



# **Bangladesh Power Development Board**

**INTEGRATED MANAGEMENT SYSTEM  
(BASED ON ISO 9001:2015, ISO 14001:2015 & ISO  
45001 :2018 STANDARDS)**

**LADDER & SCAFFOLD SAFETY**



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### LADDER & SAFETY

#### 1. Purpose

The purpose of this procedure is to give guidance on the provision and use of Ladders, and Scaffolding. Application of these guidelines will assist in the prevention of persons or tools/equipment falling from their places of work, causing possible injury and or damage to persons and equipment. Control and monitoring of the erection, usage and dismantling of scaffolding shall be carried by way of the Scaff-tag System in conjunction with the Lock Out and Tag Out Procedure.

#### 2. Scope

The procedure applies to all the sites of BPDB.

#### 3. Terms and Definition

None

#### Abbreviations

**BPDB** - Bangladesh Power Development Board

#### 4. Roles and Responsibility

None

#### 5. Procedures

##### 5.1 Ladders

##### 5.1.1 General

Ladders must be properly maintained and used only after careful assessment of the risks involved. In particular, a ladder should not be used as a place of work unless the work is of short duration and such that it is within easy reach and can be carried out with one hand, the other hand being on the ladder for support.

##### 5.1.2 Portable Ladders

Only non-conductive ladders must be used. Ladders with metal reinforcement must not be used on any work around electric circuits or equipment, and they must not be allowed on BPDB power plants or substation premises.

Ladders should be erected on a firm level base and should be supported by stiles only. Both stiles of the ladder must be set firmly against the solid support at the top and should be secured at the top by lashing or clamping each stile to a convenient secure anchorage to prevent slipping of the ladder.

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The head of the ladder should rest on a firm solid surface.

Ladders must not be used as a scaffold or platform support.

Ladders must be equipped with ladder shoes and must be secured against slipping by at least one of the following methods:

- Tying or fastening top and bottom.
- Cross board or hooks, at the top of the rails.
- In certain instances, it may be sufficient to have the bottom of the ladder held by another employee.

The correct slope for a ladder is an angle of about 75 degrees to the horizontal i.e. one yard out horizontal for every four yards of height. Other way, the distance of the foot of the ladder from the wall or pole should be form one-quarter to one-third the length of the ladder.

The hoisting rope of extension ladders must be tied in such a manner as to prevent collapse of the ladder in the event that the rung supporting the hook breaks.

Where a ladder cannot be secured at the top, it must be secured near its base by means of guy ropes secured between stiles and stakes embedded into the ground or to the other suitable anchorage. The feet of the ladder, where possible, should be heeled in. If no other means of securing the ladder, to prevent slipping, can be used, then someone must hold it at the base whilst it is in use.

The base of the ladder must have secure footing. On sloping or uneven surfaces where there is no firm level base, a foot ladder board should be used. Non-slip pads can be used on slippery floor surfaces. Persons should face towards the ladder while ascending or descending. Only one person should be permitted on a ladder at any one time. If ladders are used to gain access to a roof or a working platform, the ladder must extend at least 1 yard above the landing place to ensure adequate handhold. If this is not possible then a nearby suitable handhold must be provided.

Ladders must not be tied together to provide longer sections. They must be fitted with the hardware recommended by the manufacturers and the extension should be done by overlapping, at least four rungs of adjacent ladders.

Ladders are not to be used in a horizontal position or as braces, skids, guys or gin poles, gangways, or for any uses other than as ladders. Ladders must not be placed in front of a door that opens toward the ladder, unless the door is locked, blocked or guarded and suitable warning notices displayed.

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Employees must not use ladders unless hands and shoes are free of slippery grease, oils, and mud.

Employees must have both hands free when climbing and descending ladders and should face the ladder at all times.

Where ladders rise more than 9 yards in vertical height, an intermediate landing place must be provided. Landing places must be fitted with guardrail or other effective barrier and toe boards if materials are to be stored on it.

Whenever ladders pass through platforms, the openings should be no longer than is reasonably practicable and leaving sufficient platform for access.

#### 5.1.3 Fixed Ladder

Rungs of ladders must be free of splinters and burrs. Ladders must have cages if they are longer than 6 yards. Landing platforms must be provided on ladders greater than 9 yards long. A platform is required every 9 yards for caged ladders and every 6 yards for unprotected ladders. Side rails must extend at least 1.1 yards above landings. There must be a clear width of 375 mm on each side of the center line of the ladder, unless the ladder is equipped with a cage.

Ladder safety devices such as safety feet, tie rod or guy rope may be used on towers, water tank and chimneys, ladders over 6.0 yards.

#### 5.1.4 Stepladders

Stepladders shall be equipped with a metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in open position.

#### 5.1.5 Inspection of ladders

All ladders should be inspected monthly and the following points should be checked:

- Rungs for signs of undue wear or movement. No rungs should be missing
- Wedges and tie rods for tightness. Metal reinforcements to stiles for correct position
- Feet for splitting and fraying

Inspection will be performed by Maintenance department using standard checklist (GPP-SP-2.1) prior to use.

#### 5.1.6 Care of ladders

Portable ladders should be maintained in good condition at all times, with tight joints, securely attached hardware and fittings, and freely operating movable parts. They must be inspected frequently for unsound rungs, cracks and splinters in the side rails. Defective ladders must be

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tagged DANGEROUS – DO NOT USE and removed from service for repair or destruction. Ladders with broken or missing steps, rungs cracked or broken stiles, or other faulty equipment must not be used.

Store ladders on edge (horizontally) in special racks or wall brackets that protect the ladder and provide a sufficient number of supporting points to prevent sagging and permanent set. Be sure the storage facility provides ample access to prevent accidents when removing or replacing ladders.

Complete ladder inspections should be frequent, especially if exposed to heat, corrosive atmosphere, oil and grease.

### 5.2 Erection and use of scaffolds and platforms

#### 5.2.1 General

Scaffolds shall be furnished and erected for persons engaged in work that cannot safely be performed from the ground or from part of a structure.

The erection of scaffolding must be properly planned to ensure that it will meet workplace requirements and is designed to carry necessary load and sufficient materials are available.

All scaffoldings should be erected, altered and dismantled by trained and experienced personnel.

Responsibility for the inspection and maintenance of scaffolding should be clearly assigned to a suitably experienced and qualified person whose duty should include the completion of Scaffold System.

Scaffolds shall be erected on sound and rigid footing. A scaffold and its components shall be capable of supporting, without failure, the weight of the men and materials, the self-weight of the scaffold and other imposed loads such as wind and accidental impact.

Standards or uprights can be directly placed on the hard surfaces. Metal packing or base plates should be used below each standard on surfaces such as asphalt, timber or flooring. Sole plates of timber should be used beneath the base plates on surfaces which would be penetrated like, soil, gravel, etc.

Standard railings and toe-boards shall be installed on all open sides and ends of platforms 2.0 yards or more in height.

Scaffolds will be erected or modified under the supervision of a qualified person. Scaffold assemblies will be inspected before use and after modifications or adjustments have been made. Scaffold assemblies will be equipped with proper railing and decking.

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#### 5.2.2 Performance Criteria:

##### 5.2.2.1 Erection

- A designated competent person must supervise all erecting, altering, or dismantling of scaffolding.
- Erect scaffolding plumb and only on a sound foundation that is capable of supporting the scaffold and its intended load without tipping or settling.
- Provide a safe means of access to all scaffold platforms.
- Completely deck work platforms with scaffold-grade planking.
- Secure planking in place
- Equip scaffold platforms erected 6 feet (2 m) or more above ground (or adjacent surface) with a standard guardrail system. The guardrail system consists of:
  - Top rail
  - Mid rail
  - Tow boards
  - That will support at least 200 pounds (90 kg) lateral force

A registered professional engineer must design all scaffolds which are over 125 feet (38 m)

##### 5.2.2.2 Types

###### Welded Frame Scaffolds

- Provide adjustable or plain base plates with adequate mudsills on soft ground.
- Never extend adjustable bases more than 18 in (7 cm)
- Cross-brace each scaffold section.
- Where uplift may occur, couple sections together with pins that can be locked.
- Secure scaffolds taller than four full sections or 20 feet (m) with guy wires (or other means) at least every 26 feet.
- Provide positive locking devices for rolling scaffolds with casters.
- Never use casters with adjusting screws
- Never exceed four times the minimum base dimension on freestanding scaffolds.
- Never ride on rolling scaffolds.

###### Tube and Coupler Scaffold (Pole Scaffold)

- Provide diagonal and cross bracing on each vertical section on at least two sides
- Never exceed 6 x 10 feet with upright pole spacing.
- Bearers and runners (horizontal members must be at least 4 inches longer than the post spacing, but not more than 12 inches longer.

###### Suspended Scaffolds

- Suspended scaffolds must be erected by qualified personnel
- Inspect scaffolds before and during use

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- Equip all scaffolds with separate vertical safety lines, anchored independently of the scaffold system.
- Secure workers to the vertical safety lines.

#### 5.2.3 Inspection

- Inspect all scaffold components before erecting and during dismantling. Discard parts with defects. Include the following in the inspection: Handrails, midrails, cross bracing and steel tubing for nicks, especially near center span, and indications where a welding has struck.
- Components for straightness and freedom from bends, kinks, dents and severe rusting.
- Weld zones for cracks and ends of tubing for splitting or cracking
- Manufactured decking for loose bolt or rivet connections and bent kinked or dented frame.
- Plywood surfaces for softening due to rot, wear, peeling, or laminated layers at edges.
- Check safety plank for rot cracks and other damage.
- Each quick-connecting device operates properly
- Casters for smooth rolling surfaces, free turning, free acting swivel and to be sure that the locking mechanism is in good working order.

#### 5.3 Procedure steps for erecting scaffolds

**Scafftag system is employed to assess the accessibility of scaffolds. There are two tagging systems: (1) RED → Do Not Use scaffold (2) GREEN → Safe to Use scaffold**

1. Identify scaffolding required for work.
2. Raise “request form” for construction of Scaffolding.
3. Scaffold request approved.
4. Scaffolders will erect scaffold and attach a Red “Scaff tag” to the structure. Use proper length of safety harness when working above 2 metres.
5. It is critical that a competent person must examine scaffold. Person completes the “Scaffold Safety Checklist”
6. If unsatisfactory, scaffolders will carry out the necessary remedial work and the scaffold will be re-inspected.
7. If satisfactory, competent person completes “Scaff tag” record of inspection.
8. Green “Scaff tag” is inserted into holder, covering the red sign.
9. The “scaffold” will be recorded in the HSE Officer’s Scaffold Register.

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10. Every seven days, after alteration or severe weather, scaffold must be inspected before use (back of the green tag).
11. After use, scaffold-dismantling request made.
12. Scaffolds remove Green tag and dismantle scaffold.
13. "Scaff tags" returned to competent person.

**IN ANY CASE OF DOUBT AS TO THE SAFETY OF A SCAFFOLD, THE GREEN TAG MUST BE REMOVED AND RETURNED TO THE COMPETENT PERSON FOR AN INSPECTION TO BE CARRIED OUT PRIOR TO USE OF THE SCAFFOLD.**

#### 6. References

ISO 45001: 2018 Standard

#### 7. Appendix

BPDB-IMS-CL-006 - Ladder Safety Checklist  
BPDB-IMS-CL-007 - Scaffold Safety Checklist

#### 8. Revision History

SI. No.	Revision Number	Section	Change Made	Date of Revision

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