

ENVIRONMENT SHOP SAFETY PROCEDURES

INTRODUCTION

This section has been formulated to set guidelines for all environment employees; we work on fire alarms, HVAC controls and equipment, balance air and water volumes, and maintain the automated computerized environment of the campus. The Control Shop work environment consists of equipment rooms, penthouses, and open-air rooftop areas. The equipment contains rotating machinery, ladders, and access hatches, which present unique workplace hazards. A Control technician must pay adequate attention to safety procedures at all times. The purpose of this section is to guide all workers of the Environment Shop through a safe and meaningful workday.

ALARMS (FIRE, SECURITY, and MAINTENANCE)

Only authorized personnel are permitted to disarm, arm, or perform maintenance on these systems. In case of a Poudre Fire Authority (PFA) response, the PFA Commander is the only one authorized to permit silencing of the horns, strobes, and/or alarm.

CONTROLS (THERMOSTATS, BUILDING HEAT, COOLING, AND VENTILATION)

Only authorized personnel are permitted to adjust or modify building controls.

COMPUTER (AUTOMATED) ASSISTED EQUIPMENT START/STOP

The main computer CPU is located in the east end of Facilities Services North. Authorized personnel can, when requested, disable, enable, start, stop, or control automated building equipment. The computer operator and Facilities Dispatch should be notified prior to anyone working on or shutting down this equipment. Call 491-0077, 491-0174, or 491-0178 respectively. In addition, signs have been posted in the equipment rooms indicating that the rotating equipment (fans, pumps, etc.) may start and stop automatically. Never take for granted that equipment is safe to work on without proper lock out/ tag out procedures in place.

CONFINED SPACE

All environment employees should know the rules about Confined Space as stated in Chapter 18 of this manual. See that section, page 1 for details. Only Trained personnel who are using the required personal protective equipment are allowed to enter confined spaces.

ASBESTOS

Asbestos removal can only be done by people trained and certified in the procedure.

PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment will always be used as stated in Chapter 26 of this manual. Please refer to section for details.

LOCK OUT/ TAG OUT

When dealing with pumps, electrical motors, or any other equipment where there may be a release of hazardous energy, Lock Out/ Tag Out procedures will be followed as stated in Chapter 27 of this manual. Please refer to section for details.

HEARING PROTECTION

Hearing protection is required when entering, or working in, noisy mechanical rooms or other posted areas. Refer to Chapter 2, page 3 for procedures that must be followed for maximum safety.

EYE PROTECTION

As with hearing protection, eye protection is absolutely essential in an environment where contact with mechanical apparatus, possible flying objects, and/or chemicals is involved. Chapter 2, page 2 of this Safety Manual outlines the procedures, which will be followed in these types of environments.

LADDER SAFETY

In the Environment Shop there are many instances where ladders are used frequently during the performance of our job. Realizing the potential dangers related to ladders is necessary to avoid accidents and injury. Refer to Chapter 22 of this manual for details in ladder safety.

ROOF ACCESS

Access to roof areas is an essential part of some duties in the Environment Shop, specifically in relation to exhaust stacks, moving electrical equipment, and hazards from roof ledges. When gaining access to restricted rooftops, the approved list of roof clearances in Chapter 25 of this manual must be consulted. If the roof fans are not properly stacked, clearance should be obtained from the Building Proctor, or through the Dispatch Office before any work is performed.

HI-RANGER USE

Only Licensed operators may use the Hi Rangers and all safety procedures in Chapter 21 of this manual must be followed.

SAFETY VIOLATION POLICY

Flagrant or repetitive violations of safety policies will result in corrective and/or disciplinary action. Refer to Chapter 28 of this manual for this policy.

SAFETY PROCEDURES FOR MECHANICAL SERVICES

Due to the overlapping duties and the demise of the Mechanical Services section in Trades, HVAC, welding, and sheet metal duties are presented together in this chapter because of their close proximity to each other. People in these shops (Electric, Environment, and Plumbing) should read the other shops' information due to the overlapping of duties. For example, both HVAC and Welding use the oxyacetylene torch, so personnel in both shops should know how to use it safely. Working with sheet metal, personnel use brazing, welding, and soldering.

The Electrical Shop, having taken over the functions of Motor Shop, cares for the proper functioning of airflow through the buildings on campus. While the heating and cooling of the buildings have only minimal safety hazards, jobs that involve maintenance of a fume hood can be extremely hazardous. This section will provide information necessary to feel comfortable with the duties that you are asked to perform, with information on fall safety and roof access.

As a worker in HVAC, you will be asked to use ropes and slings, hydraulic rigging, "come-alongs," and block and tackle rigging. After setting up any of this equipment, step back and check to see that it is correct. Avoid any unnecessary hazards. Work efficiently and safely. Do not rush during work.

Usual attire has been discussed in the general section of this manual. Wear steel-toed, leather boots/shoes. The only exception is when working on the cooling towers. Wear athletic shoes, as the surface is slippery.

Proper footwear is a personal responsibility. See GENERAL WORK RULES (Chapter 2), Safety Shoes Section (see page 3).

The next three sections discuss the different facets of HVAC and any hazardous information in which you should be aware.

HEATING

There are three types of heating: hot water, steam, and gas forced air. These sources of energy are potentially dangerous. The hot water temperature is 180 degrees Fahrenheit and can scald the skin; a steam leak can cause burns; and natural gas is highly combustible. You must be aware of the potential for explosion.

When working on pumps and motors, you will often be working in water. There are boots available, including hip waders that should be worn. After putting on the appropriate gear, be sure to lock out the circuit prior to any work. And, as a safety precaution, carry a meter even after the circuit is dead. There is always a possibility that the pump or motor is still energized. Act on the side of caution. And be aware of the Lockout/Tagout procedure in Chapter 27.

If asbestos is encountered when performing work, discontinue work and report it to your supervisor immediately. Asbestos should not be disturbed. Only qualified, certified personnel may handle asbestos-containing materials.

VENTILATION AND ROOF ACCESS

Be familiar with the new procedures concerning Roof Access and clearances (see Chapter 25). The major concern of working with ventilation is fume hoods, because of their previous contents. Ask lab occupants what chemicals have been sent up the hood. If in doubt or a clear answer is not available, radio the shop supervisor and make him/her aware of the situation. Also contact the Building Proctor. Be familiar with other hoods attached to the ducts.

Ventilation work is performed on rooftops, some with restricted access. Always be aware of your body position.

If you must bring to the shop any potentially contaminated materials, for instance as a fan housing, at the very minimum, run water on it. If decontamination is required, contact Environmental Health Services (EHS) prior to transport or handling for a sample survey.

AIR CONDITIONING AND REFRIGERATION

The main safety hazards when working with air conditioning and refrigeration are Freon, electrical components, displaced oxygen levels due to large Freon leaks, and heavy components and equipment. Any hazardous condition encountered must be reported to your foreman.

When transferring large volumes of Freon (larger than 30 lb. container) and/or working in a confined space, oxygen detectors should be used. Respiratory equipment (oxygen bottle and mask) should be readily available when working with, loading, or recovering Freon due to the hazard of phosgene gas, an odorless, green toxin.

Should a major Freon leak occur:

- ◆ Evacuate the area immediately.
- ◆ Call 911. CSUPD will contact all non-university agencies requiring notification (Poudre Fire Authority, etc.)
- ◆ Contact Environmental Health Services
- ◆ Radio dispatch the shop foreman to notify him/her of the situation.

Poudre Fire Authority will gain control of the building and will not release it until the oxygen level is safe for re-entry.

SAFE USE OF OXYACETYLENE CUTTING TOOL

The main dangers of oxyacetylene cutting are fire, burns, and toxic fumes. If a person feels dizzy or nauseated, or has blurred vision, they should discontinue the job and get some fresh air.

PRECAUTIONS

- ◆ When using oxyacetylene torches, make sure that a multipurpose dry-chemical fire extinguisher is readily available and in working condition. It is recommended that a 10 lb. (4A.40BC) portable extinguisher be on hand.
- ◆ When using torch indoors, use only in a well-ventilated place.
- ◆ Wear welding goggles and protective clothing including gloves and welding shield. Keep gloves, hands, and clothing free of oil and grease. Wear gloves to handle hot metal.
- ◆ Avoid breathing toxic fumes like galvanized metal fumes, and some paint fumes.
- ◆ Use welding shield for jobs on campus that can be seen from passersby.
- ◆ Do not leave a burning torch unattended.
- ◆ Cut or weld at least 5 feet away from cylinders.
- ◆ Always use regulators; do not use oxygen or acetylene directly from cylinders. Be sure that the regulators used are of the proper design for the cylinder.
- ◆ Use flint lights, **NOT MATCHES**, for lighting torch.
- ◆ Use hoses designated for oxygen and acetylene only.
- ◆ Do not use oil on regulators, torches, fittings, or any equipment surface that may come in contact with oxygen. Be especially careful not to oil or grease oxygen fittings. These substances will ignite with a violent explosion.
- ◆ Do not use compressed oxygen to clean off clothing, as compressed oxygen is not compressed air. Oxygen speeds up combustion, and if clothes become oxygen-soaked, they will need only a spark to burst into flames.
- ◆ Do not breathe compressed oxygen directly from cylinder or hose.
- ◆ Use soap and paintbrush to test connections for leaks.
- ◆ Do not use acetylene at pressures higher than 15 pounds per square inch (psi). Acetylene becomes unstable and highly explosive when pressure is over 15 psi.
- ◆ Do not cut or weld directly on gravel or concrete.
- ◆ Keep heat, flames, and sparks away from combustibles.
- ◆ Do not cut or weld on containers that have been used to store combustible materials unless containers have been properly cleaned and purged. Containers that fall into this category are ones that once contained nitrogen, carbon dioxide, or argon.

Safety Rules for Operating Hi-Ranger (Aerial Lift)

See HI-RANGER (AERIAL LIFT) SAFETY PROCEDURES, Chapter 22 of this manual.

SHEET METAL

- ◆ Always be aware of your environment. Keep the work areas as clean as possible; clean up metal scraps immediately after using any of the cutters.
- ◆ When carrying an object that weighs more than 50 pounds, use one of the two-wheelers (dolly).

- ◆ If you use the solvent tank, put on the rubber gloves found on the tank.
- ◆ When soldering or welding in the shop, remember to turn on the exhaust fan.
- ◆ When welding, lens' light-resistance should be rated #9- #11.

Safe Use of the Machines in the Shop

BAND SAW: Use the light provided on the saw at all times. Use a push stick to guide wood through the saw rather than guiding it with your hands.

BRAKE MACHINE: The brake machine bends metal. As the arms move, there is a chance of being hit below the belt. When using the machine make sure that the area is clear of personnel. If someone else is using the machine, stay clear of its operation.

SHEARS: The shears cut metal. They are relatively safe to operate, but always be aware of your hand position. Keep hands away from the blades as you depress the footplate. Immediately after using the machine, clean up the scraps.

GRINDER: Wear gloves and full-face shield provided at the grinder. Use only the front of the grinding wheel, not the side. This will avoid wearing down the wheel and causing it to break.

DRAFT

Electrical Standard Operating Procedures				
	Disconnect Switch and Lock Out/ Tag Out	Connect/ Disconnect Wiring Related to Specific Pieces of Equipment	Measure Amperage	All Other Electrical
Carpenter Shop				
<input type="checkbox"/> Carpenter	X			
<input type="checkbox"/> Paint	X			
Environment				
<input type="checkbox"/> Alarms	X			
<input type="checkbox"/> Controls	X			
<input type="checkbox"/> HVAC	X	X	X	
Plumbing				
<input type="checkbox"/> Plumber	X			
<input type="checkbox"/> Heat/Cool	X			
Electric	X	X	X	X
Lock	X			
Zone	X			
District Energy	X	X	X	
Utility Locator	X			
Electrical Engineer			X	

Notes:

1. Specify voltages for the restrictions.