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# Performing Arts Safety Manual

Faculty • Staff • Students



Provided by:  
University of California, Office of the President  
Environment, Health & Safety



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# Introduction

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## University performing arts activities present significant health, safety, and risk management challenges.

Depending on the campus, performing arts activities might occur as part of academic programs in theater, dance, music, or drama departments; within performance “roadhouses;” or they may be coordinated by a student-run club or organization. Each of these entities is faced with a variety of health and safety challenges, and although some risks overlap into all areas, others are unique or more significant based on the scope and complexity of the performance, where it is occurring, and who is coordinating it.

In academic departments, faculty, staff, and students may be involved in numerous phases of a production including design, set construction, props, special effects, costumes, electrics, makeup, acting, and front-of-house activities. All these areas present a wide diversity of health and safety hazards including, but not limited to, physical, chemical, and mechanical hazards in the shops; working at height challenges both on stage and back stage; and material handling risks during set construction, load in, and strike activities.

Beyond the great diversity of hazards in academic performing arts activities, challenges exist in evaluating the risks associated with new productions and training the many students involved in the programs. Dynamic and elaborate shows are being produced on a regular basis, thereby creating unique and challenging safety

considerations for each play or concert. Students are integrated into many aspects of academic performing arts operations, and the constant influx of new individuals into the programs creates difficulties in providing and documenting safety training.

Along with academic programs, larger campuses may have performance “roadhouses” that coordinate and manage professional traveling shows including plays, concerts, and other events. Although performance houses may not involve as many student employees or volunteers relative to academic departments, they are faced with new shows and different set ups on a regular basis, significant material handling considerations, and they manage important contractual agreements with groups both inside and outside the University.

Most campuses also have student organizations and clubs that produce smaller skits and shows. These productions might not receive as much attention from campus officials; however, the risks associated with them can be considerable, and a thorough health and safety review of certain events may be necessary.

Last but not least, we are opening the doors of the University and inviting members of the general public to gather and enjoy our performances. With all these factors to consider, and many more, the integration of safe practices into University performing arts activities has been and continues to be critical for the well-being of faculty, staff, students, and the general public.

The purpose of the University of California Performing Arts Safety Manual is to provide faculty, staff, and students who work or participate in the performing arts with a general overview of potential hazards and related safe work procedures. As part of the introduction to this manual, a basic review of Injury & Illness Prevention Program (IIPP) requirements and the UC Policy on Health, Safety and the Environment will be provided and put in context of performing arts safety.

This manual is designed to follow a theater production from the planning stages to strike as outlined in the table of contents. In addition to the manual, the Performing Arts New Employee Checklist and the Codes of Safe Practice provide additional information on safe work procedures. All are excellent resources to assist you in:

- Recognizing and understanding the hazards associated with various performing arts operations and activities,
- Knowing when to apply various types of health and safety controls such as engineered devices (ventilation, machine guards, etc.), administrative practices (safety training, warning signs, etc.), or personal protective equipment (PPE) (respirators, safety glasses, hearing protection),
- Planning for and responding to emergencies such as fires, earthquakes, or chemical spills.

Integration of the Safety Manual and Code of Safe Practices into routine training procedures and operations will meet key objectives and regulatory requirements of your IIPP.

## **IIPP Overview**

The IIPP is a written guide to protect employees from illnesses and injuries. The IIPP complies with the California Code of Regulations Title 8, Section 3203 (8 CCR 3203), by establishing a safety management framework for identifying and correcting workplace hazards, ensuring employee training and compliance, and communicating information related to employee safety and health issues.

## **IIPP Responsibilities**

Well-defined roles and responsibilities are the cornerstone of a robust safety program, and this is especially true

in the dynamic and diverse world of University performing arts activities.

**Upper management**, including Deans and Department Chairs, are responsible for ensuring an effective IIPP is implemented in all areas under their scope of responsibility. For performing arts activities, this would include all facilities where employees and students work or are involved with production activities including the scene shop, costume shop, prop shop, stage area, front of house, music recital hall, catwalks, etc. Upper management must assign and authorize designated individuals to establish and support the key processes and procedures of the IIPP.

**Supervisors** are faculty and staff that oversee and direct others. Within University programs, this might include Directors, Producers, Stage Managers, House Managers, Technical Directors, or Scene Shop Managers. Supervisors play a critical role in the implementation of the IIPP and must be empowered and authorized to:

- develop safe work practices and procedures,
- enforce health and safety rules,
- stop work activities that pose imminent danger,
- ensure routine documented safety inspections occur,
- provide or coordinate safety training,
- make available and ensure proper use of PPE,
- report and investigate injuries and incidents, and
- maintain health and safety documentation associated with the IIPP.

**Employees and students**, including student employees, volunteers, and students engaged in academic activities, are accountable for understanding health and safety rules and for following safe work practices. Employees and students must:

- obtain appropriate training for designated activities,
- use PPE as required and directed,
- report unsafe conditions, malfunctioning equipment, and other safety concerns,
- report all work-related injuries and incidents, and
- understand what to do in the event of an emergency.

**Campus Environment, Health & Safety (EH&S)** provides health and safety consultation to all levels of individuals within the UC organization. EH&S safety professionals may:

- assist with safety program implementation,
- develop and provide safety training,
- perform safety inspections,
- conduct job or task hazard evaluations,
- conduct incident investigations, and
- monitor compliance.

**Campus Risk Management** provides risk mitigation and injury management services to all levels of individuals within the UC organization. Risk Management professionals may:

- identify and evaluate emerging risks,
- monitor Enterprise Risk Management best practices,
- manage incident and injury claims, including workers' compensation claims,
- coordinate transitional return-to-work activities, and
- review contractual agreements.

EH&S and Risk Management should be considered resources to assist you in developing and implementing your unit-specific IIPP.

### **IIPP Hazard Identification and Correction**

Recognizing hazards within your performing arts activities and correcting these hazards are critical elements of a robust IIPP. Your campus IIPP includes recommendations for performing routine safety inspections and your campus EH&S office can provide forms to document noted hazards and corrective actions taken.

Inspections can include “self-inspections” performed by trained and knowledgeable in-house staff, which can be coordinated with campus EH&S, or an outside consultant or contractor with specific expertise may perform them. General facility inspections, including review of items such as housekeeping, seismic safety, electrical safety, emergency egress, shop safety, and hazardous material storage, should be performed and documented quarterly as a best practice or annually at a minimum. Facility safety inspection checklists are provided as part of this manual and can be used to document noted hazards and the corrective actions taken to address the finding.

Focused inspections on specialized systems within the facility, such as the counterweight rigging system or tension grid, should be performed based on the frequency of use, manufacturer guidelines, and recommended industry best practice. These systems are typically not inspected or maintained by your Campus Facilities staff, yet they are integral to safety and the routine work that occurs in the facility. At a minimum, the counterweight rigging system should receive a documented, thorough inspection by a knowledgeable person once a year. An in-house staff member with sufficient counterweight rigging system experience and knowledge gained through professional development courses can perform the annual inspection, a comprehensive inspection by a qualified outside contractor is recommended every three to five years.

Hazard identification needs to extend beyond facility inspections and must also include process related safety evaluations. Examples of process-related safety evaluations would be determining and documenting the safe method for dyeing cloth for a costume, hanging lights from a balcony rail, raising or lowering an actor through a trap door system, or rehearsing a dance routine near the leading edge of an orchestra pit. A number of different approaches can be used to perform these evaluations including a job hazard analysis (JHA) or by using the 5-core safety function approach outlined in the UC Policy on Health, Safety and the Environment.

A JHA describes a task in a detailed step-by-step format, identifies potential hazards with each step, and outlines health and safety controls to minimize injuries or illnesses associated with these steps. The form for documenting a JHA can be as simple as three columns entitled “task,” “hazard,” and “control.” This flexible process and systematic approach can be applied to tasks both large and small. Once completed, the document can be used as a training tool and can be incorporated as part of the written operating procedures for designated jobs or tasks within the facility.

The 5-core safety functions of Integrated Safety and Environmental Management (ISEM) are outlined in the UC Policy on Health, Safety and the Environment. Similar to a JHA, the 5-core safety function approach provides a flexible and systematic way to evaluate a task or process, identify hazards, designate appropriate controls, and review the overall procedure for effectiveness. As outlined in the policy, the degree of rigor in terms of applying the 5-core safety function approach can be adjusted based on the complexity of the task and risk associated with it. In some cases, the 5-core safety function process may be as simple as thinking through and reviewing the steps outlined below as an uncomplicated and relatively low risk task is completed. In cases where greater risk or complexity exists, each step in the process should be documented and reviewed on a regular basis before the project or activity is commenced.



## ISEM 5 Core Safety Functions

- 1. Define the Work or Activity** – Clearly defining a task from initiation to completion helps reveal the possible risks, hazards, and environmental impacts associated with the activity.
- 2. Analyze the Hazards** – Understanding the risks and hazards enables appropriate planning to protect people, property, and the environment.
- 3. Develop and Implement Hazard Controls** – Appropriate controls, authorizations, monitoring, emergency procedures, equipment, and training are established and implemented before work begins.
- 4. Perform Work or Activity** - Work begins when identified risks have been eliminated or controlled, and readiness is confirmed.
- 5. Review and Provide Continuous Improvement Feedback** – How can we do better next time? From the planning stage to the wrap up, gather feedback, review monitoring results, and look for ways to improve the process.



Reporting unsafe conditions is another important component of hazard identification and control. Employees have the right to report hazardous workplace conditions without the fear of reprisal from their employer. Your supervisor must provide training and guidance on how to report a workplace hazard and in all cases, these reports can be provided anonymously either to your supervisor or directly to the Campus EH&S office. Most campuses have multiple ways for submitting a hazard alert form including a paper document, an email, or some type of electronic web-based submission process. Your supervisor will review the appropriate hazard alert process for your campus and, specifically, for your department. Examples of unsafe conditions that may need to be reported to your supervisor or EH&S include lack of PPE to perform a task safely, an inoperable emergency eyewash unit that is not being tested regularly, or a frayed electrical cord in the scene shop.

Safety inspections, process-related hazard evaluations (job hazard analysis, the 5-core safety functions), and reporting unsafe conditions are all critical components of systematic hazard identification and control, and they are all valuable processes in creating and maintaining a safe work environment.

### IIPP Health & Safety Communication and Training

Supervisors are your first point of contact concerning health and safety information related to the areas where you work and activities you perform. Health and safety information may be distributed via emails, newsletters, or posters, during meetings, or by other suitable methods. Supervisors must provide and review EH&S resource and reference information pertinent to an individual's job including relevant safety training, Safety Data Sheets (SDS), warning labels, JHA information, emergency response procedures, and safe work practices.

Another important component of training is termed on-the-job training or OJT. OJT is instruction and guidance provided by a supervisor or knowledgeable individual while a job or task is being completed at the workplace. OJT is an important step in the process of an employee or student becoming fully trained and supports the fundamental safety training received by reading information, watching videos, attending instructor-led training, or reviewing on-line material.

The IIPP requires training needs be identified for individuals and applicable operations, that training commensurate with the complexity and hazard of the task be provided, and that training received be documented. Training is required for all new employees, to all individuals before starting a new job, task, or operation, and whenever a process, procedure, material, or equipment is introduced into the work environment that represents a new hazard. Supervisors must receive training in order to recognize and understand the hazards their employees and students may be exposed to, and they must be well versed in the regulations and safe work practices to control these hazards.

The Performing Arts Safety Manual and Codes of Safe Practice can be incorporated into your Campus or unit specific IIPP as a means of:

- Identifying training needs for various types of work activities (set construction, costumes, lighting, etc.) within the theater and performing arts
- Documenting safety training including review of the Safety Manual, General Safety Awareness Training Record, and the Codes of Safe Practice

### **IIPP Accident Investigation and Injury Reporting**

An accident is an unplanned event that results in injury, illness, or property damage. A near miss is an unplanned event that does not result in significant injury, illness, or property damage but had the potential to do so and “almost” happened. An example of a near miss is when a ladder becomes unstable while you are reaching and overextending, but it rights itself, you regain your balance, and you do not fall off the ladder. Both accidents and near misses should be investigated to determine the causes of the event and to reduce or eliminate the hazards that contributed to it.

When accidents occur, employees and students must inform their supervisors immediately so appropriate medical treatment and follow-up procedures can be initiated. In the event of a serious or life threatening injury or illness, 9-1-1 should be called immediately. Once the injured person has been attended to, Campus notifications need to be made to EH&S and Risk Services. In some cases, the Campus has an obligation to notify the California Occupational Safety & Health Administration (Cal-OSHA) regarding a workplace injury, and EH&S can assist with that process. The timeframe for reporting designated serious injuries (death, amputation, disfigurement, concussions, crush injuries, hospitalization > 24 hours) to Cal-OSHA is 8 hours, so prompt notification to your Campus EH&S office is critical. Even if the accident occurs after hours or during the weekend, call your Campus EH&S office main phone number or access the EH&S web site and determine how to reach someone within the office. When in doubt, contact EH&S as soon as possible to determine if Cal-OSHA needs to be called within 8 hours of an accident occurring.

When an employee (staff or faculty) has been injured and requires or requests medical treatment, the Risk Services or Disability Management web site and/or office needs to be consulted so the appropriate workers’ compensation claim forms are completed and submitted within 24 hours of the injury. In all cases, you need to inform your supervisor as soon as possible when an injury or illness occurs or is suspected, and you need to begin completion of the appropriate workers’ compensation claim forms.

Once medical treatment and initial notifications have been made, EH&S or Risk Services may assist supervisors with conducting accident investigations and can provide the appropriate forms and documents to guide the process. In the event of a serious accident, EH&S or Risk Services may take the lead in performing the investigation. In the event of a near miss or minor accident, trained supervisors can complete the process and report the findings to their employees and students. Once accident and near miss investigations are complete, the

findings and corrective actions should be reviewed with all employees and staff during a safety meeting.

Accidents causing injuries and illnesses do not happen that frequently and by definition are unplanned and unexpected. Understanding and being familiar with your Campus procedures for responding to an injury and following up with the appropriate notifications and completion of forms is critical. Supervisors need to be trained and understand these processes BEFORE an accident occurs.

### **Summary**

Each Campus has developed and implemented its IIPP in a manner that best fits its needs. In all cases, the UC Performing Arts Safety Manual can provide faculty, staff and students a general overview of performing arts hazards and related safe work practices. To access and review your comprehensive Campus or Departmental IIPP, check with your Supervisor, Department Manager, or Campus EH&S office.

# Set Construction

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**Planning is a critical component of set construction. Set designs are planned out in order to have a clear idea of the overall scope of the production; including structural requirements, special effects, props, lighting, furniture, decorative materials, paints, costumes, etc.**

Planning also helps supervisors identify equipment and tool requirements, use of chemicals, personal protection requirements, and employee training needs. This, in turn, helps identify and implement applicable safety policies and procedures throughout the production process.

This section contains a brief overview of commonly identified set construction operations, exposures, and safe practices. In addition, the Performing Arts Code of Safe Practices Matrix identifies the applicable Performing Arts Codes of Safe Practices you are required to read for set construction operations.

## Fall Protection

Set construction involves exposure to fall hazards from a variety of processes and procedures. Fall hazards are present when working on ladders, around the paint frame, on the catwalks, outside of the catwalks, in elevated storage areas of the shops, and on unprotected elevated work platforms such as the open edge of the stage.

Fall protection systems must be provided to protect cast and crew from fall hazards where the fall will be from an elevation of 7.5 feet or more. There may also be special situations or conditions where fall protection is warranted or recommended at heights below 7.5 feet. Refer to the Codes of Safe Practice that address fall hazards associated with aerial work platforms, catwalks, unprotected elevated work (controlled access) surfaces, fixed and portable ladders, paint frames, rooftops, scaffolds, and tension grids. Be sure to review each of these codes along with the Code of Safe Practice on fall protection trigger heights.

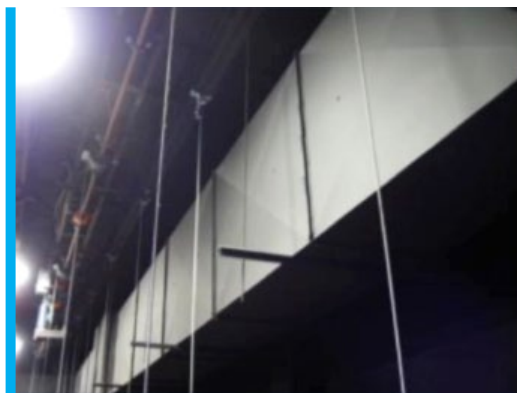
The temporary nature of set construction presents unique challenges. When it is impractical to use conventional fall protection systems or the fall protection system presents a greater hazard, special steps must be taken to protect cast and crew from falls. The special steps start with the creation of a Fall Protection Plan that is developed by a qualified person<sup>1</sup> and developed specifically for the site where the set construction is being performed. The plan must:

1. Be kept up-to-date
2. Be kept on site
3. Be implemented under the supervision of a person competent<sup>2</sup> in fall hazards and prevention
4. Specify the steps to be taken to reduce or eliminate fall hazards for workers who cannot be protected using conventional fall protection systems
5. Identify each location where conventional fall protection methods cannot be used
6. Include a safety monitoring system
7. Name the protection methods to be used for each job title
8. Specify the fall incident investigation process

## Rigging

Rigging is the use of hardware to lift, lower, and hold performance equipment on or above the stage. A variety of rigging hardware may be used for various tasks, and understanding the load capacity for each piece of equipment is critical. Employees must receive training prior to operating any rigging equipment. General safety guidelines for the use and maintenance of rigging equipment include:

1. Inspect rigging equipment before use, after any alterations, and at regular intervals.
2. Make sure the counterweights are secured with a lock plate to keep the counterweights in place.
3. Report and remove any damaged or defective ropes from service.
4. Never shorten chains and ropes by knotting.
5. Never exceed the safe load capacity of the system.
6. Follow safe procedures when loading, unloading, or operating rigging systems.
7. Warn people on the stage and grid before moving any rigged scenery or other object.
8. Maintain control of moving pieces at all times.
9. Never access the catwalks until trained and authorized to do so.
10. Secure rigging equipment when it is not in use.



<sup>1</sup> Qualified Person, Attendant or Operator: Is a person designated by the employer who by reason of training, experience or instruction has demonstrated the ability to safely perform all assigned duties and, when required, is properly licensed in accordance with federal, state, or local laws and regulations. As defined by Cal-OSHA.

<sup>2</sup> Competent Person: Is a person who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. As defined by Cal-OSHA.



## Paint Frame

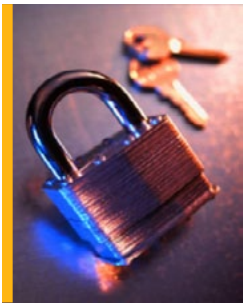
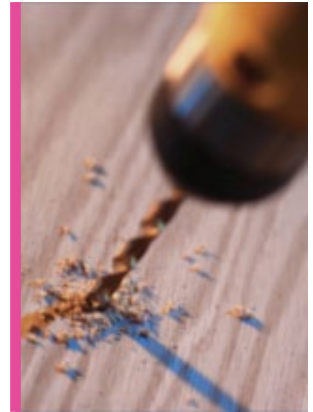
The paint frame poses a unique fall hazard. The floor opening through which the paint frame moves is large enough for a person's leg to enter and in some cases could allow a body to pass through. It is easy to forget the danger of the floor opening as the canvas comes to life.

- Ensure the guardrails are kept in place at all times.
- Never step over or stand over the floor opening.

## Power and Hand Tools

Employees must be trained on the proper use of power and hand tools, including applicable safety features, guards, and the required personal protective equipment. While each tool has specific guidelines, the following are general safety guidelines for all tools:

1. Follow all manufacturers' instructions on the use and care of the tools.
2. Inspect tools before use to check for any defects such as frayed wires or damaged hand tools. Remove defective tools from service and report findings to your supervisor.
3. Never carry or hoist a power tool by its power cord.
4. Unplug power tools before loading them, changing blades or bits, making adjustments, or cleaning them
5. Never use power tools on wet surfaces or in wet weather.
6. Never alter or remove any machine or blade guards.



## Lockout/Tagout/Blockout

Lockout/tagout/blockout (LOTO) is a method of preventing equipment from being set in motion and endangering workers. Failure to properly isolate and de-energize energy sources can be fatal. Compliance with the University's LOTO policy is mandatory for your protection and the protection of others. Although the application of LOTO is often limited to electrical energy, you should understand that other power sources, including mechanical, hydraulic, pneumatic, chemical, and thermal energies, require similar procedures and care to ensure your safety. Other energy is often stored energy, such as in electrical batteries, capacitors, and springs. Even gravity presents a form of energy. See the Code of Safe Practice regarding lockout/tagout/blockout for additional information

## Ladders

Inspect portable ladders at frequent regular intervals, and maintain them in good condition, free from oil, grease, or other slippery materials. Remove defective ladders from service and report the defect to your supervisor. Place ladders on stable bases. Never use boxes, chairs, or other unstable surfaces in place of a ladder. For more information on ladder safety read the Codes of Safe Practice on fixed and portable ladders.

## Personal Protective Equipment (PPE)

PPE includes all types of equipment used to increase safety while performing potentially hazardous tasks. PPE may include eye and face protection, head protection, foot protection, hand protection, respiratory protection, and

the use of other equipment to help protect you against injury or illness.

Your supervisor will identify required PPE for designated tasks and work areas and will communicate proper use procedures to you. Training will also be provided as needed. As a PPE user, you must understand and comply with the PPE use requirements provided to you during training and by your supervisor and remember to ask questions if the direction is unclear. Consult with the EH&S Department and refer to the UC PPE Policy for more information.

## Lifting and Material Handling

Back pain and injuries related to lifting and material handling are some of the most frequent types of injuries. Stage pieces are often awkward, heavy, or oddly shaped, which makes them difficult to lift properly.

Ask yourself these questions before lifting your load:

1. Is it too large or heavy for one person to lift?
2. Do you need a mechanical aid or partner?
3. Are there any tripping hazards on your route?
4. Will you be able to get through doorways or corridors as you are carrying the object?



Remember to wear supportive non-slip closed-toe shoes to help avoid a fall while carrying your load. In some cases, protective work boots with steel toe reinforcement and other safety features may be required. Discuss proper footwear with your supervisor or Campus EH&S Office. Follow these safe lifting techniques:

1. Stand close to the load – Carrying an object as close to your body as possible will reduce the strain on your back and help maintain balance.
2. Lift with your legs – Using your leg muscles helps keep your back better aligned, which will reduce the load on your lower back.
3. Grip the load securely – Get a good handle on the load before you lift to avoid slipping. If the load starts to fall, let it go.
4. Lowering the load – Make sure you keep the load close to you, and use your legs while lowering the load to the floor.



## Chemical Hazards

The key to safe chemical use is to understand the physical and health hazards of the materials you use, implement safe handling precautions, and recognize emergency/first aid procedures.

Each chemical container has a manufacturer's label with the chemical name(s), hazard warnings, and the manufacturer's name and address. Labels must not be removed. If secondary containers are used, those containers must also be labeled with the information.

Each product will have a Safety Data Sheet (SDS) that contains the following:

1. Physical properties
2. Flammability and fire-fighting information

3. Health hazards
4. Emergency and first aid procedures
5. Stability and special storage considerations
6. Spill, leak, and disposal procedures
7. Personal protection information

Your supervisor will identify which products will be used for the set construction. All employees will receive training on the location and content of the SDS; the required PPE; and the proper use, storage, and disposal of each product.

There are many types of paints, inks, pigments, and dyes used in the performing arts. While each product will have specific manufacturer's instructions, the following safety guidelines apply to all products:

Read the product labels and the SDS to help you identify the potential hazards of the product you are using.

1. Know the ventilation requirements of the products you are using.
2. Avoid ingestion of materials by not eating or drinking in your work area, and wash your hands before eating and drinking.
3. Keep containers closed except when you are using them.
4. Control ignition sources in areas where flammable liquids are used.
5. Never puncture aerosol cans or expose them to high heat.
6. Dispose of each product as directed by the manufacturer and in accordance with your Campus Hazardous Waste Management Program. Contact the EH&S Department if you have questions.
7. Know and understand the chemical spill procedures for each of the products you are handling.

For more information, consult your Campus Hazard Communication Program and the Code of Safe Practices regarding hazard communication.

The use of chemicals often results in the generation of hazardous waste. Dispose of waste as directed by the product manufacturer and in accordance with the Campus Hazardous Waste Management Program. You can contact the EH&S Department for more information and guidance regarding hazardous waste management. They will provide guidance regarding:

- Proper storage of the waste until it is collected
- Proper labeling of the waste containers
- Special handling requirements based on the hazard characteristics of the waste

## Confined Space Hazards

Recognizing confined spaces and the hazards they present is critical when you are working in facilities and areas where they are found. Untrained, ill-equipped workers who try to work in or rescue people from confined spaces often become victims of serious injury or death. Only authorized personnel trained in accordance with the Campus Confined Space Entry Program may enter confined spaces.

A confined space is defined as:

- An area large enough for a person to enter and perform assigned work, and
- Has limited or restricted means of entry or exit, and





- Is not designed for continuous human occupancy.

Examples of potential confined spaces found in the performing arts include, but are not limited to:

- Orchestra pit lift area (area under the orchestra pit)
- Elevator pits
- House cove (attic) lighting positions
- Plumbing runs
- Boilers

Depending on the construction of the paint frame system, the floor level area below the main shop floor (where the paint frame is typically accessed) may also fall under the definition of a confined space. In some cases, a fixed ladder is used to access this lower area. If that were the case, the types of tasks performed and materials used in the lower level of the paint frame would be limited. See your EH&S Department for further information and restrictions regarding your performing arts facilities.

### Protect yourself and others

1. Consult with the EH&S Department and refer to the campus-specific Confined Space Entry Program, procedures, and training requirements.
2. Never violate the posted “ACCESS RESTRICTED TO AUTHORIZED PERSONNEL” and “ENTRY BY PERMIT ONLY” signs if you are not authorized to enter.
3. Know how to identify a confined space.
4. Never enter an area that could be a confined space. Contact your supervisor or instructor if you are in doubt.
5. NEVER enter a confined space to try to rescue another worker unless properly trained and equipped to do so.

Contact your Campus EH&S Department for assistance in identifying confined spaces in your facilities. For more information, consult your Campus Confined Space Entry Program, and read the Code of Safe Practice regarding confined space entry.

## Housekeeping

Work areas can become congested while set building and rehearsals take place. Clutter can contribute to slip and fall injuries or to being struck by objects and can be a significant fire hazard. Remember to clean up after each work session. Place trash in proper receptacles. Avoid accumulating scrap lumber and materials. Store tools in the proper areas when not in use.

## Storage of Materials

The proper storage of materials is extremely important to the safety of employees, students, performers, and audience. Storage procedures should comply with the following guidelines:

1. Store flammable and combustible materials in the designated flammable storage cabinets.
2. Store materials at least 18 inches below all sprinkler heads, and at least 36 inches horizontally from the sprinkler heads.
3. Store materials at least 24 inches below the ceiling where sprinkler heads are not present.
4. Never obstruct exits.
5. Never obstruct access to firefighting equipment, such as extinguishers, hose stations, or alarm pull stations.
6. Maintain a clear unobstructed space of at least 36 inches in all directions from electrical service equipment.



# Prop Shop



**The prop shop houses many different types of operations; it functions as a wood and metal construction shop, costume shop, crafts shop, paint shop, graphics shop, floral shop, and more.**

Prop shop operations have potential chemical exposures and injuries sustained from the use of power tools, tripping hazards, lifting, and other types of hazards. Adherence to all safety policies, training prerequisites, and the use of personal protective equipment (PPE) is required and will be enforced. In addition, the Performing Arts Code of Safe Practices Matrix identifies

which codes of safe practices you are required to read for prop shop operations.

We will review common operations within three primary prop rooms or work areas: the dirty room, the clean room, and the craft room. Your Performing Arts Department may have separate rooms for each of these operations, or all the activities may be conducted within one large shop divided into separate work areas. These primary work areas generate sawdust, paint spray, upholstery lint, wet glues, finishes, damp dyed fabric, noisy sawing, and gases released by drying castings.

To help reduce these exposures, the prop shop may be equipped with temporary barriers, mobile work tables, tools on rolling stands, and flexible systems for ventilation and dust collection. You may also have policies regarding the use of storing supplies in plastic containers with secure lids, providing dust covers over sewing machines or computers, or even rigging a physical barrier to temporarily divide the shop as needed.

## Power Saws

Common within all work areas of the prop shop is the use of various types of saws, such as table saws, circular saws, jig saws, and hand saws. All employees must receive documented training before



*Wood lathe with guards in place.*

operating any type of saw. Using a saw can be extremely dangerous if safe and proper operating procedures are not learned and followed. In addition to the codes of safe practices for specific types of saws, here are some general safety guidelines:

1. Always talk to your instructor or supervisor if you discover a faulty machine or tool or if you are not fully qualified to operate the machine or tool.
2. Wear the proper PPE: Safety glasses, goggles, and, when necessary, a face shield. Note: the use of a face shield by itself does not qualify as wearing appropriate eye protection.  
Hearing protection devices when power tools and woodworking machines are in use even if you are not the operator. Appropriate shop attire when using hand and power tools including full-length pants (or equivalent) and closed-toe shoes.  
Tight-fitting work gloves only for handling materials. Never wear gloves while working with power tools. Consult with your Campus EH&S Department and refer to the UC PPE Policy for more information.
3. Remove rings, watches, necklaces, other jewelry, and loose clothing and leave them in your locker or bag.
4. Restrain long hair to keep it away from machinery, tools, and points of operation.
5. Inspect tools and machinery prior to starting to ensure they are safe to use.
6. Immediately lockout and tagout damaged machinery and power tools, and report it to your supervisor. For additional information regarding lockout and tagout, read the Lockout/Tagout/Blockout section in the Set Construction chapter, the Code of Safe Practice on Lockout/Tagout/Blockout, and the Campus Lockout/Tagout/Blockout Policy for more information.
7. Shut off and disconnect all power tools and machinery from their power source prior to making adjustments or changing out components; wait for the machine/tool to come to a complete stop.
8. Never leave machinery or power tools running unattended.
9. Sweep up and clean away saw dust and scraps as needed throughout the work process to keep the floor free of slip, trip, fall hazards and the work area clean. Sweep and clean again prior to leaving the area.
10. Keep saws in good condition. Keep them sharp and clean for optimal performance. Follow manufacturer instructions for lubricating and changing accessories.
11. Never operate the saw while under the influence of drugs, alcohol, or medication that could impair your judgment or motor skills.

The Set Construction section also contains valuable information on the use of power and hand tools, PPE, chemical handling, and lifting.

## Dirty Room

The dirty room is primarily a wood and metal working space. Typical power tools include the standard table saw, radial arm, and band saw. It may also have tools more specific to furniture construction like a power miter saw, a wood lathe, a vacuum form, a shaper, a planer, a jig saw, and hand tools. A wide variety of clamps are also used for construction and furniture work.

Furniture construction, stripping, restoration, metal reinforcement, plastics and foam work, and many other activities generate dust, smoke, dirt, and fumes. Dirty rooms often have a dust collection system to keep the sawdust generated by the woodworking process to a minimum.



The metal working area may have a MIG welder for mild steel welding with an aluminum spool gun to allow for construction of lighter-weight structural or decorative items. For larger jobs an oxy-acetylene rig may be used for braising metals and cutting.

Smaller projects may involve the use of propane or map gas torches for sweating copper and tiny butane torches for hi-temp soldering. Cutting and finishing tools such as chop saws, portable metal cutting band saws, grinders, wire wheels, buffers, pneumatic nibblers for delicate or small scale grinding and metal shaping applications, benders for small scale steel stock, vices, etc., may be used.

Training on the safe operation of all tools and equipment is required. Good housekeeping practices are required for proper storage of plywood, lumber, metal, and plastics, as well as maintaining organized storage for fasteners and supplies such as staples, bolts, nails, screws, brads, hinges, glues, molding, sandpaper, etc.

Reduce fire hazards by ensuring metal working areas are well separated from woodworking areas. Use portable shields if necessary to separate the metal working areas from other areas. Use sawdust collection systems to reduce the risk of fire. Keep flame and other ignition sources out of the woodworking and lumber storage areas. Routinely sweep the floors in the woodworking area to clear wood scrapes and sawdust.

Housekeeping also includes proper storage of hand and power tools. While in use, power hand tools such as drills, sabre saws, or routers have cords that can run across the floor and cause tripping hazards. Take steps to reduce the trip hazard through cord placement and cord guards.



## Clean Room

The clean room is designated for fabric lay-out, draping, upholstery tasks, paper goods, floral projects, graphics work, and other activities that require a space free from air-borne contaminants or dust.

The graphics area will typically have a computer, scanner, printer, and drafting/light table. The upholstery and soft goods process requires tools that can handle drapery and upholstery weight materials. In addition to various types of sewing machines, the shop may have an

ironing table with industrial steam iron, patterning tables, staple guns, tack pullers, saws, scissors, tack hammers, tufting needles, etc.

Upholstery and drapery supplies include batting, foam rubber, spray adhesives, thread, twine, decorative fringes, as well as various fasteners such as staples, webbing tacks, and nail strips.

Common exposures include burns, needle sticks, and significant lifting exposures. Good housekeeping practices are critical to a safe work environment.

## Craft Room

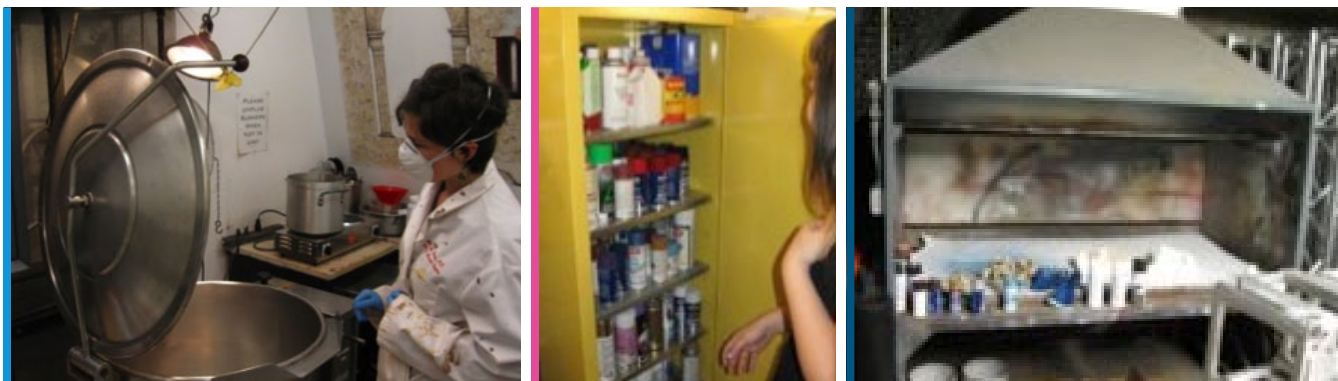
The craft room supports a wide variety of craft work done in the prop shop. It may have a large steam vat for dye work, dye mixing area with a stove or hot plate for heating water for dye solutions, a ventilation grill to pull dye vapors away from the work area, a walk-in spray booth for exhaust of paint and curing materials, and a paint/plaster sink. The spray booth and dye ventilation systems allow contaminated air to be removed from the work

area and exhausted via a filtering system to the outside.

Any spray painting or work with finishes that emit a vapor (it may have an odor or may not, check to see if the Safety Data Sheet (SDS) says the material is volatile) or generate a fine mist should be done in this ventilated space. The prop shop utilizes spray paint and spray finishes more than any other area in the performing arts due to the highly detailed nature of many of the processed items.

Water-soluble latex or acrylic paint and glaze materials are standard for prop shop painting as well as the use of pure pigments for mixing into the glaze, dyes for French enamel varnish (FEV) work, bronzing powders, and gold leaf. Supplies will also include buckets and pails, brushes, wood combs, and sponges.

The crafts area usually has tables for working on the wide variety of projects. Hand tools include pliers, screwdrivers, hammers, saws, clamps, paint brushes, an airbrush for detail work, floral wire, tape, putty, markers, sealers, and paper. Molding and casting supplies might include mixing cups, stir sticks, a scale, pans, plaster, spray releases, a hot plate, spatulas, plastic tubs, and aluminum sheet pans. Standard supplies for this area include plaster, tape, glue, spray sealers, stamps, and seals.



One of the major exposures in the craft room is the use of chemicals. Training is required to ensure you know the physical and health hazards of the chemicals you are using, safe handling precautions, emergency/first aid procedures, and proper storage of flammable liquids. As stated in the Set Construction chapter, follow the specific manufacturer's instructions for each product, as well as the following safety guidelines:

1. Read the product labels and the SDS to help you identify the potential hazards of the product you are using
2. Know the ventilation requirements of the products you are using.
3. Avoid ingestion of materials by not eating or drinking in your work area, and wash your hands before eating or drinking.
4. Keep containers closed except when you are using them.
5. Control ignition sources in areas where flammable liquids are used.
6. Never puncture aerosol cans or expose them to high heat.
7. Dispose of the product as directed by the manufacturer and in accordance with the Campus Hazardous Waste Management Program. Contact the EH&S Department if you have questions.
8. Know and understand the chemical spill procedures for each of the products you are handling.

For more information read the Set Construction chapter and consult your Campus Hazard Communication Program and the Code of Safe Practices regarding hazard communication.

The use of chemicals often results in the generation of hazardous waste. Dispose of waste as directed by the

product manufacturer and in accordance with the Campus Hazardous Waste Management Program. You can contact the EH&S Department for more information and guidance regarding hazardous waste management. They will provide guidance regarding:

- Proper storage of the waste until it is collected
- Proper labeling of the waste containers
- Special handling requirements based on the hazard characteristics of the waste

Always be aware of the potential hazards you may create and the hazards around you and remember to talk to your supervisor if you have any questions about the policies, procedures, personal protection, or training requirements before working in any area of the prop shop.

## Special Props

Some productions call for special props, such as weapons or live animals. These props pose unique risks that require special handling procedures to ensure the safety of performers, crew, and audience.

### Weapons

When we talk about prop weapons, we're not talking about toys. Although props, stage weapons both real and mock-up can cause serious and life-threatening injury. Weapons come in many shapes, sizes, and varieties and might include firearms; stun guns; air guns; edged weapons; arrows and bows (cross and recurve); pitch forks; clubs; sling shots; grenades; whips; chemical weapons, such as pepper spray; and any object that could be used in stage combat, such as a mace (spiked ball on a chain) or a staff. Examples of firearms include hand guns, rifles, shotguns, and BB guns. Edged weapons are defined as knives, swords, spears, daggers, kunai, and axes.



### General Safety For All Weapons

There are several rules and procedures in place to provide for the safe use of weapons regardless of the type of weapon.

### Permission & Notification

1. Obtain written permission from for the use of weapons before they are purchased, made, or used. This individual may be with the Campus Police Department, a Technical Director, Department Chair, Producer, etc. Check with your supervisor regarding your departmental procedures.
2. Notify Campus Law Enforcement when weapons will be used in any production.
3. Notify Campus Law Enforcement and other building tenants of the intended schedule for the use of weapons to avoid any confusion or problems.
4. Restrict access, as well as handling of weapons, to authorized stage management representatives, Performing Arts supervisors, performers, and crew.
5. Only weapons owned by UC or rented by authorized UC staff may be used in UC programs and productions
6. No personal weapons may be used or brought on site.
7. Use of UC weapons is restricted to UC programs and productions; loaning, renting, or otherwise authorizing the use of UC prop weapons to other groups is prohibited.

## Training

1. Train stage management representatives, Performing Arts supervisors, designated employees, as well as all performers and crew who will handle the weapons.
2. Provide appropriate PPE such as hearing protection, eye protection, face protection, and body protection for all hands-on weapons training.



Include in the training all weapons policies; how to handle the weapons in a safe manner; the use, care, and maintenance of weapons; weapons security; noise exposure from weapons discharge; and hazards of and procedures for firing weapons in controlled settings.

1. Include the actual discharge of weapons in the training; ensure the required notification of discharge to Campus Law Enforcement.
2. Provide additional training regarding loading, cleaning, inspection, and repair to those employees responsible for those activities.
3. Document all training.
4. Provide adequate time during tech rehearsals to allow the performers to become comfortable using the weapons.

## Storage

1. Store all weapons in locked cabinets or rooms.
2. Restrict access to the weapons storage areas to authorized UC staff.
3. Secure weapons used in rehearsals in their transportation cases or other secured areas when not in use.
4. Store all weapons in secure areas at the end of each performance.

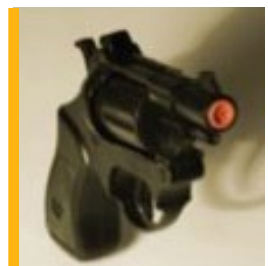
## Use and Handling

1. Only use weapons as intended by the choreography of the play.
2. Never play with the weapons or engage in horseplay onstage or offstage.
3. Never remove the weapons from the stage/backstage area.
4. Only stage management, designated Department staff, and designated crew members may maintain, load, handoff and receive, and store the weapons.
5. Store weapons in an unloaded state in a safe protected manner while they are backstage and not standing by for use onstage.
6. Immediately clean weapons post show, and store them in dedicated locked storage areas.
7. Use a checklist for each show to ensure all requirements are met.
8. Only UC personnel, students, performers, and crew members who have received documented training on weapons handling guidelines will be permitted to use, handle, maintain, or store weapons.

## Firearms Safety

Following the safety rules for the use of firearms is essential for the safety of the performers and crew. Injury and even death can be caused by discharged wadding of blank rounds. The noise levels produced by the discharge of firearms can cause hearing damage. Take firearms safety seriously.

1. Notify the Campus Police Department when firearms will be used in a production.
2. Treat all firearms as though they are loaded.
3. Never use live ammunition. The use of live ammunition is prohibited.
4. Only use the blanks designated for each individual weapon. Never use substitutions.



5. Store blank rounds and shells in a separate container from the firearms.
6. Never load any firearm until actually ready to use it.
7. Never permit a performer to handle a firearm except during supervised training, supervised rehearsals, fight calls, and performances.
8. Always follow safe handoff procedures.
9. Maintain all safety devices in place until ready to use the firearm.
10. Never leave a firearm unattended.
11. Secure firearms when not in active use during rehearsals, performances, or inspection and cleaning activities.
12. Maintain a firing log to record which weapon was fired and to note any misfire or other problems with the weapon.
13. Read the Code of Safe Practice regarding special props for firearms for more detailed safety instructions.

### Edged Weapons

Piercing weapons are included in the category of edged weapons. Examples include, but are not limited to, knives, swords, rapiers, razors, arrows and bows (recurve and crossbow), pitch forks, mace, hatchets, axes, saws, spears, kunai, throwing stars, and darts.

1. Dull the edges of edged weapons.
2. Blunt the tips of piercing/pointed weapons.
3. Only use edged weapons designed for stage combat.
4. Provide qualified supervision for all training sessions, rehearsals, and performances.
5. Inform performers and crew of safety precautions to be observed, including their positions during the action sequences.
6. Review and practice the choreography with performers and crew prior to the introduction of weapons.
7. Keep all protective devices, such as sheaths, in place until ready to use the weapon.
8. Use storage cases for kunai and throwing stars.
9. Never leave the weapons unattended.
10. Inspect weapons for damage after each use.
11. Repair weapons prior to their next use, including the removal of burrs along sharp edges
12. Read the Code of Safe Practice regarding special props for edged weapons.



### Other Weapons

Many other types of weapons appear as props in productions, such as whips, staffs/walking sticks, clubs, sling shots, and grenades.

1. Only use weapons designed for stage combat. These weapons should be strong enough and constructed so as not to break into dangerous pieces during use.
2. Inform performers and crew of safety precautions to be observed, including their positions during the action sequences.
3. Review and practice the choreography with performers and crew prior to the introduction of weapons.
4. Never leave weapons unattended.

### Live Animals

Live animals in performing arts productions can pose a variety of hazards and challenges. The animal may cause





illness or injury to the performers, crew, or audience. Materials for the care of the animals may increase the fire load within the building and may otherwise be hazardous to human health. The animals themselves may be harmed by the actions of the performers, crew, or audience.

Physical injury such as scratches, bites, contusions, and broken bones can result

when animals are frightened or threatened and use their natural defensive mechanisms. Animals can also transmit illnesses to humans through scratches, bites, simple contact, secretions, and airborne pathogens. Animals may also cause flea infestations. Performers and crew members may have an allergic reaction to the animals.



Ensuring the safety of the performers, crew, audience, and the animals requires adhering to specific steps before allowing the use of any animal in a production.

**NOTE: No poisonous animals will be permitted at any time.**

### **Conduct a Risk Assessment**

Conduct a risk assessment to identify potential hazards associated with the proposed use of animals in a production. Contact your Campus Institutional Animal Care & Use Committee (IACUC) if you need assistance in conducting the assessment. The EH&S Department can assist you in reaching the IACUC if needed. Involve persons experienced with animals, such as zoo keepers, personnel from other university departments, animal trainers, and/or a veterinarian as needed.

### **Control Measures**

If the decision to use animals is approved after the risk assessment is completed, work with the IACUC to develop control measures designed to help protect the cast, crew, audience, and animals. Notify all potential performers and crew members of the nature of the animal to be included in the production, and implement the Animal Care Plan developed with the IACUC. Also contact the Risk Management Department regarding potential insurance and contractual obligations. Read the “Special Props – Live Animals” Code of Safe Practice for more details.

# Lighting

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**Performing arts lighting has many functions; it is used to see what's occurring on the stage, to focus the audience's attention on a specific person or area, or to set the tone or mood of a particular scene. The uses of performing arts lighting are as varied as each production at your campus.**

Working with performing arts lighting can be a dangerous activity. Conducting operations such as hanging lights, sometimes in the dark, with high-voltage electricity has the potential to cause a variety of accidents and injuries such as falls, fires, electrocution, and injuries from falling objects. In addition, lighting equipment is heavy and can cause significant injuries if mechanical aids or proper lifting techniques are not used.

This section contains a brief overview of typical lighting operations and hazardous exposures while installing, maintaining, and storing lights and fixtures. Review the rigging and safe lifting guidelines in the Set Construction section. In addition, the Performing Arts Code of Safe Practices Matrix identifies the applicable Performing Arts Codes of Safe Practices you are required to read for lighting operations.

## Fire Risks

Performing arts lighting equipment may burn hot, and the lenses used in the lights can magnify the heat. Make sure you use only approved equipment to modify your lights; using unauthorized materials to rig lighting colors or

change the shape of the light can put you at risk for fire. Make sure any sources of heat, such as very hot lights, are placed well clear of anything that could ignite, including paper, plastic, flammable furniture, and draperies.

Your fire prevention training will provide you with critical information about your venue's fire protection systems, including the use and location of fire extinguishers.



## Electrical Risks

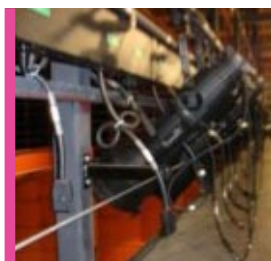
Electrical shock happens when a part of your body completes a circuit between conductors or a grounding source. The effects of electrical shock range from a tingle to death, depending on the amount of current flow and the path of the current through your body. To prevent electrical shock, follow safe electrical work practices including lockout/tagout. For additional information regarding lockout and tagout, read the Lockout/Tagout/Blockout section in the Set Construction chapter and the Code of Safe Practice on

lockout/tagout, and refer to your Campus Lockout/ Tagout/Blockout Program for more information. For additional information on fundamental safe electrical work practices, review the electrical safety code of safe practices to understand why and how electrical shock can be so dangerous.

There are inherent electrical exposures while working with lighting instruments. Performing arts lighting uses a lot of electricity, and the risk of electrocution is high. Lighting equipment must be checked regularly for worn areas and exposed wire that might put an employee at risk for electric shock. Do not ignore even a slight tingle when you feel this sensation while handling a lighting instrument, cord, or component of the equipment. This tingle is an indication that something is wrong, and you may be at risk of exposure to a more significant electrical shock. Inform your supervisor of this condition and correct the issue before it becomes a major problem.

## Risk of Falling From Heights

The procedures for hanging and focusing lights may require you to work from significant heights on catwalks, scaffolding, tension grids, aerial work platforms, or other elevated work surfaces. Fall exposures must be identified in the planning stages and where necessary, appropriate fall protection measures (guardrails, fall arrest gear, etc.) need to be in place and used. Employees and students must be trained on potential fall exposures and the presence or use of required fall protection. Supervisors must ensure employees are following all safety requirements. In addition to direct training, there are several codes of safe practices that address fall protection.



## Overhead Lighting

Performing arts lighting rigs are very heavy and can cause severe injuries if they fall. Employees and students must be trained on how to hang and properly secure lights. All lights must be double-checked for safety and tethered to the lighting rig with a safety cable.

Because the lights are at greatest risk of falling when the lighting rig is being moved or worked on, make sure no one is in the area below before proceeding with overhead lighting work. In addition to looking below, clearly announce and notify all individuals in the area that overhead work is occurring. Remember, the performing arts venues are often dark, and you may not be able to see if anyone is below the work area.

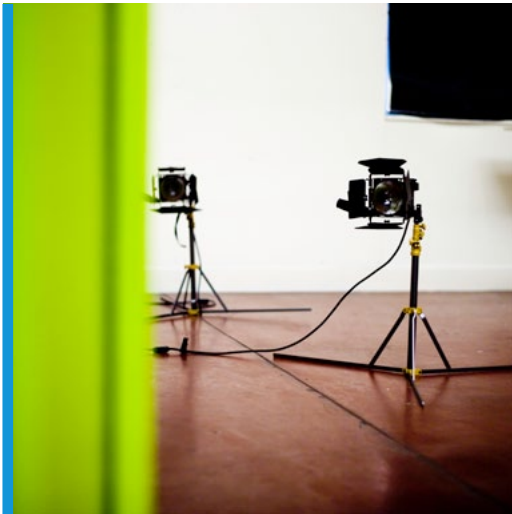
## Battens – Pipes with Lighting Instruments Attached

Lighting instruments are plugged into raceways that are attached to line sets that are commonly referred to as “electrics.” The raceways contain many wires that when energized are dangerous. Make certain the electrics are not too close to flammable materials, such as scenery and draperies, because the heat can scorch and possibly ignite the materials.

Regular inspection and maintenance will identify loose screws and bolts that may fall and cause an injury to someone below. Checking the rope locks is important to ensure electrics are holding properly. Cables need to be properly rigged to avoid snagging on battens, scenery, and draperies.

## Dimmer Rooms and Boards

Only trained and qualified employees are allowed to operate and maintain the light board and dimmers. Make sure the manufacturer manuals are available for review. Good housekeeping practices are essential. Never store flammable or combustible materials in the dimmer room or near dimmer equipment.



## Followspot

The followspot is a light that is physically moved by an operator to follow a performer as he or she moves around the stage. It might have devices to change colors or the beam size. The followspot operator may have to monitor several areas at the same time.

The followspot operator must be thoroughly trained on the manufacturer’s instructions and safe operation of the followspot, maintenance procedures (electrical attachments, worn cables, grounding, gel frame, stability of the unit, lamp replacement), potential burn exposures, and what to do in the event of an emergency. For example, the followspot operator should know what to do if the gel in the gel frame begins to smoke.

## Cable Management

Lights focus the attention of the audience and set the mood for a scene. A lot of planning goes into the placement, color, and intensity of the lights, and the same amount of care must be given to running cable. Improperly run cables can become a tangled mess that poses trip and fire hazards and hinders troubleshooting to determine why a light is not working. Failure to manage the cables can also become a distraction to the patrons in those small intimate venues where the audience can see everything. Start with a plan that precludes chaos.

1. Create a circuiting diagram for the theater of all circuits.
2. Use a light plot to determine how many circuits are needed for each lighting location.
3. Use the circuiting diagram to plan which circuits will be used for which lights. Try to leave a few spare circuits in each location.

4. Use gaffers tape to label the circuit number at both ends of each cable.
5. Note on the light plot which circuit each light was plugged into.
6. Use the shortest cables possible to eliminate hanging loops that will tangle.
7. Provide sufficient slack in the cable to allow for focusing.
8. Never tie down the lighting instrument's power cord.
9. Group cables in parallel lines and use Velcro rip-ties, theatrical cord, or tie line (glazed or unglazed) to keep them organized. The use of Velcro rip-ties, theatrical cord, or tie line (glazed or unglazed) has several advantages:
  - a. you need not replace the Velcro rip-ties, cords, or tie lines each time you need to add or remove a cable from the group
  - b. the cables are not at risk of being cut as they are when you have to cut off a zip-tie
  - c. the risk of injury from the sharp edge of a trimmed zip-tie is eliminated
  - d. the job is not disrupted by the search for a replacement tie as can happen when using zip-ties that cannot be reused
  - e. rip-ties, cords, and tie lines, generally, cannot be pulled so tight they damage the cables
10. Never wrap cables around support beams or catwalk guardrails.
11. Use re-closable J hooks and/or Velcro cable straps to support cables that must be suspended from one point to another.
12. Coil extra lengths of cable, and use Velcro rip-ties or tie line to keep the coil stable.
13. Use cable guards where the cables must cross a foot-traffic area. If practical, use a cable guard that is equipped with yellow or orange stripes to alert cast and crew of the trip hazard.

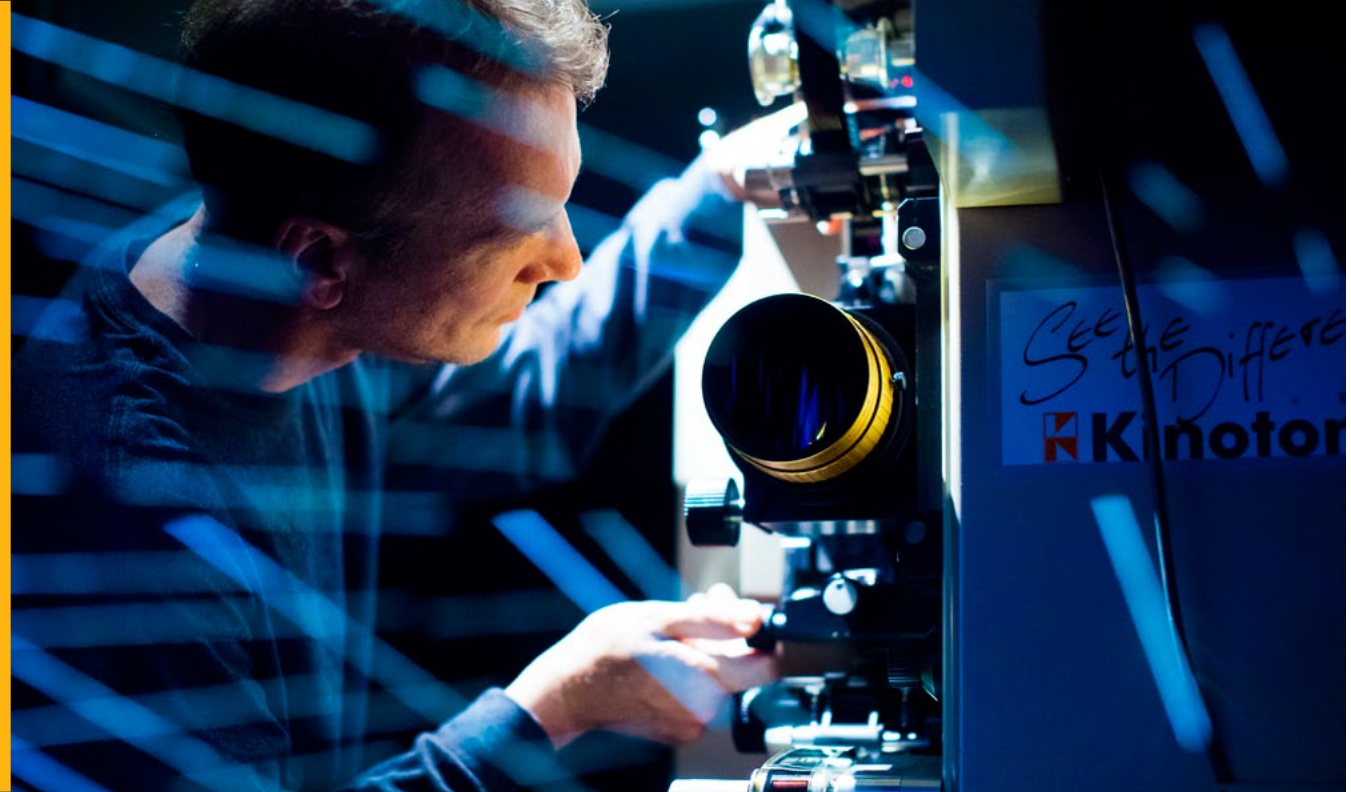
## Inspection, Maintenance, and Storage

Regular inspection and maintenance will significantly reduce potential electrical malfunctions and fire hazards. Training is required for any employee responsible for inspecting or maintaining lighting instruments. Your Performing Arts Department will have specific inspection requirements. In general, inspecting lighting equipment should include:

1. Visual observations of the condition of cables, plugs, cords, grips, insulation, and electrical pockets.
2. Confirmation that lighting instruments, electrics, cables, gel frames, top hats, barn doors, and other electrical instrumentation are clean and dust free.
3. Confirmation that electrical equipment is stored in a clean and dry storage area.
4. Confirmation that the power cords are coiled, the shutters closed, and all attachments secured.

# Audio and Video

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**Your performance venues may use a variety of audio and video equipment, such as mixers, amplifiers, loud speakers, outboard gear, microphones, computers, projectors, and external dowers, etc.**

Like lighting operations, there are significant exposures while installing, maintaining, and storing audio and video equipment. You may be exposed to hazards such as fall from heights while installing speakers, injury sustained from falling equipment, or back injuries from lifting heavy equipment. An added hazard may result from the decibel level generated by the speakers and amplifiers.

It is important to review the rigging and safe lifting guidelines in the Set Construction section. In addition, the Performing Arts Code of Safe Practices Matrix identifies the applicable theater codes of safe practices you are required to read for audio operations.

## Electrical Risks

Your supervisor will train you on the proper grounding requirements of the audio equipment. Proper grounding will help eliminate a ground loop that can potentially damage the equipment and may also result in electrical shock. The best thing to do is avoid electrical shock by following safe electrical work practices including lockout/

tagout. For additional information regarding lockout and tagout, read the Lockout/Tagout/Blockout section in the Set Construction chapter and the Code of Safe Practice on lockout/tagout/blockout, and consult your Campus Lockout/ Tagout/Blockout Program for more information. For additional information on basic electrical safe work practices, review the electrical safety code of safe practices to understand why and how electrical shock can be so dangerous.

## Risks of Falling from Heights

The procedures for hanging audio equipment may require you to work from significant heights on catwalks, scaffolding, tension grids, aerial work platforms, ladders or other elevated work surfaces. Fall exposures must be identified in the planning stages and where necessary, appropriate fall protection measures (guardrails, fall arrest gear, etc.) need to be in place and used. Employees and students must be trained on potential fall exposures and the presence or use of required fall protection<sup>3</sup>. Supervisors must ensure employees are following all safety requirements. In addition to direct training, several codes of safe practices that address fall protection must be reviewed.

## Suspended and Stand-Mounted Audio Equipment

Overhead speaker units can cause severe injuries if not suspended properly. Supervisors will train employees on how to properly install and rig the suspended units. Ensure swags for flown cables are marked with caution tape and placed at a safe height. The cable should be placed at a height that will clear moving scenery and also be a safe distance off the deck. Tripods can present trip/fall and falling object hazards. Supervisors will train employees regarding proper tripod placement to ensure they are placed to reduce trip/fall hazards and properly installed to prevent tip-over incidents.

## Noise Levels

High noise levels generated during rehearsals and productions can result in hearing damage and hearing loss for the performers, crew, and orchestra. Conduct sound level testing when planning high noise level events, and provide appropriate hearing protection devices when the planned noise levels reach an 8-hour time weighted average of 85 decibels. Contact your Campus EH&S office for assistance in evaluating the hazards of high noise levels.

## Video and Projection Equipment

The use of video and projection equipment may involve placing computer towers on the tension grid or catwalks, running Cat5 (Ethernet) cables, placing heavy projectors in elevated positions, mounting bright lights, mounting theatrical dowsers at elevated heights, or installing projection screens. The use of proper body mechanics is important when lifting heavy equipment. Fall protection may be necessary when working in elevated positions. The use of ladders is common. It is important that Performing Arts Codes of Safe Practice for electrical safety, fall protection – catwalk safety, fall protection – portable ladder, fall protection – tension grid, lockout/tagout, and material handling – safe lifting and moving materials are reviewed and followed as appropriate.

## Cable Management

Cable management for audio equipment poses the same hazards as cable management for lights. Audio cabling includes the signal carrying cables, as well as, the power cables. The same cable management steps used for lights apply to audio cables:

<sup>3</sup> See the code of safety practices regarding fall protection – trigger heights.

1. Create a circuiting diagram for the theater indicating the location of all the audio/visual equipment.
2. Add extra sheets as needed to plot the sound board.
3. Use the circuiting diagram to plan the equipment locations. Use gaffers tape to label the circuit number at both ends of each cable.
4. Use the shortest cables possible to eliminate hanging loops that will tangle.
5. Provide sufficient slack in the cable to allow for position adjustments.
6. Group cables in parallel lines and use Velcro rip-ties, theatrical cord, or tie line (glazed or unglazed) to keep them organized. The use of Velcro rip-ties, theatrical cord, or tie line has several advantages:
  - a. you need not replace the Velcro rip-ties, theatrical cord, or tie line (glazed or unglazed) each time you need to add or remove a cable from the group
  - b. the cable are not at risk of being cut as they are when you have to cut off a zip-tie
  - c. the risk of injury from the sharp edge of a trimmed zip-tie is eliminated
  - d. the job is not disrupted by the search for a replacement tie as can happen when using zip-ties that cannot be reused
  - e. rip-ties, cord, and tie line generally cannot be pulled so tight they damage the cables
7. Never wrap cables around support beams or catwalk guardrails.
8. Use re-closable J hooks and/or Velcro cable straps to support cables that must be suspended from one point to another.
9. Coil extra lengths of cable, and use Velcro rip-ties to keep the coil stable.
10. Use cable guards where the cables must cross a foot-traffic area. If practical, use a cable guard that is equipped with yellow or orange stripes to alert cast and crew of the trip hazard.

## Inspection, Maintenance, and Storage

Regular inspection and maintenance will significantly reduce potential electrical malfunctions. Training is required for any employee responsible for inspecting or maintaining audio and video equipment.



# Special Effects

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**A variety of special effects can be found in performing arts productions. The list is extensive and includes, but is not limited to, atmospheric smoke, fog, and haze; confetti; snow; foam; lasers; strobe lighting; pyrotechnics; fire; explosives; pits; trap doors; changes in elevation; flying and rigging performers and other objects; and suspended items above the audience.**



Special effects pose hazards that increase the risk of personal injury and property damage; therefore, the use of designated special effects may need to be reviewed and approved by the Campus Risk Manager, the Campus EH&S Office, and in some cases the Campus Fire Marshal. In addition, the Performing Arts Code of Safe Practices Matrix identifies the applicable Performing Arts Codes of Safe Practices you are required to read for special effects operations.

## Atmospheric Smoke, Fog, and Haze

Smoke is an atmospheric effect composed of solid particulate produced by combustion, where fog or haze is composed of liquid droplets. Smoke is produced using pyrotechnic materials, such as white or color smoke cartridges, or other flammable substances. Fog or haze can be produced using a variety of commercially available machines using glycol, glycol/water mixtures, water, mineral oil, or dry ice. The use of the equipment to produce these special effects can result in operator injury from chemical exposure, fire, or explosive discharge. Train all operators prior to permitting them to work with the chemicals, equipment, and devices that produce these special effects.

Many people are sensitive to smoke or the airborne constituents of smoke, fog, or haze equipment. When smoke, fog, or haze is approved for use in a production, warnings must be posted at the front of the house, at entrance doors to the theater, and in the program. As an example, the following communication could be posted: “WARNING: Synthetic fog is used during this performance.”

The use of atmospheric smoke, fog and/or haze may change a non-hazardous confined space into a hazardous confined space. Consult with your Campus EH&S Department prior to using atmospheric smoke, fog, or haze. For more information on confined space entry and its hazards, see the Set Construction chapter of this manual and consult your Campus Confined Space Entry Program and the Code of Safe Practice regarding confined space entry.

## Laser and Strobe Lights

Laser and strobe lights can induce seizure in some people with epilepsy or photosensitivity. When laser and/or strobe lights are approved for use in a production, warnings must be posted at the front of the house or entrance doors to the theater and in the program. As an example, the following communication could be posted: “WARNING: Laser and/or strobe lights are used during this performance.”



*Class 2 Lasers – Standard Laser Pointers*

Some laser lights have the potential to cause eye damage if a person was to stare at the light, and some lasers can cause skin burns if too strong or too close. Consult with your Campus Risk Manager and the Campus Laser Safety Officer prior to using laser lights in the production. Only Class 2 lasers may be used. Approved laser lights must meet requirements set forth by the Food and Drug Administration’s (FDA’s) Center for Devices and Radiological Health. Only employees trained to do so may operate the laser lights. Inform all performers and crew in advance, and educate them regarding the hazards and safety precautions associated with the use of lasers and strobe lights.

The use of laser lights in outdoor theaters can present a threat to aircraft operators. Therefore, the use of laser lights in outdoor theaters is prohibited unless prior permission is obtained in writing from the Federal Aviation Administration (FAA).

## Open Flame, Pyrotechnics & Explosives

The use of open flame, pyrotechnics, or explosives can result in tragedy. Consequently, the use of open flame and pyrotechnics is discouraged and may only be used when approved by the Campus Risk Manager and Campus Fire Marshal. The use of explosives is prohibited. Fire permits are required in most jurisdictions for the use of open flame in an assembly area and for the use of fireworks and pyrotechnics. Contact the Campus Fire Marshal at least four weeks in advance of the performance for assistance in obtaining the required fire permit.

### Open Flame

Open flames include candles, lanterns, camp stoves, cigars, cigarettes (herbal, tobacco, and vegetable based), pipes, incense, and basically anything else that is burning. Contact the Campus Fire Marshal when planning to use an open flame in a production. Provide the specifics of the scenarios and obtain written permission for its use from the Fire Marshal. Once approved, follow the directions provided by the Fire Marshal. These directions may include:

1. Maintain two stage crew members with fire extinguishers in hand (one on each side of the stage) whenever an open flame is present.
2. Maintain buckets of moist sand on either side of the stage for the immediate extinguishment of smoking materials (cigars, cigarettes, pipes).
3. Empty any ashtray props into the moist sand buckets as soon as they are removed from the stage and again at the end of each performance or rehearsal.
4. Never permit smoking back stage, in the dressing rooms, in the audience area, or in the lobby. The University of California is a smoke and tobacco free system. Consult your local Campus smoke and tobacco free resources for additional information.
5. Use flickering lights (theatrical) in place of candles whenever possible.
6. Maintain a wall-mounted fire blanket.



## Pyrotechnics

All use of pyrotechnic devices before a proximate audience in California must meet the requirements found in the California Health and Safety Code, Title 19, under the jurisdiction of the California State Fire Marshal (CSFM); by reference, Title 19 includes the Bureau of Alcohol, Tobacco, and Firearms (BATF), Code of Federal Regulations (CFR), Title 27 and the Department of Transportation (DOT), CFR, Title 49, which regulate pyrotechnic materials nationally, NFPA Standard 1126 and any local municipal requirements. In addition, the State of California requires the user of pyrotechnic material to hold a current license issued by the California State Fire Marshal's Office. The appropriate license for theater use is the "Special Effects First Class."



If the use of pyrotechnics is desired, a written plan must be submitted to the Campus Risk Manager and Campus Fire Marshal for approval. The plan must include:

1. Name of the person in charge of or sponsoring the production
2. Name of the campus venue to be used
3. Dates and times of the production
4. Name of the pyrotechnic operator(s) who will be firing the pyrotechnics
5. Photocopies of the current pyrotechnic licenses held by the pyrotechnic operator(s)
6. Names and ages of all assistants who will be present
7. Certificate of insurance, endorsement of the University as an additional insured, and a copy of the insurance policy when the venue is leased or otherwise used by an outside entity
8. Diagram of the venue that shows:
  - a. each location from where the pyrotechnics will be fired
  - b. the fallout radius for each pyrotechnic device used
  - c. the lines delineating where the audience will be restrained
  - d. the location where the pyrotechnics will be assembled
9. Description of the storage location and measures taken to secure the pyrotechnic materials and devices
10. Safety Data Sheets (SDS) for the pyrotechnic materials
11. Certification statements that performers in the fallout area wear costumes that are made of inherently flame-retardant materials or that the materials have been treated in accordance with State Fire Code requirements to be flame retardant
12. Certification statements that the set, scenery, and rigging materials are inherently flame-retardant or have been treated in accordance with State Fire Code requirements to be flame retardant
13. The designation of at least two fire watch attendants.

Once a permit is obtained from the Fire Marshal, a demonstration of the pyrotechnic effect must be conducted for the fire officials.

## Explosives

No use of explosives is allowed.

## Snow, Confetti & Foam

Artificial snow may be made from chemical mixes, shredded paper, or plastic. Chemically produced snow may



pose hazards such as skin and eye irritation or internal ingestion risks. Check the SDS for any warnings and safe use directions, and share these warnings and directions with the performers and crew.

Shredded paper, shredded plastic, or foam may be used as confetti or artificial snow. These materials can produce dust that can be a fire hazard, and/or result in eye or respiratory irritation.

1. Never use these materials when an open flame or other ignition source is present.
2. Provide dust masks to crews assigned to clean up the material.
3. Never reuse disbursed material, as it can become contaminated with moisture or other debris from the floor.
4. Clean up the disbursed material immediately following each performance or rehearsal.
5. Dispose of the material in closed metal containers.
6. Use flame-proofed materials when possible.

## Pits, Trap Doors & Changes in Elevation

Pits, trap doors, and changes in elevation (stairs, ladders, etc.) pose trip/fall hazards. To reduce the risks of trip/fall incidents:

1. Mark changes in elevation, including the edge of the stage, with phosphorescent tape or LED lights as appropriate.
2. Inspect ladders and stairs for stability prior to each performance and rehearsal.
3. Lock trap doors in place when not in use.
4. Lock pits in place when not in use.
5. Use barricades and other signs to restrict under-stage access to pits and trap door operations to authorized crew and performers.



Temporary fall protection measures may be required during rehearsals around open traps, elevated stage platforms, or at the leading edges of the stage or orchestra pit. Identify these hazards during the production planning process and install temporary rails or create a controlled access zone to prevent individuals from falling into or off of these features. Consult the Code of Safe Practices on trigger heights and controlled access zones for additional information.



*Photograph courtesy of ZFX, Inc.*

## Flying & Rigging Performers and Other Objects

Flying and rigging performers and other objects poses a hazard to the performers and crew below. It also poses a hazard for the performers being flown. Contact the Campus Risk Manager for approval when planning to fly any performers in a production. Use the services of a company with a professional technical engineer with suitable experience in rigging performers and flying overhead objects.

## Suspended Items Above the Audience

If an unusual item or particularly challenging items are to be suspended above an audience, contact the Campus Risk Manager for approval.

Examples of these situations might include when planning to suspend very heavy or large items above the audience. Follow the rules for rigging set pieces and consider contracting with an outside company if this is beyond the normal scope of your rigging operations.

## Managing Chemical Waste

The chemicals used to generate some special effects may result in the generation of hazardous waste. Dispose of waste as directed by the product manufacturer and in accordance with your Campus Hazardous Waste Management Program. You can contact the EH&S Department for more information and guidance regarding hazardous waste management. They will provide guidance regarding:

- Proper storage of the waste until it is collected
- Proper labeling of the waste containers
- Special handling requirements based on the hazard characteristics of the waste

# Costumes



**Hazardous conditions can arise during the making, wearing, and storing of costumes. Costume designers may be exposed to hazards while operating scissors and other cutting devices, sewing machines, glue guns, and steam irons and when applying chemicals during the construction and repair phases.**



The design of the costume and the costume material itself may expose performers to fire, heat stress, and trip/fall hazards while wearing the costumes. The costumes and accessories can pose fire, material handling, and trip/fall hazards during the storage phase. The Performing Arts Code of Safe Practices Matrix identifies the applicable Performing Arts Codes of Safe Practices you are required to read for costumes/cosmetics operations. The first rule of thumb is to never touch costumes or use the equipment until you have been given permission to do so.

## Constructing, Modifying, and Repairing Costumes

### Before You Start

If you are using the facilities and equipment of another department, such as the Fashion Design Department, be sure you have permission to do so. Also ensure you have received and understand their use directives. As with any tools, it's important to read the instruction manuals first. Some of the tools to be mindful of are sewing machines, power scissors and cutting devices, and steam irons. Know the purpose of the tools you plan to use and how to use the tool safely. Just as important as knowing how to use the tool is ensuring the tools are safe

to use. For that, you will need to inspect the tools prior to use. Be sure you know how to report problems, take damaged tools out of service, and submit them for repairs or replacement. Always wear shoes to protect your feet from dropped and broken needles and pins. Always sweep the floor clean of debris after each work session.



### Sewing Machines

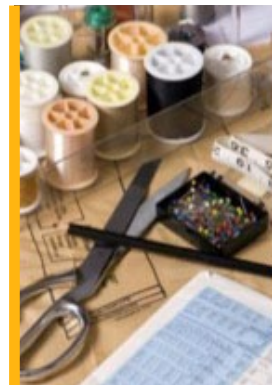
The U.S. Consumer Product Safety Commission estimates that in 2005, 2,700 people were treated in emergency rooms for sewing machine injuries. Of those injuries 60% were puncture wounds and cuts to the fingers. As you can see, it's not unusual for operators to sew their fingers into the garment they are constructing. Make sure you have received training on how to use the sewing machine prior to use. Remember, not all machines are the same, and some are quite aggressive, such as sergers (also known as merrow and overlock machines) that use

loopers and knives to tidy up the edges. Keep your fingers well away from the “presser foot” and “feed dog” of any machine to avoid exposing your fingers to the needles and/or knives.

### Scissors and Cutting Devices

Costume design and construction may require the use of various scissors and cutting devices, such as bent fabric shears, paper or craft scissors, embroidery scissors, pinking shears, power scissors, or rotary cutters. Here are a few reminders regarding the safe handling of scissors and rotary cutters:

1. Always cut away from your body and hands.
2. Keep your hands and fingers away from the cutting line.
3. Always carry manual scissors with the point toward the floor and with your hand around the closed blades.
4. Walk slowly when carrying scissors and be alert to your surroundings to avoid trips and falls.
5. Hand off the scissors to someone else by holding the scissors by the closed blades in a loose grip and offering the handles (known as bows) to the person receiving the scissors.
6. Remove power scissors from their power adapter prior to using them.
7. Ensure the power cord is out of the cutting area.
8. Only use rotary cutters that are equipped with a built in blade guard.
9. Follow the manufacturer's instructions for changing the rotary cutter blades.
10. Take dull scissors out of service and submit them for sharpening; remember only personnel trained to do so are permitted to sharpen scissors.
11. Use scissors only for their intended purpose.



### Flat and Steam Irons

The improper use and handling of irons can result in personal injury and property-damaging fires whether you are using a domestic flat/steam iron or an industrial steam iron. Industrial steam irons may be gravity-feed or steam box varieties. The industrial steam irons generate greater heat than the domestic steam iron; therefore, their use requires greater caution. In a gravity-feed steam iron, the steam is generated from a water supply tank suspended above the ironing box. In a steam box iron, the steam is under pressure, and the inadvertent release of the steam

may result in painful steam burns.

Here are some tips to ensure the safe use of irons:

1. Never use an industrial steam box iron until properly trained and given permission to do so.
2. Never set a gravity-feed iron on its back (like a domestic iron); place it on its base plate or rubber heat-resistant pad.
3. Never leave an iron turned on; turn it off when you are done using it.
4. Unplug domestic and gravity feed irons after turning them off.
5. Check to ensure all irons have been turned off and unplugged prior to leaving the area.
6. Wear Teflon-coated gloves when handling hot steamed garments.

## Using Chemicals

Chemicals are often used to alter the appearance of materials used in costume design, such as dyes, stiffening chemicals, glues, and glue removers. The proper use, storage, and/or handling of chemicals can reduce the risk of injury and illness. Controls designed to reduce the risk of injury and illness include proper chemical use and storage; the proper use of personal protective equipment (PPE); and the use of engineering controls, such as ventilation systems and capture hoods.

Safety Data Sheets (SDS) and container labels provide information regarding the use, storage, and handling of chemicals. Know where to find the SDS for the chemicals you are using. Always read the label and directions regarding how to handle a chemical prior to using it. If you do not understand the information provided, ask someone to help you. Always return the chemical to the storage location specified.

Costume enhancement is often achieved through the aerosol application of a variety of chemically-based products such as paint and special finishes. Inhalation of chemical vapors and dusts poses a health hazard, so applications that generate dusts and vapors should be conducted within a ventilation booth that captures these contaminants and exhausts them out of the building.

Be sure to wear the PPE assigned even when conducting chemical applications within a ventilation hood. PPE may include, but not be limited to, splash safety goggles, face shields, respiratory protection, chemically resistant gloves, aprons, coveralls, and dust masks. Use, store, and care for all PPE as instructed.

For more information read the Set Construction chapter, and consult your Campus Hazard Communication Program and the Code of Safe Practices regarding hazard communication.

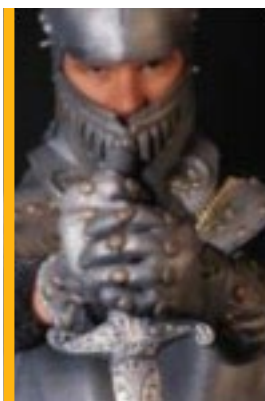
The use of chemicals often results in the generation of hazardous waste. Dispose of waste as directed by the product manufacturer and in accordance with your Campus Hazardous Waste Management Program. You can contact the EH&S Department for more information and guidance regarding hazardous waste management. They will provide guidance regarding:

- Proper storage of the waste until it is collected
- Proper labeling of the waste containers
- Special handling requirements based on the hazard characteristics of the waste

## Wearing Costumes

Performers may be exposed to injury and/or illness while wearing costumes. Trip/fall injuries may result from the costume design, such as stepping on a long trailing hem or tripping over the toes of over-sized shoes. Trip/fall hazards may also be posed by a costume that obstructs the performer's vision. Conduct an assessment in a





low hazard area to determine how the costume moves, how the performers handle the costume, and the performers' ability to see where they are going.

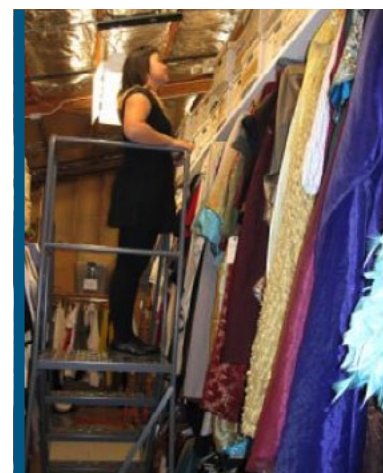
The risks of heat illness may be increased by the costume. Period costumes with corsets and multiple layers trap body heat close to the skin. Costumes that enclose the performer's head trap heat and humidity within the costume making it difficult for the body's cooling mechanisms to function properly. These conditions combined with the hot stage lights can increase the body's internal temperature. Monitoring performers for signs of heat stress and training them to drink plenty of water and avoid caffeine and alcohol is a critical component of reducing the risk of heat-related illnesses caused by costumes.

Flowing costumes and those coated with flammable treatments increase the risk of fire when open flame is included as a stage prop. The use of flammable treatments and the use of open flame should be reviewed with campus safety and health personnel. The risks of costumes catching fire can be reduced through the use of flame-resistant materials in the construction of the costumes or treating the costume with flame-retardant chemicals at the conclusion of the construction of the costume.

## Storing Costumes

Costume storage practices can pose injury and property damage risks. Where and how the costumes are stored may damage fire suppression systems, obstruct exits, increase the fire load in the building, cause falling object hazards, result in falls to other elevations during the storing or retrieval process, or present material handling hazards.

Label the pipes of fire suppression systems with signs like "NEVER HANG ANYTHING FROM THIS PIPE." Similar signs should be posted below fire suppression sprinkler heads that project horizontally from the wall, stating "NEVER HANG ANYTHING ON THE SPRINKLER HEADS." Conduct training to ensure all performers and crew understand all materials should be stored 18 inches below sprinkler heads and a clearance of 36 inches maintained on a horizontal plane out from the sprinkler head in all directions.



Exit aisles should be kept free and clear of obstructions. Aisle widths will often depend on the depth of the storage shelves and the room needed to remove materials from the storage shelves. Where rows of costumes are hung, ensure aisles at least 24-inches wide are maintained. Nothing should be stored on stairs or landings, and an area the width of the doorway and at least six feet deep should be maintained on each side of all storage area doors to ensure a clear exit path from within the room and out of the area.

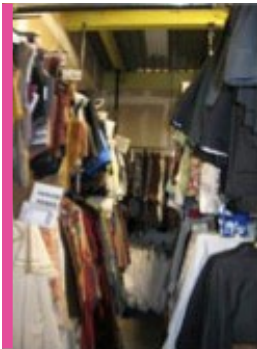
Storage shelves should be equipped with some means of preventing items from falling off the shelves, such as shelf guards, cargo netting, or bungee cords. Stored items should not extend beyond the edge of the shelf. Heavy, awkward, and frequently accessed items should be stored on shelves within the optimum lift zone, which is between the knees and shoulders.

Provide step ladders. The type of step ladder needed will depend on the layout of the storage area. If the area

will accommodate it, use a mobile ladder stand. A mobile ladder stand is a movable, fixed height, self-supporting ladder that has wide flat treads in the form of steps and has a top step enclosed by guardrails. Ladders used should be either a Type I or Type II industrial ladder. Ladders should be inspected routinely to ensure they are in good condition. Ladder training should be conducted at assignment and periodically to facilitate use compliance.

Conduct routine documented inspections to ensure storage rules are followed.

Stored costumes and props made of materials such as draperies, upholstered furniture, or carpets are subject to damage from moths and carpet beetles. Frequently used and cleaned clothing is less likely to be damaged because the damage to the clothing is actually done by the insect larvae that are destroyed during the cleaning process. The larvae are also destroyed during vacuuming of carpets and brushing draperies.



The use of mothballs and crystals that contain naphthalene is not recommended. The naphthalene is toxic to humans as well as the insects. These chemicals are only effective when the larvae are exposed to high concentrations of the chemical, which can only be achieved when the clothing, draperies, furniture, or carpets are stored in air-tight containers. If the decision is made to use these chemicals, they must be handled in accordance with the manufacturer's instructions. In addition, clothing exposed to these chemicals must be cleaned before they are worn. Draperies and carpets exposed to the chemicals must be aired out in well-ventilated areas until the chemical odor is no longer noticeable.

The best means of controlling these pests is good housekeeping. Storage shelves and the floors in storage areas should be cleaned prior to storing the materials and then routinely cleaned thereafter. Carpets and furniture should be routinely vacuumed and draperies routinely brushed.

# Cosmetics – Theatrical Makeup

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**Theatrical makeup enhances the features of the performers so the audience at the back of the house can connect with them, and it brings to life a world of fantasy created the playwright.**



The use of makeup in performing arts can also pose hazards for the performers and makeup artists if not safely selected, applied, removed, or stored. Preservatives, metals, solvents, dyes, waxes, and oils can be found in a variety of makeup and hair products. As an example, formaldehyde is a toxic chemical that can be found in artificial nail products. Chrome, aluminum, bronze, copper, and nickel can be found in eye makeup and powdered makeup applied to the body; these products can cause allergic reactions. Solvents, such as acetone and alcohol, are found in nail products, glue removal

products, and hair spray; these products can cause the skin to dry and crack. Acetone and alcohol based solvent products may also pose fire hazards. Hair dyes may contain chemicals suspected to be human carcinogens. Waxes and oils can cause inflammatory skin reactions, such as acne and rashes.

## Selection

Use only cosmetic products for skin application; never use paint or other non-cosmetic products. The actor Buddy Ebsen was hospitalized after the studio used silver paint on his skin rather than cosmetic products for his role as the Tin Man in the Wizard of Oz. Only use face products for the face, eye products for the eyes, and body products for the body, and use the products only as directed.

Purchase makeup that is commercially manufactured. Ensure the product label lists the product's ingredients. Maintain the informational sheets and Safety Data Sheets (SDS) that accompany the product in its original packaging and make that information available to the performers. Sharing the information can help performers avoid products that contain ingredients to which they know they are allergic. Have each user conduct a small patch test of the product before using it the first time to determine if the user has a reaction to the product. Visit the product manufacturer's website to find out more about the product.

When selecting products that are sprayed, such as hair spray, select products that can be dispensed via a manual pump rather than pressurized gas. Replace spirit gum used as an adhesive with surgical adhesive where possible. When using glitter, only use glitter sized for makeup use.

## Application



### Makeup

Sharing makeup and makeup applicators may result in the transmission of diseases, such as conjunctivitis. A primary key to makeup application safety is keeping it clean. This is true whether the makeup supply is a personal supply or a communal/shared makeup supply; and whether the performer applies his or her own makeup or a makeup artist applies the makeup.

### General Guidelines for Keeping Makeup Clean

1. Wash your hands prior to handling the makeup
2. Ensure the performer's face is washed prior to applying the makeup
3. Never smoke, eat, or drink while handling or applying the makeup
4. Replace makeup regularly
5. Never use old makeup
6. Keep makeup containers sealed when not in use
7. Use clean brushes to apply makeup
8. Never share makeup tools with others
9. Use tap or distilled water to moisten palettes, brushes, or pencils; never use saliva

### Guidelines for Shared Makeup

1. Dispense makeup, whether cream or powder, from larger containers into smaller ones, and label the container to identify the performer using it
2. Slice cream stick makeup and lipstick using a clean palette knife and place the sliced portion in an individual labeled container or on a labeled paper
3. Use a palette knife or wooden craft stick to transfer cream makeup from its original jar into labeled individual containers
4. Never place an applicator back into a shared makeup container after the applicator has been used
5. Use disposable applicators, such as brushes and sponges
6. Ensure makeup artists wash their hands between performers
7. Clean and sanitize makeup pencil sharpeners between users
8. Clean and sanitize re-usable makeup brushes and sponges between users/performers
9. Use clean containers of clear water for each performer's makeup application

### Hair

Hair products can pose skin absorption and inhalation hazards. Read the label prior to using any product and follow the listed safety precautions. Hair styling tools such as curling and flat irons and steam curlers can cause burns. Sharing brushes, combs, hair clips, as well as skullcaps, wigs, and facial hair can transmit lice and nits.

### Hair Product Guidelines

1. Wear gloves when applying hair dyes and lightening products
2. Avoid dispensing large amounts of sprayed products in closed or unventilated areas
3. Use a hairspray face shield to protect the performer's breathing zone and eyes during the application of hair spray



## Hair Styling Tools and Prop Guidelines

1. Use thermo-shields or pads to protect surfaces and performers from contact with hot curling and flat irons
2. Remove combustible and flammable materials from areas where hot irons will be placed
3. Clean and sanitize facial hair pieces, skullcaps, and wigs between users
4. Clean and sanitize combs, hairbrushes, curlers, and other styling tools between users

## Removal of Makeup

The proper removal of the makeup is as important to the performers' health as is the proper application. Avoid the use of solvents for the removal of makeup, nail treatments, as well as latex and spirit gum removal. Never pull spirit gum or latex off, as this action can also remove healthy skin cells. Instead slowly peel off the gum or latex. Promptly remove makeup after each performance using cold cream followed by warm water and an exfoliating cleansing product. Be sure to moisturize after the cleansing with a hypoallergenic moisturizing lotion or cream.



## Storage Practices

Adopt makeup storage practices that reduce the likelihood of shared use and unauthorized access and that also promote cleanliness.

### Makeup

1. Clean and sanitize reusable brushes and sponges and then place them in sealed labeled bags to keep them clean.
2. Ensure all containers are closed.
3. Store the makeup in a secure location to prohibit unauthorized access.
4. Store makeup in a cool dry location.
5. Replace mascara every three months.
6. Replace other makeup every six months.
7. Keep disposable applicators in sealed containers.

### Hair

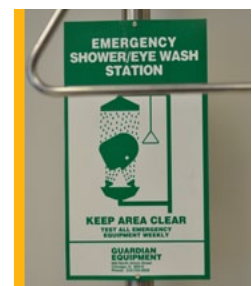
1. Clean and sanitize brushes, combs, and curlers and place them in sealed labeled bags to keep them clean.
2. Inspect the power cords on curling and flat irons, as well as hair dryers, prior to putting them away.
3. Report any damaged styling equipment and take it out of service.

## General Safety Guidelines

Know where the first aid kit and emergency eyewash station are located. If the performer experiences any of the following seek immediate medical attention:

1. Serious skin reaction to any makeup application
2. Symptoms of pink eye/conjunctivitis, such as redness in the white of the eye, swelling of the eyelids, itching or burning of the eyelids, a lot of tearing, eye discharge
3. Scratched cornea

Provide the physician with a copy of the product information sheet for each product the performer was using.



## Chemical Handling

Hair dyes, hair and wig treatments, hair sprays, nail polish, and nail polish remover are just some of the hazardous materials used in performing arts cosmetics. These chemicals should be treated with the same respect as those hazardous materials used in set construction and props. As stated in the Set Construction chapter, follow the specific manufacturer's instructions for each product, as well as the following safety guidelines:

1. Read the product labels and the SDS to help you identify the potential hazards of the product you are using.
2. Know the ventilation requirements of the products you are using.
3. Avoid ingestion of materials by not eating or drinking in your work area, and wash your hands before eating or drinking.
4. Keep containers closed except when you are using them.
5. Control ignition sources in areas where flammable liquids are used.
6. Never puncture aerosol cans or expose them to high heat.
7. Dispose of the product as required by the manufacturer.
8. Know and understand the chemical spill procedures for each of the products you are handling.

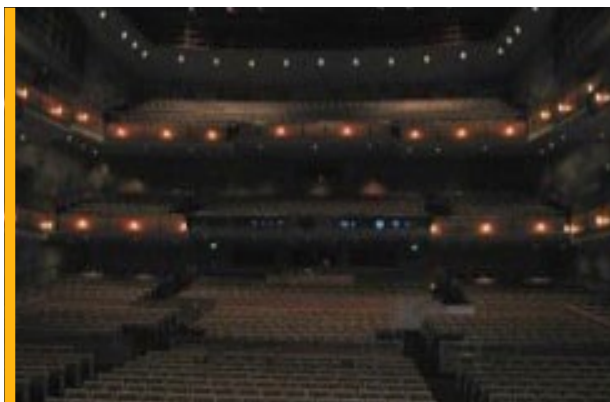
For more information, read the Set Construction chapter and consult your Campus Hazard Communication Program and the Code of Safe Practices regarding hazard communication.

The use of chemicals often results in the generation of hazardous waste. Dispose of waste as directed by the product manufacturer and in accordance with your Campus Hazardous Waste Management Program. You can contact the EH&S Department for more information and guidance regarding hazardous waste management. They will provide guidance regarding:

- Proper storage of the waste until it is collected
- Proper labeling of the waste containers
- Special handling requirements based on the hazard characteristics of the waste

# Front of House

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**Front-of-house personnel have multiple responsibilities that impact audience safety, and these responsibilities begin as soon as the public arrives, continue throughout the performance, and are not finished until the audience members exit the facilities.**

Front of house can also help ensure the safety of the performers during the performance. Fire and life safety duties are first and foremost. Beyond fire and life safety responsibilities, front-of-house personnel are also responsible for signs and notices, food safety including licensing and permit compliance, safety inspections, safe facility conditions, and incident investigations.

## Advance Preparation

Actions must be taken in advance of the performance to ensure the front-of-house staff is ready. Getting ready includes the establishment of an Emergency Evacuation Plan that will be discussed in detail in a later chapter, training the staff, preparing the facilities, and routine maintenance. Front-of-house staff responsibilities often vary from one campus to another. They generally include the lobby, the auditorium, the ticket office, restrooms, and refreshment areas. Some may also include heating, ventilation, and air conditioning; the exterior of the building; gift shops; and cloak rooms.

### Training the Staff

Front-of-house staff includes paid personnel and volunteers involved in managing the front of the house, box office sales, and ushers. Each position has responsibilities that are detailed in the job description, and these responsibilities need to be reviewed during training sessions conducted well in advance of the arrival of patrons.

The training should include:

1. Specific job duties
2. Dress codes
3. House rules
4. Hazard recognition
5. How to deal with difficult and/or unruly patrons
6. Emergency response duties

### Food Safety

Food is often made available during intermission and may vary from concession tables that dispense pre-packaged beverages and retail food items, such as candy and chips, to the serving of hot and cold beverages

from bulk containers and the dispensing of “homemade” food items.

The front-of-house staff must ensure compliance with the specific campus food and beverage rules. In many cases, Campus EH&S offices will be in charge of reviewing and approving plans related to serving food on campus, and a food permit will need to be obtained through your local EH&S office. Contact your Campus EH&S office for assistance well in advance (at least two weeks) of planning to serve food or drinks at any event. Campuses will also have policies related to serving and consuming alcohol at events. Beyond these campus-specific procedures, other considerations that may need to be addressed include:



1. Ensure an adult will oversee the concessions.
2. Verify at least seven days prior to the event the appropriate food license has been obtained from the local authority having jurisdiction. This authority has been granted to most Campus EH&S offices. Check with the EH&S office early in the planning process.
3. Obtain local Campus alcohol permits and ensure all Campus requirements for serving alcohol have been met. You may need to verify whether alcohol permits from the California Department of Beverage Control are required for your event. Work with Campus officials in charge of your local alcohol policy to determine all requirements have been met.
4. Ensure food license and/or alcohol permits, when required, are clearly displayed in the concession area.
5. Ensure the handling of food and beverages for public consumption meets California Department of Health requirements.



### Patron Safety

Ensuring patron safety is essential. Patron safety begins prior to their arrival and continues until their departure from the facility.

1. Ensure the Fire Marshal has approved the seating layout for venues equipped with portable seating
2. Ensure routine documented safety inspections are conducted and appropriate corrective action taken. This inspection should include the exterior of the building and night lighting conditions.
3. Ensure routine inspection and testing of the emergency lighting system, including the testing of the back-up generator when one is present.
4. Check emergency lighting fixtures to ensure they illuminate the pathway without blinding the evacuees.
5. Check all illuminated exit signs to ensure they are functioning properly.
6. Ensure the program has been printed with the appropriate warnings regarding the planned use of:
  - a. Strobe lights
  - b. Laser lights
  - c. Pyrotechnic effects
  - d. Live animals
7. Ensure there is a back-up plan to provide production warnings in case the programs are printed without the required warning information.
8. Ensure arrangements are made with facilities maintenance personnel to clear and clean exterior entrance aprons and sidewalks of slip and trip hazards. Conditions that might create these hazards include wet leaves, twigs, gravel, sand, wet grass clippings and in some locations, snow and ice.
9. Ensure arrangements are made to provide additional entrance mats in case of sudden adverse weather.



## Performer Safety and House Rules

The House Manager must:

1. Ensure the program contains prohibition language regarding:
  - a. The use of flash photography
  - b. Video recording
  - c. Food in the auditorium
  - d. Beverages in the auditorium
2. Make arrangements for extra security if necessary.



## Prior to Each Performance

Although routine safety inspections are made of the facility, the House Manager must ensure the facilities are inspected again prior to the performance and arrival of patrons in order to identify hazards that may have developed since the last routine safety inspection. The House Manager should ensure all hazardous conditions are immediately corrected and, if necessary, cancel the performance and evacuate the building. Use a checklist to document the inspection; this will help to ensure all areas of concern are observed and can also be used to document corrective actions taken.

## Fire and Life Safety

The focus of fire and life safety is the reduction of the possibility of fire and ensuring the ability to safely evacuate patrons in the event of a fire.

### Accessible Exits

1. Ensure aisles, corridors, exit pathways, and exit doors are unobstructed.
2. Ensure aisle widths meet building code and Fire Marshal specifications in venues equipped with portable seating.
3. Ensure aisles and corridors along the exit pathway are not reduced.
4. Ensure no concession or vending tables obstruct access to the exits.
5. Ensure no curtains or decorative hangings obstruct or obscure the view of the exits or access to the exits.
6. Remove any decorations or posters from the surface of exit doors.
7. Ensure there are clear areas on both sides of the exit doors to allow the convergence of evacuees. The clear area on each side of the door must be at least the width of the exit doorway and at least 6-feet deep.
8. Ensure exit doors are unlocked and open with ease.
9. Check the exterior side of all exit doors to ensure the required exterior area is clear.
10. Ensure the immediate removal of any exit constrictions or obstructions.
11. Ensure there is a clear exit path from the building to a safe place of refuge on the exterior side of all exit doors.
12. Remove any mirrors placed near an exit in any manner.
13. Remove any items stored in or under stairways.



### Emergency Lighting and Illuminated Exits Signs

1. Test the emergency lighting system.
2. Inspect the emergency back-up generator test record to ensure the generator can be expected to function properly.
3. Check all illuminated exit signs to ensure they function properly and are unobstructed.

4. Check the aisle lighting to ensure aisle pathways are properly illuminated.



#### **Fire Extinguishers, Fire Alarm Pull Stations, and Fire Hose Stations:**

1. Ensure all fire extinguishers are in place and intact (the seal has not been broken).
2. Ensure all fire extinguisher “charge indicator gauges” are in the green zone of the gauge.
3. Ensure all fire hoses are properly mounted and undamaged.
4. Ensure access to the fire extinguishers, fire alarm pull stations, and fire hose stations, is unobstructed and un-obscured. The clearance vertically must be from the floor to the ceiling and must extend horizontally 36 inches from all sides of the fire extinguisher (except the mounting side).

#### **Patron Awareness**

Some special effects and special features of the performance may pose a hazard for patrons. It is essential the patrons be notified in advance.

1. Ensure signs are posted in the lobby advising patrons of the planned use of:
  - a. Strobe lights
  - b. Laser lights
  - c. Pyrotechnic effects
  - d. Live animals
2. Ensure signs are posted in the lobby advising patrons of the prohibition of:
  - a. The use of flash photography
  - b. Video recording
  - c. Food in the auditorium
  - d. Beverages in the auditorium
3. Ensure informational signs are positioned to ensure patrons see the notice prior to entering the auditorium but not in a manner that obstructs or obscures the exit pathways.

#### **Facility Conditions**

The facilities must be checked for cleanliness and the absence of slip, trip, and fall hazards:

1. Ensure entry rugs are level and do not pose trip/fall hazards.
2. Ensure the lobby floor is dry and will remain dry as the patrons arrive. Provide extra entry mats if necessary
3. Ensure the exterior of the entry way and sidewalks are free of wet leaves, twigs, gravel, sand, wet grass clippings and in some locations, snow and ice.
4. Ensure the restrooms are:
  - a. Clean
  - b. Dry – no water on the floors
  - c. Safe – toilet seats are secure
  - d. Stocked with:
    - i. Soap
    - ii. Hand drying materials or functioning dryer machines
    - iii. Toilet tissue
5. Ensure cleaning tools and materials are immediately accessible should it become necessary to clean up spills or respond to patron illnesses.



## While the Patrons are Present

The front-of-house personnel are responsible for making safety announcements, crowd control, safety rule enforcement, emergency response, and incident investigation. The House Manager must be on premises prior to patron arrival and stay until all patrons have left.

### In an Emergency

1. The House Manager will go to the stage and provide information regarding the nature of the emergency and instruct the audience as to expected actions; i.e., evacuate, shelter in place, etc. The Stage Manager is generally responsible for evacuating the back of the house.
2. The ushers will direct patrons to exits during evacuations and lead them to assembly points specified in the Emergency Response Plan.
3. After the emergency is over, cooperate with EH&S and Risk Management to complete an incident investigation.
4. Venue-specific Emergency Response Plans may vary; check the Emergency Response Plan for your venue to ensure you understand the procedures.



### Crowd Control

1. Take steps to prevent patrons from accessing the stage uninvited.
2. Take steps to control unruly patrons.
3. Enforce house rules regarding the use of:
  - a. Flash photography
  - b. Video recording
  - c. Mobile telephone use
  - d. Food and beverage consumption

### Patron Injury/Illness Response and Investigation

1. Immediately provide first aid for minor injuries using universal precautions to reduce the risk of transmitting bloodborne pathogens. Universal precautions include:
  - a. Allow the injured person to clean, bandage, and/or apply pressure to wounds if he or she is able.
  - b. Wear latex gloves.
  - c. Wear a safety CPR mask when administering CPR.
2. Summon emergency medical services by dialing 9-1-1 for non-minor injuries. Examples of non-minor injuries include:
  - a. Head injuries
  - b. Unconsciousness
  - c. Heart attack or symptoms of heart attack
  - d. Stroke
  - e. Deep wounds
  - f. Not breathing



- g. Broken bones
3. Use the automated external defibrillator (AED) (if one is available) in accordance with the instructions and any training you have received.
4. Notify the person in charge immediately of injuries and illnesses that are not minor.
5. Post personnel along the route from the building entry to the injured person to assist the prompt arrival of emergency medical personnel.
6. Begin the gathering of information for the investigation as soon as the injured or ill person's medical needs are met.
7. Begin incident investigation.
8. Obtain information regarding the injured/ill patron from the patron and/or persons with the patron.
  - a. Name
  - b. Address
  - c. Telephone number
  - d. Medical conditions and/or medications being taken; this information must be provided to emergency medical personnel as soon as possible
9. Obtain information from witnesses:
  - a. Name
  - b. Contact information
  - c. What they saw and/or heard.
10. Document investigation on the appropriate investigation form.
11. Report the incident to the EH&S office and Risk Management Department.

## After the Performance

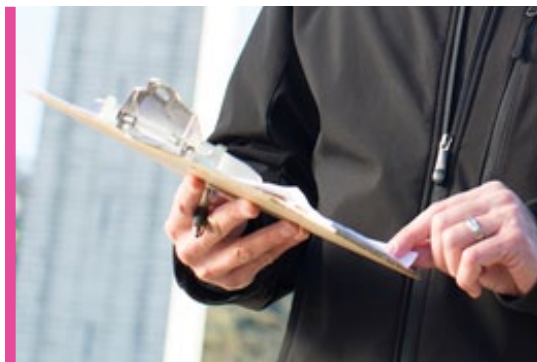
To ensure the safety of the patrons and premises, the House Manager must remain on the premises until all patrons have departed. Additional measures must be taken to ensure the security of the site and must ensure:

1. All patrons have departed.
2. Clean-up operations are initiated.
3. Food and beverages are properly stored and secured.
4. Exit doors are secured.
5. Incident reports are completed and filed.

# Set Deconstruction – Strike

**Set deconstruction is also known as the strike. Sets are deconstructed in order to build up the next scene, but complete deconstruction and removal from the stage of sets, props, costumes, lights, and sound equipment occurs when the show ends its run at the venue.**

Roadshows are deconstructed and packed for transportation and remounting at the next venue. The deconstruction of shows in a production house often involves recycling and reusing as much of the material as possible. The strike is busy, loud, and, to the untrained, confusing. Ensuring everyone’s safety during the strike starts with a plan.



## Make a Plan

The strike plan will address the what, how, when, who, and safety of the deconstruction process. Since there are costs associated with deconstruction, the strike plan should be developed at the design stage of the production, so the costs of the strike can be included in the production’s budget. The strike plan should take into consideration the campus’s sustainability plan when determining what will be salvaged for recycling and reuse and what will go to the landfill. This decision is made early on because there are often extra costs associated with recycling and reuse

that will impact the budget. To eliminate confusion later, the plan should be in writing. Additional checklists for use during the actual strike will facilitate efficient operations and ensure nothing is overlooked.

## What and How

The strike plan includes details regarding what areas will be deconstructed, such as:

Strike Plan Includes	
Stage deck	Wings
Backstage hallways	Orchestra pit
Bridge/catwalks	Tension grid
Booth	Costumes
Dressing rooms and makeup	Foyer/lobby
Classrooms	Lighting
Audio/sound	Auditorium when the venue has portable seating

The strike plan states in what order the deconstruction will occur. This will often depend on the number of crews who can safely complete their work concurrently. Steps of the strike may include:

1. Removal of portable auditorium seating

2. Installation of guardrails or chains and warning signs at the edge of elevated stages
3. Removal of props
4. Removal of electrical fixtures
5. Removal of sound equipment
6. Removal of chairs and music stands from the pit or orchestra area
7. Removal of soft goods, such as stage curtains, screens, shims, fabrics, masking, etc.
8. Dismantling of the sets/scenery
9. Removal of lighting booms
10. Removal of battens
11. Repainting the stage deck



The strike plan defines how deconstructed items will be handled. The plan should identify what will be retained for reuse, what will be recycled through a formal recycling program or vendor, and what will go into the dumpster for landfill disposal. Identify where to obtain the storage containers for the items that will be retained for reuse and where they will be stored once the strike is completed. Identify what arrangements will be made to provide containers going into formal recycling and what arrangements need to be made to schedule the dumpster.



### When

The strike plan stipulates when the strike will occur. The determination for the timing of the strike is influenced by the scheduled use of the venue, the availability of the strike crew, the availability of the scene shop, labor contracts, and safety concerns. Multiple studies have shown that more injuries occur on night shifts and when personnel work extended or unusual hours. Scheduling the strike to occur the morning after the last performance reduces the risk of injury incidents related to fatigue and the inattention associated with fatigue. Often the schedule of an incoming production dictates the strike must begin as soon as the final curtain call is concluded. When this is the case, the proper training and preparation of the strike crew and the provision of rest breaks and healthy refreshments becomes more critical. We will discuss crew safety issues later in this chapter.

### Who

The written strike plan spells out who will be involved in the strike and what responsibilities they are assigned. The strike should be supervised by a trained and qualified person. This may be the set designer, show carpenter, or technical director. The strike supervisor must remain on premises and actively supervise the strike during strike activities. Strike efficiency is increased when several crews are working safely in concert and that requires trained and qualified strike crew leaders to report and take direction from the strike supervisor. Identify who will serve as crew, students and/or paid professionals? Besides the strike crews, determine:

1. Who will install the safe guards for the edge of the stage?
2. Who will be responsible for providing personal protective equipment (PPE):
  - a. Collection
  - b. Dispensing
  - c. Retrieval
3. Who will be responsible for safety oversight and ensuring compliance with safety rules and regulations is maintained?
4. Who will make the arrangements for the packaging, storage, and disposal materials, such as bubble wrap, paper, boxes, and dumpsters?

5. Who will be responsible for making the arrangements for the provision of refreshments?
6. Who will complete the final walk through to ensure the strike is complete?

## Keep It Safe

Advanced planning helps to ensure the safety of the strike crew. Strike safety considerations include:

1. The scheduling of the strike as discussed in the “when” section above
2. Strike crew and leader training
3. The provision of PPE
4. Provision of appropriate tools
5. Reducing distractions
6. Provision of rest periods and refreshments



### Strike Scheduling

We discussed the potential effects of when the strike is scheduled and how that can impact safe operations. When late night, through the night, or overtime is required to complete the strike, extra steps need to be taken to ensure strike crew safety. Conduct documented “night shift and extended shift” safety training for the strike crew well in advance of the strike. Design the training to inform them of the safety issues associated with fatigue and disrupted sleep rhythms associated with night and extended shift work and the steps they can take in advance of the strike to reduce their risk of injury.

### Strike Training

Conduct documented strike training for the crew, crew leaders, and strike supervisor in advance of the strike.

Ensure the training includes:

1. An explanation of the strike plan – including who, what, when, and how
2. Each crew’s assigned tasks – what are they expected to do and when it will occur in the schedule
3. How to handle recycled and waste materials –
  - a. remind them to remove nails and staples from wood or hammer them flat
  - b. tell them where will the materials go
  - c. instruct them to keep routes and access to the exits and the dumpster clear and safe
4. How to safely use the tools assigned for their tasks –
  - a. tell them what tools they will be using
  - b. give instruction regarding how to safely use the tools
  - c. give instruction regarding how to safely clean and store the tools at the completion of the strike
5. PPE requirements –
  - a. tell them what they have to wear
  - b. tell them when they have to wear it
  - c. tell them how to care for their PPE
  - d. tell them how to return or dispose of it at the completion of the strike
6. Basic electrical safety training
7. Prohibited behavior, such as no horseplay, no working under the influence of drugs or alcohol, etc.

Prior to starting the more hazardous deconstruction tasks, conduct a quick safety meeting to review the task steps. An example of such hazardous tasks is the removal of large steel flats that require the use of bull lines, lots of people, and complete concentration.

### Provide PPE

The appropriate use of PPE reduces the risk of injury. The PPE necessary for each crew member will depend on the task they are assigned and the work that is occurring around them. Provide and require the use of:

1. Hard hats – when overhead hazards are present
2. Safety glasses and goggles – when using hand and power tools or there is a risk of flying debris
3. Work gloves – when required to handle materials with abrasive edges
4. Reflective vests – required to increase their visibility
5. Chemically resistant gloves – when hazardous chemicals are used



### Provide the Appropriate Tools

Provide the appropriate tools for the tasks to be completed, and require the crew to use the tools in the manner for which they were designed, for example use a hammer when a hammer is needed rather than a screw driver. Ensure crew members are trained to use the tools they are assigned and understand they should never use a power tool without proper training in its use and limitations.

### Reduce Distractions

Distractions during strike activities increase the risk of injury, just as distracted driving increases the risk of accidents. Strikes are already noisy due to all the activity taking place. It is not unusual to have to shout to be heard. Turn off the music. Prohibit the use of the sound system to project music, and prohibit the use of personal entertainment devices. Distractions can also be caused by unauthorized personnel “visiting” the strike. Limit the strike to authorized personnel. If students must be there to observe the operations, require them to adhere to all safety rules and precautions expected of the crew, and require them to be continuously supervised.



### Provide Rest Periods and Refreshments

It is important to promote strike crew alertness by providing routine rest periods and refreshment breaks. When it comes to refreshments, stay away from sugary and caffeinated foods and beverages. Sugar and caffeine can have an initial short-term energizing effect, but that sugar/caffeine high is followed by a crash. Provide fresh water and vitamin drinks, such as Propel and Gatorade. The fresh water and the replenishing electrolytes of sports drinks help keep the body hydrated. Dehydration causes listlessness, headaches, and feeling tired. Serve snacks that are high in protein and complex carbohydrates. Ensure adequate time for meal breaks when the strike will last more than four hours.

### Post-Strike Review

After each strike it is important to conduct a review of the strike. Ensure the review answers the following questions:

1. What lessons can be learned from the events of the strike?
2. What went well?
  - a. Why?
  - b. How can you ensure you can repeat it?
3. What did not go according to plan?
  - a. Why?
  - b. What needs to be changed?



4. What should be done differently?
  - a. How will you ensure the change occurs?
5. If injuries occurred, even minor ones,
  - a. Why did each injury incident occur?
  - b. What could be done to prevent a recurrence at the next strike?
6. If near miss incidents occurred,
  - a. Why did each incident occur?
  - b. What can be done to prevent a recurrence?
7. What do you need more of:
  - a. PPE?
  - b. Rest periods?
  - c. Refreshments?
  - d. Training?
8. Are there policies or procedures that need to be amended or created?
9. How will you share the information from this meeting to benefit others?

### The Review Team

After you review the list of questions, you may have additional questions to add to the list. In order to answer these questions, who will you need to have at the table? Be sure you include one or more representatives from the EH&S Department and/or the Risk Management Department. Physical Plant may also have important input that would increase the value of the review.



### Fall Protection

Fall hazards discussed in the Set Construction chapter are also present during the strike. It is important to review the fall protection information located in the Set Construction chapter, as well as the various Codes of Safe Practices regarding fall protection.

# Emergency Response and Business Continuity

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**Each campus has an overarching campus Emergency Response Plan and a Business Continuity Plan; however, similar plans that are specific to each performing arts venue are necessary to protect the students, performers, crew members, and patrons.**

In addition to developing site specific plans, training must be conducted for performers, crew, and front-of-house personnel. Assistance in developing the plans and conducting the training can be provided by EH&S, Risk Management, Fire, Police, and Campus Emergency Management personnel.

## Emergency Response and Business Continuity Plans

The overall department and individual emergency response plans will start with the campus Emergency Response Plan. Additional information on emergency response planning can be found at your local campus Emergency Services web site and from your Campus Emergency Manager. These plans will define the procedures for responding to a variety of emergency situations. The Business Continuity Plan will describe the steps to be taken to get the venue up and running again as quickly as possible. Review the campus Emergency Response and Business Continuity Plans to identify department duties and responsibilities. Then develop department and venue-specific emergency response procedures and business continuity procedures. Ensure incident investigation procedures are included in each plan.

## Identify and Assign Duties

Assign duties based on level of responsibility and skill set. Ensure those placed in charge have the authority to carry out their assigned duties. Will what is happening in the building and who is present change who is in charge? Consider building conditions and staff during classes, production preparations, rehearsals, and performances. Ensure emergency response duties are specified in job duty descriptions. Ensure those persons assigned emergency response duties receive initial and on-going training in regard to their duties and the emergency procedures.

Develop site specific plans for each venue that are compliant with and compatible with the campus's overarching Emergency Response Plan. Each plan should address evacuation procedures, shelter-in-place procedures, and the response duties of site personnel. Contact your Campus Emergency Management Unit for assistance.

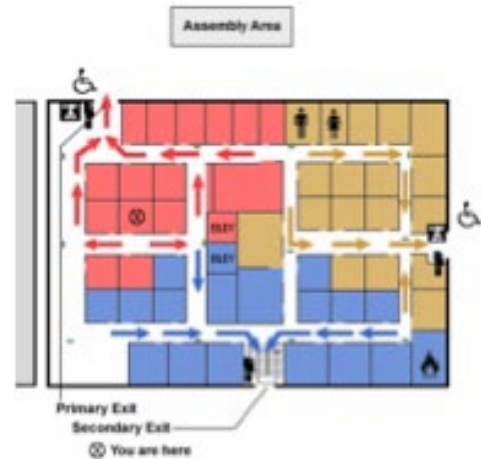
## Emergencies Requiring Evacuation

Some aspects of evacuation planning will apply to all venues, such as:

- **Evacuation Duties** – Front-of-house personnel are responsible for assisting patrons in safely evacuating the venue. Stage management personnel are responsible for assisting performers and crew in safely evacuating the venue. Instructors are responsible for evacuating students.
- **Evacuation Announcement Procedures** – Define how the patrons, performers, and crew will be informed of the need to evacuate, and specify who is responsible for making the announcement when an announcement is necessary.

Other aspects of evacuation planning will be specific to the venue, such as:

1. **Exit Routes** – Ensure site personnel and those assisting patrons to evacuate know:
  - a. The primary and secondary<sup>5</sup> exit routes from all areas of the venue.
  - b. The location of hazardous materials storage areas and that they should evacuate away from these areas. Remember, never store hazardous materials in or near an exit or exit pathway.
  - c. The accessible evacuation routes and the areas of refuge where evacuees unable to exit can shelter in place until assistance can arrive.
2. **Assembly Areas and Sites**<sup>6</sup> – Ensure site personnel and those assisting patrons to evacuate know where to assemble after leaving the building. Ensure the location for each assembly area or site is out of the anticipated path of emergency responders and away from the venue or other structures or conditions that may present a hazard as a result of the event that generated the need to evacuate. As an example, another building would not be an acceptable assembly site in cases of earthquake.
3. **Visible Evacuation Maps** – Ensure evacuation maps are posted and kept visible at all times.



## Shelter-in-Place Emergencies

Some emergency situations may require performers, crew, and patrons to shelter in place, such as severe weather events, power outages, or active shooter on campus situations. Determine how the facilities will be secured and where personnel and patrons will be gathered to shelter them from hazards, such as shattering glass. Ensure items such as water and restroom facilities can be safely accessed within or from the sheltering place.

## Fire Emergencies

In case of fire,

1. Immediately notify campus safety by dialing 9-1-1. Report the exact location of the fire.
2. Activate the fire alarm.
3. Evacuate the building. Only Campus Fire Department personnel are trained, equipped, and required to fight fires.
4. Activate the fire curtain. In some cases, this involves breaking the glass cover and activating the curtain

<sup>5</sup> Secondary evacuation routes are necessary in case the emergency event obstructs access to the primary exit.

<sup>6</sup> An assembly area is an area located outside of the building. An assembly site is a nearby building that is safe to use as a shelter from the weather and other elements.

release to drop the fire curtain.

5. Close doors after each area/room is evacuated.
6. Go immediately to the assigned assembly area.
7. Wait in the assembly area until further directions are given.
8. Never re-enter the building until permitted to do so by Fire Department personnel.
9. After each fire incident is controlled, investigate the incident to determine the causes of the incident and the results of the response actions, and take corrective action to prevent a recurrence of the incident and improve incident responses.



An attempt may be made to extinguish a fire ONLY if:

1. You have been trained in the proper use of a fire extinguisher.
2. It is a small incipient fire involving simple combustibles, such as wood or paper. Never attempt to extinguish hazardous materials, electronics, or equipment.
3. The fire is extinguished within 10 seconds; after that you must evacuate the building.

## Chemical Spill Emergencies

All personnel who work with hazardous chemicals or work in an area where hazardous chemicals are used or stored need to be informed of what steps to take in case of a chemical spill. Not all chemical spills require a call-out of the hazmat team. Contact your campus EH&S personnel to determine the specific steps to take for chemical spills on your campus. Work with campus EH&S personnel to determine if performing arts personnel can be trained and authorized to clean up some small spills. Ensure spill containment materials are properly maintained within the shops and areas where hazardous chemicals are used and/or stored.

## Chemical Exposure Emergencies

Chemical exposure may occur through contact with skin or eyes, inhalation, or ingestion. Each type of exposure requires a different response. After the exposure incident is controlled, investigate the exposure incident to determine the causes of the incident and the results of the response, and take corrective action to prevent a recurrence.



### Contact with Eyes

1. Immediately flush the eyes using the emergency eyewash station.
2. Never wait to remove contact lenses.
3. Keep your eyes in contact with the running water for at least 15 minutes.
4. Seek immediate medical attention.
5. Provide a copy of the chemical's Safety Data Sheet (SDS) to medical personnel.

### Contact with Skin

1. Immediately flush your skin in running water.
2. Remove jewelry and contaminated clothing while you are rinsing.
3. Seek medical attention for chemical burns.
4. Provide a copy of the chemical's SDS to medical personnel.

### Inhalation

1. Immediately leave the room and seek fresh air.
2. Immediately remove anyone overcome by vapors to fresh air.

3. Leave the door open as you exit to ventilate the room.
4. Provide first aid to persons overcome and call 9-1-1 for medical assistance if the person has lost consciousness.
5. Seek medical attention if your symptoms do not subside.
6. Provide a copy of the chemical's SDS to medical personnel.

### Ingestion

1. Reduce the risk of ingestion by refraining from eating, drinking, preparing, or serving food or beverages in areas where chemicals are used or stored.
2. Seek medical attention for ingestion incidents.
3. Provide a copy of the chemical's SDS to medical personnel.

## Power Outage Emergencies

Trip and fall incidents increase in a power outage due to people trying to move around in the dark. In facilities equipped with backup generators, the lights are back on within minutes. For those facilities that are not equipped with a backup generator or if the generator does not function properly:

1. Stay put if there is no imminent danger.
2. Wait for direction from front-of-house or stage management personnel.
3. Call Facilities Services to report the outage.
4. Proceed with care to an area lit with emergency lighting if the emergency generator does not activate after five minutes.
5. Use your cell phone as a light source if you do not have access to a flashlight.
6. Turn off all computer, equipment, appliances, and lights to reduce the risk of damage from a power surge when the power is restored.

## Medical Emergencies

1. Immediately provide first aid for minor injuries using universal precautions to reduce the risk of transmitting bloodborne pathogens. Universal precautions include:
  - a. Allow the injured person to clean, bandage, and/or apply pressure to wounds if he or she is able.
  - b. Wear latex gloves.
  - c. Wear safety a CPR mask when administering CPR.
  - d. Wash your hands with soap and water after removing the gloves.
2. Summon emergency medical services by dialing 9-1-1 for serious injuries. Examples of serious injuries include:
  - a. Head injuries
  - b. Unconsciousness
  - c. Heart attack or symptoms of heart attack
  - d. Stroke
  - e. Deep wounds
  - f. Not breathing
  - g. Broken bones
3. Use the automated external defibrillator (AED) (if one is available) in accordance with the instructions and any training you have received.



4. Notify the person in charge immediately for injuries and illnesses that are not minor. Post personnel along the route from the building entry to the injured person to assist the prompt arrival of emergency medical personnel.
5. Begin the gathering of information for the investigation as soon as the injured or ill person's medical needs are met.
6. Report the incident to the EH&S office and Risk Management Department.

## Training

Conduct documented emergency response training for all new crew members, performers (including visiting performers), students, and front-of-house personnel, including volunteers and temporary employees. Ensure all personnel understand their responsibilities and duties in each type of anticipated emergency. Provide front-of-house and backstage personnel with first aid, CPR, and AED training in addition to the other emergency response duties. Conduct training at least annually for all permanent personnel. Conduct training whenever the procedures change.

## Practice Drills

Conduct documented emergency drills. These can be conducted in various scales from table top to campus-wide events. Invite students to be the audience and practice evacuations during dress rehearsals. Track and record the time it takes to evacuate the building or respond to an emergency. Conduct reviews of drills to identify what improvements are needed.

Remember there are campus resources available to assist you. Contact EH&S, Risk Management, Fire, Police, Campus Emergency Management and Business Continuity Planners with your questions and requests for guidance.

## Everyday Preparation

Being prepared to respond to emergency situations takes preparation as stated in the prior sections, but it also takes vigilance each day to ensure basic fire and life safety is maintained. As you go about your everyday activities and especially during times of chaotic activity:

1. Ensure fire exits, aisles, and exit pathways are clear and accessible.
2. Ensure exit doors are clear of obstructions on both sides of the door.
3. Report to the Physical Plant Department any exit signs or emergency lights that are not functioning.
4. Ensure fire extinguishers are properly hung (extinguishers greater than 40 pounds in weight may be mounted on a cart), the seal is intact, and the indicator gauges are in the green zone. Immediately report any fire extinguishers that do not meet these criteria to the Physical Plant Department.
5. Ensure all fire-fighting equipment is clear of obstructions and accessible; this equipment includes fire extinguishers, fire hose stations, fire pull stations, fire suppression sprinkler heads, and fire sprinkler risers.
6. Ensure flammable and combustible materials are properly stored and protected from ignition sources.
7. Ensure compressed gases are secured to prevent them from falling or being knocked over.
8. Ensure electrical panels are clear of obstructions and accessible.
9. Ensure the doors of electrical panels are closed.
10. Ensure extension cords are not used in place of permanent wiring
11. Take immediate action to correct any non-compliant conditions.

# Theater Maintenance

**Theater maintenance can easily be overlooked in the excitement of production preparation and performances. Theater maintenance is essential for providing a safe and healthful entertainment and working environment for staff, students, and patrons.**

Theater maintenance involves personnel from a variety of departments who are involved in the inspection, repair, and scheduled maintenance of the campus's theater facilities.



## Awareness through Inspection

Maintenance starts with being aware of what needs to be repaired. That is best achieved through routine inspections. Effective inspections involve more than simply making observations and checking them off on an inspection sheet. Effective inspections involve a cycle of steps that move from the initial observations through a variety of steps to arrive at verification of corrective action effectiveness. The first step in the cycle is making the observations and taking immediate steps to correct conditions and behaviors where possible. The evaluation step is next. Sometimes the corrective actions appear to be simple and immediate, such as removing a box from in front of an exit door. However, if the exit door is found obstructed again

after a later inspection, there is a deeper problem that needs to be evaluated for root cause and a plan established for effective corrective action. Other observations reveal issues that require planned/scheduled corrective actions that may also require additional budget development. Once the plan is established, the corrective measures need to be implemented. Not all corrective measures are effective, so it is necessary to review the corrective action to verify it had the desired effect. If the outcome was not the one that was anticipated, re-evaluate, develop, and implement a new corrective action plan and review and evaluate again until the desired state is achieved. In dynamic environments hazards can develop and evolve quickly, so it is necessary to be vigilant through on-going routine inspections that check prior conditions for effective correction and identify new unsafe conditions and behaviors. Theaters and stagecraft definitely present dynamic environments. In these ever-changing environments hazardous conditions can develop rapidly through normal wear and tear and through the actions of those working within the environment. Early recognition and correction is essential to providing appropriate maintenance, as well as a safe and healthful environment.

Setting up an effective inspection cycle requires identifying what needs to be inspected; who is responsible for the various inspection steps; when will inspections occur; and how will the inspections be managed, including the documentation, initiation of corrective actions, and monitoring corrective actions.

### What Needs To Be Inspected

Identifying what needs to be inspected will help clarify who needs to complete each of the designated inspections. A number of these inspections were discussed in prior chapters, so some of this has been touched on earlier.

Let's start with the exterior of the building. The exterior includes:

1. The loading dock
2. The dumpster area
3. The sidewalks and stairways
4. The exterior lighting
5. The landscaping
6. The parking lot
7. The general condition and appearance



Inside the building there are a multitude of areas, fire and life safety issues, tools, equipment, and machinery that require routine inspection. This list is not all-inclusive, but it gives you an idea of what needs to be inspected.

Areas:			
Lobby/foyer	Backstage	Elevators	Rigging
Offices	Balcony	Fly floors	Scene dock
Concession areas	Catwalks/bridges	Grid	Scene shop
Stairways	Control room	Lift	Stage
Restrooms	Costume shop	Prop shop	Undercroft
Auditorium	Dressing rooms	Prop and costume storage areas	

Fire & Life Safety Issues:	
Accessible exit paths	Emergency lighting and signs
Accessible exit doors	Accessible fire alarm pull stations
Backup generators	

Tools/Equipment/Machinery:	
Aerial lifts	Ventilation hoods/spray booths
Forklifts	Welding equipment
Heating, air conditioning and ventilation (HVAC) systems	Sewing machines
Hand tools	Steam irons
Hoists	Sound equipment
Paint frame winch	Lighting systems
Power tools	Personal protective equipment
Power saws	

Supplies:	
Lumber	Dyes
Steel	Makeup
Welding rod	Paint and related chemicals



### Emergency Response Equipment:

Fire response:

- Fire extinguishers
- Fire hose stations
- Fire suppression system risers

Emergency eyewash stations

Emergency deluge showers

Chemical spill kits

First aid kits

Fire blankets

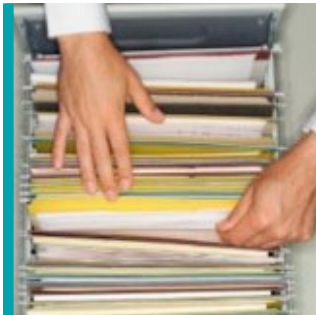
AED

## Who Conducts Inspections

The “who” is most often dictated by what is being inspected. A wide-range of people may conduct inspections, such as campus personnel (staff and students), outside experts, and regulatory agencies. In-house personnel could include campus personnel from the Theater & Performing Arts Department(s), Physical Plant, Fire Department, Risk Management Department, and EH&S Department. The selection of in-house inspectors will depend on their training and area of expertise. Outside experts are generally called in for those inspections requiring unique expertise, because regulatory requirements dictate the use of an outside source, or in response to a campus request. Regulatory agency inspections may be conducted by Cal-OSHA compliance officers (employee safety and health), Department of Industrial Relations (elevators), and the State Fire Marshall (fire and life safety).



Each campus will determine who will complete the various in-house inspections. In addition, a decision needs to be made regarding who will make the arrangements for the outsourced inspections. Examples of outsourced annual inspections include, but are not limited to, fire extinguishers, elevators, ventilation hoods/spray booths, and designated rigging system components.



Additional “who” questions to answer are:

1. Who will develop the customized inspection checklists?
2. Who will receive and store the inspection reports?
3. Who will track/record that the inspections were completed?
4. Who will track/record the corrective actions?
5. Who will have overall responsibility to ensure corrective actions are completed?
6. Who is responsible for paying for and/or budgeting for the necessary corrective actions?

Even if corrective measures must be completed by another department, such as Physical Plant, or outsourced, it is important the Performing Arts personnel monitor and track the status of the corrective actions needed. Inspection reports must be maintained in a manner that permits the quick retrieval of any report requested by regulators and/or other authorized personnel.

## How Will Inspections Be Managed

The “who” questions in the prior section tie into “how” issues, such as how often will inspections be scheduled, how will they be documented, how will they be monitored, and how will those assigned to complete in-house inspections be trained to recognize unsafe conditions and unsafe behaviors.

Cal-OSHA requires routine inspections of all work areas, and in-house personnel generally conduct these routine inspections. “Routine” is dictated by the dynamics of the environment. In areas where things are in continuous motion, the need for frequent inspections increases. Cal-OSHA requires some inspections be conducted at the start of each shift, such as aerial lifts and forklifts. Other inspections are conducted by outside experts. Inspections conducted by experts or competent persons are generally less frequent, such as the annual fire extinguisher, elevator, and rigging inspections.

Inspections should be documented to identify what hazards were identified and what steps were taken to initiate

correction. Provide customized inspection checklists to guide the inspector to check all areas and items of concern within his or her assigned area. Require the inspectors to document both safe and unsafe conditions and what corrective actions were taken for unsafe conditions.

Not all unsafe conditions or unsafe behaviors can be corrected immediately, so a corrective action log is needed to track the outstanding corrective actions. That does not mean unsafe conditions should be allowed to continue to exist; take temporary corrective actions to eliminate the hazard. That may mean putting up barriers or taking unsafe equipment out of use. Immediately counsel personnel exhibiting unsafe behavior, and find out the cause(s) of their behavior. Permanent corrective action may require policy development and training at a later date.

## Routine Maintenance

Routine maintenance includes those activities that keep the facilities clean and sanitary. Safety precautions must be taken to reduce the risk of injury to those completing the cleaning tasks and persons in the areas being cleaned. Here are some safety tips:

1. Schedule floor maintenance, including simple cleaning, during the hours when the fewest people will be present.
2. Post portable signs warning personnel the floors are wet and/or to identify areas being cleaned; post warning signs regardless of the cause of the wetness – mopping or carpet cleaning.
3. Mop in front of only one elevator at a time; allow the floor to dry prior to mopping in front of the alternate elevator.
4. Keep the labels on cleaning materials in place and legible.
5. Label all secondary containers with the chemical name and primary warning listed on the original container.
6. Block the entry of restrooms with the service cart to prevent people from entering when custodial personnel are working.
7. Select less hazardous cleaning materials where possible.
8. Provide the appropriate PPE to cleaning personnel.
9. Conduct fall hazard awareness training for custodial personnel assigned to clean elevated seating areas.
10. Emergency eyewash stations and deluge showers must be inspected and operated to clear the water lines on a monthly basis. Typically this is conducted by Physical Plant. If the shop has been shut down for more than 30 days, contact Physical Plant to ensure the eyewash stations and deluge showers are inspected and flushed prior to re-starting the use of the shops. Maintain a record of the inspections.



## Scheduled Maintenance

Scheduled maintenance is also known as preventative maintenance. Your personal vehicle needs scheduled maintenance, such as oil changes to prevent damage to the engine. Much like your personal vehicle, tools, machines, equipment, and production systems need scheduled maintenance. Scheduled maintenance is generally coupled with an inspection to identify other repair needs. Some types of scheduled maintenance will be performed by Performing Arts Department personnel, some will be performed by EH&S or Physical Plant, and some will be performed by outside contracted personnel. It is critical for the Performing Arts Department to know what needs to be inspected and serviced, who will perform the task, and when that task needs to be completed. Much like a mechanic finishing the oil change on your vehicle, you are still the one who has to schedule the maintenance and ensure it gets done. Examples of scheduled maintenance that must be managed include, but are not limited to:

1. **Ventilation/Spray Booth Hoods** – Cal-OSHA requires the hood to be tested after its initial installation, after alternation or repairs, and at least annually. Contact the EH&S Department for assistance in arranging these tests. Maintain records of the tests, as required by Cal-OSHA, for at least five years. Work with Physical Plant to determine how the regular replacement or cleaning of the filters will be accomplished. The proper maintenance of the filters is essential to prevent significant reduction in airflow. Cleaning and replacement instructions are located in the owner’s manual. Maintain a log to record filter changes and maintenance activities.
2. **Heating Ventilation and Air Conditioning (HVAC)** – Filters must be replaced or cleaned regularly to prevent significant reduction in airflow. This task is generally the responsibility of Physical Plant. A log must be maintained that records filter changes and maintenance activities. Work with Physical Plant to ensure the manufacturer’s owner’s manual regarding scheduled maintenance is followed.
3. **Back-up Generators** – This equipment must be tested at least monthly; this test is typically conducted by Physical Plant personnel. The generators must be serviced annually by qualified personnel; work with Physical Plant to ensure the annual inspection is completed. Follow the manufacturer’s guidelines for scheduled maintenance.
4. **Stage Curtains** – The stage curtains require routine frequent inspections and periodic inspections by qualified outside personnel. After each performance, inspect the curtains for tears, dirt, and other damage. Repair tears and holes immediately using pins or sewing the fabric; never use tape. Semi-annually, clean the curtains either by brushing them with a medium soft bristled brush or by vacuuming with an industrial vacuum. Start at the top front of the curtain, working left to right or right to left, and then down the curtain. Repeat the procedure on the back of the curtain. If the material is not constructed of inherently flame retardant material, the curtains must be inspected and retreated by a company certified by the state to do so. Flame retardant retreatment must be completed after the curtains are washed or dry cleaned. They must also be retreated every two to five years; check with your local Fire Marshal who has jurisdiction regarding treatment frequency. Replace the draperies when the fabric begins to tear easily, starts to rip free from its heading, or begins to fray on its own.
5. **Counterweight Fly System** – Complete annual fly system inspection and servicing by competent Performing Arts personnel. Arrange for an inspection by an outside expert at least every three to five years. Maintain records of all inspection and servicing activities.
6. **Tension Grid** – Schedule periodic inspections of the tension grid with outside contracted experts in accordance with the manufacturer’s instructions or at least every three years. Remember the outside expert inspections are in addition to routine inspections conducted by Performing Arts personnel. Maintain records of all inspections and service activities.
7. **Forklifts and Aerial Lifts** – Follow the owner’s manual specifications for the maintenance schedule. Some maintenance may be completed by campus personnel and other work will be completed by outside contracted personnel. In addition to the scheduled maintenance, ensure daily inspections are completed prior to the use of the forklifts or aerial lifts.
8. **Elevators** – Contact Physical Plant to determine how to ensure the annual inspection of the elevators is scheduled with the California Department of Industrial Relations. Post the current inspection certificate in each elevator.
9. **Scene Shop Power Tools** – Follow the maintenance schedule defined for these items in each owner’s manual. Most often this can be completed by trained Performing Arts personnel, while some work should be completed by outside contracted services.



10. **Costume Shop Steam Irons and Sewing Machines** – Follow the maintenance schedule detailed in the owner’s manual for each machine. Depending on the equipment, maintenance may be completed by Performing Arts personnel or outside contracted services.
11. **Vector Control**<sup>4</sup> – Coordinate periodic vector inspections and servicing through the Physical Plant Department.
12. **Asbestos** – Your facilities may contain asbestos in a wide variety of building materials and equipment components. If the facility was constructed prior to 1982, asbestos may very well be present in thermal system insulation (pipe insulation, duct wrap, etc.), acoustical materials (“popcorn” ceilings), sprayed on materials (fire proofing, etc.), electrical lighting insulation, the fire curtain, and the joint compound of wall board. Even if the facility was built after 1982, it might contain asbestos building materials. Contact the EH&S Department for assistance in regard to inspecting and maintaining any areas/items that may contain asbestos. If you note a suspect asbestos building material listed above is damaged, contact EH&S as soon as possible.



The EH&S, Risk Management, and Physical Plant Departments can provide assistance in developing your Performing Arts Inspection and Maintenance Program.

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<sup>4</sup> Methods used to control pests of all types: mammals, birds, insects, and arthropods.

# Performing Arts Safety Inspection Checklists

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The ensuing pages contain the following safety inspection checklists:

- **General Safety Inspection Checklist**
- **Front-of-House Inspection Checklist**
- **Shop and Workroom Inspection Checklist**
- **Storage Areas Inspection Checklist**
- **Tension Grid and Catwalk Inspection Checklist**



# UC Performing Arts General Safety Inspection Checklist

Location: \_\_\_\_\_ Area: \_\_\_\_\_

Inspected by: \_\_\_\_\_ Date: \_\_\_\_\_

*Quarterly inspections are recommended. Annual inspections are required. Document the inspections using this checklist. Mark potential hazards according to your judgment. Check all items that apply, and make comments when warranted. Place an “X” in the appropriate box to indicate the item is compliant/safe (Yes), non-compliant/hazardous (No), does not apply to the area (NA).*

Fire Prevention, Emergency Exits, Emergency Response		Yes	No	N/A	Corrective Action/Date Completed
1	Emergency phone numbers (including EH&S injury hotline) are posted near a phone.				
2	Fire doors are unlocked and kept closed at all times.				
3	Emergency exit doors are visible and free of obstructions on both sides of the doors.				
4	Exits are properly marked and illuminated.				
5	Fire extinguishers are mounted, accessible, fully-charged and serviced within the last 12-months.				
6	Fire extinguishers, alarm pulls, sprinkler risers, and sprinklers heads are free of obstructions.				
7	Intercom or emergency communication equipment is operational.				
8	Occupancy limits are posted near the main exit of large rooms and assembly areas.				
9	Evacuation maps are posted where required.				
10	First aid kits are fully supplied and sanitary.				
11	Flammable and combustible materials are stored away from ignition sources.				
12	Space heaters are absent.				
Storage, and Hanging Objects		Yes	No	N/A	Corrective Action/Date Completed
13	Storage shelves are not overloaded.				
14	Bookcases, storage cabinets, and file cabinets are secured from tipping.				
15	File drawers are closed when not in use.				
16	Materials are stored to minimize unnecessary climbing, reaching, and bending.				
17	No storage is within 18” of sprinkler heads (24” from ceiling when no sprinklers).				

**UC Performing Arts - General Safety Inspection Checklist (continued)**

<b>Electrical Hazards</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
18	Cords and plugs are in good condition; no exposed internal wires or taped wires.				
19	Extension cords are only used temporarily.				
20	No multi-extension cord or extension cord to surge device usage.				
21	Outlets and switches cover plates are present.				
22	Breakers and fuse switches are identified.				
23	Electrical panels are free of obstructions have a clearance of 30" to each side and a clearance of 36" in front.				
<b>Walking Surfaces, Stairways, Ramps and Corridors</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
24	Building entrances, aisles, and work areas are free of trip and fall hazards.				
25	Entrance mats are in place, and extended mats are used during wet weather.				
26	No tripping hazards present; walkways are clear of all materials, cords, wires, paper, and equipment.				
27	Carpets and rugs are secure and in good condition.				
28	Floors are clean, dry, and free slippery materials.				
29	Stairways, ramps, and corridors are illuminated.				
30	Stairways, ramps, and corridors are clear and free of stored materials.				
31	Stair treads are in good condition.				
32	Ramps have non-slip surfaces.				
33	Handrails and guardrails are present where required and are in good condition.				
<b>General Safety and Housekeeping</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
34	Work tables, desks, and chairs are in good condition.				
35	Step stools and ladders are available to facilitate reaching items stored overhead.				
36	Sharp and pointed tools are shielded to prevention accidental contact.				
37	Good housekeeping practices are in place.				
38	Restrooms are clean, and the fixtures are secure.				



**UC Performing Arts - General Safety Inspection Checklist (continued)**

<b>General Safety and Housekeeping</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
39	Safety data sheets are accessible.				
40	Primary and secondary chemical containers are labeled to identify the contents and specific hazard.				
<b>Other</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
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# UC Performing Arts–Front of the House Safety Inspection Checklist

Location: \_\_\_\_\_ Area: \_\_\_\_\_

Inspected by: \_\_\_\_\_ Date: \_\_\_\_\_

*Quarterly inspections are recommended. Annual inspections are required. Document the inspections using this checklist. Mark potential hazards according to your judgment. Check all items that apply, and make comments when warranted. Place an “X” in the appropriate box to indicate the item is compliant/safe (Yes), non-compliant/hazardous (No), does not apply to the area (NA).*

Fire Prevention, Emergency Exits, Emergency Response		Yes	No	N/A	Corrective Action/Date Completed
1	Emergency phone numbers (including EH&S injury hotline) are posted near a phone.				
2	Fire doors are unlocked and kept closed at all times.				
3	Emergency exit doors are visible and free of obstructions on both sides of the doors.				
4	Exits are properly marked and illuminated.				
5	Fire extinguishers are mounted, accessible, fully-charged and serviced within the last 12-months.				
6	Fire extinguishers, alarm pulls, sprinkler risers, and sprinklers heads are free of obstructions.				
7	Intercom or emergency communication equipment is operational.				
8	Occupancy limits are posted near the main exit of large rooms and assembly areas.				
9	Evacuation maps are posted.				
10	First aid kits are fully supplied and sanitary				
11	Flammable and combustible materials are stored away from ignition sources.				
12	Space heaters are absent.				
13	Aisle widths in venues without permanent seating are maintained in accordance with fire department requirements.				
Electrical Hazards		Yes	No	N/A	Corrective Action/Date Completed
14	Cords and plugs are in good condition; no exposed internal wires or taped wires.				
15	Extension cords are only used temporarily.				
16	No multi-extension cord or extension cord to surge device usage.				
17	Outlets and switches cover plates are present.				

**UC Performing Arts - Front of the House Safety Inspection Checklist (continued)**

<b>Electrical Hazards</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
18	Breakers and fuse switches are identified.				
19	Ground fault circuit interrupters are in use in wet areas.				
20	Electrical panels are free of obstructions have a clearance of 30" to each side and a clearance of 36" in front.				
<b>Walking Surfaces, Stairways, Ramps, and Corridors</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
21	Building entrances, aisles, and work areas are free of trip and fall hazards.				
22	Entrance mats are in place, and extended mats are used during wet weather.				
23	No tripping hazards present. Walkways are clear of all materials, cords, wires, paper, and equipment.				
24	Carpets and rugs are secure and in good condition.				
25	Floors are clean, dry, and free slippery materials.				
26	Stairways, ramps, and corridors are illuminated.				
27	Stairways, ramps, and corridors are clear and free of stored materials.				
28	Stair treads are in good condition.				
29	Ramps have non-slip surfaces.				
30	Handrails and guardrails are present where required and are in good condition.				
31	Aisle lights are functioning properly.				
<b>Food Service and Storage Areas</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
32	Food and beverage service permits are properly displayed.				
33	Food, beverages, and service equipment is stored away from cleaning products.				
34	Refrigeration units are set no higher than 45°.				
35	Freezer units are set below 32°.				
36	Signs are posted in adjacent restrooms reminding service personnel to wash their hands.				
37	Primary and secondary chemical containers are labeled to identify the contents and specific hazard.				

**UC Performing Arts - Front of the House Safety Inspection Checklist (continued)**

<b>General Storage</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
38	Storage shelves are not overloaded.				
39	Bookcases, storage cabinets, and file cabinets are secured from tipping.				
40	File drawers are closed when not in use.				
41	Materials are stored to minimize unnecessary climbing, reaching, and bending.				
42	No storage is within 18" of sprinkler heads (24" from ceiling when no sprinklers).				
<b>Other</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
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# UC Performing Arts–Shop and Workroom Safety Inspection Checklist

Location: \_\_\_\_\_ Area: \_\_\_\_\_

Inspected by: \_\_\_\_\_ Date: \_\_\_\_\_

Quarterly inspections are recommended. Annual inspections are required. Document the inspections using this checklist. Mark potential hazards according to your judgment. Check all items that apply, and make comments when warranted. Place an “X” in the appropriate box to indicate the item is compliant/safe (Yes), non-compliant/hazardous (No), does not apply to the area (NA).

Fire Prevention, Emergency Exits, Emergency Response		Yes	No	N/A	Corrective Action/Date Completed
1	Emergency phone numbers (including EH&S injury hotline) are posted near a phone.				
2	Exit doors are visible and free of obstructions on both sides of the doors.				
3	Exits are properly marked and illuminated.				
4	Fire extinguishers are mounted, accessible, fully-charged and serviced within the last 12-months.				
5	Fire extinguishers, alarm pulls, sprinkler risers, and sprinklers heads are free of obstructions.				
6	Intercom or emergency communication equipment is operational.				
7	Evacuation maps are posted.				
8	Eyewash/shower stations are accessible, operational and properly maintained.				
9	First aid kits are fully supplied and sanitary.				
10	Flammable and combustible materials are stored away from ignition sources.				
11	Sawdust collection system is inspected and emptied regularly.				
12	Space heaters are absent.				
Tools & Machines		Yes	No	N/A	Corrective Action/Date Completed
13	Sharp and pointed tools are shielded to prevent accidental contact.				
14	All machine guards are in place to prevent contact with point of operation or in-running nip point.				
15	Grinding wheel guards are in place and adjusted properly (tool/work rest 1/8 inch, tongue guard 1/4 inch; flanges in place and properly adjusted).				
16	Only Type I and Type II rated ladders are utilized and labels are in place.				

**UC Performing Arts - Shop and Workroom Safety Inspection Checklist (continued)**

<b>Tools &amp; Machines</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
17	Tools and equipment are in good condition.				
18	Operating permits for all air compressors are current and posted.				
<b>Hazardous Materials</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
19	Safety Data Sheets for the chemicals in use are accessible to personnel.				
20	Primary and secondary chemical containers are labeled to identify the contents and specific hazard warnings.				
21	Flammable and combustible materials are stored in NFPA-approved containers/ cabinets.				
22	Spill response kits are available in hazardous and industrial material storage areas.				
23	No noticeable leaks or spills are present.				
24	Waste containers are closed and properly labeled regarding waste and accumulation dates.				
25	Work areas where chemicals are present are free of open beverages and food.				
26	Ventilation systems are in use for welding, spraying, and dry powder dispensing operations.				
27	NFPA Hazardous Materials Diamond signs are posted on the exterior of the building where hazardous materials are used or stored, and the signs display the appropriate hazard ratings.				
<b>Personal Protective Equipment (PPE)</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
28	Personnel are wearing appropriate PPE for tasks being completed (gloves, clothing, face shield, etc.).				
29	Eye protection is available (glasses, goggles) and worn when needed.				
30	Hearing protection is provided (ear plugs, ear muffs) and worn appropriately when needed.				
31	Signs warning employees to wear PPE are posted.				
<b>Electrical Hazards</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
32	Power cords, extension cords, and plugs are in good condition; no exposed internal wires or taped wires.				
33	Extension cords are only used temporarily.				

**UC Performing Arts - Shop and Workroom Safety Inspection Checklist (continued)**

<b>Electrical Hazards</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
34	No multi-extension cord or extension cord to surge device usage.				
35	Outlets and switches cover plates are present.				
36	Electrical panels are free of obstructions have a clearance of 30" to each side and a clearance of 36" in front.				
<b>Welding Operations</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
37	Compressed gas cylinders are secured in an upright position with chains or straps.				
38	Welding ventilation systems are operational and clean and filters regularly changed				
39	Welding curtains are available and used when appropriate.				
40	Welding rod holders are empty and properly stored when not in active use.				
<b>General Safety and Housekeeping</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
41	Work tables, desks, and chairs are in good condition.				
42	Step stools and ladders are available to facilitate reaching items stored overhead.				
43	Shops are neat, clean, and orderly.				
44	Aisles and work areas are free of trip and fall hazards.				
45	Floors are clean, dry, and free slippery materials.				
46	Shops and workrooms are free of apparent hazards and safety concerns.				
<b>Walking Surfaces, Stairways, and Ramps</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
47	Entrance mats are in place at exterior doors, and extended mats are used during wet weather.				
48	Carpets and rugs are secure and in good condition.				
49	Stairways, ramps, and corridors are illuminated.				
50	Stairways, ramps, and corridors are clear and free of stored materials.				
51	Stair treads are in good condition.				
52	Ramps have non-slip surfaces.				
53	Handrails and guardrails are present where required and are in good condition.				

**UC Performing Arts - Shop and Workroom Safety Inspection Checklist (continued)**

<b>Loading Docks</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
54	There is a warning stripe or barrier at the edge of the loading dock area.				
55	Wheel chocks or dock locks are present to secure vehicles being loaded/unloaded.				
56	Handrails are present on dock access stairs.				
<b>Material Handling Equipment</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
57	Cal/OSHA Powered Industrial Truck Guidelines posters are displayed adjacent to the vehicles' storage area.				
58	Aerial work platforms are secured to prevent unauthorized use.				
59	Personnel authorized to operate the forklift and/or aerial work platform equipment have received the Cal/OSHA required training.				
60	Forklifts and aerial work platforms are inspected prior to use.				
<b>Storage, and Hanging Objects</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
61	Storage shelves are not overloaded.				
62	Storage shelving units and cabinets are secured from tipping.				
63	File drawers are closed when not in use.				
64	Materials are stored to minimize unnecessary climbing, reaching, and bending.				
65	No storage is within 18" of sprinkler heads (24" from ceiling when no sprinklers).				
<b>Other</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
66					
67					
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73					





# UC Performing Arts–Storage Areas Safety Inspection Checklist

Location: \_\_\_\_\_ Area: \_\_\_\_\_

Inspected by: \_\_\_\_\_ Date: \_\_\_\_\_

*Quarterly inspections are recommended. Annual inspections are required. Document the inspections using this checklist. Mark potential hazards according to your judgment. Check all items that apply, and make comments when warranted. Place an “X” in the appropriate box to indicate the item is compliant/safe (Yes), non-compliant/hazardous (No), does not apply to the area (NA).*

Access to Exits and Emergency Response Equipment		Yes	No	N/A	Corrective Action/Date Completed
1	Exit doors are visible and free of obstructions on both sides of the doors.				
2	Exits are visible and unobstructed by stored items.				
3	Fire extinguishers are accessible.				
4	Fire extinguishers, alarm pulls, sprinkler risers, and sprinklers heads are free of obstructions.				
5	Eyewash/shower stations are accessible and free of obstructions.				
6	Electrical panels are free of obstructions have a clearance of 30” to each side and a clearance of 36” in front.				
7	First aid kits are accessible and free of obstructions.				
Hazardous Materials		Yes	No	N/A	Corrective Action/Date Completed
8	Flammable and combustible materials are stored in NFPA-approved containers/ cabinets.				
9	Spill response kits are available in hazardous and industrial material storage areas.				
10	No noticeable leaks or spills are present.				
11	Flammable and combustible materials are stored away from ignition sources.				
12	Hazardous and industrial waste is properly labeled and routinely disposed of.				
Storage Areas		Yes	No	N/A	Corrective Action/Date Completed
13	Storage shelves are not overloaded.				
14	Storage shelving units and cabinets are secured from tipping.				
15	File drawers are closed when not in use.				

**UC Performing Arts - Storage Areas Safety Inspection Checklist (continued)**

Storage Areas		Yes	No	N/A	Corrective Action/Date Completed
16	Materials are stored to minimize unnecessary climbing, reaching, and bending.				
17	No storage is within 18" of sprinkler heads (24" from ceiling when no sprinklers).				
18	Cabinet doors are closed and latched.				
19	Heavy, awkward, and/or frequently accessed items are stored on shelved located between knee and shoulder height.				
20	Nothing is suspended from the fire suppression system pipes.				
21	Nothing is stored in electrical and mechanical rooms.				
22	Items stored vertically, such as pipes, lumber, brooms, ladders, are secured to prevent unintended movement.				
23	Prop weapons are secured in locked cabinets.				
24	Excess or idle power cables, ropes, and hoses are coiled in neat stacks or hung on the walls.				
25	Guardrails and toeboards are in place in elevated storage areas.				
26	Clear aisles are provided throughout the storage area to reduce trip/fall incidents.				
27	Appropriate ladders and step stools are provided for accessing shelves above shoulder level.				
28	Palletized items are shrink-wrapped to prevent unintended movement.				
Other		Yes	No	N/A	Corrective Action/Date Completed
29					
30					
31					
32					
33					
34					
35					
36					



# UC Performing Arts–Tension Grid and Catwalk Safety Inspection Checklist

Location: \_\_\_\_\_ Area: \_\_\_\_\_

Inspected by: \_\_\_\_\_ Date: \_\_\_\_\_

Quarterly inspections are recommended. Annual inspections are required. Document the inspections using this checklist. Mark potential hazards according to your judgment. Check all items that apply, and make comments when warranted. Place an “X” in the appropriate box to indicate the item is compliant/safe (Yes), non-compliant/hazardous (No), does not apply to the area (NA).

Grid & Catwalk Access and Fall Prevention		Yes	No	N/A	Corrective Action/Date Completed
1	Access is controlled and restricted to unauthorized personnel.				
2	Fall prevention or arrest systems are in place and functional on fixed ladders.				
3	Guardrails (top and mid rails) and toeboards are secure on all tension grids and catwalks.				
4	The gates/guards on ladder access openings are kept closed.				
Storage		Yes	No	N/A	Corrective Action/Date Completed
5	Counter weights are stacked below the top level of the toeboards.				
6	Counter weights are evenly distributed along the loading platform.				
7	Signs are present to warn against stacking counter weights higher than the top of the toeboards.				
8	Tension grids and catwalks are free of other stored items.				
9	Tension grid and catwalks are free of graffiti.				
Rigging Ropes, Cables, Chains, Hoists, and Winches		Yes	No	N/A	Corrective Action/Date Completed
10	Light and audio fixtures/equipment is secured to battens with secondary restraints.				
11	Rigging ropes and cables are in good condition and are routinely inspected by knowledgeable staff.				
12	Rigging ropes and cables are inspected every five years by knowledgeable outside agency.				
13	Hoists and beams are clearly labeled to indicate maximum capacities.				
14	Line set weight-capacity signs are present on the loading bridge.				

**UC Performing Arts - Tension Grid and Catwalk Safety Inspection Checklist (continued)**

<b>Grid &amp; Catwalk Access and Fall Prevention</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
1	Access is controlled and restricted to unauthorized personnel.				
2	Fall prevention or arrest systems are in place and functional on fixed ladders.				
3	Guardrails (top and mid rails) and toeboards are secure on all tension grids and catwalks.				
4	The gates/guards on ladder access openings are kept closed.				
<b>Storage</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
5	Counter weights are stacked below the top level of the toeboards.				
6	Counter weights are evenly distributed along the loading platform.				
7	Signs are present to warn against stacking counter weights higher than the top of the toeboards.				
8	Tension grids and catwalks are free of other stored items.				
9	Tension grid and catwalks are free of graffiti.				
<b>Rigging Ropes, Cables, Chains, Hoists, and Winches</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
10	Light and audio fixtures/equipment is secured to battens with secondary restraints.				
11	Rigging ropes and cables are in good condition and are routinely inspected by knowledgeable staff.				
12	Rigging ropes and cables are inspected every five years by knowledgeable outside agency.				
13	Hoists and beams are clearly labeled to indicate maximum capacities.				
14	Line set weight-capacity signs are present on the loading bridge.				
<b>Personal Protective Equipment &amp; Injury Prevention</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
15	Personnel are using personal fall protection devices appropriately.				
16	Personnel are wearing hard hats with chin straps in head bump areas.				
17	Personnel have tied off their tools.				
18	Personnel are wearing other personal protective equipment as required for the work.				
19	Safety and warning signs are present; i.e., head bump, keep access gate closed, etc.				

**UC Performing Arts - Tension Grid and Catwalk Safety Inspection Checklist (continued)**

<b>Fire Prevention, Emergency Exits, Emergency Response</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
20	Access is controlled and restricted to unauthorized personnel.				
21	Fall prevention or arrest systems are in place and functional on fixed ladders.				
<b>Electrical Hazards</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
22	Cords and plugs in good condition; no exposed or patched wires.				
23	Power cords are not wrapped around structural supports.				
24	Power cords and communication wires are well organized.				
25	Power cables are placed to the edges of catwalks and out of walking areas.				
<b>Other</b>		<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Corrective Action/Date Completed</b>
26					
27					
28					
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33					
34					
35					



# Performing Arts General Safety Awareness and Codes of Safe Practice

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## Use Instructions

This section of the Performing Arts Safety Manual contains the:

- Form for recording the General Safety Awareness Training
- Form for recording the Codes of Safe Practice Training
- Code of Safe Practice Matrix
- Codes of Safe Practice

### **General Safety Awareness Training**

Prior to starting work activities or being authorized to access and use facility space, equipment, or tools, all new employees/students/volunteers must receive an initial overview of the department/facility safety plans and complete an orientation to critical emergency response procedures and life safety equipment.

#### **Supervisors/Instructors**

Supervisors/instructors must complete all the information blanks at the top of the training checklist: trainee's name; supervisor's/instructor's name; the name of the department, and the name of the facility. Then the supervisor/instructor must review each applicable item on the training record checklist with each new employee/student/volunteer and document the training on the training record checklist. A separate general safety awareness training checklist must be used for each trainee. Even if an employee has been employed in another University department, he or she must complete the performing arts general awareness training. Ensure each trainee signs his or her initials next to each item covered during the training as confirmation the training was completed.

### **Codes of Safe Practice Training**

The Codes of Safe Practice were developed to be used as training tools. The Codes must be reviewed at initial job assignment and should be used in refresher training prior to conducting non-routine tasks, refresher training for those not following safe practices, and/or as a refresher for those returning after an extended absence. Many of the codes will apply to a variety of job titles/tasks. A matrix is located behind the Codes of Safe Practice Training Record form to assist supervisors/instructors in selecting the appropriate codes for each trainee.

#### **Supervisors/Instructors**

Identify the processes to which each employee/student/volunteer will be assigned, and then check off the appropriate topics to be covered on the trainee's Codes of Safe Practice Training Record. Use the Codes of Safe Practice matrix to identify the topics that must be completed for each process. The second page of Codes of Safe Practice Training Record has been provided for recording additional training topics not currently included on the training matrix.

We anticipate the Codes of Safe Practice will be reviewed over a period of time. Ensure the date each topic is covered is noted on the training record, and ensure the trainee records his or her initials as confirmation the information was covered and understood.

**Employees/Students/Volunteer**

Employees/students/volunteers are responsible for reviewing the Performing Arts Safety Manual, reviewing the assigned Codes of Safe Practice, and participating in assigned training sessions. Work with your supervisor/instructor to ensure all required training is completed. Talk to your supervisor/instructor if you have any questions, or if you do not understand the materials. You must initial each topic as the training is completed as documentation that the topic was reviewed and you understood the information provided.

**Training Record Retention**

Training records must be retained for a minimum of three years as required by the Cal-OSHA IIPP regulation or in accordance with the University's record retention policy.



# General Safety Awareness Training Record



Prior to starting work activities or being authorized to access and use facility space, equipment, or tools, all new employees, students, and volunteers must receive an initial overview of the department/facility safety plans and get an orientation to critical emergency response procedures and life safety equipment.

**Supervisors / Instructors:**

- Review each applicable item on this checklist with all new employees, students, and volunteers.
- Document the training using this form.
- Use a separate sheet for each new employee, student, and volunteer.
- Ensure the trainee signs his or her initials next to each item as it is covered as confirmation of the training.

Employee / Student / Volunteer’s Name: \_\_\_\_\_

Supervisor / Instructor’s Name: \_\_\_\_\_

Department: \_\_\_\_\_ Facility: \_\_\_\_\_

Topic & Learning Activity	Date Reviewed	Initials
<b>Injury &amp; Illness Prevention Program</b> Provide an overview of the plan, explain how to access the Department or facility specific plan, how to report a hazardous condition, and what an employee’s rights are under the plan.		
<b>Hazard Communication</b> Review how to access relevant Safety Data Sheets, identify and discuss posted warning signs and hazard communication labels.		
<b>Attire and Personal Protective Equipment (PPE)</b> Discuss appropriate work attire for various areas and activities, review the location of PPE, and explain steps to becoming trained and authorized to use PPE.		
<b>Restricted Work Areas</b> Identify restricted or “authorized personnel only” areas including grids, catwalks, confined spaces, or other hazardous work locations.		
<b>Fire Safety</b> Review the location and use of fire alarm pull stations and fire extinguishers and how to activate the fire curtain (when present).		
<b>Emergency Exits and Egress</b> Identify primary emergency exits, evacuation routes, and emergency assembly areas.		
<b>Emergency Contact Information</b> Discuss emergency contact information and location of phones to call 9-1-1 and provide campus phone numbers for Police, Fire, EH&S, and Risk Management.		
<b>Life Safety Equipment</b> Identify the location and discuss the proper use of emergency eyewash and safety shower equipment, first aid kits, and automated external defibrillator (AED).		
<b>Codes of Safe Practice</b> Use the Codes of Safe Practice matrix to select the codes of safe practice to cover based on each employee’s, student’s, or volunteer’s work assignment. Note each code covered on the second page of this form.		





# Code of Safe Practice Training Record

Employee / Student / Volunteer's Name: \_\_\_\_\_

- Check Applicable Operations:**
 Set Construction
  Prop Shop
  Lighting
  Audio
  Special Effects  
 Costumes
  Cosmetics
  Front-of-the-house
  Deconstruction
  Theater Maintenance

Supervisor Name: \_\_\_\_\_

Supervisors/Instructors:	Employees/Students/Volunteers:
<ul style="list-style-type: none"> <li>Identify the type of operations your employee or student will be completing.</li> <li>Refer to the Code of Safe Practices Matrix and identify the topics you must review with the employee/student, and provide documented on-the-job training in regard.</li> <li>Check off the required topics below.</li> <li>Note the date each topic was reviewed.</li> <li>File the completed sign-off sheet and use when additional topics are added.</li> </ul>	<ul style="list-style-type: none"> <li>Review the required Codes of Safe Practices and participate in on-the-job training.</li> <li>Talk to your supervisor or instructor if you have any questions or if you do not understand the materials you are reviewing.</li> <li>Enter the date on which each topic was reviewed and initial to confirm coverage.</li> </ul>

Topic	Date Reviewed/ Trained	Initials	Topic	Date Reviewed/ Trained	Initials
* All faculty, students, and staff are required to review the Performing Arts Safety Manual and the Performing Arts General Safety Awareness Code of Safe Practice.					
<input checked="" type="checkbox"/> Performing Arts Safety Manual*			<input type="checkbox"/> Lockout/Tagout/Blockout		
<input checked="" type="checkbox"/> Performing Arts General Safety Awareness*			<input type="checkbox"/> Material Handling – Forklift Safety		
<input type="checkbox"/> Aerial Work Platforms			<input type="checkbox"/> Material Handling – Loading & Unloading		
<input type="checkbox"/> Confined Space			<input type="checkbox"/> Material Handling – Safe Lifting & Moving Materials		
<input type="checkbox"/> Cosmetics – Theater Makeup			<input type="checkbox"/> Paints, Dyes, Inks		
<input type="checkbox"/> Electrical Safety			<input type="checkbox"/> Personal Protective Equipment		
<input type="checkbox"/> Emergency Action/Response			<input type="checkbox"/> Respiratory Protection		
<input type="checkbox"/> Ergonomics – The Basics			<input type="checkbox"/> Rigging – Counterweight Fly Systems		
<input type="checkbox"/> Eyewash Stations			<input type="checkbox"/> Rigging – Hoists and Winches		
<input type="checkbox"/> Fall Protection – Catwalk Safety			<input type="checkbox"/> Rigging – Ropes, Cordage, and Chains		
<input type="checkbox"/> Fall Protection – Controlled Access			<input type="checkbox"/> Slip/Trip/Fall to Same Level		
<input type="checkbox"/> Fall Protection – Fixed Ladders			<input type="checkbox"/> Special Props – Edged Weapons		
<input type="checkbox"/> Fall Protection – Outside the Catwalk			<input type="checkbox"/> Special Props – Firearms		
<input type="checkbox"/> Fall Protection – Paint Frames			<input type="checkbox"/> Special Props – Live Animals		
<input type="checkbox"/> Fall Protection – Portable Ladders			<input type="checkbox"/> Storage		
<input type="checkbox"/> Fall Protection – Rooftop Restraint			<input type="checkbox"/> Tools & Machines – General Shop Safety		
<input type="checkbox"/> Fall Protection – Scaffolds/ Elevated Work Platforms			<input type="checkbox"/> Tools & Machines – Hand & Power Tools		
<input type="checkbox"/> Fall Protection – Tension Grid			<input type="checkbox"/> Tools & Machines – Saws –Circular		
<input type="checkbox"/> Fall Protection – Trigger Heights			<input type="checkbox"/> Tools & Machines – Saws - Table		
<input type="checkbox"/> Hazard Communication			<input type="checkbox"/> Tools & Machines – Welding/ Soldering/ Brazing		
<input type="checkbox"/> Housekeeping			<input type="checkbox"/>		



# Codes of Safe Practice Training Record

Topic	Date Reviewed/ Trained	Initials	Topic	Date Reviewed/ Trained	Initials
Use this page to document any additional topics covered.					
<input type="checkbox"/>			<input type="checkbox"/>		
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<input type="checkbox"/>			<input type="checkbox"/>		

*Record Keeping Requirements – Maintain a copy of the sign-off sheet for your records and forward the original to your supervisor/ instructor.*



# Code of Safe Practices Matrix

University of California Performing Arts Code of Safe Practices	Set Construction	Prop Shop	Lighting & Spotlights	Audio	Special Effects	Costumes/Cosmetics	Front-of-the-House	Set Deconstruction	Theater Maintenance
<p><b>If you are assigned to work within any of the processes identified in the column headings above, you must review the codes of safe practice marked with an “X” with each column. Record the date the code was reviewed on page 2 of the General Safety Awareness Code of Safe Practice.</b></p>									
1. General Safety Awareness	X	X	X	X	X	X	X	X	X
2. Aerial Work Platforms	X	X	X	X	X			X	X
3. Confined Space	X		X	X	X			X	X
4. Cosmetics – Theater Makeup						X			
5. Electrical Safety	X	X	X	X	X	X	X	X	X
6. Emergency Action/Response	X	X	X	X	X	X	X	X	X
7. Ergonomics – The Basics	X	X	X	X	X	X	X	X	X
8. Eyewash Stations	X	X			X	X		X	X
9. Fall Protection – Catwalk Safety	X	X	X	X	X			X	X
10. Fall Protection – Controlled Access	X	X	X	X	X			X	X
11. Fall Protection – Fixed Ladder	X	X	X	X	X			X	X
12. Fall Protection – Outside the Catwalk	X	X	X	X	X			X	X
13. Fall Protection – Paint Frames	X								
14. Fall Protection – Portable Ladder	X	X	X	X	X	X	X	X	X
15. Fall Protection – Rooftop Restraint	X	X	X	X	X			X	X
16. Fall Protection – Scaffolds/Elevated Work Platforms	X	X	X	X	X			X	X
17. Fall Protection – Tension Grid	X		X	X	X			X	X
18. Fall Protection – Trigger Heights	X	X	X	X	X	X	X	X	X
19. Hazard Communication	X	X	X	X	X	X	X	X	X
20. Heat Illness	X	X	X	X	X	X	X	X	X
21. Housekeeping	X	X	X	X	X	X	X	X	X
22. Lockout/Tagout	X		X	X	X			X	X
23. Material Handling – Forklift Safety	X							X	X
24. Material Handling – Loading and Unloading	X	X	X	X				X	X

<b>University of California Performing Arts Code of Safe Practices</b>	<b>Set Construction</b>	<b>Prop Shop</b>	<b>Lighting &amp; Spotlights</b>	<b>Audio</b>	<b>Special Effects</b>	<b>Costumes/Cosmetics</b>	<b>Front-of-the-House</b>	<b>Set Deconstruction</b>	<b>Theater Maintenance</b>
<p align="center"><b>If you are assigned to work within any of the processes identified in the column headings above, you must review the codes of safe practice marked with an “X” with each column. Record the date the code was reviewed on page 2 of the General Safety Awareness Code of Safe Practice.</b></p>									
25. Material Handling – Safe Lifting & Moving Materials	X	X	X	X	X	X	X	X	X
26. Paint, Dyes, Inks	X	X			X	X		X	X
27. Personal Protective Equipment	X	X	X	X	X	X	X	X	X
28. Respiratory Protection	X	X			X			X	X
29. Rigging – Counterweight Fly Systems	X	X	X	X	X			X	X
30. Rigging – Hoists and Winches	X	X	X	X	X			X	X
31. Rigging – Ropes, Cordage, and Chains	X		X	X				X	
32. Slip/Trip/Fall to Same Level Prevention	X	X	X	X	X	X	X	X	X
33. Special Props – Edged Weapons		X			X				
34. Special Props – Firearms		X			X				
35. Special Props – Live Animals		X			X				
36. Storage	X	X	X	X	X	X	X	X	X
37. Tools & Machines – General Shop Safety	X	X			X			X	X
38. Tools & Machines – Hand & Power	X	X	X	X	X	X		X	X
39. Tools & Machines – Saws – Circular	X	X			X				X
40. Tools & Machines – Saws – Table	X	X			X				X
41. Tools & Machines – Welding/ Soldering/Brazing	X	X			X			X	X



# Aerial Work Platforms



**Aerial work platforms (AWP) are pieces of equipment used in the performing arts to raise a person to the height necessary to adjust lighting instruments, move curtains, reach out-of-the-way places, etc.**

All operators must receive formal and documented training on each type of AWP. You must be authorized prior to operating an AWP.

The following codes of safe practices are general guidelines. Refer to the manufacturer's instructions for specific operating instructions.

## Use Guidelines

1. Lock off, chain off, or lock away all AWP's when not in use to prevent unauthorized use.
2. Inspect all parts before and after the use of the AWP. Immediately report any missing, broken, or defective parts. The supervisor will determine if the lift should be used.
3. Check the area in which the AWP is to be used for possible hazards such as drop areas, holes, floor obstructions, and overhead obstructions.
4. Ensure the outriggers are deployed and properly placed for all AWP equipped with outriggers. This is critical for the prevention of tip-over incidents.
5. Immediately report any potentially hazardous conditions that become evident during operation.
6. Know how to operate the manual emergency descent controls. Keep in mind each AWP is different, as are the controls. Some are manual handles located at the base of the lift while others are valves that are opened in a designated order to lower the boom.
7. Wear the required personal protective equipment when on the lifts. Talk to your supervisor or instructor if you do not know the requirements.
8. Follow the manufacturer's safety guidelines regarding the use of fall restraint and/or fall protection devices as the requirements differ depending on the size and design of the AWP. Contact the EH&S Department if you have questions.
9. Always maintain a three-point contact when getting on and off the AWP – two feet one hand or two hands one foot.
10. Always face the AWP when getting on and off.
11. Always lower the basket completely to the ground before getting on or off.
12. Always maintain a firm footing while on the platform floor.
13. Never use planks, ladders, or any other devices on the AWP to achieve additional height or reach.
14. Never stand or climb on the guardrails.
15. Never exceed rated capacities. Rated capacity includes the combined weight of all persons, tools, and

materials.

16. Never exceed the maximum allowable persons in the platform.
17. Never exceed the maximum allowable persons on the deck extension of a scissor lift.
18. Never ride the AWP while it is elevated unless the following conditions are met:
  - a. The travel speed at Maximum Travel Height does not exceed 3 feet (0.9m) per second (creep mode).
  - b. Self-propelled units are equipped with electrical or other interlock means that will prevent driving them with the platform height greater than the Maximum Travel Height or at speeds greater than permitted at Maximum Travel Height. Review to the manufacturer's guidelines for your unit.
  - c. The surface upon which the unit is being operated is level with no hazardous irregularities or accumulation of debris that might cause a moving platform to overturn.

Always follow the manufacturer's instructions regarding the use of the AWP while elevated.

*Talk to your supervisor if you have any questions about this information.*



# Confined Spaces

**Recognizing the presence and hazards associated with confined spaces is critical if you are working around them. Untrained, ill-equipped workers who try to work in, or rescue people from, confined spaces often become victims.**



This code of safe practice is intended to raise awareness of confined space hazards. It is not a permit-required confined space entry training resource. Only employees trained in the confined space entry operating procedures established by the UC are allowed to enter confined spaces.

## What is a confined space?

1. It is an area large enough for an person to enter and perform assigned work, and
2. It has limited or restricted means of entry or exit, and
3. It is not designed for continuous human occupancy.

## What is a permit-required confined space?

Any space that meets the definition of a confined space **AND**:

1. Contains or has the potential to contain hazardous air conditions,
2. Contains a material with the potential to engulf someone who enters the space,
3. Has an internal configuration that might cause an entrant to be trapped or suffocated, or
4. Contains any other recognized serious safety or health hazards.

## Examples of confined spaces in performing arts facilities:

1. Orchestra pit lift area
2. Elevator pits
3. House cove (attic) lighting positions
4. Plumbing runs
5. Boilers

## When might personnel encounter confined spaces in performing arts facilities?

1. When conducting inspections, repairs, and/or maintenance activities
2. When working in designated areas such as front of house attic lighting positions
3. When conducting emergency rescue operations

## What are the hazards that make performing arts confined spaces deadly?

1. Hazardous air conditions (such as flammable gas, too little oxygen, too much oxygen, airborne combustion

dust)

2. Conditions that can trap or suffocate an entrant (such as inwardly converging walls, the lowering of the orchestra floor)
3. Mechanical hazards (such as gears, conveyors, etc.)
4. Electrical hazards
5. Poor visibility, lack of lighting
6. Falling objects
7. Falling, tripping, insecure footing
8. Other hazards that would make escape or rescue from the area difficult

**Processes that can create a hazardous atmosphere:**

9. Aerosols, dust, fumes, mist, gases, vapors, radiation
10. Chemical reactions
11. Decomposition of organic matter
12. Cleaning materials and reagents
13. Welding, spray painting, grinding, sand blasting
14. Stored products/chemicals
15. Leaks and spills
16. Charging batteries

**Never enter confined spaces until properly trained and authorized as you are putting yourself at risk of serious injury or death.**

**Ways you can help protect yourself and your co-workers:**

1. Consult with the EH&S Department and refer to the campus-specific Confined Space Entry Program, procedures, and training requirements.
2. Never violate the posted “ACCESS RESTRICTED TO AUTHORIZED PERSONNEL” and “ENTRY BY PERMIT ONLY” signs if you are not authorized to enter.
3. Know how to identify a confined space.
4. Work with the EH&S Department to identify permit and non-permit required spaces in each venue.
5. Develop written safe working procedures for all confined spaces within each venue.
6. Never enter an area that could be a confined space unless you are trained and authorized to do so. Contact your supervisor or instructor if you are in doubt.
7. Never rely on your senses to determine if a confined space has no hazards. A number of hazardous gases are both colorless and odorless.
8. NEVER enter a confined space to try to rescue another worker unless properly trained and do so.





# Cosmetics – Theatrical Makeup

**The theatrical makeup practices can pose hazards for performers and makeup artists if not safely selected, applied, removed, and stored.**



## Selection

1. Use only commercially manufactured cosmetic products for skin application.
2. Select manual pump rather than pressurized gas when selecting aerosol dispensed products.

## General Guidelines for Keeping Makeup Clean

1. Purchase and use a personal makeup kit if possible.
2. Wash your hands prior to handling the makeup.
3. Wash your face prior to applying the makeup.
4. Do not smoke, eat, or drink while handling or applying the makeup.
5. Replace makeup regularly.
6. Dispose of old makeup to prevent its further use.
7. Keep makeup containers sealed when not in use.
8. Use clean brushes to apply makeup.
9. Do not share makeup tools with others unless cleaned and sanitized between users.
10. Use tap or distilled water to moisten palettes, brushes, or pencils; never use saliva.

## Guidelines for Shared Makeup

1. Dispense makeup, whether cream or powder, from larger containers into smaller containers and label the smaller container to identify the performer using that container.
2. Use a palette knife or wooden craft stick to transfer cream makeup from its original jar into labeled individual containers.
3. Slice cream-stick makeup and lipstick using a clean palette knife and place the sliced portion in an individual labeled container, or on a labeled paper disk.
4. Never place a makeup application device back into a shared makeup container after the applicator has been used; i.e., do not place a mascara brush back in the mascara tube after the applicator has come into contact with someone's lashes.
5. Use disposable makeup applicators, such as brushes and sponges.
6. Ensure makeup artists wash their hands between performers.
7. Clean and sanitize makeup pencil sharpeners between users.
8. Clean and sanitize re-usable makeup brushes and sponges between uses/performers.
9. Use clean containers of clear water for each performer's makeup application.

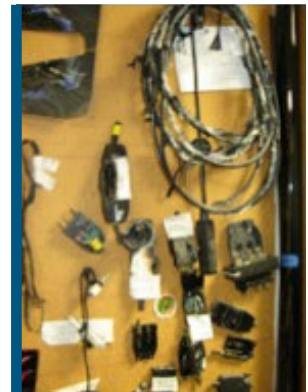


# Electrical Safety

**Electrical hazards can be found throughout performing arts operations and include, but are not limited to, exposed wiring; improperly spliced wires; improperly installed temporary power distribution; improperly grounded wiring; use of damaged electrical cords; i.e., frayed, repaired, missing ground prongs, and the use of inappropriate extension cords.**

## Common Examples of Misused Equipment (Source: Fed OSHA)

1. Homemade ungrounded multi-receptacle boxes.
2. Fabricating extension cords with ROMEX® wire.
3. Using equipment outdoors that is labeled for use only in dry, indoor locations.
4. Attaching ungrounded, two-prong plug adapter or extension cords to three-prong cords and tools.
5. Using circuit breakers or fuses with the wrong rating for over-current protection; e.g., using a 30-amp breaker in a system with 15- or 20-amp receptacles. Protection is lost because it will not trip when the system's load has been exceeded.
6. Using modified cords or tools; e.g., removing ground prongs, face plates, insulation, etc.
7. Using cords or tools with worn insulation or exposed wires.



## Electrical Safety Measures

1. Conduct routine documented inspections and correct electrical hazards immediately.
2. Permit only qualified, trained personnel to correct electrical equipment.
3. Stop the work and correct the conditions when:
  - a. Circuit breakers are tripped and/or fuses are blown
  - b. An electrical tool, appliance, wire, or connection feels warm
  - c. A burning odor is noticed
  - d. A tingling sensation or minor shock is felt when contacting the tool, cord, or piece of equipment
4. Maintain at least a 36-inches clearance in front of and to the sides of all breaker panels.
5. Ensure all wiring is appropriately encased in conduit (including ROMEX®).
6. Never drape or staple electrical wiring over doorways or openings.
7. Provide strain relief equipment for all electrical cables.
8. Use and test GFCIs.
9. Use grounded (three-prong plug) or double insulated power cords.
10. Use extension cords only when necessary.
11. NEVER use an extension cord in place of permanent wiring.
12. Ensure extension cords are in good condition and the right type for the job and/or work environment.

13. Never connect multiple extension cords and surge protection devices together.
14. Protect all temporary cables/extension cords subject to vehicular or excessive pedestrian traffic.
15. Never wrap an electrical cable or power cord around a pipe or race way.

### **Lighting**

1. Check lighting equipment regularly for worn areas and exposed wires.
2. Vacuum dust from mechanically interlocking auto-transformer dimmer boards on a regular basis.
3. Ensure overhead lighting equipment is attached, and all component parts are properly tied with the proper cable.
4. Never allow cables to come into contact with any lighting instrument; properly attach cables to battens.
5. Only use clip lights and extension cords for temporary lighting needs. The clips lights and extension cords must be removed before you leave the task or at the end of the work shift.
6. Ensure live components are not exposed on lighting fixtures, lamp holders, lamps, or receptacles.

### **Motorized Equipment**

1. Provide precautionary signage in those areas where electrical equipment is being used and where there are high-energy sources.
2. Check all motorized equipment on a regular basis to ensure its proper operation.
3. Apply lockout/tagout/blockout controls for equipment that may involve unexpected energization or start up (or release of stored energy) during cleaning, repairing, servicing, setting-up, adjusting, or un-jamming.

### **Audio**

1. Check for proper grounding of audio equipment to eliminate a ground loop that can potentially damage the equipment and also result in electrical shock.
2. Connect all devices to the same ground at the same point.
3. Never overload amplifiers.
4. Never connect audio equipment to the same circuit as lighting equipment.



# Emergency Action/Response

**Each campus has an overarching campus Emergency Response Plan. Contact your Campus Emergency Management unit for more information and copies of this plan.**

For the protection of students, campus personnel, visiting performers, and patrons, more detailed, venue specific emergency response plans may need to be developed. In most cases, a Department or venue will have a pre-show recorded or standard announcement with details about the emergency exits. This is a good opportunity to communicate key venue specific emergency response information to the audience. Stage management and front-of-house personnel will have a variety of emergency response duties that will require specialized training; however, certain aspects of emergency response apply to everyone and are included in this Code of Safe Practice.



## Prior to an Emergency

1. Find and review the emergency evacuation map for the area(s) in which you will work. Contact your supervisor if you cannot find the map.
2. Know the primary and secondary emergency evacuation routes.
3. Know the assembly location to which you are to report in the event of an evacuation.
4. Know where to report in the event of shelter-in-place emergencies.
5. Keep the exit pathways free of obstructions.
6. Keep exit doors clear of obstructions on both sides of the exit doors.
7. Know how to report emergencies.
8. Know how to report damaged or used fire extinguishers, exit signs that are not properly illuminated, and emergency lights that are damaged or need to be repositioned.
9. Know your duties and responsibilities for each type of emergency to which you are expected to respond.
10. Know where the first aid kits and automated external defibrillator (AEDs) are located.
11. Establish a system for inspecting and stocking the first aid kits.
12. Participate in emergency response training and practice drills.

## Fire Emergencies

1. Activate the fire alarm.
2. Evacuate the building. Only campus fire department personnel are required to fight fires.
3. Never attempt to use a fire extinguisher unless you have received appropriate training.
4. Close doors after you exit a room.
5. Assigned specific trained personnel to activate the “Curtain Release” to drop the fire curtain.

6. Go immediately to the assigned assembly area.
7. Wait in the assembly area until further directions are given.
8. Never re-enter the building until permitted to do so by fire department personnel.

**Chemical Emergencies**

1. Chemical contact with the eyes:
  - a. Immediately flush your eyes using the emergency eyewash station.
  - b. NEVER wait to remove contact lenses.
  - c. Keep your eyes in contact with the running water for at least 15 minutes.
2. Chemical contact with other parts of the body or clothing:
  - a. Immediately flush your skin with water.
  - b. Remove contaminated clothing and continue flushing your skin for at least 15 minutes.
  - c. Keep your chemical splash goggles on as long as your eyes have not been exposed. Keep the goggles on until after your hair and face have been flushed with water for at least 15 minutes.
3. Seek immediate medical attention for chemical contact with eyes and when skin is burned by chemical contact.
4. Seek fresh air if you begin feeling dizzy due to chemical fume exposure.

**Medical Emergencies**

1. Provide first aid to the extent of your training and comfort level.
2. Exercise universal precautions to reduce the risk of the transmission of bloodborne pathogens. Universal precautions include:
  - a. Treat all bodily fluids as though infectious,
  - b. Wear latex gloves,
  - c. Use CPR masks, and
  - d. Wash your hands with soap and water after removing the latex gloves.
3. Summon emergency medical services by dialing 9-1-1 yourself or direct a specific person to do it for you. Review venue-specific instructions for details related to that venue.
4. Post personnel along the route from the building entry to the injured person to assist the prompt arrival of emergency medical personnel.



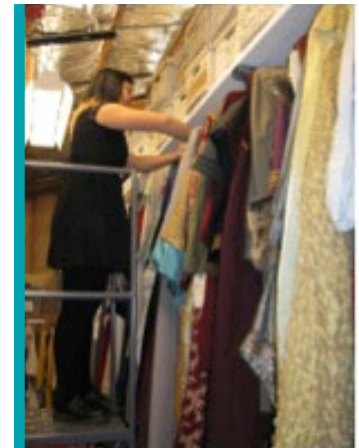
# Ergonomics – The Basics

Many people assume ergonomics only applies to using a computer or how you lift and move materials. Ergonomic risk factors are present in everything we do, at work and at home. It is important to understand these factors, identify them in the tasks we perform, and take steps to change how we work to reduce or eliminate them.

## Know and Recognize the Ergonomic Risk Factors

Job activities involving any of the ergonomic risk factors below, either alone or especially in combination, contribute to an increased risk of injury:

1. Awkward postures – Non-neutral positions that put our bodies at a mechanical disadvantage while we work
2. Repetitive motion – The same or similar movement is performed frequently
3. Static postures – Maintaining the same posture for extended periods of time
4. Forceful exertion – Using a high level of physical effort to perform a task
5. Static exertion – Holding the same posture for extended periods while applying force
6. Compression or contact stress – Pressure between hard or sharp objects and the soft tissues of the body
7. Lighting – Inadequate lighting or significant glare (contributes to eye strain)
8. Noise – High noise levels, based on decibel level and duration, can result in hearing damage
9. Vibration – Overexposure to vibration from tools or equipment increases risk of injury
10. Cold Temperatures – Decreases the flexibility of our muscles as well as our touch sensitivity as we work



## Avoid Ergonomic Risk Factors

1. Complete ergonomic injury prevention training. See the EH&S Department or the UC Training Center for scheduling the training
2. Maintain comfortable, neutral body postures during daily activities
3. Reduce the frequency of performing the same motions, alternate between tasks to use different muscles. Take short breaks every 1-2 hours to reduce muscle fatigue.
4. Take breaks and/or routinely change your posture.
5. Use the right tools for the job: tools designed to help you maintain neutral body postures by reducing reaching and awkward wrist or arm positions. Avoid forceful pinching or gripping. Use tools with comfortable handles and controls.
6. Arrange your workstation to reduce or eliminate awkward postures such as over-reaching, bending, or twisting.
7. Store only light-weight items above shoulder height. Use a step stool or stepladder to reach items at this height.

8. Store items that are heavy or awkward to lift on shelves that are positioned at waist height.
9. Wear the appropriate personal protective equipment, such as hearing protection devices and vibration absorbing gloves, when indicated.
10. Reduce contact stress by rounding or padding any square edges of work surfaces where your body is in continuous and/or repeated contact with the edge.
11. Use material handling devices such as carts, hand trucks, and dollies to reduce muscle fatigue.
12. Lift safely – review the Code of Safe Practice regarding Material Handling – Safe Lifting & Moving Materials
13. Contact the EH&S Department to schedule an ergonomic evaluation or for assistance with your workstation.



# Eyewash Stations

**Many performing art facilities have eyewashes in the shop facilities since these are the typical areas where activities may create chemical or mechanical eye hazard exposures. The placement of the eyewash station is critical; an eyewash station is required by Cal/OSHA to be available within 10 seconds travel time from where the potential eye hazards exist.**

Evaluate areas where any painting, spraying, or construction of scenery occurs and determine if there is a need for a plumbed eyewash station.

## Evaluate the Following to Determine the Need for an Eyewash Station:

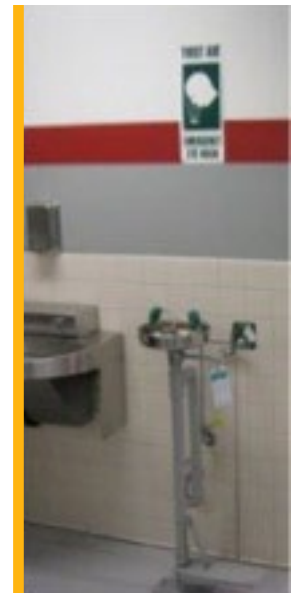
1. Are chemicals (corrosives, irritants, etc.) used that require eyes to be flushed if the individual is splashed in the eyes? Consult Safety Data Sheets (SDS) and if needed, contact the EH&S Department for assistance.
2. How accessible is an eyewash station to the area in which chemicals are being used? Emergency eyewash facilities shall be in accessible locations that require no more than 10 seconds for the injured person to reach.
3. Is the use of face shields, goggles, or safety glasses required for the work performed? If this equipment is required to work with the chemical, then an eyewash station is most likely required. Again, consult the SDS or the EH&S Department.
4. Never use water hoses or sink faucets in place of an emergency eyewash device.

## Equipment Operation in an Emergency

1. Move quickly to the nearest eyewash station.
2. Lean over the eyewash station.
3. Push the lever to activate the eyewash.
4. Hold eyelids open and direct the flow of water into the eyes.
5. Continue flushing the eyes for a minimum of 15 minutes.
6. Keep the eyes open and rotate the eyeballs in all directions to remove contamination from around the eyes.  
An injured person may require help holding their eyelids open.
7. Seek immediate medical help after flushing the eyes.

## Equipment Maintenance

1. Maintain a clear path to and around the emergency eyewash station.
2. Activate eyewash stations at least monthly to flush the line and to verify proper operation.
3. Verify monthly inspection activities and line flushing is being completed by responsible parties. Generally these activities are noted on an inspection tag attached to the equipment.





4. Ensure eyewash spout caps are kept covered to keep them clean.
5. Ensure caps are easy to remove for an emergency.

**Additional Tips**

1. Keep energized electrical equipment away from eyewashes.
2. Never use eyewashes for cleaning shop equipment or personal objects or for other non-emergency purposes.
3. Never store things on or around eyewash stations.
4. Never delay the use of the emergency eyewash station. The first few seconds after exposure to a hazardous chemical (especially a corrosive chemical) are critical. Delaying treatment, even for a few seconds, may result in irreparable eye damage.
5. Never hesitate to use safety equipment.



# Fall Protection – Catwalk Safety

**Catwalks are walkways that provide access to technical and service areas located above the stage or auditorium. They may also provide a bridge linking fly-floors. These elevated work surfaces pose fall hazards. Falls from the catwalks can result in serious debilitating injuries and death.**



## Catwalk Requirements

1. Secure rigid guardrails capable of supporting a live load of 20<sup>7</sup> pounds per linear foot applied either horizontally or vertically downward at the top rail.
2. A top rail and mid rail; top rail height of 42 inches to 45 inches from the upper surface catwalk flooring and mid rail approximately halfway between the top rail and the catwalk floor.
3. The vertical support posts must have a 1.5 inch outside diameter or larger, and the spacing must be 8 feet or less.
4. Toeboards to prevent items being kicked over the side.

## Guidelines

1. Only trained and authorized personnel may access and work on or from the catwalks.
2. Complete fall protection training prior to accessing the catwalks.
3. Remove all loose items from your pockets prior to ascending to the catwalk.
4. Tie-off or otherwise attach all tools to your person prior to ascending to the catwalk.
5. Take a hard hat up to the catwalk with you when the catwalk is known to have low head clearance areas.
6. Strap the hard hat to your head once you reach the catwalk to prevent dropping it as you work.
7. Use a fall protection system when the work requires you to lean over or through the catwalk guardrails to access the equipment on which you are working.
  - a. Inspect all components of the fall protection system prior to each use.
  - b. Wear a full body harness that has the D-ring attachment at the back.
  - c. Ensure the lanyard is attached to an anchoring point that is capable of supporting 5,000 pounds. Contact the EH&S Department if you are unsure of the anchoring points.
  - d. Choose an anchor point that is close to and behind you.
  - e. Ensure all connections are secure, and the connections closed and locked.
  - f. Never allow the lanyard to cross the front of your body or wrap around your arm or leg.

<sup>7</sup> CCR Title 8, GISO Section 3209 provides these requirements for permanent structures. When constructing temporary guardrails, follow CCR Title 8, CSO, Section 1620 (4)(c), which requires all railings, including their connections and anchorage, to be capable of withstanding without failure, a force of at least 200 pounds applied to the top rail within 2 inches of the top edge, in any outward or downward direction, at any point along the top edge.

8. Ensure personnel have been removed from the area beneath you prior to adjusting equipment that extends over the catwalk guardrails.
9. Never use wooden planks, bars, ladders, or other devices to increase your height above the floor of the catwalk.
10. Never use wooden planks to create 'catwalks' across open spaces or areas not designed to be weight bearing, such as the ceiling above the audience.
11. Never leave loose tools or materials on the catwalk.
12. Never stack counterweights above the level of the toeboards.
13. Ensure adequate lighting is available on the catwalk; use a flashlight attached to your hard hat if necessary.
14. Never participate in horseplay on the catwalks; never throw items from the catwalks to the surfaces below.
15. Never remove the catwalk rails unless secured with appropriate fall protection equipment that is properly installed.
16. Always replace catwalk rails after removal to load items onto the catwalk.
17. Conduct routine inspections and immediately report any unsafe conditions to your supervisor or instructor.



# Fall Protection – Controlled Access

**Fall hazards are present for crew and performers when they work around the open edge of rooftops, elevated platforms, and other unprotected elevated surfaces. There are times when the use of a conventional fall protection system will not work in these areas.**



As an example, the open edge of the stage is often treated as a controlled access area during construction-like activities including set construction, when the orchestra pit is lowered for equipment and material load in / load out tasks and during set deconstruction/strikes. When a fall hazard exists and conventional fall protection will not work, the area is deemed a controlled access area. A controlled access area requires the development of a Fall Protection Plan and monitoring of the area by a competent safety monitor skilled in fall hazard recognition.

## Controlled Access Requirements

1. Develop a written Fall Protection Plan for each area that will require controlled access.
2. Train personnel in the requirements of the Fall Protection Plan and controlled access requirements prior to allowing them to construct a controlled access area or work in or around a controlled access area.
3. Delineate the controlled access zone with one or more control lines or by other means that restrict access.
4. Post signs to warn unauthorized personnel to stay out of the controlled access zone.
5. Install the access control lines not less than 6 feet nor more than 25 feet from the unprotected or leading edge.
6. Run the access control line along the entire length of the unprotected or leading edge and parallel with that edge.
7. Securely anchor both ends of each access control line to a standard railing or wall.
8. Attach highly visible flags, or other material, to the access control lines at 6-foot intervals or less.
9. Support each access control line to ensure at its lowest point (including sag) it is not less than 39 inches from the working level and its highest point is not more than 45 inches from the working level.
10. Ensure the access control lines and supporting stanchions are strong enough to sustain the stress of not less than 200 pounds.
11. Assign a safety monitor who is skilled in fall hazard recognition to monitor the work within or near the controlled access area.
12. Ensure the safety monitor is present whenever personnel are working within or near the controlled access area.
13. Ensure the safety monitor has no other duties than monitoring personnel in and around the controlled access area.
14. Instruct all personnel to comply with all hazard warnings from the safety monitor.

**Duties of the Safety Monitor**

1. Warn personnel when it appears they are unaware of a fall hazard or are acting in an unsafe manner.
2. Stay within visual sighting distance of personnel being monitored.
3. Maintain communication with the personnel being monitored.
4. Never engage in behaviors that take your attention away from the monitoring task – refrain from unnecessary conversations – never use your mobile phone while on monitoring duty – never engage in other duties.
5. Restrict access to the area being monitored to personnel covered by the Fall Protection Plan.
6. Eject personnel from the area if they fail to comply with your fall hazard warnings.



# Fall Protection – Fixed Ladder



**A fixed ladder is permanently attached to a structure, building, or equipment. Fixed ladders are used throughout Performing Arts facilities to access elevated areas, such as fly lofts, the tension grid, and bridges/catwalks.**

When fixed ladders are constructed for use in outdoor performances, they must be constructed as specified in California Code of Regulations, Title 8, General Industry Safety Orders, Sections 3277 and 3278.

## General Guidelines

1. Participate in ladder and fall protection training prior to ascending fixed ladders.
2. Never use unprotected fixed ladders over 20 feet in length.
3. Remove all loose items from your pockets.
4. Maintain three points of contact with the ladder when climbing; two hands and one foot or one hand and both feet.

In certain cases, a ladder safety system must be used when using a fixed ladder. A ladder safety system is required for ladders that:

1. Exceed 20 feet in length and are not equipped with a cage and do not have rest balconies every 20 feet or fraction thereof.
2. Exceed 30 feet and are equipped with a ladder cage but do not have rest balconies every 30 feet or fraction thereof.
3. Have no off-set (rest balconies) ladder sections.

Cal-OSHA defines a ladder safety system as an approved assembly of components whose function is to arrest the fall of a user. The ladder safety system includes:

1. A carrier that is a flexible cable or rigid track to which the lanyard will be attached.
2. Permanent attachment of the carrier.
3. Associated attachment elements such as safety sleeve, full-body harness, and connectors.

## Ladder Safety System Fall Arrest Guidelines

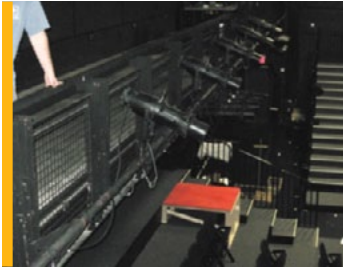
1. Only use full-body harnesses that are equipped with front or hip D-ring attachments.
2. Inspect all fall protection equipment prior to each use. Immediately report any damaged equipment to your supervisor or instructor.

3. Never use defective fall protection equipment.
4. Attach or tie-off any tools or equipment, including your hard hat, to your body when you need to transport items up or down the ladder.
5. Attach the front or hip D-ring to the carrier connection prior to ascending or descending the ladder.
6. Ensure the connections are compatible and secure, and the snap hook is closed and locked.
7. Disconnect from the ladder safety device to exit the ladder only after you are stable.
8. Never detach from the ladder safety system during an ascent or descent of the ladder until you are prepared to exit the ladder.
9. Allow the carrier connection to lead you down. Climbing down out of position will cause the carrier connection mechanism to lock onto the carrier.
10. Move upward slightly to release the carrier connection should it lock.
11. Never use the ladder climbing body harness for attachment to fly, tension, and other types of fall protection systems that require body harness D-ring attachment at the back of the harness. Change body harnesses prior to attaching to another type of fall protection system.

*Talk to your supervisor if you have any questions about this information.*



# Fall Protection – Outside the Catwalk



**Some activities, such as hanging and focusing lighting instruments or audio equipment, require working on installations located outside the guardrails of catwalks, tension grids, or work platforms.**

Working outside the guardrails, even if your entire body is not beyond the railing (leaning over, reaching through), greatly increases the risk of a fall. Falls from the catwalks and elevated areas can result in serious debilitating injuries or death. If there is a risk of falling, Cal-OSHA requires fall protection to mitigate that risk.

## Guidelines

1. Participate in and successfully complete fall protection training prior to working on, from, or beyond the guardrails of catwalks, tension grids and elevated work areas.
2. Only trained and authorized personnel using an appropriate fall protection system may work outside the guardrails of catwalks, tension grids, and elevated work areas.
3. Remove all loose items from your pockets prior to ascending to the elevated areas.
4. Tie-off or otherwise attach all tools to your person.
5. Use a fall protection system when working in these areas.
6. Inspect all components of the fall protection system prior to each use.
7. Wear a full body harness that has the D-ring attachment at the back.
8. Ensure the lanyard has a breaking strength of 5,000 pounds.
9. Select a self-retracting lanyard (SRL) whenever possible.
10. Never use any means to extend the length of the lanyard. Ensure the lanyard permits a maximum free fall distance of no more than 6 feet.
11. Ensure the lanyard is attached to an anchoring point that is capable of supporting 5,000 pounds. A guardrail is not a suitable anchorage point. Contact the EH&S Department if you are unsure of the anchoring points.
12. Choose an anchor point that is close to and behind you.
13. Ensure all connections are secure and the connections are closed and locked.
14. Practice using the attached SRL in these areas to ensure you are familiar with the tension and locking actions of the system.
15. Never allow the lanyard to cross the front of your body or wrap around your arm or leg.
16. Maintain your balance by avoiding quick or sudden movements in any direction that might cause line tension or locking.
17. Move back behind the guardrails and onto the catwalk, tension grid, or elevated work area prior to removing the lanyard and repositioning it to another anchor point farther away.
18. Move back behind the guardrails and onto the catwalk, tension grid, or elevated work area before removing the lanyard from the anchor point at the completion of a work activity.
19. Ensure personnel have been removed from the area beneath you.

*Talk to your supervisor if you have any questions about this information.*





## Fall Protection – Paint Frames

**Paint frames move through large floor openings from one level of the scene shop to another. The floor opening allows the paint frames to move vertically giving access to all areas of large backdrops and scenery pieces.**



The ability to move the canvas up and down reduces the risk of falls by reducing the need to use ladders to access the upper reaches of the canvas. However, the floor opening in the floor through which the paint frame moves poses trip/fall and fall hazards that could result in serious debilitating injuries or death.

There are two Cal-OSHA regulatory definitions that may apply to the opening for a paint frame system. A “floor hole” is defined as any opening measuring 12 inches or less in the least horizontal direction through which materials but not persons may fall. A “floor opening” is defined as an opening measuring 12 inches or more in its least dimension through which persons may fall. In both cases, floor holes and floor openings require either guardrails or covers to be in place to prevent tools or materials from falling into them and to prevent injuries to individuals working near the openings. In cases where guardrails or covers are removed and a fall risk is present, a fall protection system (harness, lanyard, anchor point, etc.) must be used to mitigate this risk.



### Safe Use Guidelines

1. Participate in fall protection training prior to working on or around the paint frame.
2. Keep the guardrails located in front of the paint frame floor hole in place at all times.
3. Never store items against the wall located behind the paint frame floor hole.
4. Keep the paint frame lowered to its lowest position when it is not in use.
5. Keep the covers/guards in place over the paint frame floor hole, where floor opening covers/guards are available, when the paint frame is not being used.
6. Wear approved fall protection when the guardrails are removed and the paint frame floor hole is exposed without the use of appropriate weight bearing covers/guards.
7. Require personnel working on the lower paint frame level(s) to wear hard hats when others are working on the floor above.
8. Never climb on the guardrails to gain access to a higher point on the canvas.
9. Never use a ladder on the upper paint frame level to gain access to a higher point on the canvas.
10. Never store items against the guardrails as they may fall through the floor opening and injure personnel on the lower level.
11. Check with the EH&S Department to determine if the lower level of the paint frame is a confined space and what steps, if any, must be followed to enter this level.

*Talk to your supervisor if you have any questions about this information.*



# Fall Protection – Portable Ladders

Portable ladders come in many shapes and forms. Portable ladder types include standard stepladders, two-way stepladders, platform stepladders, orchard ladders, trestle ladders, extension trestle ladders, extension ladders, articulating ladders, rolling steel ladders, and telescoping ladders.



Improper use of ladders can result in serious injuries; however, following basic safety rules can greatly reduce the risk of fall incidents.

## Maintenance/Condition

1. Inspect any ladder prior to use. Check for loose steps and rungs, cracked or split steps or side rails, loose or bent hinges, and missing ladder feet.
2. Never use a defective ladder. Mark defective ladder as “DEFECTIVE” and remove it from service. Advise your instructor/supervisor of the ladder’s condition.
3. Only complete ladder repairs as directed and specified by the manufacturer. Never make unauthorized repairs.
4. Check to ensure the OSHA required ladder information labels are in place.
5. Make sure the ladder is free of oil, grease, or other hazards.
6. Use only fiberglass or wood ladders when doing electrical work.

## General Safe Use of Portable Ladders

1. Check the ladder label to ensure the ladder is rated to support the combined weight of your body and the tools/materials you will be carrying.
2. Make sure stepladders are securely spread open. Never use a folding stepladder in an unfolded position.
3. Use ladders on stable and level surfaces only. Exception: articulating ladders are designed for use on multiple levels.
4. Ensure ladders are stable prior to mounting the ladder.
5. Always face the ladder when ascending or descending, and use three points of contact at all times (two hands, one foot/one hand, two feet).
6. Never stand on the top two steps of the ladder.
7. Keep your body within the rails of the ladder.
8. Never reach too far above or to the side of a ladder, as this may cause you to lose your balance.

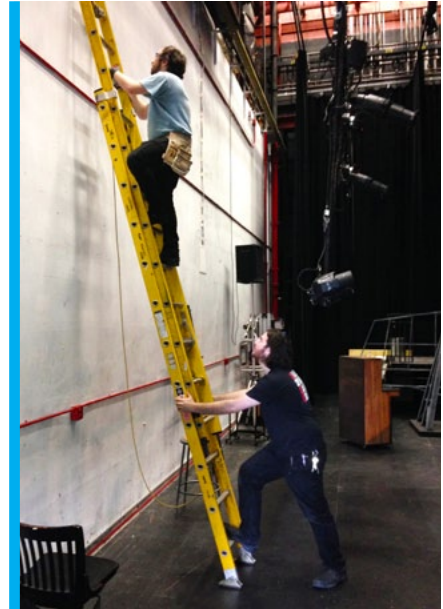
9. Move the ladder as needed to reach the desired work area.
10. Use a hand line, lift, or hoist to raise and lower heavy and/or awkward loads. Never carry in your hands while climbing a ladder.
11. Secure materials when using a hand line, lift, or hoist to prevent them falling out when being raised or lowered.
12. Never stand, walk, or work under a ladder while it is in use.
13. Store ladders away from doorways, exits, the edges of the apron or orchestra pit, traps, platforms, and tables.
14. Secure stored ladders with ropes or chains to prevent them from falling.

### Safe Use of Extension Ladders

1. Position extension ladders so the base to height ratio is 1 to 4 or 75 degrees. For example, the base of a 12-foot extension ladder is 3 feet away from the wall.
2. Ensure straight and extension ladders extend at least 3 feet beyond the landing surface.
3. Secure extension ladders at both the top and the base to prevent the ladders from moving from the points of rest. If this is not possible, have someone stand at the base of the ladder and secure it against slipping.

### Safe Use of Trestle and Articulating Ladders

1. Assemble and use a trestle and/or extension trestle ladder in compliance with the manufacturer's user guide.
2. Obtain the manufacturer's written permission and direction prior to modifying a ladder; i.e., never add after-manufacturer wheels or rollers to trestles or extension trestle ladders.
3. Ensure the extension section of an extension trestle ladder never exceeds the base section length.
4. Step down and off of "A" frame trestle ladders prior to moving them. Never ride the ladder.
5. Position and secure the ladder in compliance with the manufacturer's instructions, especially if it is equipped with manufacturer wheels.
6. Ensure the ladder is stable prior to mounting it.



*Talk to your supervisor if you have any questions about this information.*



## Fall Protection – Rooftop Restraint



Photograph courtesy of Safety Equipment Solutions.

**When working within 6 feet of the unprotected edge of a flat or low-pitched roof (maximum allowable pitch 4:12 slope) or around unguarded skylights, you must use fall restraint equipment.**

This equipment includes a full-body harness and a lifeline and an adjustable rope grab all attached to an appropriate anchorage point by a cross arm strap or other similar method.

**Note: Roof edges protected with a 42-inch guardrail (permanent or a temporary equivalent) or a 42-inch or higher parapet wall do not require the use of fall restraint equipment.**

### Guidelines

1. Consult with the EH&S Department and refer to the Campus specific Fall Protection Program for use procedures and training requirements.
2. Never perform tasks that require fall protection equipment until after receiving fall protection training and passing all other requirements specified in the Fall Protection Program.
3. Consult with the EH&S Department for fall protection guidance when introducing a new fall exposure.
4. Contact your instructor, supervisor, or the EH&S Department if you have any problems using the assigned fall protection devices.
5. Inspect all fall protection equipment prior to use.
6. Never use defective equipment.
7. Immediately report any damaged equipment to your supervisor or instructor.
8. Connect the lanyard to the D-ring located on the back of the body harness with a double-locking snap hook or self-locking carabineer.
9. Select an anchorage point that is capable of supporting 5,000 pounds.
10. Ensure the length of the lanyard combined with the location of the anchorage point will prevent you from falling over the edge of the roof.
11. Ensure you are properly attached to the fall protection system prior to positioning yourself for work.

*Talk to your supervisor if you have any questions about this information.*



# Fall Protection – Scaffolds/Elevated Work Platforms

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**Scaffolds and elevated work platforms are used in the performing arts for a variety of reasons. Cal/OSHA defines scaffolds as, “Any temporary elevated platform and its necessary vertical, diagonal, and horizontal members used to support workers and materials (also known as a scaffold tower).”**

All crew members must receive formal and documented training regarding how to assemble and work safely on scaffolding, and performers must receive formal and documented training regarding working safely on scaffolds.

## General Guidelines

1. Complete scaffold user safety training before working on a Performing Arts project that includes the use of a scaffold. A trained person with knowledge, prior experience, and the recognized ability to train users in scaffold assembly and use may provide scaffold user safety training.
2. Inspect all scaffolding parts before and after use.
3. Ensure the entire width of the scaffold platform is equipped with planking.

4. Ensure the planking is scaffold-grade or better wood when using wooden planking.
5. Immediately report any missing, broken, or defective scaffolding parts.
6. Use scaffolds only when they are constructed with the proper guardrails, mid rails, and toe boards (as appropriate).
7. Ensure toeboards are installed when work levels are 6 feet or higher above the ground floor and where persons are required to work or pass under the scaffold.
8. Ensure screens or other barriers are installed between the toeboards and upper guardrail if personnel will be passing under or near the scaffold.
9. Tie the scaffolding to a permanent structural support using heavy wire or tie-in devices.
10. Lock the wheels on rolling towers to prevent movement except when the tower is moved to a new location.
11. Keep scaffold loads within safe limits. Follow the manufacturer's or construction coordinators safe working load recommendations. Ask if you don't know the rated capacity.
12. Never use scaffolds where contact could be made with live electrical circuits or power lines. Always maintain safe clearance from any electrical source.
13. Immediately report any potentially hazardous conditions that become evident during operation.

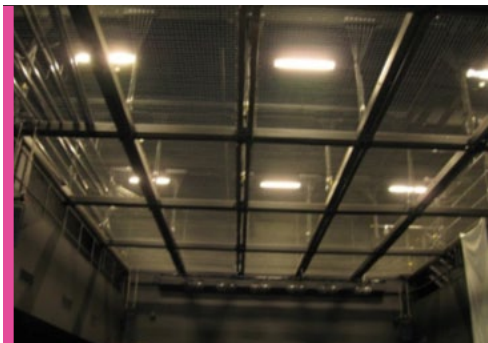
**Safe Use Guidelines**

1. Use a personal fall arrest system when working from boatswains' chair, catenary, float, needle beam, ladder, or pump jack types of scaffolding.
2. Wear a hard hat equipped with a chin strap when working on a scaffold.
3. Tie off your personal fall protection system to a permanent structure. Never tie-off to the scaffold.
4. Never climb cross braces. Use only approved access ladders or steps to climb the scaffolding.
5. Use both hands while climbing, and always maintain three points of contact.
6. Never exceed the maximum allowable persons in the platform.
7. Never stand on the scaffold guardrails.
8. Never place ladders or makeshift devices on top of scaffolds to gain greater height.
9. Never ride a moving scaffold.
10. Never jump down onto the platform.

*Talk to your supervisor if you have any questions about this information.*



# Fall Protection – Tension Grid



**The tension grid is modular wire grid system that provides access to theatrical lighting, audio cables, loudspeakers, and stage rigging. Any edge of the grid that is not attached directly to a wall must be equipped with guardrails.**

Guardrails must have a top rail that ranges between 42 inches and 45 inches above the grid floor and a mid rail approximately halfway between the top rail and the grid floor. The guardrails must be designed for a live load of 20 pounds per linear foot applied either horizontally or vertically downward at the top rail. The guardrails must also be equipped with toeboards that extend at least 4 inches above the grid.

## On the Grid

1. Only trained and authorized personnel may access and work on the tension grid.
2. Never enter the grid alone.
3. Always work with a spotter below when there is a risk of objects falling from the tension grid; i.e. during set-up and strike. The spotter should be positioned in a safe location to keep people out of the area below and warn those working on the grid of hazards or hazardous behavior.
4. Remove all items from clothing pockets prior to ascending to the grid.
5. Tie or otherwise secure tools to the worker.
6. Wear a hard hat equipped with a chin strap in low ceiling grid areas. Hoist the hard hat to the grid using a bucket and line system similar to getting other materials onto the tension grid; never wear it while climbing to the grid. Secure the hard hat to your head with the chin strap once you attain the grid.
7. Wear fall protection harnesses attached to the fall arrest system in accordance with the fixed ladder code of safe practice when using fixed ladders to access the grid.
8. Wear fall protection harnesses and properly anchored lanyard when working on lighting and other elements suspended outside of the tension grid.
9. Never drop ropes or electrical cables from the grid to the stage. Pull ropes and electrical cable up to the grid, coil them, and carry them down or lower them using a bucket and line system.
10. Never cut holes in the tension grid or otherwise physically alter the grid.
11. Never bounce on the tension grid surface.
12. Never exceed the weight load specified by the grid manufacturer.
13. Conduct routine documented inspections of the grid.
14. Immediately report hazards to your supervisor or instructor.

## On the Stage

1. Wear hard hats on the stage floor whenever personnel are working in the grid.

2. Install warning signs and barriers to prevent personnel from entering the area beneath the grid when there is a risk of objects falling from the grid; i.e., during set-up and strike.

*Talk to your supervisor if you have any questions about this information.*



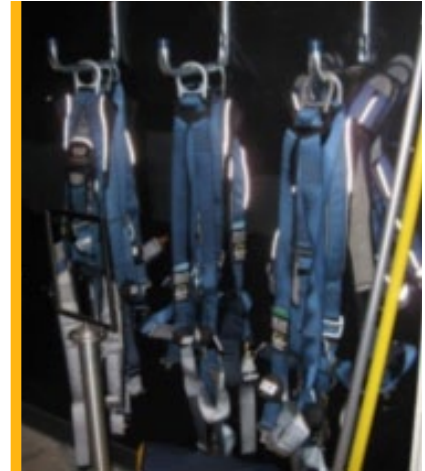


# Fall Protection – Trigger Heights

**Working at heights poses a risk of fall incidents. Falls from heights can result in serious debilitating injuries or death.**

Working at heights occurs in many performing arts activities and may include working on or from permanent structures (catwalks, tension grid systems), temporary structures (elevated scenic platform) or portable devices (ladders, mobile scaffolds, aerial work platforms). This code of safe practice discusses the trigger heights for fall protection requirements and general safety guidelines for working at heights.

Please keep in mind there is not one single trigger height that can be applied to all settings and all work activities. A review of regulatory requirements confirms that trigger heights vary depending on the code citation (Fed-OSHA or Cal-OSHA), workplace setting being evaluated (building or other elevated work location), and work activity being performed (construction or general industry work). Based on these differences, the heights can range significantly from 30 inches, 4 feet, 6 feet to 7.5 feet. Beyond these requirements, there may also be different trigger heights designated for certain special circumstances such as low slope roofs, aerial work platforms, fixed ladders, and erecting scaffolding.



Ensure you review the other Performing Arts Codes of Safe Practices that address specific areas of working at heights: controlled access, fixed ladders, portable ladders, working outside the catwalk, paint frames, rooftop restraints, and tension grids. All personnel must successfully complete fall protection and fall rescue training prior to working at heights. Keep in mind OSHA regulatory requirements represent the legal minimum standards. There may be situations where fall protection should be used at heights less than those mandated by the regulatory standards. As noted, fall protection and trigger heights can be a complex topic and consulting your EH&S staff for assistance is advised.

## **Guardrails Are Required**

Guardrails must be provided on all open sides of unenclosed elevated work locations, such as roof openings, open and glazed sides of landings, platforms, runways, ramps, or working levels more than 30 inches above the floor, ground, or other working areas of a building.

**EXCEPTIONS: There are some exceptions for loading docks, stages, and seating areas, and machine servicing areas, such as:**

1. On the auditorium side of the stage, raised platforms and other raised floor areas such as runways, ramps and side stages used for entertainment or presentation
2. Performing Arts galleries, balconies, or other such elevated seating locations where a 42-inch railing would obstruct the sight lines may be protected by a guardrail or other barrier of not less than 34 inches in height

provided that a horizontal concave safety ledge not less than 6 inches in depth and not less than 36 inches in effective width is installed beyond the railing at the balcony floor level. The safety ledge shall be designed to carry a live load of 100 pounds per square foot.

3. Elevated locations used infrequently by employees if the employees using them are protected by a fall restraint/fall arrest system used in accordance with the requirements in Article 24 of the Construction Safety Orders.

Contact the EH&S Department if you have questions regarding the use of fall protection systems

Fall Protection System is Required When:

The work exposes personnel to a fall of 7.5 feet or more. Types of fall protection systems include:

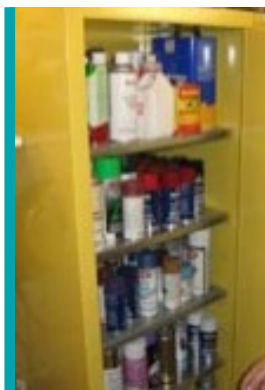
1. **Personal Fall Arrest Systems:** These systems consist of a horizontal life line or retractable lanyard secured to the back and above the person's waist to a harness. The life line (also known as a lanyard) must be anchored to a point capable of supporting at least 5,000 pounds per person. The life line itself must have a breaking strength of 5,000 pounds. The system is designed to limit the fall to 6 feet.
2. **Positioning Devices:** These devices consist of ropes and body harnesses that limit the fall to no more than 2 feet. The anchoring point must be capable of supporting twice the intended load or 3,000 pounds, whichever is greater.
3. **Personal Fall Restraint Systems:** These systems consist of body belts and harnesses attached to a life line that does not permit the user to move beyond the edge of the working area. The anchoring point must be capable of supporting 4 times the intended load.
4. **Approved Safety Nets:** These systems are used for working heights of 25 feet or more, only when personal fall protection or other conventional types of protection are not practical.

*Talk to your supervisor if you have any questions about this information.*



# Hazard Communication

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Various chemicals are used in all stages of a performing arts production. Some of the more common exposures include paints and solvents used in relation to scenery, production and set construction, fire retardants and paints applied to costumes, dry ice used for smoke/fog, oil-based and water-based fog fluids used for special effects, pyrotechnics, and makeup.

## Basic Guidelines

1. Consult with the EH&S Department and refer to the Campus-specific Hazard Communication Program, procedures, and training requirements.
2. Use personal protective equipment (PPE) per training and as specified by the Safety Data Sheets (SDS).
3. Label all secondary containers with the chemical's name and primary hazard warning.
4. Immediately report chemical spills if you are not a trained responder.
5. Ensure all chemicals are stored in appropriate containers and/or cabinets.

## Maintain An Organized Facility

1. Ensure the chemical inventory is updated on a regular basis, in accordance with the guideline set forth in the Hazard Communication Program.
2. Maintain a lean, well-managed chemical inventory
3. Evaluate storage methods to ensure incompatible chemicals are stored separately.
4. Provide appropriate storage cabinets for flammable and combustible materials.
5. Keep corridors free of hazardous materials at all times.
6. Keep containers, including hazardous waste containers, closed except when in use.

## Follow Safe Handling Procedures

1. Evaluate the hazards: Read the SDS before beginning work with a chemical.
2. Ensure appropriate PPE is available and used.
3. Never smell chemicals to identify them.
4. Understand the labels/pictograms associated with chemicals being used and proceed accordingly.
5. Label all secondary containers.

## Be Prepared

1. Clean up only small quantity spills if trained to do so. In the event of a large spill, clean up should be conducted by specially trained personnel. Inform your supervisor or shop manager of all spills.
2. Know the locations of emergency equipment and how to use it: telephone, first aid kit, fire extinguishers, eyewash and emergency shower, and spill kit (if applicable).

**Identify and Handle Hazardous Waste**

1. Regularly check hazardous material to identify:
  - a. Use
  - b. Expiration date
  - c. Labeling
  - d. Abandoned
  - e. Containers that once held chemicals
  - f. Unwanted material intended to be discarded or recycled
  - g. Handle hazardous waste as identified in the hazardous waste management program
2. Dispose of waste as directed by the product manufacturer and in accordance with the UC Hazardous Waste Management Plan.
3. Contact the EH&S Department for more information and guidance regarding hazardous and industrial waste management. They will provide guidance regarding:
  - a. Proper storage of the waste until it is collected
  - b. Proper labeling of the waste containers
  - c. Special handling requirements based on the hazard characteristics of the waste

*Talk to your supervisor if you have any questions about this information.*



# Heat Illness



**Heat-related illness is most often associated with outdoor venues; however, it is important to remember heat-related illnesses can also occur while working indoors when air conditioning is not available.**

Performers may be susceptible to heat-related illnesses as a result of wearing heavy costumes and/or exerting physical efforts under the stage lights. Heat illness is a serious medical condition resulting from the body's inability to cope with a particular heat load and includes sunburn, heat rash, heat cramps, heat syncope (fainting and dizziness), heat exhaustion, and life-threatening heat stroke.

## Basic Guidelines

1. Consult with the EH&S Department and refer to the Campus-specific Heat Illness Prevention Program, procedures, and training requirements.
2. Know the environmental conditions that increase the risk of heat illness, such as high air temperatures, high humidity, exposure to sun light, exposure to heat generating equipment, lack of air movement, physical exertion intensity and duration, and the clothing, such as personal protective equipment (PPE) or costumes.
3. Know the personal conditions that increase the risk of heat illness, such as medications, age, weight, physical fitness, alcohol consumption, caffeine consumption, water consumption, food, and other physical conditions.
4. Ensure shade is available when outdoor temperatures reach or exceed 85°F.
5. Ensure cool water is available throughout the work shift.
6. Learn to recognize the signs and symptoms of heat illness, such as rashes, muscle pains and spasms, dizziness, light-headedness, heavy sweating, headache, nausea or vomiting, paleness, fatigue, and weakness. Symptoms of heat stroke include red, hot, dry skin; very high body temperature; dizziness; nausea; confusion; strange behavior or unconsciousness; rapid pulse or throbbing headache.
7. Immediately summon emergency medical assistance for anyone exhibiting the signs and/or symptoms of heat exhaustion or heat stroke.

## Protect Yourself

1. Pre-hydrate and stay hydrated. Women: drink at least 9 eight-ounce glasses of water on a daily basis. Men: drink at least 12 eight-ounce glasses of water on a daily basis. It takes about three days to hydrate your body; so it is important to maintain the habit of drinking the minimum amount of water every day.
2. Drink at least one quart of water every hour.
3. Report to your supervisor or instructor immediately if water is not available.
4. Avoid caffeinated beverages that de-hydrate the body, such as coffee, tea, colas, and energy drinks.

5. Avoid alcohol as it dehydrates the body.
6. Eat lighter meals when working in hot conditions.
7. Pace yourself if you are not accustomed to working in warm or hot environments. Start work slowly and pick up the pace gradually.
8. Seek shade and/or a cool area to rest if you begin experiencing symptoms such as dizziness, headache, weakness, fatigue.
9. Loosen or remove PPE and heavy costumes whenever they are not needed.
10. Immediately report any heat illness symptoms to your supervisor or instructor.
11. Summon emergency medical assistance when necessary. While waiting move the person to a cool shady area, loosen or remove heavy clothing, provide cool drinking water, and fan the person.

*Talk to your supervisor if you have any questions about this information.*



# Housekeeping

**Work areas can become congested during production and performance processes. Maintaining a clean work environment is essential to the prevention of injury, fire, and chemical spill.**

Clutter can contribute to slip and fall injuries and struck by injuries and can increase the risk of fire. Everyone has a responsibility for keeping all areas of the Performing Arts facilities clean and orderly.



## Basic Housekeeping Practices

1. Clean-up work surfaces when finished or at least at the end of each work session.
2. Place tools and materials back in their proper storage location at the end of use or the end of the work session.
3. Sweep the floors at least daily; sweep more frequently when the work generates waste material that falls to the floor, such as scrap materials, threads, wood chips, and saw dust.
4. Use a brush to clear waste from work tables, work benches, and machinery. Never use your hands.
5. Ensure trash and recycle receptacles are properly labeled and available.
6. Empty trash receptacles at the end of each day.
7. Immediately clean up spills of any kind. Follow hazmat spill procedures for large chemical spills.
8. Maintain well-organized storage areas.
9. Ensure storage areas are clean, dry, and labeled.
10. Place small items, such as fasteners, staples, bolts, nails, screws, brads, hinges, glues, molding, sandpaper, buttons, thread spools, needles, scissors, and makeup in sealed containers.
11. Purchase only the quantity of materials needed; avoid purchasing excessive amounts that clutter storage areas.
12. Conduct routine inspections and immediately correct unsafe conditions and behaviors.
13. Conduct routine inventories, and dispose of unnecessary materials.

## Shop Housekeeping Practices

1. Avoid running power cords across or in aisles; use cord guards if necessary to reduce trip hazards.
2. Keep machines clean of all scrap materials.
3. Always sweep the floor clean of debris after each work session.
4. Avoid accumulating scrap lumber, metals, and other materials.
5. Secure stored plywood, lumber, metal, and plastics in a manner that prevents the stored items from falling.
6. Hang or otherwise secure ladders.
7. Store power tools with the power cords coiled.

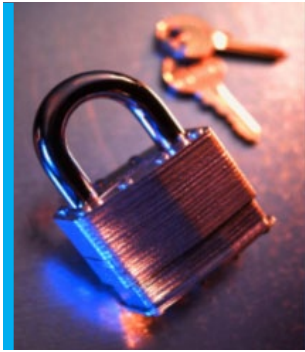
8. Store power tools in their custom storage cases when such cases are available.
9. Never store flammable or combustible materials in the dimmer room.
10. Ensure sawdust collection systems are properly positioned and functioning properly.
11. Empty sawdust collection systems in accordance with the manufacturer's specifications to ensure they function properly.
12. Replace ventilation hood filters in accordance with the manufacturer's instructions.
13. Dispose of hazardous and industrial waste in accordance with the University's Hazardous Waste Program procedures. Call the EH&S Department if you have questions.

*Talk to your supervisor if you have any questions about this information.*





# Lockout/Tagout



**Lockout/tagout/blockout (LOTO) is a method of preventing equipment from being set in motion and endangering workers. Failure to properly isolate and de-energize energy sources can be fatal. Compliance with the University's LOTO policy is mandatory for your protection and the protection of others.**

The application of lockout/tagout/blockout is often limited to electrical energy. It is critical for your safety to remember that power sources include mechanical, hydraulic, pneumatic, chemical, thermal, and other energy sources. Other energy is often stored energy, such as in electrical batteries, capacitors, and springs. Even gravity presents a form of energy.

## General Guidelines

1. Consult with the EH&S Department and refer to the Campus-specific LOTO Program, procedures, and training requirements.
2. Apply LOTO procedures whenever adjusting, servicing, or maintaining any power tool or machine. Examples include whenever the blades or attachments on power tools or machinery must be changed, whenever a guard or safety device must be removed or by-passed, whenever you will place any part of your body where it might be caught in moving machinery, or whenever the unexpected movement of the machinery or tool could cause injury.
3. Identify all sources of energy supplying the tool or machine prior to starting the procedures.
4. Ensure you have the appropriate lockout/blockout devices, locks, and tags.
5. Never assume when the power switch is in the "off" position there will be no movement. Dissipate all residual energy prior to beginning the service or repair work. Ask your instructor or supervisor if you do not know how to do this procedure.
6. Ask your supervisor or instructor if you are unsure of how to proceed.

## Applying Energy Controls

1. Notify others in the area that you are shutting down and locking out the tool or equipment.
2. Shut down the tool or machine using its on/off switch and normal shut-down procedures.
3. Bleed, drain, and clear all steam, air, gas, and hydraulic lines to ensure there is no residual energy.
4. Release and block any mechanism under load or pressure.
5. Apply the lockout devices and/or blockout devices, as well as the locks and tags. Unplug tools and equipment equipped with a power cord; apply a clamp-shell cover to the plug. Remember some machinery and power tools have more than one source of energy; ensure all energy sources are de-energized and lockout.
6. Fill out the tags: name of person performing the lockout, reason, and date.

7. Test the on/off switch to verify there is no movement or energy release.
8. Keep the keys to the lockout devices on your person at all times.

**Removing Energy Controls**

1. Only the personnel who applied the LOTO may remove the LOTO. See your supervisor for exceptions.
2. Remove all tools, parts, and scrap.
3. Ensure the system is fully assembled, and all guards and safety devices have been restored.
4. Notify personnel in the area that you are re-energizing the tool or machine.
5. Remove the locks, tags, and lockout/blockout devices following manufacturer's checklist to re-energize.
6. Make another visual check to ensure everyone is clear prior to starting the tool or machine.
7. Never remove a lock until you are absolutely sure that it is completely safe to do so.

*Talk to your supervisor if you have any questions about this information.*



# Material Handling – Forklift Safety

**The use of forklifts and other powered material handling equipment, such as pallet jacks and other motorized hand and hand/rider trucks, poses injury hazards for the operators and those working in the area where the equipment is in use, and it poses the risk of damage to the building and materials.**



Operating forklifts and other powered industrial material handling equipment requires training and employer authorization. The following guidelines are not a substitute for obtaining the required training and authorization.

## General Safe Operating Guidelines

1. NEVER attempt to operate a forklift or other powered industrial equipment until trained and authorized to do so.
2. Complete and document a pre-use inspection. If the vehicle is used over the course of multiple shifts, complete the documented inspection at the top of each shift.
3. Never operate a faulty vehicle. Tag it out of service, remove the keys, and report the problem to your supervisor.
4. Never engage in stunt driving or horseplay.
5. Always look in the direction of travel.
6. Never drive the vehicle up to anyone standing in front of a bench or other fixed object.
7. RAMPS:
  - a. For forklifts:
    - i. Keep the load up grade when ascending or descending ramps,
    - ii. Tilt the load back, and
    - iii. Raise the forks only as far as necessary to clear the traveling surface.
  - b. For motorized hand and hand/rider trucks, keep the load down grade at all times.
8. Only the driver may ride the vehicle, unless the manufacturer designed the vehicle to accommodate more than one rider.
9. Never ride on the forks of a lift truck.
10. Never ride on the load being moved.
11. Barricade the area and assign spotters to keep personnel out of the area when the forklift is in use.
12. Never permit anyone to stand, pass, or work under the elevated portion of any industrial truck, whether it is under load or empty.
13. Prior to **LOADING AND UNLOADING** trucks and trailers:
  - a. Ensure the vehicle to be loaded or unloaded has been turned off.

- b. Ensure the wheels of the truck or trailer have been properly secured with chock blocks or other device that prevents movement, such as a dock lock.
  - c. Ensure trailer nose stands are fully engaged if the tractor has been removed.
14. Park the forklifts and/or other motorized industrial trucks in designated parking areas when they are not in active use.
15. When parking the vehicle, set the brake, move the mast to a vertical position, lower the forks to their lowest position.

*Talk to your supervisor if you have any questions about this information.*



# Material Handling – Loading and Unloading



**Loading and unloading material from trucks, trailers, and storage shelves presents unique risks to the operators of motorized industrial trucks, such as forklifts and hand and hand/rider trucks. Serious injury and death have been known to occur during loading and unloading operations.**

## General Safe Guidelines

1. NEVER attempt to operate a forklift or other powered industrial equipment until trained and authorized to do so.
2. Prior to loading and unloading trucks and trailers, complete the following whether the truck/trailer is at a dock or in the yard:
  - a. Ensure the vehicle being loaded or unloaded has been turned off.
  - b. Ensure the wheels of the truck or trailer have been properly secured with chock blocks or other device that prevents movement, such as a dock lock.
  - c. Ensure trailer nose stands/jacks are fully engaged if the tractor has been removed.
  - d. Walk the floor of the truck/trailer prior to beginning loading operations to identify floor defects and weaknesses.
3. Designate a “driver waiting area” to keep drivers out of the area of the loading/unloading operations.
4. Obtain portable lights if necessary to ensure the interior of the truck/trailer is well lighted and visible during loading and unloading operations.
5. Shrink wrap palletized loads to prevent the loads from shifting during movement.
6. Never drive a forklift into an elevator unless trained to do so and the elevator is rated for the load (this includes the weight of the driver, the forklift, and the load on the forklift).

## Dock Safety

1. Ensure the edges of loading docks are marked.
2. Install dock barriers, such as chains equipped with signs, to warn drivers and pedestrians of the dock fall hazards.
3. Use dock boards or plates to bridge the gap between the dock and the trailer.
4. Get assistance to move the dock board/plate into place where automated dock plates are not in use.

## Loading/Unloading in the Yard

1. Install traffic cones to delineate the travel path from the vehicle being loaded and the area where the load is being deposited.

2. Post additional signs to warn pedestrians away from the area.
3. Ensure the delineated traffic area is large enough to allow the forklift operator to lower the load and turn into the direction of travel.

### **Loading and Unloading Storage Shelves**

1. Label the storage shelves/racks with their weight bearing capacity. Never exceed this capacity.
2. Ensure the storage shelves/racks are anchored to the ground.
3. Never place a pallet into storage racks if it is too short to fully engage both of the rack rails.

*Talk to your supervisor if you have any questions about this information.*

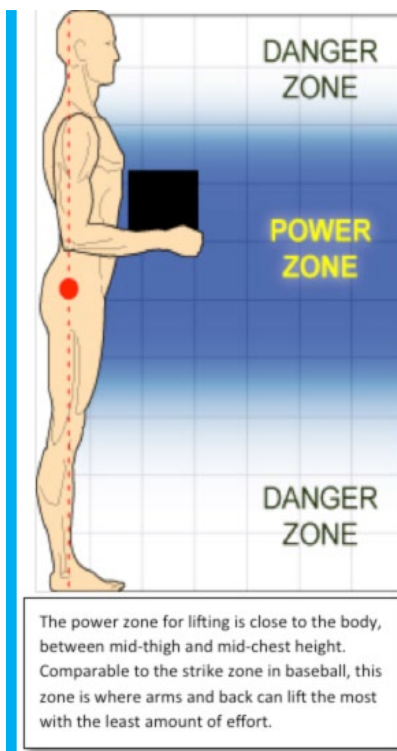


# Material Handling – Safe Lifting and Moving Materials

Performing Arts work involves a lot of lifting and moving of items. Improperly lifting items increases the risk of injury.

## Hazards exist when:

1. Moving lumber and platforms
2. Setting up scenery
3. Placing ramps and welded structures on stage
4. Lifting and placing counterweights in arbors
5. Pushing and pulling wagons and possibly orchestra shells
6. Pulling curtains
7. Lifting lighting instruments
8. Unloading pallets and trucks
9. Lifting AV equipment
10. Moving choir risers
11. Lifting costumes or boxes of accessories



## Before You Even Consider Lifting or Moving Materials

How you lift and move is just as important as what you lift or move. Even a light load can cause injury if handled improperly. Before you start a lift or move materials:

1. Warm up your muscles.
2. Assess the object(s) to be moved noting size, weight, shape, and balance.
3. Assess and clear your path of travel before moving an object.
4. Use a mechanical aid such as a cart or dolly whenever possible.
5. Never perform unnecessary lifts. If a cart or dolly is not available, ask a co-worker for assistance if needed.
6. Wear sturdy footwear to ensure secure footing.

## Lifting Tips

1. Stand as close as possible to the object you are going to lift.
2. Position your feet shoulder width apart with one foot slightly behind the other.
3. Squat down to the load. Bend at your knees, not at your waist.
4. Grip the object firmly with both hands (not just your fingers) and keep

- your arms and elbows tucked in close to your body.
5. Use handles, if provided.
  6. Tighten your stomach muscles as you grasp the load securely (but don't hold your breath!).
  7. Maintain a comfortable position, keeping the normal curve of the lower back.
  8. Keep your head and chin up as you lift.
  9. Lift with your legs; they are the strongest muscles.
  10. Lift smoothly and keep the load close to your body.
  11. Avoid twisting your body while lifting or carrying objects. If you need to change directions, move your feet in the direction of travel.
  12. Avoid storing heavy items above shoulder level or below knee level, if possible.
  13. Modify work practices so workers perform work within their power zone (i.e., above the knees, below the shoulders, and close to the body).

### **Pushing and Pulling Tips**

1. Always keep the load close.
2. Push rather than pull the load whenever possible.
3. Tighten your stomach muscles before and as you push – this gives support to your back.
4. Bend your knees to help maintain the natural curve of your spine.
5. Maintain the alignment of your shoulders and hips (avoid twisting).
6. Keep your hands aligned with your wrists and forearms; avoid bending your wrists.
7. Lean toward the object being moved when pushing, and lean away from the object when pulling.
8. Use the power of the large muscles of your legs rather than your back to move the load.
9. Place your hands near the outer edges of the cart's handle to provide turning leverage; but keep your hands within the parameter of the handle to reduce the risk of crushing your hands.
10. Use a power grip on the handle if its design allows. A power grip is when the palm and fingers are in contact with the handle. Applying ergonomic grips to handles can reduce grip force.
11. Use a cart equipped with well-functioning wheels; undamaged tire surfaces, lubricated components, and properly inflated pneumatic tires (when present).
12. Ensure the casters are rated for the weight being transported. Consult with your vendor for specifics regarding caster selection.
13. Plan the transport by mapping out pathways with fewer inclines, traffic, and obstructions. Sweep the travel path to reduce debris that may interfere with the smooth rolling of the wheels of the material handling device.
14. Use a cart with large wheels when moving the load over uneven or rough surfaces.
15. Keep the load in front of you and use caution when negotiating a slope; whether uphill or downhill. Assistance may be required to negotiate a slope, depending on the grade.
16. Use material handling equipment equipped with a hand break when moving heavy materials down a steep or long slope.
17. Never move a load that feels too difficult for you to handle. Seek assistance or break the load up into smaller, more manageable sizes.
18. Never exceed the load bearing capacity of the material handling device being used.

*Talk to your supervisor if you have any questions about this information.*





# Paints, Dyes, Inks



Paint and glaze materials are standard for scene and prop shop painting activities, as well as the use of pure pigments for mixing into the glaze, dyes for French enamel varnish (FEV) work, bronzing powders, and gold leaf. Paints, dyes, and inks are commonly used in costume design. Dyes are often used to change the color of the hair of performers and wigs.

## General Guidelines

1. Know the location of the nearest emergency eyewash station, first aid kit, and fire alarm pull boxes.
2. Know the location of the nearest fire extinguisher, but only use it if trained in its proper use.
3. Review the product Safety Data Sheet (SDS) prior to using a product for the first time or for a material that is infrequently used. Follow the stated safety precautions.
4. Never use paint thinner to remove paint, dye, or ink from your skin. Only use materials specifically formulated to remove paint, dye, or ink from skin.
5. Maintain good housekeeping practices:
  - a. Maintain clean and organized paint, dye, and pigment storage and use areas.
  - b. Clearly label the containers.
  - c. Immediately clean up spills.
  - d. Never allow paint, chemicals, or other materials to accumulate on shop floors, shelves, or stage floors; under platforms; or in other work areas where they do not belong.
  - e. Store flammable and combustible materials in NFPA-approved storage cabinets.
  - f. Properly dispose of all hazardous waste in a timely manner in accordance with the Campus-specific hazardous waste disposal procedures.
  - g. Never dump chemicals down the sink, storm drain, or septic systems or in the trash.
  - h. Keep floors swept clean of debris.
  - i. Remember, the lack of appropriate housekeeping increases the risk of chemical exposure.
6. Never eat, drink, or prepare foods or beverages in areas where chemicals are used or stored.
7. Wash your hands prior to eating, drinking, preparing food, or smoking.

## When Working With Powdered Materials

1. Use water-based products if available.
2. Select pre-mixed paints and dyes when available.
3. Measure, mix, and handle powders in a designated and contained glove box or in a hood equipped with local exhaust ventilation.

4. Wear chemically resistant gloves to protect your skin and protective clothing, such as a lab coat, to protect your clothing.
5. Wear chemical goggles when using caustic dyes and other corrosive chemicals.
6. Wear a dust mask if using large amounts of powdered dye.
7. Ensure the container is tightly sealed after dispensing the material.
8. Damp mop or sponge to clean floors and spilt powders.



### When Working With Liquids and Aerosols

1. Wear safety glasses when applying paints and dyes.
2. Wear protective clothing, such as painter's coveralls and a painter's cap to keep paint out of your hair and off your scalp.
3. Ensure the room is properly ventilated; use fans if necessary to move the fumes and vapors out of the area and away from your breathing zone.
4. Use a ventilation hood when applying aerosol paints and dyes.
5. Use the appropriate respiratory protection device when applying aerosol paints and dyes whenever appropriate ventilation is not available.
6. Wear chemically resistant gloves when your hands will come into contact with the dyes, such as when wigs and human hair is dyed.

### Waste Disposal

1. Dispose of waste paint, inks, and dyes as directed by the product manufacturer and in accordance with the UC Hazardous Waste Management Plan.
2. Contact the EH&S Department for more information and guidance regarding hazardous waste management. They will provide guidance regarding:
  - a. Proper storage of the waste until it is collected
  - b. Proper labeling of the waste containers
  - c. Special handling requirements based on the hazard characteristics of the waste

*Talk to your supervisor if you have any questions about this information.*



# Personal Protective Equipment

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**Personal protective equipment (PPE) includes all types of equipment used to reduce the risk of injury while performing potentially hazardous tasks. PPE may include eye and face protection, head protection, foot protection, hand protection, respiratory protection\*, and fall protection\*.**



Your supervisor or instructor will identify the PPE you will be required to use and will communicate the requirements for its use.

## General Practices

1. Wear the PPE assigned to you in the manner it is meant to be used.
2. Inspect the PPE prior to wearing it, and immediately replace damaged PPE.
3. Clean and sanitize PPE as instructed by the manufacturer and your supervisor and after each use.
4. Keep PPE for personal use clean, and store it a manner to keep it clean.
5. Comply with all posted PPE safety and instructional signs.
6. Consult the EH&S Department and refer to the UC PPE Policy and Campus-specific PPE Program, procedures, and training requirements.

## Eye and Face Protection

1. Wear the appropriate eye and face protection for the task.
2. Wear safety goggles or safety glasses and/or a face shield when the work will likely generate flying debris.
3. Wear chemical splash goggle when working with hazardous liquids.
4. Wear a welding helmet when welding.
5. Wear goggles or face shield equipped with the appropriate level of shading when using a torch to solder or braze.

## Head Protection

1. Wear a hard hat equipped with a chin strap when working in areas where there is a potential for injury to the head from falling objects or low head clearances.
2. Wear a painter's hat or hair net when painting to keep paint out of your hair and off your scalp.

## Foot Protection

1. Wear safety shoes when working in areas or on tasks where there is a danger of falling objects, rolling objects, or objects that may pierce the sole of the shoe. Safety shoes have a protective toe box and a protective shank in the sole to prevent piercing.
2. Wear safety shoes with non-conductive soles when the task may pose an electrical hazard.

### **Hand Protection**

1. Wear the appropriate glove for the task to protect your hands from cuts, burns, harmful physical or chemical agents; i.e., chemical-resistant gloves for working with chemicals; leather or canvas work gloves for handling materials with rough edges.
2. Never wear gloves where there is a danger of them becoming entangled in moving machinery or power tools.

### **Hearing Protection**

1. Wear hearing protection devices when exposed to continuous or intermittent high noise levels.
2. Wear hearing protection devices appropriately to achieve the anticipated level of protection.

\*These topics are covered in separate codes of safe practice.

*Talk to your supervisor if you have any questions about this information.*



# Respiratory Protection

**Respiratory protection is mandated by Cal-OSHA for some exposures and may be a good option and prudent approach to further reducing exposures even when not required to do so by the regulations.**

Respiratory protection devices may include N-95 masks (disposable “dust” masks), half-face air purifying masks (reusable elastomeric masks with cartridges and filters for different contaminants), or a self-contained breathing apparatus (SCBA). The type of respiratory protection device needed will depend on several variables including the toxicity of the material, length of exposure, and engineered control measures. Use of respiratory protective equipment requires initial coordination and consultation with the EH&S Department and must follow the requirements of the Campus-specific Respiratory Protection Program. These requirements include training in the proper selection and use of respirators, understanding the nature of the air contaminant (gas/vapor or particulate), an evaluation of the concentration and duration of potential exposure, medical certification, and fit testing in the particular type of respirator you will be using.



## General Guidelines

1. Consult with the EH&S Department and refer to the Campus-specific Respiratory Protection Program for use procedures and training requirements.
2. Never perform tasks that require respiratory protective equipment until after receiving respiratory protection training and passing all other requirements specified in the Respiratory Protection Program.
3. Consult with the EH&S Department for respiratory protection guidance when introducing a new chemical product.
4. Contact your instructor, supervisor, or the EH&S Department if you have any problems using the assigned respiratory protection devices.

## Respiratory Use

1. Never enter an area that is suspected of having an oxygen deficiency.
2. Inspect the respiratory protection device for defects before each use.
3. Never wear a defective respiratory protection device.
4. Wear respiratory protective equipment appropriate for the exposure as required by law or by EH&S.
5. Wear N-95 dust masks when performing tasks that generate sawdust.
6. Ensure there are no items or materials, such as facial hair, long hair, a respirator strap, etc., between a tight fitting respiratory protective device and the sealing surface of the face. A good fit and seal must be obtained for the mask to function properly.

7. Complete a positive and negative user seal check after donning a tight fitting respirator to ensure the device is properly placed and sealed against the skin.
8. Follow guidance provided by EH&S for changing respirator cartridges and filters used to remove gases and vapors. Gas/vapor cartridges and filters should be changed before chemical breakthrough occurs, meaning the cartridge or filter should be changed before it becomes saturated and the chemical enters the mask
9. Immediately leave the exposure area if you smell or taste the contaminant the respirator was supposed to remove. Inform your supervisor and consult with EH&S on how to correct this problem.
10. Replace particulate filters and pre-filters designed to remove particles (dusts, mists, etc.) if breathing through them becomes difficult. Immediately report to your instructor or supervisor if changing the particulate filters or pre-filters does not relieve breathing difficulty.
11. Dispose of N95 dust masks according to guidance provided by your supervisor or EH&S or when they become damaged or excessively dirty.
12. Clean re-usable respiratory protection equipment in accordance with the manufacturer's instructions.
13. Never share respiratory protection devices with other users until the devices have been cleaned, sanitized, and dried in accordance with the manufacturer's instructions.
14. Store cleaned and sanitized respiratory protection devices in a manner that keeps them clean and in good condition. Store them in a sealed bag or container where they will not get deformed, away from extreme heat, sunlight, dirt, and debris. Do not hang them on a hook in the shop near your workbench.

*Talk to your supervisor if you have any questions about this information.*



# Rigging – Counterweight Fly Systems

The rigging system is designed to support or move (“fly in and out”) items that are associated with the production. The items flown may include scenery, lights, equipment, and people.



The combination of equipment and materials supported by the rigging system can weigh hundreds to thousands of pounds. Flown items are located above the stage and may be flown over the audience; therefore, the lives of cast, crew, and the public can be put at great risk if a component fails or there is a failure to operate the system correctly.

There are many variations and combinations of rigging systems including hemp, counterweight, and motorized. Each theater will have unique design features associated with the rigging system and

in many cases, a combination of these systems will be used to meet the overall needs of a production. Individuals involved with operating the rigging system must be trained regarding their specific roles and responsibilities. The following guidelines are a general overview of those roles, responsibilities, and safe practices. These guidelines are designed to be used in conjunction with hands on facility training. NEVER use these guidelines in place of formal hands-on rigging training. Ensure rigging training is specific to the individual theater in which you are working and the installed rigging system used.

REMEMBER...lack of proper training and attention while operating a rigging system can be extremely dangerous and may result in death.

## Crew Responsibilities

**Flyman:** The lead or head flyman is responsible for the supervision and oversight of the entire flying operation including directing the loading and unloading of counterweights, scenery, and equipment. The flyman also operates the rigging system during the performance and is responsible for maintaining the rigging system use log.

**Loaders:** The crew members who work on the bridge to load and remove counterweights from the rigging system. This work is conducted under the direction of the head flyman.

**Stage Crew:** The stage crew is directed by the technical director, or in some cases, the lead carpenter or lead electrician. They are responsible for loading and unloading lowered battens (pipes) with scenery, lights, and equipment. The head flyman gives direction to the stage crew regarding when to attach or remove scenery, lights, and equipment. The lead for the stage crew acts as spotter and is responsible for ensuring the stage area around a moving piece is clear and the piece being loaded or unloaded will not strike or interfere with other battens, scenery, curtains, lights, etc.

**Performers:** Some productions require the flying of performers. The performers have a responsibility to follow the

direction of the flyman, knowing how to use their fall protection, and conducting a personal inspection of their fall protection equipment.

### General Safe Work Practices

1. Complete documented training for all individuals authorized to operate the rigging systems and rigging system components. Ensure the training includes their roles, their responsibilities, the rigging system they will work with, how to tie the required knots, their required personal protective equipment, and the fall protection systems they will be required to use.
2. Change counterweights and attach and remove scenery, lights, and other equipment only under the direction of trained and knowledgeable flyman, loaders, and stage crew.
3. Use the designated fall protection equipment associated with the loading bridge. This may include a passive guardrail and chain or an active fall restraint/arrest harness, connector, and anchorage point.
4. Maintain good housekeeping on the loading bridge area. Keep stacks of weights on the loading bridge below the height of the toe board.
5. Ensure all rigging personnel know how to recognize and report line sets that seem out of balance or difficult to move or when rigging systems make unusual noises during operation. These may all be indications of significant problems that need to be addressed immediately.
6. Conduct routine documented inspections of the fall prevention systems. Include the guardrails, as well as, the fall protection equipment.
7. Conduct documented rigging system inspections. Ensure in-house inspections are conducted by trained personnel at least annually. Ensure a documented inspection is conducted by an independent rigging professional every three to five years based on use or noted problems.
8. Create a rail log binder for the rigging system. Ensure the binder:
  - a. Includes the equipment manufacturer, date of installation, and the installer.
  - b. Lists problems, repairs, and component replacements for each line set.
  - c. Documents all rigging system equipment inspections.
9. Develop communication systems, including warnings and work phrases, to be used by all individuals on-stage and on the overhead grid. Ensure cast and crew are trained regarding the communications.
10. Ensure all crew use the established warning system even if no one is visible on the stage or grid.
11. Post a sign on the loading bridge that provides information regarding the weight of various sized counterweights and maximum capacity of weight not to be exceeded on any given line set.
12. Post signs warning crew not to stack counterweights higher than the toe board.

SET	LIVE LOAD	TOT. LOAD
GENERAL PURPOSE	2050 lbs.	2350 lbs.
6" SETS	2220 lbs.	2520 lbs.
LIGHTING LADDERS	1800 lbs.	2675 lbs.
TAB MASKING	1500 lbs.	1700 lbs.
COUNTERWEIGHT		
4" WIDE X 1" THICK	= 14.02 lbs.	
4" WIDE X 2" THICK	= 28.04 lbs.	
6" WIDE X 1" THICK	= 2173 lbs.	
ROPE LINE KEY		
SHORT LINE	170'	YELLOW
SHORT MID. LINE	182'	RED
MID. LINE	194'	GREEN
LONG MID. LINE	206'	BLUE
LONG LINE	218'	BLACK

### Set Up

1. Reduce the noise during rigging construction to ensure communications between the flyman, loaders, and the stage crew can be heard.
2. Announce when weight changing has started and finished.
3. Position a spotter on the floor to keep people from walking in the vicinity of the counterweight arbors while weights are being loaded or unloaded above.
4. Shout a loud warning should a line set run free. Remove yourself from the area and take cover. Leave the stage area immediately and drop and cover if you are on the loading bridge. DO NOT try to stop the runaway line set.



5. Use spotters when test flying scenery and have them in place before unlocking the break or initiating the rigging system.
6. Use two people to load and unload counterweights on the loading bridge. Designate one individual to load/unload the weight and one individual to hand the weights to the other.
7. Only transfer weights from one person to another above the loading bridge; never hand off the weight over the open space above the arbors.
8. Load the batten first and the arbor second.
9. Identify each line set on the lock rail and document what is on each line.
10. Place spreader plates or spreader bars on the rods of the arbor every two feet between stacks of counterweights.
11. Always secure a lock plate on the top of a counterweight stack and tighten the thumbscrews.
12. Always lock the brake and apply the locking ring to a line set prior to leaving it.
13. Never lock an unbalanced line set.
14. Load one line set at a time.

### **During Rehearsals and Performances**

1. Check to ensure the performer's fall protection system is properly assembled and secured.
2. Move line sets only on cue. Doing so too early or too late could cause severe injury to persons or damage property on stage.

### **Strike**

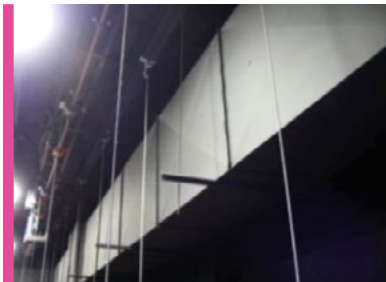
1. Reduce the noise during the striking of the flown scenery, equipment, and other materials to ensure communications between the flyman, loaders, and the stage crew can be heard.
2. Unload the arbor first and the batten second.
3. Unload one line set at a time.
4. Lower the batten to the lowest position for unloading.

*Talk to your supervisor if you have any questions about this information.*



# Rigging – Hoists and Winches

**Hoists and winches are used to move all types of materials and equipment such as scenery, platforms, flying individuals, operating fire safety curtains, moveable lighting instruments, and hoisting trusses.**



Employees and students must receive formal and documented training on proper use and safe operation of the equipment prior to use.

The following codes of safe practices are general guidelines. Each motorized device has a manufacturer's manual that contains information about the intended use and design of the device, load specifications, and instructions on safe operation.

1. Never exceed the hoist's lifting capacity; check to ensure the capacity is stenciled on both sides of the hoist.
2. Determine the allowable weight of the load by checking the manufacturer's information.
3. Ensure the allowable weight is clearly labeled on the hoist/winch and support beam.
4. Select the proper rigging gear. Ensure it is within the Safe Working Load (SWL) of the web sling or wire rope being used.
5. Inspect the rigging gear prior to use. Look for signs of wear and/or damage, such as broken wires, separation in the wire or strand, flattened wires, signs of chemical etching, rust, or other unusual conditions.
6. Replace and discard wire rope when even one broken wire is observed at any point in the rope.
7. Check emergency stops and brakes for efficiency and safety.
8. Only use a hoist hook equipped with a safety latch that closes the throat of the hook.
9. Lock out and tag out the equipment if it is defective, malfunctions, or needs repair, and report these details to your supervisor or instructor immediately.
10. Never exceed 45 degrees on the sling angle, as this will put too much tension on the sling.
11. Conduct all lifting operations so no one would be injured if there were an equipment failure.
12. Never leave a suspended load unattended.
13. Never pass a load over coworkers or allow anyone to walk under the load unless appropriate safety measures are in place.
14. Require all students and employees working in the area to wear personal protective equipment appropriate to the hazard, including hard hats, eye protection, hearing protection, and gloves.
15. Talk to your supervisor or instructor if you have any unanswered questions as to capacity, loads, applications, or movement.

*Talk to your supervisor if you have any questions about this information.*



# Rigging – Ropes, Cordage, and Chains

If you use rope, cordage, or chains, it is important to understand how to use and properly care for these materials. Ropes and cordage are used to operate the rigging mechanisms and to hoist materials and/or equipment to overhead platforms.



No matter what it is made of, it still requires maintenance and safe operation. Chains are used to support, lift, and attach materials and equipment such as curtains, rigging equipment, lighting, etc.

## Fiber Rope

1. Make sure the rope is aligned so it doesn't abrade on metal housing or other metal parts of the rigging system.
2. Inspect the rope prior to use. Look for signs of wear, crushing, fibers shedding, rips in the covering jacket, breaking of the internal core, parts of the rope becoming unbraided, and breaking of the shell.
3. Smell the rope to check for rope rot.
4. Never drag a rope as this action damages the outer fibers and leads to the eventual deterioration of the rope's overall strength.
5. Avoid kinking the ropes. This strains the rope and overstresses the fibers.
6. Never knot two ropes together. Talk to your supervisor or instructor if rope splicing is required. Splicing is forming a semi-permanent joint by partly untwisting then interweaving the rope's strands.
7. Never allow rope to freeze.
8. Always store the rope away from heat, moisture, chemicals, rodents, and sunlight.
9. Use gloves to protect your hands from splinter-like fibers.
10. Check with your supervisor or instructor when a rope is shedding an excessive amount of fibers to see if there is a problem with the process or you are required to use a respirator during that activity.

## Wire Rope

1. Inspect the length of the rope for signs of:
  - a. Friction or obstructions
  - b. Wear
  - c. Kinking
  - d. Deformation
  - e. Broken wires – replace the rope if even one wire is broken.
2. Report damaged wire rope to your supervisor immediately.
3. Use gloves to protect your hands from broken wires.
4. Apply the U-bolt over the dead side of the wire rope, and tighten the nuts on the live side. "Never saddle a dead horse."
5. Use a thimble at the loop to protect the wire rope from wear.



## **Chains**

1. Ask your supervisor or instructor if you do not know which type of chain to use for the task at hand.
2. Inspect the chain prior to each use for wear, elongated, and worn links.
3. Know the load capacity of the chain you are using. Never use the chain to carry an excessive load.
4. Never twist or knot the chain.
5. Take up slack slowly and make sure every link seats correctly.

*Talk to your supervisor if you have any questions about this information.*



# Slip/Trip/Fall to Same Level Prevention

**A simple slip or trip that results in a fall to the same level can result in serious injury. It isn't necessary to be working at heights to suffer injury from falling down, so everyone is at risk. You can avoid slips, trips, and falls by observing some simple safety guidelines.**



## General Slip, Trip, Fall Prevention Guidelines

1. Wear the appropriate footwear for the environment; i.e., sturdy work boots with non-slip soles in the shop and back stage areas.
2. Walk rather than run.
3. Ensure you allow enough time to travel and avoid rushing.
4. Focus on where you are walking.
5. Never talk on the phone, text, or read email or texts while walking. Give your attention to where you are walking.
6. Never carry loads that obstruct your field of vision.
7. Get assistance for carrying heavy loads, or take smaller loads and make more trips.
8. Use a material handling device, such as a cart.
9. Clear the path of travel prior to moving materials.
10. Keep the floors swept and clear of debris.
11. Keep the aisles and passage ways clear of stored items and other obstacles.
12. Hold onto the handrails when walking up or down stairs. If you are worried about the cleanliness of the handrail, carry a small bottle of hand sanitizer or a re-sealable packet of hand wipes.
13. Never run up or down stairs.
14. Keep the drawers of filing cabinets, storage cabinets, and desks closed. Never turn your back or walk away from an open drawer.
15. Immediately clean up any spills whether they are of liquid or dry materials. Ask someone to watch the area of the spill if you have to leave it to obtain clean-up materials.
16. Report chemical spills and evacuate the area if you have not been trained and authorized to clean chemical spills.
17. Follow the specific procedures established for cleaning up chemical spills and disposing of the waste material. Report the spill if you have not been trained to clean it up properly and dispose of the material.
18. Complete the entire process for cleaning up spills, which includes sweeping up and removing the absorbing materials prior to leaving the area.
19. Keep cleaning materials, such as absorbent materials, brooms, dust pans, and waste containers adjacent to areas that are routinely contaminated with debris and/or spills.
20. Use warning cones and signs to warn of wet floors, whether they are wet from cleaning or weather conditions.

21. Increase the length of entry mats during inclement weather.
22. Provide umbrella bags near entry doors during inclement weather.

*Talk to your supervisor if you have any questions about this information.*



# Special Props – Edged Weapons

**Special props, such as weapons, add realism and excitement to productions. They also increase the risk of injury to the cast, crew, and audience, so special care is needed when handling, using, and storing weapons.**

The category of edged weapons includes piercing weapons, and examples include, but are not limited to, knives, swords, rapiers, razors, arrows and bows (recurve and crossbow), pitch forks, maces (spiked ball on a chain), hatchets, axes, saws, spears, kunai, throwing stars, and darts.

## Prior to Use

1. Never use personal weapons in a production.
2. Never bring personal weapons on site.
3. Use only weapons owned by UC or rented by authorized UC staff.
4. Follow the weapons checklist for each production to ensure all weapon requirements are met.
5. Obtain written permission for the use of weapons before weapons are obtained or used.
6. Notify Campus Law Enforcement when weapons will be used in any production.
7. Only use weapons designed for stage combat for stage combat, as these weapons are constructed to be strong enough not to break into dangerous pieces during use.
8. Ensure the edges of the edged weapons are dull, and the tips of piercing/pointed weapons are blunted.
9. Review safety precautions to be observed prior to each training, rehearsal, and performance session.



## Use and Handling

1. Never play with the weapons or engage in horseplay onstage or offstage.
2. Never remove the weapons from the stage or backstage area without prior authorization.
3. Only use weapons during supervised training, rehearsal, and performance sessions.
4. Review and practice choreography prior to the actual use of the weapons.
5. Never leave weapons unattended.
6. Inspect weapons for damage after each use.
7. Immediately report weapons that are damaged during training, rehearsals, or performance, and submit them for repair. Damage includes the formation of burrs caused by contact with hard surfaces.
8. Wear the appropriate personal protective equipment such as hearing protection, eye protection, face protection, and body protection during training, rehearsals, and performances.

## Storage

1. Keep all protective devices, such as sheaths, scabbards, and edge guards in place until ready to use the weapon.

2. Keep kunai and throwing stars in storage cases when not in active use.
3. Store weapons in locked cabinets and/or storage rooms.
4. Store bows in an unloaded state until needed for use onstage. Unloaded means the release of the string on a recurve bow and cross bow.
5. Store arrows in a separate location from the bows.

*Talk to your supervisor if you have any questions about this information.*





# Special Props – Firearms



**Special props, such as weapons, add realism and excitement to productions. They also increase the risk of injury to the cast, crew, and audience, so special care is needed when handling, using, and storing weapons.**

Injury, and even death, can be caused by discharged wadding of blank rounds. The noise levels produced by the discharge of firearms can cause hearing damage. Take firearms safety seriously.

## Prior to Use

1. Never bring personal weapons on-site.
2. Use only weapons owned by UC or rented by authorized UC staff.
3. Work with designated responsible campus and/or departmental staff to obtain written permission for the use of weapons prior to obtaining or incorporating into a performance.
4. Designate and identify trained and authorized weapons handlers/managers and users.
5. Follow a weapons checklist for each production to ensure all weapon requirements are met.
6. Notify Campus Law Enforcement when weapons will be used in any production.
7. Only use weapons designed for stage combat for stage combat as these weapons are constructed to be strong enough not to break into dangerous pieces during use.

## Use and Handling

1. Treat all firearms as though they are loaded.
2. Never use live ammunition. The use of live ammunition is prohibited.
3. Never load any firearm until actually ready to use it.
4. Never permit a performer to handle a firearm except during supervised training, supervised rehearsals, fight calls, and performances.
5. Always follow safe handoff procedures:
  - a. Make eye contact
  - b. State whether the firearm is “unloaded” or “loaded”
  - c. Offer the firearm grip first with the muzzle point down
  - d. Wait for a “thank you” to confirm the recipient has control of the firearm prior to releasing it
6. Never cock or ready a firearm for discharge until it is called for onstage.
7. Maintain all safety devices in place until ready to use the firearm.
8. Always keep your finger outside of the trigger guard until ready to pull the trigger.
9. Never point-blank fire or dry fire a weapon.
10. Never point the firearm directly at another person.
11. Wait 15 seconds after a misfire before ejecting or clearing the unfired blank from the firearm.
12. Immediately engage the safety devices after discharging the firearm.
13. Use proper personal protective equipment when firing a weapon.

14. Never leave a firearm unattended.

**Storage**

1. Store weapons in locked cabinets and/or storage rooms.
2. Store blank round and shells in a separate container from the firearms.

*Talk to your supervisor if you have any questions about this information.*



## Special Props – Live Animals



**Live animals in theater productions can pose a variety of hazards and challenges. The animal may cause illness or injury to the performers, crew, or audience. Materials for the care of the animals may increase the fire load within the building and may otherwise be hazardous to human health.**

The animals themselves may be harmed by the actions of the performers, crew, or audience. Physical injury, such as scratches, bites, contusions, and broken bones can result when animals are frightened or threatened and use their natural defensive mechanisms. Animals can also transmit illnesses to humans through scratches, bites, simple contact, secretions, and airborne pathogens. Animals may also cause flea infestations. Performers and crew members may have an allergic reaction to the animals.

Ensuring the safety of the performers, crew, audience, and the animals requires adhering to specific steps before allowing the use of any animal in a production.

**NOTE: No poisonous animals will be permitted at any time.**

### Conduct a Risk Assessment

The use of live animals in Performing Arts activities may require the review and approval of the Institutional Animal Care & Use Committee (IACUC). As part of production planning, contact your IACUC office early in the decision-making process and request assistance. The IACUC can help you work through the risk assessment process and document the safe procedures for handling and caring for the animals.

The risk assessment should answer these fundamental questions:

1. Is the animal essential to the production?
2. Are there alternatives?
3. How will the producers ensure the animal is obtained only from a competent handler/trainer or other legal provider?
4. What hazards are posed by the animal's natural behavior when reacting to loud noises, lighting, special effects on stage, stunts, other animals on stage, or service animals in the audience?
5. Will the animal be exposed to other animals on stage or in the audience?
6. How can you influence the animal's behavior?
7. With whom will the animal interact or have contact; i.e., crew, performers, or audience?
8. How much contact will there be with the animal?
9. What routes of entry might microorganisms be transmitted; i.e., hand to mouth contact, mouth to mouth contact, secretions, bites, scratches, or airborne?
10. Could the animal cause an infection that might threaten pregnancy, such as cats and litter box contact

- transmitting the parasite that causes toxoplasmosis?
11. How will the animal's movements be controlled?
  12. How will bodily fluids and secretions be managed?
  13. Who will be responsible for the animal on campus? Off campus?
  14. How will separation between the animal and any food and beverage areas be maintained?
  15. Will the animal have an experienced handler/trainer?
  16. Where will the animal be housed during the course of the production and between performances?
  17. How will the animal be fed and cared for during the course of the production?
  18. Will materials needed for the care and comfort of the animal, such as hay and/or straw, increase the fire load in the theater?
  19. What are the costs of including the animal in the production? Be sure to consider all fees, licenses, rentals, equipment, insurance, security, food, veterinary inspections/care, maintenance products, and waste disposal.
  20. What special emergency response and evacuation procedures need to be developed?



### Control Measures

If the decision to use animals is approved after the risk assessment is completed, work with the IACUC to develop control measures designed to help protect the cast, crew, audience, and the animals. The following control measures must be activated.

### Develop an Animal Care Plan

Develop an "Animal Care Plan" to ensure the safe and humane treatment of the animal and the safety of the performers, crew, and audience.

**NOTE: The use of drugs and sedatives to control the animal's behavior is strictly prohibited.**

### Ensure the plan details

1. Who will be responsible for the care and behavior of the animal
  - a. During rehearsals and performances?
  - b. All other times? It is best if the animal is cared for off-site by its owner/trainer.
2. How the animal will be transported onto and off of campus
3. What travel paths will be used for the animal's transportation
4. How the animal's movements will be controlled
  - a. When waiting for rehearsals and performances?
  - b. On-stage?
  - c. During transportation?
5. What will be the frequency of the rehearsals and performances; ensure the amount of time is kept to a minimum
6. How long the animal will be on campus
7. How food and water will be provided while waiting for rehearsals and performances
8. What measures will be taken to ensure the animal is able to relieve itself
9. Who will dispose of the waste and ensure the area is kept sanitized
10. Who will groom the animal
11. How the animal will be protected from:
  - a. Unnecessary handling, including excessive contact from performers and crew, such as petting?

- b. The loud noise and activity of the production while waiting for rehearsals and performances?
  - c. Patron contact?
12. What are the emergency response and evacuation procedures for:
- a. Evacuation of the animal in case of fire or other emergency evacuation of the building/campus?
  - b. Escape and recapture of the animal?
  - c. Injury to the animal?
  - d. Injury to the performers, crew, or audience?
13. How and when the animal will be returned to its owner; how that return will be confirmed
14. What is the name and contact number for:
- a. The animal's owner?
  - b. The animal's trainer?
  - c. The emergency veterinarian?

### Contact the Risk Management Department

Work with Risk Management to identify any insurance and/or contractual obligations. Risk Management may direct you to:

1. Notify all potential performers and crew members of the nature of the animal to be included in the production. Inform them of the amount of contact anticipated for each performer/crew member and the potential hazards associated with the contact.
2. Obtain hold harmless waivers from each performers and crew member. Ensure the hold harmless waivers also require the disclosure of any known allergies.
3. Obtain written verification the animal is healthy from a licensed veterinarian. This must be obtained prior to bringing the animal onto campus.
4. Ensure an adequate number of competent people have been retained to control the animal.
5. Obtain written verification the animal is properly licensed where required by local ordinances.
6. Provide adequate means to maintain personal hygiene, i.e. hand washing and/or sanitizing materials for use before and after handling the animal.
7. Provide the appropriate personal protective equipment when needed; i.e., safety shoes when working with large animals, gloves when working with large birds, etc.
8. Ensure patrons and the public are informed to the use of animals in the production. As with special effects notifications, this information should be included in advance advertising, posted in the lobby, and printed in the program.
9. Notify IACUC, Risk Management, Campus Police and Security personnel, Campus EH&S personnel, and the Office of Public Affairs.
10. Obtain a signed contract(s) with the animal's owner/handler that has been approved through the Risk Management Department.



*Talk to your supervisor if you have any questions about this information.*



# Storage

**Proper storage practices help ensure exit pathways and doors are accessible, fire hazards are reduced, chemical exposure risks are reduced, and the risk of injury is reduced. Storage practices apply to all areas, and everyone has a responsibility to keep tools and materials properly stored.**

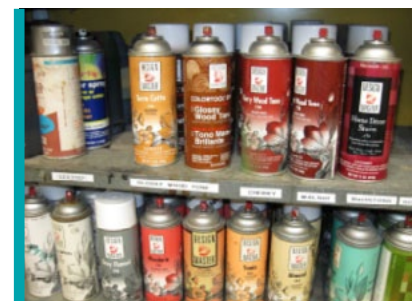


## General Storage Practices

1. Use clean and dry areas for storage.
2. Keep stored items at least 18 inches below fire suppression sprinkler heads.
3. Keep stored items at least 24 inches from the ceiling in areas that are not sprinklered.
4. Never obstruct doors, doorways, or exit pathways.
5. Maintain a clear unobstructed space of at least 36 inches, in all directions, from electrical service equipment, fire extinguishers, fire hose stations, and fire alarms.
6. Never hang stored items on or from fire suppression sprinkler pipes or sprinkler heads.
7. Secure overhead storage.
8. Never allow stored items to extend beyond the storage shelf.
9. Store small items within sealed storage containers to promote stable storage.
10. Ensure stacked items are level or secured to prevent tip-over.
11. Secure lumber, brooms, and ladders to prevent them from falling or sliding out of their storage areas.
12. Label storage areas and shelves to promote the return of items to their designated storage area.
13. Conduct routine inspections of storage areas for the early identification of safety and storage issues.

## Chemicals (Paints, Thinners, Dyes, Spray Paint, Cleaning Products)

1. Store flammable and combustible materials in designated NFPA-approved flammable storage cabinets.
2. Store oxidizers separately from flammable and combustible materials and segregate them from other types of non-compatible chemicals.
3. Store corrosive acids and bases separately and segregate them from other types of non-compatible materials.



## Hand and Power Tools

1. Store tools that have custom storage cases in those cases.
2. Keep guards and protective sheaths in place when storing sharp-edged tools.
3. Coil power cords and hoses.

## Props and Costumes

1. Store weapons in locked cabinets.

2. Never hang items on or from fire suppression sprinkler pipes or lines.
3. Maintain clear aisles.

### **Lights and Lighting Equipment**

1. Coil cords and close shutters.
2. Store color film away from heat sources.

### **Bridges and Catwalks**

1. Keep bridges and catwalks clear of tools, equipment, and other materials.
2. Never stack counter weights higher than the toeboard.

*Talk to your supervisor if you have any questions about this information.*



# Tools & Machines – General Shop Safety



**All employees and students must receive documented training before operating any type of equipment, machine, or tool in a woodworking or metal shop. Woodworking and metal work are DANGEROUS. It is important that safe and proper operating procedures are understood and followed.**

Using the machines and tools with respect and caution will considerably lessen the possibility of personal injury. If normal safety precautions are overlooked or ignored, severe injury may result. If you do not understand the task, equipment interfaces, or safety precautions, get advice from your instructor or supervisor. This Code of Safe Practices provides fundamental shop safety procedures that should be followed in all woodworking and metal shops. Review other Codes of Safe Practices on table saws, circular saws, hand and power tools, and welding, brazing and soldering for more specific details on those pieces of equipment and work activities.

## General Safety Guidelines

1. Receive and complete fundamental shop safety training and tool/machine/equipment specific training prior to beginning work in a wood or metal shop.
2. Wear proper shop attire including full-length pants (or equivalent) and closed-toe shoes.
3. Wear the proper personal protective equipment (PPE):
  - a. Safety glasses, goggles, and, when necessary, a face shield. Note: the use of a face shield by itself does not qualify as wearing appropriate eye protection.
  - b. Hearing protection devices when power tools and woodworking machines are in use even if you are not the operator.
  - c. Appropriate shop attire when using hand and power tools including full-length pants (or equivalent) and closed-toe shoes.
  - d. Tight-fitting work gloves only for handling materials. Never wear gloves while working with power tools.
  - e. Consult with the EH&S Department and refer to the UC PPE Policy for more information.
4. Store food and drink in designated locations away from the shop work areas.
5. Never consume food and drinks in the shop work areas.
6. Leave your rings, watches, necklaces, other jewelry, and loose clothing in your locker or bag.
7. Restrain long hair to keep it away from machinery, tools, and points of operation.
8. Store cell phones, MP3 players, and other personal electronic devices. Never use these devices in the shop work area.



9. Maintain clean and organized work areas. Plan ahead to avoid rushing and allow sufficient time to clean up after a project or task is completed.
10. Inspect tools and machinery prior to starting to ensure they are safe to use.
11. Shut off and disconnect all power tools and machinery from their power source prior to making adjustments or changing out components; wait for the machine/tool to come to a complete stop.
12. Never leave machinery or power tools running unattended.
13. Report all injuries, spills, or emergencies to the shop supervisor immediately.
14. Report tool, machine, or equipment malfunction or damage to the shop supervisor immediately. Never attempt to repair these items unless trained to do so. Shop supervisors will properly lockout and tagout equipment requiring repair.
15. Sweep up and clean away saw dust and scraps as needed throughout the work process to keep the floor free of slip, trip, fall hazards and the work area clean. Sweep and clean again prior to leaving the area.
16. Never dump hazardous wastes down the drain. Consult the EH&S Hazardous Waste Program for proper disposal of wastes.
17. Wash hands thoroughly after completing work in the shop.

**WARNING:** The dust generated by certain woods and wood products may be injurious to your health.

Always operate machinery in well-ventilated areas and provide for proper dust removal.

Use local exhaust ventilation when it is available.

Use appropriate PPE as instructed by the shop supervisor and EH&S.

*Talk to your supervisor if you have any questions about this information.*



# Tools & Machines – Hand & Power



**Hand and power tools pose injury hazards that may result from contact with their sharp edges, sharp tips, moving surfaces, power source, point of operation, and material waste generated during operation. Additional injury hazards are presented from inappropriate use.**

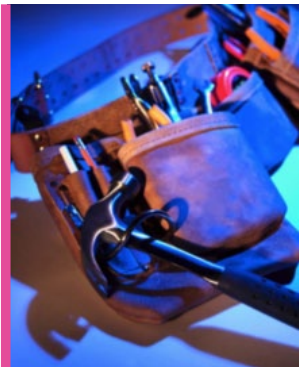
Training is a critical component for the safe use of hand and power tools. All employees and students must receive documented training before using designated hand and power tools. Follow these general safety guidelines to reduce your risk of injury.

## General Use

1. Wear the proper personal protective equipment:
  - a. Safety glasses, goggles, and, when necessary, a face shield when working with tools that generate debris, such as dust, splinters, chips, flakes, or shards or when the materials being worked with may snap, such as wires, as they are cut. Note: the use of a face shield by itself does not qualify as wearing appropriate eye protection.
  - b. Hearing protection devices when power tools and woodworking machines are in use even if you are not the operator.
  - c. Appropriate shop attire when using hand and power tools including full-length pants (or equivalent) and closed-toe shoes.
  - d. N-95 dust masks when generating saw dust, such as sanding operations.
  - e. Tight-fitting work gloves only for handling materials. Never wear gloves while working with power tools.
  - f. Consult with the EH&S Department and refer to the UC PPE Policy for more information.
2. Leave your rings, watches, necklaces, other jewelry, and loose clothing in your locker or bag.
3. Restrain long hair to keep it away from machinery, tools, and points of operation.
4. Never use a tool without prior training regarding its safe use.
5. Comply with the manufacturers' instructions on tool use and care.
6. Inspect tools before each use to identify any defects, such as frayed power cords, damaged casings, damaged handles, or damaged working surface.
7. Remove defective tools from service and immediately report it to your supervisor or instructor.
8. Direct the action end of the tool away from your body during use.
9. Keep observers at a safe distance away from the work area.
10. Service and maintain tools as specified by the manufacturer.
11. Sweep up the floor and work surfaces to remove the waste generated by the use of the tool.
12. Properly dispose of the waste. Consult the EH&S Hazardous Waste Program for assistance.

**Power Tools (tools with power sources: electric, pneumatic, liquid fuel, hydraulic, and powder-actuated)**

1. Never use power tools on wet surfaces or in wet conditions.
2. Never use a tool with its machine or blade guard altered or removed.
3. Never carry or hoist a power tool by its power cord.
4. Never yank the cord or the hose to disconnect it from the receptacle.
5. Keep your finger away from the power switch while carrying a tool connected to a power source.
6. Keep power cords and hoses away from sources of heat and sharp surfaces or edges.
7. Turn off and unplug power tools before servicing or making any adjustments, such as loading them, changing blades or bits, adjusting settings, or cleaning them.
8. Turn the power switch off, unplug the tool, and properly store it at the end of each use or end of the work period.
9. Secure the work piece with clamps or a vice to ensure the tool is controlled with both hands.
10. Secure work with clamps or a vise, freeing both hands to operate the tool.

**Hand Tools (tools that are powered manually)**

1. Use hand tools only for the purpose for which they were designed; i.e., use a screwdriver as a screwdriver only.
2. Remove tools from use when their handles are damaged. Wooden tool handles are damaged when the shaft is splintered or cracked or handle is loose.
3. Remove wrenches from use if the jaws are sprung.
4. Remove impact tools, such as chisels and wedges, from use when the head of the tool is mushroom-shaped.

*Talk to your supervisor if you have any questions about this information.*



## Tools & Machines – Saws – Circular

**All employees and students must receive documented training before operating any type of saw. Woodworking is DANGEROUS. Safe and proper operating procedures must be learned and followed.**



Using the saw with respect and caution will considerably lessen the possibility of personal injury. If normal safety precautions are overlooked or ignored, severe injury may result.

### General Safety Guidelines

1. Wear the proper personal protective equipment:
  - a. Safety glasses, goggles, and, when necessary, a face shield. Note: the use of a face shield by itself does not qualify as wearing appropriate eye protection.
  - b. Hearing protection devices when power tools and woodworking machines are in use even if you are not the operator.
  - c. Appropriate shop attire when using hand and power tools including full-length pants (or equivalent) and closed-toe shoes.
  - d. Tight-fitting work gloves only for handling materials. Never wear gloves while working with power tools.
  - e. Consult with the EH&S Department and refer to the UC PPE Policy for more information.
2. Leave your rings, watches, necklaces, other jewelry, and loose clothing in your locker or bag.
3. Restrain long hair to keep it away from machinery, tools, and points of operation.
4. Always exercise caution; if a procedure feels dangerous or you do not understand the task and saw interface, get advice from your instructor or supervisor.
5. Inspect the saw before each use. Ensure the casing is not cracked, the handles are secure, and the power cord is in good condition.
6. Never use a faulty saw. Lockout the saw, and report it to your supervisor or instructor.
7. Never change the saw blade until ensuring the switch is turned off and the power cord unplugged from the power source.
8. Set the cutting depth as shallow as possible to keep the exposure of the blade below the cut to a minimum.
9. Never carry the saw with your finger on the trigger switch.
10. Keep your second hand away from the blade; place it on the auxiliary handle or motor housing.
11. Never reach underneath the work or place your hand under the shoe or guard of the saw.
12. Never stand or have any part of your body in line with the path of the saw blade, and never reach behind or over the saw with either hand for any reason.
13. Maintain firm footing; never overreach to complete the cut.
14. Never begin cutting before checking for obstructions, such as nails and screws.
15. Never start the saw with the work-piece pressed against the blade.
16. Never perform any operation “free-hand.” Always use a rip fence or guide, clamped or nailed to the stock, to position and guide the work during ripping operations.

17. Avoid kickbacks (work thrown back toward you); keep the blade sharp; keep the rip fence parallel to the saw blade; never force the saw during cutting.
18. Never attempt to free a stalled saw blade until first turning the saw “off” and unplugging it from its power source.
19. Ensure the blade has stopped, and the lower blade guard is in place before setting the saw down.

*Talk to your supervisor if you have any questions about this information.*



# Tools & Machines – Saws – Table



**All employees and students must receive documented training before operating any type of saw. Woodworking is DANGEROUS. It is important that safe and proper operating procedures are understood and followed.**

Using the machine with respect and caution will considerably lessen the possibility of personal injury. If normal safety precautions are overlooked or ignored, severe injury may result. Always exercise caution, if a procedure feels dangerous or you do not understand the task and equipment interface, get advice from your instructor or supervisor.

## General Safety Guidelines

1. Wear the proper personal protective equipment:
  - a. Safety glasses, goggles, and, when necessary, a face shield. Note: the use of a face shield by itself does not qualify as wearing appropriate eye protection.
  - b. Hearing protection devices when power tools and woodworking machines are in use even if you are not the operator.
  - c. Appropriate shop attire when using hand and power tools including full-length pants (or equivalent) and closed-toe shoes.
  - d. Tight-fitting work gloves only for handling materials. Never wear gloves while working with power tools.
  - e. Consult with the EH&S Department and refer to the UC PPE Policy for more information.
2. Leave your rings, watches, necklaces, other jewelry, and loose clothing in your locker or bag.
3. Restrain long hair to keep it away from machinery, tools, and points of operation.
4. Keep your work area clean; cluttered areas and benches increase the risk of accidents.
5. Inspect the saw prior to each use.
6. Keep guards in place and in working order.
7. Never use a faulty saw. Lock it out and apply a lockout tag to the saw, and then report the faulty saw to your supervisor or instructor.
8. Make sure switch is in “off” position before plugging in power cord.
9. Remove adjusting keys and wrenches from the table saw before turning it “on.”
10. Turn the switch to “off,” disconnect the power cord, and apply a lockout device and tag to the power cord before servicing the saw or when changing accessories, such as blades, bits, etc.
11. Keep others at a safe distance from your work area and stay a safe distance from other work areas.
12. Never engage in conversations with others while operating the saw. Concentrate on your work.

**WARNING:** The dust generated by certain woods and wood products may be injurious to your health.

Always operate machinery in well-ventilated areas and provide for proper dust removal.

Use local exhaust ventilation when it is available.

Use appropriate PPE as instructed by the shop supervisor and EH&S.

13. Never use excessive force, a table saw will cut cleaner and be safer at the rate for which it was designed.
14. Ensure large pieces are supported.
15. Never make free-hand cuts; use the rip fence or miter gauge.
16. Keep your hands away from the blade. Use a push stick to cut small pieces of stock (6 inches or less in width). Use a stop block to crosscut short lengths.
17. Never leave the saw running unattended. Turn the power off. Never leave until the blade comes to a complete stop.
18. Never operate the saw while under the influence of drugs, alcohol, or any medication.
19. Never stand on a table saw.
20. Keep saws in good condition. Keep them sharp and clean for optimal performance. Follow manufacturer instructions for lubricating and changing accessories. Check damaged parts, alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation and report the damage to your supervisor or instructor.

*Talk to your supervisor if you have any questions about this information.*



# Tools & Machines – Welding/ Soldering/Brazing



**Welding is the most common method of joining metals. Many times constructing a set involves metal fabrication, which requires metal welding and cutting. Soft soldering, using an electric soldering iron, is a common practice when working with lighting and audio wiring.**

Brazing is similar to soldering; however, the temperatures used to melt the filler metal are higher. Welding, soldering, and brazing present significant hazards including exposure

to hot materials, ultraviolet light, gases, fumes, noise, and heat stress. Only trained employees and students are authorized to operate perform welding, soldering, or brazing work.

## General Safety

1. Protect all persons adjacent to the welding areas from the infrared rays through the use of noncombustible or flameproof screens or shields.
2. Require appropriate safety goggles for all persons who may view the welding or cutting operations.
3. Use all required personal protective equipment, such as leathers, gloves, welding helmets or hoods, leather shoes, fire retardant overalls, and goggles in all welding and soldering operations.
4. Inspect welding helmets, soldering goggles and hand shields for leaks, openings, or highly reflective surfaces. Replace them as needed.
5. Conduct cutting, welding, and soldering operations only in areas that are, or have been made, fire safe.
6. Conduct cutting, welding, and soldering operations in well-ventilated areas; use local exhaust ventilation, such as snorkel hoods or backdraft slot hoods to control fugitive emissions.
7. Maintain suitable fire extinguishing equipment ready for use during welding and cutting operations.
8. Maintain designated fire watches whenever cutting, welding or soldering.
9. Never use creams or ointments on burns. Expose the burned area to cold water for at least 15 minutes. Seek medical treatment for any large burns and/or if the burn is second degree (blisters) or third degree (the skin is charred).
10. Maintain your personal protective equipment in good condition. Talk to your supervisor or instructor if you have any questions about the requirements.
11. Ensure an emergency response burn blanket is available.
12. Discard welding rods, solder, and dross in accordance with the Campus Hazardous Waste Disposal procedures. Contact the EH&S Department if you are unsure.



13. Do not store, prepare, or consume food and beverage in or around areas where cutting, welding, or soldering operations occur.
14. Always wash your hands with soap and water upon completion of welding and soldering work and before preparing or consuming food and beverages.

### **Gas Welding**

1. Store and transport compressed gas cylinders in the upright position with the valve protective caps on. In addition, secure the cylinders in an upright position using two restraining devices made of non-combustible material, such as metal straps or chains; place the restraining devices within the top and bottom 1/3 of the tank. Never use ropes or canvas straps as these will be destroyed in a fire.
2. Ensure cylinders in portable service are secured in an upright position.
3. Never store or place cylinders where they are exposed to heat, flame, impact, electric arcs or circuits, high temperature process equipment, or sparks.
4. Tag empty cylinders with an “EMPTY” tag, and store them separately from full ones with the valve cap in place.
5. Ignite torches using only friction lighters or other approved devices.

### **Arc Welding and Cutting**

1. Remove electrodes from the holders prior to leaving the area. Situate holders so as to prevent student or employee injury.
2. Keep the power supply switch in the off position when arc welders or cutters leave or stop work and when machines are moved.
3. Never unplug a machine while it is in the “on position.”
4. Require all students, employees, and observers to cover their skin completely while conducting or observing welding operations to prevent ultraviolet burns or damage.
5. Keep power cables and welding leads clear of walking and working areas to reduce the potential of a trip and fall injury.

### **Soldering and Brazing**

1. Always wear appropriate protective eyewear. Soft soldering using an electric soldering iron does not require tinted safety glasses or goggles; however, protective eyewear must be worn as solder can spit and create an eye hazard from the molten metal. Brazing and torch soldering require tinted safety goggles or helmets due to the higher temperatures and potential exposure to ultraviolet light.
2. Use lead free solder to reduce the potential exposure to lead fumes, dust, and debris.
3. Conduct soldering operations on a fire-proof or non-flammable surface to reduce the risk of fire. Keep the work area clean and free of clutter and combustible materials.
4. Always use a secured soldering stand, and always place the soldering iron in the stand when you put it down.
5. Never touch the tip or element of the soldering iron to check if it is hot.
6. Allow the work piece to cool prior to touching it.
7. Let the soldering iron fall if you drop it; NEVER try to catch it as it falls. Immediately, pick it up by the handle and place it in the stand.
8. Always unplug the soldering iron if you have to leave the area and when you finish the job.
9. Never leave a hot soldering iron unattended.

*Talk to your supervisor if you have any questions about this information.*

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