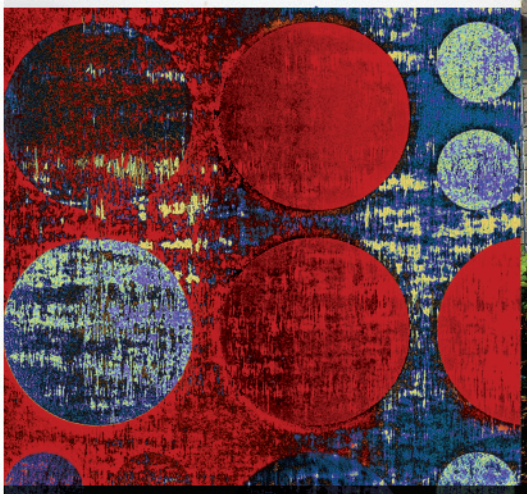

Facility Management LOSS PREVENTION BEST PRACTICES GUIDE

MCIT
Minnesota Counties
Intergovernmental Trust

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Questions concerning this guide should be directed to MCIT Director of Field Services at 1.866.547.6516.

Minnesota Counties Intergovernmental Trust, 100 Empire Dr., Suite 100, St. Paul, MN 55103-1885
www.MCIT.org

06-2020

INTRODUCTION TO FACILITY MANAGEMENT LOSS PREVENTION

1

INTRODUCTION

Facility management is a large responsibility that includes maintaining a safe environment for employees and visitors. This may encompass a number of locations and structures that require a wide variety of tasks; and involves several types of tools, chemicals and work environments.

The nature of the work and the equipment used can expose people and property to harm. Keeping people safe and property protected is a priority. This guide provides information and recommendations to help recognize and reduce the hazards of the job and protect public entities from liability and loss.

Each of the topics within this guide describes the safety exposures surrounding equipment and work tasks common in maintaining facilities. Best practices are outlined to help educate employees and reduce those exposures.

The topics covered in this guide target specific equipment, work processes and policies or programs that should be in place as part of an overall safety program. Each topic includes a check list or checkup.

Chapters related to specific equipment or work processes describe the risks related to the topic and then offer guidelines or best practices to help recognize and reduce those hazards. Check lists can be used as targeted safety audits. They can quickly identify safety hazards and allow for action items to be developed to remedy the identified exposures.

Certain policies and programs required by the Occupational Saftey and Health Administration (OSHA) may need to be reviewed and updated annually or as needed. Each chapter addressing these issues outlines the components that are required in that specific safety program. The checkup can be used to determine quickly if all the components of the program are in place.

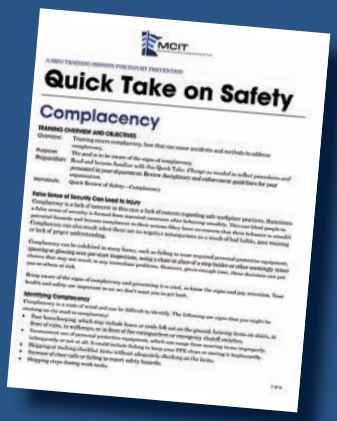
This guide does not provide resources to address liability arising out of human resources policies or insurance coverage. It addresses a few nonemployee injury- or property damage-related exposures, but is not a complete discussion of these exposures, which are often specific to an organization and are not well-suited to a general guide.

Also, this guide does not cover pollution, pollution control or the Minnesota Pollution Control Agency's policies beyond including that additional requirements may be necessary. Beyond potential workers' compensation coverage, the MCIT Coverage Document excludes all liability claims resulting in bodily injury liability and/or property damage arising out of the actual, alleged or threatened discharge, dispersal, seepage, migration, release or escape of pollutants.

Members are encouraged to contact their MCIT risk management consultant for more information about the scope of MCIT coverage and exclusions, and other risk management questions.

All MCIT member organizations have a Minnesota Safety Council membership. This partnership gives members access to no-cost or reduced-fee safety services, including training classes and videos, consultation services and written educational resources. Visit MinnesotaSafetyCouncil.org *to access materials.*

Quick Takes on Safety


MCIT

Quick Take on Safety

Complacency

Educating facility management staff to understand work hazards and best practices is an important part of the organizatin's safety program. Quick Takes on Safety help management with this.

Quick Takes are ready-to-use mini training scripts and employee handouts that provide succinct information about a specific job hazard and steps employees can take to keep themselves and others safe.

All Quick Takes are intended to be customized with details about the organization's specific policies, procedures, equipment and circumstances.

Supervisors use Quick Takes at staff or team meetings. These discussions help give priority to safety and bolster previous training.

Members can download Quick Takes on Safety and handouts at *MCIT.org/quick-takes-on-safety/* at no cost.

The topics in this guide are presented with bulleted safety points that can easily be used for Quick Take trainings and discussed within three to five minutes.

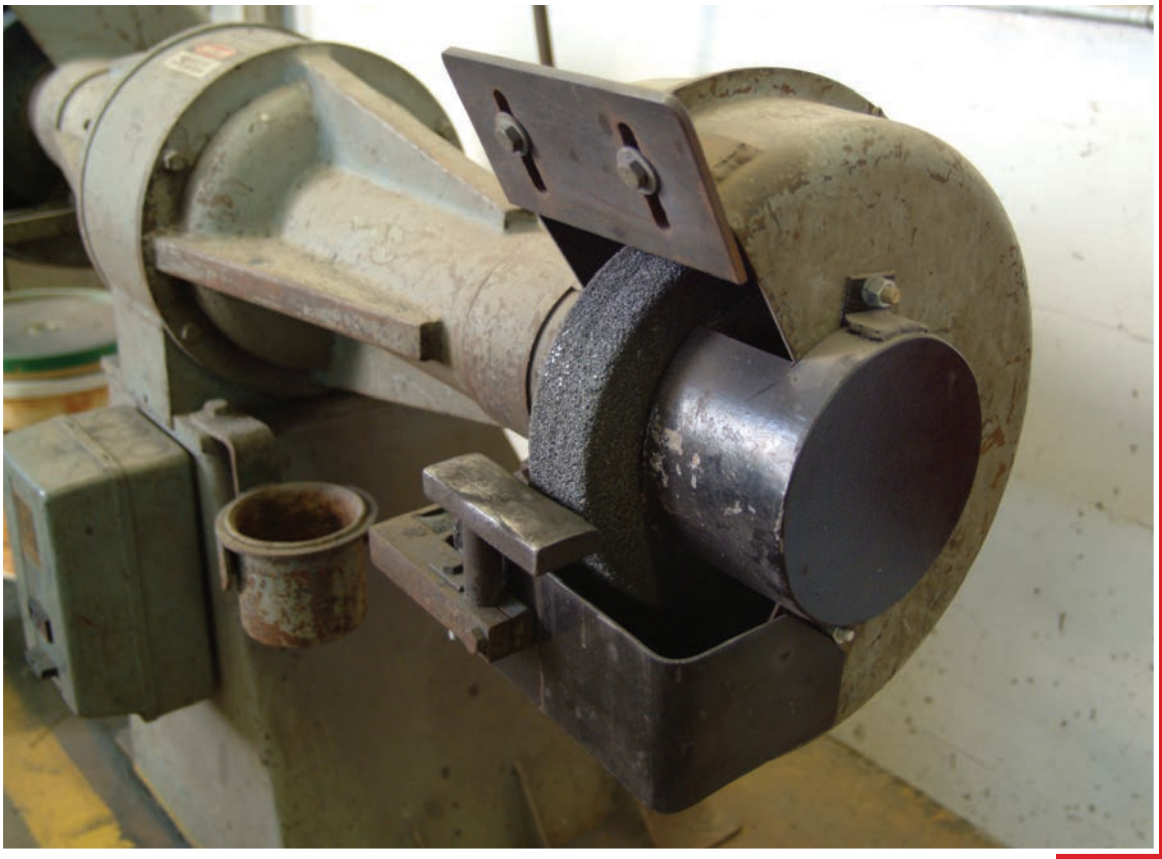
ABRASIVE WHEEL GRINDERS

2

ABRASIVE WHEEL GRINDERS

Abrasive wheel grinders come in many styles and sizes. Most commonly used are fixed-position bench or pedestal grinders and portable grinders.

The wheels of these grinders operate at high speeds, often rotating at several thousands of revolutions per minute. Because of the speed of the rotating wheel, grinders can pose a significant hazard from projected debris. On rare occasions, the wheel itself may shatter, ejecting material at high speeds. Other hazards include contact with the moving wheel, burns, ignition of nearby combustibles, particulate inhalation, noise and excessive vibration. These hazards can be mitigated with the following guidelines.

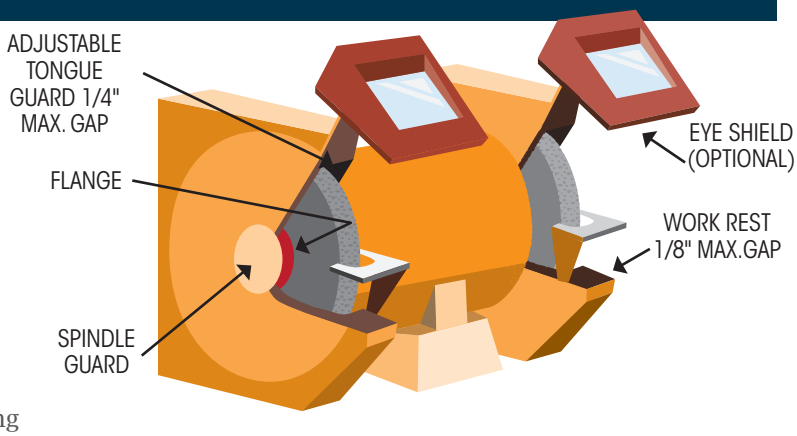


ALL ABRASIVE WHEEL GRINDERS

Wearing personal protective equipment is key to safe operation of abrasive wheel grinders.

- Before replacing a vitrified or bonded adhesive grinding wheel, it should be visually inspected and given a ring test to determine if the wheel has microscopic cracks that could cause it to shatter. A solid wheel with no cracks will emit a ringing sound when tapped. When a wheel has imperfections, a dull thud will sound when it is tapped.
- Use flanges that are clean, flat and smooth, and have a diameter equal to or greater than one-third the wheel's diameter.
- Wheels should always be operated at speeds that do not exceed those set by the manufacturer.
- Only use the correct kind of wheel for the material to be ground.
- Before use, inspect grinding equipment for missing parts, visible defects and damage.
- Do not use a grinder until it has attained full speed.
- Avoid applying too much pressure to the grinding wheel.
- Do not use the side of the wheel for grinding unless it is specifically designed for this use.
- Wear proper personal protective equipment when using an abrasive wheel grinder. At a minimum, safety goggles, ear protection and a face shield should be worn during use. This protective equipment should be kept clean, in good condition and readily available. Depending on the work, aprons, safety boots or respiratory protection may be required.
- Secure loose clothing that could get caught by the grinder.
- Keep the working area clean, well lit and free from obstructions. Check to make sure the work area is clear of flammable and combustible materials. Sparks can travel more than 20 feet and could potentially ignite materials outside the immediate work area.
- When storing abrasive wheels, make sure they are protected from the environment and accidental damage.

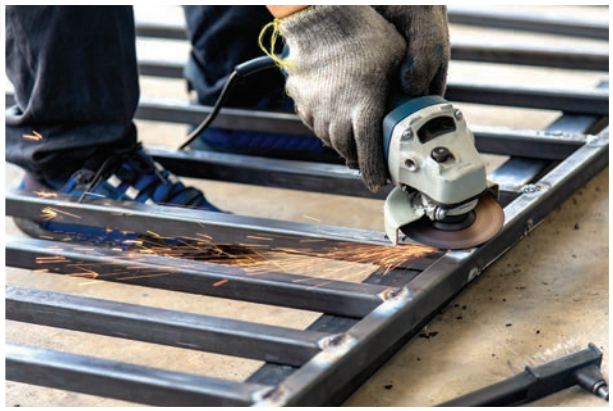
PEDESTAL OR BENCH GRINDERS



- All pedestal and bench grinders should be permanently mounted. They should not move or tip over during use.
- Each electrically operated grinder should be effectively grounded and plugged directly into an electrical outlet or connected to the electrical supply through metal conduit.
- Each grinder should have its own on/off switch to allow for fast shut off in the event of an emergency.
- Machine guarding should be in place and cover a minimum of 75 percent of the grinding wheel. In addition, there should be side guards that cover the spindle, end nut and flanges. Only a quarter of the wheel should be exposed and unguarded.
- To minimize hazards from undetected wheel defects or imbalance, stand to one side of the wheel until it has reached full speed.
- Grinding wheels should be equipped with a work rest adjusted so there is no more than a one-eighth inch maximum opening to prevent the work from slipping into the gap.
- Grinding wheels should be equipped with a tongue guard adjusted so there is no more than a one-fourth inch maximum opening to protect against ejected materials.
- Gloves should not be worn when working close to the wheel. The spinning wheel could grab the glove and pull the hand into the grinder.

PORTABLE GRINDERS

- Right angle head and vertical grinders should have no more than half of the wheel exposed. The disk guard should be positioned between the user and the wheel, and deflect materials away from the body.
- Ensure the disk guard is positioned between the handle and wheel.
- Use both hands when operating the grinder.
- Do not clamp a portable grinder in a vise for use on hand-held work.
- Position yourself to avoid overreaching and overbalancing when using a portable grinder.
- Do not use a grinding wheel to cut material.
- Some smaller materials may need to be held by a vise or other securing method. Do not hold materials in your hand when grinding with a portable grinder.
- Do not set portable grinder down until the wheel has come to a complete stop.



Ensure working material is firmly positioned and will not move when the grinding wheel is applied.

PREVENT REPETITIVE MOTION INJURIES

To mitigate repetitive motion injuries:

- Avoid continuous vibration exposure; take frequent breaks and consider using appropriate vibration-resistant gloves.
- Keep wrists as straight as possible.
- Minimize extent of reaching.
- Use a firm grip without excessive force.

Further safety rules and regulations regarding abrasive wheel grinders and their use can be primarily found in OSHA Standard 29 CFR1910.215, Abrasive Wheel Machinery.

PEDESTAL OR BENCH GRINDER CHECK LIST

ITEM	YES	NO	ACTION ITEM
Is the grinder permanently mounted without possible movement or tip over?			
Is the grinder effectively grounded and connected to the electrical supply with metallic conduit or other permanent wiring method?			
Does the grinder have its own on/off control switch?			
Is cleanliness maintained around the grinder? Is the work area free of flammables and combustibles?			
Are new abrasive wheels visually inspected and ring tested before they are mounted and used?			
Is the maximum revolutions per minute (rpm) rating of the abrasive wheel compatible with the rpm rating of the grinder motor?			
Do side guards cover the spindle, nut and flange, and 75 percent of the wheel diameter?			
Is the work rest used and kept adjusted to within one-eighth inch of the wheel?			
Is the adjustable tongue on the top of the grinder used and kept adjusted to within one-fourth inch of the wheel?			
Is personal protective equipment readily available and in good, clean condition? This may include safety goggles, face shields, ear protection, aprons, safety shoes or respiratory equipment, depending on work performed.			

PORTABLE GRINDER CHECK LIST

ITEM	YES	NO	ACTION ITEM
Does the abrasive wheel fit firmly around the grinder spindle?			
Is the abrasive wheel attached to the grinder spindle with the correct flanges, backing plate and locking nut?			
Is the power supply (electric or pneumatic) compatible with the requirements of the grinder?			
Is the abrasive wheel rated for the maximum possible speed of the grinder?			
Are guards and handles in place, secure and positioned between the wheel and user?			
Does the guard cover a minimum of 50 percent of the abrasive wheel circumference?			
Is the abrasive wheel clean and free of visible damage?			
Is the grinder's outer body and power cord or air hose free of visible defects, missing parts or damage?			
Is personal protective equipment readily available and in good, clean condition? This may include safety goggles, face shields, ear protection, gloves, aprons, safety shoes or respiratory equipment, depending on the work performed.			

AERIAL LIFTS

3

AERIAL LIFTS

Aerial lifts are often used to reach inaccessible areas overhead and are equipped with a platform or bucket to move people and equipment to these areas. Due to the nature of their operation, aerial lifts pose safety risks that should be understood and addressed.

Many of the risks associated with lifts occur when they are raised. Tip overs, falls, contact with objects and electrocution are some of the more common hazards related to aerial lift operation. In addition, without proper restraint, ejection from the platform or bucket can occur at any height if the lift is jarred during movement.

Employees should be trained specifically on each lift they use, understand the hazards and always conduct pre-start inspections.

PRE-START INSPECTIONS

Before using an aerial lift, two separate inspections should always be performed. The first is an equipment check. Function controls, fluid levels and warning devices are just some of the items that should be checked before use. Employing a pre-use check list would help ensure a more thorough and documented inspection. The equipment manual may have a pre-use checklist available.

The second inspection is a site inspection. It should be conducted before operating. Ruts, slopes, unstable ground and debris can create conditions that adversely affect the stability of the lift and should be avoided or addressed.

OTHER SAFETY POINTS

- Always keep feet on the floor of the platform or bucket; do not lean over or climb on or over guardrails.
- Never use ladders or other equipment to further extend your height from the lift platform.
- Always use fall restraint/arrest protection equipment that is attached to an identified location on the boom or bucket, not other structures outside the platform. A body harness should be worn and connected as soon as the operator or any other worker enters the platform or bucket. *Note: This safety point applies to all aerial lifts with the possible exception of scissor lifts. Please see the section at right concerning fall protection with those lifts.*
- Always have a thorough understanding of the specific load capacity, wind tolerance, reach and other limitations of the lift to be used. Do not exceed these limits.
- If used outdoors, always be aware of weather conditions that could adversely affect lift operation. It is especially important to keep an eye on changing wind conditions.
- Always be aware of what is in the travel path of the lift. Avoid electrical lines and other objects into which the lift or you could collide. Always be aware of your overhead clearance.
- Never use aerial equipment in place of a crane to lift materials. Ensure loads are not larger than the platform or bucket.
- Never travel with the lift raised more than what is specified in the manufacturer's instructions.
- Never travel with someone in the elevated bucket or platform unless the equipment is specifically designed for that use.
- If the aerial lift has both platform controls and lower level controls and the worker is on the platform, the lower controls should not be operated without express consent from the worker, except in an emergency situation.
- Always ensure that the lift is stable before beginning work. If equipment has outriggers, they should be positioned on a solid, level surface, and the brakes should be set.
- If operations require the lift to be positioned on an incline, wheel chocks must be used, provided they can be safely installed.

SCISSOR LIFTS

Scissor lift

Falling from any aerial lift, including a scissor lift, is a risk that should always be addressed and mitigated. However, OSHA does not require employees to be tied off when using scissor lifts as long as protection is provided by standard guardrails. It would still be prudent to employ restraint protection when working near or leaning on the guardrails.

Further safety rules and regulations regarding aerial lifts can be primarily found in OSHA Standard 29 CFR1910.67, Vehicle-mounted Elevating and Rotating Work Platforms.

Further information about fall protection requirements is provided in Chapter 17, Fall Protection.

AERIAL LIFT CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are employees trained on the operation of the specific aerial lift before they operate it?			
Is there an inspection of the components and functions of the aerial lift before use?			
Is a check list used to help ensure a complete pre-start inspection?			
Are areas of operation inspected for features that could adversely affect the stability, operation or safety of the aerial lift before use?			
Are aerial lift operators required to wear and attach fall restraint/arrest equipment anytime they enter and use the platform or bucket?			
If operating a scissor lift, are all guardrails intact, and is the entry door locked shut before use?			

APPLIANCES

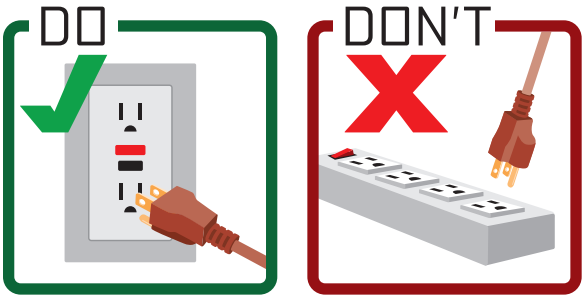
4

APPLIANCES

Although appliances used in the workplace can provide comfort to employees, they may not be in the best interest of the employer. When used improperly, appliances can overload circuits, damage equipment and more importantly pose electrical or fire hazards. As with other equipment, appliances in the workplace should be assessed from the perspective of safety.

Fires and electrocution are among the most common safety hazards associated with appliances. However, members can take steps to reduce these hazards:

- Use only commercial grade UL* or another nationally recognized testing laboratory approved appliances. Residential grade appliances are not made to stand up to the use typically found in work settings.
- Ensure appliances have grounded plugs or are double insulated to reduce the risk of people being shocked.
- Plug appliances that use liquids into ground fault circuit interrupter (GFCI) outlets. These protected circuits are designed to cut off power when a disturbance in current is detected, which could signal possible electrocution.
- Plug appliances located within 6 feet of a water source or in areas where there could be wet floors or surfaces into a GFCI protected outlet.
- Unplug appliances that incorporate heating elements at the end of the work day.
- Immediately remove or repair appliances when there are signs of component damage.
- Locate appliances incorporating heating elements in designated break room areas on a laminated or metal surface away from combustible materials.
- Ensure that space heaters have a high-temperature shutoff device, have built-in tip over protection, and are positioned away from flammable and combustible materials.
- Ensure that fans are grounded or double insulated if located in areas of high moisture, or if used to dry surfaces such as entryways.
- Ensure that power strips (surge protectors) are only used to power low amperage equipment (e.g., computers, monitors, fans, etc.). Appliances equipped with a heating element or that draw higher power should be plugged directly into a hard-wired outlet unless the power strip is rated for such use.



Plug appliances directly into wall outlets, not into extension cords or power strips.

Always follow the manufacturer's guidelines for the safe use of all appliances. If the organization has implemented an appliances in the workplace policy, the procedures and guidelines should be followed.

In addition to the precautions above, employees should not store, prepare or consume food and beverages in areas where toxic chemicals are used or stored.

Further safety rules and regulations regarding appliances and other electrical equipment can primarily be found in OSHA Standard 29 CFR1910.303, Electrical, General.

*UL is an independent safety science company.

APPLIANCES CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are appliances UL or another nationally recognized testing laboratory approved and of commercial grade?			
Do all appliances have grounding, three-prong plugs?			
If not, are they double insulated?			
Are appliances that use liquid or are located near water sources plugged into ground fault circuit interrupter (GFCI) circuits?			
Are appliances plugged directly into outlet receptacles (not power strips or extension cords)?			
Are appliances that use heating elements (coffee pots, toasters, etc.) unplugged at the end of each work day?			
Are appliances that use heating elements located in a designated break room area on a non-combustible surface?			
If space heaters are used, do they have high-temperature shutoff devices, have tip over protection, and are located away from flammable and combustible materials?			
Are appliances showing signs of component damage (sparking, damaged plugs or cords, etc.) removed from service until repaired or replaced?			
Are fans located in areas of potential high moisture or used to dry surfaces such as entryways double insulated or have grounded plugs?			

ASBESTOS

5

ASBESTOS

Asbestos was discontinued in building materials in the late 1970s, but it may still exist in the workplace. It is a naturally occurring mineral with long, thin, strong fibers used because of its insulation and fire-resistant properties. However, when disturbed, tiny fibers are released into the air. Prolonged exposure can cause significant health conditions, including asbestosis, pleural disease, lung cancer and mesothelioma.

The Occupational Safety and Health Administration (OSHA) has asbestos standards, which buildings must meet. The following is an overview of the requirements that can be used to help determine if additional policies, procedures, training and documentation are necessary.

- If any building or part of a building was constructed prior to 1980, formal documentation indicating the presence of asbestos-containing material (ACM) or presumed asbestos-containing material (PACM) must be retained. Documentation is also required indicating that suspect materials, such as vinyl flooring, ceiling tiles, thermal system insulation, do not contain asbestos or asbestos capable of being released.
- The presence, location and quantity of ACM or PACM must be communicated to employees who work in or adjacent to such areas. Housekeepers and contractors must also be told about this. The building owner must retain documentation of the communication.
- An annual training course for housekeeping employees working in these areas must be established and documented. Training should include the health effects of exposure to asbestos, the locations of ACM and/or PACM, recognition of damage or deterioration of these materials, the requirements in the OSHA standard related to housekeeping and proper response to fiber release episodes.
- A copy of the OSHA asbestos standard and self-help smoking cessation program materials must be available to affected employees.
- Special care must be taken with maintenance of asbestos-containing flooring materials. This includes prohibiting sanding and limiting burnishing or dry buffing of flooring that has sufficient finish so that the pad does not contact the asbestos-containing materials. If stripping of finishes must be conducted, it should only be done using low-abrasion pads at speeds lower than 300 rpm and using wet methods.
- Specific signs must be posted in areas that contain ACM and/or PACM where employees can be expected to enter. Labels must be installed on asbestos products where feasible. The signs and labels identify the material present, its location and appropriate work practices that ensure these materials are not disturbed.

Types of Asbestos

Friable pipe insulation

Nonfriable 9x9 floor tile

Asbestos is classified into two distinct types: friable and nonfriable. Friable can easily become airborne if disturbed and presents the greatest risk of exposure. Nonfriable cannot become airborne easily and is only hazardous if it becomes friable.

Building owners must be aware of the presence of both types of asbestos, their hazards and regulations to help ensure the health and safety of building occupants.

- All exposed friable ACM on ceilings, beams, pipes, boilers, tanks and similar areas must be repaired, replaced, removed, enclosed or encapsulated.
- Before construction work subject to the asbestos standards is performed, all affected employees and other personnel shall be informed of the location and quantity of ACM and/or PACM in the area and the precautions to be taken to ensure airborne asbestos is confined to the area.

For additional and more specific information about Minnesota OSHA asbestos requirements, see the resource titled "Building Owner's Responsibilities for Asbestos" found on the Minnesota Department of Labor and Industry website.

ASBESTOS CHECK LIST

ITEM	YES	NO	ACTION ITEM
Have buildings or parts of buildings constructed prior to 1980 been determined to contain asbestos-containing materials (ACM) and/or potentially asbestos-containing materials (PACM)?			
Has formal documentation been retained?			
Has the presence, location and quantity of ACM and/or PACM been communicated to employees, housekeepers and contractors who work in or adjacent to such areas?			
Has this communication been documented and retained?			
If ACM and/or PACM are present, are housekeeping employees offered a training course offered annually that includes materials, health hazards of asbestos exposure, locations of materials and recognition of deterioration of materials?			
Are copies of the OSHA asbestos standard and self-help smoking cessation program materials available to affected employees?			
Are specific procedures in place to care for the maintenance of asbestos-containing flooring materials?			
Are specific signs and/or labels posted in areas that contain ACM and/or PACM materials where employees are expected to enter?			
Are affected employees informed of work being done subject to the asbestos standard and the precautions taken to mitigate exposure?			
Are all exposed, friable ACM on ceilings, beams, pipes, boilers, tanks and similar areas mitigated?			

AWAIR (A WORKPLACE ACCIDENT AND INJURY REDUCTION) PROGRAM

6

AWAIR PROGRAM

Minnesota OSHA requires most employers, including public employers, institute a written AWAIR program. AWAIR acts as the overall umbrella for the safety program and must include the following five required components:

1. How managers, supervisors and employees are responsible for implementing the program and how continued participation of management will be established, measured and maintained

2. The methods used to identify, analyze and control new or existing hazards, conditions and operations
3. How the plan will be communicated to all affected employees so that they are informed of work-related hazards and controls
4. How workplace accidents will be investigated and corrective action implemented
5. How safe work practices and rules will be enforced

Every employee should be trained about the components of the program at the time they begin employment. In addition, the AWAIR program should be reviewed yearly and updated as needed.

SAFETY COMMITTEES

A joint labor-management safety committee is required for employers with more than 25 employees and can be an effective tool to assist in accomplishing the requirements of AWAIR. Safety committees are typically made up of representatives from the various areas of operations within an organization. As facilities operations are important to the health and safety of employees, a member of the management or staff should have a seat on the safety committee.

A safety committee can focus on safety issues relevant to the particular needs of its employees. A safety committee can:

- Bring employee safety and health concerns to the attention of management and suggest recommendations for correction.
- Help identify and analyze hazards through regular walk-around inspections, safety check lists and developing job hazard analyses. For more information about job hazard analyses, see Chapter 29.
- Review and evaluate incident and near miss reports.
- Assist in accident investigations.
- Promote safety in its member's prospective areas.

A safety committee should meet at least quarterly. Depending on its level of activity, more frequent meetings may be necessary.

Further rules and regulations regarding AWAIR and safety committees can primarily be found in Minnesota Statutes, Sections 182.653, Rights and Duties of Employers, and 182.675, Safety Committees.

Develop a Successful Safety Committee

Download the resource "Discussion Items and Resources for Safety Committees" from the MCIT website *(MCIT.org/safety-committees/)* or ask an MCIT loss control consultant for a copy.

AWAIR (A WORKPLACE ACCIDENT AND INJURY REDUCTION) PROGRAM CHECKUP

ITEM	YES	NO	ACTION ITEM
Is a written AWAIR program in place and reviewed annually?			
Do employees receive AWAIR training when first on the job?			
Are methods in place to identify, analyze and control workplace hazards?			
Are accidents promptly investigated?			
Are safe work practices and rules enforced?			
Does a joint labor-management safety committee meet regularly to review and discuss safety concerns and forward recommendations to management?			

BATS AND PESTS

7

When wildlife and insects take up residence near or within buildings, they become a nuisance or hazard to persons and property. Careful maintenance, observation and timely management is critical to control these pests and prevent injuries or property damage.

BATS

Bats are common in Minnesota; however, many people view them with fear or as pests to be eliminated. These attitudes do not accurately reflect the actual severity of risks bats pose to human health or property. All of the bat species in Minnesota eat insects and consume about half of their body weight in insects each night.

Unfortunately, nationally and in Minnesota, many bat populations have been in decline. This has prompted federal and state agencies to declare some Minnesota bat species as threatened or of special concern. According to the Minnesota Department of Natural Resources, seven bat species are known to inhabit the state, and four of them are listed as threatened or of special concern on state or federal endangered species lists.

Penalties for killing a threatened species on the federal endangered species list could include a $25,000 fine and six months in prison, depending on the intent to kill. In addition to these criminal penalties, high civil fines may apply. Furthermore, killing a threatened or special concern species may damage an organization's reputation if environmental groups or advocates bring media attention to the situation.

BAT HABITAT

Many old or historic buildings make ideal homes for bats as roosts or winter hibernation sites. Brick buildings with large attics are the most popular. Cracks or holes in eaves or masonry as small as a dime can allow bats to inhabit the space.

As bats do not chew their way into buildings, these cracks or openings must be pre-existing. As a result, aging or historic buildings should be regularly inspected, and cracks and holes sealed. This helps prevent bat infestation, improves energy efficiency and limits the potential for water infiltration.

Large attics in old buildings are common roosts for bats.

BAT REMOVAL

There are several control methods for bats, depending on where the bats are or how close they are to people. If bats are already in a building in areas where people do not typically go, such as attics, belfries or towers, methods to exclude the bats can be implemented. This is often done by a bat exclusion company.

The process of exclusion is typically done with the installation of one-way gates that allow bats to leave but not re-enter the location. In addition to the gates, any other entry points are identified and patched.

When pursuing this option, it is important to consider the time of year and the bat life cycle. In spring and summer, bat species give birth, and babies are unable to fly. Excluding bats in the spring or summer could inadvertently kill the young, as their parents would not be able to feed and care for them once leaving the roost.

In cases where bats enter a space where employees or the public are present, the bat should be actively removed from the property. In these situations, the best approach is to isolate the bat into a room and open a window to allow it to escape.

Another option is to capture the bat and either release it outside or submit the bat for rabies testing.

When capturing a bat, always use leather or other thick protective gloves. To capture a bat, approach it slowly and place a container over the bat. Slide the lid or a piece of cardboard underneath the container and flip the container over, trapping the bat. Secure the lid with tape. Ideally, the bat should be held in a container with a lid, as bats can chew through fabric, such as towels, nets and blankets. As quickly as possible, either release the bat outside or take it for rabies testing.

RELATED HAZARDS

Another hazard presented by bats is the accumulation of droppings, known as guano. Bat and bird droppings in significant accumulations can cause fungal spores to become airborne. If these spores are inhaled, it can lead to adverse respiratory conditions such as histoplasmosis. Handling rodent droppings in the same manner can also lead to pathogens becoming airborne and lead to serious respiratory conditions such as hantavirus.

Employers should have a written respiratory safety program to ensure proper fit, use and storage of the equipment. Consideration should be given to hiring an outside service to clean droppings, given these requirements. Many bat exclusion companies or exterminators may also offer this service.

When cleaning or removing droppings, people should be equipped with appropriate respirators.

OTHER PESTS

Buildings and other properties are often home to many different nuisance animals, birds and insects. Holes and burrows from gophers or ground squirrels can create tripping hazards to people and animals. Nests from birds or other animals can damage buildings, and insects can sting and be a nuisance.

Controlling for these pests requires identification and specific measures, depending on the type of vermin encountered. For specific information and recommendations about removing vermin, consider consulting with local animal or pest control specialists.

Periodic inspections should be made for:

- Holes or burrows in walkways or paths and along foundations of buildings, both inside and outside.
- Active wasp nests, ant colonies or evidence of termites.
- Signs of rodents, including nests, feces or damage. Dead rodents are also a clear sign of infestations, but should be handled with care. Proper personal protective equipment should be worn when removing rodents and other pests.
- Bird nests and rodents. Indoor animal droppings may provide indications of an infestation. As discussed previously, be wary when cleaning up droppings, as harmful bacteria or fungi may become airborne if it is disturbed. If possible, ventilate the area and ensure employees always wear appropriate protective equipment.

For specific information and recommendations about removing vermin, consider consulting with local animal or pest control specialists.

In conjunction with periodic inspections, maintaining good housekeeping and grounds keeping removes food sources and shelters for most animals or insects. Controlling humidity can also help discourage insects, particularly in dark, cool areas.

See chapters 23, 26, and 28 on grounds keeping, housekeeping and indoor air quality for more information.

OSHA Sanitation Standard 1910.141 also addresses vermin control.

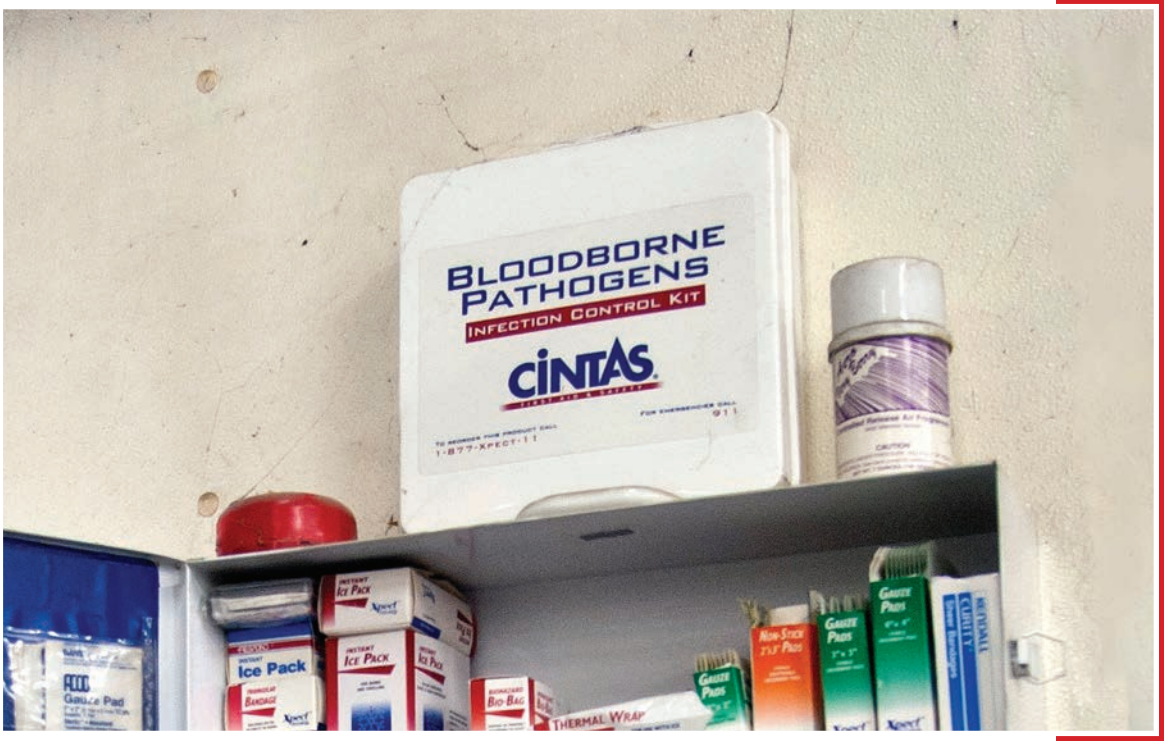
BAT AND PEST CONTROL CHECK LIST

ITEM	YES	NO	ACTION ITEM
Have historic or old buildings been sealed to reduce the chances of nesting bats?			
If bats are discovered, have methods been put in place to exclude them from the site?			
Is the facility management staff trained not to kill bats, but are trained on other methods to remove bats safely from occupied areas?			
Are facility management employees instructed to take care and use appropriate personal protective equipment around accumulated animal droppings?			
Are inspections made periodically for signs of pests?			
Are good housekeeping and grounds keeping maintained to minimize the risk of pests?			

BLOOD BORNE PATHOGENS

It is probable that an employee will sustain a cut or minor injury at some point on the job. In addition to keeping a supply of first-aid materials on hand, employees should have an understanding of the potential hazards involved with exposure to blood.

In Minnesota, the Employee Right to Know annual training needs to include information about infectious agents for every employee. However, for some job classifications, more may be required in terms of training, such as inclusion in a blood borne pathogen written policy or additional requirements for first-aid kits. For more information about first-aid kits, see Chapter 20 First-aid, CPR Training and Kits.



BLOOD BORNE PATHOGEN (BBP) EXPOSURE

The universal precaution when encountering a blood exposure is to treat it as though it may be infected with a blood borne pathogen (e.g., hepatitis, HIV).

If employees have a reasonable expectation that they will come in contact with blood or other potentially infected materials in the course of their work, they are required by the Occupational Safety and Health Administration (OSHA) to be included in a blood borne pathogen (BBP) program.

EXPOSURE CONTROL PLAN

If an organization has employees with an occupational exposure to blood borne pathogens, OSHA requires that a written policy be in place and followed. If the facilities/maintenance department does not have a specific BBP policy, check to ensure occupationally exposed employees are included in the organizationwide policy.

This policy should be updated annually and include:

- Identification of job classification(s) that are determined to have occupational exposure to blood or other potentially infected materials.
- Identification and use of work practice controls. This could include the method for cleaning contaminated surfaces or how to deal with contaminated items.
- Identification and use of personal protective equipment.
- Procedures for making hepatitis B vaccinations available to employees with occupational exposure.
- Procedures for offering post-exposure evaluation and follow-up care after an exposure incident.
- Procedures for providing information and training (both initial and annual refresher) to employees and maintaining training records on the topics of the written plan.
- Trainings should offer the opportunity for interactive questions and answers with the person conducting the training.

TRASH HANDLING

It is important for employees to understand trash handling best practices. Potentially contaminated needles or other sharps may be disposed and hidden among the trash.

Sharps disposal container

To help reduce the amount of used syringes thrown in the trash, consider providing sharps disposal containers in public restrooms. Signage showing locations of containers can help if limited placement is chosen.

HAND HYGIENE

When working with garbage or potentially infectious materials, it is important to maintain good hand hygiene. Hand hygiene is the single most effective means of preventing the spread of infectious illness.

This is accomplished through regular hand washing with soap and warm water or hand sanitizer. When hands are soiled, hands should be washed with soap and water, rather than hand sanitizer. Sinks for hand washing should be available, and employees should be encouraged to use them.

Always carry trash away from the body. Do not throw it over shoulders or let it bump against legs or body.

Never press down trash to make more room in collection containers without properly protecting hands.

Further safety rules and regulations regarding blood borne pathogens can be primarily found in OSHA Standards 29 CFR1910.1030, Bloodborne Pathogens.

BLOOD BORNE PATHOGEN CHECKUP

ITEM	YES	NO	ACTION ITEM
Is a written program in place, updated annually and include classifications of employees that have occupational exposure to blood borne pathogens?			
Are employees who have an occupational exposure to blood borne pathogens trained about it upon employment and annually thereafter?			
Are hepatitis B vaccinations offered to all employees with an occupational exposure at no cost to the employee?			
Are cleanup procedures and materials in place to deal with blood or other potentially infectious material spills?			
Is personal protective equipment, such as gloves, eye protection and masks, provided?			
Are post-exposure evaluations and follow-up care offered to any worker who experiences an exposure incident?			
Is information and training pertaining to blood borne pathogen exposure provided to employees?			
Are medical and training records maintained?			
Are employees trained about safe trash handling procedures?			
Do employees practice good hand hygiene?			
Are sharps disposal containers available to help prevent discarding of sharps, including syringes, in trash receptacles?			

BOILER AND PRESSURE VESSEL INSPECTION

9

Many facilities operate some form of a boiler for heating, whether steam or hot water, or high or low pressure. Compressed air tanks may also be used by facility maintenance staff. To ensure these vessels are operated safely, the State of Minnesota has established rules for the design, construction, installation, maintenance and operation of boilers and pressure vessels.

It is essential that each boiler engineer or operator hold the class of license for the specific equipment he or she oversees. Minnesota statutes state: "No person shall be entrusted with the operation of or operate any boiler, steam engine or turbine who has not received a license of proper grade covering that boiler, steam engine or turbine."

Up-to-date boiler operating licenses must be displayed in a conspicuous place in the boiler room. Each person who may be operating the boiler should have his or her license displayed.

REQUIRED INSPECTIONS

DAILY INSPECTIONS AND LOG KEEPING

Depending on the type of boiler equipment in use, regular daily, and possibly weekly or monthly, inspections are required. These inspections must be logged by an operating engineer and made readily available to the boiler inspector during annual inspections or other times upon request.

These inspections should follow guidelines set forth by engineering standards dictated in Minnesota boiler statutes. Sample boiler logs are available from the Minnesota Department of Labor and Industry or may be acquired from the equipment manufacturer.

HOT WATER HEATING BOILERS — **Maintenance • Testing • Inspection Log**

BUILDING	ADDRESS	MONTH	YEAR	FUEL TYPE	BOILER NO.

PERSONS TO BE NOTIFIED IN CASE OF EMERGENCY (INCLUDE NAME AND PHONE NUMBER)

DAILY MAINTENANCE INSPECTION CHECKS

DATES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Checked by (please initial):																															
1. Record Boiler Pressure																															
2. Record Boiler Water Temp																															
3. Record Flue Gas Temp.																															

WEEKLY MAINTENANCE INSPECTION CHECKS

WEEKS	WEEK 1	WEEK 2	WEEK 3	WEEK 4
Checked by (please initial):				
1. Observe Flame Condition				
2. Observe Circuation Pumps				

MONTHLY MAINTENANCE INSPECTION CHECKS (Enter Date Checked)

1. Manual Lift Relief Valves	Relief Valve Check Date:	Date Checked		Date Checked
2. Review Condition of each item and/or Test each item	A. Flame Detection Devices		F. Refractory	
	B. Limit Controls		G. Stop Valves	
	C. Operating Controls		H. Check Valves	
	D. Floor Drains		I. Drain Valves	
	E. Flue Piping		J. Linkages	
3. Observe gage glass on expansion tank			Weekly and Monthly Checks Performed by:	
4. Combustion Air adequate/unobstructed				

COMMENTS:

Sample boiler logs, like the above, and related information can be found at the Minnesota Department of Labor and Industry website under the Boiler Engineer/Boiler Documents page.

ANNUAL INSPECTIONS

It is the responsibility of the owner and the engineer to make sure the boiler is inspected annually and that pressure vessels (e.g., compressed air tanks) are inspected every two years.

MCIT collaborates with Hartford Steam Boiler (HSB) to provide coverage for equipment breakdown, or boiler and machinery coverage. As part of this arrangement, HSB conducts the inspections on boilers and pressure vessels as required by the Minnesota Department of Labor and Industry at no additional charge.

EQUIPMENT SUBJECT TO INSPECTION

Equipment that falls under state inspection requirements is detailed below.

STEAM BOILERS

Steam boiler

- High-pressure steam boilers operated at a pressure exceeding 15 psig.
- Low-pressure steam boilers operated at a pressure of 15 psig or less.

WATER BOILERS

Water boiler

- High-pressure hot water boilers operated at a pressure exceeding 160 psig or a temperature exceeding 250 degrees Fahrenheit.
- Low-pressure water boilers operating at a pressure not exceeding 160 psig and a temperature not exceeding 250 degrees Fahrenheit.

Exemptions:

- Heating boilers not exceeding a heat input of 750,000 BTU per hour.
- Hot water supply boilers (water heaters) not exceeding a heat input of 500,000 BTU per hour, a water temperature of 210 degrees Fahrenheit, a nominal water capacity of 120 gallons or a pressure of 160 psi.
- Pressure vessels that have an internal or external working pressure not exceeding 15 psig regardless of size

PRESSURE VESSELS

- All pressure vessels, including compressed air tanks

Exemptions:

- Heating boilers not exceeding a heat input of 750,000 BTU per hour
- Hot water supply boilers (water heaters) not exceeding a heat input of 500,000 BTU per hour, a water temperature of 210 degrees Fahrenheit, a nominal water capacity of 120 gallons or a pressure of 160 psi
- Pressure vessels that have an internal or external working pressure not exceeding 15 psig regardless of size

Pressure vessel

- Pressure vessels that do not exceed 5 cubic feet in volume and are equipped with an ASME code stamped safety valve set at a maximum of 100 psig
- Pressure vessels that have an inside diameter not exceeding 6 inches.

For complete rules, members should review the boiler requirements on the Minnesota Department of Labor and Industry website *(DLI.mn.gov)*.

HSB INSPECTIONS

Inspections performed by HSB professionals within the state guidelines are considered a part of coverage, so MCIT members do not see a bill for this service. Inspection of a boiler or pressure vessel outside of the required schedule is the responsibility of the owner of the property.

Following the inspection, the HSB representative completes the required state forms and files them with the appropriate jurisdiction(s).

When conditions are discovered that could result in a serious loss or a jurisdictional code violation, HSB prepares a Loss Prevention Report and provides it to the member and MCIT. Recommendations are categorized as:

- **Code:** A condition that violates jurisdictional boiler and/or pressure vessel requirements and that must be corrected prior to the issuance of an operating certificate by the jurisdiction.
- **Critical:** A condition that could lead to a significant loss if not corrected immediately.
- **Priority:** A condition that could lead to a significant loss, but the likelihood of failure is not imminent. This recommendation is intended to allow members to schedule corrective action in the near future rather than immediately.
- **Advisory:** A condition that has a low probability of loss; minimal impact in the event of failure; or a condition that would not cause a loss but if corrected, would improve the operating efficiency or useful life of the equipment.

Scheduling Inspections

MCIT regularly provides HSB with member locations and contact information to make arrangements for the next inspection. However, members who think they may have a boiler or pressure vessel requiring registration with the state or is currently overdue for an inspection can contact the HSB hotline to schedule an inspection or speak with HSB to answer some questions.

The HSB hotline is **1.800.333.4677** and is answered 9 a.m. to 9 p.m. Monday through Friday. Members can also e-mail questions or schedules to *NSCInsp_Hotline@HSB.com*.

SAFETY SHUT-OFF SWITCH

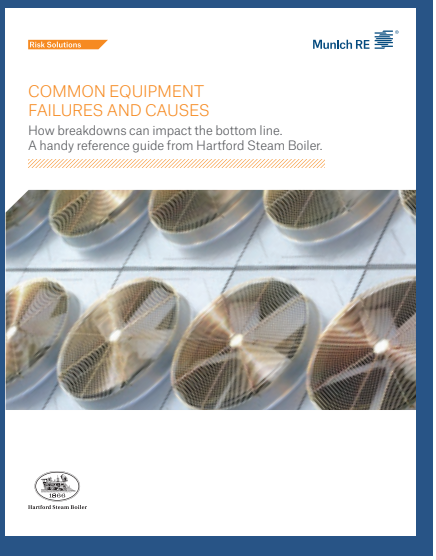
Per state code, a manually operated remote shutdown switch must be located just outside the door to the boiler room and be marked for easy identification. Periodic testing of the shut-off switch should be conducted.

Consideration should be given to the type and location of this switch to safeguard against tampering.

Equipment Breakdown

Although members have coverage for equipment breakdown, it is better to prevent failures from happening in the first place. It saves time, money and hassles to perform regular maintenance than to replace broken electrical equipment, mechanical equipment, air conditioning and refrigeration systems, boilers and pressure vessels, or business equipment and systems.

Hartford Steam Boiler, the provider of MCIT members' equipment breakdown coverage, details the common causes of equipment breakdowns and how that affects the bottom line in its pamphlet Common Equipment Failures and Causes, available through MCIT loss control consultants at **1.866.547.6516** or at *MunichRe.com/HSB.*



BOILER AND PRESSURE VESSEL INSPECTION CHECKUP

ITEM	YES	NO	ACTION ITEM
Is each boiler engineer and operator properly licensed for the equipment overseen?			
Is each operator's license current and conspicuously displayed in the boiler room?			
Are required inspections, maintenance and testing logged as per state regulations?			
Are all required boilers inspected at least annually?			
Are all required pressure vessels inspected at least every two years?			
Is a system in place to ensure that new pressure vessels or other equipment is added to inspection schedules as needed?			
Are safety shut-off switches installed as required, and are they periodically tested?			

COMPRESSED AIR

10

COMPRESSED AIR

AIR COMPRESSORS AND RECEIVERS

Air compressors pump high-pressure air into pressure vessels for use when operating pneumatic tools or to power HVAC control systems. Proper care, maintenance and operation are necessary to help prevent injury from electrocution, vessel ruptures, explosions, noise and the force of compressed air.

Most air compressors used in public entity buildings are required to be registered and certified with the State of Minnesota. As a part of certification, pressure vessels require an inspection once every two years.

MCIT provides members equipment breakdown coverage through a partnership with Hartford Steam Boiler (HSB). As part of this coverage, HSB conducts jurisdictional inspections per state requirements at no charge to members. For more information, see Chapter 9, Boiler and Pressure Vessel Inspections.

REDUCE COMPRESSOR FAILURE AND INJURY

In addition to these once-every-two-years inspections, the following recommendations should be considered to help reduce the chance of compressor failure or injury:

- Air receivers should be drained frequently to prevent accumulation of water and oil inside the tank.
- Pressure relief valves and pressure gauges should be regularly inspected and tested to make sure they are in good working condition.
- Inlet filter cartridges should be inspected and cleaned or replaced per the manufacturer's specifications.
- Periodic inspection of the air receiver should be conducted to detect leaks or corrosion.
- Air hoses should be checked for signs of deterioration.
- The compressor should be oiled and lubricated according to the manufacturer's directions.
- Belt drive systems should be completely enclosed to protect against contact with moving parts.
- If the compressor has an automatic starting feature, a sign should be posted nearby that states, "Warning: Compressor starts automatically."
- When working on or near air compressors, eye and ear protection should be worn.

COMPRESSED AIR USE

Compressed air is used to run various types of equipment and for cleaning. However, compressed air can pose risks if used improperly.

Compressed air is a concentrated stream of air at high pressure and when released at high speed, can cause serious injury to the operator or those nearby. Potential injury can occur:

- When particulates are ejected during cleaning and become embedded under the skin, in wounds or other open areas, such as eyes and ears.
- When compressed high-speed air is directed at oneself or another person, it can cause damage to eyes or eardrums. It can even create air bubbles in the blood when released near the skin.
- From exposure to excessive noise, causing hearing loss.
- When the compressed air line becomes loose or damaged and whips around uncontrollably.

To operate effectively, most pneumatic tools, including air guns, require air lines to operate at pressures of 80 to 120 pounds per square inch (psi). However, the Occupational Safety and Health Administration (OSHA) requires that if the end of the air gun is blocked, the

Other Ways to Mitigate Risks of Compressed Air

- For cleaning purposes, air guns must be equipped with chip guarding to help prevent chips and other particulates from flying toward the operator. These chip guards may be included in the nozzle or a safety shield may be attached to the equipment. More protection may be required in the form of barriers, baffles or screens to protect workers near the operator if they are exposed to flying chips or particles.
- Proper protective equipment should be worn when cleaning with compressed air. Goggles or a face shield should be worn over safety glasses to protect against flying particles. Appropriate gloves should be used to protect the operator's hands.
- Hearing protection should be worn when appropriate. Other considerations for reducing noise may include the use of noise-reducing air guns.
- Never use compressed air to clean dirt and dust off clothing or a body.
- Never direct the stream of compressed air toward another person.
- Ensure all hoses and components are rated to handle the supplied pressure from the compressor. Never use PVC for compressed air.
- Check air hoses and connections periodically for damage. Use only clamps designated for compressed air hose, and make sure they are tightened and secure and designed for the pressure to which they are subjected.
- Avoid allowing air hoses to lie on the floor where someone could trip on them or where they could be damaged by closing doors, vehicles or other equipment.
- Before making hose connections, make sure to shut off and relieve hose pressure. Do not crimp, couple or uncouple pressurized air hose.

static output pressure at contact must be no greater than 30 psi. This is to protect employees who may come in contact with the tip of the equipment.

If an air pressure reducer is not incorporated in line, then air guns used for cleaning purposes must come equipped with a relief device that will drop the pressure to under 30 psi if the air system becomes dead ended.

Further safety rules and regulations regarding compressed air use can be primarily found in OSHA Standards 29 CFR1910.242(b), Hand and Portable Power Tools and Equipment; and 29 CFR1910.169, Air Receivers.

COMPRESSOR AND COMPRESSED AIR CHECK LIST

ITEM	YES	NO	ACTION ITEM
Is compressor registered, inspected and currently certified per State of Minnesota requirements as required?			
Is compressor equipped with functioning pressure relief valve(s) and pressure gauge(s)?			
Are all safety valves and devices tested at regular intervals to determine whether they are in good operating condition?			
Is compressor operated and lubricated in accordance with the manufacturer's directions?			
Are air filters installed on the compressor intake and periodically checked and cleaned when necessary?			
Is the belt drive system completely enclosed to provide protection on all sides?			
Is the compressor air receiver periodically drained of moisture and oil?			
Is a sign posted to warn of the automatic starting feature of compressor (if it has one)?			
When using compressed air for cleaning, is pressure reduced to no more than 30 psi when dead ended?			
Are relief tips in use?			
Are compressed air tools that are used for cleaning chip guarded?			
Are compressed air hoses and connections secure and free from damage?			
Are compressed air hoses used and stored in a manner to prevent trip hazards and damage?			
Are employees who are using compressed air tools wearing appropriate personal protective equipment, such as eye and ear protection?			
Are employees instructed not to use compressed air for cleaning of clothes and skin?			

CONFINED SPACES

11

CONFINED SPACES

Confined spaces have potential to be dangerous places. Serious injuries and even death can result when workers enter a space with hazardous conditions and have difficulty getting out. Knowledge of these areas, and procedures for working in and around them, are important for the safety of employees.

Storage tanks, utility vaults, scale pits, air handling equipment, and crawl spaces are examples of possible confined spaces facility maintenance employees may encounter. It is important to understand what defines a confined space. More important is understanding and identifying what makes a space a more hazardous “permit-required” confined space and what should be done to make entry safe.

CONFINED SPACE

To be considered a confined space, an area needs to have the following three characteristics:

1. It is large enough that an employee may enter. If the space is not large enough to allow someone inside, it is not considered a confined space.
2. It has a restricted means for entry or exit. This would include small or drop-down openings, ladders or anything that makes it difficult to get into or more important out of the space.
3. It is not designed for continuous employee occupancy. The space is only occasionally entered and not used on a routine basis. Often this space has poor lighting or ventilation.

PERMIT-REQUIRED CONFINED SPACE

A permit-required confined space meets the criteria above, plus has at least one of the following characteristics:

A permit-required confined space may have a design that could trap an entrant.

- Contains or has the potential to contain a hazardous atmosphere. This could include a flammable, toxic or oxygen-deficient atmosphere. Consideration should be given to confined spaces that have the potential to develop a hazardous atmosphere. For example, when opened, it could fill with carbon monoxide or other gases from the surrounding environment.
- Contains a material that could engulf an entrant. This is typically a dry bulk material, such as salt or sand; however, trenches and excavation also present the possibility of collapse or flooding.
- Has a design that could trap an entrant. This includes sloping floors or inwardly converging walls.
- Contains other recognized safety or health hazards. Electrical, fall, heat, noise and moving parts hazards are all examples of conditions that qualify.

If an area qualifies as a permit-required confined space, these steps should be taken:

1. Employees must be notified of the presence of the permit-required confined space. This can be accomplished through the use of identifying signage and training.
2. Determination must be made whether the space will be made enterable or worked in by employees. If not, measures must be taken to prevent entry into the space. If the space needs to be entered, a series of procedures must be followed and incorporated into a written program. As required by OSHA, the written program must include all of the following:*
   - Implement necessary measures to prevent unauthorized entry.
   - Identify and evaluate permit space hazards before allowing employee entry.
   - Test atmospheric conditions in the permit space before entry operations and monitor the space during entry.
   - Perform appropriate testing for the following atmospheric hazards in this sequence: oxygen, combustible gases or vapors, and toxic gases or vapors.
   - Establish and implement the means, procedures and practices to eliminate or control hazards necessary for safe permit-space entry operations.
   - Identify employee job duties.
   - Provide and maintain, at no cost to the employee, personal protective equipment and any other equipment necessary for safe entry and require employees to use it.
   - Ensure that at least one attendant is stationed outside the permit space for the duration of entry operations.
   - Coordinate entry operations when employees of more than one employer are working in the permit space.
   - Implement appropriate procedures for summoning rescue and emergency services, and preventing unauthorized personnel from attempting rescue.
   - Establish in writing and implement a system for the preparation, issue, use and cancellation of entry permits.
   - Review established entry operations annually and revise the permit-space entry program as necessary.
   - Implement the procedures that any attendant who is required to monitor multiple spaces will follow during an emergency in one or more of those spaces.
3. Entry permits must be obtained and displayed outside of the permit-required confined space when work is being performed. These permits require that pre-entry precautions have been followed and are signed by the entry supervisor.
4. All employees required to enter the permit-required space must be trained to ensure that they have the understanding, knowledge and skills to work safely in this environment.
5. If rescue service personnel cannot respond in a timely manner (within three to four minutes) in the event of an emergency, trained individuals must be on hand with appropriate rescue equipment and valid first-aid, CPR certification. Any authorized person entering the permit-required space must also be equipped with a chest harness and retrieval line or other equivalent rescue gear.

Many serious injuries and deaths have occurred when unprepared individuals attempt to rescue someone from a permit-required confined space without proper training or equipment. Employees should be made aware that only trained rescue service personnel are to retrieve an individual.

Further safety rules and regulations regarding confined spaces can be primarily found in OSHA Standard 29 CFR1910.146, Permit-required Confined Spaces.

*From "Permit-Required Confined Spaces," OSHA.gov.

PERMIT-REQUIRED CONFINED SPACE (PERMIT SPACE) CHECKUP

ITEM	YES	NO	ACTION ITEM
Are all confined spaces identified as "permit required" or "nonpermit required"?			
If permit spaces are not meant to be entered, are they secured to prevent entry?			
If the confined space is below ground and near areas where motor vehicles will be operating, is it possible for vehicle exhaust or carbon monoxide to enter the space?			
Is the confined space checked for decaying vegetation or animal matter, which may produce methane or sulfurous gases?			
Are all permit spaces labeled as appropriate?			
Is there a written permit-required confined space entry program in place, and is it up to date?			
Are affected employees trained in permit space procedures?			
Is adequate illumination provided for the work to be performed in the permit space?			
Are appropriate tests performed to check for hazardous atmosphere or substances at various elevations in the permit space before entry?			
Are all impellers, agitators or other moving parts and equipment inside permit spaces locked out if they present a hazard?			
Are all lines to a permit space that contain inert, toxic, flammable or corrosive materials valved off, and disconnected or separated before entry?			
Is either natural or mechanical ventilation provided prior to permit space entry?			
Whenever combustion-type equipment is used in a permit space, are provisions made to ensure the exhaust gases are vented outside of the enclosure?			
Is the atmosphere inside the permit space frequently tested or continuously monitored during work?			
Is approved respiratory equipment required if the atmosphere inside the permit space cannot be made acceptable?			
Is all portable electrical equipment used inside permit spaces either grounded and insulated or equipped with ground fault circuit interrupter protection?			

CONFINED SPACE CHECKUP CONTINUED

ITEM	YES	NO	ACTION ITEM
Are entry permits displayed outside the permit-required confined space when work is being done inside?			
Is each authorized entrant equipped with a retrieval line and harness (or effective alternative) before entering the permit space?			
Is there a trained and equipped standby employee positioned outside the permit space whose sole responsibility is to monitor the work in progress, sound an alarm if necessary and render assistance?			
Are employees or emergency responders trained and equipped to respond to emergency situations in a timely manner?			

ELECTRICAL

12

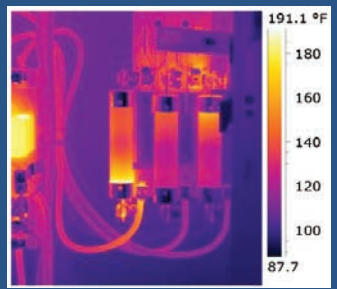
ELECTRICAL

Electrical incidents can cause serious injury, including burns, shock or death. In addition, they can cause fires and damage equipment. It is important not only for employees to work safely around electricity, but also to make sure electrical equipment is sound and used in the correct manner.

ELECTRICAL WORK

- Ensure that all equipment is de-energized and properly locked out prior to beginning work. Any equipment should be verified with appropriate test equipment to ensure that hazardous energy has been eliminated. Nearby equipment may still be energized; those working on electrical systems should identify energized and de-energized lines near the work area with which they could come in contact. See Chapter 31, Lock Out/Tag Out for more information.
- A shock risk assessment should be conducted on new or existing electrical equipment prior to conducting work. This assessment should identify hazards, estimate the likelihood of shock and determine any necessary personal protective equipment requirements. The results of the assessment should be documented.
- Be aware of the risk of arc flashes. An arc flash is an unplanned electrical discharge passing between conductors or from a conductor to ground resulting in an explosive effect capable of ejecting heated gases or molten metal fragments in an area around the flash.
  - An arc flash risk assessment should be conducted prior to work on electrical equipment. This assessment should identify hazards, estimate the likelihood of occurrence and potential injuries, and determine any necessary personal protective equipment requirements. The results of the assessment should be documented.
  - Establish safe working boundaries and prevent others from entering. Arc flashes can cover a wide area depending on the current and voltage. Nonqualified persons should be trained to avoid approaching energized equipment during maintenance.

Infrared Thermography



Infrared Thermography image

Consideration should be given to having an infrared thermography survey performed on electrical equipment. This survey can uncover abnormal or unexpected thermal patterns that can indicate a problem with the equipment. Caught early, these issues can often be repaired at a cost much less than if repaired after the equipment fails. More information about infrared surveys can be obtained by calling the HSB Inspection Hot Line toll free at **1.800.333.4677**.

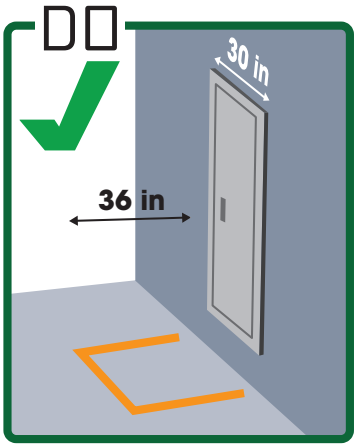
- When working with electrical equipment, use insulated or nonconductive tools to reduce the risk of arc flashes and electric shock.
- Use appropriate personal protective equipment for the work being done. This may include arc-rated clothing, gloves, insulated tools, arc-rated face shields or balaclavas and hearing protection.

QUALIFIED ELECTRICAL WORK

Under Minnesota Department of Labor and Industry rules, electrical work must only be done by individuals appropriately licensed or by a qualified and registered maintenance electrician supervised by a responsible master electrician who either works for or is contracted by the individual's organization.

More information regarding electrical work within the scope of a maintenance electrician and the supervision requirements of the responsible master electrician, are provided in the "Licensing Requirements for Employees Performing Electrical Maintenance Work on an Employer's Premises" from the Minnesota Department of Labor and Industry (*DLI.mn.gov*).

ELECTRICAL PANELS



Maintain minimum clear space around electrical breaker panels.

- The electrical breaker panel should be easily accessible at all times in the event of emergency. A clear space of not less than 36 inches deep and 30 inches wide (or the width of the electrical equipment, whichever is greater) should be maintained. One method of maintaining this clear space is either to tape or paint a stripe on the floor around the electrical panel to mark the above dimensions. There should also be a clear, direct path to the panel.
- The panel should have a closed cover. The panel cover should be able to open at least 90 degrees without obstruction.
- The panel should have an index identifying each individual circuit breaker. The labels should be

legible and easily understood. This index is typically found on the inside face of the cover.

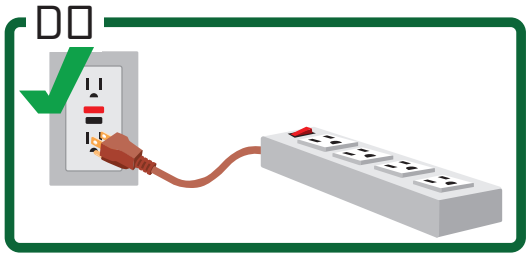
- There should be no other openings or missing knock-out plugs on the panel box that would allow contact with the inside wiring.
- There should be no missing breakers or other openings in the faceplate that would allow contact with panel wiring.
- When tripping or resetting breakers, employees should face away from the panel and trip the breaker with an outstretched arm. While arc flashes are rare, this precaution helps mitigate potential injury.
- If the electrical panel has not been inspected in the past 10 years, it would be prudent to have a certified electrician check the equipment to ensure that circuit breakers, fuses and switch gears have no corrosion, evidence of arcing, excess wear or damage.

EMERGENCY DISCONNECTS

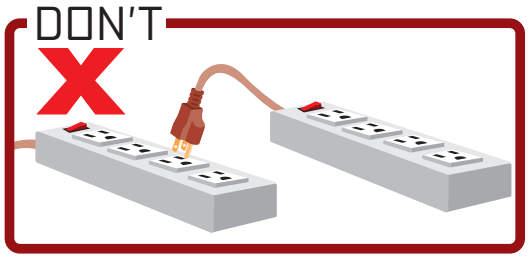
- Access to emergency disconnects must remain clear and accessible for people to disconnect the power in the event of an emergency. A best practice would be to maintain a clear area 36 inches in front of and 30 inches wide around the disconnect switch (similar to electrical panels).
- Avoid hanging objects on disconnect switches; switches must be clearly visible.
- Disconnect switches should be capable of accepting a lock to lock out a piece of equipment properly.

OUTLETS

- Outlet receptacles should show no signs of electrical burns or other damage. They should be secure in their electrical box and fully covered with a faceplate to protect against accidental contact with a “hot” wire.
- Outlets should be GFCI (ground fault circuit interrupter protected) if located near water or a water source. The Occupational Safety and Health Administration (OSHA) requires GFCI protection in bathrooms, rooftops and other locations where water may pose a danger when using equipment plugged into the outlet. A GFCI-protected outlet or circuit quickly opens the circuit, cutting power, when a minute change of current difference is detected. GFCI outlets should be tested periodically.
- Outdoor outlets should be protected against water by being equipped with a splash-proof cover.



Plug power strips into wall outlet.



Do not plug power strips into each other.

EXTENSION CORDS/POWER CORDS/POWER STRIPS

- All power strips or extension cords should be plugged directly into fixed outlets and not into each other. Plugging power strips, surge protectors or extension cords into one another, known as daisy chaining, increases the risk of fires or power shorts by overloading the equipment.
- Extension cords are to be used for temporary work only. They are not meant to be used as a permanent source of electricity. If an extension cord is required, it should not be in place for more than 90 days.
- Use extension cords that are the correct size or rating for the equipment. The diameter of the extension cord should be the same or greater than the cord of the equipment in use.
- Avoid using residential extension cords or power strips in public entity buildings.
- Only use electrical cords rated for outdoor use when using a cord outside.
- Keep electrical cords away from areas where they may be pinched and areas where they may pose a tripping or fire hazard.
- Only use electrical cords with the grounding pin (round prong below two flat prongs on a plug) intact. The grounding pin should never be removed.
- Electrical cords should be inspected before use to ensure that insulation is not cut or damaged. Discard damaged cords, cords that become hot or cords with exposed wiring.
- Extension cords that are 12 gauge or larger may be repaired only if spliced so that the splice retains

the insulation, outer sheath properties and usage characteristics of the cord being spliced.

- Do not unplug an electrical cord by pulling on the cord; pull on the plug.
- Consider using a cord strain relief device on areas of the cord that are under tension.
- Extension cords should be UL or another nationally recognized testing laboratory approved for their intended uses.
- When fans and other appliances are used on or near wet floors, ensure that they have grounded power cords in good condition.

TROUBLE LIGHTS

Using trouble lights to illuminate work under gas-powered vehicles or equipment can present several fire hazards. Leaking fuel vapors may accumulate in high concentrations in an unventilated service pit and ignite with a spark generated when an electric cord is plugged into or unplugged from a receptacle on the trouble light itself. A spark caused by an arc of a light's metal shield contacting the vehicle's electrical system could also ignite fuel vapors. Fires can be caused by flammable liquid dripping onto a hot incandescent bulb.

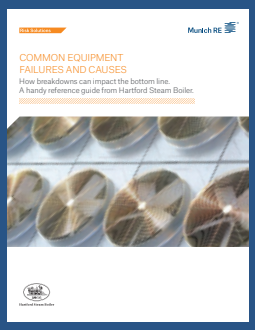
To mitigate these fire exposures, trouble lights used under vehicles should include the following features:

- Enclosed light bulb
- Nonmetallic shield
- Nonsparking electrical switches
- No outlet receptacles

Further safety rules and regulations regarding electrical equipment can primarily be found in OSHA Electrical Standards 29 CFR1910.303, Electrical, General; 29 CFR1910.304, Wiring Design and Protection; 29 CFR1910.305, Wiring Methods, Components and Equipment for General Use; and Minnesota Department of Labor and Industry publication "Licensing Requirements for Employees Performing Electrical Maintenance Work on an Employer's Premises."

Equipment Breakdown

It is better to prevent failures from happening in electrical equipment than to have a breakdown. Hartford Steam Boiler, the provider of MCIT members' equipment breakdown coverage, details the common causes of equipment breakdowns and how that affects the bottom line in its pamphlet Common Equipment Failures and Causes, available through MCIT loss control consultants at **1.866.547.6516** or at *MunichRe.com/HSB.*



ELECTRICAL CHECK LIST

ITEM	YES	NO	ACTION ITEM
Electrical Work			
Are employees working on electrical equipment trained, licensed and authorized?			
Are electrical devices de-energized and locked out prior to maintenance per lock out/tag out instructions?			
Are these conditions verified with appropriate testing equipment and are other nearby energy sources tested that employees could contact?			
Has a shock risk assessment been conducted and documented on the electrical equipment prior to conducting work?			
Are employees working on electrical equipment aware of the risks of arc flashes?			
Are appropriate boundaries established when the risk of arc flash is present?			
Is staff trained not to cross the barrier without authorization and appropriate protective equipment?			
Are tools insulated or nonconductive when working on electrical equipment or systems?			
Is the appropriate personal protective equipment available for use when working on electrical equipment or components?			
Electrical Panels			
Is the area in front of electrical panels clear of materials to a distance of 36 inches and 30 inches wide or the width of the panel, whichever is greater, while maintaining a clear, direct path to the panel?			
Does the panel have a closed cover?			
Does the panel identify each breaker with its corresponding coverage area?			
Is the panel free of openings exposing electrical components? This includes missing breakers or knock out plugs.			
Emergency Disconnects			
Are electrical disconnect switches and the area around them clear and unobstructed?			
Are emergency disconnects free of hanging objects?			

ELECTRICAL CHECK LIST CONTINUED

Outlets			
Are outlets free of damage and fully covered with a secure faceplate?			
Are other electrical enclosures, e.g., junction boxes and switches, covered with tight-fitting plates?			
Are outlets within 6 feet of water sources or in wet areas GFCI protected?			
Are outdoor and wash bay outlets GFCI protected and equipped with splash-proof covers?			
Are all GFCI-protected outlets tested periodically?			
Electrical Cords/Power Strips			
Are extension cords or power strips plugged into fixed outlets, rather than into each other?			
Are extension cords used for temporary work only (not in place longer than 90 days, not attached permanently)?			
Are extension cords approved by UL or another nationally recognized testing laboratory and rated for their intended uses?			
Are electrical cords stored in a neat, orderly manner and is care taken not to pose a tripping hazard?			
Are electrical cords free of pinching or crushing hazards?			
Are electrical cords free of damage caused by doors, equipment, vehicles?			
Are electrical cords free of damage?			
Are plug grounding pins intact?			
Trouble Lights			
Are trouble lights used under vehicles equipped with a nonmetallic shield, nonsparking electrical switch, enclosed light bulb and without an electrical outlet?			

EMERGENCY ACTION PLANS

13

EMERGENCY ACTION PLAN

In the event of fire, severe weather, medical emergencies, gas leaks and other emergencies, employers must have procedures to evacuate personnel quickly and safely. OSHA requires organizations with more than 10 employees to have a written emergency action plan that must be communicated to all employees.

If an emergency action plan is already in place, the organization must ensure that the plan includes specific procedures for employees at all locations, including those off site.

Emergency action plans must include the following procedures for all potential emergencies:

- Procedures for reporting a fire or other emergency
- Procedures for emergency evacuation or sheltering
- Procedures for employees who remain to perform critical operations before they evacuate
- Procedures to account for all employees after evacuation
- Procedures for employees performing rescue or medical duties.

DEVELOPING AN EMERGENCY ACTION PLAN

Establish gathering points after an evacuation or other emergency.

As a result of these requirements, creating an emergency action plan for an organization requires input from a variety of departments. Other departments or offices, such as law enforcement, also have their own plans for locations such as jails. In many of these cases, facility/maintenance staff should be involved in the creation of the plan or be aware of any of their responsibilities under the plan.

Best Practices

Some best practices and considerations for emergency action plans include:

- Methods to notify proper authorities (fire, rescue, etc.). Consider methods to provide alerts for events, such as fires, that provide automatic notification to emergency responders to help prevent damage during nonbusiness hours, e.g., a fire occurs on a weekend or in a location where people are rarely present.
- Notification for employees when an emergency occurs. This can be as simple as audible alarms with visual cues or other means. Mass notification systems, such as "code red", can help alert employees in the field or off site, while audible and visual alarms are helpful for those with sensory impairments, such as blindness or deafness.
- Notification of tenants and the public. With some emergencies, such as fires or severe weather, alarms or sirens are commonly used. However, for medical emergencies, security threats or other emergencies, there may need to be another system to alert people of hazards. Some popular means include using a public address system and designated code words, call and contact trees and word of mouth to those nearby.
- Maintaining a clear list of responsibilities for those who authorize and coordinate emergency actions. Designated people should be responsible for declaring an evacuation or to take shelter, and others to coordinate the response to ensure people go to the correct areas.
  - Establishing a chain of command ahead of time is helpful in these situations to avoid confusion during an emergency.
- Identifying shelter locations, if available, prior to any events, particularly for severe weather.
- Developing emergency procedures with regards to evacuation or moving to a shelter, which may include rules to discourage running, leaving belongings behind, locking computers before leaving the desk and other best practices to help avoid potential injury.
- Determining exit routes for all locations within the facility. Give special attention to maintaining unobstructed paths for egress. For more information about exit routes, see Chapter 16.
- Meeting locations are vital when trying to account for everyone from a particular area. Meeting locations should be a safe distance from the facility and not hinder roadways or routes for first responders.
  - Secondary points may be required if primary meeting locations are unavailable.
- Assigning individuals responsible for conducting a head count at the evacuation gathering site. Consider maintaining a copy of the staff schedule that can be referenced at an evacuation site to determine if anyone missing may be still inside the facility. Staff contact numbers may also be prudent to maintain to attempt to reach those who may not be at the evacuation location.
- Methods and instructions to assist those with special needs or visitors/contractors during an evacuation. This may include directing individuals to designated areas of refuge.
- Identifying utilities and other equipment requiring shutdown or protection during an emergency. The locations of these utilities and who is responsible for shutdown are commonly added to emergency action plans.
- Establishing contact numbers for outside agencies, such as hospitals, fire stations or other first responders, to be called to provide emergency assistance.

- Identifying the location of emergency safety devices, such as first-aid kits, fire extinguishers, automatic external defibrillators (AEDs), emergency eyewash stations or other equipment. These locations are often listed on emergency action plans, making it easy for employees to find them. Conveying emergency action plans to employees upon orientation and repeated whenever the plan changes or when an employee's responsibility under the plan changes.
- The name and job title of the employee(s) who may be contacted if other employees need more information or explanation concerning procedures or duties under the program.
- Updating the plans when responsibilities change, procedures change or if remodeling changes parts of the egress.

MULTIPLE EMERGENCY ACTION PLANS WITHIN THE SAME FACILITY

As OSHA requires employers to create emergency action plans, many of the tenants within any given facility may have their own emergency action plans. This can cause some problems if the plans conflict, or each instructs employees or visitors to the same shelter area, which then lacks capacity.

Other issues can emerge with regard to communication or reporting emergency situations. Plans often include guidance to alert employees and emergency personnel, but may fail to alert those within the same facility. It is important to be aware of any potential shortcomings with multiple emergency action plans within the same facility. To this end, it is a good idea to invite tenants when conducting drills or practices. This helps identify problems with each other's plans.

EMERGENCY GENERATORS

Emergency generator

In the event of a power outage, it is important that equipped emergency generators are well-maintained and ready to run. Facility managers should follow manufacturer guidelines and instruction manual recommendations to keep the equipment functioning.

It is important that facility managers maintain at least two copies of the manuals both near the machine and elsewhere to refer to and become familiar with them.

Any special tools or testing devices, as well as any personal protective equipment, such as hearing protection, required for routine maintenance should also be present to be used if needed.

Any maintenance or testing work should be documented to serve both as a record and as a tool to help identify problems. For further information, see "Inspection and Testing of Emergency Generators" from the Minnesota Department of Health.

Further safety rules and regulations regarding emergency action plans can be primarily found in OSHA Standard 29 CFR1910.38, Emergency Action Plans.

EMERGENCY ACTION PLAN CHECKUP

ITEM	YES	NO	ACTION ITEM
Is a written emergency action plan available, detailing all procedures for all sites and employees?			
Is the emergency action plan available to employees to review?			
Are all employees trained on the emergency action plan and retrained when the plan changes or their responsibilities under the plan change?			
Do all agencies or tenants within the facility have emergency action plans that do not conflict with the plans of the owner of the facility?			
Are methods in place to inform employees, tenants and the public about emergencies?			
Are all emergency generators within the facility maintained according to manufacturer guidelines, and are these maintenance or repair records documented?			
Does each employee know his or her designated gathering area and secondary area if denoted?			

EMPLOYEE RIGHT TO KNOW: HAZARDOUS SUBSTANCES

14

EMPLOYEE RIGHT TO KNOW

Handling hazardous substances is part of the daily duties for many facility/maintenance employees. Pesticides, solvents and other cleaning agents are just some of the examples of chemicals that can expose employees to harm if not handled properly. The Occupational Safety and Health Administration (OSHA) requires that a safety program be in place to help protect employees who are exposed to dangerous materials.

EMPLOYEE RIGHT TO KNOW (ERTK)

Minnesota OSHA requires that employers have a formal, comprehensive written program that details how hazardous substances and other harmful physical agents, such as heat, noise, radiation and infectious pathogens, are identified and how employees will be trained to work safely with and around them.

The program must include all of the following:

- An inventory of hazardous substances and/or agents in the workplace.
- Identification of employees who are routinely exposed to these substances or agents.
- A system for obtaining and maintaining written information about these substances or agents.
- Methods for making ERTK materials, including safety data sheets, readily accessible to employees and other exposed workers (e.g., independent contractors) in their work areas.
- A plan for providing and recording pre-assignment and annual employee training.
- Implementation and maintenance of a labeling system and other warning methods.

SAFETY DATA SHEETS

A key component to the Employee Right to Know program is safety data sheets (SDS). Each substance has a corresponding SDS that is made up of 16 categories, detailing information about that substance. This information includes the chemical composition, hazard identification, first aid, handling, storage and other details pertaining to the substance.

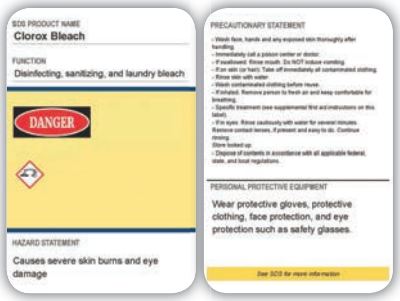
All distributors of these materials are required to make available corresponding safety data sheets, but it is the duty of the employer to maintain a copy for each substance used in the workplace. These SDS need to be retained for 30 years even if the material is no longer in use.

Whether SDS are kept in hard copy form in a notebook or maintained in an electronic version, they must be easily accessible to employees. Special consideration should be given to SDS access for employees working after normal operation hours, contracted individuals, and password protected computers when using online information.

Missing or outdated safety data sheets can often be replaced by obtaining them directly from the chemical supplier or from the manufacturer. They can also be found via Internet searches.

CONTAINER AND PIPE LABELING

Purchased chemical products should already come with a label that provides hazard warnings and other related health information. However, when a product is moved from its primary container to a secondary, workplace container, that secondary container needs proper labeling, too.



Labeling on secondary containers for chemicals must be clear about the substance and its hazards.

The labeling on secondary containers must provide employees with an immediate, clear understanding of the primary health and/or physical hazard(s) of the hazardous substance in the container through the use of words, pictures, symbols or any combination of these elements. Care must be taken to assure that these labels do not fade or get washed out.

If an employee keeps control of a secondary container and uses its entire contents or returns the remaining chemical back to the primary container, this labeling is not required. However, if this workplace container is put aside and not kept in the control of the employee, labeling is necessary.

Clearly labeling pipe contents can help identify leaking substances.

Many buildings also have a maze of piping throughout the facilities carrying water at different temperatures, gas, waste water and other materials. Clearly labeling the contents of pipes can help with identifying leaking substances and aid with closing proper valves to minimize the effects of a leak.

TRAINING

Training is required to make employees aware of:

- Hazards to which they may be exposed, to know the short- and long-term effects of exposure to substances or agents, and how to protect themselves from exposure (e.g., appropriate personal protective equipment and/or clothing, etc.)
- How to find, read and use information on safety data sheets, labels or other reference materials.
- Appropriate work practices. Employers should enforce these work practices.

Employee Right to Know training is required for employees:

- When they are assigned to a workplace where they may be routinely exposed to a hazardous substance, harmful physical agent or infectious agent.
- When any new or additional hazardous substance or agent is introduced into the workplace and there is routine exposure.
- When information on a safety data sheet changes.
- When a hazard changes.
- Annually as a refresher.

Records of ERTK training must be retained for a minimum of three years but may be longer, depending on an organization's retention rules.

Further safety rules and regulations regarding the Minnesota Employee Right to Know program and additional details about emergency eyewash/shower stations are available at the Minnesota Department of Labor and Industry's website, *DLI.mn.gov*.

Emergency Eye Wash/Shower Station

If employees have potential splash exposure to corrosive chemicals, an emergency eyewash station and/or shower must be installed within 55 feet of the exposure area. At this distance, an employee should be able to reach the station within 10 seconds to rinse eyes or skin after a chemical splash.

Corrosive chemicals can be found in boiler additives, batteries, cleaning solutions and other products. If the chemical product has an indicated pH of 0-2 or 11-14 on its corresponding safety data sheet, it can be assumed to cause significant eye irritation and possibly permanent damage or blindness. Some products with a pH between these values may still cause damage to eyes or skin; it is important to review the label or SDS for every chemical product in use.

If chemical products contain highly corrosive chemicals and indicate a strong acid (pH less than or equal to 1) or base (pH greater than or equal to 12), American National Standards Institute recommends an eyewash station be positioned immediately adjacent to the area where potential splashes of this chemical may occur. Consult the SDS for any specific details related to these chemicals.

Emergency eyewash and shower stations can be plumbed in or installed as stand-alone units. Plumbed stations should include a mixer to control temperature to a tepid range between 60 degrees and 100 degrees Fahrenheit. If the water temperature is beyond this range, an affected employee may not rinse long enough to be effective.

Plumbed stations must be evaluated weekly to ensure cleanliness, easy access and that all components are in good, working order. During these weekly inspections, the water must be run long enough to verify operation and to clean the lines of potentially harmful bacteria or other contamination. Inspection of portable or self-contained units should follow the manufacturer's instructions for content and frequency of inspection. If the manufacturer lacks guidelines on maintenance or frequency, checks should be done periodically to verify the level of solution, the flushing solution is changed per manufacturer guidelines, the unit is not blocked and that commercially available solutions for eye flushing are used. The weekly inspections for plumbed stations and periodic inspections for stand-alone stations should be recorded on a water resistant tag near the unit.

Emergency eye wash shower station

Given these requirements, it may be prudent to switch to safer alternative chemicals that do not require the presence of an emergency eyewash or shower station. Organizations such as the Environmental Protection Agency (EPA) offer certifications, such as the Safer Choice program, that feature less hazardous alternative chemicals. Vendors can also help potentially supply less hazardous chemicals.

SDS for any new chemicals should be reviewed prior to removing or determining the need for emergency eyewash stations.

EMPLOYEE RIGHT TO KNOW CHECKUP

ITEM	YES	NO	ACTION ITEM
Is a written Employee Right to Know program reviewed annually and as necessary updated?			
Is the ERTK program available for all employees to see?			
Is there an inventory of workplace hazardous materials and harmful agents?			
Is there a record of employees who are routinely exposed to hazardous materials, substances and harmful agents?			
Is ERTK information, including safety data sheets, available and current on all hazardous materials and agents?			
Do all employees and contracted individuals have easy access to ERTK information in written or electronic format?			
Is training conducted and recorded on the safe use of hazardous substances and safely working around harmful agents for new employees before being assigned job duties?			
Is ERTK refresher training conducted and recorded annually?			
Are all primary and secondary containers of hazardous substances labeled to provide clear understanding of the product and its related safety information?			
Are any corrosive chemicals used that would require the installation of an emergency eye wash and/or shower station?			
If an emergency eye wash/shower station is installed: • Is the flushing fluid temperature maintained between 60 degrees and 100 degrees Fahrenheit?			
• Is the access path to the station kept clear and unobstructed?			
• Are weekly inspections conducted of plumbed units with periodic inspections of self-contained units to ensure the cleanliness and working order of the station?			
• Are weekly inspections recorded and kept in good condition near the station?			

ERGONOMICS

15

Facilities/maintenance employees often perform tasks that involve forceful lifting, awkward body postures, pushing and pulling of heavy or bulky objects, vibration, or prolonged repetitive motion. Ergonomic strategies should be employed to fit and prepare an employee better for these tasks and help to reduce injury.

STRETCHING

No baseball player would start a game without an extensive warm-up involving stretches. The demands on building maintenance employees may not be the same as that of baseball players, but many tasks can put strain on their musculoskeletal system.

Simple stretching exercises before performing tasks that demand a great deal of physical effort can better prepare muscles for the job. Only use stretching techniques that are safe and work for each individual. Stretching should never reach the point of experiencing pain.

TAKING MICROBREAKS

When performing prolonged work, it is important to take microbreaks. These short breaks do not have to be more than a minute but should include time to stretch and relax. This allows the body time to recover and brings blood and oxygen to fatigued muscles and joints. Microbreaks should be regularly scheduled every 20 minutes or so during prolonged exertion.

USING SAFER LIFTING TECHNIQUES, ELIMINATING LIFTS

Handling heavy materials is common during the workday. Employees should focus attention on proper body mechanics when lifting, shoveling or handling heavy tools and equipment.

Proper lifting technique prevents injuries while shoveling snow.

Safer lifting techniques include:

- Standing close to the load with solid footing.
- Bending at the knees and not the back.
- Keeping the back straight.
- Lifting with the legs.
- Contracting stomach muscles during the lift.
- Holding the load close to the body.
- Avoiding twisting or other awkward movements.
- Asking for help if the load is too heavy, awkward or long.
- Using handles or carrying tools when available.

If possible, consider using equipment designed to ease or eliminate lifting or carrying. A movable hoist or a dolly can make moving materials and lifting less strenuous. Carts can help move objects around in offices. Even a properly sized shovel handle can help reduce the amount of bending needed.

A cart makes awkward or heavy items easier to move.

When storing materials, consider how they will be lifted off the shelf or pallet rack. If the materials are meant to be manually lifted from a shelf, positioning is important to reduce strain. Heavier objects should be stored between knee and shoulder height. This will reduce the amount of reaching or lifting required to move that object. Only lighter objects should be stored above shoulder height.

REDUCING VIBRATION

Regular exposure to vibration can create tingling and numbness in fingers, hands and arms. Prolonged exposure can result in a condition known as vibration syndrome.

Measures should be taken to reduce vibration in power tools and equipment. Among the types of equipment that pose vibration hazards are sanders, grinders, saws and other power tools or equipment.

Both administrative and engineering controls can be used to mitigate vibration. If possible:

- Alternate work involving vibration with tasks that do not, or allow rest breaks to reduce continuous exposure.
- Check tools before use to make sure they are in good working condition and operate without excess vibration.
- Keep cutting tools sharp. Dull blades can create more vibration.
- Let the tool do the work; maintain only enough grip to operate equipment safely and effectively. Do not force a tool more than is needed.
- Wear vibration-reducing gloves. They not only help decrease vibration, they also keep hands warm.
- Add anti-vibration tape to handles of power tools.

PLANNING AHEAD

Thinking about the different requirements of a coming task can help identify alternative ways to do the job more safely. For example:

- If the task requires handling large or awkward objects, consider ways to do this more safely and with less strain. Will there be obstacles in the path of movement or uneven ground? Is there equipment that can help move these objects more safely?
- If the task requires hand tools, are they the best for the job? Do they fit the employee's hand comfortably? Can they be used while maintaining a straight wrist?
- If power tools are used, can they be supported to relieve some force? Is the working surface at a height that reduces back strain or overextension of the arms?
- Does the task require squatting or kneeling? Consider using personal protective equipment, such as knee pads, to reduce impact from hard surfaces. Could a stool be used while performing this job?

More information about ergonomics can be found in the OSHA publication No. 3125, "Ergonomics: The Study of Work" found at *OSHA.gov*.

Job Hazard Analysis

Job hazard analysis can be an effective way to plan a job by breaking it down into separate actions. Each of these actions should be looked at from an ergonomic and safety perspective. Listing the exposures of each action can then help identify ways to remedy the hazards. **For more information about job hazard analyses, please see Chapter 29.**

ERGONOMICS CHECKUP

ITEM	YES	NO	ACTION ITEM
Is task rotation or are rest breaks encouraged when employees are engaged in a repetitive activity for a prolonged period?			
Are safe stretching exercises encouraged before engaging in strenuous activities?			
Are tools the proper size and shape to fit the individual employee's hands?			
Are tools used during hand-intensive tasks designed so the wrist can remain straight?			
Is equipment vibration mitigated through the use of anti-vibration gloves or tape?			
Are cutting tools kept sharp to minimize vibration?			
If tasks require kneeling, are knee pads or cushions provided?			
Can equipment be used to reduce kneeling?			
If tasks require squatting, can equipment be used to reduce squatting?			
Are employees using safe lifting techniques?			
Is equipment available to help minimize strain when lifting heavy objects (e.g., carts, etc.)?			
Are materials stored with ergonomics in mind (e.g., heavy objects between knee and shoulder height)?			
Has a job hazard analysis been performed on each common task?			

EXIT ROUTES

16

In the event of an emergency, employees need clear and defined exit routes to move quickly to safety. Exit routes must be free of hazards and maintained to allow unhindered movement. Special care should be taken to ensure adequate lighting, signage and safe egress.

Keep in mind that some jurisdictions may have their own codes for exit signage and illumination. Consideration should be given to discussing these topics with the local fire marshal.

LIGHTING

Emergency lighting must be tested monthly and yearly.

Exit routes, including stairs, aisles, corridors and ramps, must have emergency lighting that stays illuminated for a period of at least one and a half hours after a power failure.

Emergency lighting must be tested per the National Fire Protection Association (NFPA) standards. These standards define both monthly and yearly testing requirements:

- For battery-powered emergency lights, there must be monthly test to ensure a full 30 seconds of illumination. This test often reveals a battery that will not hold a charge or a bad bulb.
- An annual test must be conducted where lights are activated for a full hour and a half to simulate a long-term power outage event.
- If emergency lighting is activated by a generator, follow all of the manufacturer's recommended testing procedures.
- All tests should be documented and retained.

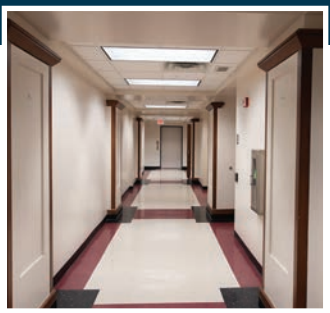
EXIT SIGNS

- Readily visible exit signs must clearly indicate the path of egress travel to exits and within exits where it is not immediately visible to the occupants.
- Decorations, furnishings and equipment should not block the line of sight to exit signs.
- If not internally lit, exits signs must have outside illumination to ensure they are legible in both normal and emergency exit lighting modes.

EXIT DOORS

- Exit doors should be equipped with fire exit hardware that make the doors easy to open in an emergency. This equipment typically consists of bars or strips rather than knobs or handles. "Panic" hardware is required for some occupancies. Consult the Life Safety Code (NFPA 101) or the local fire marshall to determine installation.
- Exit doors must open outward, away from the structure.
- Exit route doors must remain unlocked from the inside. Any devices or alarms equipped on the door must not restrict use of the exit route if the device or alarm fails.

EXIT ROUTES



- Exit routes must have lighting adequate for employees with normal vision.
- Exit access—the portion of the exit route that leads to the exit—must be at least 28 inches wide. Ensure that materials or other equipment does not reduce this clearance.
- Ensure that exit routes are unobstructed by materials, equipment, locked doors or dead-end corridors. If exit stairs continue below level of exit discharge, they should be equipped with a gate or other means to discourage continued travel in the event of an emergency.
- Ceilings of exit routes must be at least 7 feet, 6 inches high.
- Exit routes should be kept free of flammable, combustible or hazardous materials and decorations. Exit paths should avoid or be shielded from high-hazard areas.
- If doors or passages could be mistaken as part of an exit route, they should be marked with a "not an exit" sign or signage that defines the room, e.g., "storage closet."
- Exit discharges must lead directly outside or to a walkway, street or other open space with access to the outside. In addition to keeping exit doors clear on the inside, care should be taken to ensure they are not blocked by snow or other materials on the outside.
- Exit routes must be maintained during construction, repair and alterations.

Employees must be made aware of evacuation procedures upon employment. If an egress is changed or modified, this information and alternate evacuation procedures must be conveyed to affected employees. More information about Emergency Action Plans can be found in Chapter 13.

For more information regarding illumination levels, sign requirements, exit route design and other detailed exit route information, refer to the NFPA 101, Life Safety Code or the OSHA website under Emergency Exit Routes.

Fire Doors

The opening between the exit access and the exit must be protected by a self-closing, approved fire door that remains closed or automatically closes in an emergency. These doors should not be propped open.

Fire doors may also be found protecting rooms where the risks of fires are high, such as boiler or electrical rooms. These too should remain closed and not be propped open.

Fire doors have tags, such as the one at right, that show the fire resistance rating for the door. Care shold be taken not to paint over or otherwise obscure these tags.

Fire door tag

EXIT ROUTES CHECK LIST

ITEM	YES	NO	ACTION ITEM
Lighting			
Are exit routes equipped with emergency lights?			
Are battery-powered exit route emergency lights tested at least monthly for at least 30 seconds?			
Are all emergency lights tested at least annually for a full 1.5 hours?			
Exit Signs			
Are exits clearly marked, legible and visible?			
Are exit signs self-illuminated or illuminated by outside sources?			
Exit Doors			
Are exit doors equipped with fire exit hardware?			
Do exit doors open outward, away from the structure?			
Are exit route doors left unlocked from the inside?			
Exit Routes			
Are exit routes adequately lit?			
Are exit routes free of obstructions with a clear path at least 28 inches wide, both inside and out?			
Are ceilings at least 7 feet 6 inches high in exit routes?			
Are exit routes free of flammable, combustible and hazardous materials?			
Are doors that could be mistaken for exits labeled to prevent people from trying to leave through them?			
Are exit routes protected with fire-rated doors, and are these doors either closed or self-closing?			
Are fire doors not propped open?			
Are exit routes maintained during renovations, construction and maintenance?			

FALL PROTECTION

17

Facility maintenance operations may require the use of stairways, mezzanines or elevated platforms and loading docks, as well as include roof inspection and maintenance or other operations above ground level. All of these present potential fall hazards to employees.

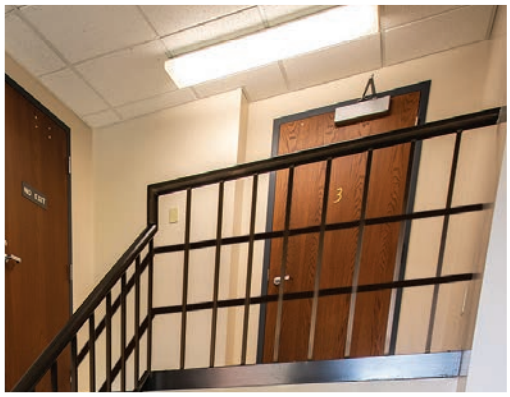
FALL PROTECTION OPTIONS

To protect employees from falls of 4 feet or more along an unprotected edge, OSHA previously required the installation of a standard guardrail. With the adoption of the OSHA walking-working surfaces standards, employers may install a standard guardrail, safety net system or personal fall protection system. All devices should be used according to manufacturer specifications.

GUARDRAILS

If this option is used, guardrails should be at a height no lower than 39 inches to 45 inches from the floor and include a midrail halfway between the top edge of the guardrail and the walking/working surface. If there is a risk of falling objects, a toeboard or screen should be installed.

Guardrails must be capable of supporting at least 200 pounds of force downward or outward, though more may be necessary when considering the combined weight of employees and equipment.



Guardrails must be capable of supporting at least 200 pounds of force.

PERSONAL FALL PROTECTION SYSTEMS

These may include personal fall arrest systems, travel restraints or positioning systems. Personal fall arrest systems feature a harness; connector; and lanyard, lifeline, deceleration device or combination of the three.

Any damaged or defective equipment must be removed from service.

Body belts are prohibited from use as a personal fall protection system. Personal fall protection systems are required to be connected to a secure anchor point.

- Anchorages for personal fall protection must be independent of platforms to support employees or work surfaces and follow manufacturer guidelines.
- Anchors must be capable of supporting at least 5,000 pounds per employee attached.
- Anchor locations must prevent employees from free-falling distances of 6 feet or more and may need to be placed overhead.
- Anchors for mobile work platforms or powered industrial trucks must be attached to an overhead member of the platform at a point located above and near the center of the platform.

When using personal fall protection systems, the system must be inspected before every shift.

SAFETY NET SYSTEMS

If this option is used:

- Employers should follow the manufacturer's recommendations and ensure sufficient clearance beneath the system to prevent contact with objects or the ground below it.
- Nets should be visually inspected at least once a week for wear, damage and deterioration. Defective nets should not be used.
- Any materials, scraps, equipment or other items in the net should be removed as soon as safely possible.
- All inspections and corrective actions taken as described above should be documented and retained.
- Employers are required to provide for prompt rescue should an employee fall.

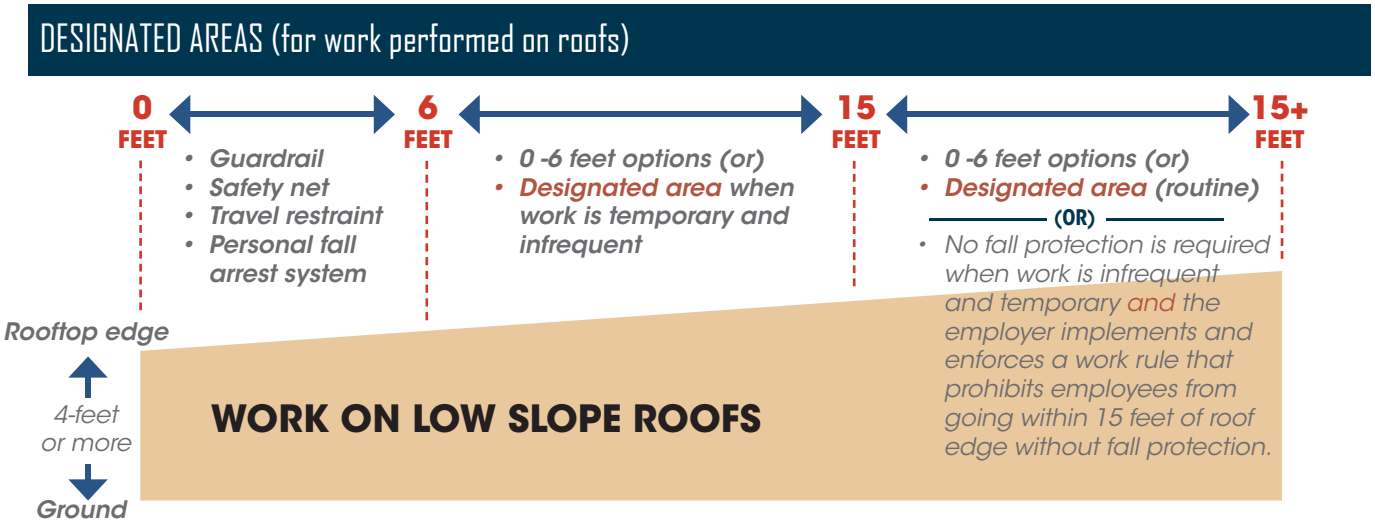
ROPE DESCENT SYSTEMS

Rope descent systems are typically used during window washing activities and involve individuals tied off to anchor points and suspended with a harness and ropes. Often, window washing services are contracted.

Facility managers are required to inform the employer or contractor in writing that the anchors have been identified, tested, certified and maintained so it is capable of supporting 5,000 pounds of force in any direction for each employee attached. These anchor points must be inspected by a qualified person annually and certified by a qualified person at least every 10 years.

When choosing a contractor to clean windows or perform other services, it is recommended to obtain a written contract. For more information about contracts, see Chapter 27, Independent Contractors.

Window washers use rope descent safety system.



For work performed on a flat or low-slope rooftop, fall protection may not be required, depending on the frequency of the work and the distance it is carried out from the fall edge. The work could be done in a "designated area." A designated area is a well-defined part of the roof surface delineated by a warning line in which employees may perform work without additional fall protection.

Any work that is done less than 6 feet from the roof edge requires the use of conventional means of protection as noted above.

For routine work performed between 6 and 15 feet, fall protection as noted above must be in place. However, for temporary or infrequent work performed between 6 and 15 feet from the fall edge, a designated area may be used.

Identifying infrequent or temporary work requires a bit of a judgment call. As a general rule, temporary work should be fast, less than one to two hours or less time than is needed to install or set up conventional fall protection. Infrequent tasks are those done annually, quarterly, monthly or as needed, such as during equipment breakdown. Examples of temporary and infrequent tasks include changing filters in rooftop HVAC systems, annual maintenance or servicing of equipment, or caulking and resealing flashing around a skylight.

If a designated area is used for temporary or infrequent work, the warning line must be set up at least 6 feet from the roof's edge to serve as a warning that a worker is nearing an unprotected edge.

For routine work performed more than 15 feet from a roof edge, no fall protection other than a designated area is required. The warning line must be set up at least 15 from the edge. For temporary or infrequent work, no designated area is necessary as long as a rule is in place prohibiting workers from going within 15 feet of the roof edge without fall protection.

When using designated areas, employees must be trained to understand the limitations of the protection and not to go beyond the delineation. The area must be clearly marked by a rope, wire, tape or chain that is both highly visible and positioned between 34 and 39 inches above the walking surface. The warning line must have a minimum breaking strength of 200 pounds.

Other rooftop considerations include skylights and falls down into stairways or other holes. Hatched roof openings should be closed or removable guardrails attached around the hatch on all sides. Any hatches must be secured to prevent accidental displacement and capable of supporting twice the intended maximum load. They should open with sufficient clearance to provide easy access to or from the ladder or stairway.

Skylights should be protected by guardrail systems or a personal fall arrest system. They can also be covered by approved covers, typically a strong metal screen able to withstand 200 pounds applied perpendicularly at any one area of the screen.

TRAINING

Any employee using a personal fall protection system or others at risk of falls must be trained about fall hazards and any fall protection equipment or other related equipment before use. A qualified person must conduct the training, and instruction must include identifying and minimizing fall hazards.

Training must include the following if used:

- Procedures for installing, inspecting, operating, maintaining and disassembling the personal fall protection system(s) offered at the facility
- Proper hook up, anchoring, tie-offs, inspections and storage of fall protection systems
- Secure placement of dockboards
- Proper setup and use of rope descent systems
- Proper setup and use of designated areas

Retraining should occur after any changes in equipment or the workplace renders previous training obsolete or when deemed necessary by the employer. All training should be documented.

FALLING OBJECTS

In situations where objects could fall on employees working below, employers are required to provide head protection and ensure that it is being used. Additionally employers are required to install devices to prevent falling objects from injuring those below. Employers may implement at least one of the following options:

- Toeboards, screens or guardrails to prevent objects from falling
- Canopy structures and placing loose items far from edges, holes or openings
- Barricading areas where objects could fall and prohibiting employees from entering the barricades

Further safety rules and regulations regarding fall protection can be primarily found in OSHA Standard 29 CFR1910 Subpart D—Walking-working Surfaces. For specific equipment safety requirements, review OSHA Standard 29 CFR1910.140—Personal Protective Equipment, Personal Fall

Workers must wear head protection if objects could fall from above.

Fixed Ladders

Fixed ladders built after November 2018 that extend more than 24 feet above a lower level require the addition of a personal fall protection system or ladder safety system. These systems gradually phase out wells or cages on ladders as the primary form of fall protection.

Existing fixed ladders need to be updated with a personal fall protection system or ladder safety system when they undergo repairs or renovations between now and 2036.

FALL PROTECTION CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are employees protected from falls of 4 feet or more?			
Are personal fall protection systems inspected prior to use for each shift?			
Are inspections of and resulting corrective actions for safety nets, anchors or tie-offs and personal fall protection equipment documented?			
If used, are safety nets inspected initially and at least weekly thereafter?			
When using designated areas: • Is the work infrequent or temporary?			
• Is the area clearly identified?			
• Are employees trained to stay within the area?			
Are floor or roof openings covered, or are employees protected from fall hazards around these areas?			
Are employees trained to identify and address fall hazards?			
Are employees who use personal fall protection equipment trained about the proper use, maintenance and storage of their equipment?			
Are employees trained about the proper use of dockboards, rope descent systems and designated areas?			
Is all training documented and retained?			
Have measures been taken to prevent injuries from falling objects?			
Are provisions in place to provide prompt rescue for employees in the event of a fall?			

FIRE EXTINGUISHERS

18

FIRE EXTINGUISHERS

Portable fire extinguishers are used to put out an incipient fire. This is the earliest stage of a fire and can typically be extinguished with a single portable fire extinguisher. However, extinguishers are only of benefit when they are in good, working condition and operated by someone who knows how to use them. In the 29 CFR1910.157 Standard, the Occupational Safety and Health Administration (OSHA) outlines requirements for placement, use and inspections of portable fire extinguishers.

INSPECTION AND TRAINING

To help ensure their proper working condition, fire extinguishers must be inspected and serviced yearly by a third-party vendor and visually checked using the manufacturer's inspection specifications at least monthly. These monthly checks ensure that fire extinguishers have not been removed, activated, tampered with or damaged. The back side of the extinguisher tag should be initialed and dated after each monthly check or another means of recording established.

If there is an expectation that employees use portable fire extinguishers in the event of a fire outbreak, OSHA requires they be trained in their use. This training includes not only fire prevention and evacuation procedures, but also hands-on training in the use of extinguishers. Training is to be completed prior to job assignment and annually thereafter.

Employees who are authorized to use portable fire extinguishers must also be included in a written emergency action plan. If the emergency action plan orders the immediate and total evacuation of employees in the event of a fire outbreak, fire extinguisher training is not required by OSHA; however, emergency procedure training is necessary. For more information about emergency action plans, see Chapter 13.

TYPES OF EXTINGUISHERS

Not all extinguishers are the same, they are divided into classes depending on the types of fires they are intended to put out. Using the wrong kind of extinguisher on a fire could create an unintended hazard, such as using a water-based extinguisher on electrical or grease fires. Refer to the included chart for information about the various types of extinguishers and how they should be used.

Server rooms or kitchens often have different types of fire extinguishers than other areas. Extinguishers can also incorporate different extinguishing agents to put out more than one type of fire with ABC being the most common, suitable for class A, B and C fires.

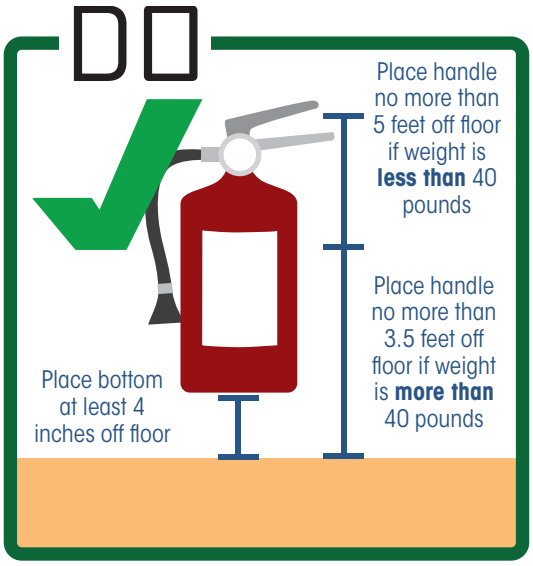
CLASS	TYPE OF FIRE	EXTINGUISHER IDENTIFICATION	SYMBOL
A	Ordinary Combustibles • Paper • Wood • Plastics		
B	Flammable Liquids • Gasoline • Paint • Tar		
C	Electrical Fires • Live electrical equipment		
D	Combustible Metals • Magnesium • Sodium • Potassium		
K	Oils and Fats • Vegetable, animal oils or fats • Cooking		

PLACEMENT

In addition to inspections and training, there are requirements concerning the placement of portable fire extinguishers. International fire code requires Class A fire extinguishers to be located no greater than 75 feet travel distance apart in occupied buildings.

All fire extinguishers should:

- Have clear, unobstructed access and not be covered by jackets or other materials that obscure visibility.
- Have identifying labels or signage to mark their location clearly.
- Be mounted so that the base is at least 4 inches off the floor and the carrying handle is no higher than 5 feet from the floor. If fire extinguishers are greater than 40 pounds, the height of the carrying handle should be no greater than 3.5 feet from the floor.



Follow proper fire extinguisher placement requirements.

Certain buildings often include work areas that require specific sizes and distances for portable fire extinguishers:

- Battery charging areas require minimum 4-A:20-B:C rating within 20 feet of battery charger.
- Fuel dispensing stations require minimum 2-A:20-B:C rating no more than 75 feet away.
- Flammable storage cabinets require minimum 20-B rating no less than 10 feet but no more than 25 feet away.
- Flammable storage rooms require minimum 20-B rating located outside the room but no more than 10 feet away.
- Hot works/welding areas require minimum 2-A:20-B:C rating no more than 30 feet away.

Additional areas, such as lunch rooms and other potential fire hazard areas, should be equipped with an appropriate fire extinguisher. Local requirements may be more strict; contact the local fire marshal for questions about specifications for buildings.

Further safety rules and regulations regarding portable fire extinguishers can be found in OSHA Standard 29 CFR1910.157, Portable Fire Extinguishers; and the Minnesota State Fire Code.

More information about portable fire extinguishers and their use is available at *OSHA.gov* in the Evacuation Plans and Procedures eTool.

FIRE EXTINGUISHERS CHECK LIST

ITEM	YES	NO	ACTION ITEM
Do all fire extinguishers have unobstructed access?			
Are all fire extinguishers up to 40 pounds mounted so their bases are at least 4 inches and the carrying handle is no higher than 5 feet from the floor?			
Are all fire extinguishers labeled so their location is clearly identifiable?			
Are all fire extinguishers inspected yearly by a third party vendor?			
Are all fire extinguishers checked monthly for: • Absence?			
• Adequate pressure?			
• Signs of tampering?			
• Damage, defects or missing parts?			
• Clear nozzle?			
Are monthly fire extinguisher checks signed and recorded on the back of the attached inspection tag?			
Are fire extinguishers mounted on vehicles that travel more than 75 feet away from another extinguisher?			
Are fire extinguishers located near fire hazard areas: • Welding or grinding areas?			
• Flammable storage cabinets or rooms?			
• Other fire hazard areas?			
Is the fire extinguisher appropriate for the type of fire expected?			

FIRE SUPPRESSION SYSTEMS

19

FIRE SUPPRESSION SYSTEMS

Many facilities are equipped with some type of automatic fire suppression system. Most often these systems use water in pipes overhead with heads that activate due to the presence of a nearby heat source. Other systems may use pre-action systems that require heat and alarms to activate before water flows. Still others use extinguishing agents other than water, such as gases or other agents. Often, facilities may employ more than one type of fire suppression system in different areas of a building.

It is important for a facility manager to understand the different types of suppression systems used on a property, how they work and the maintenance requirements of each to reduce the risk of property damage and injury should a fire occur.

TYPES OF FIRE SUPPRESSION SYSTEMS

WET PIPE

The most common type of fire sprinkler system is a wet-pipe system of overhead pipes filled with pressurized water with sprinkler heads that activate when the temperature reaches a certain threshold. This threshold is typically 155 degrees Fahrenheit. The heads activate when a vial of liquid breaks or metal fusing melts, which releases the flow of water.

This system has been reliable for decades, but runs the risk of unintended activation if a sprinkler head is bumped or damaged, as the pressurized water is ready to flow. As such, care should be taken when using these systems in areas with sensitive equipment or documents.

Combination wet pipe and dry pipe (middle blue) fire suppression system.

These systems are also not suitable for areas where the temperature reaches below 40 degrees Fahrenheit, as the water inside may freeze, expand and damage pipes or prevent the system from functioning during an emergency.

DRY PIPE

Another type of system is a dry-pipe system. In this system, the sprinkler pipe is filled with pressurized air or nitrogen. The pressurized air contains the flow of water behind a clapper valve and only opens once a sprinkler head activates and the air is released.

These systems are most often used in areas where pipes are subjected to freezing temperatures, such as attics, vestibules, unheated basements, loading docks or other areas. They are more complicated than typical sprinkler systems, and may be difficult to which to make additions in the future.

PRE-ACTION

In pre-action systems, the overhead pipes are not flooded until a pre-action system triggers the pipes to flood, so it blends some of the aspects of a wet-pipe and dry-pipe system. A pre-action system typically begins with the activation of a smoke detector. After this, the pipes are flooded until heat activates a sprinkler head.

These systems are best used in areas where accidental activation could cause significant damage. As two actions are required to cause the system to activate, accidental damage of a sprinkler head alone does not cause water to flow. Areas such as document storage rooms, server/IT rooms or others are common examples of where a pre-action system may be used.

DELUGE

Deluge systems are similar to pre-action but are designed for all sprinkler heads to activate at the same time. These systems are used in areas of extreme fire risk, often where fire hoses would have difficulty reaching. They are most common in industrial or manufacturing settings. In a typical configuration, the sprinkler heads are kept open, and the pipe is flooded with water or another agent once the system activates, typically from a smoke or heat detector.

CLEAN AGENT

Another type of system uses clean agents. These systems use a different type of extinguishing medium, which could be either gas or powders. These are commonly found above kitchen fryers or in server/IT rooms or other areas where water may create additional hazards or be ineffective at fighting fires.

Gas-based systems, using halotron or similar gases, are most common in server/IT rooms and work by displacing the oxygen a fire needs to burn. This can protect sensitive electronics or documents, but places those inhabiting the space in danger of asphyxiation should the oxygen in the room become depleted.

Other systems, such as Ansul systems, are typically placed above kitchen fryers and use an extinguishing agent that can suppress grease fires.

Clean agent systems most often have a manual activation switch that employees use to turn on the system quickly to minimize damage. If equipped with a manual activation switch, the switch and the path to the switch must be free of obstructions to allow staff quick access during an emergency.

FIRE SPRINKLER SYSTEM MAINTENANCE

All fire suppression or sprinkler systems require regular inspections, testing and maintenance to continue their effectiveness. These inspections and tests should take place at regular intervals based on manufacturer recommendations and local safety codes. Facility managers should review manufacturer recommendations and confer with the local fire marshal and sprinkler vendors when determining inspection frequency and topics.

Keep sprinkler systems operational with routine inspections, testing and maintenance.

COMMON RISKS

Listed below are many of the most common risks associated with sprinkler or suppression systems and should be included as items in any inspection program.

- **Obstructed fire suppression heads:** Sprinklers require at least 18 inches of clearance below them to cover a room effectively.
  - Items should not be placed next to them in a way that the water flow pattern would be disrupted.
  - Items, such as hangers, holiday decorations and other materials, must not be hung from sprinkler pipes, heads or equipment, whether they disrupt the flow pattern or not.
  - Care must be taken when painting around sprinkler heads. Paint on a sprinkler head may prevent it from activating at the correct temperature or inhibit the valve from opening. Paint may also clog the water deflector, which could negatively affect the spray pattern.
  - In kitchens, accumulated grease and dust can clog nozzles or other equipment over time. These should be cleaned periodically to ensure they will function when needed.
- **Obstructed fire department sprinkler hookups:** Fire department hookups are located outdoors and allow the fire department to attach hoses to direct water into a sprinkler system to help maintain pressure and add more water. These areas require easy access to the fire department or fire truck and should be clearly visible.
  - Hookup covers can be targets for theft. If left open, birds or other pests could take up residence and block the pipe.
- **Valve checks:** Many sprinkler failures occur because control valves were closed that should not have been. Valves with public access are especially subject to this, such as at risers or standpipes between levels. In these locations, consider locking valves to prevent tampering.
  - Other systems are equipped with electronic tamper alarms or other devices to alert individuals of closed valves.
- **Insufficient pressure:** When pipes are not pressurized, the water does not flow properly. Checking on gauges can indicate if leaks or corrosion are occurring and may give notification of additional problems.
  - Air compressors for dry-pipe systems should also be properly maintained and checked to ensure that the proper air pressure within the pipe is maintained.

Corroded pipes may not activate a fire suprression system when needed, or activate it unexpectedly.

- **Corrosion or leaks:** Pipes or sprinkler heads can corrode over time and then fail to activate when needed, or may activate when unintended. Inspecting the pipes and sprinkler heads for signs of corrosion or leaks can help identify these problems and address them prior to failure.
  - A supply of additional sprinkler heads and plugging tools should always be on hand to replace damaged or worn out fixtures to prevent or repair leaks.
- **Damaged fire sprinkler heads, nozzles or pipes:** This occurs most often in areas with low ceilings where items or individuals can bump into the fire suppression heads or nozzles. This can direct the flow of water or agent away from where it is most necessary and limit the effectiveness of the system.
  - Tamper-resistant sprinkler heads should be considered for jails and other areas where tampering could be an issue.
  - In certain locations with low ceilings or in storage rooms, consider installing approved guards or covers around the sprinkler heads to prevent accidental damage and activation.
  - Damaged sprinkler heads can be replaced with spares, which should be kept on hand, as well as the wrench used to install them.
- **Freezing:** Water expands when it freezes, so it can lead to pipes bursting in unheated areas. Burst pipes can lead to severe property damage and can disrupt operations and services to the public.
  - Identifying areas where pipes pass through unheated areas and taking steps to avoid freezing, such as heating the pipes, switching to dry pipe systems or other means, can help prevent a burst pipe.
  - Clearly labeling pipes and shut-off valves, and training relevant employees on what to do when a pipe breaks can help minimize damage. See Chapter 41, Winter Preparedness for more about preventing burst pipes.

FIRE SUPPRESSION CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are sprinklers inspected and tested regularly?			
Are means in place to ensure that sprinkler control valves remain open and secure against tampering?			
Are tamper alarms regularly checked to ensure functionality?			
Are air compressors for dry-pipe systems inspected and properly maintained?			
Are employees aware of the types of fire suppression systems in use in their work area or facility?			
Are sprinkler pipes and heads free from leaks and corrosion?			
Are sprinkler heads free of paint, grease or other hindrances that might affect their functionality?			
Are spare sprinkler heads available with the wrench to replace them?			
Is storage kept a least 18 inches below sprinkler heads to allow for clearance?			
Are manual activation switches for clean-agent systems free of obstructions and have a clear path of access?			
Do sprinkler systems have adequate water and/or air pressure (depending on the style of system)?			
Are fire suppression sprinkler systems protected against damage?			
Are all fire sprinkler water pipes protected from freezing in the winter or equipped with dry-pipe systems?			
Are outdoor fire department sprinkler hookups free of obstructions and show no signs of theft or damage?			
Have any special manufacturer requirements for the systems been met?			

FIRST-AID, CPR TRAINING AND KITS

20

Although every effort must be made to prevent accidents from occurring, if an injury does occur, a combination of employees trained in first aid and cardiopulmonary resuscitation (CPR), and available first-aid supplies may be required to prevent further injury or to save lives.

TRAINING

The Occupational Safety and Health Administration (OSHA) requires that at least one employee in workplaces not in near proximity to a hospital or emergency response be trained to render first aid and that adequate first-aid supplies be available.

OSHA has typically interpreted near proximity to mean three to four minutes of response time in areas where serious accidents are possible. In areas where the likelihood of serious injury is more remote, such as office buildings, a 15-minute response time is acceptable.

Consideration should also be paid to employees working alone. Solitary workers may not be capable of administering aid or calling for emergency services, which could increase response times. See Chapter 32, Lone Worker for more information.

Employers should survey sites and locations for hazardous activities and emergency response times. If necessary, employers should determine whether employees need to receive first-aid and CPR training. This may include employees working in remote locations.

Additionally, all employees in the specific area where chainsaws are used or those on a confined space rescue team are required to undergo first-aid and CPR training.

Given the training required for employees who use a chain saw, in addition to the PPE requirements, it is recommended that chain saw work be done by trained public works or highway employees, or a third party.

Other than the noted circumstances above, OSHA standards do not detail training content or refresher guidelines. Employers, therefore, determine the frequency of training, the trainers used and content of the training.

In any case, it is important that trained employees know how to respond should an event occur. Any trainers should be knowledgeable in the subject matter and should be available for questions. First-aid and CPR training should include a skills demonstration and evaluation component where results are documented and retained.

FIRST-AID, CPR TRAINING

In the case of employees conducting confined space rescue or who use a chain saw, OSHA requires that all individuals be trained in first-aid and CPR. At least one employee on the team must maintain an active first-aid and CPR certification with the American Red Cross, American Heart Association or the National Safety Council. To maintain this certification, the individual must complete required refresher training every two years from a certified instructor.

FIRST-AID KITS AND AEDs

Employers are required to provide medical supplies corresponding to the hazards of the workplace. An examination of the work tasks and equipment should help better define the types and amounts of supplies that should be made available.

All first-aid kits should be checked periodically. These inspections should include restocking of used items and removal of expired products. Some items have printed expiration dates; others, such as adhesive bandages, typically do not. If the package shows signs of aging or the seal is broken, the items should be discarded. This applies to all first-aid kits whether in buildings or in vehicles.

First-aid kit

Over-the-counter medicine, such as painkillers, antacids and cold medicines, are sometimes stocked in first-aid kits. Consideration should be given to the potential risks to providing this type of medicine to employees. Risks include undesired side effects, such as drowsiness, allergic reactions and overdosing.

If over-the-counter medication is included in first-aid

kits, employers should institute safeguards, such as including only sealed, single dose, tamper-evident packaged medication with appropriate labeling that employees can review to make an informed decision upon use.

An automatic external defibrillator (AED) is a device that measures a person's heartbeat and if necessary sends an electric shock to restore the heartbeat to a normal rhythm. Although not required by OSHA, these tools can be valuable for first aid and improve survivability when compared to using CPR alone.

Automatic external defibrillator

If an AED is available, the device should be periodically inspected for battery life, pad expiration or signs of tampering. If it is stored in a public area, it should also be added to a national registry of AEDs. This process can be done at no charge at multiple online registries, such as *Minnesota.nationalAEDregistry.com*.

Further safety rules and regulations regarding first-aid and CPR training and first-aid kits can be primarily found in OSHA Standards 29 CFR1910.151, Medical Services and First Aid; and OSHA Publication No. 3317, "Fundamentals of a Workplace First-Aid Program" available at *OSHA.gov*.

MINIMUM FIRST-AID KIT RECOMMENDATIONS

Even though there are no mandatory requirements for first-aid kits other than the the first-aid kit required on loaction at logging (chainsaw use) sites, employers have some options regarding first-aid kit contents. The contents of any first-aid kit should address the hazards of the workplace. Employers should reference the American National Standards Institute (ANSI) standard Z308.1-2015 regarding the contents of first-aid kits. These components are a recommended minimum and may need to be altered to accommodate different workplace hazards.

The recommended minimum contents from the ANSI standard are as follows:

- Adhesive bandages, 1 x 3 inches (16)
- Adhesive tape, 2.5 yards (1)
- Antibiotic treatment, 0.14 fl. oz. (0.5g) applications (10)
- Antiseptic, 0.14 fl. oz. (0.5g) applications (10)
- Breathing barrier (1)
- Burn dressing, 4 x 4 inches (1)
- Burn treatment, 1/32 oz. (0.9g) applications (10)
- Cold pack, 4 x 5 inches (1)
- Eye coverings (2)
- Eye wash, 1 oz. (1)
- First-aid guide (1)
- Hand sanitizer, 1/32 oz. (0.9g) applications (6)
- Medical exam gloves (4)
- Roller bandage, 2 inches x 4 yards (1)
- Scissors (1)
- Sterile pads, 3 x 3 inches (2)
- Trauma pads, 5 x 9 inches (2)
- Triangular bandage, 40 x 40 x 56 inches (1)

FIRST-AID, CPR TRAINING AND KITS CHECKUP

ITEM	YES	NO	ACTION ITEM
Has a workplace assessment been made identifying the need for first-aid and CPR training and kits?			
Are employees on a confined space rescue team or who use chain saws first-aid and CPR certified with valid certificates?			
Have other employees been trained on first aid and/or CPR as needed?			
Are records retained and stored documenting the training and that demonstrations and evaluations were completed successfully?			
Are first-aid kit contents suitable for the potential injuries at the given workplace?			
Are first-aid kits present and periodically checked for restocking and disposal of expired products?			
If providing AEDs, are these inspected regularly for battery life, expiration dates and evidence of tampering?			
Are AED units that are located in public spaces added to the national registry of AEDs?			

FLAMMABLE STORAGE

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FLAMMABLE STORAGE

Gasoline, some paints and many solvents present unique fire hazards. They emit vapors that can travel long distances and catch fire quickly or explode when ignited by something as small as a static discharge. Careful attention needs to be paid to the safe storage of these materials and also to the recognition and control of ignition sources.

- All flammable rated materials such as gasoline should be stored in UL-rated safety cans with self-closing lids and flame arresters in place.
- Flammables should never be stored beneath stairs or anywhere near exits or other areas of safe passage for people.
- Occupational Safety and Health Administration regulations allow up to 25 gallons of Class 1 flammable liquids to be stored in approved containers in any one fire area outside of an approved cabinet or room.

FLAMMABLE STORAGE CABINETS

Flammable rated materials should be stored in an approved flammable storage cabinet.

- Up to 60 gallons of Class I and 2 flammable and combustible liquids can be stored in each cabinet. Some examples include gasoline, mineral spirits, diesel fuel and motor oil.
- Flammables cabinets should be clearly labeled with the words, “Flammable: Keep Fire Away.”
- Only flammable liquids and chemicals of the same hazard class should be stored in the same cabinet. Strong oxidizers and acids may not be compatibly stored with flammables and should have storage of their own. Consult safety data sheets to determine storage compatibility of flammable materials.
- Flammable storage cabinets must be located away from exits, stairways or other egress areas. They should also be located away from electrical equipment, heating equipment or other potential sources of ignition.
- No more than three cabinets can be located in a single “fire area” (a portion of the building separated from the remainder of it by construction having a fire resistance of at least one hour).
- At least one portable fire extinguisher, rated no less than 20-B, must be located no less than 10 feet but no more than 25 feet away from the cabinet.
- Flammable storage cabinets should be kept closed when not in use and latched to prevent accidental opening.

Flammable materials storage cabinet

FLAMMABLE STORAGE ROOMS

Flammable-rated materials may also be stored in a flammable storage room.

- A flammable storage room requires fire resistant walls, doors and windows based on the size of the room with two-hour fire ratings for rooms between 150 and 500 square feet. Rooms 150 square feet or smaller only require one-hour fire-rated walls, doors and windows. The inclusion of sprinklers or fire protection does not change this requirement.
- Flammable storage rooms should not be larger than 500 square feet.
- The inclusion of sprinklers or other automated fire suppression systems permits larger amounts of flammable materials to be present in the room.
  - If a 150 to 500 square foot room is equipped with an automated fire suppression system, up to 10 gallons of flammable liquids may be stored per square foot of floor area. If the same room does not have an automated fire suppression system, only five gallons are permitted per square foot.
  - In a room 150 square feet or smaller protected with an automated fire suppression system, up to 4 gallons of flammable materials may be stored per square foot of floor area. If the same room does not have an automated fire suppression system, only 2 gallons are permitted per square foot.
- Flammable storage rooms require either liquid-tight sills or ramps at least 4 inches in height at doorways or must be located at least 4 inches below the surrounding floor.
- To control spills, the walls of flammable storage rooms must be liquid tight, where the walls join the floor, or an open-grated trench may be located within the room that drains to a safe location.

- Electrical wiring and lighting within flammable storage rooms must be approved for hazardous locations if storing class 1 or 2 flammable liquids, such as gasoline, mineral spirits, diesel fuel, motor oil and some paints.
- Every flammable storage room must have at least one unimpeded aisle at least 3 feet wide.
- Containers larger than 30 gallons should not be stacked on top of each other.
- At least one portable fire extinguisher rated no less than 20-B must be located no more than 10 feet from flammable storage room doors.

Minnesota State Fire Code, Minnesota Pollution Control Agency or local jurisdictions may be more stringent with regard to containment and storage of flammable materials. Consult with the fire marshal for additional guidance.

Further safety rules and regulations regarding flammable storage can primarily be found in OSHA Standard 29 CFR1910.106, Flammable Liquids; and the Minnesota State Fire Code.

FLAMMABLE STORAGE CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are flammable-rated materials, such as gasoline, stored in UL rated safety cans of no more than 5 gallon capacity and equipped with self-closing lids and flame arresters?			
Are all flammable materials stored away from stairs, exits and other areas of safe passage?			
Are safety storage cans designed to prevent spills and to relieve internal pressure of expanding vapors?			
Are fewer than 25 gallons of Class 1 flammable liquids stored outside of an approved cabinet or room in any one fire area?			
Flammable Storage Cabinets			
Are flammable storage cabinets clearly labeled with the words, "Flammable: Keep Fire Away"?			
Are flammable storage cabinets located away from exits, stairways or other paths of egress?			
Are flammable storage cabinets located away from electrical equipment, heating equipment or other potential sources of ignition?			
Are there no more than 60 gallons of Class 1 or 2 flammable and combustible materials stored in each cabinet?			
Are flammable materials of the same hazard class stored in the same cabinet? Strong oxidizers and acids should have storage of their own.			
Are no more than three flammable storage cabinets located in a single fire area?			
Are flammable storage cabinets kept closed when not in use and latched to prevent accidental opening?			
Is there at least one portable fire extinguisher located no less than 10 feet but no more than 25 feet away from the flammable storage cabinet?			
Flammable Storage Rooms			
Are flammable storage rooms no larger than 500 square feet?			
Are liquid-tight sills or ramps of no less than 4 inches in height present at doorways or is the floor at least 4 inches below surrounding floors or have other containment measures been installed per local jurisdictional rules?			

FLAMMABLE STORAGE CHECK LIST CONTINUED

Are walls in the flammable storage room liquid tight or protected with an open grated trench that drains to a safe location or have other containment measures been installed per local jurisdictional rules?			
Do rooms between 150 and 500 square feet: • Have at least two-hour fire-rated walls, doors and windows?			
• Have an automated fire suppression system?			
• If equipped with an automated fire suppression system, are there less than 10 gallons of flammable materials per square foot?			
• If *not* equipped with an automated fire suppression system, are there less than 5 gallons of flammable materials per square foot?			
Do rooms of 150 square feet or less: • Have at least one-hour fire-rated walls, doors and windows?			
• If equipped with an automated fire suppression system, are there less than 4 gallons of flammable materials per square foot?			
• If not equipped with an automated fire suppression system, are there less than 2 gallons of flammable materials per square foot?			
Are electrical wiring and lighting approved for hazardous locations?			
Is at least one unimpeded aisle of at least 3 feet wide maintained?			
Are containers of 30 gallons or more stacked on the floor and not on each other?			
Is there at least one portable fire extinguisher located outside the flammable storage room no more than 10 feet from the door?			
Have both Minnesota State Fire Code and Pollution Control Agency regulations been reviewed and the local fire marshal been contacted regarding additional requirements or local jurisdictional rules regarding flammable storage?			
Have any additional requirements been met?			

GAS CYLINDERS

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GAS CYLINDERS

Many types of gases can be stored in compressed gas cylinders: atmospheric, fuel, refrigerant, etc. The most common types of cylinders are oxygen, acetylene and argon, which are used during the welding process. Often these gases are pressurized to more than 2,000 pounds per square inch.

This pressurization, along with the gases themselves, can pose hazards that include oxygen displacement, toxic effects, explosions and physical hazards resulting from a ruptured cylinder. Care needs to be exercised when storing and handling these “sleeping giants.”

STORAGE

- Gas cylinders must be stored in a cool, dry and well-ventilated area. Care should be taken not to store the cylinders in areas that are near open flames, sparks, or other heat or ignition sources.
- Cylinders must be stored in areas away from exit routes and where passing vehicles or falling objects may strike them.
- Oxygen cylinders must be stored away from other fuel gas cylinders and combustible materials at a minimum of 20 feet or be separated by a noncombustible barrier at least 5 feet high. Oxygen and fuel gas cylinders stored on a welding cart are considered "connected for use" or "in use" and can be stored together on the cart if they are secured and the valves are protected.
- All compressed gas cylinders must be secured to prevent falling over. When using chains to secure cylinders against a wall, be sure they are kept tight so as not to droop and allow a cylinder to tip.
- When in storage, regulators must be detached from stems and valve protector caps must be attached if appropriate to cylinder design.
- Labels identifying cylinder contents should be intact and legible.
- Cylinders should be labeled "full" or "empty" as appropriate for employees' awareness. Empty tanks need to be treated as full tanks with regard to storage and handling.

HANDLING

- Compressed gas cylinders should never be dragged or rolled. When moving, cylinders should be secured to a hand cart designed for that purpose. All cylinder valves should be closed before moving.
- Take care not to drop gas cylinders, allow them to collide together or strike hard surfaces.
- Special care should be given to maintain the integrity of the valve components. If the valve is compromised, pressure can quickly release, turning the cylinder into a dangerous projectile.
- When welding or performing other hot work, the gas cylinders must be located safely away from sparks.

TRAINING AND SAFETY DATA SHEETS

All employees working with compressed gas should:

- Be trained in the proper storage and handling of the cylinders.
- Have access to and understand the information found on the safety data sheet (SDS) kept on file for each gas. The SDS details the characteristics of the gas, safety hazards, first aid, emergency information and other data pertaining to the product.

Further safety rules and regulations regarding compressed gases can primarily be found in OSHA Standards 29 CFR1910.101, Compressed Gases; and 29 CFR1910.253, Welding, Cutting and Brazing.

GAS CYLINDER CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are cylinders stored away from heat, sparks or other ignition sources in a well-ventilated area?			
Are oxygen cylinders stored away from fuel cylinders and combustible materials? *At a minimum of 20 feet apart or separated by a noncombustible barrier at least 5 feet high.*			
Are cylinders secured to prevent tip over?			
Are cylinders stored away from exit routes?			
Are cylinders stored away from areas where they could be damaged by falling or passing objects?			
When stored, are regulators detached from cylinder stems and are valve protector caps in place?			
Are all cylinders clearly and legibly labeled?			
Are empty cylinders segregated and labeled as such?			
Are cylinders moved via a hand cart or similar equipment to prevent being dragged or rolled?			
Are safety data sheets readily available for each type of gas used or stored?			
Are employees trained in the proper storage and handling of compressed gas cylinders?			

GROUNDS KEEPING

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GROUNDS KEEPING

Visitors and employees to public facilities expect the premises to be well-maintained, clean and safe to access. Cracked sidewalks, blocked signs, falling tree limbs, uncollected garbage and other hazards can lead to injuries or property damage and negatively affect the public's perception of the facility.

Grounds keeping requires careful planning, forethought and continuous effort.

OUTDOOR WALKING PATHS AND PARKING AREAS

Walkways and parking areas can quickly become heaved, cracked, broken, washed out or overgrown. They also may have obstacles or other debris that can present tripping hazards or impede the flow of traffic, block emergency exits or emergency equipment, and may even have sharp or low hanging objects protruding into the walking area.

Periodic inspections of both indoor and outdoor walking surfaces and parking areas should be conducted on an ongoing basis to identify and address any issues. When conducting a periodic inspection look for:

- Sudden changes in elevation in walking paths or other walking surfaces. These are often related to cracks in the floor, drainage or erosion, vehicle use or animal burrows. Entryways and exits can also show sudden elevation changes when property settles or roots grow under foundations.
- Missing or unsecure railings on stairways.
- Branches, trash, rocks or other debris blocking paths or creating potential tripping hazards.
- Rocks or sharp debris that could damage vehicle tires or the shoes or feet of people.
- Spills or other wet areas in walking areas. Spills and wet areas can lead to slips and falls and should be addressed in a timely manner. Wet areas could be caused from leaks or from poor drainage. If leaks or drainage are causing wet areas on walking paths or muddy spots, the leaks should be addressed or drain pipes reviewed to direct runoff out of walking paths. During winter, misdirected runoff can turn to ice on walking surfaces.

Periodically conduct inspections of outdoor walking surfaces.

- Muddy areas, potholes or low-lying spots in parking areas. These can also damage vehicles or negatively affect drainage. Consider redirecting traffic around such areas until they can be repaired or addressed.
- Sharp objects such as nails, twisted metal or rough wooden edges protruding into walkways. These tend to be found around entryways or on railings, picnic tables or benches. A nail or sharp edge does not have to protrude far into a walkway to hurt someone.
- Clearance around entrances and exits, particularly emergency exits. There should be clear walking paths to allow people to evacuate the building quickly in the event of an emergency. The outdoor exit discharge can be easily overlooked. Snow or other debris should be removed to allow the door to open fully.
- Lighting and emergency lights in walkways or parking lots. There should be ample illumination to allow people to spot hazards and other objects, and during an emergency can assist with people exiting the building or grounds.

Build Awareness to Prevent Slips, Trips and Falls

MCIT's Step Wisely all-season slip, trip and fall prevention program offers several resources to help raise awareness about common workplace slip, trip and fall hazards. Step Wisely materials are available at *MCIT.org/step-wisely/*, or members can contact their loss control consultants for further information. **More information about Step Wisely is available in Chapter 26.**

TREE/FOLIAGE RISK REDUCTION PLAN

Dead trees or limbs can present serious hazards to property and people should they fall, as well as during removal. Musculoskeletal injuries are common during the felling process from the use of equipment, such as chain saws and wood chippers, and due to lifting and moving pieces. Less well-known hazards include blocked line of sight to signage or traffic, obstructed lights or conflicts with utilities. Deciduous trees also lose their leaves in the fall, which can clog drains or create slick walkways when wet.

Employers should have established measures to check the health of trees continually on the grounds and to remove or control them if they show signs of decay, or if limbs or trunks are overhanging the building or parking areas. Not only can this help prevent injuries and property damage, it may also limit the effect of tree diseases.

Obstructed signs, sight lines, lights or utilities may also require trimming of trees to address these hazards.

The U.S. Department of Agriculture Forest Service Northeastern Area resource "Urban Tree Risk Management: A Community Guide to Program Design and Implementation" offers detailed descriptions of tree hazards, prevention methods and resources to develop a risk reduction plan.

Facility managers are encouraged to work with public works departments and other organizations as necessary when developing an emergency action plan to fell trees and to address cleanup efforts due to storm damage.

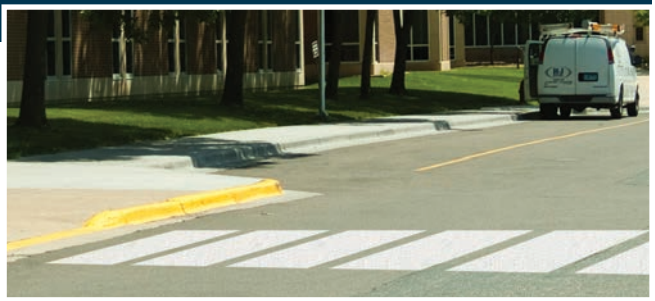
SITE CONTROL

As a general rule, pedestrians and vehicles do not mix well. Therefore, it is important to take precautions, where able, to prevent collisions or related risks. This can be accomplished in a variety of ways. The most common are a combination of signage, barriers and clear sight lines.

Signage or visual cues are the first step in site control. Signs can direct traffic and pedestrians, and separate types of traffic, such as larger vehicles to loading areas. Signage should also clearly label buildings and entrances to help reduce confusion and frustration among drivers or visitors. This signage can also help first responders in an emergency situation.

Visual cues such as painted crosswalks or other marks on the floor or road surface can help direct pedestrians and drivers into the correct areas. When using paint in this fashion, ensure that it is slip-resistant.

Barriers, such as vehicle bollards or other means, can separate vehicles from pedestrian walkways or important pieces of equipment.



Crosswalks can help direct pedestrians and alert drivers to their presence.

Sight lines are another vital part of site control. Blind corners, high foliage, snowbanks or other obstacles can prevent drivers and pedestrians from seeing each other until it is too late. This can also block sight to important signage or visual cues. Be sure to keep sight lines open by moving snow out of the way, trimming trees and alerting traffic to blind corners or intersections.

PREMISES MAINTENANCE

Seasonal grounds keeping involves regular cycles of lawn mowing, trimming or blowing, and snow and ice removal. These tasks should be performed in a safe manner.

Employees should be familiar with the manufacturer's handbook and trained on the equipment they use. This training should be documented and retained on file.

Training should also include proper use of required personal protective equipment (PPE). Proper ear protection should be worn when operating loud equipment. Wraparound eyewear or safety glasses with side guards should be worn when mowing, blowing or weed whipping to guard against flying or ricocheting debris. Proper foot or hand wear should also be worn as needed. A written PPE assessment should be conducted to ensure the proper equipment will safeguard employees.

Employees should be familiar with the manufacturer's handbook and trained on the equipment they use.

More details regarding personal protective equipment can be found in Chapter 36. In addition, maintenance checklists on common grounds keeping equipment is provided in Appendices A, B and C.

Information regarding snow removal and winter preparedness can be found in Chapter 41.

GROUNDS KEEPING CHECK LIST

ITEM	YES	NO	ACTION ITEM
Outdoor Walking Paths and Parking Areas			
Are outdoor walking and parking surfaces regularly inspected and problems promptly addressed?			
Are sharp objects, such as nails and broken glass, removed from parking lots and walkways?			
Are walkways free of liquid spills and kept reasonably dry with good drainage?			
Are walkways free of protruding objects that could present cut, snag, trip or bump into hazards for passersby?			
Are outdoor exit discharges unobstructed and can doors open freely?			
Are outdoor parking lots and walkways well lit?			
Tree and Foliage Risk Reduction			
Is foliage on the grounds regularly inspected for health or decay?			
Are trees and branches kept from overhanging the building or parking lot?			
Are signs and sight lines unobstructed?			
Are walkways, drains and gutters clear of leaf debris?			
Site Control			
Are parking areas and buildings well-labeled with signs or other means?			
Are crosswalks or barriers present to direct foot traffic away from vehicle traffic?			
Are small railings or other devices present to help control the flow of people or vehicles in high traffic areas?			
Does the property have clear sight lines for drivers and pedestrians to see each other easily?			
Premises Maintenance			
Are employees trained about lawn and snow removal equipment use?			
Is personal protective equipment provided and worn when conducting hazardous tasks?			

HEARING CONSERVATION

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HEARING CONSERVATION

Facilities/maintenance employees often perform duties using noise-generating equipment. Over time, exposure to high noise levels can potentially result in hearing loss.

The Occupational Safety and Health Administration (OSHA) requires that employers develop a hearing conservation plan when sound level exposures exceed time-weighted average of 85 decibels (dB) over eight hours, measured on the A-weighted system (dBA). This is also called the action level. The written plan consists of more than merely providing hearing personal protective equipment.

Depending on the noise level of equipment commonly used by maintenance personnel and exposure time, the action level may be exceeded. MCIT has measured the sound levels of different equipment used by facilities/maintenance employees. MCIT consultants have measured the following short-term noise exposures at member facilities: bench grinder, 88 dBA; push mower 91 dBA; lawn tractor, 94 dBA. Other examples of common equipment can be found in Table A.

TABLE A: NOISE LEVELS OF COMMON SOUNDS	
80–90 Decibels	100+ Decibels
Hand Drill	Snow Blower
Push Mower	Leaf Blower
Gas Trimmer	Chain Saw
Air Compressor	Circular Saw
Shop Vac	Car Horn

To determine if using this equipment exceeds the permissible noise exposure as directed by OSHA, both the sound level and time exposed are factored. For example, if an employee is clearing brush and operating a chain saw (dBA of 105) for more than one hour in a typical workday, this would trigger the implementation of a noise conservation program. This exposure would require inclusion in a hearing conservation program regardless of any hearing protection the employee may be wearing.

Table B shows the maximum hours per day that an employee can be exposed to different sound levels.

To determine whether an employee is exposed to the action level that would require inclusion in a hearing conservation program, start by determining the noise level that equipment makes when operated. To do this, consider the following:

- Work with employees to make a list of equipment that generate loud noise. As a rule of thumb, if you have to shout to be heard from three feet away, the level is close to 85 dBA.
- Determine the noise level of that equipment. Decibel ratings can often be found on the manufacturer's plate affixed to that equipment or in the owner's manual. A sound level meter can also be used to determine a snapshot of the equipment's noise level. An MCIT loss control consultant can assist with these readings.
- In situations where an employee is exposed to multiple noises over an eight-hour workday or where there is uncertainty of the noise level exposure, further determination can be made using a dosimeter. This device uses a monitor that is attached near the hearing zone of an employee and can calculate the eight-hour, time-weighted noise average.

TABLE B: OSHA DAILY PERMISSIBLE NOISE EXPOSURE	
Hours Per Day	Sound Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or Less	115

MITIGATING NOISE EXPOSURE

When it is determined that an employee is exposed to noise at an eight-hour, time-weighted average of 85 dBA or more, the next step is to try to remedy the exposure through engineering or administrative controls. These remedies could include muffling the noise with baffles or other dampeners, replacing the equipment with quieter models, or changing work patterns to reduce an employee's exposure.

The use of personal protective equipment (PPE) to reduce the noise level will not affect this determination but may be required. Examples of engineering and administrative controls are found in Table C.

If, after these controls, the noise is still above the action level, OSHA requires employers to develop a written hearing conservation program. This program must include the following:

- Documentation of noise exposure levels.
- Identification and notification of employees exposed to noise at or above the action level.
- Implementation of an audiometric testing program, including a baseline audiogram and subsequent annual testing. These yearly follow-up tests indicate whether the hearing conservation program is preventing hearing loss.
- Employee training at least annually regarding the effects of noise on hearing; the purpose, advantages and disadvantages of various types of hearing protectors; the selection, fit and care of protectors; and the purpose and procedures of audiometric testing.
- Evaluation, selection, proper use, care and availability of hearing protection devices.
- Recording and retention of noise level and audiometric testing records.

Even if noise levels do not exceed the action level, measures should be taken to protect the hearing of employees in noisy surroundings. Hearing protection suitable for the environment should always be provided and encouraged when working around loud equipment. In addition, warning signs should be posted in noise hazard areas and labels placed on identified noisy equipment.

TABLE C:
EXAMPLES OF ENGINEERING AND ADMINISTRATIVE CONTROLS

Engineering Controls	Administrative Controls
Choose low-noise equipment and tools	Limit time that employee works with noisy equipment
Add mufflers or baffles to dissipate sound	Distance employees from noise source
Place barrier between source of noise and employee	Review work procedures to determine potential sound level reduction
Reduce equipment vibration	Increase noise awareness and training
Lubricate equipment	
Isolate or enclose noise source	

Further safety rules and regulations regarding hearing conservation can primarily be found in OSHA Standard 29 CFR1910.95, Occupational Noise Exposure. Additional information can be found in OSHA Publication No. 3074, "Hearing Conservation," available at *OSHA.gov*.

HEARING CONSERVATION PROGRAM CHECKUP

ITEM	YES	NO	ACTION ITEM
Is there an inventory of equipment that generates loud noise?			
Has the level of noise from inventoried equipment been determined?			
Have engineering controls been applied to mitigate noise?			
Have administrative controls been applied to mitigate noise?			
If the noise level of a piece(s) of equipment is greater than or equal to 85 dBA, does the time of employee exposure exceed the action level required to implement a hearing conservation program as per OSHA Standard 29 CFR1910.95?			
If a hearing conservation program is required by OSHA, does it document noise levels and employees who meet the action level of 85 dBA or greater during a time-weighted eight-hour work day?			
If a hearing conservation program is required by OSHA, does it include notification of employees meeting the action level and their involvement in the hearing conservation program?			
If a hearing conservation program is required by OSHA, does it document training on the effects of noise on hearing; the purpose and procedures of the program; and how to choose, use and care for proper ear protection equipment?			
If a hearing conservation program is required by OSHA, has a plan for baseline and subsequent yearly audiometric testing been put in place?			
If a hearing conservation program is required by OSHA, does it provide properly fitted ear protection that is worn and cared for?			
If a hearing conservation program is required by OSHA, are testing records retained for the entire length of employment?			
If a hearing conservation program is required by OSHA, is the hearing conservation updated to take into account changes in work processes and equipment?			
Is hearing protection made available to employees who are not included in a hearing conservation program but still have an exposure to noise?			

HOT WORK: WELDING, BRAZING AND SOLDERING

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Any work that involves burning or produces sparks can be considered hot work. Welding, brazing and soldering fall under the category of hot work. Most often, these processes are done in a designated area, but sometimes hot work needs to be performed in other locations. No matter the location, hot work presents safety risks that need to be addressed. Fire control, ventilation and personal protective equipment (PPE) are a few of the measures that should be included in a hot work safety protocol.

To reduce the risks of performing hot work, the following safety tips should be observed:

- Fuel and oxygen cylinders should be stored and handled in a safe manner. See Chapter 22, Gas Cylinders for more information about safe gas cylinder storage and handling.
- All equipment should be inspected before use. Connections should be tight, hoses in good condition and no leaks detected.
- Flashback arrestors and/or back flow preventers should be installed on equipment.
- Before arc welding, check that the equipment is properly grounded, work is performed on a dry surface and that there is clear access to emergency disconnect.
- Before welding or cutting, check the work area for flammable or volatile substances. Look above and below the work area, and close any floor openings. If working on tanks, drums or barrels, ensure the inside is cleaned and free of flammable or toxic substances.
- Before starting work, combustibles should be cleared in an area measuring 35 feet around the hot work operation, including above and below. Sparks and molten metals can travel this far and smolder for long periods before igniting into a fire. If clearance is not plausible, a fire retardant blanket or other means of protection should be used to cover combustibles.
- Fire extinguishers or other fire suppression equipment should be made available near the work area. At least one fire extinguisher with a minimum rating of 2-A:20-B:C must be readily accessible within 30 feet of any hot work location. These extinguishers should be maintained yearly and inspected on a monthly schedule.
- All hot work processes produce gases, some of which are more hazardous than others. Special attention should be given when working with galvanized metals, stainless steel and coated materials that could contain cadmium, chromium or other hazardous chemicals. Proper ventilation and/or respiratory protection should be provided. If respiratory PPE is required, a written program must be in place. It is also important to be aware of ventilation within a facility to ensure that fumes or sparks do not enter fresh air intakes and spread throughout a facility.
- Ventilation should be periodically inspected to ensure proper air flow. Filters may need cleaning or replacing. Flexible venting tubes should be checked for cracks or tears.
- Depending on the hot work process, suitable personal protective equipment should be available, kept in good condition and worn. This may include respiratory, hearing, vision and skin protection. Loose clothing, jewelry and hair should be controlled before starting work.
- Eye protection should be included for others near the work area. Keeping others at a distance, providing a light screen or requiring proper eye wear should be considered.

HOT WORK PERMIT PROGRAM

If hot work activities are performed by employees or contractors in an area away from a designated welding area, consideration should be given to establishing a written hot work permit program. This program formalizes many of the above best practices and outlines the procedures required to begin hot work. A permit includes a pre-inspection of the work area by a permit authorizing individual and a fire watch signature by an authorized individual tasked with watching over the area for potential fire hazard, as well as inspecting the work area after the work is completed. Any fire watchers must be:

- Trained about the use of a portable fire extinguisher and have fire-extinguishing equipment readily accessible.
- Able to view the entire area; more fire watchers may be needed if sparks or other items can fall vertically to other areas or out of a line of sight.
- Watching for a minimum of 60 minutes after conclusion of work to ensure sparks do not smolder and ignite later.

The hot work operator conspicuously displays this permit throughout the operation. Visible hazard identification signs are also required when the hot work area is accessible to persons other than the operator of the hot works equipment to warn people before they enter the area. Any contractor performing hot work should be contractually obligated to follow the permit program.

Further safety rules and regulations regarding hot work can be primarily found in OSHA Standard 29 CFR1910.252, Welding, Cutting and Brazing, and the Minnesota State Fire Code.

SAMPLE HOT WORK PERMIT

WELDING and BURNING PERMIT

(Work is not permitted unless this card is filled in and posted in work area)

Date _____/_____/_____ Time _____ AM PM

Building _____

Department _____ Floor _____

Work to be done _____

_____

Special Precautions _____

_____

Fire Watch Required? _____ Yes _____ No

The location where work is to be done has been examined by me, the necessary precautions have been taken (see back of permit), and permission is granted for this work.

Permit Expires _____/_____/_____ Time _____ AM PM

Signed _____

Individual responsible for work authorization (Facility Manager)

Time Started _____ Time Completed _____

FINAL CHECK

(Where fire watch is required)

Work area, and all adjacent areas where sparks might have spread, were continuously inspected during the entire time cutting, welding, or other hot work was conducted, and 30 minutes after completion. In addition, the work area was monitored every 30 minutes for four (4) hours after the cutting, welding, or other hot work was completed, and no fire conditions were noted.

Signed _____

Return this permit, after work is completed, to facility manager for filing.

Rev. 1/2015

CHECK LIST

- ☐ Fire protection system(s) in service (sprinklers, CO_2, foam).
- ☐ Cutting and welding equipment in good condition.
- ☐ Floor/ground clean (and wet down when necessary).
- ☐ Combustibles at least 35 feet from welding area.
- ☐ Flammable liquids and other hazards removed from area.
- ☐ All floor and wall openings within 35 feet covered.
- ☐ Non-combustible covers used to protect nearby combustibles and equipment.
- ☐ Containers, tanks, ducts, and other enclosures cleaned and purged of flammable vapors, liquids, dusts, and other hazardous materials.
- ☐ Fire extinguishers or small standpipe fire hose provided.
- ☐ All hazardous operations discontinued in area.
- ☐ Fire watch should be present during, and at least one-half hour after, welding or burning has ceased.
- ☐ Location of nearest fire alarm box identified.

When possible, do work in a non-combustible area.

An individual should generally be assigned to watch for dangerous sparks in the area and the floor below.

The above hot work permit template is available to download from the Minnesota Department of Administration's website, MN.gov/admin.

HOT WORK CHECKUP

ITEM	YES	NO	ACTION ITEM
Are fuel and oxygen cylinders stored and handled in a safe manner?			
Are flammables and other combustible materials located at least 35 feet away from hot work activities?			
Are fire extinguishers or other fire suppression equipment located within 30 feet of hot work activity?			
Are back-flow or flashback preventers installed between the torch and hose or built into the equipment?			
Is hot work equipment inspected before use?			
Is the work area, including above and below it, inspected for flammable or volatile substances?			
Are tanks, drums and barrels cleaned and free of flammable or toxic substances before hot work is started?			
Are hot work areas supplied with adequate ventilation?			
Is hot work ventilation periodically checked for adequate air filtration? Are filters regularly cleaned and checked? Are flexible vent ducts free of cracks and tears?			
Is personal protective equipment (PPE) available for all hot work activities?			
Are hot work operators trained on PPE care and how to wear it properly?			
If hot work requires the use of a respirator, is the operator fit-tested and trained as per a written respiratory program?			
Are signs present and staff trained to avoid entering hot work areas?			
Are other precautions taken to protect helpers and bystanders from eye hazards caused by hot work?			
Is a hot work permit program in place for activities outside the designated welding area?			

HOT WORK CHECKUP CONTINUED

ITEM	YES	NO	ACTION ITEM
Is a designated fire watcher(s) who is trained about fire extinguisher use and stays at least 60 minutes after work is completed present during hot work in areas with combustibles or other fire hazards?			
When arc welding, is the equipment properly grounded and equipped with an easily accessible emergency disconnect breaker or switch?			
Are contractors required to follow hot work best practices and the permit program?			

HOUSEKEEPING, INDOOR WALKING SURFACES, STORAGE

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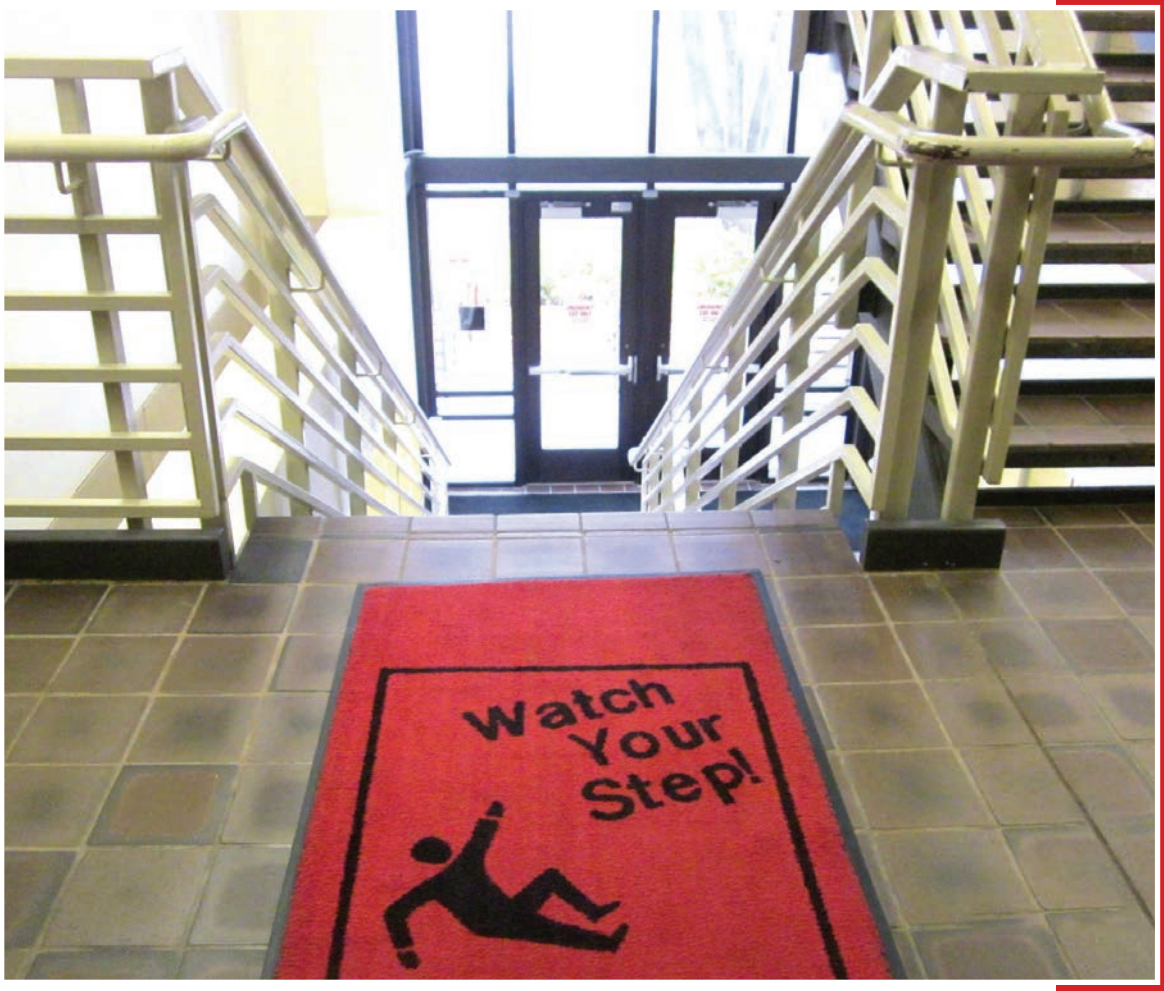
One of the most frequent responsibilities of facility maintenance staff is maintaining the cleanliness and order of a workplace. Numerous safety hazards are created when work areas are untidy. Slips, trip and falls are among the most common accidents stemming from poor housekeeping. Disorderly work areas can also increase the likelihood of fire outbreak and hamper emergency procedures.



GENERAL HOUSEKEEPING

Employees and maintenance staff can help reduce hazards by following these best practices:

- All walking-working surfaces must be inspected regularly and as necessary. They must also be maintained in a safe condition, which includes addressing slip, trip and fall hazards on the floor surface. These inspections and any maintenance or repair work should be documented and retained.
- Prevent employees or others from encountering hazards by prompt action or guarding. Whenever hazards are identified, employees should be notified to avoid the hazard until addressed.
- Evaluate floor finishes, ensuring they have an adequate coefficient of friction (COF). Use only floor waxes and finishes labeled with a COF of 0.5 or greater. The Americans with Disabilities Act recommends a COF of 0.6 for floors and 0.8 for ramps.
- Monitor floor-cleaning techniques to ensure that floors are as nonskid as possible, including using clean, uncontaminated mops and cleaners proper for the type of flooring.
- Be aware of camouflaged tripping hazards. Common examples are steps matching the same color or design as the landing or adjacent floor, or parking curbs painted the same color as the pavement. Adding visual cues such as handrails or a contrasting color between the stair tread and lower floor level or curb and parking lot increase the likelihood that people will see the difference.
- Coil and/or store cords, hoses and other lines when taking a break or when jobs are finished.
- Promptly clean up liquid spills. Spill stations should be readily available and have appropriate clean-up materials for the majority of potential spills.
- Fix rugs or carpets that have buckled, been pulled up, have rolled corners or have become oversaturated.
- Keep debris and other materials cleared from walking surfaces and stairs.
- Clean up accumulations of wood dust or metal shavings in shop areas.
- Cover holes open in the floor that could create a tripping hazard. Openings more than 1 inch wide should be repaired or protected.
- Remove objects protruding at head height into walkways or other materials that may catch or snag passersby. Consider capping them or flagging them as a visible warning.
- Ensure adequate lighting in corridors, stairways and parking areas. Burned out lights should be promptly replaced.

Step Wisely for Slip, Trip and Fall Prevention

One of the main causes of injuries related to housekeeping and grounds keeping are slips, trips and falls. Because of this, MCIT developed Step Wisely, an all-season slip, trip and fall prevention program. It includes:

- **Display items of wall posters, table tents and mini fliers.** Mini fliers can be added to payroll statements, handed out at meetings, distributed in staff mailboxes or on desks or added to the employee newsletter.
- **E-mail messages.** These can also be used as computer lock screen images.
- **Animated videos.** These one-minute videos can be posted to the organization's intranet or e-mail a link to staff.
- **Quick Take on Safety mini training scripts** to be used periodically with small teams to remind employees about safety and to identify hazards.
- **Power Point training session.** It takes about 20 minutes to review with staff, can be customized to an employer's specific concerns and can be broken into shorter sessions as desired.
- **Employer handbook** that identifies common slip, trip and fall hazards and provides commonsense solutions.
- **Facility checklist** to use for premises surveys to identify slip, trip and fall hazards that may have developed since the last inspection.

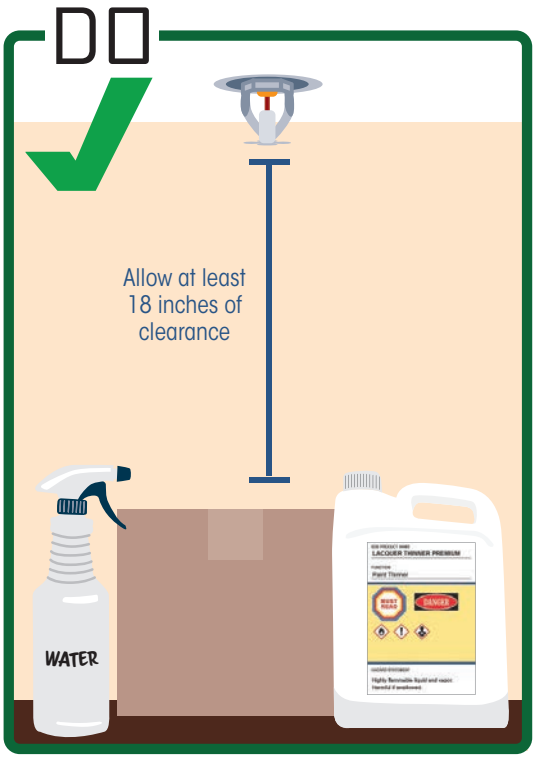
Members can access Step Wisely materials at *MCIT.org/step-wisely/* or by contacting the MCIT loss control consultant toll free at 1.866.547.6516.

- Return tools to storage when a job is finished.
- Place trash in appropriate containers. Sufficient trash containers should be provided, used and emptied before overfilling. Oily or paint-soaked rags should be placed into approved covered metal waste receptacles.
- Ensure piled or stacked materials are stable and cannot slip, fall or collapse.
- Keep flammable materials away from sparks or other ignition sources.
- Keep the areas in front of electrical boxes and disconnects clear. This cleared space should measure 36 inches in front of the panel and be at least 30 inches wide or the width of the panel, whichever is larger. Consider using high-visibility paint or floor tape to create a visual boundary in front of the panels.
- Keep the area in front of fire extinguishers, automatic external defibrillators or emergency eyewash stations clear with an easily accessible path. It is recommended to keep at least 36 inches of clearance in front of these safety devices.
- Maintain the area around air filtration intakes free of materials and storage. Items placed near intake vents can reduce or impede air circulation.
- Ensure clearance around emergency exits and egresses are maintained. These walkways should be sufficient to accommodate the maximum permitted occupant load and be at least 28 inches wide at all points. Walkways should be visually defined where appropriate, and both sides of exit doors should remain clear of obstructions.
- Ensure fire doors are not propped open unless they are equipped with a magnetic catch that will release and allow the door to shut fully in the event of a fire emergency.

STORAGE SHELVING

When shelves get overloaded, they become prone to tipping or collapse. If stacked too high, they can impede sprinkler heads or create lifting hazards. The following steps can help maintain shelving safety:

- Employees must be aware of the load capacity of storage shelving through training or posted load capacity signage.



To allow sprinkler heads to function effectively, adequate space must be left between it and items below it.

- Clearance must be maintained around fire sprinkler heads with at least 18 inches of clearance below sprinkler heads to ensure an effective spray of water throughout the area.
- Storage shelving should be protected against vehicle impact, as damage may affect structural integrity and load capacity if located near where vehicles may be present.
- Ensure safety ladder is available for storing or retrieving items at height.
- Heavy storage materials should be stored between knee and shoulder height to reduce risk of strain injuries when moving the items.

Further safety rules and regulations regarding housekeeping and sanitation can be found in OSHA Standards 29 CFR1910.141, Sanitation; and 29 CFR1910.22, Walking-working Surfaces, General Requirements.

Everyone's Responsibility

Keeping the workplace clean should be the responsibility of all employees. Housekeeping should be an integral part of the job and performed throughout the day. Periodic walkthroughs can be performed to evaluate and control hazards created by poor housekeeping.

HOUSEKEEPING, WALKING SURFACES, STORAGE CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are extension cords, air or water hoses and other lines properly stored away from walking areas?			
Are walking surfaces and stairs free of debris or other materials?			
Are all holes more than 1 inch in diameter in the floor covered?			
Is the floor surface free of cracks or pits of sufficient size to create a trip hazard?			
Are rugs and carpets free of buckles and pulled up edges or corners?			
Are floors free of spills and kept reasonably dry?			
Are appropriate cleaning materials available for possible spills and used when spills occur?			
Are work areas free of protruding objects that could snag, cut or be bumped into?			
Do all areas have adequate lighting?			
Are piled and stacked materials stable?			
Are tools returned to appropriate storage after use?			
Are oily or paint/stain-soaked rags put into a covered metal container and cleaned or disposed of properly?			
Are flammable materials kept a safe distance from sparks or other points of ignition?			
Is the area in front of electrical panels and disconnect switches clear of all materials to a distance of 36 inches and 30 inches wide or the width of the panel, whichever is greater?			
Are fire extinguishers, automatic external defibrillators, eyewash stations accessible?			
Are emergency exits kept clear?			
Are the areas around air filtration intake vents clear of materials that may reduce air circulation?			
Are emergency exits and egresses kept clear of obstructions to a width of at least 28 inches?			

HOUSEKEEPING, WALKING SURFACES, STORAGE CHECK LIST CONTINUED

Are emergency exit doors clear from obstructions both inside and out, including snow in winter?			
Are employees made aware of storage shelving load limits?			
Are storage shelves that are subject to vehicle impact protected?			
Is a minimum of 18 inches of clearance maintained between sprinkler heads and stored materials?			

INDEPENDENT CONTRACTORS

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INDEPENDENT CONTRACTORS

There are times when independent contractors are needed to complete projects or perform tasks. When engaging independent contractors, many factors should be included in the decision process. Quality, cost, safety, insurance and risk management requirements are only some of the most important topics to consider.

From determining insurance requirements to ensuring that the independent contractor stays independent, this section addresses some of the many issues related to using independent contractors for various activities.

SELECTION PROCESS FOR AN INDEPENDENT CONTRACTOR

When engaging an outside party to complete a project, the selection process is crucial.

When seeking bids, consider including bid specifications that allow potential bidders to know key components of the project. These specifications should be specific enough to ensure accuracy relative to the quality, timing and pricing of the responsive bids. Bid specifications should also include the project's insurance requirements, such as bonds, insurance types and limits, and so forth, as those may affect the contract price.

Governmental entities may want to request references of current and/or past government clients to assist in evaluating the most suitable service provider.

KEEP INDEPENDENT CONTRACTORS INDEPENDENT

Steps should be taken to avoid establishing an employer-employee relationship with an independent contractor. Failing to do so may lead to potential tax, workers' compensation or employment law implications if an independent contractor is later deemed to be an employee rather than a contractor.

In addition, a benefit to contracting service includes transferring risk to the contractor. Blurring the lines of the relationship could affect the ability to transfer the risk effectively.

Some problems can be avoided through following simple steps, such as always using a contract to define the scope of the job and always following the contract, not allowing contractors to use the organization's equipment and avoiding dictating hours when the contractor may work.

Prior to engaging in any contract, it is advisable to consult with the county attorney or other legal counsel.

Establish a Contract

The use of an independent contractor to deliver goods or perform services for the organization can be a prudent strategy to transfer risk from the organization. However, to do that effectively, a contract/agreement must transfer that risk. Organizations may be tempted to use a handshake agreement for small contracts; however, it is always better to put the agreement in writing. Sometimes low-cost agreements can have equal to or greater risk than high-cost agreements.

For example, an organization may hire a local painter to stain the interior of a building. The total contract price may be low, but if the stain is not stored properly, it could start a fire that destroys the entire building.

CONTRACT PROVISIONS

The following are provisions to consider when entering into an agreement with an independent contractor. This list is not all inclusive, and not every item may be appropriate for every situation. As always, contacting the organization's legal counsel prior to drafting or entering into any contracts or agreements is recommended.

Scope of Work

- Clearly define expectations regarding the final product: The independent contractor has the independence to make day-to-day decisions on how to get the job done.
- The independent contractor has the ability to hire and fire assistants if needed: The independent contractor should be held solely responsible for the work product and the actions of any assistants.
  - No additional payments should be made to the independent contractor simply because assistants are hired. Additional payments should be made to the independent contractor, not the assistant.
- Set forth the reasons if the independent contractor is required to provide the services personally, such as reputation, specialized experience, training or expertise.
- Do not require specific attendance or hours of work. The organization may limit access of the independent contractor to its buildings and facilities, however.

Compensation

- Generally, avoid payments that appear to be made in the same form as employee wages. Payment should be on a fee-for-service basis (e.g., paid at the end of the project, specified project benchmarks, upon certain billing cycles, etc.).
- Do not pay the independent contractor using the organization's payroll system. An independent

contractor is issued a 1099 form, so it is necessary to have the independent contractor provide his or her tax ID on a W-9 form.

- If a conflict gives rise to litigation or a question on the employment status of an individual, the fact finder will likely look to the contract and the context of the working relationship. The court and/or other agencies responsible for employment issues may find that an employer-employee relationship exists, despite an agreement that states otherwise.

Terms and Conditions

- State that the independent contractor agrees to provide services solely as an independent contractor. Nothing should imply a right to employment or benefits.
  - The agreement should clearly state that the independent contractor is responsible for payment of all state and federal taxes for his or her operation.
- Require that the independent contractor comply with all applicable federal and state laws.
  - Whenever a contract requires that data on individuals be made available to a contractor, the Minnesota Government Data Practices Act (MGDPA) requires that the contractor maintain the data in accordance with the Act (Minn. Stat. § 13.05, subd. 6).
  - Whenever a government entity enters into a contract with a private person to perform any of its functions, the government entity must make it clear in the contract terms that all of the data created, collected, received, stored, used, maintained or disseminated by the contractor in performing those functions is subject to the requirements of the MGDPA and that the contractor must comply with those requirements as if it were a government entity (Minn. Stat. § 13.05, subd. 11).
- Require completion dates in the agreement, but do not require that the independent contractor work solely for the organization until the project is complete.
- Require the independent contractor to abide by any policies or rules related to the work site, including visitors, safety, anti-discrimination and harassment.

Indemnification

Include an indemnification and hold harmless clause favorable to the organization. This means that if the contractor's conduct causes injury, it will pay for any attorney fees and damages that the contracting organization is required to pay because of the contractor's wrongful conduct.

The following is sample language that will need to be modified or tailored to fit each individual situation:

> *"The [independent contractor] agrees to defend, indemnify and hold [organization's name], its employees and officials harmless from any claims, demands, actions or causes of action, including reasonable attorney's fees and expenses arising out of any act or omission on the part of the independent contractor or its subcontractors, partners or any of his/her agents or employees in the performance of or with relation to any of the work or services to be performed or furnished by the [independent contractor] or its subcontractors, partners or any of his/her agents or employees under the agreement."*

Equipment and Supplies

Require the independent contractor to provide his or her own materials, tools and equipment. If there is a business reason for allowing the independent contractor to use the organization's tools or equipment, provide an explanation for this in the agreement (e.g., a contractor hired to work on the organization's computer system may need to access the organization's computers to complete the project for which he or she is hired).

Policies and Procedures

The contract/agreement must be executed by the chair of the governing board (of commissioners/directors) as authorized by board action. The board may delegate this responsibility to a designee, but it should be by board action.

If delegated, there is typically a set dollar value for which authorization has been granted.

Comply with the Contract

Once the agreement has been executed, it is imperative that the organization and independent contractor comply with and enforce the terms and conditions of the contract.

DETERMINE INSURANCE REQUIREMENTS

Just as one project may differ from another, risk management concerns may also differ. Some, but not all, of the general concerns are as follows.

- Every independent contractor should have insurance coverage that is primary and not excess to any other coverage carried by the member organization.
- The independent contractor's insurance providers should be acceptable to the member organization based on the carrier's financial rating, among other factors the member determines.
- Coverage should be in force for the duration of the project with consideration given to whether the coverage is on a claims made or occurrence basis.
- Members should require advance notice of any changes to insurance coverage and that changes continue to meet contractual requirements.
- Members should require a certificate of insurance prior to beginning any work.
- Members should require that the member organization be listed as an additional insured on all policies other than workers' compensation and professional liability. Being listed as an additional insured provides protection to the government entity when it is named in a lawsuit due to the contractor's wrongful conduct.

Amounts and Kinds of Coverage

Members should determine the amount of insurance needed to cover the amount of risk to be covered. For example, consider a contracted carpenter who cuts into a wall to make repairs prior to beginning work. This act causes a problem with the wiring of the building, which leads to a fire. The contract may have been for a minimal amount, but the complete loss of a building and all of its contents could cost millions of dollars.

At a minimum, limits should match the tort caps of $500,000 per claimant and $1.5 million per occurrence. Common lines of insurance required are general liability, auto, products and completed operations, workers' compensation, employer's liability. In some instances, a member may want to require professional liability coverage or errors and omissions coverage.

The accompanying table includes recommended minimum limits. The organization needs to decide for itself the required levels of coverage and should consult with the county attorney or other legal counsel prior to signing any contract.

RECOMMENDED COVERAGES AND MINIMUM LIMITS

Policy	Limit	Aggregate Limit
Commercial General Liability	$1.5 million	$3 million
Commercial Auto	$1.5 million combined single limit	N/A
Products and Completed Operations		$3 million
Workers' Compensation and Employer's Liability	Statutory/ $1.5 million	
Professional Liability or Errors or Omissions	$2 million per wrongful act	At least $4 million

The organization should also consider requiring the following types of insurance policies, floaters and bonds:

- Pollution liability
- Builder's risk/installation floater (construction projects)
- Fidelity bond/crime insurance
- Performance/payment bond

Members are encouraged to contact their MCIT risk management consultant at **1.866.547.6516** for questions concerning contracts or other coverage questions.

MCIT risk management consultants can review members' contracts from a risk management perspective before members enter into an agreement. This service is provided at no cost to members.

More information about contract risk management is available in the following MCIT resources available at *MCIT.org/resource*:

- **"Checklist of Coverage(s) and Liability Limits for Independent Contractors"**
- **"Independent Contractors Limits of Liability"**
- **"Red Flags in Contracts"**

INDEPENDENT CONTRACTORS CHECK LIST

ITEM	YES	NO	ACTION ITEM
Do bids for contractors include specific obligations and specifications, including insurance requirements, required of the contractor?			
Does the organization seek and receive input on contracts from legal counsel?			
Contracts			
Have expectations of the final product been clearly defined?			
Is the contractor held solely responsible for the actions of its employees or assistants?			
Is the independent contractor required to comply with all applicable state and federal laws, including the Minnesota Government Data Practices Act, and Occupational Safety and Health Administration rules?			
Does the contract include an indemnity and hold harmless clause favorable to the facility's organization?			
Is the independent contractor required to provide his or her own materials, tools and equipment?			
Are modifications to the contract (including change orders) in writing and signed by both parties?			
Are contracts authorized by board action?			
Insurance Requirements			
Do independent contractors have primary coverage and not excess to any other coverage carried by the member organization?			
Is the independent contractor's insurance provider acceptable to the facility's organization?			
Is coverage in force for the duration of the project?			
Is the facility's organization listed as an additional insured on all policies other than workers' compensation and professional liability?			
Are insurance coverage amounts at least the recommended minimum limits of $500,000 per claimant and $1.5 million per occurrence?			
Is the coverage on an occurrence basis?			
Does the independent contractor hold the license required for the work he or she is performing?			

INDOOR AIR QUALITY

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Indoor air quality refers to air quality within and around buildings as related to the comfort and health of occupants. Poor indoor air quality may lead to cases of irritation, discomfort or illness. People's reactions to indoor air pollutants can vary widely. As symptoms may arise from acute or chronic exposure, facility managers should take care to maintain good indoor air quality.

IMPROVING AND MAINTAINING GOOD INDOOR AIR QUALITY

Most heating ventilating and air conditioning (HVAC) systems run with a high degree of autonomy and minimal maintenance. However, this maintenance is essential to the smooth operation of equipment.

HVAC EQUIPMENT

The American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) creates and publishes industry consensus standards of the best practices for the maintenance, operation and design of HVAC systems. ASHRAE guidelines offer the best practices for HVAC maintenance and operation even though current versions are not always adopted by law. The guidelines are available to view online at *ASHRAE.org/technical-resources/.*

According to ASHRAE, facility managers should consult with equipment operations and maintenance manuals and perform recommended tests and inspections. Many HVAC vendors offer preventive maintenance and ongoing service for their specific equipment. These visits typically occur at regular times each year, but are not a substitute for more frequent minor maintenance and inspections whether or not facility managers make use of these services.

ASHRAE also offers guidelines to measure air filter effectiveness. On a scale of one to 16 (formerly one to 20), the minimum efficiency reporting value (MERV) ratings detail the size and quantity of particulates captured by the air filter when used properly. Certain occupancies may require higher or lower MERV ratings.

Routine tests and inspections keep HVAC systems running smoothly.

When using air filters, as with other HVAC equipment, it is important to follow manufacturer recommendations for replacing them. Filter vendors and associations, such as the National Air Filtration Association, can be helpful when determining the level of filters required for the specific locations within each facility.

The pamphlet "Understanding MERV," produced by the National Air Filtration Association, offers more information about selecting appropriate air filtration products.

Hartford Steam Boiler's "Preventive Maintenance for Your Air Conditioning" and "End of Season Lay-up of Air Conditioning Equipment" offers tips on how to maintain air conditioning systems throughout and at the end of the cooling season (*MunichRe.com/HSB/loss-prevention*).

HUMIDITY CONCERNS

Humidity and temperature should be monitored and controlled, particularly in sensitive locations, such as server/IT rooms and storage archives, where increased moisture or high temperatures could damage equipment or records.

It may also be prudent to monitor moisture levels in rooms that are visited infrequently (e.g., storage rooms), as leaks or spills can go undetected in such areas for extended periods. Facility managers should maintain a record and/or a map of known moisture problem areas and update it as issues are

Dehumidifiers can help manage moisture levels.

addressed or discovered. Facility managers should also ensure that others are aware of these areas and when moisture is likely to appear.

For more information about moisture control, see Chapter 34, Mold.

AIR CIRCULATION

Another common problem with maintaining good indoor air quality comes from maintaining clear pathways for air to travel throughout a space. As Minnesota Administrative Rule 5205.0110 requires an airflow of 15 cubic feet per minute of outdoor air into all indoor places of employment, maintaining this airflow is critical.

Often items can block air intake or exhaust vents or pathways within a room. This can hinder the effectiveness of HVAC systems to control temperature, moisture and other effects, particularly in storage rooms or other areas where items may be stored at height. As a result, the air may become more musty and stagnant in certain locations. This can be especially problematic in garages or locations where potentially hazardous gases accumulate (see Carbon Monoxide section for more about this).

Keep vents and airways clear for optimal air circulation.

Indoor Temperature Considerations

Perhaps the most well-known function of HVAC systems is the regulation of temperature. Although individuals have varying preferences regarding temperature, Minnesota administrative rule 5205.0110 provides some detail about the acceptable minimum and maximum temperatures for indoor places of employment.

The rules utilize wet bulb globe temperature (WBGT) index values over a two-hour time-weighted average. WGBT indices provide a detailed picture of how temperature, air flow, humidity and radiant heat affect workers over time.

CARBON MONOXIDE

Carbon monoxide (CO) is a colorless, odorless gas that is a byproduct of burning fuel. Exposure to low levels of carbon monoxide can cause flu-like symptoms, such as headaches, weakness and dizziness. Higher levels or prolonged exposure can cause tissue or brain damage and potentially death. A common myth is that carbon monoxide sinks in the air. It is actually slightly lighter than air and spreads normally throughout a room.

In Minnesota, risk for high CO concentrations inside increases in the winter because buildings are sealed to keep out the cold. Facility managers should pay careful attention to exhaust from vehicles and other fuel-burning equipment so that CO amounts do not rise to hazardous levels.

Carbon monoxide detector

For most facilities, this would include indoor parking garages, sally ports, public workshops or mechanics bays. In these locations in particular, members should be aware of the risks and monitor as needed. Indoor

idling of vehicles should be minimized and rooms ventilated as required.

Another hazard is obstructed air intake and exhaust vents. If the airflow throughout a room is impeded, the effectiveness of the ventilation system may not be enough to maintain carbon monoxide levels in safe ranges. Care should be taken to avoid blocking these vents.

Vehicles idling or operating near outdoor fresh air intakes is another source of carbon monoxide. Ideally, buildings should be designed with air intakes located away from vehicle traffic; however, if this is not the case, members should take steps either to prevent vehicles from idling near air intake vents or to limit the amount of time vehicles idle in these locations.

Large repair garages with six or more vehicles, or areas with propane, or propane or diesel forklifts also have additional state rules mandating ventilation and monitoring. **More information about these rules is provided in Minnesota Rule 5205.0200 Garage Ventilation and 5205.0116 Carbon Monoxide Monitoring.**

RADON

Radon is a colorless, odorless and radioactive gas that occurs naturally in the soil. Chronic exposure to radon can cause lung cancer and is the leading cause of lung cancer among nonsmokers and the second leading cause of lung cancer overall (after tobacco).

Radon enters structures through cracks in walls and floors, and can affect buildings with or without basements. Radon exists in high levels in every U.S. state; Minnesota is no exception.

Locations below ground level, particularly unsealed tunnels and areas with higher moisture, may have elevated concentrations of radon and should be tested.

Radon can be tested at low cost from a variety of testing vendors or kits. State and county public health departments may have less expensive kits or lists of testing or remediation vendors.

There are two basic types of radon tests: short and long term. Short-term tests take between two and seven days and are best used to screen for radon—to check if further testing is necessary. Long-term tests take a minimum of 90 days and give a more reliable estimate of annual average radon levels.

Some best practices when testing for radon:

- Follow the manufacturer directions when using the kits to obtain the most accurate and reliable results.
- Test in both heating and nonheating seasons, as buildings typically are sealed in heating seasons and more open during nonheating seasons.

Long-term radon test equipment

- Test structures every two to five years and document and save test results to determine trends, according to the Minnesota Department of Health.
- Retest after modifications are made to heating, ventilation or air conditioning equipment, or when making changes to a structure's foundation. Consider testing for radon before large remodeling projects to determine if radon mitigation should be part of the remodeling project.
- After any radon mitigation systems are used, the area should be retested to ensure it is working properly.

Remediation of radon levels typically involves piping air outdoors from low areas or basements. Each situation is different, and radon contractors or mitigation providers can help determine the optimal way to remove radon.

FRAGRANCES/ODORS

People have varying degrees of sensitivity to fragrances and odors. Though rare, these sensitivities could be the basis of a disability under the Americans with Disabilities Act. Facility managers should work with human resources and department heads to promote employee education about the ramifications of introducing fragrances into the workplace.

Fragrances can include, but are not limited to perfumes, potpourri and essential oils. Entities that want to establish formal guidelines on the use of perfume, cologne or other scented products in the workplace should consider adding a provision to a dress code policy if one exists.

In addition, the following best practices can help minimize odors in the workplace:

- Consider adding signage near microwaves, toasters/toaster ovens that states: "Do not leave food unattended when using microwave/toaster." The idea is to keep employees vigilant to prevent overcooked food, such as popcorn.
- Keep waste traps filled to prevent sewer gas from escaping.
- Keep air intakes and exhaust vents free of obstructions. Items blocking the pathway of air can reduce the effectiveness of current ventilation equipment and contain fragrances in an area rather than exhausting them.
- Be aware of concentrations of odors in small or enclosed rooms, such as bathrooms.
- Ensure that vehicles or gas-run equipment are not located near outdoor air intakes. Be mindful of other activities when working near intakes, such as painting, roof tarring, welding, etc. Close attention should be paid to third-party operations when performing construction or renovations.
- Designated smoking areas should not be located near entrances or air intakes.

Odors emitted by air fresheners or cleaning products can become overpowering if the room lacks adequate ventilation.

- Use paint, varnish and other chemical products containing low volatile organic compounds (VOCs).
- When renovating or during periods of construction:
  - Keep employees informed of potential odors that could be emitted during this time.
  - Install barriers, such as plastic sheeting, to minimize dust and other pollutants from work areas.
  - Work with vendors to keep volatile organic compounds in paints, adhesives and other solvents to a minimum. If installing carpet, request that the vendor air out materials before bringing them into the workplace.
  - Wipe down all surfaces as soon as practical after dust-generating work to reduce dust and other pollutants.
  - Ensure adequate ventilation of work areas when installing carpet, using other finishing material or when activities generate vapors or odors.
  - Schedule maintenance, cleaning, construction or renovation work during periods of low employee occupancy whenever possible.

INDOOR AIR QUALITY CHECK LIST

ITEM	YES	NO	ACTION ITEM
General Air Quality			
Are HVAC systems regularly maintained per manufacturer guidelines as outlined in the operations and maintenance manual?			
Are air filters in HVAC systems sufficient to the types of occupancy within the property and changed as necessary per manufacturer guidelines?			
Are temperature and humidity monitored and controlled, particularly in sensitive areas (e.g., server/IT rooms, storage archives, infrequently visited rooms)?			
Are air intake and exhaust vents clear of obstructions, permitting air to flow freely throughout the room?			
Carbon Monoxide			
Are areas where vehicles may idle well ventilated?			
Is carbon monoxide monitored in garages, sally ports and other areas where vehicles may idle?			
Is care taken to ensure idling vehicles and gas-run equipment are not located near air intakes?			
Radon			
Have spaces below ground level, particularly tunnels and areas prone to high moisture, been tested for radon?			
Have radon tests been conducted during both heating and nonheating seasons?			
Have radon mitigation systems, if installed, been tested to ensure they are managing radon levels?			
Fragrances/Odors			
Are employees educated about the ramifications of introducing fragrances into the workplace?			
Are designated smoking areas located away from entrances and air intakes?			
Are steps taken to reduce volatile organic compounds, dust and other odors during maintenance or renovation work?			

JOB HAZARD ANALYSIS

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JOB HAZARD ANALYSIS

Minnesota's A Workplace Accident and Injury Reduction (AWAIR) program requires that workplace hazards be identified, analyzed and controlled. One technique recommended in the AWAIR program is the job hazard analysis (JHA) or job safety analysis. A job hazard analysis breaks down a job or process into its component tasks and identifies hazards within the steps required to do the particular job. Once the hazards are known, then measures to reduce or eliminate them, such as personal protective equipment, are identified before injuries occur. After the JHA is complete, including required safety controls, an evaluation should be conducted to determine if the JHA addresses all hazards inherent in the task or process.

Because a completed JHA has identified a job's hazards and corresponding safety measures, it can also be useful for conducting accident/incident investigations and safety training.

EMPLOYEE PARTICIPATION

A job hazard analysis offers the best results when employees are involved in the process. Employees are often the most familiar with the required activities for particular tasks and can offer valuable insights. Some tips for employee involvement include:

- Discuss what the JHA process is and why.
- Explain that the focus is on the task or step and not employee performance.
- Keep employees involved during the entire process for the JHA.
- Consider having members of the safety committee participate.

IDENTIFYING JOBS FOR JHAs

To determine which jobs should have a JHA, consider the following:

- Jobs with the highest injury or illness rates.
- Jobs where there have been close calls—where incidents have occurred but no one was hurt.
- Jobs with identified violations of OSHA standards.
- Jobs with the potential to cause serious injuries or illness, even if there is no history of such problems.
- Jobs that are new to the operation or have been changed.
- Jobs complex enough to require written instructions.

Further resources for conducting a job hazard analysis are provided by OSHA in Publication 3071, "Job Hazard Analysis" found at *OSHA.gov*.

6 Steps for Conducting a Job Hazard Analysis

Six steps and tips for conducting a job hazard analysis are below.

1. Break the job task into steps.
   - Watch the employee do the job and list each step in order with employee input.
   - Begin each step with a verb, for example, "Turn on the saw."
   - Do not make steps too broad or too detailed.
   - Consider videotaping or photographing the process to review.
   - Review the steps with the employee and consult with other employees who do the same job.
2. Identify the hazards of each step. For each step of the process ask:
   - What can go wrong?
   - What could be the consequences?
   - How could accidents/injuries happen?
   - What is the likelihood that an accident would occur?
3. Review the list of hazards with employees who do the job. Discuss how to eliminate or reduce them, focusing on the hazards that have the most severe consequences and those that have the highest frequency.
4. Identify ways to eliminate or reduce hazards:
   - Remove unnecessary steps.
   - Implement equipment changes or engineering controls to manage the hazard, for example installing machine guarding or exhaust ventilation, or using different machines or tools.
   - Change how the task or process is done when engineering controls are not possible, for instance rotating jobs, changing steps or providing additional training.
   - Improve personal protective equipment, such as new gloves or different hearing protection.
   - Be specific; avoid generalizations such as "Be careful."
5. Correct unsafe conditions and processes: Train all employees who do the job about any changes and ensure they understand the changes.
6. Review the JHA when the task or process changes and when injuries or close calls occur doing the task.

JOB HAZARD ANALYSIS CHECKUP

ITEM	YES	NO	ACTION ITEM
Have jobs been identified and given priority for JHAs?			
Have employees been involved in the process?			
Are all of the steps of a job included and are the hazards identified?			
Are all hazards assigned a level of risk?			
Are recommendations included to address each hazard?			
Have engineering controls been considered prior to other controls?			
Have any changes to the job process/safety measures been communicated to employees?			
Has the job hazard analysis been reviewed periodically?			

SAMPLE JOB HAZARD ANALYSIS FORM

JOB TITLE: Custodian	**JOB TASK:** Blood spill clean up	**DATE:** 08/01/2019
Department: Facilities	**Supervisor:** Joe Anyone	**Analysis By:** Jane Somebody
Required and/or Recommended Personal Protective Equipment: Rubber gloves, goggles, face shield, shoe covers, apron (as appropriate)		**Reviewed By:** Hector Inspector
Vehicle Traffic Control Required ❒ Yes ☒ No:		**Approved By:** Ima Boss
Sequence of Basic Steps	**Potential Hazards**	**Recommended Action/Procedure**
1. Control traffic	Slip on wet floor	- Use wet floor signs or caution tape - Warn others of slippery floor - Move slowly and carefully around spill
2. Assemble clean up materials	Bleach/chemical splash	- Gather materials for clean up: spill kit, absorbent pads/materials, bleach, spray bottle or mop and bucket (for large volume jobs), biohazard container bags - Carefully fill bottle or bucket with one part bleach and nine parts water; must wear eye protection and gloves when filling
3. Perform clean up	- Slip on wet floor - Bleach/chemical splash - Contact with bodily fluid spill - Contact with sharps or sharp objects	- Proceed with caution around bodily fluid spill - Depending on severity of spill, wear rubber gloves, goggles, face shield, apron and/or shoe covers; ensure PPE is intact - Avoid direct contact with bodily fluid and waste material - Avoid direct contact with bleach solution; carefully apply
4. Disposal of waste	Contact with soiled clean-up materials or sharps	- Avoid direct contact when discarding waste materials; carefully discard in designated waste container(s) or sharps container - Disinfect goggles and/or face shield - Remove shoe covers, gloves and any other disposable PPE and place in biohazard bag; use inside-out technique to avoid contact with glove surface - Take sealed container to biomaterials closet - Notify maintenance supervisor of need to dispose of biowaste
Training Requirements	**Internal (within organization)**	**External (by outside group)**
	Initial and annual blood borne pathogens training	

LADDERS

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LADDERS

Accidents stemming from the use of ladders are one of the leading causes of workplace injuries and fatalities. Ladder accidents can be divided into three categories:

1. Fall: When an employee falls from the ladder.
2. Electric shock: When an employee using, holding or carrying a ladder is electrocuted.
3. Struck by: When a person below the ladder is struck by an object falling from above.

To mitigate these accidents, the following guidelines should be followed.

GENERAL

- Scan the work area to ensure there are no hazards above or around either the path of travel with the ladder or the work area. Pay particular attention to overhead electrical lines.
- If working near energized electrical lines or equipment, the ladder must have nonconductive side rails, such as wood or fiberglass.
- Always follow the manufacturer's rated load capacity before using the ladder. This includes the weight of the user and any tools or equipment. The load rating should be clearly labeled.
- Ladders should only be used for the purposes for which they are designed. Do not use ladders horizontally as a platform. Residential-use ladders should not be used in workplace settings.
- Ladders should not be placed in front of doors or in other high-traffic areas without preparation. Some examples of preparation include locking the door, using warning signs or cones to mark the area or having co-workers keep watch.
- Always set the ladder on a level and stable surface (unless secured). Do not use other materials to raise the height of the ladder.
- Always face the ladder when ascending and descending.
- Always maintain three points of contact (two hands and a foot or one hand and two feet) when ascending or descending a ladder.
- Do not extend the midline of the body beyond the side rails of the ladder.

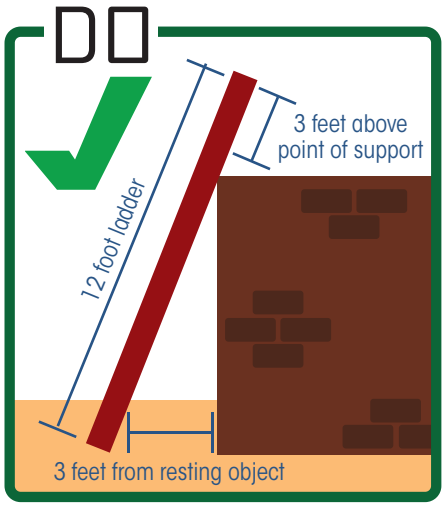
Always inspect the ladder before each use:

- Look for broken rungs or rails.
- Inspect all pulleys, ropes and locks.
- Check for corrosion.
- Check footings, pads and rungs to make sure they still provide a nonskid surface.
- Pay particular attention to open-ended hollow rungs on metal ladders for signs of corrosion inside the rungs.
- If any defect is found, the ladder should be tagged as unsafe and taken out of service. If it cannot be fixed, the ladder should be disposed of properly.
- Ensure that spilled or applied paint is not covering defects.

- Secure all tools and work materials before ascending or descending a ladder. Do not carry tools or work equipment in your hands. They should be carried on a tool belt or pulled up with a rope or handed up from the ground after reaching the desired height. Do not rest tools on ladder rungs.
- Ladders should be stored securely to reduce risk of tipping over.

EXTENSION LADDERS

- When using extension ladders remember the 1-to-4 ratio. For every four feet of ladder height, the base should be one foot away from the object the ladder rests on. Therefore a 12-foot ladder would require the base to be 3 feet from the resting object.
- The ladder should reach at least 3 feet above the point of support and should be secured whenever possible.
- Only make adjustments when standing at the base, not when standing on the ladder or positions above it.
- Extension ladders should be fully retracted before attempting to reposition them.
- Ensure all locks are firmly engaged.
- Do not step or stand higher than the step indicated on the label marking the highest standing level.



Follow proper 1-to-4 ratio set up of an extension ladder.

STEP LADDERS

- When using a stepladder, make sure the folding cross braces are locked in the proper position before stepping onto the ladder.
- Do not use step ladders like an extension ladder and lean them against a wall. Step ladders should always be spread out fully.
- Never step on the top cap or top step of a step ladder.
- Follow all manufacturer warning stickers for more information.

Workers should not step on top cap of a step ladder.

FIXED LADDERS

Steps should be taken to prevent employees from falls from tall fixed ladders. OSHA requires all new fixed ladders (built after November 2018) over 24 feet in height from a lower level be equipped with personal fall arrest or ladder safety systems. These systems will gradually phase out wells or cages on ladders as the primary form of fall protection.

Existing fixed ladders need to be updated with a personal fall protection system or ladder safety system when they undergo repairs or renovations between now and 2036.

Further safety rules and regulations regarding ladders and their use can be found in OSHA Standard 29 CFR1910.23, Ladders.

Existing fixed ladders should be updated to include personal fall protection or ladder safety systems.

LADDERS CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are rungs free of cracks, defects and corrosion, and are they securely attached to side rails?			
Are the interiors of open-end hollow rungs of metal ladders free of corrosion?			
Are rails straight and free of cracks or other damage?			
Are spreaders secure, unbent and able to lock?			
Are locking mechanisms and casters (if present) intact and operable?			
Are pulleys and ropes (when present) intact and operable?			
Are all hardware and fittings securely attached, and movable parts operating freely without binding or too much play?			
Are nonslip safety feet provided on each metal or rung ladder, and are ladder rungs and steps free of grease and oil?			
Are portable metal ladders legibly marked with signs reading, "Caution: Do Not Use Around Electrical Equipment" or equivalent wording?			
Are all labels intact and readable?			
Are employees trained about ladder safety?			
Are ladders rated for industrial or commercial use, rather than residential use?			
Are ladders stored securely to prevent tipping over?			

LOCK OUT/TAG OUT

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Understanding the exposures of hazardous energy and implementing a program to control the hazard is important for the safety of employees who install, operate, maintain or remove equipment that may store or release this energy. Hazardous energy comes in various forms, including electrical, mechanical, pneumatic, hydraulic, thermal and chemical. Even gravity can be considered a form of hazardous energy.

Facilities/maintenance departments regularly work with equipment that should be included in an energy control program. Live electricity, steam from lines or radiators and elevator counter weights are just a few examples of energy that must be neutralized and controlled for safety with lock out/tag out equipment and procedures during service and repairs.

Lock out/tag out equipment and procedures must also be used any time an employee bypasses or removes a safety guard or places any part of his or her body near dangerous points of operation on the equipment.

Cord and plug equipment can be excluded from this program when all hazards from energy release can be controlled by unplugging the equipment and the plug is under the control of the employee performing service.

Lock out/tag out devices specific to equipment, including in the hazardous energy program, must be on hand for foreseeable repairs, durable and not used for anything other than locking out/tagging out equipment.

When lock out/tag out procedures are required, a written program must be created and used to:

- Identify hazardous energy sources for all equipment and processes that could pose a danger to an employee.
- Identify employees authorized to work on the equipment included in this program.
- Detail procedures to lock out and fully neutralize those energy sources before any work can start.
- Define tag out procedures to identify each individual working on the equipment and to ensure he or she is in control of the locked out energy.
- Coordinate training for all authorized employees who directly work with the equipment and affected employees who also work in the area.
- Provide direction when outside contractors or groups of individuals work on equipment.

The written lock out/tag out program must be reviewed on an annual basis and updated when new equipment is added or when a change is made to procedures.

Further safety rules and regulations regarding lock out/tag out can be found primarily in OSHA Standard 29 CFR1910.147, The Control of Hazardous Energy.

Lock Out/Tag Out Steps

When detailing the lock out/tag out procedures, a series of steps should be outlined for authorized employees to follow when working on equipment included in the program. The Occupational Safety and Health Administration (OSHA) considers these steps to be as follows:

1. Before starting service, all affected employees working in the area need to be notified that work is about to commence.
2. The employee(s) authorized to work on the equipment must be familiar with and use the procedures for lock out/tag out for that equipment.
3. Equipment is shut down by the normal stopping procedure (button, switch, valve, etc.).
4. Equipment is isolated by deactivating the energy-isolating device(s) (circuit breaker, disconnect switch or other device that mechanically prevents the transmission or release of energy).
5. The deactivated energy-isolating device(s) is then locked out with assigned, individual lock(s). If lock out is physically impossible, another method must be used that is as effective as locking out.
6. The locked out device(s) is tagged with individual identification.
7. Once locked out and tagged out, stored energy must be released or dissipated (hydraulic systems, air, gas, water pressure, wound coils, etc.).
8. Isolation of equipment is verified by attempting to restart the equipment with normal starting procedure.
9. Service can then be done on equipment.
10. When service is complete, an inspection must be made to assure that all nonessential items are removed and equipment is ready to be restarted.
11. A survey of the area must be done to assure that all employees are safely positioned or removed from work area.
12. Verify that all starting components are in a stop or neutral position.
13. Tags and locks are then removed by the same authorized individual that placed them.
14. Affected employees are notified that service is completed and restart will commence.
15. Restart equipment by normal starting procedure.

LOCK OUT/TAG OUT CHECKUP

ITEM	YES	NO	ACTION ITEM
Is a written lock out/tag out program in place and reviewed at least annually?			
Are annual reviews certified with the date of inspection and signature of authorized inspector?			
Are both authorized and affected employees trained and familiar with the elements of hazardous energy control?			
Is all machinery or equipment capable of movement or storing hazardous energy required to be de-energized or disengaged and blocked or locked out during cleaning, servicing, adjusting or setting up operations?			
Are the power disconnects, not the startup mechanism, for equipment identified, and is a means provided to ensure that the control circuit can also be disconnected and locked out?			
Are all equipment control valve handles provided with a means for locking out?			
Does each lock out procedure require that all stored energy (mechanical, hydraulic, air, etc.) be released or blocked before equipment is locked out for repairs?			
Are sufficient lock out devices available for any foreseeable repairs of equipment included in the lock out/tag out program?			
Are appropriate authorized employees provided with individually keyed personal safety locks?			
Are authorized employees required to keep personal control of their keys while they have safety locks in use?			
Is it required that only the authorized employees exposed to the hazard can place or remove the safety lock?			
Is there a means provided to identify authorized employees who are working on locked-out equipment by their locks or accompanying tags?			
Are identifying tag out devices self-locking, nonreleasable and durable?			
Are affected employees notified when lock out/tag out activities take place?			
Is it required that authorized employees check the safety of the lock out by attempting a startup after making sure no one is exposed?			
Are authorized employees instructed always to activate the equipment stop mechanism prior to re-energizing the main power switch?			
If equipment or lines cannot be shut down, locked out and tagged, is a safe job procedure established and rigidly followed?			

SAMPLE LOCK OUT/TAG OUT PROCEDURE

Equipment Name: AHU _____ Date Written: _____

Operating Unit: _____ Date Revised: _____

Location: _____

Lock Out Steps

1. Determine responsibilities: pre-job plan.
2. Know the types and magnitute of hazardous energy.
3. Shut down, turn off equipment.
4. Isolate the eqiupment from hazardous energy.
5. Apply the lockout: devices/locks.
6. Relieve stored energy.
7. Verify isolation: try to start the equipment.

Release from Lock Out

1. Remove nonessential materials.
2. Make sure all employees are safely positioned and notified.
3. Remove locks and devices: personal locks may only be removed by their owners.

List Hazardous Energy:

Electricity, potential energy in humidification system, heating and cooling water systems

Lockout Steps:	*Initial in Boxes* VERIFIED	LOCKED	UNLOCKED
1. Notify affected personnel of lock out/tag out as appropriate.			
2. Open electrical disconnect to unit and lock out/ tag out. Verify isolation: try to start equipment.			
3. Potential energy in the humidification system, temperature and pressure: valve off supply and return, drain, then lock out/tag out.			
4. Potential energy in the heating water system, temperature and pressure: valve off supply and return, drain, then lock out/tag out.			
5. Potential energy in the chilled water system, pressure: valve off supply and return, drain, then lock out/tag out.			
6. When work is completed, notify area personnel and remove lock out/tag out.			
7. Verify isolation: Try to start equipment.			

Comments and Suggested Revisions:

Verify job is complete and all locks have been removed.	Signature:	Date:	Time:

LONE WORKER

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When an employee works alone outside of normal working hours or in an isolated location, unique risks and hazards may be present compared to the same tasks done with or in the presence of others. Employers should review tasks and situations performed by lone workers to identify and reduce risks of injury. This may include restricting or modifying tasks. Effective procedures and methods of communicating with lone workers are needed to check in and allow for quick response in the event of an incident.

IDENTIFYING HAZARDOUS TASKS

Begin by identifying hazardous tasks that may pose risks to employees while working alone. Particular attention should be directed to tasks involving powered equipment, working at height or using hazardous substances. Time of day may also be a factor, as it may affect the ability to communicate or check in.

Seasonal tasks should also be considered, as extreme heat and cold can create hazardous conditions. See Chapter 40, Temperature Extremes for more information about addressing risks of working in hot and cold weather.

A job hazard analysis (JHA) can be an effective tool in identifying workplace hazards. More information is provided in Chapter 29, Job Hazard Analysis.

An assessment should be made of the risks of the tasks and estimated response times for emergency services should an injury occur. Lone workers may not be in a position to self-administer first aid or call for assistance. For more information about first aid and CPR response times and training, see Chapter 20, First-Aid, CPR Training and Kits.

MODIFYING WORKPLACE TASKS

After hazardous tasks are identified, employers can take steps to modify procedures that pose a danger when working alone. Certain tasks may be modified to require more than one employee be present nearby.

If the hazards arise from the use of a particular piece of equipment, different equipment may make the task considerably safer. As manufacturers continue to improve equipment and safety, consider the tools and equipment used by employees.

Other tasks may be contracted to specialized vendors to transfer the risk away from employees.

The assessment should also include strategies to reduce the emergency response time in the event an injury does occur. These strategies could include requiring employees to check-in periodically. If working before or after typical shift hours, there must be protocols in place detailing who will respond to check-in procedures.

Cell phones, radios or other equipment may be necessary for employees to maintain communication. However, any equipment provided for communication should be reliable and capable of functioning in the intended locations.

Any changes in procedures should be developed with employee input after explaining the hazards. Employees should be trained and required to follow the lone worker safety rules and any changes periodically reviewed and revised as needed.

LONE WORKER CHECKUP

ITEM	YES	NO	ACTION ITEM
Have hazardous workplace tasks involving solitary work been identified?			
Have workplace tasks been modified to eliminate or reduce hazard risk when working alone?			
Are procedures in place for communication and to reduce the response time of emergency services?			
Are employees trained about changes in policies and procedures to limit hazards from working alone?			
Have any modified tasks been reviewed and revised as necessary?			

MACHINE GUARDING

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MACHINE GUARDING

The moving parts or electrical components of machines and equipment can be hazardous to both the operators and those nearby. If any part of an employee's body can come into contact with a moving piece of equipment or electrical component or is exposed to flying debris, guarding must be in place to reduce the risk of injury.

Every machine is different, but the following general guidelines apply to all equipment. Machines with moving components should be assessed using these guidelines. Information about guarding specific equipment is provided.

GENERAL MACHINE GUARDING

- Guarding should be present at the point of operation to help prevent parts of the body from coming in contact with moving equipment. However, a guard should never be affixed so as to present an additional hazard in itself (e.g., creating visibility issues).
- Guards should prevent access to exposed areas not used at the point of operation, such as belts, pulleys, gears, shafts or other moving parts.
- Guards should help prevent sparks, chips or kickbacks from injuring the worker.
- Guards should cover any exposed wires or electrical devices in a machine.
- Fixed machinery should be secured from moving, rocking or excessive vibration.
- Guards should be of sufficient strength to contain any shards or other projectiles adequately.
- Guards should be inspected and evaluated after any failure of the machine causes the guard to absorb impacts.
- Protective guards should cover start buttons and foot pedals to prevent startup from accidental contact.
- Do not tamper with "dead man" safety switches that require constant pressure before a tool will operate.
- Machines that require guarding should not be used until guarding is installed.
- Do not remove guarding during normal operations.
- The use of tools to place or remove items at the point of operation does not remove the need for machine guarding.
- Follow lock out/tag out procedures whenever clearing jams, conducting maintenance or when removing guards.
- Conduct regular safety inspections and maintenance to ensure guards are present and in good condition.

SPECIFIC EQUIPMENT

PORTABLE HAND GRINDER

- No more than half of the wheel should be exposed.
- Disk guard should be positioned between the user and the wheel to deflect materials away from the body.
- Guard should be positioned between the handle and the wheel.

BENCH OR PEDESTAL GRINDER

- Bench grinders should be securely mounted to the bench.
- Pedestal grinders should be securely fastened to the floor to prevent tipping over or excess movement when in use.
- Guarding should cover a minimum of 75 percent of the grinding wheel.
- Additional side guards should cover the spindle, end nut and flanges.
- Tongue guards should provide no more than a one-fourth inch opening to protect against ejected materials.
- Tool or work rests should be set no more than one-eighth inch away from the grinding wheel surface to help protect against objects being caught between the rest and the wheel.

DRILL PRESS

- Drill presses should be securely anchored to the floor to prevent tipping over when in operation.
- Whenever possible, use a clamping device to hold materials and keep hands away from the bit.

FANS

- Fans with blades positioned below 7 feet high should have guarding over the blades with less than a half inch of spacing.

TABLE SAWS (CIRCULAR HAND-FED RIPSAW)

- Blades should be guarded with a hood that encloses the saw blade above and below the table, and above the material being cut. The hood should automatically adjust itself to the thickness of the material and remain in contact with the material while sawing.
- The hood must be of sufficient strength to withstand incidental damage during the course of reasonable operation.
- Saws should use a spreader to keep the material in position against side thrusts and kept in alignment with the saw even when tilted. This is not required for grooving, dadoing or rabbeting.
- Non-kickback fingers or dogs should be used on both sides of the blade to prevent throwing of material or kickback to the user.

RADIAL SAWS

- The blade should be enclosed in a fixed hood with a lower guard that automatically adjusts to the thickness of the stock and remains in contact with the material.
- Non-kickback fingers or dogs should be provided to prevent kickback or throwing of material.
- Stops should be installed to limit the distance a saw could be pulled forward to avoid going over the edge of the table.

BAND SAWS

- The blade should be enclosed either by solid material or by wire mesh not less than 0.037 inches (U.S. gauge No. 20) thick with openings no smaller than three-eighths inch.
- An adjustable slide should be set to the thickness of the material being cut and no greater.

MITER SAWS

- Miter saws should be equipped with a guard that protects the portion of the saw above the table or material being cut. This guard should adjust itself to the thickness of the material being cut to provide continuous protection from the blade.

CHOP SAWS

- Guards should enclose all but the bottom of the blade throughout operation and return to the normal position quickly after use.

PORTABLE CIRCULAR SAWS

- Blade should be guarded by a fixed upper guard and a retractable lower guard that returns to cover the blade after use.
- Users should not wedge or wire the blade guard open. Replace worn out springs as needed to ensure smooth functioning of the retractable guard.

Further safety rules and regulations regarding machine guarding can be found in OSHA Standards 29 CFR1910.212, Machinery and Machine Guarding; and 29 CFR1910.213, Machinery and Machine Guarding/ Woodworking Machinery Requirements.

MACHINE GUARDING CHECK LIST

ITEM	YES	NO	ACTION ITEM
General			
Are all belts, pulleys, gears, moving parts and electrical components guarded?			
Are guards in place to protect operator from sparks, chips or other flying debris?			
Are guards present at the point of operation?			
Are start switches and foot pedals protected from accidental contact and startup?			
Are machines secured to the ground to prevent tipping or movement during use?			
Are guards present without creating additional hazards (e.g., reducing visibility)?			
Is equipment regularly inspected and maintained to ensure guards are present and in good condition?			
Portable Grinders			
Is no more than half of the grinding wheel exposed?			
Is disk guard positioned between the handle and the wheel?			
Is disk guard positioned between the user and the wheel to deflect materials away from the body?			
Bench or Pedestal Grinders			
Are grinders securely fastened to bench or floor?			
Is guarding in place that covers a minimum of 75 percent of the grinding wheel, as well as the spindle, end nut and flanges.			
Is the tongue guard positioned within one-fourth inch from the wheel?			
Is the tool/work rest positioned within one-eighth inch from the wheel?			
Drill Press			
Are drill presses securely anchored to prevent tipping over or excessive movement during operation?			
Are devices used to hold materials to be drilled, keeping hands away from the bit?			
Fans			
Are fans positioned less than 7 feet high protected with guards no greater than half an inch apart?			

MACHINE GUARDING CHECK LIST CONTINUED

ITEM	YES	NO	ACTION ITEM
Table Saws			
Are the blades guarded above the table by guards that enclose the blade and automatically adjust to the material?			
Is the blade guarded below the table?			
Is a spreader present to keep the material from shifting (except when dadoing, grooving or rabbeting)?			
Are anti-kickback fingers or dogs present and used?			
Radial Saws			
Is the saw blade guarded with a fixed guard on top and a movable guard on bottom that automatically adjusts to the material?			
Are anti-kickback fingers or dogs present on both sides of the blade?			
Are there stops in place to prevent the blade from going over the edge of the table?			
Band Saws			
Is the blade entirely enclosed except for the point of operation either entirely or by a wire mesh of no greater than three-eighths inch?			
Is the adjustable guard only as wide as the material being cut?			
Miter Saws			
Is the blade guarded with a hood that automatically adjusts itself to the material being cut?			
Chop Saws			
Is the blade guarded by a hood that protects the top and sides of the blade throughout operation?			
Does the guard return to regular position quickly after use?			
Portable Circular Saws			
Is the blade guarded by a fixed upper guard and retractable lower guard that returns to cover the blade after use?			

MOLD

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MOLD

Mold is a term that people often react to with worry or panic and spend considerable sums of money to test for and treat. Although mold can be a serious health concern, not all mold is harmful and the risks people associate with it are often exaggerated. Frequently the presence of mold indicates a humidity or water issue. Elimination of the water source is the best way to eliminate future mold growth.

Mold can be found in almost every house, office, car or building and is a natural part of the environment. In most cases, the amount of outdoor mold spores in a given area greatly outnumbers mold spore counts indoors.

According to the Centers for Disease Control and Prevention, prolonged exposure can cause eye irritation, nasal stuffiness or wheezing in those sensitive to molds. More severe reactions are possible in people with allergies, asthma, respiratory disease or a weakened immune system. These include fever, shortness of breath or infection.

As with any illness, prolonged exposure varies among individuals, but mold spore counts are the highest in times of warm, wet weather, generally in the spring. Although mold is a known allergen or allergy trigger, there are no permissible limit levels for mold developed by the Occupational Safety and Health Administration (OSHA) regulating workplace exposure to mold.

Current scientific evidence suggests that, for most people, normal daily encounters with the microscopic fungi are not cause for alarm. Mold exists as part of the environment. Mold spores float in and out of buildings and can be found in walls, carpets, office furnishings, etc. They can lie dormant for years. In most cases, mold is not the problem but a symptom of excessive moisture.

If employees have been having allergic reactions or other symptoms of mold exposure, consider testing for spore counts. This can help identify the location of the mold buildup or if mold may be the cause. It can also provide a useful baseline to test against after any remediation work is done. Multiple testing companies exist, as do companies that send testing material that can be placed by building employees and then shipped back to the lab for testing.

While tempting, it may not be necessary to test for specific types of mold, as the treatment for mold tends to be similar regardless of type.

CONTROLLING MOLD

Mold requires the right combination of moisture, temperature and an adequate surface to grow. The following are tips for preventing and controlling mold:

Fix leaks in roofs, walls and plumbing so mold does not have moisture to grow.

- Keep humidity levels low. If possible, no higher than 50 percent. In winter, the humidity level may need to be kept at 40 percent or lower to avoid condensation on windows or cold concrete.
- Ensure good ventilation. This is especially crucial in areas susceptible to moisture accumulation, such as bathrooms and basements.
- Clean up and dry out water-damaged spaces thoroughly and quickly (within 24 to 48 hours) after the initial damage to prevent mold growth.
- Remove or replace carpets and upholstery that have been soaked and cannot be dried promptly.
- Consider not using carpet in rooms or areas such as bathrooms or basement floors that may have a higher risk of moisture accumulation.
- Consider adding mold inhibitors to paint for higher-moisture areas.
- Maintain or replace air filters on HVAC equipment per the manufacturer guidelines.
- Ensure HVAC drip pans are unobstructed and free flowing.
- Keep building foundations dry. Ensure good drainage, proper landscaping and other moisture control practices, such as periodically checking sprinkler systems to make sure they are not soaking the foundation.

MOLD CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are humidity levels kept between 40 percent and 50 percent as needed?			
Is good ventilation maintained and unobstructed?			
Are leaks promptly repaired?			
Are water-damaged areas cleaned and dried promptly?			
Are air filters in HVAC systems in use and replaced as needed per manufacturer recommendations?			
Are wet ceiling tiles replaced promptly?			
Are HVAC drip pans unobstructed and flowing properly?			
Are building foundations kept dry?			

OVERHEAD GARAGE DOORS

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Industrial Overhead Garage Doors with sufficient weight or closing force can cause injury or damage to people or property caught in their path of travel. Because of this hazard, the Minnesota Administrative Rules and Department of Labor and Industry have outlined requirements for overhead door safety.

The requirements state that overhead doors must incorporate at least one of the following safety options:

- A constant pressure actuation switch that would be operated within sight of the door and could be released and manually reversed if a person or object were in the path of the closing door.
- An external reversing device that would immediately reverse the direction of the door upon striking an obstruction. Common reversing devices include:
  - A safety edge pneumatic air hose installed on the bottom edge of the door that signals the door to reverse when an obstruction is detected.
  - An optic sensor that detects objects in the path of the door and immediately reverses downward travel.
- A three-button control switch, but only if the following conditions are met:
  - A permanent sign must be placed adjacent to the switch and display wording similar to "Warning: To prevent entrapment, do not start door downward unless doorway is clear."
  - The control switch and sign are located within sight of the doorway.
  - The operator controlling the switch must observe the door until completely closed.
  - Automatic closing controls are not installed.

Warning sign accompanies three-button control switch.

If reversing devices are installed, they should be periodically inspected and maintained to assure that they are in good working condition. These inspections and maintenance should further be recorded and retained in the event of an incident.

The above regulations regarding overhead doors can be found in the Minnesota Administrative Rules 5205.0675, Covers and Overhead Doors.

OVERHEAD GARAGE DOOR CHECK LIST

ITEM	YES	NO	ACTION ITEM
Are at least one of the following safety features incorporated into each door? 1. Constant pressure actuation switch within sight of door 2. External reversing device 3. Three-button control switch: a. Within sight of door b. Adjacent to warning sign c. With no automatic closing controls installed d. Where controller observes until door is completely closed			
Are overhead garage doors equipped with external reversing devices (safety edge, optic eye) periodically checked to ensure they are functioning correctly?			
Are overhead garage doors inspected and serviced annually by a qualified vendor?			
Are all inspection/maintenance records retained?			

PERSONAL PROTECTIVE EQUIPMENT

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When a job poses a hazard and administrative and engineering controls cannot mitigate the risk, personal protective equipment (PPE) may be required. To function effectively, the equipment must fit properly, be kept clean and in good condition, and then actually be worn. When PPE is dirty, uncomfortable or not readily available, an employee may be less apt to wear it. To protect employees, the Occupational Safety and Health Administration (OSHA) requires the adoption of a written personal protective equipment policy that includes hazard assessment, proper PPE selection and employee training.

WRITTEN HAZARD ASSESSMENT

A hazard assessment must be made of the workplace to determine the need for PPE. Each hazard should be reviewed and a determination made of the type and level of risk to an employee. Conducting a job hazard analysis is one approach to identify hazards and controls for them (see Chapter 29 for more information). When completed, this information needs to be included in a written assessment that also includes the name of the workplace, date and name of the person who conducted the assessment. Based on these findings, appropriate personal protective equipment must be purchased for employees to use when working around the hazards.

PPE SELECTION

Personal protective equipment must fit properly and provide protection greater than the minimum required to protect employees from hazards. Consideration should be given to the size and fit for individual employees. PPE that is comfortable and fits well is more apt to be worn.

EMPLOYEE TRAINING

After appropriate personal protective equipment is provided to employees, training is essential. At a minimum, training must include:

- An understanding of the hazard, how PPE protects against the hazard and the limitations of the equipment.
- How to put on, take off and properly adjust the equipment.
- How to maintain and care for the PPE.
- An understanding of the useful life of the equipment and how properly to dispose of it.

Training should be provided when new personal protective equipment is introduced or there is a change in a process or hazard. The content and date of each employee PPE training must be recorded and retained.

ONGOING ASSESSMENT

Periodic assessments should be made to assure that the PPE is adequate and the employee is using it correctly. Retraining should occur if the employee has not retained the necessary understanding of the use of the equipment.

Regular site inspections should be conducted to ensure that PPE is kept clean, usable and readily available. Some equipment may require special storage (e.g., in bags or other containers) to ensure that it does not become dirty or damaged until used. Consideration should be given to storing PPE near the hazard area or piece of equipment to make it easier for employees to find and use.

HIGH-VISIBILITY APPAREL

All employees who are exposed to vehicular traffic or construction equipment should wear appropriate high-visibility apparel. At a minimum, employees should wear a shirt or vest meeting ANSI standards for the work environment.

ADDITIONAL PPE REQUIREMENTS

Some activities and exposures require specific rules when considering personal protective equipment. Please take note of the following chapters of this manual:

- Hearing Conservation
- Respirators
- Electrical
- Fall Protection

Further safety rules and regulations regarding PPE can be primarily found in OSHA Standard 29 CFR1910.132, Personal Protective Equipment. The OSHA publication, "Personal Protective Equipment" offers additional information.

PERSONAL PROTECTIVE EQUIPMENT CHECKUP

ITEM	YES	NO	ACTION ITEM
Has a hazard assessment been made of the workplace?			
If a hazard assessment has been made, has it been certified in written form, including hazards found, the name of workplace, date and person who conducted the assessment?			
Has PPE been selected to protect adequately against the hazard, been fit to the individual and is comfortable?			
Are approved safety glasses required to be worn at all times in areas where there is a risk of eye injuries, such as punctures, abrasions, contusions or burns?			
Are protective goggles or face shields provided and worn where there is any danger of flying particles or corrosive materials?			
Is approved head protection required to be worn in areas where there are risks of falling objects or "bump into" hazards?			
Is appropriate foot protection required where there is the risk of foot injuries from hot, corrosive or poisonous substances, falling objects, crushing or penetrating actions?			
Are approved respirators provided when needed? See Respirators chapter.			
Is PPE kept clean and in good condition?			
Are employees trained on the limits of PPE, how the equipment protects them from hazards, how to wear and care for it and how to identify its useful life?			
Are employee PPE trainings recorded and retained?			
Are periodic assessments made to ensure PPE is adequate, clean and worn?			
Are adequate work procedures, PPE and other equipment provided and used when cleaning up spilled hazardous materials?			
Is high-visibility apparel worn when working near vehicular traffic?			

RESPIRATORS

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Whether employees are required to wear respirators as part of a personal protective equipment (PPE) program or voluntarily use dust masks to filter airborne particles, consideration needs to be given to the OSHA standards for respiratory protection.

The first step is to assess the need for respiratory protection. If employees are not exposed to harmful levels of hazardous gases or dust, respiratory protection may not be needed. However, many employers make dust masks or filtering face pieces available for employees to use when they clean or perform other tasks that make airborne particulates a nuisance even though they are below permissible exposure limits. If respirators are not required, consideration should be given to removing them from the premises.

Respirators and other personal protective equipment should always be the last option and used only after engineering or administrative controls are considered.

If employees are required to wear any form of respiratory protection, employers must have a written program and employees must follow it. If employees voluntarily use their own or employer-provided respiratory protection, a more limited program as defined below must be followed. To determine whether an employee is required to wear respiratory protection, a hazard assessment must be performed. For more information about assessing hazards, see Chapter 36, Personal Protective Equipment.

RESPIRATORY PROTECTION PROGRAM

If respiratory protection equipment use is mandated, the required written program must include the following components.

- **Selection of respirator:** Depending on the hazards encountered in the workplace, specific respiratory equipment is required to filter that hazard best. These exposures and equipment are defined in the program.
- **Medical determination:** Some employees may experience claustrophobia or breathing difficulty when donning respiratory protection equipment. At a minimum, a medical evaluation is made of the employees using a questionnaire (Appendix C of OSHA Standard 29 CFR1910.134 is commonly used), which is then reviewed by a health care provider. The provider then determines whether individuals are able to wear a respirator or whether a follow-up medical exam is needed.
- **Fit testing:** If a tight-fitting respirator, such as a filtering face piece respirator, is required, a qualitative fit test must be conducted. This fit test often uses a challenge agent, such as isoamyl acetate or irritant smoke, to assure the equipment is properly fitted to the individual.
- **Training:** Employees must be trained before initial use and again annually on the following:
  - The respiratory hazards and why the respirator is necessary.
  - The limitation and capabilities of the respirator.
  - How improper fit, use or maintenance can compromise the protective effect of the respirator.
  - How to inspect, put on and remove, and use and check the seals of the respirator.
  - How to clean, store and maintain the respirator.

Risk Management Considerations

If gases, dust or other particulates are found to be above the permissible exposure limits, consideration should be given to engineering the hazard to acceptable levels or transferring the risk to a third party. Examples of engineering controls include:

- Installation of ventilation systems to help control and/or eliminate air contaminants.
- Enclosing or confining operations to mitigate employee exposure.
- Substituting chemicals or materials that are less hazardous.
- Transfer risk to a third party.

VOLUNTARY USE OF A FILTERING FACE PIECE OR DUST MASK

Dust mask

If employees voluntarily want to use filtering face pieces (such as an N95 particulate filter), whether self- or employer-provided, the employer must:

- Determine that such use would not create an additional hazard (such as limit visibility or fog glasses); and
- Make the employee aware of the information in Appendix D of OSHA Standard 29 CFR1910.134 found at the end of this chapter.

The employee should read and sign the document, and it should be retained as acknowledgment of the information.

Further safety rules and regulations regarding respirator equipment, the written program and Appendix C can be found in OSHA Standard 29 CFR1910.134, Respiratory Protection.

RESPIRATOR CHECKUP

ITEM	YES	NO	ACTION ITEM
Has an assessment been made to determine if respiratory equipment is needed?			
Have engineering or administrative controls been considered to reduce or eliminate the need for respiratory protection?			
If respiratory equipment is needed, is a written respiratory protection program in place?			
Does the respiratory protection program include the following components: • Equipment selection?			
• Employee medical determination?			
• Fit testing?			
• Employee training?			
Are respirators regularly cleaned and maintained? Are records kept of these inspections?			
If employees voluntarily use filtering face pieces (such as N95 masks) or dust masks, are they presented with information from Appendix D from OSHA Standard 29 CFR1910.134?			

29 CFR1910.134, APPENDIX D—(MANDATORY) INFORMATION FOR EMPLOYEES USING RESPIRATORS WHEN NOT REQUIRED

Under the Standard, respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard. You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

ROOFS

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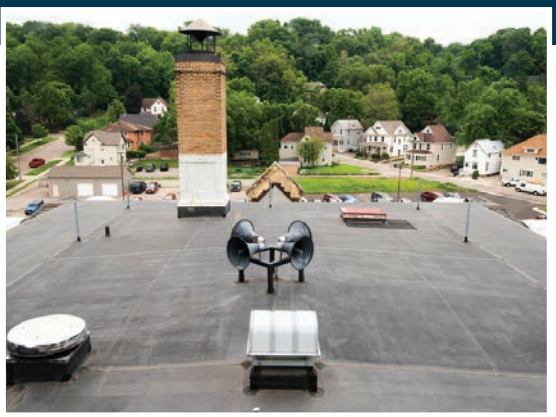
ROOFS

The basic function of any roof is to offer protection from the elements for occupants and property, as well as to protect the building structure itself. Roofs can also provide insulation, retaining heat in the winter or cool air in the summer. Ongoing exposure to sun, rain, snow, hail and wind deteriorates roofs. It is important for organizations to have an ongoing formal process to inspect roofs so that repairs can be made before costly damage occurs.

TYPES OF ROOFS

It is important for facility managers to know the type of roofing materials used at each location, as the maintenance requirements differ for each. Roof types vary greatly depending on factors such as design, size, location and age of the building. Most common pitched roofs include metal sheeting and asphalt shingles. The most common flat roofing systems are discussed below.

For more information about the types of roofs and their strengths and weaknesses, facility managers are encouraged to review the design recommendations from the Whole Building Design Guide produced by the National Institute of Building Sciences.



Facility managers should consult with vendors or manufacturers to learn the specific maintenance requirements for each roof type.

BUILT-UP ROOF: SMOOTH OR TAR/GRAVEL

These are some of the oldest and most effective roofing materials for low-slope roofs. Built-up roofs are composed of three elements: layers of felt, layers of bitumen and surfacing.

Felt paper is applied first to counteract expansion and contraction forces and allows a suitable surface for bitumen to be applied. The alternating layers of felt and bitumen effectively bind them together.

For a smooth surface, a smooth cap sheet is added to protect the built-up bitumen and felt layers. A tar/gravel style built-up roof includes a layer of gravel or mineral granules or mineral-coated cap sheet to provide protection against the elements.

MODIFIED BITUMEN

This system for low-slope roofs features certain types of bitumen infused with additives to offer increased flexibility. These layers are then cut and installed similar to built-up roof membranes.

The main types of modified bitumen roofs are based upon the common chemical polymers, atactic polypropylene (APP), styrene butadiene styrene (SBS) or styrene ethylene butadiene styrene (SEBS).

This hybrid technology between built-up roofs and single-ply membranes offers many of the benefits of both options.

SINGLE-PLY MEMBRANES

This style of low-slope roofing features a synthetic rubber flexible membrane that is applied with a roll. With vulcanized seams, the membrane offers a strong resistance to ultraviolet light and ozone, as well as excellent functionality in cold temperatures.

It can also be referred to as thermoset roof membranes or EPDM roofing, referring to the specific type of rubber used in the membrane, (ethylene propylene diene monomer rubber).

THERMOPLASTIC ROOF MEMBRANES

Although functionally similar to the rubber of single-ply membrane roofs, the materials of a thermoplastic roof are instead made of plastic polymers. When applied with a roll to a low-slope roof, the seams are often heat-fused to form the continuous membrane. Some types of roofs use solvents rather than heat and can form a continuous membrane over the rooftop.

Thermoplastic membranes also contain reinforcement layers to provide additional strength and stability. Most are made of polyvinyl chloride (PVC) or thermoplastic polyolefin (TPO).

ROOF MANAGEMENT PROGRAM

Regardless of the type of roof and roofing materials, every building should have a roof management program. This program can range from simple to complex but at a minimum should include collecting and maintaining information about each roof. As part of any management program, inspections, repairs and other information should be documented and retained.

Organizations should keep historical information about each roof, such as documents related to installation, repairs and warranties. It should also keep details gathered from regularly scheduled inspections.

Creating diagrams and taking photos of the location of equipment, roof penetrations, gutters, trouble spots, patterns of ballast movement and other items serve to memorialize details that could be forgotten and create a visual story of the roof over time.

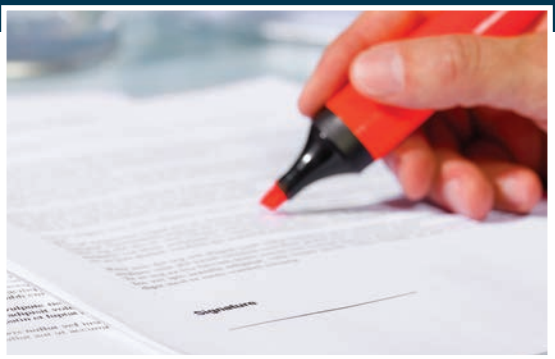
This gathered information could better inform decisions when giving priority to repairs and replacements, as well as assisting in budget planning and maintaining warranties.

Document any rooftop repairs as part of a roof management program.

WARRANTIES

Roofs typically come with a two- to five-year warranty from the contractor. This warranty typically covers installation defects. Beyond that, coverage is often provided through the manufacturer's material warranty, which only covers the materials that make up the roof.

It is important to know the terms and coverage specifications of each roof's warranties. Knowing how to stay compliant with warranties can protect the building, as well as the entity's financial interests. It is beneficial to know the extent of repairs that could be covered and what actions could constitute voiding a warranty.



Warranties should be reviewed before any repairs or remodeling is started.

INSPECTIONS

Given the exposures to which roofs are subject, especially in Minnesota, regularly scheduled inspections are vital to prevent unexpected problems, costly repairs and to extend the life of the roof. At a minimum, inspections should be done in early spring to reveal damage or deterioration caused by snow, wind and ice; and again in the fall to make sure that the roof is in sound condition for the coming winter.

Inspections should also be conducted after a major weather event to assess for potential damage. Considerations should be given to using third-party roofing experts to perform supplemental inspections, especially for unique or complex roofs.

Inspections should include a visual observation of the following:

- **Water ponding, algae/vegetative growth or staining** from previous pooling. All are indications of poor drainage and can lead to deterioration of the roofing membrane, water infiltration and increased weight load on roof.
- **Soft spots**—often related to ponding and an indication of water infiltration and deterioration of materials below.
- **Clogged drains and scuppers.** Leaves and other debris can clog roof drainage and lead to excessive standing water. Facility managers should ensure that drainage is sufficient around flashing, coping and counter flashing.
- **Roof membranes.** Organizations should watch for tears, punctures, splitting at seams and blistering. The membrane should stay well adhered to the roof surface.
- **Ballast.** It protects the roof membrane and should adequately cover all areas of the roof. Wind, water and traffic can move ballast and expose materials beneath it to damage.
- **Branches, tools and other equipment** that have dropped on the roof or been left behind. These items should be removed and the area examined to ensure that there are no punctures in the membrane.
- **Overhead branches.** Tree branches hanging over a roof could cause damage through repeated contact, if broken due to storms, snow load or wind. Branches should be trimmed as necessary to reduce this risk.
- **Flashing, coping and fascia.** Check for deterioration and ensure that they are well attached.
- **Caulking and sealant** around equipment, expansion joints and other roof penetrations.

Routine inspections are essential in preventing unplanned problems.

Caulking can dry or pull away during expansion. Ensure seals are sound.

- **Roof edge and exterior walls.** Check for missing mortar, deterioration, staining or other signs of leaks.
- **Snow load.** Heavy snowfall, often combined with wind, may pile snow in corners or concentrate on specific sections of a roof. The weight of this snow could cause considerable damage to the structure beneath. Deep snow can also block air intakes if they are positioned at low height. Plans should be in place for removal if necessary. See Chapter 41, Winter Preparedness for more about this and other winter hazards.
- **Inside walls and ceilings.** Check for sagging, leaks, discoloration and other signs of water infiltration or increased snow load.

Infrared Scanning

Technology can be used to detect heat leakage or moisture-related problems in a building envelope. Using infrared thermography as a component of the roof inspection process can show potential problems because moisture reads cooler than normal construction materials.

Infrared thermography can also be helpful in tracing water back to its origin. Because the technology detects differences in energy, it can be used to identify energy leaks and electrical hotspots. See Chapter 12, Electrical for more information.

WORKING ON THE ROOF

Safety should be a priority anytime someone goes on the roof. Employees should be trained about the procedures of working on the roof system; fall protection; and working near roof edges, skylights and access doors. All contractors should be required to adhere to roof safety standards.

Anchorages for Elevated Work

If rope descent systems and powered platforms are used to do work suspended more than 14 feet above the ground (window washing, building maintenance, etc.), certified anchorages must be identified, certified and inspected annually.

- Each anchorage must be able to support at least 5,000 pounds per employee attached in any direction.
- Certification must be done by a qualified individual with extensive knowledge and experience of anchorages.
- Re-certification must be conducted at least every 10 years or when the anchor is subject to damage or stress.
- A competent person must visually inspect anchorages annually to ensure that there is no damage or change to equipment.
- Building owners are responsible for providing written information to the employer doing the work that the anchorages have been identified, tested, certified and maintained.

More information can be found in OSHA standard 29 CFR 1910.27, Scaffolds and Rope Descent Systems; 29 CFR 1910.66, Powered Platforms for Building Maintenance; and Minnesota Administrative Rules 5205.0730 Window Cleaning; Building Maintenance.

Depending on the roof configuration, fall protection may be required whenever someone is on the roof or only when in certain areas of the roof (see Chapter 17, Fall Protection).

ROOFS CHECK LIST

ITEM	YES	NO	ACTION ITEM
Does each roof have an inspection plan, at a minimum in early spring and in the fall?			
Does each building's roof have its own management program and are specific maintenance requirements understood?			
Does each roof management program include measures to collect and maintain information about the roof?			
Is historical information about each roof maintained, such as installation, materials, repairs and warranties?			
Are diagrams created and are photos taken of the location of equipment, roof penetrations, gutters, trouble spots, patterns of ballast movement and other items to memorialize details about the roof?			
Are warranties (both contractor and materials) kept and reviewed before commencing work on each roof?			
Are roof inspections conducted after major weather events?			
Do roof inspections include visual observations for: • Water ponding, algae/vegetation and staining? • Soft spots? • Clogged drains and scuppers? • Roof membranes? • Ballast? • Branches, tools and equipment dropped or left behind? • Overhead branches? • Flashing, coping and fascia? • Caulking and sealant? • Roof edge and exteror walls? • Snow load? • Inside walls and ceilings?			
Is infrared thermography for roof inspections considered?			
Are anchorages for roof descent systems certified and inspected annually?			

SECURITY

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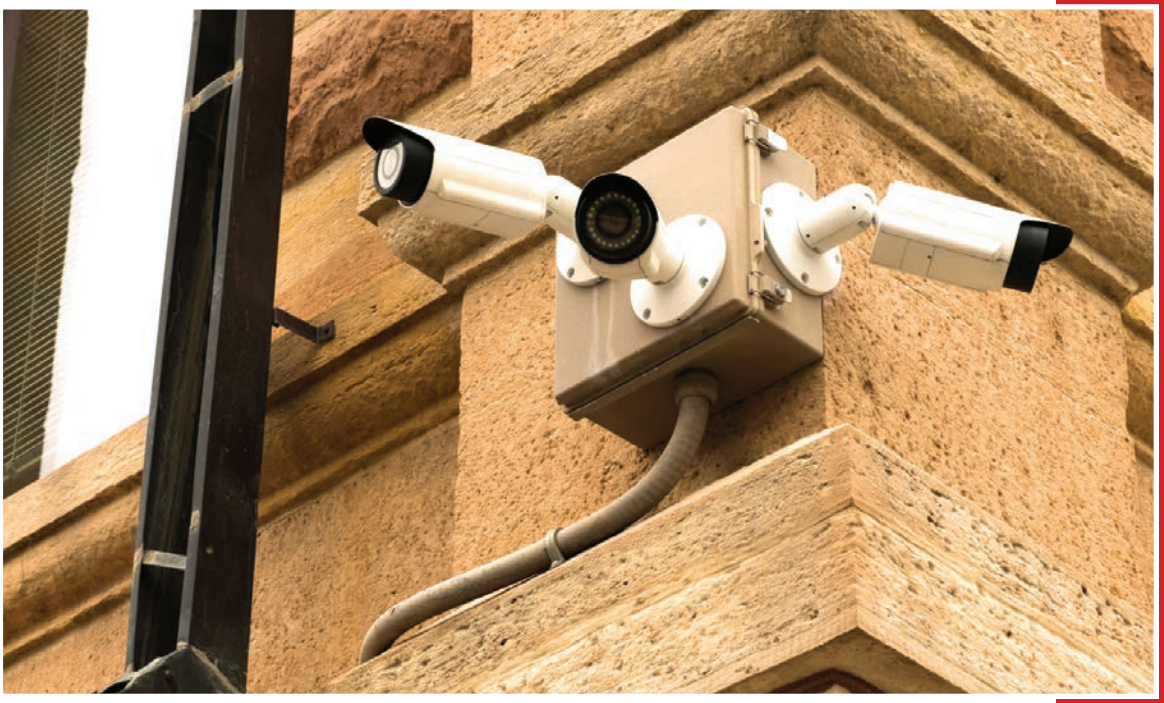
SECURITY

Employees have the right to workplace conditions that do not pose a risk of serious harm, and the public expects safe and secure buildings when at public entities. Theft, vandalism, arson and violence, while rare, are some of the criminal activities that public entities may experience. In addition to protecting people and property, public entities are often entrusted with a great deal of data that must be protected. Securing premises and data requires input from multiple departments, including facility managers.

Security, in particular, varies depending on the building and departments within the building, so conducting a security assessment is a key first step, followed by consideration of common security features involving secure access; surveillance cameras; management of weapons on premises; and vandalism, theft and arson prevention.



SECURITY ASSESSMENT

One of the first steps when considering security is to conduct an assessment of the facilities. This helps identify inadequate measures and procedures, areas that should be secured or other security concerns that can then be addressed.

A variety of organizations can perform this service or it may be possible to complete the assessment internally with law enforcement personnel or through observations and interviews with employees. Conducting an assessment may also open opportunities for grants or other resources to help address security deficiencies.

The Minnesota Occupational Safety and Health Administration consultation services can perform these assessments at no charge. To discuss security assessments, contact Minnesota OSHA consultation at 1.800.657.3776. Other services may be available as well.

SECURE ACCESS

One of the most basic steps of security is to control who enters the facility or certain areas within the building. However, given the public nature of many buildings, this can prove challenging. As part of the security assessment, areas where confidential information is stored or used, mechanical or IT equipment is housed, and other spaces may be identified as areas requiring special access.

Key cards restrict access to designated employees.

A variety of options exist to help secure areas. But when considering options, members need to remember some basic elements:

- Egress and evacuation routes must be preserved. Locked doors or secure areas must not limit exits for employees and the public in the event of an emergency (see Chapter 16, Exit Routes for additional information).
- A secure access policy should be created, and employees must be trained about the policy and rules of secure access. The policy should include:
  - A means to account for contractors, vendors or others in restricted areas.
  - Policies for reporting unidentified or unauthorized persons in restricted areas.
  - Rules to maintain the security of a facility, such as not holding doors open for co-workers, not propping doors open and prompt reporting requirements of potential problems with doors not closing or other concerns.
  - Provisions for enforcement and disciplinary measures if the policy is not followed. All rules should be enforced.
- A maintenance, testing and usage plan for security systems should be created and followed that adheres to manufacturer recommendations.

Emergency Action Plans

- Emergency response procedures should be included in the written emergency action plan for the organization. This may need to be updated following any security assessment or changes, such as the addition of lockdown rooms and new hardware (e.g., panic alarms).
- Employees should be trained about new policies and procedures. Members should consider drills or other means to practice emergency action plans and to ensure any new alarms or hardware work properly.

See Chapter 13, Emergency Action Plans for more about this.

SURVEILLANCE CAMERAS

Using cameras to monitor strategic locations is often part of a security plan, but members should consider how the footage will be used and how the data will be retained, along with other security concerns and privacy issues.

A number of issues must be considered when using surveillance cameras.

All data collected, created, received, maintained or disseminated by any government entity regardless of the data's physical form, storage media or conditions of use is considered government data and may fall under the Minnesota Government Data Practices Act and its data classification, access and security provisions.

Other laws are in place to protect the privacy of the public, and the entity must comply with records retention rules regarding creating an accurate record of business conducted and managed. Still more laws protect against unauthorized audio recordings.

When using security cameras, members should consider the following:

- Ensure security cameras are not in areas where individuals may have a reasonable expectation of privacy.
- Create protocols or procedures regarding the general use of security cameras and the maintenance of any recordings (e.g., the time frame that recordings will be kept before recorded over or erased, if not subject to the records retention plan).
- Post signs that security cameras are used on the premises and/or ensure that cameras are visible and noticeable. Signs serve to inform the public that they should not have an expectation of privacy in the area.
- Talk to the county attorney or other legal counsel regarding potential legal implications of security cameras and their recordings.

WEAPONS MANAGEMENT

Minnesota law prohibits individuals from carrying firearms in public unless the individual has a valid permit to carry license. Many private establishments open to the public may also ban all firearms from their establishments even if the owner has a valid permit; however, public entities do not have this same flexibility. Signs stating that firearms are banned from certain public buildings may not be permitted.

Consult with legal counsel before putting up signs that ban weapons.

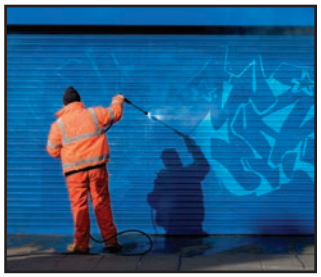
Members may want to consult with legal counsel regarding applicable laws.

Beyond members of the public entering facilities with weapons, the member may want to consider the issue of civilian employees carrying weapons while on the job. Minnesota Statutes, Section 626.84, Subdivision 2 prohibits public employees who are not law enforcement or county attorneys from carrying firearms while in the performance of their official duties. Though other self-protection items, such as stun devices and pepper spray are not covered under this statute, strong consideration should be given to developing corresponding policies relating to their use.

It is unclear that granting authority to civilian employees to carry weapons on the job would keep them any safer than being unarmed, and the liability risks of allowing an armed civilian workforce are significant. Civilian government workers are limited in their legal authority to use force (compared to their law enforcement counterparts), but the employer's responsibility is broad, particularly regarding employee conduct on the job.

VANDALISM, THEFT, ARSON PREVENTION

Occasionally incidents of vandalism to, theft of or arson of member property occurs. The majority of these cases involve property that is not in continuous operation, such as public works garages and small offices in remote locations, or within jails.


Crime prevention through environmental design guidelines can help reduce vandalism incidents.

One method to help reduce the potential for crimes involves the use of crime prevention through environmental design (CPTED). The concept is to design facilities and landscaping to make crime more difficult to commit, therefore deterring criminals.

Some common examples of CPTED include:

- Maintaining adequate lighting at the facility and grounds. This should not only deter crime but can also help prevent other hazards such as slips, trips and falls.
- Removing good hiding places where criminals can remain undetected. This could include shrubbery or other foliage, fences or signs near entryways or windows. Trimming of foliage or removing other objects also reduces the amount of nearby flammable materials.
- Installing curtains or other items to prevent clear views of valuable items within the facility.
- Installing strong locks or securing vulnerable entrances (e.g., replacing windowed doors with windowless doors to prevent easy access to locks by breaking windows).
- Maintaining the property in good condition. This can include replacing damaged lighting, timely snow removal and good management of the landscaping. These elements can suggest that the property is being observed and taken care of and therefore a greater risk for criminals than a property that is poorly maintained, which conveys an image that no one pays attention to it.

Additional methods to help address vandalism, theft or arson are:

- Always lock buildings, equipment and vehicles when closed or not in use.
- Encourage regular law enforcement patrols of remote locations to discourage vandalism or other criminal activity.
- Store all flammable materials, such as gasoline, in secure locations.
- Keep garbage collection bins away from flammables, air intakes and flammable sections of buildings, as these are a common target for arson.
- Make plans to address vandalism within the jail, particularly concerning water shut offs for sprinkler discharges or plumbing issues.

More information about building security is available in the following MCIT resources available at *MCIT.org/resource*:

- **"Security Cameras and Managing Their Data"**
- **"Permit-to-carry Law: Restricting Firearms in Public Buildings"**
- **"Civilian Employees and Weapons on the Job"**

SECURITY CHECKUP

ITEM	YES	NO	ACTION ITEM
Has a security assessment to identify areas that need improvement been conducted?			
Has the emergency action plan been updated based on changes made to security measures, policies and procedures?			
Secure Access			
Is access secured for necessary areas to protect important equipment (IT servers, building mechanicals) and data?			
Is there a means to account for contractors, vendors or others in restricted areas?			
Do policies include a method for reporting unidentified or unauthorized persons in restricted areas?			
Are rules established to maintain the security of a facility, such as not holding doors open for co-workers, not propping doors open and prompt reporting requirements of potential problems with doors not closing or other concerns?			
Does the secure access policy include provisions for enforcement and disciplinary measures if the policy is not followed, and are all rules enforced?			
Is there a maintenance, testing and usage plan for security systems that adheres to manufacturer recommendations, and is the plan followed?			
Are employees trained about secure access policies and procedures?			
Surveillance Cameras			
Is there a policy for how to manage the data collected from security cameras in accordance with all applicable laws?			
Are security cameras located only in areas where individuals have no reasonable expectation of privacy?			
Are protocols or procedures established regarding the general use of security cameras and the maintenance of any recordings (e.g., the time frame that recordings will be kept before recorded over or erased, if not subject to the records retention plan)?			
Are signs posted that security cameras are used on the premises and/or are cameras visible and noticeable?			
Vandalism, Theft, Arson			

SECURITY CHECKUP CONTINUED

Are crime prevention through environmental design elements used around facilities to help reduce the likelihood of criminal activity?			
Are buildings, equipment and vehicles always locked when closed or not in use?			
Are regular law enforcement patrols of remote locations requested to discourage vandalism or other criminal activity?			
Are all flammable materials, such as gasoline, stored in secure locations?			
Are garbage collection and recycling bins, and combustibles kept away from flammables, air intakes and flammable sections of buildings?			
Are plans in place to address vandalism within the jail, particularly concerning water shut offs for sprinkler discharges or plumbing issues?			

TEMPERATURE EXTREMES

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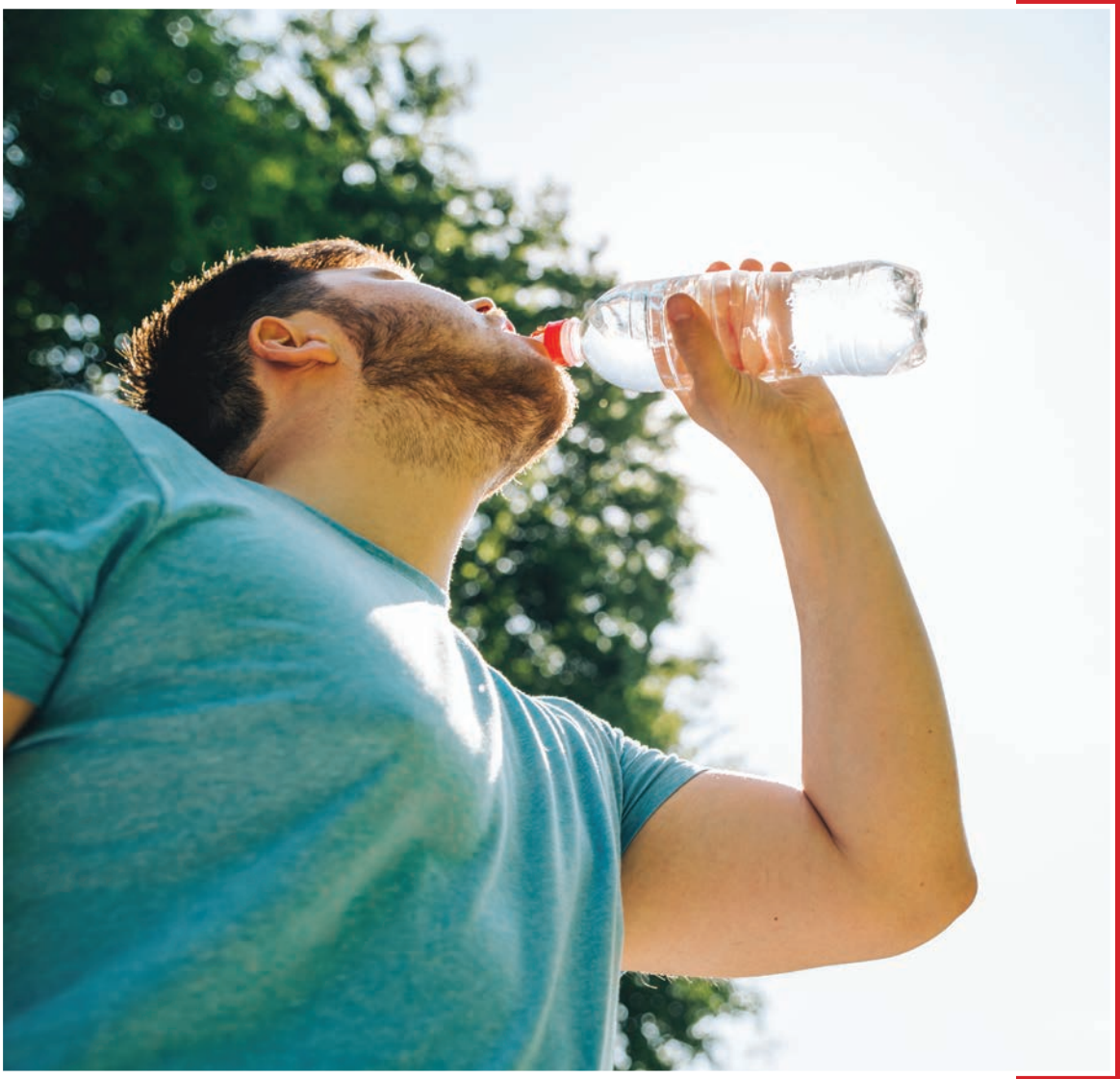
Outdoor workers in Minnesota can face extreme heat in the summer and subzero temperatures in the winter. To help protect employees in these conditions, employers should emphasize the importance of symptom recognition and prevention methods to reduce incidents of employees suffering from heat and cold stress.



HEAT STRESS

Heat stress is the term for health conditions related to heat exposure. The most common types of heat stress are heat rash, heat cramps, heat exhaustion and heat stroke. Heat stroke is particularly serious and can result in permanent injury or death. Fortunately heat exhaustion frequently precipitates heat stroke and if detected at this stage, can be treated more easily.

Common Symptoms of and Treatments for Heat Stress

HEAT STRESS	SYMPTOMS	TREATMENT
Heat Rash	Red cluster of pimples or small blisters, typically located on neck, upper chest, groin, under breasts or in elbow creases	• Keep rash dry. • Move to cooler, less humid work areas. • Avoid using ointment or creams.
Heat Cramps	Muscle cramps, pain or spasms in the abdomen, arms or legs	• Drink water. • Have a snack and/or electrolyte replacement beverage, such as a sports drink • If cramps do not subside in an hour, seek medical attention.
Heat Exhaustion	• Headache • Nausea/dizziness • Irritability • Thirst • Weakness • Heavy sweating • Elevated body temperature • Decreased urine output	• Remove worker to cool area (air conditioning if possible) and give liquids to drink, particularly cool liquid. • Remove unnecessary clothing from worker. • Cool the worker with cool water or compresses. • Bring worker to clinic or emergency room for evaluation and treatment. • Stay with the worker until help arrives.
Heat Stroke	• Confusion, altered mental state, slurred speech • Loss of consciousness • Sweating stops or profuse sweating • Seizures • Very high body temperature	• Call for emergency medical care. • Remove worker to cool area (air conditioning if possible, shade, etc.) and remove unnecessary clothing. • Cool worker aggressively with cold water or ice bath. • Place cold, wet cloth or ice on head, neck, armpits and groin. • Circulate air around worker. • Stay with worker until medical help arrives.

Heat Stress Prevention

- Be aware of dangerous heat index advisories and weather service forecasts and plan accordingly.
- Provide water for employees and encourage them to drink plenty of it: 8 ounces of water every 15 minutes—32 ounces an hour is recommended for sustained heavy work. Avoid drinking more than 48 ounces of water an hour.
- Take frequent breaks in cooler areas particularly when feeling heat discomfort. Limit time outdoors and alter the physical demands of workers when experiencing dangerous heat indexes.
- Maintain air circulation; consider a fan for vehicle interiors.
- Train workers and supervisors on warning signs of heat stress.
- Wear comfortable clothing that is not too warm.
- Avoid drinks with high caffeine and sugar.
- Implement a buddy system where workers observe each other for signs of heat stress.
- Consider providing cooling vests to workers on hot days.
- Consider acclimatizing workers to the environment over the course of a few weeks by scheduling 20 percent to 50 percent of the usual duration of work and gradually increasing it. Taking breaks within air-conditioned rooms does not affect the acclimatization rate.

COLD STRESS

Cold stress is the term for health conditions related to cold exposure. The three main types of cold stress are chilblains, frostbite and hypothermia. Extreme incidents of cold stress can result in amputations or death. However, cold stress can be prevented.

Common Symptoms of and Treatments for Cold Stress

COLD STRESS	SYMPTOMS	TREATMENT
Chilblains	• Redness • Itching • Possible blistering • Inflammation	• Avoid scratching. • Slowly warm the skin. • Corticosteroid creams help relieve itching and swelling. • Clean and cover blisters or ulcers.
Frostbite	• Reduced blood flow to hands and feet • Numbness, tingling or stinging • Aching, bluish or pale waxy skin	• Move to a warm area. • Avoid walking on frostbitten toes or feet when possible. • Immerse affected areas in warm—not hot—water. If immersion is not possible, warm fingers under arm pits or with body warmth. • Avoid rubbing frostbitten areas. Be aware that numb areas are easy to burn, for example with water that is too hot.
Hypothermia	• Early symptoms: shivering, fatigue, loss of coordination, confusion and disorientation • Late symptoms: no shivering, blue skin, dilated pupils, slowed pulse and breathing, loss of consciousness	• Call for emergency medical assistance. • Move affected individual to a warm area. • Remove wet clothing. • Warm center of the body first using an electric blanket or chemical hot packs. • Give warm nonalcoholic beverages to worker, but do not give beverages to unconscious workers. • After temperature has increased, keep worker dry and wrapped in a warm blanket including the head and neck. • Stay with worker until medical help arrives (as needed).

Cold Stress Prevention

- Be aware of weather reports, temperature and wind-chill forecasts, and plan accordingly.
- Wear appropriate clothing with multiple layers of loose clothing. Tight clothing can reduce blood circulation needed for warming.
- Protect ears, face, hands and feet.
- Wear waterproof, insulated boots.
- Take breaks in warm areas and limit time outside on cold days.
- Train employees and supervisors about the symptoms of cold stress.
- Consider including chemical hot packs in first-aid kits.
- Stay dry whenever possible. Consider having a separate set of clothes to change into if clothing becomes wet.
- Monitor self for signs of cold stress.
- Implement a buddy system where workers observe each other for signs of cold stress.
- Provide warm beverages to workers.
- Schedule long periods of outdoor work for the warmest part of the day or for the warmer months.
- Schedule additional workers for long or demanding jobs in the cold.
- Maintain vehicle heaters and general vehicle maintenance.

More information about heat and cold stress is provided by the Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health's website at *CDC.gov/NIOSH.*

TEMPERATURE EXTREMES CHECK LIST

ITEM	YES	NO	ACTION ITEM
Heat Stress			
Are supervisors and employees trained about the symptoms of heat stress?			
Do employees watch for signs of heat stress in themselves and others while working on hot days?			
Are employees encouraged to drink plenty of water during hot days?			
Do supervisors and employees review weather service forecasts, paying attention to heat advisories?			
Are employees made to take breaks or limit time outdoors on hot days?			
Is the clothing employees wear appropriate for the temperature?			
Do employees avoid drinks with high amounts of caffeine and sugar on hot days?			
Are employees and supervisors trained in basic treatment for heat stress?			
Does the air conditioning work in vehicles equipped with air conditioning?			
Are workers allowed to acclimatize to the hot environment?			
Cold Stress			
Are supervisors and employees trained about the symptoms of cold stress?			
Do employees watch for signs of cold stress in themselves and others while working on cold days?			
Do supervisors and employees review cold weather advisories?			
Are employees encouraged to wear multiple layers of loose fitting clothing on cold days?			
Are first-aid kits equipped with heat packs for cold days?			
Are employees or supervisors trained in basic treatment for cold stress?			
Are employees made to take breaks in warm areas during cold days?			
Do heaters work in vehicles equipped with them?			

WINTER PREPAREDNESS

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With cold temperatures and large amounts of snow and ice typical for Minnesota winters, it is important to prepare for these conditions. Having plans to ensure snow and ice is controlled, equipment is functional, pipes are protected from freezing and roofs are well-maintained can go a long way to keeping employees and visitors safe and the organization running.

SNOW AND ICE CONTROL

Creating a formal plan to address snow and ice removal or control can help prepare for winter hazards in an organized and effective way. Whether snow and ice removal is done in-house or contracted out, the plan should be reviewed before the first snow flies. This ensures that everyone involved is clear about his or her responsibilities for prompt and effective removal.

- Develop procedures and assignments for staff regarding snow removal operations. Procedures should include a determination of where to dispose of snow so that runoff melt will not create a slip hazard.
- Snow removal, sanding or salting of ice should be done first thing in the morning before the workday starts and employees enter the parking lot. If heavy snow or ice occurs during the day, have the lot plowed or sanded before the workday ends.
- Apply de-icing agents to parking lots and sidewalks before a storm, and during and after as needed. Consider using a liquid potassium de-icer to treat these surfaces up to 12 hours prior to a snow or ice storm. Potassium acetate is effective to -15 degrees Fahrenheit and is more environmentally friendly than salt, minimizing damage to vegetation and concrete.

Dispose of snow so that run off melt does not create a slipping hazard.

- Control drainage from roofs, parking lots and gutters to prevent ice building up on walkways.
- Snow removal equipment should be tested and operational. Ensure safety guards are in place.
- Facility staff should be trained on the use of snow removal equipment and safe shoveling practices.
- Have adequate salt, sand, grit or other ice-melting and traction-providing material available for the winter.
- Document snow and ice removal activities of employees and contracted help. These documents can be helpful in the event a claim is filed. A sample snow and ice removal log can be found in Appendix D.

OTHER WINTER HAZARD MITIGATION TIPS

- Place temporary condition hazard warning signs in wet or slippery areas. Signs should be removed promptly when conditions improve so people do not become complacent when approaching such signs.
- Place cones or otherwise highlight slip and trip hazards on sidewalks, parking lots, floors, stairways and ramps until repairs can be made.
- Use grated or moisture-absorbing mats at entrances where shoes and boots are cleaned. Stairways and ramps may need additional nonskid materials, such as textures and serrations, added to their surfaces to add friction. Nonskid paints or coatings can be added to metal and concrete surfaces to improve slip resistance.
- Mop frequently around building entryways to clean up melted snow.
- Have procedures in place for detecting changing weather conditions. Be aware of weather forecasts; weather radios can provide current conditions and forecasts for particular areas.

Warning sign alerts people to a temporary hazard.

- Keep employees informed of changing weather conditions as appropriate. This could include an e-mail reminder of potential slippery conditions or posting of changing weather conditions signs. Pre-made "changing weather" signage can be downloaded from *MCIT.org/step-wisely/*.

SLIP, TRIP AND FALL DOCUMENTATION

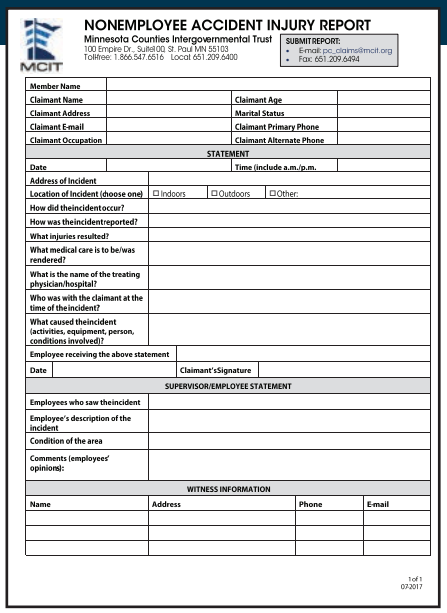
Procedures should be in place to document slip, trip and fall incidents involving visitors. These procedures should include details regarding:

- weather conditions
- time
- snow/ice removal
- lighting
- surface debris
- other relevant facts surrounding the incident.

Prompt collection of information and documentation can greatly assist with hazard mitigation and any future liability claims whether the visitor requires medical attention or not.

Photos and surveillance video (if available) preserved immediately following the incident will document the surface conditions and facts surrounding the slip, tip or fall incident for evaluation by the MCIT claims representative. For more about claims, see Chapter 42, Property and Injury Claims.

Use of the MCIT Nonemployee Accident Injury Report form (see Appendix E) is useful in gathering data and can be submitted with a claim.



NONEMPLOYEE ACCIDENT INJURY REPORT

Minnesota Counties Intergovernmental Trust
100 Empire Dr., Suite100, St. Paul MN 55103
TollFree: 1.866.547.6516 Local: 651.209.6400

SUBMIT REPORT:
- Email: pc_claims@mcit.org
- Fax: 651.209.6494

Member Name			
Claimant Name		Claimant Age	
Claimant Address		Marital Status	
Claimant E-mail		Claimant Primary Phone	
Claimant Occupation		Claimant Alternate Phone	
STATEMENT			
Date		Time (include a.m./p.m.	
Address of Incident			
Location of Incident (choose one)	☐ Indoors	☐ Outdoors	☐ Other:
How did the incident occur?			
How was the incident reported?			
What injuries resulted?			
What medical care is to be/was rendered?			
What is the name of the treating physician/hospital?			
Who was with the claimant at the time of the incident?			
What caused the incident (activities, equipment, person, conditions involved)?			
Employee receiving the above statement			
Date		Claimant's Signature	
SUPERVISOR/EMPLOYEE STATEMENT			
Employees who saw the incident			
Employee's description of the incident			
Condition of the area			
Comments (employees' opinions):			

WITNESS INFORMATION			
Name	Address	Phone	E-mail

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Document accidents in detail to assist in future liability claims.

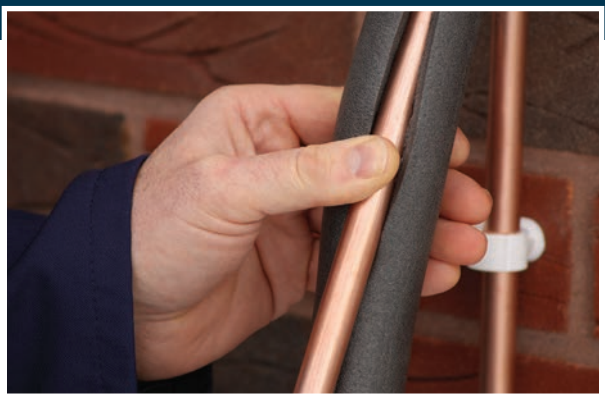
Step Wisely: A Slip, Trip and Fall Prevention Program

MCIT developed Step Wisely, a slip, trip and fall prevention program, for its members to build awareness about these hazards among employees and provide tips for how they can avoid injury. The program is available to members at no charge. See Chapter 26 or visit *MCIT.org/step-wisely/* for more information.

FREEZE-UP PREVENTION

As winter approaches, it is important to continue preventive maintenance on heating equipment, as low winter temperatures put them to the test and increase the risk of damage or leaks. Identifying potential exposure of pipes and equipment to cold before the temperatures drop is key. Also, having a plan before they fail is good risk management.

- Have systems that provide timely alerts when there is a heating failure. Consider functioning water flow alarms on sprinkler systems that sound on site and off site using a monitoring service.
- Develop a response plan in the event of a pipe burst or leak. Key staff should be trained about how to inform appropriate maintenance personnel and how to turn off water supply. All water shut-off valves should be easily accessible and well-labeled.
- Ensure all pipes located in unheated areas and outdoors are properly insulated or otherwise protected to prevent against freezing.
- Create an inventory of all water pipes throughout the facility. Identify areas where pipes may be exposed to cold temperatures. Ensure heating is sufficient in transitional areas such as vestibules and entryways, which are more susceptible to temperature extremes.
- Inventory rooms or areas that have changed occupancy since the previous year and may no longer be heated. Water pipes near those areas may have a new exposure to cold.
- Outdoor equipment should be equipped with low-temperature lubricants where applicable.

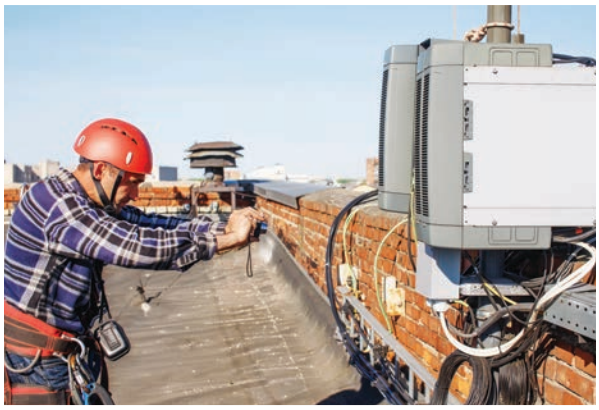


Ensure all pipes located in unheated areas and outdoors are properly insulated.

ROOF MAINTENANCE PLAN

The integrity of the roof is vital. A well-maintained roof helps prevent water infiltration, reduces risk of structural damage and can lower liability risk resulting from falling or accumulating snow or ice. Conducting pre-winter surveys of rooftops and roof drainage can help identify and address issues before damage or leaks occur.

- Roofs, particularly low-slope roofs, should be thoroughly inspected before the onset of winter. Roofing membranes should be free of tears, punctures and splits. These membranes should be well-fastened to the roof surface and free of ridges and curls. Areas of water pooling should be evaluated to determine cause and steps taken to minimize the accumulation of standing water.
- Flashing, counterflashing, coping and curbing should be secure, free of deterioration and well-maintained. Ensure good drainage around these features.
- Caulking and seals around equipment and edges of roof should be intact.
- Roof drainage areas should be clear of obstructions. Ensure gutters and drainage are directed away from walkways to minimize icy conditions.
- Snow/ice guards should be in place on metal roofs where appropriate. Missing guards should be replaced. Ensure measures are in place so that snow and ice do not fall on sidewalks, gas meters and vehicles.
- When snow is removed, ensure safety practices are followed and the integrity of the roof membrane stays intact.
  - Plan ahead, as snow will likely hide designated walking and working areas.
  - Ensure snow removal will not harm people or property below.
- Carefully review the roof warranty and manufacturer's guidelines to determine appropriate rooftop snow removal and repairs so as not to void the warranty.



Flashing, counter flashing, coping and curbing should be secure, free of deterioration and well-maintained.

Documentation is important. Rooftop inspection logs can help track areas in need of attention and keep track of past repairs.

For more information about roofs and a general inspection check list, see Chapter 38, Roofs. Air conditioning lay-up and other resources for winter preparedness are available at no cost from Hartford Steam Boiler's website at *MunichRe.com/HSB/loss-prevention/index.html*.

Safe Roof Maintenance

Care must be taken when performing maintenance or repairs on the roof. Employees should be trained on proper procedures for safe roof maintenance. Special emphasis should be placed on training and proper equipment for fall protection (see Chapter 17 for more information).

WINTER PREPAREDNESS CHECK LIST

ITEM	YES	NO	ACTION ITEM
Snow and Ice Removal			
Are procedures and assignments in place regarding snow removal operations?			
Are staff trained regarding snow removal operations?			
Is the facility staff trained on using the equipment and on safe shoveling practices?			
Is all snow removal equipment tested, operational and equipped with required safeguards?			
Is adequate ice-melting and traction-providing material available for the upcoming winter?			
Are changing weather condition hazard warning signs available and ready to put out if needed?			
Are mats of sufficient size to absorb expected moisture in place at entrances where shoes and boots are cleaned?			
Have floor surfaces and cleaning techniques been evaluated to ensure floors are as nonskid as possible?			
Is weather monitored for changing conditions for all employee locations?			
Are snow and ice removal tasks documented?			
Is a slip, trip and fall program in place to increase awareness of winter exposures?			
Are procedures in place to document slip, trip and fall incidents?			
Freeze-up Prevention			
Is a response plan in place should a pipe burst or a leak occur?			
In the event of a burst pipe or leak, are key staff members trained to inform maintenance personnel and to turn off the water?			
Are water shut-off valves easily accessible and well-labeled?			
Are all water pipes identified throughout the facility?			
Have any rooms changed occupancy since the previous year to where they may no longer be heated?			
Is heating sufficient in transitional areas (e.g. vestibules, entryways) where water pipes are located?			
Are systems/procedures in place for timely alerts of heating failures?			
Are all pipes located in unheated areas and outdoors properly insulated or otherwise protected to prevent against freezing?			

WINTER PREPAREDNESS CHECK LIST CONTINUED

Are systems in place to work with utilities, such as the city, to manage hazards from frozen pipes or fire hydrants?			
Roof Maintenance			
Is there a plan for proper rooftop snow removal if needed?			
Does the roof maintenance plan follow the manufacturer's guidelines?			
Are roofs thoroughly inspected before the onset of winter to ensure: • Membranes are free of tears, punctures and splits and are well fastened to the roof surface?			
• Ballast is evenly distributed throughout roof?			
• Flashing, coping and other components vital to weatherproof integrity of the roof are free of deterioration and well-maintained?			
• Caulking and seals are intact and in good condition?			
• Drainage is sufficient around flashing, coping and counter flashing?			
Are tree branches trimmed away from rooftops to minimize risk of damage from contact, falling limbs or leaf buildup?			
Are roof drainage areas clear of obstructions?			
Are drainage downspouts positioned so runoff will not create icy spots on walkways?			
Are icebreakers or snow guards installed and repaired on slanted roofs above entryways if necessary?			
Are measures taken to prevent ice and snow from falling onto sidewalks, gas meters, vehicles, etc.?			
Are employees trained about rooftop work and equipped with proper fall protection if necessary?			
Are terms of the roof warranty reviewed before repairs or remodeling is done?			
Are inspections and repairs documented and retained?			

PROPERTY AND INJURY CLAIMS

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When damage to property, an accident, injury or near miss occurs, facility management employees often play a key role in securing the scene to prevent further damage or injury, as well as in gathering information for the post-incident documentation and the investigation process.

Timely action can assist in identifying corrective measures and controlling costs which helps lead to better outcomes.

CLAIM, NEAR MISS PROCEDURES

Members should adopt an incident response plan or procedure. This process should include steps to take after an incident, such as emergency response procedures, gathering photographs, witness statements or other supporting evidence, and prompt reporting to MCIT, the organization's provider of property, liability and workers' compensation coverage.

Facility managers should know who within the organization is responsible for coordinating and submitting incident notices (claims) to MCIT. The person may be different for property and liability incidents than for workers' compensation claims. The facility manger should work with the designated individual to ensure the prompt submission of information to MCIT.

Many claims are at least partially caused by weather or other rapidly changing conditions, so the sooner the scene and facts are recorded, the better. Facility managers or other responsible staff members should promptly evaluate information to identify steps necessary to prevent or reduce losses in the future.

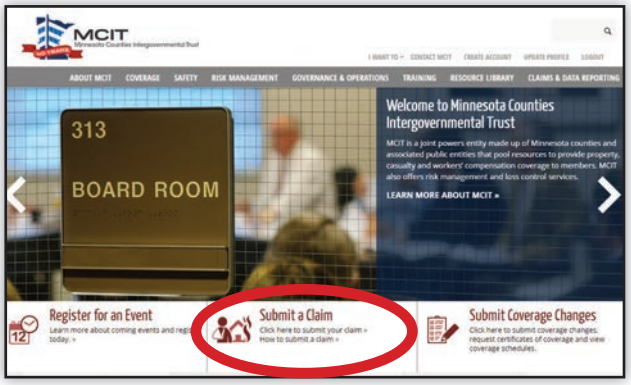
PROPERTY DAMAGE

When property is damaged, members must take certain actions to ensure that coverage applies. Conditions are detailed in the MCIT Coverage Document. Generally, members must:

- Protect damaged and undamaged property from further loss.
- Use other property to reduce the loss, if possible.

Third-party Property Damage

Damage to someone else's property, for example a slip and fall that damages a laptop or a vehicle damaged by debris from a mower, should be carefully documented. Staff should take photos of the damaged property and obtain contact information and any statement from the property owner. Members should follow their incident reporting procedures and upload copies of all relevant photos and documentation through the online MCIT member portal.



Promptly report any incident to MCIT using the online member portal.

- Report the loss to MCIT via the online member portal as soon as possible.
- Report the situation to law enforcement if a potential crime has occurred.
- Identify, document and retain any evidence of the loss.

Photographs of damaged property can be helpful in the claim adjusting process. They provide essential documentation of the property itself and the conditions at the time of loss discovery.

INJURIES

GATHER FACTS PROMPTLY

Gathering incident facts is critical to an injury claim investigation and to future incident prevention. When an injury occurs:

- Obtain information, such as the injured party's name, address, age and a detailed account of the facts.
- Retain in writing any statement from the injured party, especially related to his or her awareness of the surroundings or level of distractedness.
- Document details regarding injuries or medical treatment being sought. For a serious injury, members should follow policies and practices about calling emergency response services.
- Record other details as appropriate, such as photographs, whether police responded, video surveillance footage and witness statements.

When an employee is injured, a similar process should be used, including prompt reporting to MCIT, as statute requires a determination of compensability within 14 days of the incident.

When evaluating a liability claim or lawsuit, the facts of the case are the most important factor in determining the chances of a favorable outcome or the need for early resolution. Although MCIT's claims professionals work diligently to investigate the details, early member documentation greatly assists their work.

For example, when faced with a slip and fall incident, items such as snow/ice removal records, salt/ice melt or abrasive use, inspections, repairs and photographs of the incident site provide a record of conditions at the time of incident. These documents not only aid the member and MCIT in the claim process, but also help the member review its applicable facility maintenance policies and procedures to identify any deficiencies.

SCENE PHOTOS

An important area where members can assist in the investigation is taking photos of the scene soon after an incident occurs, especially when conditions could change rapidly. For instance, if a person falls on a sidewalk and alleges that the conditions were slippery, a photograph taken as soon as possible after the incident would show whether the sidewalk had been shoveled or salted, if snow or ice were present and whether other sidewalks or safer routes could have been taken.

Take photos of the scene soon after the incident occurs.

In one instance, photos provided by a member showed a mostly clear sidewalk with safe access to a building the claimant did not take. The pictures allowed MCIT to deny liability early in the investigation, causing the individual to drop the claim.

Conversely, if photos show that a hazardous condition existed and possibly was not addressed in a timely manner, MCIT can quickly make that determination and discuss with the member options for resolving the claim and preventing potential future claims.

GENERAL TIPS

When an injury occurs, the member should:

- Check member-owned security/surveillance cameras at or near the accident location (on the member's property) to see if the incident was captured. If so, save a copy of the video and mark it so as not to record over it.
- Use the MCIT-provided Nonemployee or Employee Accident Injury Report to gather information from all witnesses, including the injured party. Forms capture what occurred in the individual's own words. They can be downloaded at *MCIT.org/reporting-mcit/* (see also Appendix E for Nonemployee Accident Injury Report form).

Spoliation of Evidence

Spoliation of evidence is the destruction, loss or alteration of evidence involved in a claim that could have a dramatic impact on a court proceeding, such as the defense of a lawsuit brought by a party against an MCIT member. Spoliation does not have to be intentional to occur. Simple negligent or accidental spoliation of any evidence can cause significant issues in defending a claim and protecting the reputation of the member.

Evidence related to an accident, claim or lawsuit should be preserved and stored in a secure area or otherwise protected until the claim or lawsuit is resolved. Accessibility to evidence should be limited, and the item should be clearly identified as to what it relates, the date and any other details to identify it later.

Some examples of physical evidence would be a roof truss that fails, resulting in property damage; a hand rail that breaks, causing a person to fall; office equipment that is alleged to have a flawed design or construction that results in injury or property damage.

Spoliation of evidence, either intentional or accidental, could have a negative impact on a lawsuit.

Less obvious but equally important examples of evidence include paper and electronic data or documents, such as video, voice mail recordings and e-mails, that may relate to a topic that is the subject of a claim or lawsuit.

- Note what the injured party says right after the incident. Some admit they were distracted, they were not paying attention, they had their hands full, etc.
- Obtain witness names and contact details. MCIT claims staff can gather formal statements later.
- Comment on any signage warning of dangerous conditions whether or not it was present.
- Take measurements when an incident involves a minor rise in sidewalks, steps, ramps, etc., such as a trip and fall.
- Provide comment about and alterations to the area, e.g., change in lighting, re-routing due to cleaning or repairs of the floor, etc.
- Take note of any factors that may have contributed to the incident. Note weather, lighting, even footwear worn by the claimant and sole composition for a slip and fall incident. Flip flops versus tennis shoes can be an important fact.

Vehicle Damage

Employees should thoroughly document any vehicle incident, regardless of whether it is entity owned.

If an incident involves a vehicle accident, for example in a parking lot, the member should take photos of the scene and vehicles involved, regardless of whether the vehicle(s) are owned or not owned by the entity. Photos should be taken from all corners of all vehicles (even if no damage is visible) and include license plates.

If possible, members should take photos of the driver(s), driver's license(s) and insurance information. It is much easier to take photos at the scene than to write down everything.

Members should follow their incident reporting procedures and upload copies of all relevant documentation or photos through the MCIT member portal.

PROPERTY AND INJURY CLAIMS CHECK LIST

ITEM	YES	NO	ACTION ITEM
Does the facility manager know who has the responsibility for coordinating and submitting property, liability and workers' compensation claims?			
Is there an incident response plan or procedure for responding to property damage or injury incidents?			
Is incident information promptly evaluated to identify necessary steps to prevent or reduce losses in the future?			
When damage occurs to member property, are conditions of coverage met to ensure coverage applies: • Is property protected from further loss?			
• Is the loss reported to MCIT via the online member portal as soon as possible?			
• Is evidence identified, documented and retained?			
• Are photos taken of damaged property and provided to MCIT?			
When an injury occurs, are the following collected and documented: • Injured party's name, address, age and account of the facts?			
• Details of injury and medical treatment being sought?			
• Other pertinent details (e.g., police response, video surveillance footage, witness statements, etc.)?			
• Photos of the scene and conditions?			
Is evidence sufficiently protected and retained?			

APPENDIX A TRIMMERS SAFETY CHECKLISTS

Weed Trimmers

- Start the engine on firm ground in an open area, holding the trimmer with two hands while maintaining good balance and footing.
- Maintain good footing and balance while operating the equipment. Do not overreach.
- Do not raise the weed trimmer head above waist level.
- Keep all parts of your body away from the trimmer head and muffler when engine is running.
- Stop or idle the engine when people or animals come too near.
- Hold the trimmer so that debris is directed away from you.
- Store gas-powered models in an upright position to help prevent spills.

Hedge Trimmers (Power Shears)

- Select a trimmer that is comfortable and easy to handle.
- Never use electric trimmers in the rain, on wet grass or shrubs, or near water. If using an electric model, plug it into a ground fault interrupted outlet if the cord is not double insulated.

APPENDIX B BLOWERS SAFETY CHECKLIST

- Start and run the equipment in an upright position.
- Operate with tubing attached.
- Direct the discharge of debris away from people, animals and property that could be damaged. Be aware of solid objects that could cause discharged materials to ricochet.
- Blowers should not be operated on ladders or unstable surfaces.
- Blowers should not be used to spread or mist chemicals, fertilizers and other toxic materials.

"Leaf Blowers: Proper Operation" video produced by Portable Power Equipment Manufacturers Association: A 19-minute DVD available through the MCIT Video Library provides general guidelines and recommendations for eliminating unsafe operation of leaf blowers and preventing environmental damage as a result of leaf blower use.

APPENDIX C MOWER SAFETY CHECKLISTS

Before Mowing

- Dress properly. Wear close-fitting clothes with long sleeves and pants, work boots with good traction, and properly fitted ear and eye protection. A pair of heavy gloves should be kept handy when servicing the mower blade.
- Familiarize yourself with the machine. Although many mowers may have similar components, every machine has specific features. Read the operator's manual to familiarize yourself with the machine. Check the mower's safety guards to ensure they are in proper working condition. Pay attention to warning labels and know how to stop the machine quickly when needed.
- Inspect the mower daily before use. When inspecting the mower, do so on a flat, hard surface. Check the hydraulic system, coolant, oil and fuel to ensure proper levels. Inspect the condition of the air cleaner or filter. Clean off radiator screen on riding mowers. Ensure that belts, catchers and guards are in proper working order. Refer to the operator's manual for inspection procedures.
- When fueling, pay attention to the type of fuel used. Ethanol can damage fuel system components. Avoid fuels containing more than a 10 percent mixture of ethanol.
- Check your work area. Before mowing, inspect the area for hidden hazards such as rocks, bottles, wire and sticks. These hazards can become projectiles when struck by the mower blades and cause injuries to pedestrians and the operator, and damage property. Also note natural hazards such as bee nests and slippery terrain.

While Mowing

- Pay attention to your surroundings. Stop the mower when a person or animal approaches. Watch for hidden hazards that were missed during the pre-inspection of the area. Never position the side-discharge toward people or property.
- Use caution on slopes. Never mow up and down slopes, mow across them. Decrease your speed when mowing on slopes.
- If the discharge chute becomes clogged, make sure to turn off the engine before getting off the mower. Disconnect the spark plug wire to prevent accidental start up and clear the discharge with a stick or a tool, never your hands.
- If it is necessary to refuel, bring the mower to a stop on a flat, hard surface. Turn the engine off and allow the engine to cool. Be careful when filling the tank and wipe up any spills.

After Mowing

- Clean and maintain the mower. When shutting down a riding mower, the operator should remain seated when turning off the engine. Make sure the engine is stopped and the engine is off before cleanup and maintenance. Disconnect the spark plug to perform routine maintenance procedures as detailed in the operator's manual. Use caution when cleaning the mower, mower deck and discharge chute. Parts of the engine will be hot after shutdown.
- If the mower needs repair, tend to it quickly. If a problem cannot be fixed immediately, ensure that the mower is unable to be used until the repair is made.

Other Safety Precautions

- Never leave a running mower unattended.
- Never disconnect the discharge chute guard or any other safety feature installed by the manufacturer.
- Never refill with gas when the engine is still hot.
- If a riding mower is equipped with a rollover protective structure, it is important that the user wears the equipped seat belt.

APPENDIX D SNOW AND ICE REMOVAL LOG

SNOW AND ICE REMOVAL LOG

Complete or check all that apply.

Date	Time	Location	Ice Melt	Sand/ Grit	Activities				Conditions					Con-tracted Service	Initials
					Shovel	Plow	Blow	Other	Clear	Snow	Sleet	Other			

Comments:

APPENDIX E

NONEMPLOYEE ACCIDENT INJURY REPORT

Minnesota Counties Intergovernmental Trust
100 Empire Dr., Suite100, St. Paul MN 55103
Toll-free: 1.866.547.6516 Local: 651.209.6400

SUBMIT REPORT
Upload with Liability Incident Notice through the online MCIT member portal (MCIT.org)

Member Name			
Claimant Name		**Claimant Age**	
Claimant Address		**Marital Status**	
Claimant E-mail		**Claimant Primary Phone**	
Claimant Occupation		**Claimant Alternate Phone**	
STATEMENT			
Date		**Time (include a.m./p.m.**	

Address of Incident			
Location of Incident (choose one)	☐ Indoors	☐ Outdoors	☐ Other:
How did the incident occur?			
How was the incident reported?			
What injuries resulted?			
What medical care is to be/was rendered?			
What is the name of the treating physician/hospital?			
Who was with the claimant at the time of the incident?			
What caused the incident (activities, equipment, person, conditions involved)?			

Employee receiving the above statement			
Date		**Claimant's Signature**	

SUPERVISOR/EMPLOYEE STATEMENT	
Employees who saw the incident	
Employee's description of the incident	
Condition of the area	
Comments (employees' opinions):	

WITNESS INFORMATION			
Name	**Address**	**Phone**	**E-mail**