IS 13416-2 (1992): Recommendations for preventive measures against hazards at workplaces, Part 2: Fall prevention [CED 29: Construction Management including safety in Construction]

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IS 13416 ( Part 2 ) : 1992
( Reaffirmed 2002 )

भारतीय मानक

# कार्यस्थलों पर खतरों के विरूद्ध एहतियाती उपाय – सिफारिशें

## भाग 2 गिरने को रोकना

*Indian Standard*

# PREVENTIVE MEASURES AGAINST HAZARDS AT WORKPLACES — RECOMMENDATIONS

## PART 2 FALL PREVENTION

UDC 69·055·4-783·4 : 658·382



BUREAU OF INDIAN STANDARDS
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Price Group 1

## FOREWORD

This Indian Standard ( Part 2 ) was adopted by the Bureau of Indian Standards, after the draft finalized by the Safety in Construction Sectional Committee had been approved by the Civil Engineering Division Council.

On many occasions accidents take place at construction worksites due to fall of persons. Some times such fall may be serious and may lead to death The fall may be from scaffolds, gangways, ladders, cranes, collapse of excavation, etc. It is, therefore, necessary to identify the areas where such fall may take place and to adopt necessary measures to prevent hazards due to such fall.

*Indian Standard*

# PREVENTIVE MEASURES AGAINST HAZARDS AT WORKPLACES — RECOMMENDATIONS

## PART 2 FALL PREVENTION

### 1 SCOPE

**1.1** This standard ( Part 2 ) lays down the types of falls of persons at construction sites and measures required to prevent such falls and the consequent hazards.

### 2 REFERENCE

**2.1** IS 3696 ( Part 2 ) : 1991 'Scaffolds and ladders — Code of safety : Part 2 Ladders ( *first revision* )' is a necessary adjunct to this standard.

### 3 TYPES OF FALLS

**3.1** Different categories of falls at worksite are generally as follows:

a) From height such as various floors, scaffolding, sloping roofs, hoists, ladders, steps, poles and platforms, etc, erected for execution of the work;

b) In pits such as lift shaft, down stairs, chutes, basements and excavations, etc;

c) In water such as wells, sea, rivers, etc;

d) In sewers;

e) Through roof covering such as tiles, slates, sheets, etc;

f) Through manholes or in tunnels containing foul air, dirty water and filth; and

g) From chimneys, steel structures, plant and machinery, etc, such as hoists, cranes, trucks, dumpers etc.

**3.2** The fall may also be flat on floors/ground due to various reasons mentioned below:

a) Stepping on objects, slipping or tripping;

b) Striking against objects; and

c) While pushing wheel barrows, trolleys, tipping wagons, etc.

### 4 MEASURES FOR FALL PREVENTION

**4.1** The various methods and precautions for preventing accidents due to fall are given in **4.1.1** to **4.1.9**. Safety belts and harnesses prevent fall of workers while working at heights and hence shall be used, where necessary.

**4.1.1** *Fall from Ladders*

Accidents from ladders are mainly due to slipping or falling of persons. Precautions recommended in IS 3696 ( Part 2 ) : 1991 shall be followed while using ladders. However, the following salient points should be specially taken care of:

a) Safe anchorages on firm footing should be provided.

b) Swaying, sagging, movements on sides should be avoided.

c) The ladders should be placed at correct angle of repose [ *see* IS 3696 ( Part 2 ) : 1991 ].

d) Equal support on each side of stile should be provided.

e) Special precautions should be taken in bad weather, specially windy conditions. Shoes with mud, grease/oil should be avoided while climbing.

f) While erecting a ladder in front of any opening, care shall be taken to keep watch on the traffic.

g) The gap between the last rung and the top floor level shall not be kept more than 220 mm.

h) The ladders should be sound, free from loose nails, screws cracks and other defects. These should be checked weekly/periodically and damaged ones repaired or removed from site [ *see* IS 3696 ( Part 2 ) : 1991 ].

**4.1.2** *Fall from Hoists*

Provision of gates for hoists and wire nets on each floor/landing should be made to prevent fall of workers.

**4.1.3** *Fall from Scaffoldings, Stagings, etc*

All stagings, scaffoldings or platforms should stand on firm ground and should be secure, properly anchored and provided with railings at least 900 mm high. Toe boards at least 100 mm high should also be provided to prevent fall of persons.

**4.1.4** *Fall from Floors and Various Storeys*

All floors after casting should be provided with walls at end as soon as possible to prevent fall of persons. In case of delay, safety parapet barricades should be provided. Unauthorised persons should not be allowed and if work is carried out beyond day light, artificial lights should be provided. All types of floor opening shall be covered or barricated to avoid fall through the openings.

**4.1.5** *Fall from Sloping and Fragile Roofs, etc*

For sloping and fragile roof self-supporting platform should be used. Safety nets may also be provided inside below the roof. The workers should be provided with safety belts, safety harness, helmets, etc. Securely supported crawling boards or ladders shall be used while working on fragile roof.

**4.1.6** *Fall in Pits, Excavations, Lift Shafts, Down-stairs, Chutes and Basements, etc*

All accesses should be barricaded to prevent accidental fall.

**4.1.7** *Fall in Water, Wells, Sea, Rivers and Ponds, Etc*

Persons working should have proper attire, safety belts or harnesses. A good swimmer trained for rescue and providing first aid should be employed. He should also keep watch on workers engaged in such typical situations.

**4.1.8** *Fall in Sewers, Tunnels, Man-holes, etc*

Special regulations for working in sewer lines, manholes and tunnels as recommended by the appropriate authority should be strictly followed.

**4.1.9** *Falls from Chimneys, Structural Framework, Plant and Machinery*

Such falls should be prevented by following the safety regulations in letter and spirit. Provision of railings, cat-walks, wire-mesh, safety belts and harnesses, etc, reduce chances of fall. Safety belts and harnesses save workers from grave injuries.

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