in an open position when the ladder is being used;
- Ladder components must be surfaced to prevent injury from punctures or lacerations, and prevent snagging of clothing;
- Do not coat ladders with an opaque covering (such as paint) except for identification or warning labels, which you my place only on one face of a side rail;
- Do not tie or fasten ladders together to create longer sections unless they are specifically designed for such use;
- Prior to each use, inspect the ladder for:
  - Cracks, splits or deterioration of the side rails;
  - Broken or missing rungs, cleats, or steps;
  - Loose rivets, screws, bolts or hardware;
  - Corroded components;
  - Damaged or non-functioning safety shoes;
  - Oil, grease or other slipping hazards;
  - Other faulty or defective components.

If you note defects, immediately mark or tag the ladder with "Do Not Use" or similar language and withdraw the ladder from service until repaired. When repairing a ladder, you must restore it to a condition meeting its original design criteria. If you cannot repair a ladder, destroy it before discarding it.

The following are suggested safe work practices when using portable ladders:

- When using portable ladders to access an upper landing surface, the side rails must extend at least three feet above the upper landing surface. If this is not possible, you must place a grabrail to assist mounting and dismounting the ladder;

- Keep ladders free of oil, grease and other slipping hazards;
- Use ladders only for the purpose for which they were designed;
- Do not load ladders beyond the maximum intended load for which they were built;
- Use straight ladders at an angle where the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder;
- Use ladders only on stable and level surfaces unless secured to prevent accidental movement;
- Never use ladders on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement;
- Secure or barricade ladders when using them in passageways, doorways or driveways where they can be displaced by work-place activities or traffic;
- Keep the area around the top and bottom of the ladder clear;
- Do not move, shift or extend ladders while occupied;
- Do not use the top or top step of a stepladder as a step;
- Do not climb the cross bracing on the rear section of stepladders unless the ladder is designed and provided with steps for climbing on both sections;
- When ascending or descending a ladder, face the ladder;
- Use at least one hand to grasp the ladder when moving up or down it;
- A worker on the ladder must not carry any object or load that could cause him or her to lose balance and fall;
- Ladders must have nonconductive side rails if they are used where they could contact exposed energized electrical conductors or equipment;
- Support, protect from damage and keep out of traffic areas ladders that are in storage. Store fiberglass ladders out of direct sunlight when possible.

Training

Train each employee to recognize hazards in the use of ladders, such as:

- Fall hazards in the work area;
- The procedures for erecting, maintaining and disassembling fall-protection systems;
- Their proper use and placement;
- Their maximum intended loads;
- Any appropriate standards, OSHA standards or NJ administrative codes.

Retrain employees as necessary to maintain their understanding and knowledge of safe ladder use.

Reference:

Standard Number	Title
1926.951(c)	Tools and protective equipment
1926.1053	Ladders
OAC 4121:1-3-11	Ladders
ANSI A14.3	Ladders-fixed, safety requirements
ANSI A14.2	Ladders-portable metal, safety requirements
ANSI A14.5	Ladders-portable reinforced plastic, safety requirements
ANSI A14.1	Ladders-portable wood, safety requirements
ANSI A14.4	Ladders-job-made, safety requirements

Aerial lifts

There are varieties of aerial lifts included within the OSHA Subpart L-scaffold standard, including extensible boom platforms, aerial ladders, articulating boom platforms, vertical towers or a combination of any of these devices. This chapter's information applies to company-owned, leased and borrowed equipment.

Manufacturers' information

Manufacturers of aerial lifts provide important information about the lift that the end user must be familiar with, including:

- Warnings, cautions or restrictions for safe operation and maintenance;
- Make, model, serial number and manufacturer's name and address;
- Rated work load, including number of occupants;
- Maximum travel height;
- Nominal voltage rating of batteries;
- Notice to study the operator's manual;
- Notice of required inspections;
- Alternative configuration use statement such as: outriggers, platform extension and attachments and extendible axles;
- Notice if platform or other parts are electrically insulated;
- Warning on key-part replacement.

User responsibilities

To ensure safe usage of aerial lifts, users must:

- Maintain copies of operating/maintenance manuals;
- Inspect and maintain to manufacturer's specifications;
- Provide operator training;
- Instruct operator on intended purpose and function of each control;
- Read and understand manufacturer's operating instructions and user's safety rules;
- Understand all instruction, warnings and decals displayed on lift;
- Demonstrate proficiency and knowledge on the same model type.

The operating/maintenance manual provides the user with critical information that describes the type of lift and ratings of the aerial platform, maximum voltage of the electrical systems and maximum hydraulic and pneumatic operating pressure. It also includes instructions, operational safety rules, operating maintenance and intended use.

Inspections

Base inspection procedures for aerial lifts on information provided by the manufacturer. Manufacturers provide various inspection intervals due to component function and wear, and deterioration that could affect component life. Frequent inspection items should include:

- All functions and their controls for speed(s), smoothness and limits of motion;
- Lower controls, including provisions for overriding the upper controls;
- All chain and cable mechanisms for adjustment and worn or damaged parts;
- All emergency and safety devices;
- Lubrication of all moving parts, inspection of filter elements, hydraulic oil, engine oil and coolant;
- Visual inspection of structural components and critical components;
- Placards, warnings and control markings;
- Any additional items specified by the manufacturer.

There also are daily prestart inspection procedures that should include quick visual checks and proper function of the following items:

- Operating and emergency controls;
- Safety devices;
- Personal protective devices;
- Air, hydraulic and fluid leaks;
- Cables and wiring harnesses;
- Loose or missing parts;
- Tires and wheels;
- Placards, warnings, control marking and operating manuals;

- Outriggers, stabilizers and extendible axles;
- Guardrail system and access gates and openings;
- Load and its distribution on platform and any platform extensions;
- Any other items specified within the manufacturer's operating manual.

Operating procedures

Before any work is started and while work is being performed from an aerial lift, you must address various site inspection and operating procedures, including:

- Avoiding drop-offs, holes or bumps;
- Checking for floor obstructions and debris;
- Avoiding grades, slopes and ramps;
- Watching for overhead obstructions/high voltage conductors;
- Being aware of wind or weather conditions;
- Providing adequate surface support;
- Looking out for hazardous locations;
- Operating the platform on a surface within limits specified by the manufacturer;
- Using stability enhancing means as manufacturer requires;
- Closing guardrails, access gate or openings per manufacturer's instructions;
- Making sure the load and its distribution are within manufacturer's rated capacity;
- Ensuring adequate clearance from overhead obstructions;
- Having personnel wear required safety gear;
- Maintaining maximum safe approach distance to energized lines and parts;
- Determining hazardous locations;
- Maintaining a firm footing on the platform floor;
- Taking precautions for any other moving equipment operating in the same area;
- Preventing ropes, electric cords, hoses etc. from entangling with the platform;
- Following rated capacities;
- Clearing personnel and equipment from surrounding areas before lowering the platform;
- Shutting down the engine while fueling;
- Charging batteries in well-ventilated areas free of flames, sparks or other hazards that could cause a fire;
- Not using other objects to steady the platform;
- Not using aerial lifts as cranes;
- Limiting travel speed to travel conditions;
- Limiting platform travel height to no more than twice the base width;
- Avoiding stunt driving and horseplay;
- Not altering safety devices or interlocks;
- Driving on grades, slopes or ramps only within the manufacturer's ratings;
- Ceasing operation if any suspected malfunction occurs;
- Permitting only manufacturer's authorized alterations to be made;
- Reporting problems or malfunctions immediately to the supervisor;
- Reporting potential hazardous locations immediately to the supervisor.

Fall protection

Operators of extensible and articulating boom lifts must wear a body harness with a lanyard attached to the boom or basket when working from an aerial lift. Also, operators of ladder trucks and tower trucks must wear a body harness with attached lanyard. The manufacturer's information provided with the lift device includes the proper attachment points and procedures. There are no requirements for the wearing of a body harness and lanyard while working from a scissors-type lift. If it is a policy of your company to wear a body harness with an attached lanyard in a scissors lift, contact the manufacturer to obtain information about suitable anchorage points and proper tie-off procedures.

Reference:

Standard Number	Title
1926.453	Aerial lifts
ANSI/SIA A92.2-1990	Vehicle-mounted elevating and rotating aerial devices
ANSI/SIA A92.6-1990	Self-propelled elevating work platforms

Personal protective equipment

When a hazard is identified on a construction site, make every possible effort to eliminate it so no one is harmed. When exposures to hazards cannot be engineered completely out of normal operations, use protective clothing or equipment. PPE covers:

- Face and eye protection — safety glasses, goggles, face shields, welding and laser protection;
- Head protection — hard hats capable of protection against impact and electrical shocks and burns;
- Hearing protection — ear muffs, and molded and formable ear plugs;
- Protective footwear — steel-toed (safety) shoes, rubber boots, metatarsal guards and slip-resistant soles;
- Respiratory protection — filter respirators, cartridge respirators, supplied-air respirator, and self-contained breathing apparatus;
- Body harness, lanyards and lifelines;
- Special clothing — chemical protective clothing (CPC), hot/cold environment clothes and high-visibility clothing (traffic vests).

Hazards of PPE

While PPE is considered to be part of the job in the construction industry as a rule, it is considered a last-resort, temporary type of protection. For normal operations, always try to eliminate the hazard in the environment before using PPE (unless the law requires the use of PPE.

No single combination of protective equipment and clothing is capable of protecting against all hazards. Thus, you should use PPE in conjunction with other protective methods. PPE use can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, hearing, mobility and communication.

In general, the greater the level of PPE protection, the greater the level of associated risks. For any given situation, select equipment and clothing that provide an adequate level of protection.

Developing a PPE program

Develop a formalized, written program once you decide employees will use PPE. This program should at least include the following elements:

- A communicated policy on usage of PPE to employees and visitors;
- Responsibility for the selection of equipment;
- The requirements of a PPE training program;
- Instructions on the correct use and maintenance of the equipment;
- Corrective action for policy violations;
- Employee involvement and recognition for safe behavior.

For the safe use of any personal protective device, it is essential that you properly instruct employees in its selection, use and maintenance. Additionally, competent persons in the use of PPE should instruct both supervisors and employees. It also is critical that contractors purchase safety equipment that fits properly and provides protection. It may be necessary to purchase more than one style of personal protective devices. Make routine and planned inspections to determine if employees properly issue, use and maintain PPE.

Legal requirements

OSHA Standards for the Construction Industry (29 CFR Part 1926) addresses PPE as follows:

1926.28	Personal protective equipment.
1926.57	Ventilation.

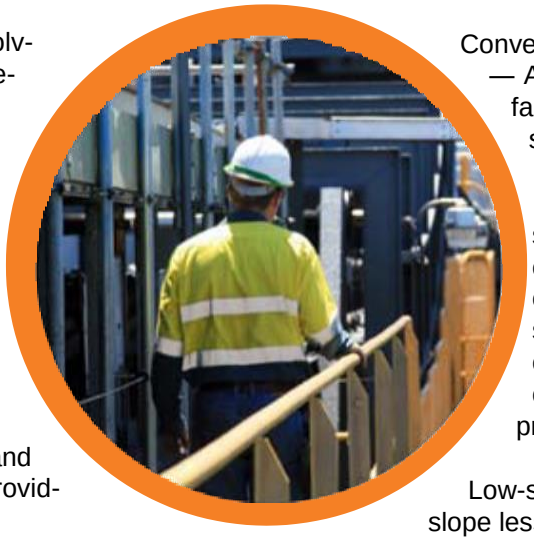
Design. All personal protective equipment shall be of safe design and construction for the work to be performed.

Subpart E - Personal Protective and Life Saving

Section	
1926.95	Criteria for personal protective equipment
1926.96	Foot protection
1926.100	Head protection
1926.101	Hearing protection
1926.102	Eye and face protection
1926.103	Respiratory protection
1926.104	Safety belts, lifelines and laynards
1926.105	Safety nets
1926.106	Working over and near water
1926.107	Definitions

Fall protection

Falls are complex events involving a variety of factors. Consequently, the standard for fall protection deals with both the human and equipment-related issues in protecting workers from fall hazards. The fall-protection rule identifies areas or activities where fall protection is needed. It also clarifies what employers can do to provide fall protection for employees, such as identifying and evaluating fall hazards and providing specific training.



The fall-protection rule sets a uniform threshold height of 6 feet. This means employees must be protected from fall hazards and falling objects whenever an employee is on a walking/working surface 6 feet or more above a lower level. The rule covers most construction workers except those inspecting, investigating or assessing work-place conditions prior to the actual start of work, or after the completion of all work.

Other OSHA regulations cover fall-protection requirements for workers on scaffolds, cranes and derricks, steel erection, equipment used in tunneling, electrical transmission and distribution lines, and stairways and ladders.

Definitions

Competent person — An individual capable of identifying existing and predictable hazards in the surroundings or working conditions that may be unsanitary, hazardous or dangerous to employees. He or she who has authorization to take prompt corrective measures to eliminate them.

Controlled access zone (CAZ) — An area in which certain work (e.g., overhand bricklaying) may take place without the use of guardrail systems, personal fall arrest systems or safety net systems, and access to the zone is controlled.

Conventional fall protection system — A guardrail system, personal fall arrest system or safety net system.

Infeasible — It is impossible to perform the construction work using a conventional fall protection system, or it is technologically impossible to use any one of these systems to provide fall protection.

Low-slope roof — A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).

Qualified person — A person, by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work or the project.

Roofing work — The hoisting, storage, application and removal of roofing materials and equipment, including related insulation, sheet metal and vapor barrier work but not including the construction of the roof deck.

Steep roof — A roof having a slope greater than 4 in 12 (vertical to horizontal).

Duty to have fall protection

Employers are required to assess the workplace to determine if the walking/working surfaces on which employees are to work have the strength and structural integrity to safely support workers. Once employers have determined the surface is safe to work on, they must select a fall-protection system for the work operation if a fall hazard is present.

Protection from falling objects

Recommendations for protection against falling objects include all affected workers wearing hard hats and at least one of the following measures:

- Install toeboards, screens or guardrail systems to prevent objects from falling from higher levels;
- Erect canopy structures and keep potential falling objects far enough from the edge to prevent accidental displacement;
- Provide barricades around areas where objects could fall, and prohibit employees from entering those areas.

Systems criteria and practices

Guardrail systems should comply with the following provisions:

- The top edge height of top rails should be 42 inches (plus or minus three inches) above the walking /working level;
- Install midrails or equivalent intermediate members at a height midway between the top edge of the guardrail system and the walking/working level;
- Guardrail systems should be capable of withstanding a force of at least 200 pounds applied within two inches of the top edge, in any outward or downward direction;
- Guardrail systems should be surfaced to prevent injury to an employee from punctures or lacerations and to prevent snagging of clothing;
- Top rails and midrails must be at least one-quarter inch nominal diameter or thickness to prevent cuts and lacerations. If wire rope is used for top rails, flag it at not more than six-foot intervals with high-visibility material;
- Inspect manila, plastic or synthetic ropes used for top or midrails as frequently as necessary to ensure they meet the strength requirements.

Safety net systems should comply with the following provisions:

- Install safety nets as close as practicable under the walking/working surface on which employees are working but in no case more than 30 feet below;
- Ensure safety nets extend outward from the outermost projection of the work surface as stated below.
- Safety nets need sufficient clearance to prevent contact with objects below.
- Install nets capable of absorbing the impact force of a drop test, which you should perform and document at the job site. The drop test consists of a 400-pound bag of sand, 30 inches, (plus or minus 2 inches) in diameter, dropped from the highest walking/working surface where employees are exposed to fall hazards, but not from less than 42 inches above that level.
- If the employer can demonstrate that a drop test is unreasonable, a competent person can prepare a certification record that the net can withstand the impact force equal to the drop test.
- Inspect the nets at least weekly; look for wear, damage and other deterioration. Remove defective nets from service. Clear material, scrap and equipment caught in the safety net as soon as possible and at least before the next work shift.

Vertical distance from working level to horizontal plane of net	**Minimum required horizontal** distance of outer edge of the net from the working surface
Up to 5 feet	8 feet
More than five feet up to 10 feet	10 feet
More than 10 feet	13 feet

- The maximum opening of the safety net should not exceed 36 square inches and be no longer than 6 inches on any side. When measuring center to center, the rope or webbing should not exceed 6 inches;
- The breaking strength of border rope should be a minimum of 5,000 pounds. Connectors need to be as strong as the integral net and spaced no more than 6 inches apart.

Personal fall-arrest systems should comply with the following provisions:

- Body belts are not acceptable as part of a personal fall arrest system. The use of a body belt in a positioning device system is acceptable;
- Only locking-type snaphooks are permitted for use;
- On suspended scaffolds or similar work platforms with horizontal lifelines, which may become vertical lifelines, the devices used to connect to a horizontal lifeline must be capable of locking in both directions;
- Lanyards and vertical lifelines must have a minimum breaking strength of 5,000 pounds. They also must be protected against being cut or abraded;
- Self-retracting lifelines and lanyards which limit free fall distance to 2 feet or less must be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position;
- Anchorages used for attachment of personal fall arrest equipment must be independent of any anchorage being used to support or suspend platforms and capable of supporting at least 5,000 pounds per employee attached, or be designed, installed and used as follows:
    1. As part of a complete fall-arrest system which maintains a safety factor of at least two;
    2. Under the supervision of a qualified person.

When stopping a fall, personal fall-arrest systems must:

1. Limit arresting force on the body to 1,800 pounds when used with a body harness;
2. Be rigged so that an employee can free fall no more than 6 feet;
3. Bring an employee to a complete stop and limit maximum deceleration distance an employee travels to 3.5 feet;
4. Have sufficient strength to withstand twice the potential impact energy of an employee free falling a distance of 6 feet, or the free fall distance permitted by the system, whichever is less.

- When personal fall-arrest systems and components are subjected to impact loading, immediately remove from service;
- Inspect personal fall-arrest systems and components prior to each use for wear, damage and other deterioration. Remove defective components from service;
- Never attach personal fall-arrest systems to guardrail systems.

Positioning device systems should comply with the following provisions:

- Ensure that positioning devices are secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater;
- Requirements for all hardware and components must meet the same criteria as those for personal fall arrest systems.

Warning line systems should comply with the following provisions:

- Erect warning lines around all sides of the roof work area;
- When not using mechanical equipment, erect the warning line no less than 6 feet from the roof edge;
- Warning lines may consist of ropes, wires or chains and supporting stanchions erected as follows:
    1. Flag the line at not less than 6-foot intervals with high-visibility material;

2. Rig the line and support it so that its lowest point is no less than 34 inches from the surface and it highest point no more than 39 inches;
3. After being erected with the line attached, stanchions must be capable of resisting without tipping a force of at least 16 pounds applied horizontally against the stanchion, 30 inches above the surface;
4. The line must have a minimum tensile strength of 500 pounds.

- Attach the line at each stanchion in such a way that pulling on one section between stan- chions will not result in slack being taken up in adjacent sections before the stanchion tips;

- Employees are not permitted in the area between a roof edge and warning lines unless they are performing roofing work in that area.

Controlled access zones should conform to the following provisions:

- When used to control access to areas where leading edge and other operations are taking place, define the zone by a control line or other means that restrict access;
- When control lines are used, erect them no less than 6 feet nor more than 25 feet from the unprotected or leading ledge, except when erecting precast members;
- When erecting precast members, erect them no less than 6 feet nor more than 60 feet or half the length of the member being erected, whichever is less, from the leading edge;
- Extend the line along the entire length of the unprotected or leading edge, and ensure it is parallel to the unprotected or leading edge;
- Connect the line on each side to a guardrail system or wall;
- When used to control access to areas where overhand bricklaying and related work are taking place:
  1. Define the zone by a control line erected not less than 10 feet or more than 15 feet from the working edge;
  2. Extend the line for a distance sufficient for the zone to enclose all employees performing overhand bricklaying and related work at the working edge and be approximately parallel to the working edge;
  3. Erect additional control lines at each end to enclose the zone;
  4. Permit only employees engaged in overhand bricklaying or related work in the zone.
- Control lines can consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:
  1. Flag or clearly mark each line at not more than 6-foot intervals with high-visibility material;
  2. Rig each line so that its lowest point is not less than 39 inches from the surface and its highest point not more than 45 inches;
  3. Each line must have a minimum breaking strength of 200 pounds.

Safety monitoring systems should comply with the provisions listed below.

- The employer must designate a competent person to monitor the safety of other employees, and ensure the monitor complies with the following requirements:
  1. Be competent to recognize fall hazards;
  2. Warn affected employee when it appears that he or she is unaware of a fall hazard or is acting in an unsafe manner;
  3. Be on the same surface and within visual sighting distance of the employee being monitored;
  4. Be close enough to communicate orally with the employee;
  5. Must not have other responsibilities which could take his or her attention from the monitoring function.
- Do not use or store mechanical equipment in areas where safety-monitoring systems are being used to monitor employees engaged in roofing operations on low-sloped roofs.
- No employee, other than an employee engaged in roofing work (on low-sloped roofs) or an employee covered by a fall-protection plan, is allowed in an area where a safety monitor- ing system is protecting an employee.

Lockout/tagout procedures

This procedure provides the fundamental components necessary for the deactivation of the mechanical/electrical energy sources through a lockout/block-out/tagout system.

General

Employees are exposed to a variety of energy sources when performing daily repairs, modifications and adjustments to their operating equipment. To eliminate the hazards associated with these activities, employers will instruct employees in the correct methods to employ when performing these operations.

Definitions

- Hazardous energy sources — Classify a hazardous energy source as mechanical, electrical, pneumatic, hydraulic, chemical, thermal or gravity.
- Lockout device — A device (a padlock or a combination of padlock and multiple-lock hasp hardware) you can use to prevent a hazardous energy source from being re-energized.
- Tagout device — A warning tag that an employee attaches to critical areas to communicate why you should not re-energize an energy source. The tag contains the name of the employee, the date and time the employee initiated the tag and a brief description of work to be performed.
- Authorized employee — A person who locks out or tags out to perform the maintenance or service task.
- Affected employee — A person who is exposed to lockout/tagout procedures.

Program elements

Follow these steps prior to initiating any repairs, modifications and/or adjustments to operating equipment:

1. Notify an affected person with jurisdiction over the equipment to deactivate energy sources;
2. The authorized person, who will work on the equipment, will identify all sources of power that he/she must lock out, block or release;
3. To ensure employees cannot re-energize the equipment while maintenance activities are performed, the employee will lock out/blank out all potential energy sources. Assign employees padlocks with their names or identification numbers affixed to the locks. Individually key the locks to prevent another employee from removing the lock inadvertently. If more than one employee is assigned to work on the equipment, use a multi-lockout hasp so that all employees working on the equipment will apply their locks and ensure their safety;

4. Affix a tagout device to all components or systems de-energized to indicate that a lockout procedure has been performed;
5. Prior to performing any work activities, the authorized person will test the systems to ensure he or she properly deactivated the equipment;
6. Upon completion of the work, the authorized person and the supervisor will verify the equipment on the system is safe to operate. Give special consideration to the installation of guards and covers for electrical wiring, and to ensure all piping systems have been properly reconnected. Also notify the affected worker when the machine is OK to use.

Special conditions

During certain operations, it may be necessary to energize the equipment for a short period of time. Notify and direct employees in the immediate area to stay clear of the equipment. If you plan to deactivate the operation again, have the authorized person repeat the third, fourth and fifth steps in the preceding paragraph before work resumes.

In some instances work will carry over to another shift. A designated person must affix a department lock to the equipment to ensure it is not energized during the transition. When the next shift employee comes to work on the piece of equipment, he or she will repeat the second through the fifth preceding steps before work resumes on the equipment.

If the work is completed and a lock remains on the equipment, nobody will remove it until the employee responsible for the lock is found or the supervisor of the employee investigates and ascertains that the equipment is safe to operate. Unauthorized removal of a lock will subject the employee to disciplinary action.

Electrical work

Prior to doing any electrical work, a qualified person must:

- Lock out the system;
- Open the disconnect;
- Make a visible inspection of the electrical panel to ensure that all blades on knife switches are open or that the circuit is open;
- Check the voltage tester on a known energized voltage source;
- Check the voltage on the load side of the circuit to make sure it is de-energized;
- After performing the voltage test, re-check the tester on a known source to ensure that it was operating correctly;
- Remove any fuses that are in the motor disconnect box;
- Close the box and place a tag and his or her lock on the disconnect switch prior to doing any other work;
- Prior to working any capacitors, discharge and ground them, and then check with the voltage tester.

First aid and medical attention

Report all work-related injuries and illnesses, regardless of severity, immediately to management. Injured employees should receive proper, competent first aid or medical care. Each facility or job site should have at least one employee per shift who is trained to provide first aid or CPR. In the case of confined space entry, at least two employees must be trained to provide first aid and CPR in accordance with OSHA's confined space entry regulations. The administration of first aid or CPR in the first few minutes of an emergency prior to the arrival of doctors, nurses or a life squad can mean the difference between the life and death of an ill or injured employee.

Designated first-aid providers should be trained in first aid, and trained and certified in CPR. First-aid training should be appropriate for the industry and its risks, including but not limited to:

- Evaluating the safety and danger of the scene;
- Evaluating and treating the injuries and illnesses, including shock, bleeding, heart attack, choking, seizures, fractures and sprains, eye injuries, chemical and thermal burns, poisoning, chemical exposure, and handling an unconscious person.

First-aid providers appointed by management must be trained in bloodborne pathogen risks and the safety procedures necessary to avoid those risks. If these providers are exposed to bloodborne pathogens, management must offer them the Hepatitis B inoculation series and medical counseling. Advise first-aid providers acting as Good Samaritans of bloodborne pathogen risks and the necessary safety procedures.

Make provisions prior to commencement of the project for prompt medical attention in case of serious injury. Develop a medical emergency response plan. The plan directs the company's action following an injury or illness. Specifically, it identifies:

- Emergency phone numbers;
- The address and location of the job;
- Individuals responsible for giving first aid on the job site;
- The process of referral to a local hospital, doctor or clinic;
- The location of emergency medical supplies and material safety data sheets;
- The location of safety equipment needed during a medical emergency that may include respirators, chemical splash suits, emergency lighting, safety harnesses and ropes;
- Reporting, documentation and the investigation of the incident.

Keep first-aid supplies in an accessible, convenient area, inspected on a monthly basis and replenished as necessary. It is essential that you train all employees in the accepted procedures for reporting injuries and illnesses, and for obtaining appropriate care. Prompt care can often avoid medical complications that can result from apparent minor injuries.

Proper reporting also allows for investigation of both accidents and incidents. Begin the investigation process as soon as you secure the scene and treat any injured employee. Compose investigation teams of management representatives, supervisors and employees. Investigate accidents and incidents completely to discover their true causes.

Investigation leads to the prevention of future accidents and, thus, the prevention of injury and death.

To: MARK DELCHER, DIRECTOR OF HUMAN RESOURCES

I _____ hereby acknowledge that I have received, read and understand the Facilities Handbook. I have been given an opportunity to ask any questions I may have. I further understand that this Handbook discusses general safety procedures and agree to abide by them. I understand the importance of workplace safety and the financial liability of the district when those procedures are ignored.

_____ _____

Name of Employee- Print Clearly Date

_____

Signature of Employee

_____

School/Location/Department