COLD-RELATED SAFETY PRECAUTIONS

During the winter months construction workers face an additional occupational hazard - exposure to the cold. Some health problems can arise including frostbite, trench foot and hypothermia.

Frostbite

Occurs when skin tissue actually freezes and cell damage results. Fingers, toes, cheeks, nose, and ears are primarily affected. The symptoms of frostbite include an uncomfortable sensation of coldness; there may be a tingling, stinging, or aching feeling followed by numbness. First aid includes treating affected areas with warm water at 102° to 110°F. Be careful to avoid rubbing frostbitten areas because this can lead to greater tissue injury. If there is a chance for refreezing, do not rewarm the affected areas.

Trench foot

Trench foot may be caused by long and continuous exposure to a wet and cold environment or immersion in water. Symptoms include a tingling and/or itching sensation, pain, and swelling. Blisters may form and be followed by death of skin tissue and ulceration. First aid treatment for trench foot is similar to the treatment for frostbite, and includes: moving the victim to a warm area; treating the affected part with warm water (102°-110°F) or warm packs; arranging bed rest in a warm environment; and obtaining medical assistance as soon as possible.

Hypothermia

The progressive loss of body heat with prolonged exposure to cold defines hypothermia. Body heat loss is accelerated more rapidly when a person is wet because of sweat or working in a damp environment. The first symptoms are uncontrollable shivering and feeling of cold. As the body's temperature continues to drop, an individual can become confused, careless, and disoriented. Individuals experiencing mild hypothermia should be moved to a warm, dry shelter. Removing wet clothing and applying warm blankets for insulation minimizes further heat loss. Warm, nonalcoholic, caffeine-free drinks may be offered. More severe cases of hypothermia require intensive medical care.

Preventing Cold-Related Disorders

- Dress appropriately. Wear layers: an outer layer to break the wind and allow some ventilation (like Gortex or nylon); a middle layer of wool, down, or synthetic pile to absorb sweat and retain insulating properties when wet; and an inner layer of cotton or synthetic weave to allow ventilation and escape of perspiration. Keep a change of clothes available.
- Protect your feet, hands, head, and face. Keep the head covered (up to 40 percent of body heat can be lost when the head is exposed).
- Wear footgear that protects against cold and dampness.
- Avoid wearing dirty or greasy clothing because such garments have poor insulating properties.
- Provide a heated shelter for workers who experience prolonged exposure to the equivalent wind-chill temperature of 20°F or less and shield work areas from drafty or windy conditions.
- Use thermal insulating material on the handles of equipment when temps drop below 30°F.
- Allow individuals to set their own pace, work in pairs and take extra work breaks when needed.
- Avoid activities, whenever possible, that lead to heavy perspiration.
- Shift as many outdoor activities as feasible to the inside; select the warmest hours of the day to work outside.
- Minimize activities requiring sitting or standing in a cold environment for long periods of time.
- Keep energy levels up and prevent dehydration by consuming warm, sweet, caffeine-free, nonalcoholic drinks and soup.
- Seek warm shelter following these symptoms: heavy shivering, an uncomfortable sensation of coldness, severe fatigue, drowsiness, or euphoria.

DISCUSSION QUESTIONS

- What are some steps you can take to stay warm and safe when working in cold temperatures?
- What should you do if you have any symptoms of cold related illnesses?

DEFENSIVE DRIVING

The formula for defensive driving is see the hazard, understand the defense and act in time. All drivers must apply this formula to prevent accidents in spite of the actions of other drivers or the presence of adverse driving conditions. A defensive driver must be able to accurately predict the outcome of traffic situations in order to apply the appropriate defense in time to prevent an accident.

Let's take a closer look at the standard accident prevention formula and ways that it can be applied to everyday driving situations.

See the hazard: Think about what may happen as far ahead of reaching a situation as possible. Never assume that a condition will have passed before you approach it.

What are some of the hazardous conditions that you should look for?

- You see an approaching vehicle starting a pass. It looks like he will complete the pass in plenty of time, but you are not really sure. Think about your defense.
- You see a vehicle on the shoulder of the road, but you can't see the driver anywhere outside the vehicle. Will he open his door as soon as you approach his vehicle? What should you do?
- You are traveling along a residential street. The vehicle approaching is a convertible with its top down. On the same side of the street you see a lawn sprinkler that is spraying water onto the roadway. What do you think the approaching vehicle will do?

These are three simple examples that could result in an accident. There are many more, so look beyond the vehicles ahead, and look for situations that may develop into an accident. **See the hazard.**

Understand the defense: There are specific ways to handle most situations. Review these situations in your mind so you can act quickly to prevent an accident.

You probably thought about a defense for the situations above. Let's look at a few more situations and briefly review the defense.

- You're approaching an intersection on a wet slippery highway. The traffic light has been green for some time. You see vehicles waiting for the light to change at the intersection.

  You can't expect to come to a smooth even stop when traveling on a slippery highway. Since the traffic light has been green for some time, anticipate a change. Slow down gradually, well ahead of the intersection and apply your brakes carefully. Give yourself plenty of time.

- You're descending a hill and you start to pump your brakes and nothing happens—the pedal slaps the floor.

  Don't panic—try to downshift into a lower gear. Look for something to sideswipe—a snow bank, roadside brush or a guardrail. Use your horn and flash your lights to warn others that your vehicle is out of control. Do whatever you can to prevent bodily injury. Vehicles can be replaced.

In an emergency situation, you should not panic. Stay calm and apply the best defensive action. **Understand the defense.**

Act in time: Once you see the hazard and decide upon a defense, you must act immediately. Never assume that the condition will clear up. The sooner you act the more time you will have to avoid an accident.

Defensive driving does not come easy. You must constantly improve your skills of observation and coordination. Go over situations in your mind and plan your defenses. Seeing the hazard, knowing the defense and acting in time will help keep you safe.

DISCUSSION QUESTIONS

- What is the formula for defensive driving?
- How can you understand the defense for driving situations?

EAR PROTECTION

Imagine what it would be like to live without being able to hear! Hearing enables you to carry on a conversation, to enjoy your favorite music on your CD player at home or on your truck or car radio. On the job you can hear the back-up alarms on bi-directional earthmoving equipment, or the warning sound of a crane horn.

More than twenty million Americans suffer some measurable hearing loss and sixteen million workers are exposed to noise on the job that could damage their hearing. OSHA regulations require employers to take measures to reduce exposure to noise levels at or above 90 decibels. The intensity of a sound is measured in decibels (DB). A whisper measures about 20 dB, our average speaking voice is 60 dB, a shop saw is 100 dB and a jet plane is 140 dB.

Many areas around the job site have high noise levels and everyone needs to take the proper steps in preventing injury to their hearing. First we can try to engineer the noise away by putting up sound barriers or enclosing certain processes. Second, the company can schedule workers so they spend less time around high noise operations. Depending on the circumstances, these two options may not be possible to implement but the third thing we can do anywhere, anytime -- wear hearing protection. Different shapes sizes are available -- ear plugs will give you some protection, ear muffs provide you with better protection. To achieve maximum protection you should use both.

Your employer is responsible for requiring the wearing of hearing protection in all operations where there is exposure to high noise levels. As an employee, your responsibility is to obey warning signs that tell you hearing protection is required - use common sense -- if the noise is loud, use protection.

Both loud and impulse noise can slowly destroy your hearing. Wearing protection is your best bet against hearing loss.

DISCUSSION QUESTIONS

- Are there instances on this job site where noises seem particularly loud?
- What types of hearing protection are available to you?

ELECTRICAL HAZARDS

Many people mistakenly think that 110 volts of electricity can't seriously injure or kill a person. However, low voltage electricity can be extremely dangerous, particularly if you use portable electric tools. One cause of electric shock when using portable electric tools is the failure of the insulation between the current-carrying part and the frame of the tool. When insulation fails, fatal electric shock, severe burns or even a fall from one level to another may result.

Electricity always tries to reach a ground potential and will always take the path of least resistance. If the outer metal shell of a defective tool becomes energized, the operator sets up a direct path through his own body between the energized tool and the ground itself. The ground can be the earth or it could be pipes or steel building structures that are in contact with the earth. Body resistance is lowered when you work in wet areas or sweat heavily; electricity can then flow easily through vital regions of the body.

When you work in a wet area, near a water pipe, grounded tank, or reinforcing rods that may be grounded, be extra careful to keep yourself as dry as possible. Stand on a wooden platform or use rubber boots. In places where tools may become wet, only use tools that are designed especially for that type of service.

Keep portable electric tools in good condition through the use of a regular inspection program. It is your responsibility to inspect your tools prior to use. Check tools and cords and turn in any that needs repair as soon as you see a defect.

Inspections

- Ensure **all** tools, equipment and extension cords are in good condition.
- Prohibit work on energized electrical circuits.
- Prohibit the use of frayed or worn electrical cords or cables.
- Ensure that only grounded type extension cords designed for hard or junior hard service (Type SJ, SJO, SJT, SJTO, S, SO, ST and STO) are used.
- Check portable electric tools before use to ensure that the cord and plug are in good condition.
- Ensure that broken or damaged tools and equipment are removed from service.
- Ensure that portable electrical tools and equipment are either grounded or of the double insulated type.
- Ensure that all construction power is protected by GFCI even if the outlet is not.
- Ensure that each 15 or 20 ampere, 120 volt AC receptacle, not part of the permanent wiring of the building, is protected by either ground-fault circuit interrupters or an assured equipment grounding program.
- Ensure that electrical equipment and cords used in wet or damp locations are approved for wet and damp locations.
- Ensure that listed, labeled or certified equipment is used in accordance with the instructions included in the listing, labeling or certification.
- Ensure that when a circuit breaker is removed from a circuit breaker panel, it is replaced with either a breaker or a blank.
- Ensure that unused openings in electrical boxes are effectively closed.
- Prohibit bypassing any protective system or device designed to protect employees from contact with electrical current.
- Ensure that electrical cords are protected from physical damage.
- Ensure electrical equipment is used only as approved and listed.

DISCUSSION QUESTIONS

- What path does electricity usually take?
- What should you do if you work in a wet area with power tools?
- What are three inspections that are recommended?

EXTENSION CORD SAFETY

Nothing about an extension cord suggests danger - there are no moving parts, no flames, no noise. It is harmless looking, yet it can be extremely dangerous if misused.

Good extension cords should be used all the time - heavy duty rated cords that are approved and tested by Underwriter's Laboratories. Cords that show wear should be repaired or thrown out.

There are some hazards in using extension cords that only you can control. First of all, no extension cord can stand rough usage. If you kink it, knot it, or crush it and even bend it, you can break the insulation, which may cause a short circuit and a fire or even an electric shock.

Most cords used carry regular 110-volt electricity. No doubt at some time you have received a shock from a 110-volt line without serious harm - just a great tingling sensation. But even a 10-volt current can kill. It is not harmless. The conditions, however, must be right. The right conditions may consist of making a good connection with a live wire carrying a 110 voltage with wet or sweaty hands, and standing or lying on the ground, a wet floor, a water pipe or another electrical connection.

So, protect the extension cords you use. Coil them in large loops, not in close kinked coils. Don't bend them unnecessarily. Don't repair them yourself.

In special situations, special types of cords are needed. Some cords are water-resistant, others are not. Some are insulated for heat resistance, others are designed to stand the action of solvents and other chemicals that may be present.

These rules should be applied for the safe use of extension cords:

- Inspect all extension cords at the beginning of each workday for any signs of wear or damage. Remove any worn, severely discolored or damaged cords from service immediately.
- Before each use, check the cord for the presence of a ground blade on the male end of the cord.
- Handle the cord gently, avoiding strain, kinking, crushing or cutting.
- String it where it will not be hit or tramped on.
- If moisture, heat or chemicals are present, be sure your cord is the proper type to resist the conditions that are present.
- Extension cords should not be used as ropes to raise and lower tools and materials.
- If a cord is unusable but repairable, tag it out until it is fixed.

DISCUSSION QUESTIONS

- Where do our tagged and unused tools and extension cords go?
- Do you know what the proper storage is for extension cords?

EYE PROTECTION

Eye protective devices have been used in the construction industry since 1910. Undoubtedly, many workers have escaped serious eye injury because of it. You may know of workers who have been spared injury or even blindness because they wore eye protection at the right time.

Take time to select the right kind

To protect the eyes from nails, wood chips, metal shavings, dusts, acids, and other building-related flying particles and chemicals, wear the appropriate eye protection. Depending on the job, you might wear safety glasses, goggles or a full-face shield. Today, we have eye protection available that will suit every type of exposure. People who wear glasses with corrective lenses may need prescription safety glasses or goggles that can be worn over their regular glasses for protection against damage or breakage.

Basically, there are four types of particles that cause eye injuries on the job:

Unidentified flying objects - These microscopic objects consist of dust and particles floating around in the air, generally by wind, equipment or cleaning operations. When working in dusty conditions, wear eye protection. Even a small speck in the eye can lead to trouble.

Particles resulting from chipping, grinding, sawing, brushing, hammering or using power tools - These particles move at an amazing speed and strike with the force of a bullet. Wear eye protection any time overhead operations are performed. Some jobs may require safety goggles under a full face shield.

Invisible Hazards - You can't see the injurious light rays generated by welding operations or laser beams and their effects are often not felt until hours later. Wear the appropriate eye protection required when using this equipment; if you happen to be working nearby, don't look in the direction of welding arcs or where a laser beam is being used.

Liquids - Hot liquids, such as tar or asphalt, solvents, paint and solutions for cleaning masonry or metal can cause serious eye injury if splashed in your face. The use of proper eye protection, possibly a full face shield and goggles, is essential when transferring liquids between containers and when using caustic or acid cleaners.

When to use eye protection

There are many operations on construction projects where it's mandatory for workers to wear eye protection. The following is only a partial list:

- Cutting construction materials with any type of power tool.
- Using pneumatic and powder-actuated nailguns.
- Using of manual impact tools, such as hammers.
- Chipping, sledging and hammering on metal, stone and concrete.
- Brushing, and grinding.
- Drilling, scaling and scraping.
- Gas welding, cutting, brazing, soldering.
- Electric arc welding and cutting, and other operations which subject the eyes to flying particles, dust, hot liquids, molten substances, gases, fumes and liquids.
- Handling of acids, caustics and creosoted materials.
- Handling of hot tar.

Some workers object to eye protection because it fogs up. Fogging occurs because sweat vaporizes and coats the inside of the lens. Wear a handkerchief or sweatband around your forehead to keep perspiration off your eye protection or use anti-fog eye protection or an anti-fog liquid coating.

DISCUSSION QUESTIONS

- Are there any operations on this construction project that would require safety glasses, goggles, or other eye protection?
- Do you personally know of anyone who has had an eye injury because they were not wearing eye protection?
- From which person in this company do we obtain our eye protection devices when needed?

FALL PROTECTION

Falls are one of the most devastating types of injuries on a job site. When fall protection is in place and used properly, falls and fall-related injuries can be prevented. There are several types of fall protection available; guardrail systems also aid in fall prevention.

Fall prevention practices

- Assess the jobsite to determine if the walking and working surfaces have the strength and structural integrity to safely support workers.
- Workers exposed to falling six feet or more from an unprotected side or edge should be protected by a guardrail system, safety net system or personal fall arrest system.
    - A personal fall arrest system consists of an anchorage, connectors, body harness, and may include a lanyard, deceleration device, lifeline, or a suitable combination.
- Workers in a hoist area exposed to falls of six feet or more should be protected by either a guardrail system or personal fall arrest system.
- Employees exposed to a floor opening more than six feet above lower levels should be protected by personal fall arrest systems, covers or guardrail systems.
- Employees using ramps, runways and other walkways should be protected from falling six feet or more by a guardrail system.
- Employees engaged in roofing activities on low-slope or flat roofs with unprotected sides and edges six feet or more above the lower level should be protected from falling by a guardrail system, safety net, personal fall arrest system, or a combination warning line system and guardrail system, warning line system and safety net system, warning line system and personal fall arrest system, or warning line system and safety monitoring system.
- Employees engaged in roofing activities on steep roofs with unprotected sides and edges six feet or more above the lower level should be protected from falling by a guardrail system with toeboards, safety net or personal fall arrest system.

Guardrails

Guardrails protect you from falls that can seriously injure or even kill. The amount of protection guardrails provide depends on how they are constructed and maintained. Most guardrails are built of strong materials and are usually solid when first put up. However, guardrails often are abused, weakened, broken or removed and not replaced. Weakened guardrails are sometimes more dangerous than no guardrails at all because they give a false sense of security.

As you go about your job

- Get into the habit of checking guardrails.
- If you discover a weakened or a missing rail or section, correct the situation if you can or report it so that the hazard can be eliminated.
- If you bump a rail with material or equipment, check to see if it is weakened.
- If you discover a broken rail, upright or toeboard, repair it if you can. Otherwise, report it so that it can be repaired.
- When repairing or replacing guardrails, use another means of fall protection as you are exposed to the very danger that you are providing protection against.

DISCUSSION QUESTIONS

- Is there a need to utilize fall protection on our job sites?
- What type of fall protection do you think is appropriate for this job site?
- What should you do to help keep our job site safe from falls?

FORKLIFT SAFETY

Training and certification requirements

Only trained and certified forklift operators are allowed to operate the forklift. The employer may create and implement a written forklift operator training program and perform training internally (operating rules should be posted and enforced). Operator recertification is required every 3 years.

Picking up a load

- "Square up" on the center of the load and approach it straight on with the forks in the travel position; stop when the tips of your forks are about a foot from the load.
- Level the forks and slowly drive forward until the load is resting against the backrest of the mast.
- Lift the load high enough to clear whatever is under it.
- Back up about one foot, then slowly and evenly tilt the mast backwards to stabilize the load.

Putting a load down

- "Square up" and stop about one foot from the desired location.
- Level the forks and drive to the loading spot; slowly lower the load to the floor.
- Tilt the forks slightly forward so that you do not hook the load.
- When the path behind you is clear of obstructions, back straight out until the forks have cleared the pallet.

Stacking one load on top of another

- Stop about one foot away from the loading area and lift the mast high enough to clear the top of the stack.
- Slowly move forward until the load is squarely over the top of the stack.
- Level the forks and lower the mast until the load is no longer supported by the forks.
- Look over both shoulders for obstructions and back straight out if the path is clear.

Lifting

- Do not exceed the lift capacity of the forklift; read the lift capacity plate on the forklift if you are unsure. Follow the manufacturer's guidelines concerning changes in the lift capacity before adding an attachment.
- Lift the load an inch or two to test for stability; if the rear wheels are not in firm contact with the floor, take a lighter load or use a forklift that has a higher lift capacity.
- Do not raise or lower a load while you are en route; wait until you are in the loading area and have stopped before raising or lowering the load.
- After picking up a load, adjust the forks so that the load is tilted slightly backward for added stability. Raise the forks an additional two inches to avoid hitting or scraping the ramp surface as you approach the ramp.

Loading docks

- Keep the forklift clear of the dock edge while vehicles are backing up to the dock.
- Do not begin loading or unloading until the supply truck has come to a complete stop, the engine has been turned off, the dock lock has been engaged and the wheels have been chocked.
- Do not drive the forklift into the truck until the bridge or dock plate has been attached.
- Do not drive the forklift into a truck bed or onto a trailer that has "soft" or loose decking or other unstable flooring.
- Drive straight across the bridge plates when entering or exiting the trailer and use dock lights or headlights when working in a dark trailer.

Safe Practices

- Ensure substantial overhead protective equipment is provided on high lift rider equipment.
- Ensure each industrial truck has a warning horn, whistle or other device that can be clearly heard above the normal noise in the area.
- Ensure the brakes on each industrial truck are capable of bringing the vehicle to a complete and safe stop when fully loaded.
- Ensure the truck's parking brake will prevent the vehicle from moving when unattended.
- Ensure that industrial trucks operating in hazardous areas (e.g., where flammable gases or vapors, combustible dust or ignitable fibers may be present) are approved for such locations.
- If industrial trucks with internal combustion engines operate in buildings or enclosed areas, carefully check to ensure such operations do not cause harmful concentration of dangerous gases or fumes.
- Prohibit employees from riding on the lift truck unless a seat is provided; use seatbelts. Each rider must have a seat and not ride on sides or forks.
- Do not remove passenger compartment guards or rollover protection devices; do not use people as counterweights.
- Do not use bare forks as a man-lift platform. Utilize a manufactured man-lift basket, securely attached to the forklift for the lifting of workers. Never move the forklift with personnel in the basket. The worker is to wear a harness secured to the basket at all times during the lift.
- Approach railroad tracks at a 45° angle when driving the forklift.
- Steer the forklift wide when making turns and sound the forklift horn when approaching blind corners, doorways or aisles to alert other operators and pedestrians.

DISCUSSION QUESTIONS

- Where are our forklift operating rules and procedures posted?
- Who is certified as a forklift operator on this jobsite?

GENERAL SAFETY IS EVERYONE'S RESPONSIBILITY

Safety is everyone's responsibility! As an employee, you should:

- Learn to work safely and take all rules seriously.
- Recognize hazards and avoid them.
- Report all accidents, injuries, illness and near misses to your supervisor immediately.
- Inspect tools before use to avoid injury.
- Wear all assigned personal protective equipment.

On the other hand, it is management's responsibility to:

- Provide a safe and healthy workplace.
- Provide personal protective equipment.
- Train employees in safe procedures and in how to identify hazards.

Everyone must be aware of potential hazards on the job:

- Poor housekeeping results in slips, trips and falls.
- Electricity can cause shocks, burns or fire if not handled properly.
- Poor material handling may cause back problems or other injuries.
- Tools and equipment can cause injuries if guards or protective devices are disengaged.

Always use the protections that are provided on the job:

- Guards on machines and tools keep body parts from contacting moving equipment.
- Insulation on electrical equipment prevents burns, shock and fire.
- Lockout/tagout assures equipment is de-energized before it is repaired.
- Personal protective equipment shields your body from hazards you may face on the job.

In case of emergency:

- Understand alarms and evacuation routes.
- Know how to notify emergency response personnel.
- Implement a procedure for leaving the scene safely so emergency personnel can do their job.
- Wipe up spills promptly and correctly.

Safety benefits everyone! By incorporating safety rules, employees avoid injury as well as illness from exposure to hazardous substances. With fewer injuries, a business can be more productive and profitable.

The welfare of the community is also enhanced by providing cleaner air and water and less chance of dangerous accidents that can put lives and property at risk.

DISCUSSION QUESTIONS

- What are three things you can do to make our job site safer?
- What are three things management should do to make our job site safer?
- What are several potential job site hazards you should be aware of?

HAND HELD TOOLS

Keep all hand tools in good condition. Check to be sure that safety devices are in place and in proper working order. Lubricate your tools on a regular schedule. Keep them sharp and they will help you perform your job safely.

Typical hand tools include hammers, wrenches, screwdrivers, hand saws, axes, hacksaws, shovels, rakes, come-a-longs, picks, sledge hammers, wheelbarrows, levels, knives, punches, chisels, pliers, etc. Each has a particular job to do and it's your responsibility to use the tool as the manufacturer designed it. Short cuts using the wrong tool will often cause an accident. A perfect example of this is using a screwdriver to pry with when the right tool is a pry bar.

When using hand tools remember to wear the proper personal protective equipment. If there is any potential for an eye injury, safety glasses are a must. Protect your hands by wearing gloves. Watch out for sharp pointed tools as well as sharp edges on saws -- both will cause a nasty cut if handled improperly. If you have any question about what to wear ask your supervisor.

After you're done with a hand tool return it to the place it belongs. This may be your own tool box or belt, or it may be back in the tool trailer or gang box. When you return it, place it properly so that the next person can pick it up without the possibility of injury. Should a tool get damaged take it out of service and tag it out until repairs are made. If it can't be repaired, dispose of it. Defective tools are dangerous and should not be used.

Inspections

- Replace hand tools, such as chisels and punches, that develop mushroomed heads.
- Replace hammers, axes and similar tools that have broken or fractured handles.
- Ensure tool handles are wedged tightly in the head of all tools.
- Ensure tool's cutting edges are kept sharp.
- Ensure appropriate safety glasses, face shields, etc. are used while using hand or powered tools or equipment that might produce flying materials or is subject to breakage

Hand tools make your job much easier. Care for them properly and use them wisely.

DISCUSSION QUESTIONS

- Have you checked your toolbox recently for damaged tools?
- Do you always use the right tool for the job, even if the job takes only a few seconds?

HARD HATS

The average safety hard hat weighs about 14 ounces; the average man's head weighs 14 pounds. So, a hard hat provides about an ounce of safety for every pound of head — provided the head protection is properly worn and maintained.

The brain is the control center of the body and the slightest damage to any part of the brain will cause malfunction of some area of the body. The skull, under normal circumstances, protects the brain. But, when the possibility of injury from falling or flying objects exists, additional protection is required.

Hard hats not only reduce the chance of serious injury resulting from falling objects, but they also provide protection when you bump your head on things like machinery, ductwork, ceiling tie wires and forms. Non-conductive hard hats protect you from electrical shock and burns (never wear metal hard hats around electrical work).

The better care you take of your hard hat, the better care it will take of you. Here are some suggestions:

- Properly adjust suspension systems to maintain clearance between your head and the shell of the hat.
- Don't cut holes for ventilation. Don't heat and bend your hard hat.
- Don't substitute a "bump cap." They aren't strong enough.
- Don't paint your hard hat.
- Don't put anything under the hard hat except your head; this includes cigarettes or notebooks.
- Don't wear your hard hat backwards.

The hard hat is a useful piece of safety equipment. But like any other protective device, it must be properly adjusted and worn and kept in good condition to give you maximum protection. Don't be a hard head — get in the hard hat habit.

DISCUSSION QUESTIONS

- Why are hard hats so important?
- Name three hazards hard hats protect you from.
- What are three ways to properly use your hard hat?

HEAT-RELATED ILLNESSES

There are a number of heat related illnesses including heat stroke, heat exhaustion and heat cramps.

Heat stroke

The most serious health problem for workers in hot environments, is caused by the failure of the body's internal mechanism to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include mental confusion, delirium, loss of consciousness, convulsions or coma; body temperature of 106°F or higher; hot dry skin which may be red, mottled or bluish. Victims may die unless treated promptly. Medical help should be called and the victim must be moved immediately to a cool area and his or her clothing soaked with cool water. He or she should be fanned vigorously to increase cooling.

Heat exhaustion

Develops as a result of fluid loss through sweating when a worker has failed to drink enough fluids, take in enough salt or both. A worker with heat exhaustion still sweats, but experiences extreme weakness or fatigue, giddiness, nausea or headache. The skin is clammy and moist, the complexion pale or flushed, and the body temperature normal or slightly high. The victim should rest in a cool place and drink salted liquids.

Heat cramps

Painful spasms of the bone muscles, are caused when workers drink large quantities of water but fail to replace their body's salt loss. Cramps may occur during or after working hours and may be relieved by taking salted liquids by mouth or saline solutions intravenously for quicker relief, if medically determined to be required.

First aid for most heat illnesses

- Act quickly and move the victim to a cool, shaded area to rest. Don't leave the person alone.
- If symptoms include dizziness or lightheadedness, lay the victim on his or her back and raise his or her legs six inches to eight inches.
- If symptoms include nausea or upset stomach, lay the victim on his or her side.
- Loosen and remove heavy clothing.
- Have the person drink cool water (a cup every 15 minutes) unless sick to the stomach.
- Cool the person's body by fanning and spraying with a cool mist of water or applying a wet cloth to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

Safe Practices

- Do heaviest work during coolest part of day and work people in pairs.
- Build up tolerance to the heat and the work activity slowly. Most people need two weeks to adjust.
- Drink plenty of cool water, about a cup every 15 minutes.
- Wear light, loose-fitting, breathable clothing.
- Take frequent short breaks in cool shaded areas to allow the body to cool down.
- Avoid eating large meals and drinking alcoholic or caffeinated beverages before hot work.

Risk Factors

- Taking certain medications. Check with your pharmacist to see if any medicines you are taking affect you during hot work.
- A previous heat-induced illness.
- Personal protective equipment that can add to physical stress.

DISCUSSION QUESTIONS

- What are our company procedures for working in hot conditions?
- What are you supposed to do if you have symptoms of a heat related illness while working?

LADDER SAFETY

One of the most commonly used, often abused, and least noticed piece of equipment on the job site may present a major hazard – the ladder. Out of 150 construction accidents involving ladders, the following were principal contributing factors:

- Climbing or descending improperly
- Failure to secure the ladder at top and/or bottom
- Carrying objects while climbing or descending
- Structural failure of the ladder

Commercial ladders are constructed properly and are of sound material. However, after they have been in use for a while they may become damaged through abuse, rough handling while moving, being struck by heavy objects, etc.

Basic Ladder Safety Information

Hazards - Be aware of broken or missing parts, energized electrical lines or equipment, ladders too short for work height, weight limit rating too low, not the correct equipment for job.

Loads - Self-supporting (foldout) and non-self-supporting (leaning) portable ladders must support four times the maximum intended load; extra-heavy duty metal or plastic ladders must sustain 3.3 times the maximum intended load.

Angle - Ladders should be set at the proper angle. The base of a non-self-supporting commercially manufactured ladder should be one-quarter its length away from the wall or supporting structure.

Rung - Rungs, cleats or steps must be parallel, level and uniformly spaced and must be spaced between 10 inches and 14 inches apart; spacing for extension trestle ladders must be 8 inches to 18 inches for the base, and 6 inches to 12 inches on the extension section, shaped so that an employee's foot cannot slide off.

Storage - Store ladders so they will not warp, sag or be damaged and secure them during transport.

Inspection - Check to ensure shoes and ladder are free of oil, grease, wet paint and other slipping hazards; warning labels are legible; spreader device can be locked in place and ensure area around the top and bottom of ladder is cleared of material. Sun damage or discoloration on the ladder can cause it to be brittle; discolored ladders should be tagged out and not used.

Safe Practices

- Face ladder and hold on with both hands when climbing
- Carry tools on belt or use hand line to move tools and materials to your work area
- Hold on with one hand when performing work
- Never reach too far to either side or rear
- Do not climb higher than second step from top on a stepladder or third from the top on a straight ladder
- Never attempt to move, shift or extend ladder while in use
- Secure ladders at either the top or the bottom or use a spotter (someone at the bottom) to keep the ladder stable

DISCUSSION QUESTIONS

- Have all workers been trained in the proper setup and use of ladders?
- Are the ladders on this job in good condition and are they properly used?
- Is the ground where the ladder is to be used stable?
- Are there ropes available on the site for securing the ladders and for use as hand lines?

LOCKOUT/TAGOUT

Lockout/Tagout (LOTO) is a way to ensure that electricity or other energy is not turned on (or released) while someone is working on machinery. Simply turning off a power switch is not enough. You must de-energize (prevent equipment from starting or moving), lock it out, release stored energy (for instance, bleed air from a pneumatic hose), and test to make sure the energy is off before working on the piece of equipment.

Lockout/Tagout Procedures - Shop and Tools

- Each piece of equipment or machinery and every tool should have its own LOTO procedures.
- Each worker who can be exposed to hazardous energy must be part of the LOTO process.
- The worker who puts on a lockout or tagout device is the **only** person who may remove it.
- Notify operators and supervisors that power is being disconnected or isolated.
- Separate all energy sources using proper isolating devices—like manual circuit breakers or disconnect switches.
- When changing a tool blade or bit, de-energize the tool by removing the battery or unplugging it from the outlet.
- Verify equipment has been de-energized by trying to restart and using testing equipment (such as an electric circuit tester).
- When the work is finished, inspect to ensure all tools, mechanical restraints, and electrical devices have been removed before you turn on power. Warn affected employees that power will be restored.
- If the LOTO job is interrupted for testing or positioning equipment, the procedures must start over from the beginning.

Lockout/Tagout Procedures - Remodeling

- De-energize circuit breakers if you plan to work on an outlet or fixture, especially during a remodeling job. There is the potential for the homeowner to flip the breaker not knowing you are working on it.
- Follow and perform the same LOTO verification procedures described above.
- Inform the homeowner of the work being done.
- Place a lockout device on the breaker to prevent energizing of the circuit while you are working.

DISCUSSION QUESTIONS

- Do you know what our lockout/tagout procedures are?
- Do you know how to complete the lockout/tagout procedure for equipment that you are individually responsible for?

MAINTAINING A CLEAN JOB-SITE

Maintaining a neat and clean jobsite means different degrees of cleanliness and neatness to different people. What one person accepts as proper "housekeeping" may not be acceptable to someone else.

Clean job sites are influenced by two things: What we do (or neglect to do) and the weather. We can control most conditions; others, we can be on the lookout for and guard against or remove. While we can't prevent bad conditions caused by the weather, we can often foresee them and plan the necessary action.

A general cleanup once a week won't guarantee safety on a construction site. You've seen jobs where it wasn't safe to turn around or even put your foot down without looking twice to be sure there wasn't something that might cause an accident. A job like this is poorly run. Not only is it unsafe, it also makes for poor relations with the owner and the public.

Safe Practices

- Keep trash and loose materials picked up and disposed of properly; put scrap in its proper place.
- Secure materials to prevent shifting or rolling.
- Remove tripping hazards.
- Store materials so there is always a clean path around and between work areas and in and out of the jobsite. Do not place objects in ways of exits.
- Keep floors, ladder rungs and stairways dry and free from oil and grease.
- Put tools and equipment in areas where they belong.
- Do not store loose materials on scaffolds.
- Do not store more than one shift of material (e.g., block or brick) on scaffolds.
- Store material for stable removal.
- Leave space for workers and equipment to load and unload stored materials.
- Ensure the platform, scaffold or support has adequate strength for the weight of material.
- Keep the height of stored material low for stability and line of sight.
- Store pipe and rods in building racks.
- Clear scrap lumber with protruding nails from work areas, passageways and stairs in and around buildings or other structures.
- Remove combustible scrap and debris regularly.
- Provide containers for the collection of waste, trash, oily and used rags, and other refuse.
- Ensure containers for oily, flammable or hazardous wastes (such as caustics and acids) are equipped with covers.
- Do not drop material outside the exterior walls of the building or structure.
- Enclose material chutes if dropping materials more than 20 feet below.
- Guard openings and discharge of material chutes.
- Don't leave open containers of flammables: gasoline, paint, oil, grease, adhesives, etc.
- Ensure the site has good lighting. Replace lights immediately when they burn out.
- Remember if waste is allowed to accumulate for just a few days, the job becomes messy and unsafe.

DISCUSSION QUESTIONS

- Is there any area on this job that presently needs a clean-up?
- Are the trash containers on this job adequate and are they being used?
- Is there a designated area on the jobsite for construction debris to be placed?

OVERHEAD POWER LINES

Contact between crane booms and power lines cause more fatalities each year than any other type of electrical accident in the construction industry. Examples of these types of accidents include:

- A framer hooked onto a bundle of material stored under a power line and was guiding the load when the boom hit the line.
- A foreman was walking backward pulling the hook when the load line contacted an overhead power line.
- A worker was leaning against the side of the crane when the boom hit a power line causing the current to ground through his body.

It is difficult for the boom operator to be sure of the exact location of the boom tip. The operator doesn't have good distance judgment looking up along the boom and is usually paying attention to the load.

The best way to avoid contact is to keep the boom at least 10 feet away from any overhead line. This may mean storing material in a location that is less convenient than the empty ground under the wires, assigning someone to watch the boom tip when work approaches a power line or asking the power company to de-energize a line or protect it with rubber sleeves.

Safe practices

- Locate and identify overhead power lines – look up!
- Remember when using a crane or other high reaching equipment near energized power lines of 50,000 volts (50 Kv) or more, the minimum distance between the lines and any part of the crane/equipment must be 10 feet plus ½ inch for each 1,000 volts over 50,000 volts.
- Request an observer when you do not have a clear view of the power line from your operating station. The observer's only job should be ensuring that the operator maintains a safe distance from overhead power lines.
- Always treat overhead power lines as if they are energized.
- When in doubt, contact the electric company to determine what voltage is on the lines.
- Always ask the electric company to de-energize and ground the lines or install insulation while you are working near the lines.
- Maintain a minimum safe clearance from the power lines even if insulation is used.
- Always make sure ladders and tools used near power lines are nonconductive.
- When using ladders or assembling pump-jack scaffolding, be aware of overhead power lines near or around the house when lifting the equipment into place.
- Use fiberglass ladders near any electrical source.
- Be aware of the distance from your finished scaffolding to the overhead power lines and any material being handled.

DISCUSSION QUESTIONS

- Do we have any material stored, or work to be done, close to a power line on this job?
- Is there anyone here qualified to give CPR to a worker rendered unconscious by electric shock?

PERSONAL PROTECTIVE EQUIPMENT

Hazards should be avoided through engineering or administrative controls. If those controls are not available or are unfeasible, personal protective equipment should be used to put a barrier between you and the hazards.

Types of Personal Protective Equipment

Hearing protection – Use when exposed to noise at or above, 90 decibels (dB) TWA. If you have to yell to communicate, you need hearing protection.

Hard hats – Wear when exposed to bumping into, electrical or struck-by hazards.

Gloves and arm protection – Cover hands and arms when exposed to chemicals, heat, cold, radiation agents or abrasive surfaces.

Respirators – Should be used when exposed to harmful inhalation hazards due to chemicals. Respirators have intended uses; ensure the respirator you are using is properly selected for the hazard to which you are exposed. For example, dust respirators are used for silica exposure when cutting block; organic cartridge respirators are appropriate for trichloroethylene found in paints and resins.

Safety harnesses with lanyards – Should be implemented when exposed to fall hazards of 6 feet or more.

Eye and face protection - Glasses are intended to be used to protect from impact hazards; e.g., when using saws. Goggles protect the eyes from splash hazards. Face shields are intended to protect the face from splash hazards and should be worn with safety glasses or goggles.

Steel-toe shoes – Should be worn when moving or working around potential falling heavy objects.

DISCUSSION QUESTIONS

- In your current job, are there instances when you should wear personal protective equipment?
- What type of equipment do you need to safely complete your tasks?
- When should you wear this equipment?

PORTABLE ELECTRIC TOOLS

Each year many workers on construction sites suffer electric shock using portable electrical tools and equipment. The nature of the injuries, including those caused by ground faults, ranges from minor injuries to serious secondary injuries. A secondary injury occurs when a worker recoils from an electric shock and, as a result, sustains an injury. Depending on the surrounding conditions, such an accident can result in a bruise, a broken bone or a fatal fall.

Methods of protection

One method of protection against injury caused by an electrical fault is the use of an equipment grounding conductor commonly known as the third – or green – wire. This equipment grounding conductor grounds the exposed, noncurrent-carrying metal parts of tools or equipment and carries off the leakage and fault currents, thus limiting the voltage on the tool frame by providing a low resistance path to ground.

Another method of protection is the utilization of a ground-fault circuit interrupter (GFCI). GFCI protection is required for ALL jobsite electrical outlets, including outlets at existing homes and businesses. This device continually monitors the current and conductors. If the leakage current to ground (either through the equipment-grounding conductor or through a person) exceeds the trip level, the circuit is interrupted quickly enough to prevent electrocution.

Tips to remember

- Before using any portable electrical power tool, inspect the plug, cord, on-off switch and housing. Look for cracked, broken or frayed insulation, exposed wires or connections and any evidence of damage in general.
- Properly tag damaged tools and turn in for repairs. Do not use.
- Inspect extension cords and the GFCI protected outlets you plug into. Look for evidence of damage and exposed conductors.
- Check the outlet, extension cord, tool and work area to determine if they are clean and dry.
- Ensure grinders, saws and similar equipment are provided with appropriate safety guards.
- Ensure power tools are used with the correct shield, guard or attachment.
- Ensure all cord-connected, electrically operated equipment is effectively grounded or of the approved double insulated type.
- Ensure effective guards are over belts, pulleys, chains, sprockets, pinch points and points of operation.
- Ensure ground-fault circuit interrupters are provided on all temporary electrical 15 and 20 ampere circuits.
- Check pneumatic and hydraulic hoses on power-operated tools for deterioration.
- Ensure the work rest is adjusted to within 1/8 inch to the wheel and the tongue is adjusted to within 1/4 inch to the wheel on abrasive wheel grinders.
- Ensure side guards cover the spindle, nut, flange and 75 percent of the wheel diameter on abrasive wheel grinders.
- Ensure the maximum RPM rating of each abrasive wheel is compatible with the RPM rating of the grinder motor.
- Ensure new abrasive wheels are visually inspected and ring-tested before use.
- Ensure appropriate safety glasses, face shields, etc. are used while using hand or powered tools or equipment that might produce flying materials or is subject to breakage.

DISCUSSION QUESTIONS

- Have you noticed any of our tools that appear to be defective?
- Do you know why GFCI protection is important on the jobsite?

PREVENTING BACK INJURIES

Preventing a back injury is much easier than repairing one. Because your back is critically important to your ability to walk, sit, stand, and run, it's important to take care of it. Most back pain arises from using your back improperly, so learning a few basic rules about lifting, posture and proper exercise can help keep your back in good shape.

Exercise

Having strong back and stomach muscles is important in order to ease the work your back is put through each day. By doing simple back-toning exercises, you not only strengthen your back but also reduce stress and improve your appearance, too! Check with your doctor to see which exercises are best for you.

Stay in good physical shape

Excess weight exerts extra force on back and stomach muscles. Your back tries to support the weight out in front by swaying backwards, causing excess strain on the lower back muscles. By losing weight, you can reduce strain and pain in your back. Check with your doctor for the most sensible diet plan for you.

Maintain good posture

You can prevent many back pains by learning to sit, stand and lift items correctly. When you sit down, don't slouch. Slouching makes the back ligaments, not the muscles, stretch and hurt, thus putting pressure on the vertebrae. The best way to sit is straight, with your back against the back of the chair, feet flat on the floor and your knees slightly higher than your hips. Learn to stand tall with your head up and shoulders back.

When lifting objects

- Plan your lift.
- Position yourself correctly in front of the load with your feet straddling the load, one foot slightly in front of the other for balance. Slowly squat down by bending your knees, not your waist, back or stomach. Using both hands, firmly grab the load and bring it as close to your body as you can.
- Lift with your legs, not your back. Slowly straighten out your legs until you are standing upright. Make sure the load isn't blocking your vision as you begin to walk slowly to your destination. If you need to turn to the side, turn by moving your feet around and not by twisting at your stomach.
- Set the load down correctly. Reverse the lifting procedures to reduce the strain on your back and stomach muscles. If you set the load on the ground, squat down by bending your knees and position the load out in front of you. If the load is set down at table height, set the load down slowly and maintain your contact with it until you are sure the load is secure and will not fall when you leave.
- Get help if the load is too heavy, bulky or awkward for you to lift alone.

DISCUSSION QUESTIONS

- What three things aid in preventing strain on your back?
- What is the process of properly lifting an object?
- Why is a strong back important to your job and your life?

SAFETY MEETING ATTENDANCE FORM

Safety Meeting Date & Topic

_____

Leader

_____

Location

_____

Workers Attending Meeting:

_____ _____

_____ _____

_____ _____

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SCAFFOLDING

Over 40% of the serious injuries to workers in the building trades are caused by falls from one level to another. These falls usually occur because the worker did not have a safe place to stand while working. A good rule of thumb: don't work from anything that was not designed for that purpose. Manufactured scaffolds should be utilized whenever possible.

Safe Practices

- Construct scaffolds according to the manufacturer's instructions.
- Use screw jacks, base plates and mudsills to ensure adequate support.
- Install a guardrail system or fall arrest system for scaffolds more than 10 feet above a lower level.
- Install guardrails on all open sides and the ends of platforms.
- Provide safe access to scaffold platform.
- Prohibit employees from climbing the cross bracing to access the platform.
- Prohibit the use of unstable objects to support scaffolds.
- Do not use front-end loaders, forklifts and similar equipment for support unless designed for use.
- Ensure that platforms do not deflect more than 1/60 of span when loaded.
- Prohibit moving a scaffold while employees are on the scaffold.
- Prohibit working from scaffold during storms or high winds unless the competent person approves work and wind screens or fall arrest systems are used. A windscreen may only be used when the scaffold is secured against anticipated wind forces.
- Inspect scaffolding before each shift. Inspection should be completed by a competent person who is capable of identifying scaffold hazards and has the authority to correct the hazards.
- Employees working on scaffolds should be trained by a person qualified to recognize hazards associated with the type of scaffold and understand the procedures to control or minimize hazards.
- Employees erecting, dismantling, moving or inspecting the scaffolds must be trained by a competent person to recognize any hazards.
- Require employees to be retrained when employees demonstrate a lack of skill or understanding in the scaffolding requirements.

Additionally for rolling scaffolds

- Do not ride rolling scaffolds.
- Remove all material and equipment from platform before moving scaffold.
- Apply caster brakes at all times when scaffolds are not being moved.
- Do not attempt to move a rolling scaffold without sufficient help. Watch out for holes in the floor and overhead obstructions.
- The working platform height of a rolling scaffold must not exceed four times the smallest base dimension unless guyed or otherwise stabilized.

DISCUSSION QUESTIONS

- Is the time used in setting up a safe scaffold saved by providing a place where a worker can work without worrying about every move he makes?
- What is the maximum number of sets of our scaffolding which can be used without going above a safe height?

SEAT BELTS

In 2009, seat belt use averaged 88 percent nationally, compared with 69 percent in 1998. However, the National Safety Council estimates that more than 14,000 people die each year in highway crashes that would not have been fatal if seat belts had been used. These 14,000 deaths could have been prevented by simply "buckling up."

There are plenty of arguments against the use of seat belts, but little evidence to support their objections. The fact is seat belts are the single most effective traffic safety device for preventing death and injury, according to the National Highway Traffic Safety Administration. And, wearing a seat belt can reduce the risk of crash injuries by 50 percent. Everyone traveling in a vehicle should consistently wear their seat belt and wear it properly.

How to Wear a Seat Belt

Lap Belt:

- Be sure the belt is snug. Slack allows room for movement before or during the crash, increasing the risk of spinal cord or head injury.
- Be sure the belt is flat. A twisted belt concentrates the stress on a small body area, increasing the likelihood of injury.
- Sit with your seat back upright. If the seat is reclined, you can slide under the belt, strike the dashboard or front seat and increase the possibility of abdominal injuries.
- Sit back deeply in the seat.

Shoulder Belt:

- Be sure the belt is snug. Too much slack could result in facial and chest injuries.
- Wear the belt over the shoulder, across the collarbone and diagonally across the chest.
- Do not wear the belt under the arm. The collarbone is strong enough to distribute the crash forces, but the ribs are likely to break and puncture the lungs, heart, liver or spleen that lie beneath them.
- Do not wear the belt in front of the face or neck.

The information above is borrowed from: http://www.nsc.org/safety_road/DriverSafety/Pages/SeatBelts.aspx

DISCUSSION QUESTIONS

- Are seat belts important? Why?
- What are two ways to properly wear your lap belt?
- What are two ways to properly wear your shoulder belt?

SILICA PRECAUTIONS

What is crystalline silica?

Crystalline silica is a basic component of soil, sand, granite and many other minerals. Quartz is the most common form of crystalline silica. The dust may become respirable particles when workers chip, cut, drill or grind objects that contain crystalline silica.

Hazards

Crystalline silica has been classified as a human lung carcinogen. Breathing crystalline silica dust can cause silicosis, which can cause severe shortness of breath, weakness, weight loss, fatigue, chest pain, and in severe cases can be disabling or even fatal. Smoking adds to the damage caused by silica dust.

Who is at risk?

Working in any dusty environment where crystalline silica is present can potentially increase a person's chances of getting silicosis. Workers who remove paint and rust from buildings, bridges, tanks, and other surfaces; clean foundry castings; work with stone or clay; etch or frost glass; and work in construction are at risk of overexposure to crystalline silica.

Controls

- Use engineering controls, such as local exhaust ventilation and blasting cabinets.
- Use protective equipment or other protective measures to reduce exposures.
- Use work practices controls, such as water sprays, when cutting bricks and blocks.
- Wear only N95 NIOSH certified respirators, if respiratory protection is required and do not alter the respirator.
- Respirators cannot be worn by workers with facial hair, such as beards. It prevents a good seal between the respirator and the face.
- Wear only a Type CE abrasive-blast supplied-air respirator for abrasive blasting.
- Shower if facilities are available and vacuum the dust from your clothes or change into clean clothing before leaving the worksite.
- Participate in training, exposure monitoring, and health screening and surveillance programs to monitor any adverse health effects caused by crystalline silica exposures.
- Do not eat, drink, apply cosmetics or smoke in areas where crystalline silica dust is present.

DISCUSSION QUESTIONS

- Do you know of instances or can you think of examples where we work in areas containing silica?
- Do you know how to properly use respirators for this type of work?

STAIRWAYS, GUARDRAILS AND OPENINGS

Providing good protection of wall and floor openings is one way to prevent falls at heights of 6 feet or more. Make sure that all wall and floor openings are properly guarded and if you have to remove guardrails to work, put them back in place when you are done. Guardrails are required to be placed at 42" +/-3 and mid-rails at 21" +/-3. Make sure that you understand the applicable rules regarding when wall and floor openings must be guarded.

Safe Practices - Stairways

- Stairways or ladders should be provided at worker points of access where there is a break in elevation of 19 inches.
- Ensure stair rails (not less than 36 inches in height) are installed on all stairways with four or more risers, or rising more than 30 inches.
- Ensure that stairways are not used to store materials.
- Except during construction of the actual stairway, skeleton metal frame structures and steps must not be used, unless the stairs are filled and secured with temporary treads and landings.
- Mid-rail screens, mesh, intermediate vertical members or equivalent intermediate structural members should be provided between the top rail and the stair rail system.
- A handrail is required on stairways that rise more than 30" or that have four or more risers.
- Temporary handrails should have a minimum clearance of three inches between the handrail and the walls, stair rail system and other objects.
- The unprotected sides and edges of stairway landings should be protected by a standard guardrail system.
- A platform must be provided at all locations where doors or gates open directly into a stairway.
- The swing of gates and doors should not reduce the effective width of the platform to less than 20 inches.

Safe Practices - Guardrails

- A guardrail is used to protect a floor opening or open sided floor six feet above the next level down. They can be found around elevator shafts, pits, duct chases, platforms, etc.
- Guardrails must be capable of withstanding, without failure, a force of at least 200 pounds applied in any outward or downward direction on the top, 150 pounds on the mid rail and 50 pounds for the toe board.
- A typical guardrail consists of a smooth surfaced top rail, approximately 42" +/-3, with a mid-rail at 21" +/-3, and a toe-board above the walking or working level.
- Smooth metal and/or pipe may be used for guardrails as long as minimum standards are met.
- Guardrails should be installed on all stairs prior to use.
- If guardrails/handrails are damaged or removed they must be repaired immediately.

Safe Practices - Covers

- Covers may be used to protect workers from falling into openings in floors, roofs, etc.
- They must be capable of supporting, without failure, twice the maximum intended load and be secured to prevent accidental displacement. Color code the cover or mark it with the word 'hole' or 'cover' to provide warning of the hazard.

As with any safety device, take the time to inspect all handrails, guardrails and covers before depending on them. Never lean on a guardrail unless you're sure it's strong enough to hold you. Avoid floor hole covers; walk around them. The person who installed it may not have secured it properly. When removing a hole cover, don't step forward or backward into the hole. A number of construction workers have been injured and some even killed by walking into a hole they just uncovered!

DISCUSSION QUESTIONS

- Has the jobsite been inspected (by the competent person) as to the fall hazards present and appropriate measures taken, before work begins?
- Is the jobsite inspected at the beginning of each workday, and as the day proceeds, for new fall hazards?
- Do you know of any locations on this job where wall/floor opening protection is either lacking or defective?

TRENCHING SAFETY

Trenching operations are common to many types of construction and maintenance projects and are inherently dangerous. Due to the great exposure, numerous accidents in connection with trenching occur every year. A few simple precautions, if observed, can serve to take most of the risk out of trench construction.

Safe Practices

- Ensure that the competent person received specific training in, and is knowledgeable about, soil analysis, use of protective systems, and the requirements of 29 CFR 1926 Subpart P: Excavations and Trenches.
- Ensure that the competent person has classified the soil using one manual and one visual test.
- In soils other than solid rock, shale or cemented sand and gravel, the trench should be shored and/or braced, or terraced if over five feet in depth.
- The trench should be shored and braced, regardless of length of time it will be open.
- Ensure that excavations, adjacent areas and protective systems are inspected by a competent person before the start of work, as needed throughout the shift, and after rainstorms or other occurrences that could increase the hazard.
- Place spoils, materials and equipment a minimum of five feet from the edge of the excavation.
- Prohibit employees from walking or working under suspended loads.
- Ensure that utilities companies are contacted and underground utilities are located as required by local, state and federal law.
- Ensure that workers inside an excavation are within 25 feet of a means of access/egress.
- Ensure that ladders used in excavations are secured and extend at least three feet above the edge of the excavation.
- Ensure that employees are protected from cave-ins when entering or exiting from an excavation.
- Ensure that precautions are taken to protect employees from water accumulation.
- Ensure that the atmosphere inside the excavation is tested when there is reasonable possibility of an oxygen-deficient, oxygen-enriched, combustible or toxic atmosphere or any other harmful contaminants.
- Ensure employees are trained to use personal protective equipment and other rescue equipment.
- Require workers to wear hard hats in trenches.
- Ensure that materials and equipment used for protective systems are inspected and in good condition.

DISCUSSION QUESTIONS

- What are some basic safety measures when working in a trench or excavation area?
- Who should be trained about soil analysis and inspect the excavation area?