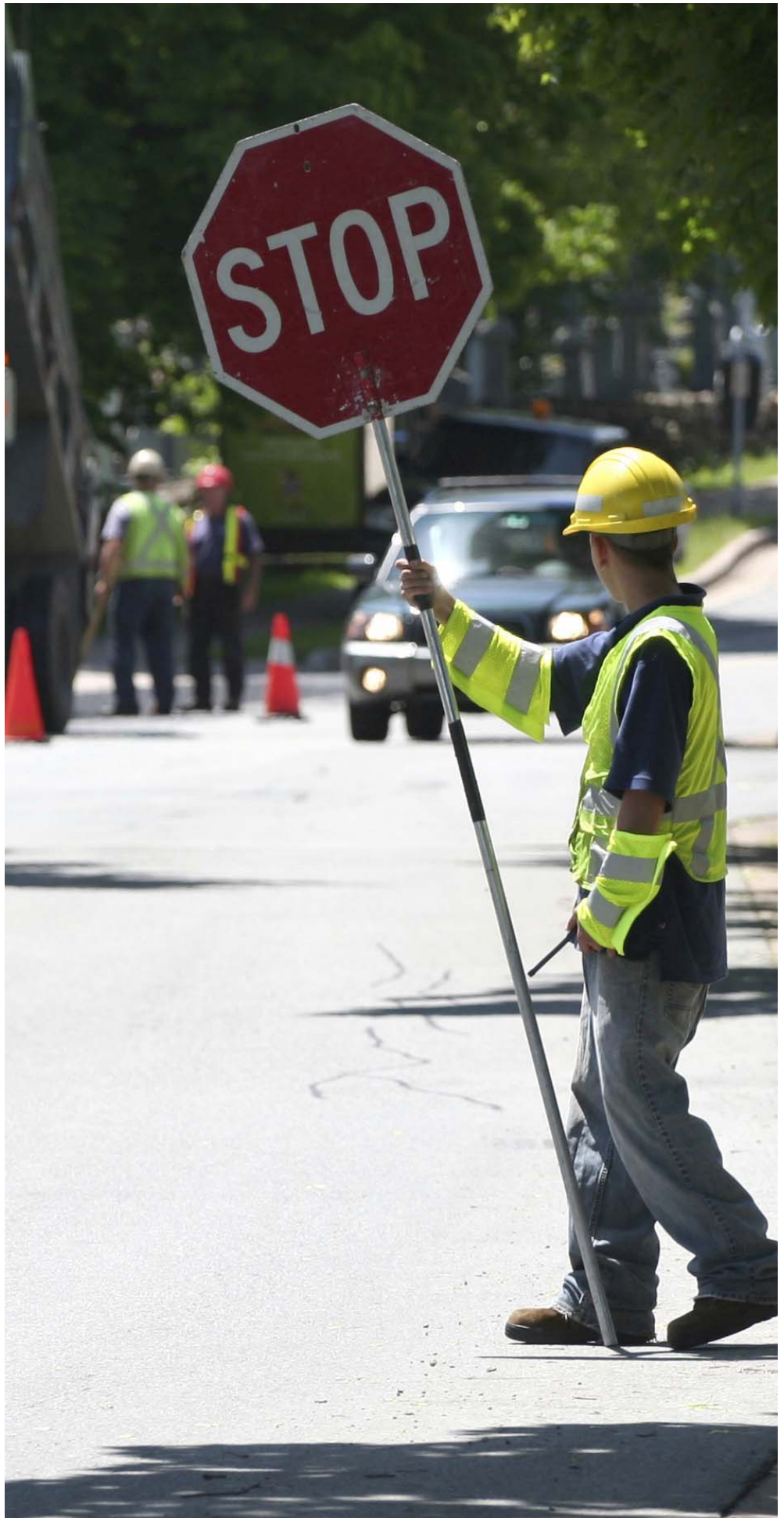


CIRMA

Tail Gate Topics II

80+ Topics
for Improving
Workplace Safety





Leading a Tail Gate Safety Discussion

Preparation

Use Tailgate Safety meetings to address actual problems on the job or to pro-actively raise safety awareness. Select a topic for the meeting based on its importance to your municipality. Consider recent accidents or incidents, demonstrated lack of skills or experience on the job, and if it is a required or mandatory training (fall protection, ladders, PPE). You can draw on the knowledge of experienced workers, and use that knowledge to remind all employee—especially newer ones—of the dangers of working with particular kinds of machinery, tools, equipment and materials.

Research the subject. Include your organization's policies and procedures. If it's not a new topic, ask the audience what they already know so you can avoid repeating instruction.

Choose a good location to train—one with few or no interruptions and good seating. Hold the meeting at the beginning of a shift or after a work break.

Presentation

- Talk about what is going to be taught.
- Tell why the subject (or training) is important.
- Describe the safety procedures, general to specific.
- Demonstrate the safety procedures!
- Repeat steps if necessary; be patient.
- Don't let the meeting drift onto other subjects; keep it short and focused.

Involvement

Get workers involved in the discussion and encourage questions.

In demonstrations:

- Ask the employees to perform the procedures.
- Correct any errors immediately; address the performance, not the person.
- Practice until you and the worker are confident that they've got it right.
Their lives may depend on it!

Follow Up

- Observe employees performing safety procedures on the job.
- Ask for feedback; encourage questions.
- Give feedback on performances.
- Address other topics as needed.

Tail Gate Topics II

Think of CIRMA's *Tail Gate Topics* as a tool set to building a safer workplace, week by week. "Tail Gate" safety meetings are short, informal on-the-job discussions held to keep employees alert to work-related safety concerns. These weekly meetings have proven their worth by making safe work practices common practice.

This booklet contains over 80 different safety topics that are written specifically for municipal operations. Each of the topics will take about ten minutes to cover in a group discussion. Some stress basic awareness, common sense, and professionalism. Others are a review of important safety practices and guidelines.

The Role of Safety Committees and Supervisors

Supervisors and managers have an important role ensuring safe work conditions and practices. CONN-OSHA requires employers to furnish to employees a place of employment free from recognized hazards that are causing or are likely to cause death or serious harm to employees. Municipal Safety Committees are empowered to identify hazards in the workplace and make recommendations regarding corrections of the hazards. CIRMA's *Tail Gate Topics* are intended to help you accomplish these important goals by providing a quick reference for dozens of safety issues common to municipal operations. The topics found in this booklet can be presented as needed on the job, or discussed one by one at weekly Safety Committee meetings, staff meetings, or as on-the-job coaching sessions.

Reminders after an accident aren't enough. Employees need ongoing *training* to recognize and avoid unsafe conditions so that safety awareness becomes second nature, **even when employees are working under difficult conditions and under tight schedules**. When good safety practices become a way of life on the job, costly accidents are prevented—and more importantly, painful injuries are prevented and vital public services are delivered without fail.

Remember too, that by OSHA's estimate, every dollar spent on a safety program yields four dollars in savings. CIRMA's *Tailgate Safety Topics* can be a valuable part of your training program.

The Safety Topics

Each of the Tail Gate Topics has an introductory statement, a guide for discussion, space for adding additional discussion notes, and who attended. Some have some reminders for the team leader on subjects to research and discuss; others require knowing municipal policy. We recommend that employees sign the page and that the municipality maintains the page as a record on file. A sample Training Record is included on page 100 in the "Additional Resources" section of this booklet.

When selecting topics, focus on what is important (and mandatory) when you begin. Listen to and follow up on Safety Committee and employee recommendations. Observe job-safety techniques in use. Identify what poor work practices are causing near misses, injuries or accidents on the job. Topics in the "Effect of Weather" section are seasonal, and are best presented at the start of the season, when weather-related injuries are more likely. Plan for and schedule topics for a month or longer, so you have time to research and possibly modify your municipality policy and procedures.

Additional CIRMA Training Resources

CIRMA provides training on many of the topics discussed. When applicable, specific workshops are recommended. A schedule of upcoming CIRMA workshops is found at ccm-ct.org/education. Check our online Risk Management Learning Media Library at ccm-ct.org/insurance/library for a listing of videos and DVDs on safety issues. Or ask your CIRMA Risk Management Consultant for more information.

Comments or Suggestions?

Are there other topics you'd like to see included in this booklet? Or if you have other suggestions, please contact your CIRMA Risk Management Consultant.

Safety Topics for common School & Municipal Operations

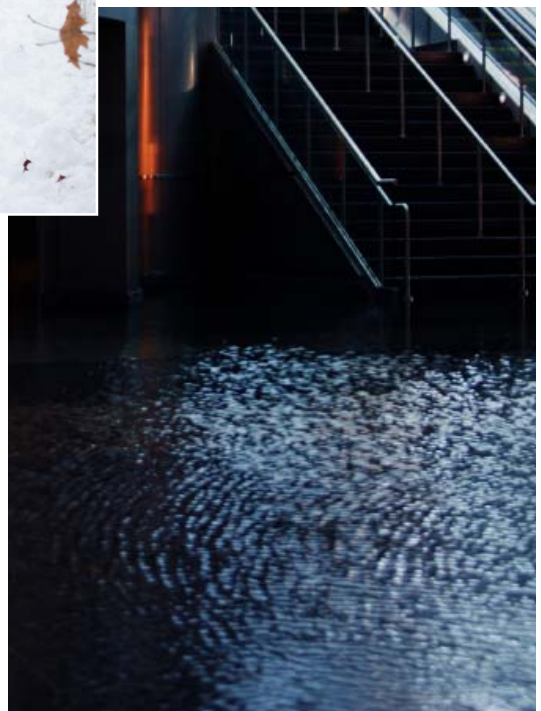


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Safety Training

*Fix the cause,
not the blame.*

Whose Responsibility Is It?

After an accident, it is not unusual for those who were around the injured worker to feel guilty. This guilt usually springs from each person's awareness that there was something they could or should have done to prevent the accident.

Sometimes the accident is the result of someone else's mistakes. Sometimes it was caused by the injured person himself. In either case, fixing blame is not as important as fixing the cause for the accident and determining what steps will be taken to correct similar accidents from happening in the future.

Guide for Discussion

The following is a partial list of responsibilities for safety on the job.

Who's Responsible? (Discussion Points)

- Elected officials?
- Municipal management?
- Supervisor?
- Each person on the job?
- Trained safety professionals?
- Safety committee?

Some Responsibility Rules for Everyone

- "If it's unsafe for me then it's unsafe for the next person and the hazard should be corrected."
- "Safety doesn't belong to any one department; it is everyone's job."
- "If safety doesn't begin with you, it won't begin at all."

An Individual's Responsibility Is

- To yourself
- To your family
- To your co-workers
- To your town and community

Remember Workers' Compensation checks won't pay all the bills nor will they replace your independence or freedom to enjoy life. Without complete cooperation from everyone, your work site will not be as safe as it should be.

Attendees _____

NOTE: Always promote a discussion on any of the topics covered in the Safety Topics.

Whose Responsibility Is It? cont. A Quiz

Instructor Note This written quiz can be given to employees, supervisors, the employer and the company safety committee to reinforce training in "Whose Responsibility Is It?" An answer sheet is found on page 99.

In our municipality, who is primarily responsible for the following safety activities?

- E = Employee
SC = Safety Committee
S = Supervisor
M = Municipality

- _____ Complying with Safety Rules
- _____ Conducting Safety Training
- _____ Recognizing Others for Safety Performances (Good or Bad)
- _____ Reporting Injuries or Illnesses
- _____ Providing Feedback About Safe Work Procedures
- _____ Enforcing Safety Rules
- _____ Conducting Area Safety Inspections
- _____ Selecting Personal Protective Equipment (PPE)
- _____ Assessing Workplace Hazards
- _____ Reporting Hazards
- _____ Conducting Accident Investigations
- _____ Rewarding Incentive
- _____ Recommending Corrective Actions to Eliminate Hazards
- _____ Demonstrating Safe Work Practices
- _____ Training Safe Work Procedures to New Employees
- _____ Ensuring Safe and Healthful Work Areas
- _____ Monitoring Safety and Health Programs
- _____ Showing Others How to Use Personal Protective Equipment
- _____ Reporting Incidents or Near Misses
- _____ Eliminating or Reducing Hazards
- _____ Developing Safe Work Procedures
- _____ Conducting Job Hazard Analyses

The “Deadly Dozen”

Accidents don’t just happen; they are *caused* by something. To prevent accidents, we must eliminate the unsafe behaviors or unsafe conditions that are their root cause. Only then can we prevent an accident or painful injury.

Guide for Discussion

The following “deadly dozen” are reminders to help you recognize unsafe acts or conditions. Discuss them.

Unsafe Acts are—

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

Unsafe Conditions are—

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, wire, or other metals.
7. Improper clearance or congestion at aisles or passageways.
8. Poor placement, storage, or arrangement of materials.
9. Hazardous tools, equipment or materials.
10. Poor lighting, high noise levels.
11. Hazardous atmospheric conditions.
12. Improper personal attire.

Additional Discussion Notes

Remember Be able to recognize the conditions or acts just discussed; then you can effectively correct or avoid them and reduce your risk of injury and accidents.

Attendees _____

Why Accidents Occur

Every accident is caused by a failure in one of four areas: the worker, the tools used, the materials used, or the methods used. Often there is a failure in more than one: first the worker, then another in one of the other areas.

Discuss the following unsafe acts and conditions, and the consequences. Can you identify others?

Guide for Discussion

Types of Unsafe Acts:

- Operating a tool or some equipment without authority.
- Working at an unsafe speed.
- Using unsafe or defective equipment or using equipment in an unsafe manner.
- Disconnecting safety devices.
- Unsafe unloading, placing or mixing materials.
- Assuming an unsafe position or posture.
- Working on moving equipment.
- Horseplay or distractions; taking shortcuts.
- Failure to wear and use personal protective equipment.

Unsafe Acts Result From:

- Improper attitude.
- Lack of knowledge or skills.
- Reduced mental or physical capacities.

Unsafe Conditions:

- Improper guarding.
- Defective equipment or materials.
- Unsafe working procedures.
- Improper housekeeping.
- Poor lighting or ventilation.
- Improper personal attire (poor dress).
- No or improper evaluation of site conditions.

Additional Discussion Notes:

Remember CONN-OSHA regulations have improved on-the-job safety over the last three decades. For example, machines are now better protected with guards. However, each worker still must use their common sense and good safety practices.

Attendees _____

Recognizing Unsafe Conditions

Recognizing unsafe conditions, or hazards in the workplace, is not just the Safety Committee's responsibility—it is everyone's. Everyone, from the most junior employee to municipal leadership, must take responsibility for identifying hazards and making suggestions on how to fix the problem.

Guide for Discussion

Causes of unsafe conditions or actions:

- Poor housekeeping.
- Horseplay.
- Confused material storage.
- Careless handling of materials.
- Improper or defective tools.
- Lack of machine guarding; failure to install warning systems.
- Lack of or failure to wear proper personal protection equipment.
- Weather.
- Worker not dressing for the job to be done.
- Failure to follow instructions.

Can you identify other conditions?

Steps to take once an unsafe condition is found:

- If possible, correct the condition yourself immediately
- Report any major unsafe condition or action to the appropriate authority.
- Follow-up—report the condition again if it is not corrected

Additional Discussion Notes

Remember There are three steps to follow in recognizing unsafe conditions. Look for trouble (the unsafe condition), report it, and act to prevent it from happening again. If you have any questions, contact your supervisor or CIRMA Risk Management Consultant.

Attendees _____

Shop Safety

Instructor Note Perform an inspection of the work area before making this presentation. Look for anything that is out of place. Check against the Guide for Discussion for items to point out.

The safe-work practices we use on the job are often the same practices we use off the job. This discussion focuses on what makes shop safety different.

Guide for Discussion

Discuss in-shop procedures initiated to ensure that frequent and regular inspections are conducted to identify potential hazards in materials and equipment in the shop by:

- Individuals
- Supervisors
- Safety Committee

Based on the inspection, identify and point out slip/trip hazards on walking/working surfaces; overhead dangers, moving equipment (such as forklifts), and general good housekeeping such as oily rags or spills.

Discuss location of key information including emergency medical plan, hazard communications (MSDS binder), fire extinguishers, fire evacuation signs and routes. Employer posters, Safety Committee meeting minutes posted, First Aid kit.

Discuss power operated tools and equipment machine guarding, anti-kickback devices, personal protective equipment that is required to be worn when operating machinery.

Additional Discussion Notes

- Employee qualification program to operate machines requirements (if any).
- Self-inspection checklists.

Remember Just as you wouldn't want a slipping/tripping hazard on a set of stairs in your home, you don't want the same hazard on the shop floor. Think safety.

Attendees _____

What Does An Accident Cost?

Every accident has one thing in common: it costs everyone involved something. There are direct and indirect costs to the employee who was injured, to co-workers, and to the employer who eventually will pay the bills. The highest costs, however, are rarely the financial ones.

Guide for Discussion

Employee Direct Costs

- Lost regular wages and overtime.

Employee Indirect Costs

- Mental anguish, physical pain and suffering, depression.
- Decreased active participation with family and friends. (It's tough to be at a ball game when laid-up in a hospital bed.)
- Inability to be productive on or off the job.

Employer Direct Costs

- Possible higher insurance rates.
- Uninsured property damage costs.

Employer Indirect Costs

- Loss of valuable employee with a result of lost efficiency on the job.
- Managerial and clerical time expended to handle injury claims.
- Overtime costs to other employees to fill-in.
- Hiring and training replacement costs.
- Damaged or destroyed equipment, materials, or tools.

Additional Discussion Notes

Remember The indirect (or hidden) costs of an accident are between three and ten times the actual cost of the insurance claim. But it is not the dollars lost that is the biggest loss. More often than not, it is the largest loss is the loss a valuable co-worker or family member.

Attendees _____

Near Misses

The only difference between a near miss and an accident is luck. Most accidents occur when an unsafe action coincides with an unsafe condition. Accidents often follow a near miss when the unsafe acts or conditions haven't been corrected. The result is an injury. Safety-conscious workplaces make a near miss a big deal—so do we.

Guide for Discussion

- Near misses are “injuries without people.”
- Near misses are not funny; they could be deadly next time.
- Always report a near miss.
- Take immediate action to prevent a similar near miss.
- If you did not cause a near miss but saw it, discuss it with those involved and your supervisor.
- Obey safety rules and you will decrease the number of near misses around you.

Additional Discussion Notes

- Describe the Safety Committee's near-miss reporting procedures.
- Safety Committee responsibility to investigate near-miss accidents and make corrective recommendations to management.
- Describe state-mandated requirements.

Remember Near misses are warnings that something or someone is not performing the job correctly. Always pay attention to near misses. Don't let near misses repeat themselves or you may find yourself or a co-worker being treated for an injury that could have been avoided.

Attendees _____

Care for the Injured

After a careful review of your Emergency Response Plan, discuss how to care for an injured worker.

Guide for Discussion

Determine the seriousness of the injury:

If Serious:

- Contact Emergency Response Team(s).
- Do not move the injured person.
- Get First-Aid trained personnel; ask them to help.
- Keep the injured person from standing.
- In case of bleeding—apply pressure to the wound. Do not use a tourniquet except in cases of excessive bleeding.
- If the injured person has stopped breathing, get someone who has been trained in CPR to help restore the breathing.
- Try to keep the injured person warm.

If Non-Serious:

- Contact the supervisor immediately
- Do not try to get the injured person to move if a fall is involved
- Get any First Aid treatment that may be needed. Be sure you know the location(s) of the nearest First Aid kit.

Other Items to Be Aware of:

- Report all injuries—even minor ones may become major ones.
- Seek First Aid for even minor injuries.
- Be sure the emergency telephone numbers and the location of the nearest cross street are posted in a conspicuous place on the job. Know them.

Additional Discussion Notes

- Company Emergency Medical Plan including location of nearest telephone, 911 or other system, and nearest cross-street.
- Who is First Aid/CPR trained on the job? _____
- The First Aid kit is kept where? _____
- The Supervisory person to contact on all accidents/injuries is? _____
- Consider attending CIRMA's *Bloodborne Pathogens* Workshop to learn more about reducing the transmission of blood borne pathogens during emergencies.

Remember Be sure to review the locations of first aid kit(s) and emergency numbers on the job site.

Attendees _____

Accidents Are Avoidable

Accidents don't just happen, *they are caused by something*. Accidents are usually the result of someone not paying attention or not knowing how to recognize a job (or home or automobile) safety hazard. Employees who have positive safety attitudes experience 80% fewer injuries compared to those who have a poor attitude. Today we will discuss some general rules to follow and the four hazard avoidance rules.

Guide for Discussion

Determine the seriousness of the injury:

General Rules

- Learn the safe way to do your job.
- Don't jump from one elevation to another.
- Don't work under suspended loads.
- Remove protruding nails or bend them over.
- Keep the work area clear of debris.
- Use the Personal Protective Equipment required for the job.
- Treat all electrical wires as "live."
- Use the right tool for the job.
- Be sure all tools are in good shape.

Four Hazard Avoidance Rules

- Know the safe way to work, and then follow the safe way all the time.
- Maintain safe working conditions – for yourself and others around you.
- Work safely, setting the example, and encourage others to do so.
- Report all accidents and near misses.

Additional Discussion Notes

- Keep scaffolds free of excess weight.
- Other ways to avoid hazards.
- Report accidents and near misses to supervisor.

Remember Remember to ask yourself if you are following the basic common sense rules. If you aren't, then you will have or cause an accident. Keep asking yourself "How can I make my work safer?" By improving safety, you will help avert a serious accident and help prevent a serious accident for a fellow worker.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Listening for Danger

Nearly all workplaces are filled with various sounds and noises from tools or equipment. In nearly every case, a tool or piece of equipment will signal a breakdown or failure by a change in its normal operating sound. That failure could cause an accident.

Everyone should train himself or herself to be able to pick up these advance warning signals—even when wearing ear plugs or earmuffs. Your safety could easily be dependent on your ability to hear approaching danger.

Guide for Discussion

Things that interfere with listening safety

- Loud radios; individual iPods, or radios with ear plugs.
- Over concentration on work.
- Lack of sleep.
- Overeating habits
- Use of alcohol or drugs (both legal and illegal).
- Poor workplace ventilation.

How to Improve Listening Safety Habits

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

Additional Discussion Notes Our municipal's policy on the use of radios in the workplace is _____.

Remember 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 only see in the direction you are looking. Fine tune your ears and you fine tune your awareness of danger.

Attendees _____

Accident and Incident Reporting

Instructor Note Before you start to talk, determine who the accident or incident information should be reported to (in addition to the Safety Committee) and who will submit the First Report of Injury. If employees work without direct supervision, such as on a night-shift, your organization should establish appropriate emergency procedures for reporting incidents and obtaining medical treatment.

The following points should be covered in discussing the importance of reporting and investigating accidents, incidents, or near-miss accidents:

Guide for Discussion

- Always report any accidents or near misses to supervisor immediately.
- All injuries that require First Aid or medical attention should be reported immediately.
- What employees should do in the case of an emergency First Aid and/or ambulance?
- Where is the nearest hospital? What is the nearest cross street? (Note: Discuss the information necessary to direct an ambulance to the work site.)
- Who are the people qualified to administer First Aid?
- Anyone witnessing an accident should report what he or she saw to the supervisor.
- An investigation should be conducted to determine the cause of all accidents requiring medical treatment.

Additional Discussion Notes

Consult CIRMA's *Workers' Compensation Accident Reporting and Investigation Program* guide to learn how best to study accidents and injuries so that their causes and contributing factors can be identified and eliminated. The guide will help managers develop accident trend information, provide needed information for claims, and comply with federal and state reporting and record keeping. Attend CIRMA's *Accident Investigation Techniques for Supervisors* to learn more about this topic.

Remember Always report any unsafe condition or unsafe acts, no matter how minor. It's far better to prevent accidents than it is to lose a valuable employee.

Attendees _____



CIRMAcare Injury Reporting Hotline

1-800-652-4762 (24 hours)

REVISED 8/28/09

LOSS INFORMATION		
Loss Date: _____	Loss Time: _____	Call Type: Claim <input type="checkbox"/> Occurrence <input type="checkbox"/>
Caller's First & Last Name: _____		Caller's Telephone Number: _____
Injured Employee's Employment Status: Full Time <input type="checkbox"/> Part Time <input type="checkbox"/> Volunteer <input type="checkbox"/> Other <input type="checkbox"/>		
Loss Location Name: _____		
Loss Location Address: _____ City & State: _____ Zip Code: _____		

INJURED EMPLOYEE'S INFORMATION		
Employee's First & Last Name: _____		
Employee's Home Address: _____ City & State: _____ Zip Code: _____		
Employee's Social Security Number: _____		
Employee's Telephone Numbers Work: _____ Home: _____		
Gender: Male <input type="checkbox"/> Female <input type="checkbox"/>	Date of Birth: _____	Job Title: _____
Department: _____		
Supervisor's Name: _____ Telephone Number: _____		
Employee's Hire Date: _____		
Did employee miss work beyond normal shift? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, continue below		
Last Day Worked: _____	Disability Date: _____	Returned to Work: _____
Time Employee Began Work: _____		Date Employer Notified: _____
Loss Description: _____		
Injury Type: _____	Cause of Injury: _____	Body Parts Involved: _____
Contact Name: _____		Telephone Number: _____

TREATMENT INFORMATION (If known)	
Name of Physician: _____	Physician's Telephone Number: _____
Name of Hospital: _____	Hospital Telephone Number: _____

WITNESS		
Name: _____		Address: _____
City & State: _____	Zip Code: _____	Telephone Number: _____
CLAIM NUMBER: _____		

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

A construction worker wearing a white hard hat, a blue t-shirt, dark blue pants, and a bright yellow safety vest is using a long-handled shovel to spread dark asphalt on a road. The worker is bent over, focused on the task. In the background, there is a grassy area, a concrete curb, and a house with white siding and a brick chimney. The scene is outdoors during the day.

Safety Sense

*It's smart to use
common sense.*

Safety Is (Often) Common Sense

According to safety professionals, four out of five serious injuries are the result of workers taking unnecessary chances. Common sense on the job is irreplaceable. Most of us have worked around people who are accident prone. They aren't jinxed; they just aren't very sensible. Discuss how to use common sense to avoid accidents in the workplace.

Guide for Discussion

Common Sense "Smarts"

- Always wear the proper Personal Protective Equipment.
- Don't overexert yourself—get help with heavy tasks.
- Don't overextend yourself when on ladders—and risk losing your balance.
- Always use the proper tool for the job.
- Concentrate on your work.
- Look for unsafe acts or unsafe working conditions – and then report them.
- Watch out for others—remember you are part of a team.
- Remember, it is tempting to **make do—Don't.**

Ask the following questions before you begin to work:

- Are the conditions safe to do the work?
- Are the methods we are going to use safe?
- Does everyone know what to do?
- Does everyone know how to do it?
- Can I fall, get struck by, get caught between or under, or get electrocuted on this job?

Additional Discussion Notes

Remember By remembering and following safety rules and by asking yourself about the conditions, methods, job site hazards and knowing what to do, you should be able to decrease your chances of being injured. Be "common sense smart" and prevent accidents, not cause them.

Attendees _____

Keeping in Shape

Staying in shape is one subject that is rarely discussed in a safety program. However, a person who stays in good physical condition is less likely to be involved in an accident. They are usually more alert, less vulnerable to the adverse effects of weather, and generally able to react more quickly to changing conditions on the job. That is why this is an important subject.

Guide for Discussion

Staying in Shape Reduces Injuries by:

- Reducing the effect that adverse weather has on your body.
- Reducing the effect of minor injuries. A body in good condition will usually repair itself much faster.
- Substantially reducing exposure to minor sprains, strains, and muscle pulls. Most people in good shape rarely strain or pull muscles.
- Cutting down the vulnerability to common illnesses. People who are in good shape get colds and the flu less often than those who aren't. A person in good shape can better fight the germs causing the illnesses.
- Increasing awareness of job site conditions.

How to Stay in Shape:

- Exercise regularly.
- Eat right.
- Get plenty of rest.
- Avoid overindulging in sweets, alcohol or food.
- Diet when needed to maintain recommended body weight.
- Avoid smoking. Smoking cuts down circulation making cold colder, hot hotter, and injury recovery longer.

Additional Discussion Notes

- The importance of eating breakfast; having a snack around mid-morning to stay alert.
- Municipal policy on smoking is _____.

Remember 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 your heart. Keeping in good shape makes good sense, and good sense is the cornerstone to safety.

Attendees _____



Warming up

Many public service jobs require physical labor. A warm up before work (or any work involving heavy lifting) is just as important as a warm-up before sports. Stretching is an effective way to prevent most common body sprain or strain injuries. Stretching before lifting is especially helpful to avoid back injuries. According to safety experts, over half of all Workers' Compensation claims and costs were due to sprain/strains.

Guide for Discussion

Overexertion Effects on Backs, Torso (Waist, Hips), Knees, Shoulders, Arms and Elbows:

The hardest injury to live with is a back injury. One professional study indicates that once you do injure your back, you are five times more likely to suffer a re-injury. Stretching has been demonstrated to significantly reduce the number of sprains and strains that occur on the job.

Helpful Hints:

- Begin stretches with a relaxed and open mind.
- Stretch to the point where it is comfortable, not painful.
- Do not strain when you stretch—straining keeps the muscle from relaxing.
- Concentrate on the muscle being stretched—think about the good feeling of a proper stretch.
- As the intensity of the stretch increases, stretch a little farther while remaining comfortable without pain.
- Don't bounce when you stretch. That can cause injuries.
- Always stretch to the tight side first.
- Breathe with a slow, normal rhythm. Do not hold your breath.

Additional Discussion Notes Demonstrate proper stretching exercises. For more in-depth training on this subject, attend CIRMA's *Preventing Sprains & Strains Workshop*.

Remember Stretching before you start work will make your job easier and helps prevent injuries on the job. Try it at home, too.

Attendees _____

Proper Lifting

It's hard to enjoy a normal, happy, and successful life with a bad back. The back contains one of the most critical muscle groups in the body, as well as the spinal cord and associated vertebrae and disks. Municipal employees must often lift materials to put them into place or move them from one location to another. Back injuries are cumulative; a lot of small injuries lead up to the big one. It is, therefore, important to remember the key elements of proper lifting.

Guide for Discussion

Preparing to Lift

- Do you need help? Get help if needed (more people or lift equipment).
- Do you need to stretch before preparing to lift?
- Determine the weight of the materials.
- Determine your ability to handle the load.
- Wear safe shoes.
- Wear gloves to protect your hands if the surface is rough.
- Make sure you have a clear walkway.

Making the Lift

- Center the load between your legs or shoulders.
- Always bend with your legs.
- Keep your back straight. "Lift like an elevator, not a crane."
- Lift with your legs. (You can feel your leg muscles doing the work.)
- Keep the load close to your body. (Hug the object you are lifting.)

Moving the Load

- Keep your back as vertical as possible.
- Keep the load close to you.
- Don't twist your body—move your feet.
- 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 rather than breaking your back."

Additional Discussion Notes For in-depth training, attend one of CIRMA's *Preventing Sprains and Strains* or *Back Injury Prevention* Workshops.

Remember The only thing you'll prove by lifting more than you should is that your back is a poor substitute for a forklift. Think before you lift—every time. Keeping in good shape makes good sense, and good sense is the cornerstone to safety.

Attendees _____



Horseplay

Nearly everyone has heard a practical joker say, "This one is gonna kill ya." Hopefully it won't. Practical jokes invite danger. Public works and public service jobs are sometimes 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 discouraged. At some point, if they continue they should be reported.

Guide for Discussion

Examples of Horseplay

- Scaring someone.
- Wrestling with someone.
- Boxing.
- Dropping objects next to someone deliberately.
- Throwing objects or tools at someone.

Additional Discussion Notes Other examples? What are some of the negative outcomes of horseplay? When is it appropriate to report horseplay to supervisors.

Remember Practical jokers can not 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 co-worker. Do you want any part of that? It's easy enough to get hurt on the job as it is. Let's not increase the chances.

Attendees _____



Short Cuts

Question: Does nearly everyone we know uses short cuts to get the job done?

Answer: Generally yes.

However, there are some reasons not to use short cuts. As we all know, a project is completed by use of appropriate methods. Short cuts usually modify those methods and as a result, decrease the safety built into proven methods.

Guide for Discussion

What are some ideas to keep in mind when doing short cuts?

- Short cuts are (too) common.
- They can be dangerous.
- Sometimes they are deadly.
- Our municipality is willing to take the time necessary to do a job properly.
- Heights increase the dangers of short cuts.
- Excavation and tunnels increase the dangers of short cuts.
- Warn those using unsafe short cuts of the hazards associated with short cuts.

Additional Discussion Notes Short cuts can hurt the community and public safety. Name some examples you have seen on the job. _____.

Remember We must be aware of the dangers that short cuts expose us to. There are two ways to perform a work task. Often the safe way is not the fastest or easiest way.

Attendees _____

Protecting the Public

Be alert, save a life.



Public Safety

It's the mission of our municipalities to serve and protect the public, even during maintenance and construction operations. If a member of the public is injured due to the operations, the municipality may face liability. In today's litigious legal environment where sovereign immunity protections for municipalities and schools have been reduced, efforts to protect the public that were once adequate, now may be considered negligent in a court of law.

Guide for Discussion

- Efforts to protect the job site should be directed toward protecting the young. (Many liability claims come as a result to injuries to children who gained access to a job site after hours or on weekends.)
- Inform the police of the normal hours of work and ask that they regularly patrol the site after working hours.
- Have workers report changes in the work conditions that may require additional protective measures.
- If needed, fence in the site using plywood or chain link fences, keep the site well lit at night, or provide for a night guard (consider using an employee on transitional duty).
- During working hours, don't let unauthorized personnel on the site without an escort.
- Always rope off or barricade excavations; protect against fall exposures.

Additional Discussion Notes

Guardrails are an important fall protection on stairways and landing platforms. What do we do to ensure guardrails remain functional?

Remember In all situations, it is important that steps are taken to eliminate the public's exposure to injuries on your job site. In defending a suit against the municipality, good faith efforts can go a long way to protecting your town and its budget.

Attendees _____

Children and Construction

Children love to explore, especially things that are new to them. Unfortunately, construction and work zones are fascinating places to explore that are especially dangerous to children.

Guide for Discussion

Some general observations:

- Children don't recognize hazards as well as those who work on site.
- Locked equipment may still be a hazard.
- All excavations are potential forts or swimming pools.
- Scaffolds can be used as gym sets.

Discouraging children:

- Don't allow children on site during the day.
- Erect a site fence.
- Mark excavations with signs or guard or both. (Remember fall protection rules.)
- Group and lock up equipment at night.
- Post "No Trespassing" signs.
- Ask for regular police patrols to check out your job site. If necessary, post a guard.

Additional Discussion Notes

Remember Most children will respect the instruction to stay out. But some will not; these are the ones that can get hurt or vandalize the project. Those who have had a child injured on their site find it a real burden on their conscience.

Attendees _____

Vehicle Operations

Few work zones or construction areas have all the space you need to move equipment and vehicles in and around. Congested or high speed traffic increase the likelihood of a serious accident at a work zone. Therefore it is important that your operations consider how to safely move equipment and divert traffic in and around the work zone.

Guide for Discussion

- Always keep the vehicles and equipment in good operating condition, including brakes, lights, turn signals, and back-up alarms if so equipped.
- Any loads extending past the vehicle body must be red-flagged.
- No employee should be allowed to “ride the load” or on the exterior of a vehicle not designed for it.
- Always give the right-of-way. Don’t worry about who should go first, rather who is the safest.
- Avoid reversing vehicles; when you have to, have someone direct in front and back.
- Report any unsafe road conditions to your fellow employees and supervisor(s).

Additional Discussion Notes If employees will work around heavy equipment, see Heavy Equipment pg 79, or Heavy Equipment Hazards pg 80 for more information.

- If the work site is going to be very busy, what is the policy on use of a spotter (guide) to direct delivery vehicles?
- What is the municipal policy on parking personal autos and trucks around the workplace?

Remember Large vehicles generate very large forces, multiplying the consequences of even small errors. The result: severe injuries, damaged materials, and expensive repair bills.

Attendees _____

Traffic Control

Almost every work zone needs traffic control. Workers are at risk of being struck by vehicles or mobile equipment in them. Traffic control often involves the use of a flagman, sign, cones, barrels, and barriers. Flagmen are preferable to signs since they can react immediately to any changes in site situations. Signs are, however, a suitable solution to an extended traffic control problem.

The intent of traffic control procedures is to protect lives, prevent a tie-up in the work zone and to allow the general public to move as efficiently as possible around the work zone.

Guide for Discussion

Is the flagman trained and certified?

Set-Up

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

Flagging Operations

- Be sure the traffic can see you.
- Wear an orange safety vest.
- Use a flag.
- Wear suitable shoes.
- Be dressed neatly (to reflect a good public image).
- Wear a hard hat.
- Never turn your back on the traffic.
- Always be courteous but firm.

Additional Discussion Notes

Our municipality's Certified Flagman are _____.

Attend CIRMA's *Work Zone Safety* and *Flagger Safety* Workshops for more in-depth instruction on these topics.

Remember The flagman has a responsibility to protect the general public as well as those at work on the construction site. Pay attention to what is going on around you.

Attendees _____

Barricades & Warning Devices

Road and highway work usually require a great deal of traffic control. Both require modifying the existing traffic patterns and, more importantly, the driving habits of the public. Today we will discuss the use of barricades and signs.

Guide for Discussion

Types of Accidents

- Collision with construction equipment such as forklifts or trucks.
- Collision with other vehicles.
- Pedestrians (both construction workers and visitors) falling into excavations.
- Driving into excavations.
- Driving into work areas.
- Loss of control of vehicle due to changes in road conditions.

Types of Warning Devices

- Signs.
- Cones.
- Drums.
- Barricades.
- Channeling devices such as barrier walls.
- Flashing lights.

General Rules

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

Additional Discussion Notes Attend CIRMA's *Work Zone Safety and Flagger Safety* Workshops to learn more about these topics.

Remember There are numerous specific rules for signs, barricades and warning device usage. It is important we use all the types of warning devices we have to protect us and the public around our construction site(s).

Attendees _____



Effects of Weather

*Whether it's hot or cold,
prepare for a change.*

Effects of Weather

There is one element that we have no control over: the elements. Municipal operations, especially public works departments, must respond to severe weather, not just carry on in spite of it. Severe weather not only effects our personal comfort, it effects our ability to perform our jobs and can be a contributing cause to a serious injury.

Guide for Discussion

Sun

- Can cause sunburn.
- Can lead to lead exhaustion and sunstroke.
- Can cause glare and poor visibility.

Wind:

- Can blow dust in your eyes.
- Can blow materials and people off scaffolds, roofs, or higher floors.
- Can blow down poorly braced formwork or newly framed walls.

Lightning:

- Often electrical storms occur without any rain. Therefore, they are very dangerous.
- Be sure to stay away from any type of tall object.
- If working around iron or rebar and lightning is seen, clear the area.

Rain, Sleet, Ice and Snow:

- All four are wet, some are cold, and all can cause slips, trips and falls.
- Snow, sleet and ice can cover floor openings and cause more slips, trips and falls.
- Mud can lead to overexertion and cause strains and sprains.
- All four can ruin materials.
- Water, ice and snow can affect trenches and other excavations. Closely inspect all excavations to determine how the weather is affecting them.
- Water, when it ponds on a job site, increases the chances of electrocution.

Additional Discussion Notes

- What other weather elements can adversely affect the job site?
- What our policy is when working in high areas to tie down equipment or people? Describe.
- Who has the authority to shut down a job because of the danger of high winds?

Remember When dealing with the weather and the effects of it on a work project, use common sense to minimize the adverse effects.

Attendees _____

Heat Exhaustion & Heatstroke

Connecticut's weather is often extreme. When working in high heat and humidity we risk developing heat exhaustion or a more severe heatstroke. Excessive heat also causes accidents in many other ways. It becomes more difficult to concentrate on the job: you sweat, you get tired and may begin making errors in judgment. When the temperature is above 90 degrees, watch for the danger signs of heat exhaustion and the more dangerous heatstroke. Pace yourself and perform heaviest labor during the coolest parts of the day.

Guide for Discussion

*How to prevent **heat exhaustion and heatstroke**:*

- Avoid consuming alcohol and ice water while working.
- Drink plenty of cool fluids; citrus or fruit juices work best.
- Avoid heavy, fatty-type foods.
- Wear light, loose clothing.
- Avoid fatigue; get plenty of rest.
- Replace lost body salts.

*How to recognize **heat exhaustion**:*

- Heavy sweating, paleness.
- Muscle cramps, tiredness, weakness.
- Dizziness, headache
- Nausea or vomiting
- Fainting

In addition, the skin may be cool and moist. The victim's pulse rate will be fast and weak, and breathing will be fast and shallow. If heat exhaustion is untreated, it may progress to heat stroke. Seek medical attention immediately if symptoms are severe, or if the victim has heart problems or high blood pressure.

*What to do for **heat exhaustion**:*

- Move victim to rest in a cool shaded area.
- Give cool fluids such as water or sports drinks (that will replace the salt that has been lost). Salty snacks are appropriate as tolerated.
- Loosen or remove clothing.
- Do **not** use an alcohol rub.
- Do not give any beverages containing alcohol or caffeine.

Attendees _____

Heat Exhaustion & Heatstroke, cont.

How to recognize **heatstroke**:

- High body temperature; 103 degrees F or higher.
- The absence of sweating, with hot red or flushed dry skin.
- Rapid pulse.
- Difficulty breathing.
- Disorientation, strange behavior, hallucinations, confusion, and or agitation.
- Seizure.
- Unconsciousness or comatose.

What to do for **heatstroke**:

- **Call 911 immediately: this is a medical emergency.**
- Move the person to a cooler environment, or place him or her in a cool bath of water (as long as he or she is conscious and can be attended continuously).
- Alternatively, moisten the skin with lukewarm water and use a fan to blow cool air across the skin and place ice packs under armpits and groins.
- Give cool beverages only if the person has a normal mental state and can tolerate them.

Heat stroke is a true medical emergency that can be fatal if not properly and promptly treated. Victims of heat stroke must receive immediate treatment to avoid permanent organ damage. First and foremost, cool the victim.¹

Additional Discussion Notes

Remember Both heat exhaustion and heatstroke 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 sports drink.

Attendees _____

¹Information from the Centers for Disease Control and Prevention

Dressing for Winter Work

Cold weather can limit your ability to see, hear, smell, and touch and awareness of danger. It is usually difficult to be productive when you are cold, too. Therefore, it is important to dress for the weather conditions.

Guide for Discussion

- Always dress in layers; the outer layers should be rather loose and the inner layers somewhat snug to trap body heat.
- Do not overdress.
- Use the outer layer of clothing as a windbreaker. This will make the layers underneath more effective.
- Minimize sweat. If you begin to get hot, take a layer off. Try to avoid getting your clothing wet. Once wet, they will not serve as good insulation from the cold.
- Wear head protection. This will increase your overall warmth. Over half of the body's heat loss is from the head.
- 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.
- Gloves are very important. Most often a thin pair of wool gloves under a pair of leather gloves will provide the best protection.

Additional Discussion Notes

Remember Don't overdress. This can restrict your movements and increase the chances of an accident. Shock resulting from an accident in cold weather can be much more dangerous than in warm weather. Should an accident occur in cold weather, it is critical that the injured person be kept warm.

Attendees _____

Personal Protective Equipment (PPE)

A person wearing dark protective pants and yellow gloves is using a high-pressure water sprayer to clean a sidewalk. The sprayer is connected to a pressure washer unit in the background. The scene is outdoors on a paved surface.

*Check your PPE.
If it's defective,
it can't protect you.*

Clothing

The proper work clothing can make a job a lot easier. Most workers never really think much about what they are wearing, but they should. It is very important to dress for the weather since work is often done outside or in areas without climate control.

Guide for Discussion

Weather

- Know the day's forecast.
- Be prepared to add or subtract clothing.
- Never work without your shirt in summer.
- If you begin to overheat, don't take off more clothes. Instead, slow down your working pace.
- In winter, try to avoid getting wet by wearing the proper clothing.
- Gloves are very important. Most often a thin pair of wood gloves under a pair of leather gloves will provide the best protection.

Proper Clothing – Head to Toe

- A hard hat when required; soft cap during winter months.
- Eye protection of either safety glasses or safety goggles (or safety shield).
- Long or short sleeved shirt depending on the weather.
- Long pants always.
- Thick socks.
- Safety shoes.
- Work gloves.

Watch for the Following

- Dirty clothes – keep your clothes clean and free of grime and bacteria.
- Keep oil and chemicals off of your clothes—don't become a human torch.
- Don't wear pants with cuffs on them.
- Missing buttons, rips and tears can increase the chances of cuts, bruises and other injuries.
- Loose garments tend to get caught easily.
- Belts, ties and other accessories that may get caught.

Additional Discussion Notes

What is municipal policy on wearing hard hats, eye protection, shirts/long pants? For more information on developing a PPE program, attend CIRMA's *Personal Protective Equipment for Employees Workshop*.

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

Attendees _____



Head Protection – Hard Hats

There are some practical reasons for wearing a hard hat. They help keep your head cooler in summer; dry during rain; and helps shield your ears from noise. But the main reason to wear a hard hat is that it protects the control center of your body—your head. Thousands of head injuries occur each year during operations; many of these injuries could have been prevented by a hard hat.

Guide for Discussion

What a Hard Hat Does

- Protects you from falling or flying objects.
- Protects your head in case of a fall or bumps into machinery, ductwork, and the like.
- Protects you from electrical shocks and burns if it's a non-conductive hat.
- It is a good place to put stickers and decals, especially First-Aid trained or Safety Committee member.

Proper Care. In order for your hard hat to take care of you, you need to care for your hat.

- Always keep your hard hat properly adjusted.
- Do not cut, bend, or heat the hard hat.
- When you see deep gouges or cracks in the shell, or the hat color turns dull, it's time for a new one.

Proper Wear.

- Do not wear it backwards.
- Don't put anything inside your hard hat except your head.
- Don't try to substitute a "bump cap" for it. The bump cap will not provide adequate protection from falling objects; it just isn't strong enough.
- It is not a stool or a step; misusing it this way weakens the shell of the hard hat.

Additional Discussion Notes What is municipal policy on wearing hard hats? _____

For more information on developing a PPE program, attend CIRMA's *Personal Protective Equipment for Employees Workshop*.

Remember The average hard hat weighs about 14 ounces. The average head weighs about 14 pounds. That's about one ounce of protection for each pound of head. A small price to pay to protect the most important part of your body—your head.

Attendees _____

Eye Protection

The protection of your sight is extremely easy, extremely important, and too often, “extremely” forgotten. Once you have lost an eye or your ability to see, it’s too late. Protecting your eyes is one of the easiest areas to protect, and one of the most important.

Guide for Discussion

Types of Eye Injuries

- Small flying objects such as dust or other microscopic objects.
- Particles resulting from chipping, grinding, sawing, brushing, hammering or using power tools (including nail guns). (These items move with the speed of a bullet and can permanently damage your eyes.)
- Liquids such as chemicals, tar, asphalt, solvents, paints or masonry cleaning solutions.
- High intensity light such as those generated by welding operations or by a laser.

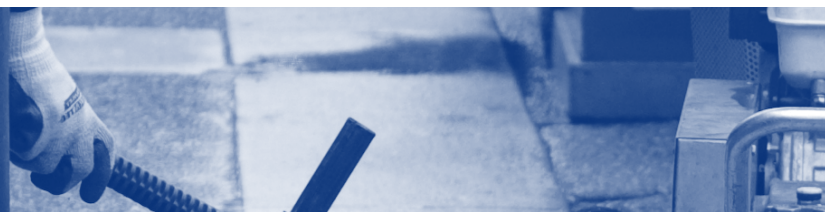
Methods of Protection

- Safety glasses.
- Safety goggles.
- Face shields.
- Welding hoods.

Additional Discussion Notes For more information on PPE and developing a PPE program, attend CIRMA's *Personal Protective Equipment Workshop*.

Remember There are all kinds of safety glasses or goggles available on the market; use the appropriate type. Eye injuries occur in a split second. Don't overlook protecting your eyes.

Attendees _____



Foot Protection

Foot protection is probably about the least talked about type of personal protection. Nevertheless, it is still an important safety topic. One nail puncture could cause weeks of lost time from the job.

Guide for Discussion

Characteristics of a Suitable Boot

- Puncture resistant soles.
- Steel toes.
- Boot extends above the ankle.
- Sole provides good traction.

Type of Injuries Commonly Resulting from Poor Footwear

- Punctures from nails and tie wire.
- Bruises of the foot.
- Unsure footing.
- Blisters.
- Body fatigue.
- Foot injuries resulting from dropped objects.

Other Acceptable Footwear

- Buckle Overshoes – for work in mud, water, and concrete.*
- Knee and hip boots – for work in deep water and mud.

*Encourage use of rubber boots when working with wet concrete. Concrete can cause severe caustic burns if it contacts the skin for any length of time.

Additional Discussion Notes What is the Municipality's policy on wearing sandals or tennis shoes on the job? _____.

For more information on developing a PPE program, attend CIRMA's *Personal Protective Equipment for Employees Workshop*.

Remember 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 on the job in order to insure that they are able to get us there?

Attendees _____

Hand Protection

Someone commented that the “hands and fingers are the instruments of the mind.” If that is true, it is difficult to be productive when your hands are injured or lost as a result of an accident. Whatever the work, a worker must be able to use both hands in order to get the job accomplished.

Guide for Discussion

Causes of Hand Injuries:

- Inattention.
- Taking chances.
- Exposure to rough materials.
- Stacking of heavy materials (i.e., getting your hand or fingers caught between materials).
- Cut by sharp objects.
- Crushed, mangled, or hit by tools.
- Burns.
- Caught in machinery.

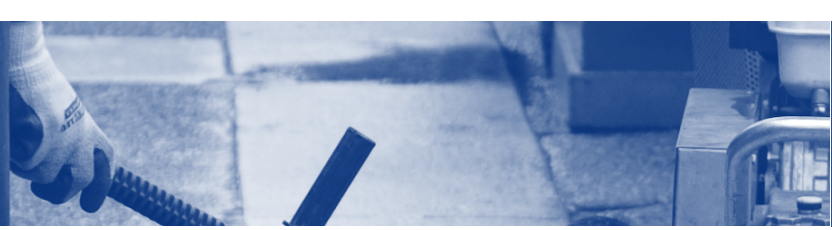
How to Protect Your Hands:

- Wear gloves whenever possible.
- Pay attention to the task being performed.
- Use the proper tools.
- Make sure any equipment used has hand guards in place.

Additional Discussion Notes For more information on developing a PPE program, attend CIRMA's *Personal Protective Equipment for Employees Workshop*.

Remember Should any injuries occur to your hands, be sure to get immediate treatment. Without treatment, a minor cut can turn into a major problem from an infection. Your hands may look tough, but when you get scratches, cuts, bruises or blows that seriously injure your hands, you take a chance of losing them.

Attendees _____



Personal Protective Equipment — Concrete Construction

Concrete construction has unique requirements for Personal Protective Equipment (PPE). Concrete is heavy, and so concrete construction requires the use of head gear. Concrete and other cement mixes are abrasive to bare skin, highly caustic (with a pH of 12 to 13), and dehydrating. During sidewalk replacement and other concrete construction projects, workers should use appropriate PPE.

Guide for Discussion

Construction: Common PPE

- Head gear. If there is a danger of falling objects, wear a hard hat. If working in cold weather, wear a hat to keep your body warm.
- Proper eye protection is essential when working with cement or concrete. Eyes are particularly vulnerable to blowing dust, splattering concrete and other foreign materials. On some jobs it may be advisable to wear full-cover goggles or safety glasses with side shields. That way any splashed concrete stays out of your eyes.
- Waterproof gloves should be worn.
- Long sleeve shirt/pants. Fresh concrete should be washed off clothing promptly with clear water to prevent continued contact with skin surfaces. Begin each day by wearing clean clothing and conclude the day with a bath or shower to prevent reduce long-term irritation. (For persistent or severe discomfort, consult a physician.)

Concrete: Extra PPE

- Kneepads. Since concrete finishing often exposes knees to additional wear and tear, it makes sense to wear waterproof kneepads designed to take the stress and prevent contact between wet cement and skin.
- Waterproof boots. If wet concrete contacts skin for any lengthy period of time, it can cause severe burns—and it's easier to wash off rubber boots than regular boots.¹

Additional Discussion Notes Avoid actions that cause cement dust to become airborne. Respirators may be used in poorly ventilated areas, where exposure limits are exceeded, or when dust causes discomfort or irritation. Avoid prolonged exposure to dust. For more information on developing a PPE program, attend CIRMA's *Personal Protective Equipment for Employees* Workshop.

Remember Let mechanical equipment work to your advantage by placing concrete as close as possible to its final position. Concrete should be pushed—not lifted—into final position with a shovel.

Attendees _____

Safety information courtesy of the Portland Cement Association.

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Knee Pads

Workers often bend their knees almost as much as their backs and, by the end of the day, they complain about their aching bodies. Just as we must be careful in lifting, we must be careful in bending and kneeling. Think about using knee pads as an important part of Personal Protection Equipment.

Guide for Discussion

Do we have exposure to knee injuries?

Is there a way to “engineer out” the constant knee bending situations on this job?

What are appropriate times and places to wear knee pads?

Is using a piece of insulation and duct tape an acceptable means of protecting knees?

Discuss as needed:

- Concrete finishing.
- Decking work.
- Roofing work.
- Finishing work.
- Electrical or plumbing work.
- Welding.
- Road work.

Improper use examples:

Binding straps too tight (cutting off circulation)

Additional Discussion Notes Are we using knee pads that can work when wearing double kneed work clothing? For more information on developing a PPE program, attend CIRMA's *Personal Protective Equipment for Employees Workshop*.

Remember It only takes a moment to strap on knee pads or wear them in double kneed work clothing. Over time, kneepads will save you from a repetitive injury to your knees, and make you more comfortable on the job.

Attendees _____

Respirators

Instructor Note: Before the safety presentation, obtain, and review your respirator protection program.

The use of a respirator is an important part of our PPE program because of the exposures municipal workers face on the job. Respiratory protection must be worn whenever you are working in a hazardous atmosphere. The appropriate respirator will depend on the contaminant(s) to which you are exposed and the protection factor required. Respirators range in effectiveness from dust masks to a full self-contained breathing apparatus.

Guide for Discussion

Generally:

- No respiratory program is required when filtering-facepiece respirators (dust masks) are the only respirator used and they are used voluntarily.
- Respirators will be worn when the employee is exposed to hazards such as fumes, gases, mists, vapors and sprays.
- Fit testing must occur before an employee is allowed to wear the respirator.
- Employees should be fit-tested at minimum of annually to ensure the respirator still fits properly.
- Respirators must be kept in a sanitary condition, covered at all times when not in use.
- Respirator training should be conducted prior to wearing the respirator for the first time.

We want all our line employees to:

- Inspect the respirator before each use.
- Know how to properly don/fit their respirator.
- Conduct a positive pressure or negative pressure check with each use.
- Report any and all problems to your supervisor.
- Take proper care of the respirator.
- Never hang respirator on a nail or leave exposed to dust.

Additional Discussion Notes Respirator Protection Program notes:

Remember The reason we wear a respirator is to protect our lungs and bodies against hazardous fumes, gases, mists, vapors or sprays. For more information on developing a PPE program, attend CIRMA's *Personal Protective Equipment for Employees Workshop*.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Housekeeping

Safe housekeeping is ongoing.





Housekeeping

Proper housekeeping on the job is a safety requirement common to all municipal operations and work zones. If debris, clutter, and spills are accepted as normal, then other more serious health and safety hazards may be overlooked. Good housekeeping also improves morale and productivity along with safety. Good housekeeping is consistent: “panic” clean ups do not improve safety.

Guide for Discussion

The following “General Rules” should be covered in any discussion on housekeeping:

- Keep all waste debris in neat piles and away from the immediate work area.
- Remove debris from the job on a regular basis.
- Keep aisles, stairways and walkways clear.
- Store materials only in their designated areas.
- Keep scrap lumber with protruding nails separate from other debris;
- Bend nails over or remove from lumber.
- Place trash barrels where needed to eliminate food rubbish.
- Keep tools and equipment stored neatly.
- Keep extension cords from being across walkways. If necessary, run them overhead; same applies to air compressor hoses.
- Don’t let trash and debris build up. If it does, make an extra effort to get it cleaned up.

Good Housekeeping Can:

- Prevent minor injuries like cuts, punctures, slivers.
- Prevent major accidents like slips, trips, falls and fires.
- Increase job productivity by speeding up the movement of workers and materials on the job.

Additional Discussion Notes When doing tear-offs, don’t drop material outside the exterior walls of the structure, unless that area is effectively protected. (See Trash Chutes, page 43 for more information.)

Remember Good housekeeping makes it easier for everyone to do their work safely and more effectively.

Attendees _____



Trash Chutes

Trash chutes (also called disposal chutes) are commonly used on multi-story projects.

Guide for Discussion

- Don't drop material outside the exterior walls of the structure, unless that area is effectively protected.
- Whenever materials are to be dropped in an unprotected area an enclosed chute must be used.
- The chute should be fully enclosed on all sides.
- Never allow someone using a chute to be endangered by material falling from above.
- Be sure the chute door can be securely latched closed.
- Be sure all debris is collected into a suitable container (i.e., trash barrels, back of a dump truck).
- Never allow debris to fall into an unguarded or unsecured area.
- Never allow debris to accumulate to overflow.
- Keep a fire extinguisher near the trash accumulation area.
- Never put solvent, oil, flammable liquids or materials soaked with any flammable liquids into a trash chute.

Be sure the chute is properly guarded with standard guardrails. (See Guardrails on page 69.) If attached to a wall opening, standard guardrails, a safety net system or a personal fall arrest system (PFAS) must be used.

Additional Discussion Notes Chutes should be designed and constructed strong enough as to eliminate failure due to impact of debris or other materials loaded on them. In short, don't use a 1 x 6 when 2 x 6s are needed.

Where debris is dumped from a wheelbarrow or other mechanical equipment, a toeboard or bumper not less than 4 inches thick and 6 inches high will be mounted at each chute opening.

Remember The use of trash chutes can greatly improve the housekeeping in a construction project. But unless the chutes are properly constructed and used, they will do nothing but create additional hazards for the workers. Be conscious of what you are doing around a chute.

Attendees _____



Material Storage

Proper material storage is a vital part to every work zone or project site and to good site housekeeping. It also makes good sense to stack and store materials so that they can be accessed safely and easily.

Guide for Discussion

Poorly stacked materials are dangerous to anyone around the job site:

- Keep aisles and passageways clear; never store materials in such a way as to block them.
- Never store materials within 6 feet of a hoistway entrance, floor opening, or at second floors and higher.
- Segregate incompatible materials. Don't stack flammables next to combustibles.
- Never store more materials than are to be used immediately on scaffolds or runways.
- Remove all nails from lumber stacks.
- Block all cylindrical storage items to prevent rolling.
- When possible, cross-tie tiers of a material to increase support.
- If heavy materials or large quantities of materials are to be stored on floors above grade, know the load limits of the floor and don't exceed them.

Additional Discussion Notes

Remember One way to increase efficiency and safety on the job is to store materials correctly the first time; it just makes good sense.

Attendees _____



Material Handling

Proper material handling is part of the successful working of any job. A good housekeeping program plans and manages the orderly storage and movement of materials from point of entry to exit. Workers need to know how to work safely with the products they use.

Guide for Discussion

Material Storage

- Ensure that floors can handle the storage loads.
- Keep materials six feet away from open floors or landings; ten feet away from the exterior of the building.
- Keep all aisles and passageways clear.
- Do not store non-compatible materials together. For example, gas containers and bulk lumber do not mix.

Proper Lifting Techniques

- Know your individual lifting capacity.
- Know the weight of the load to be lifted.
- Avoid over-extending or twisting your back.
- Use your legs to lift—keeping your back straight—with the load close to your body.
- Get help if needed.

Additional Discussion Notes Attend CIRMA's *Preventing Sprains & Strains and Preventing Back Injuries* Workshops to learn more about proper lifting techniques.

Remember There is a place for everything and everything needs to be in its place. The proper storage of work materials will make your job easier. Proper lifting and handling, with help if needed, will keep you from being injured on the job.

Attendees _____



The Spotter

Traffic direction is an important job, especially in work zones that have high traffic. This Topic reviews what the spotter should do and watch for when he directs traffic.

Guide for Discussion

A spotter should always be used any time a vehicle with restricted view is operating on site.

A spotter should always:

- Look out for themselves.
- Look out for others.
- Make sure the delivery vehicle is not damaged.
- Make sure the project and project materials are not damaged.
- Give clear and understandable signals.
- Never move out of view of the driver without first stopping the vehicle.

If you must go directly behind a vehicle, keep one hand on it so that you can immediately sense any movement of the vehicle.

- Always signal on the driver's side.
- Be consistent in giving signals.
- Use hand signals.
- The spotter must watch where they are walking.

Additional Discussion Notes Attend CIRMA's *Flagger Safety and Work Zone Safety Workshops* to learn more about these topics.

Remember It is the responsibility of the spotter to get the delivery vehicle on and off the site without injury or property damage. This is a big responsibility—no one should take it lightly.

Attendees _____



Signaling Techniques

Proper signaling can greatly increase the efficiency and productivity in a work zone or project site, whether it is guiding a delivery vehicle, a forklift, or a bucket truck. Improper signaling can kill or injure workers as well as cause severe property damage. Discuss the following:

Guide for Discussion

Know the signals. If you have to, get with the operator and coordinate what signals mean. Allow only one person to give signals. Be sure the operator knows who the signal person is.

The signal person must:

- Always be in a position to see both the operator and the work area.
- Always watch the load; the operator must watch the signal person.
- Never move a suspended load over workers.
- Always warn workers when loads are being moved in their area.
- Watch for overhead power lines and any other obstructions.
- Remember the proper type of signaling operation—for a truck, forklift or crane.
- Always signal on the driver's side.
- Be consistent in giving signals.
- Use hand signals.
- The spotter must watch where they are walking.

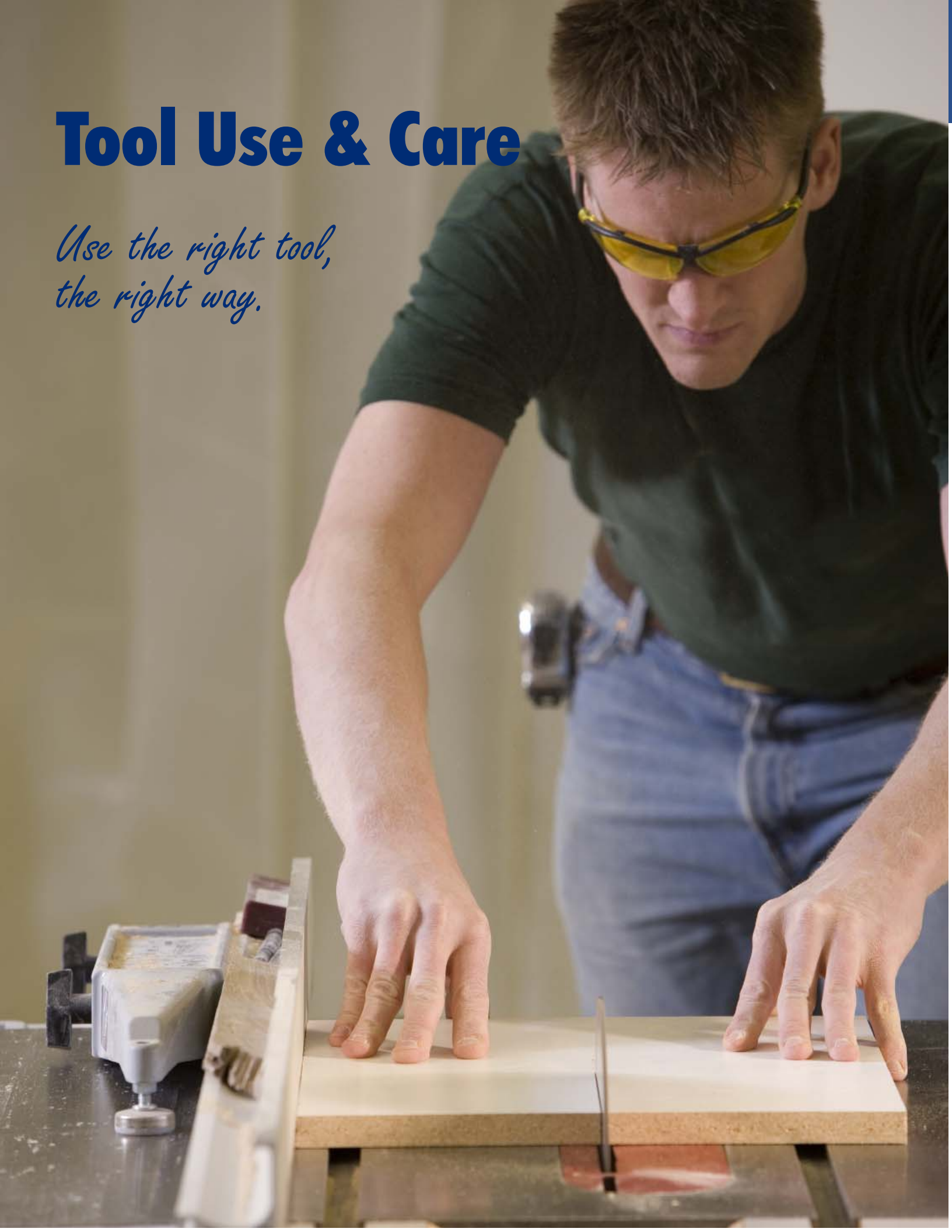
Additional Discussion Notes Attend CIRMA's *Flagger Safety* and *Work Zone Safety* Workshops to learn more about these topics.

Remember It only takes one small mistake on the part of the signal person to cause a severe injury or major property damage. Make sure you and the operator understand each other and the signals to be used.

Attendees _____

Tool Use & Care

*Use the right tool,
the right way.*



The Right Tool for the Right Job

An easy way to be injured on the job is by using the wrong tool for the job. There are two important points to remember when using hand tools: first is the selection of the proper tool for the job, second is the proper use of the tool for the job.

Guide for Discussion

Some key points to remember:

Misuse results from:

- Ignorance.
- Poor attitudes.
- Production demands.
- Missing tools.

General Points:

- Keep your tools clean and in good condition.
- Chose the right tool for the job.
- Never use a tool not designed for the job you are doing.
- Never carry tools in your pockets.
- When chipping or cutting, wear eye protection.
- Be wary of the effect of your actions on other nearby workers.
- Use a pulling motion to operate hand tools rather than a pushing method.
- Never leave hand tools in areas where they may be kicked off onto lower levels or where they may be a tripping hazard.
- Never improvise.
- Don't adapt or use electrical "cheaters."
- Never remove an electrical cord by jerking it; pull it away from power by the plug.
- Always be sure that power tools are electrically safe.

Additional Discussion Notes

Remember The use of hand tools effects everyone in the workplace. Therefore, everyone should follow safe hand tool practices.

Attendees _____

Hand Tools

Without the use of hand tools, the completion of most projects would be nearly impossible. Yet, as vital as they are, they are often the cause of serious accidents. All too frequently, hand tools are used improperly or when they are defective. Since we use hand tools continually, it is important to use them correctly.

Guide for Discussion

Pre-Work Inspection

Chisels

- Be sure the heads are safe ended or dressed.
- Be sure the cutting edges are sharp and square.

Files

- The tangs should be protected with handles.
- The teeth should be sharp and clean.

Hammers

- Be sure the handles are tight, unbroken, and clean.
- The face of the head should be smooth and not mushroomed.

Screwdrivers

- Be sure handles are smooth and clean.
- Be sure all bits should be sharp and square.

Saws

- Blades should be kept sharp and oiled.
- Handles should be smooth and continuous.

General Hand Tool Rules

- Always use the right tool the right way.
- Use only tools in good condition.
- Keep tools sharpened.
- Store tools properly.
- When chipping, always wear a face shield or safety glasses.
- Never throw tools to coworkers.
- Never use a tool in such a way that you will be injured if it slips.

Additional Discussion Notes

Remember Each tool is designed to perform a specific function. As long as you use the right tool and keep it in good operating condition, the various hand tools will serve you well. When you begin to improvise, expect the unexpected—injuries.

Attendees _____

Screwdrivers

The screwdriver is one of the most commonly misused hand tools. Although it is designed to tighten or loosen screws, you can also find it being used as a pry bar, punch, or chisel. When that happens, the screwdriver can slip. When it slips, it can cause an injury or can ruin the tool.

Guide for Discussion

Proper Care

- The handle should be tight, smooth but not slippery.
- The shank should be true and straight.
- The bit should be flat, with the end at a right angle with the shank.
- Keep the bit square edged.
- When sharpening, be sure not to remove the bit temper.
- Keep the bit and handle clear and free of grease and oil.

Proper Use

- Always use the proper size bit to fit the screw head.
- Keep the bit square to the screw head.
- Never use pliers on a screwdriver; if possible, use a vise.
- Never use as a pry, chisel, punch, or lever.
- Use only a standard screwdriver on a standard screw; Phillips head on a Phillips head screw.
- Select the right length for the job; don't try to improvise.
- Always use a screwdriver with an insulated handle for electrical work.

Additional Discussion Notes

Remember The screwdriver is a valuable tool when used properly. When used improperly, it becomes a hazard to your safety with the possibility of an injury.

Attendees _____

Wrenches

Wrenches—a very good name for a tool that has, when misused, caused wrenched backs, and injured hands, wrists, and shoulders as well.

Guide for Discussion

Proper Care

- Inspect on a regular basis.
- Replace sprung jaws, cages, and faces.
- Replace all bent handles.
- Keep the jaws sharp.
- Keep the wrench clean and free of grease and oil.

Proper Use

- Always use the proper size wrench for the job.
- Never use a shim to make a wrong size wrench fit a nut.
- Never use a piece of pipe on the handle to increase your leverage. (Slip hazard.)
- Don't use a wrench as a substitute for a hammer.
- Don't pound on a wrench to try to loosen a frozen bolt. Use penetrating oil instead.
- Always pull a wrench toward you—never push away. (Slip hazard.)
- See that the wrench jaws are sharp and can bite the nut.

Additional Discussion Notes

- Avoid possible falls—be sure you have firm footing.
- Use a wrench on moving equipment? Never.

Remember After you have banged up several knuckles or broken a finger misusing a wrench, you have learned the hard way that a wrench is dangerous. Bottom line: If you use a wrench improperly, it can cause painful injuries.

Attendees _____

Hammers/Chisels

One of the most common causes of hand injuries is from the improper use of hammers and chisels. Both are responsible for a high number of eye injuries as a result of flying nails, metal or concrete chips.

Guide for Discussion

Chisel Use

- Never use a chisel with a mushroomed head.
- Always wear eye protection.
- Hold the chisel between the thumb and forefingers—don't make a fist around the chisel.
- Do not grip a chisel if your hands are too cold or numb.
- If another worker is nearby, place yourself between the other worker and the chipping area.
- Always use sharp chisels.

Hammer Use

- Use the right type of hammer for the job.
- Only use hammers in good condition.
- Use only hammers to drive objects.
- Always grip the hammer close to the end and grip it tightly.
- Whenever possible, wear eye protection.
- Always concentrate on the striking point.
- Strike blows as squarely as possible.
- Be sure there is an unobstructed back swing.
- Don't strike blows with the side of the hammer.
- Never strike a hammer or tempered tool with another hammer.
- Always keep your hammer free of grease and oil.
- Never allow someone else to hold a nail or chisel while striking it.

Additional Discussion Notes Our Municipality's policy on wearing eye protection on the job is _____.

Remember In addition to using common sense and following the techniques we discussed earlier, wear safety glasses or goggles when chiseling or hammering.

Attendees _____

Nails Are Dangerous too

You might think that nails are not a big safety concern. However, about 20% of all minor injuries on construction jobs are a result of punctures, scrapes, and cuts from nails that were not properly removed from 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 scrap.

Guide for Discussion

Driving Nails:

- Be sure your hammer is in good condition.
- Always hit the nail squarely, especially on the first blow.
- Always strike the nail head on the perpendicular.
- Make sure the back swing is unobstructed; being hit by the claws can cause serious injury.
- Be consistent—"groove" your swing.
- Concentrate on the head of the nail.

Pulling Nails:

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

Additional Discussion Notes

Remember Always treat nails with the respect due them. Otherwise you may end up with puncture wounds, scrapes, cuts, or the loss of your eyesight. Use your common sense when driving or pulling nails.

Attendees _____

Table Saws

We all recognize how important our hands are to us. However, every year hundreds of fingers and hands are lost in accidents involving table saws. Table saws are the fastest and surest way to lose a finger or a hand. Much of this is a result of getting too familiar with the saw and losing respect for it. That is why it is so important that we review the common safety rules pertaining to the operation of a table saw.

Guide for Discussion

Two common types of saws: Table saw and radial arm saw.

General Operating Rules:

- Never operate without all guards in place, especially the blade guard.
- Be sure you stand in the correct position—always allow for kickback.
- Maintain good footing.
- Never allow other workers to work or rest where they are exposed to kickback.
- Maintain good housekeeping in the saw area.
- Never use your hands to run lumber through the blade or to clean off sawdust. Get a pushstick and a brush.
- Never use a saw with a dull blade. (Note: When you go to change a blade, make sure the power is disconnected and you control the switch.)
- Don't crowd (i.e., pinch) a blade especially when cross cutting.
- Don't wear loose clothing around a saw.
- Always wear eye protection.
- Be wary of warped lumber.
- Be wary of kickback, also called fly back, when ripping.
- Keep the blade set so it just barely makes the desired cut.

Additional Discussion Notes

Remember The use of table saws can greatly increase productivity. But if improperly used, they can seriously injure or permanently handicap the user.

Attendees _____

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 safe and proper use.

Guide for Discussion

The following rules should be followed when using electrical power tools:

- Select the right tool.
- Know how to use it.
- Be sure it is properly grounded or double insulated (a plastic body and two-pronged plug).
- Inspect for the following:
 - Broken, frayed, or defective cords.
 - Defective terminal connections.
 - Defective plugs.
 - Defective or loose switches.
 - Brushes that spark excessively.
- Never use a tool unless the guards are in place and in working order.
Before using the tool:
 - Remove the chuck or adjusting key.
 - Firmly secure the work.
 - Be sure you have firm footing.
- Always use proper personal protective equipment and remove dangerous items:
 - Safety glasses or goggles.
 - Hard hat.
 - Safety shoes.
 - Loose clothing.
 - Jewelry.
- Never carry the tool by its cord.
- Never adjust the tool when it is plugged in.
- Disconnect the tool when finished or when not using.
- Maintain good housekeeping.
- Avoid working in wet areas whenever possible. When you do, wear insulating Personal Protective Equipment such as rubber gloves or a rubber vest.

Additional Discussion Notes

Remember All the basic rules we discussed are common sense in nature. Yet too many times they are forgotten or disobeyed with the result of someone being injured—too often, seriously.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Electric Hand Saws

The electric hand saw is one of the most commonly used power tools. It is also one of the most abused. Today we are going to discuss basic safety, guard, and saw-blade rules.

Guide for Discussion

General Safety Rules

- Use only grounded or double-insulated tools.
- Use only extension cords that are in good condition.
- Make sure there is an Assured Grounding program or Ground Fault Interrupter (GFI) being used. (See Electrical section, page 83, for more information.)
- Make sure all work areas are as dry as possible.
- Never do maintenance work on the saw while it is plugged in.
- Never, ever use your leg as a sawhorse.
- Always remain alert.

Guard Rules

- Make sure all guards are operable before use.
- Do not use the saw if it has a defective guard.
- Never disable any of the guards.
- Always check before setting the saw down to be sure that the blade guard does not jam open.

Saw Blade Rules

- Always keep the blade sharp.
- Use the right blade for the materials being cut.
- Never change blades while the saw is plugged in.

Additional Discussion Notes

Remember An electric handsaw can, in a blink of an eye, severely injure you or a co-worker. Be alert when using an electric hand saw and use common sense.

Attendees _____

Portable Electric Tools

Municipal workers use portable power tools continuously. Electricity always seeks the path of least resistance to ground, and often that is through a defective cord to the user's body. This is especially true if the worker is exposed to wet weather or has been sweating.

Guide for Discussion

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

- Use only equipment that is in good condition.
- Be sure the tool is properly grounded.
- Always report the following:
 - Defective or broken cords.
 - Bad connections to power terminals.
 - Defective or broken plugs.
 - Defective or loose switches.
- Never overstrain the tool, thus overloading the motor.
- Never use an uninsulated tool without a grounding plug.
- Avoid working in wet areas unless a Ground Fault Interrupter (GFI) circuit is used.
- Never use a tool in the presence of flammable vapors or gases unless it is designed for such use.

Additional Discussion Notes What is your Municipality's policy on power tool use?

Remember Electricity is an unseen killer; it gives no warning. But electrical shock can be avoided by using tools in good condition and by using common sense.

Attendees _____

Powder-Actuated Tools

Powder-actuated tools, or nail guns, fire nails or fasteners into walls or substrates. As such, the safety rules that apply to firearm safety almost always apply to the use of powder-actuated tools. Equally important, the surface being nailed must be capable of stopping and holding the nail. No one is allowed to operate a powder-actuated tool without proper training. The rules discussed today are not intended to train users, but to serve as a reminder.

Guide for Discussion

Hazard Examples

- Flying particles.
- Shoot-throughs.
- Ricochets.
- Fire hazards.
- Interchanging tool charges with firearm charges.

Basic General Safety Rules

- Allow only qualified workers trained and have on their person a qualified operator card for operating powder-activated tools.
- Inspect the tool before each use.
- Test the tool before each use.
- Always follow the manufacturer's specifications for operation.
- Always study and determine the proper charge.
- Know what is on the other side of the work surface.
- Know what is on the work surface.
- Don't allow other workers on the other side of the work surface.
- Know what can't be shot into, such as cast iron, high carbon steel, armor plate, glazed brick, glass, or tile. See manufacturer's instructions.
- Load just prior to shooting.
- Always wear eye protection.
- Store the tools, charges, and studs safely and securely.
- Don't try to fix jams and misfires.

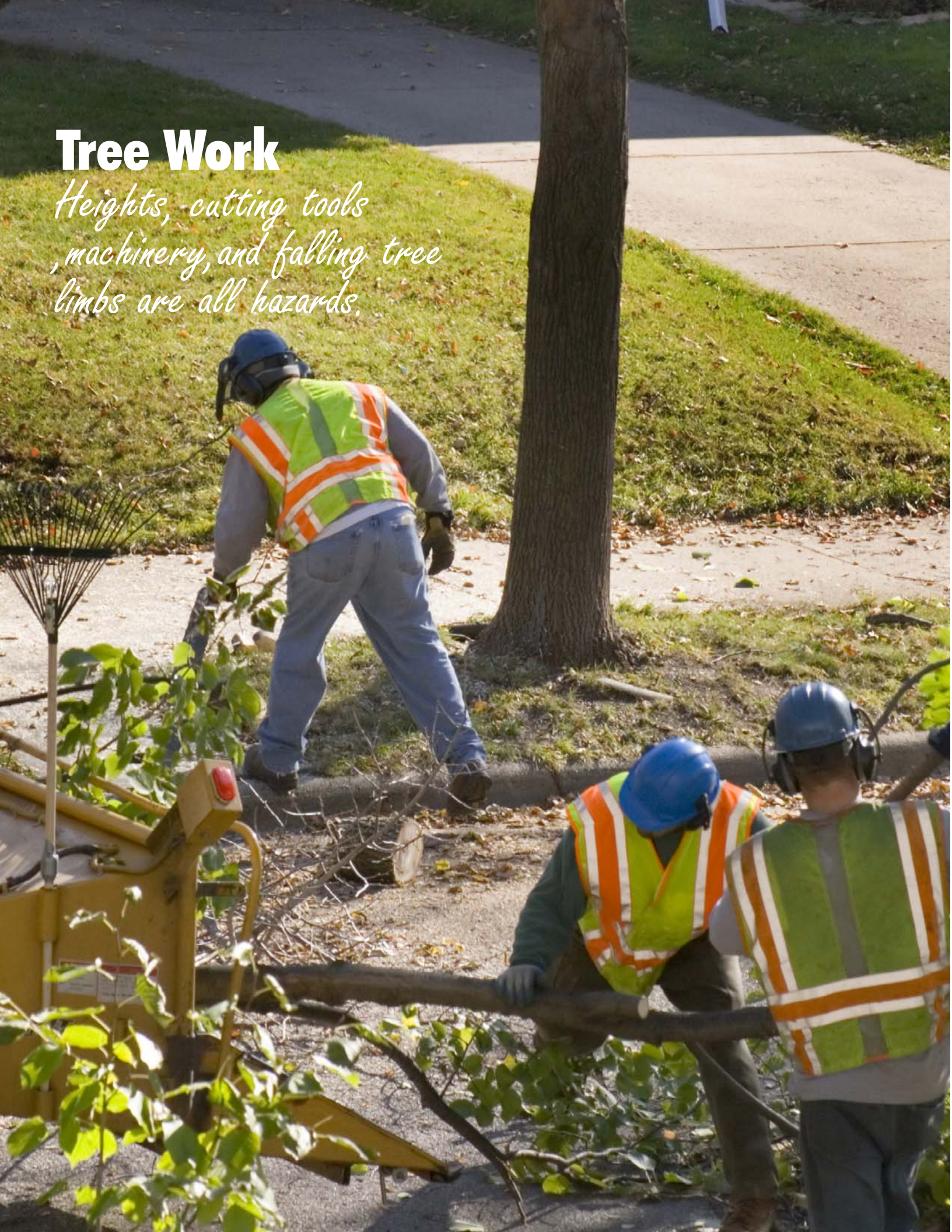
Additional Discussion Notes What is your Municipality's policy on powder-actuated tool use?

Remember Powder-actuated tools in the wrong or unqualified hands can be as deadly as a firearm. Use extreme caution when you are using or are around a powder-actuated tool. The examples of hazards and basic general safety rules we discussed are only a partial listing. This is not a substitute for formal training.

Attendees _____

Tree Work

*Heights, cutting tools
, machinery, and falling tree
limbs are all hazards.*



Tree Trimming & Removal

Tree trimming or removal, whether it is done as routine maintenance or after a storm, has resulted in serious injuries and fatalities to public works employees. Hazards are many: tree work must often be performed near power lines, heavy tree limbs and trunks may fall unpredictably, and the power equipment itself poses dangers.

Guide for Discussion

Assume that all power lines are energized!

- Contact the utility company to discuss de-energizing and grounding or shielding of power lines.
- All tree trimming or removal work within ten feet of a power line must be done by trained and experienced line-clearance tree trimmers. A second tree trimmer is required within normal voice communication range.
- Line-clearance tree trimmers must be aware of and maintain the proper minimum approach distances when working around energized power lines.
- Use extreme caution when moving ladders and equipment around downed trees and power lines.

Do not trim trees in dangerous weather conditions.

- Perform a hazard assessment of the work area before starting work.
- Eliminate or minimize exposure to hazards by the tree and in the surrounding area.
- Operators of chain saws and other equipment should be trained and the equipment properly maintained.
- Use Personal Protective Equipment such as gloves, safety glasses, hard hats, hearing protection, etc., recommended in the equipment manufacturer's operating manual.
- Determine the tree's felling direction. Address forward lean, back lean, and/or side lean issues, and for vines that may tether the tree with other trees or objects.
- Determine the proper amount of hinge wood to safely guide the tree's fall. Provide a retreat path to a safe location.
- Inspect tree limbs for strength and stability before climbing. Tree trimmers working aloft must use appropriate fall protection.
- Do not climb with tools in your hands.
- If broken trees are under tension, determine the direction of the pressure and make small cuts to release it.
- Use extreme care when felling a tree that has not fallen completely to the ground and is lodged against another tree.
- Never turn your back on a falling tree.
- Be alert and avoid objects thrown back by a tree as it falls.

Additional Discussion Notes:

Remember

Attendees _____

Chipper Machines

Chipper machines cut tree limbs into small wood chips. Hazards arise when workers get too close to, or make contact with, the chipper. Contact with chipper's spinning blades, discs, or knives may result in amputation or death. Workers may also be injured by material thrown from the machine.

Guide for Discussion

Hazards

- Workers making contact with or being pulled into the chipper.
- Hearing loss.
- Face, eye, head, or hand injuries.

Proper use:

- **Never** break the "plane" in front of the chipper feed with your hands or arm.
- **Never** put your foot or leg on the chipper apron. You may lose your balance and be dragged into the chipper blades.
- **Never** open the access panel when the chipper is running.
- Ensure all ropes and climbing lines are kept away from the chipper, so they are not caught in the branches.
- Do not wear loose-fitting clothing around a chipper.
- Use earplugs, safety glasses, hard hats, and gloves.
- Workers should be trained on the safe operation of chipper machines. Always supervise new workers using a chipper to ensure that they work safely and never endanger themselves or others.
- Prevent detached trailer chippers from rolling or sliding on slopes by chocking the trailer wheels.
- Maintain a safe distance (i.e., two tree or log lengths) between chipper operations and other work/workers.
- Be aware of the direction of the material discharge and keep out of its path.
- When servicing and/or maintaining chipping equipment ("unjamming") use a lockout/tagout system to ensure that the equipment is de-energized.

Additional Discussion Notes To learn more about Lockout/Tagout systems, attend CIRMA's Lockout/Tagout Workshop.

Remember

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Chain Saws

Instructor Note: Review Municipal policy on always wearing a hard hat, ear plugs, safety glasses or goggles, leg protection, and safety shoes when using a chain saw.

Chainsaws are often used by municipal workers to trim trees or remove fallen trees and limbs after a storm. Chain saws are a specialty tool that have their own special hazards. Before you use, review the guidelines below:

Guide for Discussion

Before Operations

- Always review operator instructions before you use a chain saw.
- Wear snug fitting clothing; don't wear jewelry.
- Use proper Personal Protective Equipment (PPE, including chaps.
- Be sure to wear earplugs especially if you plan to cut for a long period of time.
- Always check for defects in the saw. Replace all defective parts before operating the tool.
- Don't use a saw with a dull chain.
- Check the item to be cut for nails, wire, and any other imbedded metal items.
- Before cutting, plan a path of retreat.
- Make sure chain saw is sharp and lubricating reservoir is full.
- Start saw 10 feet from refueling area.
- Start chain saw on ground on a firm support. Don't drop start it.

During Cutting

- When cutting, keep the saw away from your body.
- Never cut anything directly overhead.
- Be wary of materials to be cut that may be under tension.
- Be careful to avoid pinching the blade or guide bar.
- As the material begins to fall, turn off the saw and move away quickly.
- Watch for a rebound.
- Carry the saw only when it is shut off or chainbrake is on.

After Cutting

- Allow the saw to cool before refueling.
- Don't operate the saw near your refueling area.
- Check the operator instructions for any special after-operations maintenance instructions.

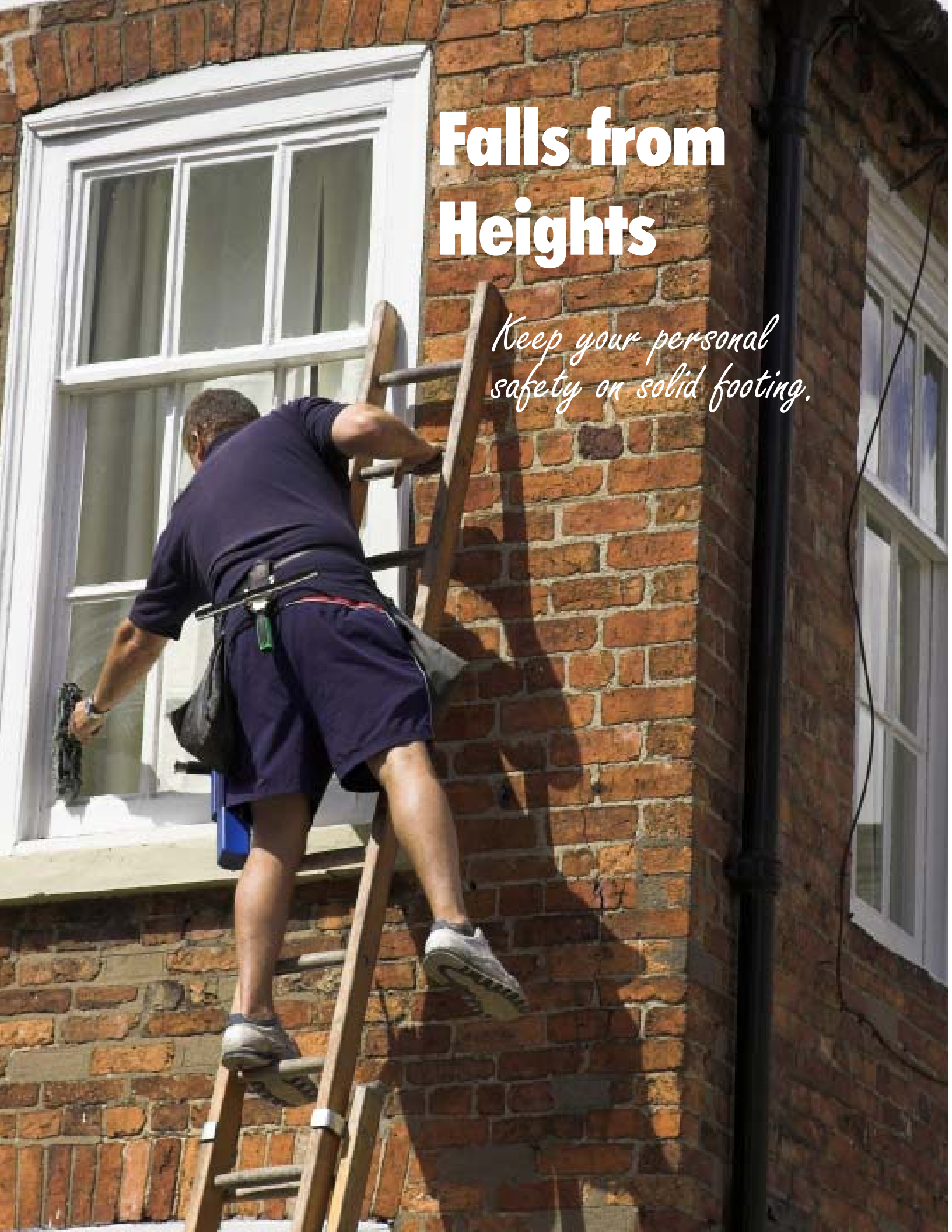
Additional Discussion Notes

Remember Chain saws are a dangerous tool and can seriously injure a worker when improperly used. Use common sense and the basic rules we discussed for their safe operation.

Attendees _____

Falls from Heights

Keep your personal safety on solid footing.



Falls from Heights

Falls from heights, whether elevated or not, are the most common cause of construction-site fatalities. According to OSHA, between 150 and 200 workers die and more than 100,000 are injured each year from falls at construction sites. The risk of working five stories above ground is obvious; but most fall injuries occur from falls of five feet or so. Care is required at all heights.

Guide for Discussion

Working high off the ground does not have to involve unacceptably high risks, however. Control measures include:

- Work from the ground, if possible.
- Use an existing safe place to work.
- Using work equipment to prevent falls.
- Reduce distance and consequences of a fall.
- Make sure you are fully trained on the use of equipment.

Following these rules will help prevent the most common falls from heights.

Ladders:

- Use correct ladder for the job.
- Set them on level ground and tie them off at the top (for security).
- Do not over reach.
- Do not over extend yourself on the ladder.
- Always face the ladder and try to use both hands when climbing.

Floor Openings:

- Floor openings should be properly covered.
- Covers must be able to support walls the same as the floor.
- Covers should be firmly attached to the floor/walking/working surface.
- Covers should be marked as such. For example: "Cover," or "Do Not Remove Floor Opening Cover."

Consider wall openings and uncompleted stairways as openings:

Stairways:

- Use handrails.
- Watch where you step.
- Keep your view clear.
- Concentrate on the stairs.
- Do not run up or down the stairs.
- Keep stairwell clean.

Housekeeping:

- Always try to provide good footing.
- Keep tools, trash, scrap materials out of walkways.
- Clean as you go.
- Always be wary of oil, ice, or snow.

Additional Discussion Notes Wear appropriate footwear (including auxiliary footwear such as corks) when necessary to prevent slips and preserve your balance.

Remember Paying attention to things around you such as ladders, floor openings, stairways and good housekeeping will help prevent a fall.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Ladder Training & Precautions

Ladders are a deceptively simple tool. *Deceptive* because they are so simple and familiar, it is easy to overlook the care and understanding required for their safe use. Many employees only occasionally use a ladder, and they and their managers may not recognize how serious the risk is. CONN-OSHA requires all employees to be trained by a Competent Person to recognize the hazards related to ladders. *Competent* means someone who through training and/or experience understands both the standard relating to ladder safety and how to use them.

Guide for Discussion

General precautions:

- Properly assess the job to determine what equipment should be used. Ladders are often used for tasks which could be done more safely and more quickly from equipment such as a cherry picker or a scaffold.
- Only use ladders for low risk, short duration tasks or where the existing features of the site cannot be altered.
- If a ladder is to be used make sure that it is secure and cannot slip. Tie it at the top, have someone hold it at the base, or use a suitable stability device to prevent it from slipping.
- If the ladder is more than 15 feet tall, a person at the base is unlikely to be able to stop it from slipping.
- Place the ladder on a firm, stable surface which is of suitable strength to keep the rungs horizontal.
- Consider using attachments such as an adjustable ladder leveller, or a 'stand' spreader bar.
- Set the ladder at the correct angle. It should be angled out one measure for every 4 up (75 degrees).
- Use a ladder that is, or can be, extended to the correct length—don't work from the top three rungs of the ladder. Make sure the ladder protrudes sufficiently above the place of landing to which it provides access—3 rungs or 3 feet should be enough.
- Check the ladder for defects, and make sure that it is only used by people who know how to use it correctly.

Employees should be trained by a competent person in the following areas:

- Nature of fall hazards in the work area;
- Correct procedures for erecting, maintaining, and disassembling the fall protection systems to be used;
- Proper construction, use, placement and care in handling of all stairways and ladders; and
- Maximum intended load-carrying capacities of ladders used.

Employers must retrain each employee as necessary to maintain their understanding and knowledge on the safe use and construction of ladders and stairs.

Additional Discussion Notes The Competent Person for ladder training in the department/ municipality is _____.

Remember

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Ladders

Injuries in the workplace because of ladders are common; about a third of all reported falls are from them. Many of the fall-related injuries result from the improper use of or a defective ladder. Step/extension ladders are made to access/egress upper levels, not to be used as work platforms. There are specifically designed ladders for use as work platforms. These ladders are constructed with a small platform and guardrail. The following safe work rules should be observed when working with all ladders.

Guide for Discussion

Inspection

- Look for missing or loose cleats at the bottom.
- Look for loose or missing screws, bolts or nails on job made ladders
- Look for cracked, broken, split, dented or badly worn rungs, cleats or side rails.
- Look for splinters on wood ladders.
- Look for corrosion on metal ladders.

Ladder Positioning

- Don't set your ladder in a walkway or door opening.
- Keep the area at the top and bottom of the ladder clear of tool cords, tools, material and garbage.
- Always set the ladder on solid footing.
- Use a twenty-five percent (25%) angle on the slope of the ladder.
- When using extension ladders, the top 3 rungs must extend beyond the landing. (Or the top of an extension ladder must be 3 feet above the landing.

Ladder Use

- Always use the right ladder for the right job.
- Don't lean to the side when on a ladder or you may tip over.
- Do not carry tools or materials on a ladder. Use both hands when climbing a ladder to grab onto the side rails. If it is necessary to move material or tools up a ladder, first climb up, then pull up the materials with a hand line.
- Only one person on a ladder at a time (unless the ladder is double cleated).
- Always secure the top of the ladder to prevent it from sliding.
- Never lean a step ladder; always fully open a step ladder.
- Always face the ladder.
- Keep 3 points in contact with the ladder; this means both feet and one hand in contact with the ladder or stepladder

Additional Discussion Notes Always tie off the ladder. That way it stays where you put it.

Remember When you are on a ladder, you can fall. And if you can fall, you can get hurt. Use ladders safely.

Attendees _____

Openings in Floors/Ground

Injuries in the workplace because of holes in walking and working surfaces are commonplace. Failures to provide guardrails for platforms or open floors is one of the most frequently cited OSHA violation. Slips, trips, and even falls from one level to the next can be as painful as a fall from a roof. The following items should be considered when dealing with opening in floors or other surfaces.

Guide for Discussion

Hazard Identification: Floor Openings (2 x 2 inch minimum at any depth)

- Temporary openings.
- Plumbing.
- Ventilation.
- Skylight wells.
- Manholes.
- Holes in Ground (Trenches and Excavations).
- Wall/Window openings.
- Temporary guardrail system.

Ladder Use

- Methods of Protection.
- Use of standard guardrails.
- Use of covers.
- Able to support four times the intended load.
- Nail down.
- Mark with "Cover."

Additional Discussion Notes Floor Openings—Types in Need of Guarding

- Ladder-way floor openings.
- Hatchways and chutes.

Remember When you create a safety hazard, you need to protect others against the hazard. The surest method is to fix the problem right when you create the problem.

Guardrail systems must be able to withstand a 200 pound load applied horizontally and vertically. All floor covers must be able to support at least twice the intended load and installed to prevent accidental shifting. Floor coverings should be so marked in a bright colored paint to communicate the danger.

Attendees _____

Guardrails

One of the more common OSHA citations is for lack of or improperly erected guardrails. There are two basic types of guardrails—the perimeter guardrail (i.e., found on flat roofs, upper stories before framing walls) and floor-opening guardrails. Both are constructed the same way and are designed to provide the same type of protection.

Guide for Discussion

The following items should be reviewed when discussing guardrails:

When are they required?

- On all open-sided floors or floor openings that expose workers to a fall of 4 feet or more.

Standard Specifications

- The top rail should be 42 inches high and constructed of 2 x 4 inch stock wood.
- The intermediate (or mid rail) should be 2 inch (also using 2 x 4 inch).
- The bottom rail or toeboard should be at least 4 inch in vertical height from the floor to the top of the toeboard.
- Uprights will be 2 x 4 inches at foot centers, at a minimum.
- All components must withstand a load test of 200 pounds at any point.

General Rules

- Install guardrails properly the first time and reduce the amount of maintenance.
- Install as you go—don't wait.
- Regularly inspect all rails.

Additional Discussion Notes

Window and Door Openings.

- Interior stairwells requiring hand rails.
- Anyone repairing a guardrail at elevated heights should be wearing their Personal Fall Arrest System (PFAS) and be tied off to an anchor point.
- Enforce replacement by subcontractors when they remove them.

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

Attendees _____

Ramps and Runways

Ramps and runways are part of almost every jobsite or work zone. However, many ramps and runways are not properly constructed or maintained, resulting in a job site hazard to anyone on the site.

Guide for Discussion

General rules for ramps and runways:

- Keep them free from job junk (debris).
- Provide suitable traction.
- Consider standard guardrails (with or without toeboard) on both sides to prevent falls.
- Ramps with a minimum width of 18 inches may have only one guardrail.
- Never exceed a twelve foot span (maximum) without bracing.
- All walkways used in lieu of stairs must have cleats.
- Give plenty of clearance when workers are carrying or pushing materials.
- Don't overload with people or materials.
- Keep all loads moving. Don't stop on a ramp or runway with a load.
- Never work under a ramp or runway; the load may wind up on you.

Dangerous ramps and runways are:

- Not wide enough.
- Not properly supported or nailed.
- Too steep an incline.
- No cleats.
- Bad spots or uneven walkways.

Additional Discussion Notes

- When are guardrails mandatory?
- Other danger condition.

Remember It makes good sense to erect safe and accessible ramps and runways. A failure to do so is just like setting up booby traps throughout the jobsite.

Attendees _____

Full Body Harness/Lifelines

A full body harness, a connector (for example, a self-retracting lanyard), lifelines and anchors are all part of a Personal Fall Arrest System (or PFAS). PFAS are generally required for working 10 feet above the ground or higher. Falls account for over a quarter of all construction injuries. Unfortunately, some workers don't want to take the time to put their PFAS on, or worse, feel they don't need the equipment. We are sure that every person who was injured or died from a fall would have gladly worn their PFAS if they had only known they were about to fall.

Guide for Discussion

General rules for ramps and runways:

- Inspect the equipment (harness, hardware, connector, and lifeline) before use.
- Never use equipment, which is not in good condition.
- Use only rated equipment. Remember, the PFAS must withstand 5,000 pounds of dead load.
- Always secure lanyards to a suitable anchor, above your work area if possible.
- Don't modify by mixing any of the safety equipment.
- Never allow acids, caustics or other corrosive materials to come into contact with any of the equipment.
- Store your equipment in a dry place.
- Replace damaged equipment; remove it from service as soon as possible.
- Use the equipment required.

Additional Discussion Notes

Remember Don't allow yourself to be lulled into a false sense of security. Always provide yourself with some fall protection. Regularly wear your PFAS and keep it attached to a lifeline. The life you save may be yours.

Attendees _____

Aerial Lifts

Many municipalities use aerial lifts for maintenance work. Aerial lifts include boom-supported aerial platforms, such as cherry pickers or bucket trucks. The major causes of fatalities are from electrocutions, falls, and collapses or tip overs. Training for use of a lift must be performed by a OSHA qualified person. All too frequently operators of a lift lack the training to know that they are creating a safety hazard.

Guide for Discussion

General use

- Always close lift platform chains or doors.
- Stand on the floor of the bucket or lift platform. Do not climb on or lean over guardrails.
- Ensure that workers who operate aerial lifts are properly trained in the safe use of the equipment.
- Maintain and operate elevating work platforms in accordance with the manufacturer's instructions.
- Never override hydraulic, mechanical, or electrical safety devices.
- Never move the equipment with workers on the elevated platform unless this is permitted by the manufacturer.
- Do not allow workers to position themselves between overhead hazards, such as joists and beams, and the rails of the basket. Movement of the lift could crush the worker(s).
- Maintain a minimum clearance of at least 10 feet, or 3 meters, away from the nearest overhead lines.
- Always treat power lines, wires and other conductors as energized, even if they are down or appear to be insulated.
- Use a body harness or restraining belt with a lanyard attached to the boom or basket to prevent the worker(s) from being ejected or pulled from the basket.
- Set the brakes, and use wheel chocks when on an incline.
- Use outriggers, if provided.
- Do not exceed the load limits of the equipment. Allow for the combined weight of the worker, tools, and materials.

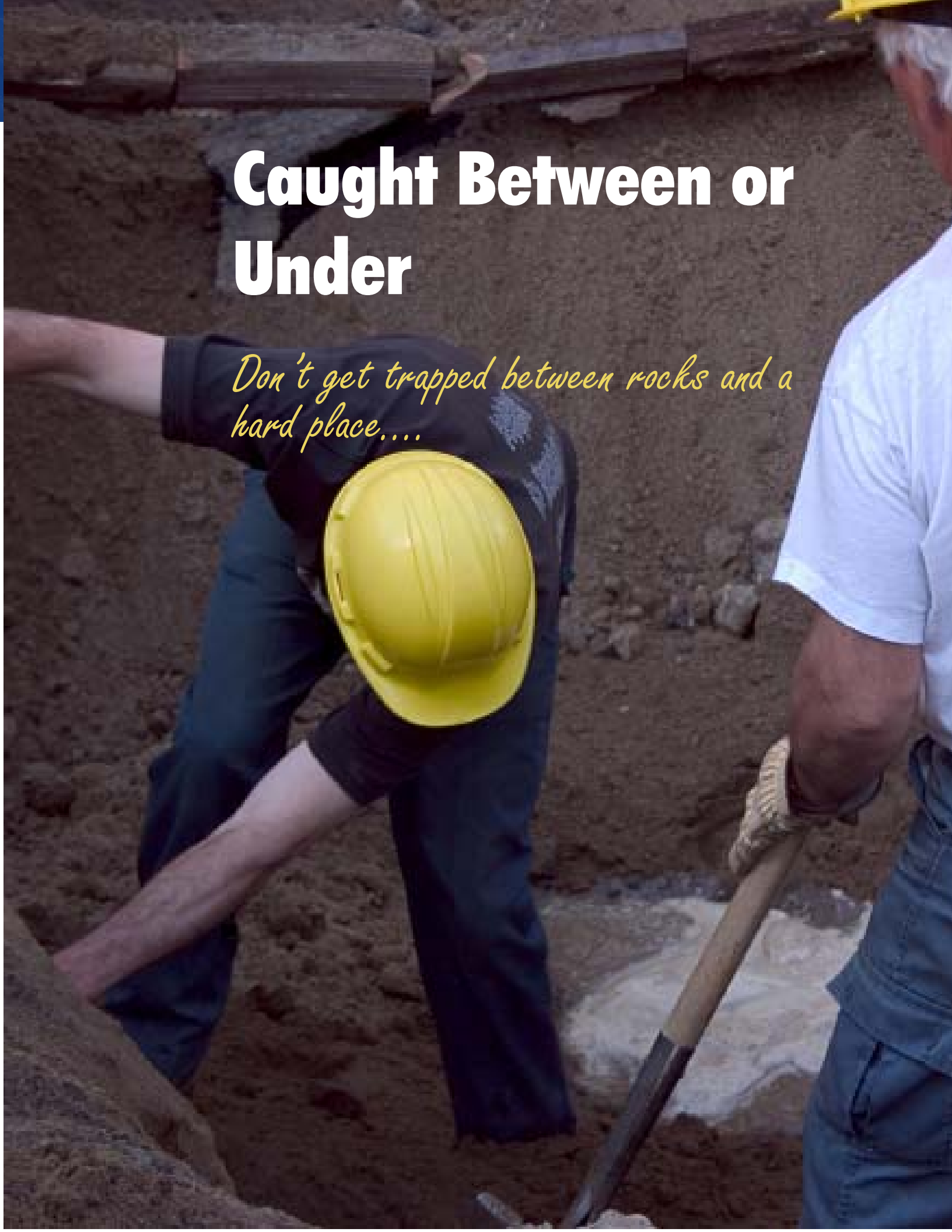
Additional Discussion Notes

Remember

Attendees _____

Caught Between or Under

Don't get trapped between rocks and a hard place....



Excavations

A cave-in is the greatest risk associated with excavation. Cave-ins and slough-offs are a major cause of deaths in construction sites 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. Other hazards include asphyxiation due to lack of oxygen, inhalation of toxic materials, fire, or drowning. A Competent Person must be involved in planning and operating a safe excavation.

Guide for Discussion

Before Excavation Review

- Where underground utilities are located? (Checked with local utility companies.)
- Presence of overhead hazards (i.e., falling rock, soil, or other materials or equipment)?
- Will there be any heavy equipment operating in or near the excavation?
- Estimated depth required for the excavation?
- How many people will work inside the excavation?
- Is there an escape plan for those inside the excavation to cover a possible cave-in or slide?
- Has there been a soil analysis? This will help determine the type of shoring to provide or the angle of repose needed.
- Moving machinery near the edge of the excavation can collapse the wall.

Steps to Take to Provide a Safe Excavating Operation

- Always shore or cut back the opening adequately.
- Any opening with a depth of 5 feet or more requires shoring or be cut back.
- Never store excavated or other materials closer than 2 feet from the edge of the excavation.
- Inspect the excavation daily. This must be done by a Competent Person.
- Access ladders must be provided every 25 foot in excavations of 4 feet or more in depth.
- Review escape procedures with all personnel who may have cause to be in the excavation.

Additional Discussion Notes

- Possible gas accumulation in the excavation?
- Barriers, guardrails or other safety warnings in excavation area?
- Who is the Competent Person in the department? _____

Attend CIRMA's Trenching and Excavation Safety Workshop for more in depth training on this topic.

Remember Unlike many accidents, the cave-in of an excavation usually can be predicted if closely watched. It is, therefore, critical that a Competent Person keeps a close eye on any excavation. Everyone should be removed from the excavation area should it appear to be unstable.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Excavations: Additional Discussion Points

Instructor Note: Review the additional discussion points for specific application to the job at hand. For example, let the crew know who is the Competent Person. Explain what the Competent Person is required to do (see below). This reinforces the training and is a further sign of your commitment to have a safe and healthy workplace. Remind employees that the Competent Person has authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work.

Guide for Discussion

The designated Competent Person must inspect the site daily. This includes both excavation and the surrounding area. Inspection points include, but are not limited to:

- Possible cave-ins.
- Failure of protective systems and equipment.
- Hazardous atmosphere.
- Other hazardous conditions (i.e., following rain or man-made condition such as blasting).

Other general requirements:

- Adequate protection must be provided against falling objects such as dirt, rock, equipment or other materials for workers. A warning system should be used to alert equipment operators of the edge of an excavation.
- Employees exposed to public vehicle movement must wear warning vests. An alternative is suitable garment made of reflectorized or high-visibility material.
- A guardrail system is recommended especially if there are walkways or bridges crossing over an excavation. (See ramps and runways for additional information.) During excavation operations, special care must be taken to insure no employee is under a load handled by digging or lifting equipment.
- Employees should not be permitted to work in excavations where water has accumulated without adequate precautions. Adequate precautions include but are not limited to: Diversion dikes, ditcher or other means to prevent surface water from entering an excavation and to provide drainage to nearby areas.
- While an excavation is open, underground installations such as utilities must be protected, supported or removed as necessary to safeguard excavation workers. Adjacent structures must be supported to prevent possible collapse.
- Employees should not enter an excavation greater than 4 feet in depth without a Competent Person testing the atmosphere. Testing takes place where oxygen deficiency or a hazardous atmosphere exists or is believed to exist.
- Emergency rescue equipment must be readily available. This equipment must be attended when hazardous atmospheric conditions may develop or exist.

Additional Discussion Notes The designated Competent Person is _____. Attend CIRMA's Trenching & Excavation Safety Workshop for more in depth training.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Trenching

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

Guide for Discussion

Pre-operations:

- Locate all underground utilities.
- Determine, if possible, soil conditions.
- Determine if there is an overhead exposure.
- Based on the depth of the trench, determine the amount of shoring needed or angle of repose.
- Determine the number of access ladders needed.
- Estimate the number of workers who will be working in the trench and the amount of roof needed to perform the task.
- Appoint a "top man"; someone who will monitor the trenching operations.
- Review rescue techniques with all workers.

Trenching Operations

- Always maintain a "top man."
- Continually monitor the soil conditions.
- Shore or slope any trench with a depth in excess of 4 feet.
- All shore or stored materials must be kept at least 2 feet away from the edge of the trench. (Same with spoil, the dirt removed from the excavation.)
- Keep all unnecessary use of equipment away from the open trench.
- Devise and practice escape routes.
- Place access ladders every 25 feet.
- Never allow personnel in trenches where there is a likelihood of a cave-in or slough-off.

Additional Discussion Notes CONN-OSHA requires a designated Competent Person to be on site for trenching operations. The competent person should have training, experience, and knowledge of soil analysis; use of protective systems; and requirements. He or she should have and be able to detect conditions that could result in cave-ins, failures in protective systems, hazardous atmospheres, and other hazards, including those associated with confined spaces. The designated Competent Person also has authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

The Competent Person in the municipality/department is _____.

Remember A safe and successful trenching operation is the result of carefully following several safety techniques and no short cuts. One key is to shore or properly slope all trenches. That knowledge comes from training and supervision.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Dangers Overhead

Using mechanical means to lift loads to the working area saves time and prevents lifting injuries. But there are still hazards. If it takes a piece of equipment to lift materials, then you can be sure that if the load falls, it may seriously injure or kill you. Always be aware of overhead operations and remember basic safety rules.

Guide for Discussion

- Always be sure loads are carried close to the ground.
- Use tag lines on loads whenever possible.
- Use only one signal person.
- Be sure the signal person can clearly observe the load and operator at all times.
- Never hoist a load over other workers; keep the hoist area clear.
- Be sure loads are properly rigged.
- Make sure the hoisting and rigging equipment is in good workable condition.
- Hoisting speed should never proceed too fast as to risk losing control of the load.
- Monitor weather conditions, especially during winds.

Additional Discussion Notes During excavation operations, special care must be taken to insure no employee is under a load handled by digging or lifting equipment.

Remember

Attendees _____

Working in Confined Spaces

Working in a confined space is a unique and serious hazard. There is no partial problem: either there is or isn't one. By one definition, a confined space is one that is large enough and arranged so that an employee can fully enter and work, has limited or restricted entry or exit, and which is not primarily designed for human occupancy.

Guide for Discussion

Primary Hazards:

- Oxygen deficiency.
- Exposure to toxic substances.
- Presence of combustible or explosive gases or materials.

Safety Procedures:

- Test for oxygen deficiency.
- Sample for combustible gases. (Most combustible gas meters will not work in oxygen deficient atmospheres.)
- Continually monitor for toxic substances (i.e., gases) as work progresses.

Making a Confined Space Workable:

- If space cannot be vented, be sure to provide proper respiration equipment.
- If space can be vented, continually flush out the space with fresh air.
- Be aware that spark producing equipment should never be used to flush out confined spaces.

Basic Rescue Procedures:

- Never rush to the aid of a fellow employee in a confined space.
- Always be sure that someone watches work in a confined space outside of the space.
- All workers in a confined space must work with a lifeline attached outside of the space.
- All rescuers must be competent in the use of rescue equipment and self-contained breathing units.

Additional Discussion Notes Attend CIRMA's *Confined Space Entry* Workshop to learn more about this topic.

Remember Confined spaces need not be dangerous places to work if the basic precautions are routinely followed. Remember that it is a rare circumstance that a single fatality occurs in a confined space; usually there are multiple fatalities.

Attendees _____

Heavy Equipment

Heavy equipment is designed to handle very large volumes or heavy loads. Therefore, these are powerful machines that are dangerous to everyone around them if they are not operated correctly. It is important to remember the proper methods used to move them from one site to another, and how to work around their operation.

Guide for Discussion

General Rules When Heavy Equipment Is Nearby

- Always remain alert to the equipment moving around you.
- Do not get near moving equipment unless necessary.
- Never ride on equipment unless it has been designed to carry you. This means it must have a seat and a seat belt.
- Do not walk along beside equipment. If it is necessary to travel with a piece of equipment, walk in front or behind it.
- Try to stay in view of the operator. You must remain in view of the operator when working in an excavation or trenching if you are the "top man."

Rules For Transporting Heavy Equipment

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

Additional Discussion Notes What does your department do to further protect the general public? For example, use a flag man or barricade the work area.

Remember A little mistake with heavy equipment can easily become a major accident that causes severe injury or even death.

Attendees _____

Heavy Equipment Hazards

The use of heavy equipment in a work zone is necessary to the overall success of many projects. However, unauthorized or unwise use of heavy equipment can result in personal injury, loss of life, or property damage. Today we will discuss some key points to keep in mind when working around heavy equipment.

Guide for Discussion

Workers

- Always be alert to the position of the equipment around you.
- Only authorized personnel are allowed to operate the equipment.
- Never ride the equipment unless it is designed for it.
- Always keep away from suspended loads.
- When working as a signal person, be aware of all overhead power lines. Keep crane booms at least 10 feet from all power lines.
- Never take naps, breaks or lunch around heavy equipment.

Equipment Operators

- Be sure that all moveable equipment is either accompanied by a signal person, or has an operational back-up alarm.
- 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.
- Always lock out the equipment before it is to be lubricated, adjusted or repaired.
- Always replace gears, belts, or any other guards after repair, or adjustment.
- Always secure and lock out equipment upon completion of use.
- Be sure to protect the glass areas of cabs with either metal grates or wood covers.

Additional Discussion Notes Who are the authorized equipment operators in the department?

Remember The best policy around heavy equipment is to take no chances. Be aware of what is going on around you—both workers and equipment operators.

Attendees _____

Working Around Cranes

A crane is one of the most versatile and important pieces of equipment found on a construction job. It can be used to accomplish a lot of otherwise heavy lifting tasks. However, it can also be one the most dangerous since it can lift heavy loads over large areas of a project. Today we will discuss some of the important safety points about working around cranes.

Guide for Discussion

- Always be aware of the swing radius of the crane.
- Cranes are to be operated only by qualified and trained personnel.
- A designated Competent Person must inspect the crane and all crane controls before use.
- Be sure the crane is on a firm/stable surface and level.
- During assembly/disassembly do not unlock or remove pins unless sections are blocked and secure (stable).
- Fully extend outriggers and barricade accessible areas inside the crane's swing radius.
- Watch for overhead electric power lines and maintain at least a 10-foot safe working clearance from the lines.
- Inspect all rigging prior to use; do not wrap hoist lines around the load.
- Be sure to use the correct load chart for the crane's current configuration and setup, the load weight and lift path.
- Do not exceed the load chart capacity while making lifts.
- Raise load a few inches; hold, verify capacity/balance, and test brake system before delivering load.
- Do not move loads over workers.
- Be sure to follow signals and manufacturer instructions while operating cranes.
- Never walk within the swing radius of the crane.
- Never work under suspended loads, the crane boom could fail.
- Never ride the hook. There are too many things that can go wrong you can't control.
- Always wear a hard hat when there is a possibility of a load being overhead.
- Stay off of and away from the crane unless you are assigned to be on the crane.
- Never walk under a boom, especially if it has a load on it.

Additional Discussion Notes

Remember When working around a crane, the crane operator is going to be watching his load or the signal person and not for stray workers. Never enter the swing radius of a crane unless it is absolutely necessary. Never work within the swing radius. Hard hats are required.

Attendees _____

Tandem Dump Trucks - Piston Failures

CIRMA has been alerted to a serious safety and accident hazard involving the failures of the dump piston assembly on tandem dump trucks, which are used often to stockpile sand for road treatment or during road work. In one instance the broken piston crashed through the roof of the truck cab, narrowly missing the truck operator. In two other incidences, the sudden failure of the piston caused dump body to slam down, endangering the lives of the operators and nearby workers. One truck actually rolled onto its side from the sudden shock of the snapping piston. Failures occurred when the trucks were in motion and while stationary.

Guide for Discussion

Given the potential for serious or fatal injuries in these cases, always follow manufacturer recommendations on truck maintenance, load capacity, and how the load should be dumped.

Please follow these additional recommendations when operating the dump body:

- The driver should always wear a seatbelt while inside the truck cab.
- Visually inspect the dump piston before each use. If the piston is leaking, scored or cracked, take the truck out of service until it can be inspected by a qualified mechanic and repaired if needed.
- Release the tailgate before the dump body is raised.
- Dump material on level ground and use heavy machinery such as bulldozers or bucket loaders to stockpile the material.
- If a bulldozer or bucket loader is not available, make sure the truck is completely stopped before dumping the load.
- The operator should never get under a raised dump body.
- Always keep the loading area free of debris and unnecessary tools.

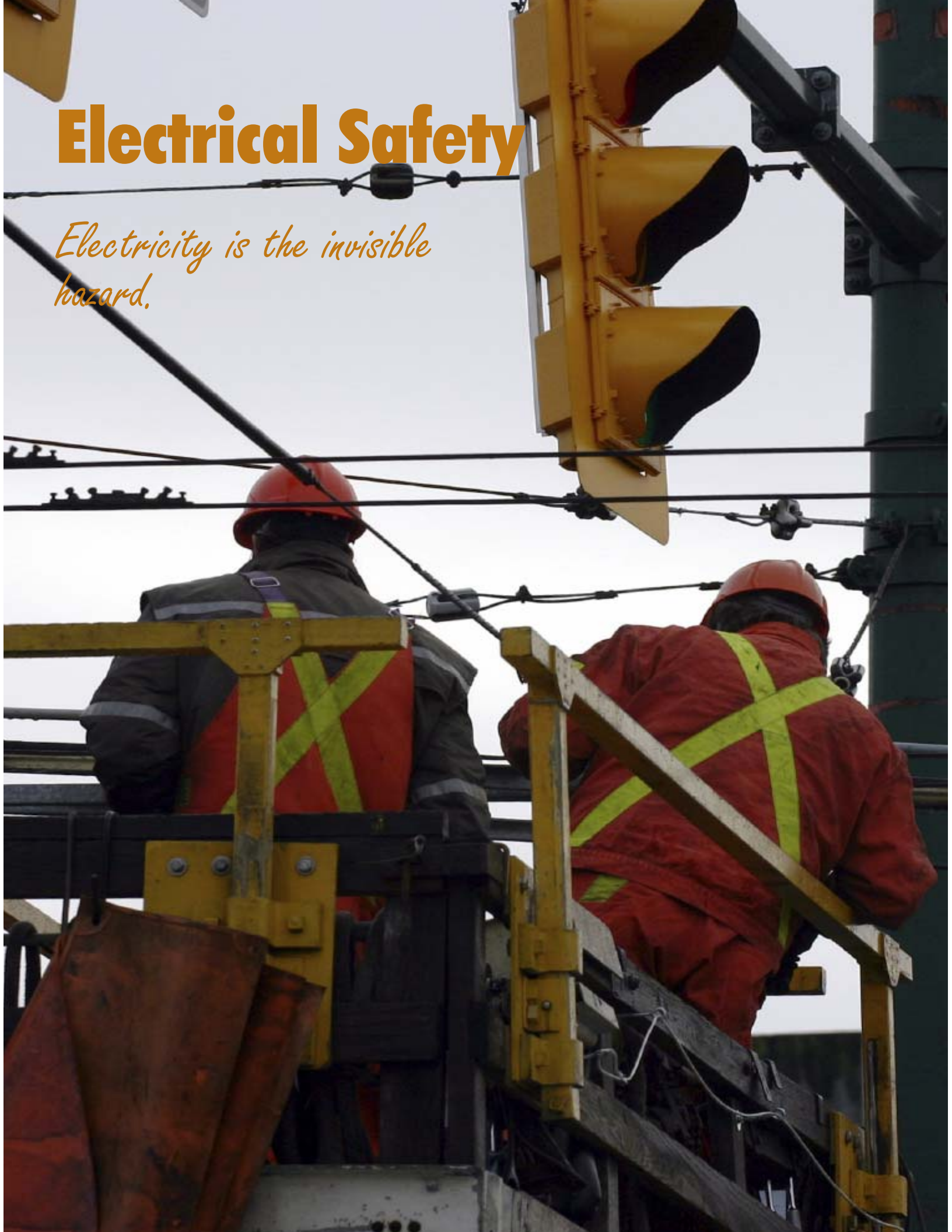
Additional Discussion Notes Although the damage to the truck from the broken piston is severe, the primary concern is the safety of the truck operators and nearby workers.

Remember

Attendees _____

Electrical Safety

Electricity is the invisible hazard.



Electrical Hazards

Electricity is doubly hazardous. Not only is there a chance of electrocution, but there is also the possibility that an electric shock will cause a loss of consciousness that will cause a fall. Today we will discuss how electric shocks happen and ways to avoid them.

Guide for Discussion

Methods of Receiving an Electric Shock

- From a defective power tool.
- From defective extension cords.
- From overloading a switch or overriding a by-pass.
- By not grounding electrical equipment.
- By coming in close contact with live electric lines.
- By coming too close to high power lines with the power arcing over and making contact.

Ways to Avoid Electric Hazards

- Use insulated tools.
- Always inspect tools and equipment for frayed cords, defective plugs, missing prongs, and cracked tool casings before using them. Attach a warning tag to the tool and do not use.
- Never use a power tool that has had the ground plug removed; inspect the plug.
- Always use Ground Fault Interrupters (GFIs) when operating within 6 feet of a water source or in an area likely to become wet.
- Never stand in water and operate a power tool without proper (i.e., insulated) footwear.
- Keep extension cords out of water when in use.
- Consider all power lines “live” and avoid contact.
- Follow the Municipal Assured Grounding Protection program.
- Disconnect all electrical tools and cords when not in use.
- Be sure all temporary lighting is equipped with bulb covers.
- Make sure all power supplies, circuit boxes and breaker boxes are properly marked to indicate their purpose.
- Use Ground Fault Interrupters (GFIs) on all job sites. Test them frequently to ensure that they are working.
- Follow lockout/tagout procedures.
- Wear proper PPE for electrical work.

Additional Discussion Notes Who is responsible for the grounding program or to install a Ground Fault Interrupter system? Attend CIRMA’s *Lockout/Tagout* Workshop to learn more about this procedure.

Remember The best way to eliminate the hazard of the “quiet killer” is to act as if each exposure to an electrical hazard may be your last. Never take electricity for granted, “it’s a killer.”

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Assured Grounding Program

CONN-OSHA standard 1910.304 (f) (4), Electrical Wiring Design and Protection Grounding Path, is one of the most frequently cited standards in Connecticut. It states that the path to ground from circuits, equipment, and enclosures shall be permanent and continuous. The standards require that a project use either Ground Fault Circuit Interrupters (GFI's) or an Assured Grounding Program is in place. GFI'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. Remember: Always use Ground Fault Interrupters (GFI's) when operating within 6 feet of a water source or in an area likely to become wet.

Guide for Discussion

Program Components

- Have the written policy on file. Our policy is located _____.
- Have a competent person conduct all tests. Our competent person(s) are: _____.
- Test all electrical equipment for proper grounding.
- Remove any defective equipment from use and tag it to prevent future use.
- Color code all equipment tested to ensure complete test result.
- We use the following colors —
- A color chart is located _____.

Tests

- Test for the continuity of the grounding conductor.
- Test before the equipment is first used; after any repair; after any possible damage and a minimum quarterly (i.e., every three months).

Inspections

- Visually daily for defects before use.
- Inspect the following types of equipment:
- Power Tools, Extension Cords and Temporary Receptacle Boxes

Additional Discussion Notes Three-prong grounding testers to check extension cord continuity are located where _____?

Remember The use of an Assured Grounding Program is not only required, but it is good common sense. Taking every precaution to reduce our exposure to this hazard makes sense.

Attendees _____

Power Lines and Mobile Cranes

Instructor Note: Power companies get very concerned when a crane (or dump truck bed or other piece of heavy equipment) gets close to or touches a power line. They also will notify OSHA, who will visit the site.

Introduction: It is not uncommon to work around power lines; however, the potential hazards to workers are enormous; workers must use extreme caution.

Guide for Discussion

How to Avoid Electrocutation

- Locate all power supplies. Besides this being the state law, it's smart.
- Have the power company inform you of the voltage and arc distances.
- Shut off or insulate the power line(s) if possible.
- Never allow a piece of equipment to break the safety zone (the distance required to avoid electric arc.)

General Rules to Remember

- Designate a competent lead signal person.
- Communicate clearly with all members of the work crew.
- Have all crewmembers watch the operation.
- Be alert.
- Watch for non-alert crew members.

Additional Discussion Notes

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

Attendees _____

Preventing Electrical System Problems

Introduction: Premature equipment failure and electrical fires can be prevented by keeping electrical equipment *clean, cool, dry*, and their connections *tight*. The chance of an electrical fire is greatly lowered by practicing good housekeeping in areas around the service panel, in electrical equipment rooms, and in electrical enclosures. Most electrical fires can be traced to overheated circuits or overloaded equipment, which causes insulation to melt or burn, then expose live wires. Electrical fires can also occur when equipment is driven beyond capacity, when accumulated oil and dirt overheat a motor, or when sparks ignite scraps, dirt, dust, or flammable liquids.

Guide for Discussion

Keep area clean

- Electrical apparatus and equipment rooms should be free of excessive dust, dirt, and corrosive gasses.
- Don't use electrical equipment rooms for storage.
- Limit access to authorized operations and maintenance personnel.
- Make sure space is well lit to ensure equipment is visible and can be properly operated.

Keep area cool. All electrical equipment produces heat during operation.

- Prevent excessive heat buildup in electrical apparatus enclosures and equipment room. Exceeding specified temperatures could be a fire hazard, and can also shorten the life of the equipment.
- Keep ventilation openings clean and free of obstruction.
- Change or clean any air filters according to the manufacturers' recommendations.

Keep area dry.

- Keep equipment rooms dry and protect equipment from moisture. Continued exposure to moisture or direct contact can cause equipment to fail or shorten its life.
- Check equipment for moisture contamination. If found, examine equipment for damage and get necessary repairs made. Identify and eliminate the source or moisture.

Keep connections tight.

- Loose connections are the most common source of electrical equipment failure.
- Consider using an infrared imaging survey to identify loose connections.
- Follow any applicable manufacturer's instructions for tightening.

Additional Discussion Notes Using electrical equipment rooms for storage can cause property damage and may create liability.

Remember Any maintenance or repairs of your electrical system should only be performed by fully qualified personnel or an electrical contractor.

Attendees _____

Information provided by the Hartford Steam Boiler Inspection & Insurance Company.

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Fire Protection

*Remember:
Pull the pin,
Aim at base of flames,
Squeeze the trigger, and
Sweep the spray back
and forth.*



Fire Protection & Control

Most on-the-job fires are a result of inattention to the job-site operations and surrounding conditions. A momentary distraction can result in the loss of life and property. Most fires can be easily extinguished if caught soon enough and the proper extinguishing tools are handy.

Buildings undergoing construction or renovations are more susceptible to fire and at greater risk to its effects. A wide variety of ignition sources in work zones increase the possibility of a fire. Concentrations of combustible materials, incomplete compartmentation or other passive systems, and unfinished fire protection systems can allow a fire to spread unstopped. This places workers in the construction area and the emergency responders who respond to the fire at greater risk.

Guide for Discussion

Steps to Remember When a Fire Starts:

- Sound an alarm—yell if necessary.
- Warn those near the fire.
- If possible and the fire is small, try to extinguish it.
- Call the Fire Department if the fire can't be easily and quickly extinguished.
- Evacuate the area if the fire can't be quickly extinguished.
- Direct the Fire Department to the area of the fire.
- Stand by to help, but only if asked by a Fire Department official.

Be Sure to Know the Following:

- The Fire Department phone number.
- Be sure you know the location of the nearest cross street to give the Fire Department directions.
- Where the fire extinguishers are and how to use them.
- How to evacuate the work area.

Steps to Prevent Fires

- Regularly inspect all fire extinguishers.
- Keep the work area free of debris and trash.
- Designate high risk areas as "no smoking" areas. Enforce no smoking rules.
- Store flammable fuels and materials only in approved safety containers.
- Check temporary wiring and electrical tools for defects.¹

Additional Discussion Notes The emergency numbers and job site location (including nearest cross streets) are posted where on the job? If welding equipment is on the job, when is it regularly inspected?

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

Attendees _____

¹ Information from the Society of Fire Protection Engineers

Fire Extinguishers

Sometimes fires do start and it then becomes a matter of putting the fire out as soon as possible. The best way to fight a fire is to use a fire extinguisher. But only fight the fire if you can do it safely.

Guide for Discussion

Evacuate the area immediately:

- If the fire is spreading beyond the spot where it started.
- If you can't fight the fire with your back to an escape exit.
- If the fire can block your only escape.
- If you don't have adequate fire-fighting equipment.

When using a fire extinguisher on a fire, leave the area immediately:

- If your path of escape is threatened.
- If the extinguisher runs out of agent.
- If the extinguisher is ineffective.
- If you no longer are able to safely fight the fire.

Care and Use

- Be sure the fire extinguishers are charged, strategically located and ready for use.
- Everyone has a responsibility to check to see that fire extinguishers and fire hoses (as well as other dispensing components) are not blocked.

Common Types of Extinguishers

- Class A Fires: Rubbish, paper, scrap, scrap lumber. Use soda acid and pressurized extinguishers or water through use of a hose or pump type water can.
- Class B Fires: Flammable liquids, oil, grease. Use carbon dioxide, dry chemical, or foam extinguishers. Do not use water on these types of fires.
- Class C Fires: Electrical in nature. Use carbon dioxide or dry chemical extinguisher. Do not use foam or water composition extinguishers.

Additional Discussion Notes:

The person responsible to insure fire extinguishers are charged, strategically located and ready for use is _____.

Our exposure is generally to Class _____ fires. We have Class _____ fire extinguishers available.

Remember The quickest way to put out a fire may not always be the best way.

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Refueling Equipment

Refueling motorized equipment, such as chain saws, chippers, grinders, and even weed trimmers, is part of the job. As such, it is important that this operation be conducted in as safe a manner as possible. Remember, gasoline and fuel oils are manufactured to cause an explosion in the engine. They are just as explosive outside it.

Guide for Discussion

Care and Use

- Concentrate on the task to be performed.
- Never smoke during refueling operations.
- Don't refuel near an open flame or near a sparking situation.
- Keep a fire extinguisher within 25 feet and no closer than 6 feet.
- If the equipment may accidentally move, chock the wheels.
- Always shut the engine off.
- If necessary, allow the engine to cool.
- Be sure both fuel dispensing tank and equipment are grounded.
- Don't spill the fuel. (Spilled fuel is a safety, health, and environmental hazard.)
- Don't overfill the fuel tank. On hot days, allow for expansion.
- Always clean up any spills.

Additional Discussion Notes:

Remember 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 bulldozer or a chain saw, it's better to do it properly than to risk an explosion that could ruin or end your life and the lives of those around you. Remember gasoline was designed to explode when ignited.

Attendees _____

Gasoline

Gasoline, when harnessed properly, is a vital source of energy. Treated carelessly, it can become an explosive monster. Many people are killed or seriously injured each year because they did not treat gasoline as a potential killer. Today we will discuss how you protect yourself from being injured or causing a fire or explosion.

Guide for Discussion

Gasoline Facts

- Liquid gasoline doesn't burn. It's the gasoline vapors that burn.
- Gas vapors are heavier than air. As a result, they collect in low areas.
- Any type of spark can ignite gas vapors.
- Gasoline should never be allowed to come into contact with your skin. Immediately clean the area contacted.

Storage

- Always store in approved safety cans. Insure the can has proper labeling (i.e., Flammable plus the type of fuel such as gasoline.)
- Always mark the storage can "GASOLINE — NO SMOKING"
- Remember, an empty can is more dangerous than a full one (because of the gas vapors).
- Always flush out empty cans.
- Keep all containers tightly closed.

Transferring Gasoline

- Never transfer gasoline from one container to another in an area where there is any chance of ignition.
- Clean up any spills immediately. It is a safety, health, and environmental hazard.
- Be wary of static electricity. Always use grounding straps when fueling from an above ground tank.

Additional Discussion Notes Don't use gasoline as a solvent for cleaning tools or parts.

Remember Working around or with gasoline is like working around dynamite. The only difference that gasoline is more dangerous if improperly handled. Remember the safety rules for handling gasoline and use your common sense.

Attendees _____

Compressed Gas Cylinders

Most of us know what the various compressed gas cylinders are used for on the job, but how many of us realize that the gases stored in those cylinders are under 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, they can explode like a bomb. Here are some rules for the safe use of compressed gas cylinders.

Guide for Discussion

Gasoline Facts

- Always store compressed gas cylinders in a secure upright position.
- Always store with caps over the valves.
- Never store two different types of gases closely together.
- Never tamper with any safety devices on the valve or cylinder.
- Always open valves slowly.
- Avoid storing cylinders in areas of high temperatures (use a shaded area).
- Never use cylinders for rollers or sawhorses.
- Never attempt to repair valves or regulators.
- Separate full cylinders from empty ones.
- Do not try to transfer gases from one cylinder to another.
- Keep a fire extinguisher nearby when handling or working with compressed gas cylinders.
- When in use, keep cylinders secured to a cart designed for that use.
- Remove empty cylinders from the work area.
- Never expose gases to oil or grease.

Additional Discussion Notes:

Remember The improper use of compressed gas cylinders is a common safety violation. Most people think the cylinders are safe. However, they are safe only if treated properly. To insure that they don't become a hazard, follow the basic rules we just discussed.

Attendees _____

The background image shows a modern building with a wheelchair accessibility sign on a pillar. In the foreground, there is a large, dark pool of water with ripples, suggesting a leak or flood. A set of stairs with metal railings is visible on the right side of the image.

Water Damage Protection

Water damage from leaky roofs and frozen or burst water pipes is the leading cause of damage to municipal property.

Preventing Water Damage

Water, whether from burst pipes or leaky roofs, is the leading cause of property damage to CIRMA members. In 2008-09 alone, water damage caused over \$13 million in property damage. Several of these claims forced a temporary closure of the building.

Water leaks are a serious threat to personal safety too. Leaks have caused electrical short-circuits that have set off major building fires. Asthma, allergies, and other health problems can be triggered by mold and mildew growth from water damage. And puddles and slick wet floors can cause slips and falls.

Most instances of water leakage can be prevented by creating and then following a building maintenance plan. Remember, too that no plan is complete if it doesn't say what to do in an emergency. When water is pouring from a broken pipe you only have time to react. Responding quickly and correctly can only happen when everyone is prepared:

Guide for Discussion

General Building Maintenance Plan

- Review the building maintenance plan. Is it current?
- How are maintenance and repair work documented?
- What is the reporting procedure to ensure follow-up repair work is completed?

Storage of items

- Make sure all items of value—especially computers, monitors, printers, copiers, books, machinery are stored off the floor and/or away from water sources.

Response Plan for Water Incidents

- Review location of shutdown of water supply, including who is authorized to access supply. make sure it is properly marked by a sign. Ensure that water supply can be shut down quickly.
- Review shutdown procedures for electrical, oil, and gas supply.
- Review damage mitigation and recovery plan, including location, easy access, and proper use of sump pumps, buckets, mops, wet vacs, etc.
- Post Emergency numbers, including Fire, Police, EMS, Plumbing and HVAC services, and CIRMA (800-526-1647 during business hours, and 203-710-4479 after hours.)

Additional Discussion Notes: Report all incidences to CIRMA as soon as possible, even if you are not sure they are covered. The sooner the claim is filed and the restoration experts can begin work, the better. Mold can begin to grow within 24 hours after an area is wet, causing further damage and creating a potential health hazard.

Remember

Attendees _____

Building System Inspections - Water Damage

Water can enter a building through a number of routes. Most water damage can be prevented by ensuring that the building's systems are well maintained and functioning properly. The following list is a good starting point for creating an inspection program for your municipality or school's facilities.

There is no such thing as a "routine" inspection: every inspection is important and should be performed with an eye out for new problems and changes. Inspections should be performed whenever and wherever they are needed at the discretion of the building maintenance team.

Guide for Discussion

Areas for Inspection

Roof

- Check the roof deck from the underside for evidence of leaks, deteriorated decking, structural cracks, structural movement, and other defects.
- Walls and parapets should also be examined to detect evidence of cracking, deterioration, and water entry or staining.
- Check roofing materials for signs of deterioration, wear, and damage.
- Check flashing for damage and that it is not loose.

Wall Systems

- What is the general condition of exterior walls (cracks/plants/etc)?
- What is the condition of the soffits, fascia, trim and flashing?
- Is the flashing intact around wall penetrations? Are sealants intact?
- What is the condition of the wall joints?
- Are walls free of vegetation?

Windows

- Inspect condition of window joints, flashing, and sealants.
- Check glass and air seal integrity (signs of condensation/moisture).
- Manually test hardware, including locks.
- Check interior walls around windows for water damage.

Grade Level

- Check at-grade plumbing and drainage systems.
- Test basement flood control and sump pump systems
- Check drains—deal with ponding and drainage issues early
- Ensure that downspouts direct water away from foundations, sidewalks and parking areas.
- Check for dampness or standing water in basements and crawl spaces; it may be caused by a hidden plumbing leak or improper drainage.

HVAC

- What is the age of the heating systems? Inspection and maintenance frequency?
- Change air filters changed or as recommended by manufacturer.
- Inspect condensate drains, drip pans, etc. to ensure they don't overflow.
- Inspect air coils.
- Inspect ductwork.
- Ensure threatening/air conditioning system is serviced at least annually.
- Humidity levels tested. Past problems resolved?

Continued

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Building Systems Inspections, Continued

Plumbing System

- Inspect pipe systems:
 - Has there been an unexplained increase in water bill?
 - Any water/sewer back-ups?
 - Cracked or warped flooring
 - Inspect under sinks, ice makers, valves, rubber/flexible hosing.
 - Inspect water heaters, flush per maintenance schedule. Place drip pan underneath to contain small leaks.
 - Inspect drip pans and drains.
 - Inspect caulking and grouting around sinks, tubs, showers, etc.
 - Check hose connections to appliances.

Automatic Sprinkler Systems

- Inspect, perform routine maintenance per requirements (NFPA 25)
- Inspect and test standpipe.

Below Grade

Water follows gravity downward, so areas below grade are prone to water seepage or flooding. Outside drains, roof drains, and irrigation systems can place large amounts of water into foundation area, saturating the soil. Even a small open or leak can lead to a major flood.

- Test the sump pump and flood control systems.
- Check all at-grade plumbing systems.
- Check all at-grade drainage systems.
- Replace any leaky fittings or drains immediately, even if they are small.
- Check to make sure that the irrigation system does not spray water against the foundation.
- Check areas that may be vandalized.
- Ensure downspouts divert water away from the foundation
- Investigate source of standing water.
- Check for signs of efflorescence, caused by moisture wicking up through the concrete, creating a white, powdery residue.

Appliances

- Check water supply lines to refrigerator icemakers, dish washers, washing machines, etc. for kinks, cracks, or blisters. If kinks are present, replace the hose.

Additional Discussion Notes: No building inspection is routine. Time, weather conditions, construction or renovation can combine to place unexpected stress or cause structural fatigue on the building's systems. Vibrations from masonry work can jar old plumbing lines, causing cracks and fissures. New insulation applied in attic areas will reduce heat loss through the roof, but will also enable heavier snow loads to form, stressing the roof structure. Inspections should be proactive and performed as needed.

Remember Smaller buildings, garages, storage buildings, even sheds should be inspected, too.

Attendees _____

Preventing Roof Leaks

Roof leaks are the most frequent source of water damage to buildings. Whether it is flat or pitched, asphalt or composite, every roof type can fail, allowing water to damage the building.

Connecticut's cold winters, wind storms, and hurricanes make roof leaks more likely to happen here than in other states. Inspect roofs before the start of hurricane season in June and before winter sets in. Also inspect after severe weather, the installation of equipment, or performing maintenance to equipment, chimneys, or other structures on the roof. Early discovery and correction of minor problems helps extend the life of the roof and prevent water damage.

Guide for Discussion

General Inspection

- Check for deteriorated, missing, or damaged roofing materials.
- Check all rooftop penetrations.
- Are seals intact around HVAC equipment?
- What is the condition of flashing around skylights, stack vents, etc.?
- Is there water staining (inside/outside)?
- Are roof drains, gutters, downspouts, scupper, etc., free of obstruction?
- Is there adequate insulation/ventilation in attics?
- Is there corrosion on underside of metal deck roofs?
- Is it free of vegetation?
- Is there snow loading?

Flashing

Many problems blamed on roofing materials are actually related to flashings.

- Carefully inspect the roofing materials near flashings for signs of breaks or moisture. Blisters in are an indication that moisture may have worked its way beneath the roof membrane through the flashings.
- Look for punctures, broken laps or seams, separation of flashings from vertical surfaces, and signs of weather deterioration. Flashings that face the sun deteriorate more rapidly than others.
- Check that the roofing felts and base-flashing sheets are tightly adhered to the cant strip. Gently tap the flashing mid-way between the roof and the vertical surface to check whether it is loose.
- Check for water staining on the inside and outside of walls and parapets.
- Check metal counterflashings for deterioration and to see that they are properly in place.

Consult a roofing expert for specific concerns or for repairs.

Additional Discussion Notes

Remember Inspect roofs after strong winds, hail, heavy snow or long, continued rain.

Attendees _____

Information from the National Roofing Contractors Association and the Asphalt Roofing Manufacturers Association manual or Roof Maintenance and Repair

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Preventing Leaks on Flat Roofs

Because water can't run off a flat roof, these roofs require more care and maintenance than pitched roofs. Inspect after severe weather, the installation or maintenance to equipment, chimneys, or other structures on the roof. Remember, one windblown plastic bag can clog a roof drain in a moment, causing serious damage.

Guide for Discussion

Flat Roofs Drainage

The drainage system on a flat roof is critically important. Inspect all roof drains frequently. One clogged drain can cause thousands of dollars in damages.

- Is there pooling/ponding of water on roof?
- Check the roof deck incline. It should be unobstructed and permit free drainage. Look for sagging and depressed areas, standing water or water-stained areas.
- Plant growth should be removed. Areas where roots have penetrated the roof membrane should be repaired.
- Look for broken and clogged drains. Make sure leaders and strainers are free from clogs.
- Look for standing water around drains; the drain may be too high or in the wrong location.
- Look for defective drain flashings. Check that the roof membrane is securely clamped in the drain clamping ring.
- Check that gutters slope downward to the leader a minimum of 1/16 inch per foot of length.

Flat Roof Gravel Stop and Metal Edge Inspection

The roof-edge should be inspected for:

- Damaged, loose, or deteriorated overhangs and fascia boards.
- Flashing flanges that have separated from the roof.
- Movement of edging in relation to the roof deck or wall.
- Bitumen drips under the gravel stops and down fascia boards.
- Missing or loose gravel stops and metal roof-edge strips.
- Split and cracked stripping felts.
- Open or broken joints between metal pieces.

Consult a roofing expert for specific concerns or for repairs.

Additional Discussion Notes Foot traffic on roofs can result in damage to the roofing membrane. Flashings can be kicked and punctured by individuals working on rooftop equipment or leaning over parapet edges. And a dropped tool can easily puncture the roof membrane. Roofs are often a target for vandalism, too. Therefore, roof traffic should be kept to a minimum, and access to the roof should be restricted.

Remember Inspect roofs after severe weather, such as strong winds, hail, heavy snow or long, continued rain.

Attendees _____

Information from the National Roofing Contractors Association and the Asphalt Roofing Manufacturers Association manual or Roof Maintenance and Repair



Preventing Slips and Falls

Slip & Fall Prevention

Keeping a “sure footing” is one of the best ways to prevent a painful on-the-job injury. The Bureau of Labor Statistics reported 166,530 injuries involving slips, trips, and falls on the same level in 2007. Falls accounted for 15% of all worker fatalities and 20% of all Workers' Compensation costs. While slips, trips, and falls can happen anywhere, icy conditions, puddles, and oily surfaces increase the hazard.

Guide for Discussion

6 ways to reduce your risk of slips, trips and falls.

Step 1: Wear sensible shoes

To prevent slips and falls, a high coefficient of friction (COF) between the shoe and walking surface is needed (Figure 1). A COF of 0.5 or more is needed for excellent traction. On icy, wet, and oily surfaces, the COF can be as low as 0.1 with shoes that are not slip resistant.

To put these figures in perspective, a brushed concrete surface and a rubber heel will often show a COF greater than 1. Leather soles on a wet smooth surface, such as ceramic tile or ice, may have a COF as low as 0.1. Shoes with small, stiletto heels, with taps on the heels, and/or shoes with leather or other hard, smooth-surfaced soles frequently lead to slips, falls, and injuries.



Figure 1. Shoes with soft rubber soles and heels with rubber cleats provide a high coefficient of friction (COF).

Step 2: Remove hazards

- Remove boxes, newspapers, electrical cords, phone cords and other obstacles from walkways.
- Secure loose rugs with double-faced tape, tacks or a slip-resistant backing.
- Repair loose, wooden floorboards and carpeting right away
- Immediately clean spilled liquids, grease or food.
- Use proper floor-cleaning methods
- Use nonskid floor wax.
- Keep exterior walkways free of snow, ice and other debris.

Step 3: Inspect walkways, report and repair hazardous conditions

- Inspect all walkways, stairs, parking areas, and sidewalks.
- Report all hazards immediately to your supervisor and/or maintenance department
- Follow-up to ensure all repairs are completed in a timely manner.

Step 4: Use assistive devices

- Use handrails on both sides of stairways and ramps
- Attach nonslip treads on bare-wood steps.
- Ramps should be constructed to have a different texture from the floors around them.
- Place non-slip mats around entrance areas that may become wet or slippery.

Continued

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Slip & Fall Prevention, Continued

Step 5: Light up your space

- Provide adequate lighting for best visibility. Night time lighting should be used to assure that all walkways are illuminated, without shadows.
- Replace burned-out light bulbs and faulty switches.
- Exercise care when moving from light to dark areas, or vice versa.
- Clear the paths to light switches that aren't near room entrances.
- Consider installing glow-in-the-dark or illuminated switches.

Step 6: Keep moving

If you aren't already getting regular physical exercise, consider starting a general exercise program. Consider activities such as walking or other aerobic activity, strength training, or any regular exercise routine. Such activities reduce your risk of falls by improving your strength, balance, coordination, and flexibility. Be sure to get your doctor's approval before starting a new exercise program.

Additional Discussion Notes One of the most dangerous situations is a rapid change in the friction coefficient of the flooring material. Slip and fall accidents most often occur where there is a transition: from dry to wet, or from one type of flooring to another.

For more information on this subject, attend CIRMA's *Slip & Fall Prevention Workshop*.

Remember

Attendees _____



Cold Weather Protection

Preparing for Winter Storms

Winter, and the freezing temperatures, snow, and ice that it brings, is a significant hazard for CIRMA members. Add in power outages, slips and falls on ice, and heavy snow and your municipality's or schools losses can, well, snowball.

Guide for Discussion

Before winter arrives

- Before the first freeze, turn off and drain all outside water faucets and sprinkler systems.
- Make sure equipment, valuable items, or items that could be damaged are located where they will stay dry—off the floor and away from sources of water.
- Test the water shut-off valve; now is a good time to replace leaky or corroded valves.
- Fully insulate all water pipes, even PVC pipes, which can crack and break when frozen.
- Pay close attention to insulating sprinkler or water lines in
 - unheated attics or dead air spaces,
 - near outside walls and windows,
 - pipes on the north side of buildings,
 - areas exposed to strong winds,
 - concealed ceilings and wall spaces, penthouses, and
 - cooler areas such as entryways and bathrooms.
- Winterize unheated, unoccupied, or vacant buildings. Even small leaks can cause extensive damage if left undiscovered for a long period of time.
- Test emergency generating equipment and battery back-ups.
- If you have generators, make sure they are properly rated for the job and are “good to go.” Perform a startup test now. Ideally generators should be tested under actual load conditions quarterly. Make sure that you have fuel on hand; do not use gasoline or diesel fuel that is more than a year old. (Please see Hartford Steam Boiler Inspection and Insurance's guidelines for *Preparing for an Electrical Power Outage* at HSB.com for more information about testing and operating back-up generators.)

Prepare and protect staff

- Schedule regular building checks, or “Freeze Watches,” during storms and cold weather.
- Schedule snow and ice removal of roadways and sidewalks. Ensure snowplow operators have attended safety training.
- Provide staff a list of emergency telephone numbers. Include, for example, snow removal contact, HVAC repair, utility company, the weather bureau, and the risk manager.
- Have cold weather gear on hand. Hats, gloves, emergency blankets, flashlights and batteries will all be useful during a cold weather emergency. Make sure that the staff knows where they are stored.

During a winter power outage

- If your building does not have its own generators, make arrangements to obtain non-electrical heating units during emergencies.
- Power surges and sags can damage equipment. Unplug them during severe weather or install surge protectors.
- Turn on the faucets to let the water trickle through to help prevent the pipes from freezing.
- Temporary or portable heating devices should only be used for facilities personnel for emergency purposes.

Additional Discussion Notes: Attend CIRMA's Snowplow Safety Workshop for more training.

Remember

Attendees

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Frozen Pipes

However tempting it is to turn down the building's thermostat to conserve fuel during cold weather—don't. The clean-up costs of fixing burst pipes is much more than the cost of the fuel saved. **Thermostats should never be set lower than 55°.** Keep thermostats **above 65°** when the weather may dip below 0° or the facility is to be unoccupied for a weekend or longer.

Guide for Discussion

During cold weather

- Keep all building areas heated, **never lower than 55°.**
- Put low temperature alarms in place.
- Remove barriers to the flow of warm air, i.e., remove some ceiling tiles to allow air circulation.
- Maintain heating system.
- Ensure adequate fuel supply for heating system over weekends and vacations.
- Consider using UL or equivalent heat tape or similar products—but consult a professional about how to apply and use heat tape, as improper use can cause a fire.
- Drain unused water systems.
- Consider using antifreeze solutions in non-potable water systems

During a "deep freeze," when temperatures drop below 20°.

- Schedule regular building "Freeze Watches," during winter storms and cold weather.
- Turn thermostat **to 65° or higher.**
- Open cabinet doors to allow warm air to circulate around plumbing pipes.
- Temporary or portable heating devices **should not be used by the building occupants for supplemental heating.** These devices should only be used for facilities personnel for emergency purposes.
- Let water trickle from faucets that are served by exposed or vulnerable pipes. Even a small trickle of water flowing through the pipe will help prevent it from freezing.

Thawing a frozen pipe

If a water pipe does freeze, it should be thawed immediately, but very carefully. Building fires have been started by careless people who've used a propane torch to thaw a pipe.

- **Locate the main shut-off valve and be prepared to close it in case of sudden rupture.**
- Find the frozen area of the pipe; it may be frosted or have ice on it. If the situation is getting critical the pipe may be slightly bulged or look slightly fissured.
- **Open the faucet closest to the frozen area.**
- Aim the warm air from a hair dryer at the frozen area of the pipe to gently thaw it. **Never use a propane torch. Pipes that heat up too quickly can rupture and burst. Worse, fires can be easily started by the open flame.** You can also use an infrared heat lamp, if the pipe is behind a wall.
- PVC pipes, as well as copper pipes, should be thawed as quickly as possible because they too can rupture and burst.
- Begin thawing from the faucet side, moving back towards the main water line; this allows the water to flow out, without adding further stress to the pipe.

Additional Discussion Notes: Areas of your buildings that have poor air circulation are likely to be much colder than in the room itself, causing pipes located there to freeze.

Remember

Attendees _____

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Snow Loading - Roofs

Snow on sidewalks and roadways can cause slips, falls and auto accidents. Heavy snow accumulations on roofs are just as problematic. Roof damage from heavy snow loads and ice dams are a major cause of property loss. Worse still, a sudden roof collapse can seriously injure or kill occupants of the building.

How much snow can a roof hold? If the building is relatively new, the snow load rating may be found on the building plans. If the building is older, a professional may have to be consulted. The fact that a roof has lasted through many snow storms does not guarantee that it will last through the next. Roofs of most older buildings were built with little or no insulation, so snow melted fairly quickly. If insulation has been added to the roof, snow and ice won't melt as rapidly and snow loads will accumulate to greater weight levels, further fatiguing an aging structure.

Guide for Discussion

Estimating snow loads

Unfortunately, there is no easy way to determine how heavy a snow load is. The density of snow varies greatly. Freshly fallen snow is much lighter than thawed and refrozen snow. Dry, newly fallen snow may weigh 7-10 pounds per cubic foot; thawed and refrozen snow may weigh up to 60 pounds per square foot. Rain water will add even more weight. Structural engineers recommend taking several cubic foot samples of snow and weighing them to calculate the weight of snow on a roof, rather than measuring the depth of the snow. Drifting snow, which may put excessive loads against equipment or penthouses or at walls between roof levels, will complicate calculations.

Signs of Danger

Fortunately, few roof failures occur without some warning signs, beware of:

- Severe roof leaks.
- Ripples or bends in steel roof supports. Also cracks in wooden members, rolled or bent metal purlins.
- Sagging ceilings or roof lines. Note: a suspended ceiling may hide these sags. Remove the tiles, and look above them.
- Cracks appearing in walls or ceiling. Again, a suspended ceiling may hide these cracks.
- Loud popping or cracking noises from the building structure. (A laminated wood beam in one school broke with such force that personnel reported hearing what sounded like a gun shot.)
- "Ponding" of water on the roof in areas where it never accumulated before.
- Obvious deformities in the roof.

Remember, look for these warning signs during the annual structural inspection as well as during cold, snowy weather.

If a snow load is too heavy for the roof, the only solution is to remove it as quickly as possible. Snow removal plans are commonplace for roads and parking lots; consider developing one for your facilities' roofs.

One way to remove snow from a roof is to physically get up on top of the roof and push the snow off with a shovel and/or broom. This approach, obviously, poses **serious safety** concerns. It's important to use ladders, safety ropes and take all necessary precautions. Snow rakes also can be used to remove snow.

When working from the ground using a snow rake, **use extreme caution** when working near overhead electrical power lines. Also, avoid excessive scraping on the roof or trying to chip off ice. This can damage the roof.

Continued

Questions? Ask your Supervisor or CIRMA Risk Management Consultant.

Snow Loading - Roofs, Continued

Roof Snow Removal

- Remove snow and ice from drains or drainage devices first.
- Remove drifted and unbalanced snow loads first.
- Remove snow in strip patterns, starting at the drainage device and proceeding up the slope. Remove snow strips. The goal is to reduce the load: the snow and ice do not have to be completely removed.
- Take care when you remove snow at the base of walls.
- Use plastic shovels and plastic tubs for lowering the snow to the ground.
- Protect and barricade areas where snow will be dumped or lowered.
- Don't use snow blowers.
- Don't pile snow on the roof.
- Don't use picks, hammers, spud bars or other sharp tools to remove ice.
- Don't use hot water pressure washers to remove snow from the field of the roof. This water generally freezes before it drains from the roof, adding to the weight.
- Don't block exit doors or fire exits with snow dumping or stockpiling.

Additional Discussion Notes:

Remember

Attendees _____

Whose Responsibility Is It?

Choices

- E = Employee
- SC = Safety Committee
- S = Supervisor
- M = Municipality

Because each municipality is different, there are no single correct answers. However, one perspective of primary responsibility recommends one of the following answers:

- E, SC, S, M Complying with Safety Rules
- SC, S, M Conducting Safety Training
- SC, S, M Recognizing Others for Safety Performances (Good or Bad)
- E, S Reporting Injuries or Illnesses
- E, SC Providing Feedback About Safe Work Procedures
- SC, S, M Enforcing Safety Rules
- SC, S, M Conducting Area Safety Inspection
- SC, MP Selecting Personal Protective Equipment (PPE)
- SC, M Assessing Workplace Hazards
- SC Reporting Hazards
- SC, S, M Conducting Accident Investigations
- SC, M Reward Incentives
- E, SC, S Recommending Corrective Actions to Eliminate Hazards
- SC, S, M Demonstrating Safe Work Practices
- SC, S, M Training Safe Work Procedures to New Employees
- SC, S, M Ensuring Safe and Healthful Work Areas
- SC, S, M Monitoring Safety and Health Programs
- SC, S, MP Showing Others How to Use Personal Protective Equipment
- E, S Reporting Incidents or Near Misses
- E, SC, S, M Eliminating or Reducing Hazards
- SC, S, M Developing Safe Work Procedures
- S, M Conducting Job Hazard Analyses

Topic	Date Presented	Date Presented
Safety Training		
Whose Responsibility Is It?		
The "Deadly Dozen"		
Why Accidents Occur		
Recognizing Unsafe Conditions		
Shop Safety		
What Does An Accident Cost?		
Near Misses		
Care for the Injured		
Accidents Are Avoidable		
Listen for Danger		
Accident/Incident Reporting		
Sample Report Form		
Safety Sense		
Safety Is (Mostly) Common Sense		
Keeping In Shape		
Warming Up		
Proper Lifting		
Horseplay		
Short Cuts		
Protecting the Public		
Protecting the Public		
Children & Construction		
Vehicle Operations		
Traffic Control		
Barricades & Warning Devices		
Effects of Weather		
Effects of Weather		
Heat Exhaustion/Sunstroke		
Dressing for Winter Work		
Personal Protective Equipment		
Construction Clothing		
Head Protection — Hard Hats		
Eye Protection		
Foot Protection		
Hand Protection		
Personal Protective Equipment		
— Concrete Construction		
Knee Pads		
Respirators		
Housekeeping		
Housekeeping		
Trash Chutes		
Material Storage		
Material Handling		
The Spotter		
Signaling Techniques		

Topic	Date Presented	Date Presented
Tool Use and Care		
The Right Tool For the Right Job		
Hand Tools		
Screwdrivers		
Wrenches		
Hammers/Chisels		
Nails Are Dangerous Too		
Table Saws		
Electric Power Tools		
Electric Hand Saws		
Portable Electric Tools		
Powder-Actuated Tools		
Tree Work		
Tree Trimming & Removal		
Chipper Machines		
Chain Saws		
Falls From Heights		
Falls		
Ladders		
Floors and Other Openings		
Guardrails		
Ramps and Runways		
Full Body Harnesses/Lifelines		
Being Caught Between or Under		
Excavations		
Excavation: Additional Discussion Points		
Trenching		
Dangers Overhead		
Working in Confined Spaces		
Heavy Equipment		
Heavy Equipment Hazards		
Working Around Cranes		
Electrical		
Electrical Hazards		
Assured Grounding Program		
Power Lines and Mobile Cranes		
Fire Protection		
Fire Protection and Control		
Fire Extinguishers		
Refueling Equipment		
Gasoline		
Compressed Gas Cylinders		