National Construction Certificate

SAMPLE RESOURCES

This RMS sample resources pack contains a selection of powerpoint slides together with a supporting lesson plan and are representative of the full set of RMS trainer materials for the NEBOSH National Construction Certificate qualification.

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Element 7
Working at height

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The risks of working at height

- Vertical distance
- Roofs
- Deterioration of materials
- Unprotected edges
- Unstable/poorly maintained access equipment
- Weather
- Falling materials

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The risks of working at height

Vertical distance

- Where work is carried out above 2 metres (vertical distance) the risks of major injury or death are considered to be very significant, for example, work on a roof or scaffold
- However, major injuries can still occur at a height of less than 2 metres, for example, while fitting false ceilings or installing utilities inside buildings
- The Work at Height Regulations (WAHR) 2005 reflect this risk and require controls to be in place to manage the risk of falling, whatever the height
- Employers must also make a risk assessment, as required by Regulation 3 of the Management of Health and Safety at Work Regulations (MHSWR) 1999

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The risks of working at height

Roofs

- The risk of people or materials falling affects the safety of those working at height and those working beneath
- Any roof that has not been specifically designed to carry a load, other than that which may be imposed on the roof by weather, should be considered a fragile roof and should not be walked on
- Materials such as asbestos cement, glass, corrugated metal, slates, tiles or plastic are likely to be unable to bear the weight of a person
- Sloping roofs are those with a pitch greater than 10 degrees - the slope may cause workers working on the roof to slide off the edge
- The slipperiness of the surface of the sloping roof will greatly influence the risk of sliding off

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The risks of working at height

Deterioration of materials

- The materials of a structure can deteriorate over time, which can reduce the strength or properties of the material
- The rate of deterioration of materials will accelerate if the structure is exposed to adverse weather conditions (including extremes of temperature) or attack by chemicals, animals, insects etc
- Asbestos cement materials can lose cement bond due to weathering, metal sheets can become reduced in thickness and strength due to rusting and plastic materials may become brittle when exposed to sunlight
- It may not always be obvious that deterioration has occurred and this should be a factor considered in the pre-work assessment

New and deteriorating materials:

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The risks of working at height

Unprotected edges

- Roofs, scaffolds, unfinished steel work and access platforms may sometimes have open sides
- This increases the likelihood of someone or something falling, particularly if people have to approach the unprotected edge, work at them or pass by them repeatedly
- It is very easy in these circumstances to lose perception of the hazard an unprotected edge presents and forget that it is there
- Errors can easily lead to fatal falls, e.g. stepping back over an edge, overreaching or being pushed over the edge whilst manoeuvring materials

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The risks of working at height

Unstable/poorly maintained access equipment

- If access equipment - like mobile elevating work platforms (MEWPs), ladders and scaffolds - is not stable it could move suddenly or fall over causing those using it to fall
- Instability is often caused by unstable or uneven ground conditions where the equipment is positioned
- Scaffolds that are not adequately tied to a structure could become unstable as could access equipment that is overloaded, used without outriggers or operating outside its stability base
- Poorly maintained access equipment can lead to sudden failure of the equipment and workers falling from height

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The risks of working at height

Weather

- Rain, snow and ice increase the risk of slips and falling from height
- When handling large objects, such as roof panels, strong winds can be a serious problem and may cause a worker to be blown off access equipment or a roof
- Extremely cold temperatures can increase the likelihood of brittle failure of materials and therefore increase the likelihood of failure of roof supports, scaffold components and plastic roof lights
- In cold weather moisture can freeze - increasing the slipperiness of surfaces and ice may not be easily visible
- Workers exposed to the cold can lose their dexterity and when hot, sweat may cause them to lose their grip

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The risks of working at height

Falling materials

- The risk of materials falling from height is increased by:
  - Poor housekeeping of people working at height
  - Absence of toe boards, brick guards, nets and sheeting
  - Incorrect hooking and slinging when using a crane
  - Incorrect assembly of gin wheels for raising materials
  - Surplus materials incorrectly stacked
  - Workplaces not kept clear of loose materials
  - Absence of waste chutes
  - Open, unprotected edges
  - Gaps in platform surfaces
- Workers and other people nearby may also be at risk of being injured when materials are deliberately thrown from a workplace at height

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Approach to working safely at height

In summary, the approach to working safely at height is:

1. Avoid working at height, if this is not reasonably practical
2. Prevent a fall from occurring by using an existing workplace that is known to be safe or use suitable equipment, where reasonably practical measures taken to prevent a fall do not eliminate the risk of falling
3. Minimise the distance and/or consequence of a fall

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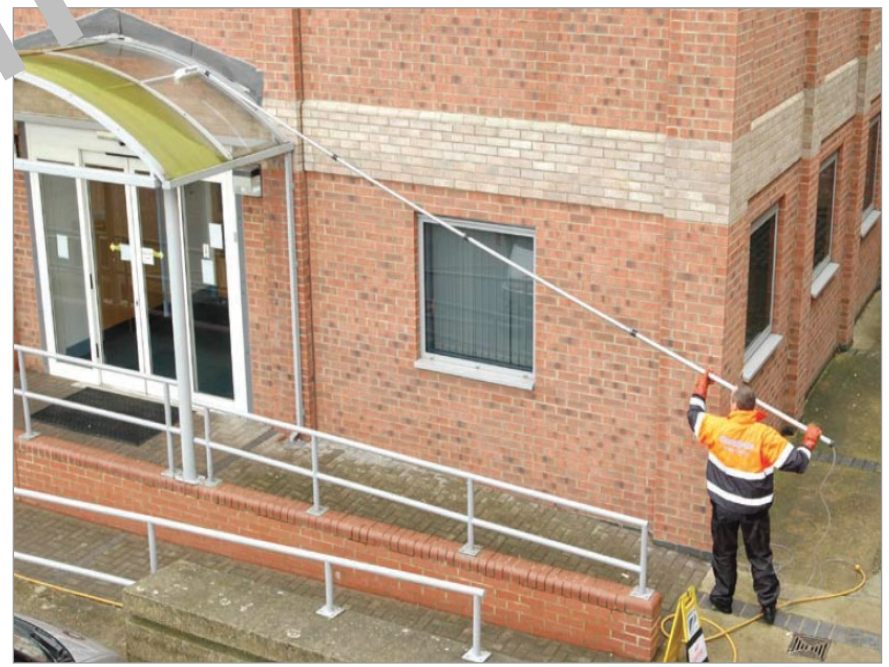
Approach to working safely at height

Avoiding working at height

- Where possible, work at height should be avoided
- This could be achieved by using different equipment or methods of work to conduct work at ground level, for example:
  - Instead of assembling materials or equipment at height pre-assemble them before delivery or on the ground on site
  - Materials can be treated or painted at ground level before assembly or fitting
  - Carrying out work from the ground using long reach tools
  - Lower equipment to the ground for maintenance or cleaning, for example lighting units

Using a pole to avoid work at height:



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Approach to working safely at height

Preventing a fall by using existing workplaces or suitable equipment

- If work must be done at height, where possible use an existing workplace that is:
  - Stable and of sufficient strength and rigidity for the intended use
  - Sufficient in dimensions to provide a safe working area, having regard to the work to be done
  - Suitable and sufficient for preventing a fall – for example, has fixed guardrails
- By using more permanent workplaces, design features that provide collective protection can be built in to the structure more easily, making the need to use personal protective measures less likely
- Provide work equipment to prevent falls
  - Where no existing, safe workplace is available it will be necessary to provide work equipment that enables safe work at height and prevents workers falling
  - This could be in the form of scaffolding, barriers that provide edge protection, provision of a MEWP or work restraint systems
- Collective measures must be given priority over personal measures

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Approach to working safely at height

Preventing a fall by using existing workplaces or suitable equipment

Use of a work restraint system to prevent worker going near the unprotected edge:

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Approach to working safely at height

Minimise the distance and/or consequence of a fall

Collective fall arrest measures:

- Are preferred to personal fall arrest measures
- Provide protection for all workers rather than individuals
- Include equipment designed to minimise the distance and consequence of falls by providing an energy absorbing 'soft landing' - such as nets and air bags

Personal fall arrest measures:

- If fall prevention measures (for example, working platforms, barriers or guard rails) and collective fall arrest measures are not practical, personal protective measures must be used
- Include work positioning systems, rope access systems or personal fall arrest systems

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Approach to working safely at height

Minimise the distance and/or consequence of a fall

Soft landing system - safety net:

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Approach to working safely at height

Minimise the distance and/or consequence of a fall

Soft landing system - air bags:

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Approach to working safely at height

Minimise the distance and/or consequence of a fall

Personal fall arrest system:

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Main precautions necessary to prevent falls and falling material

Proper planning

- Planning must include the selection of suitable equipment, take account of emergencies and give consideration to weather conditions impacting on safety
- Careful consideration during the risk assessment phase of work planning should establish if work at height can be avoided, if not which equipment is best suited for the working environment and the work to be done
- Every employer must take reasonably practicable steps to prevent injury to any person from the fall of any material or object
- Planning should consider what will need to be done when a worker falls from height and the nature of this emergency

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Main precautions necessary to prevent falls and falling material

Carried out safely

- Supervision - although workers have a responsibility to ensure they use the fall prevention and protection measures correctly, adequate supervision must be provided to ensure they do
- Avoiding working in adverse weather - wind, rain, sun, cold, snow and ice - particularly in extreme cases, can present a significant hazard to work at height
- Inspection - It is good practice, and a legal requirement, to inspect access equipment routinely and to ensure that the person carrying out the inspection is competent to do so
- Competent - People engaged in any activity in relation to work at height must be competent - if under training they must be supervised by a competent person

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Emergency rescue

- When selecting equipment for work at height the employer must consider additional risks that may arise from emergencies and the need for evacuation or rescue from the equipment, including:
  - Clear emergency escape routes from major scaffold installations
  - Rescue arrangements for workers where a MEWP fails in its raised position
  - Rescue for those on a fall arrest net or in a harnesses
- Steps must be taken to minimise the risk of injury due to the fall or contact with the fall arrest system
  - Even a short fall onto a net or other system could cause minor injuries or fractures
  - This should be anticipated and workers taught how to minimise the likelihood of injury

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Instruction, training and other measures

Instruction and training

- Employers should ensure that no one engages in any activity in relation to work at height unless they are competent to do so
- If they are being trained, they must be supervised by a competent person
- Workers should receive full training and instruction on the use of equipment to prevent and minimise the consequences of a fall
- Where personal fall arrest systems are to be used, this should include how to wear the equipment, how to fit it to anchor points, what is a suitable anchor point and how to attach it at a height that minimises the fall
- Training should also include the checks that need to be made on collective fall arrest systems before they are used, such as checks on the security of nets and the adequacy of airbags

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Instruction, training and other measures

Requirements for head protection

- Head protection, usually in the form of a hard hat, is required where there is a foreseeable risk of injury to a worker's head from being struck by falling materials
- A wide range of hard hats are available
- Actions to be taken include:
  - Decide on which areas of the site require hats to be worn
  - Make site rules and tell everyone
  - Provide workers with hard hats
  - Make sure hard hats are worn and worn correctly

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Element 7
Working at height

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NEBOSH Health and Safety Management for Construction (UK)

Lesson Plan - Day 1

TIME	ELEMENT/TOPIC	CONTENT	RESOURCE/TASK
09.00	Welcome		Complete attendance sheet
	Introduction	Name, job, background, experience	Name ...ds/flip chart/marker pens **Ice ...aker:** Spilt t... ...up into teams of three or four. ...eam memb...s to interview ...ch ...er and find out hobbies/ li...s/dislikes etc and repr...nt these pictorially. Team to ...e themselves a name and introduce their team to the wider group.
	Course plan	Admin arrangements toilets/meals/exist/smoking/mobile p...ne...etc. Course content, course materials Syllabus and OBE exam structure/arrangements Progression onto other qualific...ions	Complete paperwork if necessary
	Programme for the week	Topics to be covered	Slides
09.00	**Element 1: The foundations of construction health and safety management**	Assessm... ...eria • 1.1 Discuss the mor... ...ancial and legal reasons for managing health and ..., ...the workplace • 1.2 Sum...arise the main health and safety duties under the Construction (Desig...and Management) Regulations 2015 and how contractors should be selected, monitored and managed • 1.3 Summarise the types of construction work and range of activities • 1.4 Identify what to consider during a construction site assessment • 1.5 Identify how to keep a site secure and in good order • 1.6 Summarise how to manage temporary construction works • 1.7 Outline what welfare arrangements should be on site and other particular construction issues	Slides / Flipchart Introduction to element *Group discussion* *What influences your organisation to manage health and safety? Consider internal and external influences*
	1.1 Morals and money	• Moral expectations of good standards of health and safety	Slides *Emphasise the size of the health*

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TIME	ELEMENT/TOPIC	CONTENT	RESOURCE/TASK
			problem *Optional video – Real people http://www.hse.gov.uk/aboutus/realpeople.htm* *Download the most recent HSE statistics and cover main points* *Ask students if they have experienced an accident they can talk about – what was their personal experience?*
		• The financial cost of incidents (insured and uninsured costs)	*Optional DVD: The Secret Syphon available from 'outtakes film communications'* *Use a case study to get learners to identify costs associated with an accident. Record answers on a flip chart and ask learners to identify those that can be insured from other costs.*
10.45	**Break**		
11.00	1.2 The Construction (Design and Management) Regulations 2015	Roles, responsibilities and duties of the following: • Client • Principal designer • Designer • Principal contractor • Contractors • Workers • Domestic clients • When the HSE need to be notified • Pre-selection and management of contractors, including third-party auditing schemes • Effective planning and co-ordination of contracted work, including interaction with existing staff	Slides The current version is available from this link: http://www.hse.gov.uk/pubns/priced/l153.pdf Health and safety in construction HSG150 https://www.hse.gov.uk/pubns/books/hsg150.htm Explains the essential tasks for achieving healthy and safe construction sites.

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TIME	ELEMENT/TOPIC	CONTENT	RESOURCE/TASK
		• Preparation of pre-construction information, construction phase plan, health and safety plan, health and safety file (including the purpose, requirements and an example of a plan)	*The HSE also has a dedicated webpage:* *Health and safety in the construction industry* *https://www.hse.gov.uk/construction/index.htm* *It offers useful supporting information and advice in support of your study and potential role within your organisation*
12.30	**Lunch**		

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