Module 10: Ergonomics

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Slings and all fastenings and attachments shall be inspected for damage or defects by a competent person before being used. Damaged or defective slings or other rigging equipment shall be immediately removed from service.

Rigging equipment must be removed from the immediate work area when not in use so it does not pose a hazard to employees.

Lesson Summary

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- Floating cranes and derricks should never exceed the original capacity specified by the manufacturer. List and trim should be kept within acceptable limits when using a floating crane.
- Only necessary employees should occupy a personnel platform, and the platform must only be used for employee tools and materials necessary to perform the work. When employees are not being hoisted, the personnel platform should not be used for hoisting tools and materials.
- A suspension system should be designed to minimize tipping the platform due to the movement of workers. Moreover, the personnel platform should be capable of supporting its own weight and at least five times the maximum intended load without any failure. The activity of hoisting a personnel platform should be performed in a controlled, slow, and cautious manner.
- Personnel platforms should be equipped with guardrails and grab-rails with no rough edges.
- When the crane engine is running and the platform is occupied, the crane or derrick operator should remain at the controls at all times. When a platform is being raised, lowered, and positioned, it is vital that employees keep all parts of the body inside, as doing otherwise could lead to an accident.
- Employers and employees should know that using a derrick or crane to hoist workers on a personnel platform is normally prohibited. The primary exception is when the conventional means of reaching a worksite such as a ladder, stairway, personnel hoist, scaffold, aerial lift, or elevating platform would be more dangerous, or the design of the structure does not allow employees to access the area. In such exceptions, a personnel platform may be used. Additional exceptions related to specific operations also exist.
- Never hoist employees if the weather is bad or other adverse conditions exist at the worksite.

Module 10: Ergonomics

Module Description

Employees who work in non-office environments are routinely required to carry out tasks that involve movement and physical exertion. These forceful exertions associated with such tasks may lead to fatigue, musculoskeletal disorders, and other serious injuries. This module is designed to help employees identify work-related problems and learn to apply the principles of ergonomics in order to make their jobs less physically demanding, thereby increasing their overall efficiency.

Module Learning Objectives

At the conclusion of this module, students will be able to:

- Discuss what is meant by ergonomics
- Name the factors that may contribute to problems in a non-office work environment
- Identify the causes of musculoskeletal disorders
- Apply effective ergonomic principles at your workplace

Lesson 1: Ergonomics in the Workplace

Lesson Focus

At the end of this lesson, students will be able to

- Define ergonomics
- Describe the effects of musculoskeletal disorders (MSDs) and how they are caused
- Identify the risk factors for MSDs

Introduction

The science of **ergonomics** looks for the best “fit” between the worker and the job conditions. Ergonomics partly involves developing and implementing solutions that make workers safer, more comfortable, and more productive. It also often involves changing tools, equipment, materials, work methods, or the workplace itself. There is a strong case for making ergonomic improvements, both to reduce workers’ risk of injury and to improve their productivity.

The principles of ergonomics are geared towards adapting the design and engineering of products and workplaces to people's sizes and shapes, physical strengths and limitations, biological needs, ability to handle information and make decisions, as well as their capacities for dealing with such psychological factors as isolation and stress.

Musculoskeletal Disorders (MSDs)

Injuries arising from ergonomic hazards generally fall into the category **musculoskeletal disorders or MSDs**. Examples of musculoskeletal injuries include carpal tunnel syndrome, tendinitis, and lower back pain. Most musculoskeletal injuries

among construction workers are sprains and strains of the muscles, but injuries to the joints, bones, and nerves are also possible. These injuries often result from constant wear and tear on the body, overexertion, fatigue, and repetitive motions.

As a result of the numerous risk factors, construction is one of the most hazardous industries in the United States when it comes to MSDs. In addition to backaches, the most reported areas of pain were in the shoulders, neck, arms, and hands. The Bureau of Labor Statistics (BLS) typically reports that approximately 25% of all workplace injuries in construction are musculoskeletal disorders caused by ergonomic issues like overexertion, fatigue, and repetitive motion. These work-related injuries are among the most frequently reported causes of lost or restricted work time. In 2018, the average time away from work due to such cases was 12 days. In order to reduce the costs associated with MSDs and avoid the problem of work-related injuries, employers must implement the principles of ergonomics in their workplaces.

Because musculoskeletal disorders have been associated with non-work activities (e.g., sports) and medical conditions (e.g., renal disease, rheumatoid arthritis), it is difficult to determine the proportion due solely to occupation. For example, in the general population, non-occupational causes of low back pain may be more common than workplace causes [Liira et al., 1996]. However, even in these cases, musculoskeletal disorders may be aggravated by workplace factors.

Medical Conditions Associated with Musculoskeletal Symptoms

Conditions associated with MSDs include:

- Muscle strain or fatigue
- Tendonitis
- Epicondylitis or "tennis elbow"
- Carpal tunnel syndrome
- Other "pinched" nerve entrapment syndrome
- Nerve injury/irritation from external compression
- Arthritis and other rheumatological disorders

Physical Risk Factors

There are certain aspects of tasks that can increase the risk of fatigue, musculoskeletal disorder (MSD) symptoms, and other injuries. These risk factors can be found in a variety of tasks that an employee is required to carry out and can be divided into two categories: physical factors and environmental factors.

Physical factors are fundamentally the interactions between the work area and the worker, and include:

- Awkward postures
- Forceful exertions
- Repetitive tasks or motions

- Pressure points
- Recovery time
- Vibration

Awkward Postures

The position of the body while performing a task is known as posture. The muscle groups used while performing a task are affected by the worker's posture. An awkward position can make the task more physically demanding by overexerting small muscle groups and not using larger muscle groups. This can increase the likelihood of poor blood-flow, which can lead to fatigue and injury.

Some examples of awkward postures include repeated or prolonged reaching, bending, twisting, kneeling, holding fixed positions, or squatting. Several areas of the body can be affected due to these postures, including shoulders, arms, wrists, hands, knees, neck, and back. Awkward postures are often caused by poorly designed work areas, equipment, and tools, as well as poor work practices.

Postures to Avoid:

- Prolonged or repetitive flexion or extension of the wrist
- Prolonged or repetitive bending at the waist
- Prolonged standing or sitting without shifting your position
- Suspending an outstretched arm for extended periods of time
- Holding or turning your head consistently to one side
- Any posture that is held repeatedly or for a prolonged time

Motions to Avoid:

- Repeated motion without periods of rest
- Repeated motion with little or no variation
- Repeated motions done with force
- Resting or compressing a body part on or against a surface
- Lifting heavy objects away from the body
- Frequent reaching or working above shoulder height

The following types of employee behavior may indicate the presence of ergonomics-related problems:

- Employees shaking arms and hands or rolling shoulders due to discomfort
- Employees voluntarily modifying workstations and equipment to increase comfort
- Employees bringing in ergonomic products to the worksite (such as wrist braces)

Forceful Exertions

The amount of muscular effort required to perform a task is called force. Exerting more force than a body can sustain can cause severe damage to muscles and ligaments. The amount of force required for tools or machinery depends upon various factors, including:

- Load weight, shape, and bulkiness
- Grip type
- Amount of pressure required to accelerate, or decelerate, the load

The degree of risk generally increases with increasing force. Various parts of the body can be affected due to high force, including shoulders, neck, lower back, forearm, wrist, and hands. The risk of injury due to forceful exertions may increase if other risk factors such as awkward posture, repetitive tasks, and extended duration are also present.

Repetitive Tasks or Motions

Repetitive tasks require workers to perform the same task over and over again, using the same muscles, ligaments, and tendons. Repetitive motion may cause severe damage, injury, and discomfort to the worker. The risk of injury increases if the worker fails to take any breaks to relax his or her muscles.

Pressure Points

Exerting pressure on different parts of the body by pressing them against hard or sharp surfaces may cause injury. Some body parts are at a greater risk as nerves, blood vessels, and tendons are present just under the skin in certain areas. Fingers, wrists, palms, elbows, forearms, and knees are examples of such body parts.

Recovery Time

Recovery time is the amount of time allocated to rest the muscles and tendons in any strained part of the body. It is very important for workers to take pauses between tasks that require forceful exertions. These breaks not only provide relief to workers but also enhance their performance. Employers must assess the duration of breaks according to the workload along with the risk factors present.

Vibration

Continuous or high intensity vibration from sitting on, standing on, or holding equipment can increase the risk of injury. Vibration transmitted through the hand that disperses as it travels up the arm and through the body is called **segmental vibration**. This type of vibration is commonly caused by power tools such as grinders, sanders, or impact wrenches, and can damage nerves and cause blood vessels to constrict. **Whole body vibration** is commonly experienced by truck or heavy equipment operators and causes repeated small traumas to the body that can eventually lead to permanent damage to the spine. While damage generally occurs over a long period of time, sudden or jarring impacts, like hitting a pothole, can also cause immediate damage.



Environmental Risk Factors

Environmental risk factors are conditions in the environment surrounding a work area that may contribute to stresses or hazards. The following are some examples.

Heat Stress

Heat stress is the amount of heat that a body is exposed to while performing a task. Heat stress can be attributed to the worker's environment and also his or her own internal metabolism. Exposure to excessive heat can cause various disorders, including heat exhaustion, heat cramps, and heat stroke. The symptoms of heat stress may include headaches, thirst, nausea, muscle cramps, dizziness, and weakness. Due to the severity of the consequences of heat stress, employees must regularly monitor the workplace and take appropriate preventive measures.

Cold Stress

Cold stress occurs when a worker is exposed to cold temperatures. Cold stress results in the decrease of the worker's body temperature and may cause shivering, unconsciousness, pain, and inadequate circulation of the blood. Cold stress may also cause the worker to lose the ability to grasp due to the decrease in body strength. Cold temperatures combined with the risk factors above may increase the risk of musculoskeletal disorders.

Noise

Continuous sound at levels above 80-85 dB in the workplace can cause severe damage to a worker's hearing. Continued exposure to high noise levels may also result in impaired hearing or permanent deafness, tinnitus, or speech misperception. Furthermore, high levels of noise may also affect the worker's ability to concentrate on his or her work.

Lighting

Improper lighting in the workplace may cause eye fatigue and may result in headaches and a loss of focus. A worker's ability to perform tasks efficiently depends greatly on the proper lighting of the work area.

Lesson Summary

- Ergonomics refers to the science of fitting the task to the worker to avoid injuries. A common category of ergonomic injuries is musculoskeletal disorders, or MSDs.
- Repetitive tasks require workers to perform the same task over and over again, using the same muscles, ligaments, and tendons. MSDs are commonly the result of repetitive motions, which may cause severe

damage, injury, and discomfort to the worker. The risk of injury increases if the worker fails to take breaks to relax his or her muscles.
- Recovery time is the amount of time allocated to rest the muscles and tendons in any strained body part. It is very important for workers to take adequate pauses between tasks that require exertions. These breaks not only provide relief to workers but also enhance their performance.
- High or continuous vibrations can cause fatigue, numbness, and pain in the exposed area. It may also cause decreased sensitivity to touch and increased sensitivity to cold.
- To prevent the consequences of heat stress, employers must regularly monitor the workplace and take the appropriate measures to ensure that all employees are adequately protected.
- In order to reduce the costs associated with musculoskeletal disorders and to avoid the problem of work-related injuries, employers must implement principles of ergonomics in their workplaces.
- Physical risk factors for MSDs include awkward postures, forceful exertions, repetitive motions, pressure points, and a lack of recovery time between exertions.
- Environmental risk factors include heat stress, cold stress, excessive noise, and improper lighting.

Lesson 2: Improving the Workplace

Lesson Focus

At the end of this lesson, students will be able to:

- Describe engineering controls that can be used to improve ergonomics
- Describe administrative controls that can be used to improve ergonomics
- Explain the proper use of PPE to avoid ergonomic hazards
- Describe the proper ergonomic training for workers

Introduction

Construction is a physically demanding but vital occupation. Workers who must often lift, stoop, kneel, twist, grip, stretch, reach overhead, or work in other awkward positions to do a job are at risk of developing strain and sprain injuries called musculoskeletal disorders (MSDs). These can include back problems, carpal tunnel syndrome, tendinitis, rotator cuff tears, sprains, and strains.

Employers can adopt various ergonomic improvements in their workplaces in order to improve the working environment for their employees. Ergonomic improvements can be divided into three categories:

- Engineering Controls



- Administrative Controls
- Protective Equipment

Engineering Controls

Employers can institute engineering controls in their workplaces by redesigning, rearranging, modifying, or replacing tools, equipment, workstations, products, or actions that increase the risks of injury. Implementing effective engineering controls can greatly reduce the risk factors. The engineering controls that follow are some commonly recommended measures.

- Install worktables with work surfaces that can be raised or lowered according to the employee's body size and position. This can reduce bending, reaching, and awkward postures that can contribute to body damage.
- Cutout work surfaces may be appropriate to allow employees to adjust their distance from the worktable. This can help reduce awkward postures.
- By allowing employees to reposition their work, their bending and reaching efforts can be reduced.
- Modifying the work surface according to the task can reduce the effort needed to complete the task. For example, to deliver packages from one area to another, workers can slide and roll the packages on the surface rather than lifting and carrying them manually.
- Ladders, scaffolds, steps or work platforms must be provided to employees who are required to reach a surface high off the ground to retrieve packages or containers.
- If employees are required to place packages and containers on surfaces high off the ground, certain mechanical lifting devices can be used to lift them. This can reduce stress to shoulders, neck, back, and other body parts. This can also reduce force, repetition, and awkward postures in tasks related to lifting or handling heavy objects.
- Certain jobs, such as loading and unloading packages from delivery trucks, may require workers to bend their torsos repeatedly. This can again increase the risk of damage to a variety of body parts. This type of operation can be improved significantly by implementing lifting devices, altering the work site, and adopting a wide range of ergonomic solutions.
- Employers should provide adjustable equipment that allows employees to accomplish tasks in a comfortable, upright working posture.
- All materials, products, and tools that have to be used frequently must be stored in a place that can be accessed easily without requiring the worker to reach high or adopt awkward postures.
- Materials should be transported around the workplace using mechanical aids when possible and appropriate. This may reduce the force required, repetition of motions, and awkward postures, while increasing workers' efficiency.



- Unnecessary repetitive reaching, twisting, bending, and forceful exertions can be avoided by properly organizing the equipment and materials stored by grouping stored items by container size or shape.
- Installing proper lighting systems in the workplace, including all storage facilities, can help reduce eye strains and headaches.

By utilizing good design and carrying out proper maintenance of all machinery and equipment, employees can ensure pressure points on the hands and wrists, awkward postures, and forceful exertions are minimized or avoided.
Exposure to vibration may be reduced by routine maintenance of vibrating equipment, covering handles with vibration-dampening wraps, operating the tool from a distance when possible, using vibration-dampening gloves, using alternate tools that produce less vibration, utilizing vibration isolators for workers who are seated, employing cushioned floor mats for tasks that have to be carried out while standing, or using vibrating tools at low speeds.

For example, workers may use a tool that automatically ties rebar with the pull of a trigger. The extended handle lets a worker perform this task while standing upright. No leaning, kneeling, stooping, or hand twisting are necessary.



Construction workers also often use screw guns and other fastening tools that require stooping, bending, kneeling or squatting for long periods of time. Working repeatedly in these positions can result in fatigue, pain, and injury. Using an auto-feed screw gun with an extension that allows you to stand upright while working. Standing while you work keeps your spine and knees in a neutral position, minimizing strain and muscle fatigue.





Another example of a task that puts strain on workers involves using a drill or screw gun for overhead work, which forces you to keep your arms and neck in a fixed, awkward, hard to hold position. You have to push upward with a heavy tool above your shoulders, using your shoulder muscles instead of your biceps. Using a bit extension shaft for the drill or screw gun, lets you hold the tool below your shoulder and closer to your waist. You strain your arms, neck, shoulders, and back less because you don't have to hold the tool above your shoulders or work in an awkward position.





Administrative Controls

Administrative controls involve developing work practices and methods that best protect the worker. These are often focused towards devising and implementing new practices and policies in order to allow employees to carry out their jobs effectively and efficiently and avoid any on-the-job injuries, illnesses, and accidents. Administrative controls rely on communication and training, as well as feedback from management and employees on the effectiveness of the controls. Administrative controls may include:

- Job Rotation
- Adjusting Work Schedules and Work Pace
- Allowing More Frequent Breaks
- Modifying Work Practices
- Regular Housekeeping and Maintenance
- Encouraging Regular Exercise

Job Rotation

Adopting a job rotation system is one effective measure to reduce damage caused to employees by using the same muscle groups every day. With a properly designed and implemented system, employees are rotated through different jobs, thus increasing job and muscle-use variety. Another system through which employees can increase job variety is through job enlargement. Through this system, employers combine two or more jobs or add different tasks to an existing job.

These systems aim to prevent overuse and overexertion of muscles and body parts, by reducing the amount of repetition, altering the pace of work, reducing the physical exertion required, and controlling visual and mental demands.

Adjusting Work Schedules and Work Pace

Employers must be careful not to assign too heavy of a workload to employees. They also must limit the amount of time that an employee spends performing a particularly challenging job in awkward positions even when physical improvements have been incorporated.

Allowing More Frequent Breaks

Breaking work into smaller tasks allows employees to take adequate breaks between them. These breaks may help employees relax their muscles, thus preventing fatigue and injury.

Modifying Work Practices

Supervisors and managers should regularly observe how workers perform their jobs. When employees perform all jobs while in a neutral posture, the body is less susceptible to injury. Employees may be able to adopt this posture by sitting or standing upright and not bending any joints into extreme positions; they should keep their necks, backs, arms, and wrists in a neutral position. Supervisors should encourage employees to work in a comfortable position and shift their positions or stretch often.

Other modifications to work practices include:

- Minimizing distances for carrying, pushing, and pulling
- Managing an equal amount of weight in each hand
- Avoiding unnecessarily twisting of the body
- Using smooth and even motions, avoiding jerking
- Utilizing the legs to accomplish tasks rather than using the upper body or back
- Ensuring that all paths are free from obstacles and even
- Organizing tasks to provide a gradual increase in the amount of force required
- Ensuring shoes are slip-resistant.

Regular Housekeeping and Maintenance

Employers must devise a system to carry out regular housekeeping and maintenance of workspaces, equipment, machinery, and tools. There should be no cluttering in the workspace, as clutter can force employees to reach, bend, or twist their bodies while handling different objects. Additionally, employers must ensure that workspaces comply with the following points:

- All floor surfaces must be kept dry and free of any obstacles when possible. This can minimize hazards associated with slipping or tripping in the work area. Problems related to overexertion can often be minimized by carrying out regular maintenance of all tools and equipment.

- Ensure that handles and padding on vibrating tools are well maintained to help reduce vibration and awkward postures while tasks are being performed.
- All moving or mechanical parts on carts and pulleys must be properly lubricated and maintained so as to reduce the amount of force required to move them.

Encouraging Regular Exercise

Regular exercise is very important to one's well-being. It not only keeps the body fit, but it also reduces the risk of injury. Individuals who are in good physical condition are more productive and sustain fewer injuries. Employers may encourage their workers to increase their energy levels, coordination, and alertness by exercising regularly. Regular exercise can also increase the efficiency of their joints and improve blood circulation. Some organizations allow and encourage employees to warm up and engage in proper stretching before beginning work and while taking a break from work.

Protective Equipment

Personal Protective Equipment (PPE) includes all protective equipment, such as gloves, footwear, knee and elbow pads, eye protection and other equipment that employees wear according to the type of task they are involved in.

- **Gloves:** Properly selected gloves help to protect hands from sustaining injuries, improve grip, and avoid contact with chemicals. However, if gloves do not fit properly or are not made of the proper materials, they can restrict hand movement and make it harder for employees to grip things.
- **Footwear:** Choosing the proper footwear according to the nature of the job can greatly reduce the risk of slipping. Some soles are designed to reduce fatigue for employees who are required to stand for long hours while performing a task.
- **Knee and Elbow Pads:** Knee and elbow pads can protect body parts that are pressed against hard or sharp surfaces. These aim to minimize the risk of negatively affecting pressure points until proper engineering improvements can be made.
- **Back Belts:** OSHA does not recognize back belts as effective engineering controls to prevent back injury. While they may be accepted by individual workers because they feel that the belts provide additional support, the effectiveness of back belts in the prevention of low back injuries has not been proven in the work environment. OSHA's preferred approach to prevention of injuries and illnesses, including back injuries, is to eliminate the hazardous conditions in the workplace, primarily through engineering controls.

Training

Training is also an important element of ergonomics. Proper training ensures that employees are informed about ergonomic concerns in the workplace and ways to minimize the risk of injury. It is best provided by individuals who have experience with ergonomic issues in their workplace, and it should be provided annually in a manner and language that all employees can understand.

Training prepares employees for active participation in the ergonomics process, including identifying potential problems, implementing solutions, and evaluating the process. Effective training includes:

- Proper use of equipment, tools, and machine controls
- Good work practices, including proper lifting techniques
- Awareness of work tasks that may lead to pain or injury
- Recognition of MSDs and their early indications
- Addressing early indications of MSDs before serious injury develops
- Procedures for reporting work-related injuries and illnesses

Employees will benefit from orientation and hands-on training before starting tasks with potential ergonomic risk factors. Employees should also be notified of workplace changes, instructed on using new equipment, and notified of new work procedures.

An effective training program includes a mix of theoretical and practical ways in which employees can develop their skills to work safely. It must be provided to aAll employees who are exposed to different risk factors, including supervisors, managers, and appropriate engineers and maintenance personnel. All supervisors who have to administer an ergonomics program should be provided with special training focusing on how to effectively incorporate sound ergonomic principles and practices into the workplace.

Qualified persons who have a thorough knowledge about the principles of ergonomics greatly improve the quality of training. Additionally, trainers must thoroughly familiarize themselves with the workplace before devising a program. Trainers should consider communication levels before devising the training program. They should adopt a language and style that is easy for all employees to understand and relate to.

Apart from ergonomic principles, the training must also cover the risk potential of damage to the body and injuries that can result from the failure to adopt sound ergonomic principles and practices. Employee training must consist of both general and specific job-related skill sets.

General Training

Employers must provide formal training to all employees who could be exposed to ergonomic hazards to inform them about the hazards associated with their jobs and the tools, machinery, and equipment they use. Information that must be included in the



training includes specific risk factors, their causes, recognizing and reporting symptoms, and the prevention of these occurrences.

Job Specific Training

All new employees and those assigned new tasks must be made aware of the specific risks associated with a particular job before they start their work. A practical demonstration should be arranged in order to show the employees how to use all the tools and equipment properly and how to carry out all procedures efficiently. The initial training program should incorporate the following:

- How to use, handle, and maintain all tools, machinery, and equipment that have to be used as a part of the job
- How to use the special tools, if any, associated with a particular job
- How to use safety equipment and guards along with personal protective equipment to ensure safety
- How to properly lift and the proper procedures to follow when an object is too heavy to lift safely without assistance

Training for Supervisors

It is the responsibility of supervisors to ensure that all employees are properly trained to follow safe work practices and that these practices are followed on a consistent basis. In addition to the training received by employees, supervisors should receive additional training that enables them to recognize early risk signs and symptoms, hazardous work practices, how to correct those practices, and how to reinforce the ergonomic program.

Training for Managers

Apart from employees and supervisors, managers must also be made aware of their responsibilities to implement ergonomic principles that ensure the safety and health of all employees. They must also be familiar with the problems and risks associated with all tasks.

Training for Engineers and Maintenance Personnel

On-site engineers and maintenance personnel must also be trained so that they can recommend and implement the best possible machinery, equipment, designs, work practices, and tools to reduce the risk of injury and bodily damage to employees.

Lesson Summary

All supervisors required to administer an ergonomics program should be provided with special training focusing on how to effectively make the workplace safe by adopting sound ergonomic principles and practices. Apart from ergonomic principles, the training must also include the risk potential of damage to the body and injuries that can result from the failure to adopt proper ergonomic practices.



Employers must provide formal training to all employees who could be exposed to hazards to inform them about the hazards associated with their jobs and the tools, machinery, and equipment they use. New employees and those assigned new tasks must be made aware of the specific risks associated with a particular job before they start their work.
An ergonomics training program must include:

- All employees who are exposed to different risk factors
- Supervisors
- Managers
- All engineers and maintenance personnel

An effective training program includes a mix of both theoretical and practical ways in which employees can develop their skills to work safely. They must manage the amount of time that an employee spends performing a particularly challenging job

Module 11: Excavations

Module Description

This module gives you a basic understanding of how to work safely in excavations and what important points and requirements must be considered when working in an excavation. Lessons will cover topics like the various standards that OSHA has implemented to protect workers during excavation, the elements of an excavation that must be included to avoid hazards, and how to identify and understand the hazards of different soil types.

Module Learning Objectives

At the conclusion of this module, students will be able to:

- Identify factors that pose a hazard to employees working in excavations
- Explain how to protect employees from cave-ins
- Describe the role of a competent person at an excavation site

Lesson 1: Standards and Protection

Lesson Focus

At the end of this lesson, students will be able to:

- Describe OSHA standards pertaining to excavations
- Describe general excavation safety
- Identify the dangers of excavations
- Explain how to protect workers doing excavation work



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