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Note: Always promote a discussion on any of the topics covered in the Tool box Talks. Should any questions arise that you cannot answer, don't hesitate to contact the Project Safety Engineer or the Safety Director.

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VI. Fire Hazards

I. General Topics

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Care For The Injured

The following points should be covered in the Toolbox talk covering how to care for the injured:

I. Determine The Seriousness Of The Injury

A) If serious
   1. Contact the jobsite trailer immediately and see that an ambulance is dispatched
   2. Do not move the injured party
   3. See if any bystanders are trained in First Aid. If so, ask them to help.
   4. Keep the injured party from standing
   5. In case of bleeding-apply pressure to the wound. Do not use a tourniquet except in cases of excessive bleeding.
   6. If the injured party has stopped breathing, try to locate someone who has been trained in CPR.
   7. Try to keep the injured party warm.

B) If not serious
   1. Contact your Foreman immediately.
   2. Do not try to get the injured party to move if a fall is involved.
   3. Get any First Aid treatment that may be needed. A first aid kit is kept in all jobsite trailers. Be sure you know the location of the nearest first aid kit on the job.

II. Other Items To Be Aware Of

A) Report all injuries-even minor ones may become major ones
B) Seek first aid for even minor injuries
C) Be sure the emergency telephone numbers are posted in a conspicuous place on the job. Know them.

Be sure to review the locations of the First Aid kit and the location of the emergency numbers on site.

Accident Reporting & Investigation

The following points should be covered in discussing the importance of reporting and investigating accidents.

Guide For Discussion

1) Always report any accidents to your foreman.
2) Any injuries needing first aid or medical attention should be reported to the Project Safety Engineer.
3) Anyone witnessing an accident should report what they saw to their foreman
4) All accidents involving any medical treatment should have an investigation conducted to determine the cause. (See Company Safety Program—Accident Investigation)
5) Always report any unsafe conditions or unsafe acts to your Foreman. It's far better to prevent accidents than it is to report them.

Short Cuts

Everyone uses short cuts, but there are some reasons no to use short cuts. As we all know, a project is completed by use of certain construction methods. Short cuts usually modify the methods and, as a result, decrease the safety built into the methods. The following should be remembers when discussing short cuts:

1) Everyone uses them
2) They can be dangerous
3) Sometimes they are deadly
4) Our company is willing to take the time to do a job correctly
5) Heights increase the dangers of shortcuts
6) Excavation and tunnels increase the dangers of short cuts
7) Warn those using unsafe short cuts of the hazards associated with the short cuts

Although we all use short cuts in our daily routines, we must be aware of the dangers that short cuts expose us to. There are always two ways to perform a task, oftentimes the safe way is not the quickest way.

Construction Clothing

The proper clothing can make a job a lot more bearable. Most construction workers never really think about their dress, but they should. It is very important to dress for the weather since most of the work is done outside or in areas without any climate control. The following lists should help each worker remember how to dress properly.

Weather

1) Know the day's forecast
2) Be prepared to add or subtract clothing as needed
3) Never work without your shirt in summer
4) If you begin to overheat, don't take off more clothes. Instead, slow down your working pace.
5) In winter avoid getting wet

Proper Attire-Head To Toe

1) A hard hat
2) A face shield or eye goggles when applicable
3) A shirt (long or short sleeve depending on season)
4) Long pants always—never wear shorts
5) Thick socks
6) Safety shoes
7) Work gloves

Watch For The Following

1) Dirty clothes, keep your clothes clean and free of bacteria
2) Keep oil and chemicals off of your clothes—don't become a human torch
3) Don't wear pants with cuffs on them
4) Missing buttons, rips and tears can increase the chances of cuts, bruises and tear injuries
5) Loose garments
6) Belts, ties and other accessories

Since we must work in our clothes all day, every day is makes good sense to wear the proper type of clothing to keep us as comfortable as possible.

Whose Responsibility Is It?

After and accident has occurred, it is not unusual for those who were around the injured party to feel guilty. This guilt is part of each person's inner awareness that there was possibly something they could do or should have done to prevent the accident. Sometimes the accident is a result of someone else's mistakes. But, who causes the accident is not as important as who is responsible for the accident and what steps will be take to prevent future similar accident from occurring. The following is a list of responsibilities for safety.

Who Is Responsible

1) Senior Management
2) Safety Director
3) Project Manager
4) On-Site Safety Engineer
5) Crew Foreman
6) Each person on the job

Some Responsibility Rules For Everyone

1) If it's unsafe for you it's unsafe for the next person and the hazard should be corrected
2) Safety doesn't belong to any one craft, rather it is part of every craft jurisdiction and responsibility
3) If safety doesn't begin with you, it won't begin at all

An Individuals Responsibility

1) To yourself
2) To your family
3) To your co-workers
4) To your company

Remember, compensation checks won't pay many bills nor will they replace the self-esteem one has from being a "good provider". Without the complete cooperation of everyone on site, the project will not be as safe as it should be.

Keeping in Shape

Staying in shape is one subject that is rarely discussed when safety is the topic; however, a person who stays in good physical condition is less likely to be involved in an accident since they are usually more alert, less subject to the effects of weather and generally able to react more quickly to the changing condition of the job. The following point should be reviewed when discussing physical conditioning and safety.

Staying In Shape Reduces Injuries By

1) Reducing the effect that weather has on your body.
2) Reducing the effect of minor injuries. A body in good condition will usually repair itself much faster.
3) Eliminating the exposure to minor strains and pulls. Most people in good shape rarely strain or pull muscles.
4) Reducing exposure to minor illnesses: the percentage of those people who are in shape getting colds and the flu are lower since that person can better fight the germs causing the illness.
5) Being more alert to job sit conditions.
6) Making you more productive and less likely to take short-cuts.

How To Stay In Shape

1) Exercise regularly
2) Eat right
3) Get plenty of rest
4) Avoid overindulging in sweets, alcohol, drugs, etc.
5) Diet when needed to maintain recommended body weight

Few people will dispute the fact that when you physically feel good, your attitude is also good. You are able to avoid illness and can react quicker to dangerous situations. It is far better on your body to stay in shape since it places less strain on your muscles and heart. Keeping in shape makes good sense and good sense is the cornerstone of safety.

Safety After Dark

Almost everyone gets in a hurry to leave when it gets near quitting time. In doing so, it is often forgotten that there are many times when this rush to leave resulting in hazards being left for those that may be on site after work. For this reason, it is important that all safety devices are intact at the end of the day just in case someone ha to enter the project that night. The following items should be discusses when reviewing safety on the job after dark.

Those That Might Be On Site After Dark

1) The site guard
2) The police
3) Firemen
4) A greaser or refueler
5) Emergency repair-men
6) Children
7) The general public

Some of the above should never be on site yet often are after hours. Therefore, the following general rules should apply:

1) When possible, provide site security for the entire site
2) Be sure all site guarding is in place, this includes:
    a) Perimeter guards
    b) Floor openings
    c) Wall openings
    d) Stairwells
3) Be sure house keeping is in good shape. Debris on the floor can create tripping hazards and make emergency work almost impossible.
4) Keep substances off the floor such as oil, in order to prevent slips and falls.

Remember that although your work for the day is finished, there are many others who work at night and may need to be in your work area. Accordingly, help protect those from the hazards that you deal with daily be keeping all the safety devices in place.

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Ladders

Over 30% of all construction injuries are a result of falls. Many of these injuries result from the improper use of the use of a defective ladder. The following rules should be observed.

I. Construction

A. Use only top quality wood for construction purposes
B. Always extend the side rails of the ladder 36 inches above the landing
C. Cleats are to be uniformly spaces, 12" apart, top to top
D. Cleats are to be inset 1/1 on the side rails or filler blocks used
E. Cleats are to be triple-nailed
F. Always secure the top of the ladder to prevent it from sliding
G. Never use double-headed nails to construct a job built ladder

II. Inspection

A. Look for missing or loose cleats
B. Look for loose or missing nails, bolts or screws
C. Look for cracked, broken, split, dented or badly worn rungs, cleats or side rails
D. Splinters
E. Corrosion on metal ladders

NOTE: Always report ladders found to be defective. Don't allow them to be used. Take them out of service until properly repaired.

III. Ladder Tips

A. Always use the right ladder for the job.
B. Don't set your ladder in a walkway or door opening
C. Keep the area at the top and bottom of the ladder clear of cords, tools, material and debris.
D. Always set the ladder on solid footing.
E. Use a ¼ angle on the slop of the ladder
F. Don't lean to the side when on a ladder.
G. Minimize the carrying of tools or materials on a ladder. Use both hands when climbing a ladder to grab onto the side rails.
H. Only one person on a ladder at a time unless the ladder is double-cleated.

NOTE: Remember where you are when you are on a ladder and remember the safety rules associated with ladders. It may prevent you from falling.

Floor and Other Openings

Over 30% of all construction injuries are a result of falls. Many of these falls occur from floor and other types of openings being improperly guarded. The following items should be considered when dealing with floor and other types of openings.

A. Floor Openings

1) Ladder way floor opening
2) Hatchway and chutes
3) Skylight openings
4) Pits
5) Manhole
6) Temporary openings (for mechanical/electric equipment)

B. Methods Of Protection

1) By use of standard guardrails
2) By use of standard floor coverings

NOTE: All standard guardrails must not deflect more than 2" in any direction and must withstand a 200 pound load applied horizontally. All standard floor coverings must be capable of supporting the maximum intended load and installed to prevent accidental displacement. Floor coverings should be so marked in orange paint.

Material Handling

Proper material handling is critical to the success of any job. Material handling is also potentially dangerous to those moving the material from the delivery vehicles to its storage place. The following items should be remembers when handling material:

Material Storage

1) Ensure that floor can handle the storage loads.
2) Keep al aisles and passageways clear.
3) Do not store materials within 6 feet of hoist entranceways or within 10 feet of the exterior of the building.
4) Do not store non-compatible materials together (i.e., gas containers and bulk lumber.)

Proper Lifting Techniques

1) Know your lifting capacity
2) Know the capacity of the load to be lifted
3) Avoid over-extending or twisting of the back
4) Use your legs to lift-keeping your back straight
5) Get help if needed

Rigging

1) Inspect all rigging equipment prior to use
2) Remove or destroy and rigging equipment found to be defective
3) Never load in excess of any of the rigging components
4) Use only accepted rigging methods

Material Storage

Proper material storage is a vital part of each project. This is especially true with finish hardware, since it can take too long to receive the materials from the supplier after the order is placed. It also makes good sense in that materials must be stores, so why not store them so they cam be easily expedited though the job. It also makes each project much safer. The following points should be discussed when reviewing material storage:

1) Poorly stacked materials are dangerous
2) Keep aisles and passageways clear; never store materials in such a manner as to block either
3) Never store materials within 6 feet of a hoist-way entrance or floor opening
4) Materials should not be store within 10 feet of the edges of the above grade floors
5) Segregate incompatible materials
6) Never store more materials than are to be used immediately on scaffolds or runways
7) Remove all nails from lumber stacks
8) Block all cylindrical storage areas to prevent spreading or tilting
9) When possible, cross tie tiers of a material to increase support
10) If heavy materials or large quantities of materials are to be stored on floors above grade, know the lead limits of the floor and don't exceed them

Since all materials must be stored on a project until used, it makes good sense to do it correctly the first time. If will also increase efficiency and greatly increase the safety of the project.

Proper Lifting

Most of us forget the importance of our backs for the enjoyment of a normal, happy and successful life. However, the back contains one of the most critical muscle groups in the body, as well as the spinal cord and associated vertebrae and disks. Everyone working in the trades must lift material to either put them into place or to expedite from one location to another. It is, therefore, important to remember the key elements of proper lifting.

I. Preparing To Lift

A. Determine the load capacity
B. Determine your ability to handle the load
C. Get help if needed
D. Wear safety shoes
E. Wear cloves to protect your hands if the surface is rough
F. Make sure you have a clear walkway

II. Making The Lift

A. Center the load between your legs or shoulders
B. Always bend with your legs
C. Keep your back straight
D. Lift with your legs
E. Keep the load close to your body

IV. Moving The Load

A. Keep your back as vertical as possible
B. Keep the load close to you
C. Don't twist your body—move your feet
D. When lowering your load, bend with the knees and keep the back straight

Remember to follow these rules of lifting and you will give your back a break instead of breaking your back!

Trash Chutes

Trash chutes or disposal chutes are used quite commonly on high-rise projects. However, they are also misused frequently in that certain types of material should never be disposed of by the use of a trash chute. The following points should be reviewed when discussing trash chutes:

1. Wherever materials are to be dropped 20 feet or more, a chute must be used
2. It is to be fully enclosed on all sides
3. Never allow someone using a chute to be subjected to material from above
4. Be sure the chute is properly guarded with standard guard rails
5. Be sure the cute door can be securely latched in a closed position
6. Be sure all debris is collected in a suitable container
7. Never allow debris to fall into an unguarded or unsecured areas
8. Never allow debris to accumulate to overflow
9. Keep a fire extinguisher near the trash accumulation area
10. Never put solvent, oil, flammable liquids, etc. or materials soaked with any flammable liquids into a trash chute.

The use of trash chutes can greatly improve the housekeeping of a project, but unless the chutes are properly constructed and properly used, they will do nothing but create additional hazards for the workers.

Housekeeping

Lack of proper housekeeping is one safety hazard that is common to all types of projects at all times. It is also one item that can help improve not only the safety on a job, but also the morale and productivity on a job.

The following topics should be covered in any discussion on Housekeeping:

General Rules

A. Keep scrap lumber with protruding nails separate from other debris
B. Keep all waste debris in neat piles and away from the immediate work area
C. Remove debris from the job on regular basis
D. Keep aisles and walkways clear
E. Store materials only in their designated areas
F. Place trash barrels where needed to eliminate food rubbish
G. Keep tools and equipment stored neatly
H. Keep extension cords from being run across walkways. If necessary, run them overhead
I. Don't let trash and debris build up. If it does, make an extra effort to get it cleaned up.

Good Housekeeping Can

A. Prevent minor accidents—cuts, punctures, etc.
B. Prevent major accident—trips and falls, fires, etc.
C. Increase productivity by speeding up the movement of men and materials on the job.

Remember that good house keeping aids everyone and makes it easier for everyone to perform their task. It also makes a job much easier.

Electrical Hazards

Electrical hazards are doubly hazardous in that there is not only the chance of electrocution, but also, there is the probability that any electric shock will cause a loss of consciousness that will result in a fall of some sort.

The following items should be discussed when talking about electrical hazards:

Methods Of Receiving An Electrical Shock

A. From a defective power tool
B. From a defective extension cord
C. From overloading a switch or over-riding a by-pass
D. By not grounding electrical equipment
E. By coming in contact with live electrical lines
F. By coming too close to high power lines with the power arching over and making contact

Ways To Avoid Electrical Hazards

A. Always inspect tools and equipment for frayed cords and defective plugs before using them.
B. Never use a power tool that has the ground plug removed.
C. Never stand in water and operate a power tool.
D. Keep extension cords out of the water when in use.
E. Consider all power lines “live” and avoid contact with them.
F. Implement an assured grounding program or a ground fault interrupter system.
G. Disconnect all electrical tools and cords when not in use.
H. He sure all temporary lighting is equipped with bulb covers
I. Make sure all power supplies, circuit boxes and breaker boxes are properly marked to indicate their purpose.

The best way to eliminate the hazard of the quiet killer is to acts as if each exposure to an electrical hazard may be your last. Never take electricity for granted.

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Assured Grounding Programs

OSHA has begun to strictly enforce the standards pertaining to electrical grounding. These standards require that a project use either Ground Fault Circuit Interrupters (GFCI's) or an Assured Grounding Program. GFCI's effectively prevent short circuits by tripping the entire circuit when a short occurs. It eliminates the possibility of electrocution and is the preferred method of protection. However, it is an expensive method and, therefore, we'll discuss the use of use of Assured Grounding Programs. The following elements constitute and Assured Grounding Program:

Program Components

A. Have the company's written record on file.
B. Have a competent person conduct the test.
C. Test all electrical equipment for proper grounding.
D. Remove from service and tag any defective equipment.
E. Record the findings of the test.
F. Color-code all equipment tested to insure complete test results.

Tests

A. Test for the continuity of the grounding conductor.
B. Test:
    1. Before first use
    2. After any repair
    3. After any possible damage
    4. At least every 3 months

Inspections

A. Visually inspect for defects daily before use.
B. Inspect the following
    1. Extension cords
    2. Receptacle boxes that are not permanent
    3. Power tools

Test Records

A. Keep a log of all items tested, by service number or description.
B. Keep a log of all items not passing the test.
C. Color-code all items to indicate whether they are approved for use or should be removed from service.

The use of an Assured grounding Program is not only required, but is also good common sense. Electrocution is no laughing matter and any steps we can take to reduce our exposure to this hazard are certainly wise.

Excavations

Cave-ins and slough-offs are the second highest cause of deaths in the construction industry each year. Excavations must be properly shored or cut back to an acceptable angle of repose; otherwise, there will be a constant threat of a cave-in and the associated chance of injury or loss of life.

The Following Items Should Be Reviewed Prior To Beginning Any Excavation

A. Locate all underground utilities.
B. Determine if there are any overhead hazards.
C. Will there be any heavy equipment in the near proximity of the excavation
D. Estimate the depth required for the excavation.
E. Determine how many people will work in the excavation.
F. Devise an escape plan for those inside the excavation to cover a possible cave-in.
G. Determine, if possible, the type of soil to be excavated. This will help determine the type of shoring to provide or the angle of repose needed.

Steps To Take To Provide A Safe Excavating Operation

A. Always shore or cut back the opening adequately.
B. Any opening with a depth of 5' or more requires shoring or to be cut back.
C. Never store excavated or other materials closer that 2' from the edge of the excavation.
D. Inspect the excavation daily. This must be done by a qualified person.
E. Access ladders are to be provided every 25' in excavations of 45' or more in depth.
F. Review escape procedure with all personnel who may have cause to be in the excavation.
G. Beware of possible gas accumulation in the excavation.

Unlike most accidents, the cave-in of an excavation can usually be predicted if closely watched. It is therefore, critical that a competent person keep a close eye on any excavation. All personnel should be removed from any excavation should it appear to be unstable.

Trenching

As far as safety is concerned, trenching and excavation operations are very similar. Both expose employees to the same type of hazards. Therefore, many of the same safety rules apply. The main difference is that a trench allows for only restricted working space. This restriction increases the potential for injury. As a result the need for safety awareness is increases when compared to excavation operations.

The following items should be carefully considered when conduction trenching operations.

Pre-Operations

A. Locate all underground utilities.
B. Determine, if possible, soil conditions.
C. Based on the depth of the trench, determine amount of shoring needed or angle of repose.
D. Determine the number of access ladders needed.
E. Estimate the number of people to be working in the trench and the amount of roof needed to perform the task.
F. Appoint a top man.
G. Determine if there is an overhead exposure.

Trenching Operations

A. Constantly monitor the soil conditions.
B. Shore or slope any trench with a depth in excess of 5 feet.
C. All spoil or stored materials must be kept at least 2 feet away from the edge of the trench.
D. Keep all unnecessary use of equipment away from the open trench.
E. Devise and practice escape routes.
F. Place access ladders at least every 25 feet.
G. Never allow personnel in trenches where there is a likelihood of a cave-in or slough-off.
H. Always maintain a top-man.
I. Review rescue techniques with all personnel.

The above items are all necessary to the safe and successful trenching operations. The most important of these, however, is to shore or properly slope all trenches.

Heat Exhaustion and Heat Stroke

Excessive heat causes accidents in many ways. It becomes difficult to concentrate on your work; you sweat; you get tired, nervous and begin to make more mistakes in judgment. When the job temperature exceeds **90° F,** the following rules on heat exhaustion and sunstroke should be reviewed:

How To Recognize Heat Exhaustion

1. The person is dazed, staggers or becomes dizzy.
2. A feeling of nausea or vomiting.
3. Facial paleness.
4. The person feels chilly.
5. A weak pulse and body temperature below normal.
6. Loss of consciousness.

What To Do

1. Call for emergency medical assistance.
2. Keep the victim lying down with the head lower than the feet.
3. Loosen the victim's clothing.
4. Keep the victim warm.
5. Give fluids if possible. Avoid ice water and alcohol.
6. Salt solutions are best.

Prevention

1. Avoid consuming alcohol and ice water while working.
2. Drink plenty of cool fluids: citrus or fruit juices are best.
3. Avoid heavy, fatty-type foods.
4. Wear light, loose clothing.
5. Avoid fatigue.
6. Get plenty of rest.
7. Replace lost body salts.
8. See a doctor if you are not feeling well.

Both sunstroke and heat exhaustion are serious matters. In both cases, the body is reacting to a life-threatening situation. Do not take chances. Should you begin to feel ill, take a break and drink some cool (not ice) water or something else other than an alcoholic beverage. Both illnesses frequently cause a loss of consciousness. In construction, this can lead to a serious injury.

Guardrails

Probably the most commonly cited OSHA citation is for lack of or improperly erected guardrails. There are two basic types of guardrails—the perimeter guardrail and the floor opening guardrail. Both are constructed the same way and are designed to provide the same type of protection. The following items should be reviewed when discussing guardrails:

Standard Specifications

1. All open sided floors, floor openings or pits exposing workers to a fall of six feet or more must be guarded.
2. The top rail shall be 42' high and be constructed of 2 • ***x*** 4' stock wood.
3. The intermediate rail shall be 21 'high and be constructed of 1 • ***x*** 6' stock wood.
4. Toe boards shall be at least 4' in vertical height from the floor to the top of the toe board.
5. Uprights shall be of 2 • ***x*** 4' stock wood on 8' centers.
6. All components must withstand a load test of 200 pounds applied at any point.

NOTE: *3/8' wire rope cable may be substituted for stock wood on the top and mid rails. However, the cable may not deflect more than 3. in any direction.*

General Rules

1. Install properly the first time and reduce the amount of maintenance.
2. Install as you go along—don't wait and then catch up.
3. Regularly inspect all rails.
4. Anyone repairing a guardrail must have an attached life line.
5. Enforce replacement on subcontractors when they remove them.

Guardrails are designed to protect you from falling from one level to another. If they are defective or not there at all, then you are exposed to serious injury or possibly even death.

Compressed Gas Cylinders

We know what the various compressed gas cylinders are used for on the jobs, but how many of us realize that the gases stored in those cylinders are under a pressure of from 250 psi to 2200 psi? These pressures make the cylinders not only dangerous from a fire standpoint, but if not handled and stored properly, the cylinders can become rockets or bombs. The following points should be stressed when discussing the safe use of compressed gas cylinders:

1. Always store in a secure upright position.
2. Always store with caps over the valves.
3. Never store two types of gases closely together.
4. Never tamper with any safety devices on the valve or cylinder.
5. Always open valves slowly.
6. Avoid storing cylinders in areas of high temperatures.
7. Never use cylinders for rollers or saw horses.
8. Never attempt to repair valves or regulators.
9. Separate full cylinders from empty ones.
10. Do not try to transfer gases from one cylinder to another.
11. Keep a fire extinguisher nearby when handling or working with compressed gas cylinders.
12. When in use, keep cylinder secured to a cart designed for that use.
13. Remove empty cylinders from the work area.
14. Never mix gases with oil or grease.

The improper use of compressed gas cylinders is one of the most common safety violations. Most people feel the cylinders are safe. They are safe only if treated properly. To insure that they don't become a hazard, follow the rules just given to you.

Blasting

The handling and use of explosives is a very dangerous operation. Extreme care should be exercised and strict adherence to the blasting regulations should be maintained. The following safety rules should be reviewed when discussing blasting safety:

1. Allow only specially qualified personnel to work with blasting agents.
2. Prohibit any sparking devices around the blasting agents.
3. All explosives must be accounted for at all times.
4. Unused explosives must be kept under lock and key.
5. Never abandon explosives.
6. Always use blast mats when there is a chance of damaging adjacent structures.
7. Proper warning devices and signals must be used to protect employees and the public.
8. Signs must warn the general public on all roads within 1,000 feet of the blasting area.
9. Never blast during an electrical storm.
10. Never use damaged or deteriorated blasting agents.
11. Competent personnel shall direct all loading and firing only.
12. Never use black powder.
13. All blasts are to be fired by electrical means only.

All blasting operations should be fully researched and all possible safety precautions taken prior to the actual blast. Only competent personnel are to be allowed to load and fire. Always consult the blasting regulations to be sure that the operation is being conducted safely.

Working in Confined Spaces

Working in a confined space is a unique and serious hazard. There is no halfway problem, either there is or there isn't a problem. By definition a confined space is one that has limited openings for entry and exit, unfavorable ventilation which could produce toxic air contaminates and which is not intended for continuous employee occupancy. The following safety rules apply to confined spaces:

Primary Hazards:

1. Oxygen deficiency
2. Combustible or explosive
3. Exposure to toxic substances

Safety Procedures:

1. Test for oxygen deficiency
2. Sample for combustible gases Note: Most combustible gas meters will not work in oxygen deficient atmospheres.
3. Continually monitor for toxic substances (gases) as work progresses.

Making A Confined Space Workable

1. If space is unable to be vented, be sure to provide proper respiration equipment.
2. If space can be vented, continually flush out the space with fresh air.
3. Be aware that spark producing equipment should not be used to flush out confined spaces.

Rescue Procedures

1. Never rush to the aid of a fellow employee in a confined space.
2. Always be sure that work in a confined space is watched by someone outside of the space.
3. All personnel in a confined space should work with a lifeline attached outside of the space.
4. All rescuers must be competent in the use of rescue equipment and self-contained breathing units.

Confined spaces need not be dangerous places to work if the above precautions are strictly followed. Remember it is rare that a single fatality occurs in a confined space accident, usually there are multiple fatalities.

Ramps and Runways

Ramps and runways are an integral part of every job site. However, most ramps and runways are not properly constructed. Such improperly constructed ramps and runways are threats to the lives of the workers as well as a source of destruction to materials. The following points should be reviewed when discussing ramps and runways:

General Rules For Ramps And Runways:

1. Keep them free of debris.
2. Provide suitable traction.
3. Erect guardrails on both sides to prevent falls.
4. Don't overload with personnel or materials.
5. Use only scaffold grade 2 x 10 stock or equivalent plywood lumber.
6. Never exceed a 12' maximum span without bracing.
7. Give plenty of clearance when workers are carrying or pushing materials.
8. Keep all loads moving, don't stop on a ramp or runway with a load. -
9. The width must be at least 20".
10. All walkways with a slope greater than 1:5 must have cleats.
11. Never work under a ramp or runway.

***Danger Signs For Ramps And Runways*:**

1. Not wide enough.
2. Not properly supported or nailed.
3. Bad spots or uneven walkways.
4. Lack of handrails or toe boards.
5. Too steep an incline.
6. No cleats.
7. No sand, cinders, salt. etc.
8. No timber guards.

It makes good sense to erect safe and accessible ramps and runways. Failure to do so is equivalent to setting booby traps throughout a job.

Effects of Weather

There is one item in this business that we have absolutely no control over—the weather. However, we can control how the weather affects the safety of a project. The following weather related safety rules should be discussed:

Wind

1. Can blow dust in your eyes
2. Can blow material and people off scaffolds, roofs or higher floors.
3. Can blow down poorly braced formwork.
4. When winds pick up be sure to keep yourself and materials tied down. This is especially true if you are working on a high area.

Lightning

1. Get off the iron or out of the rebar area if lightning is seen. Don't become part of a large lightning rod.
2. Be sure to stay away from any type of tall object.
3. Often electrical storms occur without any rain, and therefore, are very dangerous.

Rain, Sleet, Ice And Snow

1. All are wet, some are cold and all can cause slips and falls.
2. Mud can result in pulled muscles from straining.
3. All can ruin materials.
4. Snow, sleet and ice can cover floor openings and cause slips and falls.
5. Water. If allowed to accumulate on site, increases the chance of electrocution.
6. Water, ice and snow can affect trenches and excavation. Closely inspect all excavation to determine if the weather is affecting them.
7. Beware of all icicles. Remove them carefully.

When dealing with weather and the effects of it on a project, always try to minimize the effects and always use your common sense.

Horseplay

Everyone has heard a practical joker say “This one is gonna kill ya”. Well, hopefully it never has killed anyone but practical jokes invite danger. Our industry is potentially dangerous and anything that unnecessarily increases the chance of an injury must be eliminated. Horseplay benefits no one and usually only builds up resentment and fosters retaliation. Practical jokes should be reported and discouraged.

The following are examples of horseplay:

1. Scaring someone
2. Air hosing someone
3. Wrestling with someone
4. Boxing
5. Goosing
6. Dropping objects next to someone
7. Throwing water on someone
8. Throwing objects at someone
9. Placing tacks under someone

Practical jokers cannot guarantee the success of their jokes. They can guarantee that they increase the chance of an accident occurring. Imagine a joke that backfires, resulting in an injury or death to a coworker. Do you want any part of that? It’s easy enough to get hurt on the job as it is, let’s not increase anyone’s chances.

Falls

Cartoon characters can fall from great heights and not be injured at all. People can't. Gravity is a great thing, except we can't avoid it and when we make a mistake, like walking over a floor opening, we have no choice but to fall. The following items represent the bulk of the exposures to falls on a construction site and some things to remember to decrease your chance of falling:

Ladders:

1. Always use the right ladder.
2. Tie them off and set on level ground.
3. Do not overreach.
4. Do not overextend yourself on the ladder.
5. Always face the ladder and use both hands when climbing.

Scaffolds:

1. Always erect permanent scaffolds.
2. Always provide guardrails and toe boards.
3. Always overlap planking.
4. On one-point and two-point scaffolds, always wear a lifeline.

Floor Openings:

1. Floor openings should be properly covered.
2. Covers must be able to support walls the same as floor.
3. Covers should be firmly attached to floor.
4. Covers should be marked as such, i.e.. DO NOT REMOVE FLOOR OPENING COVER.
5. Consider wall openings and uncompleted stairways as openings with suitable protection provided.

Stairways:

1. Use handrails.
2. Watch where you step.
3. Keep your view clear.
4. Concentrate on stairs.
5. Do not run up or down stairs.
6. Keep stair well clean.

Housekeeping:

1. Always try to provide good footing.
2. Keep tools, trash, and scrap materials Out of walkways.
3. Clean up as you go.
4. Always be wary of oil, ice and snow.

All of the above items will, if followed, help you prevent a fall. Balance is one of the keys to preventing a fall.

Dangers Overhead

If it takes a piece of equipment to tilt material, then you can bet that if the load falls, it can seriously injure or kill you. Always be aware of overhead operations and remember the following safety rules that apply to the dangers overhead:

1. Always be sure loads are carried close to the ground.
2. Use taglines on loads when possible.
3. Use only one signalman.
4. Be sure the signalman can clearly observe the load and the operator at all times.
5. Never hoist over workers.
6. Alert workers when hoisting in their area.
7. Be sure loads are properly rigged.
8. Make sure all hoisting and rigging equipment is in good condition.
9. Hoisting speed should never proceed too fast so as to risk losing control of the load.
10. Monitor weather conditions, especially wind.

It is important that the overhead danger of moving materials across the site be watched by all assigned to this task. It is also important that workers are aware of the overhead hazard. It is difficult to avoid a load once it has begun to free fall.

Vehicle Operations

Most construction sites never have all the site space that is needed. It is, therefore, important that all the space is conserved and used to its maximum. This usually congests traffic and increases the likelihood of a vehicle related accident.

Remember the following vehicle operation rules:

1. Always keep the vehicles and equipment in good running conditions. This includes brakes, lights, signals, etc.
2. Any loads that extend past the vehicles body must be tagged.
3. No employee should be allowed to ride the load or exterior of any vehicle not designed to transport personnel.
4. Only operate vehicles at a slow rate of speed, always watch for other vehicles and personnel.
5. Always give the right of way, don't worry about who should go first, rather who is the safest.
6. On very busy sites, a signal man or spotter should accompany all delivery vehicles.
7. Avoid backing vehicles in.
8. Be sure bi-directional equipment has operational back up alarms.
9. Report any unsafe road conditions.

Unsafe acts when compounded by the force of large vehicles can result in severe injuries and expensive repair or damaged material bills.

The Deadly Dozen

We all know that there must be a cause for an accident to occur. In order to avoid accidents we must remove the cause. Every cause is a result of an unsafe act or unsafe condition. By recognizing the unsafe act or condition, we can effectively remove the exposure to them. The following are 12 reminders to help you recognize unsafe acts and unsafe conditions:

Unsafe Acts

1. Unauthorized use or operation of equipment.
2. Failure to secure or tie down materials to prevent unexpected movement.
3. Working or operating too fast.
4. Failure to issue warnings or signals as required.
5. Disconnecting or removing safety devices.
6. Using defective tools or equipment.
7. Improperly using tools or equipment.
8. Standing in an unsafe place or assuming an improper posture.
9. Servicing moving equipment.
10. Riding equipment not designed for passengers.
11. Horseplay
12. Failure to wear personal protective equipment.

Unsafe Conditions

1. Lack of proper guards.
2. Lack of a proper warning system.
3. Fire and explosion hazards.
4. Poor housekeeping.
5. Unexpected movements.
6. Protruding objects such as nails, wires, etc.
7. Improper clearance or congestion of aisles or passageways.
8. Poor placement, storage or arrangement.
9. Hazardous tools, equipment or materials.
10. Poor lighting, high noise levels.
11. Hazardous atmospheric conditions.
12. Improper personal attire.

By being able to recognize the above conditions and acts, you can effectively correct or avoid them and reduce your exposure to the causes of accidents.

Winter Heat

Most areas of the country require heat in winter for materials and for workers. The most commonly used temporary heating device is a LP Gas salamander. The following safety rule should be reviewed before using any of these heating units:

1. Use only those heaters approved by a nationally recognized laboratory.
2. All LP Cylinders should have a cap or shield to protect the valve against damage when not in use.
3. Cylinders and regulators should be placed at least six feet away from the heating appliances.
4. Cylinders not in use should not be stored in the building.
5. Cylinders should be securely fastened in an upright position.
6. Fire extinguishers should be provided wherever heaters are in use.
7. A competent watchman should be present during all heating operations.
8. LP Cylinders should never be used below grade.

The following are general winter heating safety rules:

1. All heating units should be kept a minimum of ten feet from combustible tarpaulins or concrete blankets.
2. Never use solid fuel salamanders.
3. Keep all heating units out of aisles and traffic routes.
4. Watchmen should be changed every fifteen minutes or removed from the confined heating space in order to prevent carbon monoxide poisoning.

Remember when using LP Gas fired salamanders. The LP Gas is heavier than air and will sink into depressions, pockets or low spots. Never light a match to check for a leak (possible build-up.) If you fear that a leak has occurred, run an air sample test or try to flush out the area.

II. Personal Protective Equipment

Head Protection

Some reasons for wearing a hard hat are: it's required company policy: it helps to keep your head cooler in summer, *dry* during a rain; and it helps shield your ears from noise: but the main reason to wear a hard hat is that it protects the most important part of your body—the control center of your body—your head.

1. What A Hard Hat Does

A. Protects you from falling objects
B. Protects your head in case of a fall or a bump
C. Protects you from electrical shocks and burns

NOTE: In order for your hard hat to take care of you, you must care of your hard hat.

2. Proper Care

A. Always keep your hard hat properly adjusted
B. Do not cut, bend or heat the hard hat.
C. Do not wear it backwards.
D. Don't put anything inside your hard hat except your head.
E. Do not try to substitute it for a "bump cap." The bump cap will not provide adequate protection from falling objects.

NOTE: The average hard hat weights about 14 ounces. The, average head weighs about 14 pounds. That's about 1 ounce of protection for each pound of head. A small price to pay to protect the control center of your body!

Eye Protection

The protection of your sight is extremely easy, extremely important and, too often, extremely forgotten. Once you have lost an eye or perhaps even your ability to see, it's too late. The following hints can help you protect, keep and enjoy your ability to see the world around you.

1. Types Of Eye Injuries

A. Small flying objects, such as dust or other microscopic objects.
B. Particles resulting from chipping, grinding, sawing, brushing, hammering or using power tools.

NOTE: These items move with the speed of a bullet and can permanently damage your eyes:

C. Liquids, such as chemicals, tar, asphalt solvents, paint or masonry cleaning solutions.
D. Invisible light rays, such as those generated by welding operations or by a laser beam.

2. Methods Of Protection

A. Safety glasses
B. Safety goggles
C. Face shields
D. Welding hoods

Eye injuries occur in a split second! Don't blind yourself to the necessity of protecting your eyes.

Foot Protection

Foot protection is probably about the least talked about type of personal protection. Nonetheless, it is still important. One nail puncture wound can cause weeks of lost time. The following points should be remembered when foot protection is discussed:

1. Characteristics Of A Suitable Boot

A. Puncture resistant soles
B. Steel toes
C. Boot extends above ankle
D. Sole provides good traction

2. Type Of Injuries Commonly Resulting From Poor Footwear

A. Punctures from nails and tie wire
B. Bruises of the foot
C. Unsure footing
D. Blisters
E. Body fatigue
F. Mashing of foot resulting from dropped objects

3. Other Acceptable Footwear

A. Buckle Overshoes—for work in mud, water and concrete
B. Knee and Hip Boots—for work in deep water and mud

NOTE: Never allow anyone to wear sandals or tennis shoes on the job. Also, encourage the use of rubber boots when placing concrete. As we all know, concrete can cause severe burns if it comes in contact with the skin for any length of time.

Almost all of us work on our feet or at least use our feet to get to work. Doesn't it make sense to take good care of our feet in order to insure that they are able to get us to work?

Hand Protection

It has been said that the hands and fingers are the instruments of the mind. Accordingly, it becomes very difficult to be productive when your hands are injured or lost as a result of an accident. Whatever the craft, a worker must be able to use both hands in order to be considered a craftsman.

Causes Of Hand Injuries

1. Inattention
2. Taking of chances
3. Exposure to rough materials
4. Stacking of heavy materials
5. Transportation of materials
6. Cut by sharp objects
7. Mashed by tools
8. Burned
9. Caught in machinery

How To Protect Your Hands

1. Wear groves whenever possible
2. Pay attention to the task being performed
3. Use the proper tools
4. Make sure any equipment used has hand guards in place

Should any injuries occur to your hands, be sure to get immediate treatment. Without treatment, a minor cut can turn into a major problem through infection. Yours may look tough, but when you scratch, cut, mash, bruise or seriously injure your hands you take a chance of losing them and in this business, you can't work without them.

Dressing For Winter Work

Cold temperatures often have a chilling effect on the senses. It is usually difficult to be productive when you are cold. It is therefore, important to dress for the weather conditions that will be present on the jobsite. The following reminders will help you in dressing for winter work:

1. Always dress in layers with the outer layers being rather loose and the inner layers being somewhat tighter.
2. Do not over bundle.
3. Use the outer layer of clothing as a wind breaker. This will make the layers underneath more effective.
4. Minimize perspiration. If you begin to get hot, take a layer off. Try to avoid getting your clothes wet. Once wet, they will not serve as good protection from the cold.
5. Always wear helmet liners in your hard hats. This will greatly increase your overall warmth. Over 50% of the body's heat loss comes from the head.
6. Be sure to properly protect your feet. Unless you are moving around, your feet will feel the effects of the cold first. Wool socks help but 4-buckle overshoes can provide better protection.
7. Gloves are very important. Most often a thin pair of wool gloves under a pair of leather gloves will provide the best protection.

Don't overdress—this can restrict your movements and increase the chances of an accident. The effect of shock resulting from an accident in cold weather can be much more dangerous. Should an accident occur in cold weather, it is critical that the injured party be kept warm.

Safety Belts & Lifelines

Safety belts and lanyards are required to be used when workers are exposed to falls of five feet or more. Both items are designed to prevent serious injuries resulting from falls. Falls account for approximately 30% of all construction injuries. Safety belts and Ianyards are easy to obtain on a jobsite, yet they are rarely used. It seems most workers don't want to take the time to put them on or, worse, feel they don't need them. I'm sure every person who was injured or died from a fall would have gladly worn a safety belt and lanyard if they had only known they were about to fall. Remember the following points when discussing safety belts and lifelines:

1. Inspect the equipment (belts, hardware and lanyard) before use.
2. Never use equipment, which is not in good condition.
3. Use only rated equipment (belts and lanyards must withstand a 5,400# dead load).
4. Always secure lanyards to a suitable area, above your work area if possible.
5. Don't modify or cut on any of the safety equipment.
6. Never allow acids, caustics or other corrosive materials to come into contact with any of the equipment.
7. Store the equipment in a dry place.
8. Replace damaged equipment; remove it from service as soon as it is determined to be defective.
9. *Use* the equipment required.

Don't allow yourself to be lulled into a false sense of security. Always provide yourself with some fall insurance. Regularly wear a safety belt and keep it attached to a lifeline. The life you save will probably be yours.

Working Over Or Near Water

Working over or near water often involves special construction methods. Along with these methods, come additional safety requirements. The most important are the use of a work vest or life jacket and the enforcement of the safety belt and lanyard policies. The entire list of safety rules and procedures for working over or near water are as follows:

General Rules:

1. Personnel over or near water must wear a Coast Guard approved life jacket or work vest.
2. All floatation devices must be inspected prior to use each day.
3. Ring buoys with at least 90 feet of line must be placed every 200 feet.
4. At least one life saving skiff must be immediately available when employees are working over or near water.

Skiff Safety Rules:

1. A competent person must operate skiff.
2. All persons in the skiff must wear a work vest of life jacket.
3. All persons in the skiff must ride sitting down with the full load equally balanced.
4. Never allow horseplay.
5. Keep the skiff neat, clean and free of excess debris and water.
6. Basic first aid equipment should be kept on board.
7. All flammable liquids should be stored only in safety approved containers.
8. A suitable ring buoy should be kept on board.

Most construction work done over or near water is in the form of bridge work. Most rivers have deadly undertows that would pull you under without a life preserver. When working over or near water be sure to use an approved life jacket or work vest and *wear* your safety belt.

Traffic Control

Almost every job at one time or another needs traffic control. This usually involves the use of a flagman and signs. In short duration situations flagmen are preferable to signs since they can react to any changes in site situations. Signs are however, a suitable solution to an extended traffic control problem. The following items are to be reviewed when discussing proper traffic control procedures:

Setup

1. Pre-plan the entire traffic control operation.
2. Have the flagman knowledgeable of all construction operations to occur.
3. Clearly mark all changes or detours.
4. Enforce the detours or changes.

Flagging Operations

1. Be sure the traffic can see you
2. Wear an orange vest
3. Use a flag
4. Wear suitable shoes
5. Be dressed neatly (to reflect a good public image)
6. Wear a hard hat
7. Never turn your back on the traffic
8. Always be courteous but firm

It should be remembered that the intent of the traffic control procedures is to prevent a tie up in the operation of the project and to allow the general public to move as efficiently as possible around the construction site. It is important that all flagmen remember that they represent the company and will come in contact with hundreds of people while flagging. Therefore, they should be courteous at all times.

The flagman has a responsibility to protect the general public as well as those at work on the construction site. This job should not be taken lightly.

Protecting The Public

In today's legalistic society with the laws of civil liability and negligence being what they are,. it is of critical importance that the steps taken to protect the public be taken seriously. All too often, steps are taken to protect the public after an accident has occurred and often after a lawyer has had a field day in court, at the cost of the company.

The following steps should be considered in guarding a site:

1. All efforts to protect the site should be directed toward the young.

NOTE: Most liability claims come as a result of injuries to youths who gain access to a site after hours or on weekends.

2. If possible, fence in the site, using plywood or chain link fencing.
3. During operations, do not allow unauthorized personnel on the site without an escort.
4. Always rope off or barricade excavations or other exposures to a fall.
5. All high-rise projects should maintain covered sidewalks and intermediate debris nets on the building.
6. Keep the site well lit at night.
7. If possible, provide for a night watchman.
8. Inform the police of the normal hours of work and ask that they regularly patrol the site after hours.
9. Have workers report changes in the work conditions that may require additional protective measures.
10. In heavy traffic areas, it may be advisable for a flagman to be used to direct traffic.

In all instances of public exposure, it is important that steps are taken to eliminate the exposure of the public. In defending a suit against the company, good faith efforts can go a long way.

Barricades & Warning Devices

Two types of construction that usually require a great deal of public protection are high rise projects in metropolitan areas and highway work. Both require modifying the existing traffic patterns and more importantly the existing driving habits of the public. The following rules should be reviewed when discussing the use of barricades and signs:

Types of Accidents

1. Collision with Construction Equipment.
2. Collision with other vehicles.
3. Pedestrians falling into excavations.
4. Driving into excavations.
5. Driving into work areas.
6. Loss of control of vehicle due to changes in road conditions.

Types of Warning Devices

1. Signs
2. Cones
3. Drums
4. Barricades
5. Channeling devices such as barrier walls
6. Flashing Lights

General Rules

1. Give the public plenty of warning by use of signs.
2. Make sure warning devices can be seen and are reflective.
3. Use flagmen on narrow passages, one way passages or when construction vehicles will be interacting with the public traffic flow.
4. Maintain all barricades and signs.
5. Give the construction area a buffer area.
6. Be sure you clearly mark the beginning and end of the construction area.

There are numerous specific rules for signs, barricades and warning device usage. It is far better to be safe than sorry, since an automobile is an awfully powerful machine.

III. Safety Awareness

Why Accidents Occur

Every accident is caused by a breakdown in one of four areas: the worker, the tools used, the materials used, or the methods used. Often there is a breakdown in at least two areas, one being the worker and the other coming from one of the three other areas. The accidents cause usually results from an unsafe act or an unsafe condition. The following points are important to review when discussing accident occurrence:

Types of Unsafe Acts:

1. Operating a tool or some equipment without authority
2. Working at an unsafe speed.
3. Using unsafe equipment or using it in an unsafe manner.
4. Disconnecting safety devices.
5. Unsafe loading, placing or mixing.
6. Assuming an unsafe position or posture.
7. Working on moving equipment.
8. Horseplay or distractions.
9. Failure to use personal protective equipment.

Unsafe Acts Result From:

1. An improper attitude.
2. Lack of knowledge or skill.
3. Reduced mental or physical capacities.

Unsafe Conditions:

1. Improper guarding.
2. Defective equipment or materials.
3. Unsafe procedures.
4. Improper housekeeping
5. Poor lighting.
6. Poor ventilation.
7. Poor dress.
8. Improper evaluation of site conditions.

With the advent of OSHA, many of the routine hazards have been effectively guarded or significantly protected. However, the bottom line is still the use by each worker of his or her common sense by avoiding contact with unsafe conditions and by avoiding unsafe acts.

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Recognizing Unsafe Conditions

This particular topic is probably the most important one that will be discussed, the recognition and avoidance of unsafe conditions.

NOTE: Statistics show that in most cases an accident could have been prevented by the use of common sense.

DEFINITION: An accident is a result of an unintentional interruption to an orderly process. My event, condition or set of circumstances that causes an interruption in your normal work process is an unsafe condition or procedure.

I. Causes Of Unsafe Conditions Or Actions

A. Poor housekeeping
B. Horseplay
C. Confused material storage
D. Improper or defective equipment or tools
E. Careless handling of materials
F. Failure to follow instructions
G. Lack of personal protective equipment
H. Improperly trained personnel
I. Weather
J. Lack of guarding or warning systems
K. Dress for the job to be done

II. Steps To Take Once An Unsafe Condition Is Found

A. If possible, correct the condition yourself immediately
B. Report any major condition to your Foreman or the Project Safety Engineer
C. Follow-up—report the condition again if it is not corrected

III. Summary

A. Look for trouble (unsafe conditions)
B. Report it
C. Act to prevent its recurrence

The New Worker

All recent research indicates that the bulk of all job related injuries happen to the new worker. A new worker is defined as someone new to the jobsite with less than one year's experience in the industry. When new workers come on the site, review the following points with the new worker's crew:

Statistics Show

1. In construction, over 55% of all injuries occur within the first year of employment.
2. Almost one half of those occur within the first three months.
3. This pattern is nationwide, as well as industry-wide.

Factors Contributing To An Accident

1. Age
2. Length of service on the job
3. Size of firm
4. Type of work assigned
5. Use of hazardous materials or substances.

Steps To Take With New Employees

1. Determine the individual's experience level.
2. Describe the job to be performed.
3. Point out all hazards.
4. Introduce the individual to other crew members.
5. Give the individual a copy of the safety rules.
6. Test the worker's ability to operate the various tools and equipment.
7. Keep an eye on the individual and watch for unsafe acts.

It is everyone's responsibility to watch and see that a new worker is not injured or does not injure others. Without the cooperation of everyone involved, the risk of the new worker being injured will not be eliminated.

What Does An Accident Cost?

Every accident has one thing in common, it costs those involved. Usually, there are only two parties, the employee and the employer. Each has direct and indirect costs, but both have costs and no one ever truly benefits in any way from an accident.

Employee Direct Costs

1. Lost wages

Employee Indirect Costs

1. Mental anguish, pain and suffering
2. Inability to be productive
3. Decreased family participation

Employer Direct Costs

1. Medical bills
2. Compensation claims
3. Associated legal costs
4. Insurance costs

Employer Indirect Costs

1. Wages paid with no work performed
2. Lost efficiency
3. Damaged or destroyed equipment, tools or materials
4. Managerial and clerical time expended to handle injury claims

If all of the above costs were added up totaled, the actual direct costs would account for only approximately 30% to 45% of the total cost of each accident. Accidents are indeed much more expensive than most of us realize. An accident benefits no one, but costs almost everyone involved.

Near Misses

Most accidents occur as a result of an unsafe condition or unsafe action coming together with a person. The result is an injury to the person. Often, unsafe acts or unsafe conditions have several misfires and result in a near miss. The only difference between a near miss and an accident is luck and we all know luck always runs out or turns bad. It is, therefore, important to remember the following items when discussing near misses:

1. Always report a near miss.
2. Take immediate action to prevent a similar near miss.
3. If you didn't cause a near miss but saw it, discuss it with those involved and your foreman.
4. Near misses are injuries without people.
5. Near misses are not funny, they are often deadly.
6. Obey safety rules and you will decrease the number of near misses around you.

Near misses are warnings that something or someone is not performing correctly. Always pay attention to near misses and co-worker's in that they don't repeat themselves or you may find yourself or a hospital.

Safety Is Common Sense

Four out of every five lost time injuries are results of workers not being sensible and taking unnecessary chances. Common sense is irreplaceable. All of us have worked around people that are accident prone. They aren't jinxed, they just aren't very common sense smart. Below are some common sense rules and basic safety questions that should be reviewed when discussing common sense and safety:

Common Sense Rules:

1. Always wear the proper personal protective equipment.
2. Don't over exert yourself—get help with heavy tasks.
3. Don't over extend yourself and risk losing your balance.
4. Always use the proper tool for the job.
5. Concentrate on your work.
6. Look for unsafe acts or unsafe conditions.
7. Report unsafe acts or unsafe conditions.
8. Watch out for others—remember you're part of a team.

Ask the following questions before you begin to work:

1. Are the conditions safe?
2. Are the methods safe?
3. Does everyone know what to do?
4. Does everyone know how to do it?

You should be able to greatly decrease your chance of being injured by remembering the common sense rules, and by asking yourself the tour questions above. Be sensible and prevent accidents, not cause them.

Accidents Are Avoidable

Each time someone is injured, there is bound to be someone asking “How did it happen?” Accidents don’t happen, they are caused. Accidents are usually a result of someone not paying attention or not knowing how to recognize a hazard. Jobs with effective safety attitudes have about 1/5 as many injuries as those without the safety attitude. The following rules can help avoid the causes of an accident:

General Rules To Follow:

1. Learn the safe way to do your job.
2. Don’t jump from one elevation to another.
3. Don’t work under suspended loads.
4. Remove protruding nails or bend them over.
5. Keep the work area clear of debris.
6. Keep scaffolds free of excess weight.
7. 7. Use the personal protective equipment required for the job. -
8. Treat all electrical wires as being ‘live”.
9. Use the right tool for the job.
10. Be sure all tools are in good shape.

Four Hazard Avoidance Rules:

1. Know the safe way to work and use it.
2. Maintain safe working conditions.
3. Work safely and encourage others to do so.
4. Report all accidents and near misses.

Remember to ask yourself if you’re following the above rules. If you aren’t following them, then the chances are you’ll have or cause an accident. Keep asking yourself “how can I make my work safer” and you’ll probably not have a serious accident.

Carelessness

Safety is often not instinctive to workers. Supervisors must. accordingly, pay close attention to the actions of their crew members and teach safety by immediately correcting the unsafe actions and conditions of the crew. The single most identifiable cause of accidents is carelessness. Carelessness accounts for about 90% of all accidents. The following points can help you label carelessness and avoid it:

Carelessness Demonstrates Itself In:

1. Near misses
2. Numerous minor injuries
3. Inattention to instructions
4. Sloppy work
5. Forgetfulness

Some General Rules To Review:

1. Concentrate on the work at hand.
2. Don't use short cuts.
3. Don't allow horseplay.
4. Use the personal protective equipment required for the job.
5. Use the right tool for the job.
6. Look for unsafe acts.
7. Look for unsafe conditions.
8. Correct unsafe conditions immediately.
9. Report all near misses and injuries to your supervisor.
10. Watch out for the other workers.

Remember to watch out not only for your own carelessness but also the carelessness of others. Take the time to avoid carelessness and you can eliminate 90% of the chances of injury to yourself and those you work with.

Listen For Danger

The construction site is filled with various noises and sounds. Each sound is the result of an action of a worker using a tool or a piece of equipment. In almost all cases, a tool or piece of equipment will signal its breakdown by a change in the normal operating sound. Everyone on site should condition himself or herself to be able to pick up these advance-warning signals. Your safety could very easily be dependent on your ability to hear approaching danger. The following points are important to listening safely:

***Things Decreasing Listening Safety*:**

1. Over concentration on work.
2. Lack of sleep.
3. Improper or over eating habits.
4. Use of alcohol or drugs.
5. Poor work area ventilation.

How To Improve Safety Listening Habits:

1. Become acquainted with the proper operational sounds of tools and equipment.
2. Listen closely to instructions. Ask questions if instructions are unclear or confusing.
3. Stay alert.

Although it may be easier to see danger than it is to hear it, your ears are able to perceive warning signals from all around you. Your eyes are only good for the direction in which you happen to be looking. Fine-tune your ears and you can fine-tune your exposure to danger and injury.

Safety Away From Work

Safety at work is hopefully a matter of routine. Just as important is safety of the job. How many of us regularly practice safety at home? The following points can help improve your offsite safety practices:

Driving

1. Don't speed
2. Don't drink and drive
3. Maintain your auto in good mechanical condition
4. Watch out for other drivers
5. Allow for proper stopping distances
6. Be courteous, especially if you're in a company vehicle

Home

1. Minimize electrical exposures
2. Eliminate tripping hazards
3. Don't overextend on ladders
4. Teach your family to recognize hazards
5. Know basic first aid and, if possible, CPR

Play

1. Be careful not to overexert yourself
2. Loosen up before you begin playing a sport
3. Don't try to keep up with the kids
4. Know any safety rules associated with your forms of recreation (i.e. boating. hunting. etc.)
5. Teach your family the above rules and enforce them

After all, our families and friends are very important to us and life is short enough. We don't need to shorten it anymore for us or anyone else. Remember off-the -Job safety and practice hazard recognition off the job-site.

Kids And Construction

Like oil and water, kids and construction don't mix. Conversely, like iron and a magnet. Kids are attracted to any type of construction. It is, therefore, important to remember the following items when talking about kids and construction sites:

1. Kids don't recognize hazards as well as those who work on site
2. Equipment although locked out may still be a hazard
3. All excavations are potential swimming pools or forts
4. Scaffolds become gym sets

How to discourage kids:

1. Erect a site fence
2. Don't allow kids on site during the day
3. Mark excavations with signs or guarding
4. Lock and group equipment
5. Light the sight well
6. Ask for regular police patrols
7. Post "No trespassing" signs
8. If necessary, post a guard

Most kids will respect your wishes and stay out but some will not and those are the ones that can get hurt or hurt your project from a vandalism standpoint. Having a child's injury on your conscience can be quite a burden.

IV. Tools

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The Right Tool For The Right Job

As we see the Industry become more and more sophisticated, we shall see about 25% of all injuries result from using a tool improperly or from using the wrong tool for the job. The two most important points to remember when using hand tools are the selection of the tool for the job and the use of the tool for the job. Some other important points for consideration are:

Misuse Resulting From

1. Production demands
2. Ignorance
3. Poor attitudes

General Points

1. Keep your tools clean and in good condition.
2. Choose the right tool for a specific job.
3. Never use a tool not designed for the task at hand.
4. Never *carry* tools in your pockets.
5. When chipping or cutting, wear eye protection.
6. Be wary of the effect of your actions on other nearby workers.
7. Use a pulling motion to operate hand tools, rather than a pushing motion.
8. Never leave hand tools in areas where they may be kicked of f onto lower levels or where they may be a tripping hazard.
9. Never improvise.
10. Don't adapt or use 'cheaters".

The use of hand tools affects the daily lives of all workmen. As a result, it is necessary that everyone be aware of safe hand tool practices and follows those practices.

Hand Tools

Without the use of hand tools, the completion of a construction project would be virtually impossible. Yet, as vital as they are, they are often the result of serious accidents. Frequently, they are used improperly or when defective. Since we use hand tools continually, it is important that we use them properly. The following points should be reviewed when discussing hand tool safety:

Pre-Work Inspection

1. Chisels
   a) Be sure the heads are safe ended or dressed.
   b) Be sure the, cutting edges are sharp and square.
2. Files
   a) The tangs should be protected with handles.
   b) The teeth should be sharp and clean.
3. Hammers
   a) Be sure the handles are tight, unbroken and clean.
   b) The face of the head should be smooth and not mushroomed.
4. Screwdrivers
   a) Be sure handles are smooth and clean.
   b) All bits should be sharp and square
5. Saws
   a) Blades should be kept sharp and oiled.
   b) Handles should be smooth and continuous.

General Hand Tool Rules

1. Always use the right tool for the right job.
2. Use only tools in good condition.
3. Keep tools sharpened.
4. Store tools properly.
5. Don’t use a hammer on a highly tempered tool; chips of the tool may fly.
6. When chipping, always wear a face shield or safety glasses.
7. Never work on moving equipment.
8. Never use any tool in such a way that you will be injured if it slips.
9. Never throw tools to co-workers.

Remember, each tool is designed to perform a specific function. As long as you use the right tool, keep it in good operating condition and not exceed design limits, the various hand tools will serve you well. When you begin to improvise, expect the unexpected—injuries.

Wrenches

Wrenches—a very good name for this tool in that often, it is the condition of a worker's back after miss-using the tool. The following points should be reviewed when discussing wrench safety:

Proper Care

1. Inspect regularly
2. Replace sprung jaws, cages and faces
3. Replace all bent handles
4. Keep the jaws sharp
5. Keep the wrench clean and free of oil and grease

Proper Use

1. Always use the proper size wrench for the job.
2. Never use a shim to make a wrong size wrench fit a nut.
3. Never use a piece of pipe on the handle to increase your leverage.
4. Don't use a wrench as a substitute for a hammer.
5. Always pull a wrench toward you—never push it away.
6. Avoid possible falls—be sure you have firm footing.
7. Don't pound on a wrench to try to loosen a frozen nut. Use penetrating oil.
8. Never use a wrench on moving equipment.
9. See that the wrench jaws are sharp and can bite the nut.

It only takes one busted finger, or several banged-up knuckles to remember that a wrench, if used improperly, can cause very painful injuries.

Hammers & Chisels

The most common cause of hand injuries is from the improper use of hammers and chisels. Both are also responsible for a high number of eye injuries as a result of flying nails or flying metal and concrete chips. The following points should be reviewed when reviewing hammer and chisel safety:

Chisel Use

1. Never use a chisel with a mushroomed head.
2. Always wear eye protection.
3. Hold the chisel between the thumb and forefinger—don't make a fist around the chisel.
4. Do not grip a chisel if your hands are numb.
5. If another worker is near, place yourself between the other worker and the chipping area.
6. Always use sharp chisels.

Hammer Use

1. Use only hammers in good condition.
2. Always grip the hammer close to the end and grip it tightly.
3. When possible, wear eye protection.
4. Always concentrate on the striking point.
5. Be sure you have an unobstructed backswing.
6. Never allow someone to hold a nail or chisel while striking it.
7. Use the right type of hammer for the job.
8. Use only hammers to drive objects.
9. Strike blows as squarely as possible.
10. Don't strike blows with the side of the hammer.
11. Never strike a hammer or tempered tool with another hammer.
12. Always keep your hammer clear and free of oil and grease..

All of the above points are common sense rules, yet they all will decrease the chances of receiving eye and hand injuries if obeyed.

Table Saws

We all recognize how important our hands are to our employability, yet each year thousands of tradesmen lose fingers and hands to table saws. Table saws are the surest and cleanest way to lose a finger or hand. Much of this is a result of getting used to operating a table saw and then losing respect for it. That's why it is so important to review the safety rules pertaining to the operation of a table saw. They are:

Two Common Types Of Saws

1. Table saw
2. Radial arm saw

General Operation Rules

1. Never operate without all guards in place, especially the blade guard.
2. Be sure you stand in the right position—always allow for a kick back.
3. Maintain good housekeeping in the saw area.
4. Never use your hands to run lumber through the blade or to clean off sawdust. Get a stick and a brush.
5. Never use a saw with a dull blade.
6. Don't crowd the blade.
7. Always wear eye protection.
8. Never allow workers to work or rest where they are exposed to kick back.
9. Maintain good footing.
10. Be wary of "fly back" when ripping.
11. Never wear loose clothing around a saw.
12. Be wary of warped lumber.
13. Keep the blade set so it just barely makes the desired cut.

The use of table saws can greatly increase the productivity of the project, yet if improperly used, they can greatly handicap the user.

Chain Saws

Chain saws, although not frequently used on many types of construction projects, are very valuable pieces of equipment. They do, however, present several types of hazards and can often cause a variety of injuries. The following points should be reviewed when discussing chain saw safety.

1. Review operator instructions before use.
2. Always wear hard hats, safety eyeglasses and safety shoes.
3. Wear snug fitting clothing.
4. Don't wear jewelry.
5. Be sure to wear ear plugs if you plan to cut for a long period of time.
6. Always check for defects in the saw. Replace all defective parts before operating the tool.
7. Don't use a saw with a dull blade.
8. Allow the saw to cool before refueling.
9. Do not operate the saw near the refueling area.
10. Check the item to be cut for nails, wire and other metal-imbedded items.
11. Before cutting, plan a path of retreat.
12. When cutting, keep the saw away from your body.
13. Never cut anything directly overhead.
14. Be wary of materials to be cut that may be under tension.
15. Be careful to avoid pinching the blade or guide bar.
16. As the material begins to fall, turn off the saw and move away quickly.
17. Watch for a rebound.

Chain saws can greatly reduce the labor burden on a project; however, they can also seriously injure personnel. The above rules do not cover all the hazards involved with chain saws, but they do cover the major steps to take to insure safe operation.

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Power Actuated Tools

Power actuated tools are nothing more than a gun that fires a stud into a wall. As such. the safety rules that apply to firearm safety should almost always apply to the use of power actuated tools. No one should be allowed to operate a power actuated tool without proper training. The following rules are not intended to be a complete set, but rather to serve as a reminder:

Example Of Hazards

1. Flying particles
2. Studs being shot through the work area
3. Studs ricocheting
4. Fire hazards
5. Interchanging tool charges with firearm charges.

Some General Safety Rules

1. Allow only qualified personnel (trained and licensed) to use the tools.
2. Inspect the tool before each use.
3. Test the tool before use.
4. Always follow the manufacturer's specifications for operation.
5. Always study and determine the proper charge.
6. Know what is on the other side of the work surface.
7. Know what is in the work surface.
8. Don't allow workers on the other side of the work surface.
9. Know what can't be shot into, such as cast iron, high carbon steel, armor plate, glazed brick, glass, tile, etc.
10. Load just prior to shooting.
11. Never transport if the tool .is loaded.
12. Always wear eye protection.
13. Store the tools, charges and studs safely and securely.
14. Don't try to fix jams and misfires.

As stated above, this is only a partial listing and is not a substitute for formal training. Power actuated tools in the wrong or unqualified hands can be as deadly as a firearm. Extreme caution should be exercised when using one.

Electric Power Tools

Electric power tools come in all shapes and sizes and are designed to do almost anything. However, there are some things that they all have in common, rules for proper and safe usage. The following rules should be remembered when discussing the use of electric power tools:

1. Select the right tool.
2. Know how to use it.
3. Be sure it is properly grounded or double insulated.
4. Inspect for the following:
   a) Broken or defective cords
   b) Defective terminal connections
   c) Defective plugs
   d) Defective or loose switches
   e) Brushes that spark excessively
5. Never use a tool unless the guards are in place and in working order.
6. Before using the tool:
   a) Remove the chuck or adjusting key
   b) Firmly secure the work
   c) Be sure you have firm footing
7. Always use the proper protective equipment:
   a) Safety glasses
   b) Hard hat
   c) Jewelry
   d) Loose clothing
   e) Safety shoes
8. Never operate in wet areas. If necessary, wear insulating materials, such as rubber gloves or a rubber vest.
9. Maintain proper housekeeping.
10. Disconnect the tool when finished or when not using.
11. Never adjust the tool when it is plugged in.
12. Never carry the tool by its cord.

All of the above rules are common sense in nature, yet they are often forgotten or disobeyed. The next time you disobey one of these rules, remember, it may be the last time you do it!

Portable Electric Tools

The use of portable electric power tools is one of the most common occurrences on a project site today. Workers are exposed to the use of these tools constantly. As a result, they are also exposed to a killer—electrical shock.

It is important to remember that electricity always seeks a path of least resistance and often that is through a defective cord into the worker's body. This is especially true if the worker is in water or has been sweating.

The following safety rules should be reviewed when discussing the safe use of portable electric tools:

1. Use only equipment that is in good condition.
2. Be sure the tool is properly grounded.
3. Always report the following:
   a) Defective or broken cords
   b) Bad connections to terminals
   c) Defective or broken plugs
   d) Defective or loose switches
   e) Brushes causing sparks
4. Never overstrain the tool, thus overloading the motor.
5. Never use a tool without a grounding plug.
6. Never use a tool in the presence of flammable vapors or gases unless it is designed for such use.
7. Tag defective tools as such and remove them from service
8. Avoid working in wet areas unless a ground fault interrupter circuit is used.

Remember, electricity is the unseen killer; it gives no warning, but can be easily avoided by using common sense and tools that are in good condition.

Electric Hand Saws

The electric hand saw is one of the most common power tools found on the job. It is also one of the most commonly abused power tools. The abuse often has disastrous results. The following safety rules should be reviewed when discussing electric hand saw use.

General Safety Rules

1. Use only grounded or double-insulated tools.
2. Use only extension cords that are in good condition.
3. Make sure there is an assured grounding program or ground fault circuit interceptors are used.
4. Make sure all work areas are dry.
5. Never work on the saw while it is plugged in.
6. Never use your leg as a sawhorse.
7. Always remain alert.

Guard Rules

1. Make sure all guards are operable before use.
2. Return the saw if it has a defective guard.
3. Never block any of the guards open.

NOTE: Always check before setting a saw down to be sure that the blade guard does not jam open.

Saw Blade Rules

1. Always keep the blade sharp.
2. Use the right blade for the material being cut.
3. Never change blades while the saw is plugged in.

An electrical handsaw can, in the blink of an eye, severely injure you or a co-worker. Always be alert and use common sense along with the above listed safety rules.

Nails

Almost 20% of all minor injuries on the job are a result of punctures, scrapes, and cuts resulting from nails that were not properly removed from form lumber and other debris. We all recognize what can happen if a nail is not properly set before driving it, yet we often forget about how dangerous a nail is once it becomes a part of scrap lumber or debris. The following points should be discussed when reviewing the importance of nail safety:

Driving Nails

1. Be sure your hammer is in good condition.
2. Hit the nail squarely, especially on the first blow.
3. Always hit with the blows 9V to the nail head.
4. Make sure your back swing is unobstructed.
5. Be consistent—groove" your swing.
6. Concentrate on the head of the nail.

Pulling Nails

1. Always pull or. bend nails when stripping.
2. Use the right pulling device for the job.
3. If needed, use a block as a fulcrum. It will make the job much easier.
4. Keep scrap materials in neat piles and out of walkways.
5. Carefully discard used nails.

Nails can become 'snake fangs" if used improperly. Always treat nails with the respect due them. Otherwise, you may end up with cuts, puncture wounds, scrapes or even the loss of your eyesight.

V. Heavy Equipment

Heavy Equipment

Heavy equipment has been designed to handle very large volumes or large loads. As such, they are powerful machines and can be very dangerous if not operated correctly and precisely. It is, therefore, important to remember the proper methods used to move them from one site to another and how to work around them properly. The following points should help with the safe operation of both:

General Rules When Equipment Is Nearby

1. Always remain alert.
2. Do not get near moving equipment unless necessary.
3. Never ride on equipment unless it has been designed to carry you. This means it must have a seat and a seat belt
4. Do not walk along beside equipment. If it is necessary to travel with a piece of equipment, stay in front or behind it.
5. Always try to stay in view of the operator.

Rules For Transporting Heavy Equipment

1. Inspect all transporting equipment and make sure it is all in good working condition.
2. Always provide for the protection of the general public by the use of a flagman and by barricading the working area.
3. Wear safety shoes.
4. Estimate the center of gravity for the equipment to be loaded.
5. Always load equipment slowly onto its carrier.
6. If equipment is to be driven off-site, make sure the steering, braking and light systems are all in good operating condition.
7. Tightly secure the piece of equipment to its carrier.
8. Be sure that the boom or any other extensions of the equipment are tightly secured.
9. If working with others, be sure to work as a team.
10. Keep your hands free of oil and grease and as dry as possible.
11. Always keep the loading area free of debris and unnecessary tools.

Remember, a little mistake when dealing with heavy equipment can be magnified a thousand times and become a major mistake. This can easily result in severe injury and loss of property.

Heavy Equipment Hazards

The use of heavy equipment on the site is vital and necessary to the overall success of the project. However, unwise or unauthorized use of heavy equipment can result in personal injury, loss of life, or severe loss to materials and the project as well.

The following points should be kept in mind while working around heavy equipment:

1. Always be alert to the position of the equipment near you.
2. Only authorized personnel are to operate the equipment.
3. Never ride the equipment unless it is designed to be ridden.
4. Be sure that all bi-directional equipment is either accompanied on site with a signalman, or has an operational backup alarm.
5. Always keep away from suspended loads.
6. Always lock out the equipment before it is to be lubricated, adjusted or repaired.
7. *Always* replace gear, belt and any other guard after repair or adjustment.
8. Be aware of all overhead power lines and the possible effect on equipment operating within the close vicinity. Keep crane booms at least 10 feet from all power lines.
9. Allow only qualified signalman to be responsible for signaling equipment. Be sure to post the signaling poster included in the OSHA jobsite packet.
10. Never take breaks or lunch around heavy equipment. You never know what. might happen.
11. Always secure and lock out equipment upon its completion of use.
12. Be sure to protect the glass areas of the cabs with either metal grates or wood covers.

The above items should always be kept in mind when working around heavy equipment. The best policy when working around heavy equipment is to take no chances, you're gambling with your life and the life of others.

Signaling

Proper signaling can greatly increase the efficiency and productivity of a project. Improper signaling can kill or injure workers and cause severe property damage to the project. The following points should be reviewed when discussing signaling.

Proper Signaling

1. Know the signals.
2. Allow only one person to give signals.
3. Be sure the operator knows who the signal man is.
4. Always be in a position to see both the operator and the work area.
5. Always watch the load; the operator will be watching you.
6. Don't move the load over workers.
7. Always warn workers when loads are being moved in their area.
8. Watch for overhead power lines and other obstructions.
9. Remember the proper type of signaling operation—for a crane, a truck, a helicopter, etc.

It only takes one small mistake on the part of a signalman to cause a severe injury or major property damage. Be sure of your signals or don't be a signalman.

Spotters

With the high level of material delivery on a project and with the delivery trucks usually required to back onto the site, it becomes very important for the safety of the workers and the project to provide spotters. The following points should be reviewed when discussing the need for spotters:

1. A spotter should be used any time a vehicle with restricted view is on-site.
2. A spotter should always:
   a) Look out for himself
   b) Look out for others
   c) Make sure the vehicle is not damaged
   d) Make sure the project and project materials are not damaged
   e) Give clear and understandable signals
3. Never pass out of view of the driver without stopping the vehicle.
4. If you must go directly behind a vehicle, keep one hand on it so that you can immediately sense any movement.
5. Always signal on the driver's side.
6. Be consistent in giving signals.
7. Use hand signals.
8. Watch where you are walking.

It is the responsibility of the spotter to get the vehicle on and off site without injury or property damage. This is a big responsibility—don't take it lightly.

Refueling Equipment

Refueling equipment is a necessary part of each construction project. As such, it is important that this operation be conducted in as safe a manner as possible. Remember gasoline and fuel oil are manufactured to cause an explosion. The following items should be reviewed when discussing refueling operations.

Simple Refueling Rules

1. Concentrate on the task to be performed.
2. Never smoke during refueling operations.
3. Don't refuel near an open flame or near a sparking situation.
4. Keep a fire extinguisher nearby.
5. If the equipment may move, chock the wheels.
6. Always shut the engine down.
7. If necessary, allow the engine to cool.
8. Don't spill the fuel.
9. Don't overfill the tank. On hot days, allow for expansion.
10. Always clean up any spills.

NOTE: If there is a refueling area, be sure it is clearly marked and keep the area neat at all times. Whether you are filling a dozer or a chain saw, it's better to do it properly than risk an explosion that could ruin or end your life and the life of those around you. Remember, gasoline was designed to explode when ignited.

Working Around Cranes

A crane is one of the most versatile and important pieces of equipment usually found on a job. It can be used for many things. However, it can also be one of the most dangerous since it can lift heavy loads over large areas of the project. Several important safety points are listed below and should be reviewed when discussing safety around a crane:

1. Always barricade the swing radius of the crane.
2. Never walk within the swing radius of the crane.
3. Never work under suspended loads.
4. Never ride the hook.
5. Always wear a hard-hat when there is a possibility of a load being overhead.
6. Stay off of arid away from the crane unless you're assigned to be on the crane.
7. Never walk under a boom, especially if it has a load on it.

Remember, when working around a crane, the operator is going to be watching his load or the signalman and not for stray workmen. Never enter the swing radius of a crane unless absolutely necessary. Never work within the swing radius.

Crane Boom Failures

Some of the largest construction accidents that have occurred are as a result of crane boom failures. When they come down, they really come down! Often, the result is multiple serious injuries and large quantities of destroyed property and materials. Therefore, it is important that the possible causes of crane boom failures be discussed and thereby prevented. They are:

General Causes

1. Overloading
2. Improper loading

Specific Causes

1. Wrong length, size, or angle of boom.
2. Improper calculations of load.

NOTE: Always include the weight of the rigging in load calculations.

3. Boom in excess height of manufacturer's specifications.
4. Sudden release of a load when boom is near vertical.
5. Failure to use boom stops.
6. Two blocking.
7. Attempting long side pulls.
8. Failure to center the top block over the load.
9. Load hitting the boom.
10. Walking or turning too fast, resulting in a twisted boom.
11. Failure to use a tagline or other type of load control device.
12. Crane chassis not being level.
13. Failure to use outriggers or failure to shore outriggers.
14. Insufficient counterweight.
15. Use of a faulty boom.
16. Poor machine maintenance resulting in defective clutches or brakes.
17. Improper, careless or inexperienced operation.

We can avoid some of the most costly (in terms of human suffering and financial loss) types of accidents by watching for these causes and preventing their occurrence.

Riding The Hook

Riding the hook is not as common a practice as it used to be but it is still a frequent occurrence. Everyone knows it is dangerous yet many foremen allow it due to production demands and the costs associated with building proper access. The general industry standards prohibit the hoisting, lowering, swinging or traveling of a load or hook if personnel are attached (29 CFR 1910.180(3XU).) The following are good reasons to avoid riding a hook:

Why It's Dangerous

1. The operator could make a mistake in the operation.
2. A mechanical failure could occur.
3. A person on the hook could lose their grip.
4. The hook could be swung or blown into an object.
5. Weather could affect the operation.
6. The person on the hook could become ill and let go.

Safe Alternatives

1. Properly constructed ladders that are tied of f.
2. Guarded stairways.
3. Personnel hoist.
4. Skip boxes designed to lift personnel.

Remember there are several things that could go wrong while you're on a hook that *you* can't control. The result could very easily be a death or a severe injury. Play it safe and don't gamble on your future.

Power Lines And Cranes

Cranes are usually the main source of expediting materials through the site. It is not uncommon to work around power lines: however, it is a potential hazard to work around power lines if you are not extremely careful. The following points should be reviewed when working with equipment and when near power lines:

How To Avoid Electrocution

1. Locate all power supplies.
2. Determine the voltages and arc distances.
3. Shut off or insulate the power lines if possible.
4. Never allow a piece of equipment to break the safety zone (the distance required to avoid electric arc).

General Rules To Remember

1. Designate a competent lead signalman.
2. Communicate clearly with all members of the crew.
3. Have all crewmembers watch the operation.
4. Be alert.
5. Watch for non-alert crewmembers.

Whenever you are near a power line, be sure to minimize your risk by de-energizing or insulating the power source and, only then, proceeding with caution. At all times, try to avoid entering an arc zone. It is far better to be safe than sorry.

Rigging

Rigging is a very important aspect of expediting materials from the delivery sources to their storage areas on site. Many feel that rigging is a simple and easy task. It is not. It takes skill and experience to become a good rigger. Many people have lost fingers while learning the safe ways to accomplish this task. The following points should be reviewed when discussing safe rigging:

Four Major Causes Of Accidents

1. Defective equipment
2. Misuse of equipment
3. Uncontrolled equipment
4. Improper rigging techniques

Check The Rigging Equipment For:

1. Manila and wire ropes for broken fibers or frays
2. Hooks for spread openings and safety latches
3. Shackles and pins for cracks and excessive wear
4. Sheaves and blocks for excessive wear

Before Lifting

1. Determine the weight of the load
2. Determine the capacity of each component to be used
3. Be sure all components are in good condition
4. Establish balance points for the loads.

During Lifting

1. Make sure the rigging crew is clear of the load before lifting
2. Test rigging and allow load to settle before hoisting
3. Attach tag! me if load is to be hoisted any distance
4. Avoid hoisting too fast, resulting in loss of control
5. Give clear signals and watch the load
6. Never stand under the load
7. Set the load gently.

When working on a rigging crew, always be sure to observe the above rules and also watch out for your hands and feet. Always wear your hard hat and other personal protective equipment. The injury you avoid may be yours!

Pile Driving

Pile Driving operations are relatively simple operations yet they involve large equipment and heavy material and are, therefore, potentially very dangerous. The following rules should be reviewed when discussing Pile Driving safety:

General Pile Driving Safety Rules:

1. Always wear the appropriate personal protective equipment.
    a) Hard hats
    b) Safety shoes
    c) Eye goggles
    d) Ear protection
2. Good housekeeping should be maintained at all times.
3. Maintain proper access to and exit from excavations.
4. Allow only the driving crew near the rig and pile driving operation.
5. Keep the rig and other tools in good operating condition.
6. Inspect the rig daily for loose bolts, worn cables, etc.
7. Keep ladders and work surfaces in good condition.
8. Be sure all hose lashings are secure.
9. Test all hitch connections before lifting.
10. Be aware of overhead power lines.
11. Keep your hands, feet, arms, head, etc. clear of the hammer, driven piles and stock piles.
12. Be extremely cautious when guiding piles under the hammer.
13. Use taglines whenever possible.
14. Block or lash the hammer to the leads when not in use.

Although this operation is simple, there are a high number of serious injuries and it is important that all parties involved be aware of the safe driving methods.

Wire Rope

Wire rope is one of the most commonly used materials on a site. Yet it is probably the most misused. Statistics show that 5Qa/~ of all wire rope used in the industry is probably defective. When thinking about how wire rope is used and the possible effects of its failure, it becomes obvious how important it is to use only wire rope in good condition. The following points are important to remember when discussing wire rope usage:

How To Determine Defective Wire Rope:

1. Running rope
    a) If six or more randomly broken strands are in one lay.
    b) If wear is greater than 1/3 the original diameter of the outside wires.
    c) If rope is kinked, crushed or similarly damaged.
    d) Extreme temperatures will cause the rope to deteriorate.
2. Standing ropes
    a) If more than 2 broken wires are in one lay.
    b) If there is more than one broken wire at an end connection.

General Rules:

1. Never exceed the rated capacity of the wire rope.
2. Blunt all ends of strands on slings and bridles.
3. Never use a rope if defects are found in it.
4. Remove defective ropes from service.
5. For eyes. All U-bolt connectors should have the ‘U” end on the dead end of the rope.
6. Be sure sufficient numbers of U-bolts are used and properly spaced.
7. Always store wire rope in a dry, cool place. Avoid water and substances like dirt, dust, lime and concrete.
8. Never drive nails into wire rope.

Anytime you have exposure to wire rope, be sure someone is responsible for it and knows how to evaluate its condition.

Aerial Lifts

Aerial lifts are becoming a more and more popular piece of equipment on construction sites. They can greatly reduce the need for scaffolding; however, they can, if improperly used, create major hazards to those using the lift and those working near the lift. The following safety rules should be reviewed when discussing aerial lift safety:

1. Completely inspect the machine before starting work.
2. Understand the machine's operation and function.
3. Always attach your safety belt to the bucket's bars.
4. Never attach a lifeline to an object outside the bucket.
5. Always maintain safe clearances, especially from power lines.
6. Be sure the tires are properly inflated.
7. When traveling, be sure your feet are firmly on the platform.
8. Never allow personnel to work below you.
9. Don't operate the lift if winds are in excess of 30 mph.
10. Chock all wheels when working on an incline.
11. If applicable, fully extend the outriggers.
12. Never modify or abuse the machine.
13. Fully retract the boom and shut off the machine when not in use.
14. Never exceed the platform capacity.
15. Keep the platform area clean.
16. Use caution when entering and exiting the platform.
17. Never walk or climb on the boom.
18. Don't work off the platform. Never use a ladder or similar items to gain additional reach.
19. Be sure to use the necessary personal protective equipment.
20. When operating within ~ confined space, monitor the quality of the air.

Aerial lifts can be a useful tool on the jobsite, but like all other tools, they must be respected and operated within their limits.

VI. Fire Hazards

Flammable Liquids

Normal construction work requires the use of many different kinds of flammable or combustible liquids. Misuse of any of these liquids can result in a severe hazard that could threaten the safety of the project crew and the project itself. The following points should be stressed when discussing flammable liquids:

1. All flammable liquids must be stored and handled in approved metal safety cans.
2. Flammable liquids cannot be stored in passages or aisles.
3. All containers must be kept closed except when in use.
4. Refueling areas and bulk storage tanks must be marked as to the type of liquid stored and a “NO Smoking” sign.
5. Bulk storage areas and refueling areas should have a 20-B rated fire extinguisher present.
6. Maintain a 50’-O” safety zone from any storage container and a~ open flame or spark.
7. Be aware of static electricity when refueling or transferring liquids from o one container to another.
8. Always follow directions on the label of a solvent, thinner or any other
9. flammable liquid.
10. Never take more than you need.
11. Never transfer onto a hot surface.
12. Never smoke around a container.
13. Be careful when using in a confined space or room. Always be concerned about ventilation.
14. Always remove the liquid from your clothes. If it comes in contact with your skin, wash immediately.

Remember flashes have occurred from over 200 feet away and some flammable liquids produce toxic vapors as well. It is always smart to use caution when working with flammable liquids.

Welding Hazards

Any time welding is performed on the job, there are certain hazards that those around the operation are exposed to. It is, therefore, important that all employees be made aware of the hazards involved with welding operations.

1. Hazards

A. Flammable Liquids B. Combustibles
1) Wood
2) Scrap Materials
3) Clothing C. Flammable Gases

2. Tips For Safe Operation

A. Be sure all welding equipment is in good operating condition.
B. Keep the gas cylinders a safe distance from the welding area.
C. At all times, maintain good ventilation.
D. Do not perform any welding operations without the proper eye protection.
E. Be aware of where the slag is going or can possibly go. Watch for the early signs of slag fires.
F. Check to see that no one is working below the work area.

NOTE: Preventing injuries that may occur as a result of welding operations is everyone's responsibility. Keep an eye open for fires.

Fire Protection & Control

Most tires are a result of inattention to the job site operations and surrounding conditions. This lack of attention or protection can result in the loss of life and loss of property. All fires can be easily extinguished it caught soon enough and the proper extinguishing tools are handy.

1. *Steps To Remember When A Fire Starts:*

A. Sound an alarm—yell if necessary.
B. Warn those near the fire.
C. If possible and if the fire is small, try to extinguish it.
D. Call the Fire department if the fire can't be easily and quickly extinguished.
E. Evacuate the area if the fire can't be quickly extinguished.
F. Direct the Fire Department to the area of the fire.
G. Stand by to help, but only if asked by Fire Department Officials.

2. *Be Sure You Know The Following:*

A. The Fire Department phone number.
B. Where the fire extinguishers are.
C. How to use them.
D. How to evacuate the work area.

3. Steps To Prevent Fires

A. Regularly inspect all extinguishers.
B. Keep the work area free of debris and trash.
C. Check welding equipment regularly.
D. Check temporary wiring and electrical tools for defects.
E. Store flammable fuels and materials only in approved safety containers.
F. Designate high fire risk areas as 'No Smoking" areas. Enforce this requirement.

Knowing how to recognize, react to, or eliminate fire hazards can greatly decrease the chances of being exposed to a fire.

Fire Extinguishers

One of the quickest ways to lose a job is to allow a fire to start. Sometimes fires do start and it then becomes a matter of putting it out as quickly as possible. The best way is by use of a fire extinguisher. The following points are important to remember when discussing the Use of fire extinguishers:

Care And Use

1. Be sure the fire extinguishers are charged, strategically located and ready for use.
2. Check to see that the hose and other dispensing components are not blocked.

Types Of Extinguishers.

1. For Class A fires of rubbish, paper, scrap, lumber, etc.
   — Use soda acid and pressurized extinguishers or water through use of a hose or pump type water can.
2. For Class B fires of flammable liquids, oil, grease, etc.
   — Use carbon dioxide, dry chemical or foam extinguishers. Do not use water on these types of fires.
3. For Class C fires of an electrical nature.
   — Use carbon dioxide or dry chemical extinguisher. Do not use foam or water composition extinguishers.

NOTE: Most extinguishers today are of a multi-class—A, B, C dry chemical nature and can be used to extinguish all types of fires.

Gasoline

Gasoline—harnessed properly, it serves as a vital source of energy. Treated carelessly, it can become an explosive monster. Many people are killed or injured each year because they do not treat gasoline as a potential killer. The following points should be reviewed when discussing gasoline:

Gasoline Facts

1. Gasoline doesn't burn, It's the gas vapors that burn.
2. Gas vapors are heavier than air and collect in low areas.
3. Any type of spark can ignite gas vapors.
4. Gasoline should never be allowed to come in contact with your skin. Immediately clean the area contacted.
5. Don't use it as a solvent to clean tools or parts.

Storage

1. Always store in approved safety cans.
2. Always mark the storage can "GASOLINE—NO SMOKING:'
3. Remember that an empty can is more dangerous than a full one.
4. Always flush out empty cans.
5. Keep all containers tightly closed.

Transferring Gasoline

1. Never transfer gasoline from one container to another in an area where there is a chance of ignition.
2. Clean up any spills immediately.
3. Be wary of static electricity.

Working with or around gasoline is like working around dynamite, only the gasoline, it improperly handled, can be more dangerous. Remember the safety rules for handling gasoline.

Safety Cans

The safe storage of flammable liquids is a serious matter. Combustible and flammable liquids should be stored in safety approved metal cans. These cans are important effective safety devices and should be cared for properly. The following items should be remembered when discussing metal safety cans:

1. Store the cans carefully, keep them out of walkways or areas where they may be kicked, dented or punctured.
2. Occasionally, check the can for leaks.
3. Be sure the can has a flame arrestor screen.
4. Make sure that the cap closure mechanism is not damaged. This will properly seal the can and allow for pressure to be released if it becomes excessive.
5. Never smoke when using the safety cans or in a safety can storage area.
6. Never leave safety cans unattended or out overnight.

If the above rules are followed, the chances of a fire or explosion will be greatly reduced to since the flammable liquids will be safety stored. It is cheaper to replace a safety can than