

CITY OF CEDAR RAPIDS

VOLUME I



EMPLOYEE SAFETY AND HEALTH HANDBOOK

PREFACE

The information provided in this handbook is intended as a general overview of occupational safety and health requirements applicable to municipal operations and services. The policies and procedures described are typically a summary of selected Iowa Occupational Safety and Health Administration (OSHA) regulations and City of Cedar Rapids policies.

Every effort has been made to ensure that the information is current and correct but you should be aware that safety standards and enforcement policy may change over time.

This handbook is not all-inclusive of every safety policy or procedure that may apply to your job but it does try to touch on the most common ones and those with the broadest application. The information provided in this handbook does not establish policy or preempt existing policies.

Always refer to the original policy document, such as the Human Resource's Personnel Policy Manual or OSHA standard, whenever there is a question or conflict.



Cedar Rapids, a vibrant urban hometown – a beacon for people and businesses invested in building a greater community for the next generation.

MESSAGE FROM THE CITY MANAGER

This handbook has been developed to help you get acquainted with the City's safety and health policies so that you can do your job efficiently and effectively.

Please keep in mind that safety is both an individual and a collective responsibility. If we work together, we can provide and maintain a safe and healthy workplace. It is my expectation that you will be proactive in the area of safety and that you will report unsafe conditions, ask questions if you are unsure of the proper or safe way to perform a task, and offer suggestions to help improve safety.

The City of Cedar Rapids is committed to safety and encourages all employees to get involved in the safety process. If you have ideas, suggestions, concerns, or questions, we want to hear them. Talk to your supervisor or contact the Human Resources Department Safety & Health Office directly.

I deeply appreciate your choosing to work for the City of Cedar Rapids and I am looking forward to your contributions in making this a better city in which to live, work, and play.



JEFF POMERANZ, City Manager
City of Cedar Rapids

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Employee Safety & Health Handbook

A – INTRODUCTION

The City of Cedar Rapids is committed to delivering municipal services in a manner that protects the health and safety of its employees, safeguards the general public, and sustains the environment. It is our policy that accident prevention be considered of primary importance in all phases of City operations and administration and that employees are entitled to work under the safest conditions possible.

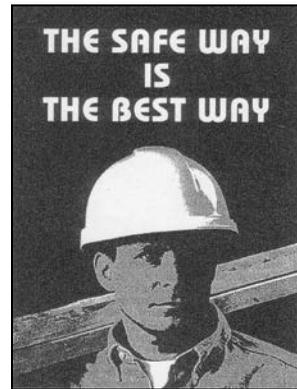


The City strives for continuous improvement in its environmental, health, and safety programs by:

- Complying with all applicable laws and regulations.
- Seeking innovative and creative ways to eliminate or minimize hazards.
- Identifying unsafe conditions in the workplace and addressing unsafe behaviors.
- Reducing potential exposures through risk assessment, management, and training.
- Communicating the City's safety and health policies to its employees, vendors, and contractors.

Employee Safety Responsibilities

- Follow prescribed safe work practices and housekeeping policies.
- Use proper safety devices and personal protective equipment.
- Report unsafe conditions or suspected hazards to your supervisor.
- Promptly report all accidents and injuries to your supervisor.
- Attend and actively participate in required safety training courses.
- Keep required job certifications and licenses current, such as CPR, forklift license, and commercial drivers' license.



Employee Rights under OSHA

The Occupational Safety and Health (OSH) Act of 1970 created the Occupational Safety and Health Administration (OSHA) and encourages employers and employees to reduce workplace hazards and to implement safety and health programs.

The law encourages workers to be active players in their workplace's safety and health effort. The

OSH Act gives employees many new rights. A few of these include the right to:

- Review copies of appropriate standards, rules, regulations, and requirements.
- Request information from the employer on safety and health hazards in the workplace, appropriate precautions to take, and procedures to follow.
- Gain access to their employee medical and environmental exposure records.
- Request an OSHA inspection if they believe hazardous conditions or violations of standards exist in the workplace.
- Review the employers' Log of Work-Related Occupational Injuries and Illnesses (OSHA 300 Log).



If you have any questions about these or other employee rights under OSHA, please see the OSHA poster, “Job Safety and Health: It’s the Law” or OSHA Publication 3021-08R, Employee Workplace Rights.

Whistleblower Protections

Under the ‘Whistleblower Laws’ enforced by OSHA, employees are entitled to file a complaint with OSHA if they feel they have been retaliated against through unfavorable personnel action because they engaged in protected activity relating to workplace safety and health, the environment, or public transportation agency safety or security. Each law requires that complaints be filed within a certain number of days (usually 30) after the alleged retaliation.

An employer may be found to have retaliated against an employee if their protected activity was a contributing or motivating factor in its decision to take unfavorable personnel action against them. Such actions may include disciplining, reducing pay or hours, denying overtime or promotion, reassignment affecting promotion prospects, blacklisting, demoting, or firing.

If you believe that you have been retaliated against because you exercised your legal rights as an employee, contact your local OSHA office as soon as possible, because you must file your complaint within the legal time limits. OSHA conducts an in-depth interview with each complainant to determine whether to conduct an investigation. For more information, call the Iowa OSHA Office at 515-281-7629 or the federal OSHA Regional Office in Kansas City at 816-283-8745.

OSHA determines whether retaliation took place if its investigation reveals that: (1) the employee engaged in protected activity; (2) the employer knew about the protected activity; (3) the employer took an adverse action; and (4) the protected activity was the motivating or contributing factor in the decision to take the adverse action against the employee. If the evidence supports the employee’s allegation and a settlement cannot be reached, OSHA will issue an order requiring the employer to reinstate the

employee, pay back wages, restore benefits, and other possible remedies to make the employee whole.

Limited Protections for Employees Who Refuse to Work

You have a limited right under the OSH Act to refuse to do a job because conditions are hazardous. You may do so under the OSH Act only when you believe that you face death or serious injury (and the situation is so clearly hazardous that any reasonable person would believe the same thing); you have tried to get your employer to correct the condition, and there is no other way to do the job safely; and the situation is so urgent that you do not have time to eliminate the hazard through regulatory channels such as calling OSHA. Regardless of the unsafe condition, you are not protected if you simply walk off the job.



Supervisor's Safety Responsibilities

- Train their employees on the proper operation of machinery, tools, and equipment and safe work practices to ensure they are technically competent to perform the work required of them.
- Ensure employees have been issued the proper personal protective equipment before they start their jobs.
- Ensure employees adhere to safe work practices and housekeeping policies in the performance of their job.

- Conduct regular inspections of their workplace to identify unsafe conditions and behaviors.
- Conduct thorough accident investigations when injuries occur and recommend corrective action.
- Take corrective action when unsafe conditions or methods are noted and correct unsafe behaviors in a constructive manner.

City Safety & Health Services

City Safety & Health Services refers collectively to the Human Resources Department (HRD) Safety and Health Office, the Utilities Safety & Health Office, and the Fire Department Safety Officer.

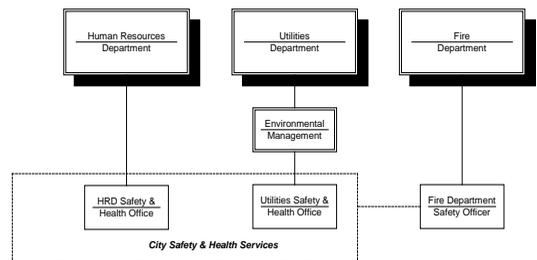


FIGURE 1. Organizational Chart: City Safety and Health Services.

City Safety & Health Services is responsible for managing the City's safety and health programs, developing safety policy, and providing an independent oversight function. The safety and health staff serve as a resource to line management to ensure that work is performed in such a manner that protects employees, contractors, and the public; and complies with regulatory requirements under the Occupational Safety and Health Act.

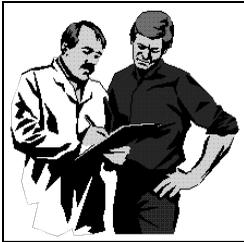
City Safety & Health Services generally serves in an advisory capacity to managers and supervisors. For example, the Safety & Health staff may develop and recommend a safety

policy, plan, program or procedure with the concurrence of management. Enforcement of the policy is the responsibility of supervisors and managers.

HRD Safety & Health Office

Safety Office

The major areas of responsibility of the Safety Office are to identify and evaluate hazardous conditions and practices, recommend hazard control methods, implement hazard control programs, and evaluate the effectiveness of hazard control programs.



Specific services provided by the Safety Office include:

- Performs periodic facility safety inspections and safety program audits.
- Investigates work-related accidents and incidents.
- Conducts job safety analyses and process hazard analyses.
- Measures and assesses employee exposures to biological, chemical, and physical hazards.
- Evaluates the effectiveness of engineering controls.
- Recommends personal protective equipment and other hazard control measures.

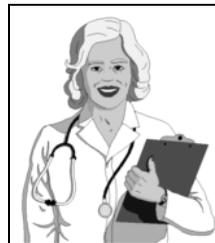
- Develops safety programs, policies, and procedures.
- Presents or arranges the presentation of safety-related training.

Health Office

The Health Office delivers health services to City employees that focus on the promotion and restoration of health and the prevention of work-related injuries and illnesses. The program consists of services to assist in worker protection from occupational hazards, promote good health and a healthy working environment for workers, further the prevention and early detection of diseases, and treat work-related injuries or illnesses.

Specific services provided by the Health Office include:

- Conducts pre-employment physicals.
- Provides first aid treatment emergency care for job related injuries and illnesses.
- Provides case management services (i.e., referrals, coordinating follow-up care, rehabilitation, return-to-work, and workers' compensation issues).

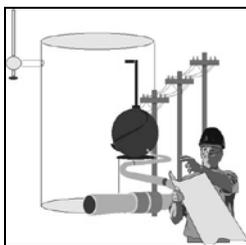


- Monitors the health status of workers exposed to specific occupational and environmental health hazards.
- Manages the City's drug and alcohol awareness program.

- Develops occupational health-related programs, policies, and procedures.
- Conducts ergonomic assessments.
- Provides health education programs to encourage workers to take responsibility for their own health.

Utilities Safety & Health Office

The Utilities Safety & Health Office performs the same functions as the Safety Office but is primarily responsible for the Public Transit Division, Solid Waste Division, Transit Division, Water Division, and Water Pollution Control Facilities.



Fire Department Safety Officer

The Fire Department Safety Officer serves as the risk manager for all Fire Department operations and is primarily responsible for administering the occupational safety and health program within the Fire Department (see NFPA Standard 1500).

The Fire Department Safety Officer has no safety or health responsibilities outside of the Fire Department but may call on CITY SAFETY & HEALTH Services for assistance or support as necessary.

Safety Goals and Objectives

The City's safety objective is to reduce the number of occupational injuries, illnesses and property damage. Almost all accidents are preventable and the overall goal is to reduce the

number of occupational injuries and illnesses to zero. CITY SAFETY & HEALTH Services develops annual safety objectives for the City based on injury and illness incidence rates and other indicators. Department directors and division managers may develop their own safety objectives, depending on their specific needs and challenges.

"It is better to be careful a thousand times than to be killed once."
-- Proverb

"There was only one catch and that was Catch-22, which specified that a concern for one's own safety in the face of dangers that were real and immediate was the process of a rational mind."
-- Joseph Heller

"It is a very sobering feeling to be up in space and realize that one's safety factor was determined by the lowest bidder on a government contract."
-- Alan Shepherd

B – ADMINISTRATION/MANAGEMENT

“In organizations, real power and energy is generated through relationships. The patterns of relationships and the capacities to form them are more important than tasks, functions, roles, and position.”

-- Margaret Wheatly

“Those who enjoy responsibility usually get it. Those who merely like exercising authority usually lose it.”

-- Malcolm Forbes

“The secret of managing is to keep the guys who hate you away from the guys who are undecided.”

-- Casey Stengel

Personnel Policies

Americans with Disabilities Act

The City will not discriminate based on disability in admission, access, or operations of its programs, services or activities. The City of Cedar Rapids does not discriminate based on disability in its hiring or employment practices.



Questions, concerns, complaints or requests for additional information regarding the ADA may be forwarded to the Human Resources Department.

Drug and Alcohol Awareness

Drug and alcohol abuse in the workplace interferes with and reduces the efficiency of City government and undermines the public’s trust in its functions. City employees have a right to work in a drug-free environment and to work with persons free from the effects of drugs and alcohol. The unlawful possession, distribution or use of a controlled substance on City property or in a City vehicle is prohibited. Violations of this policy will result in disciplinary action, up to and including termination, and may have legal consequences.



City employees are prohibited from consuming alcohol on the job and may not report for work within four hours of having consumed alcohol. You may not take prescription drugs while on the job except by a doctor’s prescription. Employees using personal prescription drugs must carry the drugs in the original container (which must be labeled with the name of the doctor and the drug prescribed).

The City may require a drug and alcohol test of those employees in the workplace where:

- There is probable cause to believe that the employee’s faculties are impaired, or
- The employee is in a position where such impairment presents a danger to the safety of the employee, another employee, a member of the public, or the property of the City.

If the employee should refuse to take an alcohol test or a drug test, or provide a urine sample, there will be a presumption that the employee has a positive reading of .04 or greater alcohol concentration or that the drug test is positive.

The City recognizes drug and alcohol dependency as an illness. Employees needing help in dealing with such problems are encouraged to use the Employee Assistance Program.

The Drug-Free Workplace Act of 1988 requires that employees report any conviction under a criminal drug statute if the violation occurred on City property or off-site if they were conducting City business. A report of the conviction must be made to the employee's supervisor and the HRD Safety & Health Office within five workdays after the conviction.



Employee Assistance Program

The City, in cooperation with Mercy Medical Center, has adopted an Employee Assistance Program (EAP) to ensure employees have a way to address mental, physical, or emotional problems that may be affecting their job performance.

Under the program, an employee or their dependents may have up to three counseling or guidance sessions with a Mercy EAP counselor without charge. During these counseling sessions, the counselor will evaluate the situation and may outline alternative solutions and

community resources available to help the person with their problem.

Records of EAP client services are considered to be EAP property and will not be available to the City without a "Release of Information" form signed by the employee or family member using EAP services.



An employee may be referred to EAP by the City in the event of deterioration of work performance.

Employee Identification Badges

Each employee is responsible for obtaining and wearing their City identification badge. The proper way to wear the badge is on the front side above the waistline and below the shoulders.



If you see people in your work area that you don't know that are without an ID badge, you should question them. Usually, a simple question such as "Can I help you find someone" or "Are you looking for some place in particular?" is all that is needed.

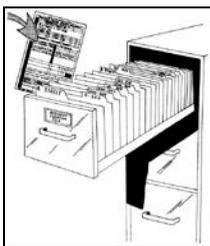
Exceptions

Those who wear uniforms may be exempt from the policy if the uniform displays their City affiliation. Although the badge may not have to be displayed, it still must be available upon request.

Also exempt from displaying an identification badge are those employees who work in operations or facilities where the badge may present a hazard to the employee due to the conditions, equipment, duties, or environment. These exceptions will be made by the department director.

Health Insurance Portability and Accountability Act (HIPAA)

HIPAA stands for the Health Insurance Portability and Accountability Act (Public Law 104-191). Among other things, HIPAA gives patients new rights to access their medical records, restrict access by others, request changes, and to learn how they have been accessed.



One of the most important aspects of HIPAA is its privacy protection. The HIPAA privacy regulation provides for the protection of confidentiality and security of health care data so that individually identifiable information about a person's physical or mental health or health care is protected from unauthorized disclosure.

Under normal circumstances, an individual must give written consent to disclose his or her health

information. HIPAA recognizes that if there is a law that requires a specific disclosure of protected health information, the law must be obeyed. It is possible to disclose personally-identifiable health information without authorization if there is a compelling need for disclosure, such as when the information is needed for public health situations, court and agency proceedings (such as workers' compensation claim proceedings), agency requirements (such as OSHA 300 Logs), law enforcement, emergencies, identification of deceased people, and national security situations.

The HIPAA privacy rule does not require the City (as an employer) to remove names of injured employees from the OSHA 300 Log. Since the OSHA 300 Log is a required record, employers have no choice but to include all necessary information on it, including the employees' name and injury information.

Injury & Illness Reports completed by an injured employee or their supervisor also are not covered under the HIPAA Privacy Rule, although any medical records relating to treatment is covered. The Injury / Illness Reports are protected as confidential documents because they contain the employee's social security and employee identification numbers. Biological exposure monitoring records (such as a blood lead test) obtained for the purpose of measuring or assessing workplace exposure levels are not covered under the HIPAA Privacy Rule.

Lean Process Improvement

'Lean' process improvement is a management philosophy and set of techniques focused on customer satisfaction and continuous improvement. 'Lean' is a dynamic process improvement philosophy that continually improves the work environment and accelerates performance. It provides a structured system for managing the quality of products or services,

processes, and resources to satisfy internal and external customers.

A basic tenet of 'lean' process improvement is that as quality improves, costs will be reduced.



We encourage all of our employees to take an active role in supporting and promoting continuous process improvement, especially on teams or projects focused on improving workplace safety.

"There is nothing permanent except change."
-- Heraclitus of Ephesus (540-480 BC)

"We are what we repeatedly do. Excellence, then, is not an act but a habit." -- Aristotle

"If at first you don't succeed, try, try again. Then give up. There's no use in being a damn fool about it." -- W.C. Fields

NIMS Training

The Department of Homeland Security published the National Incident Management System (NIMS) in 2004 to provide a comprehensive and consistent approach to manage domestic incidents. Implementation of the NIMS process is crucial to the nation's success in preventing, preparing for, responding to and recovering from disasters – regardless of their cause.

While most emergencies are handled locally, help may be needed from the state and federal government when there is a major incident. Under NIMS, responders from different jurisdictions and disciplines can work together in response to natural disasters and emergencies. NIMS benefits include a unified approach to incident management; standard command and management structures; and emphasis on preparedness, mutual aid and resource management.

All City employees are directed to complete specific courses at FEMA's Emergency Management Institute (EMI) online independent study program. Currently, six courses are required in order for an individual or organization to be considered NIMS compliant.



To determine what level of training an employee needs according to their responsibilities during an incident, check the following website: www.fema.gov/pdf/emergency/nims/TrainingGdIMatrix.pdf

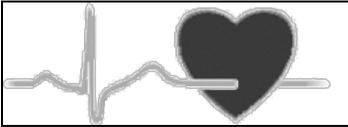
Public Access Defibrillators

Automated external defibrillators (AEDs) are portable, battery-powered devices that analyze a sudden cardiac arrest (SCA) victim's heart rhythm, determine if a shock is necessary, set the proper charge, and instruct the responder to shock the victim.

A person in sudden cardiac arrest is vulnerable because, within seconds, he or she loses consciousness and has no pulse. Quick actions

of others are critical to a victim's survival because survival rates drop 10 percent every minute without appropriate treatment.

AEDs increase the chances of survival from sudden cardiac arrest by helping to restore a normal heart rhythm. Properly trained, non-emergency personnel can use AEDs in addition to CPR to provide aid until emergency services arrive. OSHA recommends AEDs in the workplace but does not mandate them.



Security Alert System

National terrorism incidents in the United States have caused the government to develop the Homeland Security Advisory System. This system allows the government to measure and evaluate terrorist threats and communicate them to public safety officials and the public at-large in a timely manner.



Based on the alert level issued by the Homeland Security Advisory System, the City of Cedar Rapids will implement protective measures to reduce the likelihood or impact of an intentional attack. The current alert level can be found at the following website:
www.iowahomelandsecurity.org

Sexual Harassment

It is the policy of the City of Cedar Rapids to provide an environment that is free of sexual harassment.



Sexual harassment can take many forms, including:

- *Verbal:* sexual innuendoes, suggestive comments, jokes of a sexual nature, sexual propositions, or threats
- *Non-verbal:* sexually suggestive objects or pictures, suggestive or insulting sounds, leering, whistling, or obscene gestures
- *Physical:* unwanted physical contact, including touching, pinching, or brushing the body



Sexual harassment can be blatant or subtle. It occurs when the conduct unreasonably interferes with work performance or creates an intimidating, hostile, or offensive working environment. Whatever form it takes, sexual harassment can be insulting and demeaning to the recipient. All City employees, supervisors

and managers are expected to take appropriate measures to ensure that such conduct does not occur.

Any employee who believes he or she has been the subject of sexual harassment should report the incident immediately to their supervisor, department director, or the Human Resources Department.

Smoking Policy

Smoking and the use of smokeless tobacco products are prohibited in all City-owned buildings and vehicles.

If you are a smoker, please check with your supervisor about the location of designated smoking areas and your department's policies on smoke breaks.



If you are a smoker and would like to quit, the HRD Safety & Health Office offers smoking cessation classes.

Work Clothing

A number of jobs in the City require a work uniform. If your job is one of these, check with your supervisor about policies concerning the wear and care of the uniform. Any work clothing, whether a uniform or not, should present a professional image. Ragged, torn, or dirty clothing should not be worn. Some departments may have additional dress code requirements.

Audio Headsets

Employees may be prohibited from using audio headsets (*iPods / MP3 players or other devices with earphones*) while performing their duties in certain instances, either for safety reasons or to maintain a professional image in the public eye. Check with your supervisor about any departmental policies that may apply.

Workplace Violence

“One only has to try and imagine the worst thing a person could do to another and, sadly enough, somewhere in the world someone is doing it.”

-- David Letterman

Violence in the workplace may include the following:

- The use of physical force with the intent to cause harm.
- Acts or threats in any form or manner, which are intended to intimidate, cause fear, or cause harm.



- Creating a hostile or intimidating work environment by means of words, actions, or physical contact which have the purpose or effect of alarming, insulting, or provoking another person.

- The intentional damage of City-owned or personal property, or acts intended to cause such property to fail to operate, or to operate improperly.

The possession of firearms or dangerous weapons while on City property or in any City facilities and vehicles is strictly prohibited. Dangerous weapons are defined in Section 702.7 of the Code of Iowa. This includes, but is not limited to, pistols, firearms, and knives. Employees violating this policy will be terminated.

Violence or the threat of violence, by or against any City employee or any other person while at work, will not be tolerated. The prohibited action will subject the perpetrator, if an employee, to serious disciplinary action up to and including termination of employment, and in all cases, possible criminal prosecution. All threats will be taken seriously.

City employees who obtain restraining orders against individuals are strongly encouraged to report the presence of a restraining order to the department director and the Human Resources Department.

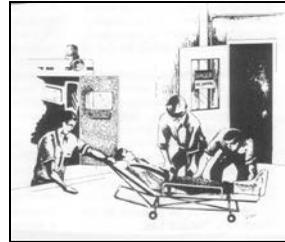
“People do not operate in a vacuum, where they can decide and act all-powerfully. To err or not to err is not a choice. Instead, people’s work is subject to and constrained by multiple factors.”
-- Sidney Dekker

“People are fallible, and even the best makes mistakes.”
-- Dr. Todd Conklin

Safety Management

Accident Reporting

Employees must report all accidents and injuries to both their supervisor and to the HRD Safety & Health Office within 48 hours or the next regularly scheduled workday.



If an injury is an emergency, the injured employee should be taken to either Mercy Medical Center or St. Luke’s Hospital. Employees needing non-emergency medical care should report to the HRD Safety & Health Office for medical treatment or referral. The injured employee must also complete an *Injury / Illness Report*, which is signed by the employee’s supervisor and forwarded to the HRD Safety & Health Office.

Behavior-Based Safety

Safestart™ is a safety awareness training program that provides an overview on behavior-based safety. The goal of Safestart™ is to reduce the occurrence of unsafe behaviors by recognizing the error patterns that increase the risk of injury. It does not replace traditional safety training but is an additional way to think about safety.

Four critical errors increase the likelihood of contacting some form of hazardous energy.

- *Eyes not on Task:* Not looking where you are going or at what is coming towards you.

- *Mind not on Task:* Not concentrating on the job, being unaware of dangers or deficiencies, and going on “auto pilot.”
- *Line-of-Fire:* Being conscious of where you are or where you are going in relation to the direction of the hazardous energy.
- *Balance / Traction / Grip:* Doing something that could cause you to lose your balance, traction, or grip, including not wearing good footwear / gloves and not having a good grip.

To reduce injuries, employees must recognize the states of mind that exist prior to a critical errors. These are the states of mind that increase your risk.

- *Rushing:* exceeding the pace at which the job is usually done.
- *Frustration:* Can be caused by relationships, malfunctioning equipment, inadequate tools, and conflicting objectives.



- *Fatigue:* Too tired (mentally or physically) to do the job safely. Too tired to concentrate and react quickly.
- *Complacency:* Familiar enough with the hazards to become less concerned and careful over time.

Safestart™ teaches these critical error reduction techniques.

- Self-trigger on the state so you don't make a critical error.

- Analyze close calls and small errors.
- Look at others for their patterns of behavior that increase the risk of injury.
- Work on your own individual habits.

Discipline for Safety Rule Violations

In order to promote the safety and welfare of all employees and safeguard property, violation of safety policies and procedures may warrant progressive disciplinary action, ranging from a reprimand up to and including dismissal.

The intent of disciplinary policies is to set a standard of conduct, not establish a system of penalties. Managers must have the discretion to consider circumstances and exercise judgment in each case. In providing a safe and healthful workplace, management also has a responsibility to ensure that discipline is not imposed arbitrarily, but is consistent, proportionate, and fair.

The following are examples of unsafe behaviors that are likely to result in some form of disciplinary action, depending upon the seriousness of the offense.

- When a safety or health violation is first observed, the supervisor should informally discuss the behavior with the employee stating the potential hazard or danger and outlining the correct procedure. Retraining may be necessary to ensure understanding.
- A second violation should generate either a formal verbal or written warning to the employee, depending on the severity of the violation.
- A third infraction should result in a formal written warning or employee suspension.
- A fourth violation may lead to employee termination.

Additional information and guidance on disciplinary action can be found in the Personnel Policy Manual.

“Injustice is relatively easy to bear; what stings is justice.”
-- H.L. Mencken

The following offenses should always warrant disciplinary action, ranging from a reprimand to dismissal, depending upon the seriousness of the offense:

- Disregard of safety rules or refusal to follow a supervisor’s instructions.
- Refusal to wear or use required safety equipment.
- Deliberately defeating or removing a lockout, safety guard, or safety control device.
- Engaging in practical jokes, horseplay, or other conduct which may be hazardous.



- Misuse or willfully damaging City tools or equipment.
- Driving a City vehicle without permission or driving with disregard for traffic laws.
- Driving a City vehicle without a current driver’s license.

- Being under the influence of drugs or alcohol on the job or reporting to work within four hours of consuming an alcoholic beverage.
- Impeding, obstructing, or failing to cooperate with an accident or safety incident investigation.
- Violence or the threat of violence, by or against any City employee.
- Carrying a weapon, explosive, or drug paraphernalia (when not within the scope of the employee’s job duties).

Hazard / Incident Reporting

“There are two primary choices in life: to accept conditions as they exist, or accept the responsibility for changing them.”
-- Dr. Denis Waitley

Reporting potentially unsafe or unhealthful working conditions is the responsibility of all employees. Report unsafe working conditions directly to your immediate supervisor or, if this is not practical, submit a report of unsafe conditions directly to the HRD Safety & Health Office using a *Hazard / Incident Report Form*.

Labor Law Posters

The City is required to display certain informational posters within the workplace in order to comply with state and federal laws.

Listed below are the labor law posters that should be displayed in your work area.

- *Equal Employment Opportunity Is the Law*
- *Family Medical Leave Act (FMLA)*
- *Safety & Health Protection on the Job*

- *Summary of Occupational Injuries and Illnesses* (required to be posted from February 1 to April 30 for the prior year's injuries and illnesses)
- *Unemployment Insurance*
- *Uniformed Services Employment and Reemployment Act (USERRA)*
- *Your Rights Under Iowa's Minimum Wage*

If these posters are not displayed, or if you have any questions about one of the topics covered, please contact the Human Resources Department.

Safety Meetings

Safety meetings are informal training sessions that are intended to give employees an opportunity to discuss safety and health issues of concern. Safety meetings can be used to address actual problems on the job or to raise awareness about a particular safety topic.



Safety Training

General safety and health training will be made available to all employees. Job-specific technical training and specialized safety training (such as lockout/tagout or confined space entry procedures) will be provided to work groups or individuals who are subject to special or unusual hazards.

“The beautiful thing about learning is that no one can take it away from you.” -- B.B. King

“We are forced to rely on people, which is why we put so much emphasis on training them.”
-- Henry Block

Workers' Compensation

The Workers' Compensation Act is designed to provide certain benefits to employees who receive injuries, occupational diseases, or occupational hearing loss arising out of their employment.

If you have questions regarding Workers' Compensation please call the HRD Safety & Health Office.

C – EMERGENCY RESPONSE

“In preparing for battle I have always found that plans are useless, but planning is indispensable.” -- Dwight D. Eisenhower

“Chance favors the prepared mind.”
-- Louis Pasteur

“Hope is not a strategy.” -- Rick Page

General Guidelines

Accidents may happen without warning and despite the fact that preventive measures were in place. In other words, you may not always be able to stop an emergency from occurring. However, there are steps that can be taken to minimize potential injury and damage. Learn the location of exits, evacuation meet locations, fire alarm pull boxes, fire extinguishers, first aid kits, AEDs, emergency eye washes and showers, phones, and other emergency equipment.



The City maintains a number of buildings and facilities with different conditions and hazards. For that reason, it is important that each employee become familiar with the emergency procedures in their respective workplaces.

Sounding an Alarm



In the event that you observe or discover any type of an emergency, you should be able to do the following:

- Sound the alarm or warn others in the area.
- Notify a supervisor (report the emergency).
- Try to control or minimize the emergency, but only if it is possible to do so safely.
- Evacuate if necessary.

Do not remain anywhere in the building where your exit route could be cut off by fire, smoke, or chemical fumes.

Handling News Media Inquiries

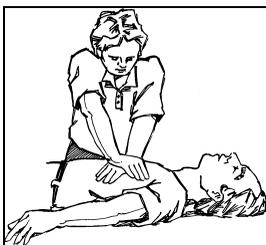
During emergencies, City employees should courteously and tactfully direct any inquiries from the news media or other outsiders to their department director or the City Manager's Office.

Medical First Aid

In case of a serious injury, call the Area Ambulance Service (9-1-1), the HRD Safety & Health Office (286-5034). Do not move a patient with a head, neck, or back injury; a broken limb; or allow them to move until a medical professional has given care.

An employee experiencing any of the following signs or symptoms is in need of emergency medical evaluation and possible follow-up care:

- Difficulty breathing
- Chest or upper abdominal pain
- Fainting
- Sudden dizziness, weakness or change in vision
- Confusion (sudden onset) or change in mental status (memory loss)
- Any sudden, severe pain
- Bleeding that won't stop
- Severe or persistent vomiting
- Coughing up blood



If there is any doubt or if you answer yes to any of the following questions, call 9-1-1:

- Is the person's condition life threatening?
- Could their condition worsen and become life threatening on the way to the hospital?
- Does the person require the skills or special equipment of paramedics?
- Could moving the person cause further injury?

Report of Injuries/Medical Treatment

Report all non-emergency injuries immediately to your supervisor and then to the HRD Safety & Health Office. The HRD Safety & Health Office will treat any simple injuries or may refer the employee for further medical treatment. A *Return-to-Work* statement is required from the doctor for each medical visit.



In a non-emergency situation, the injured employee is not to be sent to a doctor for medical treatment unless referred by the HRD Safety & Health Office. Workers' Compensation will not cover medical treatment received if the employee was not referred by the HRD Safety & Health Office.

Emergency Eye Washes & Showers

Protection of the eyes and face in the industrial environment is extremely important. Injuries may be caused by exposure to chemicals, by materials thrown from equipment or machinery, and when substances are propelled with sufficient velocity to be injurious.

The best means of protection is to engineer hazards out of the job so a worker is not exposed. If this is not possible, safety goggles and face shields need to be worn. Accidental exposure to liquid chemicals can still occur even with good engineering controls and safety precautions. As a result, it is essential to look beyond the use of goggles, face shields, and procedures for using personal protective equipment. Emergency showers and eyewash

stations are a necessary backup to minimize the effects of exposure to chemicals.

The need for emergency showers or eyewash stations is based on the properties of the chemicals that workers use and the tasks that they do in the workplace. Work areas and operations that may require these devices include battery charging areas, laboratories, spraying operations, high dust areas, dipping operations, and hazardous substances dispensing areas.



For emergency showers and eyewash stations to be effective, immediately flush the affected body part for at least 15 minutes using a large supply of clean water under low pressure. Water does not neutralize contaminants -- it only dilutes and washes them away. This is why large amounts of water are needed.

The first 10 to 15 seconds after exposure to a hazardous substance, especially a corrosive substance, are critical. To be effective, the equipment has to be accessible. ANSI recommends that a person be able to reach the equipment in no more than 10 seconds. In practical terms, consider that the person who needs the equipment will be injured, and may not have use of their vision. Recommendations for this distance in linear terms range from 50 to 100 feet.

Emergency showers also known as drench or deluge showers, are designed to flush the user's head and body. Emergency showers can also be used effectively in extinguishing clothing fires or

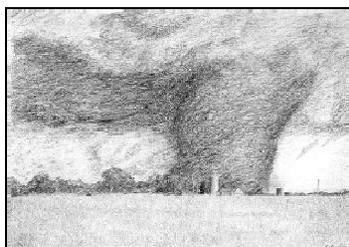
for flushing contaminants off clothing. They should not be used to flush the user's eyes because the high rate or pressure of water flow could damage the eyes in some instances. If irritation persists after flushing, repeat the flushing procedure.

Emergency eyewashes and showers often go unused on a regular basis. To verify proper operation in an emergency, emergency eyewash and shower units must be operated regularly to ensure there is adequate pressure, volume, and flow of water.

Severe Weather

All employees are expected to make reasonable efforts to report to work; however, that may not be possible during adverse weather conditions. If you are unable to report to work because of weather conditions, inform your supervisor as soon as possible.

If you are at work during severe weather, be alert to the possible hazardous conditions caused by tornadoes, lightning, wind, and flash flooding. Monitor radio announcements for severe weather watches or warnings.



Tornados

Tornados and severe storms can develop quickly. If a tornado has been spotted or indicated by weather radar, the Linn County Emergency Management Agency will activate the Outdoor Warning Siren System for affected areas.

If a tornado warning is issued, City employees need to report to their designated tornado shelters immediately. Supervisors account for their staff. Tornado shelters are usually designated in the sturdiest part of a building, away from windows, and in the basement or lower level stairwells. If you are out of your work area, go to the nearest shelter. Do not leave the shelter until the all clear is given.

A tornado watch is issued when the weather conditions are such that the formation of tornadoes is possible. A tornado warning means that a tornado has been sighted or indicated by weather radar.

Winter Weather Conditions

National Weather Service updates on severe weather can be accessed via the weather link on the City's Intranet. Definitions of terms used by the National Weather Service when referring to winter weather are listed below:



Definitions

- **Blizzard Warning:** Winds are 35 mph or greater and visibility is less than a quarter mile for three hours or longer.
- **Wind Chill:** The combined effect of low temperature and wind to speed up heat loss from the body.
- **Winter Storm Warning:** Severe winter conditions are imminent or are already occurring. Winter storm warnings are issued for ice, heavy snow, or a combination of snow and blowing snow.

- **Winter Storm Watch:** Severe winter conditions such as heavy snow or ice are possible in a day or two.
- **Winter Weather Advisory:** Weather conditions are expected to cause significant inconveniences. Conditions that prompt advisories include snow, freezing drizzle, blowing snow, and dangerous wind chill.



Flooding

Flood stage water levels from the Cedar River can inundate streets and affect traffic routes taken by employees to and from work. Information on Cedar River water levels can be accessed via the weather link on the City's Intranet.

Fires

When a fire is discovered, employees should activate the nearest fire alarm. Yell out to warn others in the area and report the fire by phone or radio, or send a runner to report the fire. Employees should follow-up with a telephone call from a safe location to provide more details.



Fire Emergency Fundamentals

- Heat and smoke rise. Stay low or crawl when leaving a smoke filled room.
- A wet towel or cloth held over the nose and mouth will help prevent smoke inhalation injury.
- Feel closed doors before opening them. If a door feels hot, assume there is fire on the other side and seek an alternate escape route.
- Do not use elevators in a fire emergency.
- Close all doors when the building has been evacuated.
- Know the work area and the locations of exits and escape routes in every building.

Chemical Spills

Chemical spills of any type, or size, must be reported immediately to a supervisor or manager. Additional reporting may be necessary to meet requirements of federal and state regulatory agencies.



Before attempting to deal with any chemical spill or release, alert others for backup. If safely possible, remove all sources of ignition (if the material is flammable), stop the flow of materials from the container, and contain the release.

All spills should be cleaned-up promptly and access to the contaminated area restricted until the clean up has been accomplished.

Procedures for proper clean up of minor chemical spills can be found in individual material safety data sheets. Only employees who have received special hazardous waste operations and emergency response (HAZWOPER) training are authorized to cleanup large spills. If no one in the work area has this training, call 9-1-1 for the Fire Department HazMat Team.

Workplace Violence Response

In a situation involving actual or threatened violence, the first priority is to protect the safety of the persons involved. With this in mind, make a good faith effort to diffuse violent or potentially violent behavior as quickly as possible to prevent it from escalating.

Each situation may involve unique factors and the following is intended as general guidance only.

- Attempt to de-escalate the situation.
- Listen to their complaint(s) and try to be helpful and supportive.
- Allow the person to vent some of their anger -- do not presume that the individual is at fault and do not try to “out shout” the person.
- If the situation does not de-escalate, try to use firm but respectful direction limits by giving them clear choices and consequences.
- If the situation continues to escalate and violence or the threat of violence occurs, immediately call 9-1-1.
- If a person enters the premises carrying or using a weapon, take cover immediately or evacuate the area as quickly as possible.

If you are involved in or witness a violent incident, immediately notify a supervisor or manager and complete a *Workplace Violence Incident Report*.

Bomb Threats

If you receive a bomb threat by telephone, use the *Bomb Threat Checklist* to record as much information as you can. This information is invaluable in determining an appropriate response to that threat. Written bomb threats should be evaluated carefully and handled as little as possible.



Treat any bomb threat seriously and report it as soon as possible to your supervisor or manager.

Facility Search

Employees will conduct searches of their work areas. They are most familiar with what belongs in the area and what might be an unusual package. The Cedar Rapids Police Department will not participate in a search of the facilities.



A search team should be assigned to check areas not normally staffed such as rest rooms, waiting areas, lobbies, fire extinguisher cabinets, and the exterior of the building.

Searchers should look for any out of place or suspicious packages, bags, boxes, or containers.

If no suspicious items are found, the area is considered safe. If what is suspected to be a bomb is found, follow these steps:

- Do not touch the suspected item.
- Do not assume it is the only one.
- Notify the search coordinator
- Clear the area of employees and visitors
- Isolate the area

Building Evacuation

The decision to evacuate a building or facilities will be made by the department director or senior manager in consultation with the Cedar Rapids Police Department.

BRICKLAYER'S ACCIDENT REPORT

The following is a bricklayer's accident report, which was printed in the newsletter of the Australian equivalent of the Workers' Compensation board.

Dear Sir,

I am writing in response to your request for additional information in Block 3 of the accident report form. I put "poor planning" as the cause of my accident. You asked for a fuller explanation and I trust the following details will be sufficient.

I am a bricklayer by trade. On the day of the accident, I was working alone on the roof of a new six story building. When I completed my work, I found that I had some bricks left over which, when weighed later were found to be slightly in excess of 500 lbs. Rather than carry the bricks down by hand, I decided to lower them in a barrel by using a pulley, which was attached to the side of the building on the sixth floor. Securing the rope at ground level, I went up to the roof, swung the barrel out and loaded the bricks into it. Then I went down and untied the rope, holding it tightly to ensure a slow descent of the bricks.

You will note in Block 11 of the accident report form that I weigh 135 lbs. Due to my surprise at being jerked off the ground so suddenly, I lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rapid rate up the side of the building.

In the vicinity of the third floor, I met the barrel which was now proceeding downward at an equal, impressive speed. This explained the fractured skull, minor abrasions and the broken collar bone, as listed in section 3 of the accident report form. Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley.

Fortunately by this time I had regained my presence of mind and was able to hold tightly to the rope, in spite of beginning to experience a great deal of pain.

At approximately the same time, however, the barrel of bricks hit the ground and the bottom fell out of the barrel. Now devoid of the weight of the bricks, that barrel weighed approximately 50 lbs. I refer you again to my weight. As you can imagine, I began a rapid descent, down the side of the building.

In the vicinity of the third floor, I met the barrel coming up. This accounts for the two fractured ankles, broken tooth and several lacerations of my legs and lower body.

Here my luck began to change slightly. The encounter with the barrel seemed to slow me enough to lessen my injuries when I fell into the pile of bricks and fortunately only three vertebrae were cracked.

I am sorry to report, however, as I lay there on the pile of bricks, in pain, unable to move, I again lost my composure and presence of mind and let go of the rope and I lay there watching the empty barrel begin its journey back down onto me. This explains the two broken legs.

I hope this answers your inquiry.

D – HEALTH AND WELLNESS
(OCCUPATIONAL & ENVIRONMENTAL HEALTH)

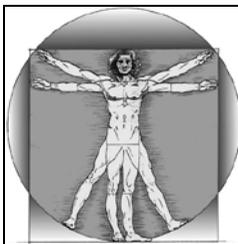
[On the subject of exercise]

“There’s no easy way out. If there were, I would have bought it. And believe me, it would be one of my favorite things!” -- Oprah Winfrey

“Happiness is nothing more than good health and a bad memory.” -- Albert Schweitzer

Wellness Program

Wellness programs help reduce employee absenteeism and turnover, promote positive work attitudes, and improve overall productivity. If the workforce isn’t in good physical, mental and emotional shape, this will surely impact job performance.



The purpose of health and wellness programs is to assess, support, and promote positive health practices. Chronic diseases are often associated with lifestyle practices. At the turn of the last century, communicable diseases such as pneumonia, tuberculosis, and influenza claimed many lives. Today, heart disease, cancer, and other chronic disabling illnesses have become more the leading causes of death.

Lifestyle behaviors around physical activity, nutrition, tobacco use, and substance abuse have a significant impact on people’s health. These

lifestyle exposures contribute to many diseases including type-2 diabetes, hypertension, heart disease, stroke, obesity, and some forms of cancer.

The City’s Wellness Program focuses on preventing work-related illness, injury and disability and promoting healthy living. The City supports the view that all illness and injury should be prevented when possible, controlled when necessary, and treated where appropriate.



The City’s health and wellness program consists of services to assist in worker protection from health hazards, promote good health and a healthy working environment, further the prevention and early detection of diseases, and treat work-related injuries or illnesses. The HRD Safety & Health Office provides health education programs to encourage workers to take responsibility for their own health including smoking cessation, wellness programs, nutrition and weight control, and stress management.

Health Screening

Screening programs are a basic component of a comprehensive wellness program. The primary goal of any screening program is to identify diseases in their early stages, thus providing for early detection and treatment. Screening programs can assess risk factors for heart disease, cancer, and diabetes. Educational programs can point out behaviors that increase the risk of developing these illnesses. The early diagnosis of a potentially major illness benefits the patient by providing an earlier opportunity for treatment and possible cure.

The health screenings help track your progress from year-to-year. Even if you had great results last year, it's important to participate every year.



Based on health screening results, high-risk employees can participate in “*Take Charge*,” a free program that provides unlimited access to a health coach. This program is designed to help individuals adopt a healthier lifestyle and possibly reduce serious health risks.

Diabetes in the Workplace

Diabetes is a disease in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches, and other food into energy needed for daily life. The cause of diabetes continues to be a mystery, although both genetics and environmental factors such as obesity and lack of physical exercise appear to play a role.



Employees with diabetes are found at all levels of an organization. Diabetes has reached epidemic proportions in the United States, affecting a growing number and percentage of people every year. Many people do not

recognize that they are at risk for diabetes (or diabetes-related complications if they already have diabetes). However, type 2 diabetes and diabetes-related complications can be prevented or delayed for many of those at high risk for diabetes.

The human and economic consequences of diabetes on an organization include a lower quality of life, higher absenteeism, increased risk of premature death, lower productivity, and greater health care expenses.

Long-term diabetes control depends on medical treatment and the choices patients make about diet, physical activity, and other health-related behavior.



Metabolic Syndrome

Metabolic syndrome (or Syndrome X) is characterized by a group of metabolic risk factors that include:

- Abdominal obesity (excessive fat tissue in and around the abdomen)
- Atherogenic dyslipidemia (blood fat disorders — high triglycerides, low HDL cholesterol and high LDL cholesterol — that foster plaque buildups in artery walls)
- Elevated blood pressure
- Insulin resistance or glucose intolerance
- Prothrombotic state (e.g., high fibrinogen or plasminogen activator inhibitor-1 in the blood)

- Proinflammatory state (e.g., elevated C-reactive protein in the blood)

People with the metabolic syndrome are at increased risk of coronary heart disease and other diseases related to plaque buildups in artery walls (e.g., stroke and peripheral vascular disease) and type 2 diabetes.

The dominant underlying risk factors for this syndrome appear to be abdominal obesity and insulin resistance. Insulin resistance is a generalized metabolic disorder, in which the body cannot use insulin efficiently. Other conditions associated with the syndrome include physical inactivity, aging, hormonal imbalance and genetic predisposition.

Smoking Cessation

“To cease smoking is the easiest thing I ever did. I ought to know because I’ve done it a thousand times.”
-- Mark Twain

Tobacco use is the single most preventable cause of death in the U.S., with cigarette smoking directly linked to 87% of lung cancer deaths and 30% of heart disease deaths. Within the first 20 minutes of quitting smoking, the healing process begins. The benefits will continue to improve your health and quality of life for years.

If you are thinking about quitting smoking, or have quit and need some motivation to keep going, the City offers a Smoking Cessation Class. Successful smoking cessation requires support, knowledge, and the determination to quit. For additional quitting aids, such as nicotine patches, consult your doctor.

Job Stress

Stress is the result of any emotional, physical, social, economic, or other factors that require a

response or change. It is generally believed that some stress is okay (sometimes referred to as ‘challenge’ or ‘positive stress’) but when stress occurs in amounts that you cannot handle, both mental and physical changes may occur.

‘Workplace stress’ occurs when there is a conflict between job demands on the employee and the amount of control an employee has over meeting these demands. Job demands include time pressures and deadlines, long hours, unclear or conflicting duties, having too much responsibility, or work that is too tiring or boring.



Organizational restructuring, dependence on temporary- and contractor-supplied labor, and adoption of lean production practices are examples of organizational practices that may increase job stress by adversely influencing work schedules, workload demands, and job security.

Stress-related disorders encompass a broad array of conditions, including psychological disorders (depression, anxiety, post-traumatic stress disorder) and other emotional disturbances (dissatisfaction, fatigue, tension), maladaptive behaviors (aggression, substance abuse), and cognitive impairment. In turn, these conditions may lead to poor work performance and increased risk of health problems or injury.

The City’s stress management program focuses on teaching employees about the nature and sources of stress, the effects of stress on health,

and personal skills to reduce stress such as time management or relaxation exercises. The Employee Assistance Program (EAP) provides individual counseling for employees with work or personal problems.

“Risks that you can control are much less a source of outrage than risks you cannot control. The risks that scare people and the risks that actually kill people are very different.”

-- Peter Sandman

Occupational Health Program

The Occupational Health Program focuses on the health hazards associated with jobs that involve exposure to biological, chemical, and physical agents. Biological hazards include bacteria, viruses, fungi, and other living organisms that can cause acute and chronic infections. Chemical hazards include chemical compounds that have a toxic effect if they are inhaled, absorbed through the skin, or ingested. Physical hazards include radiation, noise, vibration, and temperature extremes.

The HRD Safety & Health Office provides health services to promote the health and prevention of work-related injuries and illnesses. They also provide first aid treatment for job-related injuries; case management services for workers' compensation issues; and monitor the health status of employees who use respirators, work in areas with excessive noise, may have contact with human blood, or work with hazardous materials.

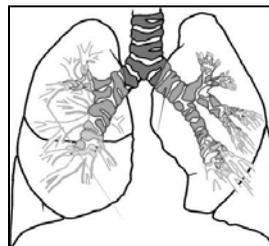
“Of what is your occupation?”

-- Bernardino Ramazzini (1633 – 1714)

[The first question he would ask of his patients - from the ‘Diseases of Workers’].

Respiratory Protection Program

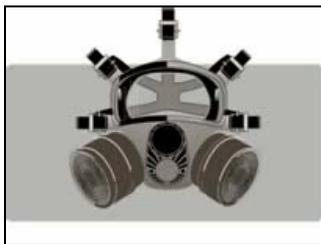
In jobs where workers are required to wear a respirator, employees must receive a medical evaluation to ensure that using a respirator doesn't place a burden on a worker's health. This burden varies with a number of factors, such as the weight and breathing resistance of the respirator and the workplace conditions under which the respirator is worn.



Specific medical conditions that may place a respirator-wearing employee at increased risk of illness, injury, or death include:

- Cardiovascular and respiratory disease, such as high blood pressure, angina, asthma, chronic bronchitis, or emphysema.
- Cardiovascular damage caused by heart attack or stroke.
- Reduced lung function caused by factors such as smoking or prior exposure to respiratory hazards.
- Neurological disorders, such as epilepsy.

- Musculoskeletal disorders, such as lower back pain.
- Psychological conditions, such as claustrophobia and severe anxiety.



In addition to a medical evaluation, a respirator fit test is also required. Fit testing is a procedure used to determine whether the respirator forms a seal on the user's face. If a good facepiece-to-face seal is not achieved, the respirator will provide a lower level of protection than it was designed to provide, possibly allowing contaminants to leak into the respirator.

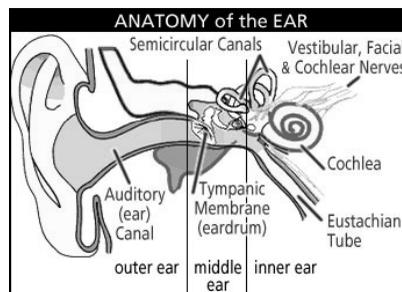
The final decision on clearance for respirator use will be made by a physician.

Hearing Conservation Program

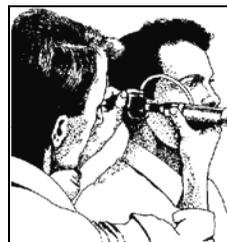
Hearing occurs when sound waves in the air are changed into electrical signals that the auditory nerve carries to the brain. Sound waves enter the outer ear and travel through the ear canal to the ear drum. The eardrum vibrates from the incoming waves and sends these vibrations to three tiny bones in the middle ear, commonly referred to as the hammer, anvil, and stirrup.

The bones in the middle ear amplify the sound and send the vibrations to the fluid-filled cochlea in the inner ear. Small, hair-like nerve endings extend into the fluid of the cochlea. As the vibrations are transmitted through the fluid, the hair-like nerve endings move. These movements are transformed into electrical impulses in the auditory nerve.

Hearing loss generally can occur due to damage to the structures of the ear or damage to the hair-like nerve endings. Damage to the ear structure, such as the tiny bones of the middle ear or a punctured eardrum could be the result of a blow to the head or an explosion. This type of damage can often be corrected with surgery.



Damage to the hair-like nerve endings because of noise exposure can be temporary or permanent. Temporary hearing loss results from short-term exposures to noise, with normal hearing returning after a period of rest. Prolonged exposure to high noise levels causes permanent damage over time.



Whether exposure to noise harms your hearing depends on the loudness, the pitch, and the length of time you are exposed to the noise. The louder the sound (measured in decibels), the shorter the exposure can be before damage occurs.

The hearing conservation program is designed to monitor the hearing of employees whose routine

problems include radiation, some chemicals, certain drugs, cigarettes, some viruses, and alcohol.

A reproductive hazard could cause one or more health effects, depending on when the woman is exposed. Exposure to harmful substances during the first 3-months of pregnancy might cause a birth defect or a miscarriage. During the last 6-months of pregnancy, exposure to reproductive hazards could slow the growth of the fetus, affect the development of its brain, or cause premature labor.



Reproductive hazards may not affect every worker or every pregnancy. Whether a worker or a baby is harmed depends on how much of the hazard they are exposed to, when they are exposed, how long they are exposed, and how they are exposed. If you have questions about the hazards of a chemical in your work area, consult the MSDS for that chemical or contact the HRD Safety & Health Office.

Dermatitis

Dermatitis is an inflammation of the skin resulting from contact with allergens or irritants. Signs of inflammation include redness, heat, swelling, and pain.

Irritant contact dermatitis is caused by chemicals that are irritating to the skin (acids, bases, and solvents). Signs of irritant contact dermatitis include redness of the skin, blisters, scales or crusts at the point of chemical contact to the

skin. These symptoms do not necessarily occur at the same time or in all cases.



Irritant contact dermatitis can develop after short heavy exposure, repeated low exposures, or prolonged low exposure to a chemical. Factors contributing to the severity of the irritant contact dermatitis include chemical properties like pH, the quantity and concentration of chemical, and the amount of time that the chemical is in contact with your skin. Skin damage usually heals within a few weeks if no complications have arisen such as a secondary infection.

To minimize skin damage from an irritant chemical, limit contact between the skin and the chemical through use of appropriate gloves and, should contact occur, immediately wash the affected area thoroughly with plenty of water.



Allergic contact dermatitis is an allergic response to skin contact with some allergy-causing material such as poison ivy or latex. Allergic dermatitis can occur in places on the body that did not contact the allergy-causing material.

Report irritant and allergic contact dermatitis to the HRD Safety & Health Office.

Haz-Map Database

Haz-Map is an occupational health information database that offers specific information about possible effects of exposure to chemical and biological agents used in industry. Haz-Map links jobs and hazardous tasks with occupational diseases and their symptoms.

Information from textbooks, journal articles, and electronic databases have been classified and summarized to create the database. Provided by the National Library of Medicine (National Institute of Health), Haz-Map is available on the internet, at: <http://hazmap.nlm.nih.gov>

"Everything is a poison. Only the dose makes the poison." -- Paracelsus (1493 – 1541)

"Not all chemicals are bad. Without hydrogen or oxygen, for example, there would be no way to make water, a vital ingredient in beer."

-- Dave Berry

Bloodborne Pathogens

Bloodborne pathogens are viral and bacterial microorganisms found in human blood, which may cause disease if transmitted by exposure to blood or other body fluids. Hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) are the most prevalent bloodborne pathogens in the United States.

On-the-job exposure can occur from accidental skin puncture from contaminated items and contact between infected body fluids and broken skin, eyes, nose, or mouth. It is important to know the ways exposure and transmission can occur in your particular job. Whenever blood or

body fluids are present, you should treat all such substances as if they are infected. If you discover blood or body fluids, notify your supervisor before attempting to clean it up.



The objective of the City's Occupational Exposure Control Program is to reduce the risk of exposure to blood and body fluids by identifying workers with potential occupational exposures, implementing engineering and work practice controls, and establishing housekeeping and laundry protocols.

The City offers Hepatitis B vaccinations to employees with a potential for occupational exposure. Medical follow-up, counseling, and preventive treatment are provided to employees following a significant exposure. Bloodborne pathogen training is given annually to employees with potential occupational exposure to blood and body fluids.

Biological Hazards

Certain jobs have an inherent risk of exposure to biological hazards because of the nature of the work, such as animal control, sewer maintenance, solid waste management, and wastewater treatment. While the risk of contracting a communicable disease is low, the danger of infection is real if safety precautions are not observed. Safe work practices include washing hands frequently, promptly attending to cuts, and wearing appropriate protective gloves.

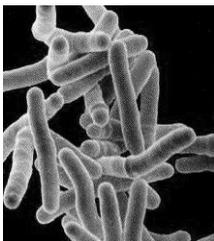
Another key to preventing infection is through immunizations, where applicable.

Disease Prevention

To reduce the spread of infection and reduce your risk of contracting communicable diseases, wash your hands frequently with soap and warm water, cover your nose and mouth when sneezing or coughing, stay home when ill, and eat and sleep to maintain a health immune system.

Avoid touching your, eyes nose, or mouth with your hands. If soap and water is not immediately available, use a waterless hand sanitizer to kill germs and minimize the spread of disease.

Keep your immunizations current for vaccine-preventable diseases, such as tetanus and influenza.



Colds and Flu

Colds and flu are difficult to prevent. The following suggestions may help:

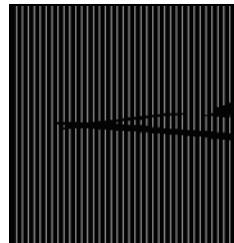
- Avoid close contact with people who are sick, especially during the first few days when they are most likely to spread the infection.
- Wash your hands after touching someone who has a respiratory illness, after touching an object they have touched, and after blowing your own nose.
- Keep your fingers away from your nose and your eyes to avoid infecting yourself with viruses that you may have picked up.

Colds

Colds are caused by several different viruses (rhinoviruses) and are highly contagious. Colds are spread when droplets of fluid that contain a cold virus are inhaled or transferred by touch. One and three days after a cold virus enters the body, symptoms develop, including runny nose, congestion, sneezing, scratchy throat, cough and weakened taste and smell.



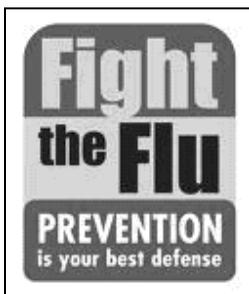
Colds get better within a few days to weeks, whether or not you take medication. However, an immune system weakened by a cold can result in other infections, including sinus or ear infections, and bronchitis. If you have asthma, chronic bronchitis, or emphysema, your symptoms of those conditions may be worsened for weeks even after your cold has gone away.



Talk to your doctor if you experience any of the following: unusually severe cold symptoms, high fever, ear pain, sinus type headache, cough that gets worse while other cold symptoms improve, or flare-up of any chronic lung problem, such as asthma.

Flu (Influenza)

Influenza, commonly called “the flu,” is a contagious disease caused by influenza viruses. The flu is easily spread from person-to-person through droplets produced while coughing and sneezing. The influenza viruses can also be transmitted indirectly by touching a contaminated object and then touching your own mouth, eyes, or nose before washing your hands. Those infected can be contagious before any symptoms are present.



A mild case of the flu may feel like an ordinary cold. More severe symptoms include fever, cough, muscle ache, headache, sore throat, chills, and extreme tiredness. Most people recover from the flu within one or two weeks. However, the flu can cause severe illness and life threatening complications. Complications include pneumonia and aggravation of pre-existing medical conditions such as congestive heart failure, asthma, or diabetes. Other infections that may be associated with the flu include sinusitis, bronchitis and ear infections. You should see a doctor if you have difficulty breathing, experience chest pain as a result of coughing; or are coughing up yellow, green, or bloody phlegm.

The best tool for preventing the flu is the annual flu vaccine, available from the HRD Safety & Health Office or your personal doctor. The vaccine does not cause the flu since there are no

live viruses in the vaccine. The vaccine is effective against the influenza virus strain that scientists predict will be widespread that year. Since the influenza virus mutates, the predominant strain varies from year to year.

Hepatitis

Hepatitis occurs when there is an inflammation of the liver. This inflammation can be caused by viruses, infections, toxins, or autoimmune conditions. Only a physician can diagnose the nature of the hepatitis, the cause, and the appropriate treatment. Hepatitis A, B, and C are the three most commonly occurring varieties of viral hepatitis in the United States.

Hepatitis A

Hepatitis A is a highly contagious disease caused by the hepatitis A virus (HAV). Most people with hepatitis A will develop antibodies and their bodies will defeat the virus within six months of infection. Hepatitis A does not develop into a lifelong illness. People that have been previously infected with HAV will not be able to contract the virus again.



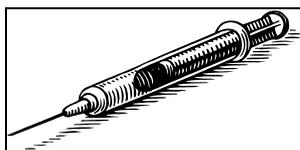
HAV is released in the feces of infected individuals and most commonly spread through contact with contaminated food or water (fecal-oral route).

Symptoms can include fever, fatigue, loss of appetite, nausea, dark urine, abdominal discomfort and jaundice (yellowing of the skin and eyes).

There is a two-dose vaccine available to help prevent contraction of the disease. This vaccine is part of recommended childhood immunizations in Iowa. High-risk teenagers and adults should also be vaccinated for HAV.

Hepatitis B

Hepatitis B is caused by the hepatitis B virus (HBV). HBV can be transmitted sexually, by contact between infected blood and open skin or mucous membranes, through piercing the skin, and from mother to child during birth.



A person with HBV may experience fatigue, loss of appetite, weight loss, headache, fever, weakness, nausea, or vomiting. As the disease progresses, additional symptoms include dark colored urine, clay colored stools, jaundice, abdominal tenderness and/or skin rash. However, 50-60 % of persons infected with the virus show no signs of illness.

Approximately 90% of infected adults recover completely within 6 months of infection and will never be able to contract the virus again. 10% of infected adults become lifelong carriers of the disease and risk problems like cirrhosis (liver cells damaged and replaced with scar tissue) and liver cancer.

The best way to prevent contraction of HBV is through a three-dose vaccine. This vaccine is required for all children born after July 1, 1994 but everyone should consider getting the vaccine.

Hepatitis C

Hepatitis C is caused by the hepatitis C virus (HCV). HCV is transmitted by contact between

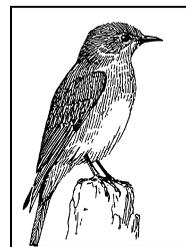
infected blood and open skin or mucous membranes and through piercing the skin. The disease is most frequently spread by sharing needles while injecting drugs but, prior to 1992, was spread through blood transfusions.

A person with HCV may not experience any symptoms. Those with symptoms experience anorexia, abdominal discomfort, nausea, vomiting, and jaundice. HCV is most commonly a lifelong illness and, while treatment is available, there is no cure. Approximately 70% of those infected develop chronic disease, leading to cirrhosis of the liver (20%) and liver cancer (3 – 5 %).

There is no vaccine available to prevent contraction of the hepatitis C virus.

Histoplasmosis

Histoplasmosis is a relatively rare, infectious disease caused by inhaling the spores of the fungus, *histoplasma capsulatum*. The fungus is found in the soil, often in places where bird or bat droppings are located. People can get histoplasmosis when soil or droppings are disturbed, resulting in dust in the air that people inhale. The disease cannot be transmitted from person-to-person.



The majority of people infected with histoplasmosis experience mild, flu-like symptoms and recover without medical treatment. In cases with more severe symptoms, antifungal medications are needed to treat the

disease, which can develop into a chronic or fatal form if left untreated.

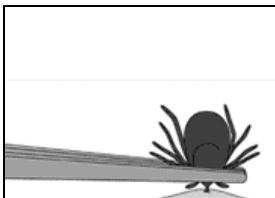
Activities that pose a health risk to workers include disturbance of soil at an active or inactive bird roost and removal of bat or bird feces from buildings. If soil that may be contaminated with bird or bat droppings will be disturbed, precautions should be taken such as wearing a dust mask and spraying the area with water to limit dust and dust inhalation.

Human Immunodeficiency Virus (HIV)

The human immunodeficiency virus (HIV) invades and destroys human T4 cells, which are a critical part of the immune system. HIV causes Acquired Immunodeficiency Syndrome (AIDS), where a weakened immune system leaves the body susceptible to other infections.

HIV can be transmitted sexually, by contact between infected blood and open skin or mucous membranes, through piercing the skin, and from mother to child during birth.

Treatment is available for those infected with HIV but there is no cure. There is no vaccine to prevent contraction of HIV.



Lyme Disease

Lyme disease is caused by the bite of infected ticks. The disease cannot be transmitted from person-to-person. Typical symptoms include fever, headache, fatigue, and a bulls-eye rash at the bite location.

Lyme disease can be treated with antibiotics. If left untreated, the infection can spread to joints, the heart, and the nervous system.

Lyme disease is an occupational hazard for people who work outdoors in areas with large numbers of infected ticks. Steps to prevent Lyme disease include avoiding brushy, overgrown grassy and woody areas when possible, using insect repellent, and removing ticks promptly.

Psittacosis

Psittacosis is a rare disease contracted from wild and domestic birds. Birds can appear healthy but still shed the bacteria in their feces.

This disease can be transmitted from infected birds to humans and is an occupational health hazard for people whose work brings them into contact with birds. Humans can become infected by breathing in the organism. Other sources of exposure include nasal secretions and dust from feathers.

Symptoms of psittacosis in humans include fever, headache, rash, muscle aches, chills, and respiratory disease. The disease is rarely transmitted by respiratory secretions to other humans. Most cases of the disease are mild and can be treated with specialized antibiotics.

For accurate diagnosis of psittacosis, a doctor must know that the person has been exposed to birds.

Tetanus

Tetanus, sometimes referred to as “lockjaw,” is caused by a toxin from *Clostridium tetani*, a soil bacterium. Tetanus spores usually enter the body through a puncture wound contaminated with soil or feces. It may also be introduced through cuts, scrapes, and burns. Tetanus is a serious illness and is often fatal.

In most cases, symptoms appear two weeks after exposure. The illness is characterized by painful muscle contractions and convulsive spasms of the jaw and neck muscles and the upper body. A common first sign of tetanus in older children and adults is painful stiffness of stomach muscles.

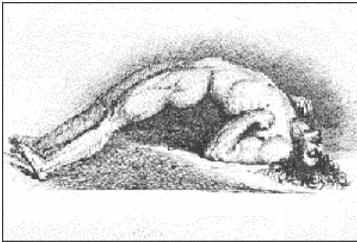
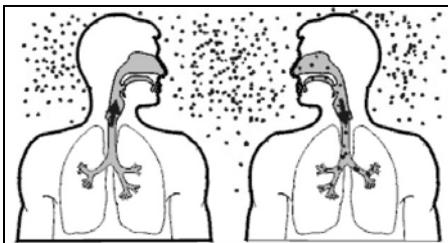


Figure 2: Classical Human Posture with Tetanus
(Note the rigidity of the entire body)

A vaccine is available to prevent tetanus infection with a booster required every 10 years. Tetanus is not spread from person-to-person.

Tuberculosis

Tuberculosis, often called TB, is a contagious disease transmitted from person to person through the air from exposure to respiratory droplets.



TB usually affects the lungs, causing chest pain and coughing up blood. It can affect the brain, kidneys, and spine with symptoms including weakness, weight loss, fever, and night sweats.

A skin test is used to identify individuals who have been infected with TB. A positive skin test

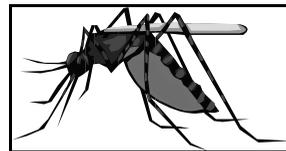
does not mean that a person has active TB. A person with active TB has a positive skin test, symptoms, and is highly contagious. A person with latent TB has a positive skin test with no symptoms, a normal chest x-ray, and is not contagious. Both active TB and latent TB can be cured with medicine.

TB was once the leading cause of death in the United States. There are 14,000 TB cases annually in the United States.

The City provides TB screening and education to employees whose duties require them to give first aid.

West Nile Virus

West Nile Virus (WNV) infection is an illness transmitted primarily by mosquitoes to humans. WNV is known to infect birds and other animals.



In most cases, persons infected with WNV experience no symptoms or have very mild flu-like symptoms. Severe illness is reported to occur in about 1 in every 150 persons infected with WNV with symptoms that include headache, high fever, neck stiffness, disorientation, tremors, convulsions, and muscle weakness.

WNV is not spread from person to person. There is no vaccine to prevent WNV infection. There is no cure.

To reduce your chances of contracting WNV, avoid contact with mosquitoes by limiting the amount of time outdoors in the warm months at dawn and dusk and wearing insect repellent containing DEET.

Environmental Health

Sun Exposure

Sunlight contains ultraviolet (UV) radiation, which can cause premature aging of the skin, wrinkles, cataracts, and skin cancer. The amount of damage from UV exposure depends on the strength of the sunlight, the length of exposure, and whether the skin is protected.

Sun exposure at any age can cause skin cancer. Be especially careful in the sun if you burn easily, spend a lot of time outdoors, or have any of the following physical features:

- Numerous, irregular, or large moles
- Freckles
- Fair skin
- Blond, red, or light brown hair

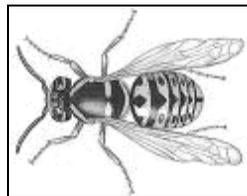


Block out UV rays by limiting sun exposure, covering exposed skin, using sunscreen, wearing a hat to protect your nose, ears, and neck, wearing UV absorbent sunglasses.

Stinging Insects

Stinging insects include bees, wasps, hornets and ants. Yellow jacket wasps, often mistaken for bees, are involved in about 70% of human stings in North America. While “killer bees” are an emerging concern, they are not found in Iowa.

Most stings will only result in a temporary injury with pain, swelling, itching and skin redness around the sting. The effect can be severe if you have an insect sting allergy.



If you experience difficulty breathing following an insect sting, get medical attention. Otherwise, check to see if the stinger is still present and, if so, remove it carefully. Wash the site with soap and water and apply ice to reduce swelling. If necessary, take ibuprofen to relieve pain and take a non-sedating antihistamine to relieve itching. Report the sting to the HRD Safety & Health Office.

Stinging insect nesting sites can be found almost anywhere. The best way to prevent stings is to avoid the insects. Most bees and wasps will not sting unless they are startled or attacked. Insect repellent does not affect stinging insects.



Dog Bites

Dogs bite more than 4.7 million people a year. Many City workers are exposed to potential harm from dangerous animals.

To avoid being bitten, try not to disturb dogs that are sleeping, eating, or caring for puppies.

Avoid dogs that are tethered or confined. Do not run past or away from a dog as the dog's natural instinct is to chase prey.

If a dog threatens you, avoid eye contact and try to remain motionless until the dog leaves. Then back away slowly until the dog is out of sight.

If a dog attacks, put anything you can between yourself and the dog. If you fall or are knocked to the ground, curl into a ball with your hands over your ears and remain motionless. Protect your head, neck and ears with your hands and arms.



Wash a bite wound thoroughly with soap and warm water. Report all dog bites to the HRD Safety & Health Office.

E – GENERAL SAFETY PROGRAMS

“We do not want production and a safety program, or production and safety, or production with safety. But, rather, we want safe production.” -- Dan Petersen

“Working safely may get old, but so do those who practice it.” -- Unknown

“Before you try to beat the odds, make sure you can survive the odds beating you.” -- Unknown

City services involve a number of different occupations, each with their own job skills and occupational hazards. These services and jobs include building and vehicle maintenance, parks and recreation, police and fire protection, streets and sewer maintenance, and water and wastewater treatment among others.

Hazards are found in every workplace. The types of hazards you may be exposed to largely depend on where you work and the type of work you do.

Some of the hazards you might face include:

- Physical injuries from tools and equipment;
- Slip, trip and fall hazards;
- Electrical shock;
- Vehicle accidents; and
- Toxic gases or oxygen deficiency in confined spaces.

Having a basic understanding of the hazards in your workplace is the first step in learning what precautions to take to avoid an accident or injury.

- Learn where to find safety information (bulletin boards, MSDSs, department safety policies).
- Observe warning signs and labels.
- Wear required personal protective equipment.
- Learn where emergency equipment is located (first aid kits, fire extinguishers, emergency eye wash and showers, etc.).
- Keep your work area clean - practice good housekeeping (a clean, orderly work place is usually safe).
- Get help to lift heavy or awkward loads.
- Don't participate in practical jokes or horseplay,
- Do something about unsafe conditions – either correct them or report them right away.

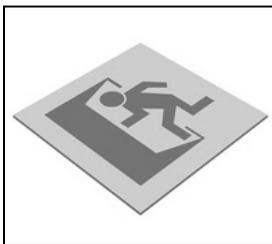
“There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle.”
-- Albert Einstein

“There are two different kinds of people in this world: those who finish what they start, and”
-- Brad Ramsey

“There are two kinds of people in this world. Those who think there are two kinds of people and those that don't.” -- Fr. Joseph Warrilow

Egress and Emergency Lighting

Each exit must be clearly visible and marked by a sign reading 'EXIT.' Each doorway or passage along an exit access that could be mistaken for an exit must be marked 'NOT AN EXIT' or similar designation, or be identified by a sign indicating its actual use (e.g., closet). Every required exit sign must be suitably illuminated by a reliable light source and be visible in both normal and emergency lighting modes.



Where the direction of travel to the nearest exit is not immediately apparent, a sign reading 'EXIT' or similar designation with an arrow indicating the direction to the exit is required. OSHA also requires that each exit route be adequately lighted so that an employee with normal vision can see along the exit route.

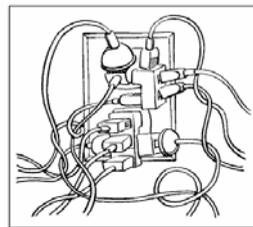
When required, emergency lighting must be provided for a minimum of 1½ hours and it must operate automatically in the event of failure or any interruption of normal lighting.

Electrical Safety

Only qualified personnel are allowed to work on electrical equipment.

Avoid rough treatment and kinking of electrical cords. Do not drag them across sharp edges, allow them to be shut in doorways, or drag them across an aisle where they can become damaged or trip someone. Carefully inspect electrical cords for sources of shock such as worn insulation and exposed strands.

Discard extension cords that are missing the ground prong, have been spliced and repaired, or show extensive wear. Some portable electrical tools are double insulated and do not require a ground prong. Never remove a ground (third) prong from a cord. Report any equipment or cords with a missing third prong to your supervisor.



Use a GFCI when using electricity in wet or damp locations.

Ergonomics

The purpose of ergonomics is to eliminate injuries caused from stress on the muscles, nerves, and joints. Poor workstation setup can result in pain and damage to muscles, tendons, and nerves in the back, neck, shoulder, wrist, hands and elbows.



Symptoms to watch for include pain, numbness, tingling, burning, stiffness, or weakness. These symptoms are caused:

- When you perform the same motion over and over again.

- When you stay in the same position too long.
- When you work in awkward positions.
- When you use tools that do not fit your body properly.
- When you need to use a great deal of physical force.
- When you are exposed to vibration.

Ergonomic hazards can be corrected or controlled by redesigning workstations, adjusting lighting, replacing tools and equipment, using correct lifting procedures, and adjusting the amount of time that a worker spends doing ergonomically risky tasks.

Contact the HRD Safety & Health Office for an ergonomic assessment of your workstation.



Back Safety

Tasks that can lead to back injuries include frequent lifting, carrying heavy loads, twisting and bending while lifting or carrying a heavy load, and extended periods of work in one posture. Avoid lifting from the floor and overreaching from above the shoulders.

The number and severity of low back injuries can be reduced by using safe lifting practices.

- Test the weight of an object before lifting.
- Ask for help if an item is too heavy.

- Keep your feet apart to provide a stable base.
- Get a correct grip or hold on the object by using a full grip--not just your fingers.
- Bend at the knees instead of your waist. Tighten your abdominal muscles.



- Lift with your legs, not your back.
- Keep the object close to your body.
- Maintain your back's natural curve as you lift.
- Turn by pivoting your feet, not by twisting at the waist.

Fire Prevention

Fires are a serious hazard. You can prevent fires by picking up papers, preventing oily rags from accumulating, and properly storing and handling flammable materials.



Keep aisles, hallways, fire extinguishers, electrical panels, and emergency exits clear and accessible.

Know where fire alarm pull boxes are and how to use them. In case of fire, alert employees in the immediate area, activate your alarm system and call the Fire Department from a safe location. Be sure to give the Fire Department complete information on the location and nature of the fire.

Housekeeping

Housekeeping tasks directly affect safety by reducing potential for slips and falls and decreasing the potential for fires.

Do your part in keeping your department clean and neat. Keep tools and materials where they belong. All trash must be placed in proper containers for disposal. Spills should be mopped up immediately. Put oily rags in covered metal containers.

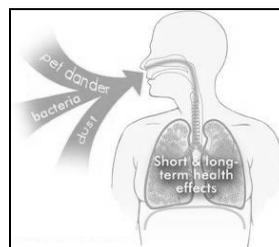


Keep exits and emergency escape routes unobstructed. Never block aisles, traffic lanes, or fire exits with equipment or materials. Work areas, walkways, and equipment must be kept clear. Report worn or broken flooring, stair treads, handrails, or any other tripping hazard as soon as possible to your supervisor.

If you are looking for a strategy to improve housekeeping in the workplace, consider the popular 'Five S' housekeeping approach imported from Japanese manufacturing. The benefits of 5S housekeeping include safety (accidents are prevented), productivity (waste is eliminated), quality (errors are prevented), and equipment reliability (breakdowns are reduced).

Indoor Air Quality

Indoor air quality issues can result from ventilation system deficiencies, overcrowding, volatile organic chemicals, tobacco smoke, mold, outside air pollutants, and improper temperature and relative humidity.



Symptoms usually include headaches, fatigue, itching or burning eyes, skin irritation, nasal congestion, and dry or irritated throats. Typically, the workplace environment is suspected because symptoms lessen when workers leave the building.

Standards specific to office indoor environments do not exist. Determining the cause for symptoms is a process of elimination with no cause frequently discovered.

An illness may be related to something in the building environment. Some examples of building-related illnesses are Legionnaires' disease, Pontiac fever, and carbon monoxide poisoning.

Measuring ventilation and comfort indicators such as carbon dioxide, temperature, and relative humidity can be useful in the early stages of an investigation to determine whether the HVAC system is functioning properly.

Air quality concerns should be reported to Facilities Maintenance or the HRD Safety & Health Office.

Hazard Communication

Employees must be informed of what chemicals are present in the workplace, and how they can protect themselves from hazards associated with those chemicals.

Check with your supervisor to find out if there are any hazardous materials used or stored in your work area, where material safety data sheets (MSDS) are located and what type of labeling system is being used.

Information about chemicals to which employees may be exposed will be communicated by these means:

- Chemical inventory, listing all chemical products used on the property.
- Appropriate labels on all containers that hold chemical products.
- Material Safety Data Sheets (MSDS) available for all chemical products on the property.



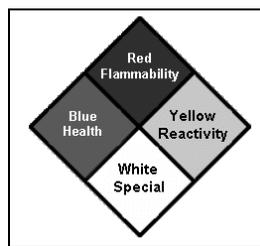
- Employee training to recognize and interpret labels, warnings, color-coding, and signs.
- Employee training to understand the elements of the MSDS and to recognize possible risks to health and physical harm.

If employees will be working with hazardous materials, they will receive additional training in the safe handling of these materials.

Signs, Tags and Labels

Signs, tags, and labels are used to alert employees about any dangers and hazards they may encounter.

OSHA currently has regulations in place that cover everything from the appropriate colors to use to the most effective message wording. The color red means danger, yellow means caution or physical hazard, and green means general safety instructions.



DANGER: Is used to indicate a hazardous situation, which has a high probability for extreme hazard that could result in severe injury or death. It means there is an immediate hazard and special precautions should be taken.

WARNING: Is used to indicate a hazardous situation that has a probability for extreme hazard that could result in severe injury or death.

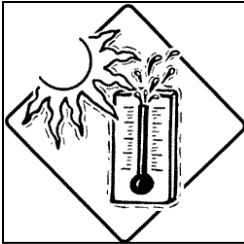
CAUTION: Indicates that a potential for minor or moderate injury is present. Cautions against unsafe practices. These signs serve as a reminder of equipment and material hazards.

NOTICE: Indicates the plant's general safety policies or promotes personnel safety protection and security of property. Serve as a quick reminder of proper safety practices for employees and visitors.

Heat / Cold Stress

Heat Stress

Special precautions must be taken during summer months to prevent heat-related illness like heat cramps, heat exhaustion, and heat stroke.



In order to manage heat, the body must perspire and that perspiration must be allowed to evaporate in order to cool. Some people are predisposed to heat-related illnesses, especially those who are overweight, have low degrees of physical fitness, are not acclimated to the hot environment, use drugs or alcohol, and/or have medical conditions such as hypertension and diabetes.

Heat exhaustion symptoms include moist, clammy skin, enlarged pupils, confusion, and weakness. The person experiencing any of these symptoms should be placed in a cool environment and given water or other cool fluids to drink. Medical help should be obtained as soon as possible because heat exhaustion could lead to heat stroke.

Heat stroke is a medical emergency caused by a breakdown in the body's sweating mechanism, resulting in the rapid rise in body temperature. When the body's temperature rises too high, brain tissue can be permanently damaged. Symptoms include dry, hot, red skin; loss of consciousness; convulsions; rapid pulse and rapid breathing.

To avoid heat-related illnesses, use these helpful tips during hot weather:

- Wear loose clothing that protects the skin from sunburn and allows perspiration to evaporate.
- Do not rely on thirst as an indicator of bodily needs. Depending on the activity, you may need to drink about one quart of water per hour.
- Limit intake of alcoholic and caffeinated beverages when performing heavy work in the sun.

Cold Stress

Hypothermia is a life-threatening emergency occurring when the body core temperature drops below 95°F. The first symptoms of illness include uncontrollable shivering and an inability to get warm. Later symptoms include reduced motor skills (hands and feet), drowsiness, and confusion. This can worsen until the victim loses consciousness.



If you suspect a person has hypothermia, get emergency help. Remove wet or frozen clothing and wrap them in warm, dry blankets. Do not rub their skin. Warm the person slowly from the inside out by focusing on warming their torso first and let the body naturally warm the extremities.

Frostbite is the freezing of body tissue that commonly affects exposed skin and extremities, such as the eyes, nose tip, ear lobes, cheeks, fingers and toes. Symptoms of frostbite include a lack of feeling in the extremities, glossy white or pale skin, tingling / aching initially followed by numbness in the area. If a person is suffering from frostbite, warm the affected area slowly. Do not rub the skin and do not apply hot items directly to the skin.

To avoid cold-related illnesses, use these helpful tips during cold weather:

- Wear loose fitting layers of clothing and cover your head.
- Wear weather-resistant shoes with insulated soles to protect the feet.
- Drink hot, decaffeinated, non-alcoholic beverages.
- Keep dry and out of the wind as much as possible.
- Work with a partner to recognize symptoms of illness and to summon help.

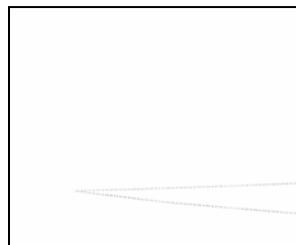


Office Safety

Offices are usually thought of as safe. Accidents in offices generally occur less frequently when compared to those experienced in industrial environments. However, office workers experience accidents and the resulting injuries can be just as painful and severe as their industrial counterparts.

Falls frequently occur in offices such as while sitting down or getting up from a chair, when leaning back and tilting a chair, slipping on wet or slipping floors; tripping over cords, while standing on a chair or other office furniture, or from slipping or tripping on stairs.

People overexert themselves in trying to lift or relocate items that are too bulky, unwieldy, or heavy to move. Some workers experience trauma from tasks that require them to constantly reach, stretch, twist, and bend down and straighten up. Electric shock and burns are also potential hazards from certain office equipment.



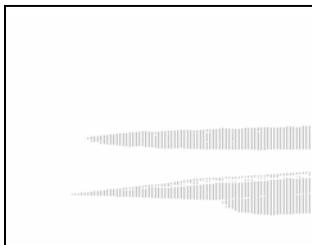
Work performed at a computer station may require an office worker to sit for a long time and involve small frequent movement of the eyes, head, arms and fingers. To sit in a fixed posture for a long time can cause muscle fatigue, and can eventually lead to muscle pain and injury. Employees may also develop various musculoskeletal disorders such as carpal tunnel syndrome and tendonitis.

Public Safety (Fire & Police)

“Courage is not the absence of fear but the will to act in the face of fear.” -- Dietrich Bonhoeffer

By their very nature, fire fighting and policing have always been hazardous occupations involving special hazards with heavy physical strain or mental stress. The operational duties of

fire and police work may at any time place fire fighters and police officers in life-threatening situations, such as major disasters or shooting incidents during the commission of a crime. With due regard to the nature of the fire service and police operations, the City will provide a safe and healthy working environment as far as is reasonably practical.



Fire Service

The fire service has evolved over the years from a single mission public service to one that provides a multitude of emergency services. The National Fire Prevention Association (NFPA) Standard 1500, Fire Service Occupational Safety and Health Programs, should be consulted for information on the occupational health hazards faced by fire fighters.



Fire fighters encounter a wide range of potentially hazardous situations in the conduct of their duty; including, but not limited to:

- Risk of burns from fire.

- Exposure to known and unknown chemicals in smoke produced by fires.
- Potential serious injury or death due to structural collapse in a structure that has been weakened by fire or other elements.
- Risk of chemical exposure causing injury or death from industrial chemicals.



- Exposure to people who may carry a bloodborne pathogen during treatment at an Emergency Medical incident.
- Risk of serious injury or death while responding and at emergency calls for service.
- Risk of electrocution at the scene of an emergency.

Police / Law Enforcement

Compared to many other jobs, police work is often regarded as a high risk job and an extremely stressful occupation, and officers typically suffer a variety of physiological, psychological and behavioral stress effects.

Police officers face a range of risks at work including:

- Being attacked, wounded or even killed by criminals.
- Falls during chase, rescue and similar operations.

- Car or motorcycle accidents while chasing fleeing vehicles, or while responding to emergency calls.
- Unavoidable physical contact with people who have contagious diseases (HIV, hepatitis, rabies, etc.) as a result of needle stick injury, human or animal bite, or close contact with infected / ill people.



- Exposures to high noise levels and lead on the firing range and exposure to carbon monoxide while directing traffic.
- Suffering effects of post-traumatic stress disorder if an incident witnessed by a police officer resulted in serious injury or death to any of those involved.
- Personal and/or family problems caused by shift work, irregular work hours, constant state of alertness (including when off duty), and similar psychosocial factors.



Methamphetamine Lab Response

Methamphetamine is a powerful central nervous system stimulant / drug that made in clandestine labs with relatively inexpensive, over-the-counter ingredients. It is a white, odorless crystalline powder that easily dissolves in water or alcohol. Meth causes increased activity, decreased appetite and a false sense of well-being. The effects of meth can last 6-8 hours, which includes the initial ‘rush’ and then afterwards a state of high agitation that can lead to violent behavior.

The methamphetamine manufacturing or ‘cooking’ process leaves behind 5-7 pounds of chemical waste for each pound of meth that is made. The chemical waste by-products are considered hazardous waste. Law enforcement response authorities who initially respond to a reported meth lab scene must be trained to follow specific safety guidelines as a part of their normal drug / law enforcement duties.



Some of the safety hazards associated with an initial response to a meth lab include exposure to flash-fires and exposure to hazardous chemicals. Skin and respiratory exposure to chemicals are two key components that require special training and knowledge in order to prevent potential serious injury during an emergency response. The training includes educating responders of the importance of wearing of correct personal protective equipment for the hazardous conditions normally present in a meth lab.

The following are general guidelines for law enforcement personnel other than the clandestine lab response-team who enter a scene:

- Contaminated areas should not be entered prior to ventilation, shutdown of equipment and removal of chemicals and equipment.



- Exposure to remnant chemicals should be prevented by limiting time on-site and by wearing the necessary protective equipment and clothing.
- Decontamination methods may include washing exposed skin and decontaminating contaminated footwear, shoes and clothing to limit chemical exposure.

Methamphetamine laboratory chemical hazards include:

Acetone / Ethyl Alcohol: Extremely flammable, posing a fire risk in and around the laboratory. Inhalation or ingestion of these solvents causes severe gastric irritation, narcosis, or coma.

Anhydrous Ammonia: A colorless gas with a pungent, suffocating odor. Inhalation causes edema of the respiratory tract. Contact with vapors damages eyes and mucous membranes.

Freon: Inhalation can cause sudden cardiac arrest or severe lung damage. It is corrosive if ingested.

Hydriodic Acid: A corrosive acid with vapors that is irritating to the respiratory system, eyes, and skin. If ingested, causes severe internal irritation and damage that may cause death.

Hypophosphorous Acid: Extremely dangerous substitute for red phosphorus. If overheated, deadly phosphine gas is released. Poses a serious fire and explosion hazard.

Iodine Crystals: Give off vapor that is irritating to respiratory system and eyes. Solid form irritates the eyes and may burn skin. If ingested, cause severe internal damage.

Lithium Metal: Extremely caustic to all body tissues. Reacts violently with water and poses a fire or explosion hazard.

Phenylpropanolamine: Ingestion of doses greater than 75 mg causes hypertension, arrhythmia, anxiety, and dizziness. Quantities greater than 300 mg can lead to renal failure, seizures, stroke, and death.

Pseudoephedrine: Ingestion of doses greater than 240 mg causes hypertension, arrhythmia, anxiety, dizziness, and vomiting. Ingestion of doses greater than 600 mg can lead to renal failure and seizures.

Red Phosphorus: May explode as a result of contact or friction. Ignites if heated above 500° F. Vapor from ignited phosphorus severely irritates the nose, throat, lungs, and eyes.

Vehicle Safety

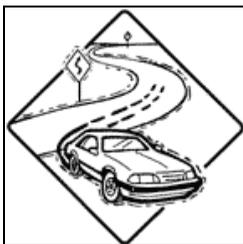
If you are required to drive a City vehicle as part of your job, you must be properly licensed, follow posted speed limits, practice defensive driving, and always wear seat belts.

Vehicle Operation

Drivers of City vehicles must possess the proper license as required by the Code of Iowa, and

must comply with all laws governing vehicle operations. Employees who are required to have a CDL must report any moving violations cited under their CDL or while in their personal vehicle to the HRD Safety & Health Office.

Inspect all vehicles prior to use and report any defective conditions or damages to your supervisor. If defects prevent safe driving, the vehicle must be taken out of service until the defects are corrected.



The vehicle driver must not allow riders on running boards, sides of trucks, or tailgates. This does not apply to the Solid Waste Management Division. Passengers must not board or alight from vehicles while they are in motion.

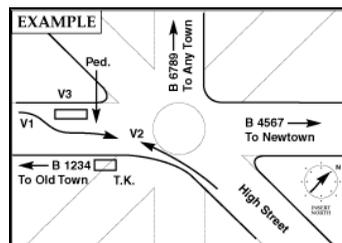
Cell Phone Use While Driving

The City is committed to promoting highway safety by encouraging the safe use of cell phones by its employees. The number of vehicle accidents caused by drivers distracted by cell phone use now rivals those caused by alcohol use.

Using a cell phone while operating a City vehicle is strongly discouraged. Employees should plan to place calls either before traveling or while on rest breaks. If you need to make a phone call while driving, find a proper parking space first. If on a highway, stopping on the side of the road is discouraged unless it is for a genuine emergency, such as an accident or car breakdown.

Vehicle Accidents

All automobile accidents involving a City-owned vehicle must be reported immediately to the Police Department whether or not there appears to be personal injury or property damage.



If you are involved in a vehicle accident with only minor vehicle damage and there are no injuries or other vehicles involved, then notifying the police is not necessary but it must still be reported to the supervisor and a *Vehicle Accident Report* completed.

Parking

Official City vehicles are permitted to park on any street in any metered space without feeding the meter except in the following areas:

- Second Avenue Bridge
- Plaza Parking
- All other off-street City parking facilities, such as at the Library.

Walking and Working Surfaces

Some of the causes or reasons for walking surface mishaps are poor housekeeping (obstacles in walk areas, liquid, dust, and the use of slippery surface cleaners); dangerous surface conditions (cracks or holes, protruding nails, broken surface materials, slippery finishes, and surfaces of different elevations); inadequate lighting; inattention to tasks, running, improper

footwear, fatigue, and lack of familiarity with the work area.

Basic facility layout considerations, such as spacing, and arrangement of equipment, machinery, passageways, and aisles are essential to avoid congestion and for safe, orderly operations.



Aisles and Passageways

Aisles and passageways must be kept clear and in good repair, without obstructions across or in aisles that could create a hazard. Floors must be kept in good condition and without any obstructions that would create a tripping hazard or hinder people leaving the area during emergencies. When slippery substances are spilled, they should be cleaned or mopped up immediately. Drip or oil pans will be used whenever the possibility of spilling or dripping exists. Areas which are constantly wet should have nonslip surfaces where personnel normally walk or work and signs posted stating "CAUTION WET FLOORS." When floors are being cleaned, signs will be posted to warn workers of a slipping hazard and will remain in place until floors have dried.

Passageways, aisles, and exit accesses must be kept clear for easy access to emergency equipment and enable fire fighters to reach a fire. Additionally, areas adjacent to sprinkler control valves, fuse boxes, and electrical switch panels shall not be obstructed. Every floor opening, such as a hatchway, chute, pit, trap door,

manhole, and ladderway must be appropriately guarded. The type of guard used is dependent on the location, reason for the opening, and frequency of use. Toeboards are required wherever falling objects present a hazard.

Barricades

Whenever an area is disturbed by maintenance, repair, or construction operations and presents a hazard to people in the area, care must be taken to warn these people and other workers of the potential hazard or to separate the construction area. Appropriate barricades, covers, or barriers will be erected around excavations; open manholes; open electrical panels; holes; or openings in floors, roofs and elevated platforms. They must also be used for overhead work, underground work, and areas where pedestrians are exposed to hot surfaces.



Warning signs and lighted or flashing warning lights for nighttime will be posted a sufficient distance from the hazard to give an ample advance warning to approaching pedestrian or vehicular traffic. Workers exposed to vehicle traffic are required to wear reflective or high visibility vests.

Grounds

All grounds adjacent to work areas will be kept free of hazardous materials, trash, and unguarded pits, openings, or obstacles. Materials are not to be stored, left under, or piled against buildings, doors, exits, or stairways. Trees and bushes

adjacent to walkways should be kept trimmed to permit a clear path for pedestrians.

Railings

Every stairway and ladderway opening must be guarded by standard railings and toeboards on all open sides, except at the entrance of the opening. If there is danger of a person walking straight into the opening, a swinging gate or offset passage will be used. All open-sided floors, platforms, and runways 4 feet or more above the ground or floor must be guarded by a standard railing on all open sides except where there is an entrance to a ramp, stairway, or fixed ladder.

Stairs and Ramps

Stairs and ramps must be kept clean, free of obstructions or slippery substances, and in good repair at all times. Outside stairways, entrances, sidewalks, loading docks, ramps, emergency exits, and emergency exit paths must be cleared of snow and ice.



Slips, Trips and Falls

Slips, trips, and falls are so commonplace that they are often thought of as minor mishaps. However, slip-and-fall accidents are the second-leading cause of on-the-job deaths, and they account for 10 percent of all nonfatal workplace injuries.

There are many conditions that may cause slips, trips, and falls, such as ice, wet spots, grease, polished floors, loose flooring or carpeting,

uneven walking surfaces, clutter, electrical cords, open desk drawers and filing cabinets, and damaged ladder steps. Safe work habits, good housekeeping, and commonsense precautions can make a major impact on the incidence of slips, trips, and falls in the workplace. Tips for reducing slip-and-fall accidents include:

- Keep floors clean and dry. Immediately mop up spills and water on floor surfaces.
- Post warning signs for wet floor areas.
- Keep aisles, walkways and exits free from obstructions.
- Provide adequate lighting inside and outside.
- Ensure that stairwells are well-lit, stair treads and risers are up to safety code and free from obstructions, and handrails are sturdy.

Managers and supervisors can help prevent these types of accidents by conducting regular inspections of working and walking areas and requiring proper footwear for their work and environment.

I Chose to Look the Other Way

I could have saved a life that day,
But I chose to look the other way.
It wasn't that I didn't care,
I had the time and I was there.

But I didn't want to seem a fool,
Or argue over a safety rule.
I knew he'd done the job before,
If I called it wrong, he might get sore.

The chances didn't seem that bad,
I've done the same, he knew I had.
So I shook my head and walked on by,
He knew the risks as well as I.

He took the chance, I closed an eye,
And with that act, I let him die.
I could have saved a life that day,
But I chose to look the other way.

Now every time I see his wife,
I'll know I should have saved his life.
That guilt is something I must bear,
But it isn't something you need to share.

If you see a risk that others take,
That puts their health or life at stake.
The question asked, or thing you say,
Could help them live another day.

If you see a risk and walk away,
Then hope you never have to say,
I could have saved a life that day,
But I chose to look the other way.

-- Author Unknown

APPENDIX A
JOB SAFETY & HEALTH POSTER

Chapter 88-Code of Iowa provides job safety and health protection for workers throughout the State of Iowa. The Iowa Division of Labor Services has the responsibility for administering this Chapter. The Division of Labor adopts Federal occupational safety and health standards as State of Iowa standards. Employers and employees are required to comply with these standards.

SAFETY ON THE JOB IS EVERYBODY'S RESPONSIBILITY!

EMPLOYERS: Chapter 88 requires that all employers must furnish to employees employment and a place of employment free from recognized hazards which cause or are likely to cause death or serious physical harm to employees and comply with occupational safety and health standards adopted under this Chapter.

EMPLOYEES: Chapter 88 requires that each employee comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Chapter which are applicable to the employee's own actions and conduct.

COMPLIANCE WITH SAFETY AND HEALTH REQUIREMENTS

To ensure compliance with safety and health requirements, the Iowa Division of Labor Services conducts periodic inspections of places of employment. Inspections are conducted by trained compliance safety and health officers. Chapter 88 requires that an authorized representative of the employer and a representative authorized by the employees be given an opportunity to accompany the inspector for the purpose of aiding the inspection. Where there is no authorized employee representative, the compliance safety and health officers will

consult with a reasonable number of employees concerning safety and health conditions in the workplace. Employees or their representatives have the right to notify the Division and request an inspection if they believe that unsafe and unhealthful conditions exist at their workplace. In addition, employees have the right to bring unsafe conditions to the attention of the compliance safety and health officer making the inspection. Complainant's names will be kept anonymous upon request.

Employees may not be discharged or discriminated against in any way for filing safety and health complaints or otherwise exercising their rights under Chapter 88. Employees who believe they have been discriminated against may file a complaint with the Division or the U. S. Department of Labor within 30 days of the alleged discrimination. Discrimination complaints of this nature by State or local governmental employees must be submitted to the Division of Labor Services.

If upon inspection the Division of Labor Services believes that Chapter 88 has been violated, a citation of alleged violations and proposed penalties will be issued promptly to the employer. Each citation will specify a time period within which the alleged violation must be corrected.

Citations issued by the Iowa Division of Labor Services must be prominently displayed at or near the place of violation.

Chapter 88 provides for penalties of up to \$7,000 for each serious violation and penalties of up to \$7,000 for each non-serious violation. Penalties of up to \$7,000 are required for each day during which an employer fails to correct a violation within the period set in the citation. Any employer who willfully or repeatedly violates Chapter 88 is to be assessed civil penalties of not more than \$70,000 for each violation. Willful violations carry a \$5,000 minimum penalty.

Criminal penalties are also provided for in Chapter 88. A willful violation resulting in the death of an employee is a serious misdemeanor and may result in a fine of \$250 - \$1,500 or imprisonment for not more than one year, or both. Conviction of an employer after a first conviction is an aggravated misdemeanor punishable by a fine of \$500 - \$5,000 or by imprisonment for not more than two years, or both.

For assistance and information, including copies of Chapter 88 and of specific safety and health standards, contact:

*Iowa Division of Labor Services
1000 East Grand Avenue
Des Moines, Iowa 50319-0209
Telephone (515) 281-3606*

COMPLAINTS ABOUT STATE PROGRAM ADMINISTRATION

Any interested person or representative of such person or group of persons may submit a complaint to the Federal government concerning the operation or administration of any aspect of the Iowa Division of Labor Services' occupational safety and health activities pursuant to Chapter 88-Code of Iowa.

Complaints may be submitted orally or in writing to:

*Assistant Regional Administrator
U. S. Department of Labor
Occupational Safety & Health Administration
911 Walnut, Room 406
Kansas City, Missouri 64106
Phone: (816) 426-5861*

Any such complaint should describe the grounds for the complaint and specify the aspect or aspects of the administration or operation of Iowa's program which is believed to be inadequate.

If upon receipt of the complaint, the Assistant Regional Administrator (ARA) determines that reasonable grounds exist to believe that an investigation should be made, the ARA shall cause such investigation, including any workplace inspection, to be made as soon as practicable.

If the Assistant Regional Administrator determines there are no reasonable grounds for an investigation of a complaint, the ARA shall notify the complaining party in writing of such determination.

The Assistant Regional Administrator shall advise the complainant of the findings of any investigation conducted and any corrective action that may result.

The complainant's name and the names of other complainants shall not appear in any record published, released, or made available. The complainant's name will be deleted from any copy of the complaint which might be released or made available.

ISSUES NOT COVERED

The Iowa Division of Labor Services will not inspect any maritime operations, including bridge construction over border rivers. These operations will be under the jurisdiction of the Federal Occupational Safety and Health Administration. All complaints regarding maritime operations should be referred to the Federal Office listed above, except those involving State or local governmental employees which continue to be covered by the Iowa Division of Labor Services.

RIGHT-TO-KNOW

The Iowa Hazardous Chemicals Risk Right-to-Know Law gives employees a right to information regarding hazardous chemicals in the workplace. Employers are to provide this information upon request.

**APPENDIX B
HOW TO READ OSHA STANDARDS**

The Code of Iowa (Chapter 88) provides job safety and health protection for workers throughout the State of Iowa. The Iowa Division of Labor Services has the responsibility for administering this Chapter. The Iowa Division of Labor adopted federal occupational safety and health standards (found in the Code of Federal Regulations) as State of Iowa standards, thus the standards are the same.



The Code of Federal Regulations is divided into 50 TITLES representing areas subject to federal regulations. Title 29 covers the Department of Labor, of which OSHA is a part. Each title is divided into CHAPTERS and the chapter usually bears the name of the individual agency. Chapter XVII of Title 29 is titled, Occupational Safety & Health Administration.

Each chapter is divided into numbered PARTS covering specific regulatory areas. Part 1910 of Title 29, Chapter XVII is the general “Occupational Safety and Health Standards.” Major blocks of information within 1910 are called SUBPARTS and are labeled with capital letters. For example, the subpart for Materials Handling and Storage is Subpart N.

Subparts are divided into SECTIONS, which are identified by the part number followed by a decimal point and a number. The section for Powered Industrial Trucks is 1910.178.

Topical sections are further broken down into PARAGRAPHS, which are designated by (a), (b), (c), etc. and SUBPARAGRAPHS, which are numbered (1), (2), (3), etc. The paragraph for powered industrial truck operations is 1910.178(m) and the subparagraph pertaining to trucks left unattended is 1910.178(m)(5). Subparagraphs can be further divided into Roman numerals (i), (ii), (iii), etc. and upper case letters (A), (B), (C), etc.

A reference to a typical OSHA provision will be a title, part, section, paragraph, and subparagraphs. For example, a typical reference to an OSHA standard would be written as 29 CFR 1910.178 (m)(5)(i):

29 CFR	Department of Labor
1910	Occupational Safety & Health (General Industry)
Subpart N	Materials Handling and Storage
1910.178	Powered Industrial Trucks
(m)	Truck Operation
(5)(i)	“When a powered industrial truck is left unattended...”

APPENDIX C

PORTABLE FIRE EXTINGUISHER

Fire extinguishers can be used to extinguish or contain the fire. Only use a fire extinguisher if:

- You have been trained to use it,
- The fire alarm has been sounded first,
- The fire is small (waste basket size) and contained
- There is a clear evacuation route, and
- Someone else knows where you are.

Proper choice of fire extinguishers is especially important. The National Fire Protection Association divides fires into four classes according to the fuel involved:

- Class A – Ordinary combustibles (like wood and paper)
- Class B – Flammable liquids
- Class C – Energized electrical equipment
- Class D – Combustible metals

To use a fire extinguisher properly, use the PASS method – Pull, Aim, Squeeze and Sweep.

- P – Pull the pin.
- A – Aim the extinguisher at the base of the flames.
- S – Squeeze the trigger while holding the extinguisher upright.
- S – Sweep the extinguisher from side to side, covering the area of the fire with the extinguishing agent.

Always approach a fire cautiously staying low and discharging the fire-extinguishing agent 6-10 feet from the fire. Never turn your back on a fire.

Only use a fire extinguisher when it is safe to do so. If the fire is too big or if is spreading or threatening to block your path of escape, leave the area immediately. If necessary, do not hesitate to use the extinguisher to clear an escape path.

APPENDIX D**IDENTIFICATION OF THE FIRE HAZARDS OF MATERIALS**

	Health Hazard (BLUE)	Flammability (RED)	Reactivity (YELLOW)
Signal	Type of Possible Injury	Susceptibility of Materials to Burning	Susceptibility to Release of Energy
4	Materials which on very short exposure could cause death or major residual injury even though prompt medical treatment were given.	Materials which will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or which are readily dispersed in air and which will burn readily.	Materials which in themselves are readily capable of detonation or of explosive decomposition or reaction at normal temperatures and pressures.
3	Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment were given.	Liquids and solids that can be ignited under almost all ambient temperature conditions.	Materials which in themselves are capable of detonation or explosive action but require a strong initiating source or which must be heated under confinement before initiation or which react explosively with water.
2	Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.	Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.	Materials which in themselves are normally unstable and readily undergo violent chemical change but do not detonate. Also materials which may react violently with water or which may form potentially explosive mixtures with water.
1	Materials which on exposure would cause irritation but only minor residual injury even if no medical treatment is given.	Materials that must be preheated before ignition can occur.	Materials which in themselves are normally stable, but which can become unstable at elevated temperatures and pressures or which may react with water with some release of energy but not violently.
0	Materials which on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.	Materials that will not burn.	Materials which in themselves are normally stable, even under fire exposure conditions, and which are not reactive with water.

APPENDIX E

HAZARDOUS MATERIALS TRAINING REQUIREMENTS

FIRST RESPONDER - AWARENESS LEVEL

First responders at the awareness level are individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release.

FIRST RESPONDER - OPERATIONS LEVEL

First responders at the operations level are individuals who respond to releases or potential releases of hazardous substances as part of the initial response to the site for the purpose of protecting nearby persons, property, or the environment from the effects of the release. They are trained to respond in a defensive fashion without actually trying to stop the release. Their function is to contain the release from a safe distance, keep it from spreading, and prevent exposures.

HAZARDOUS MATERIALS TECHNICIAN

Hazardous materials technicians are individuals who respond to releases or potential releases for the purpose of stopping the release. They assume a more aggressive role than a first responder at the operations level in that they will approach the point of release in order to plug, patch or otherwise stop the release of a hazardous substance.

HAZARDOUS MATERIALS SPECIALIST

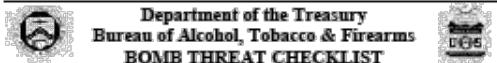
Hazardous materials specialists are individuals who respond with and provide support to hazardous materials technicians. Their duties

parallel those of the hazardous materials technician, however, those duties require a more directed or specific knowledge of the various substances they may be called upon to contain. The hazardous materials specialist would also act as the site liaison with Federal, state, local and other government authorities in regards to site activities.

ON SCENE INCIDENT COMMANDER

Incident commanders assume control of the incident scene and have a minimum of first responder – operations level training plus training in incident command.

APPENDIX F BOMB THREAT CHECKLIST



Department of the Treasury
Bureau of Alcohol, Tobacco & Firearms
BOMB THREAT CHECKLIST

1. When is the bomb going to explode?
2. Where is the bomb right now?
3. What does the bomb look like?
4. What kind of bomb is it?
5. What will cause the bomb to explode?
6. Did you place the bomb?
7. Why?
8. What is address?
9. What is your name?

EXACT WORDING OF BOMB THREAT:

Sex of caller: _____ Race: _____

Age: _____ Length of call: _____

Telephone number at which call is received: _____

Time call received: _____

Date call received: _____

CALLER'S VOICE

- | | |
|-----------------------------------|-----------------------------------|
| <input type="checkbox"/> Calm | <input type="checkbox"/> Nasal |
| <input type="checkbox"/> Soft | <input type="checkbox"/> Angry |
| <input type="checkbox"/> Stutter | <input type="checkbox"/> Loud |
| <input type="checkbox"/> Excited | <input type="checkbox"/> Lisp |
| <input type="checkbox"/> Laughter | <input type="checkbox"/> Slow |
| <input type="checkbox"/> Rasp | <input type="checkbox"/> Crying |
| <input type="checkbox"/> Rapid | <input type="checkbox"/> Deep |
| <input type="checkbox"/> Normal | <input type="checkbox"/> Distinct |

- | | |
|---|--|
| <input type="checkbox"/> Slurred | <input type="checkbox"/> Whispered |
| <input type="checkbox"/> Ragged | <input type="checkbox"/> Clearing Throat |
| <input type="checkbox"/> Deep Breathing | <input type="checkbox"/> Cracking Voice |
| <input type="checkbox"/> Disguised | <input type="checkbox"/> Accent |
| <input type="checkbox"/> Familiar (<i>If voice is familiar, who did it sound like?</i>) _____ | |

BACKGROUND SOUNDS:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Street noises | <input type="checkbox"/> Factory machinery |
| <input type="checkbox"/> Voices | <input type="checkbox"/> Crockery |
| <input type="checkbox"/> Animal noises | <input type="checkbox"/> Clear |
| <input type="checkbox"/> PA System | <input type="checkbox"/> Static |
| <input type="checkbox"/> Music | <input type="checkbox"/> House noises |
| <input type="checkbox"/> Long distance | <input type="checkbox"/> Local |
| <input type="checkbox"/> Motor | <input type="checkbox"/> Office machinery |
| <input type="checkbox"/> Booth | <input type="checkbox"/> Other (<i>Please specify</i>) _____ |

BOMB THREAT LANGUAGE:

- | | |
|--|---|
| <input type="checkbox"/> Well spoken (education) | <input type="checkbox"/> Incoherent |
| <input type="checkbox"/> Foul | <input type="checkbox"/> Message read by threat maker |
| <input type="checkbox"/> Taped | <input type="checkbox"/> Irrational |

REMARKS:

Your name: _____

Your position: _____

Your telephone number: _____

Date checklist completed: _____

APPENDIX G

THE FIVE 'S' PROCESS

The five elements of 5S are all Japanese words beginning with the letter 'S.' They are seiri (sort), seiton (set), seiso (shine), seiketsu (standardization), and shitsuke (sustain). The cornerstone of the 5S concept is that a well organized workplace results in a safer, more efficient, more productive operation, while an untidy, cluttered workplace is unproductive. Beside the physical implications of junk getting in the way and dirt compromising quality, people are happier and productive in a clean and tidy environment.

1. Seiri is a series of steps by which you identify things that are being kept in the workplace when they should not be, or are being kept in the wrong place. For example, a work area may be devoted to tools or instruments, some of which are needed regularly and some used infrequently. First, 'red-tag' items, giving each a tag that says what the item is, its location and when it was identified in this location. Then leave the area for some time and come back later to identify things that have not been moved or used. These items can then potentially be disposed of or perhaps relocated.

2. Seiton is a series of steps where everything is set in its proper place for quick retrieval and storage. Seiton essentially continues the Seiri phase by removing items to be discarded or held in an alternative location to create space. This phase also standardizes the way of doing things in a consistent manner. This includes standard operation and maintenance methods, standard equipment and tools, consistency in documentation, engineering design, and standardization in administrative processes that deliver work to the shop floor and tracks its progress.

3. In the Seiso or shine phase, the task is to establish the maintenance of a clean environment as an ongoing, continuous program. Time should be set aside for cleaning each day, or each shift. Everyone should be involved in cleaning the workplace. The more practical element here is that if everything is clean, it is immediately ready for use. By having employees clean and maintain their tools, they are afforded the opportunity to spot worn or damaged components (i.e., preventive maintenance). Implementing Seiso revolves around two main elements: an assignment map that identifies who is responsible for which areas; and a schedule that says who does what and when. A key aspect is minimizing downtime needed to keep the facilities clean; making sure the equipment being cleaned is always available when needed.

4. Seiketsu or standardization should not be confused with the second pillar. Seiketsu is a means of standardizing the way cleanliness is maintained. There is always a danger in any improvement effort that once the focus is removed and another hot button issue grabs management's attention, things tend to go back to the way they were before. Seiketsu is a set of techniques intended to prevent this from happening. It involves setting a schedule by which all the elements are revisited on a regular basis. The first step is a periodic review of the work area to identify where standards have slipped. The second step is to undertake Seiton activities as required, that is, as prompted by the first step.

5. Shitsuke (Sustain) is the final stage and is the set of approaches to make people want to keep applying good housekeeping practices. It is making the practice of 5S a daily way of life. The way management achieves this ongoing commitment within the workforce depends a lot on the culture or climate already in place. A strong link unquestionably exists between culture or climate and the physical environment.

APPENDIX H

HOW TO READ A MSDS

OSHA's Hazard Communication Standard explains the types of information that must be included on a MSDS, but it does not prescribe a specific format or organization for the forms. MSDSs will generally include at least nine sections giving a variety of information about the chemical. The following is a section-by-section explanation of a Material Safety Data Sheet (MSDS).

I. PRODUCT IDENTITY

This section gives the name and address of the manufacturer and an emergency phone number where questions about toxicity and chemical hazards can be directed.

Trade Name: This is the manufacturer's name for the product. For example, sodium hypochlorite is a chemical name and Brite Bleach[®] is its trade name. If the product is a mixture of several chemicals, only its trade name will be listed.

Chemical Family: This classification allows the grouping of the substance along with a class of similar substances, such as acids, caustics, mineral dusts, etc.

II. HAZARDOUS INGREDIENTS

This section describes the composition of the substance by percent, listing chemicals present in the mixture.

Permissible Exposure Limits (PELs) and Threshold Limit Values (TLVs): Values for airborne toxic materials that represent concentrations to which nearly all workers can be exposed for long periods of time without harmful effect. TLVs are usually expressed as parts per million (ppm) for gases and vapors or as milligrams per cubic meter (mg/m³) for dusts,

fumes, mists, gases or vapors. TLVs are recommended guidelines. Compliance with PEL concentrations is enforceable by law.

III. PHYSICAL DATA

This section describes the physical properties or characteristics of the product, such as whether it is a liquid, solid or gas at room temperature; how much vapor it forms; whether the vapor rises or settles; and whether the product dissolves in water.

Appearance and odor information may help identify the substance if it spills or leaks in the work area.

Boiling point is the temperature at which a liquid changes to a vapor at atmospheric pressure. For mixtures, the initial boiling point or the boiling range may be given. Flammable materials with low boiling points generally present special fire hazards.

Specific gravity tells whether the liquid is lighter or heavier than water. Water has a density of 1.0.

Percent volatile by volume tells how much of the substance will evaporate away.

Vapor density tells whether the vapor is lighter or heavier than air. The density of air is 1.0. A density greater than 1.0 indicates a heavier vapor, a density less than 1.0 indicates a lighter vapor. Heavier-than-air vapors can flow along just above the ground and can collect in depressions and low-lying areas.

IV. FIRE AND EXPLOSION HAZARD DATA

This section describes the circumstances under which the product may ignite and provides instructions on how to deal with these hazards.

Flash point is the lowest temperature at which a liquid gives off enough vapor to ignite when a source of ignition is present.

Flammable limits are the lowest and highest concentrations of a gas or vapor in the air that will ignite when exposed to a spark or open flame. The lower explosive limit (LEL) and the upper explosive limit (UEL) define the range of concentration in which combustion can occur.

V. HEALTH HAZARD DATA

This section describes the potential health effects resulting from overexposure to the chemical, and gives emergency and first aid procedures to follow in case of overexposure. Health hazard information includes the routes of exposure and the effects of short-term (acute) and long-term (chronic) exposure. Any medical conditions that are generally recognized as being aggravated by exposure to the product will be included.

The **LD50** or “Lethal Dose 50,” is the dose of substance that will cause the death of half the experimental animals. The **LC50** is the concentration of the substance in air that will cause the death of half of the experimental animals.

VI. REACTIVITY DATA

This section tells how the product will react under particular environmental conditions. Chemical substances may be hazardous when they break down into other substances or when they react with other chemicals.

Stability indicates whether the product will decompose in time and environmental conditions, such as heat or direct sunlight. Unstable compounds decompose spontaneously under normal temperatures, pressures and

mechanical shocks. Rapid decomposition may be hazardous because it produces heat and may cause fire or explosion.

Incompatibility indicates which chemicals should not come in contact with the product. Any materials that are identified as incompatible should be stored and used separately.

Hazardous decomposition products indicate which substances might be released during fires or from decomposition.

Hazardous polymerization is a process by which the molecules of a chemical can combine to form larger molecules. If this chemical reaction happens too quickly, it may produce a great amount of heat, which may result in a fire or explosion. If a polymerization hazard exists, specific storage instructions and the shelf life of the chemical should be listed.

VII. SPILL OR LEAK PROCEDURES

This section includes information on how to handle and clean-up product spills or leaks (including emergency and first aid procedures) and guidance for proper disposal of the material if it becomes a waste.

VIII. SPECIAL PROTECTION INFORMATION

This section includes information on employee protection requirements (protective clothing, gloves, goggles, or respiratory protection), any recommended engineering controls, or other safe work practices.

IX. SPECIAL PRECAUTIONS

This section may include information on precautions for the safe handling and use of the material.

APPENDIX I
VEHICLE ACCIDENT REPORTING

ACCIDENT INFORMATION CARD CARRIED IN EVERY CITY OF CEDAR RAPIDS VEHICLE

What to do if a City vehicle is involved in an accident:

1. Call the Police immediately to come to accident 286-5491 for non-emergency and 911 if someone is injured.
2. Ask the other driver and passengers if they are ok and Request medical help if someone is injured.
3. Notify your supervisor.
4. Tell the Police what happened. Do not make statements to others.
5. Refer the other driver's damage claims to the City Risk Manager at 286-5008.
6. Report to the HRD Safety & Health Office:
 - All employees must report to the HRD Safety & Health Office before the end of their shift.
 - Within 2 hours of the accident, drivers operating a vehicle requiring a CDL must report to the HRD Safety & Health Office or call 521-5652 when the HRD Safety & Health Office is closed if:
 - There is a fatality, or;
 - City driver receives a citation and someone is transported from accident site to a medical facility, or;
 - City driver receives a citation and a vehicle is disabled, towed, or removed from service.
 - Bring the driver's exchange information the Police Officer gave you with the other driver's information. The HRD Safety & Health Office can assist you in filling out a City Vehicle Accident Report.

Financial Responsibility Information: The City has adopted a self-insurance program and has a fund to pay claims for which it is found liable. Refer claimants and insurance company representatives to the City Risk Manager at 286-5008.

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CITY OF CEDAR RAPIDS

VOLUME II



EMPLOYEE SAFETY AND HEALTH HANDBOOK

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SPECIAL SAFETY PROGRAMS

“Workplaces are easier to manage than the minds of individual workers. You cannot change the human condition, but you can change the conditions under which people work.”

-- Dr. James Reason

“Never remove a safety barrier that has dents in it.”

-- Dr. Todd Conklin

“Never test the depth of a river with both feet.”

-- African adage

The Code of Iowa, Chapter 88, provides job safety and health protection for workers throughout the State of Iowa. The Iowa Division of Labor Services has the responsibility for administering this Chapter. The Iowa Division of Labor adopts federal occupational safety and health standards (i.e., Code of Federal Regulations) as State of Iowa standards, thus the standards are the same. Federal and state occupational safety and health standards are considered minimum requirements.

Written safety programs will be developed by Safety & Health when there is a regulatory requirement or an operational necessity. Citywide safety programs will describe who the program applies to, assign responsibilities, and outline general requirements. Each City department, division, or work group will supplement City safety programs when more detail is needed to implement the safety program. Safety & Health will help develop these supplemental programs, when requested.

Air Contaminants

Chemical hazards include chemical compounds in the form of solids, liquids, and gases that may pose a fire and explosion hazard or exert a toxic

effect by inhalation (breathing), absorption (through direct contact with the skin), or ingestion. Air contaminants can be produced during use, handling, or processing of chemical materials.

Air contaminants are commonly classified as particulate, gas, and vapor contaminants.

The most common particulate contaminants include dusts, fumes, fibers, and mists. Dusts are solid particles formed through mechanical processes such as crushing, grinding, drilling, and scraping. Fumes form when material from a heated solid condenses in cool air, as occurs during welding and soldering operations. Fibers are solid particles whose length is several times greater than their diameter, such as asbestos or fiberglass. Mists are finely divided liquid particles suspended in the air formed by splashing, foaming, or atomizing liquids. Mists are generated during spray painting operations.



Gases are formless fluids that expand to occupy the space or enclosure in which they are confined. Examples include welding gases (oxygen, acetylene, nitrogen, helium, and argon), carbon monoxide from vehicle exhaust, and hydrogen sulfide (sewer gas) formed during the decomposition of organic materials.

Vapors are the gaseous form of substances that are normally in a liquid or solid state and are formed by evaporation, such as gasoline vapors.

Exposure Limits

As a guide to evaluating inhalation hazards from air contaminants, OSHA has established permissible exposure limits or PELs to set limits on how much of certain air contaminants employees can be exposed to while at work.

The PELs are intended to suggest levels of exposure to which most workers may be exposed to for up to 8-hours per day, 40-hours per week, for a working lifetime without experiencing adverse health effects. A small percentage of workers may experience adverse health effects below these criterion levels because of individual susceptibility, a pre-existing medical condition, or hypersensitivity (allergy).



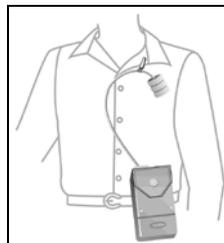
Chemical Monitoring

Air monitoring is conducted for certain jobs or tasks to ensure that employee exposures to airborne chemicals are within permissible limits.

The City Safety & Health Services will conduct air sampling using the following guidelines if there is reason to believe that a hazard exists or may develop in the workplace. This monitoring includes:

- **Initial Monitoring:** This type of monitoring is conducted when a new chemical or process is introduced; an employee exhibits signs or symptoms of exposure; or if there is reason to believe that an employee exposure exceeds the PEL.

- **Periodic Monitoring:** This type of monitoring is conducted to ensure the effectiveness of corrective actions.
- **Standard Specific Monitoring:** This type of monitoring is performed for compliance purposes for specific chemical standards that require exposure monitoring on an established schedule, such as asbestos, benzene, and lead.



The City Safety & Health Services has the capability to perform air sampling / chemical monitoring of various chemicals or compounds. For further information regarding chemical exposure monitoring, contact the HRD Safety & Health Office. Evaluation criteria may change over time as new information on the toxic effects of a substance becomes available or OSHA publishes new exposure standards.

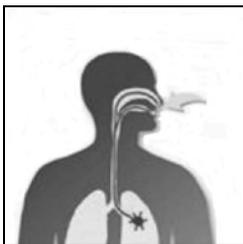
Bioaerosols

All microorganisms produce antigens – molecules (often proteins or polysaccharides) that stimulate the immune system. A single exposure to an antigen may result in sensitization. If the sensitized person is exposed again to the same antigen, a hypersensitive or allergic response may occur. Allergic reactions to inhaled antigens may be limited to the upper respiratory tract (runny nose), or they may affect the airways (allergic asthma), or portions of the lung (hypersensitivity pneumonitis).

No standards or guidelines have been set by the Occupational Safety and Health Administration (OSHA) for bioaerosols. A general permissible

exposure limit for bioaerosols is not scientifically supportable because:

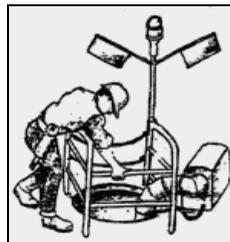
1. Microorganisms and biological particles do not comprise a single entity.
2. Human responses to bioaerosols range from innocuous effects to serious or fatal diseases depending on the specific material involved and workers' susceptibility to it.
3. It is not possible to collect and evaluate all bioaerosols components using a single sampling method (different methods of collection and analyses may result in different estimates of concentration).
4. Information relating bioaerosol concentrations to health effects is insufficient to predict health effects.



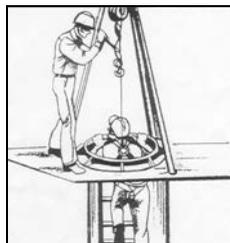
Air sampling for microbials provide a short-term snapshot, which may not be representative of the conditions over the whole workday or under different environmental conditions. Due to the limitations in air sampling for fungi and bacteria, air sampling results should not be used to prove a negative case. Microbes in air vary seasonally, between day and night, and with activity level. These data should be used to help characterize the microbial environment rather than to establish safety exposures. The occurrence of work-related health effects or the lack of health effects is the only way to assess whether an environment is acceptable.

Confined Space Entry

The city maintains a confined space permit program to protect employees and minimize the hazards of entering and working in confined spaces.



A confined space is any space that is large enough to enter and work in but not designed for continuous occupancy (no ventilation or no lighting) and has limited or restricted entry or exit (you must stoop, use a ladder, or crawl). These characteristics make for unfavorable natural ventilation and difficult escape in event of emergency. Confined spaces include sewage and sludge wet wells, covered process tanks, utility manholes, valve and meter pits, and chemical storage tanks.



A confined space becomes a *permit-required confined space* if it contains additional hazards such as a potentially toxic or low oxygen atmosphere, liquid or solid material that can trap and engulf an entrant, fire or explosion hazards, fall potential, electric shock, and moving machinery. A permit-required confined space must not be entered without an entry permit,

proper training, and control of the hazards in the space.

Every effort will be made to enable the performance of any necessary work from outside the confined space. No permit-required confined space will be entered unless absolutely necessary. All confined spaces are considered dangerous and may not be entered until all safeguards are in place and authorization has been granted in strict compliance with an entry permit. If an employee in a confined space detects unusual odors, experiences dizziness, or irritation of the eyes or nose, all workers must leave the confined space immediately.

Each city department that is involved with confined space entry must have a site-specific written program to ensure employees are properly trained and the hazards within the confined space are adequately controlled to permit safe entry.

Employees with questions about a confined space and potential hazards may contact the HRD Safety & Health Office for a hazard assessment.



Construction / Contractor Safety

There will be occasions where contractors will be performing construction, renovation, demolition, maintenance, or repair operations in city facilities or on city property.

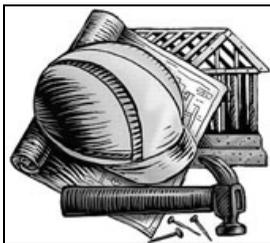


Construction sites are particularly hazardous because the worksites are constantly changing: several subcontractors may be working at once; construction workers frequently change worksites and employers; safety procedures may vary by job site; there are continuous changes in the physical layout of the site as construction progresses; the movement of heavy construction vehicles; harmful exposures to dust, noise, and chemicals from construction operations; and there may be changes in emergency devices available (in the event of power outages).

Construction is a high hazard occupation for a number of other reasons as well. Causes of accidents in the construction industry include being struck by falling or moving objects, being caught-in or between machinery or equipment, electrocution, unsafe ladders, improperly assembled scaffolding, unguarded holes in floors or walls, lack of safety standards for situations (such as confined space entry or chemical use), not having the right tools for the job, defective equipment, and construction debris.

The City has a responsibility to ensure that any contractors performing work at city facilities are informed of the safety and health hazards they may encounter prior to the start of their work. The contractor must also be informed of any safety controls necessary, applicable city safety

rules, and emergency procedures. The goal is to create a work environment in which contractors can control their operations and ensure the safety of their employees as well as minimize the risk to city employees and the public.



This calls for communication and coordination efforts between the city and contractors, especially for operations such as lockout/tagout, confined space entry, and line breaking/blanking. This ensures the safety of city employees and the public who may be in close proximity to contractor operations and informs contractors of the presence of any hazards near their work area.



Prior to the start of construction or renovation, all areas should be inspected for the presence of worksite hazards. The best way to manage construction / contractor safety is to integrate safety into the contractor bid and acceptance procedures. Contractors cannot follow safety procedures if they are not explained. If a hazardous work permit is required for certain operations – confined space entry, hot work, line

breaking – then the contractor will need to know this in order to work safely.

City employees should stay well clear of construction sites unless they are authorized to be there and have a specific job to perform. When working on or near construction or renovation projects, always wear the proper personal protective equipment and comply with the contractor's safety and security requirements.

Control of Hazardous Energy

Electrical Safety

The OSHA Electrical Safety standard identifies two types of people that may come in contact with electrical equipment on a jobsite; qualified and unqualified. A qualified person is one who has been trained to avoid electrical hazards when working on or near exposed energized parts and is familiar with the safety related work practices, able to distinguish exposed live parts of electrical equipment, and is knowledgeable of the skills and techniques used to determine the nominal voltages of exposed parts. An unqualified person is someone who has little or no training regarding electrical hazards. Only qualified personnel are allowed to work on electrical equipment.



Electrical Shocks

Electricity travels in closed circuits, normally through a conductor. Sometimes a person's body mistakenly becomes part of the electric circuit. This can cause an electrical shock. Shocks occur

when a person's body completes the current path with both wires of an electric circuit; one wire of an energized circuit and the ground; a metal part that accidentally becomes energized due, for example, to a break in its insulation; or another conductor that is carrying a current. When a person receives a shock, electricity flows between parts of the body or through the body to a ground or the earth.



An electric shock can result in anything from a slight tingling sensation to immediate cardiac arrest. The severity depends on the amount of current flowing through the body, the current's path through the body, the length of time the body remains in the circuit, and the current's frequency. With good contact, 115 volts is sufficient voltage to cause death. If the lungs are involved in the path of the circuit, voluntary respiration can be halted. If the heart is involved, fibrillation can occur resulting in heart failure.

When a person receives an electrical shock, the electrical stimulation can cause muscles to contract, leaving the person unable to pull free of the circuit. This is extremely dangerous because it increases the length of exposure to electricity. Longer exposures at even relatively low voltages can be just as dangerous as short exposures at higher voltages.

If a person is unable to pull free from live electrical contact, shut off the current immediately. If this is not possible, use boards, poles, or sticks made of wood or any other non-

conducting materials and safely push or pull the person away from the contact. It is important to act quickly, but remember to protect yourself as well from electrocution or shock.

Electrical shocks can cause involuntary muscle reactions that result in injuries from collisions or falls.

Burns are the most common shock-related injury. An electrical accident can result in an electrical burn, arc burn, thermal contact burn, or a combination of burns. Electrical burns are among the most serious burns and require immediate medical attention. They occur when electric current flows through tissues or bone, generating heat that causes tissue damage. Arc or flash burns result from high temperatures caused by an electric arc or explosion near the body. Thermal contact burns are caused when the skin touches hot surfaces of overheated electric conductors, conduits, or other energized equipment. Thermal burns also can be caused when clothing catches on fire, as may occur when an electric arc is produced.



Electricity poses other dangers besides shock and burn hazards. For example, arcs that result from short circuits can cause injury or start a fire. Extremely high-energy arcs can damage equipment, causing fragmented metal to fly in all directions. Even low-energy arcs can cause violent explosions in atmospheres that contain flammable gases, vapors, or combustible dusts. While an electrical shock may not be strong enough to cause a fatality, it could still cause a

person to fall or jolt them into to dangerous equipment or machinery.

Static Electricity

Static electricity can cause shocks or discharge to an object with serious consequences, as when friction causes a high level of static electricity to build up at a specific spot on an object. This can happen simply through handling plastic pipes and materials or during normal operation of rubberized drive or machine belts found in many worksites. Static electricity can potentially discharge when sufficient amounts of flammable or combustible substances are located nearby and cause an explosion. Grounding or other measures may be necessary to prevent this static electricity buildup.

Safe Work Practices

Most electrical accidents result from one of the following three factors: unsafe equipment or installation, unsafe environment, or unsafe work practices. Electrical accidents are largely preventable with insulation, guarding, grounding, electrical protective devices, and safe work practices. Safety-related work practices are used to prevent electrical shock by keeping workers away from energized equipment or circuits and by training qualified workers on the correct procedures when working on energized equipment or circuits.

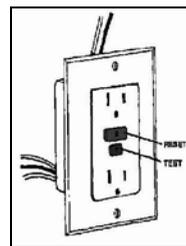
Prior to using or performing maintenance on electrical equipment, the employee should first determine if it is safe by checking the following:

- Make sure the electrical equipment is not located in a hazardous environment such as a damp/wet location or where it is exposed to high temperatures and flammable liquids and gases;
- Make sure current and safety devices such as fuses, breakers and ground fault circuit interrupters (GFCI) have not been tampered with and are working correctly;

- Make sure the power cord and plug do not have any defects such as cuts in the insulation exposing bare wiring;
- Know if the equipment has an emergency shutoff switch and where it is located prior to use;
- Make sure there is sufficient space around the electrical equipment or circuit in order to maintain or operate;
- Make sure all personal metal jewelry is removed prior to using or working on electrical equipment or circuits; and

De-energize electrical equipment before testing or repairing.

If de-energizing the electrical equipment or circuit will increase the potential for an electrical hazard or is necessary for testing and troubleshooting, the appropriate tools and personal protective equipment (PPE) must be used and worn for the specific parts of the body to be protected.

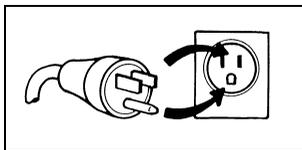


Ground Fault Circuit Interrupter

Ground fault circuit interrupters (GFCIs) are designed to shut off electric power within as little as 1 /40 of a second. It works by comparing the amount of current going into the electric equipment to the amount of current returning from the equipment along the circuit conductors. If the current exceeds six milliamperes, the GFCI

interrupts the current enough to prevent electrocution.

For example, electricity follows the path/route of least resistance. If someone were to touch an electrical system with a leak, the person touching the system may be a better route of ground for the electricity to pass through since the individual offers very little resistance. GFCIs are typically used in wet or humid environments, high-risk areas and places where people could come into contact with ground or ground equipment, and other applications (such as outdoor outlets, steam plants, and construction sites).



Insulated Tools

Insulated tools must be used when working on or near exposed energized live conductors. Only insulated tools that comply with the International Electrotechnical Commission Standard IEC 900, and marked with the international 1000V rating symbol should be used. Not all tools with a plastic coating or plastic handles provide protection from electrical shock. That is why it is important to inspect tools before performing electrical work not only to verify if the tools are rated for the job, but also if they are damaged or worn and no longer provide adequate protection from electrical shock. Damaged or worn tools should be removed from service immediately.

Electrical Protective Equipment

Electrical protective equipment includes items such as insulated blankets, matting, covers, line hose, gloves, sleeves, face shields and arc flash clothing. Blankets, gloves, and sleeves are clearly marked with class and type while

clothing is labeled with an ATPV rating (arc thermal performance value). The class refers to the maximum use voltage. Insulating must not exceed maximum use voltages. The type refers to its ozone resistance. Type I is not ozone resistant; Type II is ozone resistant. The ATPV rating cal/cm² identifies the amount of energy that can be delivered to a point at a particular distance from an arc flash, so the higher the number, the more protection the clothing offers.

Insulated equipment should be inspected prior to each use and immediately following an incident that may have caused damage. Damage consists of holes, tears, cuts, punctures, ozone cutting, embedded foreign objects, swelling, softening, hardening or any other defect. Once an insulated piece of equipment is removed from service, it may not be reused until it has been retested and certified. All electrically-insulated equipment must also be retested and certified periodically.

Overhead Power Lines

Before working under or near overhead power lines, ensure that you maintain a safe distance to the lines and, for very high-voltage lines, ground any equipment such as cranes that can become energized. Employees unqualified to work with electricity, as well as mechanical equipment, should remain at least 10 feet away from overhead power lines. If the voltage is more than 50,000 volts, the clearance increases by 4 inches for each additional 10,000 volts. When mechanical equipment is operated near overhead lines, employees standing on the ground should avoid contact with the equipment unless it is located outside the danger zone.

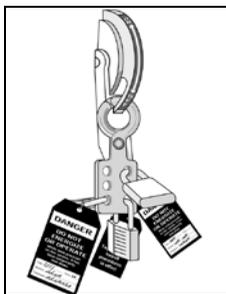
Disconnecting Means (Circuit Breakers and Disconnect Switches)

Unless their purpose is evident, circuit breakers and fuse boxes must be legibly marked to indicate their purpose. Proper identification needs to be specific – the marking should not

merely indicate ‘motor,’ but rather ‘motor, water pump’; not merely ‘lights,’ but rather ‘lights, front lobby.’ Circuit breakers and disconnect switches must clearly indicate whether they are in the open (off) or closed (on) position. Circuit breakers, disconnect switches, and fuses must be readily accessible. Breakers that frequently trip are an indicator of possible electrical problems and must be promptly reported and corrected.

Lockout / Tagout

Lockout / Tagout refers to specific practices and procedures to safeguard employees from the unexpected startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities. Lockout means blocking the flow of energy to a piece of equipment to prevent unexpected start-up. Employees servicing or maintaining machines or equipment may be exposed to serious physical harm or death if hazardous energy is not properly controlled.



The lockout / tagout standard requires that employers establish a program to ensure that machines and equipment are isolated and inoperative before any employee performs servicing or maintenance work on them. It also requires facilities to adopt and implement practices and procedures to shut down the equipment, isolate it from its energy source(s), and prevent the release of potentially hazardous

energy while maintenance and servicing activities are being performed.

An effective lockout / tagout program should include the following elements:

- An inspection of equipment by a trained individual thoroughly familiar with the equipment operation and associated hazards
- Identification and labeling of lockout devices
- Purchase of locks, tags, and blocks
- A standard written operating procedure that is followed by all employees

Specific steps for shutting down, isolating, blocking, and securing machines and equipment to control hazardous energy include the following:

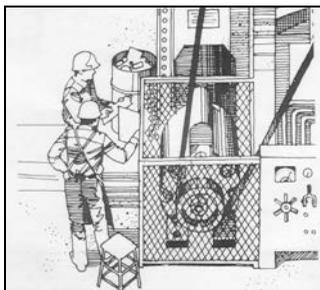
1. Prepare for shutdown
2. Notify affected employees
3. Shutdown
4. Isolate equipment
5. Apply lockout devices
6. Release stored energy
7. Verification

Only trained employees are permitted to lock out equipment to do repair and servicing work and only qualified employees are authorized to work on electrical equipment.

The main causes of LOTO-preventable injuries include failure to stop equipment, failure to disconnect from the power source, failure to drain residual energy, accidental restart of machinery, and failure to clear work areas before restarting. If you see equipment that is locked out, do not attempt to restart the equipment.

Machine Guarding

Machine operators and others exposed to moving parts can get clothing, hair, or body parts caught in the machinery. Injuries resulting from working on or near moving machinery can range from minor cuts and bruises to a severed limb. Safeguards are essential for protecting workers from these preventable injuries. Any machine part, function, or process that may cause injury must be safeguarded.



Guards provide physical barriers to hazardous areas. They should be secure and strong, and employees should not be able to bypass, remove, or tamper with them. Guards should not obstruct the operator's view or prevent employees from working. Machine devices help prevent contact with points of operation and may replace or supplement guards. Devices can interrupt the normal cycle of the machine when the operator's hands are at the point of operation.

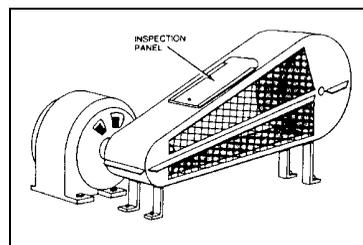
All mechanical motion is potentially hazardous. Employees working within areas where they are exposed to machinery or equipment hazards must be aware of the potential for mishaps.

The types of mechanical components that present amputation hazards include:

- Point of operation [*the area of a machine where it performs work on material*],

- Power-transmission apparatuses [*flywheels, pulleys, belts, chains, couplings, spindles, cams, and gears in addition to connecting rods and other machine components that transmit energy*], and
- Other moving parts [*machine components that move during machine operation such as reciprocating, rotating, and transverse moving parts as well as auxiliary machine parts*].

There are many ways to guard machines. The type of operation, size or shape of stock, work being performed on the material, method of handling, and production requirements are some of the factors that help determine the appropriate safeguarding method for an individual machine.



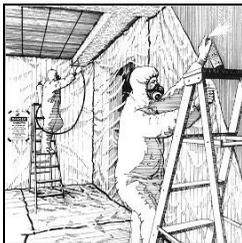
Do not operate machinery and equipment unless trained and authorized to do so. Do not operate machinery without guards or other safety devices in place and operational, do not bypass emergency safety devices, and do not remove guards from machinery without following lockout procedures. Never adjust, repair, clean, or oil machinery or equipment while any of its parts are in motion. If you need to leave a machine or make adjustments, shut the equipment off and let it come to a full stop. Ensure the machinery will stay off by using the appropriate lockout / tagout procedures. Always replace guards after repairs have been made, even while just testing repaired equipment.

Environmental Health

Asbestos

Asbestos is a generic term for a group of naturally occurring fibrous minerals with high tensile strength, flexibility, and resistance to heat. Asbestos may be found in installed products such as shingles, floor tiles, cement pipe and sheet, roofing felts, insulation, ceiling tiles, fire-resistant drywall, and acoustical products. Very few asbestos-containing products are currently being made or installed in buildings. Consequently, most worker exposures occur during the removal of asbestos and the renovation and maintenance of buildings and structures containing asbestos.

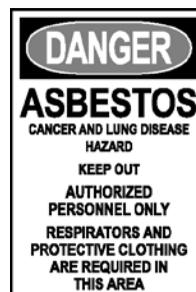
In City facilities, asbestos might be found in sprayed-on insulation (in mechanical rooms, on steel reinforcing beams, and some ceilings in older buildings), ceiling tiles in buildings built prior to 1981, 9" and 12" floor tiles and glue in buildings built prior to 1981, insulation around pipes and boilers, and interiors of fire doors.



Asbestos-containing materials will not release asbestos fibers unless they are disturbed or damaged in some way. For example, if an asbestos ceiling tile is drilled or broken, it may release fibers into the air. If it is left alone and not disturbed, it will not. Asbestos pipe and boiler insulation is not hazardous unless the protective canvas covering is damaged and the asbestos underneath is exposed to the air. Water damage, constant vibration, aging and acts such

as drilling, grinding, buffing, cutting, sawing or striking can damage the materials, making it more likely that asbestos fibers will be released.

OSHA began regulating workplace asbestos exposure in 1970. The regulations have become more stringent to better protect workers as the adverse health effects of asbestos exposure have become known. The standard primarily addresses potential workplace exposures to asbestos, resulting from the manufacture of asbestos-containing products or from the installation or removal of asbestos-containing building materials.



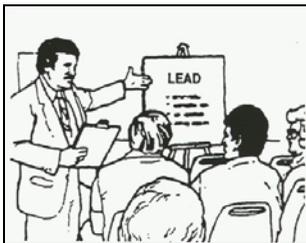
Asbestos is removed only when required for renovation, remodeling or maintenance. Not every pipe and ceiling tile contains asbestos, but asbestos cannot be identified visually. Construction projects which impact existing building materials must include a survey for asbestos-containing material in all areas impacted by construction and, if needed, develop a plan for removal and disposal. Do not assume that any building (new, old or renovated) is asbestos-free.

Asbestos-containing material is not generally considered to be harmful unless it is releasing dust or fibers into the air where they can be inhaled or ingested. Airborne asbestos is a significant health hazard because it may stay suspended in the air for hours or even days.

Asbestos fibers enter the body by the inhalation of airborne particles that pass deep into the lungs and become embedded in the tissues of the respiratory system or, if swallowed, into the digestive tract. Exposure to asbestos can cause disabling or fatal diseases, such as asbestosis, an emphysema-like condition; lung cancer; and mesothelioma. The symptoms of these diseases generally do not appear for 20 or more years after the initial exposure.

Lead

Lead was a major ingredient in many types of house paint for years prior to and through World War II. In the early 1950s, other pigment materials became more popular, but lead compounds were still used in some pigments and as drying agents. Federal regulatory efforts began with the enactment of the Lead-Based Paint Poisoning Prevention Act (LBPPPA) in 1971. In 1973, the Consumer Product Safety Commission established a maximum lead content in paint of 0.5% by weight in a dry film of paint newly applied and lowered the allowable lead level in paint to 0.06% in 1978.



Workers potentially at risk for lead exposure include those involved in iron work; demolition work; painting; lead-based paint abatement; plumbing; heating and air conditioning maintenance and repair; electrical work; and carpentry, renovation, and remodeling work. Plumbers, welders, and painters are among those workers most exposed to lead. Significant lead exposures also can arise from removing paint

from surfaces previously coated with lead-based paint such as bridges, residences or offices being renovated, and structures being demolished or salvaged.

The principal hazard with lead-based paint was thought to be from paint chips containing lead. Research in the early 1980s showed that lead dust is of special concern because the smaller particles are more easily absorbed by the body. Common methods of paint removal, such as sanding and scraping, can create excessive amounts of dust. Interior lead-based paint dust can also come from the normal abrasion of painted surfaces, such as the opening and closing of windows and doors.

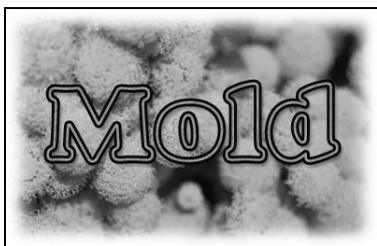
Lead is most commonly absorbed into the body by inhalation. When workers breathe in lead as a dust, fume, or mist, their lungs and upper respiratory tract absorb it into the body. Lead can also enter the body through ingestion. Inhaled or ingested lead gets into the bloodstream where it circulates through the body and is stored in various organs and body tissues. Some lead is filtered out of the body quickly, but some remains in the blood and tissues. As exposure continues, the amount stored will increase. The lead stored in the tissue can slowly cause irreversible damage, first to individual cells, then to organs and whole body systems.

When absorbed into the body in high enough doses, lead can damage the central nervous system (particularly the brain), and the blood-forming, urinary, and reproductive systems. Short-term (as short as days) occupational exposure to lead rarely causes health effects. There is no sharp dividing line between rapidly developing acute effects of lead and chronic effects that take longer to develop.

Mold

Exposure to mold can cause a variety of health effects and symptoms, including allergic reactions. Most typical indoor air exposures to mold do not present a risk of adverse health effects.

Molds can cause adverse effects by producing allergens (substances that can cause allergic reactions). Health concerns are important reasons to prevent mold growth and to remediate existing problem areas. The onset of allergic reactions to mold can be either immediate or delayed. Allergic responses include hay fever-type symptoms such as runny nose and red eyes. Molds may cause localized skin infections but, in general, do not cause systemic infections, except for persons with impaired immunity, AIDS, uncontrolled diabetes, or those taking immune suppressive drugs.



Molds are part of the natural environment and can be found anywhere, indoors or outside, throughout the year. Molds reproduce by creating tiny spores that usually cannot be seen without magnification. Mold spores continually float through the indoor and outdoor air.

Mold spores are usually not a problem unless they land on a damp spot and begin growing. They digest whatever they land on in order to survive. There are molds that grow on wood, paper, carpet, foods and insulation, while other molds feast on the everyday dust and dirt that gather in the moist regions of a building. When

excessive moisture or water accumulates indoors, mold growth often will occur, particularly if the moisture problem remains uncorrected.

While it is impossible to eliminate all molds and mold spores, controlling moisture can control indoor mold growth. A visual inspection is the most important initial step in identifying a possible mold contamination problem. This assessment is important in determining the extent of any water damage and mold growth and planning remedial strategies. Ventilation systems should be visually checked for damp conditions, damp filters, and overall cleanliness.

In buildings where mold is a problem, the mold must be remediated and the sources of moisture eliminated. The identification and repair of leaky plumbing and other water sources in a timely fashion is necessary to prevent moisture and mold growth. It is important to dry water-damaged areas and items within 24–48 hours to prevent mold growth from starting. Water-damaged porous or absorbent materials (such as ceiling tiles, wallboard or cellulose and fiberglass insulation) should be discarded and replaced.

For small areas of mold growth, an N95 respirator, goggles, and gloves should be worn during cleaning. The cleaned area should be thoroughly dried. Dispose of any sponges or rags that were used to clean the mold, along with the used personal protective equipment.

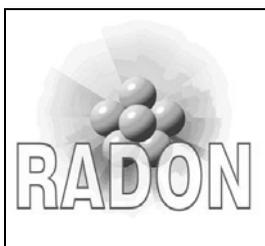
If mold contamination is extensive, an experienced remediation professional may need to be consulted.

Radon

Radon is a radioactive gas that is generated through the breakdown of uranium inside the earth. Radon gas is invisible, odorless and tasteless with no immediate health symptoms.

According to the EPA, it is the second leading cause of lung cancer in the U.S.

Radon gas enters buildings primarily through cracks and other holes in the foundation. Once inside a structure, radon is trapped and levels of the gas can become concentrated.



Radon gas can easily be detected and monitored using passive monitors placed in an area of a structure for a set period of time and then sent to a laboratory for analysis. A radon reading of < 4 pCi/L is below the EPA's action limit and no remediation measures are necessary.

The EPA recommends remediation if the radon levels are 4 pCi/L or higher. While there are several radon reducing techniques that can be employed, the first step with most any remediation plan is to seal all the cracks or gaps in a structure's foundation.

Facility Maintenance

Facilities maintenance focuses on the maintenance and minor repair of city buildings and structures; providing repair and maintenance of HVAC, electrical, mechanical, and plumbing systems. A variety of maintenance, repair, replacement, fabrication, installation, alteration, and construction jobs are performed.

While HVAC, electrical, plumbing, carpentry, masonry and painting work each involve particular safety risks and hazards of their own, there may be environmental health factors

associated with the facilities themselves that can also be of concern.

In planning the work, the safety and health of building occupants as well as the maintenance workers' safety has to be taken into account. Prior to the start of any construction, demolition, or renovation work; all affected areas in the facility should be inspected for the presence of asbestos and lead as well as the location of all sources of potentially hazardous energy. Other factors such as site-access, site security and disabling life safety devices such as sprinkler systems and fire alarms need to be considered and planned for if necessary.



Boiler System Safety

Boilers are used in commercial and public facilities to produce steam, heat, and hot water. Using a boiler is a way to transfer stored energy from a fuel source to the water in the boiler, and then finally to the point of end use. Without proper operation and maintenance, boiler conditions and safety can deteriorate. Boilers can be fuel oil, natural gas, biogas or electrically fired or heated as an attachment to a heat-producing device such as an incinerator. Though boilers are usually equipped with a pressure relief valve, if the boiler fails to contain the expansion pressure, the steam energy is released instantly. This combination of exploding metal and superheated steam can be extremely dangerous.

It is estimated that nearly two-thirds of all boiler failures result from poor operating and maintenance practices and most unscheduled boiler shutdowns result from poor operating and maintenance practices. By paying close attention to safety devices and maintenance practices, maintenance employees can enhance boiler performance, reliability, and safety.



Only trained and authorized workers should operate a boiler. Workers should be familiar with the boiler manufacturer's operating manual and instructions. Boiler operators should frequently inspect boilers for leakage, proper combustion, operation of safety devices and gauges, and other functions. All controls and safety devices should be inspected, tested and calibrated, and the steam and mud drum should be cleaned and inspected.

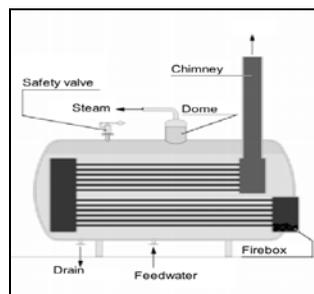
Boilers should always be brought on line slowly and cold water should never be injected into a hot system. Sudden changes in temperature can warp or rupture the boiler. Boiler operators should ensure that the fuel system (including valves, lines, and tanks) is operating properly with no leaks.

Fuel related accidents usually occur when there is a failure to purge combustible gases from the firebox before ignition is attempted. To prevent furnace explosions, it is imperative that boiler operators purge the boiler before igniting the burner. Workers should check the fuel to air ratio, the condition of the draft, and the flame to make sure that it is not too high and not smoky.

Ventilation systems should also be maintained to ensure that combustion gases do not build up in the boiler room.

If the operator notices any gas odor, the boiler should be shut down and a repair technician notified immediately. Never bypass safety devices with jumper wires to restart a boiler. Unintended ignition of unburned combustion gases in the firebox is possible. Fuel and air linkages should be checked for proper positioning and tension, and tubes should be closely examined for leaks and cracks. Suspect tubes should be examined using ultrasonic testing or other methods to determine tube thickness and condition.

The area around the boiler should be kept clean of dust and debris, and no flammable materials should be stored near any boiler. Spills should be mopped or cleaned up immediately. Make sure that adequate lighting is provided. Boilers have hot surface areas so there should be plenty of clearance for workers. Boiler rooms can be noisy, so workers should wear hearing protection when working inside the boiler room.



Repair of boilers is only allowed by trained and authorized technicians. Repair workers should wear hard hats, heavy-duty work gloves, eye protection and coveralls. A boiler vessel is a permit-required confined space. When the boiler is shut down for repair, all sources of energy should be isolated using approved lock-out / tag-

out procedures and residual pressure in steam, water, and fuel lines should be relieved by following proper bleed and block or capping procedures.

Low-water cutoff controls are designed to prevent boiler operation when there is insufficient water and are essential to prevent accidents. Operating a boiler under low-water conditions can overheat steel components, causing them to warp or rupture. Operators should visually check the water level in the boiler at least daily to confirm proper operation. To ensure that the visual check of the boiler's water level is accurate, the water column must be blown down regularly to remove accumulated sludge and sediment.



As makeup water is introduced into the boiler system, it brings with it contaminants that can precipitate onto heat-transfer surfaces, forming scale that interferes with heat transfer, reduces boiler efficiency and increases thermal stress. Scale build up can result in high stack temperatures or ruptured tubes. Regularly bleeding off part of the water in the boiler system keeps the level of contaminants within limits. This blowdown also helps maintain the concentration of chemicals in the system at the desired level. The frequency and quantity of blowdown from the system depends on how much makeup water must be added to the system, the quality of that makeup water, and the rate of scale formation within the system. Blowdown systems might require inspection and adjustment as often as once a day.

Boiler technicians must regularly inspect and clean the fire and water sides of the boiler to remove soot and scale. Refractory materials need to be inspected for cracks and other signs of deterioration. Burners need to be inspected for corrosion, contaminants, and wear.

The most lethal type of boiler accident is excessive pressure. These accidents occur when the boiler can no longer contain the excessive pressure allowed to build in the boiler. Excessive pressure accidents, even in small boilers, have been known to destroy a building. The safety relief valve is the boiler's last measure of protection against overpressure. It must be adequately sized and of the correct pressure rating for the boiler. The safety relief valve must be inspected and tested regularly. Scale from the boiler can interfere with the operation of the relief valve.

Boiler technicians should exercise caution when testing relief valves, as steam or hot water will be discharged through the valve at the operating pressure of the boiler. Valves should be tested every time a boiler is started and at the interval recommended by the manufacturer. At no time should technicians test the valve by increasing the pressure of the boiler to a level higher than the safety-valve setting.

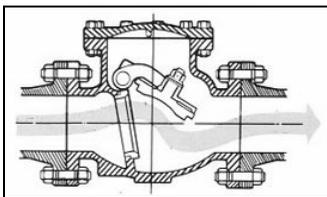
Water Hammer

Steam and water cannot be safely mixed in a piping system without risking condensate-induced water hammer. Water hammer is the unexpected release and associated shock wave of high-pressure steam / condensate that can cause death, severe injury, and extensive property damage. It has been likened to detonating a stick of dynamite in a pipe.

The primary causes that may lead to water hammer and other general steam/condensate incidents include: (1) condensation in lines containing both steam and condensate, (2)

condensate entrainment in steam-filled lines, (3) voiding of normally condensate-filled lines, and (4) rapid valve action (e.g., check valve closing, relief valve opening, control valve instability, and personnel error).

Do not mix steam with water either by injecting water into a steam system or steam into a system that includes water (condensate). Condensate should be assumed to be in all low points and dead legs until proven otherwise.



When water hammer occurs, the system's ability to withstand the resulting pressure surge is influenced primarily by the strength of the system's components/materials. Older systems may contain components / materials incapable of containing pressure surges, particularly when temperatures and pressures have increased beyond their design tolerance. Working on steam / condensate components usually requires that these systems be shut down, blown down, or adequately locked out/tagged out.

Troubleshooting pressurized steam lines can be dangerous. High-pressure steam coming through a pinhole leak can cause serious injury.

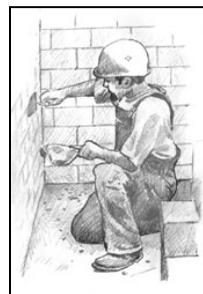
Masonry and Concrete

Mixing concrete and mortar is a very strenuous operation. Potential hazards for masonry workers include eye, skin and respiratory tract irritation from exposure to cement dust; overexertion and awkward postures; slips, trips and falls; and chemical burns from wet concrete. Brick and concrete block work includes carrying brick, concrete or cinder block, and mortar from place to place on the job as well as putting them

in place. Proper lifting and carrying techniques are necessary to avoid injury.

Inhalation, ingestion or direct skin or eye contact with cement dust can irritate eyes, nose, throat and the upper respiratory system. Skin contact may result in moderate irritation to thickening / cracking of skin to severe skin damage from chemical burns. In mixing concrete or mortar, it is almost inevitable that workers will come in contact with Portland cement. Portland cement is an ingredient in concrete, mortar, plaster, grout, stucco and terrazzo. Portland cement will cause chemical burns and rashes so protective clothing and boots must be worn when mixing concrete. Employees who work with Portland cement are at risk of developing skin problems, ranging from mild and brief to severe and chronic.

When necessary, wear a respirator to minimize inhalation of cement dust. Use soap and water to wash off dust to avoid skin damage, eat and drink only in dust-free areas to avoid ingesting cement dust, and rinse eyes with water if they come into contact with cement dust and consult a physician as soon as possible.



The best way to prevent cement-related skin problems is to minimize skin contact with wet Portland cement. Butyl or nitrile gloves, rather than cotton or leather gloves, are frequently recommended for caustic materials such as Portland cement. Always wash your hands

before putting on gloves and every time that you remove your gloves. Dry your hands with a clean cloth or paper towel before putting on gloves. Keep the inside of gloves clean and dry.

Paints and Painting

Paint is a general term for a family of products (latexes, enamels, and lacquers) used to protect and add color to an object or surface. There are several components to paint which typically consist of binders, pigments, solvents, and additives. The most important component is the binder, which is generally made up of natural or synthetic resins such as acrylics, polyurethanes, epoxy or polyesters. Metals and metal oxides used for pigments include chromium, lead, nickel, titanium, zinc and others. Paints may also contain a range of solvents with varying levels of toxicity including alcohols, esters, glycol esters, aliphatic and aromatic hydrocarbons, ketones, or water. Additives, such as driers and fungicidal agents, are often found in special purpose paints.



Paints can be applied by brushing, dipping, roller application, electrocoating, and spraying. Hazardous chemicals contained in paints can enter the body several ways. Workers can inhale chemical vapors from spraying, absorb the chemical by skin contact, or inject the chemical with high pressure spray painting equipment. Typically, a painter may be exposed to paint solvents during mixing, application, and air drying; and also to the paint mist (including pigments) if it is sprayed. Even some surface

preparation and cleanup solvents can pose a hazard, if not handled properly. Workers should use water-based cleansers that are meant for personal cleanup and avoid using solvents for cleaning paint from hands or skin.

Spray painting is the most common painting method and presents the greatest hazard. Spray painting allows coverage of large areas with even coats of primer, paint, sealers, and other coatings. However, workers in spray painting operations need to recognize and guard against the hazard associated with spray painting processes. Whatever the type or brand of paint, if the paint is sprayed, mists and vapors will be generated which can increase the worker's exposure to whatever resins, pigments, solvents and additives contained in the paint. Painters must ensure that the spray mist is not inhaled, and that suitable precautions are taken so it does not get on the skin or into the eyes.

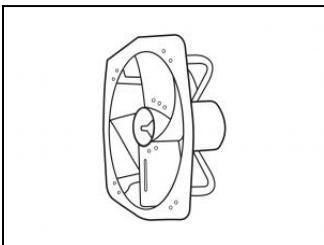
Repeated exposure to paint solvents can cause long term health effects such as nerve, kidney, or liver damage. Paints also contain pigments and exposure to high concentrations of these metals can cause heavy metal poisoning. Symptoms of heavy metal poisoning vary considerably depending on the metal. Inhalation of isocyanate-containing products can cause asthma-like wheezing with tightness in the chest and skin contact can cause a severe inflammatory reaction, producing pain, redness, and swelling.

Before work begins, painters should read the Material Safety Data Sheet (MSDS) of the paint they will be using then wear the appropriate personal protective equipment such as safety glasses, respirator (if medically qualified, properly fit-tested, and trained), gloves, or coveralls to protect themselves against its hazards.

Ventilation Systems

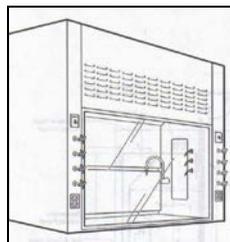
Ventilation is the mechanical system in a building that brings in fresh outdoor air and removes the contaminated indoor air. In an industrial workplace, ventilation is used to control exposure to airborne contaminants such as dusts, fumes, gases and vapors. Ventilation can be accomplished by natural means such as opening a window, or by mechanical means such as using a fan or blower. Industrial systems are designed to move a specific amount of air at a specific speed or velocity that removes or exhausts undesirable contaminants.

There are four purposes of ventilation, which are: (1) to provide a continuous supply of fresh outside air, (2) maintain temperature and humidity at comfortable levels, (3) reduce potential fire or explosion hazards, and (4) remove or dilute airborne contaminants.



Ventilation is considered an engineering control to remove or control contaminants released in indoor work environments. It is one of the preferred ways to control employee exposure to air contaminants. The parts of an industrial ventilation system include an air intake area (such as a hood or an enclosure), ducts to move air from one area to another, an air cleaning device, and a fan to bring in outside air and exhaust the indoor contaminated air. Industrial ventilation systems can be either dilution ventilation or local exhaust ventilation systems.

Dilution or general ventilation supplies and exhausts large amounts of air to and from an area or building. It usually involves large exhaust fans placed in the walls or roof of a room or building. Dilution ventilation controls pollutants generated at a worksite by ventilating the entire workplace. The use of general ventilation distributes pollutants throughout the entire worksite and could affect persons who are far from the source of contamination.

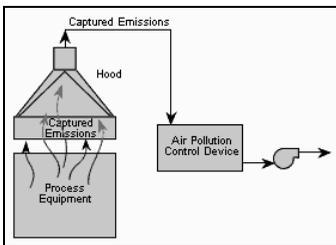


Dilution ventilation can be made more effective if the exhaust fan is located close to exposed workers and the makeup air is located behind the worker so that contaminated air is drawn away from the worker's breathing zone. When used to control chemical pollutants, dilution must be limited to only situations where: (1) the amounts of pollutants generated are not very high, (2) their toxicity is relatively moderate, and (3) workers do not carry out their tasks in the immediate vicinity of the source of contamination.

Local exhaust system is used to control air contaminants by trapping them at or near the source. Local exhaust is generally a far more effective way of controlling highly toxic contaminants before they reach the workers' breathing zones. This type of system is usually the preferred control method if air contaminants pose serious health risk, large amounts of dusts or fumes are generated, increased heating costs from ventilation in cold weather are a concern, emission sources are few in number, and emission sources are near the workers' breathing

zones. In a general way, a local exhaust system operates similar to a household vacuum cleaner with the hose as close as possible to the place where dirt would be created.

An important and sometimes overlooked aspect of ventilation is the need to provide enough air to replace the air that is exhausted from the workplace. If enough make-up air is not provided when large volumes of air are exhausted, negative pressure is created. Negative pressure in the workplace increases resistance on the ventilation system causing it to move less air. One simple way to judge if a building is under an excessive negative pressure is if you have difficulty opening a door that pushed into the room or building (the air wants to force the door closed). A separate intake fan, located away from the exhaust fans, should be used to bring in fresh, uncontaminated air from outside. This air must be clean and heated in winter or cooled in summer, as needed.



Exhaust ventilation systems deteriorate over time. Periodic maintenance and air velocity testing is required to ensure that they continue to deliver the required exhaust airflow.

Fall Protection

Falls and falling objects can result from unstable working surfaces, ladders that are not safely positioned, and misuse of fall protection. Workers are also subject to falls or to the dangers of falling objects if sides and edges, floor holes, and wall openings are not protected.

Any time a worker is at a height of four feet or more, the worker is at risk to a fall hazard and needs to be protected. The two ways of accomplishing this are engineering controls and fall protection equipment. Engineering controls can be the addition of platforms, railings and toe boards to provide permanent and secure access to high maintenance areas. When engineering controls are not feasible or practical, such as construction or maintenance projects, a personal fall protection system is employed to prevent injuries from falls.



Employees who are exposed to a potential free-fall greater than four feet must receive fall protection training and implement proper fall prevention methods. Employees must never perform any duties that require the employee to get closer than six feet to an unprotected edge, platform, or walkway of any building, nor to utilize elevated equipment unless the employee is properly secured from falling four feet or more. Employees are also restricted from stepping across any elevated opening greater than 12-inches when that opening is elevated four feet or more above a walking / working surface.

Fall Protection Systems

Fall protection systems can consist of devices that arrest a free fall or devices that restrain a worker in position to prevent a fall from occurring. A fall arrest system is used when a worker is at risk of falling from an elevated location or position. A positioning system

restrains the worker, preventing them from getting into a position where a fall could occur, and also allows hands-free work. Both systems have three components: (1) harnesses or belts, (2) connection devices, and (3) tie-off points.

Full-body harnesses wrap around the waist, shoulders and legs. A D-ring located in the center of the back provides a connecting point for lanyards or other fall arrest connection devices. In the event of a fall, a full-body harness distributes the force of the impact throughout the trunk of the body.

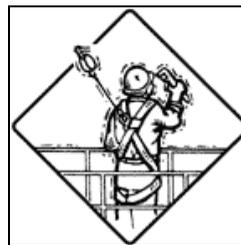
Connection devices attach the harness to the final tie-off point. This can be one device, such as a lanyard, or a combination of devices, such as lanyards, lifelines, work lines, rope grabs, tie-off straps and carabineers. Lanyards are used both to restrain workers in position and to arrest falls.



A tie-off point is where the lanyard or lifeline is attached to a structural support. This support must have a 5000-pound capacity for each worker tying off. Workers must always tie off at or above the D-ring point of the belt or harness. This ensures that the free fall is minimized, and that the lanyard does not interfere with personal movement. Workers must also tie off in a manner that ensures that a lower level will not be struck during a fall. To do this, add the height of the worker, the lanyard length, and an elongation factor of 3.5 feet. Using this formula, a six-foot tall worker requires a tie-off point at least 15.5 feet above the next lower level.

Inspection and Maintenance

All fall arrest equipment must be inspected prior to its use. This includes looking for frays or broken strands in lanyards, belts and lifelines, and oxidation or distortion of any metal connection devices. Periodic cleaning is necessary to properly maintain the devices. Clean all surfaces with a mild detergent soap, and always let the equipment air dry away from excess heat. Follow the manufacturer's instructions for cleaning and maintenance.



Fall Rescue

An employee who falls from a height wearing personal fall protection may be saved from instant death or terrible injury, but that employee is still at risk until rescued. Unless a suspended employee is rescued quickly, the worker could suffer serious or fatal injuries. There may be as little as 15 minutes before adverse health effects begin. For this reason, a work plan that requires the use of fall protection equipment must also include provisions on timely rescue. For more information on orthostatic intolerance and rescue, please go to:

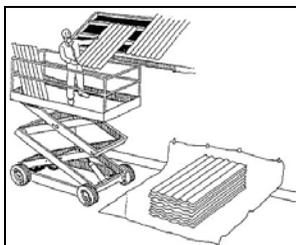
www.osha.gov/dts/shib/shib032404.html.

Aerial Lifts

Vehicle-mounted devices used to position personnel are considered aerial devices. This includes extensible and articulating boom platforms, aerial ladders, vertical towers, and a combination of any of the above. An articulating boom is raised and lowered by two or more

hinged sections. An extensible boom is raised and lowered through a telescoping motion.

Common injuries associated with aerial lifts are falls, falling objects, and electrocution. The hazard of electrocution is increased when work platforms are used near energized high voltage lines. Unsafe acts such as jumping from the platform, leaning too far out from the platform, and dropping or throwing tools and equipment from the elevated position may cause injuries. Mishaps can be avoided by only using aerial lift equipment within its design specifications, thorough training, equipment inspections, and equipment maintenance.



Lift controls for extensible boom platforms must be tested prior to use and used only by trained individuals. A body belt for positioning must be worn with a lanyard attached to the boom or basket when working from an aerial lift. Belting off to an adjacent structure is not permitted.

When preparing an aerial lift for use, brakes must be set and outriggers (when used) positioned on pads or a solid surface. If the lift will be used on an incline, wheel chocks must be installed. Once a boom is elevated in working position with people in a basket, the vehicle may not be moved unless the equipment is specifically designed for this type of operation.

Articulating and extensible boom platforms designed as personnel carriers must have both upper controls on the platform and lower controls at vehicle or ground level. Although

lower controls must be able to override upper controls, lower level controls must not be operated unless permission has been obtained from the employee in the lift, except in case of an emergency.



Ladder Safety

Falls are the primary hazard associated with the use of portable ladders. Most falls are caused by using ladders that are in poor condition or unsafe acts such as:

- Ladders set on unstable surfaces, placed in front of doors that open towards the ladder without proper guarding, or ladders used as scaffolds.
- Workers reaching too far out to the sides or standing too high to maintain their balance.



- Use of a defective ladder (broken rail or rung) or using a makeshift ladder.
- Workers carrying materials in their hands while climbing or descending a ladder;

- Workers descending with their back to the ladder.
- Using metal or wooden ladders with metal sides and reinforced or metal rungs while working on electrical circuits.

These hazards can be prevented or minimized by the proper selection and training of workers; supervisory enforcement of safe ladder use; and proper design, installation, and maintenance of ladders and climbing devices.

Be sure to select the right ladder for the task -- the ladder type is determined by how much weight it can support. Choose a ladder of sufficient length. Only use the ladder for the purpose for which it was designed (refer to manufacturer's labeling and recommendations). Never use a ladder in a horizontal position as a platform or scaffold. Do not climb on machinery or use chairs, crates, or boxes for climbing.



Before you use a ladder, check it carefully for broken or missing steps, rungs or cleats; cracked or slippery rungs, broken side rails; spreaders or other locking devices are in place and working properly; splinters or sharp edges have been removed, or sanded or filed away; safety feet are in place on extension ladders; ropes are not worn or frayed; or other defects. When an inspection uncovers a problem, the ladder should be immediately removed from service and a "DO NOT USE" tag put on it to make sure it is not used until it has been scheduled for repair or destruction. If a ladder is to be discarded,

remove it from the maintenance area and cut it in half to prevent further use.

Carry ladders parallel to the ground and tie ladders down securely when transporting by vehicle. If using a ladder in an aisle or corridor set up cones or barricades in traffic areas near the ladder and lock or guard doorways.



Angle the base of the ladder one foot out from the wall for every four feet of ladder height (e.g., for a 12-foot height, the base of the ladder should be 3-feet from the wall). The ladder should reach at least three feet above the landing. When in position, extension ladders must be securely tied off at the top to prevent slipping / tipping, or secured at the base by another employee. Keep the area around the top and bottom of the ladder clear.

Stepladders should be fully opened and the spreaders locked in position. Always maintain at least three points of contact with the ladder (two feet and one hand, or two hands and one foot should be in contact with the ladder at all times). The top two rungs should not be used for standing or sitting. Do not stand on the back cross bracing. Ladders will not be used by more than one person at a time unless the ladder was specifically designed for use by two people. Use the belt buckle rule: keep your belt buckle positioned between the side rails at all times -- this will maintain your center of gravity in the proper position. Move the ladder to keep work within arm's length. Do not move, shift, or extend the ladder while you are standing on it.

Never walk a ladder; climb down and move the ladder.

Fixed ladders are provided as a means of access to roofs, pits, silos, towers, tanks, and other limited-access areas. Fixed industrial stairs should be provided where access is daily or during each shift for gauging, inspection, regular maintenance, or when carrying tools or equipment is normally required and sufficient space is available.

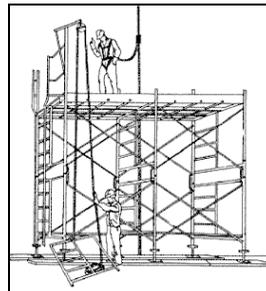
Scaffolds

All employees who work with scaffolds must be trained by a qualified person to recognize the hazards associated with the type of scaffold being used and how to control or minimize those hazards. The training must include fall hazards, falling object hazards, electrical hazards, proper use of the scaffold, maximum intended load and capacity, handling of materials, and other hazards that may be encountered.



All scaffolds must be erected level and plumb on a firm, rigid base. Scaffolding should not be used if solid footing or a safe ladder is not available. Only qualified scaffold erectors are permitted to build scaffolds. If the scaffolding is greater than 10 feet in height, it must be equipped with handrails, midrails, toeboards, and deckboards. All scaffold boards are to be of scaffold-grade lumber and cleated on each end. Scaffold planks must extend a minimum of six inches over the end supports. Guard rails and toe

boards are required on any scaffold over five feet high. Scaffolding must be secured at intervals of 15 feet to a solid support by wire, cable, chain or rope.



Provide an access ladder or the equivalent for all scaffolds. Climbing the side of scaffolding is not permitted. Caster brakes should be set before an employee gets on a scaffold. If no brakes are available, another employee should be in position to secure the scaffold. Ladders and boxes should not be set on scaffolds to increase working heights. Scaffolds should not be moved until its height is reduced below 15 feet and should never be moved with an employee or materials on the scaffold. A "watcher" must be posted to watch for overhead obstructions as well as holes at ground level.

In addition to initial and periodic inspections, scaffolds must be inspected for visible defects before each work shift and scaffolds should also be inspected after any event that could make the scaffold unsafe (for example, after being hit by a construction vehicle or following a strong storm). Here are just some of the things that should be looked for by a qualified employee when inspecting a scaffold:

- The scaffold does not block exits, egress, paths, fire alarms, and fire suppression systems.
- The scaffold is erected at a safe distance from power lines.

- Safe access is provided by ladders, stairs, or ramps.
- The scaffold is plumb and level, and resting on stable footing and a firm foundation (including base plates on supported scaffolds).
- Diagonal cross-bracing is in place to support legs.
- Required guys, ties, or bracing is installed to maintain scaffold unit stability.
- Working level platforms are fully planked between guardrails and secured to prevent movement.
- Scaffold platforms are at least 18 inches wide.
- Indoor scaffolds are made of fire-retardant wood or other suitable materials.
- The platform is free of debris and slipping or tripping hazards.
- The platform guardrails are firmly in place on all open sides / ends, where required.
- Installed toe boards, screening, area barricades, or canopies, provide adequate protection against falling objects.

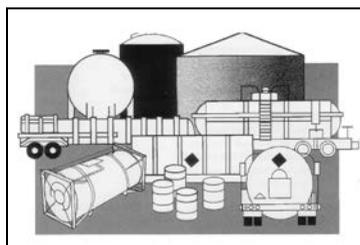


Hazardous Materials

Many chemicals commonly found in the workplace are potentially toxic to humans. Some items are used in such a manner that the

potential for excessive exposure is extremely remote and no special precautions are necessary. Strict controls may be required with other substances, which display high toxicity, accidental spill or release potential, or heavy usage.

Harmful chemical compounds in the form of solids, liquids, gases, mists, dusts, fumes, and vapors exert toxic effects by inhalation (breathing), absorption (skin contact), or ingestion (eating or drinking).



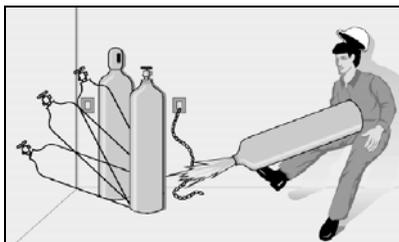
The degree of worker risk from exposure to any given substance depends on the toxic effects and the magnitude and duration of exposure. Information on the risk to workers from chemical hazards is found on the material safety data sheet (MSDS) that OSHA requires for all hazardous materials. The MSDS is a summary of the important health and safety information on the chemical or substance. All containers of hazardous substances in the workplace must have warning and identification labels.

Compressed Gases

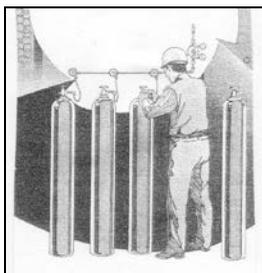
Compressed and liquefied gases are routinely used in laboratory and various other operations. Compressed gases include atmospheric gases, fuel gases, refrigerant gases, and poison gases. The main hazards from handling compressed gas cylinders include: impact from the blast of a gas cylinder explosion or rapid release of compressed gas; impact from parts of gas cylinders that fail or any flying debris; contact

with the released gas or fluid; fire resulting from the escape of flammable gases; and impact from falling cylinders.

Mishandled cylinders may rupture, release their hazardous contents or become dangerous projectiles. A standard 250 cubic foot cylinder pressurized to 2,500 PSIG can become a rocket, attaining a speed of over 30 miles an hour a fraction of a second after venting from the broken cylinder connection.



Compressed gas cylinders must be adequately secured while in storage, transit or use to prevent tipping, falling or rolling. The cylinders should be stored in a cool, dry, well-ventilated, fire-resistant area. When a cylinder is empty or not being used, ensure that the valve is closed, the regulator removed and that the valve protector cap is secured in place. Cylinders can be secured with straps or chains connected to a wall bracket or other fixed surface, or by use of a cylinder stand.



Handle all compressed gas cylinders as if they were full. Move cylinders on a properly

equipped truck and do not drag, roll, or drop them. Cylinders can explode if heated above 130°F so never leave them in the hot sun or against a radiator. Never let oil get near oxygen cylinder controls.

Appropriate lifting devices, such as cradles or nets, must be used when using a crane, hoist or derrick to transport gas cylinders. Do not use magnets or slings to lift gas cylinders. Do not use the valve protection cap for lifting a gas cylinder.

Consult the appropriate MSDS for detailed information on the chemical contained in the gas cylinder. Specific chemical handling and storage precautions will be outlined in the MSDS. The MSDS will also have specifications for appropriate personal protective equipment for worker protection.



Corrosives

Most acids and bases are liquids and are easily splashed on the skin or eyes, resulting in severe burns and usually permanent eye damage. Pain from acid contact is usually immediate. Pain does not occur immediately when contact is made with strong bases but damage may be just as severe. Severe burns and destruction of tissue on the mouth, throat, and gastro-intestinal tract can result from ingestion of acids or bases.

If you are exposed to acids or bases, immediately flush the area with large quantities of water for 15 minutes and seek medical attention. Speed in flushing the exposed area can reduce the damage to the skin or eyes. You should know in advance

where to find the closest safety shower and eyewash station in case of exposure to hazardous materials.

Fire or explosion can occur when acids or bases are combined with incompatible materials, especially when combined with each other. Always follow standard piping checklists for work on pipe, including wearing personal protective equipment such as aprons, rubber gloves and face shields.

Cryogenics

A cryogenic liquid is a liquid with a normal boiling point below -240°F. The most commonly used industrial gases that are handled in the liquid state at cryogenic temperatures are argon, helium, hydrogen, nitrogen, and oxygen.

Safe practices must be observed because of the extremely low temperatures and high rates of conversion into gas of all the cryogenic liquids. All cryogenic liquids involve potential hazards that stem from the following properties:

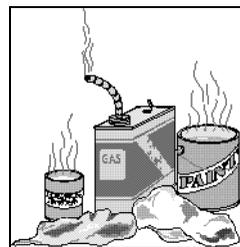
- All cryogenic liquids are extremely cold. Cryogenic liquids and their vapors can rapidly freeze human tissue and can cause many common materials such as carbon steel, rubber, and plastics to become brittle or even break under stress.
- All cryogenic liquids produce large volumes of gas when they vaporize.
- Vaporization of a cryogenic liquid, except oxygen, in an enclosed area can displace the air, causing death due to lack of oxygen. Vaporization of liquid oxygen in an enclosed area can cause oxygen to saturate combustibles in the area such as workers' clothing. This can cause an accelerated fire if an ignition source is present.

If you work around cryogenic liquids, you will receive additional training on the safe operation of equipment and the MSDS of the product.

Flammables

Handling flammable and combustible liquids is a common occurrence in industry. Flammable liquids like gasoline, lacquer thinner, and alcohol are much more volatile than combustible liquids. A flammable liquid releases enough vapors to ignite below 100° F. A combustible liquid such as fuel oil and kerosene must be heated to above 100° F in order to release enough vapors to ignite.

Whenever handling liquids in containers marked flammable or combustible, read the warning label to understand if there are additional health threats from these liquids in addition to the fire hazard.



Safety containers are required for storing, handling and transporting flammable or combustible liquids of any quantity. A safety can is ". . . An approved container, of not more than 5 gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure." Safety cans must be Factory Mutual (FM) or Underwriter Laboratory (UL) approved.

Flammable and combustible materials should be stored in flammable storage cabinets that have a label reading, "FLAMMABLE – KEEP FIRE AWAY" and self-closing doors.

Oxidizers

An *oxidizer* is any substance that combines with fuel in a combustion reaction. The most common oxidizer is oxygen, but other substances can serve as oxidizers as well.



Oxidizing liquids and solids can be severe fire and explosion hazards. Oxidizing materials can: (1) cause substances that do not normally burn readily in air to burn rapidly, (2) cause combustible materials to burn spontaneously without the presence of an obvious ignition source such as a spark or flame, and (3) speed up the development of a fire and make it more intense. Store oxidizers away from all fuel sources.



Pesticides

A pesticide is any substance used to control pests such as insects, vegetation, and fungi. Most pesticides control pests by poisoning them. Unfortunately, pesticides can be poisonous to humans as well and may seriously injure or even kill them. Pesticides can irritate the skin, eyes,

nose, or mouth. Use caution whenever you work with any pesticide!

Proper use of PPE and clothing is an important way to reduce pesticide exposure. Always check the pesticide label to see what PPE is required and follow all precautions and restrictions. Only use the pesticide for pests indicated on the label and do not use more pesticide than directed by the label.

Use protective measures when handling pesticides as directed by the label, such as wearing impermeable gloves, long pants, and long-sleeve shirts. Change clothes and wash your hands immediately after applying pesticides. If there is leftover pesticide, check with Linn County Solid Waste Agency to determine if it can be disposed of as a household hazardous waste. If not, follow label directions regarding disposal.

Process Safety Management

ASHBY'S LAW OF REQUISITE VARIETY

"In order for a controller to have complete control over a system, the controller must be capable of taking a counteraction for every action the system is capable of. For very complex systems or those involving human beings, this is not possible."

-- W. Ross Ashby

The process safety management standard targets highly hazardous chemicals that have the potential to cause a catastrophic incident. The purpose of the standard is to aid employers in their efforts to prevent and respond to chemical releases.

The main objective of process safety management (PSM) is to prevent unwanted

release of hazardous chemicals. The PSM program combines engineering, safe work procedures and management practices to control the risk of a release.

An effective process safety management program requires an evaluation of the chemical process. The process design, process technology, process changes, operational and maintenance activities, non-routine activities, emergency preparedness plans, and training programs are all considered in the evaluation. The evaluation looks at the potential for a release in event of a failure of equipment or procedures. Procedures are built in to eliminate or minimize the severity of a release.



For the City of Cedar Rapids, the only chemical that is regulated under OSHA's PSM rules is chlorine, which is used at the water and wastewater treatment plants.

Lab Safety

Practicing safety in a laboratory involves more than keeping the lab area clean and wearing proper personal protective equipment. Lab workers are routinely exposure to a variety of hazardous chemicals, although the use of chemicals in labs in generally limited to small quantities on a short-term basis. Consequently, the physical and health hazards from chemicals for laboratory employees vary from those of non-laboratory employees.

The OSHA Laboratory Safety standard emphasizes the use of work practices and worker

protection appropriate to the unique nature of the lab. To provide safeguards for lab employees, the standard requires that laboratories develop a Chemical Hygiene Plan. The chemical hygiene plan specifies work practices, training, control methods, protective equipment, medical evaluations, and special precautions for work with hazardous substances.



Chemical exposure for laboratory employees must fall below established permissible exposure limits. Employees experiencing symptoms of exposure should report these symptoms to their supervisor and the HRD Safety & Health Office.

Specific safety considerations are made for particularly hazardous chemicals, including carcinogens, reproductive toxins, and substances with acute toxicity. Provisions include establishing a designated work area for these hazards, using containment devices (fume hoods), developing procedures for removal of contaminated waste, and developing procedures for decontamination.



Incoming chemical containers must be labeled for their contents and hazards. MSDSs received with shipments must be retained and made accessible to lab employees. Lab employees

need to be trained on the hazards of the chemicals created in the laboratory. MSDSs must be created for any hazardous chemicals created in the laboratory that will be used outside the laboratory.

Lab fume hoods need to be routinely evaluated to ensure they are functioning properly.



Landscaping

Landscaping includes a range of services such as lawn mowing and fertilizing, garden planning / planting, and tree trimming. Landscaping service workers are at risk of injury from a variety of potential hazards including exposure to chemicals, machinery, lifting, and weather related hazards. Occupational hazards that are of concern include cuts and amputations; heat and cold stress; lifting and awkward postures; vehicle safety; noise; pesticides / herbicides; and slips, trips and falls.

Chain Saws

While chain saws are a useful piece of equipment, they can be lethal. Most chain saw injuries involve contact with the cutting chain, which results in severe injury to the hands, legs, feet and head. The first line of defense against injury is instruction and training.

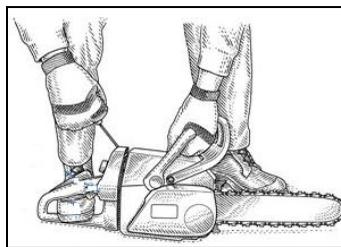
Chain saw operators will receive training on safe working techniques; basic information about the chain saw, components, design and limitations; stopping and starting; cleaning and servicing; kickback prevention; chain sharpening; and PPE

use and limitations. Review the manufacturer's instructions on operation and maintenance before attempting to operate a chain saw.

Before starting a chain saw, check that the saw is in good general condition (no leaks, damage or loose fittings). Check for proper chain sharpness and tension; and check that the throttle, safety throttle lock, and stop switch operate correctly.

When starting a chain saw, it should always be started on the ground or a well supported and stable surface. Drop starting a chain saw is dangerous and prohibited by OSHA. A drop start is done by thrusting the saw down with your left hand and pulling the starter cord up with your right hand.

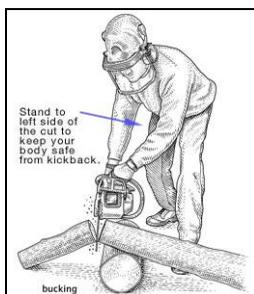
Wear safety goggles to protect your eyes from twigs, sawdust, and flying wood chips and wear safety shoes to protect your feet in case you drop the saw or a heavy log on them. Chain saws are noisy, so always wear hearing protection. To prevent injury to the legs, special chaps or leggings should be worn. When choosing protective clothing, look for equipment that meets American Pulpwood Association (APA) guidelines.



Most chain saws are powered by a two-cycle engine, which requires an oil-gasoline mixture. Follow the manufacturer's mixing instructions. Use only approved safety containers for fuel. Do not allow smoking or open flames where fuel is stored or handled or while maintaining or operating the saw. Remove any fuel or oil spills

from the saw before starting. Allow the saw to cool before refueling.

The major injury risk from a chain saw is from kick-back. Chain saw kickback occurs when the upper portion of the tip comes in contact with another object or the chain is pinched in a cut. As a result, the chain saw will violently jump or kick back towards the operator. Even modern safety features, such as the chain brake and inertia brake, cannot be guaranteed to prevent kickback injury. The safest way is to avoid kickback situations. To prevent kickback injury, the following precautions should be taken:

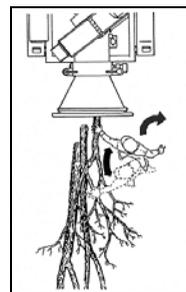


- Buy chain saws with or install chain brake (preferably inertia activated)
- Check brake mechanism before each use for effective operation
- Use a low kickback chain (meets ANSI B175.1-1991)
- Sharpen the saw chain frequently; a sharp saw chain is safer than a dull one (if wood shavings become dusty, the chain is dull and needs to be sharpened)
- Hold chain saw firmly
- Check chain tension
- Never bend over the saw, if you stand up straight and to the left of the bar any kickback should go over your right shoulder

- Wear protective equipment
- Don't cut above shoulder height
- Never hold saw with one hand or by one handle
- Always begin the cut at peak revs
- Clear brush and debris from area

Chipper Machines

Chipper machines cut tree limbs into small chips. Hazards associated with chipper machines include making contact with or being pulled into the chipper; hearing loss; and face, eye, head or hand injuries. Contact with chipper operating components (blades, discs or knives) may result in amputation or death. Workers may also be injured by material thrown from the machine.



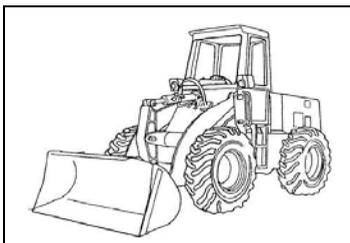
To minimize these hazards, use appropriate engineering and work practice controls, including:

- Workers should be trained on the safe operation of chipper machines before they are allowed to operate them.
- Always follow the manufacturer's guidelines and safety instructions.
- Do not wear loose-fitting clothing around a chipper.

- Use earplugs, safety glasses, hard hats, and gloves.
- Never reach into a chipper while it is operating.
- Prevent trailer chippers from rolling or sliding on slopes by chocking the trailer wheels.
- Maintain a safe distance between chipper operations and other workers.
- When servicing or maintaining chipping equipment (i.e., “unjammings”) use a lockout system to ensure that the equipment is de-energized.

Front-End Loaders

Front-end loaders are versatile but they change the center of gravity and the stability in the tractor-loader combination, so they can be dangerous if not operated properly. Changing the center of gravity presents a potential tipping hazard for the operator. Before working with a front-end loader, read and follow the directions in the operator’s manual for the tractor.



Use a front-end loader only for its specific purpose. Never allow people to ride in the bucket and never walk or work under a raised loader. Raise and lower the loader arms slowly and steadily. Never attempt to operate steering levers or any other hydraulic controls while standing outside the cab. Never move or swing a load with people in the work area. Do not make

sharp, fast turns or move bucket controls abruptly.

With loaded buckets, drive forward when going uphill and back downhill with loads. Allow extra room to turn and maneuver because of the extension of the bucket. Travel slowly with front-end loaders filled. Carry the load low to maintain stability and visibility. However, make sure the load is high enough to avoid contact with the pavement. Be careful when turning with loads, especially those that may shift or slide.

When operating a front-end loader, watch the road or field. Avoid holes, rocks, loose fill or any other obstacle that could upset the tractor. Watch for overhead wire and obstacles when the loader is raised. If working inside buildings, watch for low ceiling beams and doorways to prevent being pinned or crushed between them and the tractor. Also, be sure there is enough ventilation so carbon monoxide from the tractor engine will not build up.

Be very careful when back filling. The weight of the fill material plus the weight of the tractor and loader could cause the new construction to collapse. When leaving the front-end loader, lower the bucket to the ground. Do not leave loader with engine running or with lift arms up. If working on front-end loaders, have the loader safely blocked before working under it or through the loader arms. Work with the bucket down. Follow the manufacturer’s recommendations for routine maintenance.

Lawn Mowers

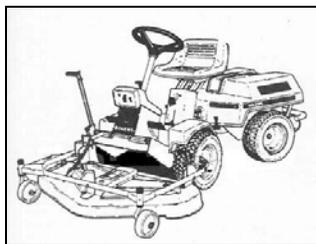
The cutting edge of the lawnmower blade can travel at speeds of up to 200 miles per hour (mph) and even a dull blade at that speed can slice anything that gets in its way. Sticks, stones, and other miscellaneous debris can become projectiles when struck by the blade. Items thrown from mowers can damage property and

cause serious injury to other people in the area or to the operator if there is no rear guard.

Before mowing, check the lawn for items such as sticks, rocks, wire, and equipment parts. Also look for and remember immovable objects, such as pipes or partially buried rocks. Running into a fixed object can shatter the blade and throw jagged chunks of metal out the discharge chute or under the housing.



Gasoline is very flammable because it vaporizes with air to form a mixture that ignites easily. Vaporization can occur in temperatures as low as zero. Always use care when filling the tank with gasoline, especially if the mower has been operating and is hot. Vapors from the gasoline can be ignited by a hot muffler. Be sure to wipe up any spills promptly.



Long pants and sturdy leather shoes protect from flying sticks, stones, or other items not caught by the rear guard. Shoes also should provide good traction. Wet grass is slippery and the operator can lose footing, slip under the mower, or allow

the mower to roll backwards. Always push walk-behind mowers across slopes to avoid coming in contact with the mower (e.g., by sliding down the hill onto the mower, or allowing the mower to roll backwards on top of operator). Drive riding mowers up and down slopes. Wear hearing protection such as earplugs.

Disconnect the spark plug when you are working on the mower. This prevents the engine from accidentally being started. Many people are hurt every year because mowers start unexpectedly when the blade is turned by hand. Keep all parts in working condition. Fluid leaks (gas or oil), blade sharpening, and balancing may require professional service.

Tree Trimming

The City operates an extensive tree trimming and removal program for the city. Trees provide shade, aesthetics, and value to property. However, trees can also cause significant problems, such as cracks in concrete, foundations, and sidewalks. Trees can also drop large limbs onto property causing serious damage and can cause electric outages when the branches come in close contact with power lines.

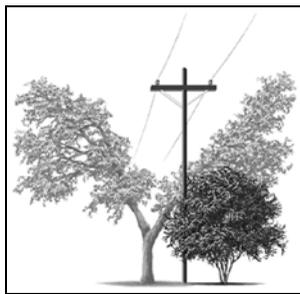


There are a number of safety precautions to consider when it comes to trimming or removing trees. Heights, cutting tools, pruning trees near power lines, and falling tree limbs all combine to make this a dangerous job that can easily lead to serious injury if proper safety practices are not

observed. The two leading causes of death among tree trimmers are electrocutions and falls.

To ensure worker safety and health, the Forestry Division has developed and implemented a comprehensive safety program that includes written rules and safe work procedures for dealing with: (1) electrical hazards; (2) climbing, felling, topping, and pruning trees; (3) mobile equipment; (4) hand and portable power tools; and (5) fall protection equipment and other protective gear.

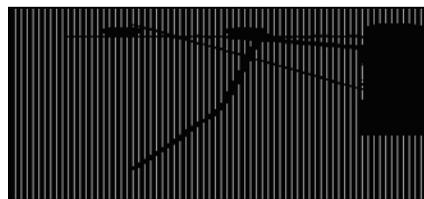
In addition to general industry OSHA safety standards, the American National Standards Institute (ANSI) has published a standard for tree care operations that provides safety requirements for cutting brush and for pruning, trimming, repairing, maintaining, and removing trees. The standard addresses safe work procedures for climbing, pruning, trimming, and felling of trees and brush; the use of mobile equipment such as aerial lifts; the use of hand tools and portable power hand tools; and other general safety requirements such as personal protective equipment, fire protection, and traffic control.



Before starting work, a hazard assessment of the work area should be performed and appropriate controls implemented to eliminate or minimize exposure to any hazards at the tree and in the surrounding area. It is important to consider factors such as the location and height of a tree and the availability of appropriate mobile

equipment. The power utility company must be contacted before working on trees near power lines to arrange for ways to protect employees. Procedures for emergency situations (for example, inadvertent contact of the boom with an energized power line) should also be considered.

Workers must also understand the hazards of performing tree care operations near overhead power lines or other electric conductors. Most overhead high-voltage power lines are uninsulated. Assume that all power lines are energized and avoid all contact (direct or indirect) until the lines are verified as being de-energized.



All tree trimming or removal work within ten feet of a power line may only be done by trained and experienced line-clearance tree trimmers. A second tree trimmer is required within normal voice communication range. Ensure that line-clearance tree trimmers maintain minimum working distances from energized conductors and that only non-conducting tools and equipment are used.

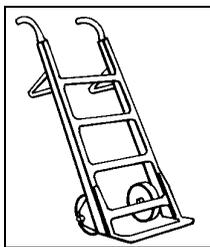
Always use personal protective equipment such as gloves, safety glasses, hard hats, hearing protection, and fall protection equipment. Inspect all fall protection equipment before each use. Remove damaged or defective equipment from service and replace or repair it as necessary.

Before trimming a tree, mark off the area around the tree and prevent bystander access. Do not trim trees in dangerous weather conditions. Inspect tree limbs for strength and stability

before climbing. Always work with another person who stays on the ground.

Broken or hanging branches, attached vines, or a dead tree that is leaning are hazards that can cause an injury. Large branches are very heavy and behave unpredictably if cut incorrectly. If broken trees are under pressure, determine the direction of the pressure and make small cuts to release it.

When removing a tree, determine the tree's felling direction. Address forward lean, back lean, and/or side lean issues. Also, determine the proper amount of hinge wood to safely guide the tree's fall. Provide a retreat path to a safe location. Use extreme care when felling a tree that has not fallen completely to the ground and is lodged against another tree. Be alert and avoid objects thrown back by a tree as it falls. Look out for hazards and make sure you know where everyone is located. Never turn your back on a falling tree.



Materials Handling

The ability to handle materials is vital to all segments of business and industry. Handling and storing materials involves a variety of tasks, such as hoisting equipment weighing several tons, driving a forklift, using hand trucks, and manually carrying materials. These operations provide continuous flow of materials, parts, and assemblies when needed.

Whether moving materials manually or mechanically, employees should be aware of the

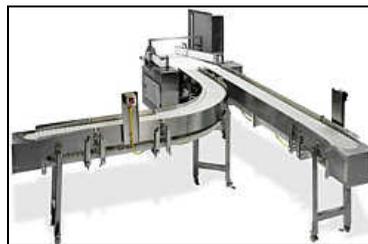
potential hazards associated with the task at hand and how to control the hazards to minimize the risks. Improper handling and storing of materials can cause costly and painful injuries, such as:

- Strains and sprains from improper lifting or carrying loads that are either too big or too heavy.
- Fractures and bruises caused by being struck by materials and equipment or by being caught in pinch points.
- Cuts and bruises caused by falling materials that have been improperly stored.

The mishandling of materials is the single largest cause of accidents and injuries in the workplace. Most of these accidents and injuries, as well as the pain and loss of productivity that often result, can be readily avoided. Whenever possible, mechanical means should be used to move materials to avoid employee injuries.

Conveyor Systems

When using conveyors, workers' hands may be caught up in nip points where the conveyor medium runs near the frame or over support members or rollers; workers may be struck by material falling off the conveyor; or they may be caught on or in the conveyor.



To reduce the severity of an injury, an emergency button or pull cord designed to stop the conveyor must be installed at the employee's

work station. Continuously accessible conveyor belts should have an emergency stop cable that extends along the entire length of the conveyor belt. The emergency stop switch must be designed to be reset before the conveyor can be restarted.

Where a conveyor passes over work areas or aisles, guards must be provided to keep employees from being struck by falling material. Screw conveyors must be completely covered except at loading and discharging points.

Cranes and Hoists

A number of types of cranes, hoists and rigging devices are used in City facilities for lifting and moving materials. Only qualified employees are authorized to operate cranes and hoists.



Due to the large and heavy objects often being moved by overhead cranes and hoists, initial and routine inspections are necessary to ensure continued operation of the cranes and the safety of the employees around the crane. Inspections must be performed by a trained and qualified individual to determine compliance with ASME/ANSI standard B30.16. The purpose of the inspections is to determine the extent of wear, deterioration or malfunction of critical components of the crane. The owner's manual specific to the hoist should be checked for inspection and maintenance requirements.

Overhead cranes are used to move heavy and oversized objects that other material handling methods cannot. These cranes have a railed

support structure called a bridge, and a wheeled trolley that travels across the bridge horizontally. The rated load of the crane must be plainly marked on each side of the crane. If more than one hoist is present, each hoist will have its rating shown. Clearance must be maintained above and to the side of cranes. Walkways cannot be placed in a crane-operating zone that would compromise employee safety when the crane is in operation.



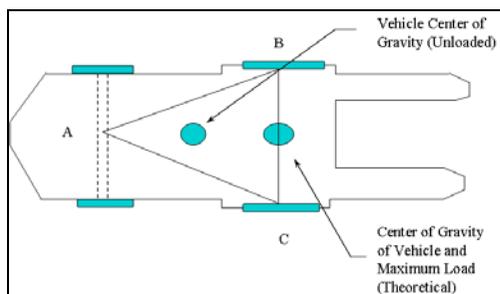
Attach the load to the block hook by means of slings or other approved devices, making sure the sling is clear of all obstacles. Once the load is properly secured and balanced in the sling, slowly raise the load. Horizontal movement must begin slowly to prevent the load from swinging or coming into contact with other obstacles. The crane warning signal or horn must be sounded when the load or hook comes near or over personnel. Carrying loads over personnel is prohibited. There is always a chance that during a lift, the load could shift and fall. A load should not be left suspended.

Forklift Safety

Powered industrial trucks, more commonly known as forklifts, can be powered through electric or combustion engines and designed for a variety of applications. The majority of counter-balanced forklifts have their weight supported on three points. The front two drive wheels are two points on the stability triangle,

while the back two steering wheels (which are connected on a central pivot) support the weight at the rear and make the third point. When these three points are connected with imaginary lines, the stability triangle is formed.

An unloaded forklift on a level surface will have a center of gravity in the middle of the stability triangle. As a load is added to the forklift, or if the forklift is on an inclined surface, the center of gravity will move within the stability triangle. If the center of gravity moves outside of the stability triangle, the forklift will tip over.



Forklifts are manufactured by several different companies with various models available and operator training must be specific to the operating characteristics of the specific forklift the employee will be using. Only qualified and fully-trained drivers are permitted to operate forklifts.

All operator training and evaluation must be conducted by individuals who have the knowledge, training, and experience to train and evaluate potential operators. Training will include a combination of formal instruction, demonstrations and practical exercises performed by the trainee, and an evaluation of the operator's performance. Practical exercises must be performed under the direct supervision of trainers and where the practical training does not endanger the trainee or other employees.

The following guidelines should always be adhered to when operating a fork truck:

- Qualified drivers will be responsible for the care and operating condition of their equipment.
- Forklifts must be operated at safe speeds, determined by condition of road, weather and loads. Slow speeds must be maintained in buildings or on docks.
- During operations, if an operator notices any mechanical difficulties, it will be his/her responsibility to stop the machine to prevent further damage, tag out the forklift, and report the problem to supervision.
- Operators will not permit any person to ride on the forks or any other part of their vehicles.
- When the forklift is left unattended, the controls must be put in neutral, the power shut off, park brake set, and forks must be in the down position.

An evaluation of the performance of each forklift operator must be conducted every three years.

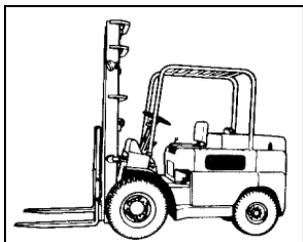
Propane Fuel Tanks

Forklift cylinders should be filled or changed only by trained personnel using proper safety procedures. Do not attempt to change a cylinder if you have not been properly trained to do so. Wear proper gloves and eye protection when performing propane activities, including connecting or disconnecting a cylinder. Avoid contact with liquid propane as it can cause frostbite.

Charging Lead-Acid Batteries

Lead-acid batteries contain sulfuric acid and only trained and authorized personnel should handle them. Follow the battery manufacturer's recommendations about when to recharge or replace batteries. Be sure to use only chargers

that are designed for the battery being charged and never overcharge a lead acid battery. Inspect for defective cables, loose connections, corroded cable connectors or battery terminals, cracked cases or covers, loose hold-down clamps and deformed or loosed terminal posts. Replace worn or unserviceable parts.



Lead-acid batteries can produce explosive mixtures of hydrogen and oxygen gases when they are being charged. Always store or recharge batteries in an approved, well ventilated area away from sparks or open flames. Lead-acid storage and charging areas should be posted with "FLAMMABLE - NO SMOKING" signs. Always keep lead acid battery vent caps securely in place. Keep metal tools and jewelry away from the battery. To prevent shocks, never touch or come in contact with both terminals at the same time.

Neutralize spilled or splashed sulfuric acid solution with a baking soda solution, and rinse the spill area with clean water. If acid gets into your eyes, flush immediately with water for 15 minutes, and then promptly seek medical attention. If acid gets on your skin, rinse the affected area immediately with large amounts of water. Seek medical attention if the chemical burns appears to be a second degree or greater.

Slings and Rigging

When mechanically moving materials, avoid overloading the equipment by letting the weight, size, and shape of the material being moved dictate the type of equipment used to move it. Because cranes and hoists rely upon slings to hold their suspended loads, slings are the most commonly used materials-handling apparatus.

Use and inspection procedures tend to place slings into three groups: chain, wire rope and mesh, and fiber rope web. Each type has its own particular advantages and disadvantages. Factors to consider when choosing the best sling for the job include the size, weight, shape, temperature, and sensitivity of the material to be moved, as well as the environmental conditions under which the sling will be used.

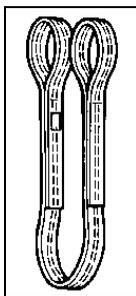


Chains are commonly used because of their strength and ability to adapt to the shape of the load. Care should be taken, however, when using alloy chain slings because sudden shocks will damage them. Misuse of chain slings could damage the sling, resulting in sling failure and possible injury to an employee. Chain slings are the best choice for lifting very hot materials.

All sling types must be visually inspected prior to use. When inspecting alloy steel chain slings, pay special attention to any stretching, wear in excess of the allowances made by the manufacturer, and nicks and gouges. These

signs indicate that the sling may be unsafe and they must be removed from service.

Wire rope is composed of individual wires that have been twisted to form strands. Strands are then twisted, sometimes over a fiber core, to form a wire rope.



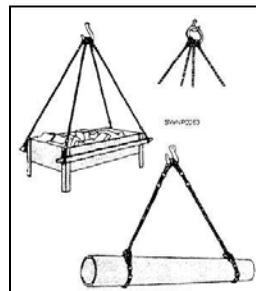
When selecting a wire rope sling to give the best service, consider strength, ability to bend without distortion, ability to withstand abrasive wear, and ability to withstand abuse. Wire rope life is affected by bending, stresses, loading conditions, speed of load application (jerking), abrasion, corrosion, sling design, materials handled, environmental conditions, and history of previous usage. Wire rope slings must be visually inspected before each day's use.

The following factors indicate when a wire sling needs to be discarded:

- Severe corrosion,
- Localized wear (shiny worn spots) on the outside,
- A one-third reduction in outer wire diameter,
- Damage or displacement of end-fittings-hooks, rings, links, or collars-by overload or misapplication,
- Distortion, kinking, bird caging, or other evidence of damage to the wire rope structure, or

- Excessive broken wires.

Fiber rope and synthetic web slings are used primarily for temporary work, such as construction and painting jobs. They also are the best choice for use on highly finished parts, fragile parts, and delicate equipment. Fiber rope deteriorates on contact with acids and caustics. Fiber rope slings, therefore, must not be used around these substances unless the manufacturer recommends them for that use. When inspecting a fiber rope sling, look for cuts, gouges, or worn surface areas; dry, brittle, scorched, or discolored fibers; or melting or charring of any part of the sling. If any of these conditions are found, the supervisor must be notified and a determination made regarding the safety of the sling. If the sling is found to be unsafe, it must be discarded.



Position the hook directly over the load and seat the sling squarely within the hook bowl for maximum lifting efficiency without bending the hook or overstressing the sling. Wire rope slings are subject to damage resulting from contact with sharp edges of the loads being lifted. These edges can be blocked or padded to minimize damage to the sling.

After the sling is properly attached to the load, there are a number of good lifting techniques that are common to all slings:

1. Make sure that the load is not lagged, clamped, or bolted to the floor;

2. Guard against shock loading by taking up the slack in the sling slowly. Apply power cautiously to prevent jerking at the beginning of the lift, and slowly accelerate or decelerate;
3. Check the tension on the sling. Raise the load a few inches, stop, and check for proper balance and that all items are clear of the path of travel. Never allow anyone to ride on the hood or load.
4. Keep all personnel clear while the load is being raised, moved, or lowered. Crane or hoist operators should watch the load at all times when it is in motion.
5. Never allow more than one person to control a lift or give signals to a crane or hoist operator except to warn of a hazardous situation; never raise the load more than necessary; never leave the load suspended in the air and never work under a suspended load or allow anyone else to.

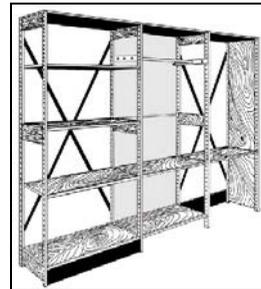
Once the lift has been completed, clean the sling, check it for damage, and store it in a clean, dry airy place. It is best to hang it on a rack or wall.

Storage and Warehousing

Warehouses storage systems have the potential to cause serious injury from unstable stacking, unsafe placement, and poor manual materials-handling procedures.

Storage shelving should be sturdy, braced, and spacious enough to allow people and equipment to move freely. When large, awkward or heavy items are warehoused, they become a challenge to store in a safe manner. When materials are shelved, they require careful placement to avoid pushing products off the facing aisle on to coworkers. Materials should be stored flat and inside the shelving units with aisle ways kept clear.

Stacking materials too high; stacking materials that hang over shelf edges; materials too heavy for the storage rack, and placing larger and heavier materials on top of smaller, lighter ones are examples of unstable stacking. Materials should be stacked according to its size, shape and weight. The storage racks themselves must have sufficient capacity to bear the loads imposed on them. Stored materials should be stacked and limited in height so they are stable and secure against sliding or collapse. Keep all material within the horizontal dimensions of the shelves. Store all manually loaded materials between knee and shoulder height. Heavy materials and equipment should be stored low and close to the ground or floor to reduce the possibility of injury during handling.



Materials must be stored so they will not obstruct fire extinguishers, alarm boxes, sprinkler system controls, electrical switch boxes, machine operations, emergency lighting, first air or emergency equipment, or exits. Store incompatible materials (such as acids and bases) separately. Check material safety data sheet for details on safe storage. Good housekeeping in a warehouse requires keeping dirt, oil, and debris off the docks and floors. Floors should be non-slippery and excess boxes, baling materials and other recyclables should be removed and stored properly. All passageways and storerooms must be unobstructed and maintained in a clean, dry and sanitary condition. Any spills must be cleaned up promptly.

Noise Exposure

Noise is one of the most common occupational health hazards found in industrial and manufacturing environments and permanent hearing loss is the main health concern.



Noise exposure can cause auditory and non-auditory health effects. Auditory effects include hearing impairment resulting from excessive noise exposure. Noise-induced hearing loss is the main concern related to occupational noise exposure. There are many factors that affect the degree and extent of hearing loss. When the noise exposure stops, a person does not regain any lost hearing sensitivity. As the employee ages, hearing may worsen as age-related hearing loss adds to the existing noise-induced hearing loss. Non-auditory health effects include hypertension, changes to blood pressure and/or heart rate, changes in breathing, annoyance, sleeping problems, and problems with oral communications.

To prevent adverse outcomes of noise exposure, noise levels should be reduced to acceptable levels. The best method of noise reduction is to use engineering modifications to the noise source itself, or to the workplace environment. Where technology cannot adequately control the problem, personal hearing protection (such as ear muffs or plugs) can be used.

As a first step in dealing with noise, workplaces need to identify areas or operations where excessive exposure to noise occurs. The

indicators of potentially hazardous noise level include:

- people have to raise their voice to talk to someone three feet away,
- at the end of a work shift people have to increase the volume of their radio or TV to a level too loud for others, and
- after working for a few years at that workplace, employees find it difficult to communicate in a crowd or party situation where there are other sounds or many voices.

Measuring noise levels and workers' noise exposures is the most important part of a workplace hearing conservation and noise control program. It helps identify work locations where there are noise problems, employees who may be affected, and where additional noise measurements need to be made.



A noise survey involves measuring noise or sound pressure levels at selected locations throughout an entire plant or sections to identify noisy areas. This is usually done with a sound level meter.

A noise dosimeter is useful in work areas where noise usually varies in duration and intensity, and where the person changes locations. A noise dosimeter is a small, light device that clips to a person's belt with a small microphone that fastens to the person's collar, close to an ear. The dosimeter stores the noise level information and carries out an averaging process.

Hearing loss can also be caused by recreational and environmental noises (loud music, guns, power tools, and household appliances) that affect the ear the same as occupational noise.

Personal Protective Equipment

Properly implemented engineering and administrative controls can greatly reduce or eliminate hazards at its source; however, in some instances, personal protective equipment (PPE) is the only feasible method of providing employee protection.



PPE typically includes protective clothing and devices for the eyes and face, hands and arms, head, hearing, respiratory protection, and other protective shields and barriers. Selection of personal protective equipment is based on a hazard assessment that identifies the type of hazard and the degree of exposure. PPE must comply with industry standards, such as American National Standards Institute.

Depending on your job duties, you may be required to use personal protective equipment to perform certain jobs or to work in certain areas. The city provides all required PPE at no cost to the employee with the exception of prescription safety glasses and safety shoes, which are the financial responsibility of the employee.

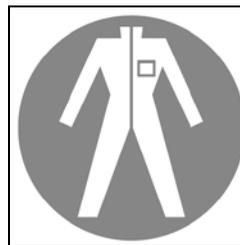
It is each employee's responsibility to wear, care for, and store his or her PPE. Damaged or defective PPE must be removed from service and not used until repaired or replaced.

Departments may require old or damaged PPE to be turned in when being exchanged for new/replacement equipment. Employees should check with their supervisor about specific departmental policies on PPE use.



Body Protection

The purpose of most protective clothing is to protect the employee from contact with physical or chemical hazards or to keep contaminants off the clothing or body. Examples of activities where body protection may be required include work in laboratories, during welding, work in confined spaces, highway work zones, and during hazardous materials emergency response.



Laboratory coats, coveralls, and aprons protect employees and everyday clothing from contamination. Welder's jackets and aprons protect the body from heat, thermal stress, molten metal, flames, and sparks. Fluorescent or high visibility vests are worn while directing traffic at night or for road or street work zone safety.

Electrical Safety Equipment

Electrical protective equipment may include rubber insulating gloves, leather glove protectors, and floor mats. Qualified electricians will be issued appropriate arc flash protection as required by NFPA 70E. Gloves must be properly rated for the voltage. Rubber insulated sleeves, mats and tools may be necessary to prevent electrical shock from contact with energized conductors. Only in limited circumstances and only when personnel are authorized, should work be performed on or near energized conductors.

Ergonomic PPE

Ergonomic hazards or risks include such factors as repetition, force, posture, contact stress and vibration. Ergonomic-type PPE include knee pads and palm pads to reduce contact stress and vibration attenuation gloves. Items such as back belts/braces and wrist braces/splints are typically marketed as devices that could prevent musculoskeletal disorders, although the evidence is inconclusive. Studies have shown that the effectiveness of these devices is highly variable and inconsistent from one worker to the next.

For the purposes of the City's safety and health program, back belts/braces and wrist braces/splints are not considered PPE. They should only be worn if recommended or prescribed by a physician or health care provider.

Eye and Face Protection

Eye or face protection is required in work locations and during activities where potential eye hazards exist, such as from flying particles, chemical splash from acids or caustic liquids, irritant gases or vapors, or injurious light radiation.

Work areas where these eye or face hazards may be found include laboratories, maintenance shop areas, chemical handling or use, and welding

shops. The most common eye hazards are flying particles, a hazard typical of many machine operations.

Protective eye and face protective devices must comply with the most recent version of ANSI Standard Z87.1. Safety glasses must have side shields.

The cost of eye examinations for those needing prescription safety glasses is the responsibility of the employee. The HRD Safety & Health Office has a form that employees can use to obtain a discount from local vendors for prescription safety glasses.

Goggles are primary eye protection intended to shield the eyes against chemical splash, irritating mists, vapors, and fumes. Face shields are secondary eye protection intended to protect the entire face against exposure to chemical hazards. Face shields should be used as a supplement protection for the face. Face shields without goggles are not considered eye protection.



Contact lenses do not provide eye protection from chemical splash and may cause materials or particles on the surface of the eye to become trapped. Some chemicals cause pain and spasms which make lens removal difficult. Contact lenses must not be worn where exposures to chemicals may occur unless chemical splash goggles are worn.

Fall Protection

Fall protection must be used when employees are exposed to a vertical fall of four feet or more over a lower level or at any height above dangerous equipment. Fall protection systems typically include a combination of full body harness, connectors (self-locking snap hooks), lanyard, deceleration device, and lifeline.



Appropriate fall protection will be determined by the task or job to be performed. Mixing of fall protection equipment is not permitted because fall protection components made by different manufacturers may not be compatible. Fall protection must comply with ANSI A10.14.

Foot Protection

Employees must wear appropriate foot protection when working in areas where there is a danger of foot injuries due to falling or rolling heavy objects, or from objects piercing the sole (such as nails), and where employee's feet are exposed to electrical hazards. Special types of shoes or foot guards may be required when special hazard conditions exist (e.g. leggings or high weather boots for hot surfaces and rubber boots / hip waders for wet conditions).

Safety shoes are designed to protect from the most common causes of foot injuries – impact, compression, and puncture. Protective footwear must comply with latest version of ASTM 2413.

Employees are expected to wear foot wear appropriate for the duties of their employment.



Sandals or other open-toe style shoes are not permitted to be worn in laboratories, shops, or other job locations where glass, caustic or corrosive chemicals, or hot materials are used or handled. Employees who experience orthopedic foot problems from wearing safety-toe footwear should call the HRD Safety & Health Office for assistance.

Hand Protection

Employees must use appropriate hand protection when their hands are exposed to hazards such as those from skin absorption of harmful chemicals, cuts, abrasions, punctures, chemical burns, temperature extremes, and contact with blood or body fluids. The selection of hand protection should be based on the performance characteristics of the hand protection, conditions present, duration of use, and the potential hazards identified.



Gloves used with chemicals must be selected to provide protection from the specific chemical to

be used. The MSDS for the chemical should be consulted for a recommended glove material. Common glove materials include neoprene, polyvinyl chloride, nitrile, and butyl and natural rubbers.

Employees should always wash their hands after using gloves. Gloves are excellent barriers to prevent contaminants from reaching the skin. However, washing hands after using gloves is a good precaution to make sure any residue which may have deposited on the skin is removed.

Skin barrier creams, ointments or lotions may be worn with gloves for additional protection against corrosive or irritating chemicals, but are not adequate substitutes for gloves.

Head Protection

Head protection is required in work locations and during activities where the potential for head injury exist from bump and impact hazards (such as striking overhead objects or impact from falling objects). In addition, employees must be protected from the risk of electrical shock or burns when working near exposed conductors, which could contact the head.



The basic head protection for consideration is the hard hat. Hard hats should meet the requirements in the most recent version of ANSI Z89.1. Supplementary hard hat equipment include winter liners for cold, sweat bands for heat, chin straps for high wind, ear muffs, and face shield.

Hard hat protection is effective only if the hat is adjusted to fit properly and is worn squared and not cocked at an angle or perched on the back of the head. Severe lacerations from relatively light blows have been incurred by workers wearing hard hats in unusual positions. Do not deface, alter, or modify hard hats in any way. Do not drill holes, modify the head harness, or wear bandanas underneath the hard hat.

Hearing Protection

Hearing protection is required in work locations and during activities where noise levels are 85 decibels (dB) or higher. Examples of hearing protection include premolded (reusable) ear plugs, disposable ear plugs, and ear muffs. The specific types of protection required depend on the type and level of noise encountered.



Hearing protection, either earplugs and / or ear muffs, should be worn in all hazardous noise areas regardless of how short the exposure might be. As a general rule, you can tell if you are in a hazardous noise area if you have to shout to be understood at a distance of five feet. Contact the HRD Safety & Health Office if a work area or equipment needs to be surveyed to measure noise levels.

Respiratory Protection

The use of respirators may be necessary to ensure adequate protection from dusts, fumes, mists or gases in work areas or during work activities where the airborne concentration of these contaminants exceed OSHA permissible

exposure limits. Respirators are also required in situations where there may be an oxygen-deficient atmosphere.

Proper selection and fit are essential in assuring protection and are dependent on several factors. There are two major classifications of respiratory protection equipment: air-purifying respirators and atmosphere-supplying respirators.



Air-purifying respirators “purify” air through a filtering element that typically involves replaceable cartridges attached to the facemask. They work by moving air through filters or cartridges designed to remove specific contaminants from the air.

Atmosphere-supplying respirators supply breathing air from a separate air source, and may be either a self-contained breathing apparatus or a supplied air respirator.

Power Tools and Equipment

Hand and power tools are a common part of our everyday lives and are present in nearly every workplace. However, these simple tools have the potential for causing severe injuries when used carelessly or maintained improperly. Hazards with power tools and equipment include:

- Contact with points of operation, such as blades, can cause serious cuts or amputations.
- Electrical malfunctions can cause shocks, fires, or electrocution.

- Flying chips, dust, or shavings can cause eye injuries.
- Noise can cause hearing damage.
- A heavy power tool dropped on a hand or foot can cause bruises or broken bones.
- Straining too hard when lifting a heavy power tool can cause a back injury.
- Remaining in awkward positions for long periods when using power tools can, over time, lead to musculoskeletal disorders.



To prevent accidents and injuries, OSHA says that employees working with power tools should observe five basic safety rules: (1) keep all tools in good condition with regular maintenance; (2) use the right tool for the job; (3) examine tools for damage before use and do not use damaged tools; (4) operate tools according to the manufacturer’s instructions; and (5) use the appropriate personal protective equipment.

Bench Grinders

Bench grinders are one of the most commonly used tools in metal fabrication. They are safe and reliable if care is taken with the grinding wheels. Bench grinder wheels can shatter into dangerous projectiles through lack of regular inspection and maintenance or improper use.

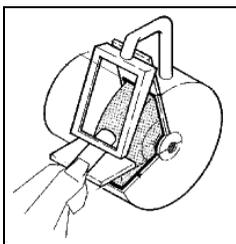
Always check that a grinding wheel's RPM rating is consistent with the speed of the grinding

machine. Before mounting a grinding wheel on a machine, make sure the power is turned off at the power point switch and the plug removed.

Occasionally a new wheel may be cracked or flawed, and will likely shatter as soon as it is used. New wheels should always be visually checked and given a resonance test before being fixed to the spindle.

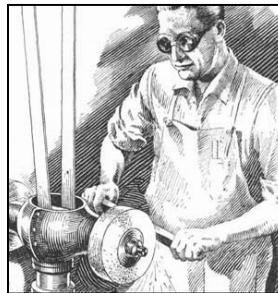
Ensure the hole in the grinding wheel fits closely on the spindle. When a wheel has been newly fitted between appropriate washers and flanges, rotate it by hand to check the balance before switching on the power to use the machine. Always ensure that the wheel has a soft washer or "blotter" on either side to distribute clamping pressure when the nut is tightened. Avoid over-tightening the locking nut.

Avoid using grinding wheels designed for steel on materials that will clog the pores between the abrasive particles. Unless the wheel is "dressed" with a special tool, the operator will have to press harder when pores become blocked or it loses its cutting surface, exerting forces that may cause the wheel to shatter.



Never remove guards from a bench grinder. They offer protection in the event of wheel failure, and protect hands and fingers from injury. The work rest on a bench grinder should be securely fixed and close enough to the grinding wheel to prevent the job slipping off. It should be adjusted as the disc becomes smaller through wear and dressing.

Abrasive wheels should be discarded when the diameter approaches that of the driving flanges, when the work rest can no longer be correctly adjusted to the wheel diameter, or when the wheel no longer cuts efficiently because of reduced peripheral speed. Wheels should never be run in excess of the maximum speed recommended by the manufacturer.



Safety glasses, face shields, and ear protection should be worn for all grinding jobs, including dressing grinding wheels.

Procedural hazards include holding the work incorrectly; using the wrong type of wheel; grinding on the side of the wheel that is not designed for side wheel grinding; taking too heavy a cut; applying work too quickly to a cold wheel or disk; grinding too high above the center of a wheel; failing to use wheel washers (blotters); incorrectly adjusting or lacking a work rest; using spindles of incorrect diameter or with the threads cut so the nut loosens as the spindle revolves; installing flanges of the wrong size, with unequal diameters, or unrelieved centers; or dressing of wheels incorrectly, resulting in off-center conditions or fracture strains.

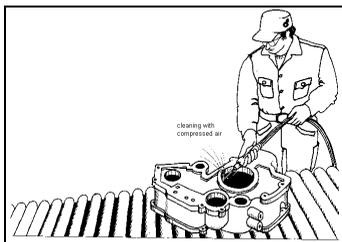
Compressed Air

Compressed air is extremely forceful, with pressures used in the workplace typically ranging from 80 to 120 pounds per square inch (psi). Many workplace injuries have occurred because of the misuse of compressed air. Filings, chips,

shavings, and particles of metal can be thrown up when compressed air is used for cleaning purposes. The pressure necessary to remove the particles from machines and surfaces is strong enough to blow them into the eyes, ears or skin of people nearby.



Compressed air must not be used for cleaning purposes except where reduced to less than 30 psi and then only with effective chip guarding and personal protective equipment. Never use compressed air to clean clothing or parts of the body. Compressed air can be forced into body tissue and cause severe injury. Use a safe alternative such as a brush or vacuum tool.



Hoses and couplings must be checked daily before use. All pipes, hoses, and fittings must have a rating of the maximum pressure of the compressor. Compressed air pipelines should be identified (with psi) as to maximum working pressure. Air supply shutoff valves should be located (as near as possible) at the point-of-operation.

Always wear the appropriate personal protective equipment. Wear goggles over safety glasses

when conducting cleaning. Normal work clothing is not a protection against compressed air.

Never kink the air hose line to cut off the air. Prevent sharp objects from rubbing against the hose. Always coil the hose without kinks and hang it over a broad support when not in use.

Generators (Portable)

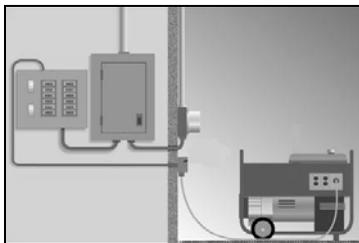
Portable generators are internal combustion engines used to generate electricity when temporary or remote electric power is needed and are commonly used during disaster response. Portable generators can be dangerous if used incorrectly. The primary hazards to avoid are carbon monoxide (CO) poisoning from the engine exhaust, electric shock, fire and burns.

CO from a generator's exhaust is a colorless, odorless, toxic gas and many people have died from CO poisoning because their generator was not adequately ventilated. When used in a confined space or poorly ventilated area, generators can produce high levels of CO within minutes. Never use a generator indoors or place a generator outdoors near doors, windows, or vents. When using a portable generator, remember that you cannot see or smell CO. If you start to feel sick, dizzy, or weak while using a generator, get to fresh air right away. The CO from generators can rapidly kill you.

Generators pose a risk of shock and electrocution, especially if they are operated in wet conditions. The electricity created by generators has the same hazards as normal utility-supplied electricity. Shocks and electrocution can happen from improper use of power or accidentally energizing other electrical systems. Shocks and electrocutions have occurred when generator users bypass the safety devices (such as circuit breakers) that are built into electrical systems. The following

precautions are provided to reduce shock and electrocution hazards:

- Never attach a generator directly to the electrical system of a structure (home, office, trailer) unless a qualified electrician has properly installed the generator with a transfer switch. Attaching a generator directly to a building electrical system without a properly installed transfer switch can energize wiring systems for great distances. This creates a risk of electrocution for utility workers and others in the area.
- Use ground fault circuit interrupters (GFCIs), especially where electrical equipment is used in or around wet or damp locations. GFCIs shut off power when an electrical current is detected outside normal paths. Regardless of GFCI use, electrical equipment used in wet and damp locations must be listed and approved for those conditions.



Fires can occur from improperly refueling a generator or inappropriately storing the fuel for a generator. Generators become hot while running and remain hot for long periods after they are stopped. Generator fuels can ignite when spilled on hot engine parts. Before refueling, shut down the generator and allow it to cool.

Generator engines also vibrate and create noise hazards. Excessive noise and vibration could cause hearing loss and fatigue that may affect job performance. Keep portable generators as far away as possible from work areas and gathering

spaces. Wear hearing protection if this is not possible.

Diesel Exhaust

Diesel-fueled standby generators are sometimes necessary to provide electricity in certain critical operations in the event of power outages. Diesel exhaust is a complex mixture of gases (nitrogen oxides, carbon monoxide, volatile organic compounds, polynuclear aromatic hydrocarbons, and others) and very fine carbon particles (commonly referred to as 'soot'). Many of the individual substances in diesel exhaust along with the exhaust itself pose a risk to health. The composition of diesel exhaust can vary with the fuel type. Ultra low sulfur fuels (< 0.1% or lower) are recommended.

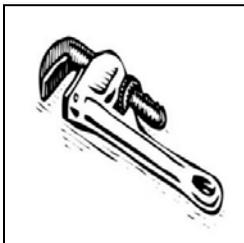
Long-term exposure to diesel exhaust fumes is suspected of causing cancer and it can have immediate health effects as well, such as irritation of the eyes, nose, throat and lungs; it can cause coughs, headaches, light headedness, and nausea; and it may aggravate preexisting lung disease such as asthma and heart disease. There are no federal occupational health standards for diesel exhaust. Proper engine maintenance with better grade diesel fuel plays a significant role in lowering diesel exhaust. Where possible, diesel exhaust should be vented directly to the outside of a working space.

Hand Tools

Typical hand tool injuries include cuts, eye injuries from flying particles, muscle strains, and electrical shock. If you are unfamiliar with how a hand or power tool operates, check the operating instructions or ask your supervisor for help.

Hand tool safety requires the tools be of good quality and adequate for the job. Tools are to be kept in a safe condition without broken or damaged parts and should only be used for their

intended purpose. Do not keep tools in pants or coat pockets. Keep all cutting tools sharp and never use tools which have burred or mushroomed heads. If tools or equipment are found to be faulty, report them to your supervisor and turn the equipment in for repair.



Normally, hand tools will be properly used so the working force is away from a person's body in case the tool slips. Crowbars bars of sufficient size and weight must be chosen to do the job safely and easily. Makeshift (cheater) bars, such as pipes or other metal objects, should never be used in place of crowbars bars or other proper tools. When workers use hand tools while they are working on ladders, scaffolds, or platforms, they should use carrying bags or tool belts for tools that are not in use. Workers should not throw tools to each other or drop tools from elevated surfaces.



Hydraulic Systems

The main hazards associated with working with hydraulic systems include crushing, burns, high

pressure injections and being hit by thrown objects.

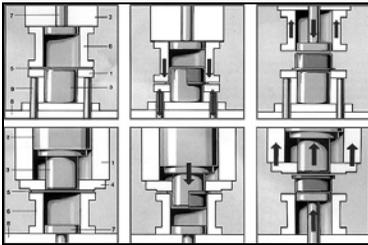
- **Crushing:** Items that are being raised by hydraulics can come crashing down if the system loses pressure, fails, or the controls are bumped. Whatever is under the equipment will be crushed. Locks need to be used when equipment that is being worked on is in the raised position. Remember that hydraulics need a running engine to raise equipment -- but equipment can be lowered without the power being activated.
- **Burns:** Hydraulic fluid operates at high temperatures and if a hose breaks, the result can be severe burns.
- **Thrown Objects:** If fluid sprays out, whether due to a large hole or due to the high pressure, it can also cause parts to go flying.



- **High Pressure Injections:** Household water comes out of the faucet at around 40 psi where hydraulic systems operate at 2000 psi or higher. If there is a pin-hole sized leak at that pressure, hydraulic fluid can be injected into a person through the skin and gloves. Never rub your hand along a hydraulic hose to find a leak -- hold a piece of cardboard or paper above the hose if you suspect a leak. Hydraulic fluid can result in gangrene if not treated and removed by a knowledgeable physician immediately. The general rule for testing for leaks is to shut down the machine and drain the pressure from hoses

before inspecting them for leaks. Eye protection should also be used.

Many systems store hydraulic energy in accumulators. These accumulators are designed to store oil under pressure when the hydraulic pump cannot keep up with demand, when the engine is shut down, or when the hydraulic pump malfunctions. Even though the pump may be stopped or an implement disconnected, the system is still under pressure. To work on the system safely, relieve the pressure first.

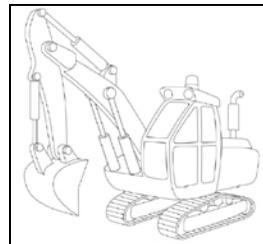


Another hazard is improper coupling of low- and high-pressure hydraulic components. Do not connect a high-pressure pump to a low-pressure system and do not incorporate a low-pressure component, hose or fitting into a high-pressure system. Component, hose or fitting ruptures are likely to occur.

Pressure relief valves incorporated into the hydraulic system will avoid pressure buildups during use. Keep these valves clean and test them periodically to ensure correct operation.

An improperly maintained hydraulic system can lead to component failures. Safe hydraulic system performance requires general maintenance. Periodically check for oil leaks and worn hoses, keep contaminants from hydraulic oil and replace filters periodically, and coat cylinder rods with protective lubricants to avoid rusting. Follow these rules for safe hydraulics operation:

- Always lower the hydraulic working units to the ground before leaving the machine.
- Park the machinery where children cannot reach it.
- Block up the working units when you must work on the system while raised; do not rely on the hydraulic lift.
- Never service the hydraulic system while the machine engine is running unless absolutely necessary (bleeding the system).
- Do not remove cylinders until the working units are resting on the ground or securely on safety stands or blocks; shut off the engine.
- When transporting the machine, lock the cylinder stops to hold the working units solidly in place.
- Before disconnecting oil lines, relieve all hydraulic pressure and discharge the accumulator (if used).
- Be sure all line connections are tight and lines are not damaged; escaping oil under pressure is a fire hazard and can cause personal injury.



- Some hydraulic pumps and control valves are heavy. Before removing them, provide a means of support such as a chain hoist, floor jack or blocks.
- When washing parts, use a nonvolatile cleaning solvent.

- To ensure control of the unit, keep the hydraulics in proper adjustment.

Jetters (Water and Sewer)

Water jetting or water blasting is a process whereby a stream of pressurized water is used for sewer and drain cleaning; or to remove materials such as, scale on the inside of a metal tank; or paint on steel, concrete, or other material. The two options to water jetting are to use a high volume of water at lower pressures or to use a low volume of water at higher pressures. Both have their particular functions and benefits.



Safety hazards specific to the water jetting or water blasting include noise, heat / cold injuries, slips/trips/falls, confined space entry, lockout / tagout, head injuries, and water blasting injuries. Water blasting operations involve streams of water under pressure. The high pressures can cause injuries similar to gunshot wounds but have the added health hazard of involving contaminated water.

The use of high-pressure cleaning equipment may expose workers to hazards such as: contact with high-pressure steam, water, or air streams from cleaning equipment; contact by uncontrolled high-pressure hoses; and contact with steam, water, or air leaks in the high-pressure equipment. Injuries associated with these hazards include loss of body parts such as fingers, hands, and toes, loss of sight, and infections from water and debris trapped under the skin.

Use the following guidelines to ensure that all hazards of the water jetter are minimized:

- Initial set up should include placing barricades to control access to the work area.
- All persons other than the operator should be excluded from the work area.
- Ensure the operator is in a safe and well-balanced position prior to operating equipment and that the area is kept clear of loose items to prevent tripping and slipping hazards.
- Hoses and connections should be visually inspected before each use.
- Ensure there is no apparent structural damage, corroded or broken wires, bulging, kinking or cuts.
- Check all end fittings and couplings are in good order and of the correct pressure rating for the unit.
- Ensure that outlets are not damaged or obstructed.
- Ensure any equipment (particularly electrical) is isolated and protected from ingress of water or overspray to prevent electrical shock.
- All hoses should be protected at all times from being run over and crushed by vehicles.
- Wear appropriate PPE including suitable eye protection, gloves and footwear.
- Systems are to be depressurized when not in use and left unattended.
- Report any defect in the system to their supervisor. Defective items are to be marked defective and removed from service.
- All jetting nozzles should be kept clean and stored safely.

In the event that a person is injured by the impact of a water jet, the injury may appear insignificant and give little indication of the extent of the injury beneath the skin and the damage to deeper tissues. If an accident occurs where pressurized water penetrates or appears to have penetrated the skin, medical assistance should be sought immediately.

Metal Working Machinery

The primary hazards associated with metalworking machinery are at the point of operation where cutting tools, other machine components, or stock are rotating or cycling at high rates of speed. Lacerations to fingers from being caught in, on, or between the points of operation are the most common injuries.

Other hazards that account for a wide variety of injuries (amputations, fractures, punctures, burns, and eye and ear damage) include: slippery floor surfaces from grease leakage and coolant splashing; flying particles; excessive noise level; exposed gears, belt drives, and clutch mechanisms; handling of extremely hot materials; loose clothing, jewelry, and hair; and inadequate lighting. (*See section on Woodworking Machinery for additional information on mechanical / motion hazards.*)

All machines must incorporate one or more emergency stop controls that, upon operation, must de-energize all machine motions. The emergency stop control must override all other controls and, when actuated, not create other hazards. These emergency stops must be located at each operator control station and, if inherent hazards are present at other operating positions, an emergency stop should also be provided. The emergency stop must be color coded red. All machine motions stopped by the emergency or master switch must be restartable only by deliberate action by the operator.

Powder Actuated Tools

A powder-actuated tool is a tool that gets its power from an explosive charge. The tool is used to drive a fastener into materials such as masonry, concrete, steel, and other hard surfaces. Powder-actuated tools operate like a loaded gun so it should be handled with the same respect and safety precautions. Only trained and qualified employees who have been certified by an authorized instructor are permitted to use a powder-actuated tool. Improper use of a powder-actuated tool could result in a serious injury or a death.



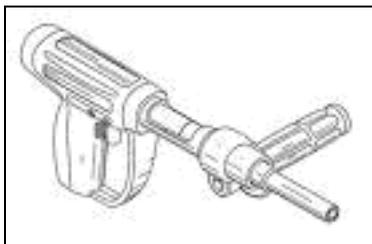
Whenever you operate a powder-actuated hand tool, safe work practices must always be followed. These tools are designed to fire nails or fastening devices into material not easily penetrated. Unfortunately, they have also been known to fire nails and fastening devices into human beings.

When a job calls for a powder-actuated tool, be sure to choose the correct cartridge for the fastener being used and then only load the tool just before you intend to use it, keeping your hands clear of the open barrel end. Never carry a loaded powder-actuated tool from job to job and do not leave it unattended. As with a gun, always keep the tool pointed in a safe direction and never point it anyone, whether it is loaded or not.

The tool should be tested each day prior to use, to assure that safety devices and the tool itself

are in proper working condition. Follow the testing method recommended by the manufacturer. Any defective or poorly working tool should be immediately removed from service and tagged as unsafe.

Always wear proper protective equipment when operating powder-actuated tools. ANSI-approved eye protection must be worn to guard against possible ricocheting materials. Hearing protection must also be worn.



When operating a powder-actuated tool, press the tool firmly against the surface into which the fastening device is being driven, so the fastener will not glance off the surface.

Never drive a fastener into a spalled or chipped surface, i.e., over an uneven area where a previous fastening was unsatisfactory. Do not drive fasteners into easily penetrated material unless that material is backed by an object that will prevent the fastener from passing completely through the material and creating a flying missile hazard on the other side. Never shoot into a surface unless you are certain it will contain the fastener. Take whatever time is necessary to examine both the surface and the opposite side, assuring your safety as well as the safety of others.

Make sure the muzzle end of the tool has a protective shield centered perpendicular to the barrel to stop flying fragments. The tool should be designed not to fire unless this shield is in place. Powder-actuated guns have a safety

interlock built into the muzzle. If the muzzle is not pressed against a work surface with sufficient force, the firing pin is blocked or cannot reach the load to fire it.

Woodworking Machines

Machines used in woodworking can be dangerous if used improperly or without proper safeguards. Workers operating woodworking equipment may suffer injuries, such as laceration, severed fingers, and eye injury. The primary hazard of woodworking equipment is high-speed, revolving cutting blades and knives. Contact with these parts can result in lacerations and amputation of body parts. Other job hazards that account for a wide variety of injuries and illnesses are: jamming or kicking back of material and wood chips; flying objects (splinters, wood chips, broken saw blades); poor housekeeping; improper material handling; unsatisfactory maintenance of machinery; excessive equipment noise; and inhalation of wood dust.



Most health hazards associated with woodworking machines include long-term exposure to excessive noise or vibration and to certain airborne substances. Wood dust and the chemicals used in finishing are health hazards, and workers can suffer from skin and respiratory diseases. Certain types of wood dust can cause allergic reactions.

Rotating parts and shafts, such as stock projecting from the chuck of a lathe, can catch hair or clothing and draw the operator in. This can seriously mangle or crush the operator. Rotating parts and stock can also force an arm or hand into a dangerous position, breaking bones and lacerating or severing parts of a limb. Bolts, projecting keys, or screws on rotating parts increase the danger of being caught by the rotary part.

Reciprocating movement is back-and-forth or up-and-down motion. Operators can be caught and crushed by reciprocating movement when the moving part approaches or crosses a fixed part of the machine.



In-running nip points (or pinch points) are a special danger arising from rotating or reciprocating parts. They occur whenever machine parts move toward each other or when one part moves past a stationary object. Parts of the body may be caught between or drawn into the nip point and crushed, mangled, or severed.

Employees can be injured if their hands get too close to the blade, particularly when working on small pieces of stock. The size of the piece may dictate that the operator's hand be close to the blade. Accidents can occur when stock unexpectedly moves or when a worker's hand slips or when any of the following occur:

- Stock gets stuck in a blade and actually pulls the operator's hands into the machine.

- The machine or its guard is not properly adjusted or maintained. An improperly adjusted radial saw, for example, might not return to its starting position after making a cut.
- The machine has controls that are not recessed or remote, and the equipment is accidentally started.
- Contact occurs during machine repair or cleaning if care is not taken to de-energize the machine.
- If an employee reaches in to clean a saw or remove a piece of wood after the saw has been turned off, but is still coasting or idling. Also, saw blades often move so fast that it can be difficult to determine whether they are moving.

Radiation Safety

Radiation sources are found in a wide range of occupational settings and applications. If radiation is not properly controlled, it can pose a considerable health risk. The risk increases as your exposure to radiation increases. However, significant increases in the numbers of cancers have only been seen in populations who received large doses of radiation in matters of seconds, minutes or hours. Studies have not found increases in cancer in populations who received smaller radiation doses delivered over a lifetime. The body can repair radiation-induced damage when the radiation exposure is spread out over long periods of time.

All life is constantly exposed to various forms of radiation, which are emitted from natural and man-made sources.

Ionizing radiation (shorter wavelengths) has sufficient energy to disrupt and separate electrons from atoms which absorb the radiation. This produces "ions" which are atoms with an electrical charge. Non-ionizing radiation (longer wavelengths) has energy in sufficient quantity to excite atoms, or electrons, but not sufficient to

remove electrons from their orbits or to cause the formation of ions.

Ionizing Radiation

ALARA (As Low as Reasonably Achievable) is a radiation safety principle for minimizing radiation doses and releases of radioactive materials by employing all reasonable methods. The three major principles for mitigating external radiation exposures and maintaining ALARA doses are time, distance, and shielding. Minimizing the time of exposure directly reduces radiation dose, doubling the distance between your body and the radiation source will divide the radiation exposure by a factor of four, and using absorber materials such as Plexiglas for beta particles and lead for X-rays and gamma rays is an effective way to reduce radiation exposures.

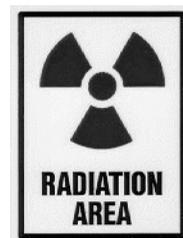


Ionizing radiation sources within the City are relatively rare, although a few departments have instruments that have a sealed radioactive source within the instrument and some departments may employ industrial radiographers (similar to medical X-rays). Industrial radiography is a nondestructive inspection method that uses a sealed radioactive source (gamma-emitting radionuclides) to examine the structure of materials.

- A sealed radioactive source means a radioactive material that is permanently bonded or fixed in a capsule designed to prevent release or dispersal of the radioactive material under the

most severe conditions which are likely to be encountered in normal use and handling. The Iowa Bureau of Radiological Health regulates the possession and use of radioactive materials.

- Industrial radiography technicians contracted by the City have a responsibility to provide information on the potential risks and hazards that are intrinsic to their work, the safety procedures that will be followed for the specific work required, the applicable standards and regulations, and be able to offer proof of training and certification of their radiography personnel.



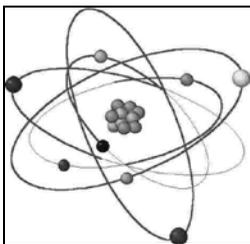
Non-ionizing Radiation

Nonionizing radiation includes the spectrum of visible light, ultraviolet, infrared, microwave, radio frequency, and extremely low frequency radiation. Lasers commonly operate in the ultraviolet, visible, and infrared frequencies. Nonionizing radiation also is dealt with by shielding workers from the source although sometimes limiting exposure times to nonionizing radiation or increasing the distance is not effective.

The different visible frequencies of the spectrum are seen by our eyes as different colors. The light that enables us to see things is referred to as visible light and is composed of the colors we see in a rainbow. Good lighting is conducive to increased productivity. Excessive visible radiation can damage the eyes and skin.

Ultraviolet (UV) radiation is similar to visible light in all physical aspects, except that it does

not enable us to see things. Sources of occupational exposure to UV radiation include the sun, black lights, welding arcs, and UV lasers. Excessive exposure can damage the skin and eyes. The severity of the effect depends on the wavelength, intensity, and duration of exposure. Medium wave UV causes skin burns, and reddening and darkening of the skin. Prolonged exposures increase the risk of skin cancer. Examples of eye disorders resulting from UV exposure include flash burn, welder's flash, and snow blindness. The symptoms are pain, discomfort similar to the feeling of sand in the eye, and an aversion to bright light. Absorption of UV radiation in the lens may be a factor in producing cataract (a clouding of the lens in the eye).



Sources of infrared radiation include furnaces, heat lamps, and IR lasers. The skin and eyes absorb infrared radiation as heat. Workers normally notice excessive exposure through heat sensation and pain.

Microwave radiation is absorbed near the skin, while radiofrequency radiation may be absorbed throughout the body. At high enough intensities, both will damage tissue through heating. Microwaves are used to detect speeding cars, send telephone and television signals, treat muscle soreness, dry and cure plywood, and a number of other applications. Sources of MW and RF radiation include such items as radio emitters, cell phones, heat sealers, high frequency welders, induction heaters, communications transmitters, radar transmitters,

and microwave ovens. Much research is under way on microwave and radiofrequency radiation and how they might affect the human body. Exposure to high levels of microwaves can cause a painful burn. The lens of the eye is particularly sensitive to intense heat, and exposure to high levels of microwaves can cause cataracts. At one time, there was concern that leakage from microwave ovens could interfere with certain electronic cardiac pacemakers. Pacemakers are now designed to be shielded against such electrical interference.

Extremely Low Frequency (ELF) radiation is produced by high-voltage power lines, induction furnaces, electrical wiring, and electrical equipment. Some epidemiological studies have suggested increased cancer risk associated with magnetic field exposures near electric power lines although these studies are highly controversial.

Lasers typically emit optical (UV, visible light, IR) radiations and are primarily an eye and skin hazard. The laser produces an intense, highly directional beam of light. The most common cause of laser-induced tissue damage is thermal in nature. The human body is vulnerable to the output of certain lasers, and under certain circumstances, exposure can result in damage to the eye and skin.

Trenching and Excavation

OSHA's Excavation Standard requires protective systems, training, and certification for all employees working in or around all open trenches and excavations. A trench is defined as a narrow underground excavation that is deeper than it is wide, and is no wider than 15 feet. An excavation is defined as any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal.

Trenching and excavation work can involve hazards such as cave-ins, contact with energized

power sources, collapse of adjacent structures, and hazardous atmospheres. Other potential hazards include falls, falling loads, and incidents involving mobile equipment. Hazardous conditions in trenches include lack of any shoring, sides cut vertically, sandy soil, loose rock and soil, undercutting, accumulated water, spoils piled too closely to trench walls, and vehicles or machinery too close to trench.

Cave-ins pose the greatest risk and are much more likely than other excavation related accidents to result in worker fatalities. Soil can cause injury or death by crushing or suffocation. One cubic foot of soil can weigh as much as 120 pounds and a cubic yard of soil can weigh up to 2,000 pounds.

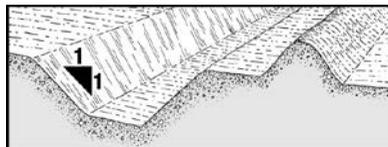


Employees working in a trench must be protected from a cave-in by an adequate protective system. Designing a protective system for a trench can be complex because many factors must be considered including soil classification, depth of cut, water content of soil, changes due to weather or climate, surcharge loads (e.g., spoil, other materials to be used in the trench) and other operations in the vicinity.

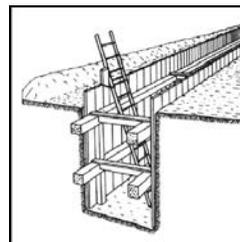
Proper sloping, shoring, and shielding can prevent or greatly reduce most trenching accidents. Sloping involves cutting back the trench wall at an angle inclined away from the excavation. Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins. Shielding

protects workers by using trench boxes or other types of supports to prevent soil cave-ins.

Entry into a trench or excavation that exceeds five feet in depth requires worker protection systems including an escape method consisting of a structural ramp or ladders placed no more than 25-feet apart. Trenches five feet deep or greater require a protective system unless the excavation is made entirely in stable rock.



General trenching and excavation safety rules include never entering an unprotected trench, keeping heavy equipment away from trench edges, keeping materials at least two feet back from the edge of the trench, knowing where underground utilities are located, testing for low oxygen and toxic gases, inspecting trenches at the start of each shift following a rainstorm, and not working under raised loads.



To provide a safe working environment at excavation sites, the use of a 'competent person' at each excavation site is mandatory. This is a term for an individual who is knowledgeable and capable of identifying existing and predictable hazards or working conditions and who has the authority to stop work if unsafe conditions exist. Trenches must be inspected daily, and as conditions change, by a competent person prior

to worker entry to ensure elimination of excavation hazards.

Welding Safety

Welding is the most common method of joining metals in industry today. When welded, two pieces of similar metals are fused (melted) together. Once completed, the welded joint is as strong or stronger than the pieces from which the joint is formed. Welders must cope with heat, metal fumes, sparks, slag (molten metal), and infrared / ultraviolet radiation created by the welding process. The proper personal protective equipment can protect workers from these hazards.



Types of Welding

Gas Welding: In gas welding, two metals are joined by melting or fusing their adjoining surfaces. This is done by directing a gas flame over the metals until a molten puddle is formed. The energy for gas welding comes from the combustion of a fuel with oxygen or air. A few of the most popular fuels are acetylene, Mapp gas and hydrogen. Since gas welding is slower and easier to control than electric arc welding, it is often used in applications such as general maintenance work, brazing and soldering.

Arc Welding: In arc welding, two metals are joined by generating an electric arc between a covered metal electrode and the base metals. Heat is produced by the arc which melts the metal and mixes the molten deposits of the coated electrode. The arc energy is provided by

a power supply unit that furnishes direct or alternating current. The electrodes carry the current to form the arc, producing a gas that shields the arc from the atmosphere, and add metal to control the weld shape. When an arc is struck using a coated electrode, the intense heat melts the top of the electrode. The drops of metal from the electrode enter the arc stream and are deposited on the base metal.

- Oxygen Cutting: Metal is heated by gas flame and an oxygen jet does the cutting.
- Arc Cutting: Intense heat of electric arc melts away the metal.

Welding Operations

Only workers who are properly trained and qualified are permitted to perform welding and cutting operations. Use only equipment that is in good condition. Valves, regulators, hoses, and torches should be thoroughly checked on a regular basis and before use. Use soapy water to check for leaks in hoses, fittings, and valves in welding equipment.

Secure gas cylinders in an upright position. Replace protective caps on all cylinders not in use. Acetylene and oxygen tanks must be stored at least 20-feet apart from each other and securely fastened to a dolly or stand to prevent their falling or being knocked over. Oil must be kept away from sources of oxygen. Oxygen-acetylene torch units must be lit with proper ignition equipment and not with matches. Oxygen should never be used as a substitute for compressed air.

Hot work may only be conducted in areas designed or authorized for this purpose. Welding operations performed outside of the shop area may only be conducted after an inspection has been done to determine if the area is safe to weld and a hot work permit issued.

Move combustibles at least 35-feet from hot work operations. If combustibles cannot be moved, they must be protected by metal guards or by listed flame proof curtains, blankets, or covers rather than ordinary tarpaulins. Do not start any hot work until the surrounding floors have been swept clean. Hot work should not be permitted in or on vessels containing flammable or combustible materials (including residues) until they have been completely cleaned and purged. Check the atmosphere for combustible gases or vapors where necessary.



Carefully connect the ground clamp when using electrical or welding equipment. Since an improperly made ground can be a source of ignition, the ground clamp should be connected as close to the work as possible so that it may be easily observed.

Personal Protective Equipment

Helmet, hand shield, goggles and safety glasses or combination of these are acceptable protection in various applications. Even a quick tack weld requires the proper safety gear, including helmet, gloves and clothing.

Welding helmets should be fitted with a proper filter shade to protect the operator's face when welding or watching. Spectacles or goggles must also be worn under your welding helmet to protect against slag chips, grinding fragments and wire wheel bristles, which can ricochet under the helmet.

Wear only flame resistant clothing, such as denim pants and a shirt made from tightly woven material or a welding jacket. Button shirt collars, cuffs, and front pockets to prevent them from catching sparks. Any exposed skin is susceptible to painful and damaging effects of ultraviolet and infrared radiation.

All welders and cutters must wear protective flame-resistant gloves, such as leather welder's gloves, which provide the heat resistance needed for welding. A gauntlet cuff offers additional arm protection, and insulated linings should be used to protect areas exposed to high radiant energy.

Welding Fumes

Fumes, smoke, and gases emitted during welding pose a health hazard. Depending on the type of welding, fumes generated can include iron, manganese, silicon, chromium, nickel, and fluoride, as well as gases such as carbon monoxide and ozone.



A welding 'plume' is the clearly visible column of fume that rises directly from the spot of welding or cutting. Welders should be careful to avoid breathing this plume. Local exhaust ventilation can direct the plume away from the face.

Hot Work Permits

Hot work operations create heat, sparks, and hot slag that have the potential to ignite flammable and combustible materials in the area

surrounding hot work activities. You may have to obtain a Hot Work Permit prior to any welding, depending on the location of the job. A hot work permit is required for work in confined spaces or in areas where combustible or flammable materials are present or could potentially be introduced. They should also be considered for any hot work performed outside of designated hot work areas.

Hot Work Permit	
Location:	Number: _____
Date:	
Name of Job:	
Name of Person Performing Hot Work:	
<small>The above location has been examined and required fire safety precautions (as shown in the attached Cutting and Welding Safety Guidelines) have been taken. Permission is granted for this work.</small>	
Individual Responsible for Authorizing Operation:	
Title of Individual Responsible for Authorizing Operation:	
Permit Expires Date:	Time: _____
Attachment: Cutting and Welding Safety Guidelines	

The Hot Work Permit is issued by an authorized manager or supervisor to the person who will be welding, cutting or performing other hot work. The permit should be attached to the welding equipment. Immediately upon completion of hot work, the permit should be returned to the person who authorized it.

Any hot work in the following areas will also require an inspection by the Fire Department and the HRD Safety & Health Office:

- Areas where the sprinkler system is impaired.
- Areas where there exists the potential of an explosive atmosphere, such as locations where flammable gases, liquids or vapors are present.
- Areas where readily ignitable materials are stored.

Fire Watch Requirements

Fire watches will be provided in all areas that contain combustibles or fire hazards. The fire

watch will include the entire hot work area. Hot work conducted in areas that are not observable by a single person should have additional personnel assigned to fire watches to ensure that all areas are monitored.

Individuals designated to fire watch duty will have fire-extinguishing equipment readily available and must be trained to use the equipment. The fire watch must monitor the hot work area for at least 30 minutes after work is completed.

Work Zone Safety

Transportation incidents and workers struck by vehicles or mobile equipment account for the highest number of fatal work injuries. Workers such as emergency responders, clean-up, utility, demolition, construction, and others in areas where there are moving vehicles and traffic are exposed to being struck by moving vehicles. Work zones are used to move traffic in an approved direction and are typically identified by signs, cones, barrels, and barriers.

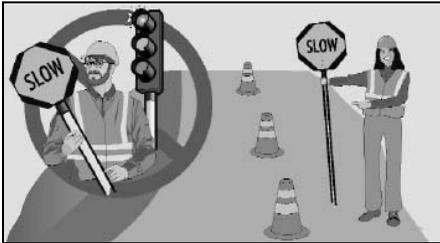


The U.S. Department of Transportation Federal Highway Administration (FHWA) has issued the Manual on Uniform Traffic Control Devices (MUTCD), which is enforced by OSHA. There must be a traffic control plan for the movement of vehicles in areas where there are also workers conducting other tasks. Drivers, workers on foot, and pedestrians must be able to see and understand the routes they are to follow. The authority in charge determines the configuration

of the temporary traffic control zone for motorists and pedestrians. The construction project manager determines the internal traffic control plan within construction / demolition worksites.

A Traffic Control Person is responsible for the safety of the motorist, their co-workers and themselves. The Traffic Control Person must be equipped with the appropriate sign and/or an orange flag, wear a reflective vest, hardhat, safety glasses, and steel-toed shoes. Only properly trained employees will be assigned to traffic control duties.

Flagger stations should be illuminated. Where lighting is not sufficient, flares or chemical lighting should be used. Glare should be controlled or eliminated.



Flaggers should be trained or certified and use the signaling methods required by the authority in charge. Workers on foot, equipment operators, and drivers in internal work zones need to know the routes that construction vehicles will use. Equipment operators and signal persons need to know the hand signals used on the worksite. Operators and workers on foot need to know the visibility limits and the “blind spots” for each vehicle on site. Workers on foot should wear high visibility safety garments designated as Class 1, 2, or 3. Workers should be made aware of the ways in which shift work and night work may affect their performance.

Seat belts and rollover protection should be used on equipment and vehicles as recommended by the manufacturer.

Standard highway signs for information, speed limits, and work zones will assist drivers in identifying, in designated traffic paths, such directives as: EVACUATION ROUTE; DO NOT ENTER; REDUCED SPEED AHEAD; ROAD CLOSED; and NO OUTLET. Using standard highway signs for internal construction worksite traffic control will assist workers in recognizing the route they are to use at the construction site.

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