



# **Health and Safety Standard Operating Procedure**

## **SOP- 06**

### **Working at Height**

**Produced by**

**HS – Facilities & GS Department**

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# SOP-06: Working at Height

## 1 Overview

### 1.1 Purpose

The purpose of this Health and Safety (HS) Standard Operating Procedure (SOP) is to provide procedures for working at height associated with activities performed at Qatar University.

### 1.2 Hazards and Risks

#### 1.2.1 Working at Height Hazards

Hazards associated with working at height include:

- Fall from height
- Struck by dropped objects
- Overhead power lines (for additional information pertaining to electrical hazards, refer to **SOP-02: Electrical Safety**)
- Unstable surfaces

#### 1.2.2 Potential Outcomes

Working at height can lead to:

- Personal injury or death from falling
- Personal injury or death from being struck by an object dropped from height
- Electrocution and arc flash from coming into contact with overhead power lines

### 1.3 Key Terminology

**Table 1 - Key Terms**

Term	Definition
Low-slope roof	A roof having a slope less than or equal to 4 in 12 (vertical to horizontal).
Personal fall arrest system	A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, a body belt or body harness and may include a lanyard, deceleration device, lifeline, or suitable combinations of these.
Safety net system	A safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.
Unprotected side / edge	Any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.
Warning line	A barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge

## **2 Scope**

The requirements outlined in this guidance document are applicable to all QU employees, students, contractors, and visitors who are working for QU, and/or conducting work on QU premises. The following subsections outline some of routine and non-routine activities in which the conditions covered by this technical guidance may be encountered.

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### **2.1 Routine**

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Routine activities undertaken at QU involving working at height include:

- Use of ladders during routine maintenance activities
- Use of step stools to access materials on shelves
- Use of man-lifts in warehousing activities
- Working on roofs

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### **2.2 Non-routine**

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Less common activities that involve working at height include:

- Construction-related activities with possible use of scaffolds
- Use of mobile elevated work platforms
- Working on unguarded platforms, walkways or above dangerous equipment

## **3 Roles and Responsibilities**

Each employee should be on the alert for hazardous conditions and promptly report any to the Health and Safety Section (HS).

The department is responsible for the correction of any operational deficiencies that are discovered. Facility deficiencies must be reported to the HS.

The Departments are the primary organization responsible to implement and maintain sound safety practices when working at height.

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### **3.1 VPs, Deans, Directors, Managers, Head Sections**

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VP, Deans, Directors, Managers, Head Sections/Units and Project Managers have the primary responsibility of directing and managing safety associated with working at heights, therefore, have responsibility for assuring sound safety practices and compliance within the Departments and Colleges. They are ultimately responsible for enforcing consequences arising from moderately serious and very serious incidents.

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### **3.2 Employees, Contractors and Students**

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Employees, contractors and students are responsible for compliance with safety regulations and this SOP, as applicable.

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### **3.3 Health and Safety Section (HSS)**

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The HSS is responsible for providing Working at Heights Safety Orientation on an annual basis or as need arises to all workers, faculties, and students.

## 4 Risk Prevention

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### 4.1 General Prevention Requirements

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The following general prevention practices should be implemented to minimize the risk of injury or incident from working at heights:

- Appropriate personal protective equipment (PPE) should be used.
  - Workers shall be competent in the use of the equipment associated with working at height.
  - Lone working should be avoided when work tasks must be conducted at height.
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### 4.2 Specific Prevention Methods

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The following specific prevention methods should be implemented to eliminate or reduce the risk of incident associated with working at height.

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#### 4.2.1 Ladders

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The following minimal standards apply to the use of ladders:

- Ladders must be used only for the purpose for which they were designed (e.g., self-supporting ladders must not be used as a single ladder or in a partially closed position).
- Ladders must not be loaded beyond the maximum intended load for which they were built beyond their manufacturers' rated capacity.
- Ladders must be maintained free of oil, grease and other slipping hazards.
- When portable ladders are used for access to an upper landing surface, the side rails must extend at least 3 feet above the upper landing surface. The ladder must be secured and a grasping device, such as a grab rail, must be provided to assist workers in mounting and dismounting the ladder. A ladder extension must not deflect under a load that would cause the ladder to slip off its support.
- Non-self-supporting ladders must be used at an angle where the horizontal distance from the top support to the foot of the ladder is approximately one quarter of the working length of the ladder. Wood job made ladders with spliced side rails must be used at an angle where the horizontal distance is one eighth the working length of the ladder.
- The top of a non-self-supporting ladder must be placed with two rails supported equally unless it is equipped with a single support attachment.
- Ladders must be used only on stable and level surfaces unless secured to prevent accidental movement. Do not place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- Ladders must not be used on slippery surfaces unless secured or provided with slip resistant feet to prevent accidental movement. Slip resistant feet must not be used as a substitute for care in placing, lashing, or holding a ladder upon slippery surfaces.
- Ladders placed in areas such as passageways, doorways, driveways or where they can be displaced by workplace activities or traffic must be secured to prevent accidental movement, or a barricade must be used to keep traffic or activities away from the ladder.

- Fixed ladders must be used at a pitch no greater than 90 degrees from the horizontal, measured from the back side of the ladder.
- Ladders must have nonconductive side-rails if they are used where the worker or the ladder could contact exposed energized electrical equipment.
- Metal ladders should not be used in areas containing electrical circuits to prevent short circuits or electrical shock.
- Single rail ladders must not be used.

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#### **4.2.2 Scaffolding**

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The following shall be implemented when using scaffolds:

- The footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Unstable objects such as barrels, boxes, loose brick, or concrete blocks, shall not be used to support scaffolds or planks.
- No scaffold shall be erected, moved, dismantled, or altered except under the supervision of competent persons.
- Guardrails and toe boards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor, except needle beam scaffolds and floats. Scaffolds 4 feet to 10 feet in height having a minimum horizontal dimension in either direction of less than 45 inches, shall have standard guardrails installed on all open sides and ends of the platform.
- Guardrails must be 2 X 4 inches, or the equivalent, approximately 42 inches high, with a mid-rail, when required. Supports must be at intervals not to exceed 8 feet. Toe board and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. standard wire 1/2 inch mesh, or the equivalent.
- Scaffolds and their components must be capable of supporting without failure at least 4 times the maximum intended load.
- Any scaffold including accessories such as braces, brackets, trusses, screw legs, ladders, etc., damaged or weakened from any cause must be immediately repaired or replaced.
- All load-carrying timber members of scaffold framing shall be a minimum of 1,500 fiber (Stress Grade) construction grade lumbers.
- All planking must be Scaffold Grades, or equivalent, as recognized by approved grading rules for the species of wood used. The maximum permissible span for 1-1/4 X 9 inches or wider plank of full thickness shall be 4 feet with medium duty loading of 50 psf.
- All planking or platforms must be overlapped (minimum 12 inches), or secured from movement.
- An access ladder or equivalent safe access must be provided.
- Scaffold planks must extend over their end supports not less than 6 inches nor more than 18 inches.
- The poles, legs, or uprights of scaffolds must be plumb, and securely and rigidly braced to prevent swaying and displacement.

- Overhead protection must be provided for workers on a scaffold exposed to overhead hazards.
- Slippery conditions on scaffolds shall be eliminated immediately after they occur.
- No welding, burning, riveting or open flame work shall be performed on any staging suspended by means of fibre or synthetic rope. Only treated or protected fiber or synthetic ropes shall be used for or near any work involving the use of corrosive substances or chemicals.
- Wire synthetic, or fibre rope used for scaffold suspension shall be capable of supporting at least 6 times the rated load.
- All scaffoldings must be inspected and tagged safe to use by competent person prior to its use.
- All unsafe scaffolding must be tagged unsafe and shall be immediately dismantled or rectified.

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#### **4.2.3 Mobile Platforms**

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- Cross bracing must be installed across the width of the platform at least every third set of posts horizontally and every fourth runner vertically. Such bracing must extend diagonally from the inner and outer runners upward to the next outer and inner runners.
- Longitudinal diagonal bracing on the inner and outer rows of poles shall be installed at approximately a 45 degree angle from near the base of the first outer post upward to the extreme top of the scaffold. Where the longitudinal length of the scaffold permits, such bracing shall be duplicated beginning at every fifth post. In a similar manner, longitudinal diagonal bracing shall also be installed from the last post extending back and upward toward the first post. Where conditions preclude the attachment of the bracing to the posts, it may be attached to the runners.
- The entire scaffold shall be tied to and securely braced against the building at intervals not to exceed 30 feet horizontally and 26 feet vertically.
- Guardrails made of lumber not less than 2 x 4 inches (or other material providing equivalent protection), approximately 42 inches high, with a mid-rail of 1 x 6 inch lumber (or other material providing equivalent protection), and toe boards shall be installed at all open sides and ends on all scaffolds more than 10 feet above the ground or floor. Toe boards shall be a minimum of 4 inches in height. Wire mesh shall be installed when needed.

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#### **4.2.4 Work on Roofs**

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- Workers engaged in roofing activities on low-slope roofs, with unprotected sides and edges 6 feet (1.8 m) or more above lower levels shall be protected from falling by guardrail systems, safety net systems, personal fall arrest systems, or 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. Guardrail systems used on roofs shall meet the same requirements as guardrail systems used on scaffolding as presented in Section 4.2.2.
- On roofs 50-feet (15.25 m) or less in width, the use of a safety monitoring system alone [i.e. without the warning line system] is permitted.

- Workers 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.
- A warning line may be used 15 feet or more from a roof edge for work activities that may take place on the roof but are not related to actual roof work (e.g., accessing roof-mounted equipment). No workers may enter or work-related activity take place in the area between the warning line and the edge;

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#### **4.2.5 Work over Dangerous Equipment**

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Regardless of height, if a worker can fall into or onto dangerous machines or equipment (such as a vat of acid or a conveyor belt), guardrails and toe boards must be installed to prevent workers from falling and getting injured.

### **5 Safe Work Practices**

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#### **5.1 General Safe Work Practices**

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The following general principles and safe work practices apply to activities associated with working at heights:

- Inspect ladders and fall protection equipment prior to each use. If a ladder or other equipment is damaged it must be either tagged for service or discarded.
- Avoid electrical hazards. Look for overhead power lines prior to beginning work at heights.

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#### **5.2 Specific Safe Work Practices**

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Workers should practice the following for specific tasks to minimize the risk of incident or injury when working at heights.

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##### **5.2.1 Ladders**

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- The top or top step of a step ladder must not be used as a step.
- Ladders must not be moved, shifted or extended while in use.
- Cross bracing on the rear section of step ladder must not be used for climbing unless the ladders are designed and provided with steps for climbing on both front and rear sections.
- The area around the top and bottom of the ladders must be kept clear.
- Always maintain 3 points of contact (two hands and a foot, or two feet and a hand) on the ladder when climbing.
- Keep your body near the middle of the step and always face the ladder while climbing
- Workers using a ladder must not carry any object or load that could cause the worker to lose balance and fall.

### **5.2.2 Scaffolding**

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- Workers shall not climb on scaffold support bars or guardrails to increase working height or access higher levels.
- Debris shall not be allowed to accumulate on platforms.
- Ladders or makeshift devices, such as but not limited to boxes and barrels, shall not be used on top of scaffold platforms to increase the working level height.
- Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for workers to be on the scaffold and those workers are protected by a personal fall arrest system or wind screens. Wind screens shall not be used unless the scaffold is secured against the anticipated wind forces imposed.

### **5.3 Personal Protective Equipment (PPE)**

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Personal protective equipment used while working at heights includes:

- A body harness
- A lanyard, deceleration device, or lifeline.

*Fall protection equipment shall comply with US Occupational Safety and Health Regulation 29 CFR 1926.104 and passed European Standard EN-361, EN-354, EN-355, EN-353-2 and EN-362.*

## **6 Training**

Workers that will be working at heights shall be provided appropriate training. QU shall ensure that no person is engaged in any activity involving working at height unless such person has the competency gained from training, technical knowledge and experience of the precautions to be taken against the risk associated with such activities.

Refer to **QU HSEMS Section 11.0: Training and Competency Procedure** for additional information regarding training processes.

### **6.1 General Training**

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All workers that will be working at heights will be provided with training. At a minimum this training will include:

- Fall hazards associated with work to be undertaken
- Types of fall protection equipment to be used while working at height
- Use and operation of guardrail systems, personal fall arrest systems, safety net systems, warning line systems, or any other fall protection methods that are used at QU.
- Proper techniques for ascending and descending ladders and scaffolds.

### **6.2 Qualified Worker**

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Select workers that will be using personal fall arrest systems shall also be trained in:

- Proper use of personal fall arrest equipment including:
  - Proper donning and doffing of safety harness

- Proper use of lanyards and lifelines
- Limitations of the equipment
- Emergency rescue procedures.

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### **6.3 Training Documentation**

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QU shall maintain a record of required training and attained competency with respect to general ergonomic understanding and implementation.

## **7 Document Control**

This Technical Guidance is a controlled document. The controlled version of this SOP is located on the QU Electronic Documentation Management System.

Any printed copies of this controlled document are reference copies only. It is the responsibility of all of those with printed copies to ensure their copy is kept up to date.

*Refer to **QU HSEMS Section 16.0 – Document Control and Record Retention.***

## **8 References**

<https://www.osha.gov/SLTC/fallprotection/index.html>

<https://www.osha.gov/SLTC/scaffolding/hazards.html>

United States Department of Labour - Occupational Safety and Health Administration regulations, 29 CFR 1926 Subpart M.