



TOOLBOX TALKS

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TOOLBOX TALKS | Cold-Related Safety Precautions

During the winter months construction workers face an additional occupational hazard - exposure to the cold. Cold related illnesses and injury can occur when the air temperatures are *above* freezing and water temperatures are below 98.6⁰F (37⁰ C). Cold related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing. The effects on the body are freezing in the deep layers of the skin tissue. The skin can become hard and numb and change color to a pale and waxy-white color. The first areas to be affected are usually the fingers, hands, toes, ears and nose. Other health problems can arise including frostbite, trench foot and hypothermia.

Frostbite

Occurs when skin tissue actually freezes and cell damage results. Frostbite is a Medical Emergency. 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. The person may have uncontrolled shivering, cool bluish skin, slurred speech, drowsiness, clumsy movements and/or confused behavior.

First aid - Move the person to a warm, dry area. Remove wet or tight clothing that could cut off blood flow. Do not rub the affected area(s) this can damage skin tissue. Gently place the affected area in a warm water bath (105⁰F). Slowly warm the affected area. Do not pour warm water directly on the affected area – this will warm the tissue too fast causing damage. Warming takes about 25 to 40 minutes. After the affected area becomes warm it may become puffy and blister. The affected area may also have a feeling of burning or numbness. When the feeling in the skin returns to normal movement and skin color should return. Note: If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.

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 - The 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.

First aid (land temperatures) - Move the person to a warm dry area. Remove wet clothing and replace it with warm dry clothing or blankets. Have the person drink warm, sweet drinks such as sugar water or sports drinks. Avoid drinks with caffeine such as coffee, tea, hot chocolate or alcohol. Have them move their arms and legs to create muscle heat. If they cannot move, place warm bottles or hot packs in the arm pits, groin, neck and head areas. The temperature-of the water in the bottles should be between 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 re-warm the affected areas. **DO NOT** place the person's body in warm bath water. This may stop the heart.

TOOLBOX TALKS | Cold-Related Safety Precautions

First aid (water temperatures) - Call for emergency help. Do not remove any clothing. Button, buckle, zip and tighten any collars, cuffs, shoes and hoods. The layer of trapped water closest to the body provides a layer of insulation and helps to slow the loss of heat. Cover the head with a hood or hat.

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.
 - An inner layer of synthetic weaves to allow ventilation and escape of perspiration. Try to avoid wearing clothing made of cotton as the inner layer.
 - 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 footwear 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 of the signs of:
 - Hypothermia
 - Frost Bite
- 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?
- How should you dress in cold temperatures?

The formula for defensive driving is:

- See the hazard
- Understand the defense
- 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.

TOOLBOX TALKS | Defensive Driving

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?

TOOLBOX TALKS | 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 (DBA). A whisper measures about 20 dB, our average speaking voice is 60 dB. Most construction noise comes from equipment. These decibel levels have been measured to give you an idea of how loud some equipment can be:

Equipment	Decibels	Equipment	Decibels
Pneumatic Hammer	103-113	Earth Tamper	90-96
Jackhammer	102-111	Crane	90-96
Concrete Joint Cutter	99-102	Hammer	87-95
Skill saw	88-102	Gradeall	87-94
Stud Welder	101	Front-end Loader	86-94
Bulldozer	93-96	Backhoe	84-93

As a rule of thumb – If you have to raise your voice for someone 3 feet away to hear you, the site may be too noisy and you need hearing protection.

OSHA has rules about how long you may be exposed to a noise level, before you must wear hearing protection:

Allowed to be Unprotected	At This Noise Level
Up to 8 Hours	90 Decibels
Up to 4 Hours	95 Decibels
Up to 1 Hour	105 Decibels

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 is **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.

Some workers do not want to use hearing protection. They are afraid the hearing protection will block out signals such as back-up alarms. New hearing protection materials will allow you to hear conversations and signals and block out other noises. When selecting hearing protection try the device out on the job-site and see how they perform. Also select hearing protection that is comfortable for workers.

DISCUSSION QUESTIONS.....

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

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?

TOOLBOX TALKS | Equipment Seat Belts

We all know that there are laws requiring the use of seatbelts when operating motor vehicles. While there aren't laws about wearing seat belts on equipment, it is just as important to do so. The following is a true story that occurred on a job-site in Northern Virginia and it demonstrates why wearing seatbelts on equipment can save your life.

There was a dirt crew that had been contracted to perform a cut to fill operation on a new subdivision. The crew had been working on this particular job-site for about three months. They had made great progress. They were actually ahead of schedule. The foreman had a very diverse crew. The oldest member of the crew was a very experienced equipment operator. He was currently operating a D6 Dozer. On the other spectrum of age was the youngest member of the crew with the least amount of experience. This youngest and least experienced was currently operation a rubber tire roller. Since the crew was ahead of schedule, the foreman decided to let the roller operator get some time operating the dozer. The dozer operator and the roller operator switched machines. The dozer at this time was in an area that was approximately 1200 feet x 900 feet (400 yards x 300 yards). There were no obstructions or other equipment around other than the occasional dump truck dropping a load of dirt to be spread and the most experienced member of the crew on the roller.

The roller operator was working alongside the dozer compacting the freshly spread dirt. The roller operator was working back and forth starting in the middle and working his way to the edge of the fill. The experienced operator reported that as he was running his last pass on the edge the dirt underneath the roller began to shift and started to slide out from underneath the roller. This caused the roller to shift on an angle. Out of natural reaction the operator attempted to steer the roller back to the flat ground. The dirt continued to slide and the roller began to tip over. The operator reported that he attempted to jump out of the roller. He picked out a spot on the ground that he determined was a good spot to land. He never made it out of his seat. The operator was wearing his seat belt and it held him in. The roller turned over on its right side. The operator was able to unbuckle himself and climb out of the roll over protection bars.

When the operator was asked what was hurt, he reported"Only my Pride!" He later stated that after 30 years of operating, he never thought that a seat belt would save his life the way that it did. He showed the exact spot where he picked out to land when he attempted to jump and it was exactly where the roll over protection (RAPS) bar was laying on the ground. He stated that he would have been crushed by the machine. He said with time he will get over his pride being hurt.

This example shows how critical wearing seat belts are when operating machinery.

DISCUSSION QUESTIONS.....

- Are seat belts important? Why?
- What equipment do you operate that requires a seatbelt?
- Is the seatbelt operable on the equipment you operate?

TOOLBOX TALKS | 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 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.

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.

What Does the 'Z' Rating Mean?

Safety eye and face protection includes non-prescription and prescription safety glasses, clear or tinted goggles, faceshields, welding helmets, and some full-face type respirators that meet the ANSI Z87.1 Eye and Face Protection Standard. The safety eyewear must have "Z87" or "Z87+" marked on the frame and in some

cases the lens. Most non-prescription safety glasses have polycarbonate lenses. The non-prescription safety glasses are tested by shooting a 1/4" BB at 100mph at the lens and dropping a 1 lb pointed weight from 4' on the lens—if it breaks in either test it won't have the Z87 mark. Prescription safety glasses may have polycarbonate, glass, or a plastic called CR39 but these glasses only have to pass a test of dropping a 2oz steel ball from 4' unless they are marked Z87+; then they must pass the high velocity/impact tests. Polycarbonate lenses are much more impact resistant than glass or plastic lenses. Glass and plastic lenses usually shatter into small sharp pieces, but polycarbonate usually just cracks.

Basic types of eye protection

Safety glasses (spectacles) are commonly used as protection against impact and optical radiation • Tinted safety glasses used in torch soldering must have a shade number (1.5-3) on the lens, but do not provide adequate protection for gas or arc welding which need shades 4 or higher Common tasks: sawing, hammering, and drilling

Side protection is required any time that there are hazards from flying particles or objects. Older styles of safety glasses used side shields Many newer styles provide side protection as wrap around safety glasses Some styles also have brow protection along the top of the glasses Many eye injuries have occurred because there was not adequate side protection, proper fit, or particles fell from above such as when drilling overhead.

Goggles are stronger than safety glasses. Goggles are used for higher impact protection, greater particle protection, chemical splashes, and welding light protection. Goggles for splash or high dust protection should have indirect venting. Goggles with direct venting (a mesh of small holes around the sides) tend to fog less, but should not be used with liquid or fine dust hazards. When goggles are used for welding make sure they are the proper shade number (the shade number is marked on the lens and shows how dark the lens is).

Faceshields are used for even higher impact protection and to protect the wearer's face in addition to the eyes. Faceshields should always be used over safety glasses or goggles. Particles or chemicals can easily go around a faceshield and the curve of the faceshield can direct them into the eye. Faceshields are frequently lifted leaving the eyes unprotected without the safety glasses or goggles. Common tasks: spraying, chipping, grinding

Fitting your safety glasses

Select safety glasses that have the best fit, which means have the least gaps around your eyes. The biggest gaps are usually near the corners of the glasses. The bigger the gap, the more exposure to hazards coming from a slight angle especially from the side, above or below. Glasses that are not snug against the face also create larger gaps in protection. Some safety glasses are made in different sizes to fit different shape faces. Different styles also may fit one person better than another. Adjustable temples and eyewear retainers or straps help hold the glasses in the proper position close to the face.

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?

Falls are one of the most devastating types of injuries on a job-site and the most frequently cited OSHA citation in construction. When fall protection is in place and used properly, falls and fall-related injuries can be prevented.

Fall prevention practices

- If possible, determine if the work can be performed by avoiding the fall exposure altogether. Ask yourself, “Is it really necessary that I expose myself to a fall to get this job done?”
- Assess the job-site 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

If work cannot be performed without exposing yourself to a fall, guardrails (not a harness and lanyard) should be one of the first considerations for protection from falls. 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.

Personal fall arrest systems

If it isn't feasible to avoid exposure to a fall while performing your task, and guardrails aren't an option, then a personal fall arrest system should be used. A personal fall arrest system is critical to ensuring you don't fall to a lower level when working at heights of six feet or higher. A personal fall arrest system should always consist of an anchor, body support and connectors:

Anchor

Anchors are a secure point of attachment. Anchorage connectors vary by industry, job, type of installation and structure. They must be able to support the intended loads and provide a sufficient factor of safety for fall arrest. An anchor used for a personal fall arrest system should be able to withstand 5,000 pounds.

Body support

Body support is typically a full body harness. Harnesses distribute fall forces over the upper thighs, pelvis, chest and shoulders. They provide a connection point on the worker for the personal fall arrest system when working at heights. A harness is the single most important equipment choice you can make for your crew!

Connectors

Connectors such as shock absorbing lanyards or self retracting lifelines connect a worker's harness to the anchorage.

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?

It may be easy to take for granted some of the everyday hazards that, if overlooked, could contribute to the occurrence of a fire on a job-site or workplace. Fire can cause injury, death, and damage to property. Smoking is the most common cause of fires on job-sites as cigarette butts can smolder for hours.

How do fires start?

- Oxygen – sustains combustion
- Heat – Provides ignition (flame or spark)
- Fuel – provides the material that will burn
- Chemical Chain Reaction – self-sustaining reaction that will allow for the fire to continue

What can you do to prevent fire?

- Read all Fire Emergency Plans and be aware of your escape routes.
- Keep fire doors shut at all times (or, if held open on automatic release, keep them clear).
- Report any damage to fire detection or fire-fighting equipment such as sprinkler systems and extinguishers
- Be aware of the risks from any flammable, highly combustible, or hazardous materials used or stored on the premises.
- Store shop rags covered with oils, paint, or petroleum products in air-tight metal containers with safety lids as these materials can ignite.
- Ensure you use proper safety gas cans.
- Ensure housekeeping practices are maintained so as to prevent the build-up of combustible materials.
- Discard cigarettes in authorized containers only.

On job-sites you should know:

- How and where to notify others of a fire emergency.
- Location of, and if applicable, how to use fire-fighting equipment.
- How to open emergency doors.
- Your assembly point, if applicable.
- When, and how, to complete a hot work permit.

DISCUSSION QUESTIONS.....

- What are two of the four things that help start a fire?
- What are two things you can do to prevent a fire?

Training and certification requirements

Only trained and certified forklift operators are allowed to operate forklifts. An 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, and 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.

TOOLBOX TALKS | Forklift Safety

- 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.

Basic Forklift Checks Before You Start To Operate

- Check the condition of the tilt and lift systems.
- Check fuel levels
- Check for damage and cracks in the forks.
- Check each tire for wear and correct inflation and check for missing wheel nuts.
- Check the operation of brakes, hand brake, steering, forklift controls, lights, mirrors, horn, and reverse beeper prior to use.

DISCUSSION QUESTIONS.....

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

TOOLBOX TALKS | 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 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 and its employees can be more productive and profitable.

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 tools are a common part of our everyday lives and are present in nearly every industry and trade. However, these simple tools can be hazardous and have the potential for causing severe injuries when used or maintained improperly. Keep all hand tools in good condition. Ensure all safety devices are in place and in proper working order.

Inspections

- Replace hand tools, such as chisels and punches, which 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.

Proper Use

- Ensure proper PPE (safety glasses, face shields, etc.) is worn at all times.
- Always wear eye protection.
- Use the proper tool for the job.
- If unsure about use, ask for assistance.
- Use spark resistant tools when working near a fuel source.
- Never use any tool in such a way that you will be injured by it if it slips.

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.

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?
- Has anyone in this group been injured by a tool or had a close call? How could this have been prevented?

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 it is properly worn and maintained.

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).

There are two types of hard hats – Type 1 and Type 2. Type 1 helmets reduce the force of impact resulting from a blow only to the top of the head. Type 2 helmets reduce the force of impact resulting from a blow which may be received off center or to the top of the head.

Two classifications of helmets have been established for electrical protection. They are:

- Class G (General) – Provide protection from low-voltage conductors and are tested to less than 2,000 volts.
- Class E (Electrical) – Provide protection from high-voltage conductors and are tested at 22,000 volts.
- Class C (Conductive) are not intended to provide electrical protection.

The outer portion of the hat is the shell, which often has a peak that extends forward or a brim, which extends outward around the entire lower shell. The second component is the harness, which attaches to the shell to maintain the hard hat on the wearer's head. When a force strikes a properly fitted hard hat, that force is distributed throughout the entire hard hat. It prevents the force from concentrating at one point.

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.

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 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 frequent sips of water. Workers suffering from heat exhaustion are at greater risk for accidents since they may feel less alert or confused.

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 drinking water and/or carbohydrate-electrolyte liquids (sports drinks) every 15-20 minutes.

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 their back and raise their 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 apply a wet cloth or ice to the person's skin.
- Call 911 for emergency help if the person does not feel better in a few minutes.

Safe practices

- Make sure that all workers know the signs and symptoms of heat illness.
- 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

- Medications - ask your pharmacist if any medicines you take could 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?

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

Basic ladder safety information

Hazards - Be aware of broken or missing parts, incorrect size ladder for the 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. This means if you are using a 12 foot ladder, the base should be three feet from the structure. Some ladders provide a picture guide on the ladder itself to assist you in this.

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. If any structural defect is found, the ladder should be tagged unsafe and taken out of service. If it cannot be fixed, it should be disposed of properly.

Storage - Store ladders so they will not warp or sag 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

- Always face the ladder when ascending or descending, and have both hands free to grasp it securely
- Carry tools on belt or use hand line to move tools and materials to your work area
- Keep your body between the side rails of the ladder. This reduces the chance of tipping it over and/or falling off. Never reach too far to either side or behind
- When setting up a ladder, make sure the ground it is set upon is level and stable
- Remember the "3-Point Rule": At least two hands and one foot, or two feet and one hand, should be in contact with the ladder at all times
- 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 and free of debris?

Many serious accidents have happened when someone thought a machine or the power to it was safely turned off. Lockout/Tagout (LOTO) is a way to ensure that electricity or other hazardous energy sources are not turned on (or released) while someone is working on the 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. Without a lock-out tag-out system, there is the possibility that a machine will unexpectedly start up, either because of stored energy which was not correctly released or through the actions of someone starting the process without realizing that it isn't safe to do so.

OSHA requires three basic elements in a lock-out tag-out program. These are training, written procedures, and inspections.

Training is required for two types of people; "authorized employees" and "affected employees." Authorized employees are those who do maintenance or servicing work. They are the people who actually perform the lock-out tag-out. Affected employees are those who may be affected by or work near equipment which is locked or tagged out. Affected employees are not permitted to perform servicing or maintenance work which requires a lock-out or tag-out.

Written procedures detailing the lock-out tag-out procedure are required for equipment having two or more energy sources. Written procedures communicate important information to persons performing lock-out tag-out. They identify energy sources, provide step-by-step instruction for locking or tagging out energy sources, releasing stored energy, and verifying the equipment cannot be re-started after lockout is applied. Group lock-out tag-out procedures must also be clearly documented.

Inspections must be done to ensure that before service and maintenance is performed, machines and equipment that could unexpectedly startup, become energized, or release stored energy, are isolated from their energy source(s) and rendered safe. Another inspection should be done, once the work is completed and the locks are removed.

Lockout/Tagout procedures - shop and tools

- Each piece of equipment or machinery and every tool should have its own LOTO procedure.
- All authorized and affected employees, who can be exposed to hazardous energy, must be trained on the LOTO process.
- The employee who puts on a lockout or tagout device is the **only** person who may remove it.
- Notify any operators and/or 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. Never remove any locks and tags other than your own or ones that you have installed. 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.....

- Can you explain the lockout/tagout procedures on this job-site?
- Do you know how to complete the lockout/tagout procedure for equipment that you are individually responsible for?

TOOLBOX TALKS | Maintaining a Clean Job-site

Every construction job-site needs regular housekeeping performed. Poor housekeeping contributes to slips, trips and falls. Everyone on the job-site is responsible for keeping work areas clean and safe and should work together to prevent accidents.

Good housekeeping also gives customers and visitors a good impression of your job-site and safety.

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 job-site. Do not place objects in ways of exits.
- Keep floors, ladder rungs and stairways dry and free from dirt, 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 leave materials outside the exterior walls/doors 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 job-site for construction debris to be placed?

TOOLBOX TALKS | Overhead Power Lines

Overhead power lines are everywhere and people tend to underestimate the danger associated with them. Awareness of safety practices is critical. Contact the utility company with any questions about power lines if unsure.

For example, contact between crane booms and power lines cause more fatalities each year than any other type of electrical accident in the construction industry. It can be difficult for a boom operator to know the exact location of the boom tip because he is 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 – always 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 raising ladders, erecting or dismantling scaffolding be aware of overhead power lines near the area. Make sure that your finished scaffolding is at least 10 feet away from any power line.
- Use fiberglass ladders near any electrical source.
- When working near power lines, remember to keep ladders, pipes, conduit and other long materials away from power lines. If you lose control of the item, let it go and flee the area. The material can act as a conductor and energize the ground around you.
- 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?

TOOLBOX TALKS | 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. Wearing earplugs or earmuffs can help prevent damage to hearing. Earplugs made from foam, waxed cotton, or fiberglass wool are self-forming and usually fit well. A professional should fit workers individually for molded or preformed earplugs. Clean earplugs regularly, and replace those you cannot clean.

Hard hats – Hard hats can protect your workers from head impact, penetration injuries, and electrical injuries such as those caused by falling or flying objects, fixed objects, or contact with electrical conductors. Also, OSHA regulations require employers to ensure that workers cover and protect long hair to prevent it from getting caught in machine parts such as belts and chains.

Gloves and arm protection – Cover hands and arms when exposed to chemicals, heat, cold, radiation agents or abrasive surfaces. Some examples of gloves commonly used as PPE include rubber gloves, cut-resistant gloves, chainsaw gloves and heat-resistant gloves. Always choose the right glove for the job.

Respirators –When engineering controls are not feasible, workers must use appropriate respirators to protect against adverse health effects caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors. 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. A proper fit is essential for respirators to be effective.

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

Eye and face protection - Each day, about 2000 US workers have a job-related eye injury that requires medical attention. Eye injuries can happen through a variety of means. Most eye injuries occur when solid particles such as metal slivers, wood chips, sand or cement chips get into the eye.

Safety glasses provide protection from external debris, like sawdust, and should provide side protection via a wrap-around design or side shields.

- Goggles provide better protection than safety glasses, and are effective in preventing eye injury from chemical splashes, impact, dusty environments and welding
- Face shields provide additional protection and are worn over the standard eyewear; they also provide protection from impact, chemical, and blood-borne hazards

Steel-toe shoes – Steel-toed shoes help prevent a wide range of injuries, not just injuries from falling objects. They can also help prevent injuries due to slips and falls, cuts/lacerations and burns, and punctures. A sturdy safety shoe or boot makes it more difficult for injuries such as these to occur.

DISCUSSION QUESTIONS

- What type of PPE should be used on this job-site and why?
- What do you do to keep your PPE clean and effective?

TOOLBOX TALKS | Pneumatic Tools

Pneumatic tools are powered by compressed air and include chippers, drills, hammers, and sanders. There are several dangers encountered in the use of pneumatic tools. The main one is the danger of getting hit by one of the tool's attachments or by some kind of fastener the worker is using with the tool.

Eye protection is required and face protection is recommended for employees working with pneumatic tools. When sanders are used, dust masks should also be worn.

Noise is another hazard. Working with noisy tools (e.g. jackhammers) requires proper, effective use of hearing protection. Refer to your company hearing conservation program.

When using pneumatic tools, ensure they are fastened securely to the hose to prevent them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard. A safety clip or retainer should be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel. Screens should be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers or air drills.

Compressed air guns should never be pointed toward anyone. Users should never "dead-end" it against themselves or anyone else. It is recommended to use air guns equipped with safety tips that have relief ports to reduce pressure if blockage or dead-ending occurs.

DISCUSSION QUESTIONS.....

- What are two hazards associated with the use of pneumatic tools?
- What safety measures should be taken to protect co-workers from injury?

TOOLBOX TALKS | Portable Electric Tools

Power tools can be hazardous when improperly used. There are several types of power tools, based on the power source they use: electric, pneumatic, liquid fuel, hydraulic, and powder-actuated.

The following general precautions shall be observed by power tool users:

- Never carry a tool by the cord or hose
- Never remove prongs from any cords
- Never stand in or near water when using power tools
- Always use a Ground Fault Circuit Interrupter (GFCI) with electrical tools if working in a wet environment
- Never “yank” the cord or the hose to disconnect it from the receptacle
- Keep cords and hoses away from heat, oil and sharp edges
- Replace all frayed and/or damaged extension cords; do not try to tape cords
- Disconnect tools when not in use, before servicing and when changing accessories such as blades, bits and cutters
- All observers should stay a safe distance away from the work area
- Secure work with clamps or a vise, freeing both hands to operate the tool
- Avoid accidental starting; do not hold a finger on the switch button while carrying a plugged-in tool
- Tools shall be maintained with care; they should be kept sharp and clean for the best performance. Follow instructions in the user’s manual for maintenance, lubricating and changing accessories.
- Maintain good footing and balance.
- Avoid wearing loose fitting clothes, ties or jewelry such as bracelets, watches or rings, which can become caught in moving parts.
- Use tools that are either double-insulated or grounded (three-pronged).
- Keep work area well lit when operating electric tools.
- Ensure that cords and hoses do not pose as a tripping hazard.
- Remove from use and tagged “Do Not Use”. This shall be done by supervisors and/or employees.

Guards

Hazardous moving parts of a power tool need to be safeguarded. For example, belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or moving parts of equipment should be guarded if such parts are exposed.

Guards, as necessary, should be provided to protect the operator and others from:

- Point of operation
- Nip points
- Rotating parts
- Flying chips
- Sparks

Safety guards should never be removed when a tool is being used. For example, portable circular saws should be equipped with guards. An upper guard should cover the entire blade of the saw. A retractable lower guard covers the teeth of the saw, except when it makes contact with the work material. The lower guard automatically returns to the covering position when the tool is withdrawn from the work. Refer to the manufacturers recommendations.

Electric Tools

Employees using electric tools shall be aware of several dangers with the most serious being the possibility of electrocution. Among the chief hazards of electric-powered tools are burns and slight shocks which can lead to injuries or even heart failure.

To protect the user from shock, tools should either have a three-wire cord with ground or be grounded, be double insulated, or be powered by a low-voltage isolation transformer. Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire should be attached to a known ground. The third prong should never be removed from the plug.

Tools must be shut down before cleaning, repairing or oiling; disconnect or use Lockout/Tagout Procedures.

General practices to follow when using electric tools:

- Operate electric tools within their design limitations.
- Gloves, eye protection, and safety footwear are recommended during use of electric tools.
- When not in use, store tools in a dry place.
- Do not use electric tools in damp or wet locations.
- Work areas should be well lit.

DISCUSSION QUESTIONS

- What is your role when it comes to power tool safety?
- Have you noticed any of your tools that appear to be defective?
- What is your company policy on defective tools?
- Do you know why GFCI protection is important on the job-site?

TOOLBOX TALKS | Powered Abrasive Wheel Tools

Powered abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments or excessive dust.

Before an abrasive wheel is mounted, it should be inspected closely and sound- or ring-tested to ensure that it is free from cracks or defects. To test, gently tap wheels with a light non-metallic instrument. If the wheel sounds cracked or dead, they could fly apart in operation and shall not be used. The sound an undamaged wheel will give a clear metallic tone or “ring.” To prevent the wheel from cracking, be sure it fits freely on the spindle. Tighten the spindle nut enough to hold the wheel in place, without distorting the flange. Follow the manufacturer’s recommendations. Ensure that the spindle wheel does not exceed the abrasive wheel specifications.

Due to the possibility of a wheel disintegrating (exploding) during start-up, never stand directly in front of the wheel as it accelerates to full operating speed.

Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage.

In addition, when using a power grinder:

- Always use eye protection and a dust mask
- Turn off the power when not in use
- Never clamp a hand-held grinder in a vise

DISCUSSION QUESTIONS.....

- What are two things to remember when operating a power grinder?
- How do you inspect an abrasive wheel?

TOOLBOX TALKS | Powder-Actuated Tools

Powder-actuated tools operate like a loaded gun and must be treated with the same respect and pre/cautions. The use of powder-actuated tools is prohibited on job-sites until approved by the safety person.

Safety precautions to remember include the following:

- Do not use these tools in an explosive or flammable atmosphere.
- Before using the tool, the worker shall inspect it to determine that it is clean, all moving parts operate freely, and the barrel is free from obstructions.
- Do not modify tools.
- Never point these tools at anybody.
- Do not load the tools unless they are to be used immediately; do not leave a loaded tool unattended, especially where it could be available to unauthorized persons.
- Keep hands clear of the barrel end.
- To prevent the tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position and another to pull the trigger.
- The tools should not be able to operate until they are pressed against the work surface with a force of at least five pounds greater than the total weight of the tool.
- If a powder-actuated tool misfires, wait at least 30 seconds, then try firing it again.
- If it still will not fire, wait another 30 seconds so that the faulty cartridge is less likely to explode then carefully remove the load; put the bad cartridge in water.
- Wear suitable eye and face protection when using a powder-actuated tool.
- The muzzle end of the tool must have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might create a hazard when the tool is fired.
- All powder-actuated tools are designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.
- If the tool develops a defect during use, tag it and remove from of service immediately until it is properly repaired.

DISCUSSION QUESTIONS.....

- Who approves the use of powder-actuated tools?
- Name two safety precautions to remember when using powder-actuated tools?

TOOLBOX TALKS | 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?

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.
- Do not climb the cross bracing to access the platform.
- Do not use 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.
- Do not move a scaffold while employees are on the scaffold.
- Do not work 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.

All scaffold operations should be directed by a Competent Person. OSHA states that a Competent Person is "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them."

The *competent person* is responsible for:

1. Directing employees who erect, dismantle, move or alter scaffolding.
2. Determining if it is safe for employees to work from a scaffold during storms or high winds, and ensure that a personal fall arrest system is in place.
3. Training employees involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolding to recognize associated work hazards.
4. Inspecting scaffolds and scaffold components for visible defects before each work shift, and after any occurrence which could affect the structural integrity, and to authorize prompt corrective action.

5. Inspecting ropes on suspended scaffolds prior to each work shift and after every occurrence which could affect the structural integrity, and to authorize prompt corrective actions.
6. For suspension scaffolds evaluating direct connections to support the load to be imposed.
7. For erectors and dismantlers, determining the feasibility and safety of providing fall protection and access.

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?

TOOLBOX TALKS | 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!

TOOLBOX TALKS | Stairways, Guardrails and Openings

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 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?

In 2015, seat belt use averaged 88.5 percent nationally, compared with 75 percent in 2002. 38,300 people died in vehicle related crashes in 2015. 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.

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?

