


NEBOSH National Certificate in Construction Safety and Health

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
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Unit 8 Working at height - hazards and control

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Work at height

Overall aims of unit

- The hazards presented by construction work where there is a risk of falling from a height
- The precautions necessary to control these hazards and to reduce the risks they present

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Work at height

Contents of unit

- Hazards and risk factors
- Control strategies for persons working at height
- Roofwork
- Protection of others
- Working over water

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Work at height

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Work at height

Hazards and risk factors

Falls of persons from height

Typical work activities and injuries

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Work at height

Hazards and risk factors

Falls of persons from height

Typical work activities and injuries

- Scaffold erection
- Fixing of cladding, roof work
- Painting and decorating
- Bricklaying
- Demolition / dismantling
- Electrical installation
- Plastering / rendering
- Carpentry

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Work at height

Hazards and risk factors

Falls of persons from height

Typical work activities and injuries

- Scaffold erection
- Fixing of cladding, roof work
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- Bricklaying
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Injuries can vary upon the distance of fall, environment and protection provided:

- Sprains, strains, twists
- Internal injury / bleeding
- Head injuries
- Fractures, breaks
- Paralysis (various degrees)
- Fatality

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Work at height


Hazards and risk factors

Falls of persons from height

Distance

- The risk of serious injury increases as the distance a person may fall increases
- Falls of a distance of more than 2 metres have resulted in serious injury and often death
- Serious injury and death does also occurs from falls of less than 2 metres
- The Work at Height Regulations seeks to avoid work at height

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Work at height


Hazards and risk factors

Falls of persons from height

Reg. 6
Work at Height Regulations

- Make a risk assessment
- Not reasonably practicable to do otherwise
- Suitable and sufficient measures to prevent falls of any distance
 - existing places of work
 - schedule 1, ergonomic
- Minimise distance
- Minimise consequence
- Additional training and instruction

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Work at height
 Hazards and risk factors

Falls of persons from height


Other hazards

- 20% roof worker fatalities

Fragile roofs, roof lights

- Falls mainly through fragile materials - asbestos, fibreglass, plastic
- Falls through roof lights and voids
- Walking along purlins or roof ridge
- Warning signs should be displayed at all access points informing of fragile roof
- Use proper access and crawler boards or roof ladder provided

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Work at height
 Hazards and risk factors


Falls of persons from height

Other hazards

- Materials that are naturally fragile or brittle tend to become more fragile with age and effects of erosion and deterioration
- Steel sheets may weaken due to corrosion which may not always be visible from outside
- Inadequate support may cause roof material to collapse under extra weight

Deteriorating materials

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Work at height
 Hazards and risk factors

Falls of persons from height


Other hazards

- Slippery conditions

Weather

- Following / during rainfall
- Following / during snowfall
- Ice & frost conditions
- Heat exhaustion / collapse
- Windy conditions
- Foggy / misty conditions
- Extreme cold may increase the risk of brittle failure of roof materials

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Work at height
 Hazards and risk factors


Falling materials

Typical work activities and injuries

Loose material falling from existing structures:

- Tiles
- Render
- Glass
- Storage of materials at height
- Equipment accidentally knocked off
- Throwing objects off and up to a place of work at height
- Missing protection devices e.g. toe and walk boards, tool rolls, netting, mesh guards, fans, waste chutes

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Work at height

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Work at height

Control strategies

- Hierarchy of measures
- Scaffolding
- Other techniques for working at a height
- Fall arrest equipment

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Work at height


Control strategies

Hierarchy of measures

Avoidance

- Can the hazard of working at height be avoided?
- Ready finished materials e.g. to avoid painting
- Specialist tools to work from ground
- If not, other precautions need to be considered

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Work at height


Control strategies

Hierarchy of measures

Working platforms

- Wide enough
 - At least 600mm wide
- Free from openings or unsupported boarding causing traps
- Constructed to prevent materials falling
 - Toe boards, close boarded
- Kept free of trip and slip hazards
- MEWPs mesh floor fine enough to prevent slips and materials falling through

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Work at height


Control strategies

Hierarchy of measures

Personal suspension equipment

- Where platform not practicable
- e.g. Boatswains Chair
- Tool / material buckets fixed rigidly to equipment, if used
- Fall arrest equipment to be used with this equipment

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Work at height


Control strategies

Hierarchy of measures

Fall arrest equipment

- Harness system where other means impracticable
- Absorb energy through lanyard device
- Inertia reel type preferred
- Lanyard type may cause injury due to force of sudden stop
- Emergency rescue and first aid procedure

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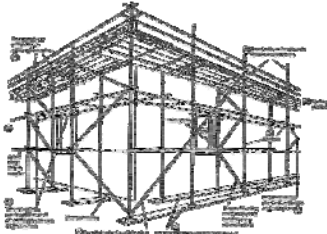
Work at height

Control strategies - scaffolding

Design features of scaffolding


Independent tied scaffold

- Constructed independently of the main structure using two sets of standards
- Tied to the structure through reveal ties, through ties, box ties or metal fixings installed into the structure
- Tied at every 20m sq
- Reveal ties not to exceed more than 50% of the tie ratio



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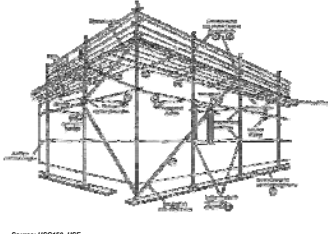
Work at height

Control strategies - scaffolding

Design features of scaffolding


Putlog scaffold

- Putlog - a tube with a flattened end
- Is not independent of the structure
- Used to span from a transom to a bearing in or on a brick wall
- Putlogs may be used to support scaffold boards



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Work at height
Control strategies - scaffolding

Design features of scaffolding

Fan scaffold

- Scaffold boards fixed at an angle to the scaffold to catch falling debris
- Provides protection to persons below - at entrances or along the footpath
- May require barriers at entrances to guide people below the fan / canopy

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Work at height
Control strategies - scaffolding

Design features of scaffolding

Cantilevered scaffold

- Extension of a normally constructed scaffold to allow additional staging or work platform
- The weight of the main body of the scaffold counterbalances the cantilevered section
- The cantilevered section can be braced from the standards of the main body of the scaffold

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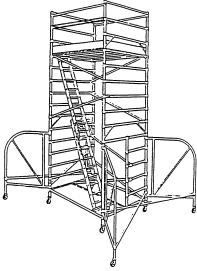


Work at height
Control strategies - scaffolding

Design features of scaffolding


Mobile tower scaffolds

- Erect on firm, level ground
- Height less than 3 x base width (outside)
- Height less than 3.5 x base width (inside)
- Use outriggers or tie to structure if more than this
- Internal access
- Wheel brakes on when in use
- Push at base level
- Do not move with people/equipment on it
- Do not use near over head obstructions
- Provide guardrails and toe boards



Source: HSG 150, HSE

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Work at height
Control strategies - scaffolding

Safety features

Base plates

- Square metal plate with a short spigot in the middle
- Spreads the load and helps to keep the standard in its vertical position
- Text

Sole boards

- Spread the weight
- Provides firm surface for scaffold erection
- Run under at least 2 standards per board

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Work at height
Control strategies - scaffolding

Safety features

Toe boards

Prevent people slipping under rails and materials being knocked off platform

- Fixed to the inside of the standards with toe board clips
- Minimum height of 150mm
- Joints near to standard
- Need to be continuous around work platform
- Replaced immediately after temporarily removal

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