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ADDITIONAL READING (See next page)
I. General Physical Plant/Maintenance Safety

A. Basic Guidelines

Employees should:

1. become familiar with and observe safety precautions to avoid workplace hazards.

2. help identify and eliminate hazards by reporting unsafe actions, conditions, equipment, or procedures to their supervisors for corrective action or to the Office of Environmental Health and Safety (OEHS) for evaluation.

3. respond promptly to requests for repair of unsafe equipment or hazardous working conditions.

4. determine whether or not the work being performed creates a hazard to other parties. If so, place barriers or warning signs in clear, visible locations.
5. ensure that spills, debris, construction products, etc., are cleaned up immediately. If immediate remedy is not possible, block off the area and place warning signs.

6. dress appropriately for the work being done, observe dress precautions in designated areas, and wear footwear that provides good stability and traction.

7. help reduce fire and slip/trip hazards by maintaining the general order and neatness of his/her work environment.

B. Personal Protective Equipment

Certain duties may require the wearing of equipment specifically designed for work where exposure to hazards cannot be otherwise controlled. If personal protective equipment is required, supervisors shall issue the equipment and instruct employees in its use. Once instructed, proper use and maintenance of the equipment becomes the employee’s responsibility. (See, Section 14, Personal Protective Equipment, and Section 15, Respiratory Safety, of this manual.)

C. Reporting Job Related Injuries/Illnesses

All job related injuries or illnesses, no matter how minor, must be reported on a First Report of Occupational Injury/Illness form (Form 18F-OEHS in Appendix E of this manual), signed by the area supervisor, and forwarded to Risk Management and OEHS within 24 hours of the occurrence. (See, Section 4, Injury/Illness Reporting, of this manual for details.)

D. Contracted Alterations, Repairs, Maintenance

Alterations, additions, repairs or maintenance of facilities, buildings, or equipment must be performed by personnel contracted by Facilities Services. (See, Section 5, Contractor Safety, of this manual.)

E. Electrical Instruments, Devices, Equipment

1. General Guidelines

   a. Lock and tag electrical switches when doing repair work. (See, VIII, “Equipment Lockout/Tagout” below). When working on electrical distribution panels, sub-panels, motor controls, fixed equipment, etc., make certain that power sources are disconnected and tagged out of service, and then test to ensure that the power is off before beginning work. Use rubber gloves, insulated tools, rubber mats and aprons as needed or required for the work at hand. When work is complete, test the system before putting it in service, restore controls to normal operating position, remove tags, and replace panel covers.

   b. Do not overload electrical circuits under any circumstances. Never exceed specifications for use of fuses or circuit breakers.

   c. Multiple outlet strips that are properly protected with a circuit breaker or fuse may be used for computer configurations.

   d. Portable electric heaters are not allowed unless the HVAC system for an area is not adequate and supplemental heating is needed. In such cases, Facilities Services shall make adjustments to the HVAC system.
e. Do not use electrical cheaters or adapters.

f. Do not unplug equipment by pulling on the power cord. Unplug by grasping the plug directly.

g. Report any device and remove it from service if: 1) it has been dropped or physically abused, or if liquid has been spilled into or on it; 2) anyone has received a shock in connection with its use; 3) there is evidence, by smell or touch, of overheating; 4) the equipment makes unusual noises.

2. Extension Cords

Use of extension cords or 3-way plugs in lieu of permanent wiring is a violation of building fire codes. Grounded, heavy gauge extension cords may be used only as a “temporary” supply of electrical power for portable equipment (e.g., maintenance power tools, audio-visual equipment, housekeeping appliances, etc.) Extension cords shall not be used in conjunction with portable heaters, irons, toasters, or similar heat producing devices. They shall not be used in locations where flammable vapors/gases are present, or in other potentially hazardous areas.

When used as a temporary supply of electrical power, extensions cords shall:

a. be used as specified by the manufacturer;

b. be used only to service a single portable lamp or portable apparatus of not more than 15 amperes (preferably less);

c. not be hung over electrical conductors such as pipes or placed under tension or coiling;

d. be of continuous lengths with no splices or tapes, of heavy duty cable, of three current carrying conductors one of which is a ground wire, with grounded-type receptacle and plug cap (metal clad plug caps shall not be used); and

e. where shop lights are used, they shall be guarded with an electrically non-conducting guard to protect the bulb against breakage and to avoid a potential shock hazard to personnel.

3. Performance Checks

Users of electrical devices or instruments are responsible for conducting “performance checks,” and for notifying the appropriate service unit or company if operational problems are found. A performance check is conducted to review the functioning of devices or equipment so that obvious malfunctions and defects may be corrected before a hazardous situation occurs. Performance checks are not intended or expected to replace a full electrical/electronic inspection.

a. If operational problems are detected during a performance check, the appropriate service unit or company shall be notified.

b. No ancillary equipment other than that used during normal operation shall require a performance check. No person or animal shall be attached to the equipment during a performance check.
c. Performance checks should include manipulation of controls, operating parameters, and calibration (if necessary) to ascertain whether or not the device is operating properly.

d. Performance checks shall be done on a regular basis, either periodically (e.g., daily, weekly, monthly, etc.) or, preferably, before each use.

e. The performance check shall include examination for any of the following conditions: 1) wires (especially power cords) that are frayed, worn, burned, or missing insulation; 2) broken, bent, or loose plugs; 3) loose cable connectors or those that do not hold securely; 4) loose switches or those that do not snap definitely from one position to another; 5) control knobs that are loose or do not turn smoothly; 6) switches, knobs, or other controls that do not consistently produce the expected result when operated; 7) burned out pilot or indicator lights; 8) events suggesting that the device is not operating normally.

F. Fire Prevention

1. Do not allow oily rags to accumulate; doing so may produce spontaneous combustion. Keep rags in UL or FM listed containers with self-closing covers.

2. Where batteries are being charged, a) they must be kept away from open flames or other possible ignition sources; b) adequate ventilation must be provided; and c) smoking must be prohibited in the area. Hydrogen given off during a charging operation is highly flammable and may flash or explode. Safety showers and eyewash stations must be installed in the charging areas.

3. Periodic checks of all fire doors shall be made to ensure that door closures function properly, that doors latch securely, and that fire doors are not blocked.

4. Follow the “No Smoking” rules in maintenance shops areas where flammable vapors/gases are present. (See, Section 26, Fire Safety, of this manual for University policy on smoking, which is prohibited in all but designated areas.)

5. If not in their original containers, all flammable coatings must be stored in UL or FM approved safety cans or flammable liquid storage cabinets according to state/local fire codes. (See, Section 26, Fire Safety, and Section 29, Hazardous Materials Safety, of this manual.)

G. Hand and Power Tools

1. Keep all hand tools in good condition. Cutting tools must be kept sharp.

2. Use only non-sparking tools when working around flammable or explosive vapors or gases.

3. Extension cords for temporary use with power tools shall be carefully checked before using to ensure that they are free of defects.

4. A handy box, or holders, is the safest way to carry tools.

5. Power driven tools shall be handled, operated, serviced, and repaired only by personnel trained and certified by qualified persons. Certification shall be documented. (See, Form 04F-OEHS, “Employee Safety Training Acknowledgment,” in Appendix E of this manual.)
6. If you are required to enter special areas of the University, such as dietary areas, radiation hazard areas, or biohazard areas, any tools you use in such areas shall be cleaned and decontaminated as required for the particular area to prevent cross contamination.

H. Piping Systems

1. When working on piping systems containing non-hazardous materials, close, and tag-out appropriate cutoff valves. Where work involves steam or other hazardous materials, implement lock-out, tag-out procedures. (See VIII, Equipment Lockout/Tagout, below)

2. Valves and switches must be shut off when work is done on steam and hot water pipelines or electrical switches and systems. Warning tags must be placed on valves as well as on switches to keep other employees from operating them. (See VIII, Equipment Lockout/Tagout, below)

3. Before any hot work is done either by in-house personnel or outside contractors, a Hot Work Permit (Form 10F-OEHS, Appendix E of this manual) must be obtained from OEHS or Facilities Services.

4. Hot water thermostats, except in dietary areas, shall be regulated so that the temperature is between 110°F-125°F at the faucet.

I. Equipment and Machinery

1. Inspect equipment regularly. Make certain that it is properly guarded and use the equipment/machinery correctly.

2. A preventive maintenance system helps in preventing accidents and shall be implemented for all equipment.

3. Equipment that is potentially contaminated (infectious, toxic, or radioactive) must be certified as safe by the area’s supervisor before it is repaired or cleaned. The certification shall be in writing on a tag attached to the equipment. This precaution extends to fixed building equipment such as chemical/biological hoods and associated plenums and central vacuum systems.

4. Machinery and equipment is fitted with protective devices such as guards and interlocks designed to protect operators from exposure to moving parts during normal operation. If a job involves the use or servicing of machinery and equipment, be sure these protective devices are in place and operable. Always follow lockout/tagout procedures and replace all guards removed during repair or maintenance activities.

5. Long hair and loose clothing must be secured when working with rotating or reciprocating machinery/equipment.
II. GROUNDS MAINTENANCE SAFETY

A. General Guidelines

1. Prevention of accidents and injuries from tools and machines used in grounds maintenance requires selection of the appropriate equipment for specific purposes, and the proper use and maintenance of the equipment selected. Fuels and chemicals shall be stored and used properly. Workers shall be thoroughly trained, and shall wear proper clothing and use protective equipment as required.

2. Maintenance employees must be able to recognize poisonous vines, shrubs and fruits and terminate poisonous growths. Employees shall also be able to recognize poisonous insects and shall take precaution against insect bites. Use gloves and wear sturdy shoes and appropriate garments for protection at all times. Remove all foreign matter such as glass, metal and wire from the grounds being maintained. To help prevent infection, hands and arms should be scrubbed thoroughly after working outdoors. Treat all cuts and scratches received outdoors with proper antiseptic coverings.

B. Storage and Handling of Gasoline

1. GASOLINE IS A FUEL; NEVER USE IT AS A CLEANING AGENT.

2. Never smoke in fueling areas, fueling system servicing areas, maintenance areas, bulk fuel delivery areas and the like.

3. Never operate a gasoline powered engine indoors.

4. Refuel outdoors, and never dispense gasoline into a fuel tank while the engine is running or still hot.

5. Tanks or equipment parts that contain gasoline shall only be drained or dismantled out-of-doors, or in a well-ventilated area free from sources of ignition.

6. Fuel powered equipment should never be stored inside a building where vapors could reach the ignition source. Allow engines to cool before storing such equipment inside a building or other enclosure.

7. Always store gasoline in a UL/FM approved safety can.
8. Gasoline spills shall be cleaned up immediately.

9. **If gasoline is spilled on the body and clothing** (includes shoes), stay away from sources of ignition. Remove gasoline saturated clothing immediately. Wash affected areas of the skin with soap and water to avoid a skin rash or irritation. Use a safety shower, if available. Wash clothing and shoes before reuse. **If the eyes are involved**, lift the eyelids and flush the eyes with copious amounts of water. Use an eyewash station, if available. Seek immediate medical attention. Eyewash stations and/or safety showers are recommended for shop areas.

C. **Edgers and Nylon Cord Weed Trimmers**

Due to spin off of debris from such machines, edgers and weed trimmers shall be operated with caution to avoid the potential harm to the operator, pedestrians, and vehicular traffic. Keep equipment guards in place and in working order. Keep blades sharp. Unless the machine is turned off, do not put hands near operating parts. Wear the appropriate personal protective equipment.

D. **Mowers and Tractors**


1. **Power Lawn Mowers**

a. Operators must be well trained. If it is the first cut of the season, the operator shall review the instruction manual.

b. Before starting, pick up rocks, glass, tree branches, twigs, and any other objects that could become a hazard if thrown out by the mower blade. Observe location of fixed objects such as pipes, lawn sprinkler heads and curbs that could damage the mower or break and spin off becoming a hazard to the operator, pedestrian traffic, or property.

c. Make any wheel height adjustment before starting the mower. Disconnect the spark plug wire when cleaning, repairing, or inspecting the mower. Unauthorized persons are not to be in the mowing area. The operator shall make a quick inspection for loose nuts and bolts, check the engine oil level (if the mower has a separate oil reservoir), and fill the fuel tank before starting. Use a vented can with a flex spout.

d. Wear work shoes and safety glasses. A brimmed hat and full length trousers and shirt will help protect against sunburn.

e. Mow in daylight.

f. Push the mower forward as much as possible because feet can be injured when pulling a mower backward. When mowing on a slope or terrace, make a series of horizontal passes perpendicular to the incline. If the operator pushes up the incline, he/she runs the risk of having the mower drift back creating a potential for a foot injury. If the operator pushes down, he/she could lose footing and fall into the mower.
g. Do not use the mower when the grass is wet and slippery. If the grass is damp or high, cut it at a slower speed (if possible), and set the cutting height higher than for dry grass, otherwise the discharge chute may clog up.

h. Guards shall be in place whenever the catcher is not in use. Rotary blades can pick up stones, pieces of wire, nails, or other objects hiding in the grass, and throw them out of the discharge chute at dangerous speeds.

i. Shut off the engine and be sure the blade has stopped completely before 1) taking off the grass catcher to empty it, 2) attempting to free obstructions from the discharge chute, 3) adjusting the cutting height, or 4) performing any operation requiring hands or feet near the blade.

2. Riding Mowers

a. The operator must be fully instructed, know the controls, and know how to stop quickly and safely. Operators shall review the owner’s manual at the start of each mowing season.

b. Clear work area of objects that might be picked up and thrown. Fixed objects that might damage the mower shall be identified. Realize that all areas cannot be reached by a riding mower and that some corners or sharp slopes will have to be mowed by a power mower. (When planning landscaping, leave enough space around new plantings for easy mower access, and allow for future growth.)

c. Disengage all attachment clutches and shift into neutral before attempting to start the engine. Disengage power to attachment(s) and stop the engine before making any repairs or adjustments, transporting attachments, or when attachments are not in use.

Exercise all precautions when leaving the vehicle unattended: disengage power takeoff, lower attachment(s), shift into neutral, set parking brake, stop engine, remove ignition key.

d. Watch for hidden hazards. When mowing, stay alert for holes in the terrain, and for other hidden hazards.

e. Do not start or stop suddenly, especially when going uphill or downhill. To ensure stability of the mower, mow up and down the face of steep slopes, never across them, because the wheelbase is longer than the thread width. Reduce speed on slopes and in sharp turns to prevent tipping or loss of control. Use extreme caution when changing direction, especially on slopes.

f. Do not back up without making certain it is safe to do so. Watch out for traffic when crossing or nearing roadways.

g. When using attachments, be sure to direct discharge of material away from anything that could be hurt or damaged by it.

h. Maintain the vehicle and its attachments in good operating condition. Keep safety guards in place. Keep all nuts, bolts--especially blade mounting bolts-- and screws tight, and make certain that equipment is in safe working condition.
i. If the vehicle or its attachment(s) strike a solid object, stop and inspect for damage. Damage shall be repaired before restarting and operating the equipment. Do not change the engine governor settings or over speed the engine.

3. **Garden Tractors**

   a. Make certain that garden tractors have safeguards for all moving parts to reduce the hazard of contacting belts, chains, pulleys or gears. Any loose or broken parts, especially blades, should be tightened or replaced.

   b. Garden tractors shall have a throttle, gears, and brakes that are accessible, can be operated smoothly and with minimum effort.

   c. Make certain that safety instructions are provided with the garden tractor and that warning labels are on the machine itself. The owner's manual must read and periodically reviewed.

   d. Keep unauthorized persons away from the machines and the fuel. Never allow unauthorized persons to operate a tractor, and keep them away from working areas during operation, or refueling.

   e. Tractor operators shall wear sturdy, rough-soled work shoes, and close-fitting slacks and shirts to avoid entanglement in the moving parts. Never operate a garden tractor in bare feet, sandals, or sneakers.

   f. Start garden tractors outdoors, not in a garage where carbon monoxide gas can collect.

   g. Drive up and down the slopes, rather than across, for greater stability when using a garden tractor on a hill.

   h. Do not smoke near a garden tractor or gasoline storage can.

   i. Always turn off the machine and disconnect the spark plug wire when the machine requires adjustment.

   j. Get expert servicing regularly; doing so may prevent serious injuries.

E. **Pesticides**

1. **General Precautions**

   a. Insecticides, herbicides, fungicides, disinfectants, rodenticides and animal repellents are all pesticides. Responsibility for the use of pesticides begins with selection and purchase and continues until the empty pesticide container has been properly disposed.

   b. Pesticide labels must include a list of 1) what the product will control, 2) directions on how to apply the pesticide, 3) a warning of potential hazards, and 4) safety measures to follow. Read the label and the Material Safety Data Sheet before mixing, handling, or applying any pesticide. Follow instructions for proper use. Don’t guess!
c. In general, poisons labeled “Danger-Poison” are highly toxic and can be lethal via inhalation, ingestion, absorption, or parenteral exposure. Poisons labeled “Warning” are moderately toxic but can be quite hazardous. Poisons labeled “Caution” have low toxicity, but could harm you if the poison is eaten or grossly misused.

d. Any restricted-use pesticide used around plants has to be applied by a Certified Pest Control Operator/Applicator according to Public Law 92.516.

e. For the safety of those handling, mixing, or applying some pesticides, medical surveillance may be required. Consult OEHS for assistance.

f. In purchasing a pesticide, buy the least toxic and use it as few times as possible. By purchasing just enough to last one season, storage and waste disposal problems are minimized.

2. Application

a. Use a pesticide only for the purposes described on the container label. Wear the proper protective equipment when using, handling, or mixing.

b. Keep pesticides in the original labeled container. Check for leaks or container damage.

c. Mix pesticides carefully and outdoors if possible. Keep pesticides off your skin, and avoid breathing dust or vapors or mists. Where required, use protective clothing and equipment, including respirators for toxic chemicals.

d. Set aside a special set of mixing tools (measuring spoons and a graduated measuring cup) and store them with your chemicals.

e. Set aside a level shelf or bench in a well-ventilated area, preferably outside, for mixing chemicals. If chemicals do spill, follow appropriate spill procedures.

f. Use the buddy system when applying dangerous pesticides.

g. Never smoke or eat while mixing or applying pesticides.

h. To minimize spray drift, avoid outside application on a windy day.

i. **If skin, clothing, or shoes become contaminated with pesticide**, remove clothing and shoes immediately. Wash affected areas of the skin with soap and water. Use a safety shower, if available. Wash clothing and shoes before reuse. If the eyes are involved, lift the eyelids and flush the eyes with copious amounts of water for 15 minutes. Use an eyewash station, if available. Seek immediate medical attention. Eyewash stations and safety showers are recommended for areas where pesticides are handled.

j. When finished using a pesticide, wash immediately with soap and water. Do not smoke, eat, or drink without first washing.

k. Never allow unauthorized personnel around treated areas, or pesticide poison mixing, storage, and disposal areas.
3. **Storage**

   a. Store all pesticide poisons in a well-ventilated, locked area or building which has been posted with appropriate signage. Packages that are likely to be damaged by dampness shall be kept off the floor.

   b. Poisons shall be kept in tightly closed, original containers. The label gives information needed in case of accidents. Do not store pesticides in soft drink or milk bottles.

   c. Do not store clothing, respirators, lunches, cigarettes, or drinks with pesticide poisons. They may pick up poisonous fumes or dusts.

   d. Have soap and water readily available; seconds count when washing poisons from your skin.

4. **Disposal**

   Disposal of pesticides is handled exclusively through the OEHS Hazardous Waste Program.

5. **Emergency Information**

   In an emergency, additional advice and information on antidotes for specific pesticides may be obtained from OEHS, or the Louisiana Poison Control Center. *(See, Section 1, Emergency Response, of this manual.)*

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### III. Confined Spaces

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### III. CONFINED SPACES

The University has practices and procedures to protect employees from hazards of entry into and work within a “permit-required confined space” in accordance with the Occupational Safety and Health Act of 1970, Subpart J, Section 1910.146. Additionally, under the “host employer” provision of the Occupational Safety and Health Administration (OSHA) standard, the University (as host employer) must ensure that contractors are properly informed whenever their employees are required to enter a permit-required confined space that is under the University’s exclusive control.
A. Identification and Hazard Assessment

1. Unit personnel shall conduct initial as well as on-going assessments of work areas in order to identify confined spaces into which the University’s employees or contractor personnel might be sent to perform work. (A unit is a department, section, center, or program, or any number or configuration of these components.)

2. When a confined space is identified, OEHS must be notified in writing by the unit. The unit contact shall complete Section A of the Confined Space Evaluation form (Form 07F-OEHS in Appendix E of this manual) and forward it to OEHS.

3. OEHS, with the assistance of the unit contact, shall determine if the confined space should be classified as a “permit-required” confined space. OEHS shall identify controls based on assessment of inherent-hazards and document entry precautions to be taken to safeguard against those hazards. Such spaces must be identified by permanent signage.

4. If conditions change in a previously identified confined space or permit-required confined space, the unit must provide written notification to OEHS. The Confined Space Evaluation form is also used by OEHS for reevaluation and hazard assessment relative to altered conditions requiring a change in permit status and entry controls.

B. Training

1. OEHS shall provide and certify the training of all University employees involved in permit-required confined space entry activities. The training shall be kept current and consistent with hazards relative to each permit-required confined space.

2. OEHS shall develop and administer proficiency tests relative to the various duties employees are required to perform, and maintain appropriate written training records that include: a) employee's name, SSN, and entry status (i.e., entrant, attendant or entry supervisor); b) duties and responsibilities of the employee’s assigned status; c) date an employee received training; and d) signature of the employee and the OEHS trainer.

C. Permit System

Before entry is authorized into a permit-required confined space, all precautions required shall be documented in a Confined Space Entry Permit (Form 09F-OEHS in Appendix E of this manual) by an OEHS representative. The OEHS representative and entry supervisor must validate the entry permit with their signatures and the current date. Additionally, a Material Safety Data Sheet (MSDS) on any chemical or product introduced into the space in support of work being done must be attached to the entry permit.

The information provided in a Confined Space Entry Permit shall identify:

1. the permit space to be entered, the purpose of entry, the date and duration of the permit;

2. names of personnel authorized as entrant(s) and attendant(s) in the permit space;

3. hazards present in the permit space;
4. equipment required such as personal protective equipment, mechanical ventilation equipment, communications equipment, alarm systems and rescue equipment;

5. entry preparations taken to isolate the space and eliminate or control hazards prior to and for the duration of entry;

6. phone numbers for emergency communication if needed by entrants and attendants;

7. acceptable entry conditions that must be maintained for the duration of entry;

8. results of pre-entry and periodic tests/observations made to evaluate atmospheric and/or physical hazard conditions, accompanied by the initials of the observer as well as the date and time each observation was made; and

9. the signature of the OEHS representative and entry supervisor certifying the space as safe prior to entry.

10. Any additional permits, such as a hot work permit, that have been issued authorizing work in the permit space must be attached to the Confined Space Entry Permit.

D. Preventing Unauthorized Entry

The unit responsible for the confined space shall ensure that unauthorized entry is prevented by: 1) providing notification to employees of the location(s) regarding the confined space, and, where practicable, 2) conspicuously posting durable signs or stenciling on or proximate to each entrance that read: DANGER, PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER, and, whenever practicable, 3) securing such spaces with locks and/or placement of barriers preventing unauthorized entry. Contact OEHS or Facilities Services for permit required confined spaces listing.

E. Confined Spaces with Hazardous Atmospheres Only

1. Even when the only hazard posed by a confined space is an actual or potential hazardous atmosphere, an entry permit is required. However, continuous forced air ventilation equipment must be sufficient to control the atmospheric hazard and maintain safe entry conditions. (In such cases, Rescue and Emergency Services defined in III. G below will not apply.)

2. The unit responsible for the confined space shall provide and set up forced air ventilation equipment. OEHS and entry supervisor shall verify the efficacy of forced air ventilation in these spaces prior to entry. Maintenance of safe atmospheric conditions throughout the duration of the entry shall be verified through continuous or periodic sampling conducted by trained personnel (i.e., entry supervisor or attendant) using calibrated direct-reading instruments provided by OEHS.

3. Confined spaces with only hazardous atmospheres shall be continuously or periodically sampled during entry for: a) oxygen content, b) flammable gases and vapors, and c) potential toxic air contaminants that might be inherent in the space or be produced as a result of operations being conducted within the space.

4. Heat stress shall be considered a potential atmospheric hazard. The unit responsible for the confined space shall take all practicable measures to reduce and maintain temperatures in the confined space within acceptable limits in order to control heat stress on personnel working
inside. For example, such measures may include flushing a vessel with cooling water to remove latent heat, allowing a sufficient cool-down period prior to entry, and application of forced air ventilation for a sufficient period of time to reduce internal temperatures.

5. In evaluating potential atmospheric hazards, including heat stress, OEHS shall apply guidelines promulgated by the American Conference of Governmental Industrial Hygienists (ACGIH) in the absence of a specific OSHA standard.

F. University’s Responsibility as Host Employer

1. Contractor work that involves entry into a permit-required confined space requires completion of a “Confined Space Hazard Addendum” form (Form 08F-OEHS in Appendix E of this manual) by Facilities Services personnel. This document is part of the contract documents.

2. Facilities Services is responsible for notifying OEHS before commencement of any permit required confined space work.

3. Before entry into a permit required confined space, OEHS shall apprise the contractor of inherent hazards and of any experience the University has had with the confined space in which the contractor would be working.

4. The contractor shall be notified of all hazards and precautions that affect the permit required confined space as documented in a completed Confined Space Entry Permit (Form 09F-OEHS in Appendix E of this manual).

5. The Confined Space Entry Permit must be dated and signed by an OEHS representative and the entry supervisor before entry is authorized.

6. The University is not responsible for providing any equipment or personnel needed by the contractor when entry involves only contractor personnel. This includes, but is not limited to, personal protective equipment, ventilation equipment, sampling/monitoring equipment, communications equipment, rescue equipment and emergency services.

7. If both contractor and University employees shall be working together in the same PRCS, OEHS shall oversee the coordination of entry operations. Provisions for needed equipment and personnel shall be arranged through mutual agreement among Facilities Services, contractor, and OEHS.

G. Rescue and Emergency Services

If it is necessary for University personnel to enter a permit-required confined space, other than that described in III. E. Confined Spaces with Hazardous Atmospheres Only, above, provisions must be made for rescue and emergency services. University personnel shall provide rescue and emergency services only when it can be assured that rescue of authorized entrants can be achieved by means other than entry into the space. This means that rescue must be accomplished by a retrieval system of non-entry personnel. Retrieval system equipment must be approved by OEHS, with the cost of such equipment to be borne by the unit responsible for the confined space. OEHS shall otherwise identify, evaluate and recommend outside services for rescue and emergency services.
H. Recordkeeping

Records that must be retained in reference to confined space entry are to be distributed as follows:

- **Confined Space Evaluation**
  (07F-OEHS)  
  Original to OEHS Uptown Office

- **Confined Space Entry Permit**
  (09F-OEHS)  
  Copy to OEHS, TUHSC Police, and to Unit responsible for the Confined Space
  (Original to be posted at site)

- **Confined Space Hazard Addendum**
  (08F-OEHS)  
  Original to Unit responsible for the Confined Space
  (to be attached to contract)

Confined space entry permits and evaluations should be kept at the work site for the duration of entry and for a period thereafter as required by law. A new permit must be obtained if entry has to be extended beyond the day and time authorized on the permit.

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IV. LADDERS AND SCAFFOLDS

A. Portable Ladders

1. *Only* standard manufactured ladders constructed in accordance with ANSI A14.5, and so labeled, shall be purchased and used. Job-built ladders are not permitted.

2. The following practices shall be observed:

   a. The base of each ladder shall be set firmly and level. Workers shall never attempt to move a ladder while they are on it, and shall avoid over reaching; both actions may cause a ladder to fall as will working from a ladder in a high wind. When positioning the ladder, use a 1:4 ratio: position the bottom one foot away from the structure for every four feet of ladder run.

   b. Access ways to and from ladders shall be kept clear. Ladder rungs or steps shall be free of mud and other slippery material. Check shoe soles for slippery material before climbing ladders.
c. Ladders shall not be used as supports for scaffold boards without using ladder jacks. Ladder jack scaffolds are acceptable for light duty use only.

d. Ladders shall be long enough for workers to perform their functions without climbing higher than the third step or rung from the top.

e. A ladder shall never be set up in a walkway, driveway, or in front of a door where the swing of the door could strike the ladder. If such placement is necessary, barricades and signage should be used and a worker (wearing a hard hat) should be stationed at the foot of the ladder to keep the ladder from being struck. Barricades and signage will work to protect pedestrians from being struck by dropped tools or materials.

f. Employees shall face the ladder and use both hands when climbing or descending. Tools and materials shall be raised and lowered by hand lines or other means; they shall not be carried by the employee on the ladder unless they are first placed in a tool belt.

g. Step ladders shall be used only in a fully opened position with spreader bars locked.

h. EXTENSION LADDERS shall extend three feet above the working or access level and be secured at or near the top. They shall be placed so that the base is one foot from the wall or structure supporting the top of the ladder for each four feet of perpendicular rise to the top most support point of the ladder. METAL LADDERS must not be used around energized electrical equipment. When moving extension ladders, precautions must be taken to avoid overhead power lines.

i. If the ladder is in need of repair, it must be immediately taken out of service for repair or replacement.

B. Scaffolds

1. Light Duty Metal Scaffolds

   a. The strength of rusted equipment may be impaired and therefore should not be used. Scaffolds and their components shall be capable of supporting the maximum intended load. Materials being hoisted onto a scaffold shall have a tag line. Employees shall not work on scaffolds during storms or high winds. Overhead protection shall be provided for men on a scaffold exposed to overhead hazards.

   b. Provide adequate sills for scaffold posts and use base plates. The footing shall be capable of carrying the maximum intended load, without settling or displacement.

   c. Use adjusting screws instead of blocking to adjust to uneven grade conditions. In no case shall the exposed thread exceed 12 inches.

   d. Plumb and level all scaffolds as the erection proceeds. Do not force braces to fit; level the scaffold until proper fit can be made easily.

   e. On wall scaffolds place and maintain anchors securely between structure and scaffold at least every 20' of length and 20' of height.

   f. Free standing scaffold towers must be restrained from tipping by guying or other means.
g. Proper guard rails, midrails, and toeboards must be used on all scaffolds where working levels are 6' or more above adjacent working surfaces.

h. Use ladders, not cross braces, when climbing scaffolds.

i. Do not use ladders or makeshift devices on top of scaffolds to increase the height.


2. Planking

a. Use only lumber that is properly inspected and graded as scaffold plank.

b. Planking must overlap at least 12" and extend 6" beyond center of supports, or be cleated at both ends to prevent sliding off supports.

c. Scaffold planks must extend over their end supports not less than 6' nor more than 12'.

d. Secure plank to scaffold.

e. Provide a working surface of not less than 20" in width. For scaffold base width in excess of 30", additional planking shall be provided.

3. Platform, Guardrails, and Stairway Handrails

a. Handrails shall be 2" x 4" or 1" x 4" nailed at right angles; platform handrails shall be 42" (but not more than 45") above platform; stairway handrails shall be 30" to 34" above nose of tread.

b. Posts shall be 2" x 4" or heavier and spaced not more than eight feet apart.

c. Midrails shall be 1" x 6" or wider; spaced midway between platform and top rail on platforms or midway between nose of tread and top rail on stairway; midrails to be nailed to inside of posts.

d. Toeboard shall be 1" x 6" or wider, placed along floor of platform and nailed to inside of posts.

e. Scaffolds shall be provided with a screen between the toeboard and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard Wire one-half-inch mesh or the equivalent, where persons are required to work or pass under the scaffolds.
V. CONSTRUCTION

A. Painting

1. To reduce evaporation, keep containers of coatings and solvents covered when not in use. This is especially important if flammable materials are being used.

2. Use flammable coatings and solvents cautiously; avoid ignition sources. Cleaning rags and paper towels coated with these materials present a spontaneous combustion hazard. Coatings and solvents shall be temporarily stored in covered metal containers and at the end of each work day they shall be properly disposed. Such materials shall not be left inside any building overnight unless in a UL or FM listed storage cabinet specifically designed for this purpose.

3. Select coatings with low volatile organic compounds for indoor use. Avoid using coatings in enclosed areas that are not well ventilated.

4. Familiarize yourself with warnings on container labels and Material Safety Data Sheets. Some coatings and solvents contain toxic chemicals that present inhalation, absorption, and contact (e.g., eyes, skin) hazards. Make certain you understand the hazards and use appropriate personal protective equipment to eliminate associated exposures.

5. Do not dump cleaning solvents or coating materials into building drains (e.g., sinks, floor drains), outside on the ground, or into storm water drains. Containers of dried coating materials (i.e., all solvent must be evaporated with only dry hard pigment remaining) can be disposed of in regular trash containers (e.g., dumpsters).

B. Excavations (Trenching, Shoring, Benching, Shielding, Sloping, and Other Systems that Provide Necessary Protection)

In accordance with the requirements of the Occupational Safety and Health Act of 1970, the following procedures for excavations have been established per OSHA 29 CFR Subpart P Excavations, Sections 1926.650 through 1926.652.

1. Procedures

   a. Before beginning any excavation (trenching, shoring, benching, shielding, sloping, etc.), remove or support surface encumbrances that are located so as to create a hazard.
b. The location of utility installations, such as steam, condensate, sewer, telephone, electrical, water, or any other underground installations that may reasonably be expected to be encountered during excavation work, shall be determined prior to opening an excavation. This may require coordination with local utility companies.

c. Safe ingress and egress for equipment and personnel shall be provided as necessary in accordance with OSHA 1926.651 (c)(1) and (2). Trenches four feet deep or more must have an adequate means of exit such as ladders or steps located so as to require no more than 25 feet of lateral travel.

d. Employee exposure to vehicular traffic and falling loads shall be controlled in accordance with OSHA 1926.651 (d) and (e).

e. A warning system, such as barricades, hand or mechanical signals, or stop logs, shall be established to safeguard the operation of mobile equipment adjacent to or which may approach the edge of an excavation in accordance with OSHA 1926.651 (f).

f. Where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation, provisions shall be made for testing and controls in accordance with OSHA 1926.651 (g)(1). Emergency rescue equipment shall be provided in accordance with OSHA 1926.651 (g)(2).

g. Employees shall be protected from the hazards associated with water accumulation. These precautions will vary with each situation and shall be established and monitored by a competent person in accordance with OSHA 1926.651 (h)(1) through (3). All employees doing this type of work must be properly trained and fully understand the job’s requirements.

h. The stability of adjacent structures shall be considered in accordance with OSHA 1926.651 (i)(1)-(3) prior to beginning any excavation work. Special precautions necessitating the review and/or approval of a registered professional engineer may be required.

i. Adequate fall protection in accordance with OSHA 1926.651 (l) shall be provided where employees or equipment are required or permitted to cross an excavation. As long as any hazards exist, appropriate warnings and barriers shall be arranged to prevent persons other than employees from venturing into the work area both during and after working hours as long as a hazard exists. This may require the use of one or a combination of the following: barricades, cautionary/warning signs, perimeter boundary tape, area illumination, and warning lights.

j. Daily inspections of excavations, adjacent areas and protective systems shall be made by a competent person in accordance with OSHA 1926.651 (k). Upon finding any indication of hazardous conditions or failure of protective systems, employees shall be removed from the hazardous area until necessary precautions have been taken and such material or equipment is evaluated by a registered professional engineer (OSHA 1926.651 (d) and (e)).
2. **Protective Systems**

Employees shall be protected from moving ground or cave-in of loose rock or soil from the faces and walls of an excavation or trench greater than five feet deep through implementation of a protective system such as a shoring system, sloping of the ground, or some other equivalent means in accordance with OSHA 1926.652 (b) and/or (c). Such systems are not required where excavations are made in solid rock or are less than five feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in.

In all excavations where employees may be required to enter, excavated or other material must be effectively stored and retained at least two feet or more from the edge of the excavation.

**Requirements for Protective Systems:**

a. Selection of a protective system shall be made by a competent person based on soil classification as defined in accordance with OSHA 29 CFR, Part 1926, Subpart P, Appendix A. Due to the variability of soil conditions on the Uptown Campus, all soil is assumed to be Type C. For all excavations requiring implementation of a protective system, the pre-engineered shoring system shall be used in accordance with the manufacturer’s recommendations.

b. The materials and equipment used for protective systems must meet the requirements of 1926.652(d). The materials and equipment must be free from damage and defects. The manufacturer’s recommendations must be followed for the use and maintenance of manufactured materials and equipment.

c. Installation and removal of support systems must be performed in accordance with 1926.652(e).

d. When shield systems are utilized, the requirements of 1926.652(g) must be met. These requirements include compliance with shield systems load limits, employee protection during entry, exit from shield protected areas, and prohibition of employees in shields during installation, vertical movement of the shield, or removal of the shield.

C. **Plumbing**

Plumbers or any personnel handling plumbing shall be aware of the following guidelines:

1. Plumbers who may be exposed to blood or other potentially infectious materials (OPIM), shall follow the University’s Exposure Control Plan for Bloodborne Pathogens. Maintenance personnel shall assume that every lab, bath, and restroom, etc. is contaminated. Workers are advised to wear appropriate protective equipment. If possible, a 1:10 dilution of household bleach shall be used to disinfect any tools or equipment that may become contaminated. After disinfection, equipment shall be rinsed with water and dried to prevent rusting.

2. Maintenance personnel shall read all warnings indicated on caution or other type of signage.

3. Caution shall be exercised in dismantling equipment such as lab sinks, drains and pipes (which may contain hazardous chemicals), fume hoods (which may contain asbestos or hazardous chemicals), glove boxes (which may contain infectious materials), etc. Check with the principal investigator in charge to ascertain the specific use of the equipment.
4. Do not repair or remove a fume hood determined to have been used in work involving perchloric acid or nitrates; doing so without proper wash down of the hood and duct work may result in an explosion. Contact OEHS before beginning such work.

- *(See, Section 30, Laboratory Safety,* of this manual for laboratory close-out guidelines regarding the dismantling and removal of lab equipment.)*

D. **Hot Work** (Welding, Cutting, Soldering, Burning)

Control of fuel exposure to ignition sources during renovation, repair, or maintenance activities conducted by any of the University's maintenance units or any outside contractor, shall be accomplished through issuance of a hot work permit. The Hot Work Permit System is intended a) to ensure that appropriate precautions are observed in the conduct of hot work activities, and b) to provide information on such activities to units that would respond to a fire emergency in the area where the hot work is being conducted.

1. **Procedures**

   a. A **Hot Work Permit** (aka, Cutting-Welding-Hot Work Permit) form (*Form 10F-OEHS in Appendix E of this manual*) must be completed at least 24 hours prior to start of work by the employee in charge of the hot work activity to allow time for notifying emergency back-up sources. In the event emergency repairs involving hot work must be performed, the permit must be completed as soon as possible. Hot work permits may be obtained from OEHS or Facilities Services.

   b. Prior to the start or resumption of hot work, the responsible employee must conduct an inspection of the area and consider the precautions listed on the reverse side of the permit form as they apply to the specific job. Further, he/she must instruct (or in the case of a contractor, ensure that instructions are given to) all workmen in the hot work area as to the nature, scope, and duration of the hot work as well as precautions to be observed.

   c. **When Fire Detection Systems are Affected by Hot Work Operations**

      1) Area in proximity to the hot work area:

         If there are smoke detectors in proximity to the hot work area that are likely to be activated by smoke and/or fumes during operations, the person initiating the permit must verbally notify Facilities Services prior to start of work. **Only Facilities Services personnel are authorized to temporarily cover detection devices.** If detectors or other detection systems are to be deactivated, a fire watch must be conducted.

      2) Responsibility for Fire Detection/Alarm Systems

         Generally, Facilities Services is the unit responsible for fire detection/alarm systems at Tulane facilities. However, the Controls Engineer, Security, Fire and Life Safety (Uptown) or OEHS may also share responsibility for these systems at the direction of Facilities Services.
d. The employee responsible for initiating the permit shall ensure that the original is retained at the work site during hot work operations (the permit defines date and time allowed for the work) and that photocopies (front only) are distributed promptly to Facilities Services, Security, Fire and Life Safety (Uptown), and OEHS. Security shall provide surveillance for smoldering fires for at least one hour after hot work completion. At TNPRC, Facilities Services shall provide surveillance. If the hot work is to continue for several days, checks for smoldering fires should be done at the completion of each day.

At TUHSC, the original permit shall be taken to Security at the completion of hot work. At TNPRC, the original permit must be taken to the Facilities Services at the completion of work.

e. Facilities Services shall retain its photocopy of the permit for a period of at least one week past the estimated completion date shown on the permit. OEHS shall maintain a file of all hot work permits for inspection purposes for a period of two years.

f. If, for any reason, the permitted hot work is not accomplished by the estimated completion date specified, the responsible employee must secure another permit for the extended period.

VI. Materials Handling

A. Manual Lifting and Carrying

1. Assess the load and your ability to carry it. Consider its size, weight, and shape in the context of your physical ability and condition. Consider the distance to be traveled and the length of time that the grip will have to be maintained. Determine whether or not the size of the load will obstruct your vision while carrying it. If your assessment indicates that you will not be able to handle the load, get help in handling the material, or in lifting it onto a hand truck, luggage cart, or dolly that you can manage on your own. If you are going to carry the load, evaluate the route to be taken to ensure that it is free of tripping hazards or obstructions.

2. Position yourself close to the object or load to be lifted and place your feet shoulder’s width apart for proper balance. Grip the item firmly, placing your hands and fingers so as to avoid striking them against other objects along your path of movement or having them caught beneath as you lower the item. Bend your knees, keeping your back straight (do not stoop) as you lift or lower the object close to your body. Avoid twisting movements and do not over-reach or stretch.
3. If you are being assisted in carrying the load, coordinate movements with your partner to avoid sudden shifts in the load, and, if the haul is of some distance, agree on and take rest stops along the way. This is especially important when negotiating stairs and ramps.

4. To place the load or object on a bench or table, set it on the edge and push it far enough onto the support to ensure that it will not fall. The object may then be moved by pushing it with the hands and body from a position in front of the object.

5. It is especially important that an object or load be securely placed on a bench or other support so that it will not fall, tip over, or roll off. Supports shall be correctly placed and strong enough to carry the load. Heavy objects, like lathe chucks, dies, and other jigs and fixtures shall be stored at approximately waist height. Protect your feet by wearing safety shoes when lifting or carrying heavy objects.

6. To raise an object above shoulder height, bend knees and lift first to waist height, then as the load is moved up further, shift the position of the hands so that the object can be boosted; straightened the knees as the object is lifted or shifted to the shoulders.

7. To change direction, lift the object to the carrying position, turn the entire body, including the feet. Avoid twisting the body. In repetitive work, the person and the material shall both be positioned to prevent the person from twisting his body when moving the material.

8. “Slide” objects into a tight space, keeping hands in the clear.

B. Powered Industrial Trucks (Rider Operated and Walk Behind)

1. Safeguards

   a. Trucks capable of lifting loads higher than the operator's head (e.g., front end loaders, forklifts) or operated in areas where there is a hazard from falling objects must be equipped with an overhead guard that shall conform to American National Standards Institute B56.1, “Safety Standard for Low Lift and High Lift Trucks.” All overhead guards should be attached to the rear of the truck body as well as the front portion of the body (not the mast.)

   b. Load backrest extensions shall always be used when the type of load presents a hazard to the operator. The top of a load shall not exceed the height of the backrest.

   c. Trucks shall be equipped with platforms extending beyond the operator's position, strong enough to withstand a compression load equal to the weight of the loaded vehicle applied along the longitudinal axis of the truck against flat vertical surface.

   d. Additional operator enclosures are not recommended. However, should additional enclosures be provided, they shall not prevent easy ingress or egress.

   e. Exposed tires should have guards that will stop particles from being thrown at the operator or pedestrian traffic. Hazardous moving parts, such as chain and sprocket drives and exposed gears, should be guarded to protect the operator in his/her normal operating position.
f. Every powered industrial truck should carry a name plate showing the weight of the truck and its rated capacity as specified by the ANSI B56.1.

g. Powered industrial trucks should have a horn, a reverse (back up) alarm, safety belts that should be worn by the operator, and should carry an ABC fire extinguisher. Steering wheel knobs are prohibited.

h. Forks should be locked to the carriage and the fork extension (if used) should be designed to prevent unintentional lifting of the toe or displacement of the fork extension.

i. Lift trucks should have means or be equipped with mechanical hoist and tilt mechanisms to prevent over travel of hoist and tilt motions. Hydraulically driven lifting systems should have a relief valve and suitable stops provided to prevent over travel.

2. Operation

   a. General Precautions

      1) Only authorized employees are allowed to operate powered industrial trucks. All safety rules and regulations are to be observed by truck operators.

      2) Operate at low speed consistent with load and rolling surface conditions, but never in excess of five miles per hour. Face the direction of travel at all times.

      3) Operator should come to a stop at blind corners and before passing through doorways, sounding the horn before proceeding. At least three truck lengths should be kept between moving vehicles (conditions such as wet roads may require more distance between vehicles). A truck should not pass another at intersections, blind spots, or other dangerous locations.

      4) Avoid quick starts, jerky stops, or quick turns at excessive speed. Use extreme caution when operating on turns, ramps, grades, or inclines. Reverse control should never be used for braking.

      5) Do not use trucks for any purpose other than that for which they are designed, e.g., bumping skids, pushing piles of material out of the way, using forks as a hoist, etc.

      6) Dock plates or bridge plates should be anchored before a truck is allowed to be driven on them.

      7) Trucks should cross railroad tracks diagonally and park at least six feet away from the nearest rail.

      8) Keep all extinguishers inside operating section of truck at all times.

      9) Internal combustion engine powered trucks should not be operated in unventilated, enclosed areas because of the potential for carbon monoxide poisoning.
b. **Grades**

1) Always drive with the load pointing upgrade, unless a bulky load interferes with visibility.

2) Trucks should ascend or descend grades slowly. When ascending or descending grades in excess of 10 percent, loaded trucks should be driven with the load upgrade. Unloaded trucks should be operated on all grades with the load-engaging means downgrade.

3) On all grades, the load and load-engaging means should be tilted back, if applicable, and raised only as far as necessary to clear the road surface. Low gear or slowest speed should be used when the truck is descending a grade. The operator should keep clear of the edge of loading docks and ramps, and never make a turn on a ramp.

c. ** Loads/Loading/Unloading**

1) All loads, whether on trucks, trailers, skids or pallets, should be stable. Materials should be neatly piled and crosstied if the shape permits.

2) Irregularly shaped objects should be loaded so that they cannot roll or fall off.

3) Heavy, odd shaped objects should be placed with the weight as low as possible. Round objects, like pipe or shafting, should be locked and, if necessary, tied so that they cannot roll.

4) Tilt back all loads to steady and secure load.

5) If a bulky load cannot be lowered enough to prevent view obstruction, the operator should drive the truck backward for a clear view.

6) To unload a large case of similar objects without a pallet, the operator should first drive into position for stacking. He should then lower the load onto a base having a block near the edge; withdraw the forks so that only their tips hold up the end of the load; withdraw the block; tilt the uprights forward and back away.

7) In attempting to pick up a palletized load, the forks should be fully and squarely seated in the pallet, an equal distance from the center stringers and well out toward the sides. Forks to be inserted in a pallet should be level, not tilted forward or backward.

8) When raising or lowering loads while standing still, the operator should not leave the truck in gear with the clutch depressed; he/she should return the shift to neutral and disengage the clutch.

9) Highway trucks, trailers, and railroad cars should have their brakes set and their wheels securely blocked by wheel chocks while they are being loaded or unloaded by a powered industrial truck.

10) When standard forks are used to pick up round objects, such as rolls or drums, care must be taken that the tips do not damage the load, or push it against workers. The uprights should first be tilted so that the tips of the forks touch the floor and then moved forward.
so that the forks can slide under the object. Tilting the uplifts backward will then cause the load to roll back against the vertical face of the forks and/or carriage and the load backrest extension creating a secure carrying position. A block or wedge should be placed against the drum or roll.

3. Lift Trucks

a. Operators of lift trucks should not move improperly loaded skids or pallets, broken pallets, or loads too heavy for the truck.

b. Using a lift truck as an elevator for employees should be done only if a work platform securely seated on the forks is fastened to the vertical face, and provided with handrails and toeboards. The truck should also have an overhead guard for the operator's protection. The operator must not leave the controls while the truck is used as a man lift.

c. Placing extra weight on the rear of a lift truck to counterbalance an overload shall not be permitted, as it may strain chains, forks, tires, axles and motor, and also may cause accidents.

d. Side stability is a critical factor in making turns at speed or on a slope. Back tilt of uprights reduces side stability on high lifts, and allowance should be made for this factor.

4. Unattended or Parked Trucks

A truck should be left unattended only after the load-engaging means has been placed in a lowered and inoperative position, the controls have been put in neutral, the power shut off, the brakes set, and the key removed or the connector plug pulled. This should be done when an operator is not in line of sight of his truck or is 25 feet or more away from the truck. A truck should never be parked on an incline, or parked so as to obstruct an aisle, doorway, material, or equipment to which others may require access.

5. Passengers and Pedestrians

Passengers must never be permitted to ride on a truck unless there is a seat provided specifically for that purpose (see VII.B.2 below). The operator must take responsibility for keeping riders off. Additionally, operators must be cautious when operating a truck near pedestrian traffic.

6. Training

Requirements for training of powered industrial truck operators are outlined in OSHA 29 CFR 1910.178, “Powered Industrial Trucks,” and include a combination of formal instruction, practical training, and evaluation of the operator’s performance in the workplace. The required training must be successfully completed before the operator is allowed to use the truck on his/her own. Performance evaluations must be conducted at least once every three years.

7. Retraining

Operator retraining must be provided if the operator: a) has been observed to operate the vehicle in an unsafe manner; b) has been involved in an accident or near-miss incident; c) has received an evaluation indicating that he/she is not operating the truck safely; d) is assigned to drive a different type of truck; or e) if a condition in the workplace changes that would affect the safe operation of the truck.
8. **Inspections and Maintenance**

All powered industrial trucks (electrical, gasoline, or liquified petroleum operated) must be examined at least daily before being placed into service. If the truck is used on a round-the-clock basis, it must be examined after each shift. The vehicle must not be put into service if conditions that could adversely affect the safety of the vehicle are noted. Defects must be immediately reported and corrected. All repairs are to be made by authorized personnel.

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**MANUAL LIFTING AND CARRYING**

Assess the load and your ability to carry it. Consider its size, weight, and shape in the context of your physical ability and condition. Consider the distance to be traveled and the length of time that the grip will have to be maintained. Determine whether or not the size of the load will obstruct your vision while carrying it. If your assessment indicates that you will not be able to handle the load, get help in handling the material, or in lifting it onto a hand truck, luggage cart, or dolly that you can manage on your own. If you are going to carry the load, evaluate the route to be taken to ensure that it is free of tripping hazards or obstructions.

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**VII. Transportation**

A. **“Slow Moving Vehicle” Emblem**

B. **Automobiles, Trucks, and Motorized Vehicles**

C. **Vehicle Repair and Maintenance Shops**

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**VII. TRANSPORTATION**

A. **“Slow Moving Vehicle” Emblem**

All vehicles and/or trailers pulled by vehicles that are designed to move 25 mph or less and travel public and/or University roads must have a “slow moving vehicle” emblem affixed to the rear of the vehicle as determined by ANSI B114.1-1971.
B. **Automobiles, Trucks, and Motorized Vehicles**

1. All automobiles and trucks are required to be equipped with seatbelts that shall be worn by all occupants. Some specialized motorized vehicles (e.g., forklifts, tractors) may require that seatbelts be worn by the operator.

2. Passengers are allowed to ride in or on vehicles only if there is a seat provided specifically for that purpose. Riding in the rear of trucks, standing or sitting on fenders, rear, or sides of vehicles, equipment or golf carts is prohibited.

3. Materials being transported in or on vehicles must be properly secured against shifting. Loose materials (e.g., construction debris) in open vehicles shall be covered during transport. Vehicles shall not be overloaded.

C. **Vehicle Repair and Maintenance Shops**

As vehicles, trucks, and autos (and other rolling stock) are essential for transportation of University personnel and materials, maintenance and repair of motorized equipment is crucial to vehicle safety. Supervisors of vehicle repair and maintenance shops must take an active role in shop safety.

Items that bear considerable attention in shop maintenance include but are not limited to:

**Air Pressure.** Air pressure used for cleaning shall not exceed 30 psi at discharge nozzle.

**Battery Charger.** Employees shall be furnished and required to use protective equipment (glasses, gloves and aprons) when charging batteries with acid. Manufacturer’s recommendations for charging rate shall be carefully followed to prevent buildup of potentially explosive hydrogen gas. Metal tools, chains, etc., shall be kept well away from batteries to prevent a possible short circuit that could result in burns and/or explosion. Floors shall be designed for protection against slips and falls and electrical shock.

**Bench Grinder** must be securely fastened to stand or work bench. Both abrasive and wire wheels must be protected by enclosure guards. The work rest shall be adjusted to maintain a clearance of 1/8” to wheel. A chip guard shall be used and eye protection worn.

**Chainhoist/Floor Crane.** Chains and/or cables shall be inspected frequently by the operator for wear. Electrical controls shall operate smoothly; hoist or crane capacity must be visible to operator.

**Fans.** Shop fans (including blowers) must be protected by a metal mesh guard with openings no more than ½ square inch if fan is located within seven feet above floor.

**Fire Protection.** Shop shall be equipped with ABC extinguishers that are properly tagged and inspected. Approved safety cans shall be available for disposing of oily rags and towels.

**Floors** shall be free of oil and grease. Absorbent compound shall be available for covering oil and grease spots.

**Hand Tools** must be kept clean and in good repair. Defective tools shall be discarded if they cannot be repaired.
**Jacks.** If a jack is used to raise a vehicle, the vehicle must be supported by metal jack stands before anyone works under the vehicle.

**Parts Cleaning.** Avoid prolonged contact with degreasers or wear gloves to protect hands. Gasoline shall never be used as a cleaning solvent. Combustible liquid solvents shall be used in cleaning (dip) tanks that are provided with a self-closing lid, held open by a fusible link designed to melt under fire conditions.

**Tire Inflation.** Tires with split or locking rims shall be inflated in a steel airing cage.

**Ventilation.** The shop shall be well ventilated. Vehicles shall not be operated inside shop buildings unless there is provision for exhaust to the outside to avoid carbon monoxide hazard.

**Work Benches** shall be neat and clear of removed parts and tools not in use.

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**EXTENSION Ladders**

Extension ladders shall extend three feet above the working or access level and be secured at or near the top. They shall be placed so that the base is one foot from the wall or structure supporting the top of the ladder for each four feet of perpendicular rise to the top most support point of the ladder. **Metal ladders must not be used around energized electrical equipment.** When moving extension ladders, precautions must be taken to avoid overhead power lines.

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**VIII. Equipment Lockout/Tagout**

**A. Lockout**

**B. Tagout**

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**VIII. Equipment Lockout/Tagout**

During maintenance and/or repair work on equipment, the possibility of the equipment being energized and making an unexpected movement must be eliminated or reduced to prevent injury to persons in the immediate area as well as those operating the equipment. Lockout refers to the neutralization of all energy sources to a machine so that a **zero mechanical state** (ZMS) is obtained. Tagout involves placing a tag on any machinery receiving maintenance or repair work.
University policy and procedures for lockout/tagout comply with OSHA 29 CFR, 1910.147, “Control of Hazardous Energy (Lockout/Tagout).” The standard provides for the safety of employees from unexpected startup of machines or equipment or release of hazardous energy while they are performing servicing or maintenance. It applies to any source of mechanical, hydraulic, pneumatic, chemical, thermal, or other energy, but does not cover electrical hazards. Subpart S of 29 CFR Part 1910 covers electrical hazards, and 29 CFR Part 1910.333 contains specific lockout/tagout provisions for electrical hazards.

A. Lockout

Lockout procedures to attain ZMS afford maximum protection against unexpected mechanical movement. Usually, procedures involve the removal of electrical energy from a machine; however, depending upon the type of equipment, sources other than electrical must be considered: 1) hydraulic fluids under pressure; 2) compressed air; 3) energy stored in springs; 4) potential energy from suspended parts; 5) any other sources that might cause unexpected mechanical movement. Achieving zero mechanical state, therefore, includes not only the locking out of electrical energy but may also include the isolation, blockage, support, restraint, containment, or control of all other energy sources (kinetic and potential) to guard against the unexpected release of energy.

Lockout of equipment involves the use of padlocks on electrical switches and pressurized fluid or compressed air shut-off valves. In some cases where stored or potential energy may create a hazardous situation, other lockout methods shall be used. These methods may incorporate holding a machine member against gravity or a spring force by blocking, suspension, or brackets, or pins designed specifically for that purpose.

Lockout Procedures

Following are lockout procedures to be followed by all maintenance personnel working on machinery:

1. Alert the operator or person(s) whose job requires him/her to work in an area in which service or maintenance is being performed that lockout procedures are commencing.

2. Before starting work on an engine or motor, line shaft, or other power transmission equipment, or power-driven machine, make sure it cannot be set in motion without your permission.

3. Turn the electrical safety switch or valve to the off or closed position and place your own padlock on the control switch, lever, or valve, even if someone has locked the control before you. Protection means installing your lock.

4. If the padlock will not place the machine into a ZMS, then the mechanism may have to be blocked or secured in some effective manner. The foreman, superintendent, or OEHS may have to be consulted if ZMS cannot be obtained.

5. When work is completed, remove your padlock or device. Never permit someone else to remove it for you, and be sure you are not exposing another person to danger by removing the padlock.

6. If you lose the key to your padlock, report the loss immediately to your foreman or supervisor and get a new padlock.
7. Only key-operated locks shall be used and no two key configurations shall be the same. For identification, locks may be color coded to indicate the shop or differentiate the shifts. Each lock shall be stamped with the employee's name or specifically numbered. One lock and one key shall be issued to each individual. Additional locks may be signed out to employees as needed. The foreman shall have a master list of the lock numbers and shall keep all extra keys. In no instance shall the foreman lend the master key.

8. Where a lockout system is to be set up, equipment shall have built-in locking devices. Equipment must be designed for the insertion of padlocks or have attachments on which locks can be placed. Methods include use of special tongues that hold several locks or sliding rods that can be extended and then locked to prevent operation of control handles. This is especially important if two or more men are to work on the same piece of machinery.

B. Tagout

Tagout, which involves placing a tag on any machinery receiving maintenance or repair work, requires the use of appropriate cautionary signage as, for example:

- **CAUTION** - DO NOT OPERATE
- **CAUTION** - DEFECTIVE-DO NOT USE
- **DANGER** - OUT OF ORDER
- **CAUTION** - DO NOT OPEN VALVE

or any other suitable warning. However, the warning must be approved by OEHS and must contain the following: 1) description of the work being done, 2) name of the employee performing the work, 3) foreman's name, and 4) shop or section.

Tags must be used in all lockout procedures but may not be used as a sole means of placing machinery in a zero mechanical state. Tags must also be used with all portable power tools such as drills or saws, even when they are removed from use for maintenance or repair. Stationary power equipment that has power cords must also be tagged even though lockout of these items would simply involve unplugging the cord.