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**General Guidelines  
for**

# **Handling, Storage, and Maintenance of Ladders**

**REVISION**

Rev No.	DCN No.	Change Summary	Release Date	DCN Initiator	Document Owner
3	DCN0456	Added Sections 7.8, 7.9, 7.10	12-18-08	Jennifer Trodden	Robert Segura

Prior revision history, if applicable, is available from the Document Control Office.

## 1. PURPOSE

- 1.1 This procedure establishes minimum rules to protect the health and safety of workers required to use ladders when performing duties at elevated levels, and to minimize the potential for personal injury.
- 1.2 This procedure is intended to provide more detailed procedures to be taken when using, handling, storing and maintaining ladders at the College of Nanoscale Science and Engineering (CNSE).
- 1.3 Although this practice describes specific safety measures to be taken for using, handling and storing ladders, it is not intended to prevent the use of any additional measures that may be deemed necessary for a particular situation.
- 1.4 To comply with the regulations outlined in the Occupational Safety and Health Administration's (OSHA) Part 29 CFR 1910, Subpart D, Walking-Working Surfaces. (29 CFR 1910.25, Portable Wood Ladders, 29 CFR 1910.26, Portable Metal Ladders, 29 CFR 1910.27, Fixed Ladders)
- 1.4.1 To ensure that ladder equipment meets American National Standards (ANSI), (ANSI A14.1-2000, Portable Wood Ladder Safety Requirements, ANSI A14.2-2000, Portable Metal Ladder Safety Requirements, ANSI A14.5-2000, Portable Reinforced Plastic Ladder Safety Requirements.)
- 1.5 All additions or deletions to this specification shall be under a Document Change Notice, coordinated by Document Control with sign-off required by but not limited to the EH&S Department.

## 2. SCOPE

- 2.1 This program establishes the minimum requirements for the use, handling, storage and maintenance of ladders at CNSE. Tenant employees, contractors and sub-contractors may comply with their own organization's program provided that it meets and/or exceeds the minimum requirements set forth in this procedure.
- 2.2 This program applies to CNSE employees, tenant employees, contractors and sub-contractor who may be involved in activities that require the use of ladders within the facility.
- 2.3 CNSE employees, tenant employees, contractors and sub-contractors will be notified of the requirement to follow this program and are required to comply with the restrictions and limitations imposed upon them by CNSE during ladder activities.

- 2.4 Facility Engineering and departmental Supervisors are responsible for supporting and enforcing this program to ensure compliance by all personnel.
- 2.5 This standard operating procedure will address only general guidelines on the use of portable and fixed ladders.

### **3. RESPONSIBILITIES**

#### **3.1 Environmental, Health and Safety (EH&S) Department**

3.1.1 The EH&S Department is responsible for the implementation, enforcement and maintenance of the provisions outlined in this program and as specified below:

- Oversee the policies and procedures of the program,
- Provide guidance on the requirements of the program,
- Perform risk assessments of work activity,
- Perform fall protection evaluations,
- Perform annual inspections of fixed ladders,
- Select and establish standard operating procedures for ladder usage,
- Assist in the selection of portable and fixed ladders at CNSE,
- Understand the hazards when using and handling ladders,
- Provide ladder safety training, and
- Notify contractors of activities that involve improper use, handling and storage of ladders.

#### **3.2 Facilities and Supervisors**

- 3.2.1 Facility Engineering and departmental supervisors are responsible for supporting and enforcing this program to ensure compliance by all personnel.
- 3.2.2 Supervisors are responsible for ensuring that their employees have been trained on the use of ladders.

### 3.3 All Employees

- 3.3.1 Employees are responsible for understanding the fall hazards associated with their job task and following established ladder safety policies and procedures.

## 4. ASSOCIATED DOCUMENTS

- 4.1 EHS-00050-F1 – Ladder Inspection Checklist
- 4.2 EHS-00050-F2 – Scaffolding Inspection Checklist

## 5. DEFINITIONS

- 5.1 **Extension ladder-** A non-self-supporting portable ladder that is adjustable in length. It consists of two or more sections traveling in guides or brackets to permit length adjustment.
- 5.2 **Fiberglass-** In this standard, fiberglass refers to glass-reinforced plastic, where the most common plastic encountered would be polyester.
- 5.3 **Highest standing level-** The vertical distance, expressed in feet and inches, from the uppermost rung or step the climber is advised to use to the horizontal plane of the ladder base support, with the ladder in the preferred climbing position.
- 5.4 **Ladder-** A device incorporating or employing steps, rungs, or cleats on which a person may step to ascend or descend.
- 5.5 **Ladder, foot, shoe, or skid-resistant bearing surface-** That component of ladder support that is in contact with the lower supporting surface.
- 5.6 **Ladder type-** The designation that identifies the working load.
- 5.7 **Portable Ladder-** A ladder that can readily be moved or carried, usually consisting of side rails joined at intervals by steps, rungs, cleats, or rear braces.
- 5.8 **Rail-** The side members joined at intervals by either rungs, steps, cleats, or rear braces.
- 5.9 **Rear braces-** Crosspieces or diagonals (in the back section of a self-supporting ladder), not intended for climbing which may be spaced at any interval.
- 5.10 **Rungs, steps, or cleats-** Ladder crosspieces that are intended for use by a person in ascending or descending.

- 5.11 **Scaffold-** A temporary elevated platform and its supporting structure used for supporting workers or materials or both.
- 5.12 **Step-ladder-** A self-supporting portable ladder, nonadjustable in length, with flat steps and hinged back.
- 5.13 **Test load-** The applied load used to demonstrate compliance with a performance test requirement.
- 5.14 **Top step-** The first step below the top cap of a portable stepladder. Where a ladder is constructed without a top cap, the top step is the first step below the rails.
- 5.15 **Visual inspection-** Inspection by the eye without recourse to any optical device except prescription eyeglasses.
- 5.16 **Working load-** The maximum applied load, including the weight of the user, materials, and tools that the ladder is to support for the intended use.

## 6. GENERAL GUIDELINES ON THE USE OF LADDERS

- 6.1 The correct types of ladder for the work activity should be chosen. All new portable 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.

### 6.2 PRE-INSPECTION

- 6.2.1 Check that the ladder is in good condition before it is used. The ladder should be checked for:
- Broken or loose rungs,
  - Rot or decay,
  - Cracks or splints on the uprights of the ladder,
  - Tie rods are secure,
  - Corrosion or oxidation of metal ladders,
  - Missing, broken or loose nails, bolts, screw and safety shoes
  - If the ladder is warped,
  - Oil, grease or other slipping hazards

### 6.3 DEFECTIVE LADDERS

- 6.3.1 Ladders found with defects are to be immediately taken out of service. The ladder is to be tagged "DO NOT USE".
  - 6.3.1.1 The ladder is not to be placed back into service until repaired.
  - 6.3.1.2 If repairs cannot be done to place the ladder at the manufacturer's design specification, it is to be replaced.
- 6.4 Never use a ladder that has been painted, as the paint may cover serious defects in the ladder.
- 6.5 Metal ladders should never be used near electricity.
- 6.6 The ladder should be placed on level and firm ground and placed against a surface which is able to support the weight of the ladder, worker and appropriate equipment.
- 6.7 Ladders should rest at an angle of 75° or 1 Unit horizontally to 4 Units vertically.
- 5.8 Fixed, straight, and extension ladders must extend three (3) feet or approximately 3 rungs above the landing surface. If this is not possible, a grab-rail must be put in place to assist an individual mounting and dismounting the ladder.
- 5.9 The top of the ladder should be reasonably rigid and have ample strength to support the applied load.
- 6.10 The top of the ladder should be securely fixed near to the upper resting place of the ladder.
  - 6.10.1 In circumstances where this is not possible, and the ladder is 6m or less, then a second worker should stand at the bottom of the ladder holding it in place. The second worker should hold the uprights with both hands and have one foot resting on the bottom rung.
    - 6.10.1.1 If it is not possible to fix a ladder of greater than 6m long, then it should not be used and an alternative appropriate means of access provided e.g. a scaffold.
- 6.11 The rung 1.05m from the top should be the last rung used by workers. This is to ensure there is an adequate region on the ladder for the worker to hold on to.
- 6.12 Only a minimum of light tools should be taken up a ladder. If practicable, tools should be held in a tool belt or a bag.

6.13 Workers should not use a ladder for access to a height greater than 10m. If work requires access to this height or above then a suitable scaffold or another suitable means of access should be provided.

## 6.14 EXTENSION LADDERS

6.14.1 When using extension ladders the sections should overlap as follows:

- For ladders of up to 5m there should be an overlap of at least 1.5 rungs;
- For ladders of 5-6m there should be an overlap of at least 2.5 rungs;
- For ladders of 6m or greater, there should be an overlap of at least 3.5 rungs.

## 6.15 STEPLADDERS

6.15.1 Stepladders are designed to be short elevations from which to work. Stepladders should not exceed 20 feet in height.

6.15.2 When using stepladders you should:

- Ensure the stepladder is located on firm level ground;
- Ensure that the stays/chains/cords holding the two halves of the ladder together are in good condition;
- Ensure the top steps or platform of the stepladder should not be used for standing on unless there is a 1.05m hand rail above the steps/platform. The stepladder should have this warning stenciled on the second step of the ladder.
- Allow only one person at a time on the stepladder.
- Keep both feet on the ladder.
- Do not lean laterally from the ladder to achieve a greater distance.

6.15.3 Stepladders are not to be used as straight ladders.

## 6.16 ROOF LADDERS

6.16.1 When using a ladder on a roof, workers should only use a ladder that can pass over the roof ridge. This is to ensure the ladder does not slip off the roof.

6.16.2 A roof ladder should have pads of a resilient material on the underside, so that it does not damage the roof.

## 7. HANDLING AND STORAGE

- 7.1 Ladders should be handled with care. If a ladder is dropped or hit by another item such that it may be damaged, then it should be taken out of service and inspected by a competent person.
- 7.2 The user should always face the ladder.
- 7.3 The user should use both hands when ascending and descending a ladder.
- 7.4 The ladder should not be moved while in use.
- 7.5 If a ladder is used near a door or in a traffic area, barricades or guards are to be put in place.
- 7.6 Ladder access points should be kept clear of tools, material or debris.
- 7.7 Do not attempt to modify ladders by drilling holes, adding accessories, etc. Alterations may weaken the ladder structure and cause failure under load conditions.
- 7.8 Ladders should be tagged by the owner and stored horizontally at floor level leaning against the wall or stored vertically also leaning against the wall.
- 7.9 Ladders should not be stored against electrical panels, equipment panels and/or tools/equipment, near heat sources or near dampness, in exit passageways or in aisle ways.
- 7.10 Ladders may be stored in a designated area marked for ladder storage and chained and locked together by ladder owner(s).
- 7.11 Fiberglass ladders should not be stored in the sunlight. Sunlight breaks down the resins in fiberglass. Fiberglass ladders are to be checked periodically for cracks and brittle spots.

## 8. MAINTENANCE

- 8.1 Ladders should be annually inspected by a 'Competent' person.
  - 8.1.1 All ladders should be labeled with the date of inspection and who inspected the ladder. See EHS-00050-F1 (Ladder Inspection Checklist).
  - 8.1.2 Where a ladder fails such an inspection it should be withdrawn from service immediately. The ladder is to be tagged "DO NOT USE".
- 8.2 Ladders should be kept clean and free from oil/grease/mud or any other item that may make the steps slippery or may damage the ladder.

## 9. EMPLOYEE TRAINING

- 9.1 Employee ladder safety training is critical to ensuring a complete fall protection program. The CNSE Ladder Safety training shall include the following elements:
- 9.1.1 Fall hazards in the work areas,
  - 9.1.2 Procedures for erecting, maintaining and disassembling portable ladders,
  - 9.1.3 Proper placement and use of ladders,
  - 9.1.4 The ladder's maximum intended load.
- 9.2 Ladder Safety training should be a combination of classroom and hands-on training. The classroom training should cover the fall protection fundamentals, while hands-on training is based upon site-specific ladder applications. Since the misuse of this equipment can result in serious injury or even death, it is extremely important that employees are able to physically demonstrate their ability to properly use the equipment. Each employee must be able to demonstrate this understanding prior to any unsupervised exposure to fall hazards and use of fall protection equipment.
- 9.3 Upon completion of the required training a written certification record is prepared, which contains the name or other identity of the employee trained, the date(s) of the training, and the signature of the person who conducted the training or the signature of the employer.
- 9.4 Retraining shall be conducted when the supervisor/department manager has reason to believe that any affected employee who has already been trained does not have the understanding and skill required by this program. Circumstances where retraining is required include, but are not limited to, situations where:
- 9.4.1 Changes in the workplace render previous training obsolete; or
  - 9.4.2 Inadequacies in an affected employee's knowledge or use of ladders and fall protection systems or equipment indicate that the employee has not retained the requisite understanding or skill.

## **10. RECORDKEEPING REQUIREMENTS**

10.1 The CNSE facility maintains the following Ladder Safety files in the EH&S Departmental office:

- Documented Annual Inspections of fixed ladders, and
- Training Records.

10.2 Records that are maintained pursuant to this section must be kept for a minimum of three years unless otherwise indicated.