APPENDIX E - Other Activities Requiring Fall Protection

The activities listed below are not covered under 29CFR 1926.500. Fall Protection requirements are addressed in the specific standard listed below:

- OSHA 29 CFR 1926 Subpart L, Scaffolds
- OSHA 29 CFR 1926 Subpart N, Helicopters, Hoists, Elevators, and Conveyors;
- OSHA 29 CFR 1926 Subpart R, Steel Erection;
- OSHA 29 CFR 1926 Subpart S, Underground Construction, Caissons, Cofferdams, and Compressed Air; and
- OSHA 29 CFR 1926 Subpart X, Stairways and Ladders.

IUEHS has separate programs for each of these standards. All fall protection systems (i.e. guardrails, etc.) used at Indiana University shall meet the requirements of 29 CFR 1926.502 "Fall Protection Systems Criteria and Practices."

Personal Fall Arrest System

When work is performed on elevated surfaces such as roofs, or during construction activities, protection against falls must be considered. Fall arrest systems, which include lifelines, body harnesses, and other associated equipment, are often used when fall hazards cannot be controlled by railings, floors, nets, and other means. These systems are designed to stop a free fall of up to 6 feet while limiting the forces imposed on the wearer.

A personal fall arrest system could consist of the following components:

- **Full-body harness** - A full-body harness consists of nylon and/or polyester straps that encompass the chest, chest and waist or full body. In the event of a fall, a full body harness distributes the fall arrest force over the pelvis, thighs, waist and shoulders. The attachment point must be in the center of the back or at the shoulder level of the wearer.

  - Body harness systems shall not be used to hoist materials.
  - Personal fall arrest systems and components subjected to impact loading or a fall shall be removed from service and shall not be used again.

  Note: The use of a body belt for fall protection is prohibited.

- **Lanyard** - A lanyard connects the body harness to the anchorage point. The lanyard should be attached to a D-ring on the body harness between the shoulder blades and above the employee. Lanyards can be equipped with deceleration or shock absorbing devices that limit up to 80 percent of the arresting force placed on the wearer during a fall. The lanyard must be of sufficient strength to withstand twice the impact energy of a person free falling 6 feet or the free-fall distance permitted by the system if the free-fall distance is less than 6 feet.

- **Self-retracting lifelines** – A lanyard that automatically limit the free fall distance to 2 feet or less shall be capable of sustaining a minimum tensile load of 3,000 pounds applied to the device with the lifeline or lanyard in the fully extended position. Self-retracting lifelines and lanyards that do not limit free fall distance to 2 feet or less, ripstitch lanyards, and tearing and deforming lanyards shall be capable of sustaining a minimum tensile load of 5,000 pounds applied to the device with the lifeline or lanyard in the fully extended position.

- **Anchorage** - Used for attachment to personal fall arrest systems shall be independent of any anchorage being used to support or suspend platforms and shall be capable of supporting at least 5,000 pounds per person attached or shall be designed, installed, and used as part of a complete personal fall arrest system that maintains a safety factor of at least two and under the supervision of a qualified person.

- **Personal fall arrest systems**

  - Shall limit the maximum arresting force on an employee up to 1,800 pounds for a body harness;
  - Shall be rigged so that the user can neither free fall more than 6 feet, nor contact a lower level;
  - Shall bring the user to a complete stop and limit the maximum deceleration distance the user travels to 3.5 feet;
  - Shall have sufficient strength to withstand twice the potential impact energy of the user free falling a distance of 6 feet or the free fall distance permitted by the system;
  - All personal fall arrest systems shall be inspected by the user prior to each use. Inspect for wear, damage, and other deterioration. If any defects or damage is present, the system shall be removed from service immediately;
  - Personal fall arrest systems shall not be attached to guardrail systems or hoists. When personal fall arrest systems are used at hoist areas, they shall allow movement of the user only as far as the edge of the walking/working surface; and
  - Fall protection equipment that was used to arrest a fall, shall be removed from service and shall not be used again.

  Note: If a personal fall arrest system is used by an employee that has a combined tool and bodyweight of 310 pounds or more, the employer must appropriately modify the system to provide adequate fall protection or the system will be not in compliance with the protocols contained in 29 CFR 1926 Appendix C to Subpart M and 1926.502(d)(16).

- **Lifeline -** A lifeline consists of a flexible line that is connected to the anchorage point at one or both ends which serves as means to connect other components of the personal fall arrest system to the anchorage. Self-retracting lifelines provide mobility as well as worker protection.

  The line retracts as the worker moves toward the unit and pulls out as the worker moves away from the unit. If the worker slips or falls, the sudden jerk on the cable activates the breaking mechanism and the worker is brought to a stop within 2 feet. Lifelines can be either vertical or horizontal.

- **Vertical Lifeline** - A vertical lifeline consists of a flexible vertical line suspended from affixed anchorage to which a fall arrest device is secured. Vertical lifelines must have a minimum breaking strength of 5,000 pounds. When vertical lifelines are used, each worker must have a separate lifeline except during the construction of elevator shafts and provided the breaking strength of the lifeline is 10,000 pounds.

- **Horizontal Lifeline** - A horizontal lifeline consists of a flexible line connected to two horizontal fixed anchorage points to which a fall arrest device is secured. Horizontal lifelines are used when maximum horizontal mobility is required and no overhead anchorage point is available.

  Horizontal lifelines shall be designed, installed, and used under the supervision of a qualified person, as part of a complete fall arrest system that maintains a safety factor of at least two. Lanyards and vertical lifelines shall have a minimum breaking strength of 5,000 pounds. Lifelines shall be protected against being cut or abraded.

  On suspended scaffolds or similar work platforms with horizontal lifelines that may become vertical lifelines, the devices used to connect to a horizontal lifeline shall be capable of locking in both directions on the lifeline.

- **Snap Hooks –** Snap hooks are used to connect the lanyard to the D-rings on the body harness. Snap hooks must be constructed from smooth, corrosion-resistant steel and be double-locking. Snap hooks and D-rings must be compatible. This helps prevent roll-out, which occurs when the D-ring twists out of the throat of the hook and rolls out, causing the catch to open and the D-ring to come loose. Locking Snap hooks shall be used instead of non-locking snap hooks because of the potential for unintentional release (rollout).

- Connectors shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth. D-rings and snap hooks shall have a minimum tensile strength of 5,000 pounds. They shall be proof tested to a minimum tensile load of 3,600 pounds without cracking, breaking, or becoming permanently deformed. All snap hooks used shall be locking-type.

    - Snap hooks that are not designed for the following connections shall not be engaged directly to:
    - Webbing, rope or wire rope;
    - To each other;
    - To a D-ring to which another snap hook or other connector is attached;
    - To a horizontal lifeline; or
    - To any object incompatible in shape or dimension relative to the snap hook that may cause the connected object to depress the snap hook keeper and release it unintentionally.

- **Positioning Device Systems** - shall not allow an employee to free fall more than 2 feet and shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall or 3,000 pounds, whichever is greater.