



## WRITTEN PROGRAM – FALL PROTECTION MARCH 2000

**INTRODUCTION:** Wright State University, under the direction of the Department of Environmental Health and Safety, has implemented a fall protection program for those university operations involving work at elevated locations. Directors, managers, supervisors and employees are responsible for identifying tasks within their department involving elevated locations and to ensure compliance with all requirements and responsibilities outlined in this program.

**POLICY:** It is the position of the university that employees who work at heights of 6 feet or greater be required to attend fall protection and be provided fall arrest or restraint systems where applicable. Additionally, those employees working on aerial platforms, scissors lifts or other elevated platform equipment must receive training on the use of such equipment.

**FEDERAL REGULATORY REQUIREMENTS:** The following OSHA standards establish the requirements of a fall protection program:

- A. 29 CFR 1910 Subpart I (Proposed) – General Requirements for Personal Protection Systems for General Industry
- B. 29 CFR 1926 Subpart M - General Requirements for Personal Fall Protection System for Construction Industry

### **FALL PROTECTION PROGRAM:**

- A. Elevated Work Locations – The following work locations are covered by the university’s written program for fall protection:
  - 1. Ladders - fixed, free standing, temporary, or roll away type
  - 2. Elevating Personal Platforms - aerial platforms, scissors lifts, forklift-mounted platforms, cherry pickers, boatswain’s chairs, etc.
  - 3. Elevated Surfaces - roofs, catwalks, skylights, boilers, chillers, etc.
  - 4. Vertical Opening - ground level entry into holes, pits, vessels, and other confined spaces.

B. Departments Affected By This Program - At the time this program was developed, the following departments conducted activities, which warranted coverage under this program.

1. Physical Plant – maintenance activities throughout campus buildings and grounds, including Lake Campus.
2. Center for Teaching and Learning – Video and audio support at the Nutter Center, Student Union, Television Center, and other campus buildings. Also, the operation and maintenance of audio and visual systems in classrooms.
3. Nutter Center - Arena activities which requires Nutter Center personnel to work on top of corporate boxes, merchandise booths and utility rooms.
4. School of Medicine, Facilities Operations - Maintenance activities at Cox Institute, Yellow Springs Family Health Center, and WSU Research Park.
5. CATS/Telecommunications - Telecommunications installation and maintenance throughout the university.
6. Student Union Operations - Preparation and coverage of events at the Student Union.
7. Liberal Arts, Theatre Department - Construction and striking of stage productions.

C. Responsibilities

1. Managers and supervisors of the above listed departments are responsible for ensuring that all requirements listed in the written program for fall protection are met. They are also responsible for ensuring that all contractors operations in these areas conform to these requirements and the requirements listed in “Standard Operating Procedures (SOP) developed for each specific operating location. Contractors are required to provide their own ladders, aerial lifts and other elevated platform equipment. Additionally, they are required to provide their own fall arrest or fall restraint full-body harnesses. These harnesses must be compatible with the university’s installed systems. The use of equipment that is not compatible with the university’s installed systems is strictly prohibited. Contractors working on university property are required to comply with the requirements listed in Environmental Health and Safety’s document, “Safety and Health Rules for Contractors”. Managers and Supervisors are responsible also for identifying to Environmental Health and Safety new and existing employees who require fall protection training. Managers and supervisors are responsible for identifying other elevated work areas to Environmental Health and Safety.
2. University Employees - Employees of the above listed departments who duties involve work activities at elevated locations are required to comply with the rules of operations and accepted safety practices outlined in the standard operating procedures contained within this written program.

3. Environmental Health and Safety - Responsible for conducting periodic visits to elevated work locations. The purpose of the visits is to inspect equipment and to observe employees' procedures while working at elevated levels. Responsible for arranging for required training of university employees in fall protection and in the safe use of elevating personal platforms. Evaluate other elevated work locations identified by managers and supervisors for fall protection requirements.

D. Training - New employees whose assigned duties involve work activities at elevated locations listed above will require training in fall protection and elevating personal platform equipment, as required. This training is to be completed prior to entering any of these areas and conducting work. Employees observed to violate established procedures or working in an unsafe manner at elevated work-areas will be required to attend a refresher course in fall protection or the safe use of equipment. Continued violation of established policies and unsafe work practices at elevated locations may lead to loss of privilege to work at these locations and possible disciplinary action.

A firm outside of the university will conduct all fall protection training and all instructions will be by a "competent" trainer, as defined by OSHA. University employees who have attended a fall protection course of instructions are not considered "competent" trainers and cannot conduct such training. To qualify, as a "competent" trainer requires attendance at a "Train the Trainer" course. Training on elevating personal platforms can be conducted by university employees who have completed the "Train the Trainer" course or by competent trainer from an outside firm.

E. Standard Operating Procedures (SOP) - Fall protection SOPs for specific locations are enclosed as follows:

1. Appendix A - Nutter Center, Corporate Boxes, Merchandise Booth, and Utility Rooms
2. Appendix B - Nutter Center, Ring Roof
3. Appendix C - University Water Tower
4. Appendix D - Elevating Personal Platforms
5. Appendix E - Elevated Surfaces/Vertical Openings
6. Appendix F - Ladders

The responsible official for this document is the Director, Environmental Health and Safety or the designated Sr. Industrial Hygienist or Occupational Safety and Health Technician. This document is to be reviewed annually. All original and revised versions of this document must be kept on file and is subject to inspection by personnel of the Public Employees Risk Reduction Commission.

**APPENDIX A**  
**NUTTER CENTER STANDARD OPERATING PROCEDURE**  
**FALL PROTECTION - ROOF AREA OF CORPORATE BOXES,**  
**MERCHANDISE BOOTH AND UTILITY ROOMS**  
**MARCH 2000 (Revised)**

**REQUIREMENT:** For many of the events held at the Nutter Center, it is required or desired to have personnel on top of corporate boxes, merchandise booths and utility rooms for lighting, filming or other purposes. Additionally, maintenance activities may require physical plant personnel to work on top of these structures. The roof areas of these structures are greater than 6 feet above the adjacent floor areas and the sides of the roofs are unprotected.

**AUTHORITY:** OSHA Standard 1926.50, Fall Protection mandates, when employees are working at a height of 6 feet or greater, that fall protection must be provided. This protection can be provided by the use of guard rail systems, safety net systems or personal fall arrest systems. The personal fall arrest system was selected for usage at the Nutter Center.

**APPLICATION:** The requirements outlined in this Standard Operating Procedure are applicable to anyone (employees, contractors, media, theater technicians, etc.) requiring access to the top of corporate boxes, merchandise booths and utility rooms regardless of purpose.  
**THERE ARE NO EXCEPTIONS TO THIS RULE.**

**DESIGNATED ROOF AREAS:** The roof area of the following structures have been equipped with the listed OSHA approved fall arrest systems.

Corporate Boxes 1 through 7 - A horizontal mansafe system which can accommodate a maximum of 4 people at any one time over the length of these boxes.

Corporate Boxes 8 through 14 - A horizontal mansafe system which can accommodate a maximum of 4 people at any one time over the length of these boxes.

Corporate Boxes 15 through 18 (Sound & Scoreboard Rooms) - A horizontal mansafe system which can accommodate a maximum of 4 people at any one time over the length of these boxes.

Merchandise Booth, SW Corner - A fixed point accommodating only one person at a time.

Merchandise Booth, NW Corner - A fixed point accommodating only one person at a time.

## **PERSONNEL PROTECTION:**

**ACCESS CONTROL:** Access to the roofs of the designated structures is permitted only by use of the permanently installed ladders. Each ladder is equipped with a lockable security cover which prevent unauthorized access to the roof areas. Individuals requiring access to the roof areas must obtain permission from the Nutter Center Office. This procedure will ensure that only individuals having a need will gain entrance to these areas and that they have been trained on the use of the personal fall arrest system. Signs have been installed at each access ladder indicating these control measures.

**PERSONAL ARREST SYSTEM:** The personal arrest systems, installed at locations listed above, consist of a full body harness which attaches to the arresting cable by way of a standard transfastener. The harness contains a retractable lanyard which permits movement out to a distance of 10 feet from the arresting cable. A transfastener is not used on the system for the fixed point locations.

## **SYSTEM INTEGRITY:**

- A. Only components of Mansafe Systems will be permitted to be used and only those that are under the direct control of the Nutter Center staff. **There will be no exception to this rule.**
- B. Horizontal Systems: In the event an individual falls while on the roof and the fall is of sufficient intensity to engage the shock absorber on the arresting cable, the arresting cable and the body harness system worn by the individual must be immediately taken out of service. Individuals needing to remain on the roofs will be instructed to disconnect from the arresting cable and connect directly to a anchor point holding the arresting cable, i.e., essentially serving as a fixed point. The fixed systems at the northwest and southwest corners of the arena do not utilize a shock absorber, however, a fall from these areas would require taking the body harness system out of service. Body harness systems involved in a fall must be kept separate from the others and must be recertified or replaced.
- C. Body harness system must be returned to the Nutter Center staff following use for inspection and proper storage. Damaged systems must be taken out of service for recertification or replacement.

## **TRAINING:**

**Personnel who have not received training on the use of the personal arrest system will not be permitted access to the roof areas.** Wright State University employees requiring access to the roofs will be trained by a competent trainer, as defined by OSHA. All training will be provided by an outside source. University employees trained in fall protection are not deemed qualified to provide training to other employees or contractors. It will be the responsibility of management personnel of the Nutter Center, Physical Plant, Planning Engineering and

Construction, and the Center for Teaching and Learning to ensure that contractors, and theatre and media personnel under their control have evidence of fall protection training and that they utilize only the Mansafe Systems equipment belong to the Nutter Center.

Anyone who removes the body harness while on the roof and refuses to put it back on will be removed from the roof immediately.

**EQUIPMENT:** Any pieces of large equipment such as portable lighting, cameras, etc. must be secured to the roof of the structure at all times it is in use. Movement of such equipment from one roof to another will require the floor area immediately below the bridge to be cleared of any people. Hand-held equipment will also be secured in such a manner that it cannot be accidentally dropped over the sides of the structures anytime there are people or there is the potential for people to occupy the space below.

**NOTE:** At the time this document was prepared there were no permanent ladders or bridges providing access to corporate boxes 15, 16, 17 and 18. According to the Operations Manager of the Nutter Center, the roof area of these boxes are not currently used and therefore there is no need for access to these areas. Fixed access ladders, approved bridges and appropriate signage must be installed prior to any future plans to utilized these areas.

Any questions regarding the contents of this SOP should be addressed to the Department of Environmental Health and Safety.

**APPENDIX B  
NUTTER CENTER  
FALL PROTECTION – RING ROOF OPERATIONS  
MARCH 2000**

**REQUIREMENT:** There is a requirement for periodic inspection and maintenance of the ring roof area of the Nutter Center. The ring roof area is at a height much greater than 6 feet above the ground level and the sides of the roof are unprotected.

**AUTHORITY:** OSHA Standard 1926.50, Fall Protection mandates, when employees are working at a height of 6 feet or greater, that fall protection must be provided. This protection can be provided by the use of guardrail systems, safety net systems or personal fall arrest or restraint systems. The personal fall restraint system was selected for usage on the ring roof of the Nutter Center.

**APPLICATION:** The requirements outlined in this Standard Operating Procedures (SOP) are applicable to all personnel who have the need and authority to work on the ring roof. Personnel authorized to be on the ring roof for periodic inspection and maintenance are designated employees of Physical Plant. No one else is permitted entry to this area. The need for university engineering personnel and contractors needing access to this area will be treated on a case by case basis and with the approval of Environmental Health and Safety. Environmental Health and Safety will ensure that the training and use requirements are met before approval is granted.

**THERE ARE NO EXCEPTIONS TO THIS RULE.**

**PERSONNEL PROTECTION:**

**ACCESS CONTROL:** Access to the ring roof is permitted only by way of the installed fixed ladder systems from penthouse A of the Nutter Center. The doorway leading from penthouse A to the lower roof area must be locked at all times when the roof is not occupied. The door is to be equipped with a locking mechanism (change key) to which the supervisor of the authorized physical plant employees is the only one to have the key. Permission for authorized employee to go out on the ring roof can be given only by the supervisor or someone else in Physical Plant at a higher managerial level. A sign is to be permanently installed on the inside of the door leading from penthouse A stating “Ring Roof - Extremely Dangerous Area: Entry by Authorized Personnel Only And Following Completion of Approval Procedures”. The entry door from the roof area back into penthouse A should be such that entry from the outside back into penthouse A does not require the use of a key. A log of date, time of entry and time of departure and name of employees on the ring roof should be maintained.

**PERSONAL RESTRAINT SYSTEM:** The personal fall restraint system to be used on the ring roof, consist of the Miller “DURALITE” full body harness, a 4 foot lanyard, Miller model 201RLS and Miller carabineer. The Miller fall restraint system, as defined here, will be the only fall restraint system to be used while on the ring roof. **There will be no exception to this rule. It will be the responsibility of the authorized employees and their supervisor to routinely inspect the component parts of the Miller System for damages and normal wear**

**and tear. Parts showing damage or unacceptable sign of wear and tear will be taken out of service and replaced with compatible Miller equipment.**

**ROOF PRE-ENTRY PROCEDURES:**

1. Physical Plant will assign only those employees as authorize personnel who have exhibited no fear of working at elevated levels and who have successfully completed a Fall Protection training course given by a “competent” trainer as defined by OSHA and as approved by Environmental Health and Safety.
2. Authorized personnel will follow at all times the principles of fall protection, wear designated equipment and follow all procedures outlined in this SOP.
3. Use of the “Buddy” system is in force any time there is entry onto the ring roof. This will constitute a minimum of 2 employees at the roof level.
4. Authorized personnel are to discuss fall protection and rescue procedures with their supervisor prior to entry onto the ring roof.
5. Assemble all equipment needed for fall protection and rescue procedures in accordance with manufacturer’s instructions.
6. Verify that all personal fall restraint equipment meets or exceeds the following standards and regulations: Federal OSHA 29 CFR 1926 Subpart M, ANSI Z359.1-1992, and ANSI A10.14-1991.
7. Perform pre-use inspection of all equipment in accordance with procedures outlined in the Fall Protection Course and the Manufacturer’s instructions.
8. Follow Lockout/Energy Control, as required.
9. Establish and maintain radio contact with supervisor and/or the Work Control Center prior to going out and while on the ring roof.
10. **Do not use this fall restraint system and equipment for any other purpose other than to inspect and conduct maintenance of the ring roof.**

**FALL PROTECTION PROCEDURES WHILE ON RING ROOF:**

1. The two authorized Physical Plant employees utilizing the fall restraint system must read and understand these procedures and review them with their supervisor prior to commencing work on the ring roof. Environmental Health and Safety will attend the pre-entry procedure review if deemed necessary by the employee’s supervisor.

2. Inspection and maintenance activities on the ring roof shall not be performed during inclement weather. This is to include, but not limited to, rain, snow, ice conditions, high winds, violent storms, etc.
3. The two Physical Plant employees authorized to go out on the ring roof shall inspect all fall restraint equipment and then put on the full body harness and secure a proper fit as required by the manufacturer's instructions.
4. The two employees to be performing the inspection and/or maintenance shall walk or crawl as close to the upward sloping roof as possible maintaining the maximum distance from the edge of the ring roof (see drawing No. 1). Each employee shall continuously observe the other employee as to maintaining this distance from the edge of the ring roof.
5. Prior to commencing work, verify that an additional fall protection trained employee (beyond those employees required to perform the roof drain inspection/maintenance of the ring roof) is in place and ready to provide fall protection trained rescue assistance. **Work does not commence without this third party in position.** The supervisor should be contacted if the third party is not on station.
6. A fall protection trained competent person shall inspect the personal restraint system prior to the start of work on the ring roof. This inspection shall include, but not be limited to clearance requirements, misuse of equipment or restraint points. If there are any problems with the system, correct them before proceeding.
7. There are 14 drain locations on the ring roof. Two (2) restraint stanchions are installed in the vicinity of each roof drain. **A maximum of one employee can be attached to a restraint stanchion.** See drawing No. 1.
8. Following inspection of the roof drains should it be determine that maintenance is required, attach the restraint lanyard to the restraint stanchion as indicated on drawing No. 2. **Employees shall never approach the edge of the ring roof without full usage of the fall restraint system.**
9. At the conclusion of the roof inspection/maintenance, inspect all equipment and properly store following the manufacturer's instructions.

**RESCUE PROCEDURES:** Authorized trained employees will never be exposed to a hazardous fall if the Fall Protection Procedures outlined in this SOP and the manufacturer's instructions are strictly adhered to. The procedures outlined in this SOP are intended to be used only as a travel restriction/restraint system and there is no requirement for a rescue procedure.

**TRAINING:** Personnel who have not received fall protection training and training on the use of the personal restraint system will not be permitted access to the ring roof. Wright State University employees identified for inspection/maintenance activities on the ring roof will

be trained only by a “competent” trainer as defined by OSHA. All training will be provided by an outside source. University employees trained in fall protection are not deemed qualified to provide training to other employees or contractors. It is the responsibility of Physical Plant management to ensure that their authorized employees have evidence of fall protection training and that they utilize only the Miller fall restraint system purchased and installed for ring roof operations.

Any questions regarding the contents of this SOP should be addressed to the Department of Environmental Health and Safety.

**APPENDIX C**  
**STANDARD OPERATING PROCEDURES**  
**FALL PROTECTION – UNIVERSITY WATER TOWER**  
**MARCH 2000**

**REQUIREMENT:** Physical Plant employees and contractors are required to conduct periodic maintenance at the top and on the inside and outside of the water tower. Contractors would include paint and electrical contractors and representative of firms who lease space at the top of the tower for installation of communications equipment (antenna, dish, etc.).

**AUTHORITY:** OSHA Standard 1910.21, Subpart D, Walking-Working Surface permits, for fixed ladders of over 20 feet in unbroken length, the use of ladder safety devices as the means of fall protection for employees and other users of the facility. The fixed ladder is equipped with arresting cables to which employees and contractors can connect their fall arrest equipment to while ascending and descending the ladder.

**APPLICATION:** The requirements outlined in this Standard Operating Procedure are applicable to anyone (employees, contractors, etc.) requiring any work activities on the fixed ladder system or on the outside of the top of the tower. **THERE ARE NO EXCEPTIONS TO THIS RULE.**

**PERSONNEL PROTECTION:**

**ACCESS CONTROL:** The water tower is designated a “Permit Required – Confined Space”. **This restricts entry by anyone until Environmental Health and Safety issue an entry permit.** The interior of the water tower clearly meets OSHA’s criteria as a confined space. It has been assigned a permit required confined space in that there is currently no supporting data that the internal environment is free of airborne contaminants. Additionally, the potential for a fall, which could result in serious injury or death, meets the criteria of other serious safety or health hazards. Environmental Health and Safety is in the process of evaluating the internal atmosphere of the tower in an effort to document that the internal environment of the tower does not contain any hazardous/toxic contaminants. This evaluation will not include the internal environment of the water containing systems of the tower. These areas will remain permit required confined space. The evaluation process will take approximately a year to complete. **Physical Plant personnel seeking access to the tower must contact Environmental Health and Safety to ensure that all confined space requirements are met. Contractors are required to go through the Work Control Center who will notify Environmental Health and Safety. Anyone failing to follow these procedures may lose their privilege to enter the tower in the future. Employees of the university may also face disciplinary action.**

**PERSONAL FALL ARREST SYSTEM:** The fall protection system employed at the water tower is the Miller Fall Arrest System. Only Miller approved equipment or other manufactured equipment certified compatible with the installed Miller system can be used. Body belts are no longer approved for use for fall protection. **It will be the responsibility of the authorized employees and their supervisor(s) to routinely inspect the component parts of the Miller System for damages and normal wear and tear. Parts showing damage or**

**unacceptable signs of wear and tear will be taken out of service and replaced with compatible Miller equipment. In the event an employee falls while ascending or descending the ladder and the fall is of sufficient intensity to engage the shock absorber, the arresting cable and the full-body harness must be taken out of service. Body harness systems involved in a fall must be kept separate from fall arresting equipment and must be re-certified or replaced.** Fall arrest equipment other than the railing affixed to the ladder is not to be stored in the water tower.

Contractors are not to use university owned fall arrest equipment. Exception: Under emergency conditions and when deemed to be in the university's best interest, contractor personnel may be permitted to use university owned equipment. Contractor's equipment must be Miller equipment or equipment certified to be compatible with the installed Miller system.

### **LADDER PRE-CLIMB PROCEDURES:**

1. Physical Plant will assign only those employees as authorized personnel who have exhibited no fear of working at elevated levels, physically capable of climbing the ladder, and who have successfully completed a Fall Protection training course given by a "competent" trainer as defined by OSHA and as approved by Environmental Health and Safety.
2. Authorized personnel will follow, at all times, the principles of fall protection wear designated equipment and follow all procedures outlined in this SOP.
3. Use of the "Buddy" system is in force any time there is an employee or a contractor ascending and descending the ladder system. The stand-by person is to remain at ground level inside the base of the tower and radio contact is to be maintained at all times.
4. Assemble all equipment needed for fall protection in accordance with the manufacturer's instructions. The person at ground level is to wear a hard hat at all times when someone else is ascending or descending the ladder.
5. Verify that all personal fall restraint equipment meets or exceeds the following standards and regulations: OSHA 29 CFR 1926, Subpart M, ANSI Z359.1-1992, and ANSI A10.14-1991.
6. Perform pre-use inspection of all equipment in accordance with the procedures outlined in the Fall Protection Course and the manufacturer's instructions.
7. Follow Lockout/Energy Control procedures, as required.
8. To ascend the ladder system, connect, as instructed, to the arresting rail, climb to the top of the first segment of the ladder system step onto the platform, disconnect and reconnect to the arresting rail installed on the second segment of the ladder system. For those going outside and onto the top of the tower, remain connected to the arresting rail and connect

to the outside arresting system by way of the fastener located to the top and back of the body harness. Reverse the procedures during the descent.

9. At the conclusion of the work activity, inspect all equipment and return to the designated storage area.
10. **Do not use this fall arrest system and equipment for any other purpose other than to ascend and descend the ladder in the water tower.**

**RESCUE PROCEDURES:** The rescue of an employee or contractor who has fallen while utilizing the fall arrest system will be handled only by trained personnel of the Fairborn Fire Department. In the event of a fall, the ground person is to immediately notify Public Safety, who in turn will contact the Fairborn Fire Department. The ground person should then notify Physical Plant and Environmental Health and Safety. **The ground person will not, under any circumstances, attempt to rescue the fallen individual.**

**TRAINING:** Personnel who have not received fall protection training and training on the use of the personal arrest systems will not be permitted to ascend or descend the ladder system in the University Water Tower. Employees identified to conduct inspection and/or maintenance at elevated levels of the water tower will be trained by a “competent” trainer as defined by OSHA. All training will be provided by an outside source. University employees trained in fall protection are not deemed qualified to provide training to other employees or contractors. It is the responsibility of Physical Plant management to ensure that their authorized employees have evidence of fall protection training and that they utilize only the Miller fall arrest system purchased and installed in the water tower. It is also Physical Plant’s responsibility to inform their contractors of the requirements outlined in this standard operating procedure. Contractors, who have communications equipment on top of the tower, have been notified of these requirements. Environmental Health and Safety will be responsible for arranging for fall protection training for new employees.

Any questions regarding the contents of this SOP should be addressed to the Department of Environmental Health and Safety.

**APPENDIX D**  
**FALL PROTECTION –VERTICAL AERIAL PLATFORMS**  
**MARCH 2000**

**REQUIREMENT:** Many work activities at the university require the utilization of vertical aerial platforms. The standard operating procedures contained within covers the responsibilities of managers, supervisors, employees, student employees, and students that must be met to ensure the efficient and safe usage of these devices.

**AUTHORITY:** OSHA standard 29 CFR 1910, Subpart F, Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms, mandate the requirements to employers and employees regarding the use and care of this equipment and the training requirements that must be met by operators. Further guidance is available in the brochure given to employees during the aerial platform training and the manufacturer’s operational instruction manual.

**APPLICATION:** The requirements outlined in this standard operating procedure are applicable to anyone (employees, contractors, students workers, theatre technology students, etc.) who are required to operate or occupy a vertical aerial platform as a requirement of their job or academic curriculum. Manager, supervisor or responsible faculty members are responsible for assuring compliance with 29 CFR 1910, Subpart F and the university’s standard operating procedures for vertical aerial platforms.

**FALL PROTECTION PROGRAM:** The federal regulatory requirements and the information gained in the fall protection and the vertical aerial platform training will not be reiterated in this standard operating procedure. Information presented in this section will pertain to equipment, users of the equipment, and security of equipment when not in use:

- A. Owners of Equipment - Physical Plant  
Nutter Center  
School of Medicine Facilities Operations  
Liberal Arts, Theatre Arts

B. Users of Equipment Others Than the Owners

<u>Department</u>	<u>Equipment</u>
Student Union Operations	Physical Plant
Center for Teaching and Learning	Physical Plant/Nutter Center
CATS/Telecommunications	Physical Plant/Nutter Center
Contractors*	Physical Plant, Nutter Center SOM Facilities Operations

- Refer to Environmental Health and Safety’s document, “Safety and Health Rules for Contractors”, for guidance on the use of university equipment by contractors.

### C. Security of Equipment

1. Owners of Equipment - It is the owner's responsibility to ensure that all equipment and the keys to the equipment are secured when not in use. Owners are responsible for ensuring that only those employees, student employees, students, and contractors who have successfully completed fall protection and vertical aerial platform training are permitted to sign out this equipment for use. Environmental Health and Safety has provided the owners with a list of university employees who have completed this training. Updated listing will be provided, as necessary. The owner is responsible for obtaining proof of training prior to loaning equipment to contractors.
2. Non-Owner Users of Equipment – Manager and supervisor share the responsibility that only those individuals with documented proof of fall protection and vertical aerial platform training are allowed to check out and use vertical aerial platform equipment. All occupants of the basket, when at an elevated position, must be trained. Any damaged or malfunctioning of equipment must be reported to the owner immediately. Damage or malfunctioning equipment will not be used until repaired and certified safe by a technical representative of the manufacturer.

**TRAINING:** Training of university employees, student employees and students in fall protection must be done by a “competent” trainer. The university does not have any employee qualified as a "competent" trainer and, therefore, an outside firm must provide all training. Arrangements for fall protection training will be made by Environmental Health and Safety. Presently, the university has 4 employees who have completed the “Train the Trainer” course in vertical aerial platforms. These employees work for the Center for Teaching and Learning, CATS/Telecommunications, Student Union Operations, and Theatre Arts. They are authorized to train their employees, student employees and students in the use of vertical aerial platforms. They cannot conduct “Train the Trainer” courses and qualify others as a “competent” trainer. Departments without qualified trainers can contact Environmental Health and Safety for training by an outside firm or contact one of the above departments for availability for training. Environmental Health and Safety can provide the names of the university employees qualified to conduct this training. A roster of attendees, date of training, written and skill test results and a copy of the permit and certificate for each individual trained must be send to Environmental Health and Safety upon completion of the training. Also forward a copy of “Letter of Caution” issued to anyone who completed the course, but for whom additional experience is needed before they can be designated a principle operator.

Managers and supervisors are also responsible to periodic evaluation of their employees, student employees and students and for determining when refresher training is warranted.

Any questions regarding this standard operating procedure should be addressed to Environmental Health and Safety.

**APPENDIX E**  
**FALL PROTECTION – ELEVATED SURFACES/VERTICAL OPENINGS**  
**MARCH 2000**

**REQUIREMENTS:** Throughout the university there are elevated work surfaces of a height greater than 6 feet which requires fall protection measures. This appendix of the fall protection program will cover those areas not already address in appendix A, B, C, D and F. Areas to be addressed are catwalks and other permanent platforms, scaffolding, cooling towers, boilers, roofs, skylights and vertical openings.

**AUTHORITY:** OSHA standard 1910 CFR Subpart D, Walking-Working Surfaces, mandates requirements that must be met to provide adequate fall protection for employees. In that it is not our intent to list all 7the requirements in Subpart D, supervisors of employees conducting work activities at any of the listed locations, are required to read and understand the contents of Subpart D applicable to the listed work areas.

**APPLICATION:** The requirements listed in this appendix and in 1910 CFR Subpart D are applicable to all departments of the university who employees are required to work at any of the listed elevated surfaces or vertical openings. These requirements apply also to contractors conducting work for the university at any campus location (reference is made to Environmental Health and Safety’s document “Safety and Health Rules for Contractors”).

**GENERAL GUIDELINES FOR WORK ACTIVITIES ON WALKING-WORKING SURFACES:** This standard operating procedure will address only general guidelines for work activities on walking-working surfaces not addressed in other appendices of this written program. For greater detail, please refer to OSHA standard 1910 CFR Subpart D, Walking-Working Surfaces.

**General Requirements**

- a. Housekeeping – All walking and working surfaces shall be kept clean and orderly and in a sanitary conditions. The floors of every workroom shall be maintained in a clean and, so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained and false floor, platforms, mats, or other dry standing places should be provided where practical. To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards.
- b. Aisles and Passageways - Where mechanical handling equipment is used, sufficient safe clearance shall be allowed for aisles, at loading docks, through doorways and wherever turns and or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstruction across or in aisles that could create a hazard. Permanent aisles and passageways shall be appropriately marked.
- c. Covers and Guardrails - Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc.

- d. Floor Loading Protection – In every building or other structure or parts thereof, used for mercantile, business, industrial, or storage purposes, the loads approved by the building officials shall be marked on plates of approved design which shall be supplied and securely affixed by the owner of the building. Such plates are to be affixed in a conspicuous location and not removed or defaced. If lost, removed or defaced, the plate shall be replaced. It shall be unlawful to place, or cause or permit to be placed, on any floor or roof of a building or other structure a load greater than that for which such floor or roof was approved.

**Catwalks and Other Permanent Platforms** - Every catwalk, open-sided floors or platforms 4 feet or more above the adjacent floor or ground shall be guarded with a standard guardrail. A standard toeboard shall be provided when any of the following exist below an open side:

- a. Persons can pass,
- b. There is moving machinery, or
- c. There is equipment with which falling materials could create a hazard.

For catwalks, this requirement must be met for heights of 4 feet or higher and whenever tools, machine parts, or materials are likely to be used on the catwalk.

Design specifications for a standard guardrail and toeboard can be found in Subpart D, 1910.23.

Catwalks that are not accessible by stairs or fixed ladder will be accessed by utilization of an extension ladder. The use of stepladders is not permitted. Employees are to follow the guidelines on usage of ladders found in Appendix F.

**Scaffolding** – At the current time, Physical Plant is the only department known to utilize scaffolds. Physical Plant utilize scaffolds manufactured by Upright and manually propelled roller scaffolds (commonly referred to as “painter’s scaffold”), none of which have an operating height of over 6 feet. The ratio of working height to the least width dimensions is such as to not require outrigging. Additionally, with a working height of less than 10, these scaffolds do not require standard guardrails or toeboards. Employees should receive training on the proper use of this equipment from a technical representative of the manufacturer. Employees are to follow all instructions outlined in the manufacturer’s operating manual. Only those Physical Plant employees who have completed training in fall protection and scaffolding are allowed to set up and use the scaffolds listed above. Scaffolding is not to be loaned out to other departments unless proof of training as stated above is provided. University owned equipment should not be loaned to contractor unless under emergency repair conditions and proof of training has been provided. **No employee, student or contractor will be permitted to erect or use any other type scaffold without the expressed approval of Environmental Health and Safety. Physical Plant supervisors or Project Managers will ensure that any utilization of scaffolding by a contractor is done in accordance with Subpart D, 1910.23.**

**Boilers** - Periodic maintenance (approximately every 3 years) requires a Physical Plant maintenance person to remove the manhole cover from the top of the boilers in Oelman Hall, Library and Student Union (old Physical Education Building). Height of this work activity is approximately 9 feet off of the floor and therefore necessitates fall protective measures. The

safety of employees during ascending or descending the top of the boilers must be ensured either by utilization of a fall arrest or fall restraint system, whenever possible. If utilization of a fall arrest or restraint system is not practical, procedures will be established based on the findings of a job hazard analysis and after employees are afforded the necessary training.

**Cooling Towers** - Those cooling towers requiring weekly maintenance (Millett, Library, Creative Arts Center, Nutter Center, and Medicine Sciences) were evaluated and found that fall protection by way of standard guardrails was available and adequate. No other fall protective measures are deemed necessary at this time.

**Chillers** - Physical Plant employees do not have maintenance requirements on the top level of chiller units. Therefore, there is no need for employees to be on top of chiller units and, as such, no fall protective measures are warranted.

**Vertical Wall Openings** - Vertical wall opening is an opening of at least 30 inches in height and 18 inches wide, in any wall or partition, through which persons may fall. Every vertical wall opening from which there is a drop of more than 4 feet shall be protected by either a rail, roller picket fence, half door, or equivalent barrier. A doorway, which leads immediately into an open pit, is considered a vertical wall opening. An example of this is the 4 doorways leading to the orchestra pit in the Creative Arts Center. Three doorways in room T060C and one doorway off the corridor across from room SB03 lead directly to the orchestra pit. **These opening are protected by safety nets which are required to be in place any time the orchestra stage is at a level higher than the floor level of room T060C. The four doors must also be posted on the entry side warning of the open pit.** It is the responsibility of theatre personnel and maintenance personnel using the stage or requiring access to the pit to ensure that the safety nets are in place when the stage is in the raised position. Physical Plant management and employees are to ensure that any other vertical opening are identified, posted, and adequately guarded. Coordination with Environmental Health and Safety is advised to ensure adequate guarding and compliance with regulatory requirements.

**Floor Opening** - A floor opening is an opening measuring 12 inches or more in its least dimension, in any floor, platform, pavement, or yard through which persons may fall. This would include hatchways, stairs, ladder openings, or large manholes. Floor opening occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from Subpart D. An example of a floor opening is the access opening from the 4<sup>th</sup> floor of Millett Hall to the penthouse. This opening is use to lift material to the penthouse. Physical Plant management is responsible for ensuring that adequate guarding is in-place anytime the metal cover is opened. Physical Plant management and employees are to ensure that all other floor openings are identified, posted, and adequately guarded. Coordination with Environmental Health and Safety is advised to ensure adequate guarding and compliance with regulatory requirements.

**Roofs** - Maintenance and inspection activities on building roofs are required periodically. It is mandated that a means of warning workers of the roof's edge be in place. For those roofs constructed with a parapet wall at the roof's edge, no additional means of warning is required. For roof without a parapet wall at the edge, a means of warning must be in place. The warning

must be, at a minimum, 6 feet from the edge of the roof. Environmental Health and Safety is to evaluate and approve any mean of warning employed other than the parapet wall.

**Skylights** – Skylights at the university will be classified into two classifications. First, are those which requires an individual(s) on the surface of the skylight for cleaning and/or maintenance activities. Physical Plant's position is to contract out this work. Two requirements must be met when contractors are on-site to accomplish work on these skylights:

- a. The contractor must comply with all applicable OSHA standards, with particular attention given to fall protection and walking-working surfaces. The university employee hiring the contractor and overseeing their work activities will ensure that the contractor representative is given and has read "Wright State University's Health and Safety Rules for Contractors". The contractor and the university representative are also required to complete page 8 of this document and submit a copy to Environmental Health and Safety.
- b. The area below the skylights must be cordoned off and no one allowed in the condoned area any time the persons are on the skylight. Any problems associated with keeping people out of the condoned area will be just cause to immediately cease work and the immediate reporting of the problem to the project manager and Environmental Health and Safety.

Skylights which are small in dimension and which do not required persons to be physically on will be guarded in a manner that will prevent the accidental falling of a person through the opening. Guarding will meet applicable OSHA standards.

The requirements outlined in this appendix are applicable to all contractors performing work for the university. It is the responsibility of the Physical Plant supervisor or the project manager over seeing the work to enforce these requirements.

Should it be questionable as to the degree of safety offered in any of the above work activities or any other job situation, supervisors or project managers are to seek Environmental Health and Safety's evaluation before any employee or contractor is placed in harms way.

**Please contact Environmental Health and Safety should there be any questions or concerns relative to the contents of this appendix.**

**APPENDIX F**  
**FALL PROTECTION – LADDERS**  
**MARCH 2000**

**REQUIREMENT:** Portable ladders are used daily by a large number of university employees in performing duties at elevated levels. Usage of fixed ladders is normally restricted to Physical Plant and SOM maintenance personnel to gain access to penthouses and roof areas. The requirements contained within are applicable to all university employees who routinely use fixed or portable ladders. These requirements are applicable also to contractors performing work for the university (Refer to Environmental Health and Safety’s document, “Safety and Health Rules for Contractors”). It is the university project manager’s responsibility to ensure compliance by contractors.

**AUTHORITY:** OSHA standard 29 CFR 1910, Subpart D, Walking-Working Surfaces, outlines the design specifications and use requirements for portable wood and metal ladders and fixed ladder.

**APPLICATIONS:** The requirements outlined in the above OSHA standard and in this standard operating procedure are applicable to the use of all portable and fixed ladders on university property. The general principles of use listed in this section for a fixed ladder applies to the ladder in the university water tower. However, the use of the fall arrest system in the tower is covered in Appendix C.

**GENERAL GUIDELINES ON THE USE OF LADDERS:** This standard operating procedure will address only general guidelines on the use of portable and fixed ladders. Information relative to design specifications can be found in the OSHA standard listed above. It is important to keep in mind that the frequent use of ladders sometimes makes us complacent as to the inherent hazards associated with their use.

1. Supervisor and employees should ensure all ladders are inspected prior to use for defects such as:
  - a. Cracks, splits or deterioration (siderails)
  - b. Missing, broken or split rungs/steps
  - c. Spreader in poor condition
  - d. Automatic locks working improperly
  - e. Oil, grease or other slipping hazards
  - f. Missing, broken or loose nails, bolts, screw; and
  - g. Damaged safety shoes
  
2. Ladders found with defects are to be immediately taken out of service. The ladder is to be tagged “DO NOT USE”. The ladder is not to be placed back in to service until repaired. If repairs cannot be done to place the ladder at the manufacturer’s design specification, it is to be replaced.

3. Wooden ladders may be painted with a clear protective coating. Do not paint ladders, as it hinders the inspection procedures. Ladders in storage should be supported, protected from damage, and kept out of traffic.
4. Fiberglass ladders should not be stored where subject to sunlight. Sunlight breaks down the resins in fiberglass. Fiberglass ladders are to be checked periodically for cracks and brittle spots.
5. All new ladders should be Type 1A (300 lb. rating) or greater. If the ladder is to be used with ladder jacks, it must be Type 1A or greater.
6. Fixed, straight, and extension ladders must extend three (3) feet or approximately 3 rungs above the landing surface. If this is not possible, a grabrail must be put in place to assist an individual mounting and dismounting the ladder.
7. When erecting a fixed, straight, or extension ladder, the base should be out one (1) foot for every four (4) feet of height. Both siderails need to rest securely against the top support and the ladder secured to prevent slippage.
8. Metal ladders should never be used near electricity.
9. Stepladders are not to be used as straight ladders.
10. Only one individual is to be on a stepladder at any one time. Never stand above the third rung on fixed, straight or extension ladders or above the second step from the top of a stepladder. Stepladder should have this warning stenciled on the second step of the ladder. This warning should be above the third rung, pointing down on fixed, straight, or extension ladders.
11. Ladders are not to be used in a horizontal position.
12. Ladders are not to be tied together to achieve a greater length.
13. Extension, straight, and fixed ladders are to be used for gaining access to different elevations; not as work platforms.
14. Stepladders are designed to be short elevations from which to work. Stepladders should not exceed 20 feet in height.
15. Sectional ladders can have a combined height of 37 feet.
16. The manufacturer's specifications for overlap should be followed when determining the height of extension ladders.
17. Ladders should be erected on level, stable surfaces

18. The user should always face the ladder.
19. When using a stepladder, keep both feet on the ladder. The safe lateral distance from a ladder to work is the normal extended distance of one's arm. Do not lean laterally from the ladder to achieve a greater distance.
20. Both hands are to be used in ascending and descending a ladder.
21. Ladders are not to be moved while in use.
22. If a ladder is used near a door or in a traffic area, barricades or guards are to be put in place.
23. Ladder access points should be kept clear of tools, material or debris.
24. Do not attempt to modify ladders by drilling holes, adding accessories, etc. Alterations may weaken the ladder structure and cause failure under load conditions.

**TRAINING:** Supervisors are responsible for ensuring that their employees have been trained on the use of ladders. Documentation of training is required. Training should include:

1. Fall hazards in the work areas.
2. The procedures for erecting, maintaining and disassembling fall protection systems.
3. The proper placement and use of ladders.
4. Their maximum intended loads
5. The appropriate OSHA standard(s) or Ohio Administrative Code

**Employees are to be retrained, as necessary, to maintain an adequate understanding and knowledge of safe ladder use.**

Any questions regarding the contents of this standard operating procedure should be addressed to your supervisor or to the Department of Environmental Health and Safety.