



ENVIRONMENTAL HEALTH AND SAFETY

ROOF LABOR SAFETY PROGRAM MANUAL

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Status

Contact(s)	Implementation Date	Comments
Greg Hogan	August 2015	Manual updated.
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Table of Contents

Status	2
A: INTRODUCTION	4
B: ADMINISTRATIVE ROLES	4
C: TRAINING.....	5
D: UNPROTECTED ROOF EDGES	5
E: HOLES	5
F: ROOFING WORK ON LOW/STEEP SLOPE ROOF	5
G: CATCH PLATFORMS	5
H: REQUIREMENTS FOR ANCHORAGE.....	6
I: SAFETY BELTS, LIFELINES, LANYARDS, AND NETS	6
J: ROOFING BRACKETS	6
K: CRAWLING BOARDS OR CHICKEN LADDERS.....	7
L: USE OF HOISTING LINES.....	7
M: WORKSITE ISOLATION	7
N: PERSONAL PROTECTIVE EQUIPMENT	7
O: RESPIRATORY PROTECTION	7
P: WEATHER	8
Q: OSHA REFERENCES.....	8
R: DIRECTORY	8

A: INTRODUCTION

Roof construction, repair, and other maintenance operations often require manual labor at dangerous heights and on steeply pitched working surfaces. The possibility of lost footing, decreased stability, and objects falling from such heights is great. Therefore, appropriate employee safeguards shall be present. When employees of Oklahoma State University (OSU) are involved in such operations, the following minimum safety guidelines shall be followed to promote a safe and healthful workplace and guard against injury to others below the work area.

B: ADMINISTRATIVE ROLES

ENVIRONMENTAL HEALTH AND SAFETY

The specific responsibility for developing and implementing OSU programs for health and safety resides with the Environmental Health and Safety (EHS) Department. In fulfillment of this responsibility, EHS has prepared the Oklahoma State University Roof Labor Program and assists other departments in the development and implementation of roof labor procedures for their areas.

FACILITIES MANAGEMENT

Facilities Management (FM) is a key partner in determining location and categorization of all roofs at OSU. FM supervisors are responsible for ensuring their employees are properly trained to do the jobs they are sent to do. This includes recognition of proper procedures for entering roof areas whenever necessary. No FM employee shall be sent on a job that potentially involves work on a roof unless they have been properly trained in roof labor safety procedures.

DEPARTMENTS

Each department is responsible for evaluating and identifying roofs in their areas and is responsible for the implementation of the components of this Roof Labor Safety Program.

MANAGERS AND SUPERVISORS

Managers and supervisors play a key role in the implementation of the Roof Labor Safety Program. They are responsible for: determining whether personnel need to enter on to a roof; identifying personnel who will be required to participate in roof work as part of their duties; ensuring that all personnel required to participate in roof work are properly trained prior to assignment; ensuring that proper safety equipment required for work is made available to personnel; and ensuring that all provisions of the program are followed.

PERSONNEL

Personnel are responsible for observing all practices and procedures contained in the Roof Labor Safety Program, other general safety practices, attending designated training sessions, and reporting hazardous or unsafe conditions to their supervisor, the entry supervisor, or EHS.

PROGRAM REVIEW

EHS will review the Roof Labor Safety Program annually. If revisions are needed, the changes shall be made, and employees trained on the revisions.

C: TRAINING

Each department whose employees are required to perform duties on roofs shall ensure that they receive safety training and comply with the minimum standards as specified in this document. EHS offers OSHA Fall Prevention Courses that can assist and aid in this training. Annual refresher training is recommended.

D: UNPROTECTED ROOF EDGES

When work is conducted within 6 feet of the edge of the roof, an appropriate parapet wall, guardrail system, or a Personal Fall Arrest System (PFAS) is required. A PFAS is only to be used by trained employees and must be attached to an approved anchor point.

E: HOLES

Each employee on walking/working surfaces shall be protected from falling through holes (including skylights) more than 6 feet (1.8 m) above lower levels, by personal fall arrest systems, covers, or guardrail systems erected around such holes.

Each employee on a walking/working surface shall be protected from tripping in or stepping into or through holes (including skylights) by covers. Each employee on a walking/working surface shall be protected from objects falling through holes (including skylights) by covers.

F: ROOFING WORK ON LOW/STEEP SLOPE ROOF

Each employee engaged in roofing activities on low-slope roofs, slopes of less than (4:12), with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by one of the following:

- Guardrail systems
- Safety net systems
- Personal fall arrest systems
- A combination of warning line system and guardrail system, warning line system and safety net system, or warning line system and personal fall arrest system, or warning line system and safety monitoring system.

On roofs 50 feet (15.25 m) or less in width (see Appendix A of 1926 Subpart M), the use of a safety monitoring system alone [i.e. without the warning line system] is permitted.

Each employee on a steep roof with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems with toeboards, safety net systems, or personal fall arrest systems.

G: CATCH PLATFORMS

A substantial catch platform shall be installed below the working area of roofs more than 20 feet from the ground to eaves with a slope greater than 3 inches in 12 inches without a parapet. In width, the platform shall extend 2 feet beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toeboard. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline. Catch platforms must comply with OSHA's scaffold standards 1926 Subpart L.

H: REQUIREMENTS FOR ANCHORAGE

Anchorage shall be designed and installed under the supervision of a Professional Engineer (PE) in accordance with the manufacturer's instructions. The PE shall have significant experience in the design of fall protection systems. Only a PE shall certify the structural integrity of the anchorages. Anchorage conditions should be field-verified by a qualified person.

Before initial use, the anchorage assemblies and fall arrest equipment shall be successfully load tested at the rated load and documentation provided to OSU. The load test shall be prescribed, defined, and certified by a registered PE.

According to the American National Standards Institute (ANSI), qualified anchorages used for personal fall arrest must meet the following requirements:

- Independent of any anchorage used to support or suspend equipment or platforms.
- Capable of supporting 5,000 pounds per employee attached or designed, or designed, installed, and used under the supervision of a qualified person as part of a complete fall-arrest system, which maintains a safety factor of at least two (i.e. 10,000 pounds). Inspections of the system by users should always be performed before each use. Any systems deployed should be discarded.

I: SAFETY BELTS, LIFELINES, LANYARDS, AND NETS

The safety belt lanyard shall be a minimum of 1/2-inch nylon or equivalent material, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

Lifelines shall be secured above the point of operation to an anchorage or structural member capable of supporting a minimum dead weight of 5,400 pounds. One employee acting as anchor for another does not fulfill this requirement.

Lifelines used in areas where they may be subjected to cutting or abrasion shall be a minimum of 7/8-inch wire core manila rope. For all other lifeline applications, a minimum of 3/4-inch manila or equivalent with a minimum breaking strength of 5,400 pounds shall be used.

Lifelines, safety belts, and lanyards shall be used only for employee safeguarding. Ropes used for hoisting lines and other purposes shall not be used as lifelines. Any lifeline, safety belt, or lanyard actually subjected to in-service loading, as distinguished from static testing, shall be immediately removed from employee safeguarding.

Where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or safety belts is impractical, safety nets shall be provided when workplaces are more than 25 feet above the ground, water, or other surface.

J: ROOFING BRACKETS

Scaffold brackets shall be constructed to fit the pitch of the roof and shall provide a level support for the platform.

In addition to the pointed metal projections, brackets shall be secured by nailing in place. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least 3/4-inch in diameter, or equivalent.

K: CRAWLING BOARDS OR CHICKEN LADDERS

Crawling boards shall not be less than 10 inches wide and one inch in thickness, having cleats 1 x 1-1/2 inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the roof peak to the eaves when used in connection with roof construction, repair, or maintenance.

A firmly fastened lifeline of at least 3/4-inch rope shall be strung beside each crawling board for a handhold. Crawling boards shall be secured to the roof by means of adequate ridge hooks or equivalent effective means.

L: USE OF HOISTING LINES

When hoisting lines are used to raise tools or materials to a roof greater than 16 feet from the ground to eaves without a parapet (or with a parapet less than 30 inches in height), the employee on the roof shall be secured by an approved safety belt attached to a lifeline.

The safety belt lanyard shall be a minimum of 1/2-inch nylon, or equivalent, with a maximum length to provide for a fall of no greater than 6 feet. The rope shall have a nominal breaking strength of 5,400 pounds.

M: WORKSITE ISOLATION

Prior to the start of roof construction, repair, or maintenance, the crew chief, foreman, or person in charge of the project shall ensure that the area below the work site is isolated against entry by the use of barrier tape or other means. If means of egress are to be blocked by ladders, scaffolds, or other equipment, or to isolate below a work site, prior approval must be obtained from EHS.

N: PERSONAL PROTECTIVE EQUIPMENT

Employees involved in roof construction, repair, or maintenance operations shall use appropriate personal protective equipment including, but not limited to, full body harness, hard hats, eye protection, foot protection, and leather gloves.

O: RESPIRATORY PROTECTION

Before entering onto any roof at OSU, please check with your supervisor, foreman or the EHS department to determine if respiratory protection is required. The correct respirator is determined by what airborne contaminants or toxins may be present in that location.

The following roof tops at Oklahoma State University shall require respiratory protection:

- Advanced Technology Research Center
- Animal Science
- Bovine Isolation Facility (Bldg. 637)
- Equine Research Park BSL-2 Barn (Bldg. 800)
- Food & Agricultural Products Center
- Henry Bellmon Research Center
- Life Science East
- McElroy Hall
- McElroy Hall Annex
- Noble Research Center
- OADDL
- OADDL West Isolation (AKA: OADDL Annex)

P: WEATHER

Employees shall not be involved in construction, repair, or maintenance operations on roofs during periods of high winds (such as when a wind advisory has been issued), lightning storms, snowstorms, or other potentially hazardous weather conditions.

Q: OSHA REFERENCES

29 CFR 1926. 450(b).....Catch platforms	29 CFR 1926.104Safety belts, lifelines, & lanyards
29 CFR 1926.451(g)(1)(iii)....Crawling boards/chicken ladders	29 CFR 1926.105Safety nets
29 CFR 1926.452 (h)(1)(2)Roofing brackets	ANSI Z359.1-1992 (R1999)

R: DIRECTORY

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