

SECTION II

JOB SPECIFIC - EQUIPMENT SPECIFIC SAFETY PROCEDURES

Following are general safety procedures that apply to individuals operating the equipment or performing the tasks described.

CorTech LLC

SAFETY PROGRAM

SECTION II

JOB SPECIFIC - EQUIPMENT SPECIFIC SAFETY PROCEDURES

INDEX

<u>PAGE</u>	<u>TOPIC</u>
1	<u>AERIAL LIFTS</u>
2	<u>COMBUSTIBLE GAS INDICATORS</u>
3	<u>COMPANY VEHICLES</u>
4	<u>CRANES</u>
6	<u>DEMOLITION</u>
7	<u>DISPOSABLE RESPIRATORS</u>
8	<u>ELECTRICAL WORK - WORKPLACE SAFETY</u>
11	<u>EXCAVATING, TRENCHING & SHORING</u>
14	<u>EXTENSION CORDS</u>
14	<u>FLAGMEN/TRAFFIC CONTROL</u>
15	<u>GROUND FAULT CIRCUIT INTERRUPTERS</u>
16	<u>HEAVY EQUIPMENT AND ELECTRICAL POWER LINES</u>
17	<u>HOISTS</u>
17	<u>LIGHTING</u>
17	<u>MACHINE GUARDING</u>
18	<u>NFPA 70E</u>
24	<u>RIGGING FOR MATERIAL HANDLING</u>
25	<u>SCISSOR-LIFT FALL PROTECTION</u>
26	<u>SIGNS & TAGS</u>
27	<u>STAIRS</u>
28	<u>TOOLS: HAND</u>
29	<u>VENTILATION</u>
30	<u>IDENTIFICATION OF HAZARDOUS JOB SITE MATERIALS</u>

JOB SPECIFIC - EQUIPMENT SPECIFIC SAFETY PROCEDURES

AERIAL LIFTS

Aerial lifts. - 1926.453

Aerial lifts acquired for use which were manufactured on or after January 22, 1973 will have a placard or label affixed which indicates that the lift is designed and constructed in accordance with ANSI standard A92.2-1969. Aerial lifts acquired for use prior to January 22, 1973 may not be used unless modified to meet this standard. Aerial lifts may be modified to perform other than originally designed tasks provided the modifications are certified by the manufacturer or a nationally recognized testing laboratory that the aerial lift conforms with ANSI standard A92.2-1969 and is as safe as before modifications.

Aerial lifts include the following types of vehicle-mounted aerial devices to elevate personnel to job-sites above the ground:

- a. extensible boom platforms.
- b. aerial ladders.
- c. articulating boom platforms.
- d. vertical towers.
- e. a combination of any of the above.

Only authorized persons may operate an aerial lift.

Lift controls and equipment must be inspected and tested each day prior to use to determine they are in a safe working condition.

When working from an aerial lift, you must stand firmly on the floor of the basket or cage and **use (wear) and an approved fall restraint system.** The fall restraint system must be attached to the boom or basket – it may not be attached to any adjacent pole, structure, or other equipment. You may not sit or climb on the edge of the basket; use planks, ladders, or other devices for a work position.

Load limits set by the manufacturer must never be exceeded.

The brakes must be set and when outriggers are used, they shall be positioned on pads or a solid surface.

Aerial lifts must not be moved with personnel in the basket unless it is designed for this type of operation. Aerial lifts designed as personnel movers must have controls that are clearly marked as to their use and the lower controls must be able to override the upper controls. Except in an emergency, the lower controls shall not be used unless permission has been granted by the persons in the lift.

It is required that the vehicle have a “reverse signal alarm” audible above the surrounding noise level or a ground-guide (spotter), using standard hand signals, when backing up. The vehicle will be backed up only when the spotter signals that it is safe to do so. Using a ground-guide provides a substantially higher level of safety than a “reverse signal alarm” because the vehicle can be guided to an exact location with assurance that there is sufficient clearance from objects, and, most importantly, no person is in harm’s way. Special attention will be given to electrical lines.

Extreme care must be exercised to avoid contact with electrical energy.

COMBUSTIBLE GAS INDICATORS

The below information is extracted from OSHA Hazard Information Bulletin, dated, January 18, 1990., subject: *The Use of Combination Oxygen and Combustible Gas Detectors*.

In tank removal operations, it is common practice to purge a tank containing flammable vapors with either carbon dioxide or an inert gas, such as nitrogen. When the oxygen content falls to about 10% or below, a false combustible gas indicator reading can occur.

The combination oxygen and combustible gas meter is used to test atmospheres for sufficient oxygen content for life support and/or the presence of combustible gases or vapors posing a potential flammability/explosion hazard. Common examples of locations where this instrument is used include storage tanks, confined spaces, manholes, tank cars, ships and shipyards, tunneling, pumping stations and hazardous waste sites.

The combustible gas indicator is designed to measure combustible gas or vapor content in air. This instrument is capable of detecting the presence of any gas or vapor which, when combined with oxygen in free air, presents a potential hazard due to flammability/explosion. The combustible gas indicator will not indicate the combustible gas content in atmospheres containing less than 10% oxygen.

Each instrument has its own set of operating procedures and instructions, however:

- a. The instrument should not be used where the oxygen concentration exceeds that of fresh air (oxygen enriched atmosphere) when sampling for gases like acetylene and hydrogen.
- b. Certain materials such as silicon, silicates (such as in certain hydraulic fluids) and organic lead (such as in leaded gasoline) will poison the combustible gas sensor thereby giving erroneously low readings.

- c. Combustible gas readings, either negative or greater than 100% LEL, may indicate an explosive concentration of gas beyond the accurate response range of the combustible gas sensor.
- d. Pressurized or low pressure samples will give erroneous oxygen percent readings.
- e. Acid gases, such as carbon dioxide, will shorten the service life of the oxygen sensor.
- f. The instrument will not indicate the presence of combustible airborne mists or dusts such as lubricating oils, coal dust or grain dust.

The safe and effective performance of any oxygen/combustible gas detector requires that the operator know the correct use of the instrument to detect explosive concentrations of combustibles. It is important that the instrument response be appraised in light of the limitations and guidelines given in the instrument manual. The instrument should be operated only after the instructions, labels, cautions and warnings, and any other literature accompanying the instrument are carefully read and understood.

COMPANY VEHICLES

Only authorized employees may operate, in the course of their work, any company-owned motor vehicle.

Prior to authorization, the employee must possess a valid and current license to operate the vehicle. The Safety Director, or authorized representative, will ensure that the employee has demonstrated his/her ability to operate the motor vehicle in a safe and competent manner.

Under no circumstances may any motor vehicle be operated under the influence of alcohol, illegal drugs, or prescription or over-the-counter drugs medications that may impair their driving skills.

Before driving on the highway, employees will ensure that the vehicle registration and proof of insurance is within the vehicle. In the event of an accident, the Safety Director will be notified **immediately** after all potential injuries are addressed and a police report is filled out. Employees must report all traffic violations to the Safety Director and they are responsible for paying all penalties imposed by law.

Loads in vans and trucks will be properly secured [strapped or blocked] to preclude any shift or movement and care will be taken to not exceed the vehicles weight limits.

All company motor vehicles will be maintained in safe operating condition and in accordance with the manufacturer's recommended maintenance schedule. A log book will be maintained for each vehicle and receipts will be kept for all maintenance and repairs performed.

Before use, a walk around inspection will be performed by the operator checking tires (tread depth and pressure), glass (chips and cracks), horn and lights, and general vehicle condition. Discrepancies will be noted in the log book. No vehicle will be operated that is not in safe mechanical condition.

It is expected that the below safe vehicle operation/driving procedures will be followed at all times:

1. Seat belts will be worn by all occupants at all times while the vehicle is in motion.
2. Safe distance [one vehicle length per 10 MPH] will be maintained.
3. Posted speed limits will not be exceeded.
4. During fuel stops, all fluids will be checked and the windows, headlights and taillights will be cleaned.
5. Constant attention will be maintained by always being aware of road conditions and surrounding vehicles. Unnecessary distractions will not be permitted such as using hands to dial or receive cell phone calls or changing radio stations while the vehicle is in motion. Hands free cell phone use is allowed.
6. Before backing up any vehicle, check behind and blow horn for the safety of others.

CRANES

Note: The below information is applicable to the following crane types and operations:

1. **Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting.**
2. **Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning automatic overload prevention device. Such sheet goods or packaged materials include, but are not limited to: sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt.**

Note: The above articulating/knuckle-boom crane exclusion does not apply when it is used to 1) hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure; 2) when the material being handled is a prefabricated component such as precast concrete members or panels, roof trusses, prefabricated building sections such as, but not limited to: floor panels, wall panels, roof panels, roof structures, or similar items; and, 3) when the material being handled by the crane is a structural steel member (for example, steel joists, beams, columns, steel decking (bundled or unbundled) or a component of a systems-engineered metal building.

All other crane operations fall under Subpart CC—Cranes and Derricks in Construction. **Our program that address Cranes and Derricks in Construction is found in Section III of this safety program.**

Cranes, like all pieces of heavy equipment, if not properly operated, inspected and maintained have a potential for causing major bodily injury or property damage. Care must be taken in all facets of crane operation.

Not only do cranes require a thorough annual inspection (a record of the dates and results of these inspections must be maintained), they require inspection prior to each use and even during use by a competent person.

All rated load capacities, recommended operating speeds, special hazard warnings or instructions must be readily visible to the operator of the crane.

While cranes easily have the lifting ability to hoist employees on a personnel platform, this is absolutely prohibited except in cases when the erection, use, and dismantling of conventional means of reaching the worksite would be more hazardous or is not possible because of structural design or worksite conditions. A conventional means would include: a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold.

It is absolutely imperative that the possibility of electrocution be totally eliminated. This can be accomplished by adhering to the safe distances from various currents noted in Heavy Equipment and Electrical Power Lines, below.

Dangers associated with cranes include numerous moving parts. These dangers can be minimized or eliminated by ensuring that all guards are in place and not tampered with.

Care must be taken to ensure that areas within the swing radius of the rear of the rotating superstructure of the crane are barricaded to prevent a person from being struck or crushed.

All employees must keep clear of loads that are about to be lifted as well as suspended loads.

When using slings made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene), the following safe operating practices will be observed:

- a. Slings shall not be shortened with knots or bolts or other makeshift devices.
- b. Sling legs shall not be kinked.
- c. Slings used in a basket hitch shall have the loads balanced to prevent slippage.

- d. Slings shall be padded or protected from the sharp edges of their loads.
- e. Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

Hand signals used to guide the crane operator will be consistent with the ANSI standard for the type of crane in use and an illustration of the signals must be posted at the job site.

Care must be taken while actually operating the crane in hoisting applications as well as when relocating the crane superstructure.

The competent person on site will ensure that the flooring on which equipment may be placed is substantial enough to safely hold the weight of the load. If the strength of the floor is unknown and/or cannot be determined, a professional engineer will determine the pounds per square foot required and, if necessary, the appropriate shoring to be installed to sustain the weight.

DEMOLITION

Preparatory operations. - 1926.850

Stairs, passageways, and ladders. - 1926.851

Chutes. - 1926.852

Removal of materials through floor openings. - 1926.853

Removal of walls, masonry sections, and chimneys. - 1926.854

Manual removal of floors. - 1926.855

Removal of walls, floors, and material with equipment. - 1926.856

Storage. - 1926.857

Removal of steel construction. - 1926.858

Mechanical demolition. - 1926.859

Selective demolition by explosives. - 1926.860

Demolition work presents specific hazards that are not normally found on typical job sites. These hazards include, but are not limited to:

- a. the actual collapse of the structure being demolished. Prior to demolition operations, a competent person must determine, and document in writing, the condition of the framing, floors, and walls, and assess the possibility of an unplanned collapse of any portion of the structure. If appropriate, adjacent structures where employees may be exposed to danger must be checked by a competent person.
 - 1. wall and floors must be braced or shored if employees must work in a structure to be demolished that has been damaged by fire, flood, explosion.
- b. explosion, electrocution, hazardous atmospheres. Prior to demolition work all electric, gas, water, steam, sewer, and other service lines must be shut off, capped, or otherwise controlled,

outside the building line before demolition work is started. In each case, any utility company which is involved shall be notified in advance.

1. additionally, the competent person must determine if hazardous chemicals, gases, explosives, flammable materials, etc. are in pipes, tanks, or other equipment on the property. If apparent or suspected, testing and purging must be performed and the hazard eliminated before demolition is started. It is not uncommon during the demolition of older structures to have potential asbestos and/or lead exposure.

Note: If an abatement contractor has abated materials from a building that we are to demolish, we will obtain written certification from the abatement contractor certifying that all the materials in question have been properly removed and appropriate air and/or wipe clearance testing has been completed.

- c. shattered glass.
- d. falling debris.
- e. falling through holes or wall openings.

Procedures to eliminate employee hazard exposure during demolition operations are found in the above referenced demolition standards. Areas that are addressed include: stairs, passageways, and ladders; chutes; removal of materials through floor openings; removal of walls, masonry sections, and chimneys; manual removal of floors; removal of walls, floors, and material with equipment; storage of waste material; removal of steel construction; and mechanical demolition.

DISPOSABLE RESPIRATORS

OSHA requires that employees who voluntarily use disposable respirators in situations where respiratory protection is not specifically required by OSHA standard (in atmospheres where exposures are below the permissible exposure limit) essentially for personal comfort or additional, though not required, respiratory protection be informed of 29 CFR 1910.134 Appendix D, printed below.

By insisting that these employees sign the tear-off employee handbook acknowledgement form, you can protect your company from OSHA citation for violating this requirement.

All disposable respirators, such as Moldex, 3M, Wilson, North Safety, etc. must be marked with the manufacturer's name, the part number, the protection provided by the filter, and "NIOSH".

Disposable filters are actually negative pressure respirators. They protect the user by filtering particles out of the air breathed.

Though disposable filters cannot be fit-tested in the traditional sense, they must be fit-tested in accordance with the manufacturer's instructions.

Under no circumstances may any respirator other than the above disposable respirators be used without compliance with a respiratory protection program.

Standard Number: 1910.134 App D

Standard Title: (Mandatory) Information for Employees Using Respirators When not Required Under Standard.

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard. You should do the following: 1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations. 2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you. 3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke. 4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998]

ELECTRICAL WORK - WORKPLACE SAFETY

Applicability. - 1926.402

General requirements. - 1926.403

Wiring design and protection. - 1926.404

Special systems. - 1926.408

General requirements. - 1926.416

Definitions applicable to this subpart. - 1926.449

All electrical work will be done according to the latest adopted National Electrical Code as well as established local codes.

ELECTRICAL SAFETY MEASURES

- a. Daily, prior to use, all electrical equipment -- including extension cords -- will be inspected and defective items will be tagged out of service and not used.
- b. With the exception of double insulated tools (with UL approval), all electrical tools and equipment will be grounded.

- c. Tools will not be hoisted by their flexible electrical cords.
- d. Except in an emergency, load rated switches and circuit breakers will be used for the opening and closing of circuits under load conditions as opposed to fuses and splice connections.
- e. While working on electrical equipment, unauthorized persons will be kept clear by barriers or other means of guarding.
- f. Temporary wiring and extension cords will be kept off of walking working surfaces and vehicle traffic areas or covered to prevent tripping and vehicle damage.
 - 1. Electrical cords will not be suspended with staples, hung from nails, or suspended by wire.
 - 2. Worn or frayed electric cords or cables will not be used.
- g. Hands will be dry when working on electrical equipment including plugging in extension cords.
- h. Areas in which electrical work is to be done must be adequately illuminated and temporary lighting must:
 - 1. have guards in place.
 - 2. not be suspended by its cords unless specifically designed for such installation.
- i. A competent person, before work commences, will inform all employees in the work area of both exposed and concealed electrical hazards. If appropriate, warning tags will be used to prevent accidental contact with electrical energy.
- j. When working around any electrical power circuit, employees will:
 - 1. **protect themselves by deenergizing the circuit and grounding it or by establishing insulation between themselves and the current.**
 - 2. ensure that any conductive materials and equipment that are in contact with any part of their body will be handled in a manner that will preclude contact with exposed energized conductors or circuit parts.
 - 3. use portable ladders that have non-conductive siderails.
 - 4. remove or insulate conductive articles of jewelry and clothing that might contact exposed energized parts.
- k. All 15, 20, or 30 amp receptacle outlets that are not part of the permanent wiring of the building or structure and that are used by personnel shall have ground-fault circuit interrupter protection for

personnel. GFCI pigtails may be used to meet this requirement if properly sized. Remember, extension cords are considered temporary wiring.

1. Ground fault circuit interrupters will be tested before use.
- l. Only qualified persons may perform testing work on electric circuits or equipment.
- m. Sufficient access and working space must be maintained about all electric equipment to permit ready and safe operation and maintenance. This space must be kept clear, i.e., it can not be used for storage.
- n. The dimension of the working space in the direction of access to live parts likely to required examination, adjustment, service, or maintenance must not be less that noted below:

Working Clearances

Minimum clear distance for conditions¹

<u>Nominal voltage to ground</u>	<u>(a) Feet²</u>	<u>(b) Feet²</u>	<u>(c) Feet²</u>
0-150	3	3	3
151-600	3	3 ½	4

Footnote¹ Conditions (a), (b), and (c) are as follows:

- {a} Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts.**
- {b} Exposed live parts on one side and grounded parts on the other side.**
- {c} Exposed live parts on both sides of the workplace [not guarded as provided in Condition (a)] with the operator between.**

Minimum Depth of Clear Working Space in Front of Electric Equipment

Conditions¹

<u>Nominal voltage to ground</u>	<u>(a) Feet²</u>	<u>(b) Feet²</u>	<u>(c) Feet²</u>
601 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9
25,001 to 75 kV	6	8	10
Above 75kV	8	10	12

Footnote¹ Conditions (a), (b), and (c) are as follows:

- {a} Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively**

guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts.

- {b} Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or tile are considered to be grounded surfaces.
- {c} Exposed live parts on both sides of the workspace [not guarded as provided in Condition (a)] with the operator between.

1. The importance of working clearances cannot be overstated. At any time, when working with live electrical systems, there is the possibility of an arcing fault causing an arc flash where the current explosively flows through ionized air at 35,000°F causing incurable burns, hearing loss, collapsed lungs, or even death from the electricity of flying metal shrapnel.
2. As a contractor working in an area where the possibility of arc flash exists, check to see if an arc flash assessment has been performed on electrical equipment on which you will be working. If it has, follow that specific guidance. If it has not, perform (or have a qualified vendor perform) the arc flash assessment. Refer to NFPA 70E for specific guidance appropriate to the facility's specific electrical equipment.

Note: NFPA 70E is a National Consensus Standard which is incorporated by reference within the OSHA standards; specifically, Appendix A to Subpart S, 29 CFR 1910. Failure to comply with NFPA 70E is citable under the general duty clause.

The above electrical safety measures are not all inclusive, however they cover many normal job site events. A complete list is found in the cited references and they are incorporated into this safety manual. If in doubt about any safety procedure, contact your supervisor or the competent person for clarification.

EXCAVATING, TRENCHING & SHORING

Scope, application, and definitions applicable to this subpart. - 1926.650

Specific Excavation Requirements. - 1926.651

Requirements for protective systems. - 1926.652

Soil Classification - 1926 Subpart P App A

Sloping and Benching - 1926 Subpart P App B

Timber Shoring for Trenches - 1926 Subpart P App C

Aluminum Hydraulic Shoring for Trenches - 1926 Subpart P App D

Alternatives to Timber Shoring - 1926 Subpart P App E

Selection of Protective Systems - 1926 Subpart P App F

Excavating involves any earth removal which creates a cut, cavity, trench, or depression in the earth's surface. A trench is a narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet. If forms or other structures are installed or constructed in

an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less (measured at the bottom of the excavation), the excavation is also considered to be a trench.

Prior to excavating, obstructions that may create a hazard to employees will be removed or supported and utility companies will be contacted, advised of the proposed work, and asked to establish the location of underground installations.

If the utility company cannot respond to this request within 24 hours and/or the exact location of the underground installations cannot be determined, actual work may begin provided that:

- a. extreme caution is observed.
- b. detection equipment or other acceptable means are used to locate the approximate location of the utility installation.
- c. as the approximate location is approached, the exact location will be determined by safe and acceptable means before proceeding.

In open excavations, underground installations will be protected, supported or removed as necessary to protect employees.

To ensure employee safety, the competent person will ensure that during excavating work in trenches there is:

- a. appropriate access and egress for personnel and/or equipment such as stairs, ramps and ladders so as to require no more than 25 feet of lateral travel for employees in trenches four (4) feet or more deep.
- b. employee protection for head injury. All employees must wear hard hats.
- c. no spoil pile or equipment within two (2) feet of the edge of the excavation.
- d. employee protection from vehicular traffic such as barricades, ground guides for operators of equipment with a limited view, away sloping grades, etc..
- e. no exposure to falling loads.
- f. no danger to employees from water accumulation.
- g. no danger from cave-in. Shoring, a structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation, will prevent cave-ins.
 1. Shoring is not required for trenches less than five (5) feet deep if an examination by a competent person determines the soil has no potential for a cave-in. In this situation, vertical sides are allowed.

2. Once a trench is over 20 feet deep, protective systems, which may include shoring, must be designed by a registered professional engineer.
 3. There are other methods of protection from cave-ins such as sloping or benching the adjacent ground according to specific criteria dependent on the soil conditions, weather, and adjacent structures.
 4. The total number of cave-in accidents is relatively small, however, the accidents which do occur are generally very serious and are much more likely to be fatal than other types of accidents in the construction industry.
- h. a method to prevent mobile equipment from falling into the excavation such as barricades. Ground guides will be used if the equipment operator does not have a clear view of the edge. If possible, the grade should slope away from the excavation.

If the atmosphere is dangerous or likely to be dangerous, testing will be done as often as needed and emergency rescue equipment -- such as breathing apparatus, safety harness and line, or a basket stretcher -- must be available.

When a hazardous atmosphere does exist, appropriate respiratory protection will be used and a rescue plan developed which includes having an attendant outside the hazardous area with appropriate equipment and training.

PROTECTIVE SYSTEMS

Except when an excavation is made entirely in stable rock or it is less than 5 feet in depth and a competent person finds no indication of potential cave-in, employees in an excavation will be protected from cave-in by protective systems designed in accordance with paragraphs (b) or (c) of 26 CFR 1926.652.

All employees involved with excavating are to review these standards and understand, in general terms:

- a. The extensive degree of basic data, design, and knowledge that goes into employee protection during excavating projects.
- b. The types of soils and how to identify them on the job site.
- c. The soil condition -- specifically moisture content -- and how that impacts on stability during excavations.
- d. The absolute need for a competent person to be on site at all times during excavating work to visually and manually test soil conditions as work progresses and to maintain a safe site.

DAILY INSPECTIONS

Prior to work and as needed throughout the shift, a competent person will conduct daily inspections of excavations, adjacent areas and protective systems to find evidence of a developing cave-in situation; failure of protective systems; hazardous atmosphere; or other hazardous conditions.

After every rainstorm or event which would affect the safety of employees within an excavation, an inspection will be made by a competent person.

FALL PROTECTION

Walkways must be provided where employees or equipment are required or permitted to cross over excavations. If these walkways are 6 feet or more above a lower level, guardrails must be used. Specific criteria for guardrails is found in 29 CFR 1926.502(b), a copy of which is found in our Fall Protection Program located in Section III of this safety program.

EXTENSION CORDS

Wiring methods, components, and equipment for general use. - 1926.405

General requirements. - 1926.416

Extension cords shall not replace permanent wiring and the following safety precautions will be adhered to:

- a. Inspect the cord for cracks and cuts.
- b. Cord must have a three prong plug for grounding.
- c. Use the shortest continuous length of cord possible. Cords may not be spliced together.
- d. Make certain the cord does not lay in water.
- e. Ensure cord is properly rated for the job.
- f. Secure and route cords out of the traffic flow to prevent tripping.
- g. Defective cords will be tagged and removed from service.
- h. Most importantly, an extension cord used on a job site MUST be used with a ground fault circuit interrupter (GFCI).

FLAGMEN/TRAFFIC CONTROL

Manual on Uniform Traffic Control Devices, Millennium Edition

The primary function of traffic control procedures is to move vehicles and pedestrians safely and expeditiously through or around temporary traffic control zones while protecting on-site workers and equipment.

Construction areas will be posted with legible traffic signs at points of hazard. All traffic control signs or devices used for protection of construction workers must conform to Part VI of the Manual on Uniform Traffic Control Devices, Millennium Edition, December 2000.

For daytime work, the flagger's vest, shirt, or jacket will be orange, yellow, strong yellow green or fluorescent versions of these colors.

For nighttime work, similar outside garments will be retroreflective. The retroreflective material will be orange, yellow, white, silver, strong yellow-green, or a fluorescent version of one of these colors and will be visible at a minimum distance of 1,000 feet. The retroreflective clothing will be designed to identify clearly the wearer as a person and be visible through the full range of body motions.

Uniformed law enforcement officers may be used as flaggers in some locations, such as an urban intersection, where enforcement of traffic movements is important. Uniformed law enforcement officers may also be used on freeways where traffic is channeled around work sites and it is necessary to assure that advisory and regulatory speeds are being enforced. For nighttime work and in low-visibility situations, a retroreflective garment as described above should be worn.

Hand-signaling devices, such as STOP/SLOW paddles, lights, and red flags are to be used to control traffic through temporary traffic control zones. The STOP/SLOW paddle, which gives drivers more positive guidance than red flags, should be the primary hand-signaling device. The standard STOP/ SLOW sign paddle will be 18 inches square with letters at least 6 inches high. A rigid handle should be provided. This combination sign should be fabricated from light semi-rigid material, and will have an octagonal shape. The background of the STOP face will be red with white letters and border. To be better seen, the STOP/SLOW paddles may be supplemented by one or two symmetrically positioned alternately flashing white high-intensity lamps on each side. The background of the SLOW face will be orange with black letters and border. When used at night, the STOP/ SLOW paddle will be retroreflectorized in the same manner as signs.

Flag use should be limited to emergency situations and at low-speed and/or low-volume locations which can best be controlled by a single flagger. Flags used for signaling will be a minimum of 24 inches square, made of a good grade of red material, and securely fastened to a staff about 3 feet long. The free edge should be weighted so the flag will hang vertically, even in heavy winds. When used at night, flags will be retroreflective red.

GROUND FAULT CIRCUIT INTERRUPTERS

Wiring design and protection. - 1926.404

A ground fault circuit interrupter (GFCI) provides protection for all 120-volt, 15-, 20-, and 30-ampere receptacle outlets that are not a part of the permanent wiring by detecting lost current resulting from a short,

overheating, and/or ground fault. It should be noted that an extension cord into which electrical devices are plugged are not part of the permanent wiring; therefore, GFCI's are required.

A GFCI will "trip" when the amount of current amperes going to an electrical device in the hot conductor and the amount of current returning from an electrical device differs by approximately 5 milliamps. The GFCI can interrupt the current within as little as 1/40th of a second.

The current that is missing is being lost through a ground fault, whether it is in the actual grounding, a short in the equipment or electricity going through the employee to the ground.

A GFCI will not protect an employee who comes in contact with two hot wires or a hot wire and a neutral wire. A GFCI will provide protection against fires, overheating, damage to insulation, and, the most common form of electrical shock hazard -- the ground fault. GFCI's must be tested before use.

HEAVY EQUIPMENT AND ELECTRICAL POWER LINES

Except where electrical distribution and transmissions lines have been deenergized and visibly grounded at point of work or where insulating barriers (not attached to the vehicle) have been erected to prevent physical contact with the lines, the following clearance -- between any part of the equipment, load line, or load **and** the power line -- will be observed:

Table A—Minimum Clearance Distances Per 29 CFR 1926.1408 & 1409

Voltage (nominal, kV, alternating current)	Minimum clearance distance(feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(As established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

A ground guide will be designated to observe clearance of the equipment and give warning to the equipment operator in situations where it is difficult for the equipment operator to maintain the desired clearances by visual means.

An overhead wire will be considered energized unless the owner of the line or the electrical utility authorities indicate that it is not energized and it has been visibly grounded.

HOISTS

Material hoists, personnel hoists, and elevators. - 1926.552

A hoist is a useful mechanical device which gives one the ability to lift and move heavy objects -- not people. No person is to ride on a hoist. As with all mechanical devices, improper use may lead to injury. You must know what you are doing and you must be careful.

Before use, hoists must be inspected for bent or damaged components. Particular attention should be paid to guarding. Fingers and loose clothing could be snagged in exposed mechanisms. Chains, cables, or rope slings must not be kinked, twisted, or frayed.

Loads must be properly rigged with hooks or slings and they must never exceed the hoist's rated capacity.

Ensure that the area around the hoist is free from debris and, most importantly, people. Do not allow yourself or others to be under a hoisted load.

LIGHTING

Illumination. - 1926.56

A competent person will ensure that all work areas have adequate lighting. Adequate lighting serves a two-fold purpose -- allowing tasks to be more readily performed as well as providing the additional safety factor of being seen by persons not involved with the work -- especially vehicular traffic.

If generators are used for auxiliary lighting, they will be operated and maintained by authorized persons who are competent by training or experience.

MACHINE GUARDING

Mechanical power-transmission apparatus. - 1926.307

Most injuries that occur when operating a machine happen at the point of operation -- the point on a machine where the actual work (cutting, bending, spinning) occurs. This is also the point where guards can protect fingers and hands exposed to that danger. Machine guarding also protects employees from other dangers such as flying pieces of metal, sparks, gears, belts, and rotating parts.

The most common types of machines on job sites are power tools which often have guards to prevent injury.

Accident prevention in this area is a function of machine design -- engineering controls -- and operator training. Types of machine guarding are almost as numerous as types of machines -- the most common being a physical barrier to prevent accidental insertion of body parts. Guards are vital for safety reasons and machine guards designed into a machine should never be altered or removed. The speed and tremendous forces

involved in modern machines are such that severe injury or even death could occur without warning and without even slowing the machine down.

Training and proper work methods go a long way toward reducing machine accidents. Like all safeguards, there is generally a way to bypass safety features that are engineered into machines. This is sometimes done to increase speed or just to make one's job easier. This could result in a tragic, avoidable accident. The few seconds saved could cause a lifetime of grief. Do not bypass safety systems.

Operate all machines according to the instructor's manual and follow all safety procedures.

NFPA 70E

Standard for Electrical Safety in the Workplace

OSHA has adopted by reference NFPA 70E-2000, *Standard for Electrical Safety Requirements for Employee Workplaces*.

A national consensus standard, such as NFPA 70E-2009, however, can sometimes be relevant to a general duty clause citation in the sense that the consensus standard may be used as evidence of hazard recognition and the availability of feasible means of abatement. The general duty clause, Section 5(a)(1) of the OSH Act, is violated if an employer has failed to furnish a workplace that is free from recognized hazards causing or likely to cause death or serious physical harm. The general duty clause is used where there is no standard that applies to the particular hazards involved.

All electrical work will be done in compliance with the National Electric Code (NEC), OSHA standards, and NFPA 70E. OSHA standards and NFPA 70E deal with worker safety. The NEC deals with the design, installation, and inspection of electrical installations.

A copy of NFPA 70E will be readily available for reference, training, and employee use. This document may be purchased from the NFPA website at: www.nfpa.org.

Training:

All employees who face electrical hazards that are not reduced to a safe level by the applicable electrical installation requirements will be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with the job assignments. Employees will be trained to identify and understand the relationship between electrical hazards and possible injury.

Training will be in a classroom and/or on-the-job and the degree of training will be determined by the risk to the employee.

Employees will receive training in emergency procedures including methods of release from contact with exposed energized electrical conductors or circuit parts; methods of first aid; and CPR if the duties warrant such training. If required, the Safety Director will certify that employees have been trained in approved methods of resuscitation annually.

Training for Qualified Persons:

Note: A qualified person has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.

1. Qualified persons must be trained and knowledgeable of the construction and operation of equipment or a specific work method and to recognize and avoid the electrical hazards with respect to the equipment or work methods.
 - a. Qualified persons will be familiar with the proper use of special precautionary techniques, PPE, including arc-flash, insulating and shielding materials, and insulated tools and test equipment.

Note: A person can be qualified with respect to certain equipment and methods but still be unqualified for others.

- b. Qualified persons will be permitted to work with the Limited Approach Boundary of exposed energized electrical conductors and circuit parts operating at 50 volts or more and will be trained in the following:
 - 1) The skills and techniques necessary to distinguish exposed energized electrical conductors and circuits parts from other parts of electrical equipment
 - 2) The skills and techniques necessary to determine the nominal voltage of exposed energized electrical conductors and circuit parts.
 - 3) The approach distances specified in Table 130.2(c) and the corresponding voltages to which the qualified person will be exposed.
 - 4) The decision-making process necessary to determine the degree and extent of the hazard and the PPE and job planning necessary to perform the task safely.
 - c. If undergoing OJT and, in the course of the OJT has demonstrated an ability to perform duties safely under the direct supervision of a qualified person, this person will be considered qualified for the performance of these duties.

- d. Tasks performed less often than once per year will require retraining before performance of the work practices involved.
- e. Qualified persons will be trained to select an appropriate voltage detector and demonstrate how to use a device to verify the absence of voltage, including interpreting indications provided by the device. Will be trained to understand all limitations of each specific voltage detector that may be used.

Training for Unqualified Persons:

Unqualified persons will be trained in and be familiar with any of the electrical safety related practices that are necessary for their safety.

NOTE: Unqualified persons will not be permitted to enter spaces that are required to be accessible to qualified employees only unless the electric conductors and equipment involved are in an electrically safe work condition.

Retraining:

Retraining will be given when.

- a. Supervisors or annual inspections indicate that the employee is not complying with the safety-related work practices.
- b. New technology, new types of equipment, or changes in procedures necessitate the use of safety-related work practices that are different than those the employee would normally use.
- c. If the employee must employ safety-related work practices that are not normally used during regular job duties.

Training Documentation:

The company will document that each employee has received the training above **after** the employee demonstrates proficiency in the work practices involved and will be maintained for the duration of the employee's employment. Training documentation will contain the employee's name and dates of training.

Host Employer Responsibilities:

The host employer will inform contract employers of:

- a. Known electrical hazards that are related to the contract employer's work that might not be recognized by the contract employer or its employees.
- b. Information about the employer's installation that the contract employer needs to make assessments.

The host employer will report observed contract employer related violations (dealing with electrical work) to the contract employer.

Contract Employer Responsibilities:

- a. The contract employer will ensure that each of its employees is instructed in the hazards communicated to the contractor employer by the host employer. This instruction is in addition to the basic instruction required by NFPA 70E.
- b. The contract employer will ensure that each of its employees follow the work practices required by NFPA 70E and safety-related work rules required by the host employer.
- c. The contractor employer will advise the host employer of:
 - 1) Any unique hazards presented by the contract employer's work.
 - 2) Any unanticipated hazards found during the contract employer's work that the host employer did not mention.
 - 3) The measure the contractor took to correct any violations reported by the host employer and prevent such violations from recurring in the future.

Electrical Safety Program:

The employer will implement and document an overall safety program that directs activity appropriate for the voltage, energy level, and circuit conditions.

Safety related work practices are only one component of an overall an electrical safety program.

Electrical Safety Program Procedures:

The program will address safety related work practices for working within the Limited Approach Boundary. Program elements found in Annex E to NFPA 70E would be included such as evaluations, anticipating unexpected events, electrical flash arc hazard analysis, and the fact that all electrical parts are considered live until proven otherwise.

Risk/Hazard Evaluation Procedures:

Risk/hazard evaluation procedures are to be used before work is started within the Limited Approach Boundary of energized electrical conductors and circuit parts operating at 50 volts or more or where an electrical hazard exists. An example of Hazard/Risk Evaluation Procedures as well an example of a Hazard Risk Analysis Evaluation Flow Chart is found in Annex F to NFPA 70E. In would contain event severity, frequency, probability and avoidance to determine the level of safe practices to be employed.

Pre-Job Briefings for Routine Work:

Prior to performing routine work [routine work is not complicated or particularly hazardous and the employee should be able to recognize and avoid hazards presented], a job briefing will be held before each job and include all employees involved. Topics would include hazards associated with the job, work procedures involved, special precautions, energy source controls, and PPE requirements.

Test Instruments and Equipment:

All test instruments, equipment, and their accessories will be rated for the circuits and equipment to which they will be connected. Further they will meet the requirements of ANSI/ISA-66010-1, *Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements*, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 volts and below.

Operations Verification:

When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument will be verified before and after an absence of voltage test is performed.

Insulating PPE Maintenance and Use:

Electrical protective equipment will be maintained in a safe, reliable condition. Insulating equipment will be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves will be given an air test along with the inspection.

Maximum test intervals for rubber insulating equipment will be in accordance with NFPA 70E Table 130(c)(6)(c). Time frames for testing would include: 1) Blankets-before first issue/every 12 months, thereafter, 2) Gloves-before first issue and every 6 months, and, 3) Sleeves-before first issue and every 12 months. Covers and line hose will be tested if insulating value is suspect.

Energized Electrical Work Permit:

Reference Annex J to NFPA 70E. Energized Electrical Work Permits **are not** part of NFPA 70E. Within Annex J, however, are both an example of a Energized Electrical Work Permit and a Flow Chart to illustrate items to consider when determining the need for the permit.

In every case, if the voltage level is ≥ 50 volts **AND** there are exposed live parts, an Energized Electrical Work Permit is required.

Part I [to be completed by the Requester] of the Energized Electrical Work Permit will include:

1. Job/Work Order Number.
2. Description of the work to be done.
3. Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage.
4. Requester Name, Title, and Date.

Part II [to be completed by the Electrically Qualified persons **doing** the work] of the Energized Electrical Work Permit will include:

1. Detailed job description procedure to be used in performing the above detailed work.
2. Description of the Safe Work Practices to be employed.
3. Results of the Shock Hazard Analysis.
4. Determination of the Shock Protection Boundaries.
5. Results of the Arc Flash Hazard Analysis.
6. Determination of the Arc Flash Protection Boundary.
7. Necessary personal protective equipment to safely perform the assigned task.
8. Means employed to restrict the access of unqualified persons from the work area.
9. Evidence of completion of a Job Briefing including discussion of any job-related hazards.
10. A signed and dated agreement by each Electrical Qualified Person that the above work can be done safely.

Part III of the Energized Electrical Work Permit will include:

Signed and dated approval(s) by persons such as:

1. Manufacturer Manager
2. Safety Manager
3. General Manager
4. Maintenance/Engineering Manager
5. Electrically Knowledgeable Person

Illumination of Work Areas:

Employees will not enter spaces containing electrical hazards unless illumination is provided that enables the employees to perform the work safely. Where lack of illumination or an obstruction precludes observation

of the work to be performed, employees will not perform any task with the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.

RIGGING FOR MATERIAL HANDLING

Rigging equipment for material handling. – 1926.251

Note: The below information is applicable to the following crane types and operations:

- 1. Articulating/knuckle-boom truck cranes that deliver material to a construction site when used to transfer materials from the truck crane to the ground, without arranging the materials in a particular sequence for hoisting.**
- 2. Articulating/knuckle-boom truck cranes that deliver material to a construction site when the crane is used to transfer building supply sheet goods or building supply packaged materials from the truck crane onto a structure, using a fork/cradle at the end of the boom, but only when the truck crane is equipped with a properly functioning automatic overload prevention device. Such sheet goods or packaged materials include, but are not limited to: sheets of sheet rock, sheets of plywood, bags of cement, sheets or packages of roofing shingles, and rolls of roofing felt.**

Note: The above articulating/knuckle-boom crane exclusion does not apply when it is used to 1) hold, support or stabilize the material to facilitate a construction activity, such as holding material in place while it is attached to the structure; 2) when the material being handled is a prefabricated component such as precast concrete members or panels, roof trusses, prefabricated building sections such as, but not limited to: floor panels, wall panels, roof panels, roof structures, or similar items; and, 3) when the material being handled by the crane is a structural steel member (for example, steel joists, beams, columns, steel decking (bundled or unbundled) or a component of a systems-engineered metal building.

- 3. Other rigging requirements are found in the applicable provisions of Cranes and Derricks in Construction, found in Section III of this program, specifically, 1926.1401, 03, 04, 07, 08, 23, 27, 31, & 33.**

Prior to use on each shift, rigging equipment including slings and all fastenings and attachments will be inspected for damage or defects by a qualified person. Additional inspections will be performed during sling use and where service conditions warrant to ensure that it is safe.

Defective/damaged equipment including slings and rigging will not be used and will be immediately removed from service.

Per 1926.251(a)(3), rigging equipment, when not in use, will be removed from the immediate work area and stored properly so as not to present a hazard to employees.

Under no circumstances may any employee be under a suspended load.

29 CFR 1926.251, *Rigging Equipment for Material Handling*, contains Tables H-1 to H-20 which indicate rated capacities for various types of slings and grommets, safe working loads for shackles, number and spacing

of U-Bolt Wire Rope Clips, and maximum allowable wear at any point of link.

Welded alloy steel chain slings must have permanently affixed durable identification stating size, grade, rated capacity, and sling manufacturer. Of course, hooks, rings, oblong links, pear-shaped links, welded or mechanical coupling links, or other attachments, when used with alloy steel chains, will have a rated capacity at least equal to that of the chain.

Rigging equipment will **not be loaded in excess** of its recommended safe working load and load identification will be attached to the rigging.

Specific requirements for use and inspection of alloy steel chains; wire rope; natural rope and synthetic fiber; synthetic webbing; and shackles are found in the above standards.

SCISSOR-LIFT FALL PROTECTION

What type of fall protection is required for scissor-lifts? This apparently simple question has a relatively simple answer. However, how it is derived is somewhat complicated because OSHA does not have a standard to deal with this issue.

Clearly, there is a hazard -- falling from height -- however, fall protection while using a scissor-lift is not covered in the fall protection, scaffold and ladder fall protection, nor aerial lift fall protection standards.

Section 5(a)(1) of the Occupational Safety and Health Act, commonly referred to as the General Duty Clause is a "catch all clause" which states: "Each employer shall furnish to each of its employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

In the absence of a specific standard relating to a safety or health risk, the above is the reference OSHA will cite.

When assessing compliance efforts, OSHA considers the requirements of pertinent national consensus standards. In the case of scissor-lifts, ANSI/SIA A92.6-1990, *Self-propelled Elevated Work Platforms*, and ANSI/SIA A92.3, *Manually Propelled Elevating Aerial Platforms*, are used.

Fall protection is provided by employees maintaining firm footing on the lift and using guardrails. Under no circumstances are employees to place ladders or other items on the lift to extend their reach. Per ANSI/SIA standards, with which OSHA concurs, "Use of planks, ladders, or any other device on the aerial platform for achieving additional height or reach shall be prohibited." Use of these items negates the value of the guardrail system and may possibly exceed the scissor-lift's design limits for stability.

Further, personnel are not to tie off to items adjacent to the lift -- the most obvious reasons are: the anchorage point may not be sufficient and movement of the lift would pull the employee out of and off of the lift.

If, for some reason, guardrails are not being provided for a specific operational reason, then a personal fall protection system may be used which would include an anchorage point, lanyard and safety harness. However, this option is severely limited because its design would have to be approved by a registered engineer or the scissor-lift manufacturer would have to approve the use of the lift as an anchorage.

Under ideal conditions, rarely found on a construction site, scissor-lifts may be moved with the lift extended. However, should obstacles, debris, drop-offs, holes, depressions, ramps or other hazards be present, the lift must be lowered prior to movement.

Finally, if the employee leaves the safety of the scissor-lift platform while working at height, some sort of approved fall protection system must be employed.

SIGNS & TAGS

Accident prevention signs and tags. - 1926.200

When appropriate, signs and tags will be used to warn of specific hazards. Types of signs are classified according to their use, and their design is regulated by OSHA standard. All personnel will be instructed in the meaning of the various types of signs. Sign usage includes:

- a. Danger Signs (Red, Black & White): indicates immediate danger and denotes that special precautions are necessary.
- b. Caution Signs (Yellow Background): warns of a potential hazard or cautions against an unsafe practice.
- c. Safety Instruction Signs (White Background): used to provide general instructions and suggestions relative to safety measures.

The wording on signs must be positive, clear, concise, and easy to understand or the sign loses its value.

Accident prevention tags are to warn of hazardous or potentially hazardous conditions that are out of the ordinary, unexpected, or not readily apparent. They are not used where signs, guarding or other positive means of protection are used.

All tags must have:

- a. a signal word: "Danger"; "Caution"; "Warning"; BIOHAZARD (or its symbol) and a major message, and

- b. a major message such as: “High Voltage” or “Do not start”.
[Major messages indicate the specific hazardous condition.]

The color scheme is basically the same as for signs:

red = danger
yellow = caution
orange = warning
fluorescent orange = biological hazard.

- a. Danger Tags: indicate an immediate hazard that presents a threat of death or serious injury.
- b. Caution Tags: indicate a non-immediate hazard or unsafe practice that presents a lesser threat of injury.
- c. Warning Tags: indicate a hazard between “Danger” and “Caution”.
- d. BIOHAZARD Tags: indicate the actual or potential presence of a biological hazard and identify equipment, rooms, containers, etc., that may be contaminated.

Pay attention to signs and tags and realize that they are in place for only one reason -- your safety.

STAIRS

Stairways. - 1926.1052

Stairways that are not a permanent part of the structure on which construction work is being performed must have landings of at least 30 inches in the direction of travel and extend at least 22 inches in width at every 12 feet or less of vertical rise. Additionally,

- a. riser height and tread depth must be uniform within each flight of stairs.
- b. where doors or gates open directly on a stairway, a platform will be provided, and the swing of the door must not reduce the effective width of the platform to less than 20 inches.
- c. metal pan landings and metal pan treads, when used, must be secured in place before filling with concrete or other material.
- d. all parts of stairways will be free of hazardous projections, such as protruding nails.
- e. slippery conditions on stairways will be eliminated before use.
- f. except during stairway construction:
 - 1. foot traffic is prohibited on stairways with pan stairs where the treads and/or landings are to be filled at a later date, unless the stairs are temporarily fitted with solid material at least to the top

edge of each pan. Temporary treads and landings will be replaced when worn below the level of the top edge of the pan.

2. foot traffic is prohibited on skeleton metal stairs where permanent treads and/or landings are to be installed at a later date unless the stairs are fitted with secured temporary treads and landings long enough to cover the entire tread and/or landing area.

Treads for temporary service will be made of wood or other solid material and installed the full width and depth of the stair.

Stairways having four or more risers or rising more than 30 inches will be equipped with:

- a. at least one handrail; and
- b. one stairrail system along each unprotected side or edge.

TOOLS: HAND

General requirements. - 1926.300

Hand tools. - 1926.301

Hand tools shall be used only for the purpose for which they are designed.

Hand tools will be kept clean and, where appropriate, oiled.

Hand tools which are damaged will not be used.

Hand held cutting tools will be kept sharp and will be sheathed or retracted when not in use.

When using a striking tool such as a hammer or chisel, safety glasses or safety goggles will be used.

Do not force tools.

If you are unfamiliar with the proper procedure for using a tool, ask your Supervisor for instruction.

Power tools may be operated only by those persons who are qualified by training or experience.

Do not alter guards on power tools; wear appropriate PPE.

Electrical tools must be grounded and, in the absence of permanent wiring, a Ground Fault Circuit Interrupter must be used.

Electric tools will not be lifted by their cords and pneumatic tools will not be lifted by their hoses.

VENTILATION

Ventilation. - 1926.57

There may be times in the course of our work such as grinding, cutting, sawing, sanding, etc. that hazardous dusts are released into the atmosphere that exceed the concentrations specified in the "Threshold Limit Values of Airborne Contaminants for 1970" of the American Conference of Governmental Industrial Hygienists, listed below:

MINERAL DUSTS	
Substance	(a)mppcf
SILICA Crystalline Quarts Threshold Limited calculated from the formula Cristobalite. Amorphous, including natural diatomaceous earth	 $(b)(250) \div (\%SiO_2+5)$ 20
SILICATES (Less than 1% crystalline silica) Mica Portland Cement Soapstone Talc (non-abestiform) Talc (fibrous), use asbestos limit	 20 20 20 20
GRAPHITE (Natural)	15
INERT OR NUISANCE PARTICULATES Note 1 Covers all organic and inorganic particulates not otherwise regulated. Same as Particulates Not Otherwise Regulated. Note 2 Inert or Nuisance Dusts includes all mineral, inorganic, and organic dusts as indicated by examples in TLV's Appendix D.	50 (or 15 mg/m ³ which-ever is the smaller) of total dust <1% SiO Note 1 See Table above

- a. Millions of particles per cubic foot of air, based on impinger samples counted by lightfield techniques.
- b. The percentage of crystalline silica in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

Below the above threshold limits, no action is required, however, employees may wear dust masks for personal comfort.

As always, engineering controls are preferred to personal protective equipment to deal with job site hazards. Therefore, local exhaust ventilation is a preferred method of maintaining atmospheres that have dust levels below the concentrations noted in the Dust Table, above.

Local exhaust ventilation must be designed so that they prevent dispersions of dust in concentrations causing harmful exposure and that dusts are not drawn through the work area of employees.

The dust collected by an exhaust or ventilating system will be discharged to the outside atmosphere.

If concentrations are so great that a dust separator is used, the dust and refuse will be disposed of in such a manner as to not harm employees. The exhaust will still be discharged to the outside atmosphere.

Of course, if the above ventilation procedures do not reduce the dust levels to acceptable limits, respirators will be used.

IDENTIFICATION OF HAZARDOUS JOB SITE MATERIALS

The presence of asbestos, crystalline silica, lead, and even mercury is possible on many job sites. Before work begins, the appropriate PPE and respiratory protection requirements will be discussed with employees.

Because of the chronic (long term) nature of these hazards, detrimental health effects due to exposure would not be immediately noticed.

The competent person on site will prevent exposures to these materials.

Areas that contain the below materials will be cordoned off or protected with appropriate warning signs. Do not enter any restricted area unless dictated by job assignment and only after specific training for dealing with these hazards. The training would include PPE, respiratory protection, work procedures, medical surveillance, containment, hygiene, handling, testing, and labeling.

These materials may be “discovered” as work progresses and employees will be protected from these hazards by:

- a. identification of these items by the competent person.
- b. informing the owner, project designer, or engineer of the hazards.
- c. securing the area in question until testing proves samples to be negative.

Subcontractors who deal with these hazards will have specific programs that address the above issues.

ASBESTOS

Substance Technical Information for Asbestos - Non-Mandatory - 1926.1101 App H

Asbestos can be found in pipe, wall, and boiler insulation; exterior sheeting; and flooring. Friable or crumbling asbestos presents the most hazard as it can float in the air and be inhaled into the respiratory system. Without respiratory protection, the microscopic asbestos fibers can enter the deepest portion of the lung, causing scar tissue to develop and stiffen the lung. The net result is a reduction of gas exchange -- a condition called asbestosis. High levels of exposure to asbestos greatly increase one's chance of lung cancer.

CRYSTALLINE SILICA

Silica, Crystalline (Respirable Size), National Institute of Health

Crystalline Silica can be readily found on many job sites in rocks as well as many concrete and masonry products. Crystalline Silica can be released in the air when employees are performing such tasks as:

- a. chipping, hammering, drilling, crushing, or hauling rock.
- b. abrasive blasting.
- c. sawing, hammering, drilling, or sweeping concrete or masonry.

Unprotected respiratory exposure to crystalline silica may cause a lung disease called silicosis as well as cancer and death.

LEAD

Substance Data Sheet for Occupational Exposure to Lead - 1926.62 App A

Lead can be found in water pipes, soldering, and paint. Lead is a heavy, toxic metal which can be absorbed into your body by ingestion and/or inhalation. It is a cumulative poison which can stay in your body for decades.

While massive doses of lead can kill in a matter of days, the more likely scenario on a job site is moderate exposure to asbestos or lead which probably would not create any health problems for years -- if at all.