



# Boston College **Environmental Health and Safety**

## **ROOF SAFETY and FALL PROTECTION**

### ***Introduction***

Personnel are required to access roofs for construction, repair and other maintenance operations. This is often done on working surfaces at dangerous heights or on steeply pitched roofs. It may also involve potential exposure to hazardous chemicals. This factsheet will provide guidelines to promote a safe workplace for workers and guard against injury to others below the work area.

OSHA requires employers to "...furnish to each employee a place of employment free from recognized hazards that are causing or are likely to cause death or serious physical harm ...." They also state "Protective Equipment .....and protective shields and barriers, shall be provided, used and maintained in a sanitary and reliable condition wherever necessary by reason of hazard.

### ***Applicable Regulations***

1. General Duty Clause under the OSH Act of 1970, Section No. 5.
2. General Industry Standards–29 CFR 1910
  - Subpart D – Walking-Working Surfaces
  - Subpart I– Personal Protective Equipment
  - Subpart Z–Toxic & Hazardous Substances
  - Subpart R–Special Industries 1910.269 (g)
1. Construction Standards – 29 CFR 1926
  - Subpart M – Fall Protection

### ***Summary of Requirements***

When accessing a roof at Boston College consider these issues when planning work:

- The strength and structural integrity of the surface to safely support employees. Employees will only be allowed to work on surfaces that can support them.
- Are the sides and edges protected or unprotected? Options to consider to protect workers are: guardrails, safety nets, warning lines, personal fall arrest systems (body belts are prohibited), safety monitoring systems or designated work areas (proposed standard).
- Exposure points on the roof which may cause employees to be exposed to hazardous materials or hazardous situations (ie. chemical exposure from chemical fume hood stacks; noise levels).
- Roof access hatches should be protected and precautions taken to ensure the cover will not latch to prohibit exit, and if opened, put up protections to prevent falls.
- When working around skylights, ensure proper protections are in place to prevent falls.
- With respect to contractors, have they been informed by BC personnel of any hazards while working on a roof, and do the contractors have a program to address these hazards?

- The meteorological conditions when working on the roof.
- Type of equipment needed to conduct work safely.
- Is it necessary to inform the occupants that roof work is being conducted in order to cease certain operations inside a building? Should signage be posted in the building?
- Steps to be taken in the event of a fire alarm activation while workers are on the roof.

## Flat Roofs

Every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing on all open sides. When adjacent to dangerous equipment, standard railings and toeboards shall be used. Further OSHA interpretations state that a personal fall arrest system may also be used. (General Industry)

## Steep Roofs

Employees on steep roofs with unprotected sides and edges 6 feet or more above lower levels shall be protected from falling by guardrail systems with toeboards, safety net systems or personal fall arrest systems. (Construction)

## Low-Slope Roofs

Employees engaged in roofing activities with unprotected sides and edges 6 feet or more above lower levels shall be protected from falling by using a combination of guardrails, safety nets, warning lines, personal fall arrest systems or safety monitoring systems. (Construction)

## Sky Lights

Skylights shall be guarded by a standard skylight screen or fixed standing railing on all exposed sides.

## ***Recommended Program***

Depending on the type of work being done, maintenance or construction, either the General Industry or the Construction Standard applies. So for each task, one may determine applicability OR follow a best practice approach as described below. The Office of EH&S recommends a best practice approach, as described, to protect both students and employees.

1. Limit access to the roof through a permit system approach.

*A system, by each department, can be devised so that access to the roof is restricted to trained authorized personnel only. Permits should be approved by supervisors.*

2. Employees should be trained so they can recognize, evaluate and control hazards they may encounter.
3. Perform a hazard analysis prior to roof access.

*Review the physical elements of a job (ie. structural integrity, skylights, type of access ladder) and select the appropriate fall protection systems consistent with job tasks. Also, review potential physical and chemical hazards of a job. This may include exhaust gases, fumes or particles from stacks or chemical hoods, radiation exposure, electrical shock, or moving machinery.*

4. Follow appropriate fall protection measures.

*This may include guardrails, safety nets, warning lines, personal fall arrest systems, safety monitoring systems or designated work areas.*

5. Monitor these practices and make necessary improvements.

## ***Training***

When working on a roof for maintenance type activities, employees should be trained to recognize hazards and procedures they can use to minimize injuries, and:

- Any fall hazards that may be encountered,
- Other regulatory standards applicable to the work being conducted,
- Correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems being used,
- How and when to report problems or to ask questions regarding fall protection.

If construction work is being conducted, training should encompass the above and the following:

- The use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, safety monitoring systems, controlled access zones, and other protective measures to be used,
- Role of each employee in safety monitoring system if being used, and in written plans,
- Mechanical equipment limitations on low-sloped roofs,
- Correct procedures for handling and storage of equipment and materials and the erection of overhead protection,

Training should be documented using the standard EH&S Office sign-in-sheet that includes date, name of instructor, name of employee(s) trained, department, social security number and signature. Copies of these forms must be forwarded to the EH&S Office for filing. Retraining should be conducted when conditions change, an incident occurs, or the employee does not possess the necessary skills to perform the work safely.

### ***References:***

1. OSHA Standards 1910 and 1926
2. Managing Roof Fall Hazards in General Industry by John F. Rekus, Penton Media, Inc.
3. LLNL Health and Safety Manual, 26.21, Roof Access

### ***Resources***

Office of Environmental Health and Safety,  
St. Clements Hall, Room 120 at x2-0308.

<http://www.bc.edu/ehs>

<http://hazard.com> [go to online library; power point files; safety presentations].

<http://www.safetyconnection.com>

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