

**SAFETY HANDBOOK  
DEPARTMENT OF PHYSICAL PLANT  
UNIVERSITY OF LOUISVILLE**

- Table of Contents -

	Page number
I. Introduction .....	3
II. Employee's and Supervisor's Responsibility .....	4
III. Training .....	5
IV. Reporting a Safety Hazard.....	6
V. Reporting an Accident.....	7
VI. General Safety Rules .....	8
VII. Specific Safety Rules.....	11
A. Carpenter Shop.....	11
B. Compressed Gas Cylinder.....	11
C. Custodial Services.....	12
D. Electric .....	17
E. Ladders .....	18
F. Lifting and Back Safety .....	19
G. Lifts .....	21
1. Genie Lifts .....	21
2. Aerial Lifts.....	22
H. Office Safety .....	23
I. Paint Shop .....	24
J. Personal Protective Equipment .....	25
1. Ear Protection .....	25
2. Eye Protection.....	26
3. Fall Protection.....	28
4. Footwear .....	29
5. Gloves.....	29
6. Hard Hats .....	30
7. Respirators .....	30

K.	Plumbing Shop .....	31
L.	Scaffolds.....	33
M.	Tools .....	35
	1. Stationary Powered Tools .....	36
	2. Portable Electrical Tools.....	40
	3. Pneumatic Portable Tools .....	36
	4. Powder or Explosive Tools.....	37
	5. Fuel Powered Portable Tools .....	38
N.	Vehicles & Heavy Equipment.....	44
O.	Walking & Work Areas.....	46
P.	Weather Conditions.....	47
	1. Cold Weather Precautions.....	47
	2. Hot Weather Safety Tips.....	47
Q.	Welding.....	48
	1. Gas Welding .....	48
	2. Arc Welding .....	49
VIII.	Definitions .....	53
IX.	Established Physical Plant Policies	
	A. Chemical Spills Policy .....	55
	C. Fire Policy .....	55
	B. Hazard Communication Program .....	55
	D. Lamp Waste Policy .....	55
	E. Lockout/Tagout Policy .....	55
	F. Confined Space Policy .....	55
	G. Fall Protection Policy (When Finalized)	
X.	Appendix A	
	A. Personnel Policy Guidelines.....	56
	B. Safety Hazard Reporting Form.....	57
	C. Non-Routine Task Form.....	58
XI.	Appendix B - Bibliography .....	61
XII.	Appendix C - Non-Routine Tasks Assessment Guidelines.....	64
XIII	Appendix D - Hearing Conservation Program. ....	66

## **I. INTRODUCTION:**

The Department of Physical Plant is dedicated to providing a healthy and safe working environment for all of its employees. The main purpose of this Handbook is to provide you with information that will help you do your job in the safest possible way. The Department of Physical Plant will provide a safe workplace for all of its employees by:

- A. Providing continuous safety education and training;
- B. Performing safety inspections at University work sites;
- C. Providing employees an opportunity to report unsafe working conditions;
- D. Ensuring support from administration and management.

This Handbook is a guide to the safety rules and procedures of the Physical Plant safety program. These safety rules and procedures are designed to help you work in an accident-free environment. The Handbook does not cover every circumstance of your job, but gives you general guidelines to assist you in your overall work effort. If you ever have a question about how to perform your job safely, you should contact your supervisor immediately.

## II. RESPONSIBILITY FOR SAFETY:

Safety is everyone's responsibility. Although your supervisor and the management of Physical Plant are dedicated to getting a job done, they are first responsible for providing a healthy and safe work environment.

### A. EMPLOYEE'S RESPONSIBILITY:

It is your responsibility to promote safety for yourself and your colleagues. You should report any unsafe practices or conditions to your supervisor.

**You will not be asked to compromise your safety and health for any reason.** If a safety hazard or problem arises, you should report it by procedures outlined in Section V, "Reporting a Safety Hazard."

### B. SUPERVISOR'S RESPONSIBILITY:

The supervisor shall be responsible for the action(s) necessary to prevent accidents. The supervisor shall conduct a job briefing with workers to discuss and evaluate any hazards. ***When workers perform Non-Routine Tasks, the supervisor shall conduct a job hazard assessment. The supervisor shall fill out a Non-Routine Worksite Hazard Assessment Form. A copy shall be given to all affected workers prior to starting a Non-Routine job. The form shall be dated, which indicates the supervisor conducted the survey and has identified all known hazards.*** He/she shall provide proper equipment/tools, personal protective equipment and/or necessary warning devices. The supervisor shall send a copy of the form to the Safety Coordinator.

The supervisor shall provide training for new employees. He/she shall also provide training for new equipment, changes in safety policies, special hazards or operational duties. The supervisor shall document and file all training records. The supervisor shall invite and consider safety comments and suggestions from employees. When a hazard has been reported to the supervisor, it is the supervisor's responsibility to ensure that the appropriate action(s) has been taken to correct the hazard in a timely fashion.

### **III. TRAINING**

All employees shall be properly trained according to their job assignments. It shall then be the responsibility of the Supervisor to see that each employee is properly trained. (See Section II, Supervisor's Responsibility). All training shall be documented by completing a Training Form for each employee for each training session held. The employee and supervisor shall sign the Training Form at the completion of the training session.

When the Training Form is signed by the employee, you indicate that you understand the training and can perform your job safely.

The original Training Form will be filed with the Safety Coordinator, with copies sent to the appropriate Supervisor and Superintendent.

#### **IV. REPORTING A SAFETY HAZARD**

All safety hazards that are related to maintenance should be reported through Physical Plant's workorder process. Callers should tell the person taking the request that it is a safety item. Non-maintenance requests should be reported by using the "Safety Hazard Reporting Form" [see Appendix A]. This form will be processed per procedures outlined in Personnel Policy Guidelines [see Appendix A].

## V. REPORTING AN ON-THE-JOB INJURY OR ILLNESS

"Any employee who is injured on the job or develops health problems that are work-related must immediately report the matter to the supervisor for medical care instruction under provisions of the Kentucky Workers' Compensation Act. Prompt and accurate reporting of all accidents to the supervisor is necessary to insure proper processing of claims...."

- A. If you are injured on the job or develop a health problem that is work-related, you must report this information to your immediate supervisor, regardless of how insignificant the injury or health problem.
- B. If the injury or health problem is deemed severe enough to require the attention of a physician, you will be sent to a health care facility that has the appropriate staff and equipment to treat your injury. If you prefer, you may see your own physician.
- C. Your supervisor will complete the Departmental Accident Investigation Report and forward it to your Superintendent for his review. The Superintendent will, in turn, forward the original to the Administrative Office with a copy to the Safety Coordinator. The Administrative Office will complete the Employer's First Report of Injury (IA-1) form for your supervisor's signature and forward that form to the Employee Benefits Office. (If you are seen at the Student Health Center, that office will complete the Employer's First Report of Injury form.)
- D. While at Student Health Services or your own physician's office, you need to obtain medical certification (a doctor's statement) indicating whether or not you are able to return to work. If you are able to return to work, you will return to work, submit the medical certification to your immediate supervisor, and note the time you were off work obtaining medical attention on your Daily Time Card (white card). Your supervisor will note this injury time on your clock card. If you are unable to return to work, you should have your physician send this medical certification to the Administrative Office, Department of Physical Plant, University of Louisville, Louisville, KY 40292. This certification must indicate the length of the anticipated inability to work.
- E. When you return to work, you must present medical certification (a doctor's statement) stating that you are able to return to work. The Administrative Office will complete a Return to Work form and forward it to the Employee Benefits Office.
- F. Failure to promptly and accurately report an on-the-job injury or work-related health problem may result in over or under payment of benefits and possible disciplinary action as appropriate.

## **VI. GENERAL SAFETY RULES:**

- You are responsible for your own safety and for exercising care to prevent injury to co-workers, students, university personnel and general public.
- You are responsible for knowing and complying with the general and specific Safety Rules that apply to the job being done.
- Do not improvise or sacrifice safety for the sake of work productivity.
- Never enter barricaded or roped-off areas without authorization.
- Know the location of all emergency exits in your work area.
- Know the location of all fire extinguishers in your work area.
- Know the location of eye wash stations and emergency showers in your work area.
- Thoroughly read and have a clear understanding of all safety materials, handbooks, rulebooks, etc. that are distributed to you. Consult your Supervisor if you have questions or you are in doubt.
- Horseplay is prohibited.
- If you cannot correct an unsafe condition, report it to your Supervisor immediately.
- The possession and/or use of unauthorized drugs, intoxicating beverages, controlled substances or being under the influence on University Property is prohibited.
- The possession of firearms on University Property by employees of the Department of Physical Plant is prohibited.
- You are responsible for general housekeeping in their work areas.
- Report all injuries to your Supervisor regardless of how minor they seem at the time.
- Do not use or operate defective or unguarded tools and equipment. Report the condition to your Supervisor.
- Be certain that all instructions are clearly understood before starting any job or task.
- Only operate tools and equipment that you have been trained and authorized to use.
- Walking and working surfaces shall be kept clean, dry and orderly.
- When operating or riding in motor vehicles, seat belts shall be worn.
- Employees should not wear finger rings, necklaces, bracelets, neckties or loose baggy clothing around moving machinery or equipment.

- Learn to lift and handle materials safely. Do not hesitate to ask for help in lifting heavy loads. Always push rather than pull a heavy load.
- Read the "Material Safety Data Sheet" (MSDS) and label, for any chemicals you use. Follow recommended safety precautions.
- Personal Protective Equipment designated by your Supervisor shall be worn or used at all times when your job requires it.
- Adjusting, cleaning, oiling or repairing of equipment and/or machinery while in motion is prohibited.
- Riding on equipment not designated for passengers is prohibited.
- Compressed air shall not be used to clean clothing, yourself, or other personnel.
- Use only approved safety containers for transporting, dispensing or storing flammable or hazardous liquids.
- Never touch exposed, frayed or loose electrical wiring. Consider it dangerous and report it to your Supervisor immediately.
- All tools shall be maintained in a good state of repair. Defective tools shall not be used.
- Tools shall be used for their intended purpose only.
- Water hoses and air hoses shall be inspected, wrapped up and stored after each use.
- Where there is vehicular traffic, workers shall use either fluorescent mesh jackets or reflective tape, etc., when working in nighttime hours.
- In the event of a fire or fire-related incident, activate the fire alarm and exit the building.
- First-aid kits shall be maintained by the supervisor and shall be checked after each monthly safety meeting.
- Be cautious of walking surfaces. Use handrails when available and watch for hazardous areas.
- If doors or doorways require cleaning or maintenance, the area shall be restricted and identified with caution tape.
- Electrical cords shall be inspected, wrapped and stored after each use. Ground Fault Interrupter Receptacles shall be used for all tools and equipment when used in or around wet conditions. If the tool or equipment is equipped with a three-prong plug, it shall be plugged into a grounded or three-hole electrical receptacle. Removal of the third prong is prohibited.
- When using electrical equipment in halls, warning signs shall be displayed and cords should not extend across the hall. Do not extend cords down stairs unless you can close access to the stairs and alternate egress is identified.

- Powered equipment shall not be left unattended. Powered equipment shall only be plugged in while in use. When removing a power cord from an electrical outlet, reach down and grasp the plug and pull straight out

## VII. SPECIFIC SAFETY RULES

### A. Carpenter Shop

1. Appropriate eye and face protection shall be worn. Have protection equipment in arm's reach of equipment being used.
2. All sharp or cutting edge tools shall have a protective cover or protective storage place when not in use.
3. Impact tools such as chisels, gouges, punches, etc. that become mushroomed or cracked, shall be dressed, repaired or replaced before further use.
4. When using sharp or cutting edge tools, direct the cutting action away from you.
5. Wood handles on tools shall be replaced if they are loose, split, splintered or broken.
6. Claw hammers are designed to drive and pull nails and shall never be used as a machinist's hammer.
7. Do not place chisels, screwdrivers or other tools in your pockets. They could cause severe injury in the event of a fall.
8. Sawdust and wood shavings are a fire hazard. They also create a hazardous walking/working surface and shall be cleaned on a daily basis.
9. Remove or bend down all nails in dismantled materials or used lumber.
10. Remove all nails before sawing any used lumber.
11. Avoid getting splinter wounds and abrasions from handling lumber. When practical, gloves should be worn.
12. Table saws, planers, sanders, drill presses and shapers shall have an outlined work area marked in yellow as a caution zone.
13. Carpenter Shop work areas, tools and equipment shall be cleaned and maintained on a weekly schedule.

### B. Compressed Gas Cylinders

1. A falling cylinder can break a leg or crush a foot. Even worse, the valve can break off and the entire 130-pound cylinder could become a rocket. All cylinders shall be stored and secured in an upright position, whether EMPTY or FULL.

2. Specially constructed dollies provide firm anchorage for oxygen, acetylene, nitrogen or hydrogen cylinders. Lacking such special equipment, the cylinders shall be chained to a solid support in an upright position.
3. Leave the valve protection cap in place until the cylinder has been secured, placed in a cylinder stand or on a cylinder cart.
4. Never allow cylinders to be dropped or permit them to strike each other violently.
5. Cylinders can be rolled on the bottom edge, but never dragged.
6. Do NOT use cylinders, whether full or empty, for rollers, supports or any purpose other than to contain pressurized gases.
7. Do NOT tamper with safety devices in valves or cylinders. Always consider cylinders full and handle with corresponding care.
8. NEVER permit oil, grease or other readily combustible substances to come in contact with oxygen cylinders or valves.
9. Regulator valves that bleed or allow more than the gauged pressure to build in the hose line shall be removed immediately and sent promptly for repair. Regulator valve repair is highly specialized and shall be repaired by an authorized and trained technician.
10. Always use a regulator to reduce the cylinder pressure unless specific equipment or tools require bottle pressure.
11. Cylinders shall be assigned to a definite storage area. Separate empty and full cylinders. Empty cylinders shall be identified as such, with a tag.
12. Always leave some positive pressure in the cylinder - 25 PSI is recommended. Refrigerant cylinders are excluded.
13. When returning an empty cylinder, be sure to replace the valve protective cap.
14. NEVER use oxygen as a substitute for compressed air.
15. Always open cylinder valves slowly
16. See Section R, "Welding," for additional information and specific rules.

#### C. Custodial Safety

1. A "Caution, Wet Floor" sign shall be displayed when floors are wet due to routine cleaning, weather conditions or emergency problems, including any type of spills on floors. Mats or runners shall be used at entrances when necessary to avoid slips or falls. (When in doubt, display the sign.)

2. Loose grit, soil or debris should be swept up as soon as possible.
3. When emptying mop buckets, use proper lifting techniques to prevent back injuries. If the bucket is too full, use a small pail to dip some of the water out and then lift the bucket. See Section F, "Lifting and Back Safety," for additional information and specific rules.
4. Trash receptacles should be emptied regularly. Lift the liner out by the top or dump the trash directly into the collection container. Never reach into a trash receptacle.
5. Trash should be carried away from your body. Report to your supervisor immediately when needles, broken glass or dangerous materials are not disposed of properly.
6. Ash receptacles should be emptied daily into a separate metal or non-flammable container. Trash or paper that has been discarded in an ash receptacle should be removed immediately in order to eliminate any fire hazard.
7. All chemical containers shall be properly labeled. Be exact when measuring chemicals. Directions should be read and carefully followed when measuring amounts to dilute chemicals.
8. Gloves and safety glasses shall be worn when diluting chemicals or using bowl cleaner.
9. Never smell a chemical to determine what it is.
10. Two or more chemicals shall not be mixed together. If a second chemical needs to be applied to a work area, that area shall be rinsed thoroughly before applying a second chemical.
11. Powered equipment shall not be left unattended. Powered equipment shall only be plugged in while in use. When removing a power cord from an electrical outlet, reach down and grasp the plug and pull straight out.
12. When using electrical equipment in halls, warning signs shall be displayed and cords should not extend across the hall. Do not extend cords down stairs unless you can close access to the stairs and alternate exits are identified.
13. Electrical cords shall be inspected, wrapped and stored after each use. Ground Fault Interrupter Receptacles shall be used for all tools and equipment when being used in or around wet conditions. If the tool or equipment is equipped with a three-prong plug, it shall be plugged into a grounded or three-hole electrical receptacle. Removal of the third prong is prohibited.
14. When it is necessary to climb, do not substitute boxes, crates, barrels, drums, cans, chairs, furniture, plumbing fixtures, etc. as ladders. (See Section E, "Ladder," for additional information.

15. Equipment with handles shall be properly secured in a cart or held in a vertical position when being transported to job site.
16. When spot cleaning wall switches, electrical outlets or surrounding areas, always spray the sponge or cloth being used for cleaning, then wipe the area to be cleaned. Never spray the switch or receptacle directly, you could suffer an electrical shock.
17. Custodial carts should be kept neat and organized at all times. All containers shall be placed in an upright position with caps/tops secured tightly on containers. Carts should not be left unattended.
18. Custodial closets should be kept neat and organized at all times. All containers shall be placed in an upright position with caps/tops secured tightly on containers.
19. If doors or doorways require cleaning or maintenance, the area shall be restricted and identified with caution tape.
20. To open or cut boxes/containers retractable knives shall be used.
21. A broom or counter brush and a dustpan shall be used to pick up broken glass.
22. Safety hazards shall be reported to your supervisor immediately.
23. Electrically Operated Machines
  - a. Low-Speed Buffer Safety - Spray Buffing
    1. Display "Caution-Wet Floor" sign/signs in work area.
    2. Check block for proper fit and pad placement.
    3. Adjust handle height for proper control.
    4. Connect electrical cord to power source, making sure cord will not come into contact with moving parts.
    5. Spray a light mist of spraybuff solution; if pad becomes too wet, machine will be harder to control.
    6. Use a smooth even motion, a jerky motion will cause loss of control.
    7. Keep electrical cord off floor or as close to wall as possible.
    8. Do not leave the buffer unattended when connected.
  - b. Low-Speed Buffer Safety - Bonnetting
    1. Prepare carpet extraction solution on mop bucket per manufacturer's instructions, submerge bonnet and wring lightly.

2. Display "Caution-Wet Floor" sign/signs in work area.
3. Check block for proper fit and bonnet placement.
4. Adjust handle height for proper control.
5. Connect electrical cord to power source, making sure cord will not come into contact with moving parts.
6. Use a smooth, even motion; a jerky motion will cause loss of control.
7. Keep electrical cord off floor or as close to wall as possible.
8. Do not leave unattended when connected.

c. Low-Speed Buffer Safety - Scrubbing

1. Display "Caution-Wet Floor" sign/signs in work area.
2. Prepare detergent, disinfectant, or stripper solution in mop bucket per manufacturer's instructions and apply.
3. Check block pad for proper fit and placement.
4. Adjust handle height for proper control.
5. Connect electrical cord to power source, making sure cord will not come into contact with moving parts.
6. Use a smooth, even motion; a jerky motion will cause loss of control.
7. Keep electrical cord off floor or as close to wall as possible.
- 8.

Do not leave unattended when connected.

d. High-Speed Buffer Safety

1. Display "Caution-Wet Floor" sign/signs in work area.
2. Check block for proper fit and pad replacement.
3. Adjust handle height for proper control.
4. Connect electrical cord to power source, making sure cord will not come into contact with moving parts.
5. Keep electrical cord off floor or as close to wall as possible.
6. Do not leave unattended when connected.

- e. Vacuums-Wet/Dry
  - 1. Display "Caution-Wet Floors" sign/signs in work area as needed.
  - 2. Keep electrical cord off floor or as close to wall as possible.
  - 3. Tank should be cleaned at least every month with disinfectant solution to prevent growth of bacteria and algae.
  - 4. Do not leave unattended when connected.
- f. Vacuums - Upright/Portable
  - 1. Regularly inspect electrical cord for fraying, looseness or improper grounding.
  - 2. Keep electrical cord wrapped and secured on holder when not in use.
  - 3. Check beater bar and belt regularly; replace/repair as needed.
  - 4. Remove all foreign matter from magnetic bar after each use.
  - 5. Do not leave unattended when connected.
- g. Sprayers
  - 1. Wear protective eye wear when using.
  - 2. Use only manufacturer recommended products.
  - 3. Rubber boots are recommended to avoid slips.
  - 4. Do not leave unattended when connected.
- h. Blower
  - 1. Use proper lifting and carrying techniques.
  - 2. Do not leave unattended when connected.
- i. Scrubber
  - 1. Display "Caution-Wet Floor" sign/signs in work area.
- j. Burnisher
  - 1. Display "Caution-Wet Floor" sign/signs in work area.
- k. Automatic Scrubber
  - 1. Check squeegee for proper fit and no cuts or breaks.

2. Make sure valves for emptying and picking up solution are properly closed.
3. Prepare solution in tank per manufacturers' instructions.
4. Display "Caution-Wet Floor" sign/signs in work area.

1. Extractors

1. Prepare carpet extraction solution in machine per manufacturer's instructions.
2. Display "Caution-Wet Floor" sign/signs in work area.
3. Wear rubber-soled shoes and step carefully as wet carpet can be slippery.

D. ELECTRIC:

1. All electrical circuitry and/or conductors shall be regarded as energized ("alive") until the power source has been removed, tested, grounded and locked-out.
2. Only electricians and/or authorized employees shall install, maintain, repair and trouble shoot electrical apparatus, equipment and circuitry.
3. Observe the RULE OF TEN: Keep ALL OBJECTS at least TEN FEET AWAY from overhead power lines.
4. When attaching grounds on high voltage conductors, the ground end shall be attached first, and the other end shall be attached and removed by means of insulated tools.
5. Whenever the cover is to be removed from a manhole or vault, the area shall be guarded by barricades, signs or flags. Where permissible, park a truck to guard the work areas from oncoming traffic.
6. Electric panels shall not be left uncovered or unprotected at any time.
7. Only fiberglass ladders shall be used to perform electrical work.
8. High Voltage Repair (Over 600 Volt)
  - a. Only trained, authorized personnel shall perform high voltage repairs.
  - b. When work is performed where phase-to-phase voltage is above 600 volts, the minimum work crew shall be two (2) authorized persons.
  - c. When working on any voltage in excess of 600 V, all protective equipment shall be worn or used, such as rubber gloves, leather

protective gloves, rubber sleeves, high voltage stick, high voltage tester, hard hat, etc.

- d. Rubber gloves and sleeves shall be worn while opening or closing high voltage cutouts or replacing fuse links or fuses, even when using an approved hot stick or hot line tool. Approved eye protection shall also be used during these procedures. Rubber gloves and rubber sleeves shall be rated at 20,000 volts and tested every six months by an authorized testing facility.
- e. All electrical personnel shall be trained in CPR.

## E. LADDERS

The following general rules shall be followed and these precautions shall be taken when it is necessary to use any type of ladders:

1. When it is necessary to climb, do not substitute boxes, crates, barrels, drums, cans, chairs, furniture, plumbing fixtures, etc., for a ladder.
2. Check ladders for defects before each use.
3. Ladders with broken or missing rungs and/or steps, split side rails, or broken, loose, or missing safety feet/safety shoes shall not be used. The defective ladder shall be tagged "Out of Service" and shall be broken up before being placed in the dumpster. Under no circumstance will a defective ladder be removed from University premises for personal use.
4. All ladders shall have approved safety feet or safety shoes.
5. Never paint ladders because paint can conceal defects. If ladders are to be protected from the weather, they can be coated with linseed oil or varnish or any other transparent non-conducting material.
6. If two people are required to work on one ladder, a two-person ladder shall be used.
7. When ascending or descending ladders, employees shall face the ladder and grip the sides or rungs with at least one hand when ladder is less than ten feet tall.
8. When an employee is working on a straight ladder or extension ladder, twenty feet or more in length, another employee shall hold the lower end of the ladder or it shall be lashed securely.
9. Use a ladder of the correct length. Ladders shall be placed so the distance from the foot of the ladder to the base of the wall or other support is approximately one-fourth the working length of the ladder.
10. When transferring or stepping from a ladder to an elevated position or landing (such as from ladder to rooftop), the ladder side rails must extend a minimum of 36 inches above the landing. Never climb using the top three rungs.

11. Only fiberglass ladders shall be used near energized equipment or electrical wiring.
12. If a ladder is to be placed where the opening of a door can misplace it, the door shall be locked, closed or otherwise secured.
13. Straight ladders or extension ladders shall not be used as scaffold platforms unless specifically designed for that purpose.
14. When both hands need to be free while working on a straight ladder, the employee shall belt off to the ladder.
15. Make sure hands and shoes are free of slippery materials like oil and mud before climbing any ladder.
16. While working from a straight or extension ladder, keep your body within the side rails and avoid over-reaching by moving the ladder frequently.
17. When carrying straight ladders, keep the front end high enough to clear anyone ahead of you.
18. While working from straight or extension ladders, use a line to raise and lower tools and supplies. Never climb ladders unless both hands are free to hold the ladder.
19. Never attempt to splice two ladders together.
20. Stepladders - Platform Ladders
  - a. Stepladders shall not be used as straight ladders.
  - b. Stepladder legs shall be fully spread and the spreaders locked open.
  - c. While an employee is working on a stepladder (except a safety platform ladder) at a point ten feet or more above ground or floor, the ladder shall be tied, blocked, secured or held in place by another employee to prevent its being displaced.
  - d. Never climb or stand on the two top steps (platform ladders excepted). Most industrial ladders carry this warning on the step surface.
  - e. When leaving any ladder, especially a platform ladder, be sure to remove all tools and materials from it.

#### F. LIFTING AND BACK SAFETY

To safely lift or move a load, the following precautions should be taken:

1. Size up the load - if it is too heavy, seek help or use mechanical means to do the job.

2. Know what you are doing or where you are going with the load before you pick it up.
3. Tuck your pelvis - by tightening your stomach muscles, you can tuck your pelvis. This will help your back stay balanced while you lift.
4. Bend your knees - bend at your knees instead of at your waist. This helps you keep your center of balance and lets the strong muscles in your legs do the lifting.
5. Hug the load - try to hold the object you're lifting as close to your body as possible, as you gradually straighten your legs to a standing position.
6. Avoid twisting - twisting can overload your spine and lead to serious injury. Make sure your feet, knees and torso are pointed in the same direction when lifting.
7. When lowering the object, perform the above steps in reverse.
8. When moving large items up and down steps, such as a desk, there shall be at least two (2) people at the lower end of equipment.
9. If the bucket is too full when emptying mop buckets, use a small pail to dip some of the water out and then lift the bucket.
10. Back Supports shall be available for employees when requested. It is recommended that they be used when lifting as a reminder to lift correctly. They are not to be worn all day.
11. A FINAL SUMMARY OF IMPORTANT POINTS
  - a. Always carry the load close to the body.
  - b. Keep your back as straight as possible.
  - c. Lift with the stronger leg and arm muscles rather than the weaker back muscles.
  - d. Always have a clear vision above the load.
  - e. Get help if the load interferes with normal walking.
  - f. Never be afraid to ask for help in handling a load.
  - g. Offer suggestions when you think some type of mechanical equipment will do a more effective job.
  - h. Housekeeping is important. Tripping hazards or objects on the floor can cause persons carrying a load to fall and be seriously injured.

## G. LIFTS

### 1. "Genie" Lifts

- a. Only authorized persons, properly trained according to operating instructions, shall be allowed to use an aerial lift. Documentation of training shall be retained on file.
- b. The Physical Plant Department shall establish a preventive maintenance and inspection program in accordance with manufacturing recommendations. The inspections shall be made by an authorized person. All maintenance and inspection records shall be made available to employees upon request.
- c. All operating instructions issued by the manufacturer shall be followed at all times. A copy of the operating instructions shall be attached to the bucket of the lift.
- d. Operating Precautions:
  1. When operating a Genie Lift, it is recommended that a ground person be present at all times in case of an emergency situation. In the event that no ground person can be assigned, lift operator shall have two-way radio communication while using lift.
  2. This ground person shall have a two-way radio.
  3. Observe maximum load of 300 pounds. This includes one person plus all tools, materials and/or equipment carried with him/her.
  4. Do not use unless all outriggers are installed and the base is level.
  5. One person only in the platform.
  6. Do not climb, sit, stand or hang on guardrails on the platform.
  7. Use on a level floor or ground only. Do not operate from an elevated platform, scaffold, truck bed or extended surface or support.
  8. Never leave a ladder against the personnel lift or subject the unit to a horizontal force or side load by pushing or pulling from the platform or by hanging heavy wires or cables over the side.
  9. Do not move the "Genie" lift when elevated.
  10. If operating around power lines, the operator shall stay ten feet away from the power line. If you will be closer than ten feet, contact electrical operations.

- e. Personnel shall be required to wear a hard hat while ascending or descending in the personnel lift. A hard hat shall be worn while working in the personnel lift if there are exposed overhead hazards.
  - f. Ground personnel are required to wear a hard hat at all times.
2. Types of Aerial Lifts and Bucket Truck
- a. Only authorized persons, properly trained according to operating instructions, shall be allowed to use an aerial lift. Documentation of such training shall be retained on file.
  - b. A valid Commercial Driver's License (CDL) shall be required to drive the Bucket Truck, if the GVWR is over 26,000 pounds.
  - c. All operating instructions issued by the manufacturer shall be followed at all times.
  - d. Operating Precautions:
    - 1. When operating aerial lifts or bucket trucks it is recommended that a ground person be present at all times in case of an emergency situation. In the event that no ground person can be assigned, aerial lift or bucket truck operator shall have two-way radio communication while operating the lift or bucket.
    - 2. Load limits shall be observed.
    - 3. Proper stabilizing devices shall be used at all times.
    - 4. The truck shall be operated by the person in the bucket.
    - 5. The use of the lower controls is for emergency conditions only. Exception: The use of the truck for lifting an object with no operator in the bucket.
  - e. When working in the bucket, each person shall wear a body belt or harness that is attached to the boom by a lanyard.
  - f. Employees shall not be permitted to transfer from bucket to any other structure.
  - g. If the bucket truck is used on a street or roadway, all necessary precautions shall be taken to avoid accidents. The operator in the bucket shall always face in the direction in which the bucket is moving. The operator shall see that the path of the boom and/or bucket is clear while it is being moved.

- h. If operating around power lines, the operator shall stay ten feet away from the power line. Contact the Electric Shop if it is necessary to be closer than this.
- i. When ascending or descending in the bucket truck, personnel shall be required to wear a hard hat. If there are exposed overhead hazards while working in the bucket, a hard hat shall be worn.
- j. A hard hat shall be worn at all times by personnel working on the ground.
- k. The work site for the bucket truck shall be half the length of the boom and shall be clearly identified by the use of signs, pylons, warning tape, etc.

#### H. Office Safety

1. Emergency exits, corridors, and passageways shall be kept clear at all times.
2. Know where fire extinguishers are located and be familiar with their use.
3. Know where fire alarm boxes are located and be familiar with their use.
4. Know the emergency evacuation procedures for your building.
5. Keep all drawers closed when not in use.
6. When setting up new files, begin by storing the heaviest items in the bottom drawer.
7. Open only one file cabinet drawer at a time and do not open a file drawer over someone's head.
8. Inspect all electrical equipment regularly for frayed or worn cords. Exposed wires can cause serious shock and injury. When exposed wires are found, you shall report the hazard immediately to your supervisor.
9. Extension cords should not be used. If additional outlets are necessary, report the hazard to your supervisor.
10. Electrical equipment cords shall be under the desk or along baseboards. Cords shall not extend across walkways.
11. Observe good housekeeping practices and make sure there is a place for everything and everything is in its place.
12. Mechanical devices such as hole punchers and paper cutters deserve special attention - even in routine use. Be sure blade is "locked down" when not in use.
13. Keep all bottles, cans and containers clearly labeled, indicating contents and use.

14. Do not lift or carry heavy items such as typewriters, computers or cartons of books or paper. Request help.
15. Liquid spills are a major cause of falls in an office. Wipe up spilled liquids immediately.
16. Be sure-footed when climbing and use a step stool or stepladder. Step stools are made with spring mounted retractable casters for your protection. Never use a chair or other furniture for climbing, or to reach higher locations.
17. On stairways, use handrails and take one step at a time.
18. Think "SAFETY" when you are outside, too!

## I. PAINT SHOP

Painters are subjected to many safety hazards and exposures that include but are not limited to eye injury, dermatitis, falls, fire, poisoning and strains.

1. Guard against undue exposure to paint ingredients. Use gloves if you have an open wound, even though it is bandaged.
2. Approved face shield, goggles with side shields or plastic coverall goggles shall be worn when wire brushing, scraping or removing old paint.
3. You shall wear an approved sandblasting hood and other appropriate personal protective equipment at all times when sandblasting.
4. Approved rubber gloves, chemical goggles and a face shield shall be worn when bleaching compounds or paint removers are used.
5. Never paint hot surfaces except with an approved type of paint, and then only after receiving special instructions from your supervisor.
6. Do not paint or scrape near vents that may contain flammable materials. This requires approval of your supervisor.
7. Close cans of paints, solvent and all flammable materials properly. Keep an absolute minimum on hand where painting.
8. Because many paint bases are highly flammable, they should not be used where an open flame work is in progress.
9. Always handle paint thinners carefully and with respect, including oils, turpentine and mineral spirits. The use of gasoline as a paint thinner is prohibited. Keep all thinners away from heat and open flame.
10. DO NOT leave paint, thinner, or solvent soaked rags in your locker or on the Paint Shop bench or floor. They may ignite by spontaneous combustion. Deposit them in approved metal disposal cans.

11. Life Safety devices, sprinkler heads, heat and smoke detectors and automatic valve stems, etc., shall not be painted.
12. The Paint Shop shall be equipped with at least one, ABC Fire Extinguisher.
13. Those using or applying spray paints shall be protected from over spray. Protection shall meet at least NIOSH/MSHA approved dual cartridge respirator requirements.
14. Eye protection shall be worn when paint, lacquer, epoxy, thinner or other solvents could be introduced into the eye, especially when employees are painting or preparing overhead objects or surfaces.
15. To help prevent dermatitis, those who have the tendency should wear cotton gloves, long sleeves and keep the top button of their shirt buttoned while painting.
16. Ladders, platforms and scaffolds are heavy and odd shaped; therefore, they present a challenge to move, lift, carry or position. When necessary, two or more personnel should be used when maneuvering equipment.
17. Falls and slips are two hazards that painters face on a daily basis. The safe use of ladders and walking/working surfaces shall be considered at all times.
18. Gloves shall be used when using paint cleaning solvents, mineral spirits, turpentine, lacquer thinner, etc.

## J. PERSONAL PROTECTION

### ***General - Non-Routine Tasks (Assessment Guidelines See Appendix C)***

- Ear Protection
  1. Ear protection shall be worn according to Manufacturer's Specifications, under OSHA Hearing Committee recommendations, when the possibility of damage to an ear exists.
  2. When an area requires personnel to wear ear protection, the area shall be marked with sign/signs, "Ear Protection Required." Personnel shall not enter the area without proper ear protection. Ear Protection shall be required when:
    - a. Working in a designated "Ear Protection Required" area.
    - b. Performing any type of powered cutting or sawing for periods longer than two (2) hours, unless decibel level

is greater than one hundred (100).

- c. Operating lawn equipment or gas powered equipment.
  - d. Operating a jackhammer.
3. Plain cotton shall not be used for ear protection.
  4. Your shop foremen/supervisor shall provide the necessary ear protection when needed.
  5. Chart for exposure to varied levels of sound:

Duration per day, hours	Sound level DBA slow responses
8	90
6	92
4	95
3	97
2	100
1-1/2	102
1	105
1/2	110
1/4 or less	115

- Eye Protection
  - a. Safety eyewear shall be worn when there is a reasonable probability of injury that could be prevented by using this equipment. The type suitable and approved for the work to be performed shall be made available.
  - b. Eye Protection shall be worn while performing the following job duties:
    1. Any type of cutting or sawing.
    2. Use of powered equipment such as drills, sanders, grinders, etc.
    3. When nailing or striking an object.

4. When performing overhead work.
  5. When spraying chemicals, unless it is not required on the MSD Sheet.
  6. When operating lawn equipment such as mowers, trimmers, etc.
  7. When using a torch or welding equipment.
- c. Full cover goggles and/or face shields shall be worn when an employee is engaged in or is close to work involving:
1. Chipping, drilling or breaking of pavement, stone, brick, concrete, paint, metal or frozen ground.
  2. Buffing, power grinding or wire brushing, whether or not there is a built-in eye shield.
  3. When dust or flying particles are present, even if the condition is caused by others.
  4. Flame welding, cutting or burning (approved colored lenses shall be used.)
  5. Hand drilling or sawing of overhead objects.
  6. Use of powered tools such as drills, saws, sanders, etc.
  7. Handling of acids, caustics, chlorines, ammonia and other similar liquids or gases. (When Material Safety Data sheets require additional personal protection equipment it shall be worn.)
  8. All sandblasting operations.
  9. Approved helmets, head shields or hoods shall be worn/used when electric arc welding, heliarc welding or hydrogen welding.
  10. Where the danger and possibility of an electrical arc exist, (including switching).
  11. When paint, lacquer, epoxy, thinner or other solvents could be introduced into the eye, especially when employees are painting or preparing overhead objects or surfaces.
  12. Any other danger of injury to the eye, or at the direction of a Foreman or Supervisor.
- d. If a chemical substance enters the eye, you should flush and irrigate the eye with running water immediately and continue for at least fifteen minutes. Consult MSD Sheet for proper treatment.

- e. Any foreign objects that enter the eye shall be removed by a physician. Accompany the injured to the medical facility. Unless the foreign body is a piece of sawdust, on the eyelid or eye, moderate efforts may be made to remove it. The edge of a clean cloth or handkerchief may be used.
- Fall Protection
  - a. Safety life belts, life lines and lanyards shall only be used for employee safeguarding. When fall protection equipment is used for any purpose besides fall protection, it shall be removed immediately and destroyed.
  - b. Lifelines shall be attached to the structure or building above the point where employee is working and shall be capable of supporting 5,400 pounds of dead weight.
  - c. Lanyards' maximum length shall not exceed six feet and have minimal breaking strength of 5,400 pounds. When necessary to prevent injury, the length shall be shortened or the proper length shall be provided.
  - d. All hardware for safety belts and lanyards shall be constructed of drop forged or pressed steel, cadmium-plated in accordance with Type 1, Class B plating per Federal Specifications QQ-P-416. All surfaces shall be smooth and free of sharp edges. The hardware, except for rivets, shall be able to withstand a tensile loading of 4,000 pounds.
  - e. Working Surfaces. Employees working more than ten feet above a solid surface shall wear safety belts and lifelines when scaffolds or sloping ladders are not provided.
  - f. Employees entering permit-required spaces such as tanks, manholes, etc. shall wear a safety life belt and be attached to a lifeline. The type of safety life belt shall be a full harness type. See "Confined Space Policy" for specific requirements.
  - g. Employees working in an aerial lift shall wear a safety life belt and lanyard. The lanyard shall be attached to the bucket or basket.
  - h. Employees working on scaffolding over 20 feet in height shall wear a safety life belt and lanyard. The lanyard shall be attached to a lifeline. The lifeline shall be attached to the structure (or building) and NOT to the scaffolding.
  - i. Boatswain's Chairs. The employee shall wear a safety life belt and lanyard. The lanyard shall be attached to a lifeline. The lifeline shall be attached to the structure (or building).
  - j. Needle-Beam Scaffold. Employees shall wear safety life belt and lanyard. The lanyard shall be attached to a lifeline when working twenty (20) or more feet above the ground. The lifeline shall be attached to the

structure (or building) and NOT the scaffold.

- k. Window-Jacket Scaffolds. Scaffolds of this type shall have suitable guardrail unless employees are wearing safety life belts and are attached to a lifeline.
- l. Roofing Brackets. Employees working in areas twenty (20) feet or more above the ground shall wear a safety life belt and lanyard. The lanyard shall be attached to a lifeline. The lifeline shall be attached to the structure (or building).
- m. Safety life belts and lanyards shall be inspected before each use.
- n. Electric Specifications For Fall Protection. Safety life belts and lanyards shall meet OSHA (1926.959) requirements. Safety life belts with approved tool loops may be used for holding tools. Safety life belts shall be free of metal hooks and tool loops not permitted by (1926.959) requirements.

- Footwear

The Physical Plant Department, at this time, does not have a specific footwear policy. Wearing canvas tennis shoes, open toed sandals or shoes and high heels is prohibited for all Physical Plant employees except office personnel.

- a. Special footwear shall be worn when personnel are removing manhole covers. The protective footwear shall meet ANSI Z41.1, Class 75 requirements.

- Gloves

Gloves come in a variety of styles and materials. Basic types include cotton, leather, rubber or synthetic and/or synthetic coated fabric. Rubber gloves basically come in two types - reusable or disposable. It is recommended that gloves be worn when there is a possibility of abrasions, burns, cuts, punctures or snags to the hand.

Gloves shall be worn when performing these specific duties:

- a. Performing any high voltage repair. (Any voltage exceeding 600 V.) The glove shall be of the insulating type and resist the voltage exposed. These gloves shall also be tested semi-annually by an approved testing agency.
- b. Performing any type of welding or gas cutting. These gloves shall be of the flame-retardant gauntlet style.
- c. When handling any materials or substances containing or potentially containing PCB's, the glove shall be of a synthetic construction and able to resist the substance to which it may be exposed.

- d. When handling chemicals, acids and caustics, per MSDS sheet recommendations, the glove shall be of a synthetic or synthetic coated type, providing protection from the material being handled. Before removing, the glove shall be washed or rinsed, followed by washing of hands.
- e. e. When cleaning, the glove shall be of a synthetic or synthetic coated type, reusable or disposable, and should resist the substance to which it is exposed.

**IT IS HIGHLY RECOMMENDED THAT GLOVES BE WORN WHEN ADMINISTERING FIRST AID. (SEE BLOODBORNE PATHOGEN POLICY.)**

- f. A leather glove shall be worn when handling any type of rope, cable or steel wool. When using steel wool with any type of chemical, see Section 5D for instructions.
- g. Wire rope in sewage cleaning machines shall be handled with a glove of leather and metal construction.
- h. Disposable gloves shall not be reused and shall be disposed of properly. See Bloodborne Pathogen or Contaminated Waste Policy for specific disposal requirements.

Disposable gloves may be discarded in a normal trash receptacle if they have been used for general cleaning.

- **Hard Hats**

Hard Hats shall be worn while working in or around areas such as scaffolding, trimming trees, overhead pipes, while ascending or descending into a confined space, operating the bucket truck while ascending or descending to work area or where there is a possibility of a head injury while performing a job.

An area with potential overhead danger or hazard, the danger of impact, the danger of falling or flying objects or the possibility of coming in contact with electrical conductors shall be considered a Hard Hat area and Hard Hats shall be worn. This is to include open ceilings or removed ceiling tiles where the possibility of a head injury exists.

Areas that require hard hats be worn shall be identified. This area shall be marked with caution tape and a posted sign, "HARD HAT AREA." No one is to enter without wearing a Hardhat. Hardhats will be made available by the Foreman for persons conducting site inspections, etc.

- Respirators

Respirators shall be worn while performing the following tasks:

- a. The use of chemicals, whether spraying or introducing into a container or system per MSDS sheets.
- b. Painting with paints whose MSDS sheets recommend their use.
- c. If having to enter manholes or confined spaces where environmental hazards exist.
- d. The removal of asbestos, per DEHS.
- e. Exposed to an extremely dusty environment.
- f. If the task you are performing requires the use of a respirator, other protective equipment may be necessary, such as eye protection, gloves or aprons. Consult MSDS sheets and your supervisor.
- g. Before proceeding, personnel shall perform negative and positive pressure testing to determine if the respirator is properly fitted. Do not proceed until a proper fit has been achieved.
- h. Respirator Protection Checklist
  1. A respirator shall be worn when required by the MSD sheets. In the event that a chemical is applied outdoors (such as pesticides, weedkillers or fertilizers), the area shall be identified.
  2. If a respirator is necessary for any task you shall perform for U of L, you will receive, annually, at no cost to you:
    - a. Training in the appropriate method of using, maintaining and inspecting your respirator through DEHS.
    - b. A fit test to assure that you are provided with the respirator model and size that best fit your face through DEHS.
    - c. A medical evaluation to assure that you are safely able to wear a respirator. (Through a clinic designated by Physical Plant.)
    - d. To be qualified to wear a respirator, you shall be clean-shaven. A mustache is acceptable as long as the hair does not extend beyond the corners of your mouth.

## K. Plumbing

The following rules and procedures will aid Plumbers and Pipefitters in performing their work safely:

1. Pipe wrenches and chain wrenches shall be in good condition and have sharp jaws; inspect them frequently
2. Always use the correct size wrench. Never stand or jump on a wrench handle or use an extension (cheater) on the handle to get better leverage; Use a larger wrench.
3. Never hammer on a pipe wrench. Never use a pipe wrench as a hammer.
4. In all cases (space permitting) push pipe wrenches and tools away from the body and head. If you are working in a close space and it becomes necessary to pull on a wrench or tool, pull gradually and stand in order to brace yourself. This will help to prevent falls and your face will not be struck if the tool slips.
5. Bolt holes in flanges shall be lined up with a drift pin or pud wrench. Keep fingers out of flange holes.
6. When two or more workers carry pipe or other material, lifting and lowering shall be done at a given signal.
7. When soldering or brazing, the following rules will help you perform your job safely:
  - a. Never attempt to modify your torch construction and never use unapproved accessories.
  - b. Treat your torch as you would any fine tool or instrument. Do not drop or otherwise abuse.
  - c. Do not use a leaking, damaged or malfunctioning torch.
  - d. Eye protection shall be worn when soldering.
  - e. Work only in well ventilated areas and avoid the fumes. When brazing, always wear goggles having an ANSI 2.87 shade #4 or #5 lens.
  - f. When using a cutting torch, another employee shall be present for fire watch.
  - g. Contact Life Safety and/or Supervisor prior to soldering or brazing near a smoke detector.
  - h. Avoid contact of Flux with skin or eyes.
  - i. An ABC fire extinguisher and a bucket of water shall be near your work area.
  - j. When your torch is connected to a cylinder, always set cylinder on flat surface to avoid accidental tip over.

8. Sewer and drain cleaning safety rules.
  - a. Stay alert. Watch what you are doing and use common sense. Do not operate sewer and sink machines when you are tired. Know your machine. Learn its applications and limitations as well as the specific potential hazards to your machine.
  - b. Ground Fault Interrupter Plugs shall be used for all tools when working in water. If the tool is equipped with a three-prong plug, it shall be plugged into a three-hole electrical receptacle. Never remove the third prong.
  - c. Keep guards in place and in working order.
  - d. Wear snug fitting clothes, proper footwear, leather gloves or leather/metal gloves and safety glasses. Cover or secure long hair. Do not wear loose clothing, unbuttoned jackets, loose sleeve cuffs, rings, watches or jewelry.
  - e. Chemical and Cleaning Compounds. Be very careful when cleaning drains where chemical and cleaning compounds have been used. Eye protection shall be worn. Wear gloves when handling cables and avoid direct contact of skin and especially eyes and facial area, as serious burns can result from some chemicals and drain cleaning compounds.
  - f. Don't Force Machine. It will do the job better and safer at the rate for which it was designed.
  - g. Do Not Overstress Cables. Overstressing cables because of obstruction may cause twisting or kicking.
  - h. Do Not Overreach. Keep proper footing and balance at all times.
  - i. Do Not Abuse Cord. Never carry the tool by its cord or yank it to disconnect from the receptacle. Keep cord from heat, oil and sharp edges.
  - j. Disconnect Tools. When not in use; before servicing; when changing cables and heads. (Per Lockout/Tagout Policy.)
  - k. Avoid Accidental Starting. Don't carry a plugged-in machine with your finger on the switch. Be sure the switch is turned off before plugging in a machine. Do not use a machine if the switch does not turn it on or off.
  - l. If sink is marked Bio-Hazard, notify DEHS or the Radiation Safety before proceeding.

L. Scaffolds

1. Scaffolds shall be constructed to safely support a weight four times the maximum intended load. For example, a scaffold normally expected to hold a 200-pound man and his twenty pounds of material should be

designed to support 880 pounds without breaking. To be on the safe side, never load a scaffold beyond the maximum intended weight.

2. For your protection, elevated working platforms ten feet or above shall be surrounded on all open sides and ends with guard railing, which consists of a top rail, intermediate rail, and toeboard.
3. The top rail shall be at least 2 X 4 lumber or the equivalent. It shall be at least 3 1/2 feet high. It shall be factory supplied per the scaffold specifications.
4. Power lines near scaffolds are dangerous - make sure the Electric Shop has checked the area before a scaffold is erected where a worker or the scaffold itself might come in contact with the lines.
5. If a scaffold is damaged in any way, it shall be repaired immediately. Do not use it again until the repairs have been completed. All repairs shall be made with manufactured parts.
6. For light-duty scaffold, the supports are spaced not more than ten feet apart along the length of the scaffold and the weight limit shall not exceed 25 pounds per square foot.
7. For medium-duty scaffold, the supports are spaced not more than eight feet apart along the length of the scaffold and the weight limit shall not exceed 50 pounds per square foot.\
8. For heavy-duty scaffold, the supports are spaced not more than six feet apart along the length of the scaffold and the weight limit shall not exceed 75 pounds per square foot.

#### A. ROLLING SCAFFOLD

1. The maximum safe load of a scaffold may be determined by measuring the platform area and multiplying the area by the platform's capacity per square foot.
2. Rolling scaffolds are similar to built-up scaffolds, except that they are wheel-mounted. They have the same safety requirements, plus a few additional ones.
3. To prevent tipping, the maximum work height of a rolling scaffold shall not be more than four times the smallest dimension of its base. When this requirement cannot be met, either use suitable outrigger frames to enlarge the base or brace the scaffold.
4. Rolling scaffold wheels shall have a locking mechanism on each wheel to prevent movement.

5. Take all material and equipment off the platform before moving the scaffold so there is no chance something could fall and strike a worker below.
6. Remember, never move or alter a rolling scaffold when it is occupied because a worker could lose balance and fall.

## B. SUSPENDED SCAFFOLD

1. For heavy duty, a suspension scaffold shall have two-point suspension, swinging less than 20" and no more than 36" and shall have minimum capacity of 50 pounds per square foot. All of these suspension scaffolds have a number of features in common.
2. Outrigger beam for a suspension scaffold shall be at least fifteen feet long; it should not extend more than six feet, six inches beyond the bearing point.
3. Outrigger beams shall be made of structural metal; the inside end shall be anchored in place by large U-Bolts and anchor plates.
4. Because suspension scaffolds can swing and move in the wind, the platform shall be tied to the building so that it will not be blown about while workers are on it.
5. Suspended scaffolds shall be hung from steel cable; the cable shall meet safety requirements.
6. The rope used for scaffold suspension shall be able to support at least six times the intended load, which includes the weight of the scaffold and anything it carries.
7. If you are using acids, torches, or open flames, wire rope shall be used.
8. Most suspended scaffolds are raised and lowered with some type of hoisting mechanism; always check the hoist daily to make certain it is operating safely. To insure true winding, there shall always be at least three turns of rope left on the hoisting drum. This extra length also reduces the force exerted on the rope where it connects with the drum, thus lessening the possibility of the rope slipping from the drum or breaking.
9. When you are working on suspended scaffolds, a safety belt and lanyard shall be worn.
10. Fasten the lanyard either to a substantial member of the structure from which the scaffold is suspended or to a securely rigged lifeline that will safely support you if you fall off the scaffold or the scaffold falls. Never attach the lanyard to the scaffold itself!

11. The area below the suspended scaffold shall be identified by use of either pylons, tape, barriers, etc., within a ten-foot radius.
12. When persons are required to work under a scaffold, a screen (#18 gauge wire, 1/2" mesh) shall be in place between the toe board and the intermediate rail and cover the entire opening.

M. Tools

1. Stationary Powered Tools and Equipment

a. Band Saw Safety

1. Appropriate eyewear shall be worn.
2. Check adjustment for blade tension.
3. Make sure blade guides are properly adjusted.
4. Do not suddenly stop the band saw by forcing an object against the blade.
5. Make turns carefully and do not cut a radius so small as to cause twisting of the blade.
6. Keep the saw sharp and set.
7. Plan saw cuts to avoid "Backing Out" of curves as much as possible.
8. The foot on the saw shall be set to proper height depending on the thickness of the material being cut.
9. Clear scraps from table only after machine has made a dead stop.
10. Always let saw come to a complete stop before removing material.

b. Jig Saw Safety

1. Appropriate eye protection shall be worn.
2. Fit the blade into the chuck securely.
3. Do not adjust hold down while saw is running.
4. Do not attempt to make close or sharp turns with large/wide blades.
5. Plan cuts so "Backing Out" will be reduced to a minimum.
6. Clear scraps from table only after machine has made a dead stop.

7. Always let saw come to a complete stop before removing material.

c. Table Saw Safety

1. Appropriate eye protection shall be worn.
2. Blade guard and splitter guard with anti-kick back fingers shall be used at all times.
3. Adjust the saw so the blade cuts through the stock but does not extend upward more than 1/8 inch through the stock.
4. Never use a saw blade with a borehole larger in diameter than the diameter of the saw blade arbor.
5. Never do "freehand" sawing; ripping without the fence or crosscutting without the sliding crosscutting miter gauge.
6. The operator should not stand directly behind the blade, but should stand to the left.
7. To reduce the possibility of kickback when ripping short stock, the salvage should be to the left side of the blade.
8. Never clean sawdust or scrap from the saw table with fingers or hands. After the saw blade has stopped rotating, use a 24 inch (or longer) stick or a duster brush.
9. If stock must be "backed out," stop the saw. This prevents kickback.
10. The saw blade shall be inspected for cracks or other defects. Report any defects immediately.
11. Be constantly aware of others around you, but keep your mind on your work.
12. Make sure that the saw blade is installed with the teeth pointing in the direction of rotation.
13. Use a push stick when the hands come within six inches of the saw blade.
14. Do not allow others to stand in the saw's kickpath.

d. Radial Arm Saw

1. Appropriate eye protection shall be worn.
2. Cut long stock only; the radial or swing saw is not intended for short pieces.

3. Always maintain a minimum clearance of six inches between saw blade and the hand that is holding stock.
4. Check to make sure that the saw blade cannot extend past the front edge of the saw table.
5. Radial Arm Saws should be restricted by a chain, to stop forward motion at a desired point.
6. Radial Arm Saw operators shall have a thorough knowledge of saw operation, the use of anti-kickback devices and safety guards.
7. Ripping on the radial saw is not recommended. However, if ripping shall be done, make certain that the saw is locked into position.
8. Before starting, make sure that the guard telescopes properly.
9. Make sure that the saw returns freely to the rear of the table at the completion of each cut.

e. Belt Sanders

1. Appropriate eye protection shall be worn.
2. When using portable sanders, check belt for proper tracking and overall condition of belt, check for torn belts, and replace same if defective. These required checks and inspections should be done before plugging tool into electrical outlet.
3. Start the sander above the work; allow the rear end of belt to touch work first.
4. Make sure electrical cord and dust bag are clear from sander belt.
5. Always lift sander off the work before stopping.
6. When using portable sanders, secure the work with a holding device. Never hold the work piece with your hands.
7. Check to make sure portable sander switch is not in a LOCKED ON position before plugging into an electrical outlet.
8. Make sure belt sander has come to a complete stop before you set it down.
9. When using table equipped belt sanders, keep the table within 1/8 inch of the abrasive belt.
10. Allow table belt sander to reach full operating speed before any sanding is done.

11. If a piece of material becomes caught or wedged in a machine, Do Not try to save the material. STOP THE MACHINE.

f. Disc Type Sanders

1. Appropriate eye protection shall be worn.
2. Follow all previously presented general safety rules and precautions for sanders.
3. Before starting portable or fixed disc sanders, check the condition of discs for excessive wear and tear. Replace any defective disc before using sander.
4. When using a table or fixed disc sander, sand only on the downward travel of the disc.
5. When using a table or fixed disc sander, do not work with pieces that are too thin or too small/short, or that cannot be controlled. Use jigs or holding devices for small work pieces.
6. All portable electrical sanders (and any other portable electric tool) shall be equipped with proper grounding cords and attachment plugs or be double insulated.

g. Drill Press

1. Appropriate eye protection shall be worn.
2. Remove finger rings and jewelry, eliminate loose clothing and confine long hair. This rule also applies to any work with rotating, revolving or reciprocating tools and equipment.
3. All guards shall be in place before using or starting a drill press.
4. Remove chuck key immediately after tightening drill bit in drill chuck. Never leave chuck key in drill chuck for any reason.
5. Clamp the work to be drilled or place it in a drill press table vise. Do not hold work piece in your hands. When a drill bit breaks through, a merry-go-round effect may set up, causing serious injury.
6. Permit the drill press to stop of its own accord, after the power has been turned off.
7. Do not reach around or in back of the revolving drill chuck.
8. Select drill press speed carefully. Generally, small drill bits should revolve at high speed, and large drill bits at slower speeds.

9. If a piece of work is caught in the drill, turn off the power; do not try to stop by hand.

h. Mortising Machine

1. Appropriate eye protection shall be worn.
2. Clamp or secure the work piece in position firmly.
3. Use sharp bits and chisel. Check bit and chisel for proper and secure setting.
4. Hand turn the mortising machine one complete revolution before turning on power.
5. Keep hands clear of drill and chisel while machine is operating.
6. All mortising machines shall have thumb stops at each side of the chisel.
7. Never leave this or any machine tool while the power is on.
8. Give your full attention to the operation. Avoid distractions.
9. Do not allow others to stand in tool's kickpath.

i. Portable Router

1. Appropriate eye protection shall be worn.
2. Make machine adjustments only when tool is at a dead stop and unplugged.
3. Fasten work piece or stock in a vise or securely clamp in place.
4. Make sure router switch is in the off position before plugging into electrical outlet.
5. Tighten all bits and cutters with proper wrench.
6. Fingers, hands and body shall be clear of revolving cutter at all times.
7. (7) Use extra caution around wood knots and other hard spots.
8. (8) Particular care shall be observed if the router is used on plastic laminates; the work area should be clear of other employees.

j. Planer

1. Appropriate eye protection shall be worn.

2. Use only clean lumber, free of nails, paint, sand or other materials.
3. Make sure that the minimum length of stock run through the planer is equal to distance between the center of the feed and delivery rollers. Ordinarily, this shall not be less than 24 inches in length.
4. Always plane wood with the grain, never against the grain.
5. For most stock, do not plane or remove more than 1/16 inch at a time.
6. Always allow the planer to reach full speed before feeding any stock into planer.
7. Cutting head guards and belt drive guards shall be in their proper place at all times.
8. If a board stalls, never look into either end of the planer. Serious injury can result from flying splinters or kickback. Turn the planer off to retrieve stock.
9. Never feed boards of different thickness at the same time, kickback will result.
10. Never stand in line with board travel.
11. Hard woods require lighter cuts.
12. Always request help in handling long pieces of stock to be planed or jointed.
13. Do not allow others to stand in tool's kickpath.

k. Jointer

1. Appropriate eye protection shall be worn.
2. The guard covering the knives shall be in place at all times.
3. Use only clean wood, free of nails, paint, sand or other materials.
4. The board being jointed shall exceed the minimum length established for a particular jointer. Ordinarily, 12 to 18 inches.
5. Cuts should not exceed 1/8 inch. Smaller cuts for hard wood.
6. Use a push stick or pusher block, when appropriate for the job.
7. Feed stock slowly, considering the grain, depth of cut and kind of wood.

8. Do not face or joint any stock less than 3/4 inch thick.
9. Allow the board or stock to pass the knives far enough so that the guard will close before you pick up the stock.
10. End grain jointing is dangerous, especially for small pieces of stock. Use a hand plane for end grain work.
11. Several light cuts are safer than one heavy cut.
12. Always request help in handling long pieces of stock to be jointed or planed.
13. Do not allow others to stand in tool's kickpath.

l. Wood Lathe

1. (1) Appropriate eye protection shall be worn.
2. When operating a lathe, remove finger rings and jewelry, eliminate loose clothing and confine long hair.
3. Make certain that the wood is free of checks, cracks, loose knots, metallic substances or any other foreign matter.
4. Keep the tool rest as close to the stock as reasonably possible, this requires making frequent adjustments. Adjust the tool rest only when the lathe is completely stopped.
5. Always remove the tool rest for sanding and finishing operations. This eliminates a major pinch point.
6. Check stock frequently to make sure it has not loosened between centers.
7. Rough down stock to cylindrical form in a lower speed
8. Make certain that the tailstock is securely locked to the lathe bed before turning on the power.
9. The dead center requires lubrication.
10. Do not feel for smoothness of work while lathe is running.
11. When using faceplates, use screws large enough to hold work securely.
12. Keep an accurate check on the depth of cut to avoid striking the faceplate screws. Inspect work frequently to see that the face plate screws have not loosened.

m. Grinders, Bench or Pedestal

1. Appropriate eye and face protection shall be worn.
2. Do not attempt to use a grinder unless the grinder wheel guards, and the safety shields are in their proper place.
3. Adjust the tool rest to 1/8 inch from grinding wheel, while grinder is stopped.
4. Never grind on the side of the grinding wheel. Grinder wheels are not designed or constructed for side pressure, and may disintegrate from misuse.
5. Always check the grinding wheel for soundness, especially before installing a new wheel on the spindle; check grinding wheel integrity by using the RING Test.
6. Grinding wheels shall be dressed so that glazing and loading do not occur.
7. If the grinding wheel chatters or vibrates excessively, stop the grinder immediately. This may be a signal that the wheel is out of balance or is loose on the spindle.
8. All grinding wheels are labeled for maximum speed. The grinder drive motor or spindle speed shall not exceed the speed rating of the wheel.
9. Small pieces to be ground shall be held with "VISE GRIP" type pliers.
10. Stand to one side, out of line of grinding wheels, when starting the grinder, especially if the grinding wheel is a new one.

n. Power Hack Saw

1. Appropriate eye protection shall be worn.
2. Install new blades with teeth pointing toward the motor.
3. Lower the saw frame slowly; a sudden drop will shatter the blade.
4. Do not reach under the saw frame or blade when the frame is in the raised position.
5. Support the end of long stock in a positive manner with material devices. Do not handle material until machine comes to a complete stop.
6. Do not bear down on the saw frame, it will not speed up the sawing process, but will damage the blade.

7. Mount work to be sawed securely in the saw vise, and only when the saw is stopped.
8. Burrs on hack sawed pieces are very sharp. Handle these pieces with care until burrs can be removed.
9. Do not attempt to cut small pieces in one side of the vise jaws, unless a piece of equal thickness is in the opposite end of the vise, this will keep the vise jaws parallel and safe to use.
10. Never use a new blade in an old saw cut or channel, (KERF). This may cause blade breakage or binding.

o. Machine Guarding

Safeguards shall meet these minimum general requirements:

1. The safeguard shall prevent hands, arms, legs or any other part of a worker's body from making contact with dangerous moving parts. A good safeguarding system eliminates the possibility of the operator or another worker placing their hands near hazardous moving parts.
2. Workers shall not be able to easily remove or tamper with the safeguard, because a safeguard that can easily be made ineffective is no safeguard at all. Guards and safety devices shall be made of durable material that will withstand the conditions of normal use. They shall be firmly secured to the machine.
3. The safeguard shall ensure that no objects can fall into moving parts. A small tool which is dropped into a cycling machine could easily become a projectile that could strike and injure someone.
4. A safeguard defeats its own purpose if it creates a hazard of its own, such as a shear point, a jagged edge, or an unfinished surface that can cause a laceration. The edges of guards for instance, shall be rolled or bolted in such a way that they eliminate sharp edges.
5. Any safeguard that impedes a worker from performing the job quickly and comfortably might soon be overridden or disregarded. Proper safeguarding can actually enhance efficiency since it can relieve the worker's apprehensions about injury.
6. When mechanically possible, a worker shall be able to lubricate the machine without removing the safeguards. Locating oil and grease fittings outside the guard, with a line leading to the lubrication point will reduce the need for the operator or maintenance worker to enter the hazardous area.

7. Whenever safeguards or safety devices are removed or deactivated to repair, adjust or service the machine/equipment. The power source shall be turned off and locked out. Safeguard shall be re-installed before machine is put back in service.

N. Vehicles and Heavy Equipment

1. Vehicles (Automobiles, Pickup Trucks, Vans)
  - a) Employees who drive University vehicles shall have a valid driver's license. In some cases, a valid Commercial Driver's License (CDL) will also be required.
  - b) All vehicles shall be regularly maintained and kept clean. This will include checking oil, gas, tires, water, brakes, turn signals, lights and other related features, such as wipers and seat belts. If the vehicle appears to be unsafe for driving, leave it parked and notify the appropriate Supervisor.
  - c) All vehicles shall be equipped with an audible warning device and automatic backup beeper. Vehicles driven on sidewalks shall activate audible warning device.
  - d) Seat belts shall be worn at all times while in any University vehicle.
  - e) Drivers shall exercise added caution when driving on or through campus. The driver shall yield the right of way to pedestrians at all times.
  - f) Materials which extend more than 3 feet beyond the front or back of the truck or trailer, shall have warning devices attached, during the day Red Flags, and at night Red Lights.
  - g) Vehicles should not be parked on the sidewalk or in front of doorways or entrances, unless loading or unloading.
  - h) Vans carrying equipment or materials shall be equipped with occupant protection barriers.
2. Golf Carts
  - a. All employees shall be properly trained, and must be authorized by their immediate supervisor before they may qualify as an operator of the equipment in this section.
  - b. Each golf cart shall be equipped with a red flag such as one for a moped or bicycle and an audible warning device.
  - c. Golf carts shall not be driven on city streets except when crossing at thoroughfares.
  - d. Pedestrians shall have the right of way. Take caution when driving near congested areas on campus.
3. Equipment (Loaders, Backhoes, Tractors, Dump Trucks, Forklifts, Sweepers, etc.)
  - a. Prior to use, the operator shall inspect all hydraulic lines and fittings for leaks, wear, etc. This inspection shall include observation of the action of the hydraulics for signs of low fluid levels, defective pump, etc.

- b. All employees shall be properly trained, and must be authorized by their immediate supervisor before they may qualify as an operator of any of the equipment in this section.
  - c. Operator shall watch for all obstacles and hazards in the area of operation, e.g., overhead wires, etc.
  - d. This equipment should not be operated on extreme slopes where there is danger of overturning or loss of control.
  - e. All of the equipment shall have backup beepers which shall be maintained in good working order. Those equipped with headlights, tail lights and yellow warning lights shall not be operated between dusk and dawn unless these lights are in good working order. No vehicles are to be driven on sidewalks unless equipped with a warning device.
  - f. The operator shall not exceed the design loads of the equipment or otherwise operate the equipment in a manner that is not within the manufacturer's design.
  - g. Any vehicle designed for road use shall have seat belts and all personnel riding in vehicles shall use the seat belts.
  - h. Mowing Equipment
  - i. All mowing equipment shall be operated in a safe and courteous manner at all times. Mower deck discharge chutes shall be down during operation.
  - j. All equipment shall be maintained in accordance with manufacturer's specifications.
  - k. Safety glasses shall be worn at all times when the blades are engaged.
  - l. Seat belts shall be used ONLY when the excel Hustlers are used with a cab in snow-removal operations.
  - m. Per manufacturer's specifications, ear protection shall be worn when operating equipment.
  - n. When servicing mowers, spark plug wire shall be disconnected. (Per Lockout/Tagout Policy.)
4. Garbage Packer
- a. A valid commercial driver's license (CDL) shall be required to drive and/or operate this equipment.
  - b. The operator shall be trained and must be authorized by their supervisor before using this equipment.
  - c. While working during dark hours, workers shall use fluorescent mesh jackets or reflective tape, etc.
  - d. A two-way radio shall be provided at all times to the operator of the Garbage Packers

## O. Walking and Work Areas

Employees are expected to keep their work area safe and hazard free. If a safety hazard exists, the hazard shall be turned over to the proper shop or the Work Control Center.

1. All work areas shall be cleaned and maintained so injury cannot occur.
2. Floors shall be free of hazards that may lead to slips, trips, or falls.
3. Fire doors and exits shall be accessible at all times and not blocked in any way.
4. Any spills or leaks that may cause a person to slip or fall shall be reported at once to be cleaned up and the cause repaired.
5. A "Caution, Wet Floor" sign shall be displayed when floors are wet due to routine cleaning, weather conditions or emergency problems including any type of spills on floors. Mats or runners shall be used at entrances when necessary to avoid slips or falls.
6. The work site shall be cleaned when the job is finished or at the end of the shift if the job lasts more than one day.
7. Lighting shall be sufficient to ensure that no injuries can occur.

## P. Weather Conditions

### 1. Cold Weather

- a. Wear layers of lightweight clothing rather than one heavy layer. Several layers of clothing create additional warmth and provide added protection from wind penetration and you can 'peel' off layers when they are no longer needed.
- b. Wear two pair of socks. One to 'keep away' perspiration and a heavier second layer for warmth and provide an insulating air space.
- c. When the outside temperature approaches freezing (32°F or 0°C), warm up out of the weather 5 - 10 minutes of every hour, and be especially mindful of the wind chill factor. Aches/pains in fingers, toes and ears may signify frostbite! Seek shelter from the elements and place fingers and hands under armpits. Add warmth to ears and feet any way possible as long as you do not use extreme heat. If your extremities become numb, call Belknap Public Safety at 6111 or HSC Public Safety at 5111!
- d. Seventy-five percent or more of body heat can escape through your head, so keep your head covered while out in the cold!

### 2. Hot Weather

- a. Strenuous activities should be monitored or rescheduled to the coolest time of the day. Individuals at risk should stay in the coolest available place, not necessarily in-doors.
- b. Dress as cool as possible within dress code standard.

- c. Drink plenty of water or other non-alcoholic fluids. Your body needs water to keep cool. Drink plenty of fluids even if you don't feel thirsty. The following persons should consult a physician before increasing their consumption of fluids: (A) Persons who have epilepsy or heart, liver or kidney disease (B) Persons on restrictive diets (C) Persons who have a problem with fluid retention. Plenty of drinking water shall be available at job sites.
- d. Do not take salt tablets unless specified by a physician. Persons on salt restrictive diets should consult a physician before increasing their salt intake.
- e. Don't get too much sun. Sunburn makes the job of heat dissipation that much more difficult.
- f. First signs of heat stress: Stop perspiring followed by nausea, dizziness, feeling lightheaded and loss of coordination.
- g. Heat stroke is a severe medical emergency. Summon emergency medical assistance or get the victim to a hospital immediately! Delay can be fatal.

Q. Welding

1. Gas Welding and Cutting

- a. If eye surgery is part of your medical history, consult your physician before operating cutting, welding or heating equipment.
- b. Operator shall have a fire extinguisher at the job site.
- c. Inspect job site for any debris or potential fire hazards.
- d. Inspect tanks, gauges, hoses and welding or cutting tips for defects to assure safe working conditions prior to each use.
- e. Contact your supervisor and/or Life Safety Shop if welding or cutting when there is a possibility of activating the fire alarm.
- f. Proper clothing such as cotton, wool or leather shall be worn. Leather gauntlet gloves, leather apron and natural fiber clothing are preferred. All shirt sleeves shall be uncuffed and buttoned, collars buttoned, cuffs removed from pants, all materials removed from shirt pockets and buttoned closed. Protect head by wearing natural fiber cap or helmet. If necessary, wear ear protection.
- g. Friction lighters shall be used to light torches. The use of cigars, cigarettes, matches or lighters is prohibited.
- h. The operator of cutting torch or any type of welding equipment shall have additional personnel available to watch for possible fire. When possible an area of 35' should be clear of all debris and any other combustibles or barrier curtains shall be used.
- i. Operator and fire watch person shall wear proper eye protection consisting of correct tint of lenses and side shields. See following table:

## **Gas Welding, Cutting and Heating**

<u>OPERATION</u>	<u>SHADE NUMBER</u>
Soldering	2
Brazing	3 or 4
Light Cutting to 1"	3 or 4
Medium Cutting, 1" to 6"	4 or 5
Heavy Cutting, over 6"	5 or 6
Gas Welding, to 1/8"	4 or 5
Gas Welding, 1/8" to 1/2"	5 or 6
Gas Welding over 1/2"	6 or 8

- j. Operator shall not use oil or sealing compounds to ensure fittings from leaking. (When oil comes in contact with oxygen, spontaneous combustion and explosion are possible.) All fittings should seal with proper tightening. If joint or packing nut continues to leak, fittings or packing nuts shall be replaced by equipment dealers. If hose is found to be faulty, one repair coupling is permitted per 25 feet of hose. Repairs shall be made by a certified technician.
- k. Do not lift cylinders by the cap. It could slip off and cause injury to yourself or to the tank, possibly dislocating the valve.
- l. Acetylene Gas Pressure shall not exceed 15 PSIG, Acetylene can become unstable when the pressure exceeds 15 PSIG (or about 30 PSI. absolute pressure.)
- m. Always be aware of materials being cut, heated or used for welding or brazing. Certain metals and fluxes will give off hazardous vapors when heated. Consult with supervisor and MSDS Sheets. Make sure area is well ventilated.
- n. Fuel gas shall always be stored 20 feet from oxygen cylinders. Gas cylinders shall be stored in locations where temperature will not exceed 125 degrees Fahrenheit. Gas cylinders shall be securely fastened by chains or straps.
- o. Operator shall tighten tank valves hand tight when hand wheels are present and use proper wrenches when hand wheels are not present, such as T-wrenches or keys. Fuel gas cylinders shall only be opened a maximum of 1 1/2 turns.
- p. Always be aware of surroundings; such as when working in labs or confined spaces. Chemical or gaseous conditions may exist. Chemicals shall be removed and proper testing of environment may be necessary in confined space areas.
- q. Welding or Cutting Containers. Do not weld, cut or perform hot work on used containers until they have been thoroughly cleaned to be certain they do not contain materials that are flammable or can produce flammable or toxic vapors when heated.

- r. Welding tanks & other compressed gas cylinders may be transported in carts or carriers designed for that purpose. If transporting tanks in vehicles, if the tank has a protective cap, the regulators shall be removed and caps properly fitted to the tank.

## 2. Arc Welding

### CONTROLLING THE HAZARDS

Arc Welding hazards can be controlled by using effective ventilation, by following safe working practices, such as, reading, understanding, and heeding safety precautions on labels and Material Safety Data Sheets (MSDS), and by using all recommended personal protective equipment. When welding indoors, local exhaust ventilation should be located as near to the welding operation as possible in order to remove hazardous fumes.

- a. Welders' helmets and goggles with proper filter plates and lenses shall be worn during arc and welding to protect from harmful rays, flying sparks and debris. Helpers and others in close proximity shall also be expected to wear proper eye protection.
- b. Erect barrier curtains around the welding operation/process to protect others in adjacent areas.
- c. All welders shall wear flameproof gauntlet-style gloves except when engaged in very light work for a very short time.
- d. Flameproof aprons and sleeves made of leather should be worn as protection against radiant heat and sparks.
- e. Wool or cotton clothing shall be worn.
- f. Arc welders shall wear leather work shoes (hightops), boots or leggings to protect feet and legs.
- g. Collars on shirts and jackets shall be kept buttoned.
- h. Cuffs on trousers should be eliminated.
- i. After a welding job is completed, the material should be chalk marked "HOT" or a warning sign posted to caution other employees.
- j. Be alert to possible FIRE hazards. Move the object to be welded to a safe area or remove flammable materials from the welding work area should be an area of 35' diameter.
- k. Fire extinguishers shall be on or near the welding process. Additional personnel shall be on the jobsite with proper protection to watch for possible fires.
- l. When welding in a confined space or permit-required confined space, continuous ventilation shall be provided or personnel shall use supplied air respirators.
- m. When welding outdoors, the welders position should be up-wind of the fumes and

gases produced.

- n. Arc welding electrode holders shall be the "COMPLETELY INSULATED" type and can safely handle the maximum rated current required by the electrode.
- o. Do NOT throw electrode or rod stubs on the floor where they would become a slipping hazard.
- p. Before picking up any metal pieces in a welding shop, check to see that they are not hot. They could cause serious burns.

### **FILTER LENS SHADE NUMBERS**

<u>Electric Arc Welding Operation</u>	<u>Shade Number</u>
Shielded Metal Arc Welding 1/16", 3/32", 1/8" 5/32" Electrodes	10
Gas Shielded Arc Welding, Non-Ferrous 1/16", 3/32", 1/8" 5/32" Electrodes	11
Gas Shielded Arc Welding, Ferrous 1/16", 3/32", 1/8" 5/32" Electrodes	12
Shielded Metal Arc Welding 3/16" 7/32", 1/4" Electrodes 5/16", 3/8" Electrodes	12
Hydrogen Welding	10 – 14
Carbon Arc Welding	14

### 3. Welding Cables and Connectors

- a. Arc welding cables shall be fully insulated, flexible type and able to handle the maximum current being used, taking into account the duty cycle under which the arc welder or cutter is working.
- b. Cable shall be free from repair or splices for at least ten feet from the electrode holder, except that cables with standard insulated connectors or splices insulated as well as the cable may be used.
- c. To connect or splice cable, use substantial insulated connectors of a capacity at least equal to the cable or use cable lugs completely insulated and securely fastened to give good electrical contact.

- d. Do not use cable in poor repair. When cable (other than that referred to in (b.2) above) becomes worn to the point of exposing bare conductors, the exposed portion shall be protected with rubber or friction tape or equivalent insulation.

#### 4. Ground Returns and Machine Grounding

- a. A ground return cable shall have a safe current carrying capacity at least equal to the maximum output capacity of the arc welding or cutting unit or units that it services.
- b. Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return. For welding on natural gas pipelines, DOT regulations apply (49 CFR Part 192).
- c. When the ground return circuit includes a structure or pipe line, the required electrical contact shall be made at all joints. If arcing, sparks or heat are generated at any point, the structure is not suitable for use as part of the circuit.
- d. If a structure or pipe line is continuously used as a ground return circuit, all joints shall be bonded and it shall be inspected periodically for electrolysis or possible fire hazard.
- e. Ground the frames of all arc welding and cutting machines either through a third wire in the cable containing the circuit conductor or through a separate wire grounded at the source of the current. Check grounding circuits other than the structure's to insure that resistance is low enough to permit sufficient flow to actuate the fuse or circuit breaker.
- f. All ground connections shall be mechanically strong and electrically adequate.

#### 5. Operating Instructions

Supervisors shall instruct employees

- a. To remove electrodes when electrode holders are left unattended and place or protect the holders so they cannot make electrical contact with workers or objects.
- b. Not to dip hot electrodes in water.
- c. To open the power supply switch when leaving the work for any length of time or when the machine must be moved.
- d. To report faulty or defective equipment to the supervisor.
- e. Also comply with other applicable requirements of the OSHA Electrical Standards

## VIII. DEFINITIONS

- A. Authorized Employee - a qualified and properly trained person assigned by their supervisor to a given job assignment.
- B. Approved - required to meet ANSI/OSHA specifications.
- C. ANSI - American National Standards, Institute.
- D. Boatswain Chair - a seat supported by slings attached to a suspended rope designed to accommodate one work person in a sitting position.
- E. Casters - small wheels supporting a device, such as a step stool.
- F. DBA - Decibel average - a unit of measurement for sound level.
- G. DEHS - Department of Environmental Health and Safety.
- H. Egress - the path or opening from which one exits.
- I. Fuel Gas - acetylene, propane, or any other combustible gas.
- J. Gauntlet Glove - a protective glove with a flaring cuff used in manual labor.
- K. KOSH - Kentucky Occupational Safety and Health.
- L. Lanyards - a flexible line of rope, wire rope or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline or anchorage.
- M. Lifeline - a component consisting of a flexible line for connection to an anchorage at one end to hang vertically or for connection to anchorages at both ends to stretch horizontally and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.
- N. MSD - Material Safety Data.
- O. MSDS - Material Safety Data Sheet.
- P. MSHA - Mine Safety Health Administration.
- Q. Non-routine Tasks - jobs that are not commonly performed, usual and/or normal***
- R. OSHA - Occupational Safety and Health Administration.
- S. Needlebeam - a light duty scaffold consisting of needle beams supporting a platform.
- T. NIOSH - National Institute of Occupational Safety and Health.
- U. Pneumatic - run by or using of compressed air.

- V. Prohibit - forbid, to prevent.
- W. Retractable - allowing automatic or manual backing or withdrawal.
- X. Roof Bracket - an adjustable device, in which walk boards are attached to and is temporarily anchored to the roof, enhancing the work surface. Usually used on pitched roofs.
- Y. Safety Belt (body belt) - a strap with means of both securing it about the waist and for attaching it to the lanyard life line or deceleration device.
- Z. Shall - mandatory.
- AA. Should - preferred or recommended.
- BB. Synthetic - any type of rubber man-made material.
- CC. Window Jack - a scaffold, the platform of which is supported by a bracket and a jack that projects through a window opening.

**IX. Established Physical Plant Policies**

- A. Chemical Spills Policy
- B. Fire Policy
- C. Hazardous Communications Policy
- D. Lockout / Tagout Policy
- E. Confined Space Policy
- F. Fall Protection Policy (When Finalized)

**X. Appendix A**

PERSONNEL POLICY GUIDELINES  
DEPARTMENT OF PHYSICAL PLANT

SUBJECT: WORKPLACE SAFETY

NUMBER: PPG-011

EFFECTIVE DATE: 01-01-96

PERSONNEL POLICY REFERENCE: PER-5.01

=====

POLICY STATEMENT:

Employees may be disciplined for ... careless, negligent, or intentional acts or failures to act in the workplace or in the scope of employment that contribute to the harm of or the unacceptable risk of harm to individuals or property...

DEPARTMENTAL PROCEDURES:

The Physical Plant Department expects its staff members to perform their respective job functions safely, as outlined in the Physical Plant Safety Manual.

All allegations of safety violations which cannot be resolved by normal means shall be submitted in writing to the Chairman of the Safety Review Committee. He/She, in turn, will notify the members of the Committee and the employee/s against whom the allegation has been made within two work days of receiving the allegation. The Safety Review Committee shall investigate each allegation it receives to determine if a safety violation has occurred and to assign disciplinary action appropriate to the scope of the violation. Disciplinary actions involving suspension or termination shall be reviewed by the Safety Coordinator, the appropriate Superintendent, and the Director of the Physical Plant, and, if found to be warranted shall be handled according to usual University procedures.

The use of progressive discipline (using the preceding 12-month period) shall be standard practice, as outlined below, unless, in the opinion of the Safety Review Committee, the severity of the violation is such that would warrant more stringent disciplinary action.

First violation of Safety Rules	Oral Warning with Retraining
Second violation of Safety Rules	Written Warning with Retraining
Third violation of Safety Rules	Three-day Suspension
Fourth violation of Safety Rules	Termination of Employment

# Safety Hazard Reporting Form

Note: Section I and II MUST be filled out completely

## Section I (General Information)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Department/Shop: \_\_\_\_\_ Telephone: \_\_\_\_\_

## Section II (Hazard)

A. Type of Hazard you are reporting (be specific):

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B. Location of Hazard (be specific):

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C. Have You Previously Reported Hazard? Yes No

D. If yes, when?

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## Section III (To be Completed by Safety Review Committee)

Date Received: \_\_\_\_\_ Date Reviewed: \_\_\_\_\_

Action Taken: \_\_\_\_\_

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Copies: White - Yellow/Safety Office: Pink/Employee

## *Non-Routine Task Form*

Jobsite: \_\_\_\_\_ Job Classification: \_\_\_\_\_

Certifying Person: \_\_\_\_\_ Date: \_\_\_\_\_

### **HEAD**

Description of Hazard and Site

Falling Objects                      Yes\_\_\_ No\_\_\_

Bumping/Contact                      Yes\_\_\_ No\_\_\_

Electrical Contact                      Yes\_\_\_ No\_\_\_

Voltage                                      Yes\_\_\_ No\_\_\_

Chemical Absorption/Dusts              Yes\_\_\_ No\_\_\_

Caustics/Acids                              Yes\_\_\_ No\_\_\_

### **EYES AND FACE**

Description of Hazard and Site

Flying Particulates              Yes\_\_\_              No\_\_\_

Liquid Chemical  
Splashes                              Yes\_\_\_              No\_\_\_

Acids and Caustics              Yes\_\_\_              No\_\_\_

Gasses and Vapors              Yes\_\_\_              No\_\_\_

Light/Radiation                      Yes\_\_\_              No\_\_\_

Circle Specific Type(s) (Welding, Laser,  
Other)

Correct Shading Used (Shade  
Number\_\_\_\_\_)

### **TORSO AND UPPER ARMS**

Description of Hazard and Site

Chemical Burns                      Yes\_\_\_              No\_\_\_

Thermal Burns                      Yes\_\_\_              No\_\_\_

Abrasions                              Yes\_\_\_              No\_\_\_

Punctures                              Yes\_\_\_              No\_\_\_

Light/Radiation                      Yes\_\_\_              No\_\_\_

Circle Specific Type(s) (Welding, Laser,  
Other)

Fall Protection Required      Yes\_\_\_      No\_\_\_

Specify Height & Harness  
Type

Other (Brief Description)

**ARMS AND HANDS**

Description of Hazard and Site

Chemical Burns              Yes\_\_\_      No\_\_\_

Thermal Burns              Yes\_\_\_      No\_\_\_

Abrasions                    Yes\_\_\_      No\_\_\_

Punctures                    Yes\_\_\_      No\_\_\_

Light/Radiation            Yes\_\_\_      No\_\_\_

Circle Specific Type(s)      (Welding, Laser,  
Other)

Electric Contact            Yes\_\_\_      No\_\_\_

Chemical Absorption      Yes\_\_\_      No\_\_\_

**LEGS AND FEET**

Description of Hazard and Site

Dropping/Falling Hazard      Yes\_\_\_ No\_\_\_

Collision/Rolling Objects      Yes\_\_\_ No\_\_\_

Puncture Hazards            Yes\_\_\_ No\_\_\_

Thermal (Hot/Cold) Hazards    Yes\_\_\_ No\_\_\_

Wet/Slippery Surfaces        Yes\_\_\_ No\_\_\_

Welding/Slag/Liquid Metals    Yes\_\_\_ No\_\_\_

Electrical Contact            Yes\_\_\_ No\_\_\_

Voltage                        Yes\_\_\_ No\_\_\_

Chemical Absorption        Yes\_\_\_ No\_\_\_

Other                            Yes\_\_\_ No\_\_\_

**AUDITORY/EAR**

Description of Hazard and Site

Noise Level                    \_\_\_\_\_

NRR Suggested                \_\_\_\_\_

Protectors/PPE \_\_\_\_\_

Type Required \_\_\_\_\_

Type Suggested \_\_\_\_\_

**RESPIRATORY**

Description of Hazard and Site

Contaminant(s)	A) _____	Level _____
	B) _____	Level _____
	C) _____	Level _____
	D) _____	Level _____

Suitable Respiratory Protection

- A) \_\_\_\_\_
- B) \_\_\_\_\_
- C) \_\_\_\_\_
- D) \_\_\_\_\_

## **XI. BIBLIOGRAPHY**

- A.S.S.E.:** American Society of Safety Engineers  
-Safety Management Training
- A.S.T.M.:** American Society for Testing of Materials  
-Gas Cylinder Safety
- A.W.S.:** American Welding Society  
-Compressed Gas Cylinders  
-Gas and Arc Welding Procedures
- B.N.A.:** Bureau of National Affairs  
-Update Mailings
- B.O.C.A.:** Building Officials and Code Administrators, Intl  
-Code Handbook
- C.G.A.:** Compressed Gas Association  
-Safe Handling and Storage of Cylinders
- C.E.C.L.A.:** Comprehensive Environmental Response, Compensation and Liabilities Act  
-Hazardous Waste Disposal
- C.P.S.N.:** Consumer Products Safety Commission  
-Safe Use of Portable Electric Tools
- D.O.A.:** U.S. Department of Agriculture  
-Power Walk Behind and Riding Mowers
- D.O.E.:** U.S. Department of Education  
-Training the Trainer
- D.O.L.:** U.S. Department of Labor  
-Electrical Safety  
-Painting Safety  
-Plumbing Safety
- D.O.T.:** U.S. Department of Transportation  
-Safety for Fork Lift Operators  
-Powered Trucks and Vehicle Safety
- Eastern Kentucky University**  
-Written Programs  
-K.O.S.H. Training

**E.P.A.:** U.S. Environmental Protection Agency  
-Handling Hazardous Materials  
-Spills Clean-up

**Georgia State University**  
-Written Programs

**Grounds Maintenance Forum**  
-Safety with Landscaping Equipment

**Idea Bank**  
-Pesticides, Safety in Handling  
-Grounds Equipment Safety  
-Hand Tool Safety  
-Handling Flammables and Safe Storage

**Indiana University**  
-Written Programs

**Jefferson County, Kentucky Public Schools**  
-Written Programs

**Kentucky Labor Cabinet**  
-Industry Standards  
-Work Related Injury Statistics  
-Technical Support  
-On-Site Consultation/Training  
-Technical Services Publications  
-K.O.S.H. Handbook, CFR 1910

**K.S.H.N.:** Kentucky Safety and Health Network  
-Safety Managers Training

**Kentucky Utilities Company**  
-Written Programs

**Louisiana State University**  
-Written Programs

**Louisville, Kentucky Fire Prevention Bureau**  
-Fire Extinguisher Safety  
-Fire Prevention Material  
-On-Site Consultation

**Louisville, Kentucky Metropolitan Sewer District**  
-Confined Spaces Programs

**Murray State University**

-Written Programs

**M.S.H.A.:** U.S. Mine Safety and Health Administration

-Confined Spaces Safety Program

**N.F.P.A.:** National Fire Protection Association

-Fire Prevention Standards  
-Portable Hand Held Fire Extinguishers  
-Regulation Update Mailings  
-National Electric Code  
-Life Safety Code

**National Safety Council**

-Supervisors Safety Manual  
-Vehicle Safety Manual

**N.I.O.S.H.:** National Institute of Occupational Safety and Health

-Regulatory Compliance Update

**Parlay International, Inc.,** Kopy-Kit, Copyright License was purchased by the Safety Program

**Phillip Morris Company, Inc.**

-Written Programs

**San Jose State University**

-Written Programs  
-Emergency Preparedness

**S.A.R.A.:** U.S. Superfund Amendments and Reauthorization Act

-Disposal Regulations  
-Discharges and Spills

**T.S.C.A.:** U.S. Toxic Substance Control Act

-Toxic Materials in the Workplace

**University of Louisville, Department of Environmental Health and Safety**

-Written Programs  
-Regulatory Compliance  
-Consultation  
-On-the-Job Training

**WHAS-TV, Louisville, KY**

-Safety Tips about Lightning  
-Safety Tips for Tornadoes

**WLKY-TV, Louisville, KY**

-Safety Tips for Thunderstorms and Severe Weather

## **XII. Appendix C - Non-Routine Tasks Assessment Guidelines**

### **PERSONAL PROTECTION**

#### **Non-Routine Tasks**

When workers perform Non-Routine Tasks, the supervisor shall conduct a job hazard assessment. The supervisor shall fill out a Non-Routine Worksite Hazard Assessment Form. A copy shall be given to all affected workers prior to starting a Non-Routine job. The form shall be dated, which indicates the supervisor conducted the survey and has identified all known hazards. He/she shall provide proper equipment/tools, personal protective equipment and/or necessary warning devices. The supervisor shall send a copy of the form to the Safety Coordinator.

Assessment guidelines. In order to assess the need for PPE, the following steps should be taken.

A. Survey. Conduct a walk-through survey of the areas in question. The purpose of the survey is to identify sources of hazards to workers and co-workers. Consideration should be given to the basic hazard categories:

- (a) Impact.
- (b) Penetration.
- (c) Compression (roll-over).
- (d) Chemical.
- (e) Heat.
- (f) Harmful dust.
- (g) Light (optical) radiation.

B. Sources. During the walk-through survey the safety officer should observe:

- (a) Sources of motion; i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects;
- (b) Sources of high temperatures that could result in burns, eye injury or ignition of protective equipment, etc;
- (c) Types of chemical exposures;
- (d) Sources of harmful dust;
- (e) Sources of light radiation, i.e., welding, brazing, cutting, furnaces, heat treating, high intensity lights, etc;
- (f) Sources of falling objects or potential for dropping objects;
- (g) Sources of sharp objects which might pierce the feet or cut the hands;
- (h) Sources of rolling or pinching objects which could crush the feet;
- (i) Layout of workplace and location of co-workers; and
- (j) Any electrical hazards. In addition, injury/accident data should be reviewed to help identify problem areas.

C. Organize data. Following the walk-through survey, it is necessary to organize the data and information for use in the assessment of hazards. The objective is to prepare for an analysis of the hazards in the environment to enable proper selection of protective equipment.

D. Analyze data. Having gathered and organized data on a workplace, an estimate of the potential for injuries should be made. Each of the basic hazards (paragraph 3.a.) Should be reviewed and a determination made as to the type, level of risk, and seriousness of potential injury from each of the hazards found in the area. The possibility of exposure to several hazards simultaneously should be considered.

**XIII. Appendix D - Hearing Conservation Program**

**Hearing Conservation Program (HCP) for Physical Plant**

**INTRODUCTION**

The HCP shall include all Physical Plant employees exposed to noise at or above an 8 hour time weighted average (TWA) of 85 decibels (dBA). This determination is made by the Department of Environmental Health and Safety (DEHS) in accordance with requirements of 29 CFR 1910.95., hereafter referred to as the OSHA Noise Standard. If employees or supervisors suspect a work environment or piece of equipment produces high noise levels, the supervisor shall contact DEHS for a noise evaluation.

**NOISE EXPOSURE MONITORING**

DEHS shall provide noise exposure monitoring including record keeping in accordance with the OSHA Noise Standard. Employees shall be notified in writing by DEHS concerning their exposure monitoring results within 15 working days after the exposure monitoring is performed. Copies of all noise exposure monitoring will be kept by DEHS and the Physical Plant Safety Director. If any employee's noise exposure exceeds an 8-hour TWA of 90 dBA, DEHS will further investigate the noise exposure to determine if any administrative or engineering controls are feasible. The following groups are included in the HCP:

<b>Classification</b>	<b>8 hr TWA exposure</b>	<b>Operation</b>
Grounds	85-90 dBA	All Campuses summer mowing crews
Steam & Chill	85-90 dBA	Belknap chiller room

**HEARING PROTECTORS (HP)**

Hearing protectors are provided at no cost to employees in the HCP and must be worn in noise hazardous areas or when operating noise hazardous equipment. Physical Plant has consulted with DEHS to ensure the HP selected provides adequate attenuation in accordance with paragraph J of the OSHA Standard. All hearing protectors worn by employees in the Division of Physical Plant shall have a noise reduction rating (NRR) of at least 20 dB. The following types of hearing protectors are currently provided:

<b>Hearing Protector</b>	<b>TYPE</b>	<b>NRR</b>
<u>Shelby Campus</u> EAR Plugs		
	foam insert ear plugs	32 dB

Belknap, HSC Grounds

Caboflex EAR 600

Taperfit 2 Model 1000

EAR

earcaps

20 dB

foam insert ear plugs

32 dB 20 dB

earmuff

Belknap Steam & Chill

Plant Bilsom Model 717

EAR Plugs

earmuff

25 dB

foam insert ear plugs

32 dB

All hearing protectors are to be provided to employees by their supervisors.

Each employee is responsible for keeping his or her hearing protectors in a sanitary condition. Supervisors shall observe employees periodically to ensure hearing protection is used properly.

**AUDIOGRAMS (Hearing Tests)**

Baseline and annual audiograms are provided at no cost to employees in the HCP. A baseline audiogram is required within six months of an employee's inclusion in the HCP. Audiograms are being provided through the service of Occupational Physicians of Louisville. The services they provide include audiometric testing with a calibrated audiometer, record retention and evaluation of audiograms including employer notification of any follow-up or referral required by the OSHA Noise Standard. Occupational Physicians of Louisville will contact DEHS if hearing loss resulting in a standard threshold shift (STS) is determined from an employee's annual audiogram. DEHS will meet with the employee, retrain the individual on proper usage of hearing protection and determine if more effective hearing protection is needed. An employee is scheduled for audiometric testing by the Physical Plant representative who schedules medical examinations, often in conjunction with the annual medical exam for use of respirators. When notified of the scheduled exam the employee shall be reminded to avoid high noise levels both at work and away from work for at least 14 hours preceding the audiogram. Hearing protectors may be used to avoid noise exposure during this period.

**TRAINING**

Annual training will be provided to all employees in the HCP. The training will be scheduled by the Physical Plant representative who schedules health and safety training. DEHS will provide the required training. The training shall include: -- the effects of noise on hearing -- the purpose of hearing protectors -- the advantages, disadvantages and attenuation of various types of HP -- instructions on selection, fitting, use and care of HP -- purpose of audiometric testing -- an explanation of the

test procedure

**POSTING OF THE OSHA NOISE STANDARD**

A copy of 29 CFR 1910.95, *Occupational Noise Exposure*, will be provided by DEHS to all units included in the Hearing Conservation Program. It is the responsibility of each unit Supervisor to ensure that the standard is posted in a conspicuous location for employee usage.